

*Sustainable mobility -
challenges for urban India*

S Sundar

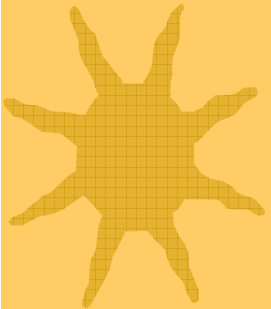
Professor, TERI University

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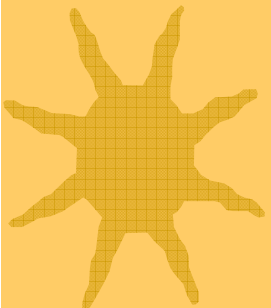
Distinguished Fellow, TERI



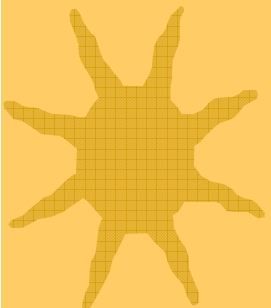
Share of transport in fossil fuel consumption - global



Growth rate of energy consumption highest in the transport sector among all end-use sectors between 1990-2002.



★ Road vehicles account for more than 3/4th of the total transport energy use



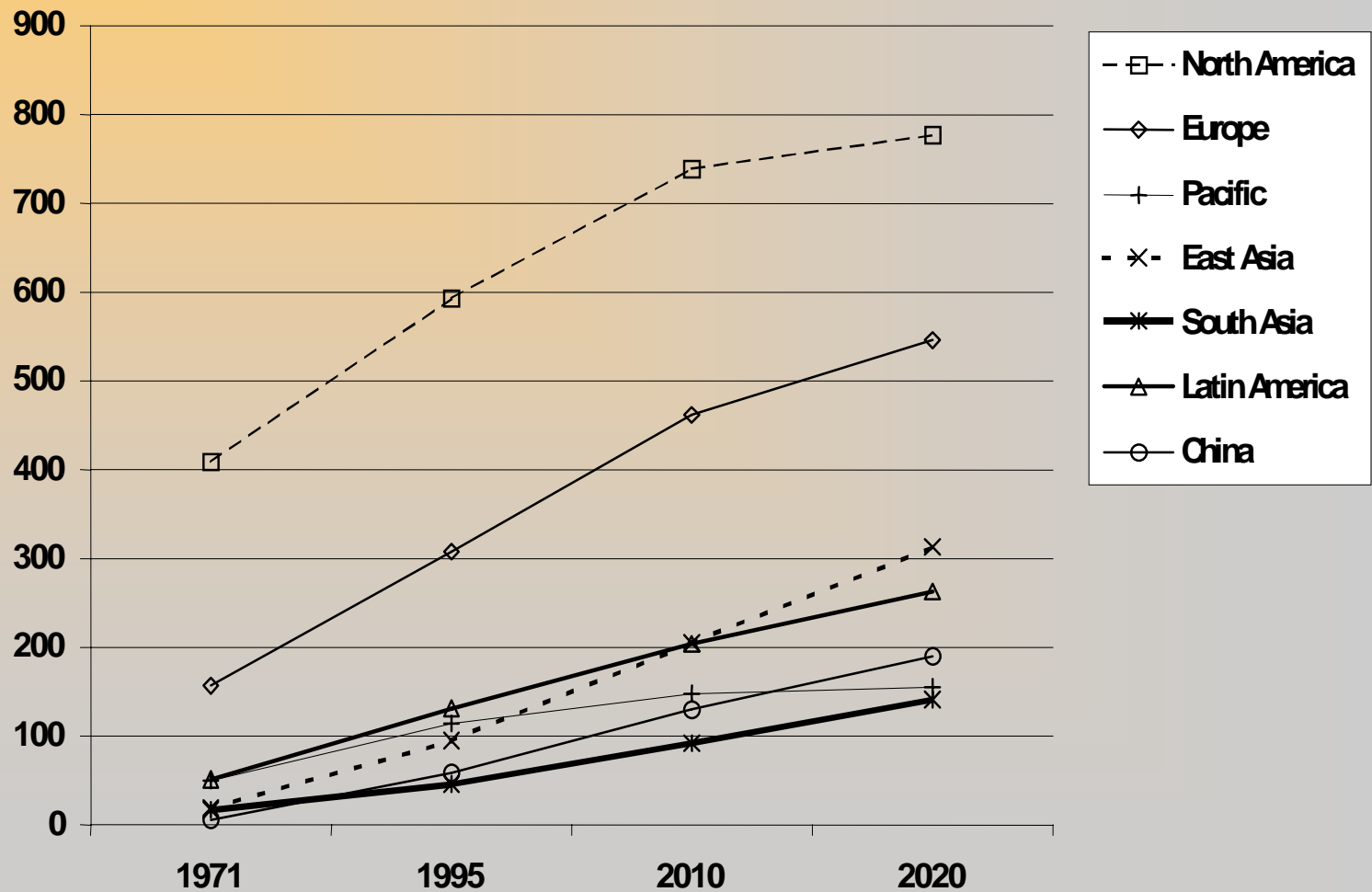
★ 95% of transport energy comes from fossil fuels

★ In 2004, transport sector responsible for about 20-28% of global energy related GHG emissions



Transport energy demand across regions

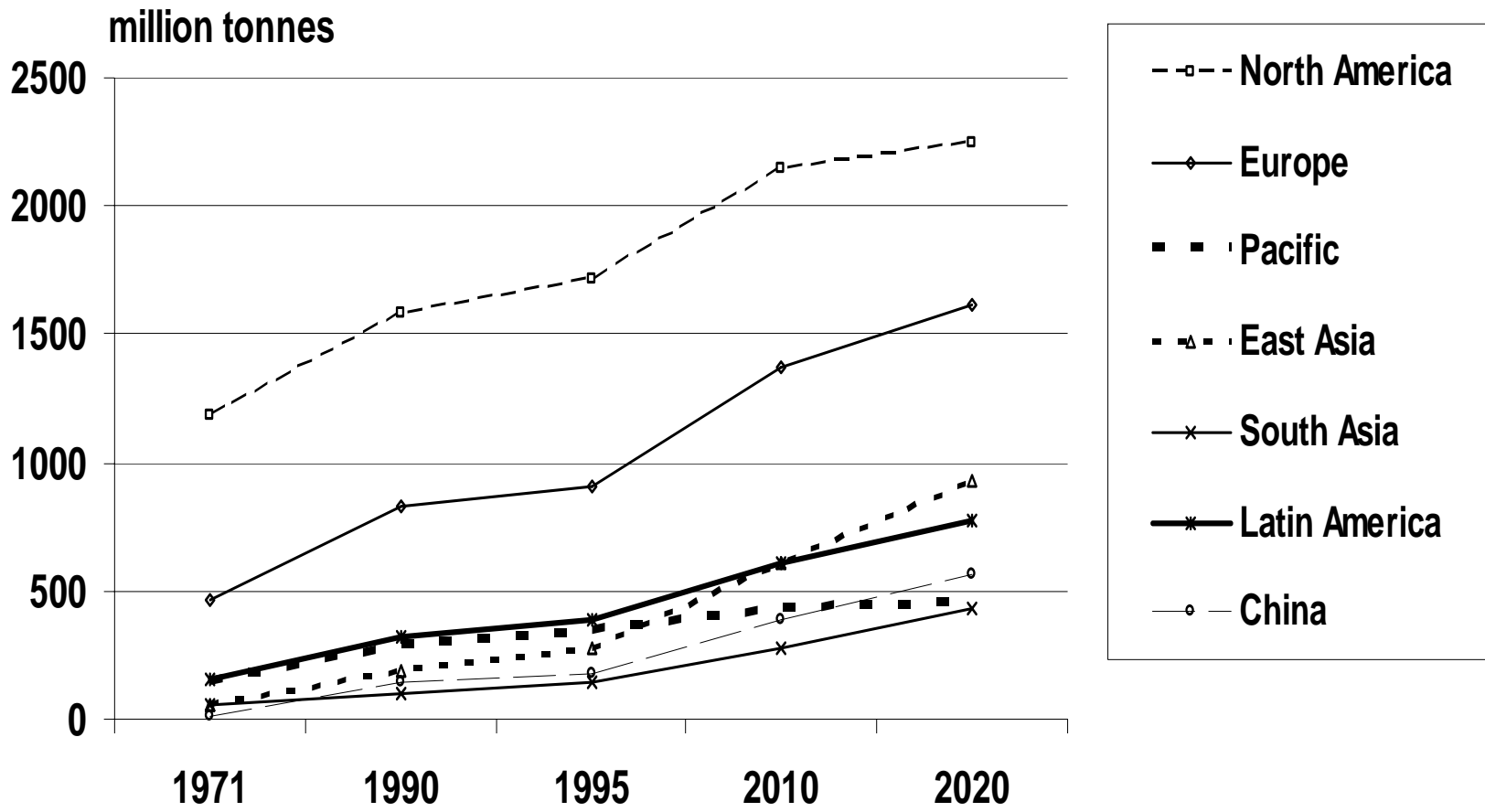
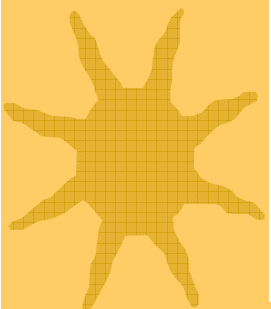
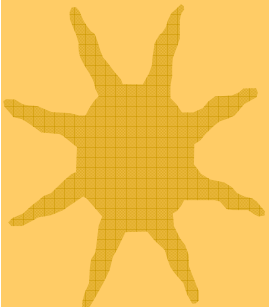
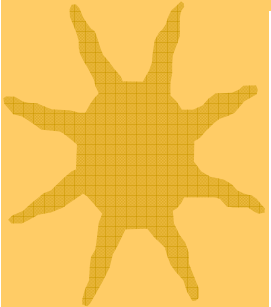
million tonnes of oil equivalent



