Heathcote - Gateway to the World

By Barrie Woods

Things could have been very different in our part of the city. In the early 1930s, when the authorities were looking for a suitable site for a commercial airport for Christchurch, one seriously considered plan was to reclaim land in the estuary and flatten the sand hills towards Bromley. Remarkably there was quite strong support from some locals including Cr C Flavell of the Heathcote County Council. This plan would have seen not only a land runway, but also a seaport for seaplanes. The availability of cheap land and the proximity to the city were seen as favourable factors, as well as close access to fuel from the nearby port. However, in the end the current location at Harewood was selected. Thank goodness, you may well say!

Since the early days of course, Heathcote has been an entry point to the city. First with the Bridle Path and the ferry wharves at Ferrymead, and then soon after with the railway tunnel. Perhaps it should therefore come as no surprise that Heathcote was selected as the location for the city-side portal of a new road tunnel. However, there is a lengthy and convoluted story, spanning 110 years, about how that came about.

Way back in 1851 a Select Committee was formed to investigate the best way for the new residents of Christchurch and farmers on the Canterbury Plains to access the sea (for transport rather than swimming). There was a suggestion of a tunnel under the Port Hills which was seriously considered and rejected, one reason being that horses would catch cold coming from the hot plains into a cold tunnel. To me this sounds like an urban myth, except it is recorded in the official papers of the day. I can only assume the people of that era knew much more about the sensitivities of horses than most people today, especially me.

Rather than building a tunnel, it was agreed to construct a road to reach the city via Evans Pass and Sumner. The route however turned out to be impractical for transport of heavy goods via wagons, which instead had to be taken from Lyttelton via ferry to Ferrymead. Before long however, a tunnel was dug though the hill, but for the new railway rather than road traffic. This was effective in facilitating the transport of goods to and from the port, but as the province grew it soon became limited in its capacity.

Before long two more road routes were built between the harbour and the plains: Dyers Pass to access the city and Gebbies Pass to access the plains to the south. Both are steep routes and were difficult to traverse in icy or wet conditions during winter. Remember roads were not sealed back in those days. Consequently, there continued to be pressure to find a more efficient way to transport not only goods but people between the port and plains, especially after the introduction of motor vehicles.

For a long time there had been efforts and plans to improve sea access for ships to the Avon and Heathcote rivers. You may have heard of the ‘canal reserves’ which were intended to provide navigable waterways as well as draining the swamps upon which the city was being built. Work was started on one of these ‘canals’ which you can still see along the Humphrey’s Drive end of Linwood Ave. If work had continued it would have joined the Avon River at the other end of Linwood Ave, or another variation on this plan would have seen a dock established in Woolston.

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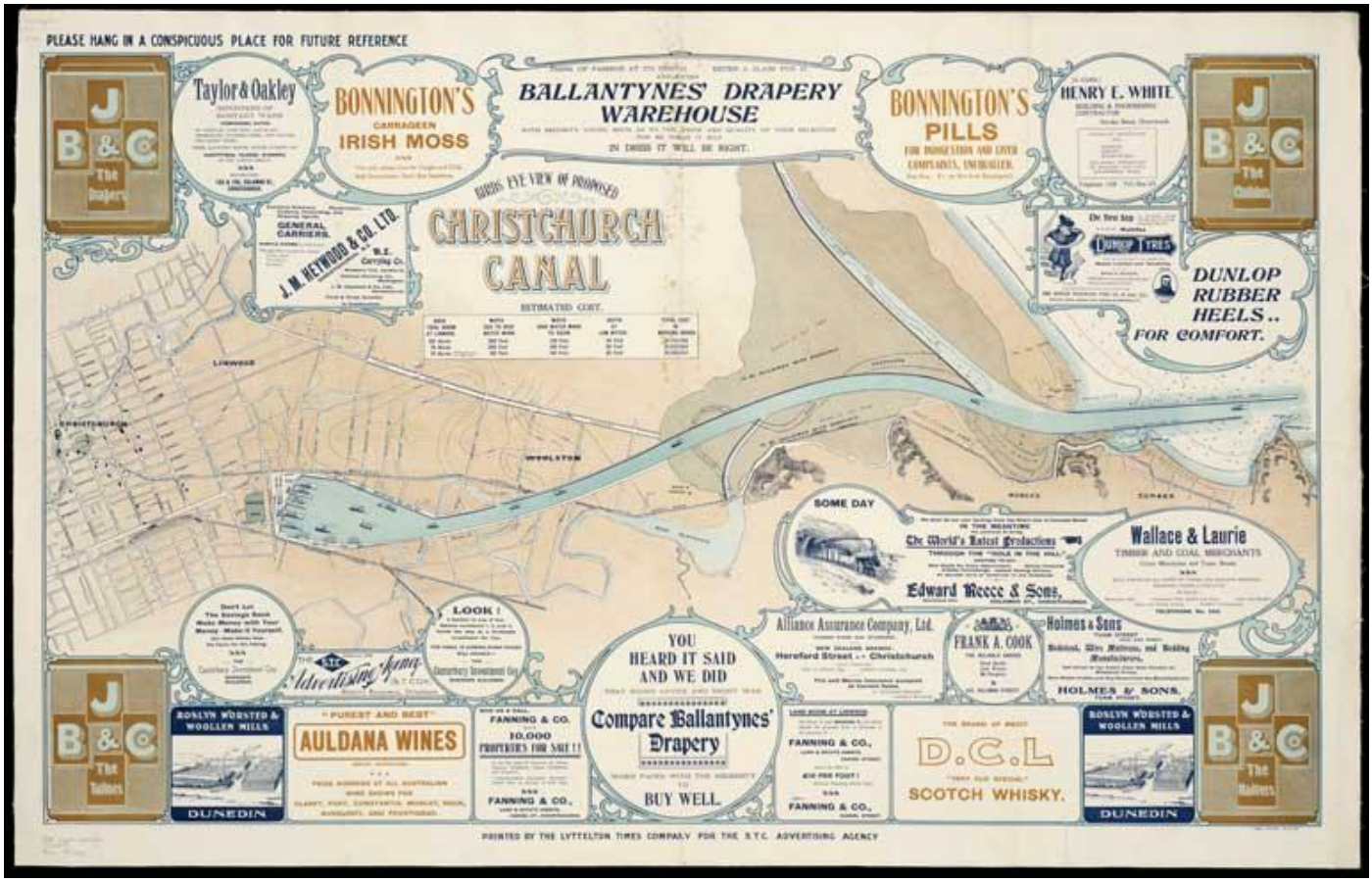

