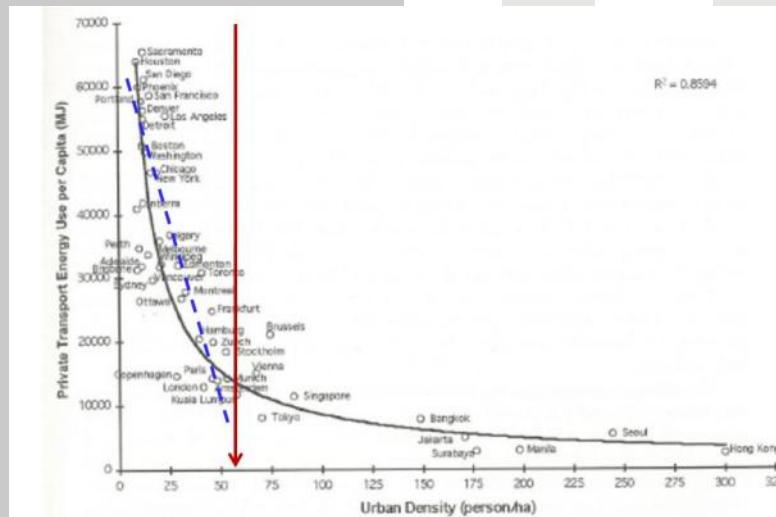


Speed, distance
and social space:
What do we make
of our cities?



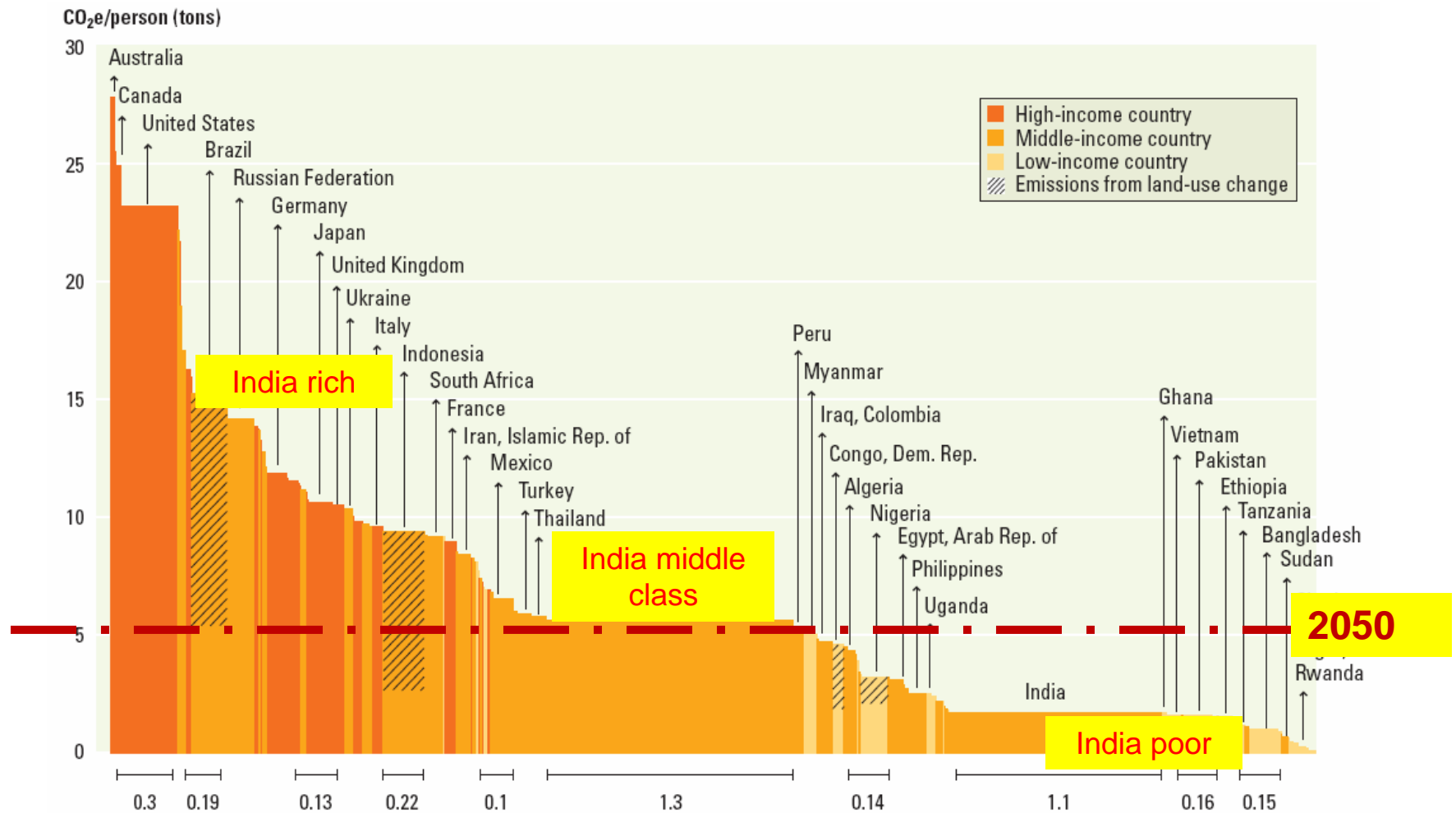
Source: Newman and Kenworthy, 1999, p. 101.

Dinesh Mohan



Urban transport – changing concerns

- <1990 **Speed**
- 1990s- **Pollution**
- 2000s- **Road Safety (concern but unscientific in most countries)**
- Late 2000s- **Lip service to climate change**



Poor have to increase energy consumption

Rich and middle class must reduce energy consumption



Urban transport – Sustainable systems

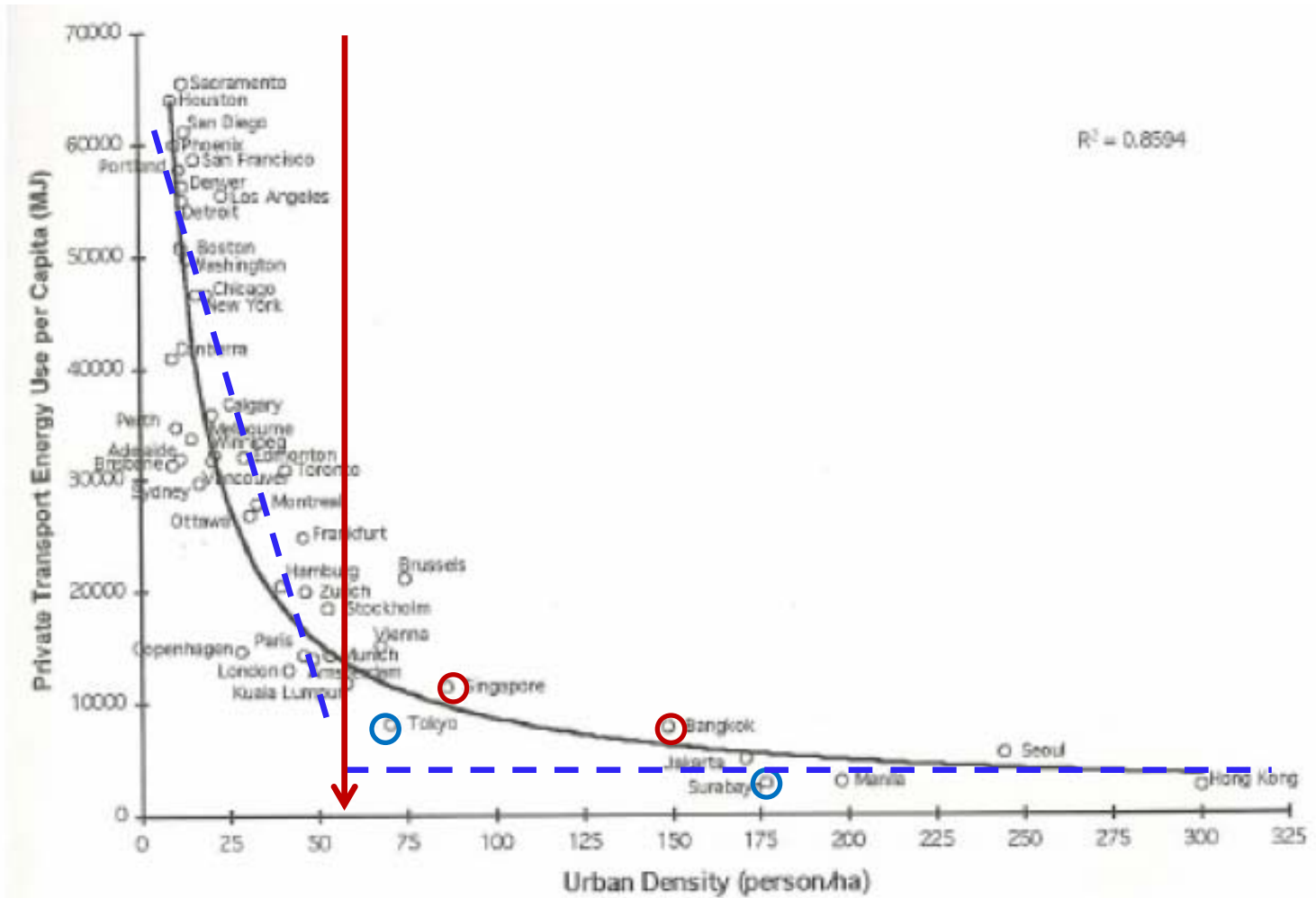
- ❑ All natural systems, including humans beings, grow to maturity and then stop growth

