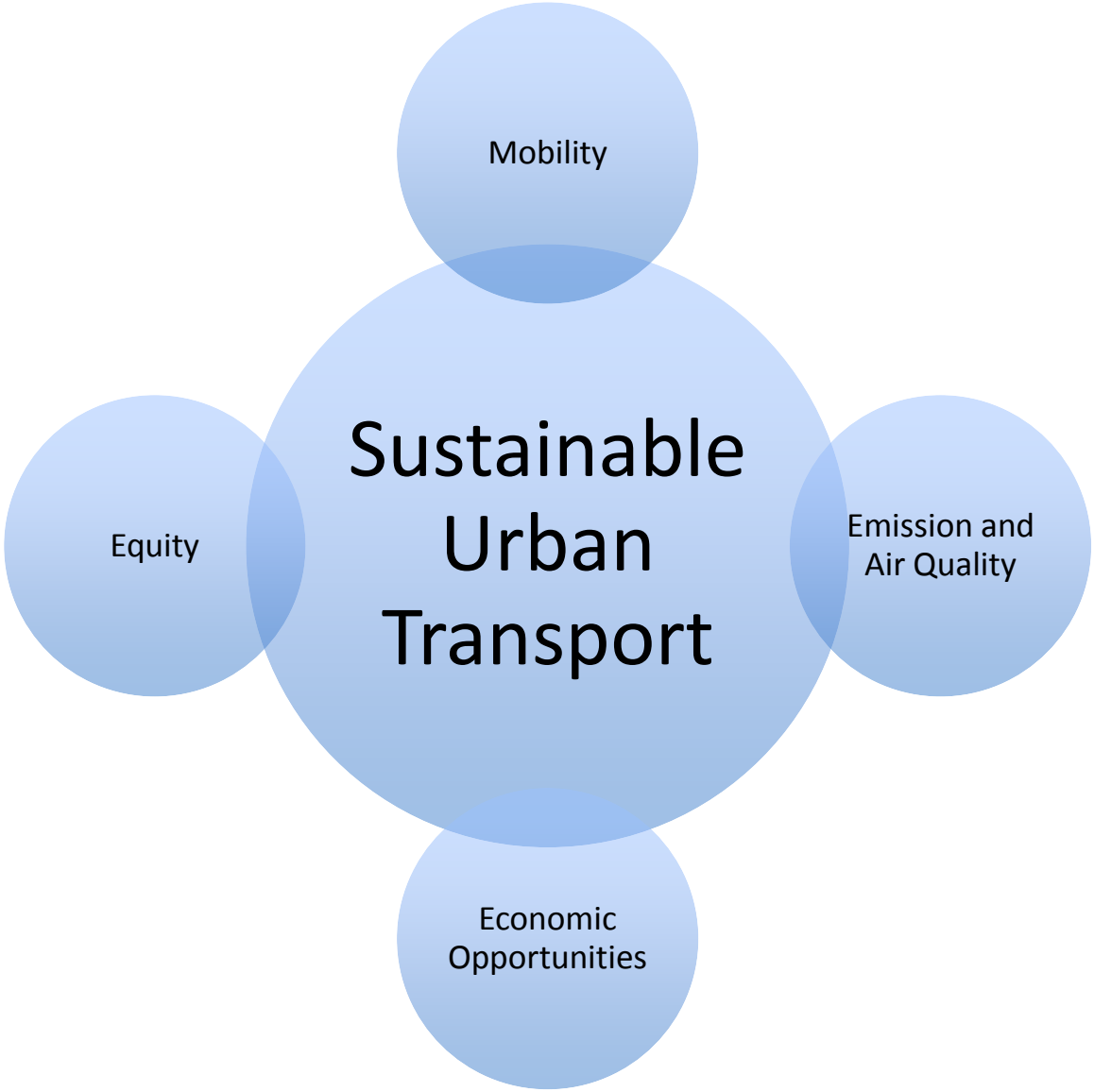
Perspective On Public Transportation-India

Sandeep Garg
India

Components of Sustainable Urban Transport



National Urban Tranport Policy-2006

NUTP's Main features are:

