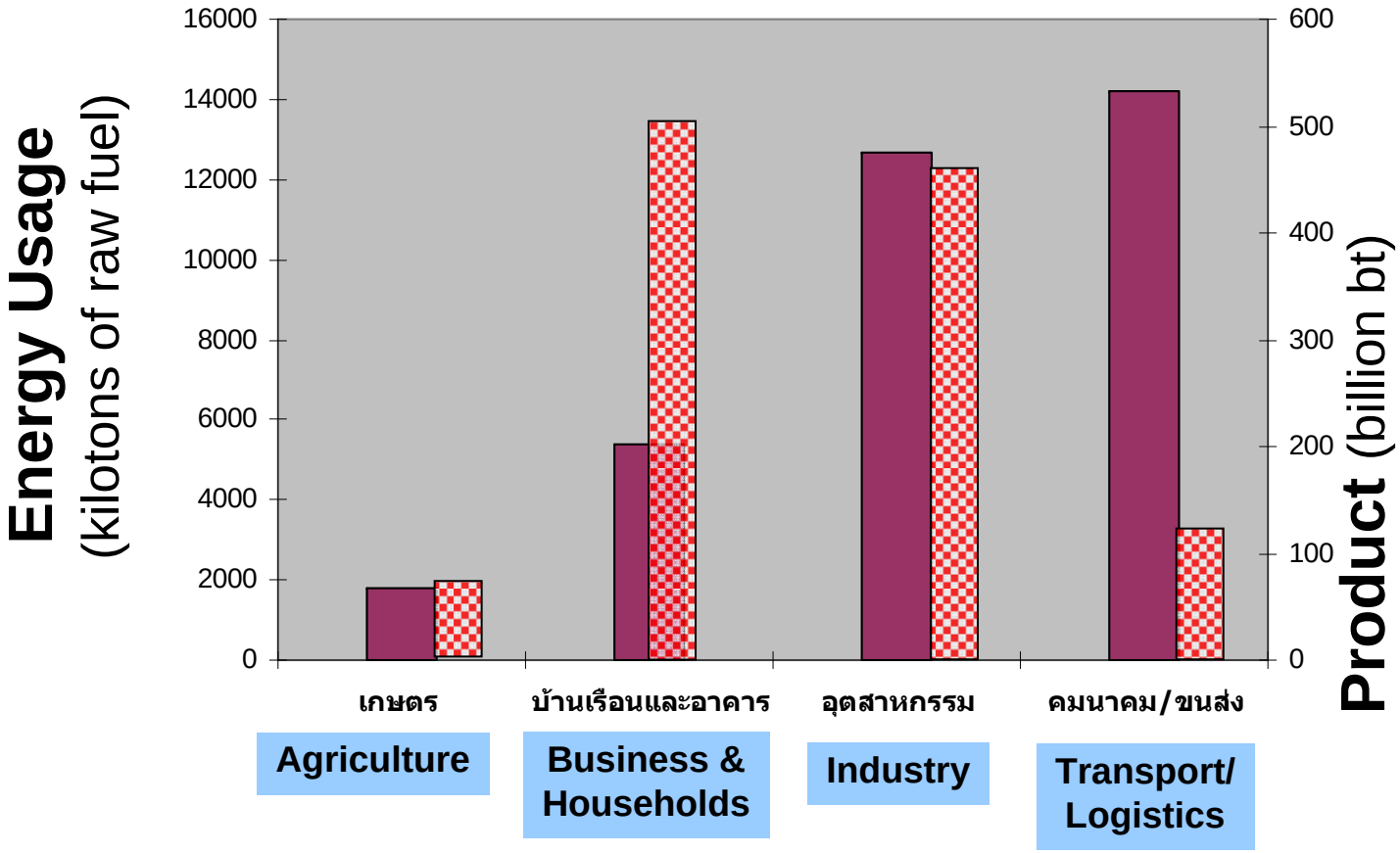
Would Sustainable Urban Transport really help reducing energy consumption and air pollution problems?

