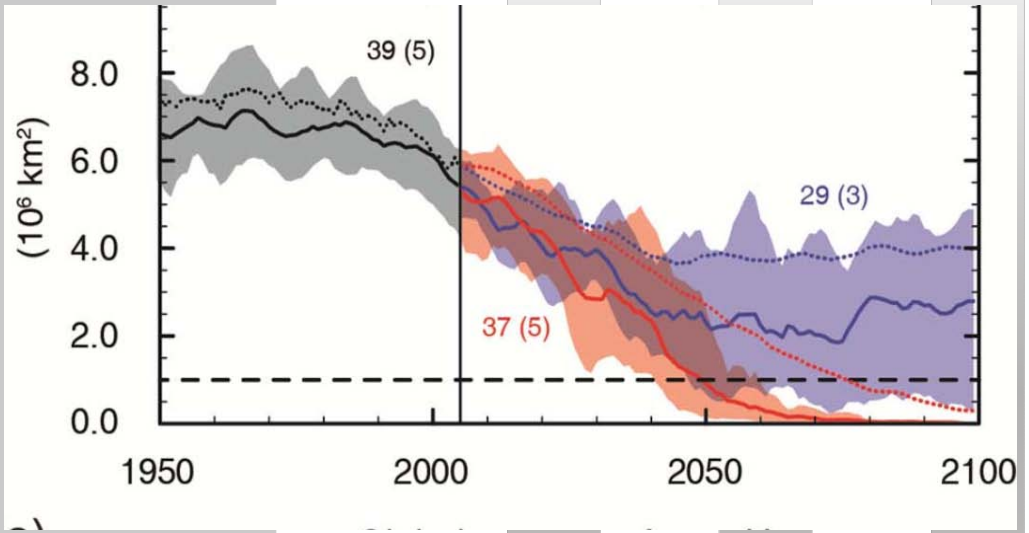
TRIPP

transport connections for liveable communities

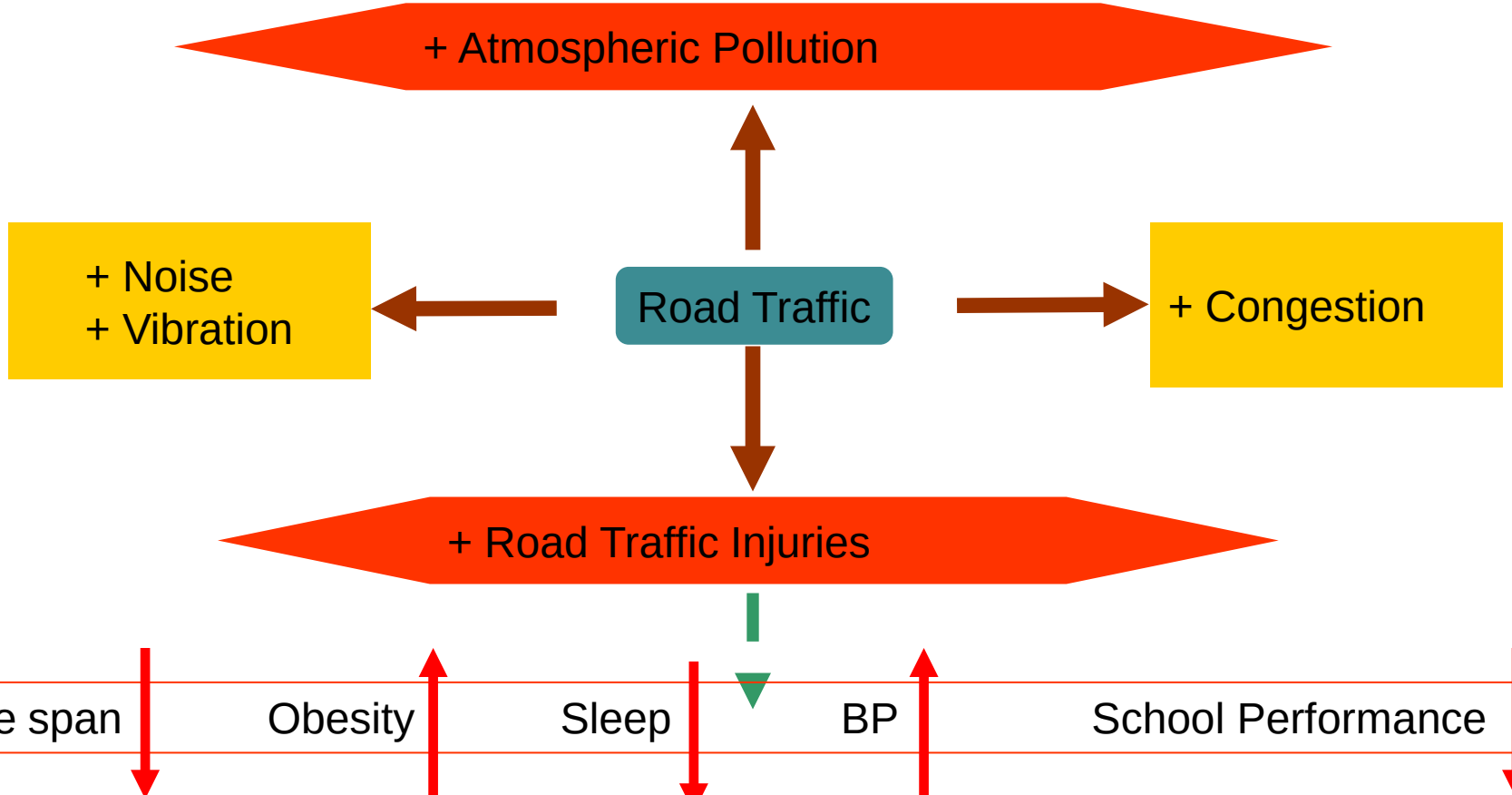
Rendezvous Grand Hotel
14-17 Sept
Auckland
2014

