

# Putting urban transport sector on a low energy and low carbon path

**A focus on passenger transport in million-plus cities**

S Sundar and Akshima T Ghate  
The Energy and Resources Institute (TERI), New Delhi

October 2011

# Key transport issues in million-plus cities

- Lack of integrated land use and transport planning
  - Urban and land use planning practices:
    - address current transport demands through specific projects, and
    - do not attempt to shape the structure of the city and influence its future growth
- Inadequate public transport and NMT infrastructure
  - Public modes in most Indian cities constitute only 2-3% of the entire vehicular fleet
    - Negative growth rate in bus fleet size witnessed in large cities
  - Dedicated public transport absent in most cities
    - Combination of para transit modes like jeeps, autos, etc. serve the purpose
  - Absence of good quality and safe infrastructure for NMT users

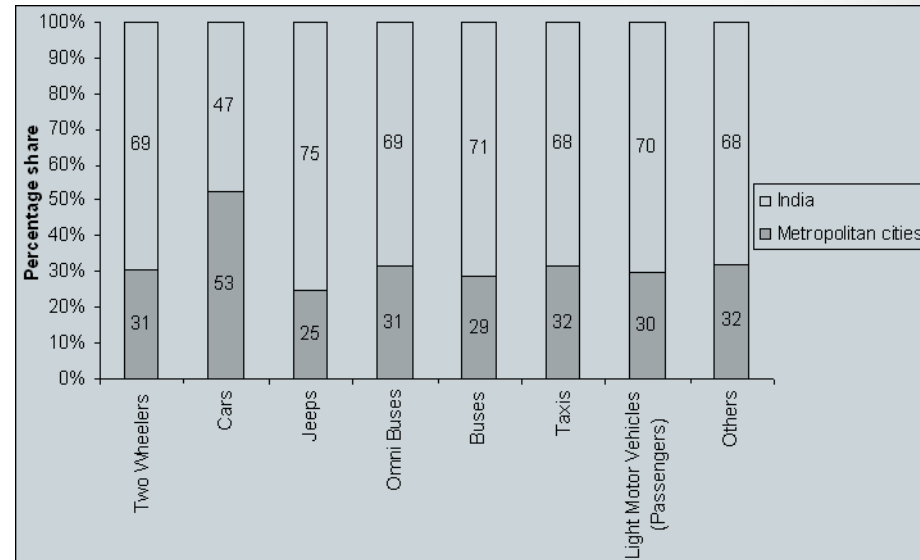
# Key transport issues in million-plus cities (contd.)

Rapid motorization and increasing share of private vehicles

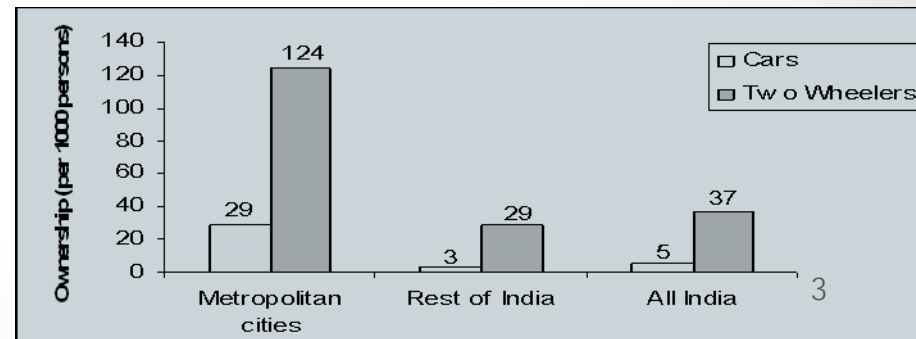
- Exponential growth in the number of motorized personal vehicles
- Heavy concentration of private motor vehicles in million-plus cities
- Car ownership in 23 million-plus cities in 2001 was 29 cars per 1000 persons as compared to 3 cars per 1000 persons in the rest of the country

## Concentration of passenger transport activities in large cities

Comparison of share of vehicles registered in 23 million-plus cities with the rest of the country in 2001



