Smart City Study (New Delhi) by INECC & URJA: 2016

Analysis Report

Household responses to information on Transportation, Eco-mobility and Travel Choice

Challenges

Nearly nine lakh new vehicles were registered and added to Delhi roads in the year 2015-16, leading to an increased level of pollution despite the government's Odd-Even scheme and other exhortations by Pollution Control Board (PCB) and National Green Tribunal (NGT). The total numbers of registered vehicles are 97.04 lakh in 2015-16 while 88.27 lakh vehicles were registered in 2014-15.

In 2015-16, the number of vehicles have increased by 8.77 lakh from 2014-15. The figures are disclosed by Delhi Statistical Hand Book. New cars and gypsies were increased by 1.96 lakh adding up to a total of 29.86 lakh such vehicles on roads in 2015-16. In 2014-15, figures were 27.90 lakh. Besides four-wheelers, two-wheelers were increased by 4.22 lakh in 2015-16 with total figures leading to 61.06 lakh. The growing dependence on private vehicle in the numbers clearly indicates that GNCT has failed to scale up its public transport system.

A deeper statistical analysis was done for probing deeply into the number of vehicles of different categories for last 20 years in Delhi and a forecast for number of vehicles was made for 2021 based on business as usual scenario and no major policy intervention in near future (figure 1).
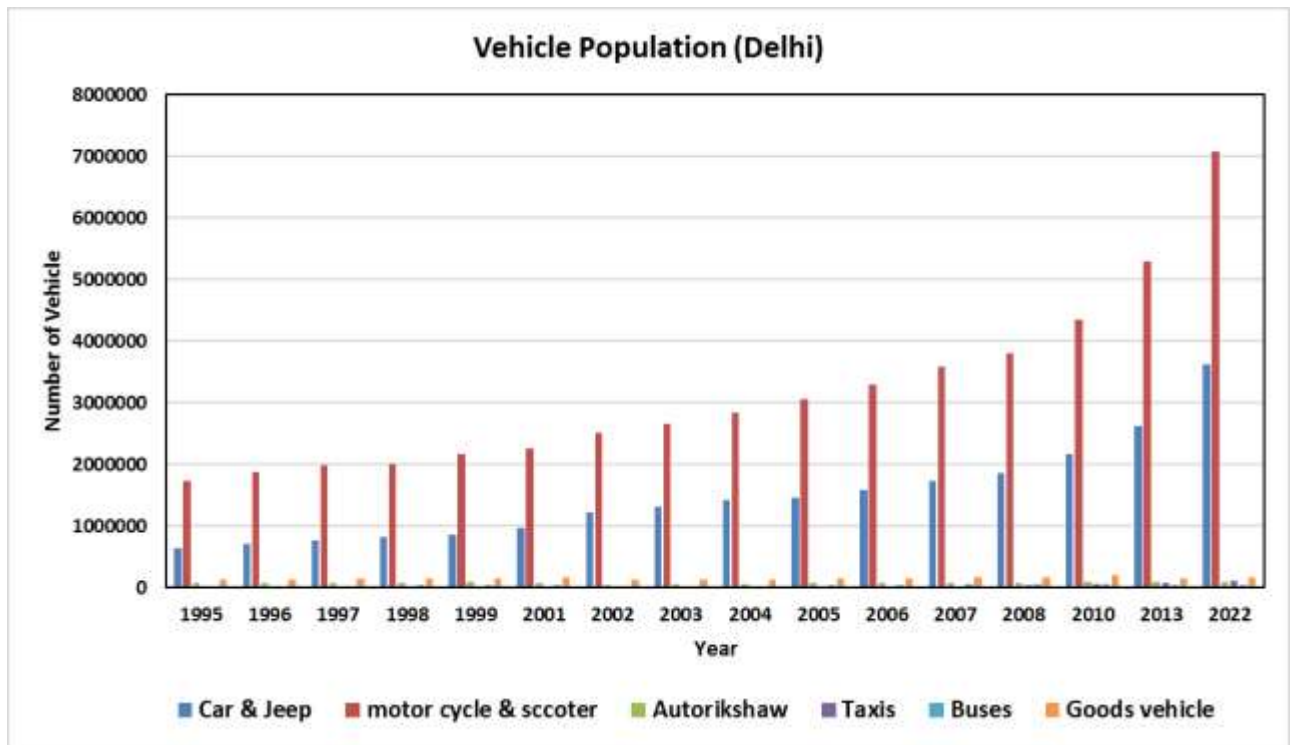
Figure 1: Vehicle population of Delhi (Delhi Statistical handbook)