Climate change & transport

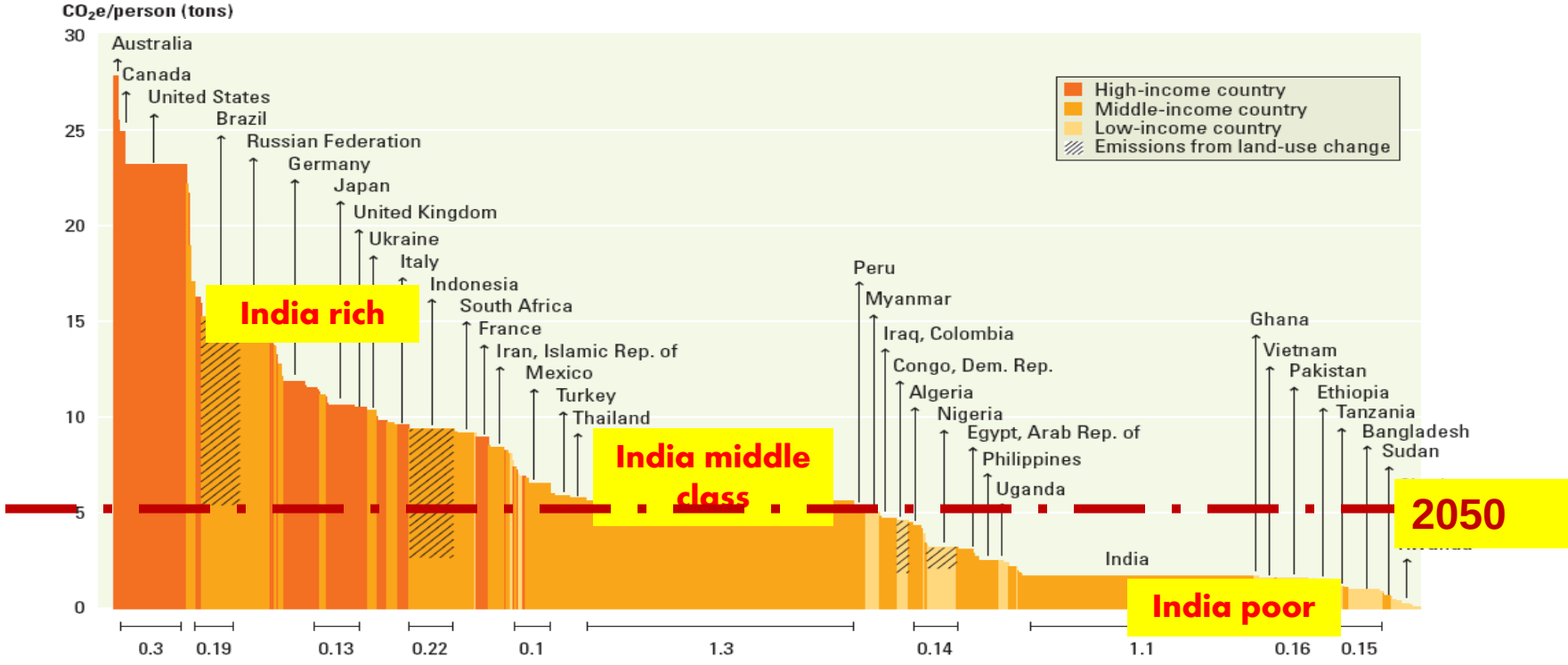


Dinesh Mohan

Road Transport – Problem Diagnosis



POLITICS OF CO2



Poor have to increase energy consumption

Rich and middle class must reduce energy consumption

Sustainability

- Motor vehicles have killed more than 20-30 million people and injured > 500 million worldwide

  This is not sustainable

- Emissions will reduce significantly only if more people walk, bicycle and use public transport

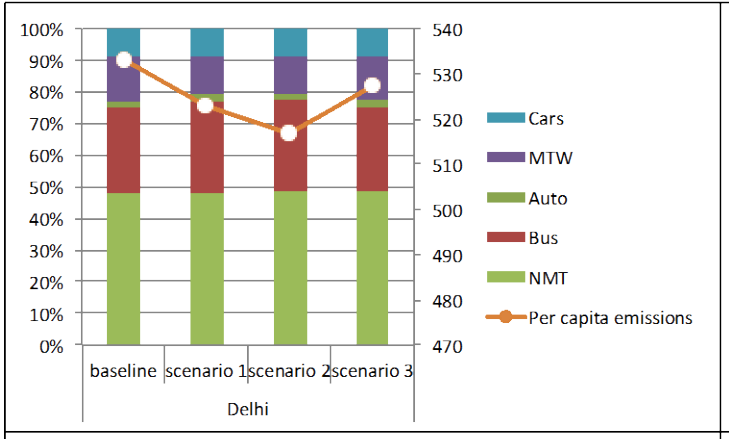
  Only possible if walking and bicycling made safer

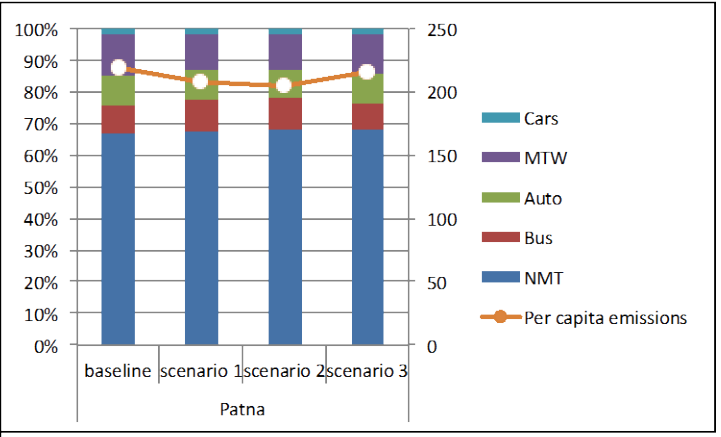
- Cities will aesthetic, humane and human scale only if streets include large numbers of people walking and playing safely

