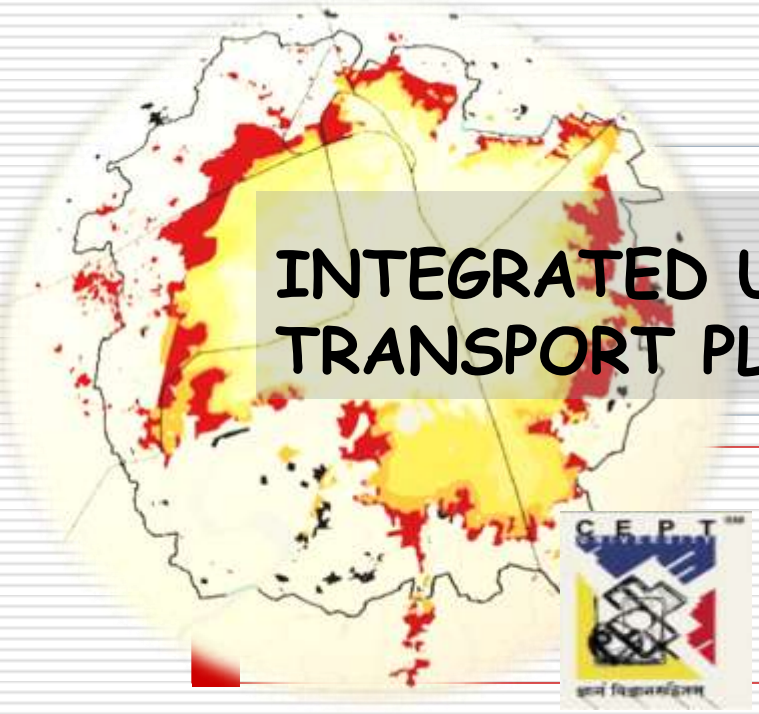
ICRIER's Program on Capacity Building and Knowledge Dissemination



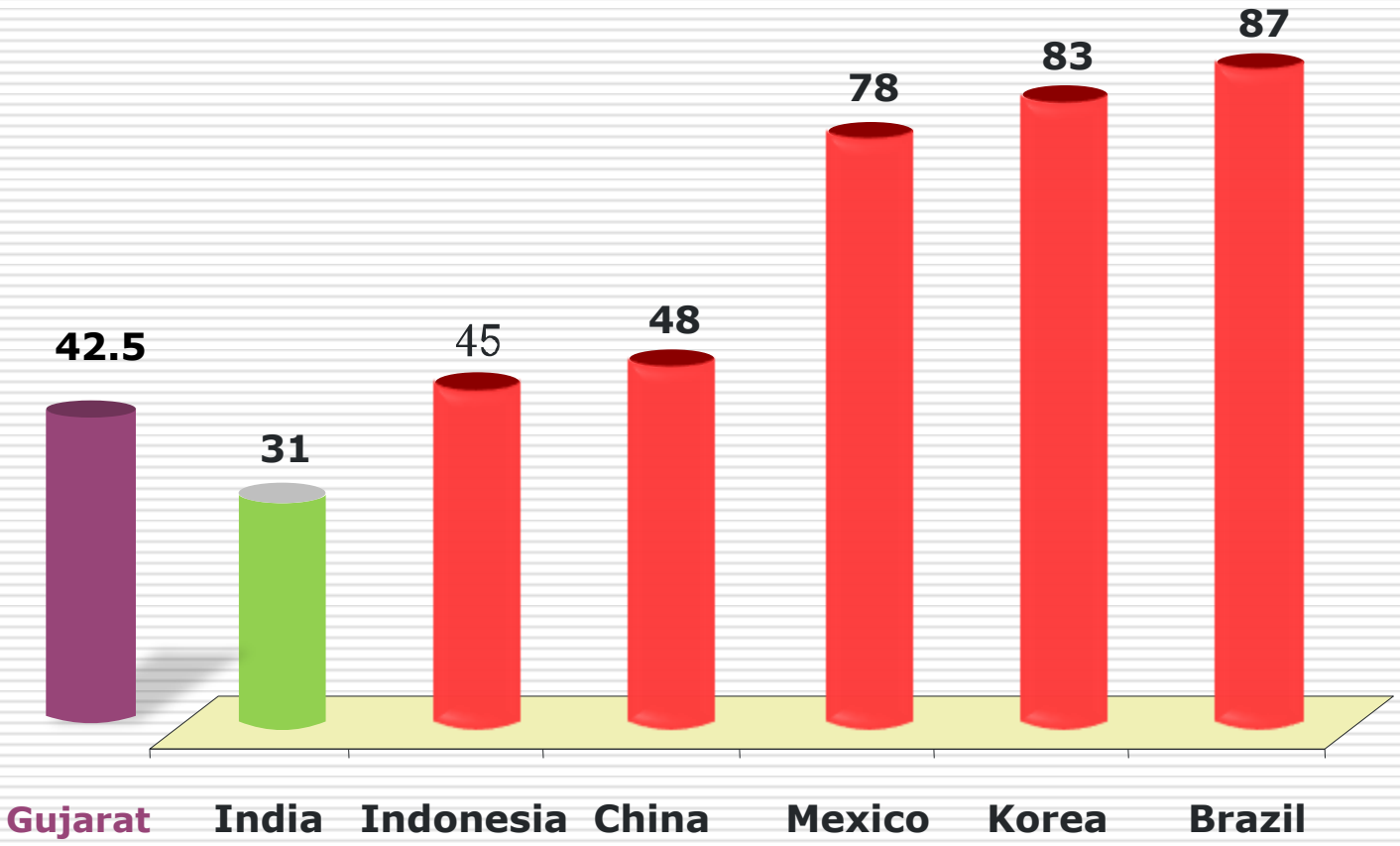
INTEGRATED URBAN LAND USE - TRANSPORT PLANNING (IULTP)

Prof. H.M. Shivanand Swamy

Centre of Excellence in Urban Transport ,CEPT University

(An Initiative of Ministry of Urban Development Government of India)

Urban share of total population - 2011 (%)



Source: **United Nations and Government of India**

Presentation by Based on Dr. Isher Judge Ahluwalia

India - Urbanisation

Urbanisation is an inevitable outcome of development process

- Urban India with 377 million people account for 31% of the total population
- By 2031, 600 million people about 40% population will live in India
- Second Largest Urban System - 8000 towns and cities
- Most cities are likely to double their population and more than double their area before they reach stable growth
- About 50% of urban population to live in 87 no. of Mill+ population Cities
- Another 70 no of 5 lakh+ Popn. Cities will also face severe transport perspective
- Urbanisation is accompanied by income growth
- Rapid motorisation to follow

India – Urbanisation – Impact on Transport & Sustainability

Urbanisation & Economic Growth - Increase in Travel Demand

- More Travellers (Million)