1st ATRANS Symposium on

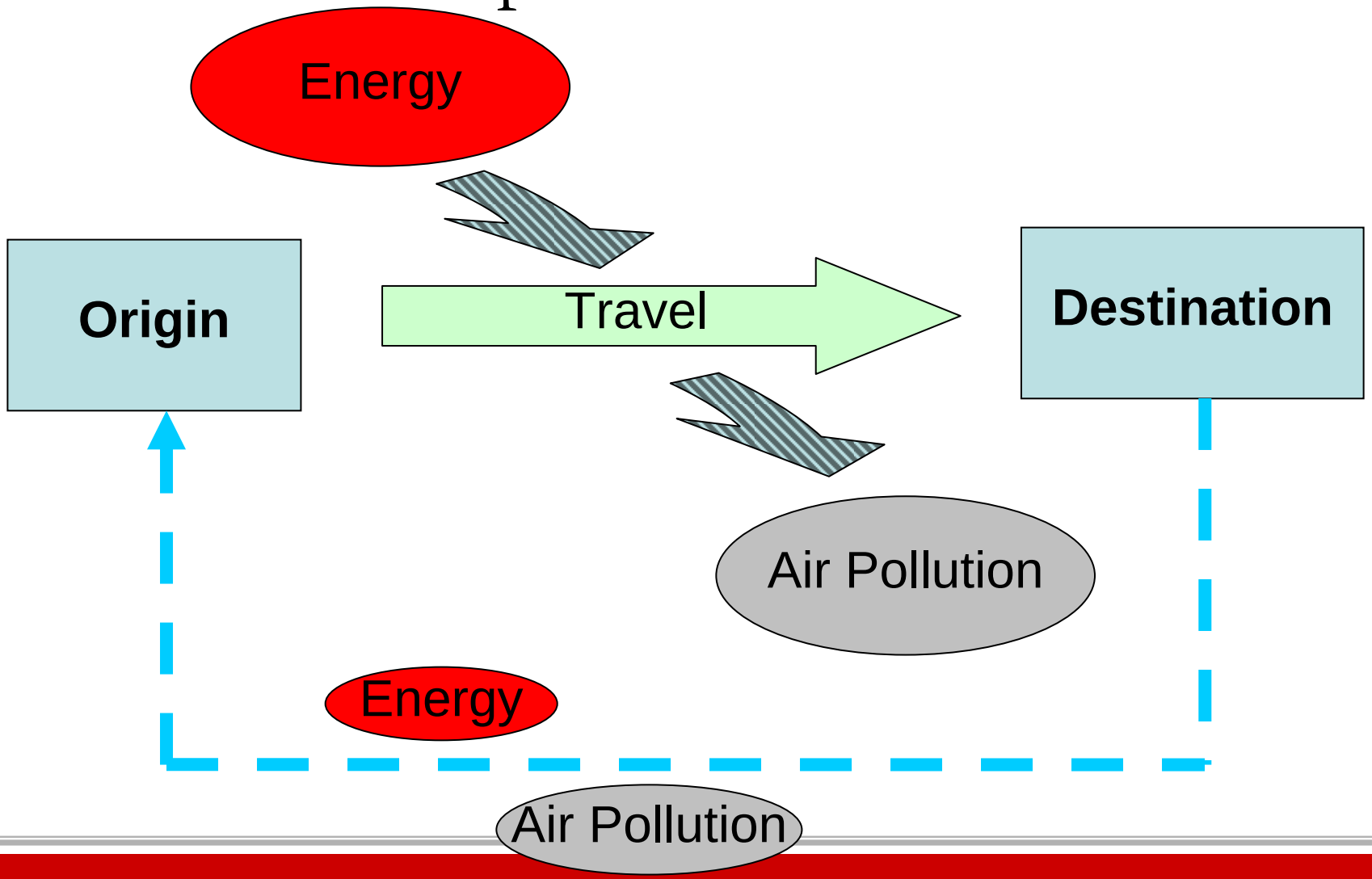
Transport Crisis in Thailand

1 August 2008



Source: Thanes and Wongharn (2006), Decomposition of Energy and CO_2 for Thailand, การประชุมสัมมนา e-nett, มทส., กค. 2548

