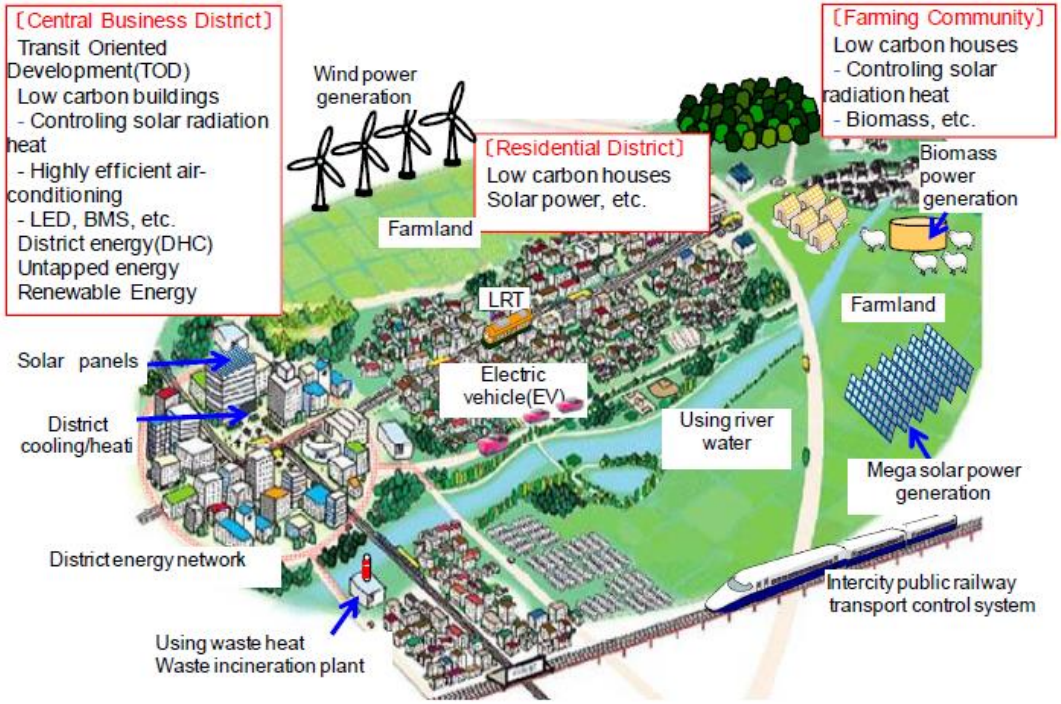
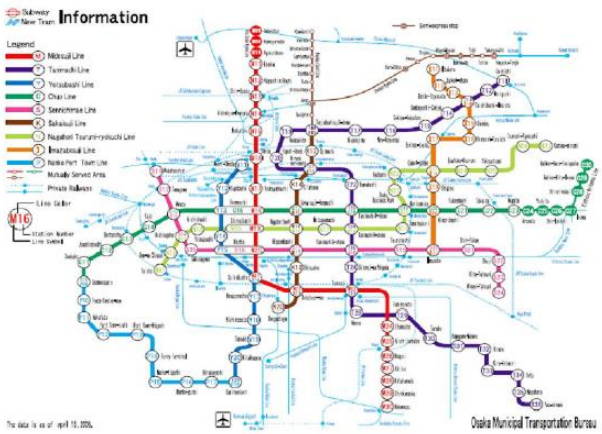
Lessons from APEC's Low Carbon Model Towns Project – personal observations

Figure 7 Image of Low-Carbon Town



Source: based on Special Report SR-79, 2008, National Institute for Environmental Studies



Subway network of Osaka City, Japan

Alan Pears AM

Senior Industry fellow, RMIT University Australia

Associate Consultant Buro North

Email: apears@c031.aone.net.au

Seminar, RMIT Centre for Urban Research

16 June 2016

Key Principles underlying LCT

http://aperc.ieej.or.jp/publications/reports/lcmt.html

"LCT means villages, towns, cities and regions which seek to become low carbon with a ***quantitative CO_2 emissions reduction target and a concrete low-carbon developing plan*** *irrespective of its size, characteristics and type of development"*

- Provide practical guidance for city, national planners, policy makers on **low carbon urban development**
- Provide a clear framework to be applied to underpin action and monitoring of progress against quantitative targets and timeframes
- Inform of case studies and best practice measures
- Recognise wide variation in stage of progress, available resources, institutional factors etc
- Complement action on other environmental, social and economic development aspects of development
- Focus on each participant's progress in its context and diagnostic feedback, NOT compare across cities or economies

