Doug Harland Consulting

business and product development - cultural innovation in manufacturing

Personal Rapid Transport (Pods)

Are they the future sustainable and affordable urban transport solution?

What are the key challenges for Australia's urban transport?

Congestion

Affordability $

Peak Oil

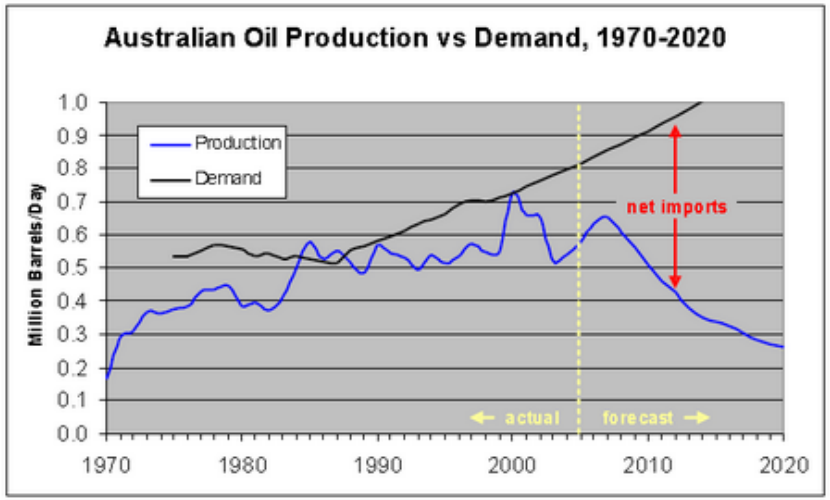

Figure 6. Australian Oil Production (Geoscience Australia, actual and P50 forecast) vs Demand (ABARE), 1970-2030.

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CONGESTION

CAUSES:

- **Intersections – Inefficient & energy wasting stop start traffic**
- **Accidents -Human emotions; inattention; road rage**
- **Flooding - Loss of access for public and emergency services**
- **Road Works - Long delays /reduced speed**
- **Population growth – too many cars - a new generation of drivers**

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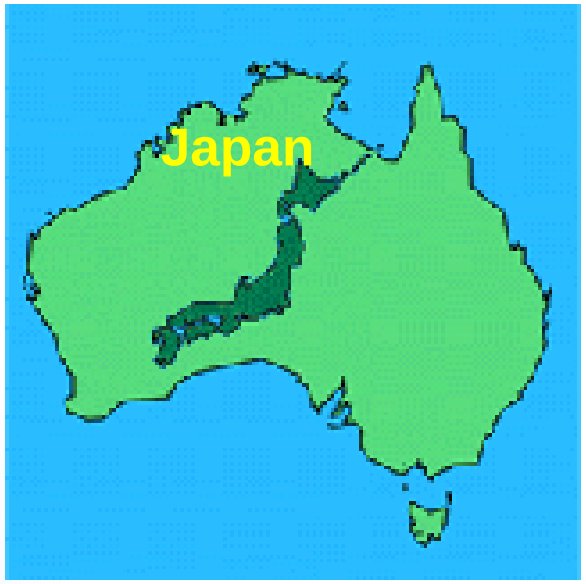
AFFORDABILITY

Current Technology urban congestion solutions are expensive:

- **Tunnels & Flyovers cost $150 - $700 million per kilometre – Regions get secondary priority re funding dollars.**



Australia's unique funding challenge:

- **Australia's small population**
- **Australia's large geographic area**
- **Australia's climate extremes**

Australia has relatively low taxation base:

Germany & Japan have approx. 5% of Australia's area and 7 times the population. Both have well maintained modern infrastructure but congestion remains