Source: IEA, 1998



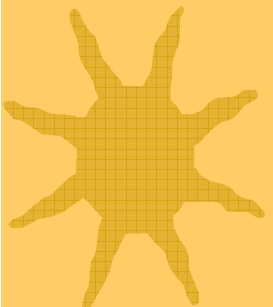
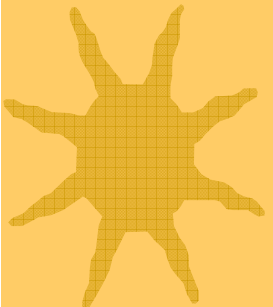
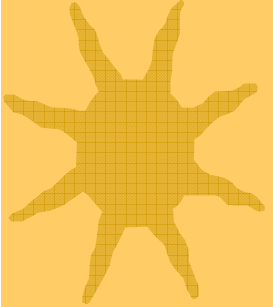
CO₂ emissions from transport - across regions



Source: IEA, 1998



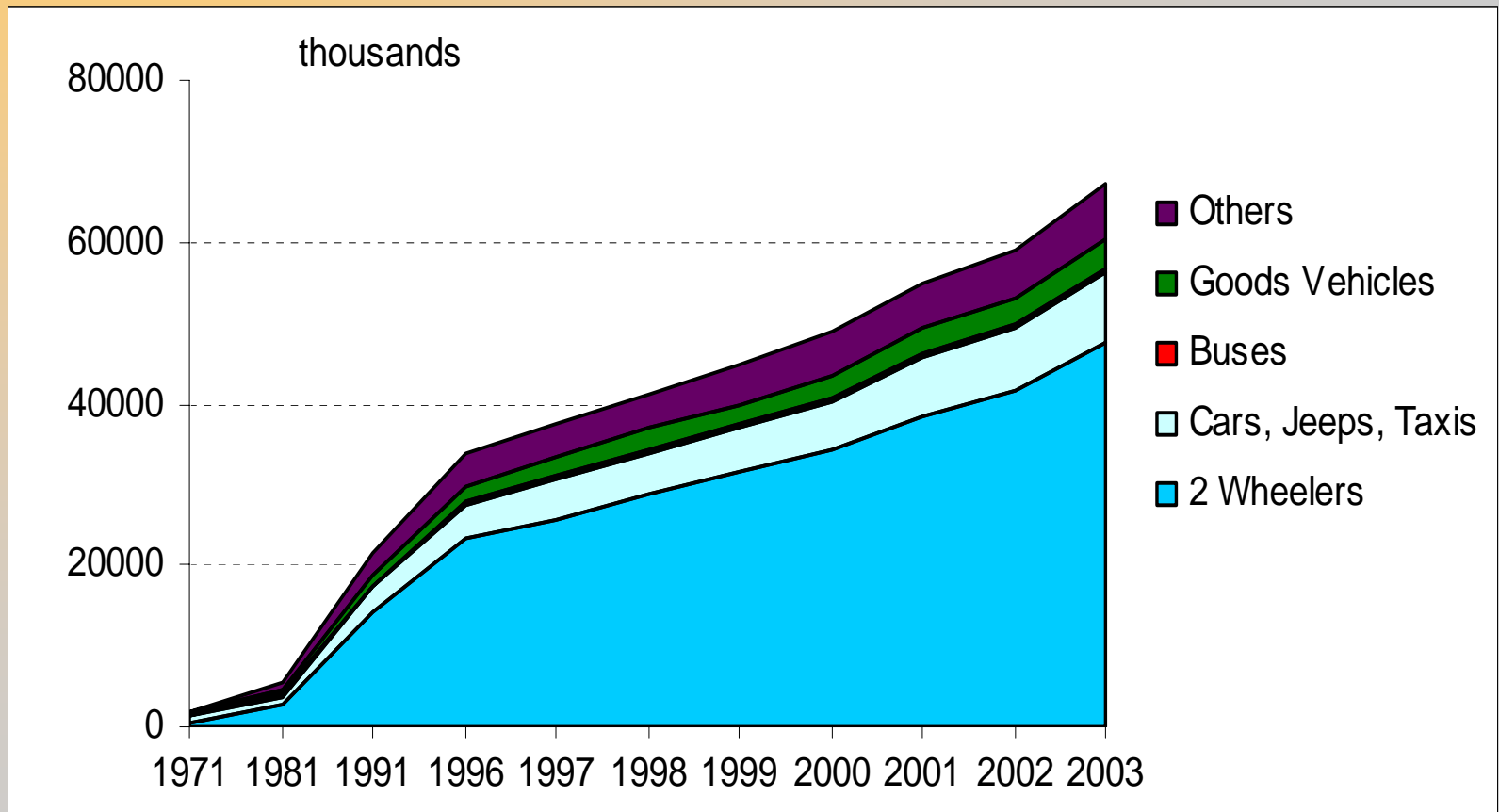
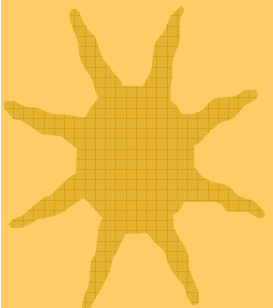
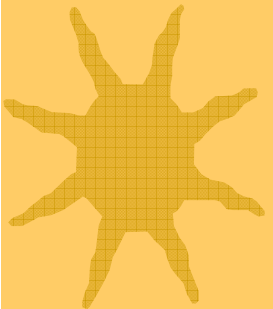
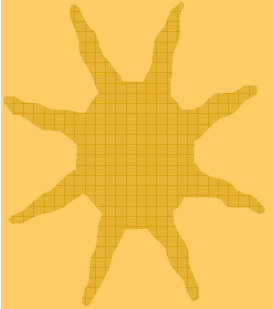
Urban Transport Scenario in India



- Rapidly increasing urbanization and travel demand
- Increasing motorization due to rising incomes, aspirations and easy financing
- Inadequate public transport
- Neglect of non motorised transport
- Disconnect between urban land use planning / transportation
- Fragmented institutional arrangements
- Absence of urban transport policies