Why energy used in Transport is not productive



Sustainable urban transport: The idea and principles

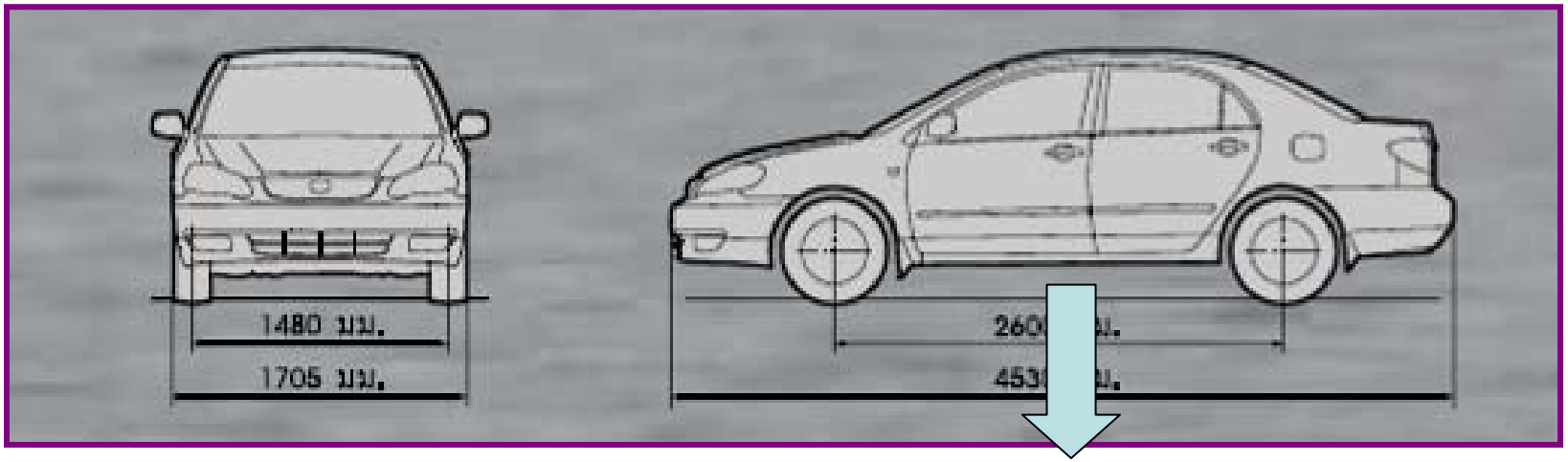
Space required for transport 60 people

CARS

BUS

BIKES

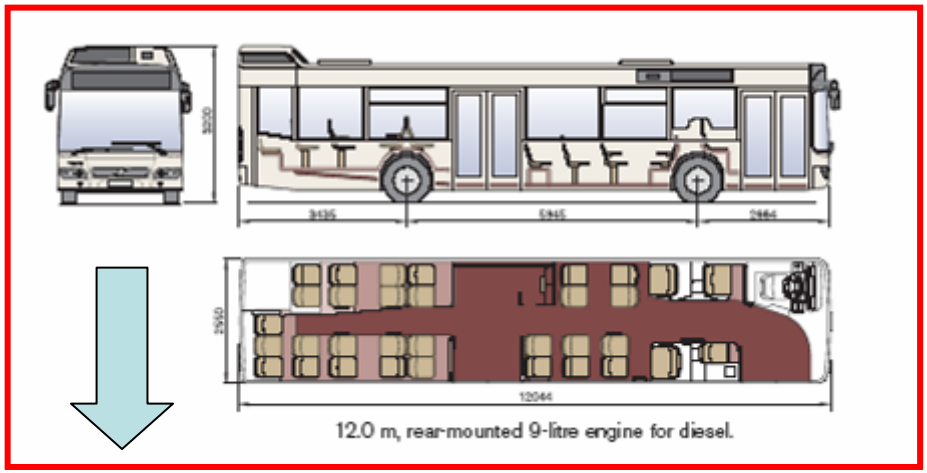
Inefficient Use of Energy



How efficient it is to transport 1 person (weights 80 kg.) by a vehicle weighing over 1 tons.

