



WorleyParsons
resources & energy

Characteristics of Infrastructure

- **Infrastructure assets, services & markets** have different attributes:
 - **'economic' infrastructure** market sectors and distribution networks: transport: road, rail, ports and airports; water: waste/water; power & telecommunications
 - **'social' infrastructure** market sectors: health, education, prisons
- **Longevity** (50+ years), **'lumpiness'** and **sunk investment**.
- Extensive complex **networks** with **multiple interfaces**.
- **Interdependencies** such as accessibility (transport) and land value.
- **Externalities** (positive and negative) and third party consequences.
- **Monopolistic** profiles and geographies.
- **Common access**: incumbent users, new entrants and third parties.
- **Productivity & Balance of Payments** – labour markets, households, firms, GDP & export earnings
- **Multiple objectives** – efficiency, equity and sustainability tradeoffs

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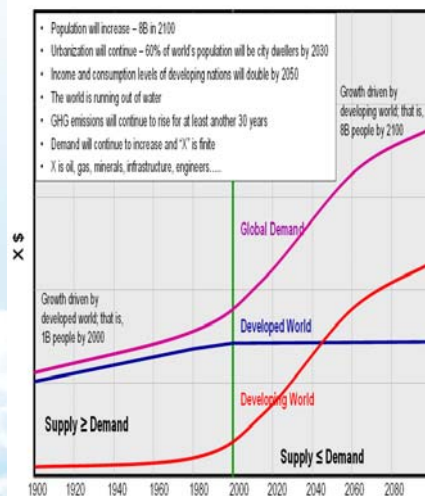
Global Infrastructure – Drivers & Moderators

Drivers

- Globalisation & trade - \$, commodities, goods and services
- Population growth, urbanisation & production specialisation
- Increasing standard of living & GDP

Moderators

- Political stability & security
- Country risk – politico/legal
- Public policy, tax and budgets
- Institutional capacity
- Risk return on capital

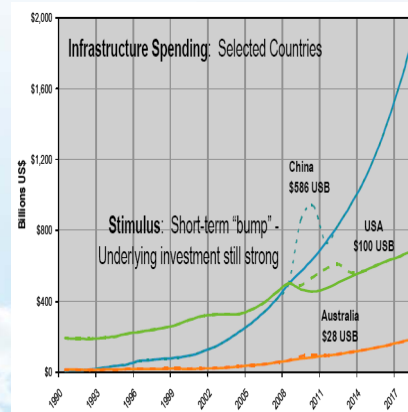


Source: CIBC World Markets Study, February 2009

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Global Infrastructure Deficits

- Trillions USD- global infrastructure deficit (CIBC) assumption/estimate?
- OECD 2008- **2.5% of world GDP** for transport (excl. ports, airports), utilities and telecommunications.
- Australia – 2008/2009 economic and social infrastructure **6.8% GDP**
- Low per capita standard of infrastructure in emerging economies – Asia (China, India, Indonesia), South America, Africa
- Tax is single largest source of finance is insufficient to fund the infrastructure gap
- Mobilizing private & diversified sources of finances depend upon creating competitive infrastructure markets.



Source: CIBC World Markets Study, February 2009

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National Government 'Step In' Infrastructure Australia (IA)

- IA Act 2008 – broad advisory role to governments, investors and owners
- IA Experience to date - uneven quality and weakness of submissions
- IA \$ allocation based on and limited by 'readiness' of submissions
- IA guidelines requiring rigorous patronage and 'wider' cost benefit analyses (CBA) – results unpublished
- IPA- \$445B-\$770B infrastructure deficit
- Australian 2008/9 total infrastructure investment (6.8% GDP or 30% total \$274B public & private investment)
 - \$46.9B economic infrastructure
 - \$11.6B social infrastructure
 - \$27.2B other infrastructure
- Source: Ken Henry 'To build or not to build..' March 18 2010

	New investment
Roads, rail and ports	\$8,453m
Regional Rail Express (Vic)	\$3,225m
East West Rail Tunnel — preconstruction work (Vic)	\$40m
Gold Coast light rail (Qld)	\$365m
Cavender rail line modernisation (SA)	\$294m
Noarlunga to Seaford rail extension (SA)	\$291m
Northbridge rail link (the Hub) (WA)	\$236m
West Metro — preconstruction work (NSW)	\$91m
Brisbane Inner City Rail feasibility study (Qld)	\$20m
O-Bahn track extension (SA)	\$61m
Hunter Expressway (NSW)	\$1,451m
Pacific Highway — Kempsey Bypass (NSW)	\$618m
Ipswich Motorway — additional works (Qld)	\$884m
Bruce Highway —	\$488m
Cooroy to Curra (Section B) duplication (Qld)	\$339m
Oakajee Port common user facilities (WA)	\$50m
Darwin Port expansion (NT)	\$50m
National Broadband Network	Up to \$43,000m
Initial Government investment	\$4,700m
Clean energy infrastructure	\$3,565m
Clean Energy Initiative	\$3,465m
National Energy Efficiency Initiative	\$100m
Education infrastructure	\$2,585m
Education infrastructure	\$2,585m
Health and hospital infrastructure	\$3,172m
Hospital infrastructure	\$1,465m
Better cancer care	\$1,276m
Translational health research	\$430m