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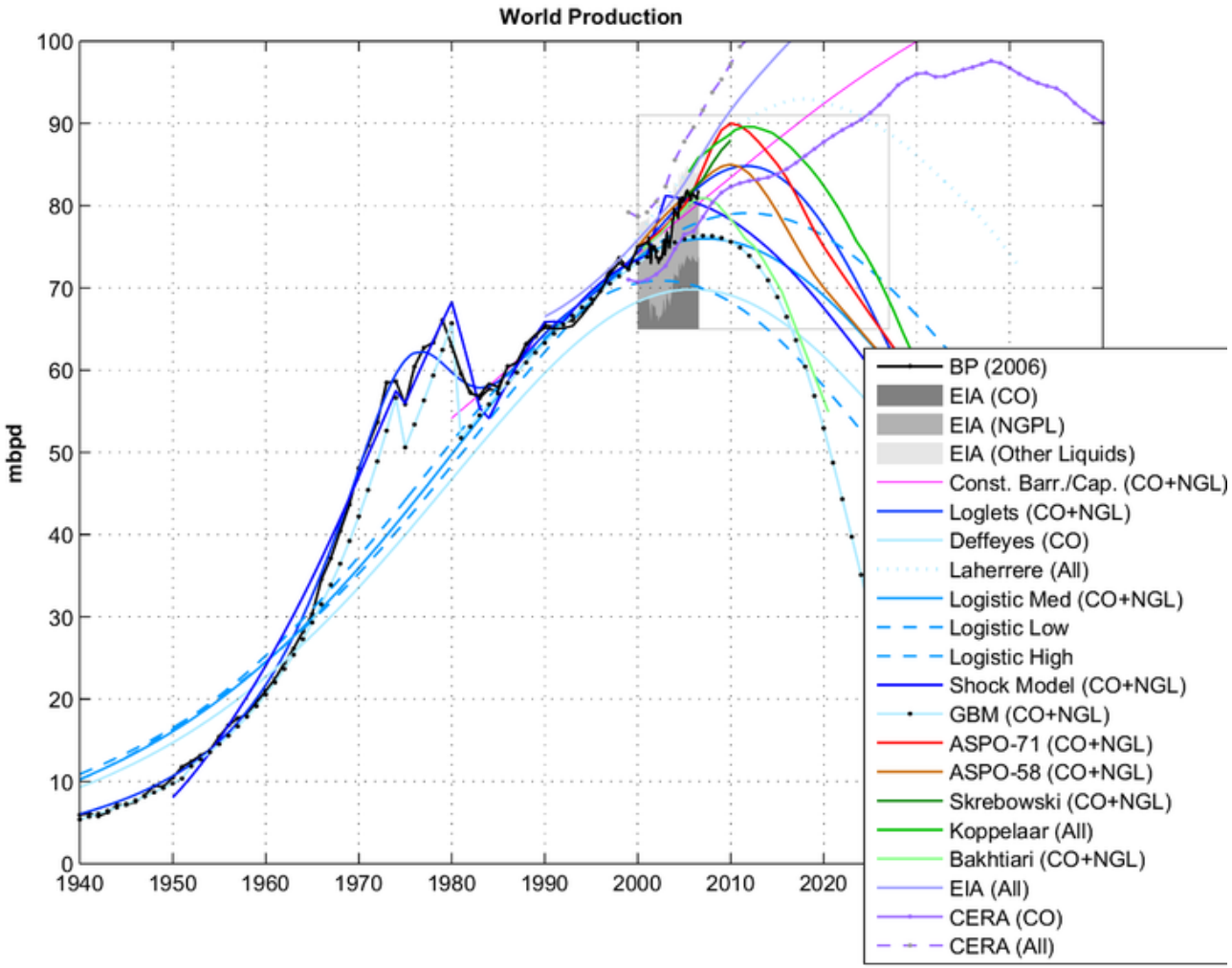
PEAK OIL

Urban Transport needs to be eventually powered by Grid Energy

BP projected current oil resources life end in 2048



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Secondary issues to address

24/7 TRANSPORT ACCESS:

- **Off peak public transport availability is often infrequent / not meeting needs.**

TIMETABLES:

Waiting for public transport – unpleasant crowding at peak hours- lightly loaded infrastructure off peak

CITIES HEAT ISLAND EFFECT:

- **More greenery is needed in cities to combat this issue.**

STORM WATER RUNOFF:

- **Roads do not allow rainwater soakage – all water runs off.**

ECOSYSTEMS:

- **Roads /rail footprints are socially intrusive and damage ecosystems and biodiversity.**

ROAD LOADING:

- **All roads & bridges are designed to carry 75 tonne B Double semi trailers – axle load increases require old bridges to be upgraded.**

EXISTING TRANSPORT CAPACITY UPGRADES:

- **Socially intrusive and expensive- $150 - $600million per kilometre**

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What is a likely future solution?