More efficient Use of Energy

BUS



18,000 kg

Weight: 18 tons
Capacity: 95 persons

Bike

10-15 kg

Weight: 10-15 kgs

Air Pollution Problems

- Affect human respiratory problems
- Increase morbidity and mortality
- In European countries, vehicular traffic accounts for
  - - 100% of CO
  - - 75% of NOx
  - - 40% of PM

  in urban atmosphere.

Air Pollution Problems

- **China** “Air pollution kills 400,000” annual. (2005)
- **Tehran** All schools and nurseries in Tehran closed 2 days in December 2005 due to smog. (2005)
- **Bangkok** PM_{10} claimed 4,000 to 5,500 premature deaths in Bangkok each year (1993).

Image source: WRI

Global Climate Change

- Large amount of pollutants was produced into atmosphere, causing excessive heat retention effect
  - Rise in Temperature
  - Shifting rainfall patterns, ocean currents
  - More frequency and intensity of extreme weathers
  - Rise in sea level (100 years -> 1 meters rise)

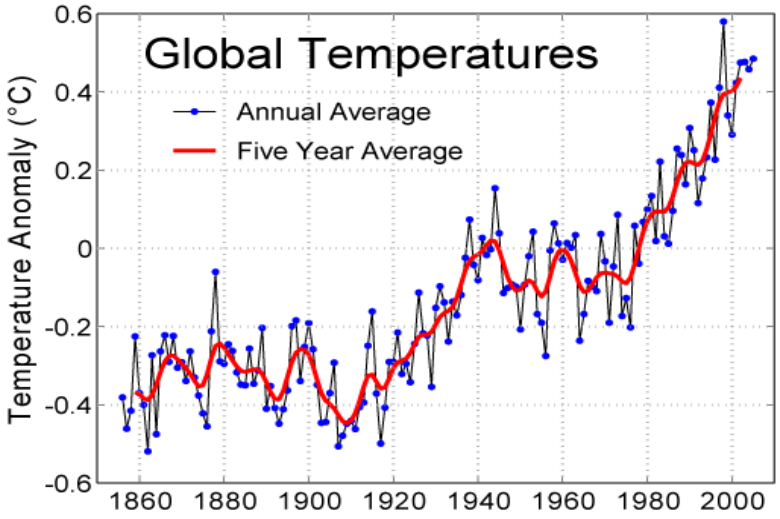
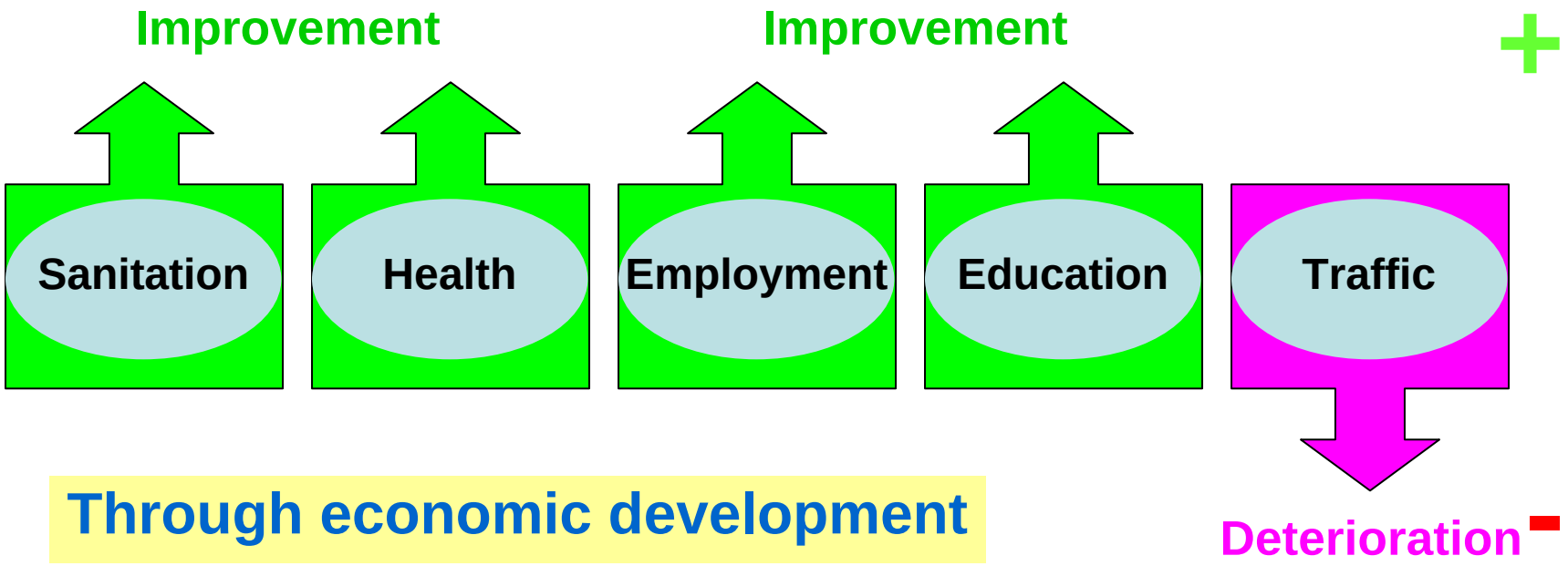


