THEME II : INFRASTRUCTURE

Chapter 3: Transport

Between city and port

Though close to the sea, Christchurch is an inland city and (unlike New Zealand's other three 'main centres') is separated from the port at which its first European settlers arrived and through which flowed the exports and imports that were the lifeblood of Christchurch industry and commerce.

The first transport 'problem' that had to be solved if Christchurch was to thrive was access to the port, Lyttelton, from the city. Captain Thomas had begun to form the Sumner Road to provide a route for wheeled traffic from Lyttelton to Christchurch before the Association settlers arrived, but had been forced to suspend work when money ran out. With the arrival of the Association settlers imminent, he had a track formed over the hills immediately behind Lyttelton to Heathcote. It was called a Bridle Path and was negotiable by horses, but most of the settlers walked and sent their heavy baggage round to Christchurch by sea, that is in boats small enough to cross the Sumner bar and navigate the shallow Estuary and Avon and Heathcote Rivers. The Avon was navigable – just – as far as 'The Bricks' by the Barbadoes Street bridge. (The site is marked by a riverbank cairn.) Most freight was taken up the lower Heathcote to the Ferrymead, Steam (about where the Tunnel Road crosses the Heathcote) or Christchurch (by the Radley bridge) wharves. There was a regular service by steamer from Lyttelton to Ferrymead by at least 1858. Evidence remains at Ferrymead of this use of the lower Heathcote.

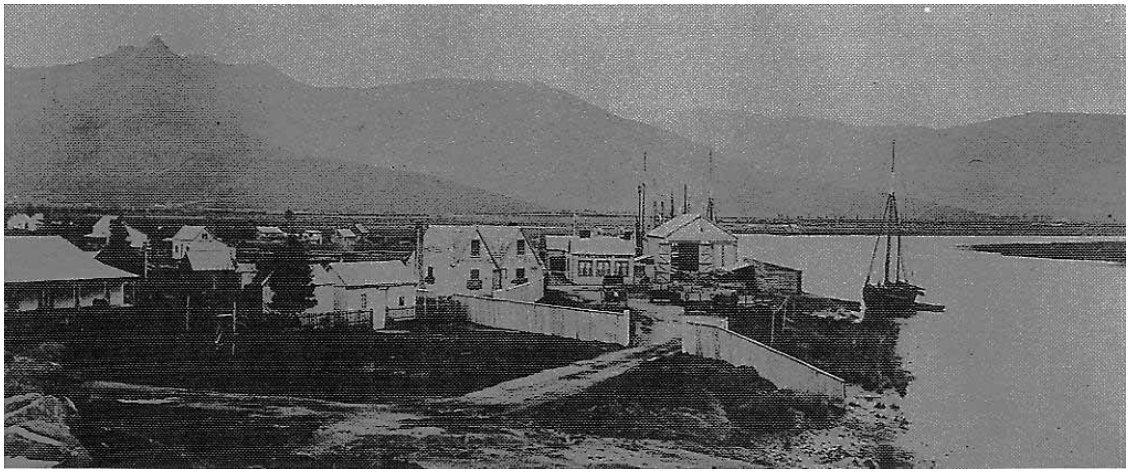

Figure 6. Detail from W.T.L. Travers' photograph of Ferrymead Wharf, 1863. The gabled Ferrymead Hotel (centre) still survives, though much altered. Nothing else is left, apart from some wharf piles. This was Christchurch's main port of entry for heavy goods until the opening of the Lyttelton rail tunnel. *Auckland Art Gallery/Toi o Tamaki*

The Rapaki Track was also used to cross the Port Hills between Lyttelton and Christchurch. The Sumner Road was completed in 1858, but the notorious zig-zag near the top of Evans Pass, on the Lyttelton side, was not eliminated until 1920.

Figure 7. The portal of the Lyttelton rail tunnel during construction, in February 1867. Edward Dobson, Provincial Engineer, is the figure with the white top hat, centre right. The rail link made Lyttelton a suburb of Christchurch and became the economic lifeline of Canterbury Province. *D. L. Mundy photograph, CM 9200*

The practice of bringing goods round from Lyttelton by boat into the lower Heathcote contributed to the construction of Christchurch's (and New Zealand's) first public steam railway. The line from the South Belt to Ferrymead was opened in 1863. It became largely redundant with the opening of the Lyttelton rail tunnel in 1867 and was finally closed in 1877.

The solution to the problem of linking Christchurch to its port, of constructing a rail tunnel beneath the Port Hills, was a bold one for a small colonial society. The tunnel was one of the most significant achievements of early New Zealand engineering. It was the first tunnel in the world through the wall of an extinct volcano, New Zealand's first rail tunnel and for many years its longest. Construction began in July 1861 and the tunnel was opened in December 1867. The tunnel eliminated the need to use small vessels coming into the Estuary to get goods to and from Lyttelton. The line through the tunnel, for its full length from Christchurch to Lyttelton, was electrified in 1928. After diesel replaced steam locomotives, the electric engines were eventually replaced by diesel.

The Estuary, however, continued to figure in the story of port facilities serving Christchurch until the 20th century. Some were sure the difficulties of access between Christchurch and Lyttelton and the shortcomings of Lyttelton as a port could best be overcome not by improving facilities at Lyttelton and upgrading transport links between city and port but by creating a 'Port of Christchurch', by dredging the Estuary and building a new port.

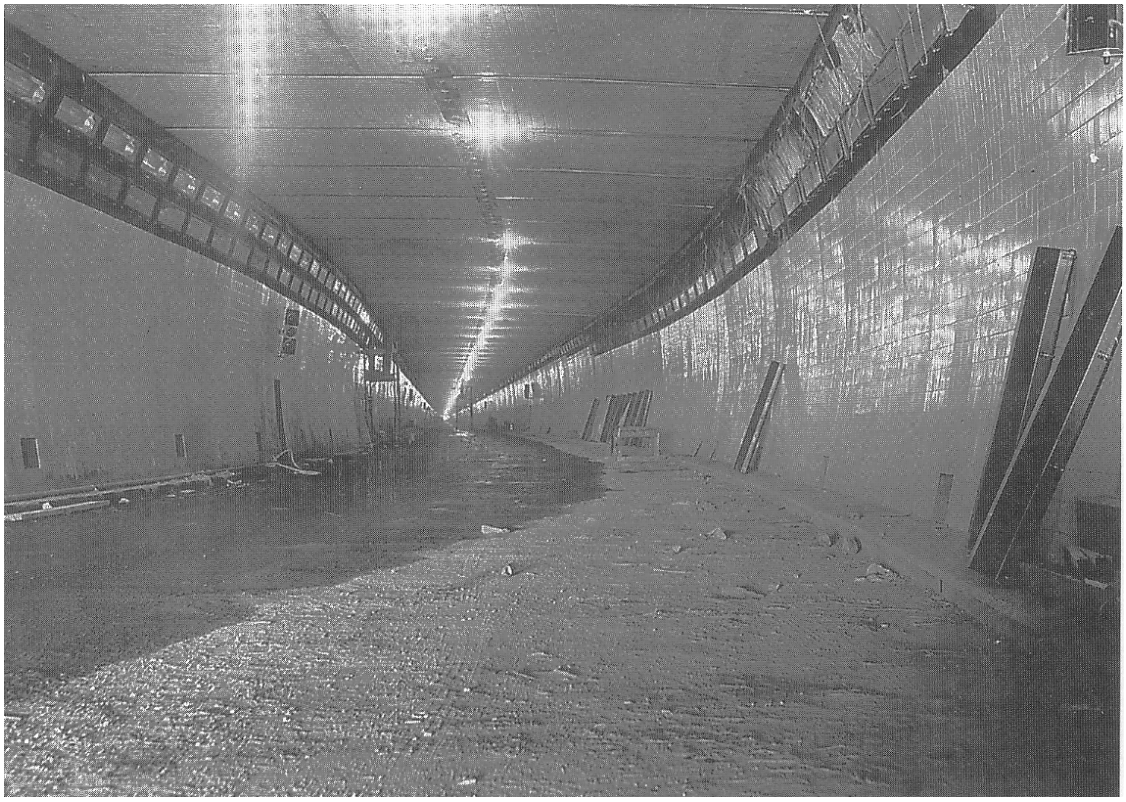

Figure 8. Road tunnel to Lyttelton nearing completion. Opened on 27 February 1964, it was designed as a toll tunnel (New Zealand's longest) but became toll-free in 1979. *Christchurch Star*

The proponents of this scheme continued to press their case into the early years of the 20th century.

The last chapters in the story of access between Christchurch and Lyttelton were not written until the second half of the 20th century. The long-mooted road tunnel was finally opened in 1964. Prior to that an oil pipeline had been built over the Port Hills, along, roughly, the line of the Bridle Path, to a tank farm in Heathcote. Later a natural gas pipeline was built across the Port Hills, taking a route from Lyttelton to Rapaki then over the hills.

(Although Christchurch and Lyttelton are interdependent, economically and socially, the port has always come under a separate local body jurisdiction.)

When Christchurch was founded, canals were still an important part of Britain's transport system. A wide reserve for a canal was set aside running from the Estuary to the Avon at Avonside, above the river's lower meanders. This is the line of Linwood Avenue. Other canal reserves were also surveyed but no canal, however, was ever constructed. The excavated waterway down the canal reserve beside lower Linwood Avenue is a later stormwater drainage outlet.

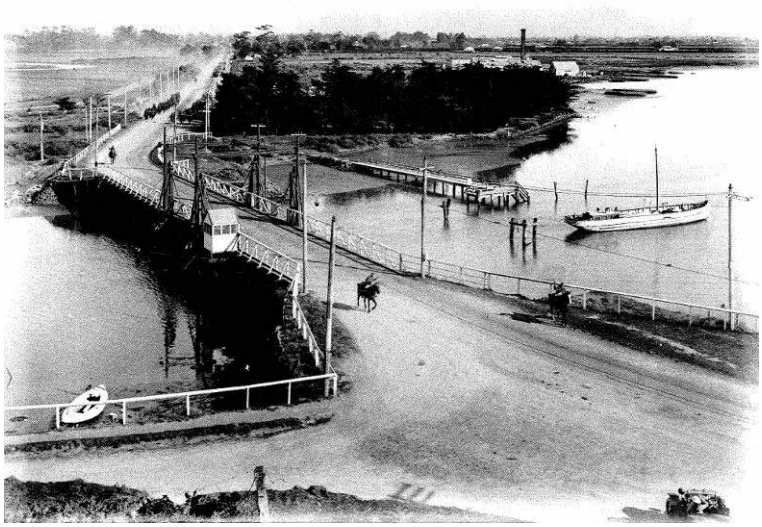

Figure 9. The lift bridge near Ferrymead, where the heathcole joins the Estuary. The bridge has been replaced. *J. Wilson Private collection*

Though canals were still in use in the Britain from which Christchurch's first large group of organised settlers came, by 1850 Britain was well into the railway age. The building of the lines to, first, Ferrymead and then Lyttelton was followed by the construction of railway lines to the south, west and north. These lines both linked Christchurch to its expanding farming hinterland and provided long-distance links between the city and other parts of New Zealand. The lines also served a limited role as commuter lines (see below) and played a role in the recreational lives of residents of Christchurch.

The line south (built initially on the wider provincial gauge) was completed to Selwyn by 1867, to Rakaia by 1873, to Ashburton by 1874, to Timaru by 1876 and provided a through route to Dunedin by 1878. The north line reached Rangiora by 1872 and Waipara by 1880. The north line was also built initially to the wider gauge as far north as Amberley. From Waipara the line was extended to Culverden and then Waiau, and to Parnassus, but the through route to Picton via Parnassus and Kaikoura was not completed until 1945. The line west (which left the south line at Rolleston) reached Springfield in the 1880s, but there was no through connection to the West Coast until the opening of the Otira Tunnel in 1923. Coal and timber came from the west; newspapers were sent west.