Current economic philosophies violate this fundamental principle

- ❑ All have negative feedback systems to maintain homeostasis

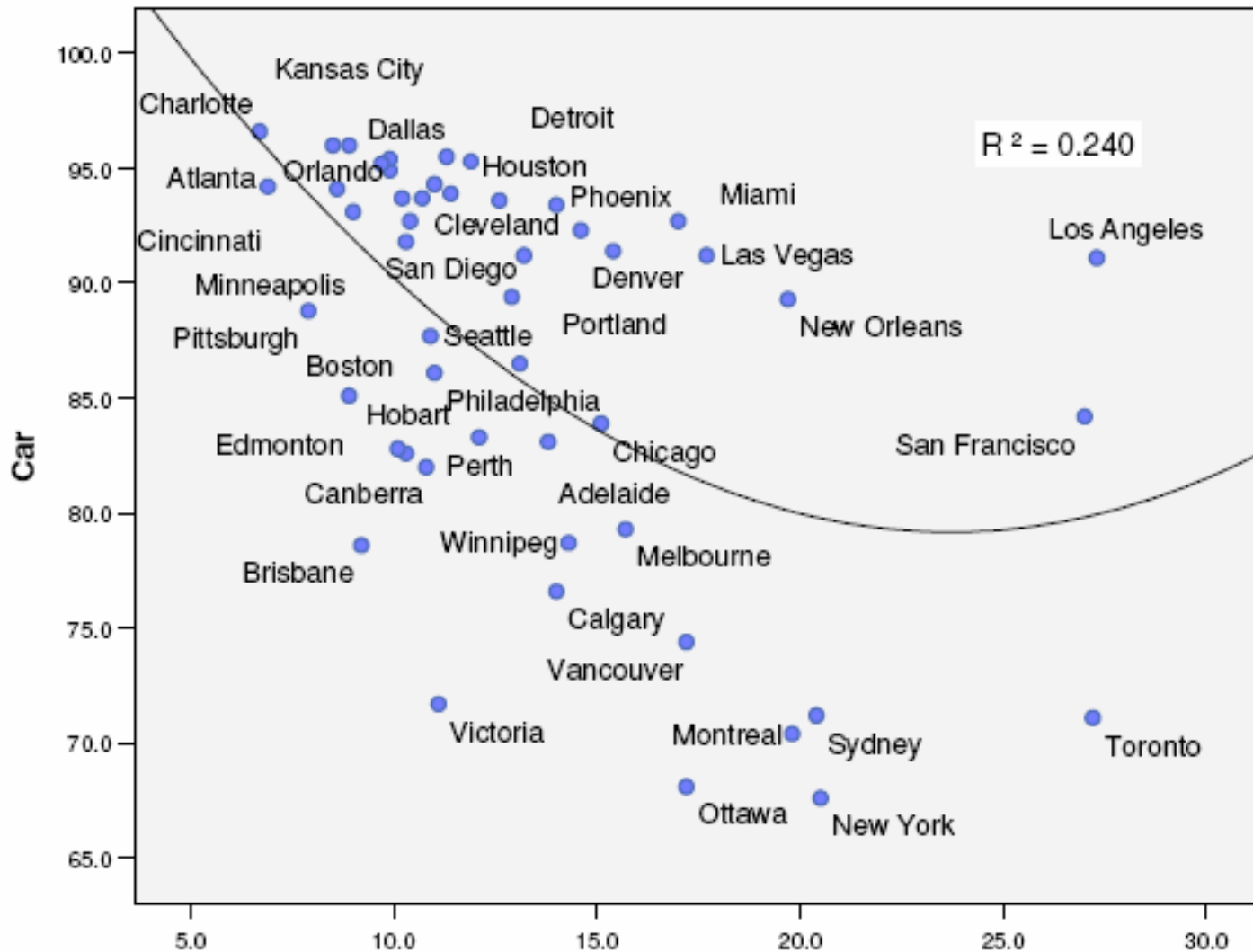
Most transportation policies have positive feedback systems embedded in them

City density – traditional understanding



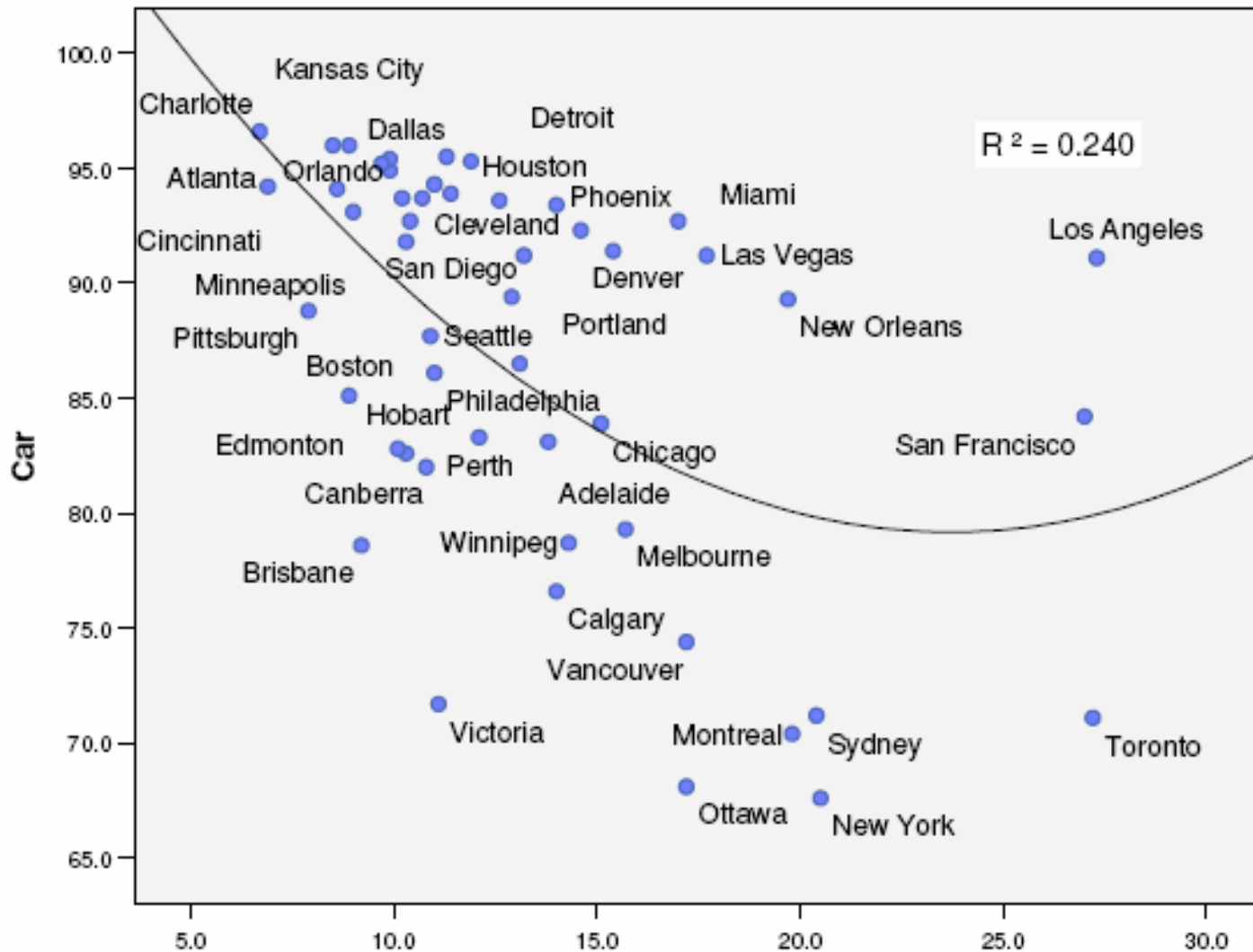
Source: Newman and Kenworthy, 1999, p. 101.