Low Carbon Model Towns: Brief history

- 2010: APEC Energy Ministers see need for action on urban emission reduction – Fukui Declaration
- Energy Working Group Objective: “encourage creation of low carbon communities in urban development plans, and share best practices for making such communities a reality”
- LCMT Task Force established, coordinated by APERC (Asia-Pacific Energy Research Centre), Tokyo, overseen by Agency for Natural Resources and Energy, METI, Japan
- LCMT Project elements:
  - Develop the ‘concept of the low carbon town’ as a guide for planners (Study Group A)
  - Conduct feasibility studies [including case studies]
  - Conduct policy reviews of planned town and city development projects (Study Group B)
  - At EWG 45 (2013), development of indicators was included

Cities and regions involved

- Where I have visited:
  - Koh Samui, **Thailand**
  - Dalian and Haikou, **China**
  - Adelaide and Melbourne, **Australia**
  - Auckland and Palmerston North, **New Zealand**
  - Santiago (and San Pedro), **Chile**
  - (Jakarta, **Indonesia** – ClimateWorks green building workshop)
  - Cebu-Mactan, **Philippines**
  - Seoul, **South Korea**
  - Krasnoyarsk, Siberia, **Russia**
  - Tokyo, Yokohama, **Japan**
- LCMT Case Studies (in ‘concept’ document and on website):
  - Bitung, North Sulawesi, **Indonesia**
  - Da Nang, **Vietnam**
  - Koh Samui, **Thailand**
  - San Borja, Lima, **Peru**
  - Yujiapu CBD, Tianjin, **China**

Visible pressures – often really symptoms

- Access and mobility:
  - Traffic congestion, cost, time taken to reach destinations, safety, health
  - Conflicts between cars and other transport modes (including parking)
  - Poor integration with urban development: poor urban organisation, extreme density without access to services, jobs, amenity
- Buildings:
  - Social equity – slums, low quality, lack of services/infrastructure/amenity
  - Poor energy performance, health standards, structural standards
- Governance:
  - Interplay between levels of government – powers, $, corruption
  - Expertise, skills, stability and consistency of leaders and staff
  - Maintain civil society, rights; conflicts with local cultures and history
- Provision of infrastructure, work and housing:
  - Population pressures (including migration and assimilation)
  - Funding, resources, skills
  - Commitment, design, construction, maintenance and management
  - Impacts of disasters, degraded environment, climate change and associated long-term adaptation problems
  - Power (financial, political, framing) of entrenched interest groups

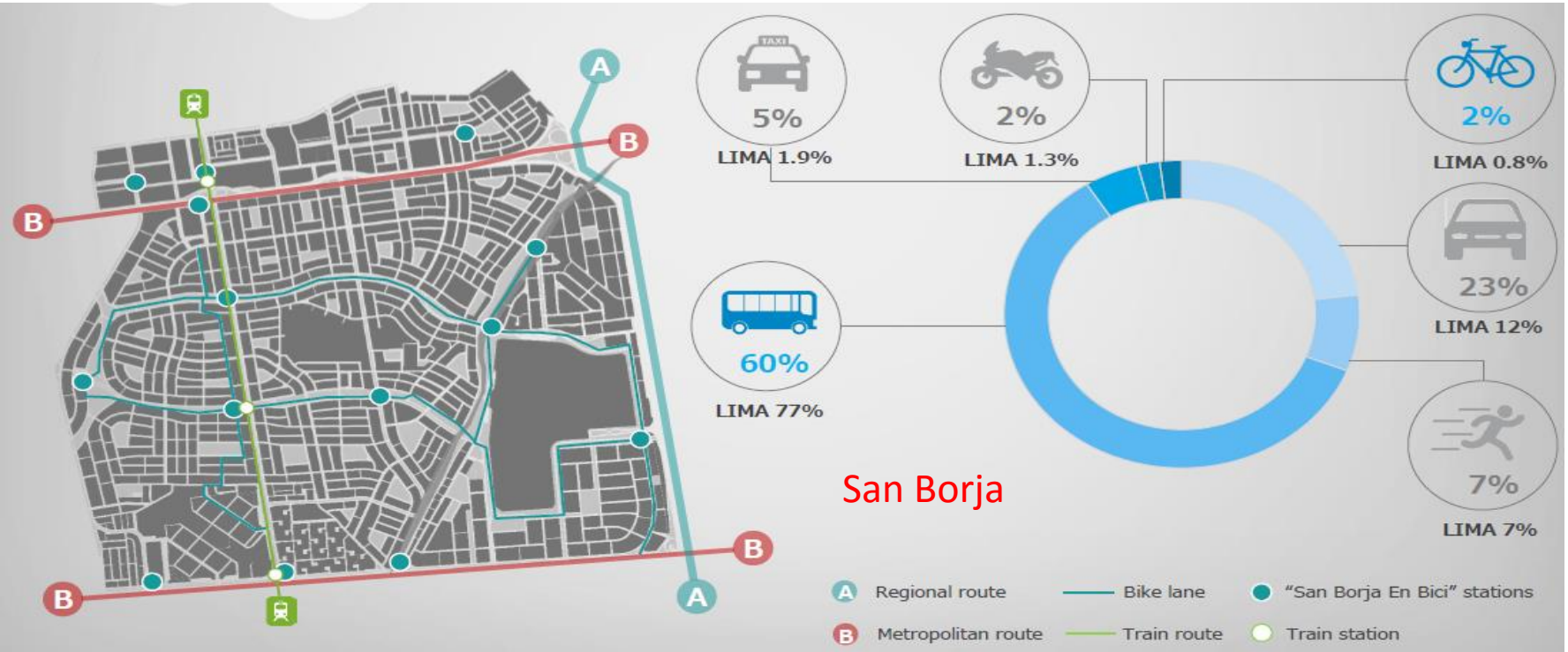
What matters?