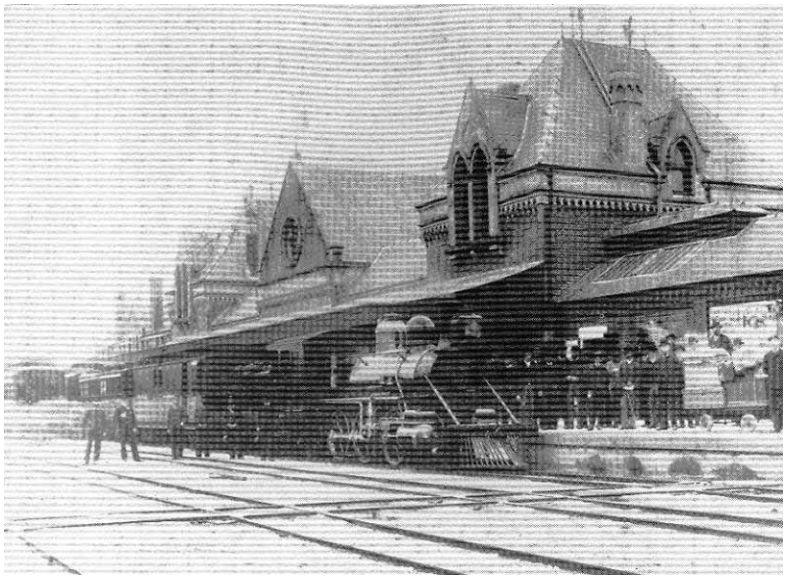

Figure 10. Canterbury citizens were justly proud of their rail station, opened on 21 December 1877.
Coutes K, A picture Book of old Canterbury, p80

The building of a South Island rail system centred on Christchurch helped cement the city's position as the economic and social 'capital' of at least Canterbury if not the entire central and southern South Island. The city acquired new rail stations in 1877 and again in 1960, the latter ironically just as passenger train travel was in near-terminal decline. Though a motor bus service to Timaru began in 1904, road challenged rail for passenger transport beyond Christchurch only after private cars became commonplace.

Figure11. New Railway Station, Moorhouse Avenue, 1960. It was designed in the thirties but construction was delayed by the war. The well-proportioned brick building was obsolete within a decade, as passengers deserted the railways for motor cars and air travel. It now houses Science Alive and a cinema complex. *Rice GW, p13, Christchurch Star*

Trains also played an important role in the working and social life of Christchurch itself. Although trains were used far less by Christchurch commuters than commuters in Auckland or, particularly, Wellington, commuter trains did run on the line to Lyttelton until 1972 and out to Rangiora on the north line until 1976 (though from 1967 there was only one return train per day). Until 1954, there was a station at the Riccarton Racecourse and race trains

were an alternative way of reaching the races to trams from the Square. The Addington racecourse and showgrounds were served by a station on the South line. Until travel by car became common, farmers and their families came into Christchurch by train for sale days (the saleyards were close to the Addington station) and to shop or for professional services. For many years, children travelled into Christchurch by train for their secondary schooling. Trains were used to escape the city. Excursion trains took hundreds of city people to Caroline Bay and Arthur's Pass. Firms and churches used trains for their annual picnics. At the time of the International Exhibition of 1906-07, a temporary railway line was built across Hagley Park from the north line to the exhibition site on the Park Terrace side of the park.

The main rail corridor – the line south and the line to Lyttelton forming a continuous through route – ran east to west across the southern side of the central city, with the city's station situated on this corridor, some distance from downtown. The line to the north left this through line at Addington; there was no direct through connection between the lines north and south until a new passenger station was built at Addington in 1993. The existence of this corridor had a significant effect on the physical development of Christchurch. Along the rail corridor were marshalling yards and goods sheds in the vicinity of the station, the Addington railway workshops to the west and the Linwood locomotive depot to the east.

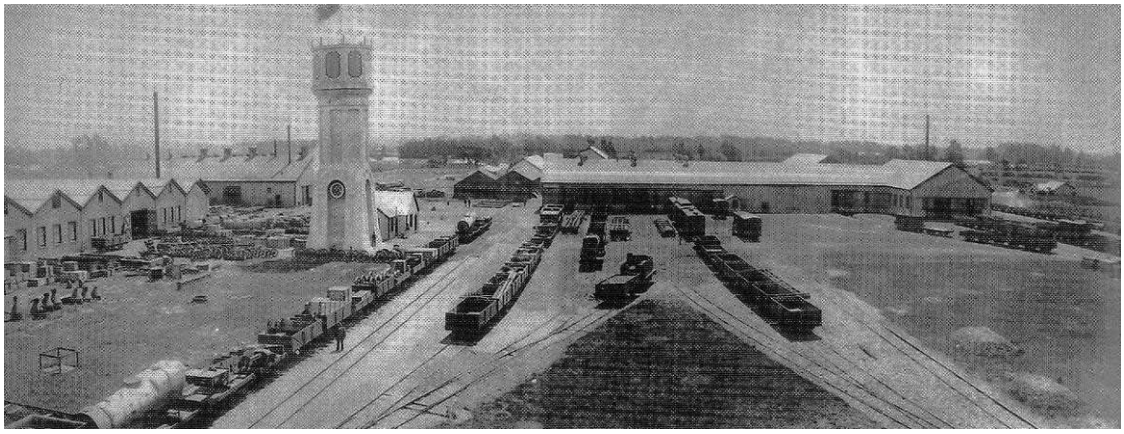

Figure 12. Addington Railway Workshops, soon after completion of the water tower (1883), one of New Zealand's earlist reinforced concrete structures. The workshops became one of the city's biggest employers in the late nineteenth century, and produced New Zealand's first locally designed steam locomotive (W192) in 1889. *French collection, CHAC/CM 931*

The building of the new railway station at Addington (on former railway workshops land, right next to the water tower which is the sole reminder that the workshops ever existed) and the transfer of all rail passenger services from the imposing station on Moorhouse Avenue was a striking physical reflection of the changes status of rail travel in the city.

The closure of the central city station and the Addington workshops and the consolidation of marshalling yards at Middleton, combined with the closure of the Addington saleyards, opened the way for zoning changes over large areas of ex-railway land along the main rail corridor in the central city and beyond. New business and residential development on the land vacated by the railways became possible.

The development of the rail corridor and the industrial and railway-related workshops, buildings and other structures (including the gasworks established in 1863) along the corridor had a profound impact on the structure of the city. As the rail network expanded an increasing population of workers settled nearby to the south of the station, to form the

district, later borough, of Sydenham. Industrial development occurred in Addington and Woolston, and Moorhouse Avenue became the centre of large stores and factories.
The remote location of the rail station from the central city was also the spur to the building of the first tram line, opened in 1880, which linked the station to the central city.

Road links out of Christchurch

Figure 13. Road construction, Sockburn. 1930s. *ATL collection*

As with railway lines, main roads leading north, west and south linked Christchurch to its agricultural hinterland. But until the mid 20th century these roads were less important than railway lines as links between Christchurch and other parts of the country. The roads to the south and west diverged at Upper Riccarton. (When St Peter's Church was built in the resulting gore, this junction became known as Church Corner.) Subsidiary routes to the south which tied outlying farming districts to the city led down Springs Road into the Ellesmere district and down Lincoln and Halswell Roads to Banks Peninsula.

The road north led out to Papanui where again two roads diverged. Harewood Road was an important access route to the Oxford district, by way of fords across the Waimakariri River. This ceased to be a main outlet when the Waimakariri was bridged between Belfast and Kaiapoi in 1858. The construction of that bridge ensured that the other of the roads which diverged at Papanui would become the 'Main North Road'.

This pattern of main road outlets from Christchurch was set early on and has been subject to only minor later modifications. A motorway was built from the northern side of Belfast when a pair of new bridges were built across the Waimakariri in the late 1960s as part of the northern motorway to bypass the bottleneck of the two-lane Waimakariri bridge. Congestion on Riccarton Road, which led to the main roads south and west, prompted the transformation of Blenheim Road, which ran parallel to Riccarton Road a little to the south, from a country lane running through farmland which was used as a stock route to a four-lane highway lined with commercial and industrial premises. This improvement of Blenheim Road, planned since the 1930s, was completed by 1957.

Long-distance bus services

Christchurch's position as the focus of main road routes in the central South Island made it a centre for long-distance bus services in the region. One local company, Days Motors, ran buses on medium-distance routes into the Ellesmere district and out to Darfield. Days Motors was eventually taken over by Midland Motors, which had services to places like Oxford, Lake Coleridge, Darfield, Springfield, Whitecliffs and Hororata. It also ran local services to Harewood and Burwood and to Templeton before the city bus services were extended into these areas. In 1952 the company introduced a service to Dunedin. Midland Motors also ran sight-seeing tours (notably along the Summit Road) and excursions (to many destinations, including Lake Ida for ice-skating in winter). The Midland Motors' later terminals were on Lichfield Street.

The other 'main player' in providing long-distance bus services was the Road Services of New Zealand Railways. Based for many years in a former motor showroom and workshop on Victoria Street (on the site now occupied by the casino), Road Services ran buses to Akaroa, the Coast, Hanmer, and on the main roads north and south. In the 1990s, most long-distance bus services were replaced by smaller, more flexible shuttle-bus services.

Other links to the rest of the country

Associated with railway lines as a link to the rest of the country was the inter-island ferry between Lyttelton and Wellington. A scheduled service began on the run in 1895 and continued until 1976. For the first two-thirds of the 20th century, the ferry was important in Christchurch life. It was the usual way by which people from Christchurch travelled to the North Island. People from the south and west generally travelled by train to Christchurch and on to Lyttelton to catch the ferry. This linkage gave Christchurch station an important place in the national transport system – and its dining room a 'captive' clientele as people waited for the boat train to take them to Lyttelton or the express to take them further south.

Air travel

The demise of the Lyttelton to Wellington ferry resulted from both improvements to main roads and increasing use of the private motor car and the growing popularity of air travel. Of Christchurch's two airports, Wigram was primarily an air force base and is discussed in chapter 29. The City Council decided to purchase land for a municipal airport at Harewood, north-west of the city, in 1935. Other sites, including one in Linwood, had been considered (with proximity to a rail station then considered desirable by some). The use of the Estuary as a sea-plane base was also discussed in the 1930s, but unlike Wellington and Auckland, sea-planes played no part in Christchurch's transport history. The following year, United Airways began inter-island air services. The airport was officially opened in 1940. Shortly afterwards, it was taken over by the government for the duration of the war as an air force base (see chapter 29). After the war, the airport reverted to civilian use and in 1950 was designated New Zealand's first international airport.

The most important step in the steady expansion of the airport was the replacement, in the 1960s, of the old wooden terminal building by a modern terminal designed by Paul Pascoe.

This terminal has subsequently been greatly extended. Burnside Road, leading to the airport, was upgraded in 1959 and renamed Memorial Avenue. The widening of Fendalton Road, completed in 2004, along with the earlier improvement for traffic of Hagley Avenue, gave Christchurch an attractive route from the airport right into the edge of the central city. The creation of such an entry route, from the airport to the north-western corner of Hagley Park was first planned by Waimairi County (later District) in the 1950s.

The era of horse transport within Christchurch

For the first 50 years of the city's life, the people of Christchurch walked, rode horses or rode in horse-drawn vehicles. (In the earliest years, while the roads remained particularly bad, bullock teams were also used for heavy haulage.) The hey-day of the horse lasted from approximately 1870 to 1910. A wide range of horse-drawn vehicles plied Christchurch streets. Some were for hire. A cab stand was established in front of the City Hotel, at the High Street 'triangle' in 1863; a year later eight licenses were issued under the new City Council's first Hackney Carriage Ordinance. A horse-drawn omnibus began running to Sumner in 1858.

Figure 14. Tram being pulled by horses. *Canterbury Museum 11524 (W.A. Kennedy collection)*

Keeping the horses fed was a major preoccupation of those who provided passenger and freight services using horse-drawn vehicles. Hagley Park and other open spaces in or close to the city were grazed and were sources of hay or wet grass which were taken to stables. Oats were grown on farms around Christchurch and cut to chaff which was transported in sacks.