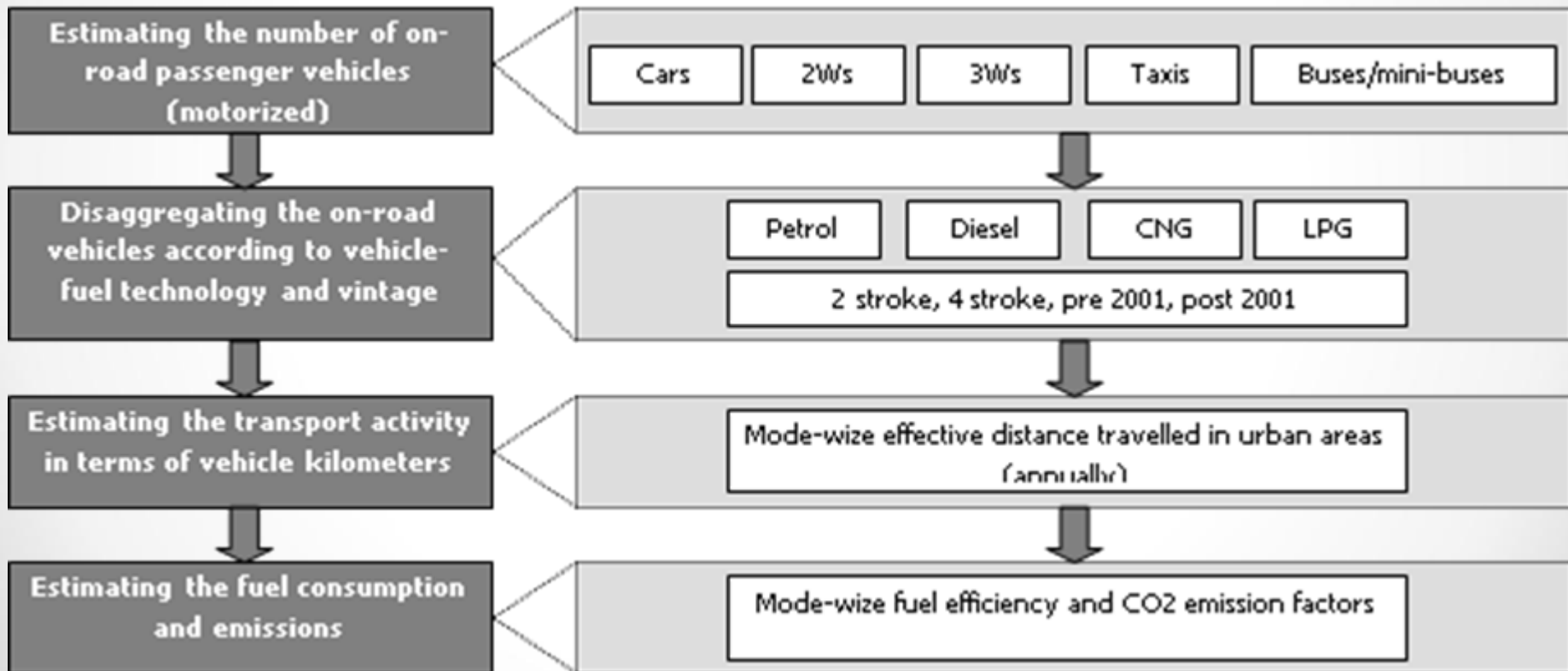
Car and two-wheeler ownership in 2001



Note: Only data for 23 million-plus cities available

# Measuring the impact on energy consumption and CO<sub>2</sub> emissions

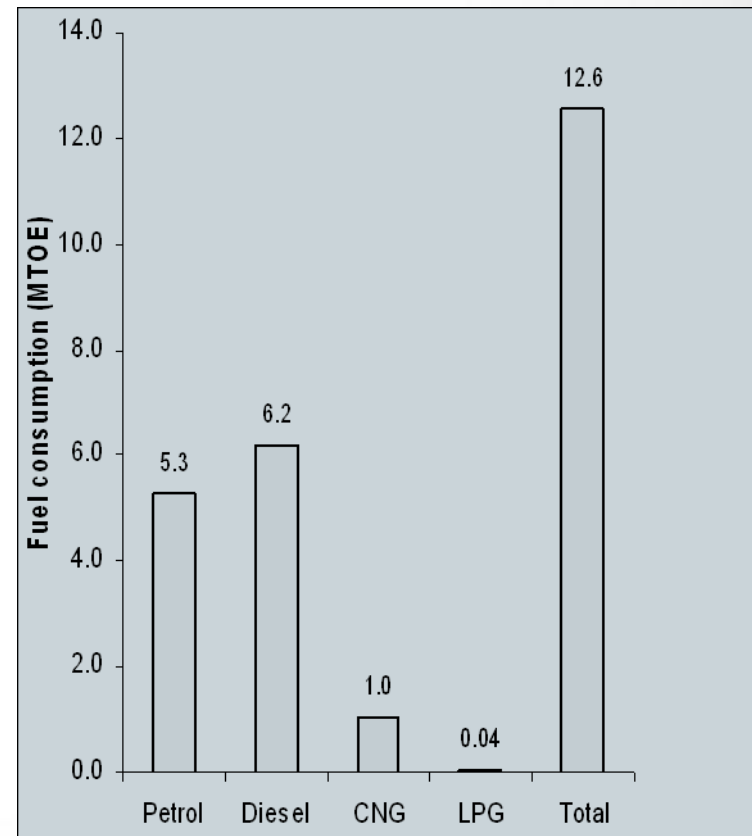
Framework for estimating energy consumption levels and CO<sub>2</sub> emissions from passenger transport activities in 23 million-plus cities