Photo: wikipedia.org, globalcrisis.com

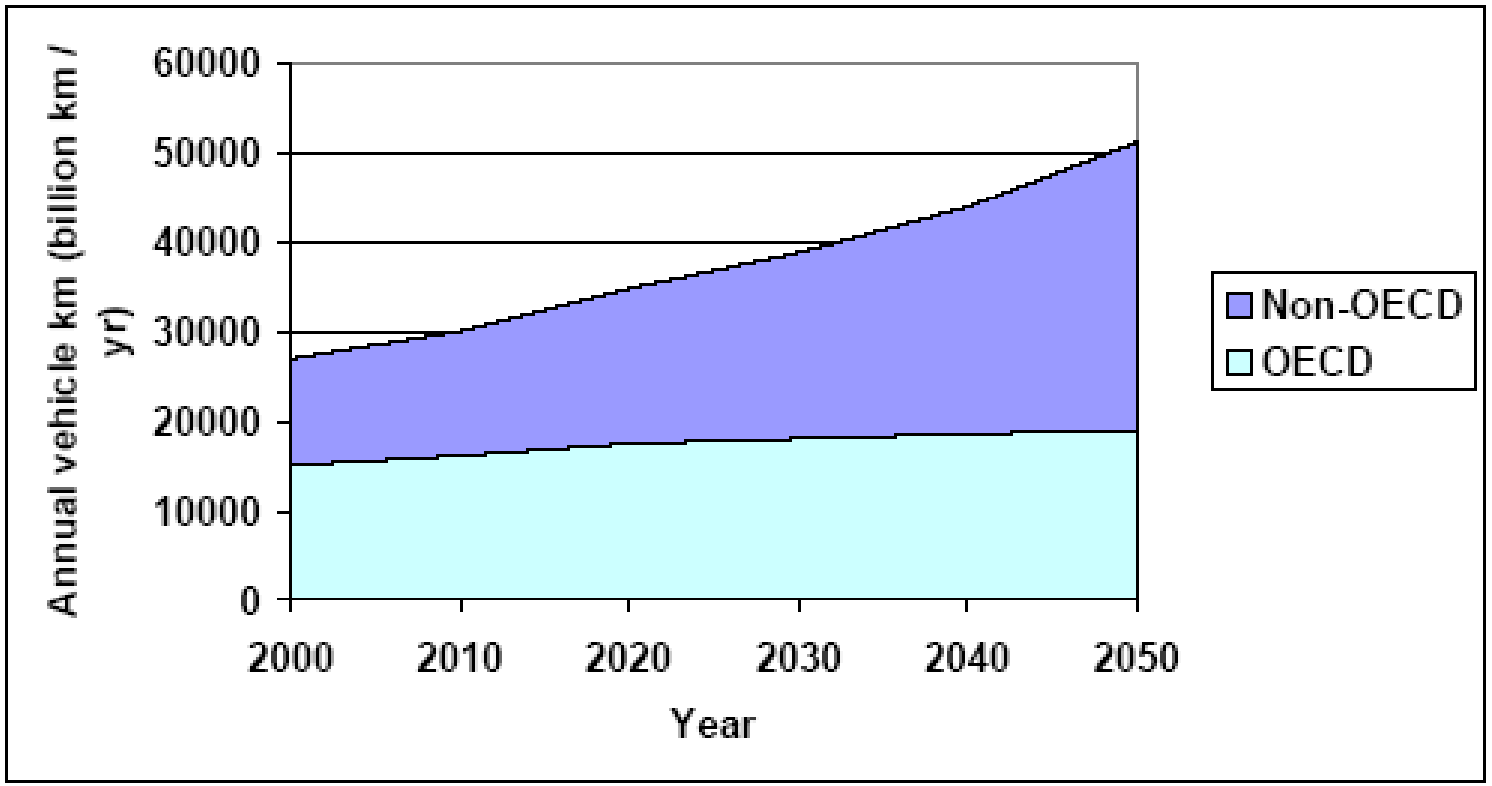
Transport Paradox

"Transport is unique as the only development sector that worsen as income rise."