Figure 15. Stirling bus, parked outside the railway station in Moorhouse Avenue with horse-drawn cabs in the forground. *Auckland Institude and Museum 1264 (H. Winkelmann)*

Many different sorts of buildings and structures were associated with reliance on horses for transport. They included stables (both public stables and smaller structures associated with private homes or hotels), the premises of horse traders (some of which were large buildings) and the premises of the saddlers, farriers and blacksmiths, which were the horse-age's equivalent of service stations and car workshops. Hitching posts were provided in front of public buildings and commercial premises. Horses were generally taken to drink or to be washed down in the Avon River at recognised watering places.

The early roads were poorly formed and surfaced – dusty in summer and muddy in winter. They generally lacked side-channelling. One of the first tasks the newly established City Council took up in 1862 was improving the city's streets, using horses and carts and wheel-barrows. Gravel was initially sourced from local pits for road surfacing. Levelling, especially the filling of gullies and depressions, contributed to the smoothing out of the original land surface of the city. Wooden culverts and stone gutters and kerbs were formed. Some use was made of rectangular cobbles to surface heavily used stretches of road. A council yard was established at the corner of Worcester Street and Oxford Terrace, where the statue of Captain Scott now stands. Later the council established a yard (with, initially, stables) on Montreal Street. Later again it moved its main yard to Milton Street in Sydenham.

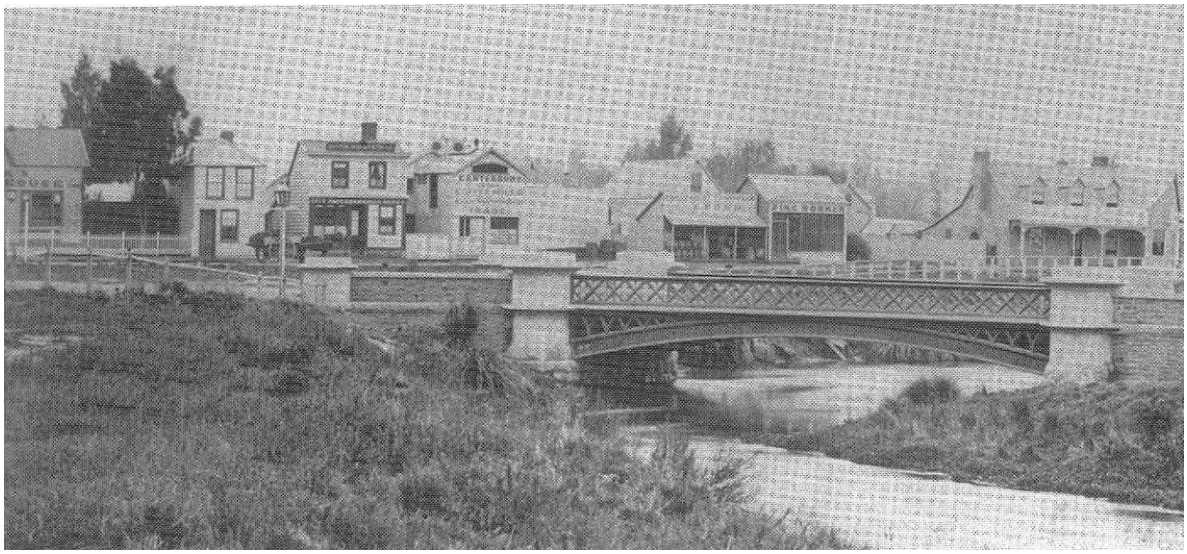

Figure16. The second Victoria Street bridge, 1865. Probably the earliest iron-and-stone bridge in New Zealand, it is now preserved as the Hamish Hay Bridge in Victoria Square. *Dr A.C. Barker photograph, CM41*

A particular problem Christchurch faced was bridging the rivers, particularly the Avon which flowed at an angle across the centre of the city. The necessary bridges were built through the 1850s and 1860s. A footbridge was built at Worcester Street in 1852 and the first cart bridge on the Whateley Road (now Victoria Street) in the north-western corner of Market Square in the same year. By 1862, there were also foot or one-way cart bridges at Armagh (west), Montreal, Hereford and Gloucester Streets and two-way cart bridges at Colombo and Manchester Streets. In 1864, the original wooden bridge on the Whateley Road was replaced by the city's first masonry and iron bridge. Subsequently, other early wooden bridges were replaced by either larger wooden bridges or masonry and steel structures. Later again, reinforced concrete bridges replaced the second-generation bridges at many of the crossings of the Avon.

Several bridges were also built across the Heathcote. The first two bridges at the river's mouth were a swing then a lift bridge (to allow for the passage of ships up the river).

Asphalt came into use, initially for footpaths, in the late 19th century. Some streets had been cobbled prior to the use of sealing. Stone was also used for edging streets and forming gutters. When concrete came into use for streets edging and guttering, a deep, dish-shaped gutter became the norm. Subsequently many of these deep gutters have been replaced by flat concrete gutters terminating in a low curb.

Trams and buses

The first ‘revolution’ in transport in Christchurch came with the construction of the city’s first tramways in the 1880s (Refer Map 10 and 10A). In 1880 itself, the Canterbury Tramway Company opened the first steam tram line between the Square and the railway station. By the year’s end the line ran between Sydenham and Papanui. In 1882 the first horse-drawn tram line opened. (Some trams remained steam-hauled, but horse power was cheaper on shorter, lightly used lines and to some extent supplanted steam power.) Tram lines reached Addington station and Woolston by 1882; by 1887 these lines had been extended to the Addington Showgrounds and Sumner respectively. New Brighton was linked to the city by tram by 1887, using the Corporation and New Brighton Tramway Company lines which met in Linwood. The Corporation line had been built out as far as the Linwood Cemetery, but a planned tramway hearse service did not ‘catch on’, although a tram hearse was built to run on it.Trams were used to carry rubbish out of the city along the Corporation Line. There was a tram service to North Beach by 1894.

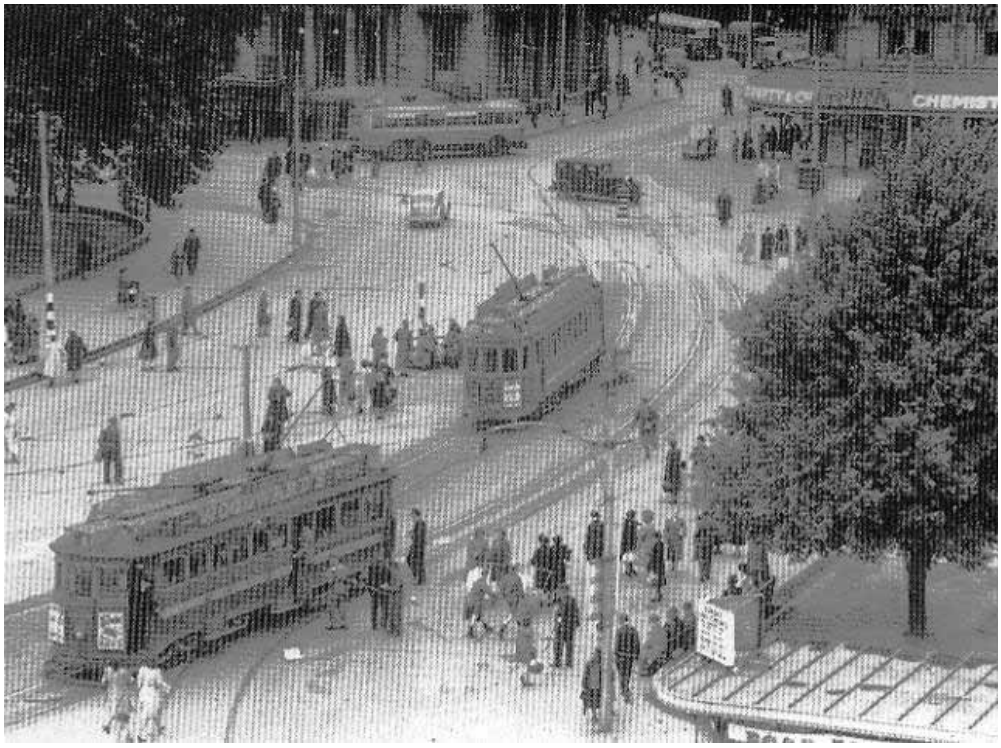

Figure 17 . Electric trams in Cathedral Square. c 1930s. *Canterbury Museum 12382*

After electric trams were introduced in 1905, the city’s tramway system grew significantly. But even these steam- and horse-drawn trams were important in the city’s development. Travel over some distance became affordable even to people of modest means. They could now live at greater distances from their places of work. The introduction of trams therefore spurred the peripheral residential growth of Christchurch. Local shopping centres developed at some train termini. But because the tram lines all radiated from the Square, they also had a centripetal effect.

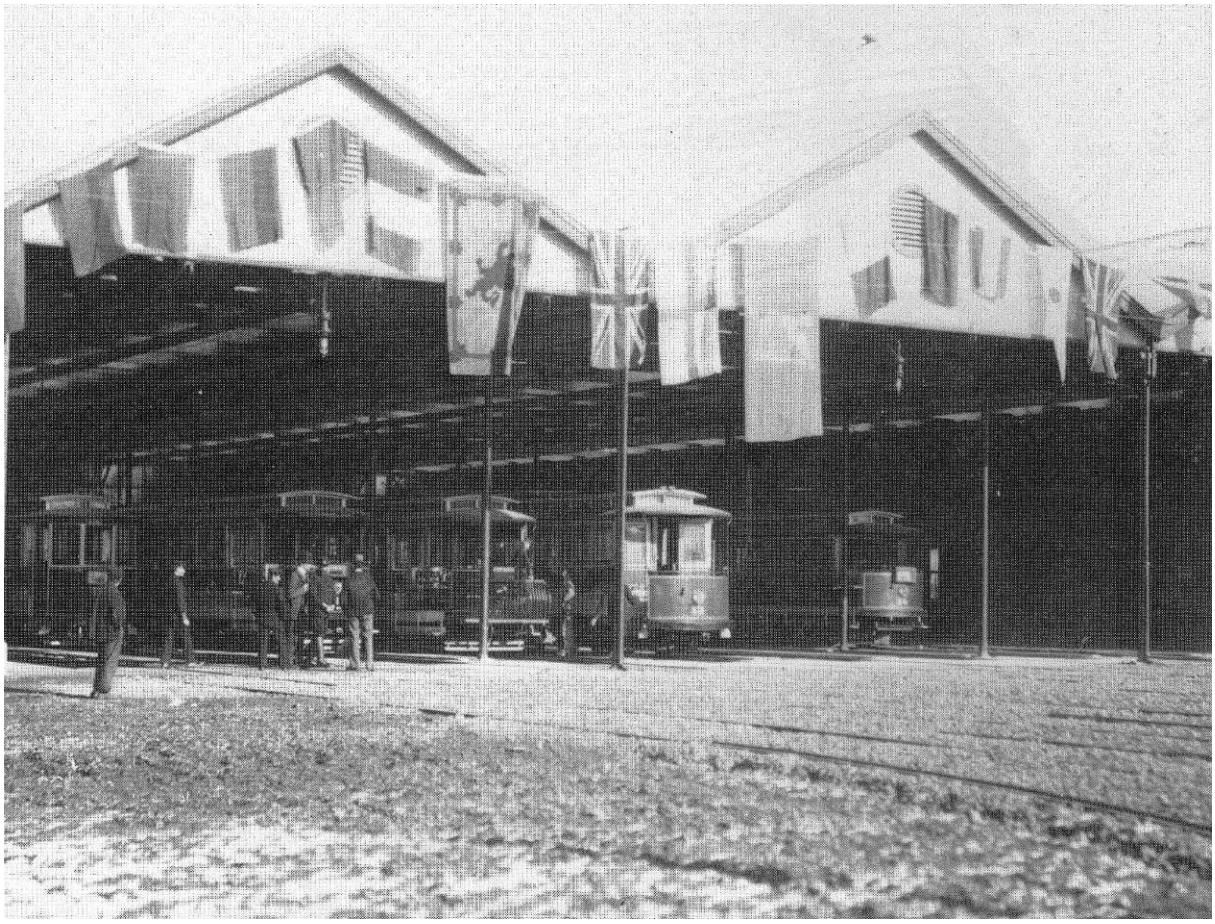

Figure 18. Christchurch's shiny electric trams began running on 5 June 1905. The tram in the centre has a front fender designed as a safety feature, because of the density of bicycle traffic. *Coutes K, p80*

It became easier to get into the central city for shopping and entertainment. Although the peripheral 'villages' and shopping centres along Ferry Road (Woolston), Colombo Street (Sydenham), Riccarton Road (Lower Riccarton) and Papanui Road (St Albans, now Merivale) and elsewhere in the city remained important, it is no accident that the years that trams were a key part of the city's transport system coincided with the years the central city drew its largest numbers of people from the suburbs, to work, shop or seek entertainment or other social diversions.