Car use and density redone



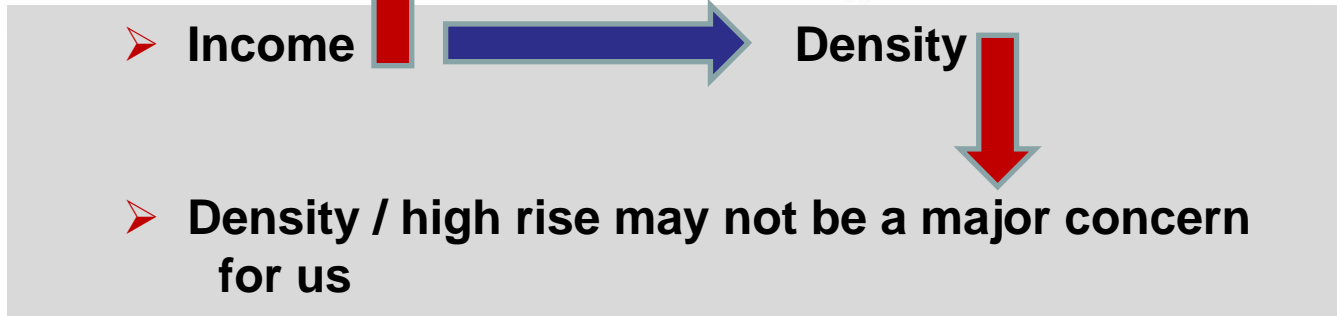
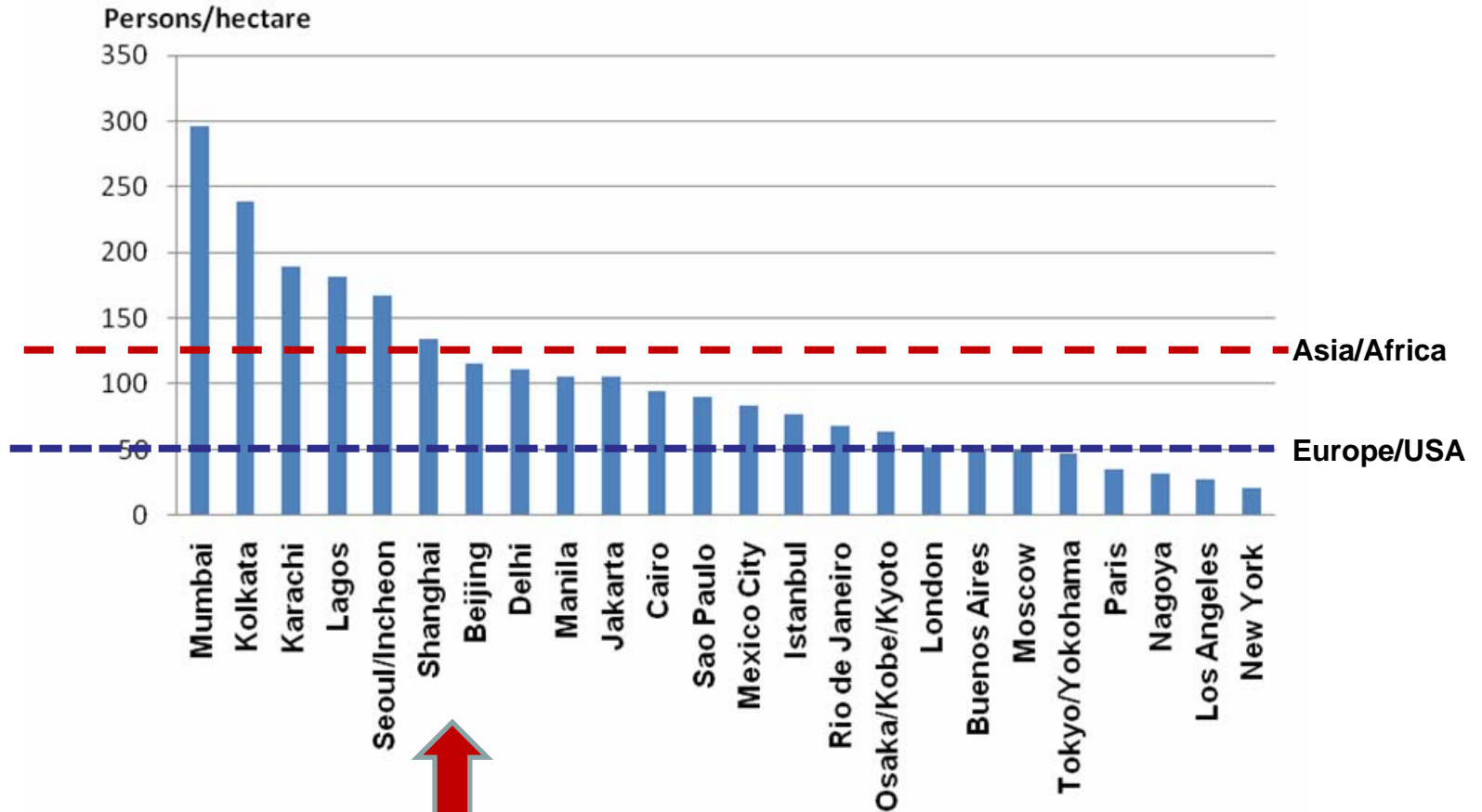
Source: MEES, P. (2010) *Density and sustainable transport in US, Canadian and Australian cities: another look at the data*, World Council Transportation Research, Lisbon, *Proceedings 12th WCTR*.