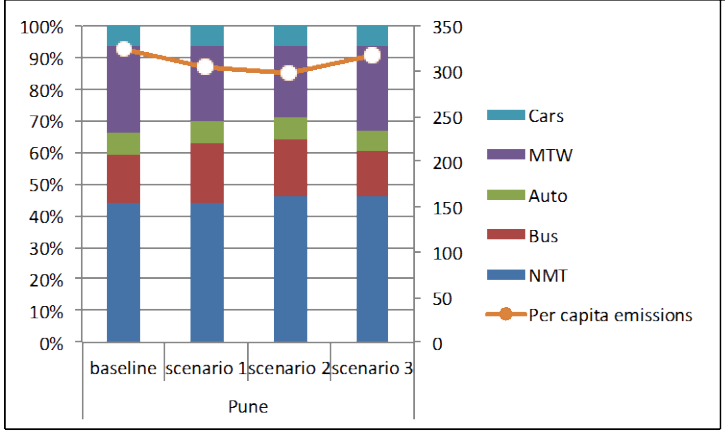
  Only possible if streets free from crime

THEREFORE ROADS FREE FROM CRASHES AND CRIME ARE A PRE-REQUISITE FOR CLEANER AIR

Resulting Emissions and Modal Share as Per Minimum







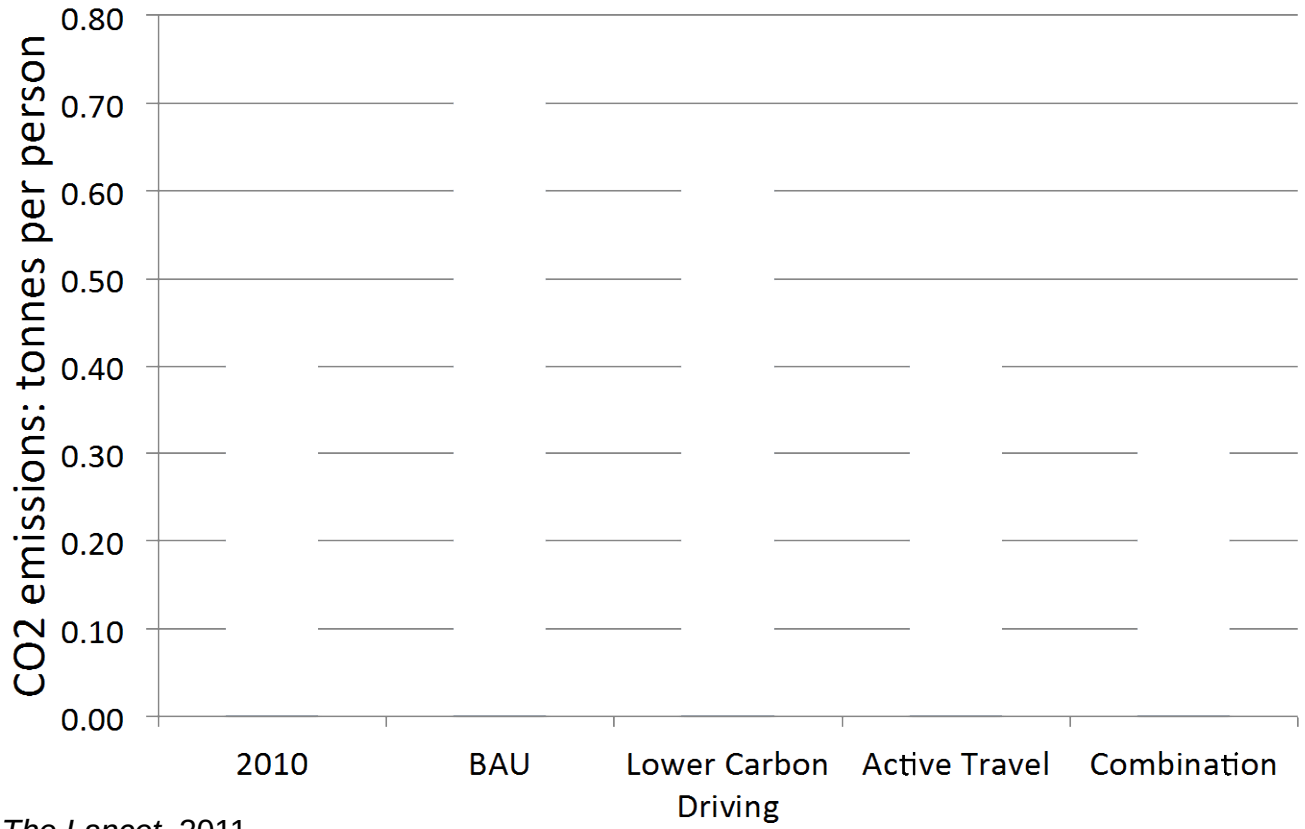
Maximum decrease in total emissions is in scenario 2 for all the three cities.

The result highlights the need of NMT infrastructure along with improved bus service in the cities to reduce emissions in all the cities.

Maximum impact of the strategy can be realized in Patna followed by Pune and least being in Delhi.

