



Comprehensive Mobility Planning (CMP) and efficiency improvement in Urban Transport in India

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Comprehensive Mobility Planning (CMP) and efficiency improvement in Urban Transport in India



IIT Delhi

SE4ALL Energy Efficiency Hub Workshop
UN City, Copenhagen
16 17 June 2014

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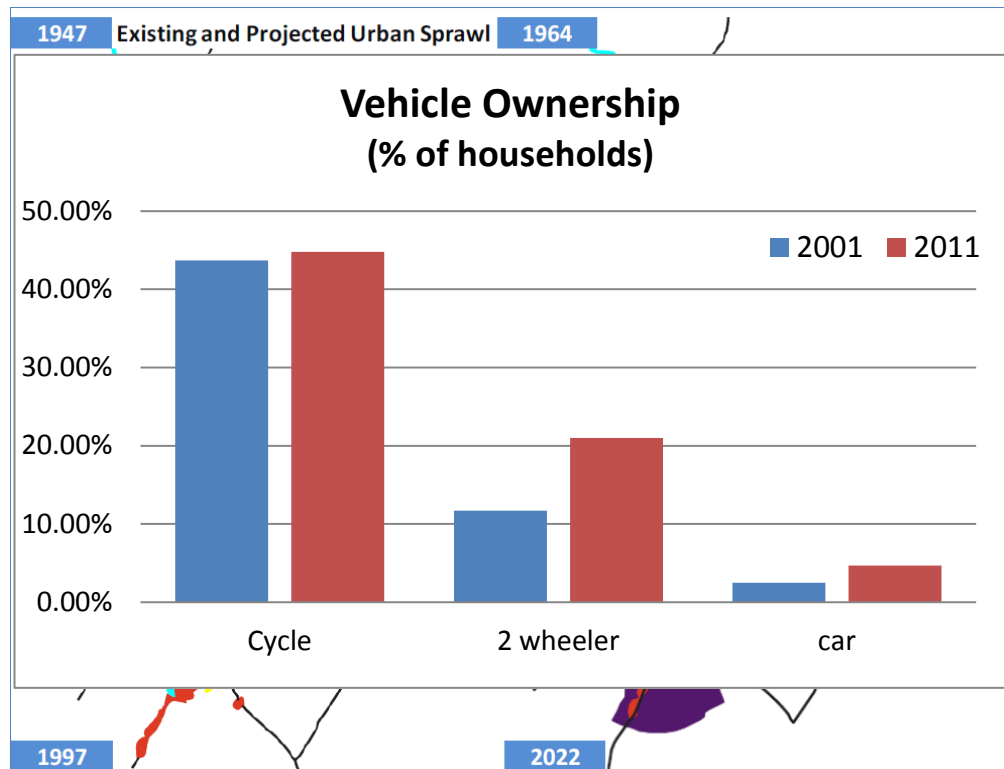
Contents

- Urbanisation Trends
- Low Carbon Scenarios for Urban Transport
- Comprehensive Mobility Planning Toolkit

Urbanization Trends

Size Category (population)	No. of cities (% of urban population)	
	1975	2000
>10 million	0 (0)	3 (15.5)
5-10 million	2 (11.3)	3 (6)
1-5 million	8 (13.7)	25 (14.7)
0.5-1 million	17 (8.3)	38 (9.4)
<0.5 million	≈ 3,000(66.8)*	≈ 4,000 (54.5)

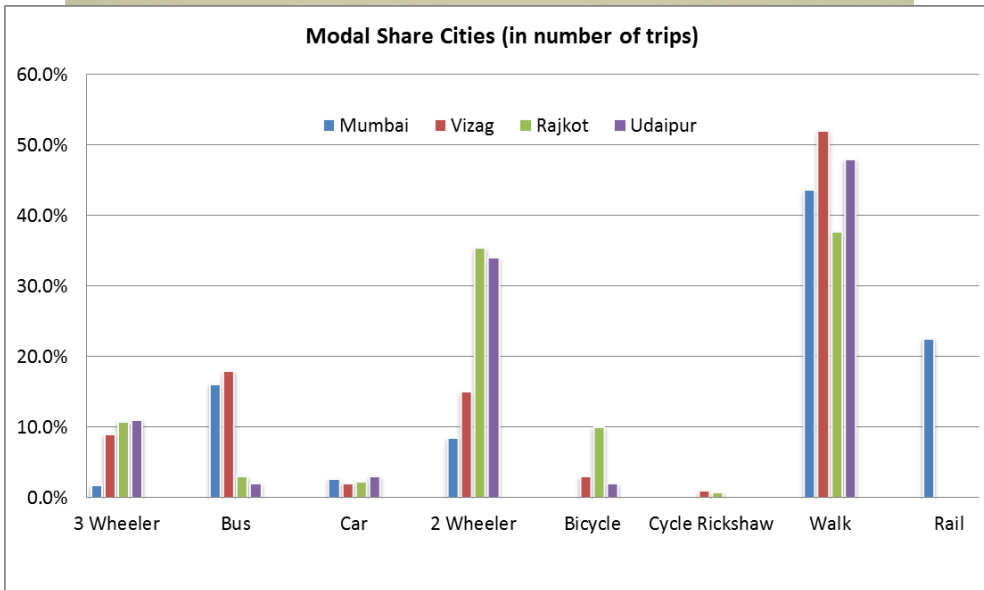
- Fast growth in number of million plus cities
- Rapid expansion in cities above 0.5 million
- Increasing trip lengths and trip rates
- Increasing vehicle ownership (2 wheelers)



Source: LCMP Udaipur

Impacts of Urbanisation

Modal Share Cities (in number of trips)