Car use and density redone

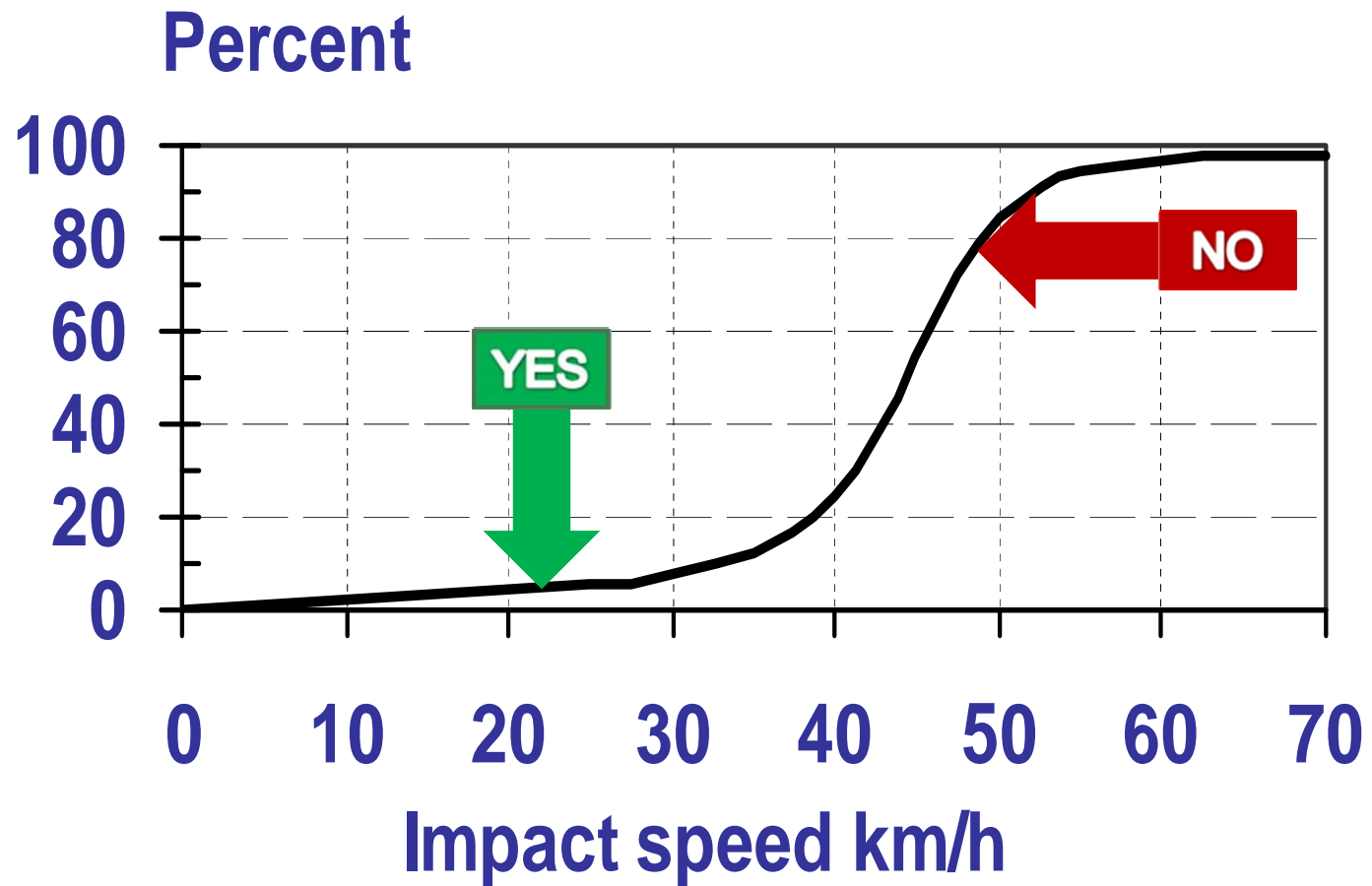


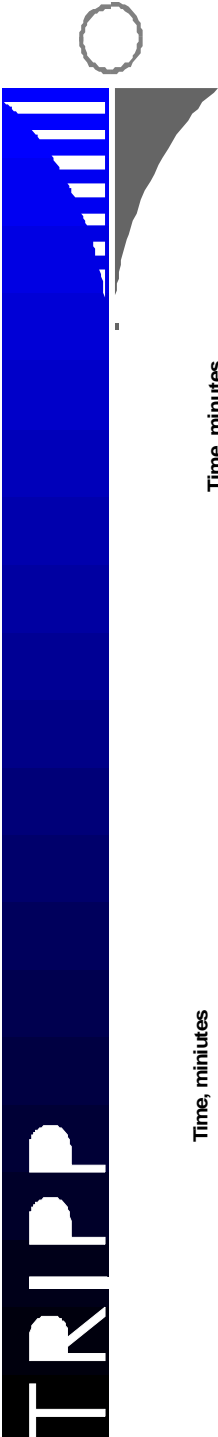
Source: MEES, P. (2010) *Density and sustainable transport in US, Canadian and Australian cities: another look at the data*, World Council Transportation Research, Lisbon, *Proceedings 12th WCTR*.

Density, cities > 10 million



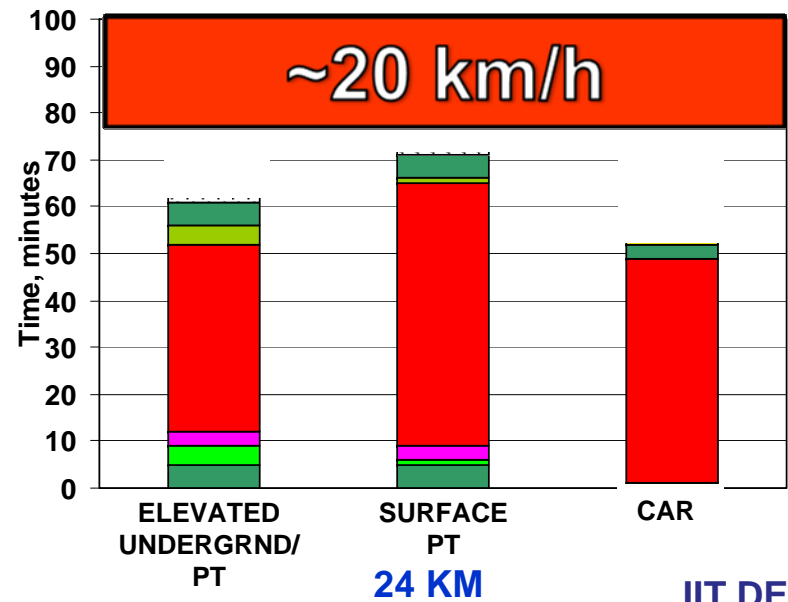
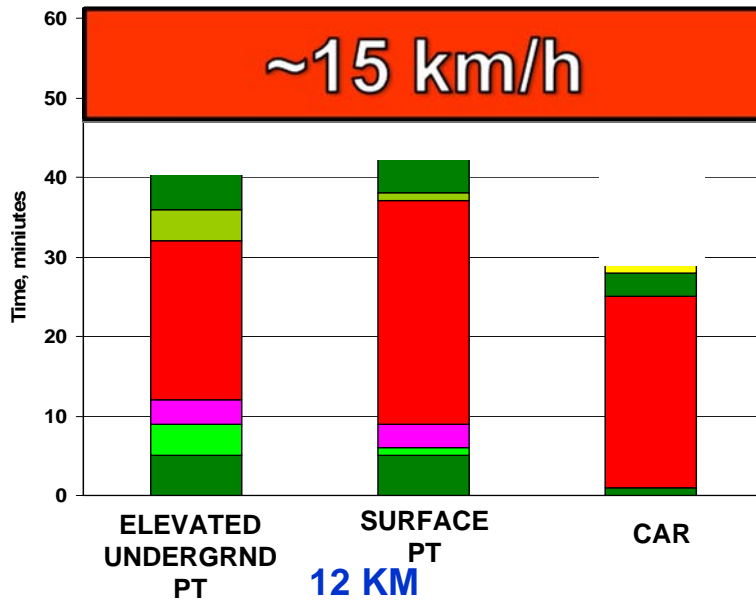
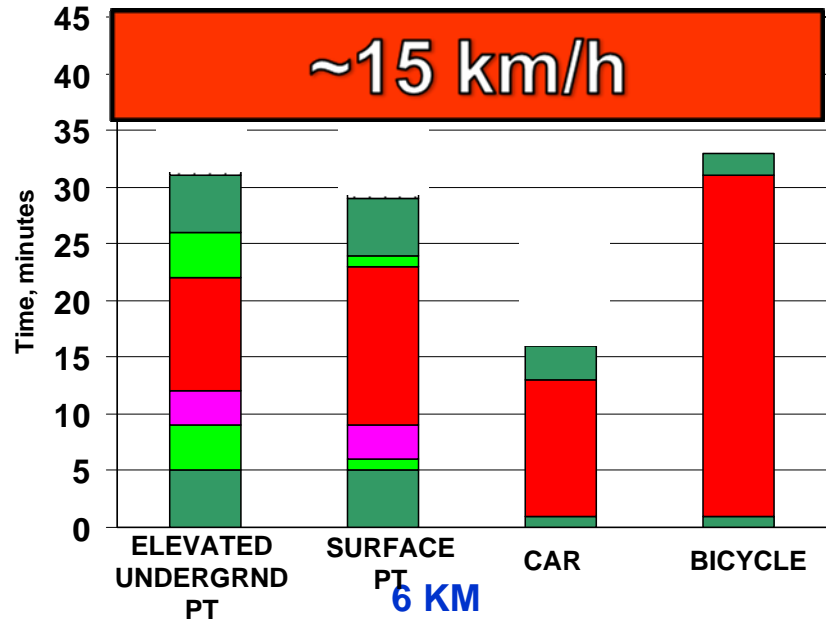
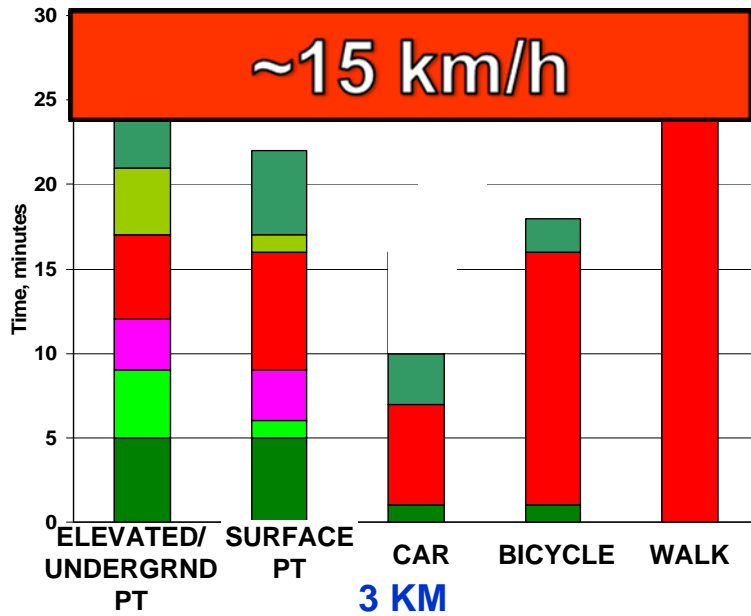
Probability of pedestrian fatality by impact speed

