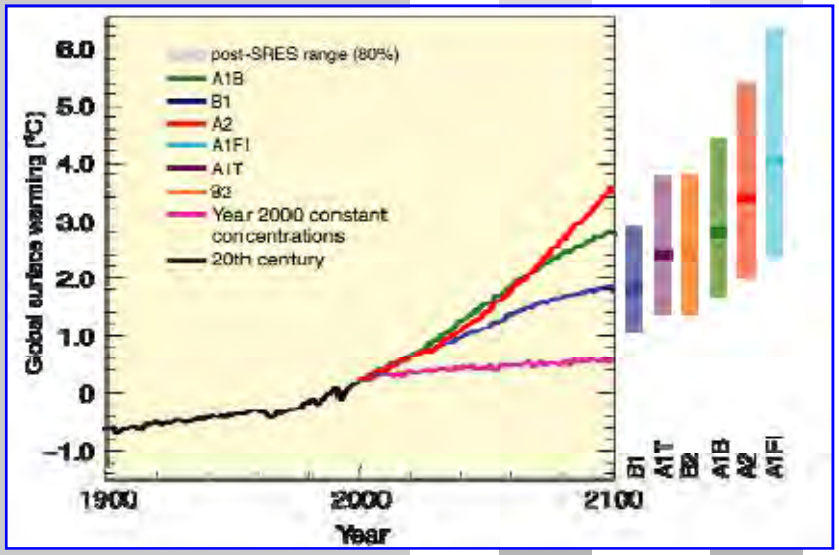
Urban mobility in an era of global warming



Dinesh Mohan

What kind of city do we want?

- Where my daughter and grandmother can walk and cross roads alone in the evening
- I have all my daily needs available within walking distance of home
- Where I share space as an equal citizen with all others
- One that I am proud off and want to show others for its beauty quiet and civility

A century of developments

- Early 20th century road surfaces not smooth – same materials and technology used by the Romans
- The use of asphalt and bitumen only gets perfected between 1910 and 1930
- The pneumatic tyre for large vehicles takes shape after 1930 and so does the heavy duty diesel engine
- Therefore, mechanised transport could be comfortable only if vehicles moved on steel rails up to 1920 or so. This is why street trams became very popular as they were more flexible in operation and cheaper to build than underground rail systems.

Rail preferred for public transport – large vehicles

A century of developments

- Public Transport came before cars
- No more Central Business Districts (CBD)
- High motorcycle ownership in manycountries – personal mobility, peg on fares
- Cars much more comfortable

CO2 and roads

20th CENTURY SOLUTIONS:

- One way streets?
- Road widening & expansion?
- Flyovers, elevated/underground corridors?
- Metro/LRT/Monorail/Skybus - providing corridor capacity to serve link demand
- Underground trains seen as a major solution during cold war as nuclear shelters

- Surface transport less energy consumimng
- Underground or elevated transit does not reduce congestion, provides extra supply > CO2↑
- CO2 ≈ road area + distance of travel

Solutions contractor driven
Not people driven

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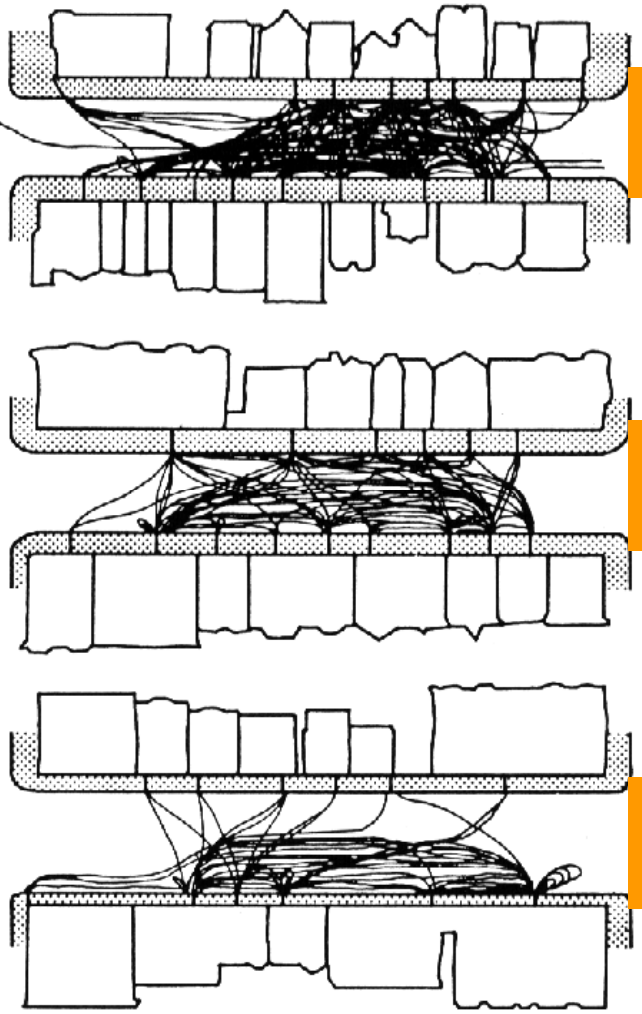
FRIENDS & URBAN TRANSPORT



