

# Another look at how we define and measure 'success' in tackling transport impacts: beyond that 'oh so tempting' tailpipe focus

- n Background and motivation
  - n Tendency to focus on impacts per vehicle km
  - n ... but huge growth in traffic
  - n Therefore many are pushing to go beyond tailpipes (eg the push for more focus on A & S in ASIF)
  - n ... but enthusiasm for restraining growth in A seems to be especially difficult to muster
  - n Research in progress on 'mission and measurement' in urban transport – so comments and debate welcome



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# System perspectives on what is 'good' urban transport

- n Three perspectives on defining success in urban transport (based on Litman's framework):
  - n 'Traffic': vehicle movement and speed beneficial; congestion as the problem; traffic reduction seems crazy
  - n 'Mobility': movement of people and goods beneficial; traffic reduction OK if movement enhanced
  - n 'Accessibility': ability to reach opportunities is beneficial; may be enhanced while reducing traffic or even while reducing mobility ('reducing the need to travel')
- n With the accessibility perspective, traffic and mobility are still important but are means not ends

# Access-focused policy versus mobility and traffic-focused policy

- n expand traffic capacity; promote low density urban development; 'decongest' urban cores; expand parking space; etc = **traffic focus**  
(danger of entrenching high traffic levels and harming accessibility for many)
- n increasing vehicle occupancy; public transport priority in space and budget allocation; etc = **mobility focus**  
(better – and usually compatible with access)
- n restrain or slow motorisation; emphasis on non-motorised transport (walking, cycling); traffic calming; charging full costs to private transport; access-oriented and transit-oriented urban planning; parking restraint, telecommuting; etc. = **access focus**  
(best – benefits in short term AND builds pathways towards sustainable transport systems)