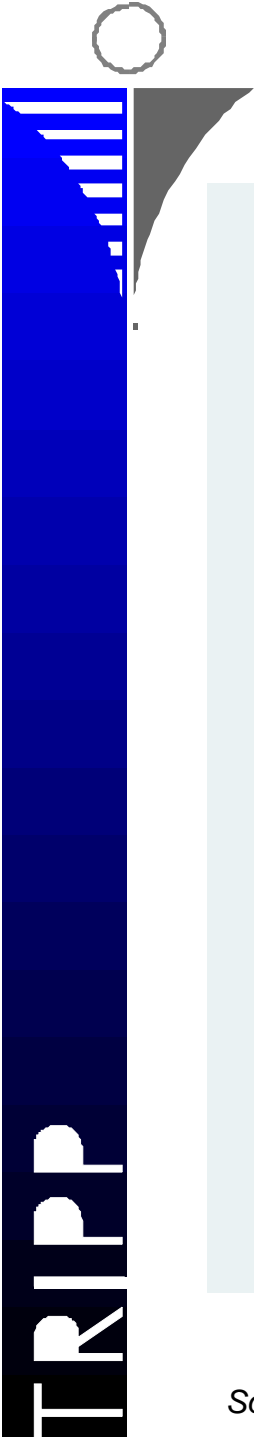




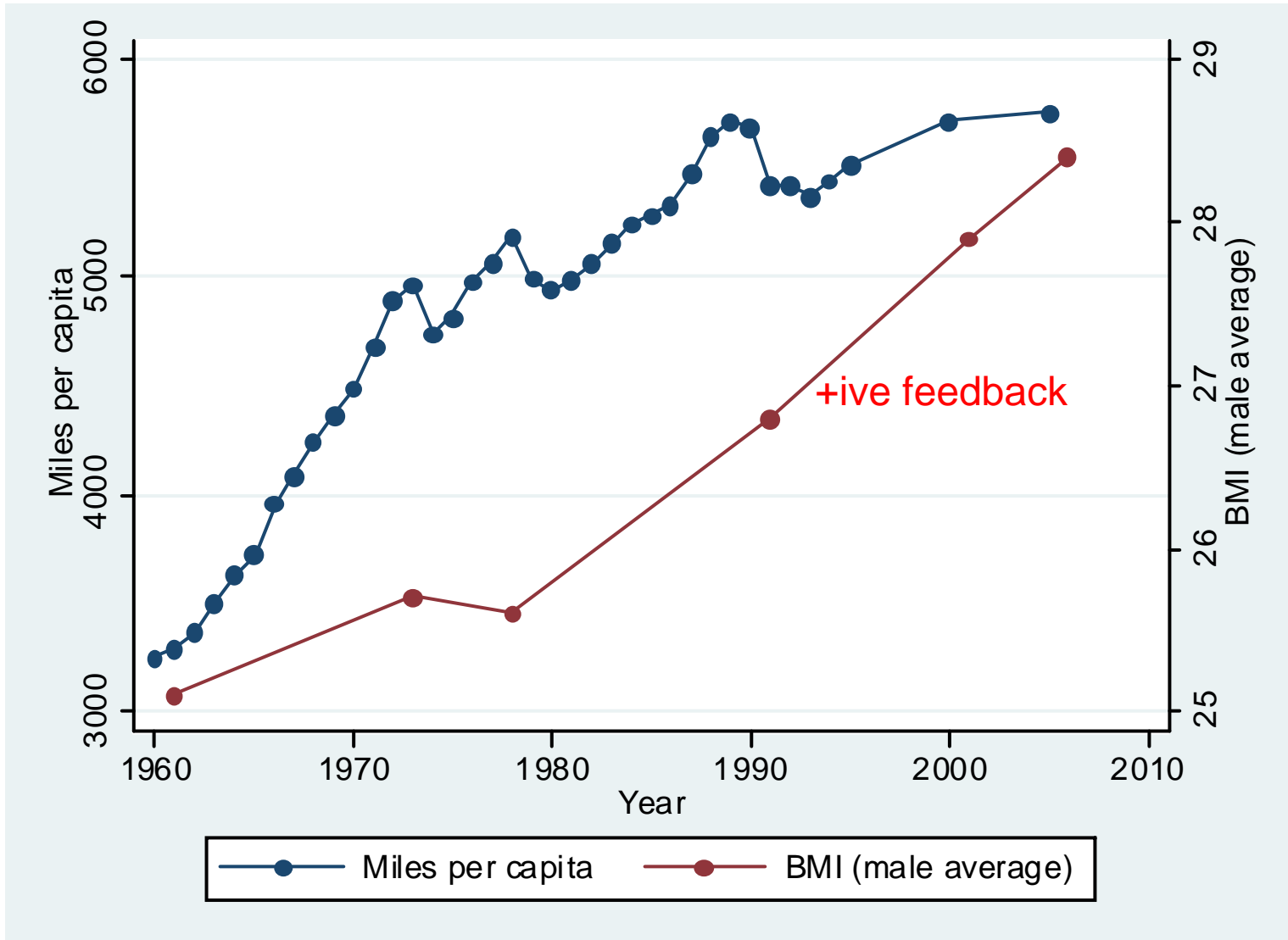
DOOR TO DOOR TRIP TIMES

- Walking to station/veh
- Journey in vehicle
- Congestion (car)
- Walking in station - in
- Walking in station - out
- One change
- Waiting at station
- Walking to destination



