

EST FORUM, KOREA

ENVIRONMENTALLY SUSTAINABLE TRANSPORT: INDIA INITIATIVES

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सत्यमेव जयते

Environmentally Sustainable Transport

■ Introduction to EST

- Transportation expected to be major driving force behind growing world demand for energy
- Adequate, efficient and effective transport systems important for access to markets, employment, education and basic services critical to poverty alleviation.
- However, current patterns of transportation development not sustainable and may compound both environmental and health problems

Environmentally Sustainable Transport

- Ensure sustainable development of transportation system and emphasis on efficient and affordable systems for poverty alleviation and greater use for public and non-motorized modes.
- Promote integrated approach to policy for land-use, infrastructure, public transport etc providing safe, affordable and efficient transportation, increasing energy efficiency, reducing pollution, congestion, adverse health effects and limiting urban sprawl as part of plan implementation.

India's Scenario

India is the

- 2nd most populous country in the world
- Consists of 16.7 % of the world population - Confined to only 2.4% of the world's area
- Sustains 1,027 million population (2001) in 28 States and 7 Union Territories (UTs).

According to Indian Census 2001

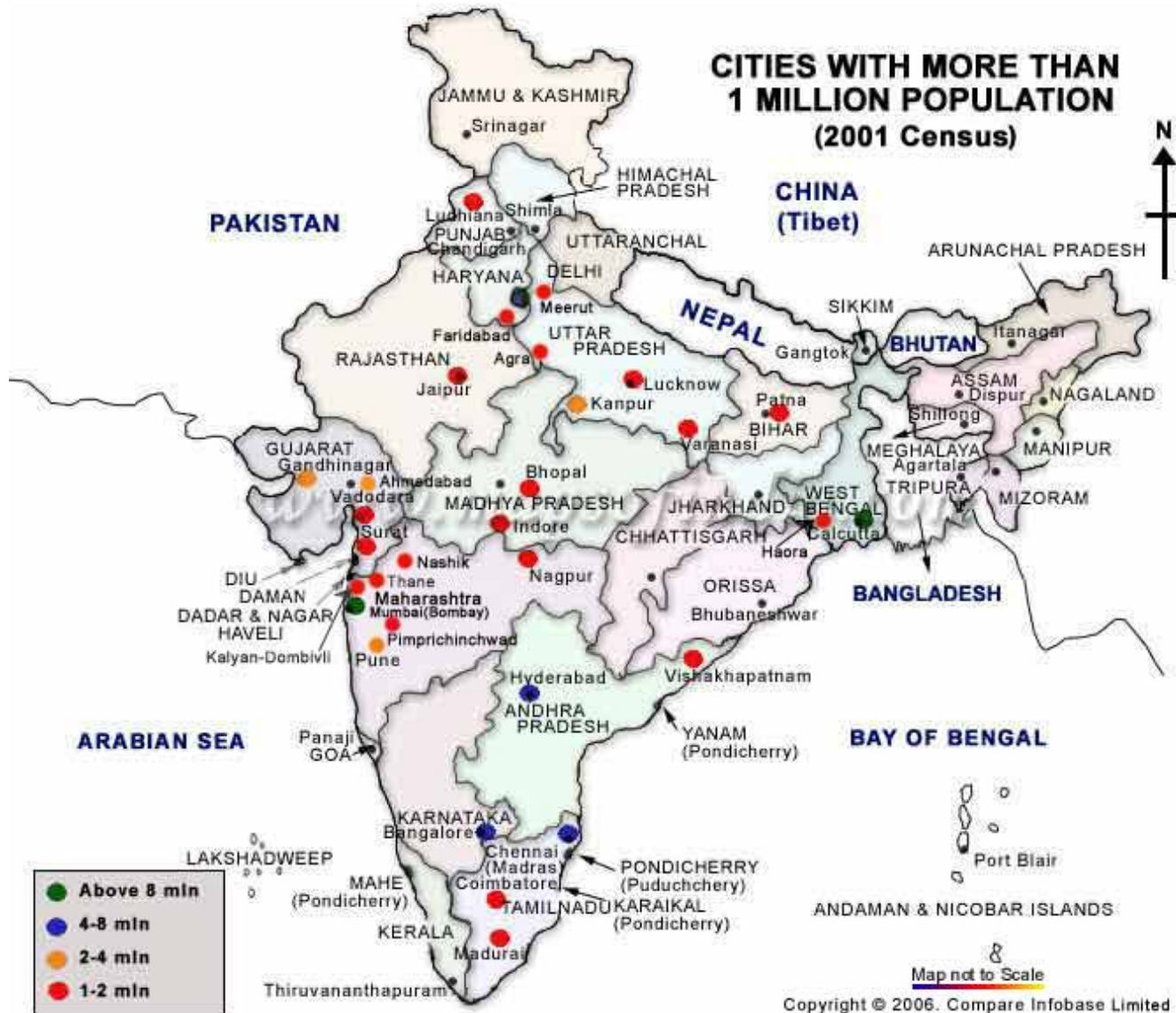
No. of towns/ cities = 5161

No. of Villages = 6,07,491

Problems and Challenges

- India is the second largest in terms of total road network in the world. Its road network constitutes around 3.34 million km.
- India has witnessed massive growth in the number of vehicles during the last three decades.
- There were 0.3 million vehicles in 1951 and there are around 90 million vehicles today.

35 cities with Population in excess of 1 million



Situational Analysis

INDIA IS PLAGUED WITH NUMEROUS TRAFFIC AND TRANSPORTATION PROBLEMS:

- The population of India's six major metropolises increased by about 1.9 times during 1981 to 2001; the number of motor vehicles up by over 7.75 times.
- Increased use of personalized modes has led to increased air pollution.
- Travel in the city more risky with accident rates up from 1.6 lakh in 1981 to over 3.9 lakh in 2001.