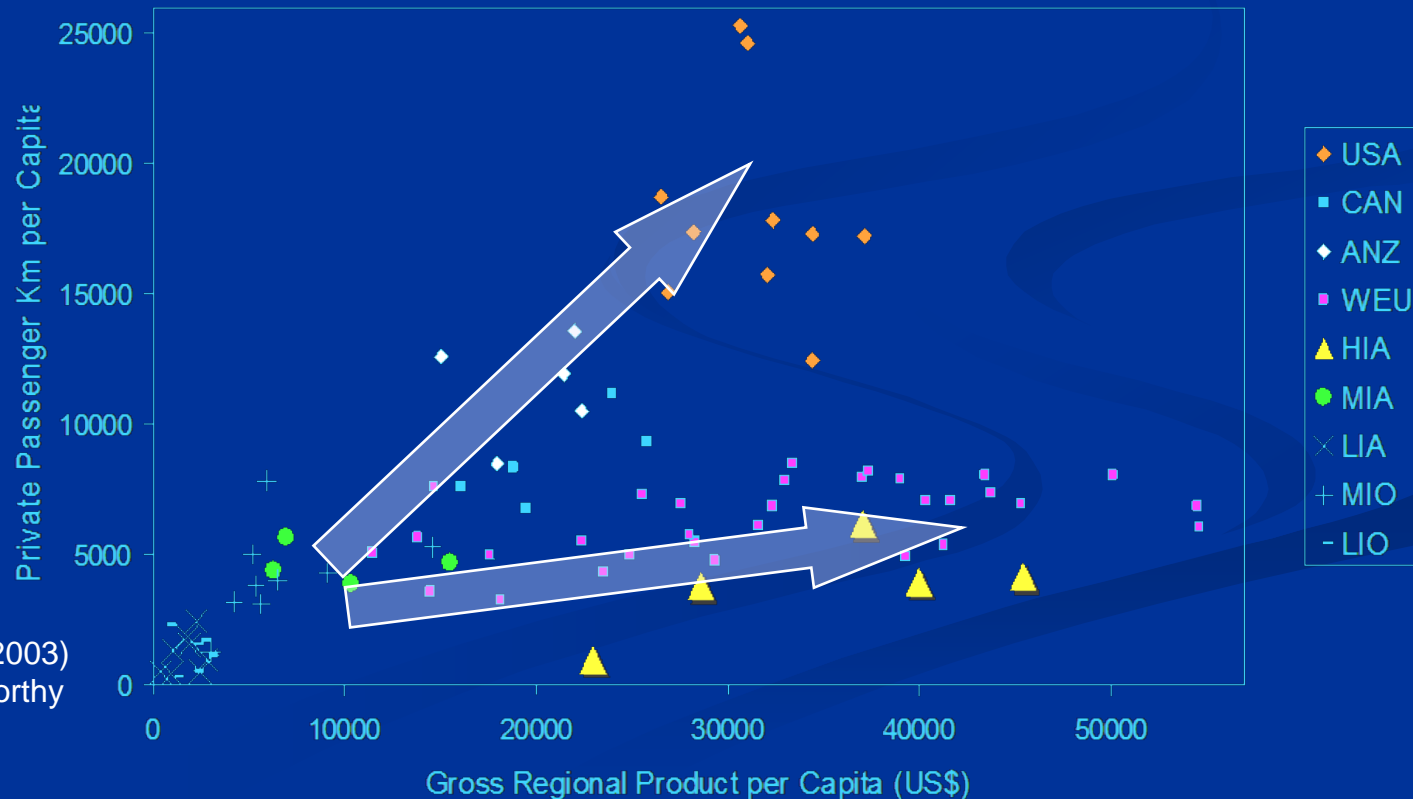
# 'Focus' in urban transport policy

- n Narrow versus integrated
- n Four levels of urban transport planning (Vuchic)
  - IV. Individual facilities
  - III. Single mode network or system
  - II. Multimodal coordinated system
  - I. City-Transport relationship
- n Levels IV, III and II are still important ... but should be subordinate to Level I



# Evolutionary perspective

- Alternative development trajectories for urban transport:
  - Rich cities but contrasting urban transport systems (high traffic/energy consuming in USA, Australia, NZ versus lower traffic/energy consuming in high-income Asia, Europe)
- Motorisation (especially if rapid) and related system-level changes - key drivers of unsustainable transport patterns in the long run...



Source: Barter et al. (2003)  
using data from Kenworthy  
and Laube (2001)

# System-wide 'success' perspectives in transport-related urban AQM?

- Awareness of these issues in the AQM community? (eg CAI website presentations as a quick assessment)
- Awareness of and/or action on:
  - ASIF framework – focus on S or A?
  - defining successful transport (eg Litman framework)?
  - narrow versus integrated focus (Vuchic)?
  - evolutionary perspective and awareness of longer term effects (e.g. on urban development patterns)?
  - The potential for harm to accessibility (and the danger of locking in high-traffic development pathways) in the name of clean air? (either in the short term or the longer term)

# Accessibility perspectives

- n Mentions of A in ASIF, Vuchic level I, 'reducing need to travel'
  - n Little or no explicit awareness that movement is not an end in itself
  - n ... except for one or two which call for reducing the need to travel and suggest planning approaches
  - n Some calls for better land-use and transport integration (potentially access-focused if transit-oriented but not always)
  - n Some mentions of non-motorised vehicles but pedestrians almost ignored
  - n Several calls for pricing approaches (potentially access oriented) or TDM
  - n One mentions slowing motorization
  - n Overall: more vague lip service than concrete proposals or policies in practice



# Mobility perspectives

- Includes mentions of S in ASIF, 'moving people & goods not vehicles', Vuchic Level II, multimodal goals
  - Several strong appeals for focus on S in ASIF
  - Improving public transport (rail, BRT common; ordinary bus less common)
  - One or two NMT mentions use mobility arguments
  - Lots of 'lip service' to S but ...





# Policies that potentially harm accessibility

- n 'Tail-pipe' work often apparently 'neutral' re accessibility and system views of success... but care required
  - n If work on I or F reduces costs then be aware of impact on A or S
  - n Be aware of growth in A and change in S in evaluating scenarios
- n Tail-pipe or traffic-focused policies in the name of air quality that could actually HARM accessibility (or mobility or both)
  - n Many cite congestion as a key cause of high emissions... then some make raising traffic speeds a key AQM goal... and some suggest capacity expansion for general traffic
  - n Several cases of cleaning up public transport but at risk of service levels being harmed and costs increasing
  - n Occasional cases of efforts to 'decongest' urban core areas