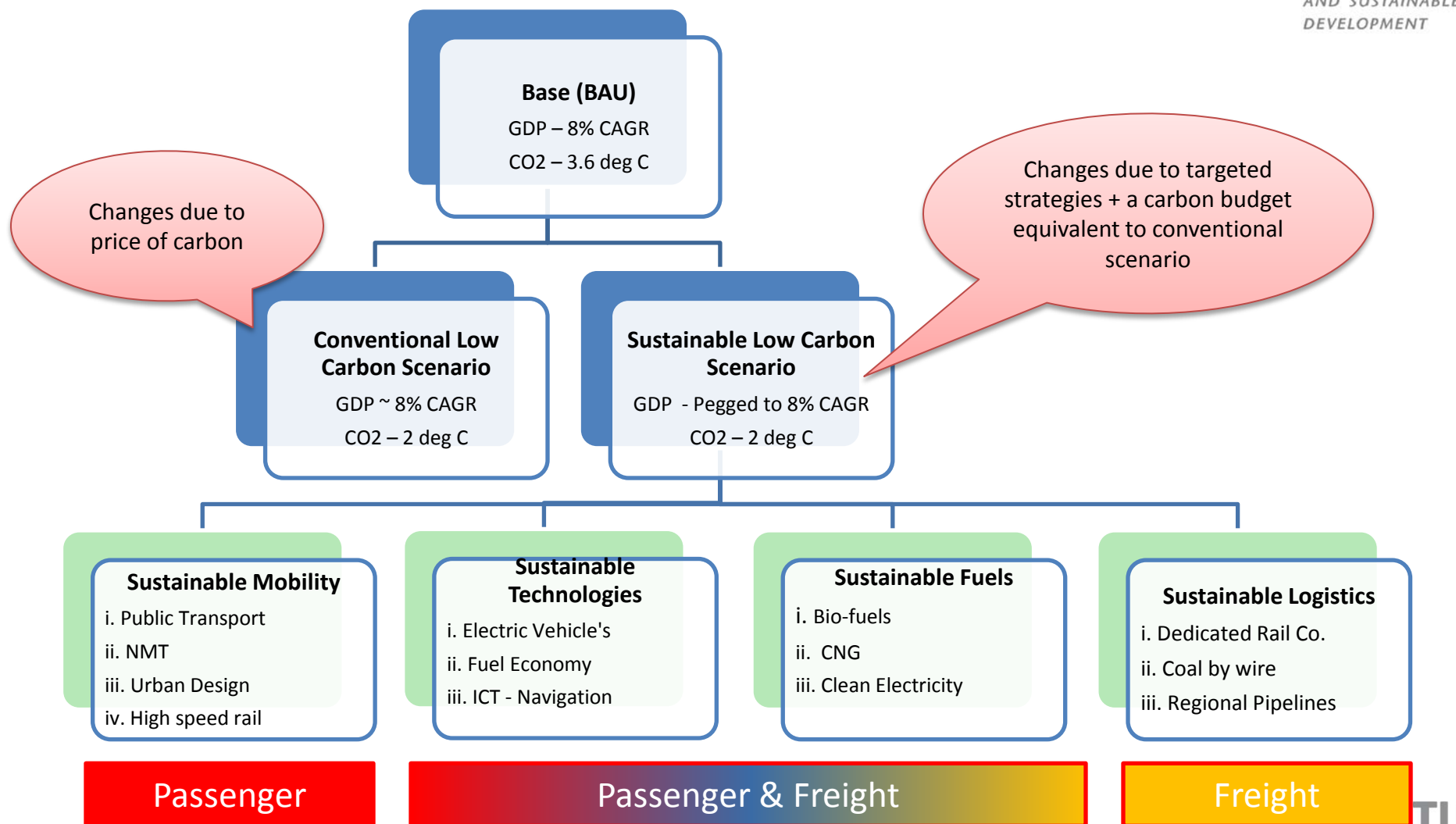


Haze in Kaula Lampur
Source: Wikicommons

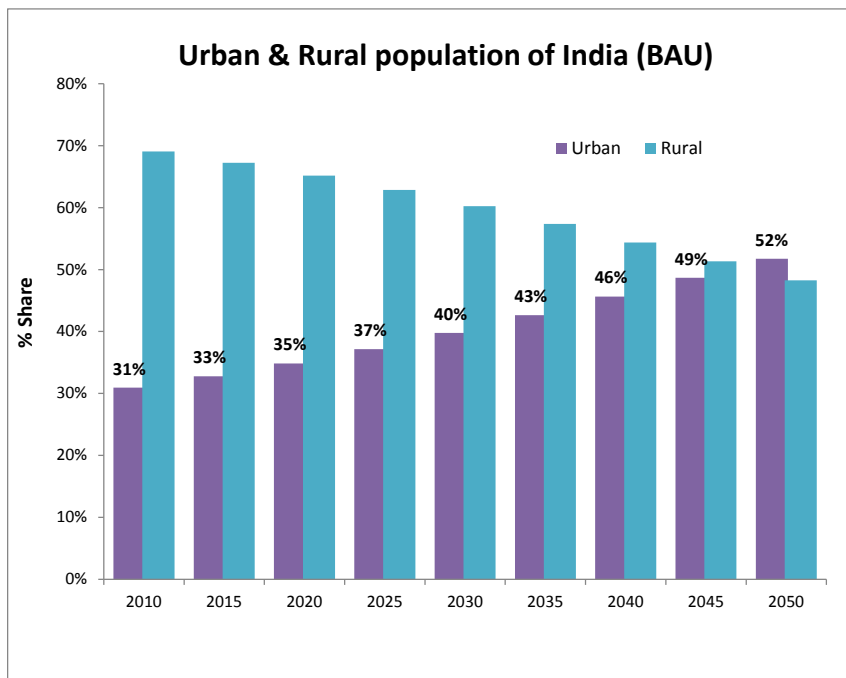
- Air Quality
 - 30% - 50% of PM from transport sector
 - 27 cities of India in top 100 cities with worst air pollution
- Safety
 - 231,027 deaths in road accidents in 2010 (WHO)
- Equity
 - Focus on roads & vehicles (See Graph)
 - PT use limited within (women and poor)
- Security