Mumbai	Jakarta
1980 - 10	1985 – 14
2005 – 21	2002 - 23

- More Trips (Because trip rate will increase) - Jakarta

HH Income	Low	Middle	High
Trips per person	1.87	2.21	2.3

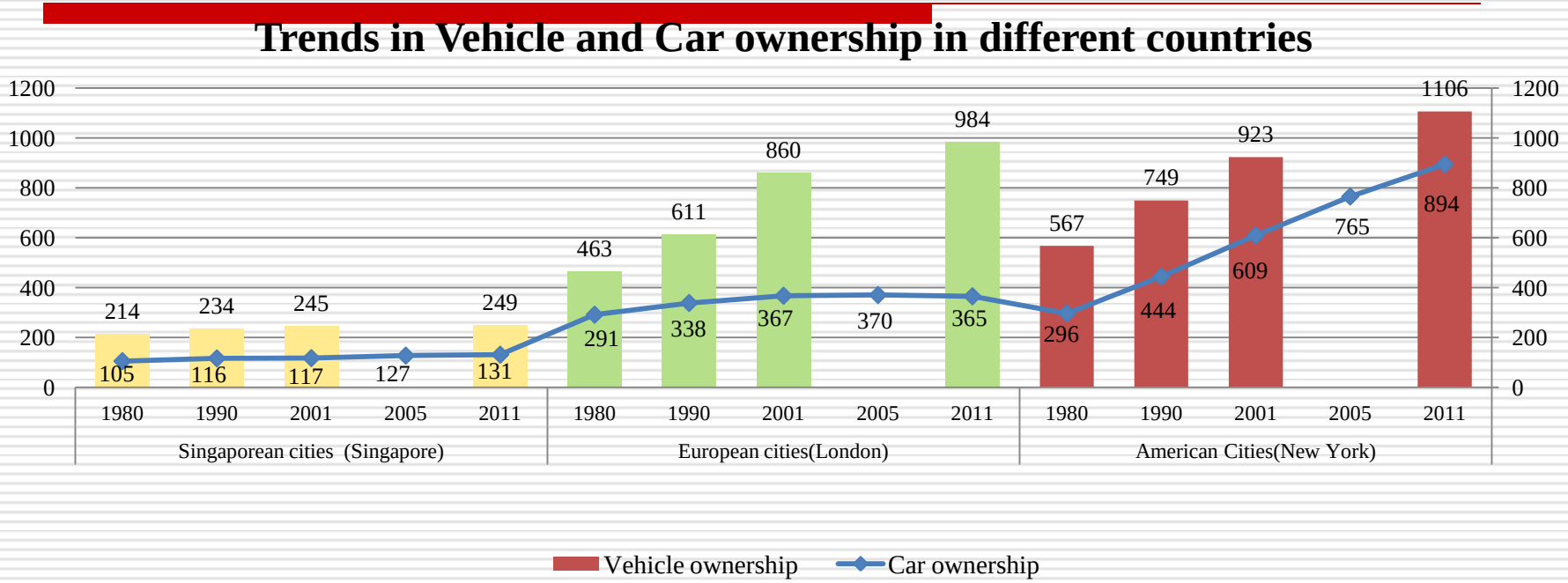
- Longer Trips -kms - Jakarta

	Work Trips	Education Trips
1985 –	6.7	2.7
2002 -	9.6	5.5

- Mode Shift – NMV & Public-> 2-wheeler-> Car

Source: based on Jose A. Gomez

MODE SHIFT



VEHICLE OWNERSHIP (CARS/1000 popn) – Registered Vehicles

Delhi – 117

Ahmedabad – 50 (25)

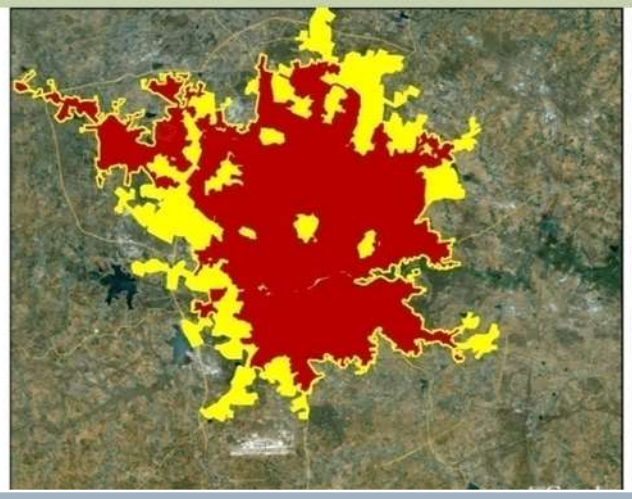
Bangalore - 50

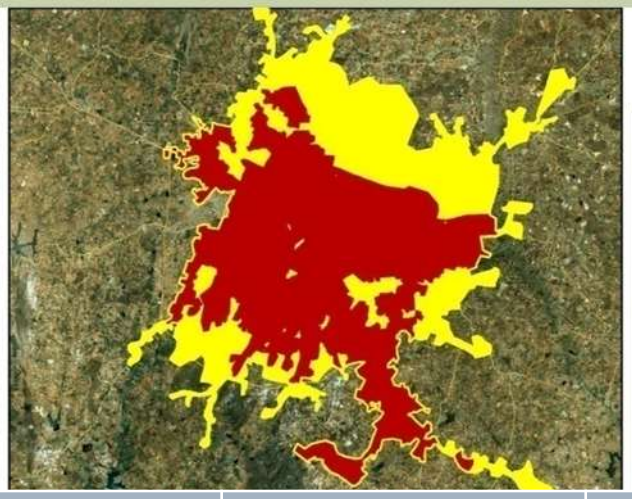
Chennai - 45

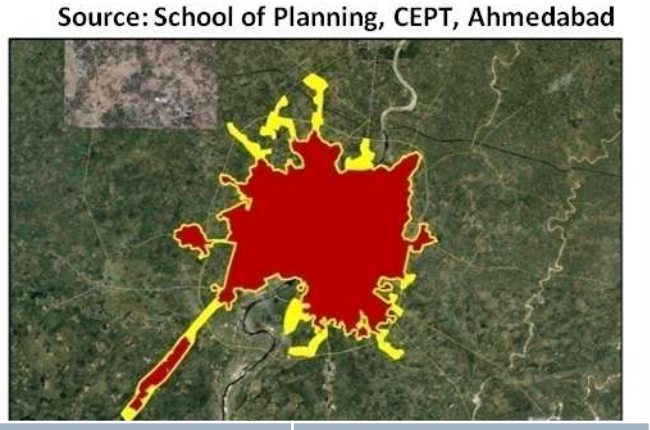
Mumbai - 25

(actual would be about 50% of registered vehicles) 140 2-wheelers

HYDERABAD **760 sq.km)** BANGALORE (853 sq. kms) AHMEDABAD (344 Sq.Km)



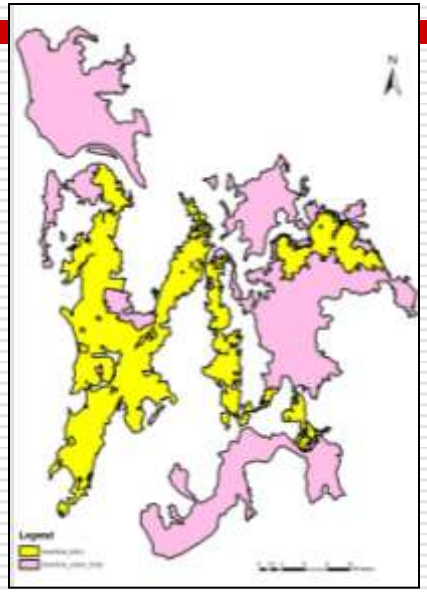




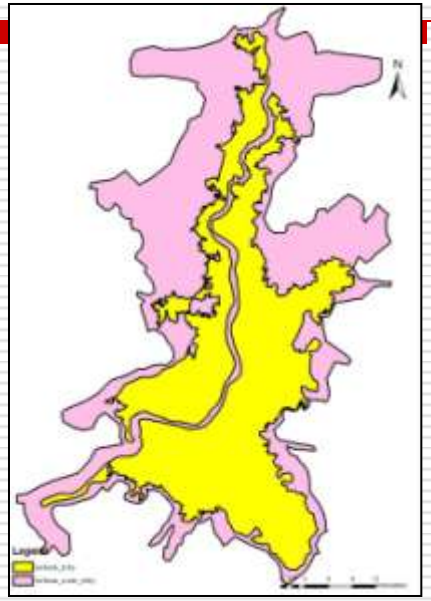
CITIES ARE SPRAWLING	HYDERABAD	BANGALORE	AHMEDABAD
Population Density (Urban Built in persons/sqkm)	**10526**	**9378**	**17441**
Population Density (Urban Sprawl in persons/sqkm)	**6265**	**5869**	**15574**
Compactness index	**0.60**	**0.63**	**0.90**
Arterial road Density	1.47	1.40	1.85
Public transport Use	48%	51	24%
NMV Use	21%	24%	32%
Trip Length (total) km	**10.5**	**11**	**5.7**
Vehicle km/capita	**10.81**	**8.90**	**6.4**
Road fatalities per	**518**	**865**	**263**
POPULATION (Million)	**8.5**	**8.5**	**6.0**