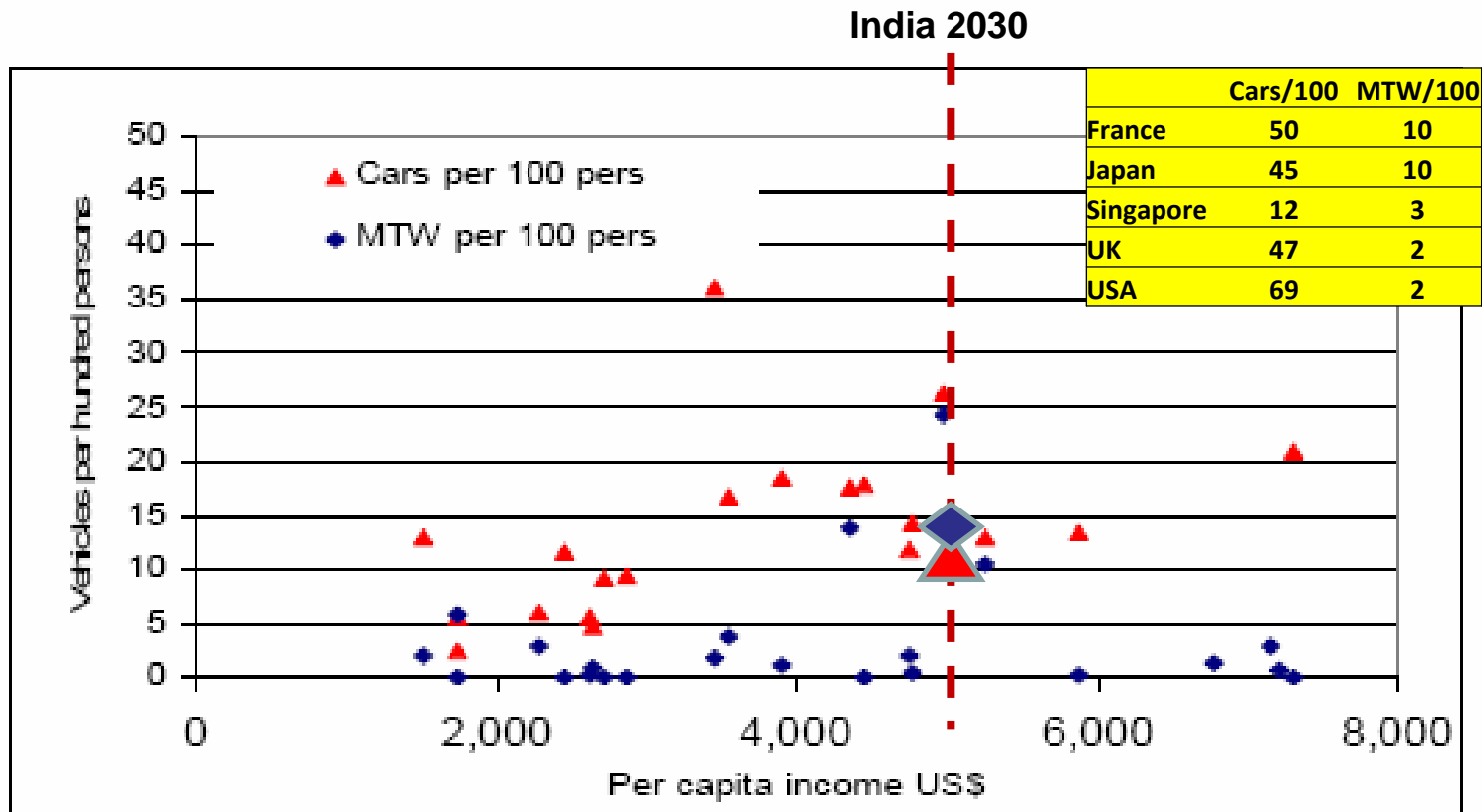


Miles travelled by car & motorcycle and average male BMI (USA)



Source: Ian Roberts, 2011

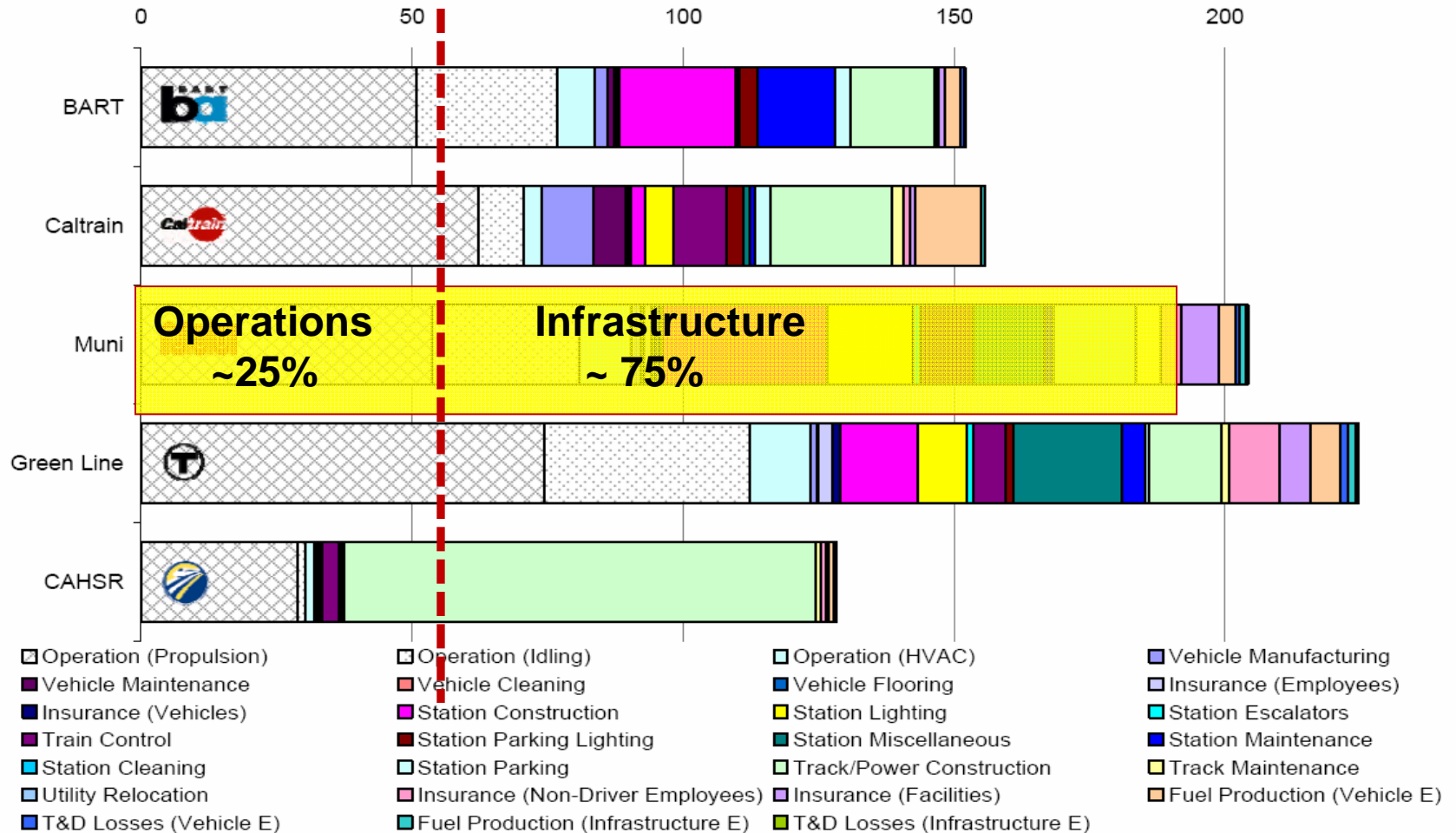
Vehicle ownership in countries with per capita incomes US\$ 1,500-8,000