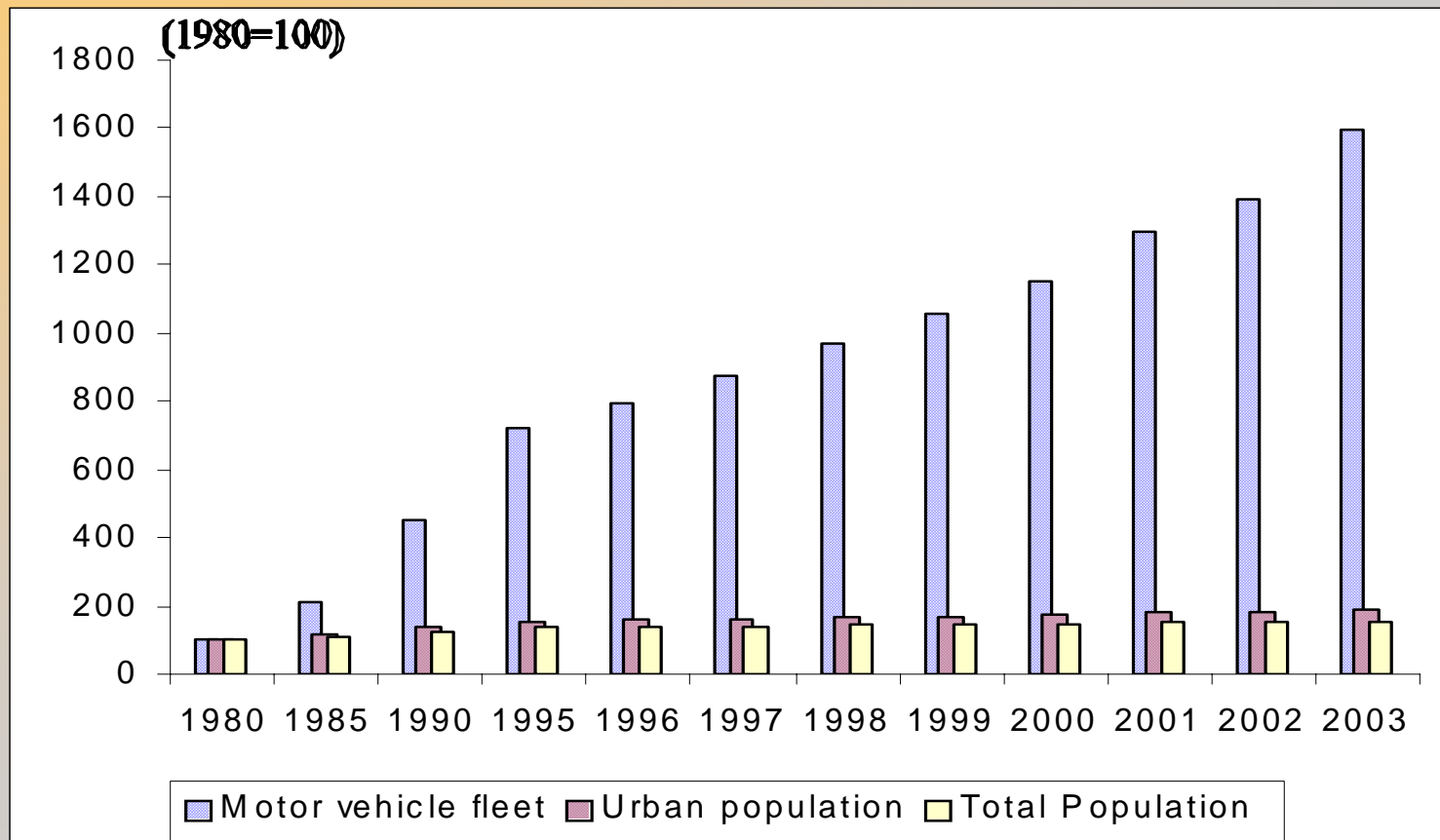
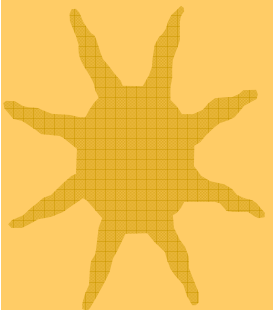
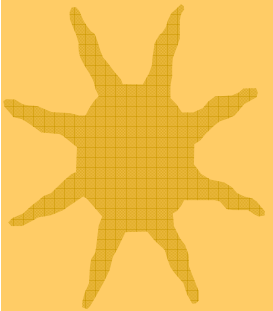
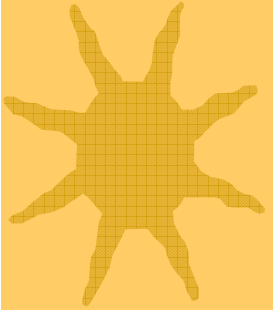
Vehicular Growth



Source: Motor Statistics



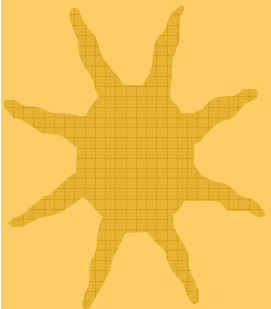
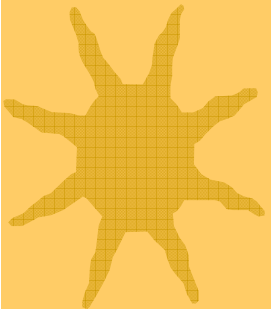
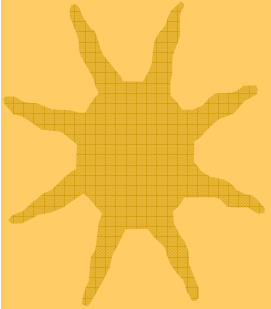
Growth of population, urban population and motorization



Source: TERI 2006-Paper for ADB



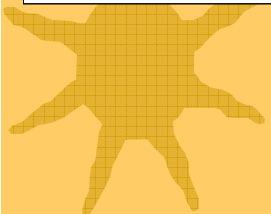
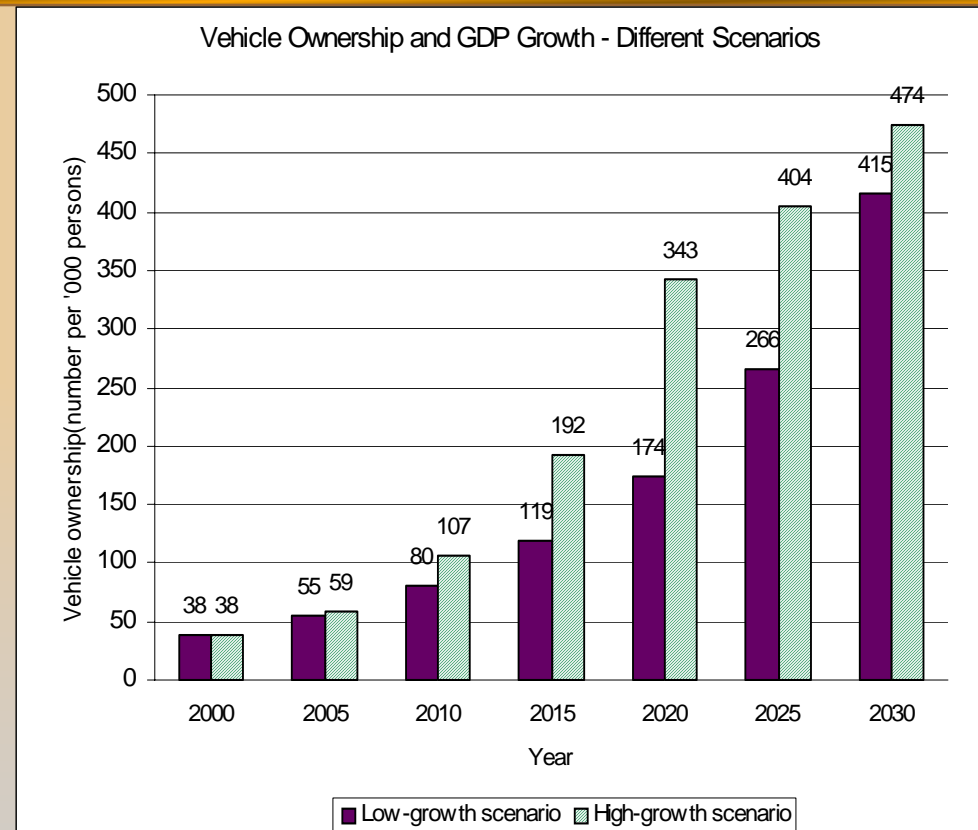
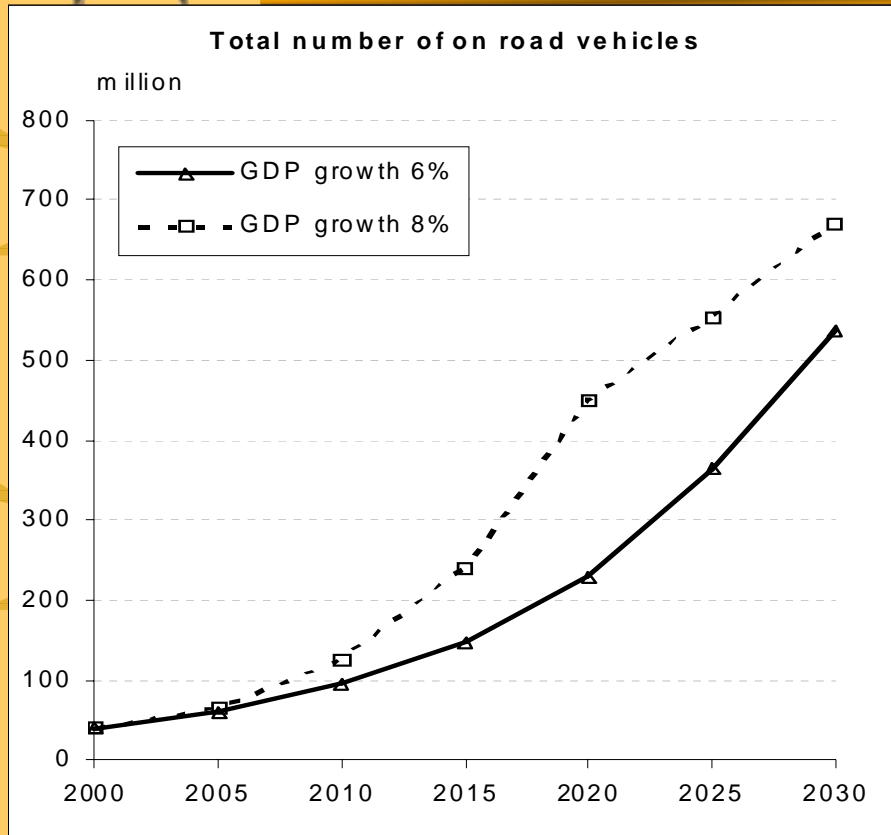
Public vs. Personal Transport



