Transition Engineering Brainstorm

Professor Susan Krumdieck
Department of Mechanical Engineering
Safe Future

- IPENZ - How do you work on a **safe** transport future?

- Research
- Engineering
- Technology
- Behaviour
Sustainable Future

- IPENZ - How do you work on a sustainable transport future?

Photoshop out the pavement?
Define the Problem

- Unsustainable Oil Production and Oil Consumption
Transition Engineering Method

1. History
   System Dynamics

2. Present
   Infrastructure Economics
   Pollution Policy, Social

3. Future
   Forward Operating Environment

4. 100 Years in the Future
   Path-Break System Concepts

5. Back-Casting
   Opportunities Barriers

6. Shift Projects
   Learning

7. Transition
   Regulation Technology Infrastructure

BAU Scenarios
Un-sustainability Risks
100 Year Perspective
Illustrated with four 10 year old boys

Julius 1917  
Julius 1947 
Jarral 1977 
Julian 2017
What is the most unsustainable thing about transport activity in Auckland right now?

Auckland Congestion
1. History 1917 Queen St
1. Historical Dynamics

1950 Queen St
1. Historical Dynamics

New Southern Motorway
1950
2. Present

Economic Picture

- Auckland GDP = $61 Billion
- Cost of congestion $725-$1,250 million/yr
- Cost of personal vehicle operation = $9.5 Billion
- Council spend on car transport = $2.6 Billion

22% of all money spent in Auckland is just to get around

Personal transport is fuelled by imported oil, so represents a risk to prosperity and carbon emissions that must be reduced
3. Technology Scenarios

- Electric Cars – Max 4% of current car Numbers
- Biofuels - Max 1% of current fuel
- Self-Driving Cars – Not available Max 0% savings

None of these solve the problem of Congestion or Oil!
3. Today’s Forward Projects
3. What are the projects?

- More Intensification of Apartments
- More Granny Flats and Infill
- More Sprawl of Houses

- More Motorways
- More Rail
- More Cycle Lanes
4. Pathbreak: 100 years from now

- Congestion is not a problem, because…
4. Pathbreak 100 Years from now

- Auckland is a prosperous city in 2117
- Congestion is not a problem
- Accessibility is not a problem
- Oil supply and oil consumption are not a problem
- Auckland is connected to the rest of the country and the rest of the world
4. Tour of Auckland 2117

- They have a lot of repurposed pavement
- They have a lot more trees
- The land use and distance relationships are complex and organic, and “human scale”
- Urban areas are mixed use, mixed density, active accessible, co-located activities
- They have a thriving manufacturing & service industries
4. Here is Auckland 2117

Barcelona
Vienna
Milan
Munich
Birmingham
Brussels

20 km
1.5 M

Or if population grows to 2.2 M
This is the size of Paris

Transport Spend
4% of GDP
5. Backcasting

- Prosperous, Uncongested Auckland 2117 is POSSIBLE
- Other prosperous cities of under 2M around the world with <30% personal vehicle mode are reality today
5. Back-Casting

2-way Tram Line
60 km

1 km
15 minute walk

4 km
15 min cycle
6. Shift Project - Innovation

- Work with Alstom to design a tram network that would serve all of core Auckland with about 60 km of line
- Transition Street Competition – Merchants and Communities prepare proposals to Extreme Make-Over their Street as a Pedestrian-Cycle-Tram Boulevard.
- Infrastructure and consents by government, investment in new properties by market
6. Shift Project - Innovation

Reality TV Show follows 5 business & community teams as they go through different stages of design, competing for $25M for Auckland’s 1st 10 km Transition Street project.

The public votes on different elements to choose the winning team.
7. Transition

- Transition Streets creates increased property values and increased revenues and the learning needed for the next project
Conclusion:
Transition Brainstorm Result

TRANSITION OUR STREET

With Hot Young Hipster

tvnz
Thursdays 7:00pm