Low Carbon Scenarios

Transport Scenario Architecture



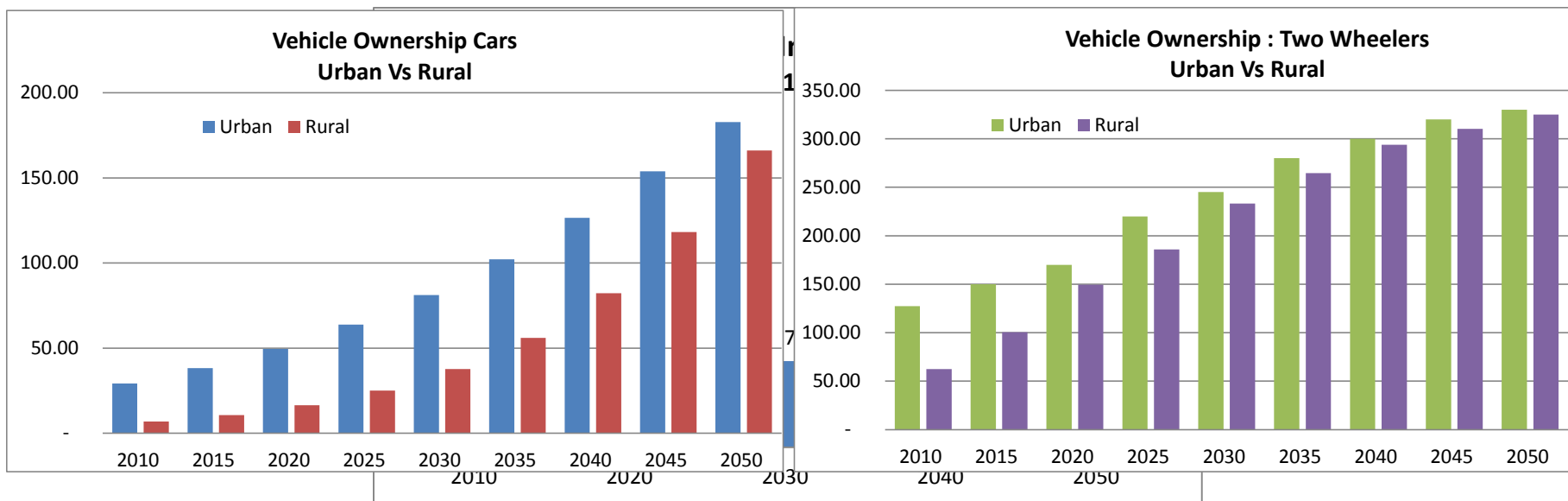
Demographic Transitions



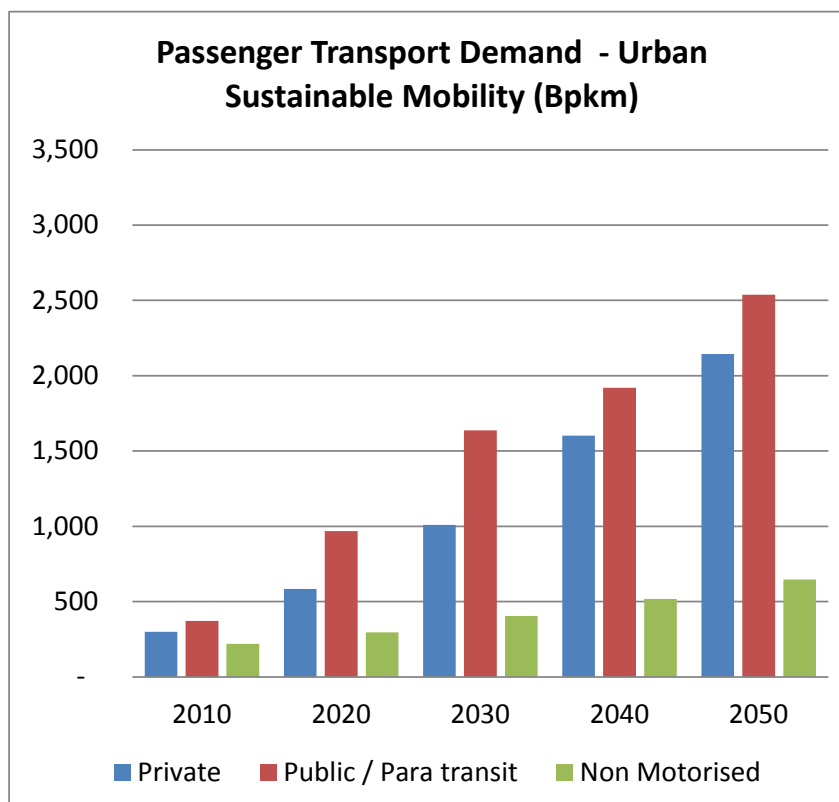
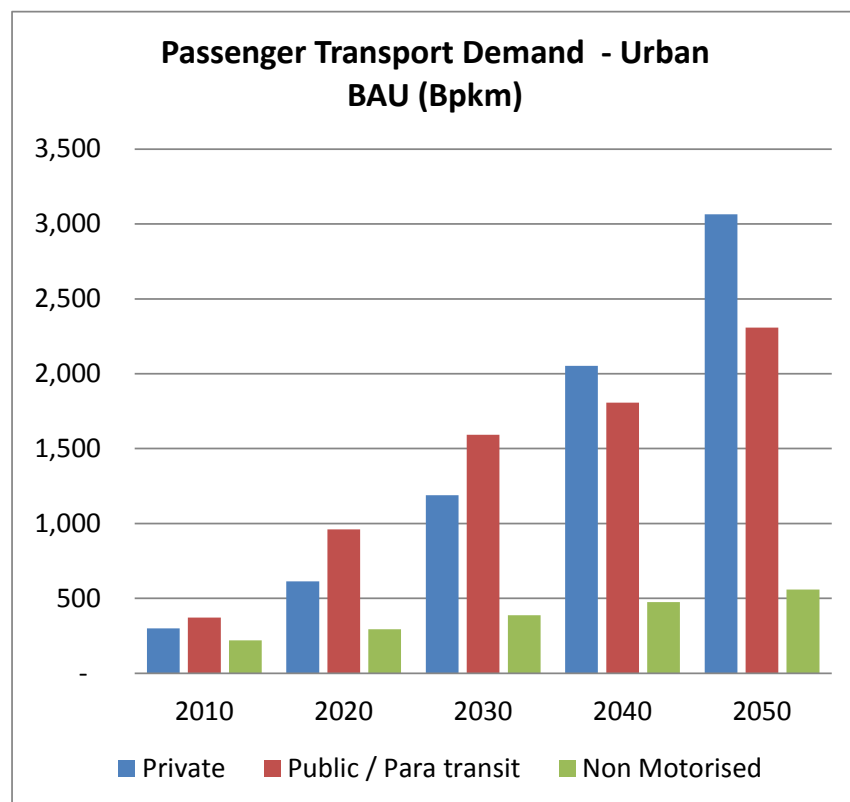
Data: UNPD, 2012

