Using Electricity for Transport: An Overview

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The Range of Electric Transport

- If we concentrate only on electric cars, we are missing the wider picture that electric transport operates over a wide range, from electric roller skates (yes, really!) all the way to electric trains
- This is very much an introductory presentation - I'm going to take a brief look at a few types of electric vehicle within this range.
- I will include some web sites for example suppliers. This doesn't imply SEF endorsement of these suppliers.
- The following three presentations will delve into much more detail. There are charts!

Electric Skateboards

Available in New Zealand e.g. http://e4ride.co.nz/

- Range: 20+ km (SLA Battery), 30 km (LiFePO4 Battery)
- Top speed: 30 km/h
- Cost: under $1000
- Charging period: 4 hours

Electric Bikes

Available in New Zealand e.g.
http://www.electricbikes.co.nz/

- Can be pedalled like normal bikes or run using motor
- Range: varies - say 25km unassisted, 40km assisted
- Top speed: 30 km/h
- Cost: most models $2000-$3000
- Regarded as bikes if under 300W
- Up to 100 million in China

Electric Scooters and Motorbikes

Available in New Zealand e.g.
http://www.syneco.co.nz/

- Now also offer an electric quad bike
- Example: SynECO eVOYAGER
- Top speed: 80 km/h
- Range: 65-75km; 100 km at 45 km/h
- Cost: For two-wheeled range, $4000-$6500
- Note: not going to deal with quadricycles or electric cars here. Is the stigmatisation of the quadricycle class in NZ helpful?

Electric buses

Various types of electric bus:

- Hybrid-electric buses (NZ company Designline makes these)
- Trolleybuses: Wellington investing in more of these. (It's often overlooked that trolleybuses are a long-standing, and well-supported, form of electric transport)
- New Wellington trolleybuses include limited "off-wire" capacity, giving more flexibility
- Fully electric shuttles and buses are being deployed in China, using both battery and ultracapacitor technology.
- Compared to lithium-ion batteries, ultracapacitors have much less storage but much faster recharging. This makes them ideal for buses, provided an appropriate proportion of bus stops double as charging stations.

Electric Rail

- Light rail (trams) - well-established, making a major comeback overseas. In NZ, has tended to be seen as a “would be nice, but” option.
- Heavy rail (trains) - commuter rail - Wellington bedeviled by inadequate rolling stock, Auckland by political indecision
- Heavy rail - main trunk line - expansion of electrification proceeding very slowly

Conclusions

- Cars are an inefficient way of moving people, especially individuals. While electric cars are more efficient than ICE cars, the problem of moving all that metal around remains
- Electric public transport is well-established, though it often has an uphill battle for official acceptance
- New electric personal transportation options are becoming available
- Changes in urban form and economic activity will tend to favour these “sub-car” options. What are the infrastructure implications of this?
- However, the light vehicle fleet will remain important.