- ❖ Between 1980 and 2003 personal vehicles grew at an annual average rate of 13% while buses by 7%
- ❖ Share of buses in travel demand projected to fall from 65% in 2005 to 44% by 2030
- ❖ Share of buses in the fleet projected to drop from 1.5% to 1% by 2030



Growth in GDP and Vehicles



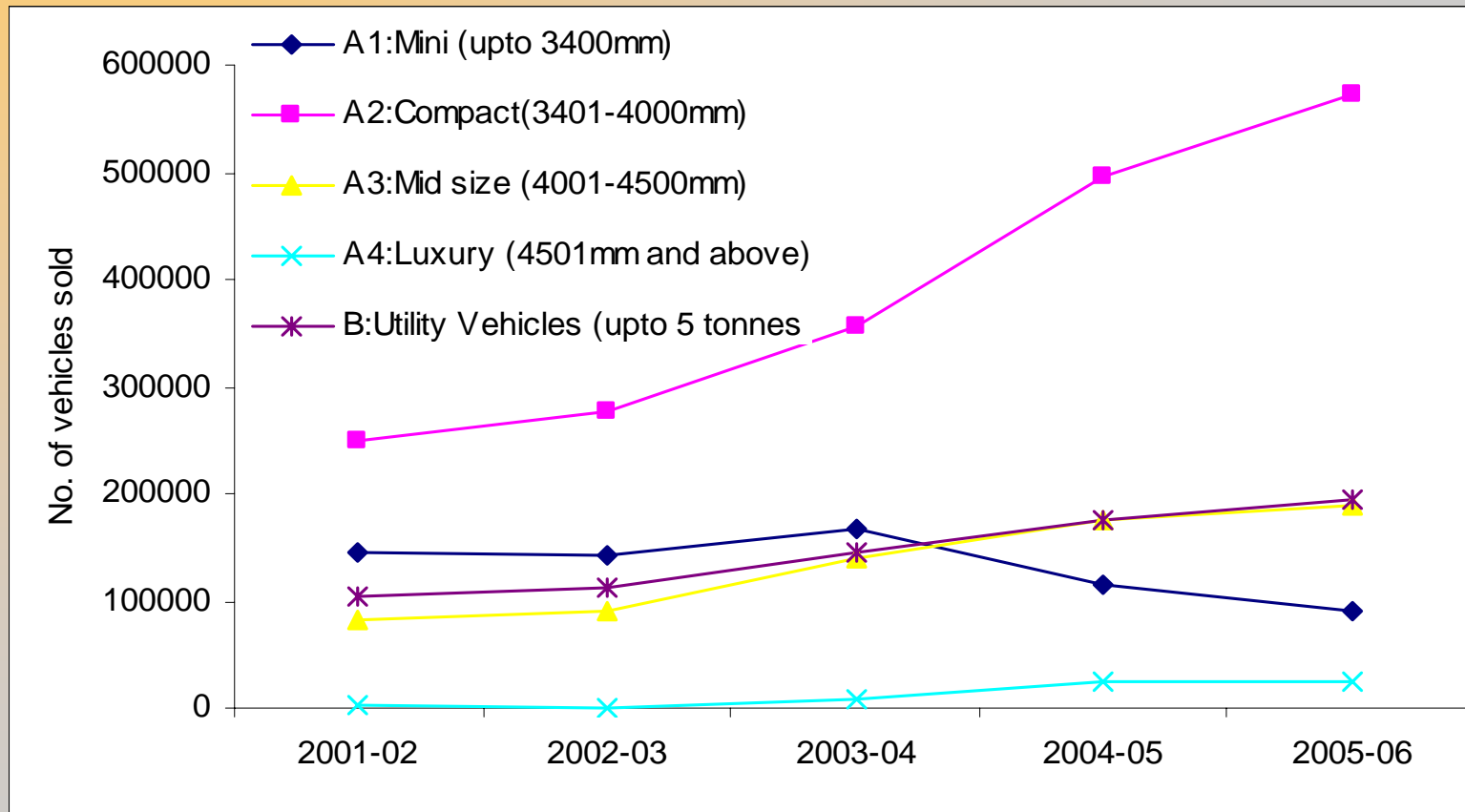
Source: TERI 2006

From 60 million vehicles in 2003

- **537 million in 2030 (6% annual growth)**
- **671 million in 2030 (8% annual growth)**