Year	Average Size of Household	
	Rural	Urban
2000*	5.40	5.10
2005	5.23	4.80
2010	5.06	4.52
2015	4.90	4.25
2020	4.75	4.00
2025	4.60	3.76
2030	4.45	3.54
2035	4.31	3.33
2040	4.18	3.13
2045	4.04	2.95
2050	3.90	2.76

Income Transitions



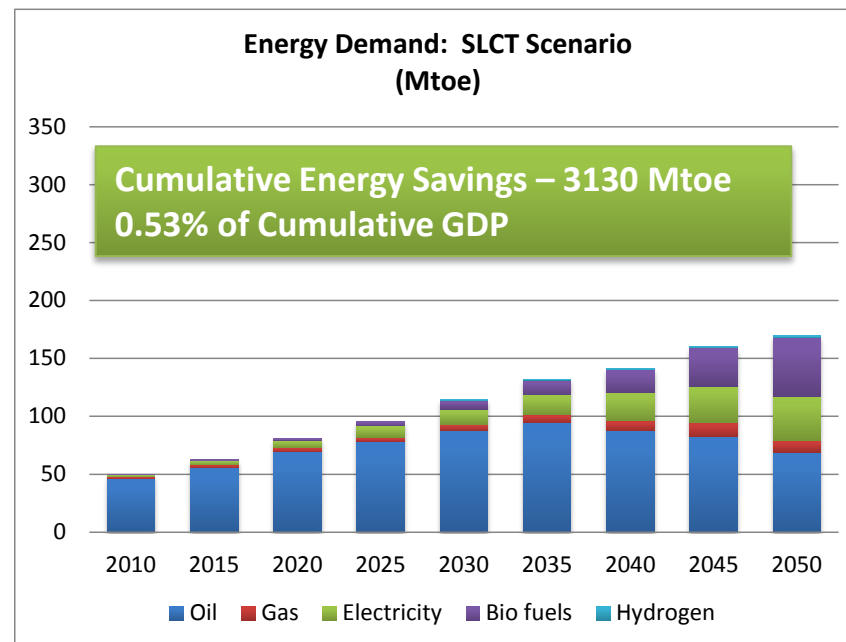
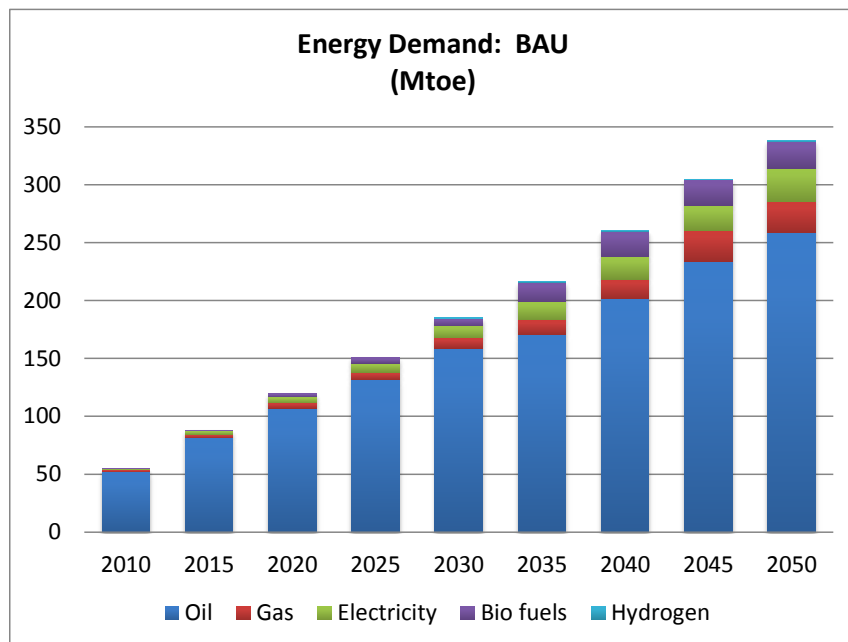
Demand Transition: BAU & Sustainable Mobility Scenario