Light traffic
2,000 v/day

3.0 friends
5.3 acquaintances

Moderate
8,000 v/day

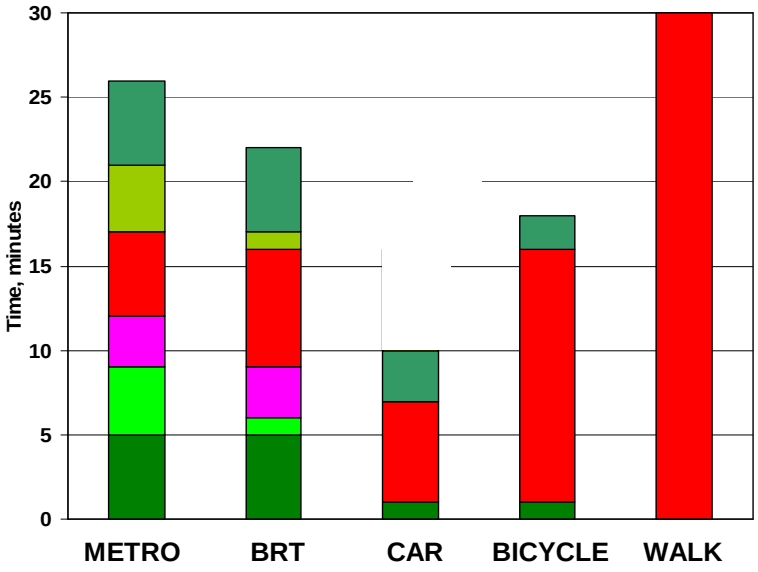
1.3 friends
4.1 acquaintances

Heavy traffic
16,000 v/day