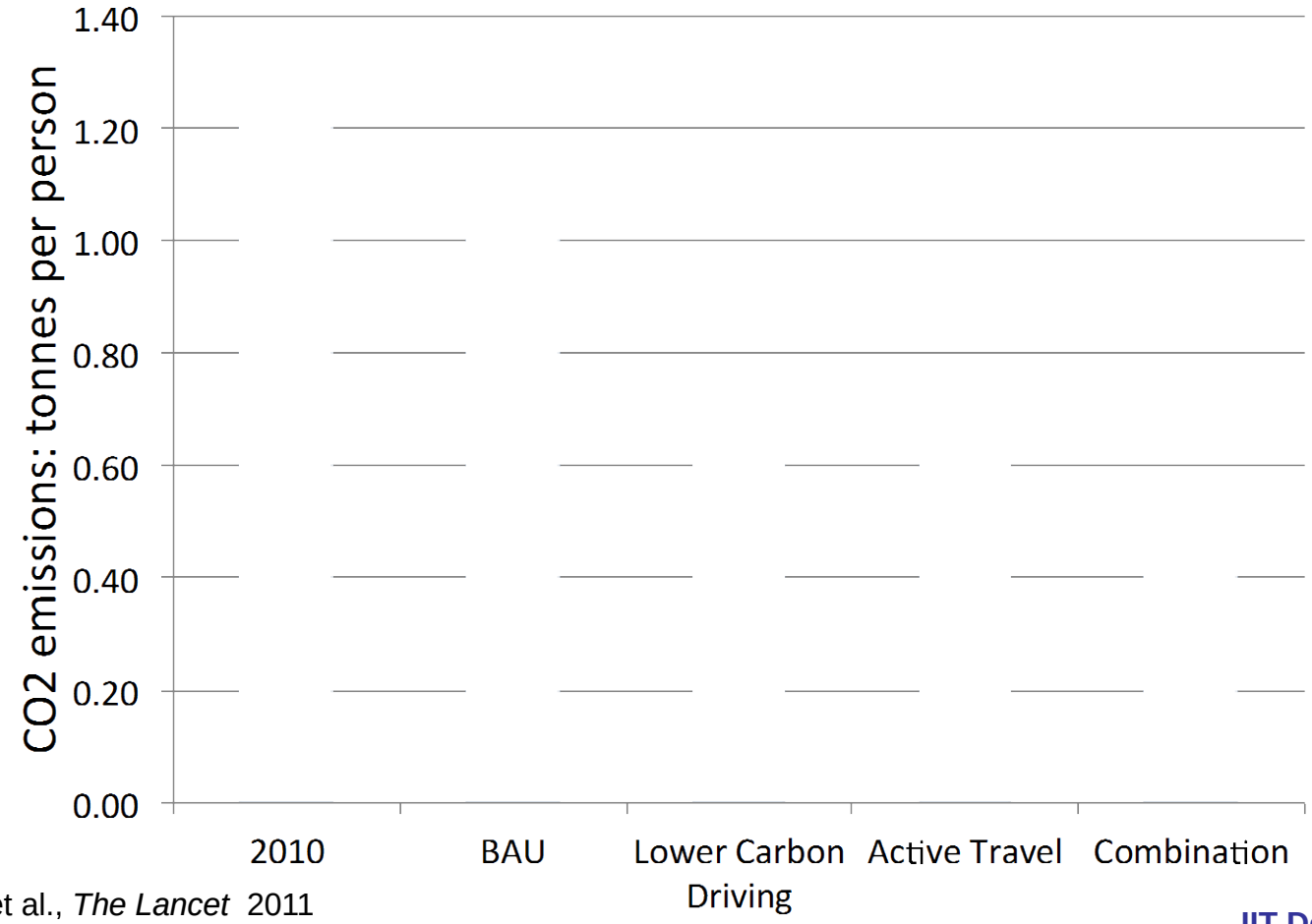
Transport and CO2 – Delhi 2030

(In collaboration with London School of Hygiene and Tropical Medicine)



Woodcock et al., *The Lancet* 2011

London: CO2 emissions transport (2030)



Woodcock et al., *The Lancet* 2011

Delhi: Health impacts by cause

	Change in disease burden	Change in premature deaths
Ischaemic heart disease	11-25%	2490-7140
Cerebrovascular disease	11-25%	1270-3650
Road traffic crashes	27-69%	1170-2990
Diabetes	6-17%	180-460
Depression	2-7%	NA