- To residents
  - Affordable access to **basic survival services**:
    - clean air and water,
    - waste management,
    - shelter,
    - access to services and work,
    - health care,
    - personal safety and security
  - Beyond basic services:
    - higher standards of above
    - education
    - urban amenity/quality of life – access to quality open space, recreation, 'convenience'
    - Community, 'connection', freedom/rights
    - Increasing income relative to living costs, opportunity for 'improvement'
- To business
  - Educated, skilled, motivated, reliable, happy workers
  - Infrastructure to support business activity – (prefer others pay for it!)
  - Scope to 'grow' business – freedom to 'act in own interests'!

Climate policy struggles to get near the top of this priority list!

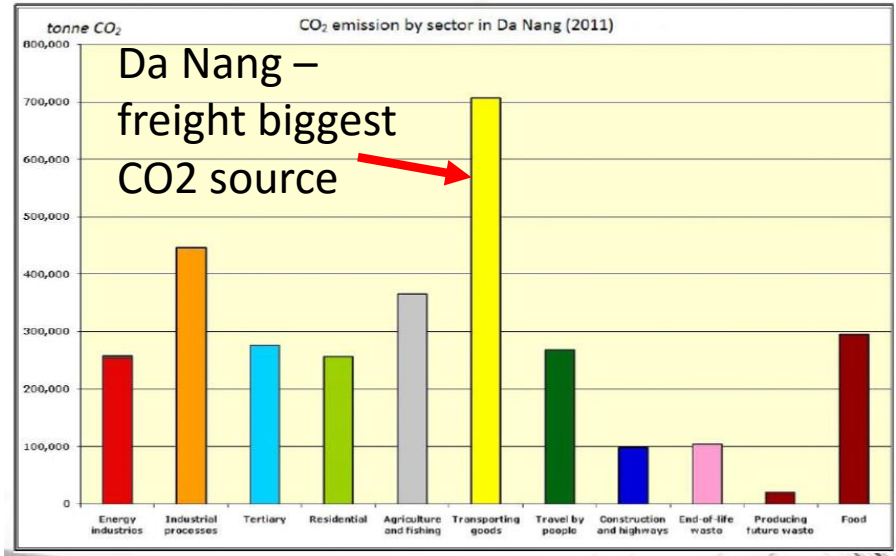
Lessons: urban access, transport

- Transit Oriented Development, careful ‘micro-design’
- Higher density (too high?) with amenity (eg quality open space, recreational facilities for kids, people, pets)
- Ground floor of buildings designed for commerce; safe, accessible road-side commerce (many micro-businesses), public storage lockers
- ‘Safe Streets’; bike paths and lanes for pedestrians and low speed personal transport
- Air-conditioned malls as community refuges and social centres



Lessons: access and transport

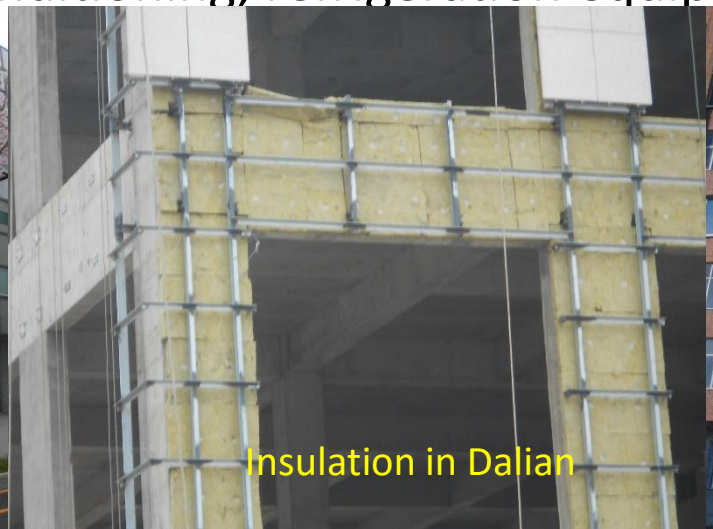
- Passenger transport
  - Public transport (integrated, easy to use), high speed inter-city rail
  - Bike share and car share services, secure bike parking, cyclist facilities
  - In congested traffic in hot, humid climates, car air-conditioning can be half of fuel use, hybrids/EVs much more efficient; fuel use avoiding freezing in cold climates – underground parking, EVs?
  - Transport for tourists – to city, within city (offer carbon offsets from local abatement projects in developing countries?)
- Freight
  - needs a lot more work - 'last kilometre/mile', port to warehouse to shop; factory or mine to port, 'virtual' solutions, smart logistics, rail…….