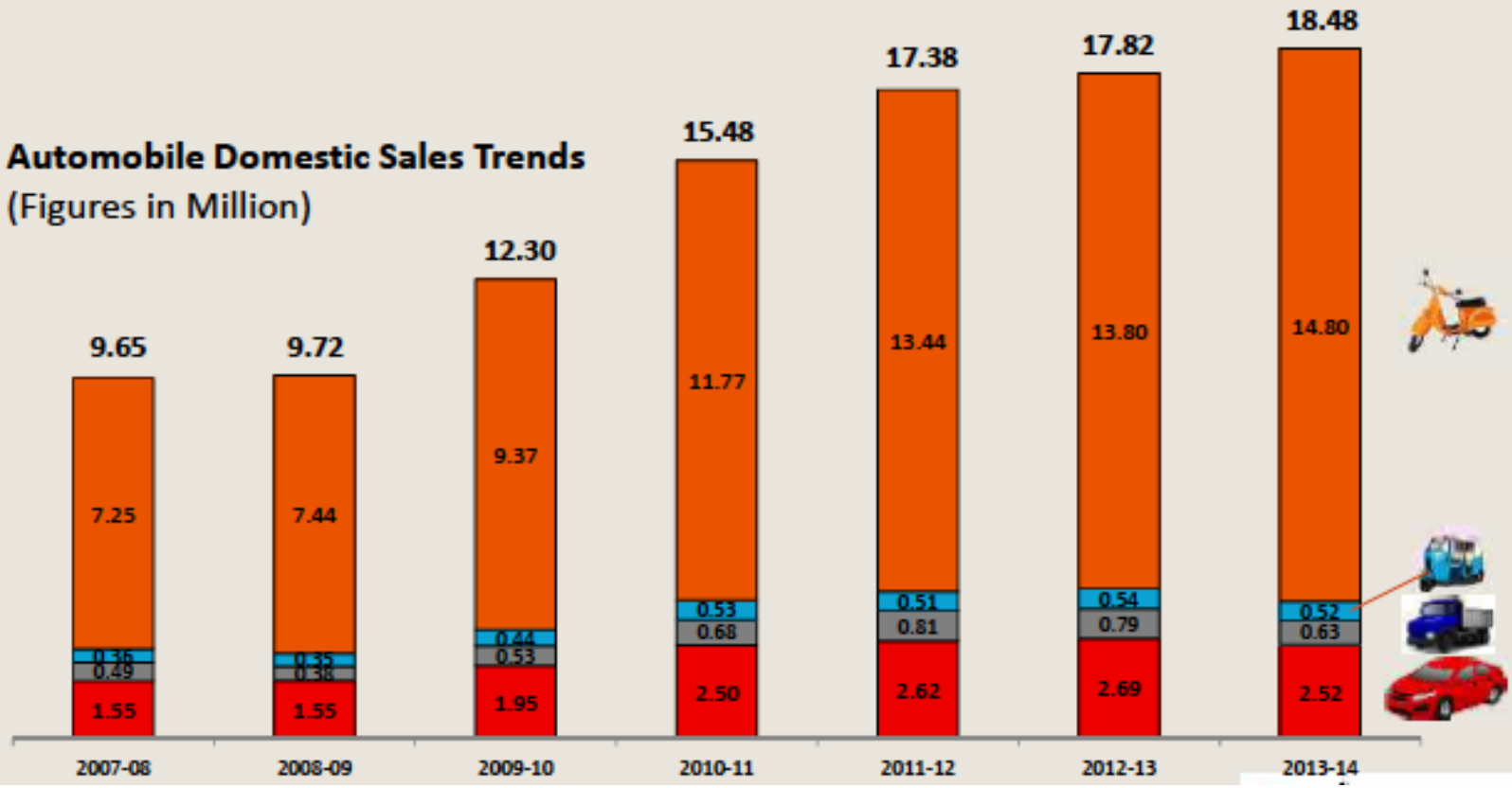
1. Integrated land-use and transport planning
2. Equitable allocation of road space
3. Promoting use of public transport
4. Priority to non-motorized transport
5. Parking
6. Freight traffic
7. Legal and administrative issues
8. Capacity building
9. Use of cleaner technologies
10. Innovative financing mechanisms
11. Association of the private sector

Under these 11 main features, there are 31 sub-features.

The Problem……

Number of Vehicles Sold in India

The demand of passenger and commercial vehicles will fuel the demand for Diesel and Petrol in future.