Woodcock et al., *The Lancet* 2011

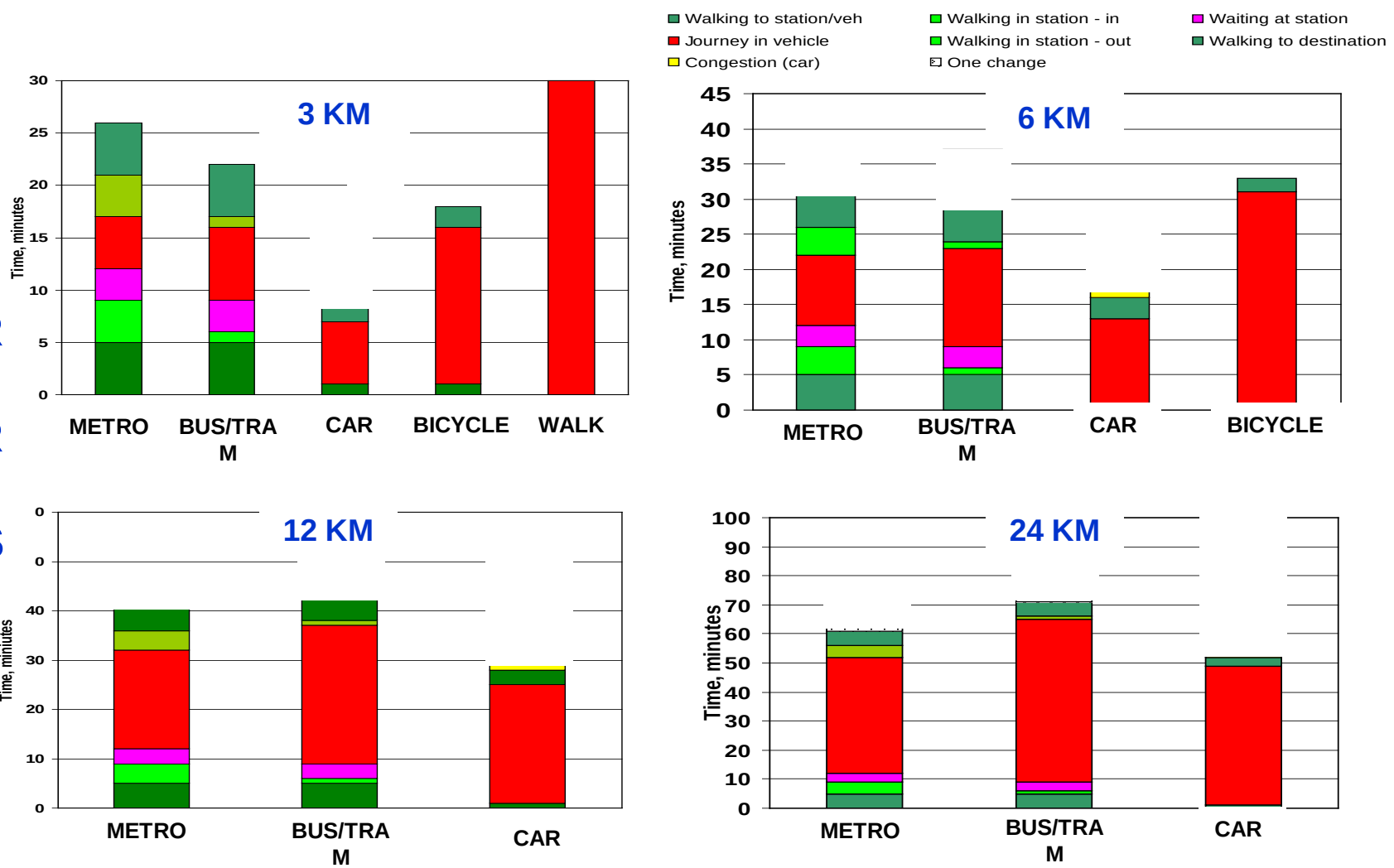
ISSUES

City	Modal share, percent		
	Car + MTW	PT	W&C
Bristol, UK	65	12	23
Leeds, UK	61	36	3
Brussels, Belgium	44	18	38
Frankfurt, Germany	42	21	37
Stuttgart, Germany	36	25	39
Amsterdam, Neth's	32	16	52

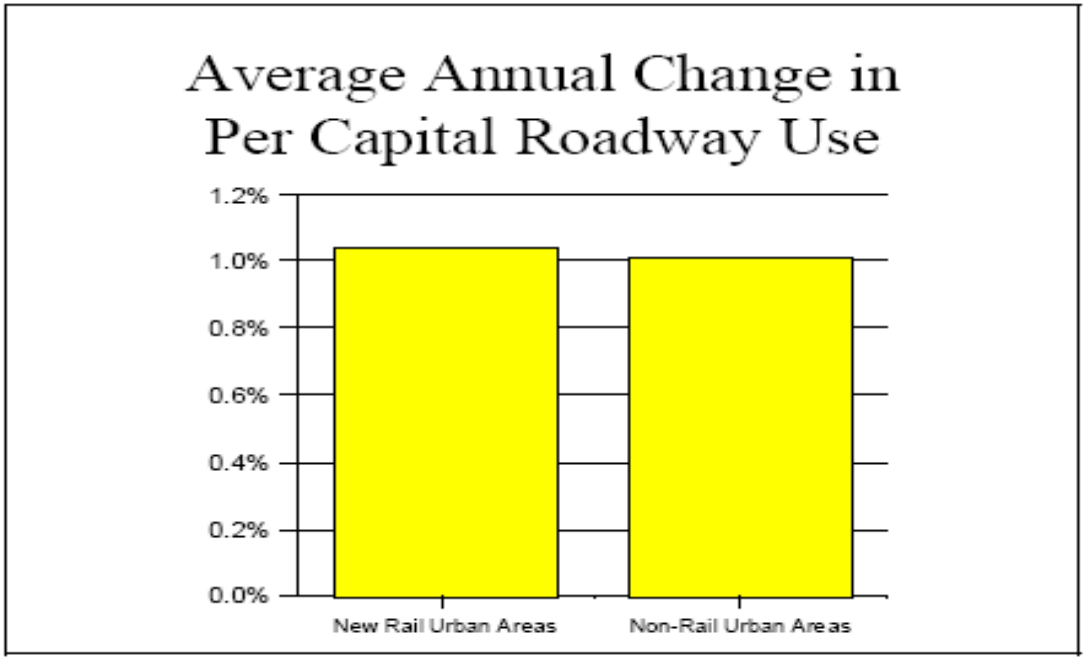
MTW- motorized two-wheeler, PT – Public transport
W&C – Walking and cycling