Growth in automobile ownership being encouraged by national and international corporate/government policies as signs of robust dynamic economies : +ve feedback

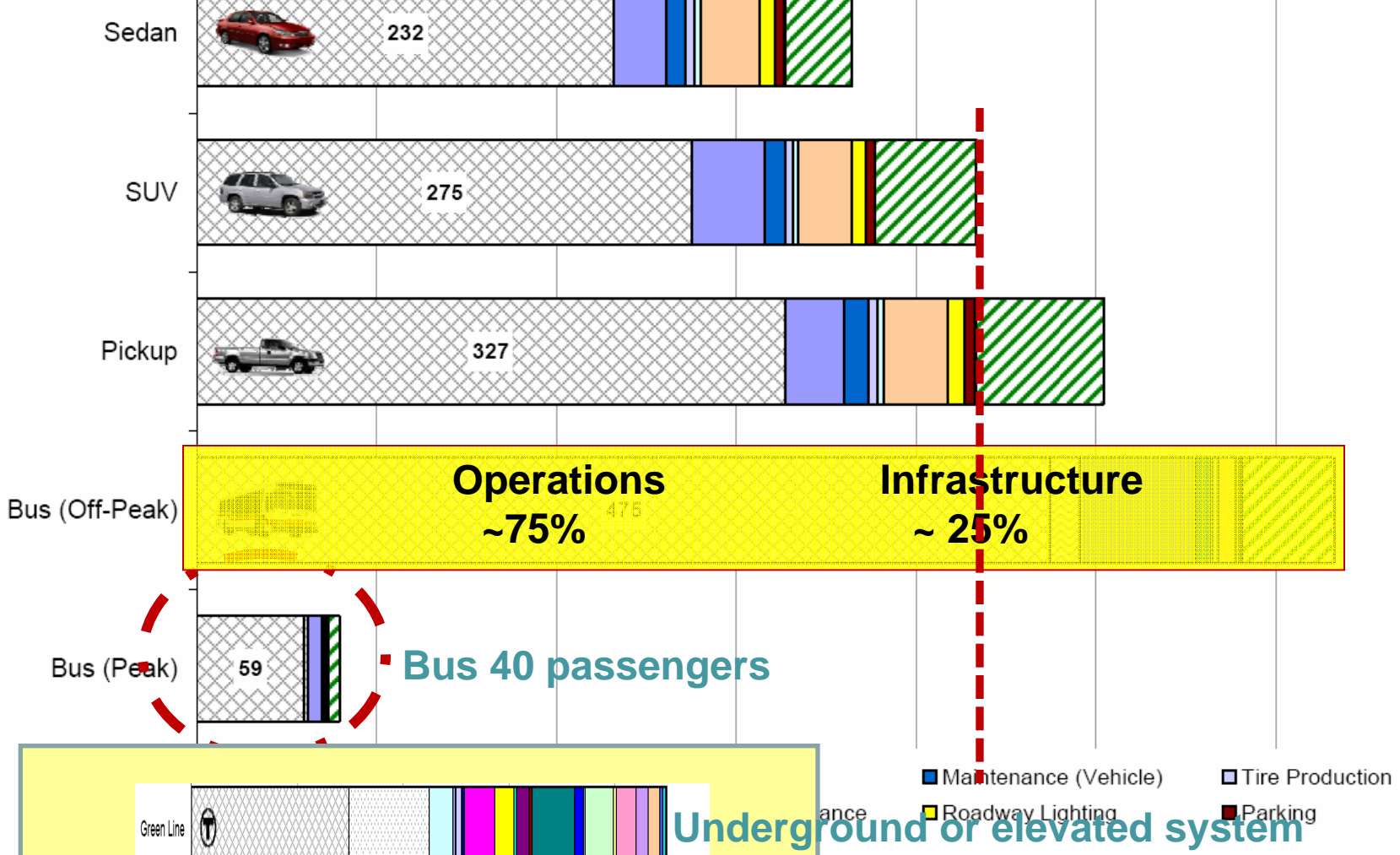
Life cycle emissions – rail modes

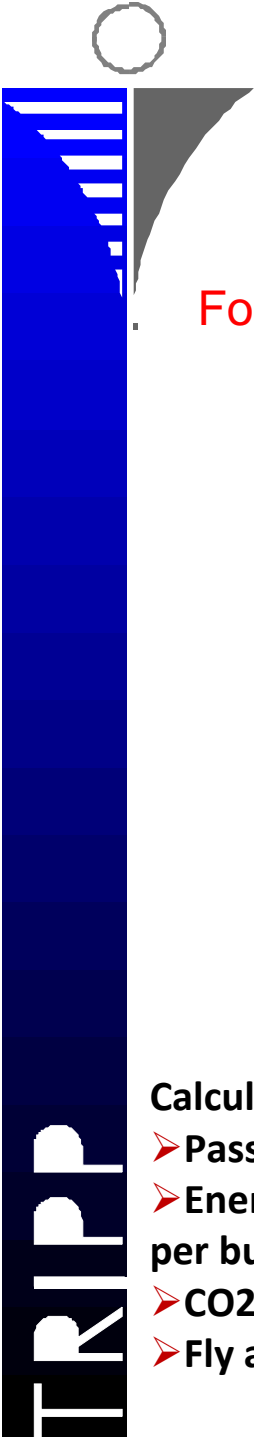
Rail Modes - Greenhouse Gas Emissions (g CO₂e) per Passenger-Mile-Traveled



3

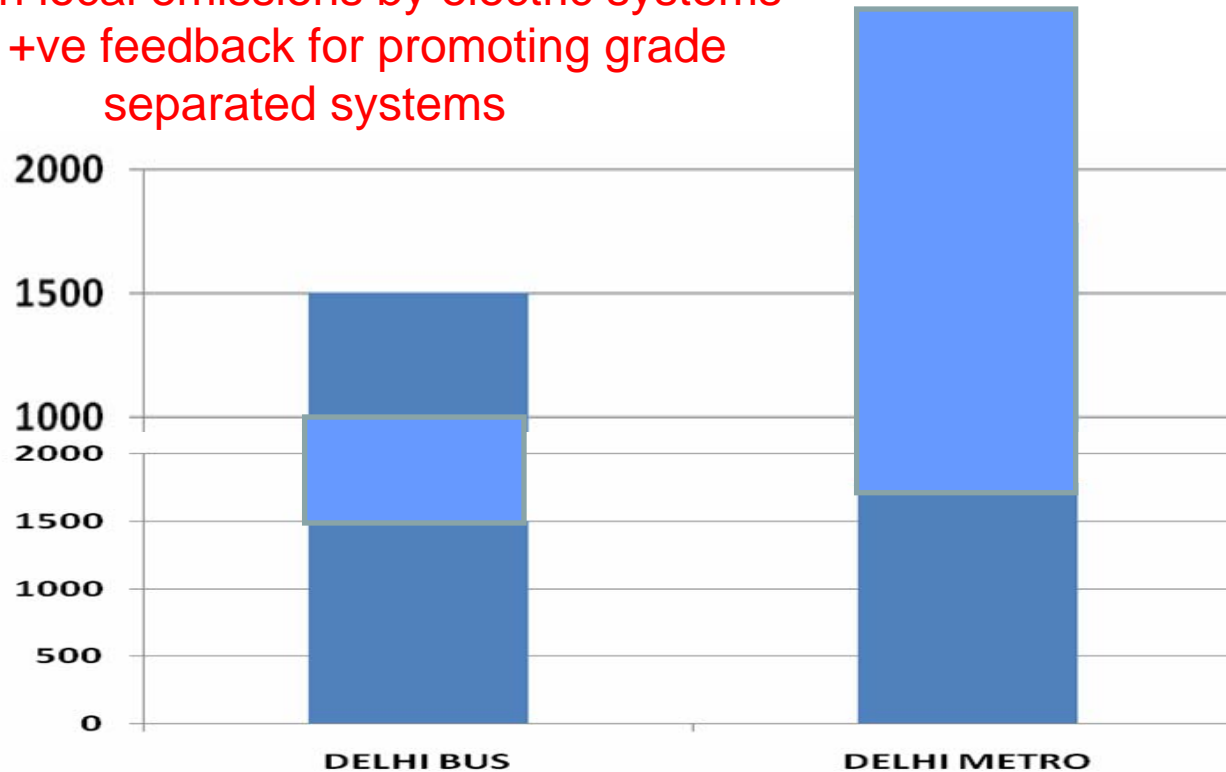
Life cycle emissions – road modes





Estimates CO2 emissions per passenger in Delhi

Focus on local emissions by electric systems gives +ve feedback for promoting grade separated systems