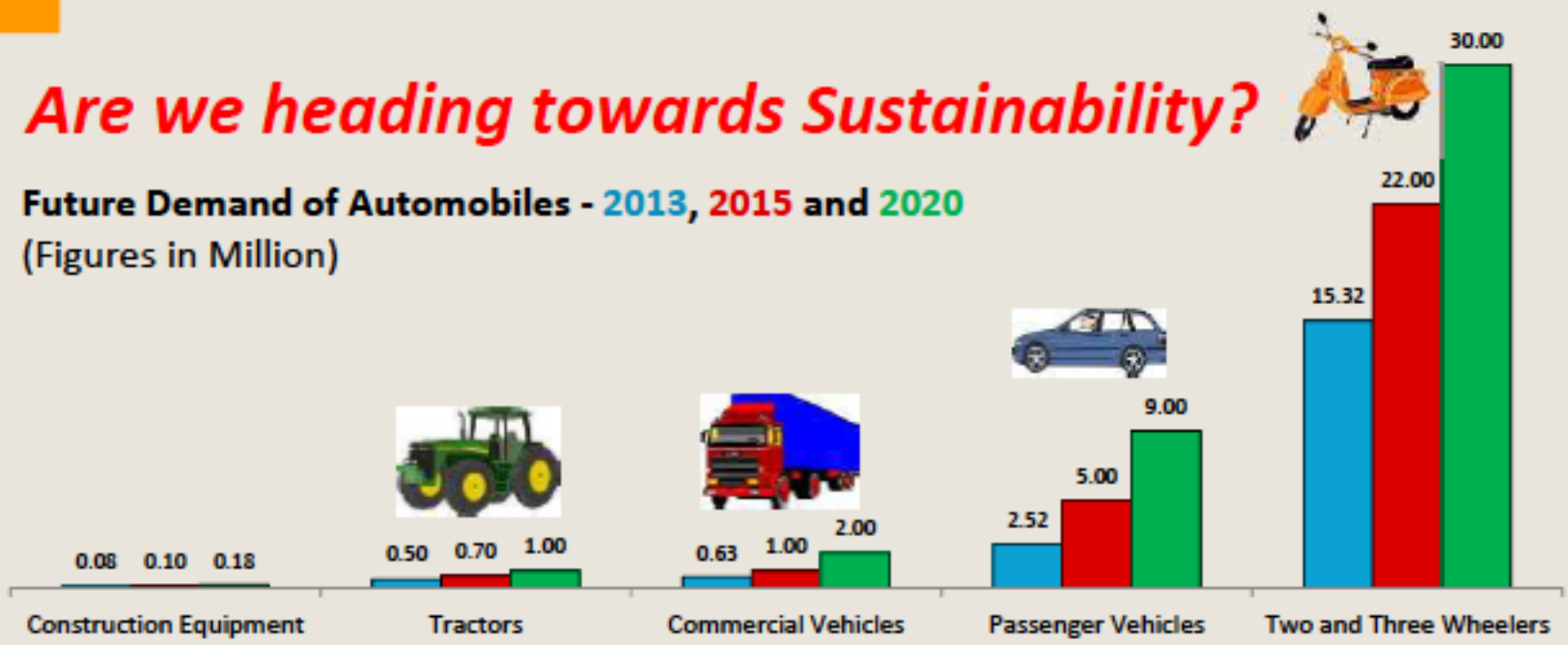


The Challenges……

Demand of Vehicles in India

Are we heading towards Sustainability?

Future Demand of Automobiles - 2013, 2015 and 2020
(Figures in Million)



India is

- The world's largest manufacturer of tractors
- 8th largest commercial vehicle manufacturer
- 6th biggest passenger car manufacturer
- 2nd largest producer of two wheelers and buses

Barriers For Improvement Of PT

- Lack of political will
- Governance
- Opposition from key stakeholders (operators, motorists)
- Political and institutional inertia
- Institutional biases

- Lack of information
- Poor institutional capacity
- Inadequate technical capacity
- Insufficient funding and financing
- Geographical./physical limitations

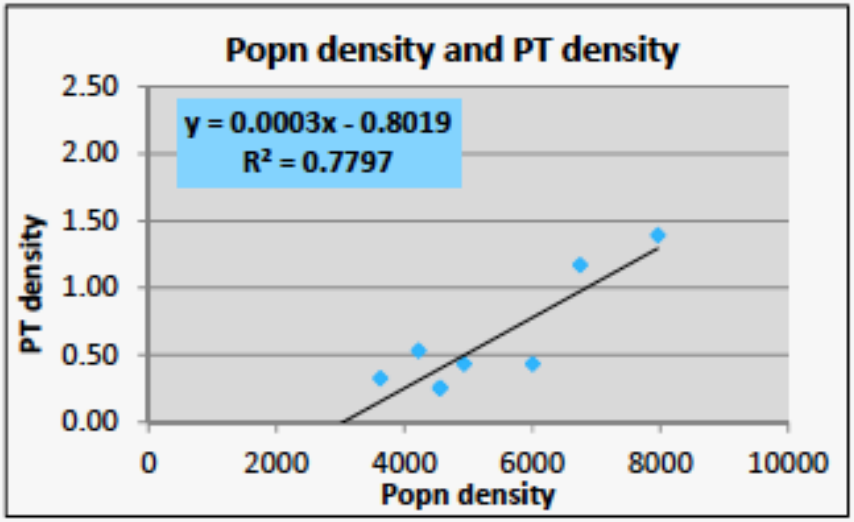
Multiplicity of Institutions

- Responsibilities for policy making, planning, investment, operations and management is divided in Central, State and Local Govt. organizations
- For example, Mumbai has 18 organizations responsible for transport.
- Multiplicity results in (a) Fragmented Functional Responsibilities, (b) Lack of Local Expertise, (c) Paucity of Financial Resources and (d) Lack of Privatization
- Attempts for setting up UMTA failed

Some Comparisons……

PUBLIC TRANSPORT SUPPLY LEVELS – GLOBAL AND INDIAN SCENE

Popn. range	PT Network (KM) Availability per 1 lac Population		% of Bus Share		Bus Supply Index/ 1 Lac Popn	
	Indian Scenario	Global Scenario	Indian Scenario	Global Scenario	Indian Scenario	Global Scenario
20 - 40 lakh	7.16	34.62	22%	38%	*NA*	92
40 -60 lakh	11.23	26.42	16%	35%	17.3	79



Pop. Density persons/sq.km	PT density (KM/Sq.KM)		
	UK (Optimistic)	India (Pessimistic	Adopted (Realistic)
<750	0.3	-	0.3
750-1500	0.6	-	0.6
1500-2300	1.0	-	1.0
2300-3000	1.25	0.10	0.7
3000-3900	1.65	0.37	1.0
3900-4600	2.0	0.58	1.1
>4600	2.5	0.85	1.7

PT density (Km/ Sq.Km) = PT network length (Km)/ City area (Sq.Km)