The establishment of the Christchurch Tramway Board in the first years of the 20th century led to the electrification of the old 'company' lines and the extension of the entire system. The Board built a large power station and car shed on Falsgrave Street (between the eastern end of Moorhouse Avenue and the railway corridor). The first electric trams ran on 5 June 1905. By 1914, the tramway system had reached its maximum extent – 53½ route miles. In addition to the termini reached in the horse and steam tram age, trams ran by that year to Riccarton, St Albans Park, Cranford Street, Spreydon, Fendalton, St Martins, Opawa, Northcote, Dallington and Cashmere Hills. The system was the largest in New Zealand, but because Christchurch was so dispersed and settled so lightly (it had a much lower population density than Auckland, Wellington or Dunedin, largely because of the abundance of flat land) the Board had to try to make the system pay with fewer passengers per route mile than other New Zealand tram systems. Nevertheless, between the wars only the bicycle competed with the tram as the way most people of Christchurch moved about the city. Tram shelters were erected along many routes and the tram shelter in the middle of the Square – where all the lines converged – became the subject of controversy.

Figure 19. Colombo Street, 1950. *Anon. 1950 Centennial Canterbury. (p21)*

The city had two trolley-bus lines, from the Square to Richmond and North Beach. The line to North Beach was discontinued in 1956.

The tram cars themselves were initially imported from Britain and the United States, but later a Christchurch firm, Boon and Co., manufactured cars for the city's system.

By the end of World War II, however, the tram system was badly run down and already facing competition from the private car. The Transport Board decided to scrap the trams and base the city's public transport system on diesel buses. The Board had begun using buses on some routes (to Bryndwr and Hornby and between central and south Brighton) in the 1920s. The last tram ran in 1954. Fifty years later, however, there are still some tram lines buried deep in some roads and they can be seen on the now pedestrianised Hamish Hay Bridge in Victoria square. The buses followed, generally, the same routes as the trams, though as the city expanded at its edges the routes to the north, west and south-west were extended steadily further and further out.

All the routes continued to run through the central city until 1999 when the Orbiter service was inaugurated to link suburban malls and other destinations so that those using public transport no longer had to travel into the inner city and out again to move perhaps just a short distance round the circumference of the city. Even after the inauguration of this service, the city's public transport system remained overwhelmingly radial, centred on downtown, although this no longer reflected the patterns of movement and living of most Christchurch residents who used their private cars rather than the buses. The Square retained its role as the central node of the public transport system, even after it was remodelled and partly pedestrianised in the early 1970s, until the bus transfer station was built on Lichfield Street. By 2001 all the main central city bus stops had been moved from the Square to the Bus Exchange. This significantly shifted much inner-city activity to the south in the very first years of the 21st century.

Although the old tram car shed and power station were demolished, the Transport Board maintained its presence in that south-eastern sector of the inner city by establishing its bus depot between Ferry Road and Moorhouse Avenue.

The bicycle

The bicycle has a special place in the history of Christchurch's transport system. The first velocipedes appeared in the late 1860s and the first safety bicycles in the 1880s. The first cycle track across Hagley Park was formed in 1897. Through the years between about 1900 and 1950 those Christchurch people who didn't take the tram to work probably biked if they didn't walk. People also biked to social events like dances, many parking their bikes in Crooks cycle storage facility, which used a token system to ensure people reclaimed the right machine. There were also cycle storage facilities at the main railway station. It was used by Lyttelton watersiders who lived in Christchurch, who would bike in to the station and take the train to Lyttelton. The station's cycle storage facilities were also used by trampers and mountaineers who used trains (the 5.30 p.m. Perishable and the early morning Press rail car as well as regular passenger services) to reach the mountains of Arthur's Pass National Park.

Figure 20. Before long the cycle became everyone's means of transport. *Canterbury Museum 10003 (Robinson collection)*

Figure 21. Kids on bikes! These boys are arriving at Elmwood School. *Alexander Turnbull Library 55162 1/2*

It was customary also for schoolchildren of all ages to bike to school and long bike sheds were a feature of all school grounds (with what happened 'behind the bike sheds' part of the child-lore of growing up in Christchurch). The city gained a reputation, which was probably correct, for having more bicycles per head of population than any other city in the world with the possible exception of Copenhagen. The popularity of cycling in Christchurch stemmed, of course, from the fact that the city is mostly flat, which means cycling is easy. The manufacture of bicycles was an important Christchurch industry. The last of the earlier cycle manufacturing enterprises closed in the 1950s, but in the late 1960s the manufacture of bicycles in the city was revived by Healings which was a significant city business for several years. The manufacture of bicycles in the city is also referred to in chapter 13. Bicycle repair shops were found throughout the city – every suburban shopping centre of any size had at least one 'bike shop' which sold new and second-hand bicycles but were primarily repair shops.

Cycle use went into steep decline with the proliferation of the private motor car (see below). In 1959 there were still 90,000 bicycles in the city, but it was noted that while children were still riding bikes to school, adults were increasingly using cars. By the end of the 20th century it had become commonplace for some parents to drive their children to school. Christchurch still has more cyclists (absolutely as well as in proportion to its population) than any other New Zealand city. Providing for cyclists has been a preoccupation of the City Council for two decades and defining cycle lanes on roads and building designated cycle paths is part of the Council's over-all transport strategy.

Figure 22. Mackie's Station Garage, 339-341 Moorhouse Avenue. *Alexander Turnbull Library 73994 ½*

The motor car first appeared in Christchurch in 1898. The Canterbury Automobile Association was formed in 1903 and in 1905 an 'auto gymkhana' was held at the Addington trotting grounds. Car numbers rose steadily but remained relatively low until after World War II, then expanded dramatically in the 1950s and 1960s. A network of small service stations appeared, most of them on corner sites and most with just two or three pumps on a small forecourt. In the earliest years petrol was provided from kerbside pumps often outside general stores. Petrol stations with initially small forecourts were a slightly later development. Between the wars, a few larger service stations were built, but into the 1960s and even later most city service stations were still relatively small, with just a handful of pumps and small repair shops attached. Specialist car repair shops also began to appear in the city between the wars. The city's first traffic lights were installed in 1930 at the corner of Colombo and Cashel Streets.

Figure 23. A typical petrol station of the sixties: the Ace Service Station, Sydenham, on the corner of Hastings and Colombo Streets. Port Hills in the background. *Stan McKay photograph, CM*

Most car firms established premises in the central city, often in substantial buildings newly built for the purpose. Somewhat later two further classes of buildings resulted from the increasing numbers of private motor cars in the city. The city council's first down-town parking building was constructed on the corner of Manchester and Gloucester Streets in 1965. Another early multi-level car parking development was the private one of Amuri Motors on the corner of Durham and Armagh Streets. Somewhat later there was a significant proliferation of new and used car yards on the southern side of the inner city, especially in the south-western sector. This was one way in which the increasing popularity of the private car, which had generally the effect of dispersing commercial activity away from the inner city (see below), contributed to the economic survival of the inner city (though not, in several cases, to the survival of its historic building stock). Vehicle testing stations were run for many years by local councils.

By 1959 of the 500,000 trips the people of Christchurch made each week-day, 40 per cent were by car, 10 per cent on foot, one-third by bicycle and only one-fifth by public transport. Making provision for people to journey to work by car became a key consideration for town-planners from the 1950s on. The increasing use of private cars also unshackled the need for residential developments to be at least relatively near a tram line or bus route. Areas between the older 'tramway' suburbs were filled in by new suburbs and suburban expansion began to spread well beyond the terminuses of the tram lines.

The improvement of the city's road network to cope with the increasing volume of vehicles took a particular course in Christchurch, similar to that taken in Dunedin but very different to that taken in Wellington and (particularly) Auckland. There were some minor improvements made as relief works during the depression, notably the widening of the causeway to Sumner to take road traffic and not just trams. A comprehensive motorway system was planned in the 1960s. The Regional Planning Authority released a master transportation plan in 1962 and an overseas expert reported on the city's traffic plans in 1965. The Christchurch City Council undertook a major strategic review of planning for the city's growth in 1966-67, including planning for the city's transport network.

Two major motorways, supported by expressways, were planned and were included in the 1972 Christchurch City Council planning scheme. However, only small parts of the proposed system were ever built, on the city's edges. One particular part of the proposed system – the 'road across the park' to link Fendalton Road with Salisbury Street and on to the northern motorway – aroused particularly strong opposition and influenced the 1971 mayoral election. The northern motorway was built from Belfast across the Waimakariri on new bridges and on the western side of Kaiapoi to Pines Corner. The first section of this motorway was opened in 1967. But plans to extend this motorway through St Albans to link with a motorway along the southern side of the inner city leading from Sockburn to Lyttelton were never implemented (though a large number of residential properties were bought with the motorway in mind).

Although the planned motorways mostly did not eventuate, the city's traffic problems were solved by a number of alternative solutions. A one-way system was introduced progressively from 1969 to 1973. It was designed to make journeys by car around and across the inner city quicker and was the first area traffic control scheme in New Zealand. In the inner city, rail overbridges were built over the rail corridor at Waltham Road, Colombo Street (in 1965) and Durham Street (in 1977). Further out, rail overbridges were built at each end of Blenheim Road. The first length of limited access motorway in the urban area was built in Addington in 1977. This was eventually linked through to the Brougham Street Expressway which became a major cross-town route.

With the lack of money available for major public works in the 1970s, some of the major transportation proposals of the 1960s were scaled back. However, transportation planning continued for a ring-road system around the city. The ring road concept was supported politically by the various Christchurch Councils in the 1980s, as a safe alternative to constructing major motorways through areas which included some of the city's mostly older housing stock. Around the city's periphery a number a new roads were built or existing roads upgraded to create the ring roads. A key part of this ring road concept, the southern arterial from Brougham Street to Curletts Road, was opened in 1981. A comparable expressway on the northern side of the city was not completed until the 1990s. The eastern expressway linking the Main North Road at St Bede's to Bexley, with a new bridge over the Avon River, was not completed until early in the 21st century, despite the Bexley Expressway having been included in the 1972 Christchurch City Planning Scheme.

These improvements reinforced the trend towards ever-greater reliance on the private car, which in turn contributed to the spectacular growth of suburban shopping malls one of the major attractions of which were the extensive areas of carparking they had available. (The significant changes in the patterns of retail shopping associated with the mutually reinforcing growth of car use and suburban malls is dealt with in chapter 14.)

The historic development of the city's roading network led to a number of localities becoming identified by a particular feature of the roads in the area. In the suburbs, the two best examples of this are the Papanui Roundabout and Church Corner (Upper Riccarton). In the central city, the southern entrance to Cathedral Square is still occasionally referred to as 'the Bottleneck', even though changes to the layout and traffic functions of the Square itself have meant that the congestion which characterised this short stretch of road no longer occurs.

Chapter 3: Transport
Comment and recommendations

General discussion

Maori trails and water routes laced the area on which Christchurch was later built, associated both with exploitation of the resources of the site itself and with travel between the pa at Kaiapoi and the settlements on Horomaka (Banks Peninsula), particularly Rapaki on the shore of Whakaraupo (Lyttelton Harbour), over the Port Hills from the area later occupied by Christchurch. The important early story in the European city's transport history was the creation of efficient and economic ways of moving people and goods between the port, Lyttelton, and the town, Christchurch. The construction of the Lyttelton rail tunnel (made possible by provincial land sales, based in turn on profits from wool shipped overseas) was an achievement not matched by other early New Zealand settlements. Later Christchurch became the focus of provincial and national transport networks, rail, road and air.