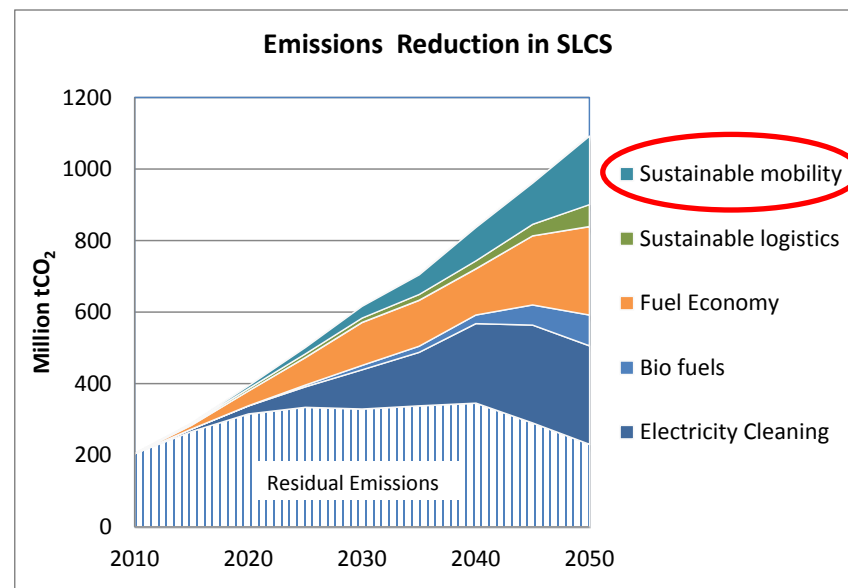
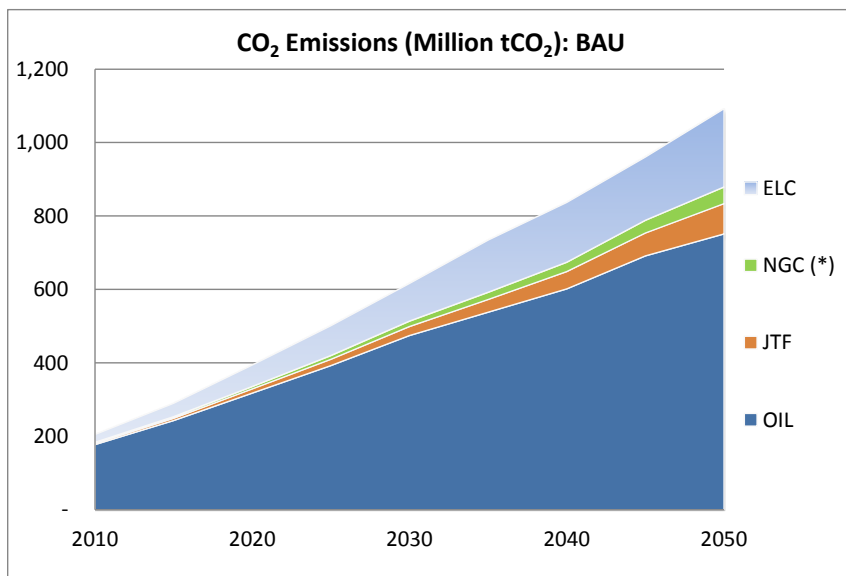
Sustainable Mobility Storyline

- **Modal Shifts** through better urban planning and creation of infrastructures for public transport (Metros, BRT) and advantaging of public transport
- **Demand reduction** through *transit leverage*