It defines Pt network (Km) per Sq.Km area

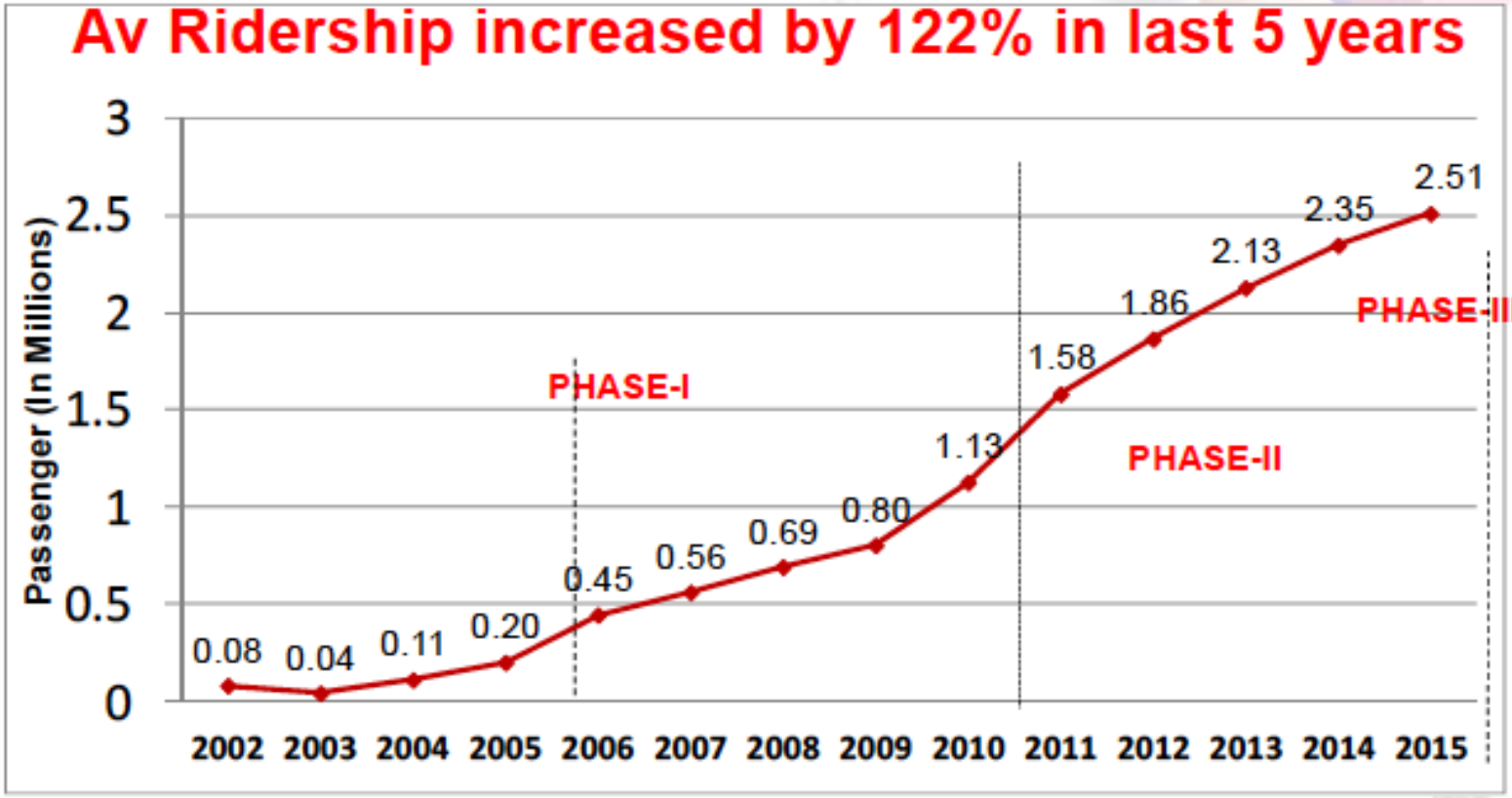
The Effort……

DMRC - AT A GLANCE

- 7 Lines - 213 km Network Length (Partly Phase-III)
- 160 stations
- More than 1225 commissioned cars
- 160 Million Car Km/year (FY 2014-15)
- 2.7 Million passengers a day.
- **Max: 3.2 Million on 28th August 2015**

The Adoption……

PASSENGER DEMAND



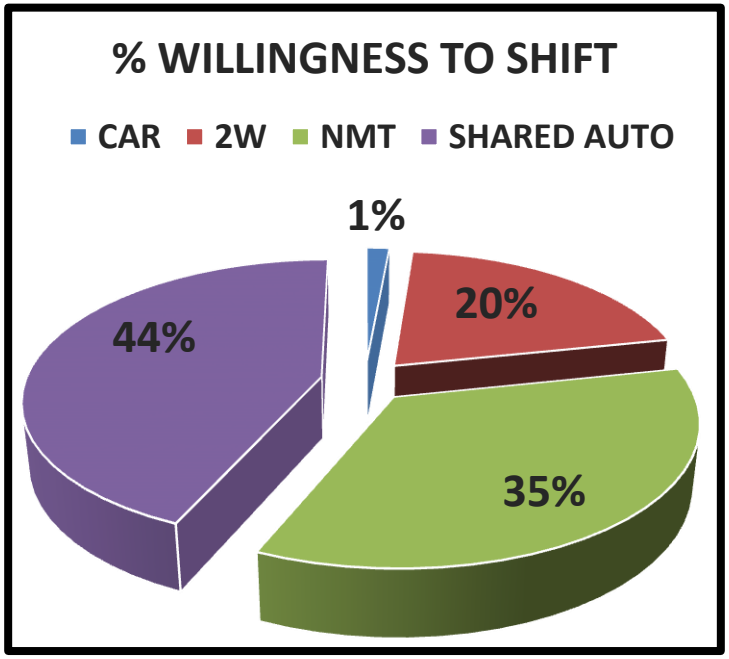
* Till Oct'2015

The Research……

BEHAVIOUR OF PASSENGER TOWARDS SHIFT TO DELHI METRO FEEDER

MODE	PERCENTAGE SHIFT
Car to Feeder Bus	1 %
2W to Feeder Bus	14 %
NMT to Feeder Bus	24 %
Auto to Feeder Bus	30 %