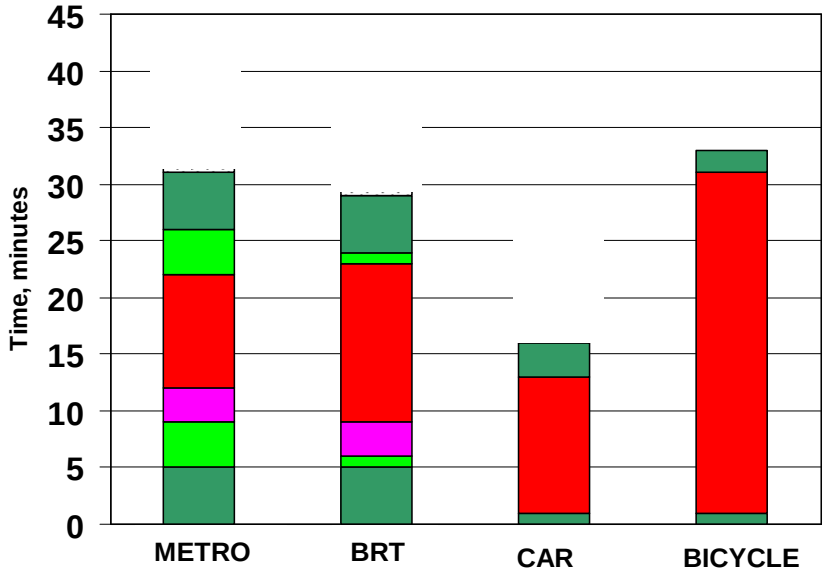
0.9 friends
3.1 acquaintances

Source: Dr.Carlos Dora

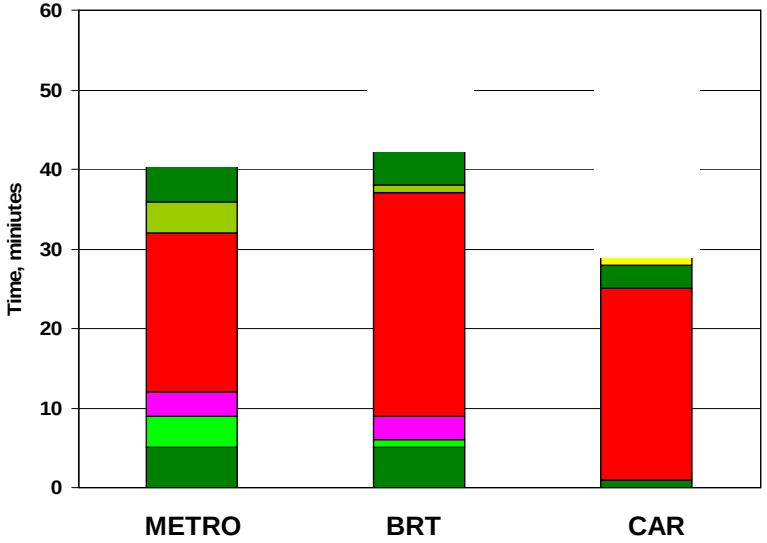
DOOR TO DOOR TRIP TIMES



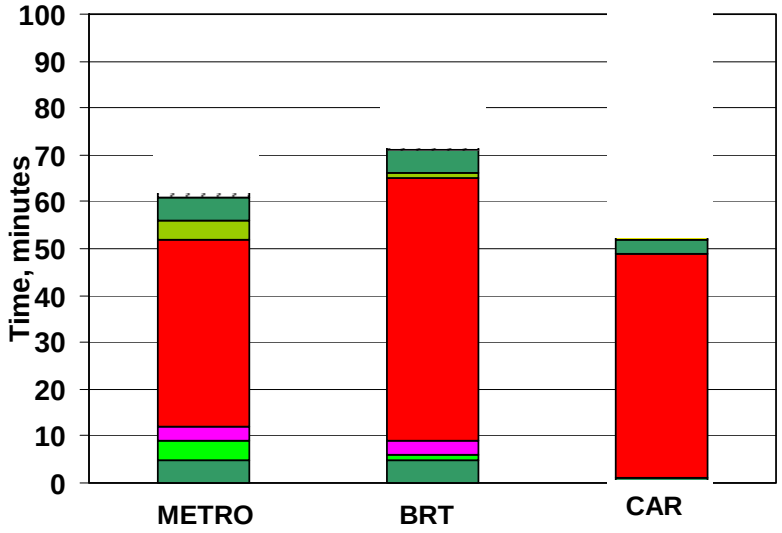
3 KM



