

**Submission on Draft Canterbury Regional Land Transport Strategy 2012-2042**

My plea in consideration of this strategy is for sufficient consideration to be given to the REALLY long-term time frame. It is not enough just to plan as far ahead as 2042.

The current transport structure in Canterbury is based on decisions taken in the 1850s and 1860s. The grid-pattern right-angled roads with counter-directional traffic were set up to suit the needs of horse-based motive power.

The main transport routes were designed around piston-powered fossil fuel-driven networks. Settlement patterns of Canterbury grew up around the north, south and western coal-powered rail networks. The main highway routes were designed to connect up to the rail network, first to deliver passengers and freight to it and later to replace many of rail's functions.

But things have changed. Horses have been replaced by fast motorised road vehicles, and the flexibility of truck transport has meant that it has largely overtaken rail's goods distribution functions in a relatively small commercial economy.

And there has been a big change over the last year - the earthquakes have given a once in 150 years chance to really re-think how the system will work in the future.

While it is hard to predict with any accuracy what will happen as far as 150 years out, we can examine the last 150 years and see some consistent trends in the factors behind land surface transport, and work from there.

POPULATION - Since 1860 the Christchurch region's population has consistently doubled every 50 years. There are no critical limiting factors such as water supply, so it is likely to continue to do that. By 2060 the population will be approaching one million, by 2110 it may be two million, and in 150 years perhaps four million.

TRANSPORT MODE - Since 1860 the system has been surface-based, with wheeled vehicles almost always carrying their own fossil fuel stored energy. Self-guided vehicles on rails have been used throughout for bulk transport, and driver-guided road vehicles for smaller quantities. In the future individual-user small road vehicles will continue to be used, at least for access to transport hubs. As population rises within-city transport of people becomes a bulk business and is likely to be used increasingly, whether by bus or light rail systems. See below.

ENERGY - In the early days the stored-energy source was wood (and chaff!), replaced by coal and liquid fuels. Electricity has become increasingly important, but there are still storage difficulties, actively being solved. In the past 50 years battery systems have become around a hundred times as energy intensive than they were. In the future electric and hybrid systems will become dominant, with regenerative and storage systems used much more. Greater use will be made of energy extraction by the use of temperature differentials and other developing technologies.

ECONOMY - There has been a consistent pattern of government funding of major

transport infrastructure, of private and business users paying for fuel and vehicles depending on usage, and of local taxation (rates) paying for smaller works, planning and maintenance of the system. The transport-related proportion of the economy is not likely to change much.

### **Where does this lead the Regional Transport Strategy?**

**Light rail** – **even lighter**. If current trends in battery and hybrid power systems continue, then it would be sensible to consider a light rail system based on these. Already hybrid buses have proved their viability on the flat roads of Christchurch. If light rail cars carry their own motive energy store, then they don't need steel rails or overhead cables, dramatically reducing the installation cost. What's more the cars can have rubber wheels, and the rails can be constructed of concrete. This will reduce construction cost, and also the cost of the vehicles required because of the smoothness of ride still obtainable with less precise engineering of track. In transitional situations, on growing routes, or at off peak times the same concrete route should be designed to be usable by conventional buses.

Even by 2042 the central area of Canterbury will have a population approaching 750,000. Rolleston and Rangiora may both be towns of 50,000. They will be prime ultimate destinations for light rail systems, with a travel time of around 30 minutes from the city, and 40 minutes from each other via a western route. This may mean the construction of a new bridge across the Waimakariri from the Eyreton area through the western end of Coutts Island and via West Melton to Rolleston. Without a light rail system these towns will generate unmanageable traffic flows in and out of the City. Think of Auckland! But Christchurch is flat, meaning that the expensive tunnelling and bridging that would be required for light rail in Auckland wouldn't be needed here.

### **Several actions are required now.**

- 1) Research and possibly development of suitable power systems and vehicles for a super-light rail system, using stored electric regenerative and/or hybrid power systems. Additional battery charging could happen automatically at passenger stops.
- 2) Work needs to be done towards identification and possible protection of key land required for such a system. Initial steps would include amendments to railway and road legislation allowing and requiring land to be made available if required. Other steps would include identifying suitable 'park and ride' bases at Rolleston and Rangiora.
- 3) Research needs to be done on possible routes from the central city to the University and airport, and to Rangiora and Rolleston, and between those points. In many cases road and railway reserves will be available, but more land may be required, including extra width at some places where light rail will cross major roads so that 'divided grade' intersections can be constructed. In some places pedestrian and cycle under or over-passes will be needed where they cross light rail routes. This should be taken into account in planning new cycle and pedestrian routes.

4) New road buses ordered and likely to still be in service when light rail becomes operational should be compatible with it in aspects such as ground clearance and step height.

5) Bylaws and possibly laws will be required to give vehicles using the light rail routes right of way at road and other crossings.

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