Energy Demand for Transport

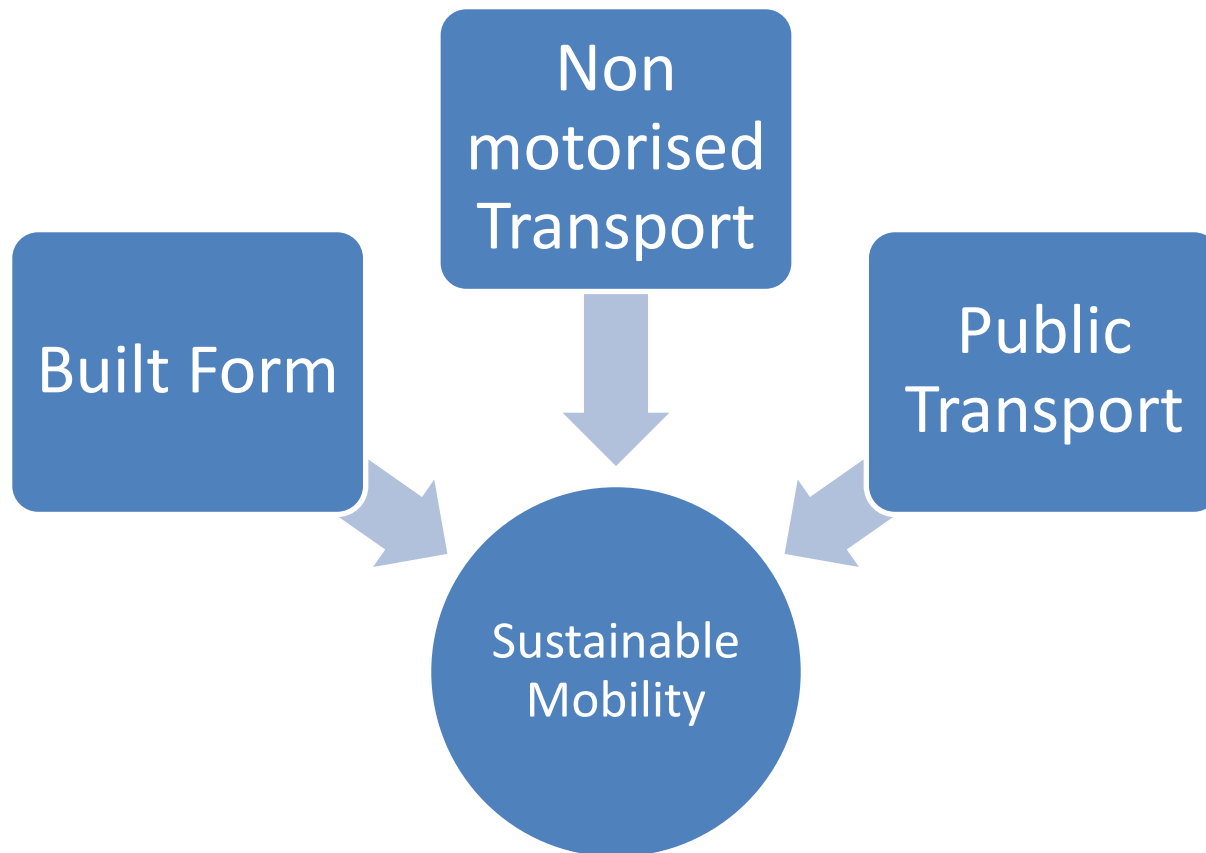


CO₂ Emissions: Transport



CMP Toolkit

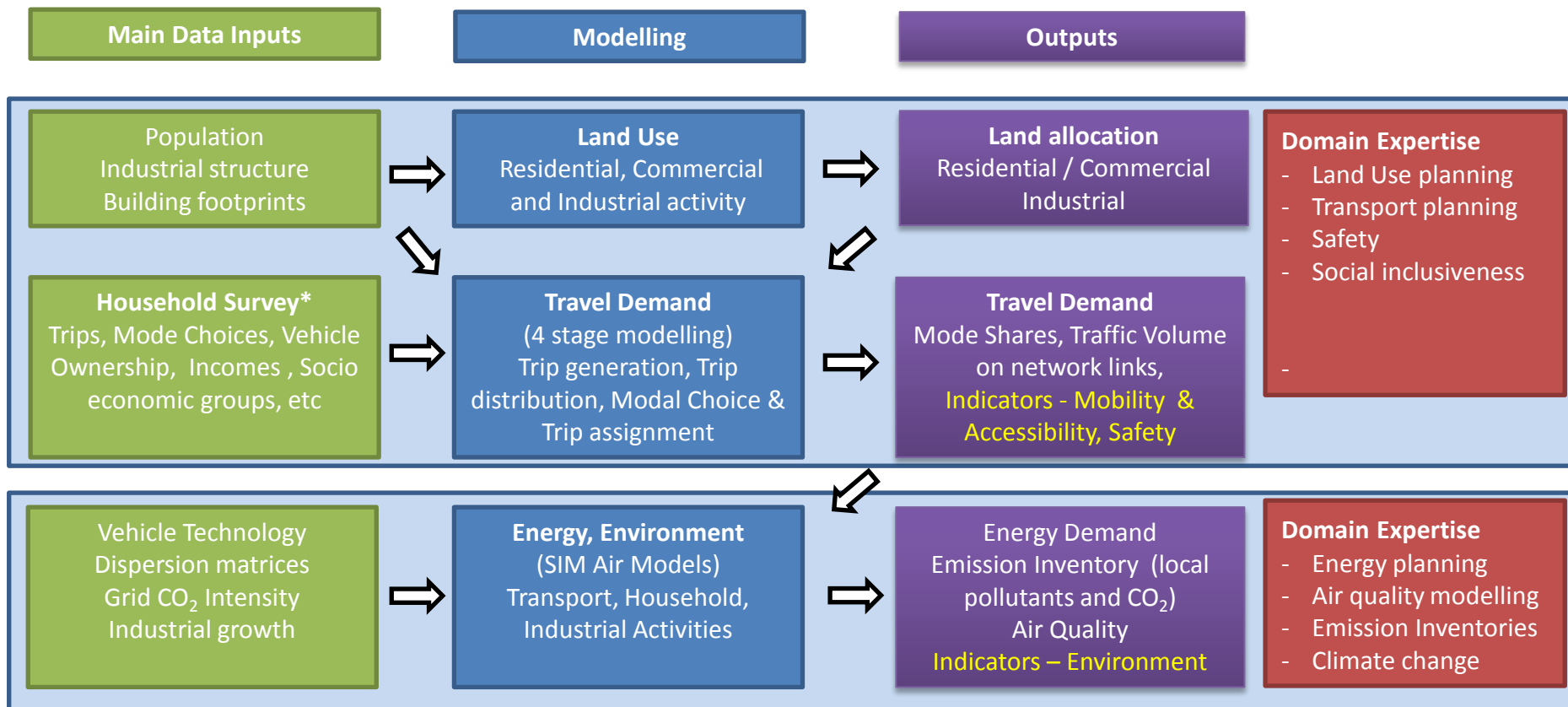
Strategies for sustainable mobility



Key Challenges for Mainstreaming

- Methodology
- Data
- Capacity
- Institutional

Modelling Framework for LCMP

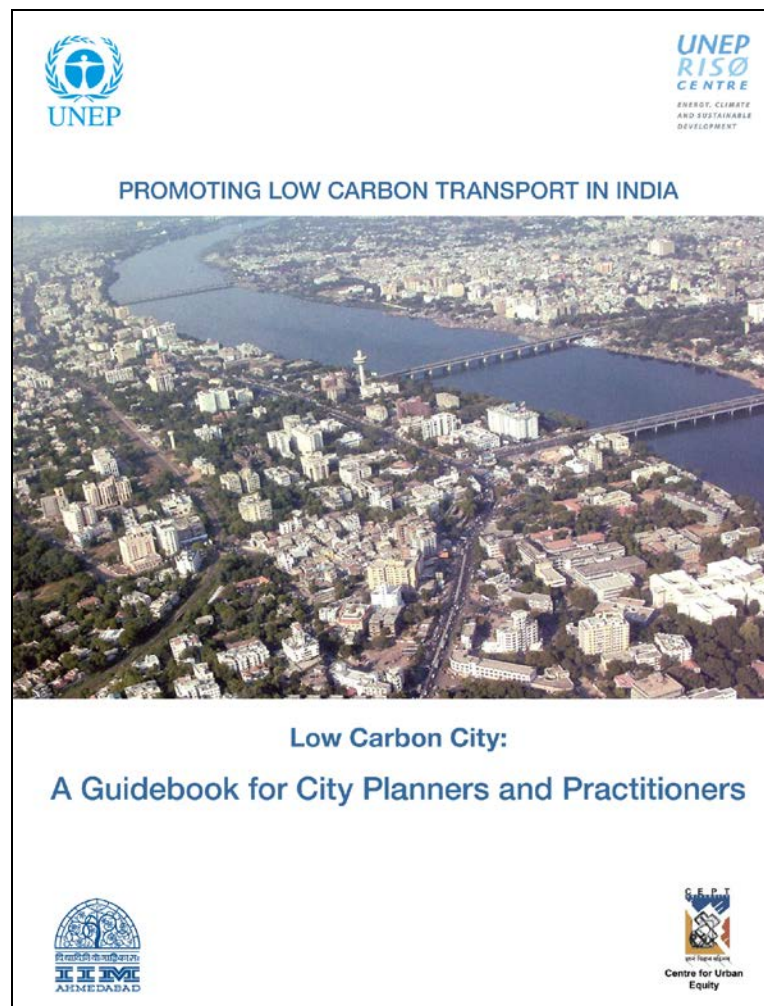


* Information of household surveys is collected using stratified sampling and all income groups, social groups, genders covered

⇒ Flow of information

