ABSTRACT

In the recent years, Indian passenger car market has witnessed a tendency among the car manufacturers for shifting to small passenger cars. India is emerging as a huge potential for small cars. Launch of ‘Tata Nano’ and recent announcement by Bajaj Auto for ‘RE60’ are steps in the same direction. Small cars are less expensive, and therefore, are easily affordable. They may replace many two wheelers from road; as a result, problems of traffic, pollution, and parking may arise. This article is an attempt to study the probable consequences and possible solution for such problems, particularly in the NCR region.

Key Words: Control of vehicular pollution; Traffic congestion; Vehicular pollution; Emission regulations

INTRODUCTION

Launching of Tata’s ‘Nano’, world’s cheapest car invites attention from all corners of the society, particularly from the car manufacturers. In the recent Auto Expo 2012, Bajaj Auto too, unveiled its low cost small passenger car RE60 in competition to Nano. Where on the one hand, car manufacturers are preparing to give Nano tough competition, on the other hand, the society is worried about the probable problems of excessive bombardment of cars on the roads. As it is expected to drastically increase the vehicles on roads, the other problems related to pollution, parking and traffic congestion could also arise. The problem seems to be more acute in metro cities than in the non-metro ones.

Hon’ble Supreme Court has issued several directions for control of vehicular pollution in Delhi NCR. It includes strict enforcement of restriction on plying of goods vehicles during the day time, elimination of leaded petrol, comprehensive inspection and maintenance, strengthening of existing air quality monitoring stations and setting up of new stations, to name a few. Alternate fuel to control the pollution is also being tried by the companies.

Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG) have emerged as attractive alternative fuels due to their clean burning characteristics and very low amount of
exhaust pollution. Besides, other means of transport like Metro Rail is being successfully implemented in Delhi. Construction of the flyovers, broadening of the roads are other measures the government has initiated. Various intelligent traffic control systems are being tried. Parking is another issue that attracts the government, builders and general public attention.

The Purpose of the Study

The present research highlights the issues and steps taken by the government related to the problems of pollution, parking and traffic congestion. The problem seems to be more acute in times to come as most of the manufacturers are focussing on small low budget passenger cars. Further it will affect metro cities more than others, as demand for means of commuting is more intense here.

RESEARCH METHODOLOGY

The present study basically is a secondary-data-based study. Vast data available on various related topics is examined and its relevance in today’s context is established, as it is expected that the problem would aggravate due to excessive production of cars in metro cities.

National Capital Region (NCR)

The National Capital Region Planning Board Act, 1985, No. 2 of 1985 governs the regulations of NCR. The following Act of Parliament received the assent of the President on February 09, 1985. Whereas it is expedient in the public interest to provide for the constitution of a Planning Board for the preparation of a plan for the development of the National Capital Region and for co-ordinating and monitoring the implementation of such plan and for evolving harmonised policies for the control of land-uses and development of infrastructure in the National Capital Region so as to avoid any haphazard development. Parliament has no power to make laws for the States with respect to any of the matters aforesaid, except as provided in articles 249 and 250 of the Constitution.

Evolution of the Concept of NCR

The genesis of the NCR lies in the recommendations of the first Master Plan for Delhi (MPD) notified in 1962, wherein, a broad area consisting of the Union Territory of Delhi and a few ring towns around it was conceived for being developed as a metropolitan region to reduce the population pressure on Delhi. The unprecedented growth of population especially during the post independence years and the consequent haphazard developments had been putting severe pressures on the infrastructure of Delhi. The Draft Master Plan for Delhi (1960) had reiterated this idea and the final Master Plan for Delhi (MPD-1962) for the perspective year 1981 recognised the need for planning Delhi in its regional context. The Master Plan had not only defined the composition of the NCR but had also recommended the setting up of a Statutory National Capital Region Planning Board and development of the region in accordance with a Regional Plan. Finally, the Parliament enacted the Planning Board Act in 1985, with the concurrence of the constituent States of Haryana, Rajasthan and Uttar Pradesh (Delhi being only a Union Territory at that time).
The Schedule to the Act has defined the region consisting of NCT Delhi and parts of the adjoining States. The idea for creating the NCR planning board was to stabilise the growth of the National capital and the adjoining areas. As a matter of fact, New Delhi is connected with three different states of India, UP, Rajasthan, and Haryana. It was therefore necessary to make a single body for a sustainable planned growth of the region. If these states are left in isolation to make their own plan probably the planned development could not have been achieved. Table-1 and Table-2 shows the State-wise area covered under NCR and details of district covered respectively.

### Table-1

<table>
<thead>
<tr>
<th>Region</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT Delhi</td>
<td>1,483 sq km</td>
</tr>
<tr>
<td>Haryana</td>
<td>13,413 sq km</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>4,493 sq km</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>10,853 sq km</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>30,242 sq km</strong></td>
</tr>
</tbody>
</table>

### Table 2

<table>
<thead>
<tr>
<th>Region</th>
<th>District Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT Delhi</td>
<td>NCT Delhi</td>
</tr>
<tr>
<td>Haryana</td>
<td>Gurgaon, Rewari, Faridabad, Sonipat, Rohtak, Panipat and Jhajjhar</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>Alwar</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>Ghaziabad, Bulandshahr, Meerut and Baghpat</td>
</tr>
</tbody>
</table>

Within these districts, the Board has identified several priority towns all over the region for its growth and balanced development. In addition, in order to arrest the migratory population to the region, counter-magnet areas have also been identified for accelerated growth.