Birds eye view of proposed Christchurch Canal, Lyttelton Times Company for the S.T.C. Advertising Agency, [1906]

Around 1922 the Christchurch-Lyttelton Tunnel Road League was established to push for the building of a road tunnel. At the same time another organisation, the Port Christchurch League, advocated for the development of a seaport in Christchurch, within the Avon Heathcote estuary. The two organisations each pushed their own agendas, selling the merits of their respective plans and exposing the follies of the opposing side. Public opinion swung between the two options and the newspapers were kept busy for more than a decade.

These days we tend to forget that, in days gone by, Ferrymead used to be a busy little port in its own right. There were plans to expand its capacity by dredging the estuary and river, and also the sand bar at Sumner to allow access by larger ships. Had the Port Christchurch League got its way (and this was a very real possibility at the time), we may well have been living alongside a busy port as well as an airport! I expect the city would have taken a very different shape had either or both these proposals proceeded.

In the 1930s the Canterbury Chamber of Commerce also began to campaign for a road tunnel. They were successful in getting the ear of Prime Minister Michael Savage and eventually convinced the government to allow the Ministry of Works to draw up concept plans. At that time, it took an average of eight days for freight arriving at Lyttleton to reach Christchurch and there was often no space at Lyttelton to store arriving goods, so it would need to be held in the railway yards in Christchurch. The port facilities were constantly backed up due to the limited capacity of the road and rail links, and perishable goods would often spoil, so there was clearly a need for better transport to facilitate trade.

Despite hold ups due to the Second World War, in 1943 the Minister of Works, Bob Semple, met with proponents of both the tunnel and the Port Christchurch proposals so both schemes could be

considered. He deemed that the port scheme, estimated to cost £5,000,000, had no hope of success, but was favourably impressed by the tunnel scheme, which was, at that time, estimated to cost a mere £750,000.

There was little more progress until 1953, when Prime Minister Sidney Holland, also MP for Fendalton, sponsored the Christchurch-Lyttelton Road Tunnel Bill in Parliament. This was eventually passed in October 1956, and led to the establishment of the Road Tunnel Authority, to construct and control a new road tunnel.

The Ministry of Works was appointed to design the project in conjunction with the Civil Engineering Department of Canterbury University. They estimated the cost to now be around £2.515 million, somewhat more than pre-war estimates. The tunnel itself was proposed to be 37ft (11m) in width, which included a roadway of 24ft (7.3m), and a 5ft 6in (1.68m) cycleway along each side. The cycle tracks contributed around £500,000 to the cost and needed to be dropped from the final design to contain costs within an acceptable budget.