Within the city the early reliance on foot and horses had given way by the early years of the 20th century to the tram car and bicycle. In the second half of the century these in turn gave way the private motor car and residual public transport services provided by diesel buses. The story of transport within Christchurch follows a common New Zealand pattern, except for the abundance of bicycles in the city through the first half of the 20th century. Christchurch's local road network needed substantially more bridges than other New Zealand cities.

Relevant listings

Transport is one of the themes better represented than some others in the current listings.

For the early routes over the Port Hills and into the lower Heathcote and up the Avon there are: ***'The Bricks' memorial***, the ***Ferrymead wharf and railway embankment***, and ***Ferrymead House***. The later links between Lyttelton and Christchurch are represented by the ***Lyttelton rail tunnel portal*** and the ***Lyttelton road tunnel control building***.

Some of the now very few relics of the age when horses dominated transport in and beyond the city have been listed. They include: the ***Victoria Square watering ramp***, the ***horse auction (bazaar) building***, the ***Canterbury Club hitching post***, the ***saddlery building***, Upper Riccarton and the ***Daresbury stables***.

Rail transport is relatively poorly represented by the ***main railway station***, the ***Papanui railway station*** and the ***Addington workshops water tower***. (The Lyttelton rail tunnel portal is mentioned above.)

The single tramway-associated listing is the ***Redcliffs passenger shelter***.

Roading is represented by the ***Armagh Street kerbstones*** and by a number of ***bridges (Antigua Street, Armagh Street, the Bridge of Remembrance, Gloucester Street, Helmores***

Lane, Victoria Street and ***Colombo Street)***. The ***Halswell quarry*** was an important source of road metal.

There are several buildings associated with aviation at ***Wigram Aerodrome*** and also the ***Kingsford Smith landing plaque***.

The **Bell's *Motorworks building*** on Lichfield Street is the only listing which has even a tenuous connection to the early development of private motor car transport in the city.

Further possible listings

The ***footings of the former ferry crossings on the Heathcote River***, close to its outlet into the estuary, should be listed.

The ***lines of the proposed but never built canals*** and the ***Carlton Mill Road towpath*** may need formal identification in some way.

The **women's memorial and other features on the Bridle Path, and the formation itself**, have not been listed. Other **early road and track formations** such as Captain Thomas's track at Evans Pass and the Rapaki Track should possibly be listed.

There may be (several or many?) more ***buildings and other relics associated with horse transport*** (including private stables at surviving larger houses) that could be listed.

Possible structures for listing associated with the past dominance of ***bicycles*** in Christchurch need to be identified (e.g. any surviving school bicycle sheds).

The ***sites of the demolished suburban railway stations***, along the Lyttelton, north and south lines, should be examined for any remaining physical features of historic interest that could be listed. So should the site of the ***Linwood locomotive depot*** and the entire length of the 'railway corridor' from Linwood through to Middleton. The surviving ***railway goods sheds*** in the corridor, including those in Waltham and Sydenham, should be assessed.

The remaining evidence of the ***history of roads*** themselves, including relics of trams and early bus routes and of different eras of road formation and gutter styles should possibly be represented in listings (as a sequence on from the Armagh Street kerbstones).

The ***original Harthcote swing bridge*** was later located to Swanns Road in (1907, when the lift bridge was built) and later relocated again to Bowenvale where it still exists. Parts of the ***lift bridge*** are at Ferrymead and are being restored for re-erection on the tram line.

Nothing is so far listed that refers to ***the development of the motor age*** in Christchurch (except, perhaps the Bells Motorworks building). There may be some ***early service stations and car repair buildings*** remaining (in other uses) and the building on Colombo Street at the Strickland Street corner (in Beckenham) should be considered for listing. Representative ***early garages for cars on private properties*** should also be considered. The old ***vehicle testing station*** on Lichfield Street may warrant listing.

Nothing is listed which reflects the role of ***long-distance bus services*** centred on Christchurch. The sites of or remaining structures at ***the Midland terminals*** may still have relics or remains that could be considered for listing. The building on the corner of Cashel and Barbados Street which was the Mount Cook Company depot until the 1960s may need listing.

The early history of aviation is well represented by the various listings at Wigram but the lack of any listings at ***Christchurch Airport*** (including the Paul Pascoe terminal which won an New Zealand Institute of Architects A Gold Medal in 1960 and the remaining World War II era buildings) is an omission that should be addressed.

Bibliographic note

Section 5 of the annotated bibliography identifies the main sources of information about the city's transport history.

In the published work horse, tram and other rail transport is reasonably well covered, but the history of roading and the motor car is mostly only touched on in other general works or works on specific topics, such as Ince on the city's bridges, Lamb on the city's early government and the Avon River, and Smith on the history of the Halswell Quarry.

Further research

The focus of past research has been on trains and trams. There is a need for specifically Christchurch-related research on early (and later) motoring and aviation to establish a general historical framework for the identification of buildings, structures and sites that could be listed.

Chapter 4: Communications

Mail

Figure 24. Victorian Christchurch: solid, respectable and sunny, but struggling with the 'Long Depression'. View south-west from the Cathedral tower, 1885. The Torlesse Building is now dwarfed by the New Zealand Insurance Company building (1885) and the Post Office (1879). The latter, designed by W.H. Clayton in Venetian Gothic, is one of the city's most important nineteenth century public buildings. *F.A. Coxhead photograph, CM 182*

The first post office was opened in Christchurch in 1850s, in a wooden building on Market Square (when a number of public services were concentrated there). When the new Government Building on the Square was opened in 1879, the post office was just one of several government departments in the new building. It gradually squeezed the other departments out and had the building to itself after 1911, when the new Government Buildings on the opposite side of the Square was completed. The 1879 building then became known as the city's Chief Post Office and remained this until, with the reorganisation of the whole department, it moved out in the late 20th century. By 2004 one of the main tenants in the building was the city's visitor centre, serving the increasing numbers of overseas tourists visiting the city.

Two other important post-related buildings in the inner city are the High Street post office (now a video parlour), designed by the Public Works Department under J.T. Mair in the 1930s, and the Cecil Wood designed building on Hereford Street which was also used by the Post Office Savings Bank.

Construction of the other major postal structure in the inner city, the Postal Centre on Hereford Street in 1981, provoked considerable controversy because of its size and its expected effect on Hereford Street. It remains the city's main post handling facility.

An extensive network of suburban post offices played an important part in the city's life in the years the Post Office Department also ran the Post Office Savings Bank and the telephone system and acted as agent for many other government departments. The post

offices were often the ‘anchors’ of local suburban shopping and business centres. As an example, Sumner’s first post office opened in a shop in 1873; the government built a new post office building in 1901, then another new one in 1938.Another example is Woolston’s 1908 post office, which became a police station when a new post office was built nearby. After the old Post Office Department was ‘dismembered’ during the reforms of the 1980s, ‘post shops’ (often agencies run in conjunction with other businesses) replaced post offices. Some suburban post offices were demolished; others were put to new uses; a few remain dedicated post offices (though now described as post shops).

The Telegraph

Christchurch had the first telegraph system in New Zealand when the line between Christchurch and Lyttelton was opened in 1863. The telegraph system expanded rapidly through the 1860s. Christchurch, linked to Bluff and Nelson by the middle of 1866, became a key ‘node’ in the South Island’s telegraph system. Telegrams, sent via local post offices, were an important means of communication before telephones became common.

Figure 25. Edwardian Christchurch: Intersection of Lichfield (foreground), High and Manchester Streets, c. 1910. The Clock Tower was erected here in 1897 for Queen Victoria’s Diamond Jubilee, and moved to its presnt site in Victoria Street in 1930. *F. W. Dutch photograph, F. W. Harris collection, CHAC/CM 172*

Telephone

Telephone services began in Christchurch in 1879. The first exchange, with 30 subscribers, opened in 1881. It was housed in the Chief Post Office building on Cathedral Square. By 1902 there were 1,164 subscribers. As the telephone system expanded relatively large buildings by modern standards were required for exchanges. Exchanges were also built in the suburbs, for example the early large exchange on St Albans Street and later, post-World War

II, exchanges on Glandovey and Papanui Roads. In the central city a new exchange building was erected in the late 20th century immediately behind the Chief Post Office building in the Square.

The other physical change that the extension of telephone services brought was the proliferation of overhead telephone lines on poles. These telephone lines went in at about the same time power lines also began appearing on city streets. The Christchurch Beautifying Association began urging that these services be put underground in the 1920s. Both these services have since been put underground on most central city and a few suburban streets, but power and telephone poles and lines remain a feature of many suburban Christchurch streets.

Public telephone boxes of several different models were used through the years. In 1988, a ‘telephone box war’ erupted in Christchurch when the ‘Wizard of Christchurch’ took direct action when Telecom began painting the telephone boxes blue instead of the traditional red. The ‘Wizard’ won the battle but lost the war when the old boxes were shortly afterwards replaced by new steel and glass structures.

Recent developments

Christchurch people proved as ready as those in other New Zealand cities in using the internet. The proportion of the city’s population with access to the internet and worldwide web is about the same as in other New Zealand urban areas, but higher than in the country districts. Cell phone use in Christchurch is also at the average New Zealand urban level. The most obvious sign of this is the cell phone towers placed strategically around the city; one in Bryndwr is disguised as a clock tower.

The rapid advance of new information technologies had the same impact in Christchurch as in other New Zealand cities. It became much easier for businesses, large and small, to operate internationally. It also probably affected the decisions of some immigrants from such countries as the United States to consider settling in what might, in the absence of access to the new means of communication, have seemed a backwater, cut off from the main world centres of business and cultural life.

Chapter 4: Communications
Comment and recommendations

General discussion

The provision of post, telegraph and telephone services from the times each were introduced until the government and economic reforms of 1980s was dominated by the New Zealand Post Office. This means that the history of the provision of these services is illustrated mostly by post office-related buildings and structures. Christchurch (like New Zealand as a whole) has historically taken up technological innovations relatively rapidly and comprehensively but the survival of features associated with successive technologies has been purely by chance.

Relevant listings

The listed post office buildings (which are generally associated with mail, telegraph and telephone services) are the three main central city buildings – the former ***Chief Post Office*** in the Square, the ***Post Office building on Hereford Street*** and the former ***High Street Post Office***. Of the suburban post offices, the former ***Sydenham Post Office*** and the former ***Woolston Post Office*** have been listed.

The ***Victoria Square telephone box*** is the only public telephone box listed.

Further possible listings

A survey and assessment of the surviving **suburban post offices** and related structures (including the relatively large number no longer in post office use) would probably identify a number of buildings that should be listed to reflect fully the story of communication systems in Christchurch.

A similar survey and assessment of **telephone exchange buildings** of different ages around the city (for example in St Albans, Papanui, Bryndwr and Shirley) should also be a priority.

The possibility of listing some ***representative suburban overhead telephone lines*** and their supports should be considered. Key examples should be recognised and preserved, preferably as parts of groups of associated buildings and structures in a townscape setting.

Bibliographic note

There are many passing references to post, telegraph and telephone services in several general titles and (mainly in reference to suburban post offices) in histories of particular parts of the city. The international aspect of telecommunications is touched on in the history of The Press newspaper.

Further research

The physical extension of first the telegraph and then the telephone system in Christchurch and the role of telecommunication has played in the city's social and physical development have yet to be examined systematically. (Some international literature touches on the topic.)

Chapter 5: Utilities and Services

Drainage: Sewerage

Christchurch was located on a flat, low-lying, water-logged site that quickly created serious drainage problems. Initially most dwellings and business premises were served simply by cess pits. These quickly polluted the city's rivers and ground water. A night-soil collection system was introduced to remove human wastes from the city itself. The newly established City Council took over responsibility for night-soil collection soon after it was established in 1862. A night-soil reserve was created among sandhills in Linwood for disposal of the wastes. In 1864, the Council took steps to build a pipe system to carry away "sullage" (household waste water) but not night soil. The plan was, however, abandoned in 1866, though only after an expensive shipment of pipes had arrived from England.