# Energy consumption and CO<sub>2</sub> emissions from passenger transport activities in 23 million-plus cities

- 23 of the 35 million-plus cities have a significant share (about 40%) in energy consumption and CO<sub>2</sub> emissions from on-road transport activities in the country
- Estimated fuel consumption in these cities in 2001 - 12.6 MTOE
  - Diesel (50%)
  - Petrol (42%)
  - CNG (8%).
- CO<sub>2</sub> emissions - 18.9 MT in 2001
- Energy and emission estimates would be even higher if the impacts of poor road conditions, congestion, and idling, were to be considered

Estimated fuel consumption from motorized transport activities in 23 million-plus cities (2001)



# Low carbon growth of the transport sector in Indian cities: Key approaches and strategies

## Avoid

- Reduce number of trips or at least rate of growth of number of trips
- Reduce length of trips

Two key instruments to do this:

- Integration of land use and transport in new developments and retrofitting existing developments
- Use of information technology (IT) as a substitute for physical mobility – tele-/e-work and flexi-work hours, e-governance/shopping/education, etc.

# Low carbon growth of the transport sector in Indian cities: Key approaches and strategies (contd.)

## Shift

- Shift from personal vehicles to public transport and non-motorized modes
- Prevent shift from NMT and public transport (PT)

### Instruments to do this:

- Encourage and facilitate NMT with appropriate policies and infrastructure provision
- Introduce/enhance public transport capacity as appropriate
- Regulate/rationalize para transit to supplement PT
- Introduce in parallel measures to discourage the routine use of personal vehicles

*World experience has shown that an effective shift to public transport can occur only if transport demand management measures are adopted in tandem with increased provision of public transport*

*Difficult to discourage ownership, discourage routine use*

# Low carbon growth of the transport sector in Indian cities: Key approaches and strategies (contd.)

## Improve

- Promote efficient and clean vehicles
- Improve traffic flow

### Instruments to do this:

- Introduce fuel efficiency standards
- Define roadmap for emission standards beyond 2010
- Establish robust inspection and maintenance regime
- Encourage the use of alternate fuels and clean vehicle technology
- Introduce intelligent transport systems to reduce congestion and facilitate smooth flow of traffic



# Impact of the 'Avoid, Shift, and Improve' approach

- The 'Avoid, Shift, and Improve' approach would contribute towards:
  - Reduction in private vehicles on-road,
  - Increase in public transport and NMT share, and
  - A cleaner vehicle fleet
- Savings in energy consumption and CO<sub>2</sub>
  - If the share of buses is increased to 75% by 2030 and private vehicles and IPT modes meet the remaining 25% of the travel demand - fuel demand would decrease by 21% and CO<sub>2</sub> emissions by 20% as compared to BAU
  - If fuel efficiency of vehicles can be improved by 5% and 20% in 2015 and 2030, respectively, for the vehicles registered after 2010, a reduction of about 17% is achievable in motor fuel consumption by 2030 as against the BAU
  - Integrated land use and transport planning can also reduce transport energy demand by 20% by 2030

# Way forward

## At city-level

- Draw up or reboot mobility plans and projects to meet growing transport needs based on the 'avoid, shift, and improve' approach
- &
- Commit to a progressive reduction in the rate of growth in fossil fuel consumption and emissions, and monitor the impact
  - Establish a good database to assess past trends and make future projections accurately
  - Develop inventories of energy consumption levels and CO2 emissions and establish base lines

# Way forward

## At state level

- Provide the enabling policy framework to cities; implement NUTP
- Facilitate cities to draw mobility plans to promote low carbon transport
- Promote public transport

## At national level

- Implement NUTP
- Lay down standards – fuel efficiency, emissions, etc.
- Provide funds

## At international-level

- Financing
- Technology transfer

Thank You