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

DOOR TO DOOR TRIP TIMES

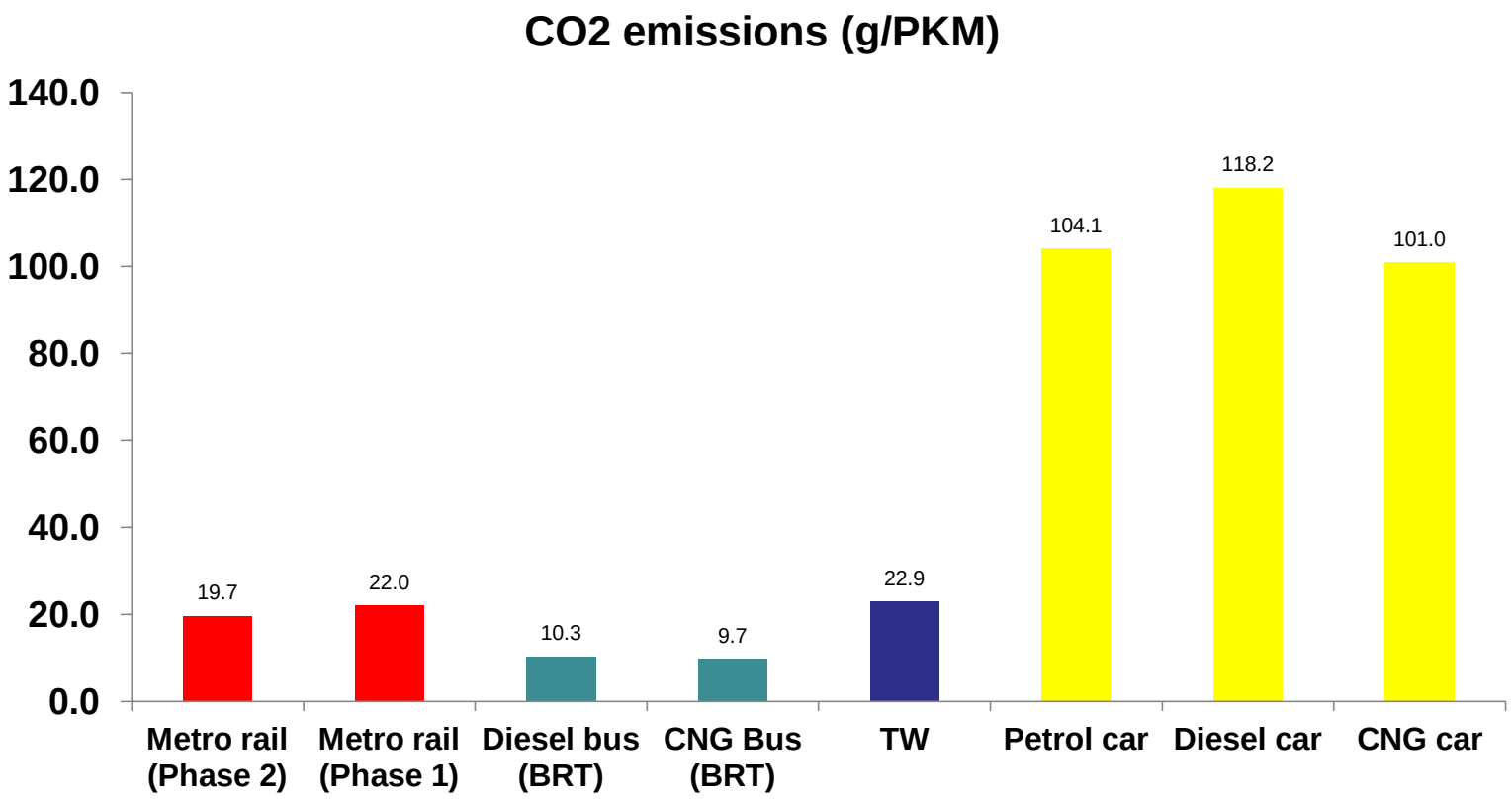


Effect of underground or elevated systems



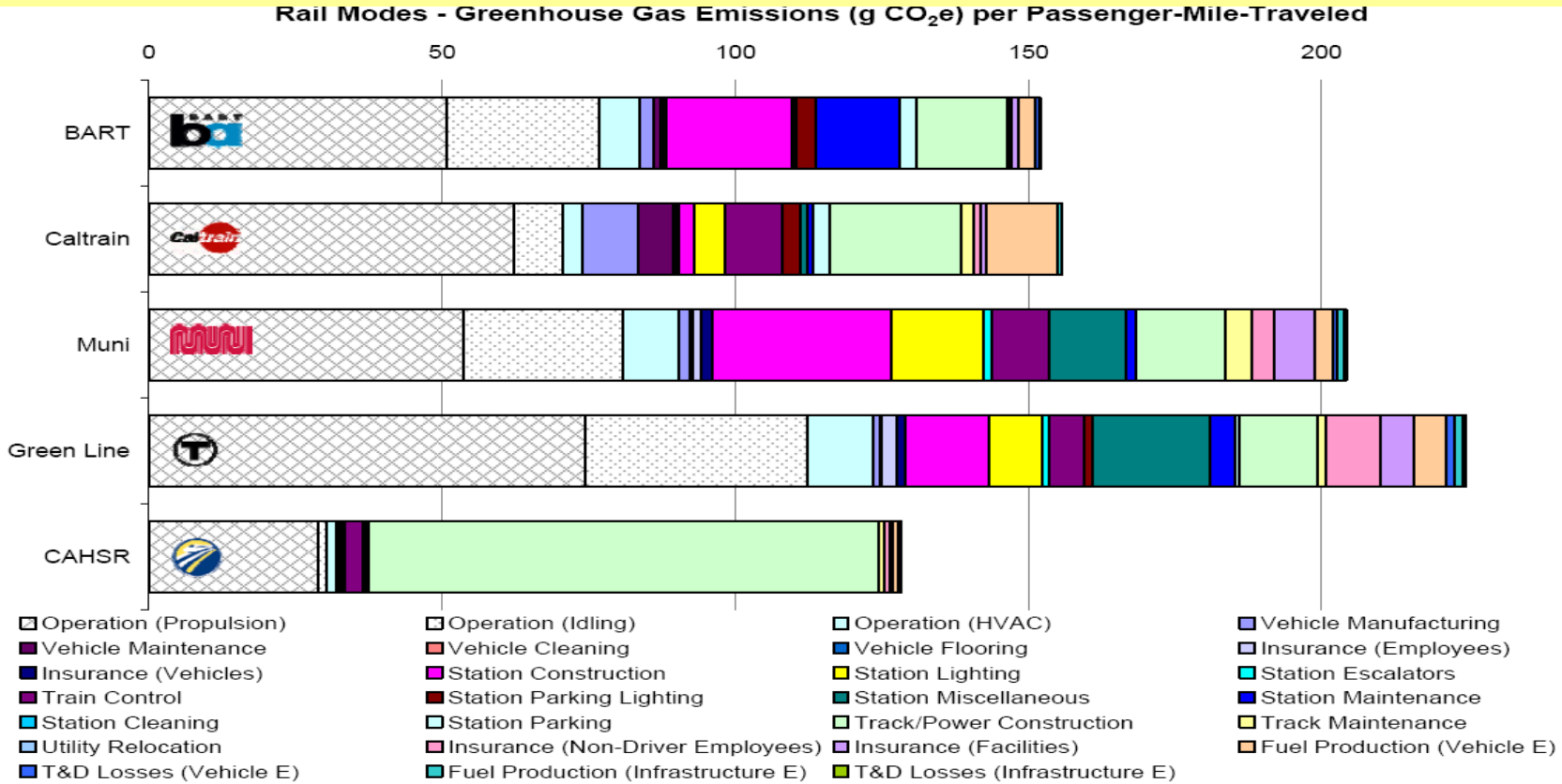
THERE IS NO PRACTICAL EVIDENCE THAT METRO OR ANY OTHER RAIL SYSTEMS REDUCE POLLUTION OR CONGESTION. THIS CAN ONLY BE DONE BY CHANGING THE SITUATION ON THE ROAD ITSELF