Current Bangkok Situations

Trends of Future Vehicle Usage



Source: IEA/SMP 2004

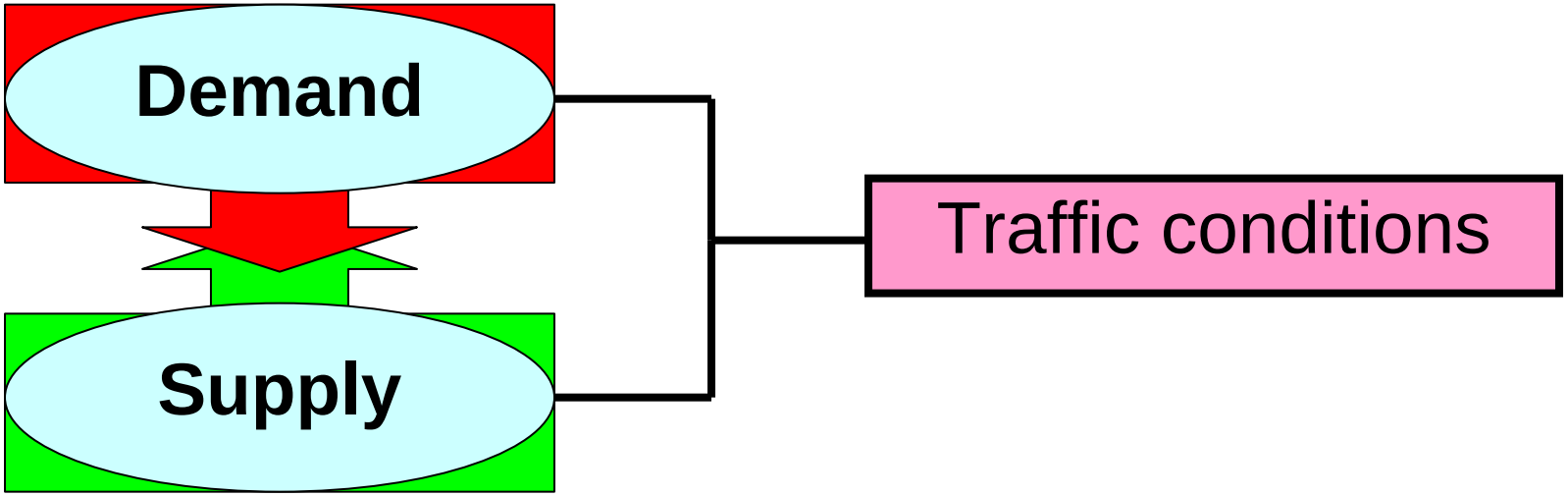
Oil Consumption and CO2 Emission Reduction