**Major Challenges**

The following section will discuss about the three major challenges NCR would be facing because of excessive production of passenger cars.

**Pollution**

The Indian Auto Industry is harmonising both safety and emission regulations with International Standards for sustained growth of the Industry for combating the environment and become a global export hub. India has a well established and Regulatory Framework under the Ministry of Shipping, Road Transport and Highways. All the stake holders are part of the regulation formulation setup. The ministry issues the notifications under the Central Motor Vehicle Rules and Motor Vehicles Act.

India is harmonising its Emission Norms for Four Wheelers with the European Regulation and has adopted Euro IV, equivalent Bharat Stage-IV norms in 11 Metropolitan Cities including New Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Pune, Kanpur, Ahmedabad, Surat.
and even Agra from April 01, 2010. The In use Vehicle Emission norms have been tightened with effect from October 01, 2004 and computerization model has been developed by Society of Indian Automobile Association (SIAM).

**Emission Norms**

Since pollution is caused by various sources, it requires an integrated, multidisciplinary approach. The different sources of pollution have to be addressed simultaneously in order to stall widespread damage. The parameters determining emission from vehicles are vehicular technology, fuel quality, inspection and maintenance of in-use vehicles, and road and traffic management. While each one of the four factors mentioned above have direct environmental implications, the vehicle and fuel systems have to be addressed as a whole and jointly optimized in order to achieve significant reduction in emission.

The need to reduce vehicular pollution has led to emission control through regulations in conjunction with increasingly environment-friendly technologies. It was only in 1991 that the first stage emission norms came into force for petrol vehicles and in 1992 for diesel vehicles. From April 1995, mandatory fitment of catalytic converters in new petrol passenger cars sold in the four metros of Delhi, Kolkata, Mumbai and Chennai along with supply of Unleaded Petrol (ULP), was affected. Availability of ULP was further extended to 42 major cities and now it is available throughout the country. Euro IV, an environment protection norm for engines, is introduced. Bharat Stage-IV norms, the Indian version of Euro IV norms, are extended to major cities. But still the need for an integrated, holistic approach for controlling vehicular emission cannot be denied.

**Alternate Fuel to Control the Pollution**

The two very commonly used alternative fuels are CNG and LPG. CNG has emerged as an attractive alternative fuel due to its clean burning characteristic and very low amount of exhaust pollution.

It is a mixture of hydrocarbons consisting of approximately 80 to 90 per cent methane in gaseous form. It is compressed to a pressure of 200 to 250 Kg/Cm² to enhance the vehicle on-board storage in a cylinder. LPG is also emerging as an important and viable alternate automotive fuel due to its clean combustion and better drive-ability compared to both conventional fuels. LPG being in gaseous state; the size of LPG tank is comparatively small. A good number of CNG and LPG filling stations have been set up in NCR.

**Parking Issues**

Today, in most of the cities, construction of the conventional multi-storied car park or providing a large amount of parking space is completely out of question. The restricted parking spaces raise only an important question for the common man where to park the car?

The problem has gone up considerably in metros and other towns during the last few years. Delhi has over five millions cars and two wheelers on its roads, but not enough parking spaces. Parking solutions are often overlooked in the transport agenda and planning policies have now shifted from specifying a minimum car space provision to setting a maximum limit. Innovative
parking solutions such as stacking and using pneumatically elevated platforms have been around for a number of years, but implementation has been less than enthusiastic. Although the cost per space of an Automated Parking System (APS) is always going to be more than a traditional car park, it can provide at least some solution to the problem. Traffic engineers have long used a combination of techniques or methods to deal with parking needs. The absence or presence of parking meters and/or curb facilities, provision of public and private off-street parking lots, varied parking time limits, rate or fee structure and traffic regulations and control are all part of the programme to adjust and assure the proper balance of parking for an area. However one of the great difficulties in studying parking is that parking programs and facilities have to be tailored to the individual needs and conditions.

Automated Car Parking System

It is one of the solutions for the present day evolving parking crises. APS is a method of automatically parking cars and retrieving them using a computerised system. The system is utilised to compact more cars in a given space, hence the space required to park the same number of cars reduces. Consequently, the volume and floor areas can be efficiently used leading to space optimisation. Automated car parking is a system that can be sited below or above ground or a combination of both. The car is automatically moved through the car park by the system of pallets, carts, lifts, and turn tables and is stored at the nearest available space in the car park. For the retrieval procedure, the driver presents the parking ticket and the car is returned to the entry module in a similar fashion using the automated system.