The problem of transport related challenges get further compounded with fact that, the number of cars entered Delhi daily from NCR region is actually more than total number of cars registered daily. Mobility is a major challenge for New Delhi Municipal Council Area. In the survey conducted as part of assignment, it was found that there were in total 256 private vehicles in the Gole Market area. These vehicles travel the roads and contribute to increased congestion, serious accidents, and the emission of pollutants and greenhouse gases.
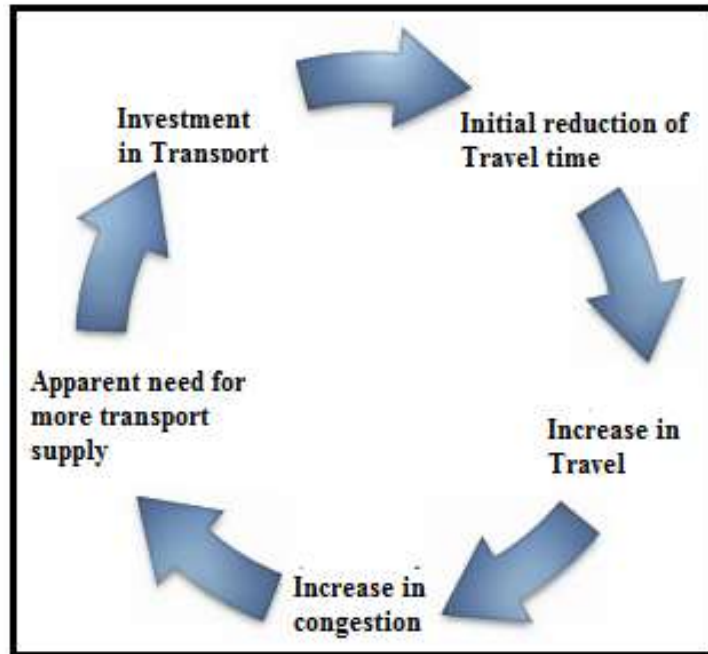
Figure 2: Overview of the Transportation sector challenge in Delhi

In last few years, Delhi has continued to perceive motorisation as an upgrade to the current quality of life, this can be seen in the amount of investment in automobile friendly infrastructure. We build   fly-overs, expand roads and provide various free services for automobiles users esp. private cars, app based car renting services and high speed motorcycles. The consequences of these decisions are shadowed by the increase in automobile use which is considered a positive indicator of development. This "predict-and-provide" fashion of supporting motorisation puts cities into a vicious cycle of transportation.

Road congestion in Delhi and especially in NDMC may costs around significant portion of GDP every, also amount of land lost to automobile facilities such as parking facilities can contribute to significant loss of GDP, it can be easily guessed that it is not cheap. The environmental and social costs of increased motorisation come in the form of increase air pollution, excessive use of fossil fuels, increased greenhouse gas emissions, road accidents, deterioration of public health especially in the form of sedentary lifestyles and increase in obesity.

Sustainable mobility and Eco Mobility suggest that cities need to shift their focus from investing in facilities for motorised modes i.e. personal cars and motorbikes that only cater for the needs of a small part of the population, to modes that cater for a major of the population i.e. public transport, walking and cycling.

SUSTAINABLE SMART DELHI STUDY: TRANSPORTATION

Delhi's vehicle population is approximately 83 lacs and approx. 9 lacs are added every year. Vehicle population is also a strong contribution factor to NOx pollution which can