Source: Australian Federal Treasury

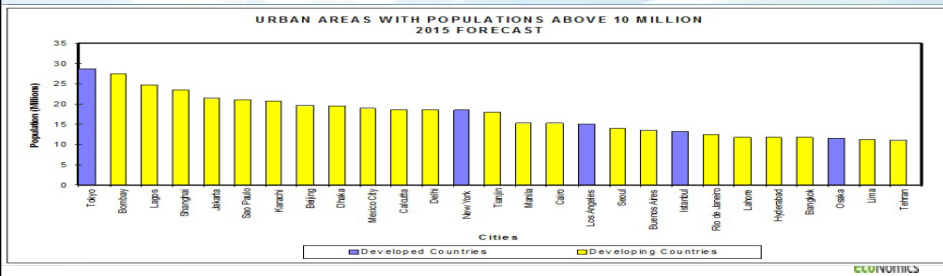
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Consequences of Infrastructure Deficit

"Failure ...towards bridging this infrastructure gap could prove costly ...**congestion, unreliable supply lines, blunted competitiveness, ...environmental problems, ...living standards and quality of life.**" (OECD Policy Brief – Infrastructure to 2030 (Jan. 2008))

- "Cities account for 70% world GDP & urbanization will define this century
- Land and housing markets require national attention as does mobility and access to jobs and critical infrastructure
- Fostering agglomeration & managing congestion will have 'big payoffs for economic growth ...' Source: Systems of Cities: Harnessing urbanisation for growth and poverty alleviation, World Bank Urban and Local Government Strategy, November 2009

World Bank Source



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Gaps in Forecasting and Analysis

World Bank and others provide guidance for metropolitan/city 'strategies'.

Benchmarking best practices on forecasting and network modelling of transport-land use of interfaces is more limited particularly in:

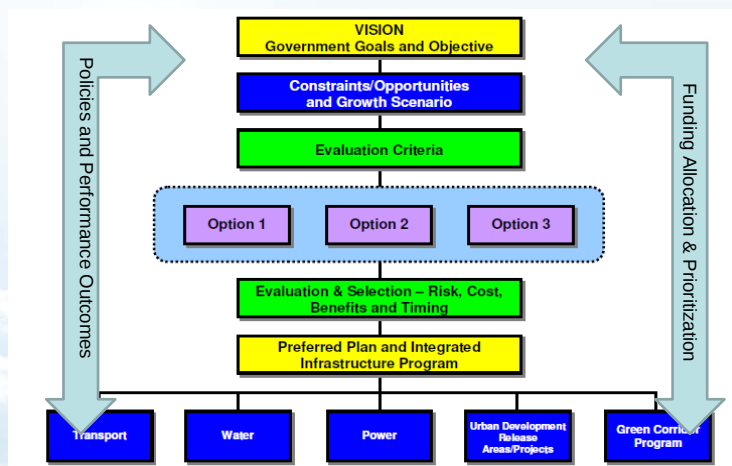
- Forecasting demographic and labour growth and distribution
- Modelling land supply elasticity and pricing for housing and business purposes
- Modelling of travel behaviour and **networks** by trip purpose, discretionary & non-discretionary travel and consequences for patronage and congestion pricing
- Micro-economic modelling of interfaces between transport (incl. fuel costs/pricing) and distribution of households and firms

Benchmarking the effect of policy, organisational and other factors across jurisdictions is also limited whether it relates to:

- Central Government (incl. Treasury): Competition policy, tax & budget allocation to agencies and jurisdictions
- Treasury: National priorities, funding, assessment and delivery models (PPP's et al)
- Independent Bodies: Competition, Third Party Access and Price
- Line Delivery Agencies: Infrastructure Planning, Prioritization and Procurement
- Local/City/Regional and/or State Government: Spatial Planning & Transport Planning

Integrated Land & Infrastructure Planning

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Financial, Wider CBA, NPV & Integrated Analytical Models