LIFE CYCLE COSTS - INDIA



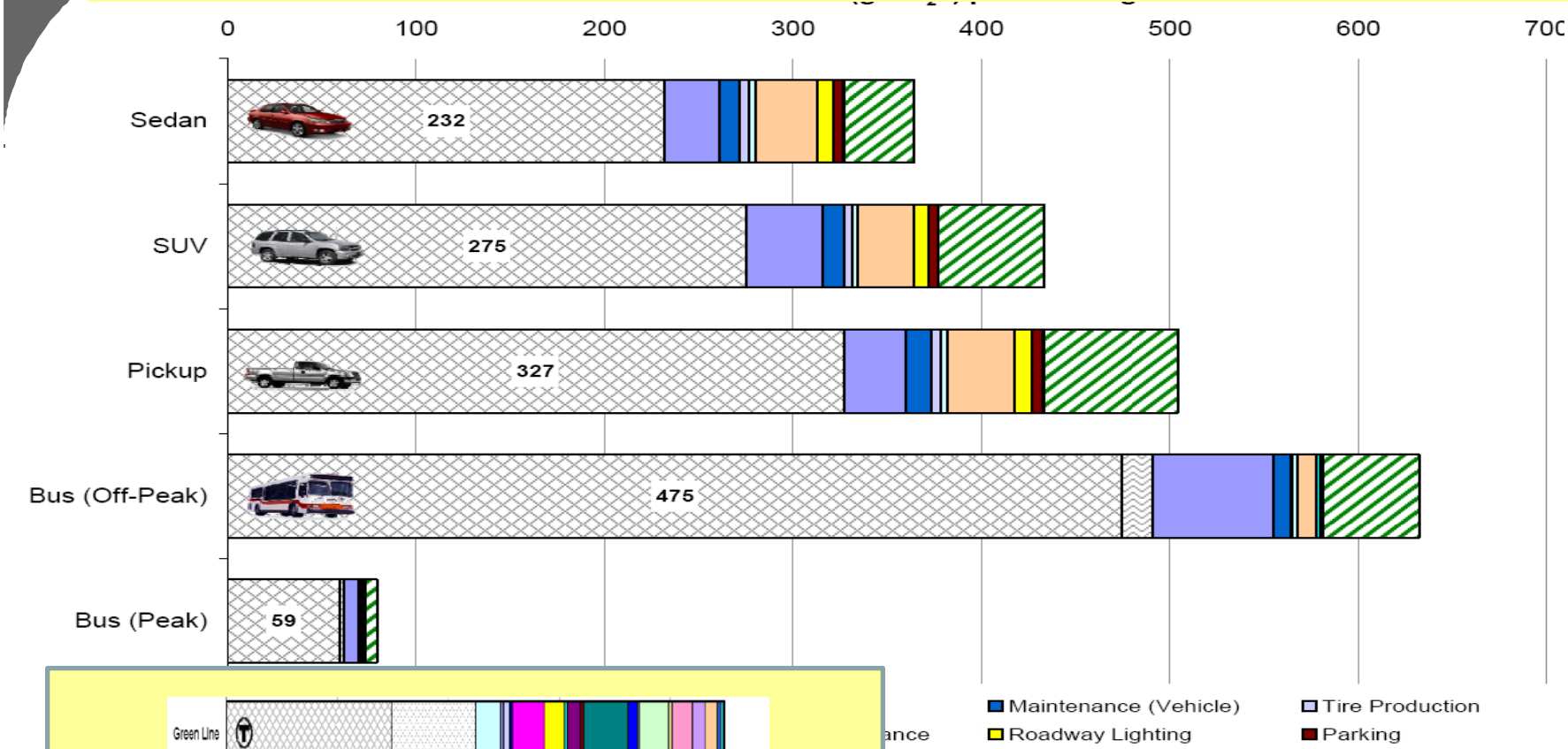
Source: TERI, 2013

Life cycle emissions – rail modes



Source: Mikhail Chester and Arpad Horvath 2008 Environmental Life-cycle Assessment of Passenger Transportation: A Detailed Methodology for Energy, Greenhouse Gas, and Criteria Pollutant Inventories of Automobiles, Buses, Light Rail, Heavy Rail and Air. WORKING PAPER, UCB-ITS-VWP-2008-2, University of California, Berkeley.