The city's sewage disposal problems were only put in hand after a Drainage Board was established in 1875-76 (with responsibility for drainage over an area that included land administered by several territorial local authorities). After making investigations and having reports prepared, the new Board decided to build a system that would take both sullage and night soil. Between 1879 and 1882, the Board constructed a main pumping station at the eastern end of Tuam Street, from which the sewage was pumped along a rising main to a sewage farm at Bromley, and also laid sewage pipes through the city itself and into Sydenham, south of the South Town Belt, and St Albans, north of the North Town Belt. The system relied largely on gravity, but because the terrain was so flat subsidiary pumping stations were needed to get the sewage to the main pumping station on Tuam Street. Though no longer part of the city's sewerage system, this pumping station remains and is one of the most significant remaining structures related to the drainage of Christchurch.

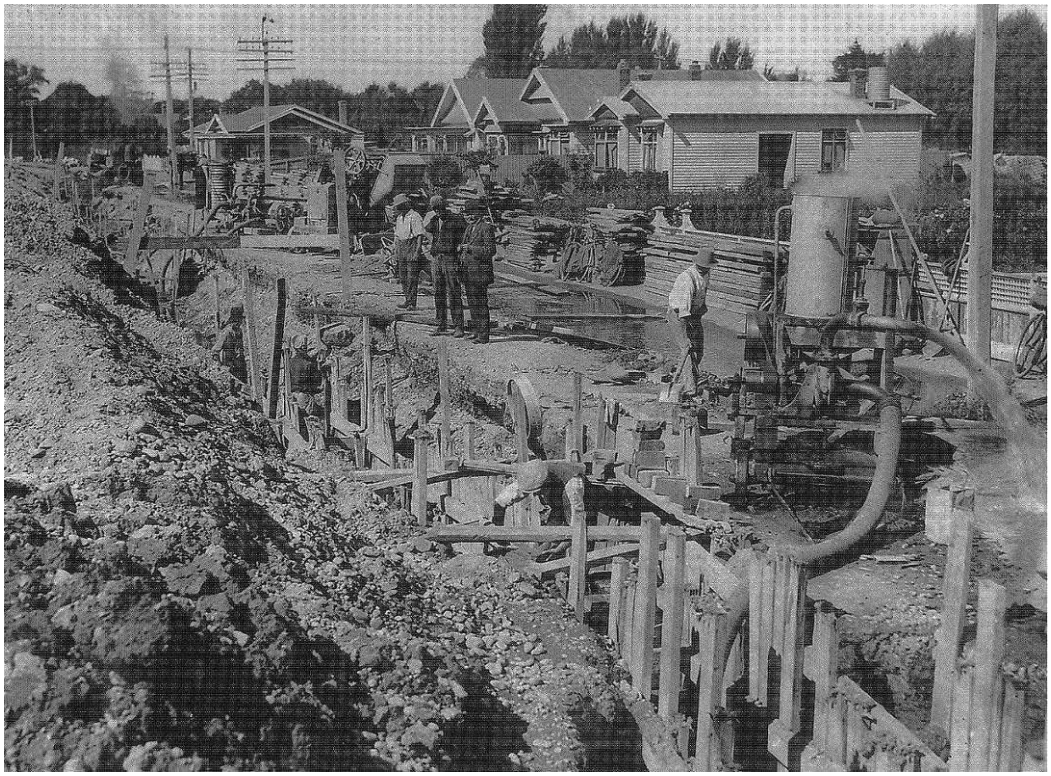

Figure 26. Drainlaying in Jeffreys Road, Bryndwr, November 1928. The Drainage Board managed to complete a major extension of the city's sewerage system to outer suburbs during the twenties, just before the Depression. *Pheloung collection, CHAC/ CM 542*

As Christchurch expanded through the following century, the sewerage system was progressively extended (along with the boundaries of the Drainage Board district), creating a complex system of both gravity and rising mains, with a large number of subsidiary pumping stations, including a large station at Woolston which came into service in 1970 to pump sewage from Sumner and the hill suburbs from Mount Pleasant round to Clifton to the sewage treatment works. This allowed the city's last large communal septic tanks to be retired. It also meant that industrial wastes, which had been polluting the lower Heathcote for more than a hundred years, could be diverted to the treatment station.

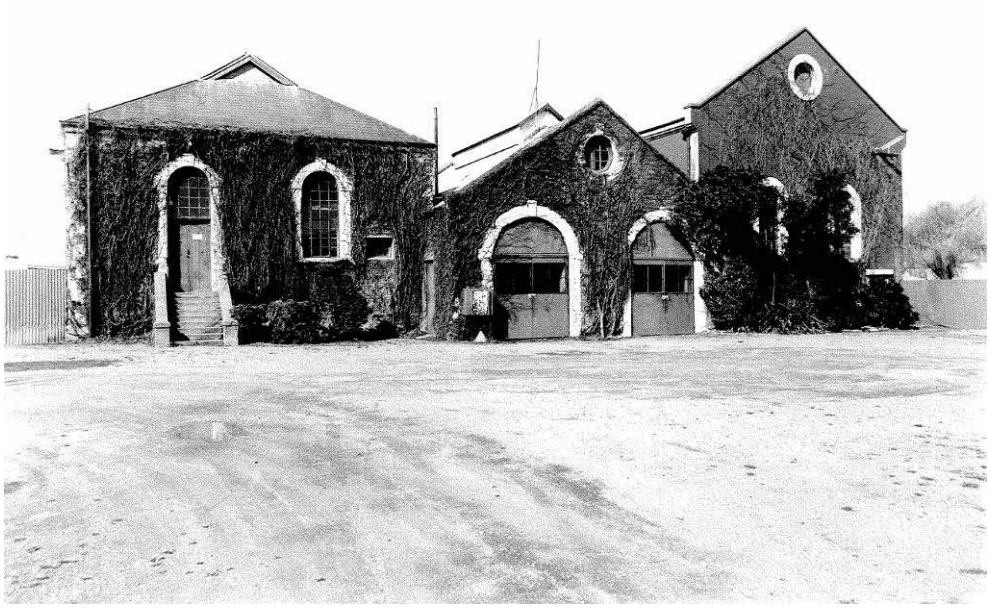

Figure 27. Old Drainage Board No.1 pumping station, now a recycling yard. *J. Wilson Private collection.*

The extension of sewers in the immediate post-war years failed to keep up with the rapid growth of new suburbs on the fringes of the city and the collection of night-soil, which had been a feature of the city's sewage disposal system since the 1860s, continued in some areas until the 1960s. New Brighton and South Brighton were the last significant areas to be served by sewers and the last areas in which night-soil collection on any scale continued.

The sewage was not properly treated at Bromley until a new sewage treatment station was built between 1957 and 1962 on the site of the old sewage farm. At the same time a new main pumping station was built on Pages Road (making the historic Tuam Street station redundant) and very large oxidation ponds were built on the northern edge of the Estuary. The 'Aranui smell' plagued the operation of the treatment works in their early years, but was largely eliminated by the building of new trickling filters in the 1970s (which were covered by large fibre-glass domes in 1986-87). The treated effluent continued to discharge into the Estuary, though by the early years of the 21st century, a long-talked-about ocean outfall was being actively planned.

Drainage: Stormwater

Prior to the formation of the Drainage Board, the Provincial Government and City Council had undertaken work to improve the drainage of stormwater from Christchurch. The city, in particular, built a brick stormwater sewer down Tuam Street east from the Town Belt. This eventually discharged into the Estuary down Linwood Avenue. This main stormwater outfall, constructed between 1871 and 1874, has served the city ever since.

When the Drainage Board was set up, it made an early decision to keep the stormwater drainage system entirely separate from the sewage system, to avoid having to pump stormwater through to the sewage farm (later treatment station). This would have meant that larger sewer pipes would have to be laid and greater operating costs. The Board continued the work the City Council had begun and created a complex system of drains, both open and piped, to carry stormwater from the city to the main stormwater outfall down Linwood Avenue. Natural streams and creeks were utilised. Many became boarded drains or were piped.

More recently the practices for coping with stormwater have changed, with the creation of swales and retention basins to relieve the stress on stormwater drains at times of sudden heavy rainfall.

Figure 28. Waltham Road, 30 March 1909, looking north towards the Cathedral of the Blessed Sacrament. Railway goods sheds on the left gasworks chimneys on the right. This area was prone to flooding until the completion of a major stormwater relief scheme in the late 1960s. *F. W. Hulme photograph, Bougen collection, CHAC/CM 117*

Stormwater flooding remained a problem in parts of the city – St Albans, Waltham and the Barrington Street area for example – until well into the 20th century and major stormwater relief works were periodically undertaken by the Drainage Board. Among them were the Dudley Creek diversion (which came into operation in 1979) which largely ended surface flooding in St Albans and the Woolston Cut (operative in 1986) which improved the capacity of the lower Heathcote River to carry stormwater to the Estuary.

The Woolston Cut, however, had the unintended consequence of allowing salt water to move further back up the Heathcote River at high tides with disastrous effects on vegetation along the banks of the river. This was subsequently alleviated by the construction of tidal barrage gates in 1993.

The Drainage Board went out of existence in 1989, the sewerage and stormwater systems thereafter being managed by the City Council. Two of the office buildings in which the Drainage Board's staff formerly worked independently of the City Council staff remain. Both are of architectural as well as historical interest.

Water supply

Christchurch was highly unusual in acquiring a sewage system long before it had a high-pressure water supply. For the first decade and a half, Christchurch households drew their water supplies from the rivers, from shallow wells or from rainwater tanks. In the absence of an effective sewage system, water from these sources quickly became contaminated, which contributed to the poor health record of early Christchurch. The problem was solved by the discovery of abundant supplies of artesian water from aquifers that lay under most of the city. The first public artesian well was drilled in February 1864 at the corner of Tuam and High Streets. Water was struck at 80 feet and the pressure was sufficient to force the water more than 10 feet above the ground level. By the end of 1864 the City Council had drilled seven more wells. A very large number of private wells were also drilled in the following years. Many households used ram pumps which used the pressure in the artesian system to lift the water into tanks on stands which ensured an even, high-pressure supply in the house. These ram pumps were, however, very wasteful of water.

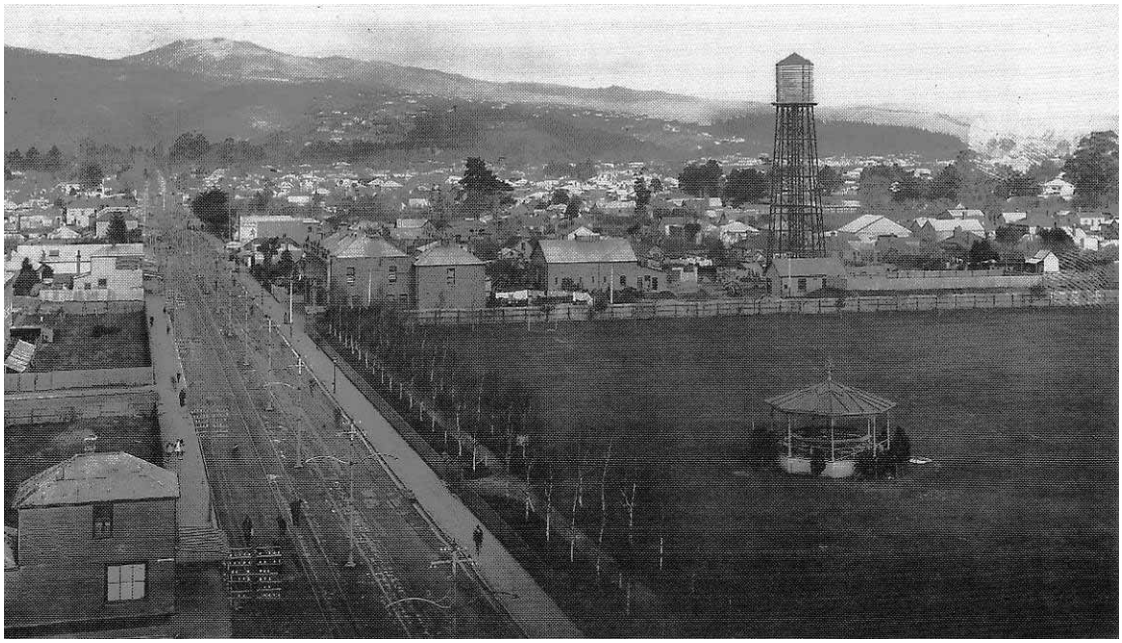

Figure 29. Sydenham, c. 1914, showing the tower for its water supply, and Sydenham Park, Christchurch's first A&P Showgrounds. *Alexander Turnbull Library, Wellington, G5377*

By the beginning of the 20th century, depletion of the supply from the upper strata of the artesian system and lowering of pressure in them prompted the City Council to plan a city-wide high-pressure water supply. A number of wells were drilled at a site on Colombo Street in Beckenham and water pumped up to large tanks on Cashmere Hills, then fed by gravity throughout the city. The system was inaugurated in 1909. Just prior to its amalgamation with the city in 1903, Sydenham had decided to build its own high-pressure water supply and for several years that part of the city was supplied with water from a huge tank on a 90-foot-high stand just south of Sydenham Park. (The existence of the system meant Sydenham could mark the 1903 coronation of Edward VII by erecting a water fountain in the Park. It survives,

relocated and reconstructed.) The Cashmere Hills were served by a high-pressure water system installed by the Heathcote County in 1914.