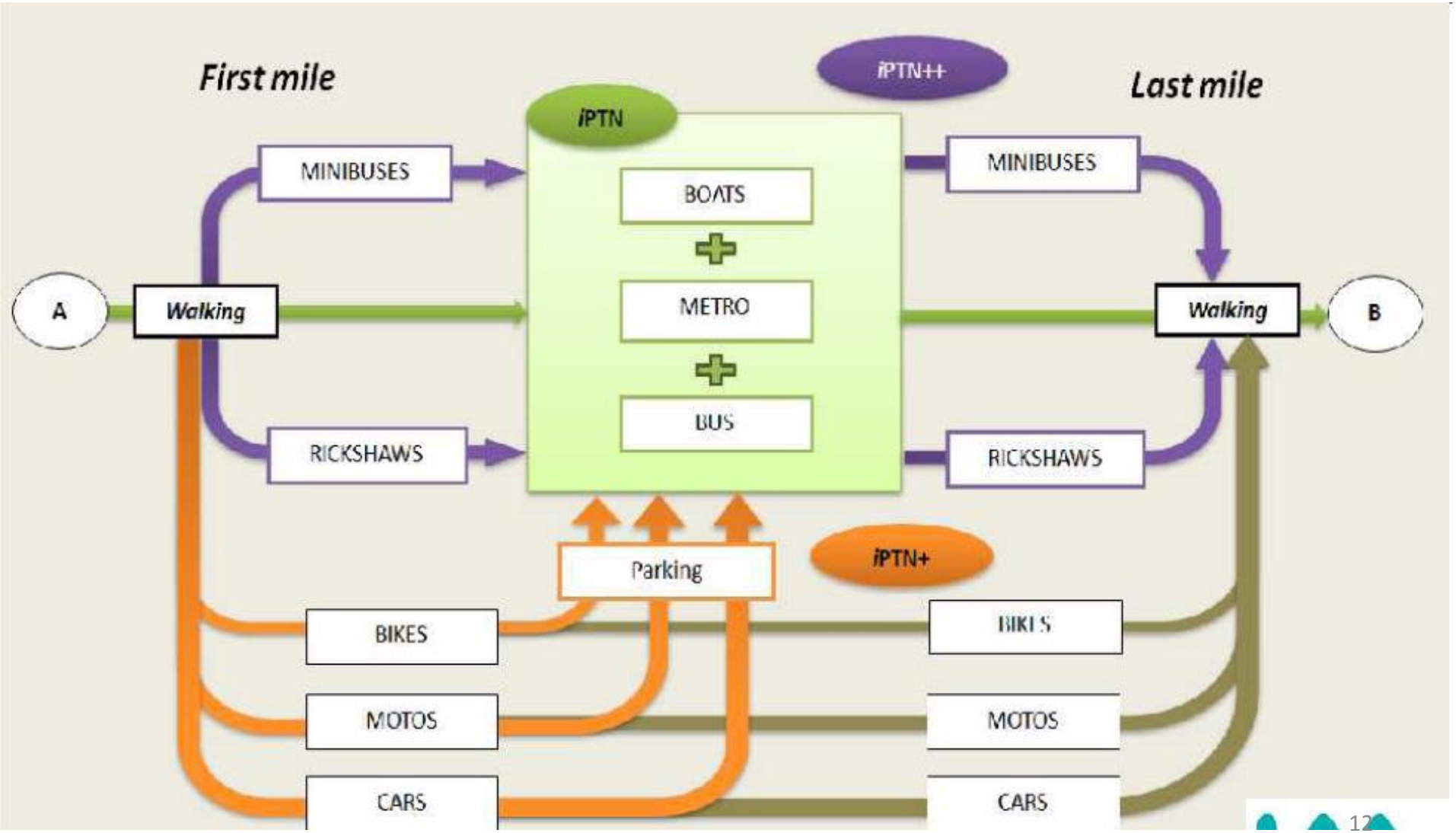
**NMT include Cycle & Battery Rickshaw because they have no priority over each other by the users.*