Life cycle emissions – road modes



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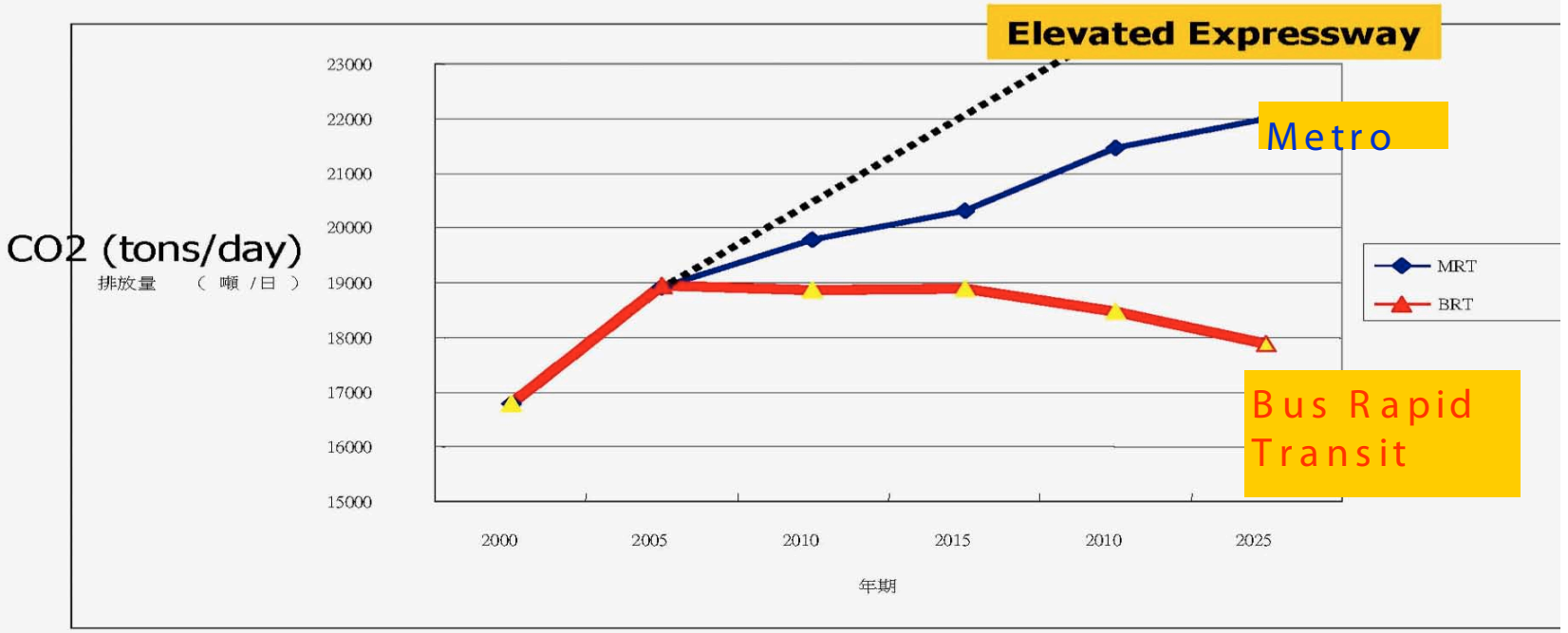
CO2 emission estimates for Taipei



○The social benefits of BRTOD will be $3 bi per year.

Source: Prof Jason Chang

CO2 and roads

20th CENTURY SOLUTIONS:

- **One way streets?**

"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,

- **Surface transport less energy consuming**

Solutions contractor driven
Not people driven

Effect of underground or elevated systems

- "None of the systems (rail based) appear to have reduced the problems caused by the car… None of them caused a decline in overall bus usage…None of the systems caused reduction in car usage, congestion relief, or improve air quality"

Mackett R. and Sutcliffe, E. B. New urban rail systems: a policy-based technique to make them more successful, Journal of Transport Geography, 11:151–164, 2003.

- "Put simply, public transit expenditures in the name of congestion reduction are growing because they are broadly popular and not because they are effective ways to reduce traffic congestion"

Taylor, B. D. The politics of congestion mitigation. Transport Policy 11:299–302, 2004

Latest evidence

Possibilities to reduce CO_2 emissions from road traffic for urban planners seem limited: a restriction of space dedicated to traffic and a change of transport means for commuting represent leverage points.

Reckien,D., Ewald,M., Edenhofer,O., & Ludeke,M.K.B. (2007). What Parameters Influence the Spatial Variations in CO2 Emissions from Road Traffic in Berlin? Implications for Urban Planning to Reduce Anthropogenic CO2 Emissions. Urban Studies, 44(2), 339-355.

The results suggest that public transport users could achieve dramatic savings on their commute if the density of that network was increased considerably

Murphy,E. (2009). Excess commuting and modal choice. Transportation Research Part A: Policy and Practice, 43(8), 735-743.

Current urban policy, which relies predominantly on ambitious and expensive programmes of transport infrastructure provision must be rethought in Beijing

ZHAO, P., LU, B. & LINDEN, G. J. J. (2009) The effects of transport accessibility and jobs and housing balance on commuting time: evidence from beijing. International planning studies, 14, (1) 65-83.

High speed systems 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.

ADOPTABLE NORMS AND BEST PRACTICES – QUESTIONS

- Will the proposed design increase walking or bicycling distance?
- Is there adequate space for pedestrians on all roads and facilities?
- Is the infrastructure design disabled friendly? This includes children, aged and those with illnesses like arthritis and heart disease.
- Does the system provide safe facilities for non-motorised transport?
- Increase in road space will always increase pollution. Is the increase in road space absolutely necessary?
- Does the measure increase use of public transport or taxis?

ADOPTABLE NORMS AND BEST PRACTICES

- MEASURES TO ENCOURAGE USE OF PUBLIC TRANSPORT
  - BUS STOPS WITHIN 500 m OF ALL ORIGIN AND DESTINATIONS
  - PROVIDE EASY ACCESS FOR BICYCLE, AND TAXI USERS
  - ACCESS ROUTES FREE FROM CRIME AND ACCIDENTS
  - IT ENABLED INFORMATION SYSTEMS AND TAXIS

- MEASURES TO REDUCE EMISSIONS
  - ENCOURAGE ROUNDABOUTS INSTEAD OF TRAFFIC SIGNALS
  - ROAD DESIGN AND TRAFFIC MANAGEMENT TO MINIMISE ACCELERATION & DECELERATION
  - MINIMISE USE OF ONE WAY ROADS
  - MINIMISE ROAD SPACE TO THE EXTENT POSSIBLE – MORE ROAD SPACE WILL ALWAYS PRODUCE MORE CO_2

Urban safety a necessary condition for control of global warming