Although the site of Christchurch appears to be level, it actually slopes markedly from the west, so that suburbs like Burnside, Sockburn and Hornby are considerably higher than say Cathedral Square. Because these western areas were too high and too far away from the Cashmere Hills for adequate water pressure large public water tanks were built at various points as the city spread to the west and north-west to provide the new suburbs with high-pressure water.

Street lighting

Prior to the establishment of the City Council in 1862, the city was lit by just a handful of kerosene lamps. The City Council set about installing more, but shortly afterwards, in 1864, the gasworks opened (see below) and the Council came to an agreement with the Gas Company to supply gas to street lights. New gas lights were installed and most of the kerosene lamps converted to gas. The Cantebury Club Gaslight (c. 1875) is a surviving early example.

Gas was superseded by electricity for street lighting in the early years of the 20th century, especially after Lake Coleridge power became available in 1915.

Fire fighting

The first fire services were provided in Christchurch by a volunteer brigade set up in 1860. It was based in the cluster of public buildings on Market Square. In 1865, the City Council first became involved in fire fighting when a steam fire engine was bought for the volunteer brigade. The City Council ran the city's fire fighting service from 1867 until 1907, when the Christchurch Fire Board took over. In 1976, the New Zealand Fire Service took over in turn from the Board.

The city's second fire station (after the Market Square station) was established on Lichfield Street in 1871 (in a converted former Baptist chapel). The Chester Street station was built in 1876 (it survives, converted to the city's Plunket rooms). A new station was built on Lichfield Street in 1900, then another new station on the same street in 1913. This remained the city's main fire station until 1962 when a new station (the present one) on Kilmore Street was opened.

Just before they amalgamated with the city, both the Sydenham and St Albans boroughs were obliged (by the city refusing to continue to cover the boroughs for fire-fighting purposes) to create their own brigades and both had built their own fire stations by 1903. A further suburban fire station was built in Woolston in 1916 and remained in use until 1963. A network of suburban fire stations was built after the Second World War. Some remain in use as fire stations but some have been withdrawn from service.

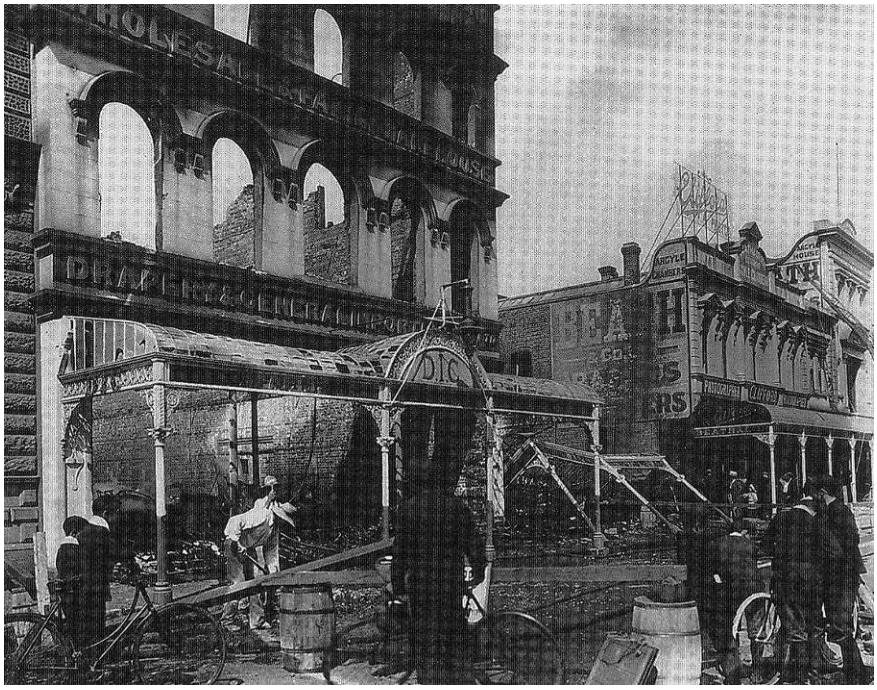

Figure 30. Aftermath of Strange's fire, February 1908, showing the burnt-out shell of the DIC and scorched wall of Beath's. This was Christcurch's biggest fire to date and destroyed half of an inner-city block. The city high-preasure supply was completed in 1909. *Brittenden collection, CHAC/CM 1209*

Before the high-pressure water system was inaugurated in 1909 fire fighters had to pump water from available sources. They included tanks at various points in the city, as well as the rivers. The need for a reliable high-pressure water supply was one of the reasons why the system was built. Ironically, just before high-pressure water became available, Christchurch suffered one of its worst fires – the fire of 6 February 1908 which burned a large number of buildings between Lichfield and High Streets.

Figure 31. Ballantyne's department store, corner of Cashel and Colombo Streets, the day after New Zealand's worst fire disaster, in which forty-one staff died. *Wenborn collection, CHAC/CM 18*

High-pressure water did not prevent the city's most notable fire – the Ballantynes fire of 1947 – from resulting in the loss of 41 lives. Other notable fires included fires in the grandstand at Addington racecourse in both 1953 and 1961 and the gutting of the Regent Theatre building on Cathedral Square in 1979. The most recent notable fire was the burning of the former Farmers store on Cashel and Modras Streets in 2005. One feature of firefighting – the street alarms mounted usually on lamp-posts or power-poles – has disappeared.

Rubbish disposal

In the city's early days, scavenging pigs were important for disposing of city rubbish. After 1863, a license from the city council was needed to keep pigs within the city. The City Council first inaugurated a rubbish collection service not long after it was established in 1862. The rubbish was disposed of in rubbish dumps at various points around the city. For a period prior to 1902 rubbish was transported from the city out to the Linwood sandhills by a special tram.

In the early 20th century, the Council decided to dispose of the city's rubbish by burning it in a destructor. The destructor came into use in 1902, its tall chimney a now long-demolished city landmark. Heat from the destructor was used to generate electricity (see below) and also to heat the water for municipal tepid baths which were opened nearby. The destructor remained in use until the 1930s. Thereafter the city's rubbish was all disposed of in dumps or landfills run by the city's different local authorities. Many of these were in locations that today would be considered highly inappropriate (such as on the edge of the city's rivers). Some former landfill sites later became parks or the sites of recreational facilities. Waimairi County for many years had a dump near the airport. The major dump at Bexley was in use until early in 1985, after a major new landfill was developed in the Bottle Lake Forest in 1984. The Waimairi County Council's dump near the airport was also closed when the Bottle Lake landfill was opened. In conjunction with this new landfill, rubbish transfer stations were built in Sockburn, Styx and Bromley. The Bottle Lake landfill is due to be closed when a new regional landfill at Kate Valley, near Waipara in North Canterbury, comes into use.

In the later 20th century, plastic bags replaced household-owned rubbish tins and recycling was inaugurated, with major resource recovery and processing centres established at the transfer stations. Individual local authorities ran their own rubbish collection systems prior to amalgamation in 1989, but before that were already co-operating in metropolitan rubbish disposal schemes. The collection and handling of materials put out in household recycling crates and collected in other ways was in the hands of a Recovered Materials Foundation. The efforts of the Christchurch City Council to make Christchurch a 'sustainable' city, in line with developing thinking about the environment, are most evident in these efforts to promote recycling and reuse of discarded materials.

Chapter 5: Utilities and services
Comment and recommendations

General discussion

Christchurch is unusual (in New Zealand and even world terms) in having had a water-based sewerage system well before it had a high-pressure water supply. This was possible because abundant water was available from the aquifers under the city. Reduction of pressure in this artesian system eventually obliged the city to establish also a high-pressure water system. Both systems were in place by the early 20th century. The site on which Christchurch was built created peculiar drainage problems. This led to Christchurch having first the worst rates of water-borne diseases in the country and then the country's first comprehensive, effective drainage system.

Street lighting was a municipal responsibility from the start. The transition from kerosene and candle lamps to gas lamps was made relatively early and quickly after the gasworks began production in the 1860s.The later transition from electricity followed the arrival of power from Lake Coleridge in 1915, although there were prior electric lights based on the city's two steam power stations.

Fighting fires required special provision of water tanks until after the high-pressure water system was inaugurated in 1908. The efforts to prevent destruction by fire led to the construction of successive fire stations both in the central city and in the suburbs. New Zealand's most famous fire, the Ballantynes' fire of 1947, occurred in Christchurch.

The city's rubbish has mostly been disposed of in landfills, though for a period some of it was burnt in the destructor in the inner city.

Relevant listings

The ***Tuam Street pumping station*** is the most important building listed because of its association with the city's sewage system. Some of the early sewage pumping stations are also listed, including those on ***Matai Street*** and ***Bangor Street (Oxford Terrace)***. These are all Council owned and managed.

None of the city's older (or more recent) water pumping stations are listed. The ***Addington workshops water tower*** is the only one of the several large community water towers which were associated with providing high-pressure water in different parts of the city, both before and later in association with the city-wide system, to have been listed.

The ***Canterbury Club gas light*** on Cambridge Terrace is the only item associated with street lighting listed.

A single fire station building has been listed: the old, but long since converted to another use, ***Chester Street fire station***.

Further possible listings

Other ***sewage and water pumping stations*** should almost certainly be listed. No.10 in the City Council's *Architectural Heritage of Christchurch* series would be the starting point for identifying the stations which are of historical and architectural interest. The ***Drainage Board's second office building*** should also be assessed for possible listing and ***the treatment works*** examined for features or structures of historic importance. (Some features on the site pre-date the modern treatment works.) If any important ***larger water towers*** remain they should be considered and the possibility that there are still a few ***backyard pump houses and water stands*** behind older houses examined. Any surviving older public drinking fountains should be located and evaluated for listing.

With the conversion of many boarded drains back to natural waterways listing and protecting ***representative types of stormwater drains*** from the past should be considered. The older riverbank ***outlets of piped waterways and stormwater drains*** should be identified and some possibly listed. Features of more ***recent stormwater drainage schemes*** like the Dudley Creek diversion and Woolston Cut may be candidates for listing. Any subsurface remains of ***original sewage reticulation*** lines should be investigated.

If any older forms of ***street lighting***, including the early electric lights, remain they should be considered for listing.

Other former and current ***fire station buildings*** besides the former Chester Street station should be assessed for possible listing.

The ***archaeological remains of domestic rubbish pits*** may remain in the grounds of dwellings in the older parts of town as evidence ofrubbish-disposal practices before the introduction of municipal services. Some may need to be listed to help prevent their destruction prior to their being examined or excavated. Former ***landfill sites*** should be at least identified and if any significant features remain from the former use of areas which are now mostly park consideration should be given to listing them

Bibliographic note

References to the development of the various utilities and services are scattered through many general references, especially those pertaining to the work and activities of the City Council and other local bodies. Donaldson's *History of Municipal Engineering* is especially useful.

On the work of the Drainage Board, Hercus and Wilson are the most useful and readily accessible sources.

Phillips, *Always Ready*, is the indispensable source on fire fighting in Christchurch.

The history of the Municipal Electricity Department (see the following chapter) refers to streetlighting.