Situational Analysis

- Congested roads with an incompatible mix of modes traveling at widely different speeds.
- Extremely high and rapidly rising traffic fatalities, especially among pedestrians and two wheelers.
- Extremely high levels of transport-related pollution, noise and other environmental impacts, especially in metropolises.

Situational Analysis

- Rampant sprawl extending rapidly in all directions, far beyond city core into the suburban/ peri-urban areas.
- Need for development of vehicles, road design etc.

Situational Analysis

- Suspended Particulate Matter (SPM) levels in the six major metropolises well above Ambient Air Quality Standards.
- Pavement dwellers, road side hawkers, cyclists and pedestrians most dangerously exposed to motor vehicle exhaust fumes.

Causes Of Vehicular Pollution

- High vehicle density in Indian urban centers.
- Absence of effective mass rapid transport system in major urban centers.
- High levels of pollution at traffic intersections.
- Improper traffic management system
- Poor road conditions.
- Inadequate inspection and maintenance facilities.
- Predominance of two stroke engines.
- Large in-migration to metropolises.

India's Progress

- India has joined WP-29 (World Forum for Vehicle Regulation).
- Bharat Stage-III emission norms in force in major cities. In the rest of the country, Bharat Stage –II norms in force.
- Bharat Stage-IV emission norms to be enforced in the 11 mega cities and Bharat Stage-III norms in the rest of the country with effect from 1st April, 2010.



Policy Vision

- Recognize people are development partners in cities
- Make cities most livable in the world
- Allow cities to evolve into an urban form best suited for their unique geography to-
 - support the main social and
 - economic activities.

Measures

- Establishment of Ambient Air Quality Monitoring
- Notification of Standards under Environment (Protection) Act, 1986.
- Notification of vehicular emission norms for year 1990-91, 1996, 1998, 2000, 2001 and 2005.
- Improving fuel quality by phasing out lead from petrol, reducing diesel sulphur, reducing gasoline benzene etc.
- Introduction of alternate fuel vehicles like CNG/LPG.
- Improvement of public transport system.