# Why is change difficult?

- n Traffic perspective is seductive
  - n fast, long trips seem valuable; traffic problems local, immediate, urgent, clear to individuals; brown agenda may seem to suggest need for more roads; easy to measure; traffic bias in assessment tools; powerful industrial lobbies; institutionalised (Levels IV and III); tail-pipe focus presents no challenge; apparently buys space (but may waste almost as much as it 'buys'); dangers of this focus not obvious immediately; wider systems assumed static
- n Mobility perspective seems an obvious improvement but surprisingly often still loses to traffic-based thinking
  - n institutions – Level II harder than III and IV; political resistance to mobility at expense of traffic – individual versus social benefits; efficiency arguments strong but seem to involve sacrifice;
- n Accessibility perspective is even harder to sell
  - n humble - short, slow trips seem trivial to many; subtle, low profile, societal, important but rarely urgent; less obvious to individuals; requires system adaptation; vulnerable – especially to impacts of traffic focus; political resistance to accessibility at expense of traffic; performance measures poorly developed or neglected; difficult to institutionalise (Level I); non-equilibrium economics poorly developed; mechanisms less well understood; may seem to some like a green agenda luxury; how far to push access at expense of traffic (or mobility) and the space it buys?

# Suggestions: accessibility-aware AQM

- Increase awareness in AQM community of systems thinking on 'success' in urban transport
- Highlight win-win accessibility-focused policies that:
  - Simultaneously address BOTH immediate AQM problems AND encourage access-efficient, urban/transport development paths
- Enrich ASIF framework. Further decompose A factor:
  - $A = \text{'activity'} = \text{total travel in passenger km or tonne km} = \text{total trips} \times \text{average trip length}$
  - Highlights benefit of restraining trip lengths or (more positively) increasing proportion of trips that can be short
  - Highlights that restraining A is not necessarily a sacrifice
- Challenge traffic-focused policies if they harm access. Never advocate these in the name of AQM! Faster travel and more travel are no benefit if accessibility has decreased

# Accessibility-aware indicators?

## n Impact reduction ...

1. per unit of vehicle travel?  
(regardless of amount of traffic) = implicit traffic focus (if this is all we do)
2. per unit of passenger or goods travel? (could reduce impacts or increase mobility per unit of vehicle travel) = implicit mobility focus
3. in absolute terms? (impacts must reduce regardless of traffic, mobility or accessibility) = possible accessibility focus (if aware of A and S in long-term)
4. per unit of accessibility?  
(could reduce impacts or increase access per unit of vehicle travel and per unit of person/goods travel) = accessibility focus (but how to measure this?)

# Suggestion: trips-based indicators

- n Trips-based indicators: 'impact per trip' (eg CO emissions per trip)
  - n Not quite same as 'impact per unit accessibility' but a step in right direction to prompting practical people to keep access in mind
  - n Total impacts divided by total trips (including non-polluting trips, eg walking trips)
  - n Requires that we measure trips better ('linked' trips -one-trip per 'purpose'- and must include ALL trips by everyone, even the shortest trips on foot)
- n Assessing impacts of a policy with 'impact per trip'
  - n Helps focus minds on reducing impacts without making vehicle kilometres grow faster than trips
  - n Highlights problem with congestion-relief as AQM policy
  - n Helps focus minds on importance of low-impact trips and preserving or increasing their role
- n Worthy of further investigation?

Low access levels ←-----→ High access levels

Low mobility/  
low traffic movement

**Traffic-saturated cities**  
(eg many modest-income Asian cities today)



Continued rapid motorisation

Mobility management/  
Restrain pace of motorisation

**Dense Asian Cities risk TRAFFIC DISASTER along the way in trying to follow this path** (eg Bangkok)

Invest in public transport  
(first bus, BRT, later others)



invest in walking and cycling facilities

Transit-oriented land-use

**'Balanced' cities** (eg Japanese, Korean, many European cities, Hong Kong, Singapore, Curitiba)

Motorisation; very high road investment, suburbanisation

Car dependence "built in"

High mobility/  
high traffic movement

**Automobile dependent cities** (eg American, Australian cities)

# In a nutshell...

- n Need clean(er) air AND a 'good' transport system
- n Accessibility perspective offers POSITIVE rationale for policies that look like a sacrifice from a traffic or mobility perspective (eg traffic restraint)
- n Be aware of systems perspectives on 'success' in urban transport AQM
- n Measure progress accordingly
- n Need not (and must not) abandon reducing impacts per vehicle kilometre ...
- n but emphasise ways that complement and do not undermine 'access-efficient' development paths for longer term sustainability