Promising Strategies

- Improving Fuel Economy
  - Lighter material, more efficient components, advanced engine,etc
- Improving on-road efficiency
  - Vehicle inspection/maintenance, Speed limit policy, vehicle retirement program
- Promoting Alternative Fuels
  - Biofuels, Hydrogen, LPG, CNG, Ethanol, Methanol
- Travel demand management

Source: IEA Saving Oils and Reducing CO Emission in Transport (2001)

Transportation System



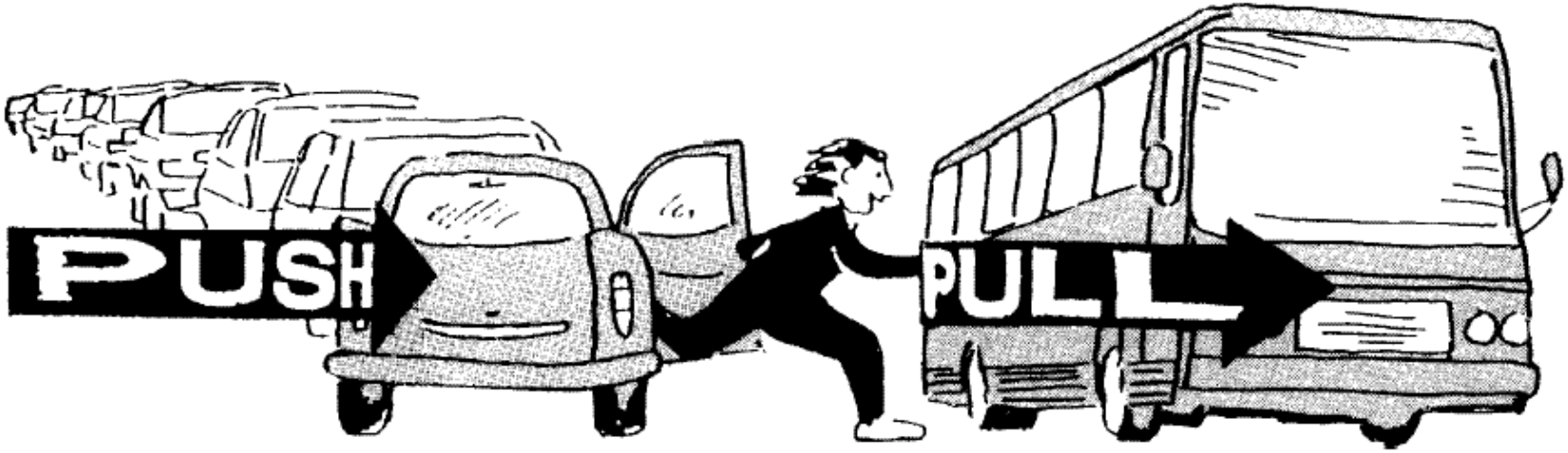
Sustainable Transport

- Ways of reducing vehicular traffic demand, while people can still meet their travel goal.
- focus on **people travel** rather than **vehicular travel**.

The push and pull approach

Measures with push-effects
Area-wide parking management, parking space restrictions in zoning ordinances, car limited zones, permanent or time-of-day car bans, congestion management, speed reductions, road pricing...

Measures with pull-effects
Priority for buses and trams, high service frequency, passenger friendly stops and surroundings, more comfort, park-and-ride, bike-and-ride..., area-wide cycle-networks, attractive pedestrian connections...



Measures with push- and pull-effects
Redistribution of carriageway space to provide cycle lanes, broader sidewalks, planting strips, bus lanes..., redistribution of time-cycles at traffic lights in favour of public transport and non-motorized modes, public-awareness-concepts, citizens' participation and marketing, enforcement and penalizing...

Source: Müller, P., Schleicher-Jester, F., Schmidt, M.-P. & Topp, H.H. (1992): Konzepte flächenhafter Verkehrsberuhigung in 16 Städten", Grüne Reihe des Fachgebiets Verkehrswesen der Universität Kaiserslautern No. 24.