It was proposed that the new tunnel would be paid for by means of a loan, which would be repaid from tolls charged to users of the tunnel. In 1959 the Road Tunnel Authority applied to the Local Authorities Loans Board but was turned down. The reason given was that there would be insufficient freight moving through the tunnel in its early years to generate enough revenue to service the loan. They obviously had an accountant on their team.

At the same time there were plans to extend the harbour facilities in Lyttelton, but they were not yet finalised. After a deputation from the Road Tunnel Authority to the Prime Minister, Walter Nash, and the Minister of Finance, Arnold Nordmyer, agreement was reached that a loan could be raised on the condition that the tunnel would not be completed prior to the harbour upgrades. The government would guarantee the loan as it was seen as essential overcome the ongoing problems with accessing sea transport in and out of Canterbury.

By the time final designs and specification were completed in 1960 the estimated cost had risen to £3,500,000. In January 1961 tenders were received from seven bidders, with the successful party being a 60/40 joint venture between New Zealand-owned Fletcher Construction and Kaiser Engineers and Constructors from the USA.

Work on the tunnel began in August 1961, though it was not until a month later, on 9 September, that the official ceremony was held to acknowledge the start of the project.

Not without controversy

The idea of a road tunnel to Lyttelton had been mooted for decades, but when plans were finally approved they were not popular with everyone, particularly many Heathcote locals.

The preferred route had always been via Heathcote Valley, mostly because the railway tunnel was already there and the geology of the hills was well understood, but alternatives were suggested and considered. One route would have gone from around the Cracroft area, through to Governor's Bay. This would have provided a direct route from the Canterbury Plains and would have been readily accessible from the industrial areas in and around Hornby. Another route would have been slightly west of Heathcote, from Bowenvale to Rapaki, but there were no particular advantages over the Heathcote route. Both alternatives would have been more difficult in terms of property ownership as access roads would need to go through established residential areas, and so were unpopular choices.

The Heathcote route, perhaps through good town planning, or maybe by chance, would have the least impact on residential ownership as most off

the land needed for the Tunnel Road had a rural zoning. A Gazette notice authorising the construction of a motorway to the proposed Heathcote portal was issued as early as 1949 with a survey of the land requirements being completed in 1952. At the Lyttleton portal several houses needed to be demolished, but they were mostly older places which had been earmarked for the route for a very long time.

At the Heathcote end, residents lobbied for an underpass from the north tunnel portal through to Bridle Path Road and were successful in having this added to the plan. Horotane Valley landowners were unhappy about access to their properties and also needed to lobby for plan changes. There was quite a bit of talk amongst Heathcote residents about disruptions due to road works and increased traffic noise. These concerns were not unfounded and certainly the latter causes a level of angst even today, particularly with heavy vehicles grinding up the hill, or using engine brakes on the way down. This problem has only increased over the years with increased traffic and heavier vehicles.

Cycle access has also been a concern since the beginning. There was no strong lobby group for cycling at the time, so travel by pedal-power was not given much priority. Perhaps it was a pity that the cycleways through the tunnel were dropped from the final plans but maybe including them could have caused safety issues with the high levels of traffic the tunnel carries today. Also, cycles were not well considered in the design of Tunnel Road. Not just with cyclists not being permitted on the road itself, but also the narrow passages under the overpass that must be shared with heavy vehicles. The more recent changes to move cyclists to the footpath have been largely unsuccessful as most still take the easy route on the road, much to the annoyance of many a truck driver with enough else to keep eyes on.

Construction

Construction of the tunnel started on 9 September 1961. Although this was the official date some work had already been under way for at least a month with some 55m having been excavated.

Often, tunnel construction is undertaken from both ends simultaneously so faster progress can be made, however the Lyttelton tunnel was worked from the Heathcote end only. In total around 150,000 cubic metres of rock was removed from the tunnel workings and this was used in building Tunnel Road.

Work at the tunnel entrance, Winter 1961

Work progressed at around 7.1m per day. Tunnellers worked three shifts each day for six days per week Their basic wage was 7s 2d per hour. Work was mostly carried out using explosives and light machinery. No petrol driven equipment could be used and diesel machinery had to be fitted with exhaust scrubbers. There were no giant tunnel boring machines such as would be used today.

Dust from the explosives and manual work at the face was a problem and when tunnelling was about 60% complete there were issues with effective ventilation which hindered work. To

solve the problem a small ventilation bore was put through to the Lyttleton portal and with additional fans this seems to have been effective.

Removing spoil from the working face. Note the ventilation drive at the top of the tunnel.

The tunnel is supported by steel mesh and sprayed concrete for most of its length. In some places steel support frameworks were needed and in other areas rock bolts were used. In total some 1400 rock bolts were used.

Steel support frameworks were used to support areas of unstable rock.

Forms being used to place the concrete lining along the walls.