I. CITIES IN INDIA ARE SPRAWLING – LACK OF INTEGRATED PLANNING

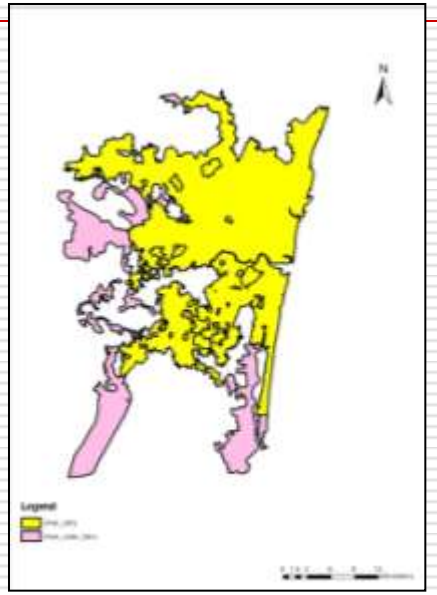
Mumbai



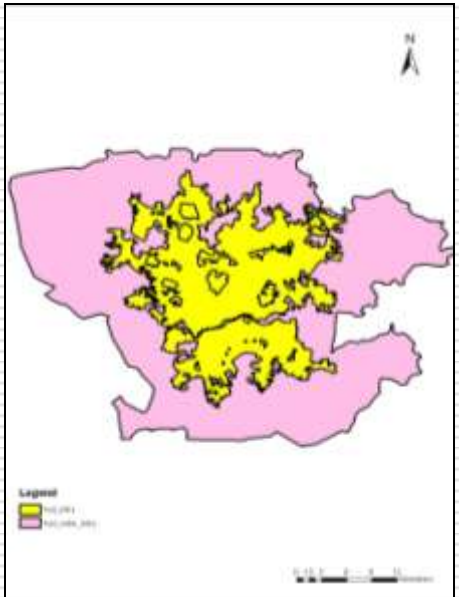
Kolkata



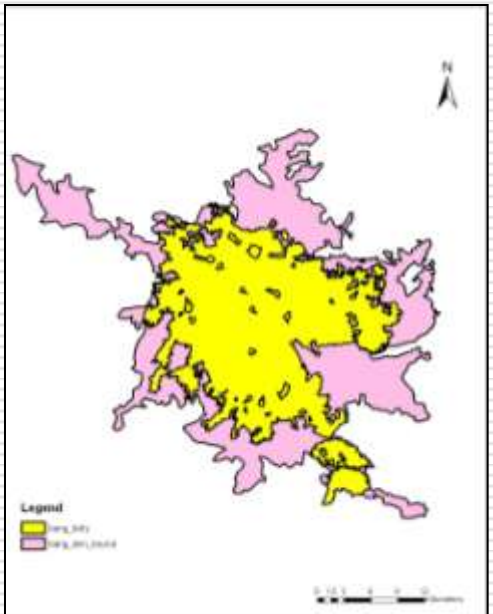
Chennai



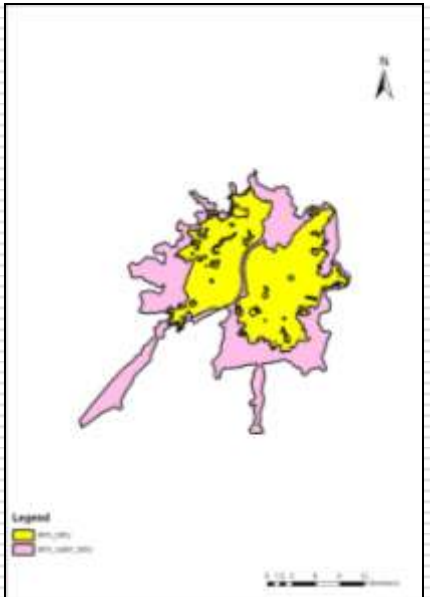
Hyderabad



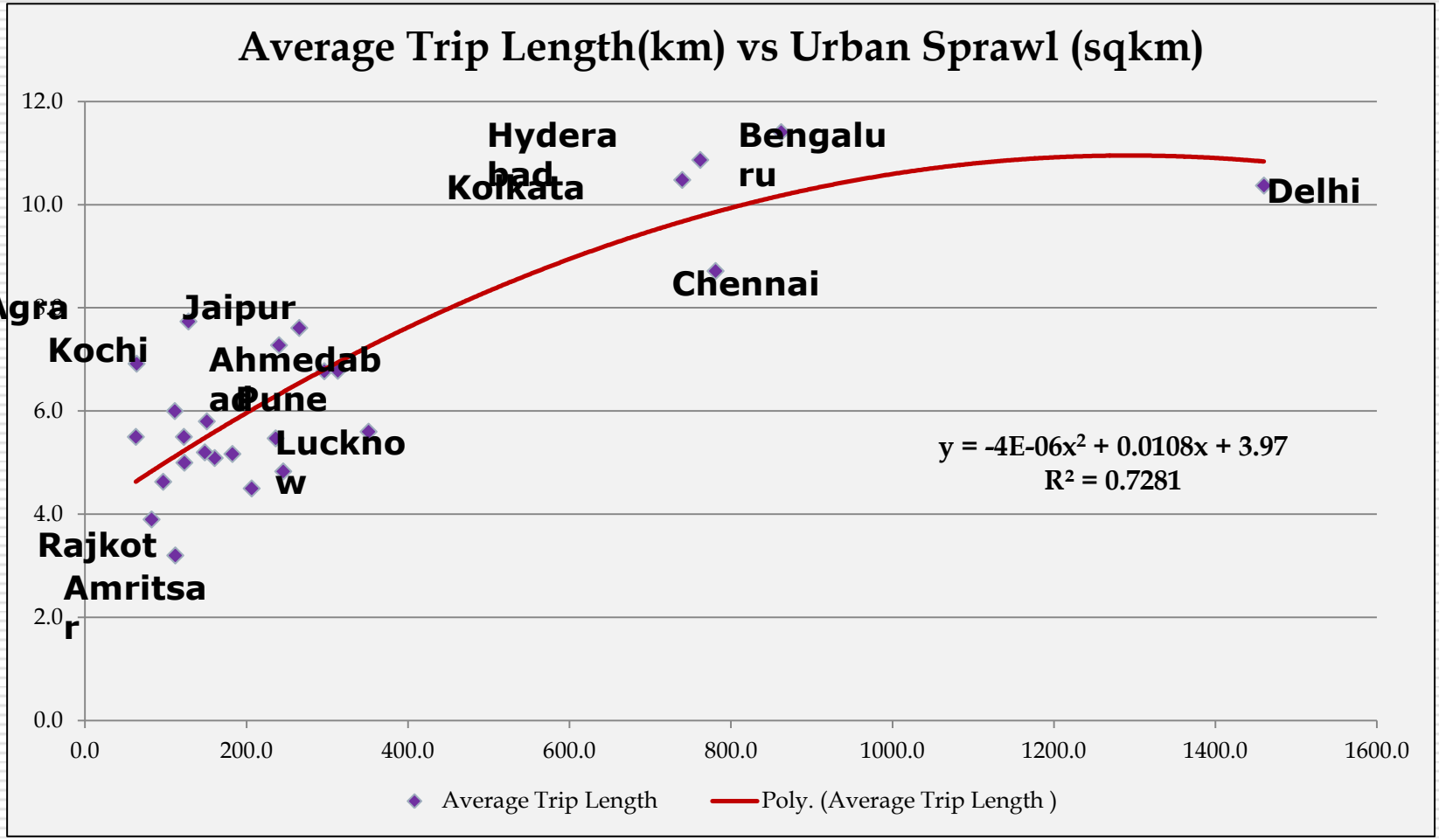
Bangalore



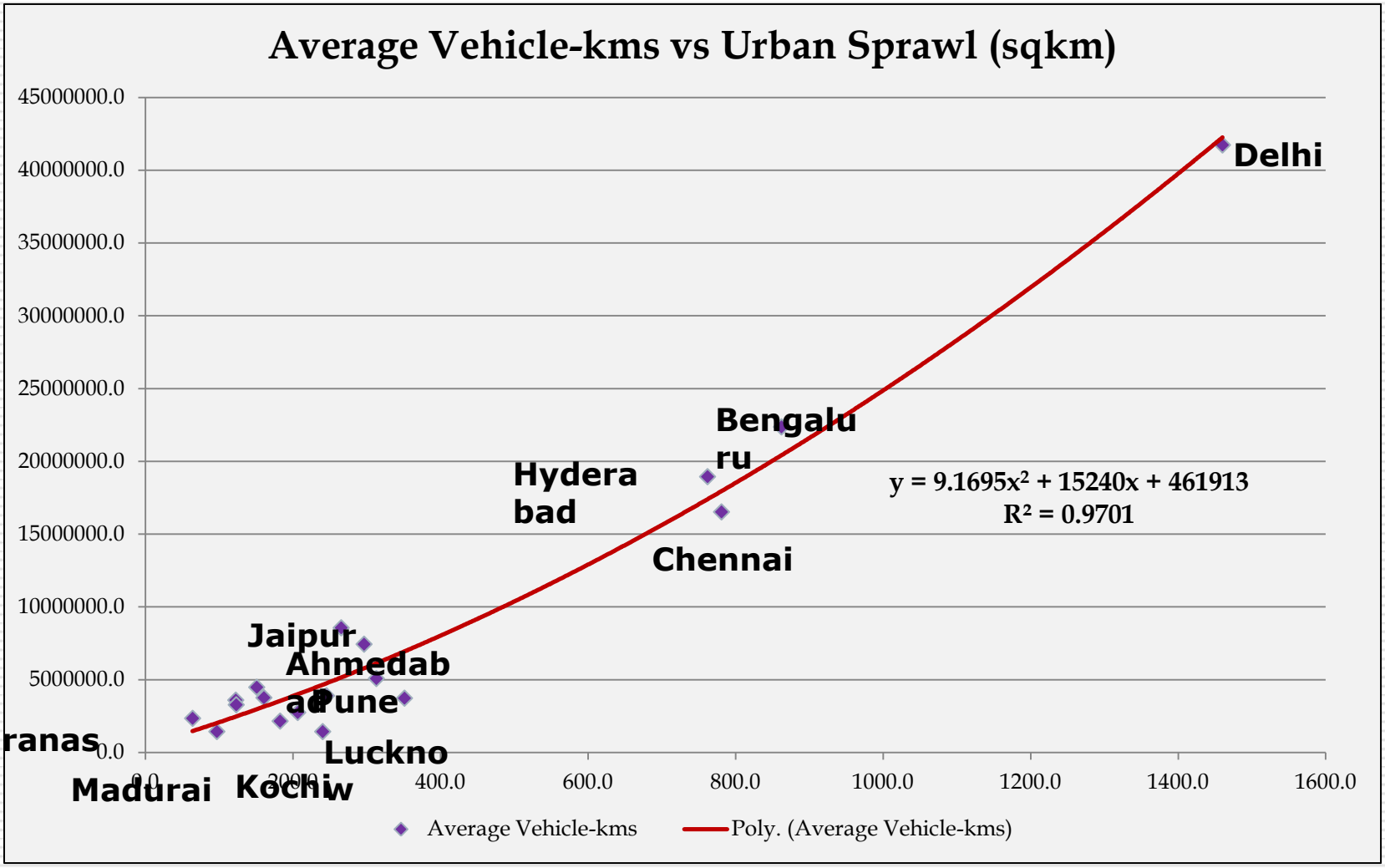
Ahmedabad



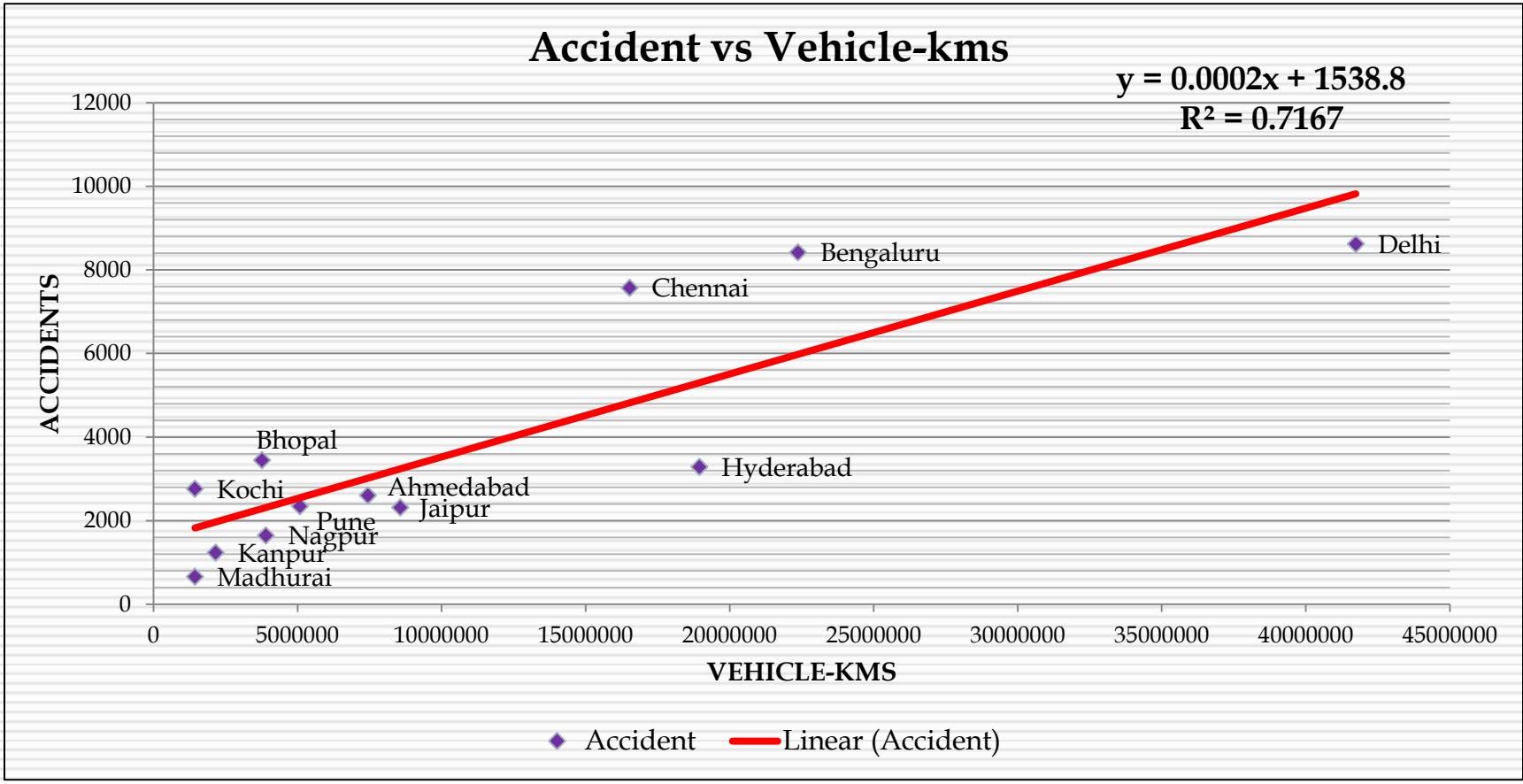
Urban Sprawl &Trip Length



Urban Sprawl &Vehicle kms



Vehicle kms and Accidents



Urban Landuse - Transport Scenario

Cities are Sprawling

Environmental Degradation

Declining Public Transport & NMT,

Low Investments

Supply Side Focus

Poor Enforcement

Multiple Institutions

Education of People

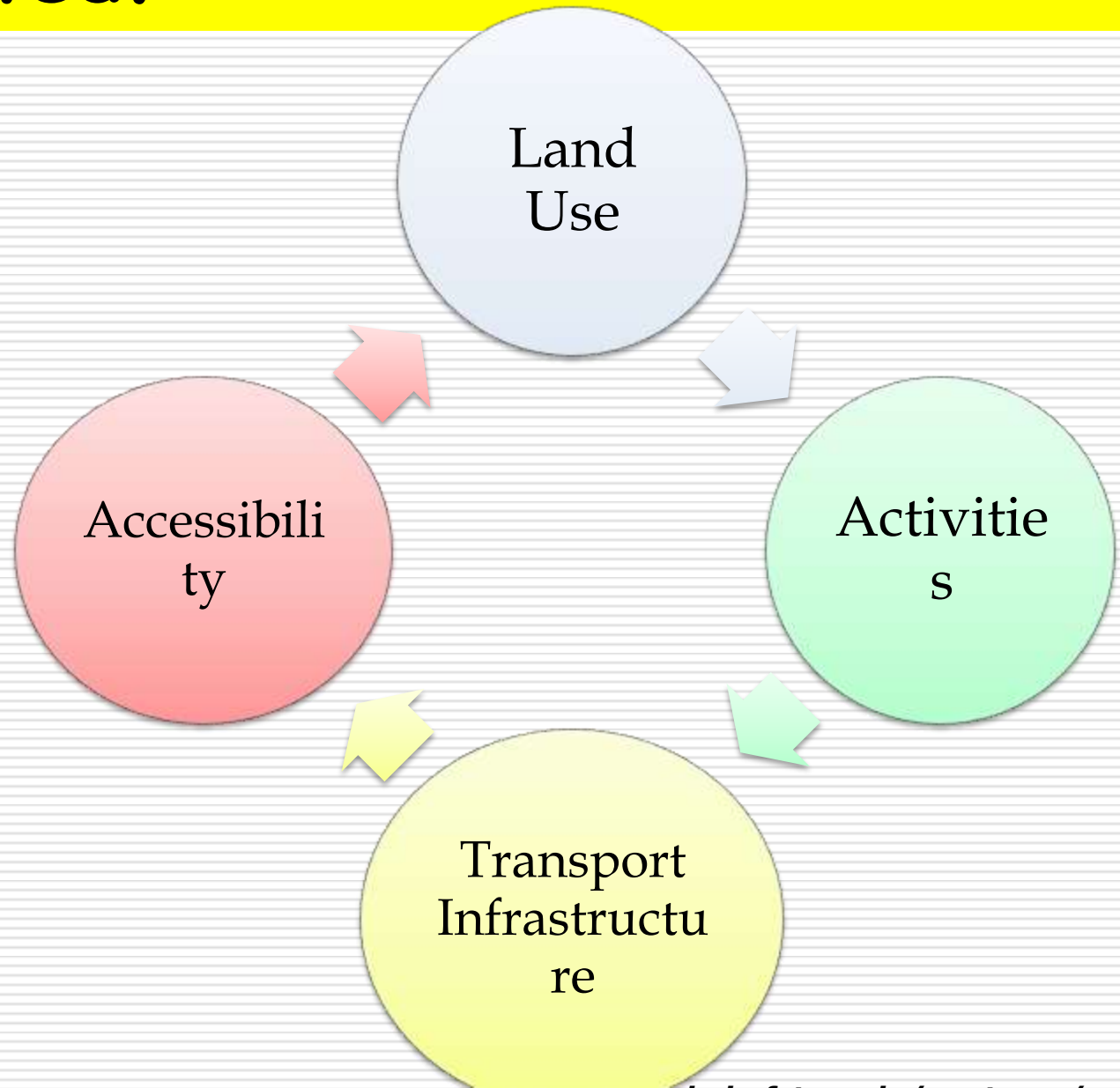
Urban Transport Focus – Since 2006 (NUTP & JnNURM)

India – Urban Structure – Impact on Transport Demand

Land use and Transport are intricately linked to each other
A 2way relationship

- Land Use/Activity distribution determines the demand for transport
- Transport supply influences land use/activity distribution