Advanced Parking Management System

Another solution could be Advances Parking Management Solutions (APMS). It is a part of Intelligent Transport system. APMS is a significant part of the Intelligent Transportation System (ITS). It obtains information about available parking spaces, process and present to drivers by means of Variable Message Signs (VMS). It can be used to guide drivers in congested areas to the nearest parking facility with empty parking spaces, and to guide drivers with in parking facilities to empty spaces. The need for APMS is most prominent in highly dense areas of the metropolitan cities of the country.

Traffic Issues

Recently, transport questions have increasingly been addressed in the context of ecologically sustainable development (Banister and Button 1993, Button, Nijkamp and Priemus 1998). Transport is, today, positioned in the conflicting role between economic and environmental interests. Transport, as an infrastructural support is a pre-requisite for economic development. But on the other hand, half of the current world oil production is consumed by motor vehicles alone. It is surprising that Delhi accounts for a vehicle population equal to the combined strength of Mumbai, Kolkata and Chennai. At present, private vehicles constitute 80 per cent of transportation in metros.

According to Delhi Environment Status report (1995), a Delhi resident, on an average, inhales half packets of cigarettes equivalent pollutants per day. A whopping 3.22 lakh litres of
petrol and 1.01 lakh litres of diesel are wasted everyday in Delhi due to vehicles idling at traffic signals. According to WHO, on an average, a Delhite visits a doctor at least 15 times in a year for health problems specifically caused by pollution. Beside pollution, heavy traffic has labelled the city as a ‘pedestrian graveyard’, where 75 per cent of the people killed on the roads are pedestrians, cyclists and motor-cyclists (Tiwari 1998).

**Transport Behaviour**

By and large, passenger traffic means journeys to and from work as the primary purpose of trips. The second next important reason for travel is for school and college travel. Moreover, people also commute for shopping, social and recreational activities. But the new dimension which is compounding the problem is that the mode of transport is perceived to determine one’s placement in a highly stratified society.

**Transport Demand Oriented Policies**

Several measures can be adopted to cut down demand for transport. Various types of taxes can be levied like fuel tax, road tax, and parking charges to cut down demand for transport by making it more costly. Regulative measures like mandatory vehicle inspection, speed limit, higher taxes for bigger cars would also have a dampening effect on demand for private vehicles. Commuters can also be encouraged to use transport more efficiently in the form of car pooling. Serious efforts should be made to motivate commuters to switch over to public transport modes.

Expansion of physical infrastructure, like expansion of road capacity, that is, more and wider roads, flyovers and freeways would considerably help smooth traffic flow and reduce congestion and pollution.

Delhi has taken up steps in this direction in a big way already. But the fact remains that most Indian cities cannot afford such solutions. Kolkata and Delhi have already experimented with metro and results are very encouraging. Metro in Delhi has caught the fancy of commuters so much that it has encouraged the government to plan expansion in a big way.

Delhi figures most prominently among the world’s most pedestrian-hostile environments. There is a great potential for bicycle use in Delhi, since 40 per cent of the journey distance is less than 2.5 km and more than 57 per cent less than 5 km (Dinesh Mohan). It is an irony that in spite of several proposals by town planners and engineers to provide exclusive bicycle tracks, no action is forthcoming. Apparently, the commitment to develop and implement technologies which are more environments friendly is lacking.

**CONCLUSION**

India is harmonising its Emission Norms for Four Wheelers with the European Regulation. The Safety Regulations are being aligned with the United Nations Economic commission for Europe (ECE regulation). The In-use Vehicle Emission norms have been tightened. Inspection & Maintenance of all categories of vehicles have been one of the chief tools used. In Delhi NCR therefore Pollution check has become mandatory by the government.

CNG and LPG are gaining popularity and are important and viable alternate automotive fuel due to its clean combustion and better drive-ability compared to both conventional fuels.
Traffic Engineers have been using a combination of various techniques and methods, to deal with parking needs. Parking meters and/or curb facilities, provision of public and private off-street parking lots, varied parking time limits, rate or fee structure are all part of the program to adjust and assure the proper balance of parking for an area.

For traffic control several measures can be adopted to cut down demand for transport. Various types of taxes can be levied like fuel tax, road tax, and parking charges. Regulative measures like mandatory vehicle inspection, speed limit, higher taxes for bigger cars would also have a dampening effect on demand for private vehicles. It is an irony that, in spite of several proposals by town planners and engineers to provide exclusive bicycle tracks, no action is forthcoming. It is highly advocated to promote Bicycles as a local mode of transport.

It appears that the government is aware of the probable consequences and therefore remedial measures are tried out. But so far as active participation of general public is concerned not much has taken place. Without involvement of public, it would become impossible to check all these issues.

The issues related to NCR are very intense in nature. They all invite attention to conduct deeper studies. Pollution by vehicles is not only harmful to the residents or commuters but also exhausting our non-renewable source of energy. They are also causing ecological imbalances. It is really necessary to handle the subject prudently. Transport congestions invites a serious study of city planning for big cities like Delhi which has to well connected from adjoining areas for economic development. With the advent of new technologies it becomes possible. Parking too is a part of the transportation studies.

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