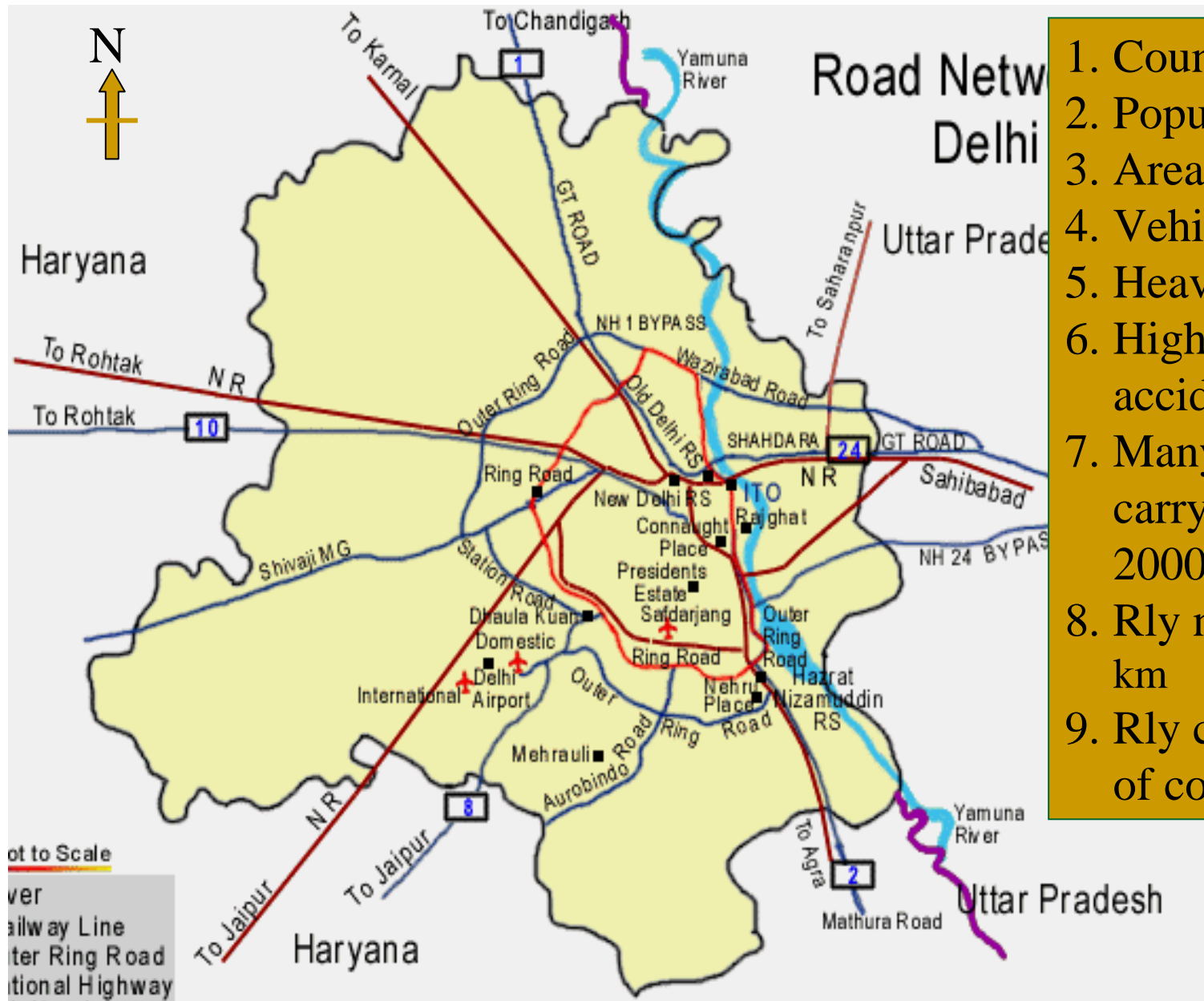
Measures

- Phasing out of grossly polluting commercial vehicles.
- Public awareness & campaigns.
- Development of integrated public transport system.
- Proposal to set up an independent road safety organization for road transport sector.

Achievements

- Delhi, has experienced decrease in level of pollution with all commercial transport run on CNG
- Delhi Transport Corporation is the World's Largest Eco-friendly CNG Fleet Operator
- Following the success of Phase 1 of Delhi Metro, Phase 2 and phase 3 construction already in progress.
- Metro construction begun in Mumbai and Bangalore, approved for Hyderabad and Chennai and at planning stage in Kolkata and Chandigarh.
- BRT corridor pilot implemented in Delhi with Induction of low floor buses to facilitate disabled and senior citizens and providing dedicated pedestrian and cycle tracks.