- Planning is undertaken separately as two different exercises; often by two different agencies
- Making separate plans is like **clapping with one hand**
- Lack of integration leads to un-intended consequences

Are land use & urban transport related?



Integrated Land Use Transport !!

- **Land Use Planning Framework - Statutory**
  - Land Use Plans with an objective to protect environmentally sensitive lands provides for a spatial framework for future urban expansion (to create livable communities)
  - **Plan Elements**
    - Location & Intensity of Land Use – Plan/Map
    - A set of DC Regulations – FSI, Zoning, Setbacks,…
  - **Issues**
    - Takes a long time to prepare; Revisions – once in 10 years ?
    - Lack integration – economic development, environment, urban poor/Informal activities & of course transport
    - Focus on New Developments – Expansionist - No renewal
    - Networks form a part
    - Levels ? Regional – **Urban** – Local/Rural
    - Practice – Stagnant; Norms/standards - basis ; Not Strategic
    - Implementation & Monitoring

MORE OFTEN PLANNING – NOT MORE DETAILED PLANNING

Integrated Land Use Transport !!

- Urban Transport Planning Framework – **Not statutory**
  - Content
    - PREDICT & PROVIDE & NOT Strategic
    - Future is uncertain but process is:
      - Data Hungry – 'Technical – Deterministic'
      - Based on PCU & PHPDT !!!!
      - Vehicle Centric- Capacity Focus
      - Mobility Focus – What we need is Access
    - Inputs & Outputs– Not Outcomes
    - Projects & Not Strategies
    - Investment Focus – Not Management
    - Big Ticket Projects - Mode bias – Affordability?
    - Driven by Funding /Donor /Technology Provider
    - Takes Land Use as Given – Generated Traffic – Ignored
    - Usually unrealistic

From CTTS → CMP → IULUT

Agencies responsible for the plan preparation?

Land use planning and zoning
(*Under respective T&CP Acts*)

- **Development Authorities**
- **Municipalities**
- **Town & Country Planning Agency**

≠

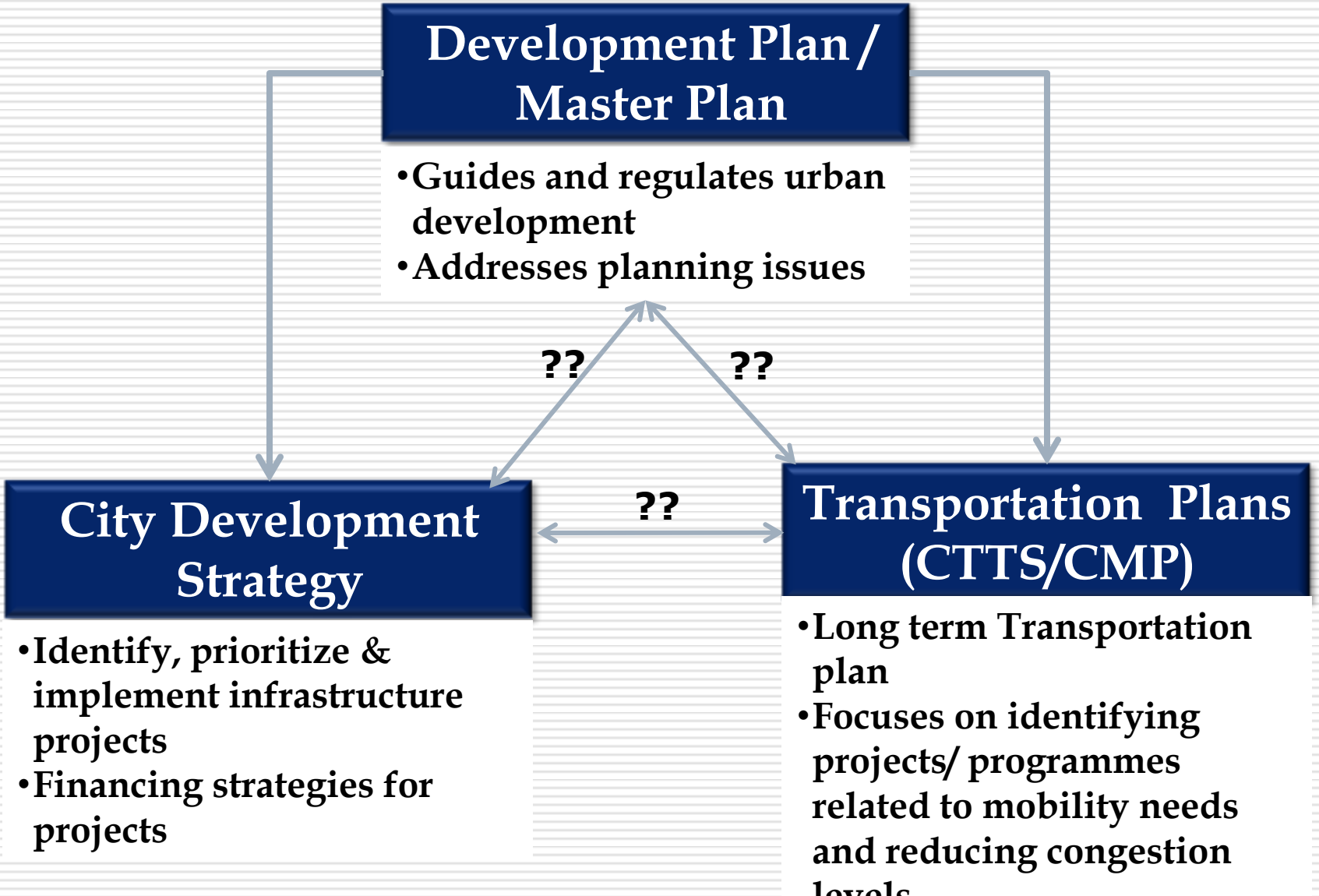
Transportation planning

Multiple agencies
(Urban roads, public transport, railways, metro, traffic management)
- **National,**
- **State level**
- **Local level**