Sales Trend of Cars

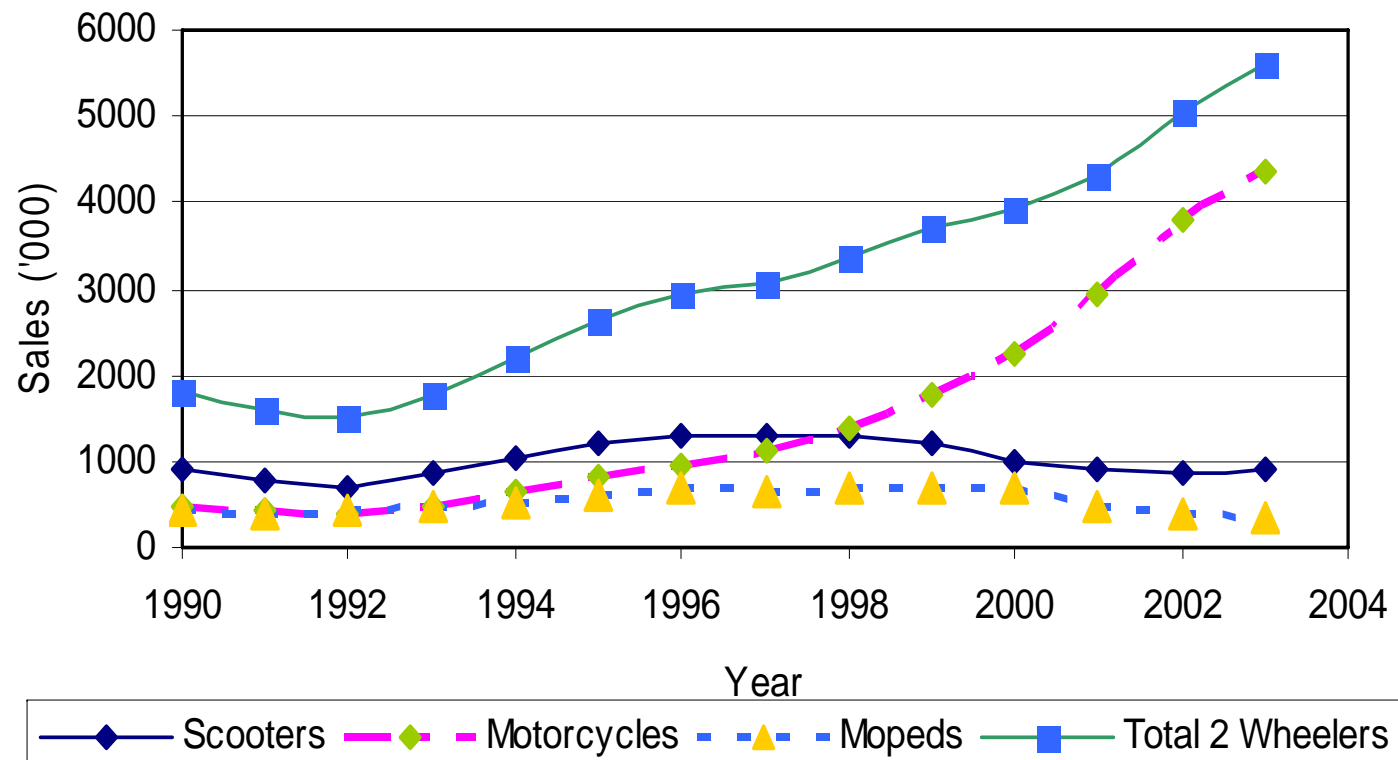


Note: A4 – Executive, premier and luxury car segments combined

Source: TERI 2006



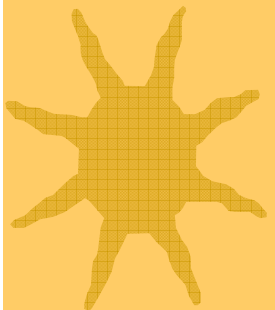
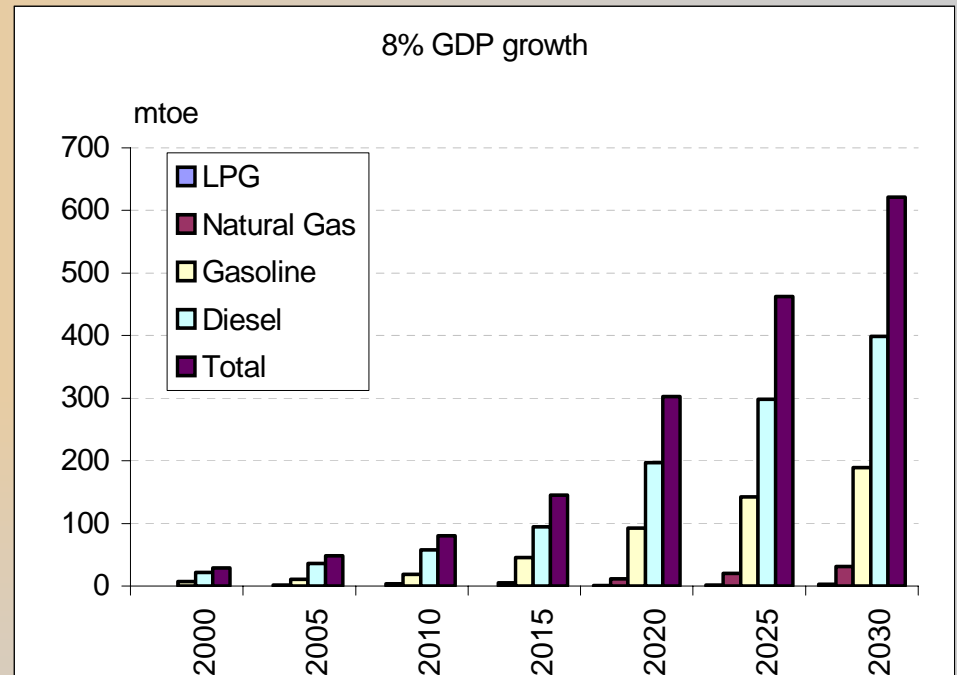
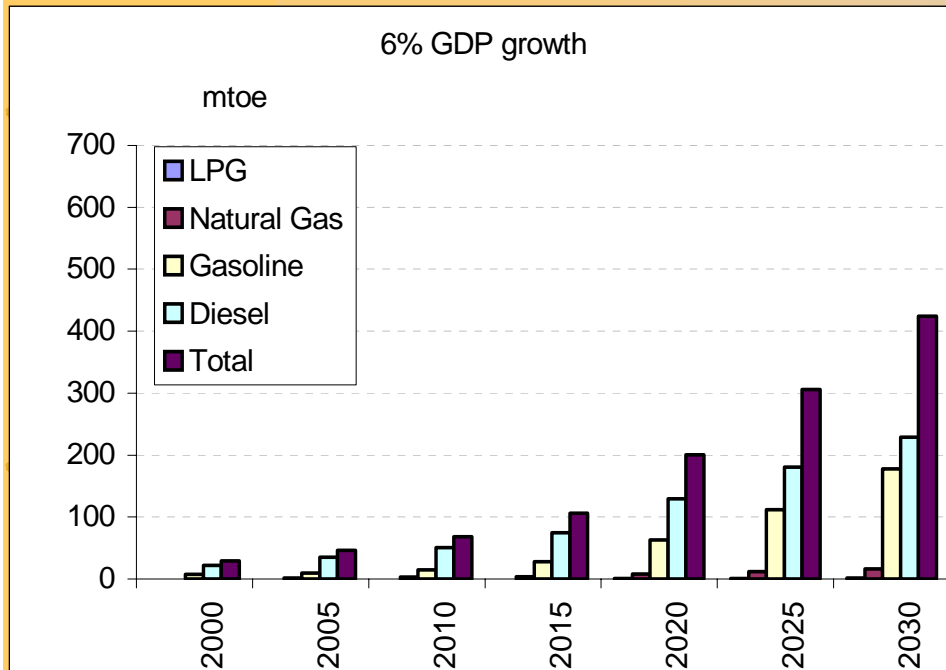
Sales trend of two wheelers



Source: SIAM, 2005



Rise in auto fuel demand



Source: TERI 2006-Paper for ADB



Growth in energy consumption & impact on energy security

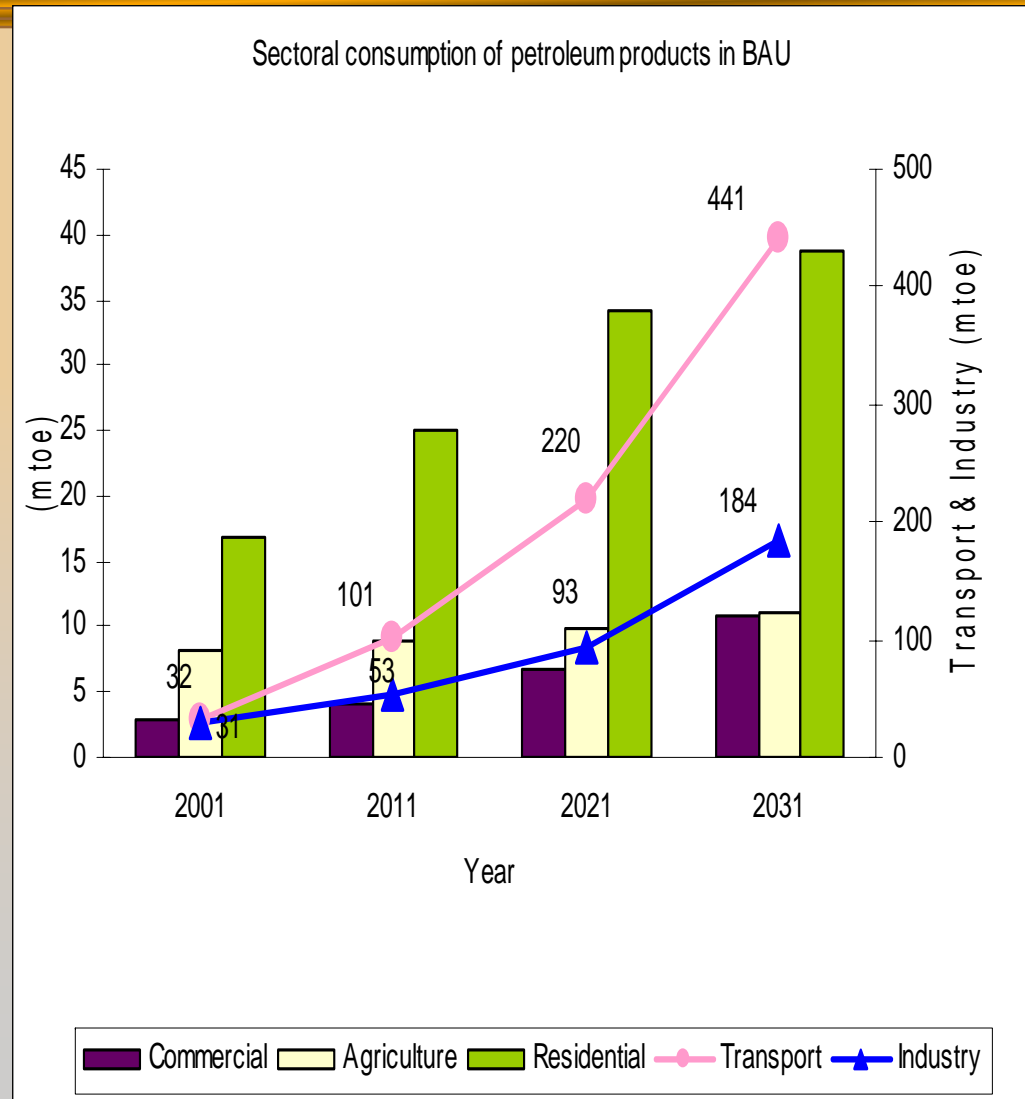
Share of transport in petroleum consumption to increase from 36% in 2001 to 64% in 2030

Oil import dependency for India to increase to 90% by 2031.