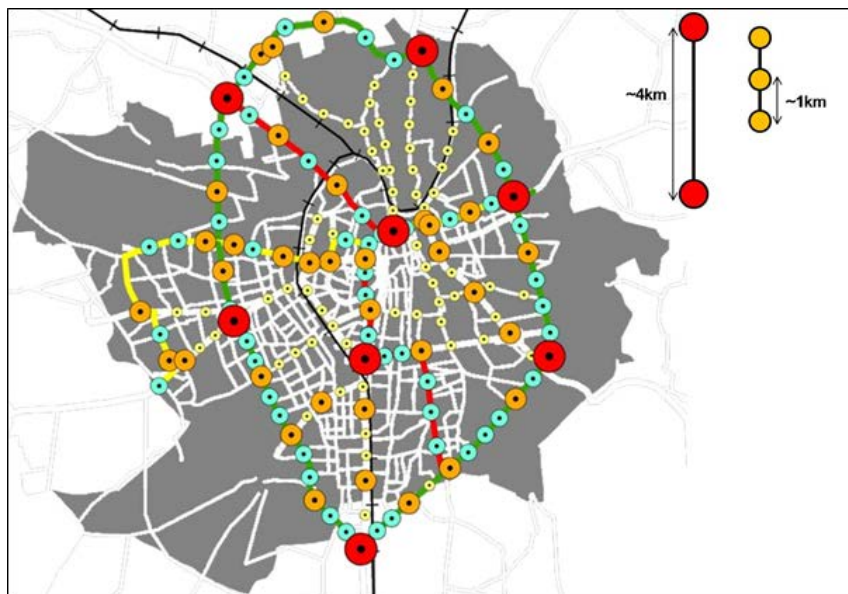
Data

- City Level
 - Building, Safety, Vehicle Registrations, Income
- National
 - Fuel Mix, Electricity, Fuel Policies, Vehicle Standards
- Global
 - Technology, Climate Policy

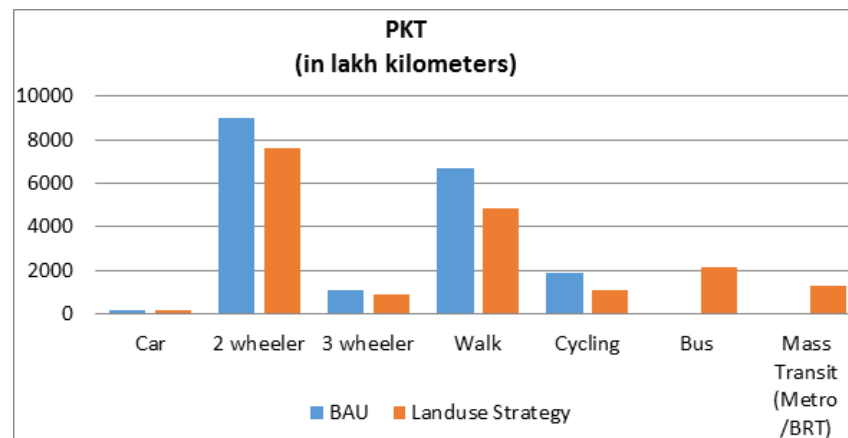


Land Use Scenario: Rajkot

Land Use Scenario



Travel Demand : 2030



Impacts: 2030

Indicators	BAU 2031	Land Use 2031
Accident rate (per million population)	217	190
PM 2.5 (thousand tonnes)	21535	13724
NO _x (thousand tonnes)	55696	35532