Lack of coordination

Integration

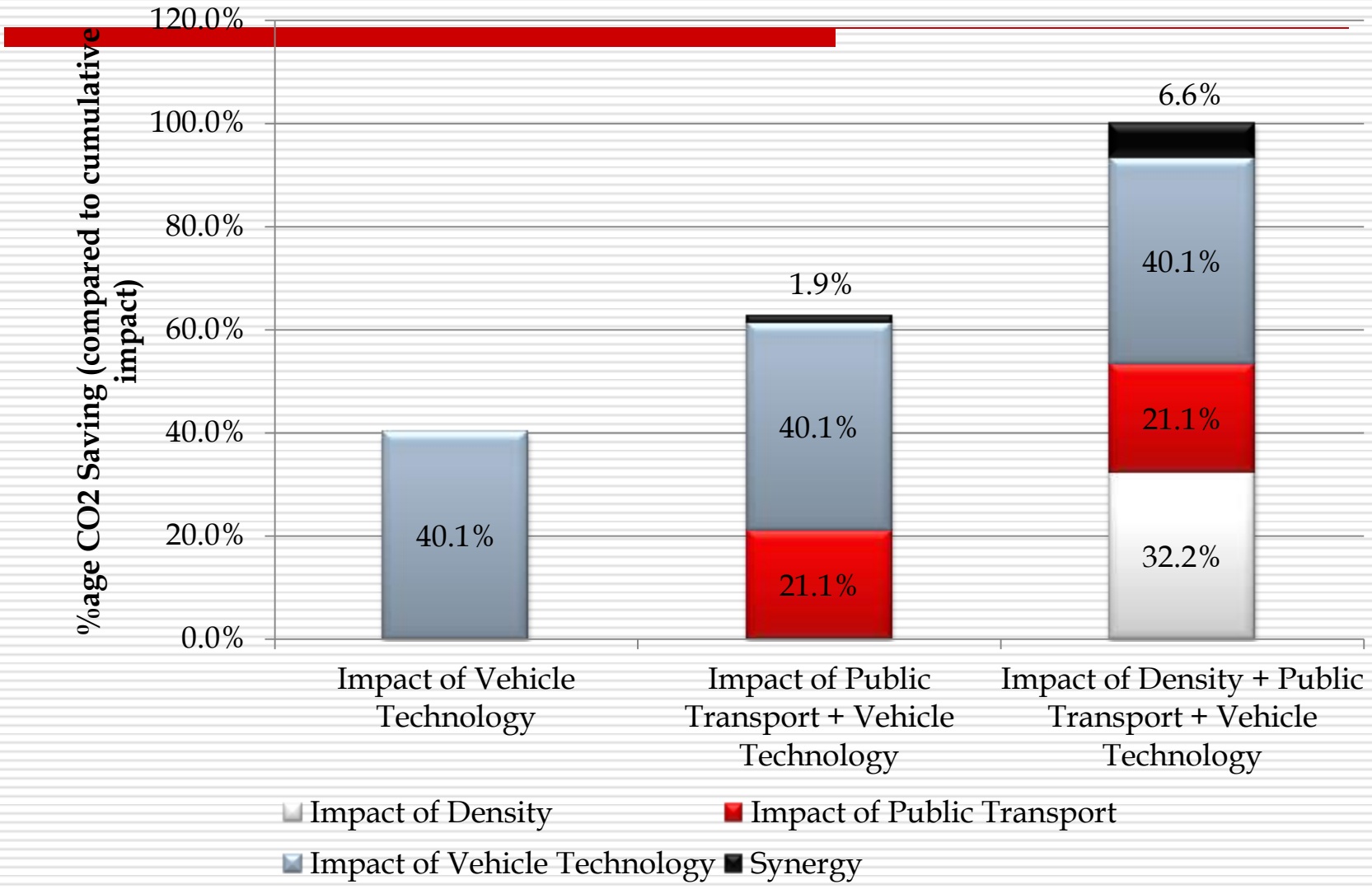
Integration of transportation plans with land use/sectoral plans

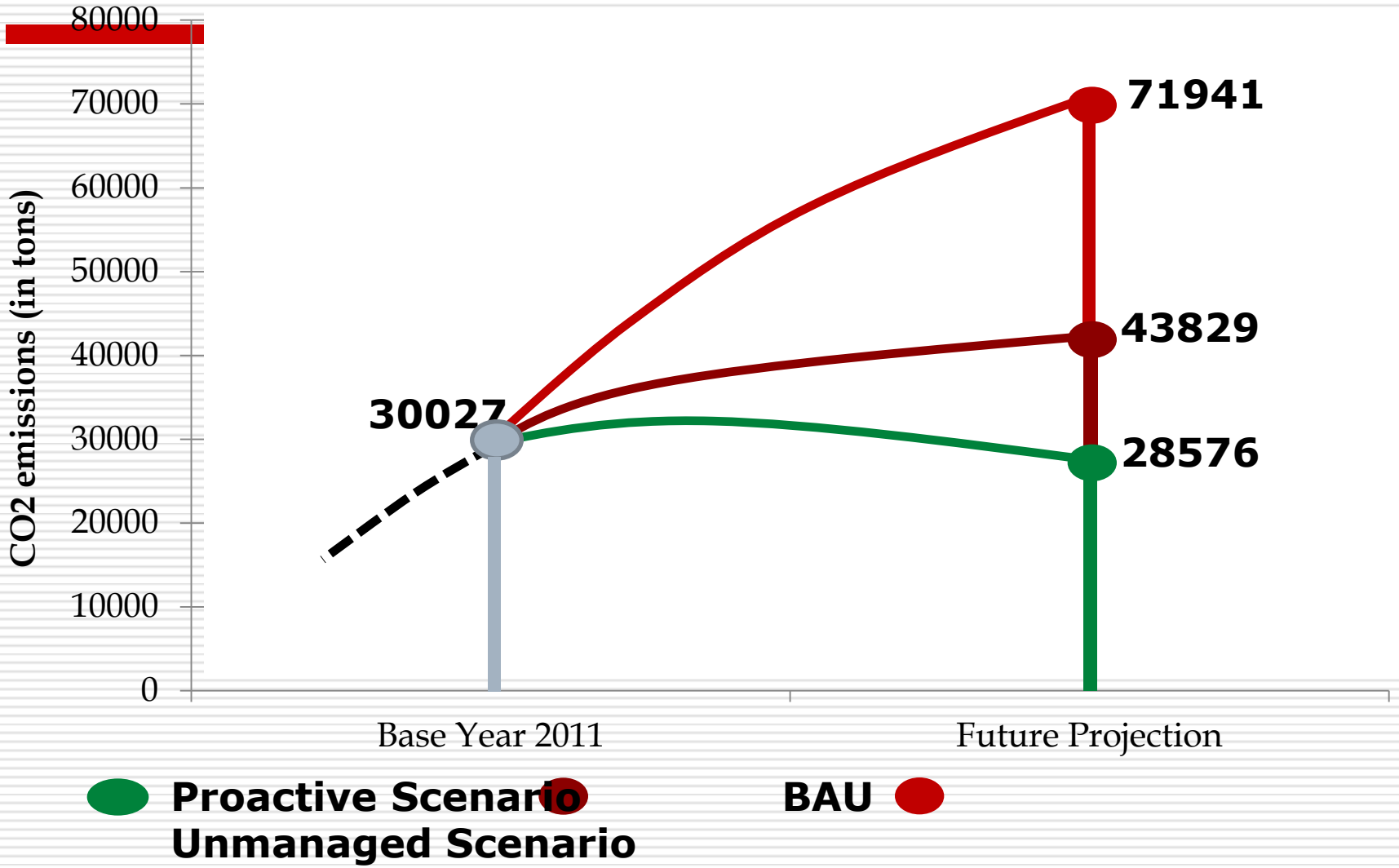


Land Use - Transport Linkage

- Compact Cities
  - -Polycentric
  - -Higher population and Employment Densities
  - - Complete Network & Streets
  - - Mixed Use
- Quality & Quantity Public Transport
- Local Access
- Quality Public Places