Evaluation & Decision Making Models

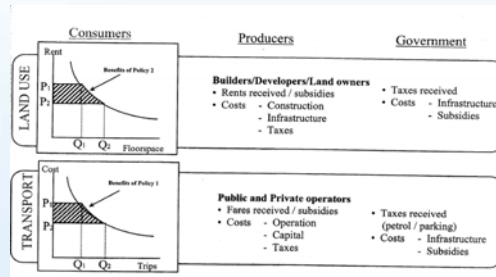
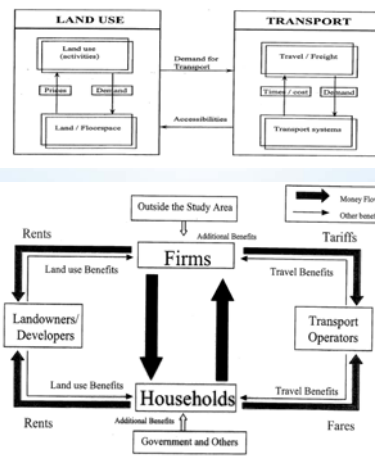
- Metropolitan & regional quantitative models (MEP, Streams)
- Patronage Modelling
- Feasibility Studies
- Wider Cost Benefit Analysis & Incidence Analysis e.g MANS Study
- Cash Flow and Capital Constraint Analysis (staging of infrastructure) – examples and outcomes

Relevance for Decision Making

- actions to keep open LR options (including reservation of land for corridors and sites)
- Projecting revenue & performance outcomes
- Selection of design solutions and technologies
- Comparative merit of options & projects
- cost planning and staging of options & projects

Economic Evaluation and Planning

External Factors - Energy Prices, Interest Rates, Population Growth Migration, Employment rates



- Transport 'network' modelling
- Integration of spatial land-use & transport models with micro-economic models & feedback
- Single project evaluation – wider cost benefit (incl. externalities) & incidence analysis

Outputs of Planning + Evaluation

- Multi-sectoral long term strategies (10-20 years) > short budget cycles
- 'Network' solutions rather than a stream of separate 'projects'
- Reservation of multi-purpose corridors for distribution networks to lease/use
- Readiness of infrastructure project pipelines as a counter-cyclical measure
- Unwinding regulatory rigidities to increase accessibility and supply of land for households and firms
- Unwinding price distortions with market signals approximating cost structures
- Reducing complexity and time between planning and implementation.
- Introduction of greater flexibility to procurement by clear specification of performance outcomes
- Transparency/contestability with project pipelines underpinned by clear outcome specifications and asset registers

Government & Private Roles

Is economic infrastructure too big & too important to fail?

Exclusive government and government/private sector roles:

- Infrastructure and spatial planning
- Prioritization
- Funding (equity and debt)
- Building, owning and/or operating infrastructure assets;
- Public acquisition of sites and corridors;
- Establishing standards;
- Environmental approvals;
- Regulation – foreign investment, competition, common user access to infrastructure and pricing;
- Taxation and
- 'Financier of last resort' in the case of market failure with 'step in' provisions to guarantee maintaining services.

'...In the coming years, **policy makers** will in addition need to:

Improve **efficiency** in the **construction** and **operation** of infrastructures.

Increase **efficiency** levels in the **use** of infrastructures through better **management of demand**.

Ensure infrastructures are **reliable** and **resilient**.

Enhance the design and capacity of infrastructures to meet **future** environmental and security **challenges**.

Strengthen life-cycle management of infrastructure assets .. increasingly to maintenance, upgrading and refurbishment of existing facilities and networks.

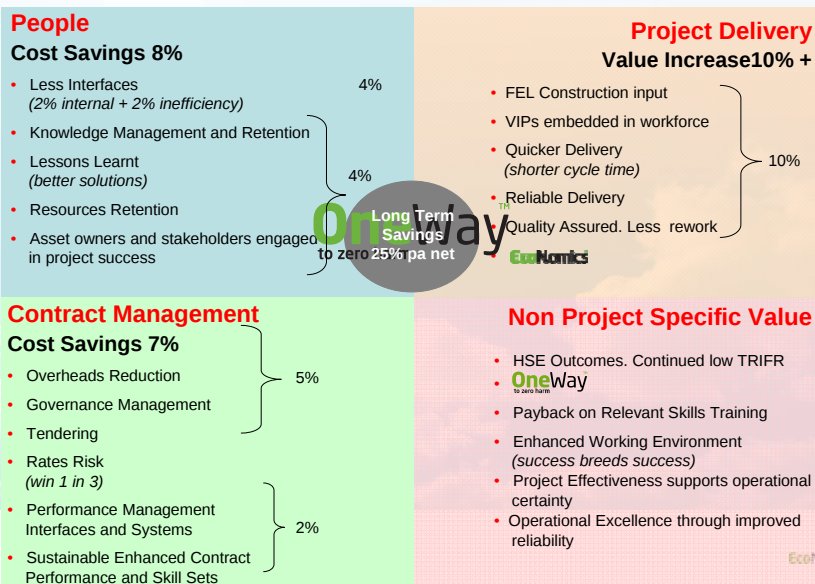
Raise the effectiveness of infrastructure development both in **meeting multiple objectives** – economic, social, environmental, etc. ...'(Our Emphasis)