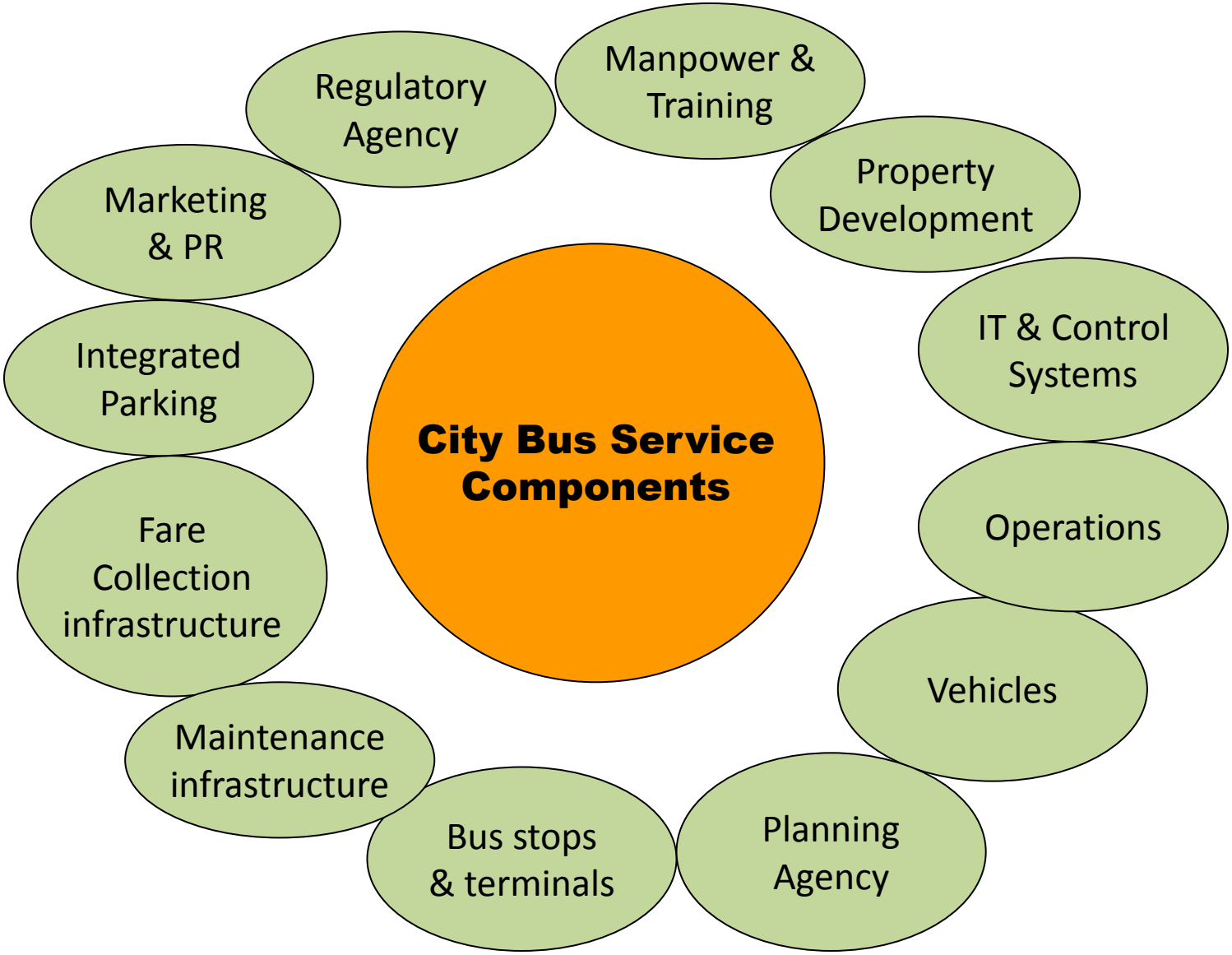
SOURCE: PRIMARY SURVEY , 2016

- The above result is obtained by stated preference survey of the passengers.
- The variables considered were travel time and travel cost.
- The saving in the above mentioned variables were calculated for different choices by the passengers.
- A binary logit model was developed to find out the willingness to shift from car, 2W , NMT & Auto by the passengers in the given choices that will improve the feeder bus service of the metro.

The Concept in Making……



City Bus Service Components



Delivery of Urban Bus Services – Service Quality Standards

SN	Quality Parameter	Formula	Specified Service Quality Level
1	Fleet utilization	No. of buses operated*100/ No. of buses scheduled	90
2	Bus utilization	Kms operated by all buses / Total no. of buses held	180
3	Occupancy Ratio	Avg. no. of passengers inside the bus per bus per day / capacity of the bus including standees	60
4	Trip Efficiency	No. of trips operated*100/ No. of Trips Scheduled	98 or better
5	Reliability of buses	Total no. of breakdowns*10000/ Total Kms operated	Less than 5
6	Safety of operations	No. of accidents*100000/ Total Kms operated	Preferably none
7	Punctuality	No. of trips on time at start*100/ Total no. of trips operated	98 or better
8	Cleanliness of buses	No. of buses observed or reported dirty*1000/ Total no. of bus trips operated	Nil
9	User Satisfaction	No. of complaints*1000/ total trips operated	Less than 2
10	Non Stoppage at Designated Points	No. of Stops where the bus stopped*100/Total number of stops on the route	90%
11	Non- Completion of entire trip	Total km operated per trip*100/total route length	95%

Narrative Examples……

BRT in Ahmedabad

The Happening……

Cluster Bus System – Passenger Friendly Initiatives

Automatic Vehicle Location System (AVLS) based Real time Passenger Information System

Web and mobile application 'Poochho'

From AVLS & ETM inputs passengers given information on bus ETA, seat availability

The Adoption……

A Comprehensive Bus Management System

Anchored by trained staff and enabled by smart, scalable and robust IT System.