significantly affect air quality. Based on our study in Gole area we calculated different parameters and analysed the results from the perspective of different income groups. The datasets of population & other parameters have been taken from Delhi Statistical Handbook.
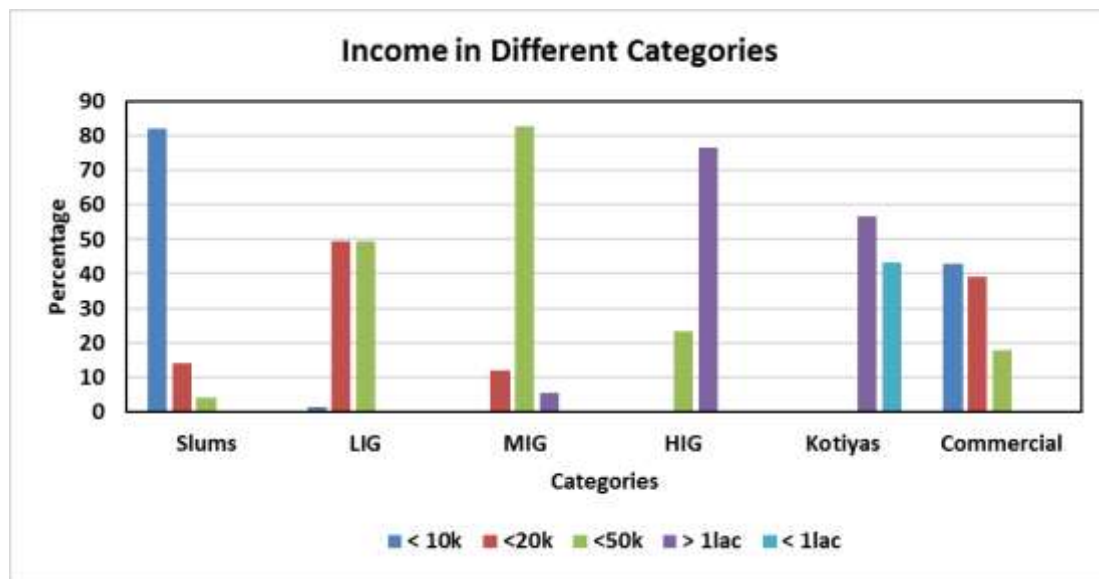

Figure 3: Income categories in Gole Market

AVERAGE CONTRIBUTION OF EACH INCOME GROUP TO AIR POLLUTION

In order to calculate the NOx emission from vehicles we took the vehicle population & average distance traversed data by different vehicles. The numbers were converted to equivalent NOx emissions based on Emission factors as shared by Guttikunda et; al 2015. It can be seen that higher income groups have higher average distance travelled and number of vehicles which in turn is associated with higher NOx emissions. In the calculations all 4 wheelers have been assumed to run on Petrol while 2 wheelers as 2 stroke. The emission from Slums is approximately 1.28 grams (Daily averaged) is so low as compared to other income categories.
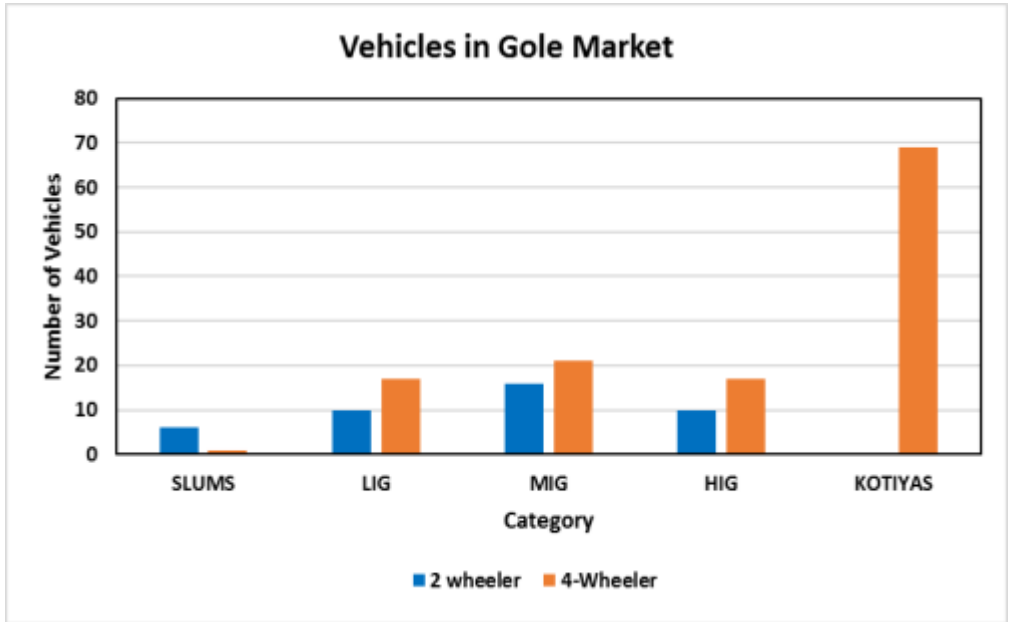
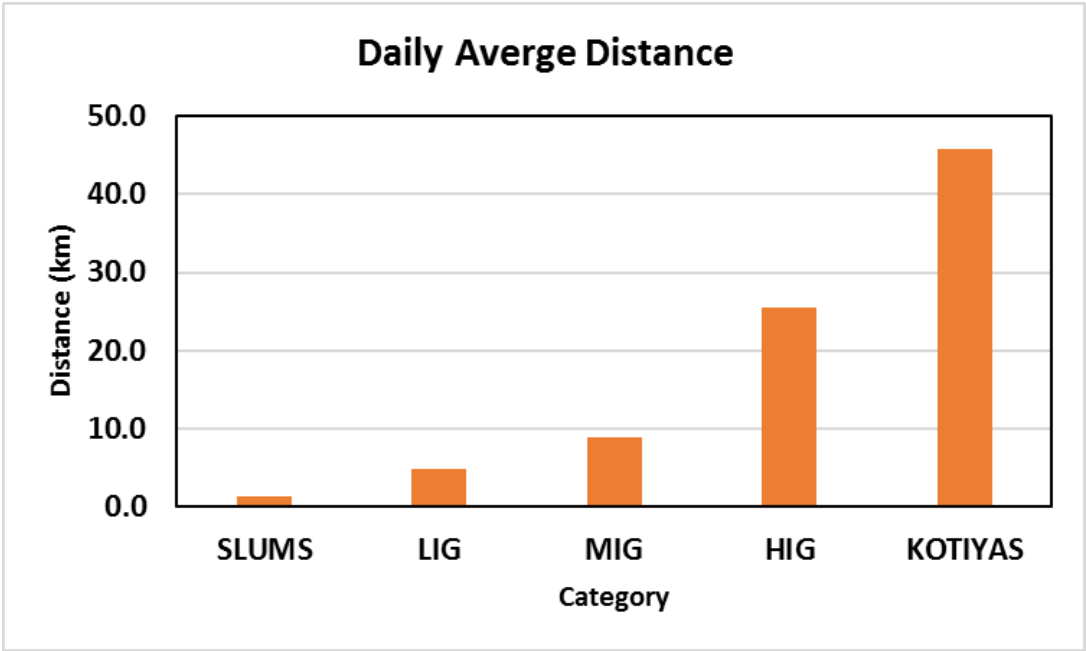Figure 4: Vehicle Population in Gole Market (Income Categories)