Limited fuel switching options for transport sector

Adverse implications for energy security of the country

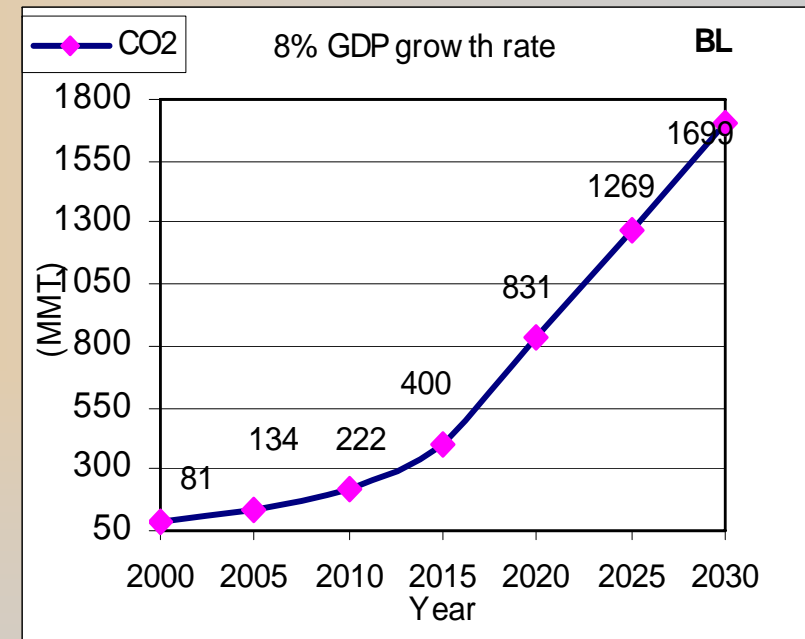
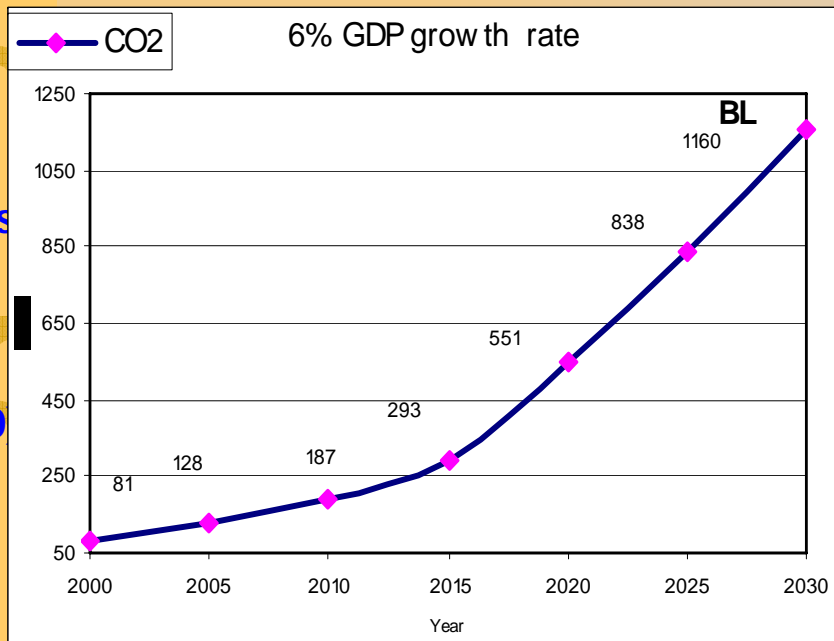
Source: TERI 2006





Growth in CO₂ emissions

CO₂ emissions 9 to 13 times increase (2000-30)



Source: TERI 2006



Policy response in India

- ★ Largely technology based

- Vehicle emissions, Fuel quality, Mandating alternative fuels

- ★ Little attention to Transport Demand Management

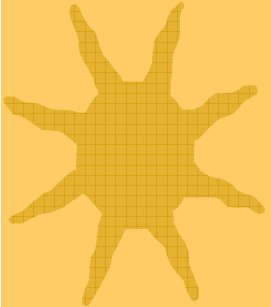
- ★ Land use / transport not integrated

- ★ Focus on “Mobility of Vehicles”

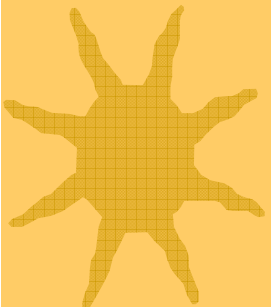
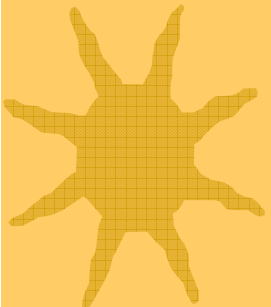
A top down approach based on technology choice



Measures to contain energy use and emissions

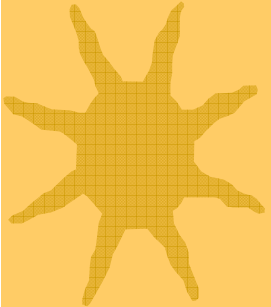


- ★ Technology improvement—vehicular technology and fuel quality
- ★ Transport Demand Management
- ★ Increase penetration of public transport
- ★ Encourage NMT
- ★ Coordinate government strategies and activities (transport and land use, infrastructure investments, transport planning etc)

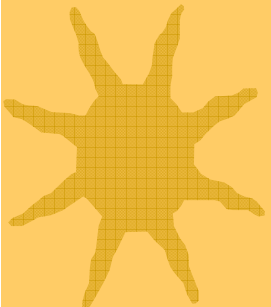




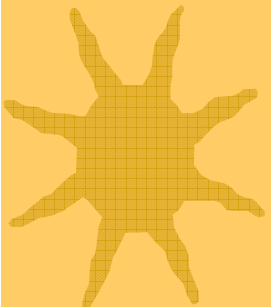
Life Style Changes



★ Changes in life style and consumption patterns to establish a sustainable low carbon economy



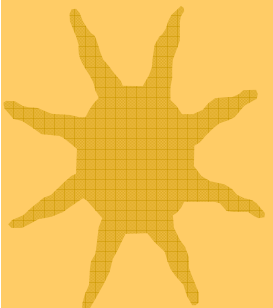
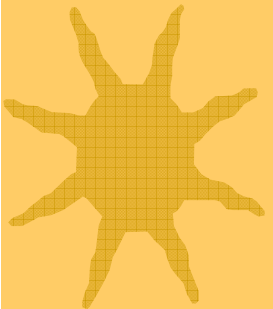
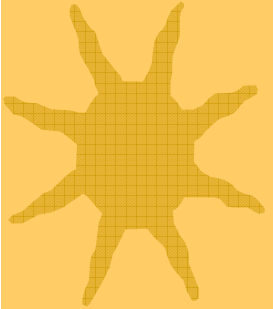
★ Transport demand management , information and education to reduce vehicle usage



(IPCC Fourth Assessment Report)



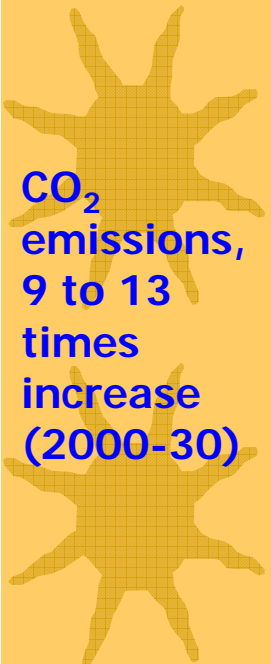
Prioritisation of mitigation measures



- ★ Multiple mitigation options in the transport sector, but their effect may be counteracted by growth. Mitigation options are faced with many barriers, such as consumer preferences and lack of policy frameworks-(IPCC Fourth Assessment Report)
- ★ Lifestyle changes call for social engineering and will take time
- ★ Increased penetration of public transport through Bus Rapid Transport System seems the most time and cost effective option –within reach of public policy