AVLS

BMS

ETM

AFCS

Smart Mobility Cards……

Connected Wallet

EMV Smart Card based Payments

Mobile based Payments

Buses

Metro Trains

Ferries

Fare purchases for Kochi Public Transit

Parking

E-Commerce

Retail Payments

Non-Transit payments enablement

Public Transport Scenario in India

- Estimated modeshare for future years

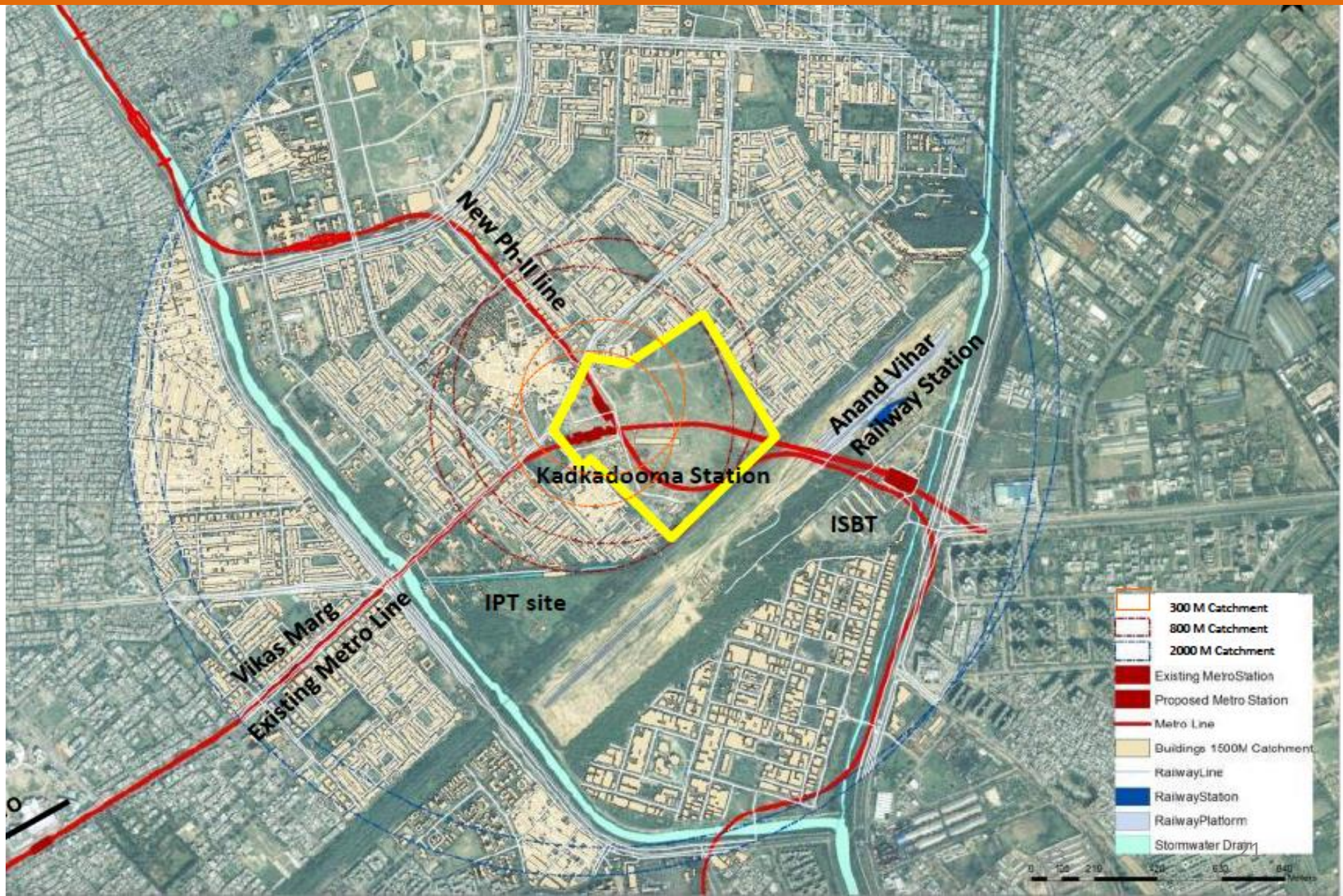
Population	2011			2021			2031		
	PT	PV+IPT	NMT	PT	PV+IPT	NMT	PT	PV+IPT	NMT
< 5 lakhs	4	59	36	3	66	31	2	72	26
5 to 10 lakhs	8	42	50	6	51	43	5	58	36
10 to 20 lakhs	12	46	43	10	52	38	9	57	34
20 to 40 lakhs	9	49	42	8	51	41	8	52	40
40 to 80 lakhs	21	45	35	15	51	34	12	54	34
Above 80 lakhs	42	28	30	31	40	29	26	46	28

P.T-Public Transport . PV-Personalized Vehicles. IPT-Auto rickshaw. NMT-Non motorized transport including walk and cycles.

Ref : Study on Traffic & Transportation policies & strategies in urban areas in India – M.O.U.D (2008).

Complimentary Policies ….TOD…….

The Redevelopment……



The New Focus.....

Existing opportunity to act for Indian cities

Smart cities Mission	**AMRUT** : Atal Mission for Rejuvenation and Urban Transformation	**HRIDAY** : Heritage City Development & Augmentation Yojna
100 cities	500 towns	12 cities
Central Allocation of INR 48000 Crore	Central Allocation of INR 50000 Crore	Mission Launched
Smart cities challenge in progress	Implementation Started	Implementation Started

Ministry of Urban Development with State and Local Governments

New Initiatives……

Smart Cities Programmes

Area Based Development

Retrofitting
OR
Redevelopment
OR
Greenfield development

Physical ,social and Institutional governance

Pan City initiative

Focus Area

- Provide Universal accessibility
- Improve Last mile connectivity
- Provide NMT infrastructure - walkability
- Provide & Improve Public transport
- Integrated Multi-Modal Transport

Smart City
MISSION TRANSFORMATION

Smart City Initiatives……

Integrated Transport System

- 17.1 Kilometres of high capacity public transport system per 100 000 population (core indicator)
- 17.2 Kilometres of light passenger public transport system per 100 000 population (core indicator)
- 17.3 Annual number of public transport trips per capita (core indicator)
- 17.4 Number of personal automobiles per capita (core indicator)
- 17.5 Percentage of commuters using a travel mode to work other than a personal vehicle (supporting indicator)
- 17.6 Number of two-wheel motorized vehicles per capita (supporting indicator)
- 17.7 Kilometres of bicycle paths and lanes per 100 000 population (supporting indicator)
- 17.8 Transportation fatalities per 100 000 population (supporting indicator)
- 17.9 Commercial air connectivity (number of non-stop commercial air destinations) (supporting indicator)

Smart City Initiatives.....