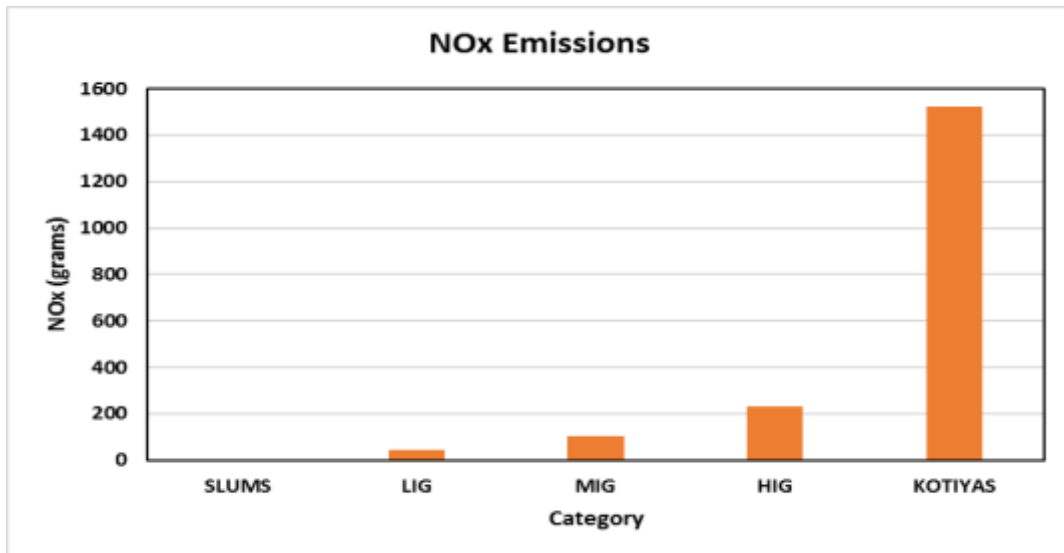Figure 5: Daily Average Distance Travelled (Income Categories)

Figure 5: NOx emissions from Vehicles (Income Categories)