Cities

- Cities
 - Vishakapatnam
 - MoU with GVMC
 - Consultant : iTrans
 - Rajkot
 - MoU with RMC
 - Consultant : CEPT University
 - Udaipur
 - MoU with UIT
 - Consultants: Urban Mass Transit Company



LOW-CARBON COMPREHENSIVE MOBILITY PLAN FOR RAJKOT:

SUSTAINABLE MOBILITY WITH LOWER EMISSIONS

ABOUT THE CITY

The fourth-largest city in the state of Gujarat, Rajkot has experienced significant growth in recent years. As a participant in UNEP's Promoting Low Carbon Transport in India project, the city has been selected as a case study for preparing Low Carbon Comprehensive Mobility Plans (LCMPs). Managed by Rajkot Municipal Corporation (RMC), the city itself is around 104 sq km. The larger metropolitan region, which is under the jurisdiction of Rajkot Urban Development Authority (RUDA), has an area of about 433 sq km. This larger metropolitan area, which is the subject of the LCMP study, includes the city of Rajkot as well as 54 nearby villages, the total population of which is 1.48 million.

CITY VISION

Rajkot's vision for urban mobility is to ensure optimum use of resources and sustainability in the urban environment in order to provide efficient and cost-effective basic services to each and every citizen of Rajkot. This, in turn, will facilitate economic, social, cultural and educational development.

PROJECT PARTNERS:



IIT Delhi



IIT Madras



CEPT

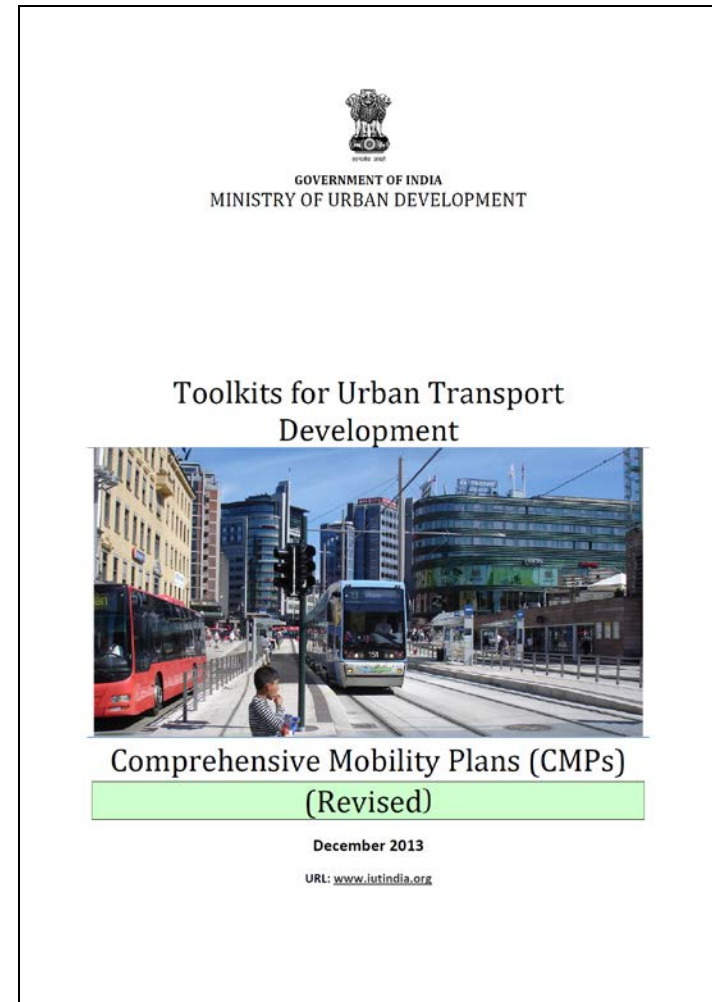
CURRENTSITUATIONANDKEY CHALLENGES

In terms of transport infrastructure, Rajkot is currently considering proposals for road widening, incorporation of pedestrian footpaths and other road infrastructure facilities. The city has already started constructing a Bus Rapid Transit (BRT) system using Jawaharlal Nehru National Urban Renewal Mission (JNNURM) funding, and 10.7 kms of the system is currently operational. Although Rajkot has already taken steps to provide public transport, pedestrian and cyclist infrastructure, these measures need to be assessed regarding demand, as well as what kind of benefits these and other strategies will bring to Rajkot in terms of improving transport, accessibility, and reducing CO₂ and other transport-related air pollution.

During the study, Rajkot's city structure and transport systems were analysed. The study found that jobs have spread out with residential sprawl, so the overall trip lengths are rather short. However, the city is rapidly expanding in all directions with very little transport infrastructure in peripheral areas. Moreover, a large por-

CMP Toolkit (Revised)

- Links what India needs to do under its [National Action Plan on Climate Change](#) for urban transport and the Jawahar Lal Nehru Urban Renewal Mission
- Combines mobility and planning objectives with other goals such as improvements in equity, safety and environment
- Involved a multi disciplinary team of transport planning, urban planning, social inclusion, gender, safety and climate change experts
- Wide stakeholder consultations (Goa, Oct 2013, Delhi, Nov 2013 and Delhi, March 2014)
- **Impact : The toolkit is an official document to be used by cities in India**



Thank You for your attention.

For further details on project
<http://www.unep.org/transport/lowcarbon/>

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