- 17.10 The city should have a good quality, efficient, sound, reliable city bus system (core indicator)
- 17.11 A Smart City should have a network of high quality Bus Rapid Transit System (support indicator)
- 17.12 The City bus system should also be planned to include complementary modes like mini and midi buses.
- 17.13 The smart city should have a network of public cycle scheme (core indicator)
- 17.14 Smart city should have a rickshaws as feeders to mass transit stations (support indicator)
- 17.15 A smart city should have implementation plan for transit oriented development in specific zones. (core indicator)
- 17.16 Urban Transport Network (Core Indicator)
- 17.17 Design Components- Cross Sections of Roads (Core Indicator)
- 17.18 Grade Separated Facilities (Core Indicator)
- 17.19 Intersections (Core Indicator)
- 17.20 Traffic management(Core Indicator)
- 17.21 Parking Development Strategy (Core Indicator
- 17.22 Intervention of Intelligent Transport System (Core Indicator)

Some Actions……

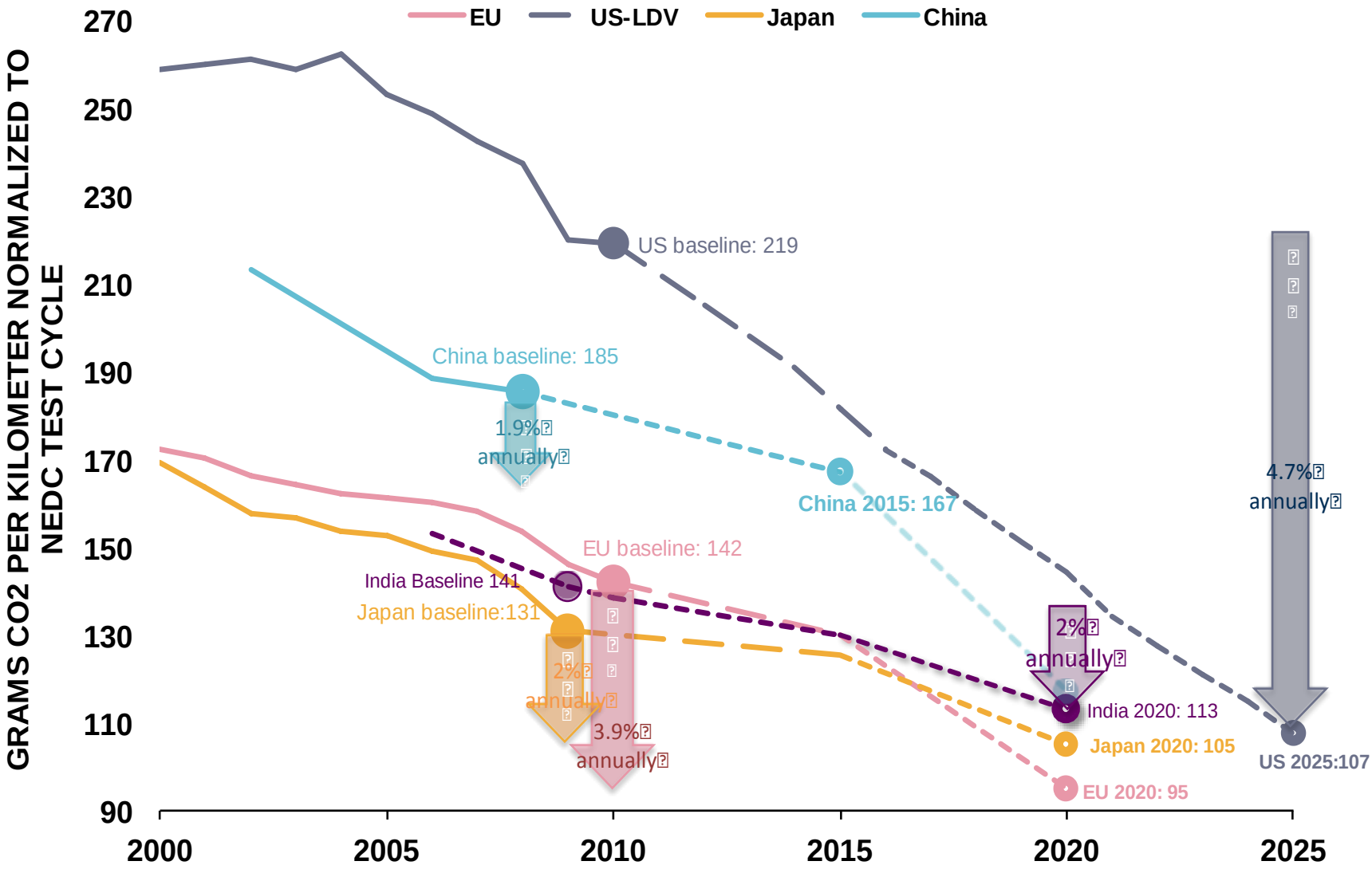
Awareness Campaigns……

Some Results……

Integration .....

Currently made across 303 tolls and expanding

Position of India in 2020-21 vis-à-vis International Standards



[1] China's target reflects gasoline fleet scenario. If including other fuel types, the target will be lower.

[2] US and Canada light-duty vehicles include light-commercial vehicles.

[3] Annual rate is calculated using baseline actual performance and target values.

FE Norms for Heavy Duty Vehicles

Vehicle Classification

Vehicle Category	Category Name	Category Details (GVW in Tons)
Buses (Carrying Passengers)		
Category – M_1	Car	< 3.5T
Category – M_2	Bus	< 5T
Category – M_3	Bus	> 5T
Trucks (Carrying Goods)		
Category – N_1	LCV	≤ 3.5T
Category – N_2	MCV	> 3.5T ≤12 T
Category – N_3	HCV	> 12 T

sandeepgarg05@gmail.com