AVERAGE FUEL CONSUMPTION IN EACH INCOME GROUP

The fuel consumption pattern follows the similar trend as observed in the emission categories. The higher income groups have an average weekly fuel consumption of more than 20 litres while the lower income groups and Slums (majority contribution) is less than 10 litres per week.
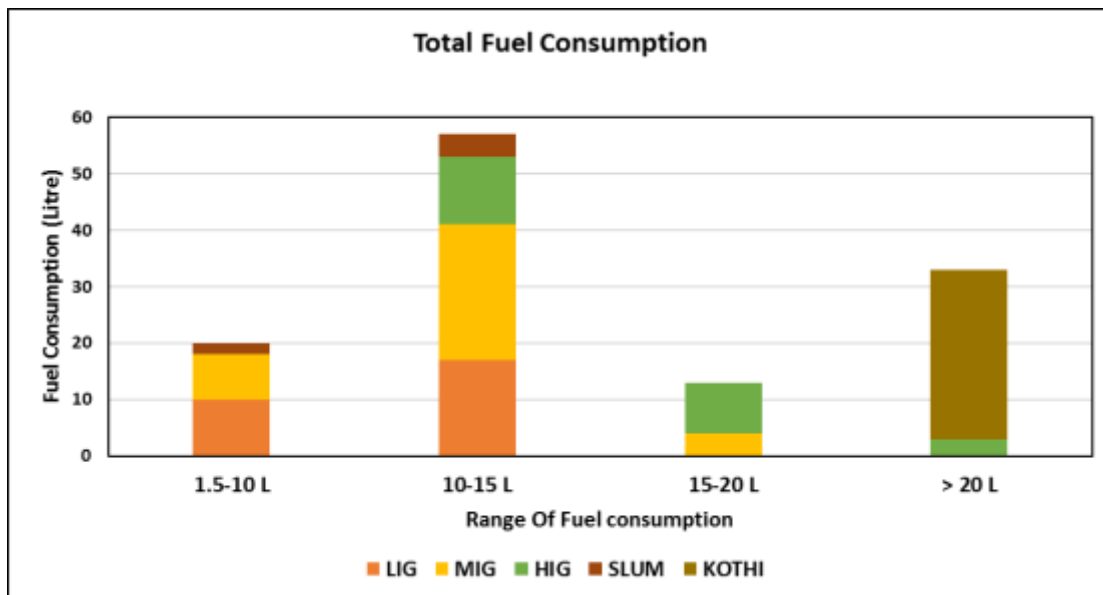

Figure 6: Total Fuel Consumption by different Income Categories

WEATHER PUC (POLLUTION UNDER CONTROL) CERIFICATE MAINTAINED?

In order to check the efficacy and implementation of pollution norms in NDMC area, in the survey questionnaire it was asked whether the commuters maintain certificate for Pollution control. The response was overwhelming and shows effective citizenship by the residents across all income groups.

Figure 7: PUC Certificate

WEATHER LICENSE IS AVAILBLE FOR PRIVATE VEHICLES?

In order to check the efficacy and implementation of law and order in reference to transportation in NDMC area, in the survey questionnaire it was asked whether the commuters have license available. The response was overwhelming across income groups and this highlights the fact that legal instruments are important policy in enforcing laws.

Figure 7: License Availability

REVIEW OF PUBLIC TRANSPORT: WEATHER ADEQUATE BUS SERVICES & MRT's (Mass Rapid Transport) AVAILABLE?

In order to check the current status of public transportation the residents were asked about the existing infrastructure transport and the adequacy of infrastructure in providing service to community, the response from people were fragmented. Non- responses from various income groups highlight the fact that community has not shared any opinion.
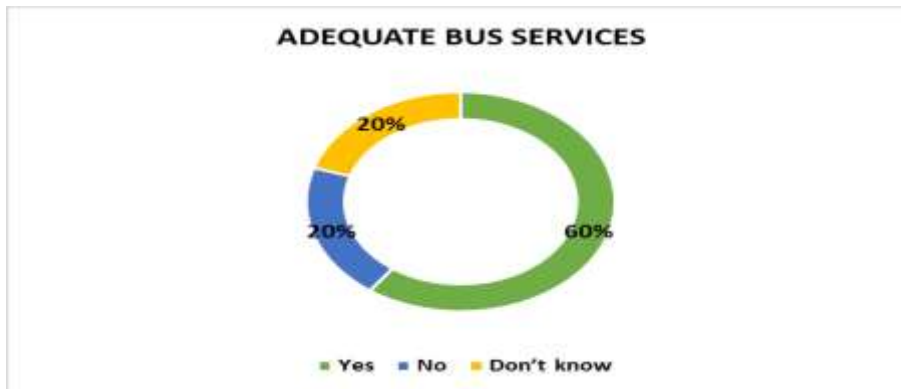