6 KM



12 KM



24 KM

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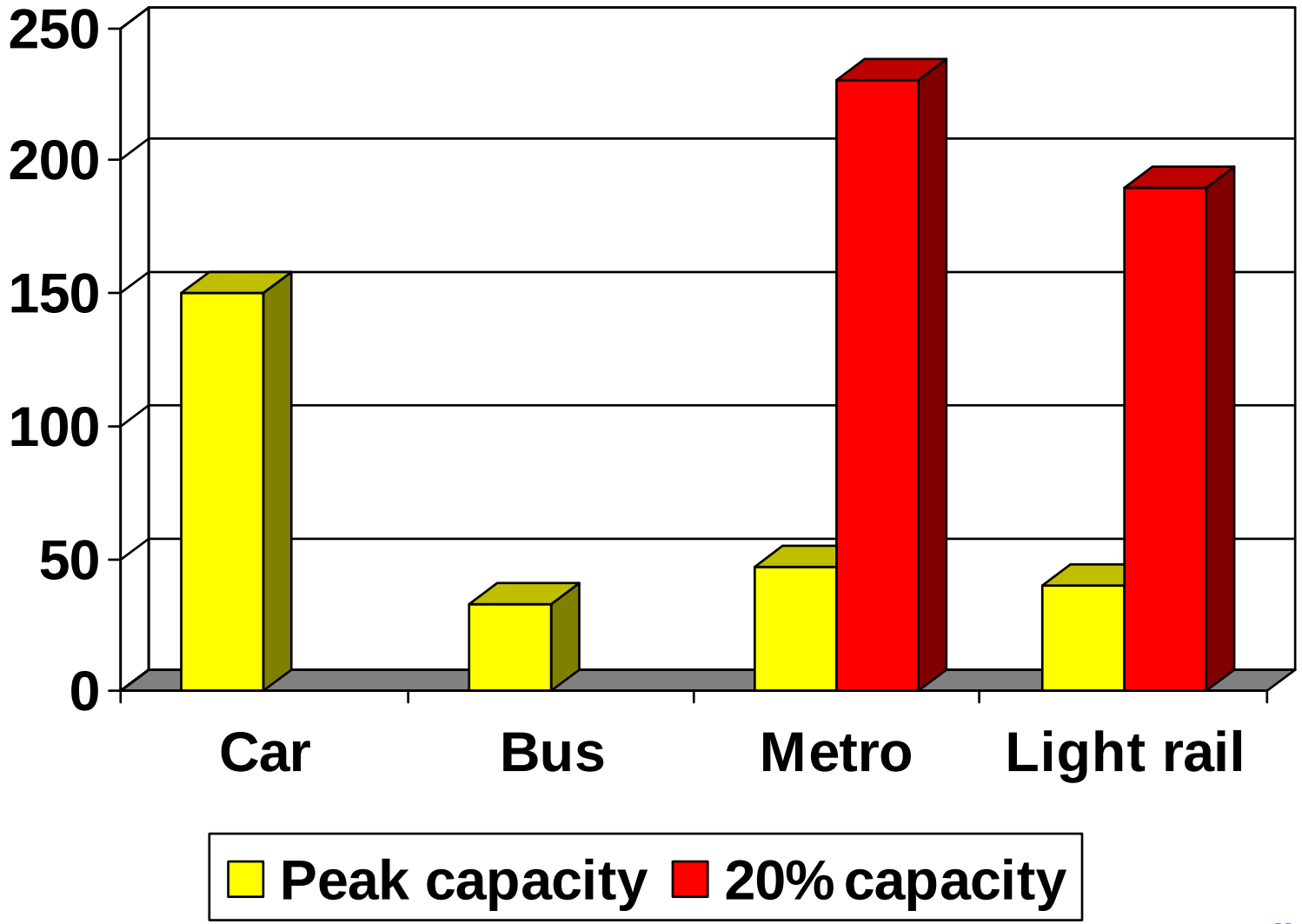
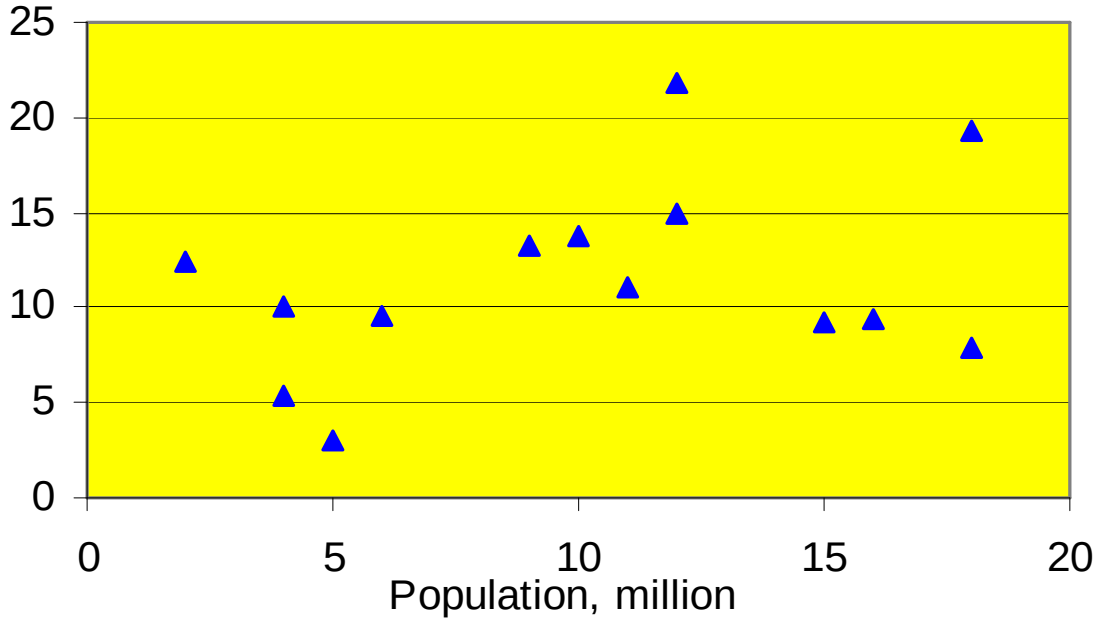
CO2 emissions per passenger km