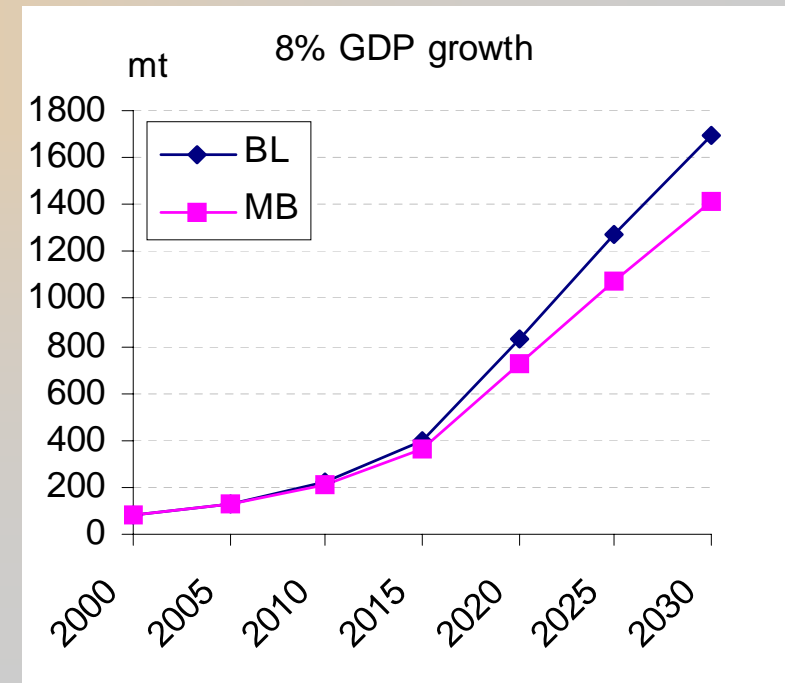
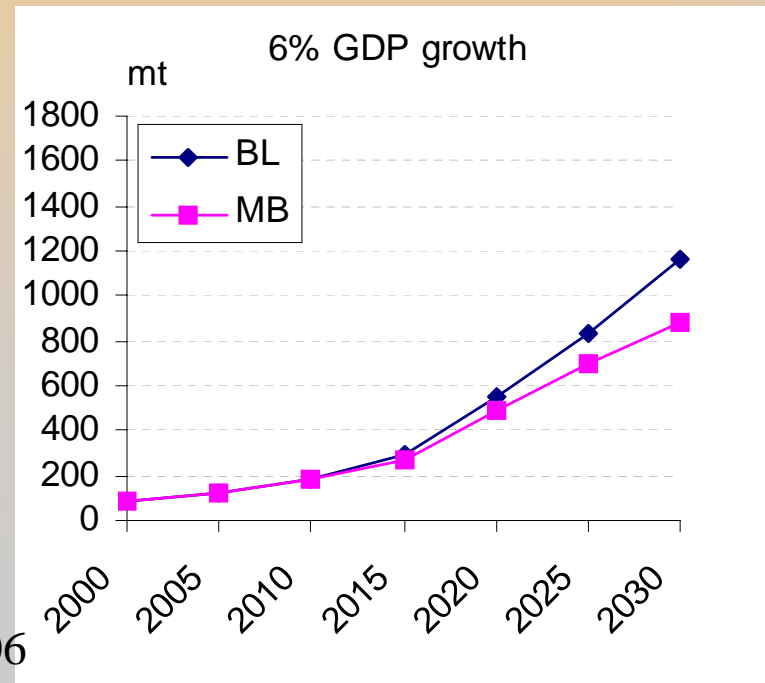
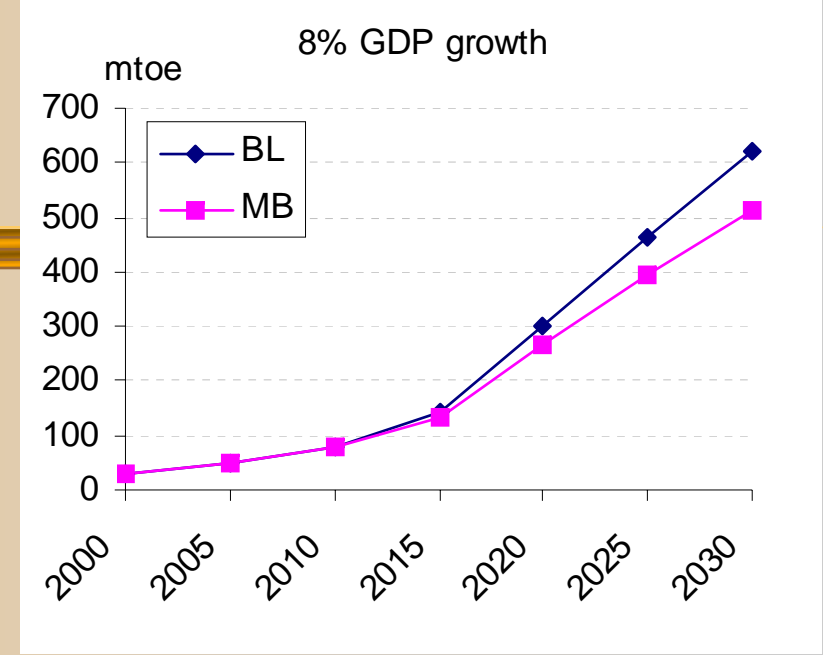
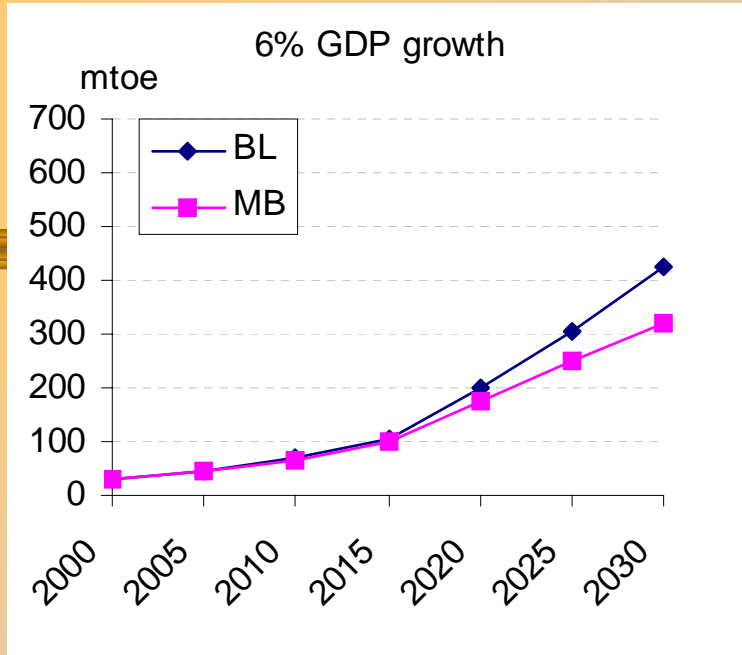


Energy demand, 9 to 13 times increase (2000-30)



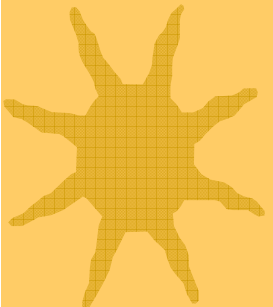
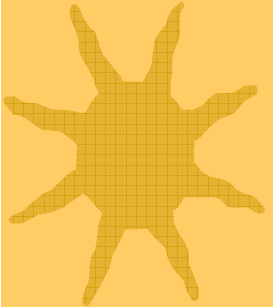
CO₂ emissions, 9 to 13 times increase (2000-30)