Figure 8: Response to Adequate Bus Services

REVIEW OF PUBLIC TRANSPORT: PROBLEMS FACED BY COMMON PEOPLE IN PUBLIC TRANSPORT

  In order to check the current status of issues related to public transportation the residents were asked about the common problems faced. The majority of population 80 percent from income groups (other than slums)   80 percent complained about traffic congestion, while slums have recognised, about 20 percent, overcrowding as major problem in public transport.
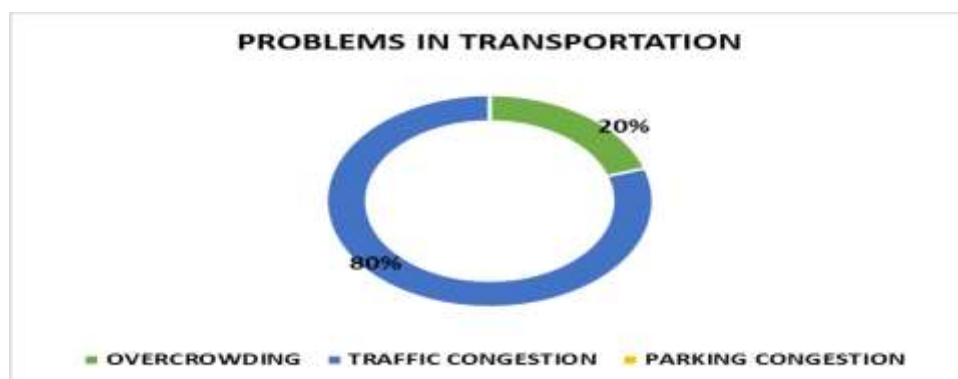

Figure 9: Common Problem in Faced by Population

SOLUTIONS:

Controlling and organizing traffic and reducing accidents in the city by investing in traffic monitoring and management systems are common goals to many Smart Cities. Results to be achieved include the use of speed radars and the adaptive and real-time programming of traffic lights, taking into consideration, among other factors, the concentration and flow of vehicles (allowing priority to ambulances, police cars, and dedicated bus lanes), the concentration of pedestrians, and the speed of vehicles. Another common concern is the provision of more efficient public transportation systems, suitable for urban development and social equity in relation to commutes. Many of the solutions are intended to prepare the city for the future implementation of a multimodal transportation system, involving different means (bicycle, subway, dedicated bus lanes, light rail vehicles), thus helping to reduce fuel consumption, gas emissions, and commute times, as well as improve air quality.

RECOMMENDATIONS:

In practical terms this transition in mobility can be summarised through the Avoid, Shift, Improve and Integrate principle. The Avoid suggests that cities need to implement policies and measure that reduce and/or avoid the need for unnecessary trip or short trip by motorised modes. This is done mainly through efficient urban planning. The Shift suggests to move trips from personal automobiles to non-motorised modes i.e. walking, cycling and public transportation, thus targeting the issues such as road safety, air pollution and road congestion. The Improve suggests retrofitting and investing in intelligent systems for better efficiency, this could be in the form of better fuel economy, intelligent transport systems for better information delivery, better vehicle technologies and shifting to smarter and cleaner energy for vehicles. Finally, Integrate refers to a collective approach in addressing urban transport issues through integrating different modes of transport available in the city in terms of infrastructure, institutions and ticketing. By implementing policies and measures supporting the Avoid, Shift, Improve and Integrate toolbox cities can effectively address urban mobility issues.

Few other recommendations based on the study to ease transportation infrastructure could be:

- Parking Pricing & Management

- Multi-Modal Integration at Metro Stations & Railway/ ISBT

- Bicycle Sharing System with bicycle tracks/ bicycle highways throughout the city

- Road retrofitting as per Street Design Guidelines

- Bus Service Improvements

- BRTS Corridor Development

- Integrated Road Network – new bypass/ elevated roads

- Intelligent Transport System

- Capacity Building Programme

URJA

United Residents Joint Action of Delhi