Case Study of Delhi Metro



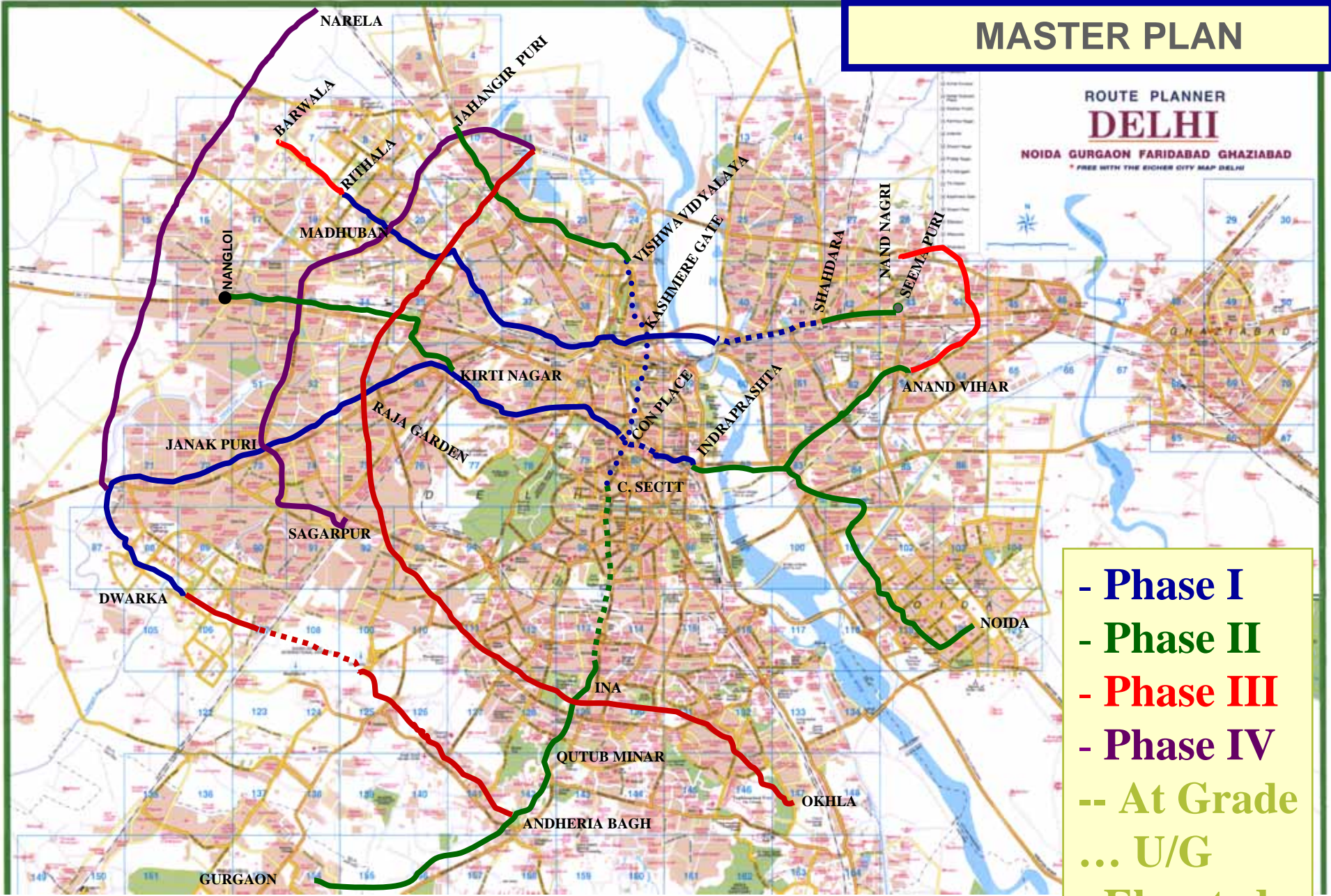
1. Country's capital.
2. Population – 14 Mn
3. Area – 1486 sq km
4. Vehicles > 4 Mn
5. Heavy pollution
6. High rate of road accidents.
7. Many corridors carry more than 20000 PHPDT.
8. Rly network – 144 km
9. Rly carries only 2% of commuters.