Lessons: buildings

- See ‘access and transport lessons’
- High energy efficiency (with summer overheating problems!)
- ‘Zero net energy/emissions’ at building, precinct, development, city levels
- Need for credible rating schemes, enforcement of regulations
- On-site/local zero/low emission energy, storage (electricity, thermal)
- ‘Smart’ energy (and other services) management systems at home, building, factory, precinct, area levels
- Resilience – run independently/ ‘off grid’ for several days
- Is district heating more efficient (including end uses)?
- Need measures to upgrade performance of basic housing, eg ‘cool roofs’
- Maintenance of air conditioning, refrigeration equipment a key issue


Zero net energy building, Japan


Insulation in Dalian


Air conditioners in Siberia!

Lessons: business and industry

- Challenge to engage or overcome resistance to change, narrow focus, ignorance
- Business priorities – survival, profit, ‘cut red tape’,
- Perceived risks/costs of change to individual businesses, sectors and flow-on to workers, communities
- Need for infrastructure – well-located buildings, energy, freight, water, waste, suitable workers, low cost overheads
- Need to build on existing models, eg roadside commerce (micro-businesses)
- Active support for emerging business models and innovators – eg innovation centres, management of risks, finance models, training, certification

Lessons: policy, governance and change

- Difficult (see Jared Diamond, *Collapse*)!
  - Power of existing interest groups
  - 'Sunk capital' (physical, cultural, mind-set, financial) – inertia, inflexibility, constraints
  - Inability to grasp potential of emerging paradigms
  - Perceptions of risk/loss from change - from leaders to tradespeople and community: tension between personal and societal/long term
  - Different financing models needed – micro-finance, aggregation
  - Need to respect and build on local cultures, needs, expectations
  - Cooperation between different levels of government and across agencies and business – power, status, conflicting cultures, agendas
  - Consistency, maintain priorities
  - Limits to understanding of diversity, nature, power and speed of change
  - Link infrastructure upgrades to future major events
- Wealthy districts and individuals set example
- Combine climate adaptation, response with other more visible, short term outcomes, focus on 'multiple benefits, synergies, 'win-win', 'indirect action', creation and use of carbon offsets
- Institutional support needed for emerging alternatives

Interesting Lessons, potential solutions

- **Koh Samui**:
- Upgrading roads increased death rates and undermined roadside commerce
- Many of the speeding vehicles were vans/utes used by small businesses for deliveries
- Local tourism industry wanted to limit growth 'don't want to be like Phuket!' No more airports!

Potential transport solutions:

- 'multi-purpose bus to carry people, freight, bikes and small motorbikes – linked to 'smart' freight management, booking and location tracking systems
- Low speed limit (with education to support rationale) and enforcement
- Promote sale and use of e-bikes, low speed electric freight vehicles, etc
- Shift to ferry/mainland train instead of air travel, longer stays, more Thai tourists

Interesting Lessons, potential solutions

- Dalian and Haikou, **China**
- Large numbers of empty high rise apartments – insulated and double glazed
- BUT reasonable amounts of open space around them
- Cars dominant, parked on footpaths in Dalian so pedestrians walk on roads!
- In Haikou, E-bikes and e-scooters dominant – few petrol bikes; In Dalian, bikes and m-bikes discouraged!
- Intercity fast trains good, but local PT variable

- Dalian BEST Eco-city: located on new underground metro between old city and airport
- Food vendors a significant contributor to urban pollution in old city!
- Summer cooling problems for highly insulated buildings with poor shading

Interesting Lessons, potential solutions

- **Koh Samui**:
- Enormous energy waste and costs but little local understanding of end-use efficiency potential, especially in traditional housing
- Excellent waste management program driven by tourism industry and schools
- Reliance on undersea electricity cables a serious risk – 2 had failed!
- Derelict palm plantations, hydro potential, rapid vegetation growth, solar, offshore wind options

Potential energy and climate solutions:

- Leverage off waste management program for energy saving
- Develop measures suited to local buildings and appliances, eg a/c maintenance, white roofs, high efficiency fans, high efficiency tourism resorts
- Move towards energy independence, or even net exports to mainland
- Develop local carbon abatement projects and sell credits to tourists to offset their travel emissions