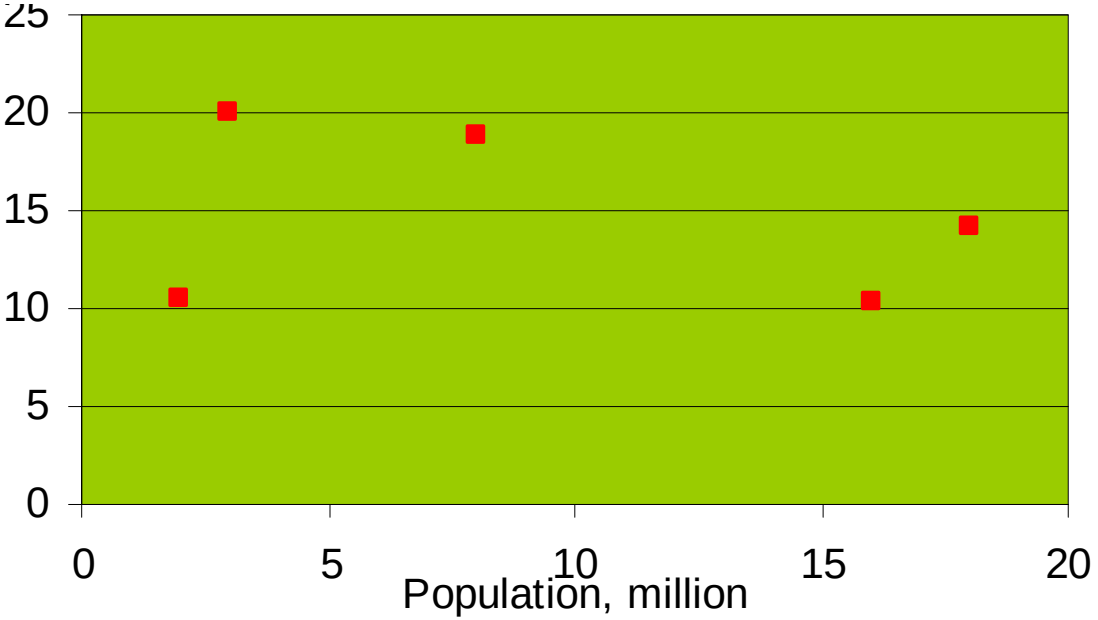


Productivity (1,000 pass/km/day) vs city population

Metro



BRT



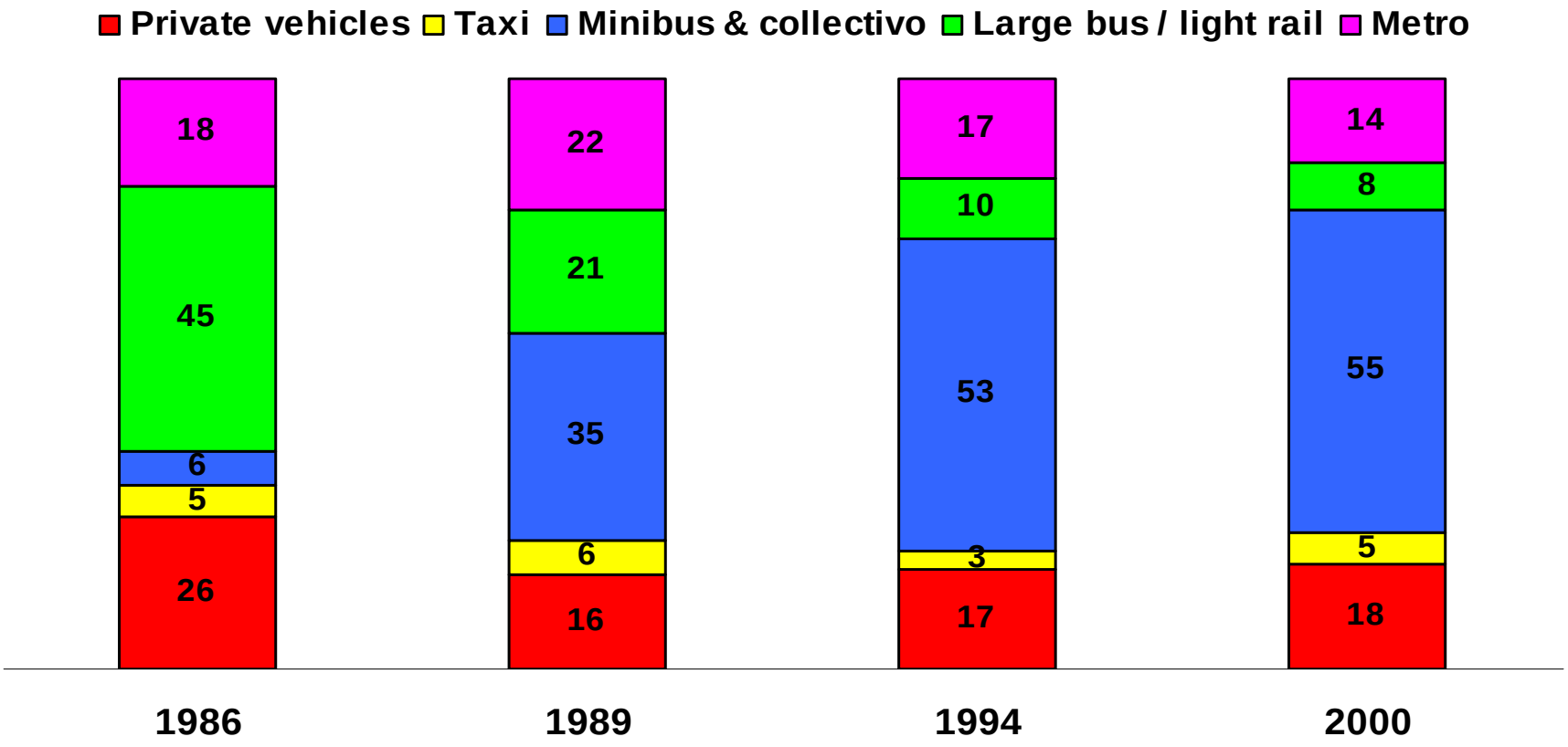
May 09

Conundrum – Public transport

	Modal share, percent		
City	Car + MTW	Public Transport	Walking and bicycling
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
MTW- motorized two-wheeler, PT – Public transport W&C – Walking and cycling			