- **Reduce Trip Length**
- **Reduce personal Vehicle Dependence**
- **Greater Transit & Non-motorised veh. Use**
- **Improving Access to employment, facilities & Amenities**
- **Reduce Green House Gas/Pollution**
- **Affects Land value & affordability**


%age CO2 Saving (compared to cumulative impact)
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
40.1%
1.9%
40.1%
21.1%
6.6%
40.1%
21.1%
32.2%
Impact of Vehicle Technology
Impact of Public Transport + Vehicle Technology
Impact of Density + Public Transport + Vehicle Technology
Impact of Density
Impact of Public Transport
Impact of Vehicle Technology
Synergy


80000
70000
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50000
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30000
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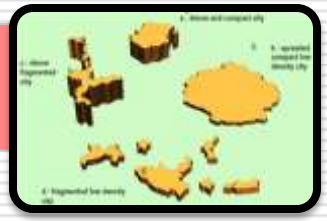
10000
0
CO2 emissions (in tons)
71941
43829
30027
28576
Base Year 2011
Future Projection
Proactive Scenario
BAU
Unmanaged Scenario

Elements of IULTP

- Enabling Urban Structure
- Strategic Alignments
- Accessibility Improvements
- Complete Network & Complete Streets
- Transit Oriented Development and Value Capture
- Integrated Transit Facilities
- Inner city and Transit
- Legal & Financial Instruments

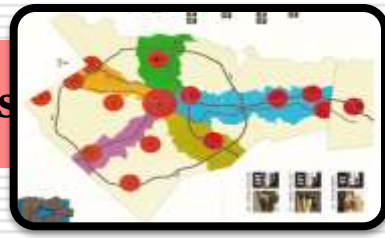
How do we develop integrated land use & transport strategies?

Enabling Urban Structure



- Settlement Size - Area Vs Population Dynamics
- Distribution of population density – Inner and Outer areas.
- Distribution of “centres” (concentrations of activity) – Mono centric V/s Polycentric
- Mix of land uses
- Transport network, both public and private

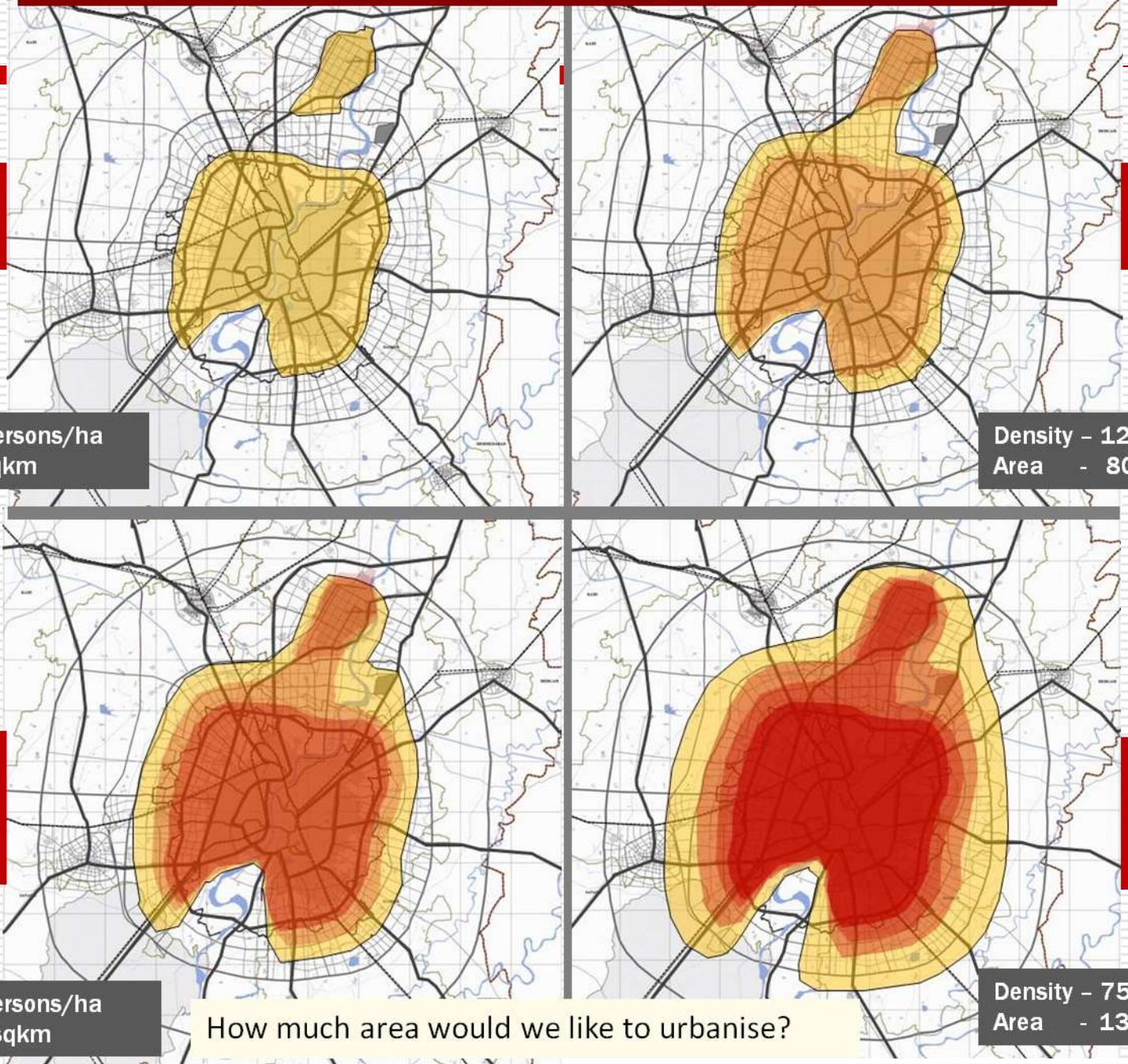
Strategic Alignments



- Densification of less intensive areas along existing public transport network
- Connect major activity center (Singapore)
- Ensure efficient movement
- Ensure availability of Right of way
- Proper accessibility to Public transport by all kind of users

CEPT STUDY OF AHMEDABAD

1 CRORE POPULATION PROJECTED FOR AHMEDABAD AND GANDHINAGAR



INR 2000 Crores/yr

Density – 150 persons/ha
Area - 666 sqkm

INR 3000 Crores/yr

Density – 125 persons/ha
Area - 800 sqkm

INR 4500 Crores /yr

Density – 100 persons/ha
Area - 1000 sqkm

INR 6075 Crores /yr

Density – 75 persons/ha
Area - 1333 sqkm

How much area would we like to urbanise?

Corridors & Travel

CURITIBA

3 million people

17000 buses
60 kms of underground Rail
260 kms of light rail

Singapore

Concept plan 2001 indicates Metro lines along with the land use around the lines.

- **The Concept Plan 2001 will provide a variety of housing choices and a comfortable living environment**

How do we develop integrated land use & transport strategies?