Excavation was completed on 18 August 1962, on time and on budget. Once this stage was complete work moved to finishing the interior of the tunnel.

Tunnel interior showing the ventilation shafts above the roadway.

The tunnel is lined with reinforced concrete which is overlaid with ceramic tiles. The concrete was supplied by Certified Concrete Ltd. from a mixing plant set up on a temporary rail siding. The sand, shingle and cement required for the concrete arrived by rail. In all, 35,405 cubic metres of concrete were placed in the tunnel and another 3,440 cubic metres was used on works outside the tunnel.

Above the ceiling of the tunnel are ventilation shafts which are used to remove exhaust fumes and supply fresh air. Services such as water, electricity and more recently sewerage from the harbour area, are carried through the ventilation shafts.

Preparing the ceramic tiles on the ceiling panels.

Lining the tunnel walls with 1,2500,000 glazed white ceramic tiles made in the NZ Insulators factory in Temuka, and another 250,000 yellow roof tiles imported from England, took longer than the groundworks to create the tunnel itself. These tiles were all positioned by hand and fastened using a newly invented epoxy glue made specially for the task by one of the Fletcher subsidiaries. The tiles were chosen over painted concrete to reduce the cost of long-term maintenance. A white, non-reflective glaze was needed for good visibility inside the tunnel. Incidentally, you may have noticed the tunnel curves slightly at each end, which is a design feature to aid vision adjustment when entering and exiting the tunnel. For the same reason the lighting also changes in intensity depending on the time of day or night. Also, in case you hadn't noticed, the tunnel slopes downwards towards Lyttelton, with a fall of 1 in 38. Be careful not to speed when heading south!

When it opened the tunnel was equipped with advanced technology for the day, including

The control room at the time the tunnel opened in 1964.

carbon monoxide monitors, air visibility detectors, ventilation controls, lighting controls, traffic lights, fire extinguishers, and emergency telephones and backup generators. Monitoring of the tunnel was done from a control room at the Heathcote end. No doubt there is even more advanced technology in use today and in recent years fire deluge systems and warning alarms have been installed. Tunnel Control can even broadcast advisory messages onto your car radio!

The tunnel was originally operated by the Road Tunnel Authority. The staff, who were responsible for traffic control, toll collection and emergency response, were employed by the authority, but they were also warranted traffic officers. That meant they could give drivers a ticket for traffic offences, some of which, such as following distances and carrying of dangerous goods, were unique to the tunnel. Their jurisdiction also covered all of Tunnel Road.

When it opened a toll of two shillings and sixpence was charged for a motor car, and one shilling for a motorcycle. Busses and trucks paid more depending on their size. Tolls were collected at booths at the Heathcote portal and needed to be paid in cash. The tolls were used to finance the construction of the tunnel and it was predicted it would take fifty-four years to pay off the loans. The tolls were scrapped in 1979, fifteen years

after the tunnel opened but I haven't been able to find out if the loans were repaid early, though this date corresponds with the dissolution of the Tunnel Road Authority. Being old enough to have paid the tolls, I remember the booth operators much preferred you to have the correct change and would grumble if you handed over a large note.

On 23 February 1964 the tunnel, which had come in under budget at £2.7 million, was opened for pedestrians to experience walking along its gleaming length. The official opening ceremonies on 27 February began with the arrival of the Governor General Brigadier Sir Bernard Ferguson announced by a fanfare of trumpets. The elaborate welcome was followed by addresses by Prime Minister Keith Holyoake and other dignitaries. Afternoon tea was then held at the Upham Memorial Garden, with the Lyttelton Marine Band playing the march "Lyttelton", composed especially for the occasion.

The toll booths with the tunnel control building award-winning tunnel administration building on the left. Architect Peter Beaven took inspiration from ships at berth in his design .

10,000 vehicles christened the tunnel free of toll charges on that day, with the queue to enter the tunnel from the city side stretching all the way to Moorhouse Avenue.

Today the tunnel is operated by Waka Kotahi and carries around 11,000 vehicles each day. It was originally designed for a capacity of 2,400 vehicles, so it now carries more than four times that number. Up until 2017 the Lyttelton Road Tunnel was the longest road tunnel in the country at 1,970 metres, but the Waterview Tunnel in Auckland now holds the record. The tunnel itself stood up well to the Christchurch earthquakes in 2010 and 2011 with minimal damage. However, the canopy which used to cover the toll booths, and the control building were extensively damaged. A new control building was opened in 2014. Though the sixty-year -old tiles may no longer be quite as sparkly white as they once were, the tunnel is expected to serve us well for many more years to come.

This year, on 27 February, marked sixty years since the Lyttelton Road Tunnel was officially opened.