Delhi Metro Master Plan

- Delhi Metro has drawn up a Master Plan consisting of 8 lines, covering a total of 245 km.
- The Master Plan to be implemented in 4 Phases by 2021.
- Phase-I of Delhi Metro completed in Dec'05.
- Construction of Phase-2 and Phase-3 in progress.
- The present day cost of entire Master Plan is Rs. 40,000 Cr.



MASTER PLAN



ROUTE PLANNER
DELHI
NOIDA GURGAON FARIDABAD GHAZIABAD
FREE WITH THE RICHER CITY MAP DELHI

- Phase I
- Phase II
- Phase III
- Phase IV
- At Grade
- ... U/G
- Elevated

Advantages of Metro System

- Carrying capacity of 60,000 – 80,000 phpdt (peak hour peak direction traffic).
- Requires 1/5th energy per passenger km. compared to road – based system.
- Causes no air pollution in the city and lesser noise levels
- Occupies no road space if underground and only about 2 metre width of the road, along central median, if elevated.



Advantages of a Metro System

- Carries same amount of traffic as 6 lanes of bus traffic or 26 lanes of private motor cars (each way)
- More reliable, comfortable and safer than road based system
- Reduces journey time by 50% to 75%



Benefits of Phase - I of the Project

- 1.1 million commuter trips per day siphoned off the roads by 2011.
 - 1,650 less buses on the roads.
 - Increase in average speed of road buses from 10.5 km/h to 15 km/h
 - Saving of 2 Mn man hours per day – 250,000 extra hands.
 - Saving in fuel cost of approximately US \$ 150 Mn per year.
 - Reduction in pollution level by 30% .
 - Reduction in road accidents by 30%.

- Economic Rate of Return – 23.8 %

Future Strategies

- First “National Auto Fuel Policy” setting out roadmap for the next decade on quality of fuels and standards for vehicles.
- Priority for non-motorized transport



Future Strategies

- Encouraging construction of segregated right of way for bicycles and pedestrians.
- Priority for construction of cycle tracks and pedestrian paths in all cities, under the Jawahar Lal Nehru National Urban Renewal Mission (JNNURM)
- Formulation and implementation of specific “Area Plans” in congested urban areas



Future Strategies

- Use of CNG for Buses and cleaner fuel: non-lead fuel.
- Encouragement of battery driven vehicles.
- Clear and time bound schedule of progressively tighter emission norms
- Statutory provisions requiring all in-use vehicles in a city, to undergo periodic check up and obtain specified certification.

Future Strategies

- Cities to prepare Comprehensive Mobility Plan (CMP) to access Government funds for Traffic and Transportation Projects.
- Make viable and reliable transportation options aimed at reducing dependence on automobiles
- CMP will ultimately lead to Environmentally Sustainable Transport System.

Future Strategies

- Comprehensive Mobility Plan for long-range transportation package to improve the city and its region, environment, land-use, and economic development.
- Create an efficient and seamless transportation network with the following objectives:
 - To improve connectivity and travel throughout the city and its region.
 - To improve mobility within neighborhoods, wards and zones and satellite towns
 - To make landuse changes so as to plan residential areas in close vicinity to industrial/commercial centres

Promotion and Dissemination

- Campaigns for public support for initiatives like greater use of public transport and non-motorized vehicles, the proper maintenance of their vehicles, safer driving practices, etc.
- Encourage individuals, families and communities to adopt “Green Travel Habits” that would make travel less polluting and damaging.
- Emphasis on bringing about such awareness amongst children through inputs in their school curricula.
- **IMPACT: BEHAVIOURAL CHANGE**

“An Environmentally Sustainable Transport System will meet today's needs for mobility, access and economic growth without compromising the ability of future generations to meet their needs and environment protection.”

Thank You