Source: TERI 2006





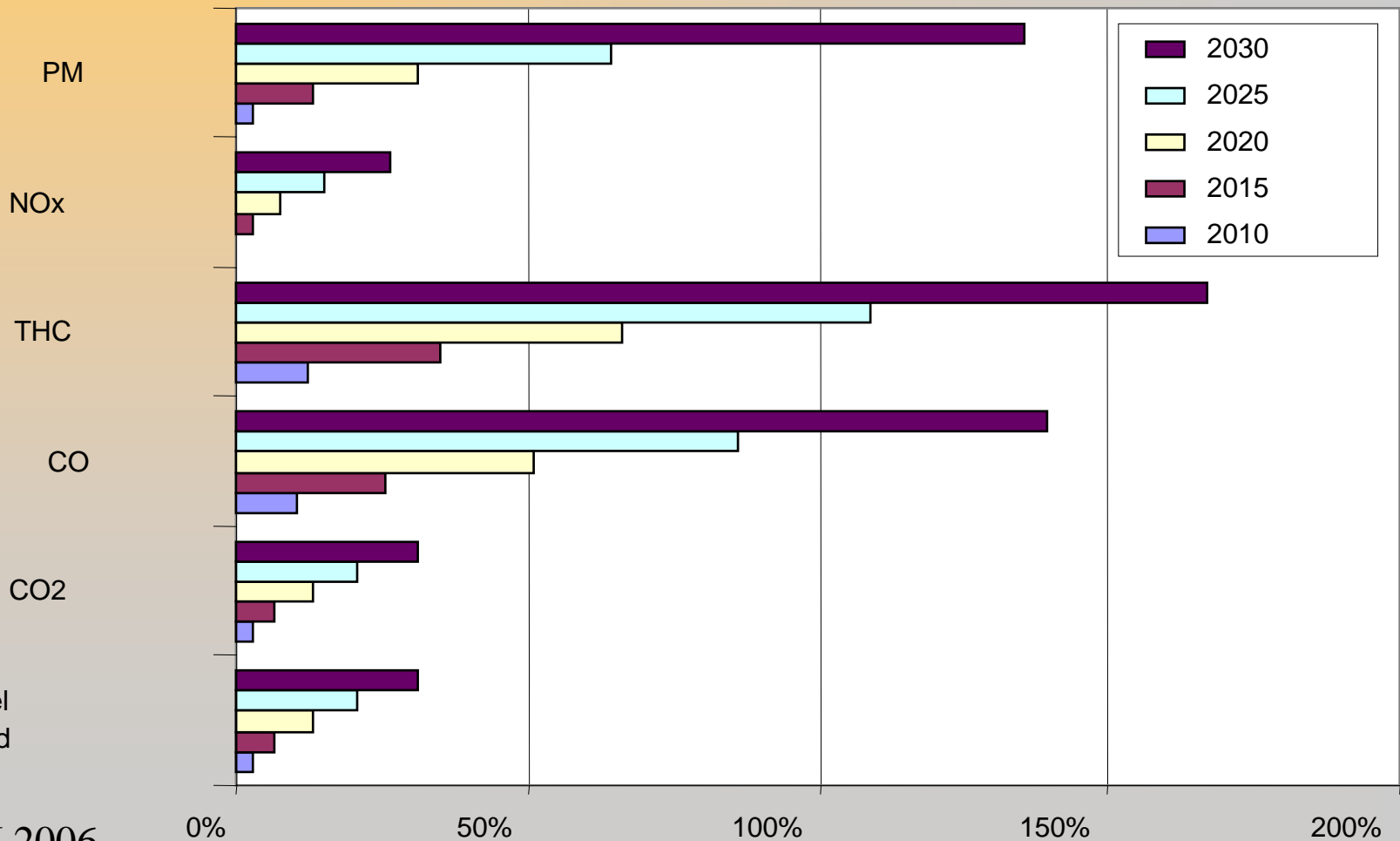
Impact of increasing bus share on energy savings and emissions



Total fuel demand

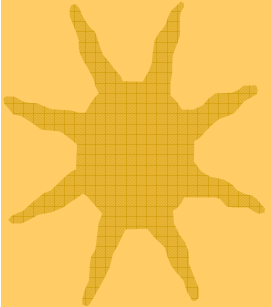
Source: TERI 2006

6% GDP growth



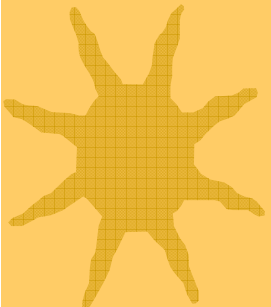


National Urban Transport Policy

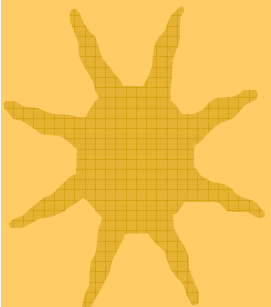


To ensure affordable, acceptable, reliable and sustainable mobility through initiatives such as :

- Integrated land use and transport planning
- Rapid transport systems that encourage greater use of public transport and NMT
- Discouraging the use of personal vehicles
- Reducing pollution levels
- Promoting PPPs



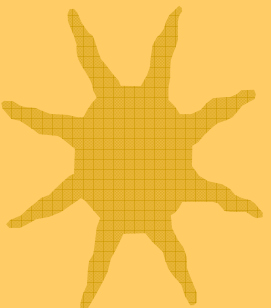
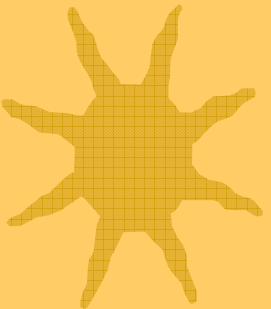
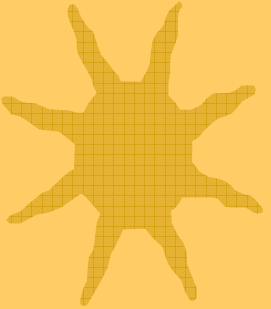
Provides for financial support under JNNURM





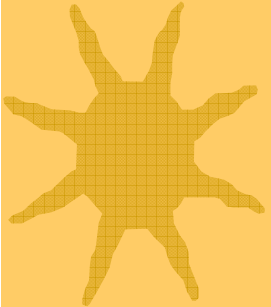
The JNNURM

- ★ An initial outlay of Rs.500 Bn(approx.\$12Bn.)
- ★ To be implemented in 63 Indian cities
- ★ Public transport an integral element
- ★ Central funding for viable and sustainable transport projects compliant with the National Urban Transport Policy

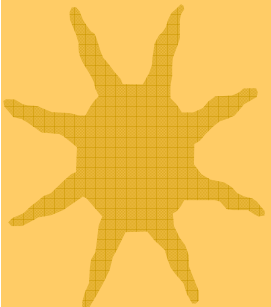




National Urban Transport Policy -initiatives

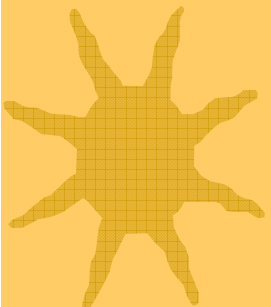


- ★ Guidelines established for preparation of DPRs for Integrated Mass Transit Systems-million plus cities encouraged to plan for MRT systems – 9 cities propose BRT



- ★ Cities encouraged to draw up Comprehensive Mobility Plans and integrate land use with transport

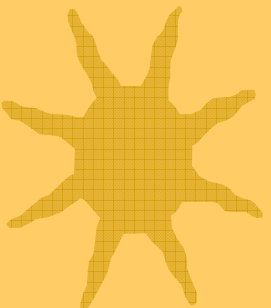
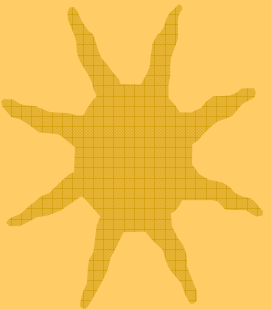
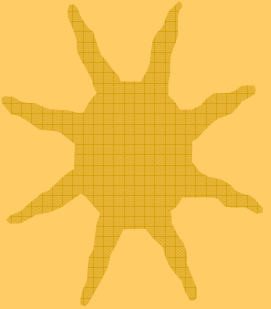
- ★ Emphasis on discouraging personal vehicles and promoting non motorised transport



- ★ Recommends public-private partnerships in introducing modern city bus services-a SPV to assist cities in drawing up CMPs and setting up bus services established



The Challenges

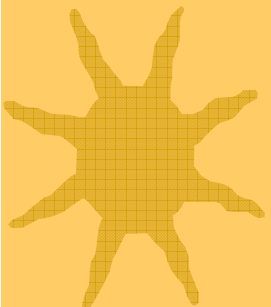
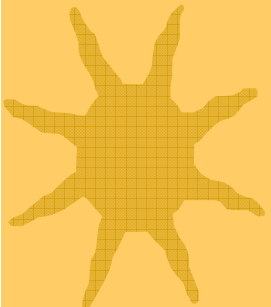
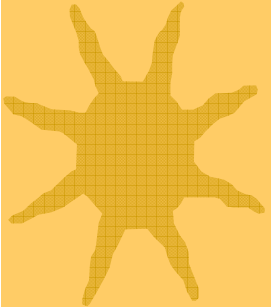


States yet to formulate urban transport policies-
need to avoid project rather than policy orientation

- Cities lack comprehensive mobility plans – lack of basic data
- Diffused institutional arrangements
- Inadequate capacity
- Restrictive legal provisions
- Appropriate tariff setting - a major issue



The Challenges



- What measures are most effective to increase the penetration of public transport and reduce the use of personal vehicles ?
- How does one design sustainable transport policies and public transport in the million plus and the second order cities?
- What capacity has to be built and how ?
- What are the appropriate institutional arrangements?
- ★ How have other countries addressed these problems?

Thank You