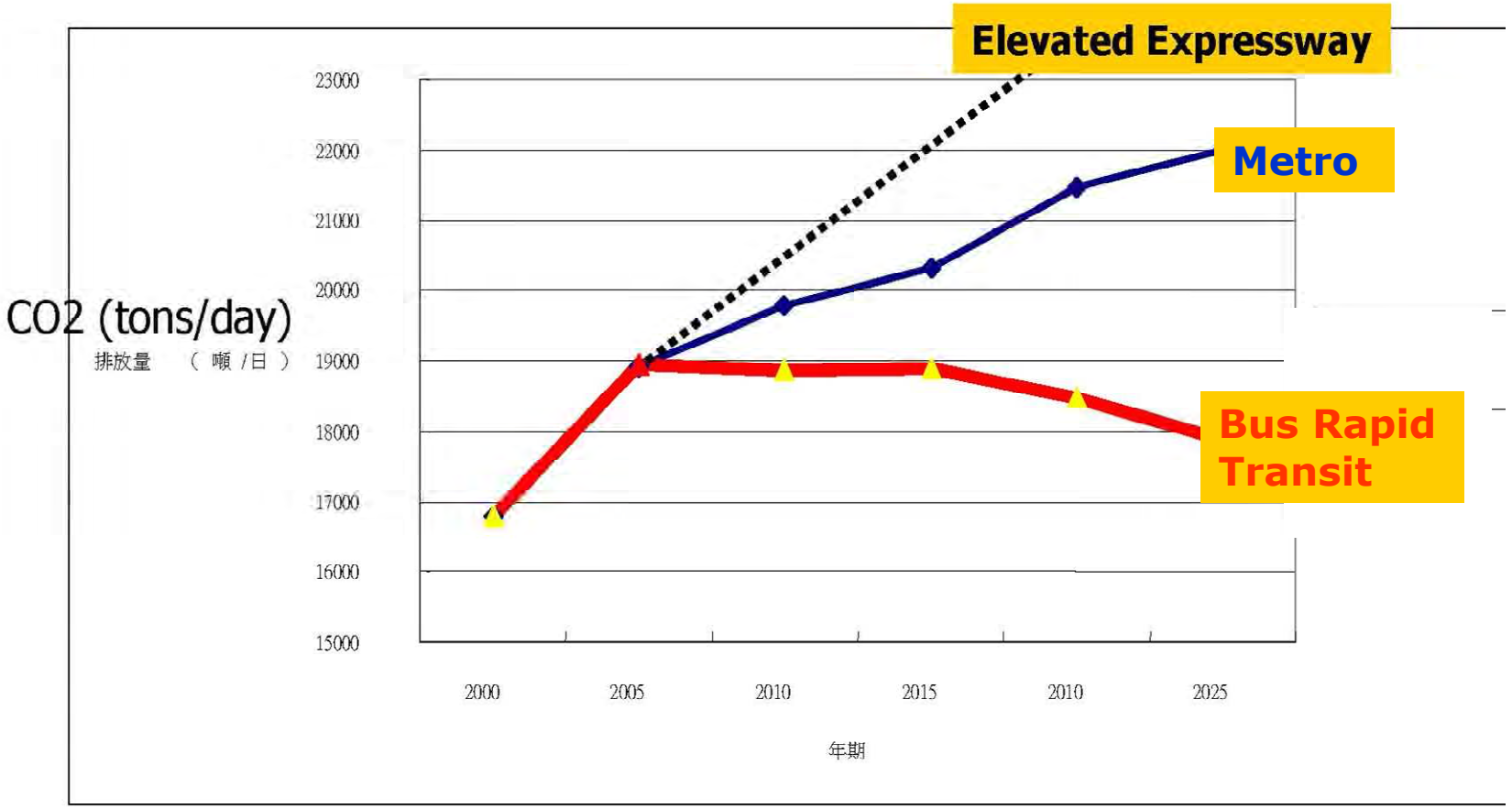
Conundrum – Public transport

Mexico city - 205 km metro rail



Just provision of high capacity systems does not provide solutions

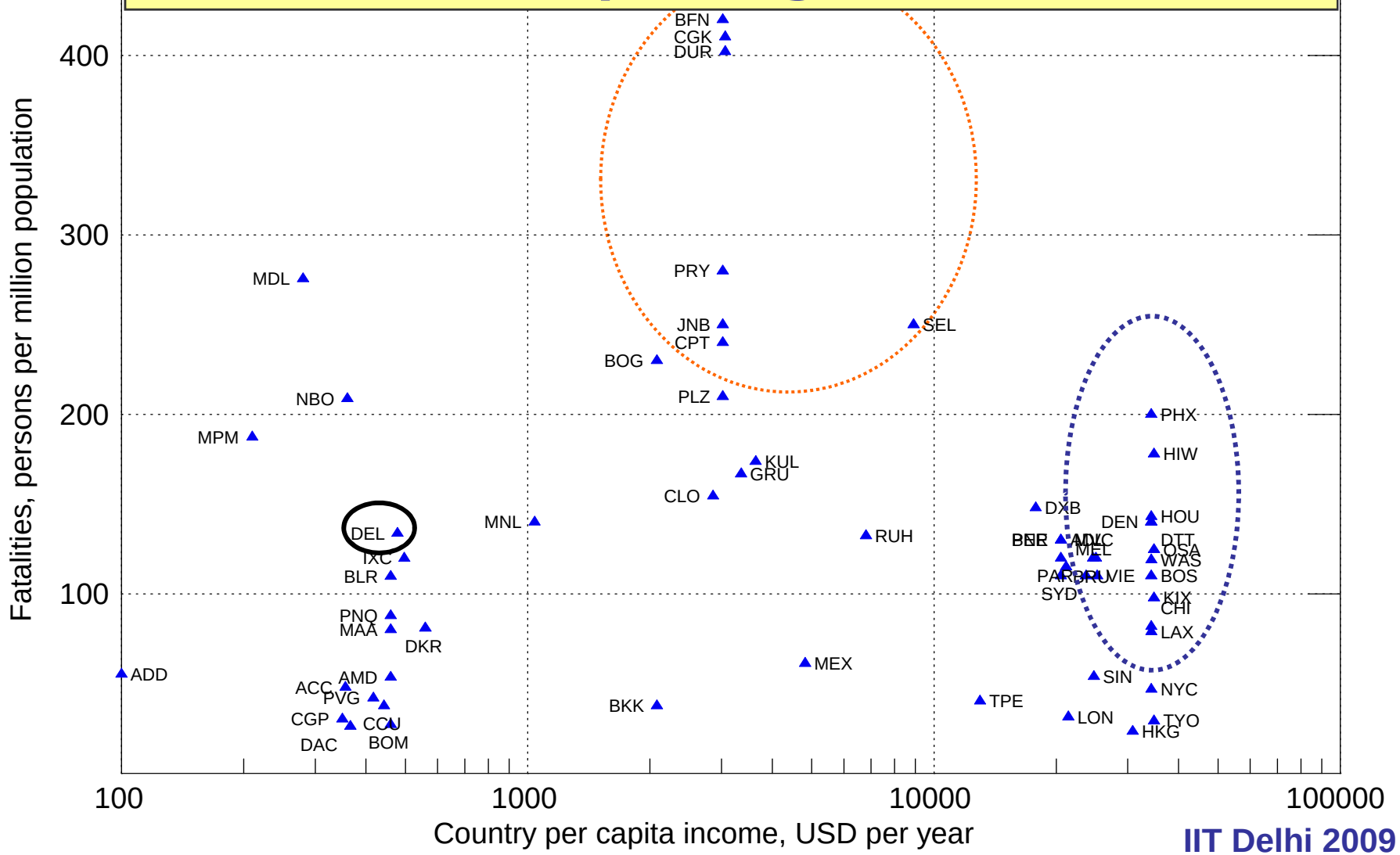
CO2 emission estimates for Taipei



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

Source: Prof Jason Chang

Q : Does urban street design, infrastructure and life style have greater impact than vehicle technologies and policing ?