Accessibility Improvements

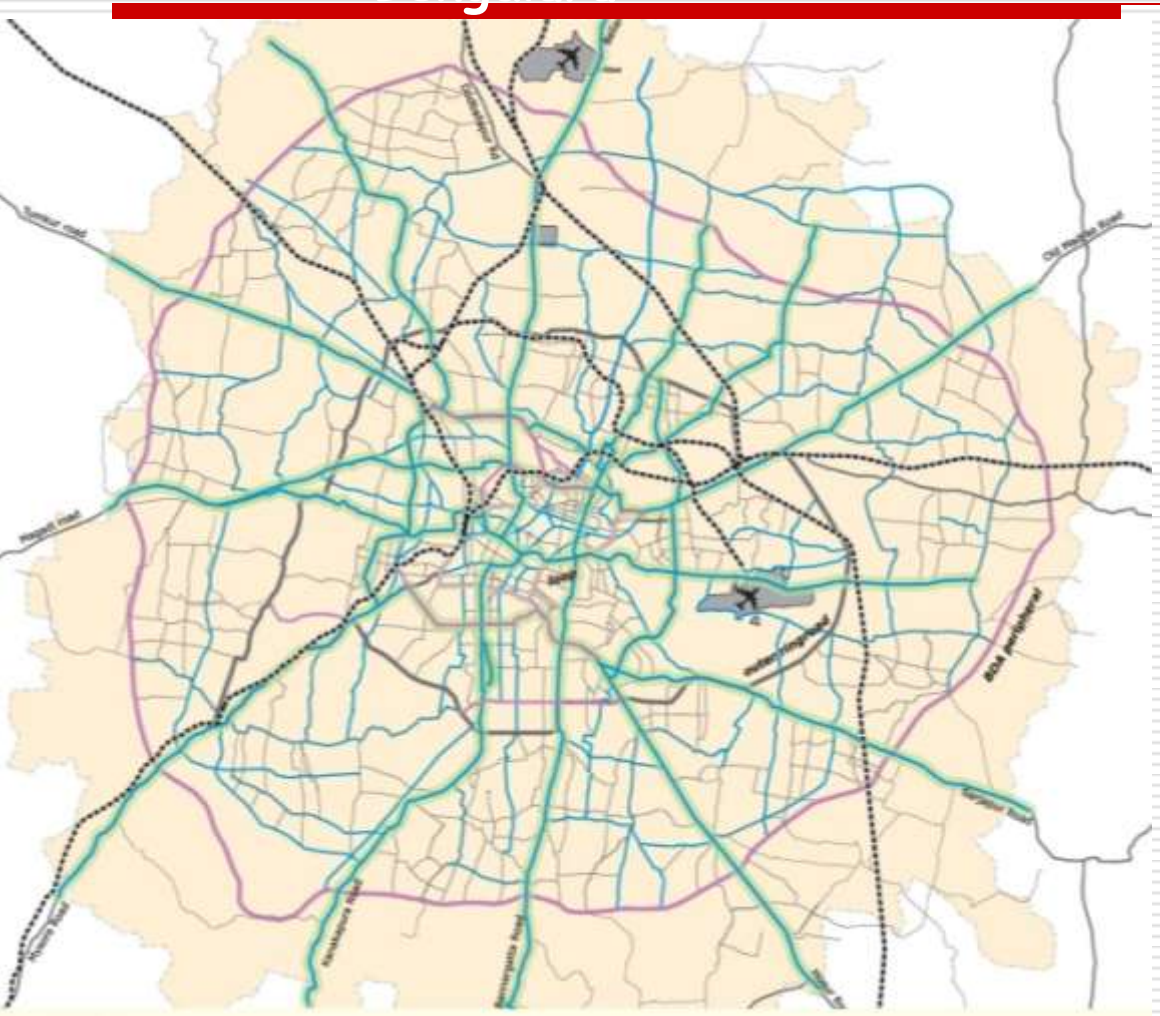
- **Neighborhoods with a complete street network and easy access to transit services**
- **Promote sustainable mode for travel (walking , cycling & public transport)**
  - **Street design should be pedestrian-friendly and cyclist-friendly**
  - **In India, National Urban Transport Policy (NUTP) recommends**
    - **To integrate land use and transport planning in cities, and to bring about comprehensive improvements in urban infrastructure**

Complete Network & Streets

- Complete network pattern with hierarchy of streets.
- Availability of alternate routes for users (Stockholm -Grid streets with traffic calming measures, increase connectivity of various neighbourhoods to the city centre)
- Higher accessibility to public transport
- Safety and comfort of pedestrians and NMV users

Road Networks – Proposed in DP

Bangalore



Ahmedabad

- **Missing links in intermediate ring**
- **Only higher level roads proposed**

- **All rings are complete**
- **Radials are clearly visible**
- **Road network detailed till three levels**

How do we develop integrated land use & transport strategies?

Transit Oriented Development

- **High densities around transit stations**
- **Provides multiple transportation choices by multimodal integration**
- **Mixed land use**
- **Pedestrian friendly and walkable neighborhoods**

Integrated Transi Facilities

- **An integrated multimodal system needs to be developed**
  - To provide a viable and low cost solution of transport
  - To minimizes the need to change modes in a trip
  - To provide convenient, comfortable and time saving journey

How do we develop integrated land use & transport strategies?

Inner city and transit

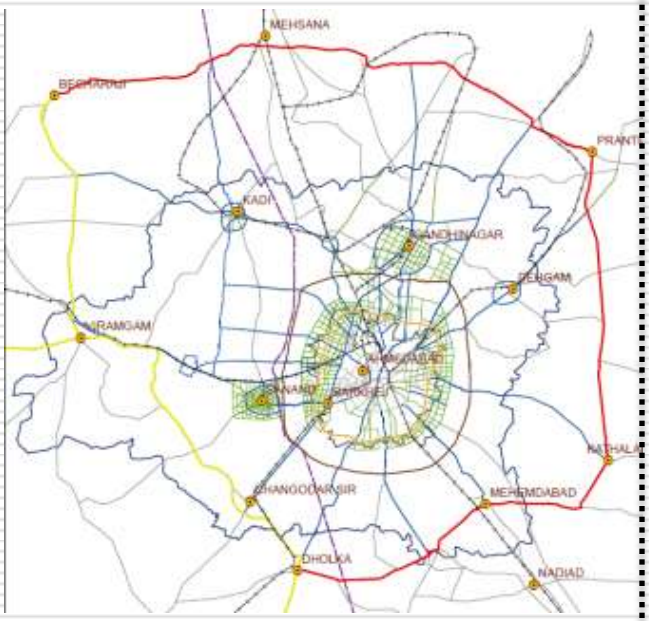
- Re-densification of low density areas with mixed land use
- Redevelopment of brown field areas and areas with other types of dereliction
- Provide high quality infrastructure facilities
- Build Strategies for efficient and optimum utilization of existing urban land and services

Financial /Leg Instruments

- **Increase in FAR**
- **Transferable development rights**
- **Mixed use zoning**
- **Spot zoning**
- **Land pooling**

ROAD DEVELOPMENT APPROACH (IMP)

REGIONAL PLAN
Greater Ahmedabad Region



A regional plan for integrating the main city and surrounding nodes/towns.

Regional Rail & Ring Rail &Road

Area - 3000 sq.km

URBAN PLAN
Ahmedabad -Gandhinagar

A Compact City Plan

Multi-Modal Integrated

AREA – 800 sq.km

Centre of Excellence in Urban Transport, CEPT University

NODAL PLAN
Sanand Node

Bicycle & Electric Mini Buses

AREA – 40 sqkm

Source: IMP report, 2010-11

ISSUES

I. Legal Framework
- New Act ot tweak existing TP & UD Act
- Role of Central Government
- NUTP, NMSH,..

II. Agencies to prepare & Implement IULTP
- New Agency of Strengthen Existing
- UDA, Municipal Corporation or UMTA!
- Inter agency coordination

III. Capacity Building
- Education focused on disciplines – interdisciplinary
- No of programmes
- Training (Whom to train!)
- Exposure Visits, Visits, Visits

IV. Funding
- To develop information base
- To develop City ILUTP Model
- To Plan
- To Implement (Incentivize land value capture)
- Project Funding -> Systems Funding

V. Technical Support
- Manuals/Tool Kits
- Best practice material

IS THIS TIME TO CREATE A CADRE OF PLANNERS!!


Thank You….