Calculation

- Passengers carried per day (metro system and per bus)
- Energy consumed (Total electricity bill for Metro and diesel consumed per bus)
- CO2 emitted per MVAH at the powerhouse, well-to-wheel CO2 for diesel
- Fly ash emitted by metro system not included

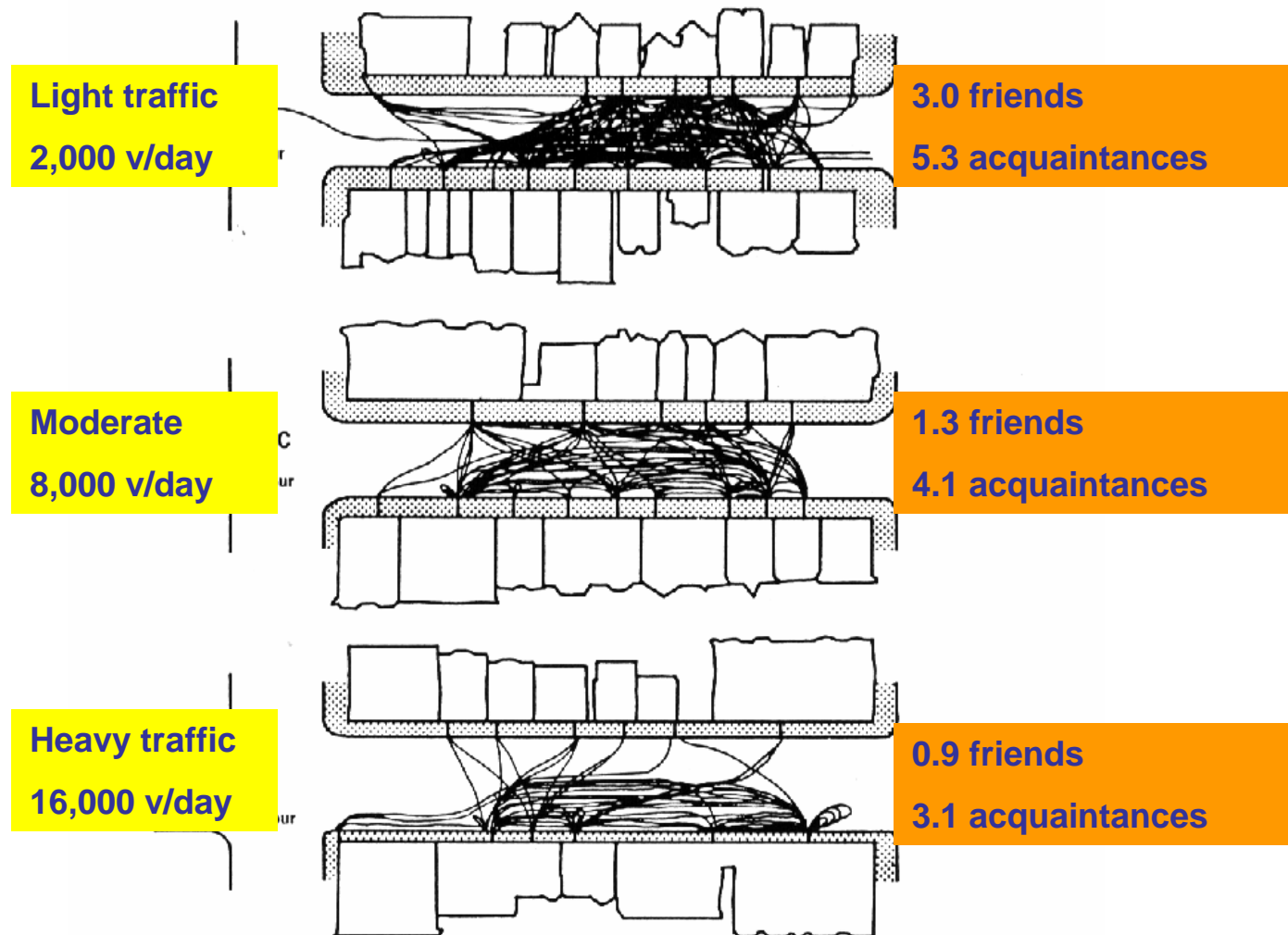
ISSUES

- ❑ Even cities in high income countries have not been able to solve the problems that all of us have to deal with in the near future

City	Modal share, percent		
	Car + MTW	PT	W&C
Bristol, UK	65	12	23
Leeds, UK	61	36	3
Nantes, France	58	14	28
Helsinki, Finland	54	20	26
Marseille, France	53	12	35
Edinburgh, UK	52	29	19
Newcastle, UK	48	19	33
Brussels, Belgium	44	18	38
Frankfurt, Germany	42	21	37
Stuttgart, Germany	36	25	39
Amsterdam, Neth's	32	16	52

Modernisation of public transport systems are very visible and profitable for manufacturers, preferred politically over sidewalks and bicycle facilities

FRIENDS & URBAN TRANSPORT



Source: Dr. Carlos Dora

ISSUES

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More vehicles



Wider roads

20th CENTURY SOLUTIONS

❑ One way streets?

Increase CO2 and fuel consumption ~ 30%

“One-way streets reflect the dominance of the car and the failed go-faster policies of the traffic engineers. As we begin to realise that walking and cycling should be the dominant forms of transport, the one-way street should be consigned to the dustbin of history.”

Peter Murray, Head of the New London Architecture Centre,

❑ High speed system public transport?

“will further encourage sprawl and greater energy consumption, and hence, Public Transit (PT), even if the commercial speed is rather low, is probably the only way to improve urban accessibility and urban attractiveness in a sustainable way”



CROZET, Y. Economic development and the role of travel time: the key concept of accessibility, Gothenberg: Volvo Research & Educational Foundations, pp. 1-22.



20th CENTURY SOLUTIONS

Long distance high speed commuting

- In the case of New York City, more than one-third of the gains in reducing car-related emissions that are associated with central city residents are offset by higher emissions from public transit
- In New York, central city residents emit more than 5600 lb of carbon dioxide less than suburbanites
- In bigger cities, suburbanites are more likely to drive longer distances relative to central city residents.

Glaeser, E. L. & Kahn, M. E. (2010). The greenness of cities: Carbon dioxide emissions and urban development. *Journal of Urban Economics*, 67, 404-418.

The logo for TRIPP (Transportation Research Institute for Policy and Planning) is located on the left side of the slide. It features a vertical blue bar with the word "TRIPP" written in white, bold, capital letters. Above the bar is a stylized graphic consisting of a white circle, a grey triangle, and a blue and white striped pattern.

20th CENTURY SOLUTIONS

Public transport fare systems

- Flat fare systems promote longer commutes
- Monthly/season tickets encourage extra long distance travel
- Both discriminate against lower income groups in need of single or infrequent trips

Rewards those who travel more

The logo for TRIPP (Transportation Research Institute for Policy and Planning) is located on the left side of the slide. It consists of a vertical blue bar with the word "TRIPP" written vertically in white, bold, sans-serif capital letters. Above the bar is a stylized graphic of a road or path leading to a horizon, with a small circle above it representing a sun or moon.

Future

Balancing of management efficiency and negative feedback mechanisms