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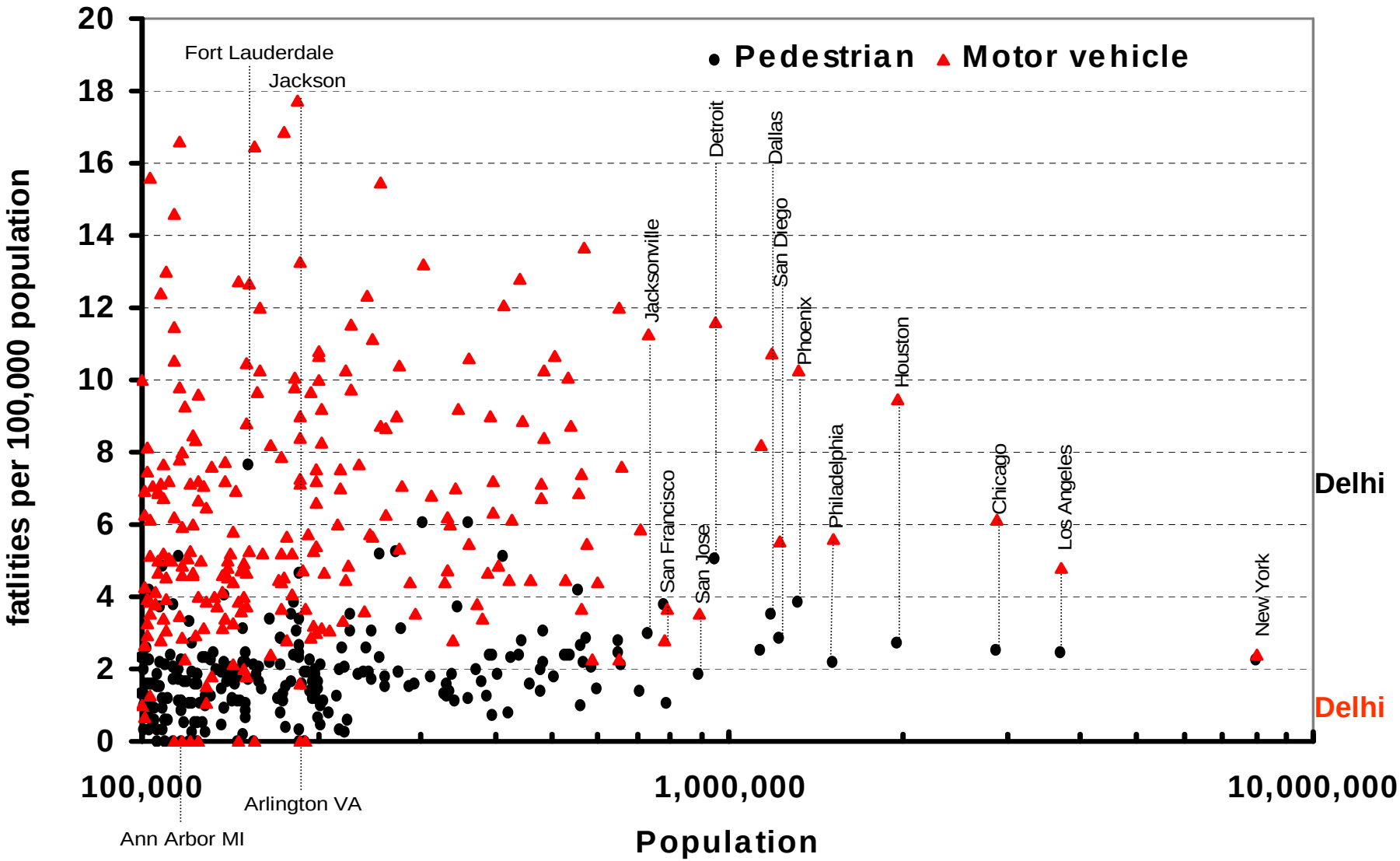
Fatality risk in traffic crashes in US cities



IIT Delhi February 09

City structure, safety & public transport

- Actual area devoted to road space may not vary much
- Residential block/development size can vary in size
- Width of roads are different across cities

Large blocks → Wide arterial roads → More fatalities

Large blocks → Long walk to bus → Less use

Safe roads a precondition for the future low CO2 city

- Children, elderly, walking speed ~ 0.8 m/s
- Pedestrian green phase < 30 s
- Therefore, motorised lanes < (30 X 0.8) = < 24 m

- Shops and/or street vendors by design
- City blocks ~ 800 m square
- Maintain urban average speeds at 15 km/h
- Public transit on surface

TRIPP