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One Example – Skyweb Express

https://www.youtube.com/watch?v=TiUDLYvNNbo

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Important Issues To Consider

- Benefits of standardised design
- Benefits of high volume factory production
- Factory - 24 hrs all weather
- 3D Technology platform
- Avoid loss of Automotive Production Plants.
- R & D optimisation testing
- Elevated tracks – Minimum earth works - less maintenance - minimum impact on ecosystems
- IP protection - World patented design

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Why are pods a likely solution?

CONGESTION - NONE:

- Potential for no intersections
- No accidents – human variability removed
- Elevated above floods
- Intelligent track network
- 80-100km/ hr speed –short travel times
- Minimal separation between pods- greater track density- equal to 3 traffic lanes.
- Go when you arrive – no grouping

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Why are pods a likely solution?

AFFORDABILITY – Low Cost solution:

- **Minimum site works – no resumptions- most existing alignments useable**
- **Factory repetitive & highly efficient production**
- **24/7 manufacture – all weather in factory**
- **Low cost track – Supports 800kg vehicles not 65/75 Tonne B Double trucks**
- **Total factory cost to manufacture system equivalent of 9 months expenditure on tunnels & elevated freeways**
- **Less & lower cost track maintenance than roads**

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Why are pods a likely solution?

PEAK OIL:

- **Grid based Energy – potential for renewables**

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Affordability

A new simpler alternative technology solution

Less than $1.0million per Km?- Factory made

Current technology solutions (*Airport link footprint greater than CBD)*

$500-700 million per km site works

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Other Pod Advantages

- No timetables – the pod waits for you
- 24/7 availability – within 10 mins walk
- Increased travel security
- Vandalism sensing and lock up
- Construction not so intrusive
- Significantly lower carbon footprint

- Over long term city streets could be 50% green – reduced heat island effect
- More storm water soakage
- Elevated track provides for trees under and wildlife corridors uninterrupted
- Less ecosystem impact

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Cars vs Pod – The benefits

(Cars are 1850's based technology)

- Grid energy – uses 25% of energy of a car
- Less embodied energy- manufacture and life
- Lower maintenance cost – less moving parts
- Higher reliability – controlled operation
- Cheaper transport – more $ for city dwellers

- Unit with no garage – $50,000 saving
- Fast, continuous & safe travel times
- No stressed drivers- everyone is a passenger
- Pod track has much lower urban footprint – could predominately use existing transport corridors

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Trains vs Pod – the benefits

(Trains are also 1800's based technology)

- Not timetable dependant
- 24/7 availability
- Viable off peak passenger loading
- Lower cost transport solution
- Less energy
- Large crowd capacity through multi track configuration
- High volume repetitive and efficient manufacture
- No rail crossings
- Better security and vandalism protection
- No stopping at "all stations" & peak hour comfort

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How can Pods happen?

- **A NATIONALLY SUPPORTED PROGRAM IS ESSENTIAL.**

- **Form & fund a university / private sector / government consortium.**

- **The concept needs to be developed in 3D using solid modelling and simulation technology – a comparatively modest investment**

- **Design of the various elements, the pod, drive system, network, parking stations and controls can be simulated & "debugged" virtually.**

- **A small R & D test track needs to be constructed to durability test concepts and test rapid track changeovers.**

- **Apply on a real life project to service a new satellite city or Canberra**

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What do the critics say?

- They would look unsightly
- They would be noisy
- They could never handle football crowds

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Conclusion

- **Pod transporters have huge potential to provide a sustainable and affordable urban transport solution – they have the potential to be a new paradigm in urban transport providing significant economic, social and environmental benefits.**

- **Australia currently has the skill base & manufacturing capability to design and construct the system – we must keep the GM plant.**

Albert Einstein

We can't solve problems by using the same kind of thinking we used when we created them."

Insanity: doing the same thing over and over again and expecting different results.

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