Source: (OECD Policy Brief – Infrastructure to 2030 (January 2008))

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Asset Management Savings: Hydrocarbons

Typical savings achieved through WorleyParsons case studies:



- UK National Audit Office (NAO) 75% projects on time or early; no construction cost burden to public sector; significant improvement on non-PFI's.
- Quantitative evidence and analysis comparing PPP's by country, sector and across sectors on 'value for money' is limited (March 2010 proceedings).
- Evidence of forecasting problems - Australian tollway patronage forecasts not achieved – '*Cross City Tunnel - reached half its patronage estimate; River City – poor numbers with \$700M estimated to be written off; Lane Cove Tunnel ..below forecasts; \$1.7B overspending on Education Revolution* (Source: AFR June 2 2010)
- ADB – water sector PPP outcomes/benefits seen as mixed (Source: Gunatilake ADB Sydney 19 March 2010).
- Outcomes are in part dependent upon the institutional capability to define and evaluate projects; negotiate contracts and country politico-legal risk.
- **Increasing public sector capability** - mature and emerging economies:

*UK - 'Key priorities for the Treasury include enhancing the efficiency of PFI as a procurement model through **streamlining the PPP bidding process, increasing the expertise of the public sector, leveraging experience and efficiency through greater centralisation of procurement, and progressive credit guarantee financing beyond its pilot phase**'. (Author's emphasis)*

Source: Standard and Poor's 'Global Credit Survey 2005 – Public Private Partnerships – Infrastructure and Public Finance Ratings' 

- Reduce bid costs and complexity
- Develop long term project pipeline & clear outcomes
- Increase certainty regarding project execution and timetable
- Open government project pipeline to alternative private sector bids against clear outcome specifications whilst retaining IP
- Create and open government asset registers and accounts to private sector bids

Barriers to Competition – Participants nominated ...largely unknown pipeline of projects ...sporadic in nature ...lack of commitment to PPP's consistently across Australian jurisdictions... magnitude of bid costs..' KPMG Corporate Finance (Aust Pty Ltd) Infrastructure Australia PPP Procurement

Towards Building Capacity, Markets & Contestability

Contestability & Competition

- Open government projects to alternative private bids against specified outcomes
- Increase contestability of land use controls and infrastructure pricing/charges
- Establish and open infrastructure and asset registers to alternative asset management proposals

Partnering in Build Capacity – Planning to Delivery

- Fast tracking institutional strengthening – teams and systems
- PPP's (including PFI's)
- Open bids to allow new or hybrid models to deliver efficiencies

Tapping into Diversified Sources of Capital and Revenue

- Banking institutions and superannuation funds;
- Public private partnerships (PPP's) including PFI's
- Privatization and/or
- Community ownership of infrastructure

Unwinding Distortions

- Unwinding mis-pricing of related/substitute infrastructure services – road rail and congestion pricing – passenger and freight; and
- Unwinding rigidities to land supply utilization (use, density and standards).

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Greater Flexibility & New Entrants

Reduce asymmetry amongst incumbent bidders to encourage new entrants
(Source: World Bank July 1 2008 Working Paper No. 4660)

Introduce flexibility in contract forms including conventional and hybrid models for bidding projects variously defined to include:

- **Design Construct** – lump sum price
- **Privately Funded Infrastructure (PFI's)** – contracts for services that may involve construction as well as operation phase
- **Concessions** – exclusive right to build and operate 'ring fenced assets'
- **Strategic Infrastructure Partnerships** - successive stages of work, open book accounting, fixed or competitive supply chains
- **Integrator** - with embedded PMC teams and systems for procurement preparation, procurement, construction and operation and delivery partner
- **Alliancing** and risk sharing to achieve joint objectives

(Source: HM Treasury Infrastructure Procurement: Delivering Long-term Value March 2008.)

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