The City Council's *Architectural Heritage of Christchurch, 10, Pavilions, temples & four square walls*, is a critical source for information on structures associated with utilities and services.

Further research

There are no critical gaps in the general research on utilities and services, except that no single work deals with water supply (responsibility for which was previously divided among several local bodies).

Archaeological research for sub-surface evidence of the development of the sewage, stormwater and water supply systems could be usefully undertaken.

Continued investigation and incorporation of Council owned and managed utilities onto the heritage list should be undertaken. Their heritage status should be evaluated during any processes of maintenance or upgrade.

Chapter 6: Energy

Water and wind

Several early Christchurch flour mills used water-power and one used wind-power. (These industries are mentioned in chapter 12.)

Wood

The first settlers relied on firewood for cooking and home heating. All of the Papanui Bush and about half of the Riccarton Bush were cut down in the earliest years of settlement for firewood as well as building timber. Timber was also obtained from the remnant forests on the Port Hills. Other more distant sources were then tapped, notably Banks Peninsula and the foothill forests of the Oxford district. A tramway was planned round the eastern edge of Te Waihora/Lake Ellesmere to bring timber from Little River to the city, but was built, from the Christchurch end, only as far as Halswell. Harewood Road developed as an early city outlet partly to provide access to the Oxford forests.

Wood has remained an important fuel for home heating, with supplies now coming almost exclusively from exotic forests and being burnt (to reduce air pollution) in approved burners.

Coal

Christchurch drew its first supplies of coal from deposits found in the foothills of the Southern Alps, notably in the Malvern Hills, where coal was being mined in the 1850s. Malvern coal was being advertised for sale in Christchurch by at least 1855. After the southern railway reached Selwyn in 1867 coal was brought down the ‘coal track’ from the Malvern Hills mines to Selwyn and then railed into Christchurch. Coal was also mined for the Christchurch market at different times at Avoca (Broken River), Acheron and Mount Somers. Coal became an important fuel for industry and for domestic heating and cooking.

Figure 32. This iron puffing-billy of the road is seen leaving the Moorhouse Avenue State Coal Depot in the 1900s. *Coates, p116*

In general, the Canterbury coal deposits were small and difficult to mine. Supplies from the much larger West Coast deposits of coal reached Christchurch initially by sea, via Lyttelton. After the Otira Tunnel was opened in 1923 West Coast coal arrived by rail. Coal yards were then located largely along the southern rail/industrial corridor. Coal for domestic use was generally bagged at these coal yards and delivered in sacks to homes. This practice continued until at least the 1950s. Although by then domestic cooking was almost all on electric stoves and most domestic hot water heated in electric cylinders, open coal fires remained an important form of home heating.

Air pollution

Figure 33. Smog has been a perennial winter problem for Christchurch. The city's worst daytime smog level was recorded in June 1977, but night-time levels were a great deal worse. *Rice GW, p138, Christchurch Star*

The reliance on wood and coal open fires for domestic heating gave Christchurch a serious air pollution problem. The problem became acute when inversions formed over the city. Pollutants accumulated in cold air trapped below a layer of warmer air against the flanks of the Port Hills. The city's territorial and regional councils began tackling the city's air pollution problem first by monitoring and publicising pollution levels, then by progressively banning open fires for domestic heating and requiring householders to install approved solid fuel burners. Air pollution was at its worst in the 1960s and 1970s but through the 1980s and 1990s began to show improvement as the City Council's measures took effect. Planning for the city's first comprehensive air quality management plan was well under way by 2004, under the auspices of the Canterbury Regional Council (Environment Canterbury). As the efforts to clean up Christchurch's air intensified, coal yards and retail coal merchants disappeared from the city. Firewood merchants tended to locate on the city's edges, in Sockburn and along Johns Road for example.

Coal gas

The availability of coal allowed a Gas Company to begin manufacturing coal gas at a gasworks on the South Belt in 1864. (This was about the same time that gasworks were built in Auckland and other New Zealand centres.) The gasworks grew through subsequent decades into a major industrial plant. Large areas of the city were reticulated for gas distribution. Gas was available in St Albans and Riccarton by the end of the 19th century, but did not reach Fendalton until 1907. The number of gas consumers leapt from around 7,000 in 1905 to around 25,000 in 1928. After that the increasing use of electricity in homes and factories halted significant increases in the number of coal gas consumers, but gas continued to make an important contribution towards meeting the city's energy demands until the last quarter of the 20th century. The large gasometers became city landmarks. Coke was also available as a domestic and industrial fuel from the Gas Company. As a major company, the

Gas Company had substantial premises in the central city which were used for administration and to sell gas appliances to the public. A small part of the earlier premises of the company remains on Gloucester Street, but the later building was demolished to allow Noahs (now Rydges) Hotel to be built.

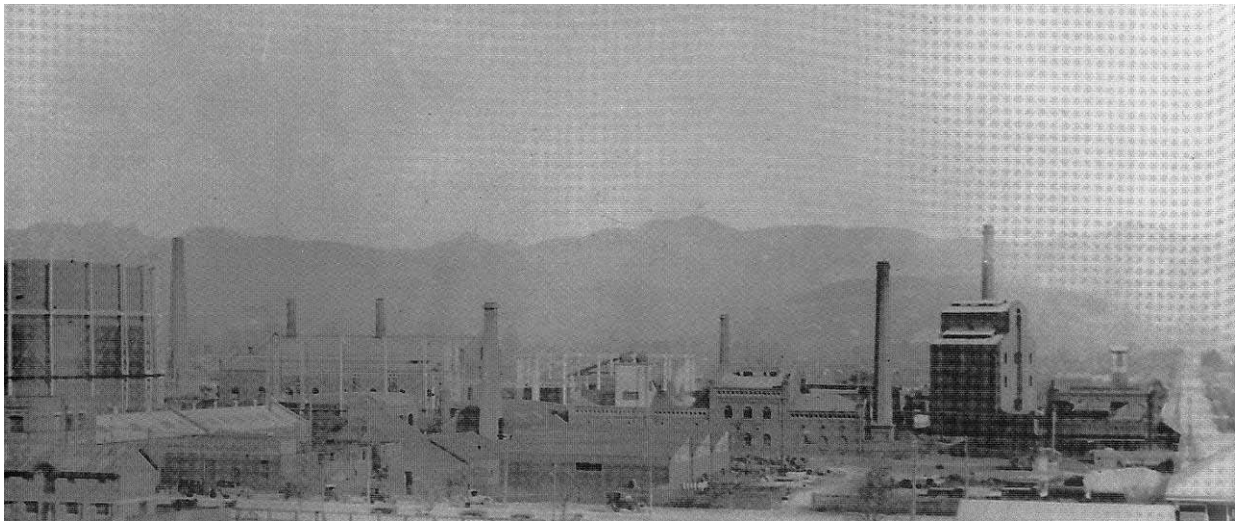

Figure 34. The Christchurch gasworks, c. 1930. Coal gas was produced here from 1864 until 1982, after which the site was completely cleared, including large quantities of contaminated soil. *S. W. Perkins photograph, CHAC/CM 873*

After production of coal gas ceased in the early 1980s, the site was cleared through 1982 and the land, after being decontaminated, used for other commercial purposes. There was also a small gasworks at Sumner which came into operation in 1912, but closed down long before the city works. The city was not subsequently reticulated for the distribution of liquid petroleum gas (which became available nationwide once the Maui gasfield was developed).

Electricity

Limited supplies of electricity became available in Christchurch in 1903, after the city's rubbish destructor was commissioned in 1902 and then from the Tramway Board's power station at Falsgrave Street, which was commissioned in 1905.

But the electric age really began for Christchurch when it became the first New Zealand city to benefit from construction of a major State hydro-electricity station. Power from the Lake Coleridge station reached Christchurch in 1915. It was brought to the city from a substation at Hororata along lines strung from wooden power poles, the antecedents of the later lines of metal power pylons that subsequently brought power to Christchurch from other major State hydro-stations on the Waitaki and Clutha Rivers. Major substations were built on the western side of the city at Addington (in 1913) and at Islington. Later large substations were built at Papanui and Bromley, the latter fed by way of power pylons built across the lower slopes of the Port Hills.

The retail distribution and sale of electricity became the responsibility of the Municipal Electricity Department of the City Council. The MED had its headquarters on the corner of Manchester and Armagh Streets, where successive buildings housed offices, sale rooms for electrical appliances, workshops, for a time a garage for a fleet of electric-powered vehicles and a substation. The MED also had a visible presence throughout the city in the form of its

many small substation buildings (which still remain), and the power poles and lines of the local distribution system.

Energy for horse transport

To feed horses, grass was gathered as “green pick” and carried to forage sites where horses used for pulling trams and mail services etc. Public park lands were leased for the grazing of animals in the 19th century. The size of Hagley Park meant Christchurch had an ample area of public park land that could be used for grazing or to harvest hay. Animal manures were also cropped from these sites for commercial garden and landscape use.

Petroleum products

The conveying of petrol (and diesel oil) by pipeline from Lyttelton to Christchurch for transport was mentioned in chapter 3. Service stations, their forms and sizes changing through the years, were the most visible manifestation in the city of an economy shifting from reliance on coal (and, in the case of animals used for transport, on grass and fodder crops) to reliance on petroleum products. A tank farm was built near Heathcote after the oil pipeline over the Port Hills was constructed. This later also became the terminal for a (buried) petroleum gas pipeline which followed a different route over the hills, from Rapaki rather than Lyttelton.

Other forms of energy

Use of solar power for water-heating has occurred on a small, individual household scale in Christchurch, but is another manifestation of the growing wish to see Christchurch become a ‘sustainable’ city. The city’s electricity has continued to be drawn from distant hydro-electric stations (still including the older Lake Coleridge and Highbank stations), though in the first years of the 21st century a Christchurch company which had begun developing a wind turbine to generate electricity installed a single turbine at Gebbies Pass.

Chapter 6: Energy
Comment and recommendations

General discussion

Until the first quarter of the 20th century, coal and wood were the major sources of energy in Christchurch. Coal was converted to coal gas at the city's gasworks from the early 1860s. Wind and water power played a small role in powering the earliest of Christchurch's industries. The relative lack of sources of firewood close to the city made Christchurch heavily dependent on 'imports' of coal, partly from small Canterbury coalfields, but increasingly and far more importantly from the West Coast. The increased air pollution caused by burning coal and wood has prompted many residents of Christchurch to change the ways they heat their homes.

Electricity had an early impact on energy supplies in Christchurch. Dunedin had a public supply earlier than Christchurch from its own Waipori scheme, but Christchurch benefited from 1915 on from supply from the country's first state hydro-electric scheme at Lake Coleridge. Apart from the nationwide shortages of electricity in the 1950s, which made domestic blackouts necessary, the city has enjoyed ample and reliable supplies of electricity from the major South Island power stations.

Oil products were all imported into Canterbury through Lyttelton. The story of getting these products over the Port Hills is a continuation of the earliest chapters of the history of transport in Christchurch.

Relevant listings

A number of ***Municipal Electricity Department substations (Gasson Street, Woolston Park, Linwood Ave, Retreat Road, Seddon Street, Milton Street*** and ***Woodard Terrace***) have been listed, as have some of the ***former MED buildings*** in the central city. Many of these are owned and managed by Christchurch City Council.

The remaining part of the ***Gas Company building*** on Gloucester Street has been listed.

Further possible listings

Any significant remaining features that reflect the importance of coal in domestic and industrial heating in Christchurch in the past should be listed. Possible examples are any ***coal yard buildings or structures, coal handling facilities*** along the railway corridor and even ***domestic coal bins***.

The ***gasworks administration building*** on Moorhouse Avenue (as the probably only surviving structure which is a reminder of that major industrial plant on the site) should be considered for listing.

There may be an opportunity for more, representative, examples of the great number and variety of ***MED electricity substations*** to be listed. This process may need to be linked to the possibilities for re-use if the original function of these structures changes. Any relics of the Tramway Boards electricity distribution system should be considered for listing.

The ***electricity transmission network*** should be investigated with a view to identifying any remaining features of historic interest, especially of the early transmission of Lake Coleridge power into Christchurch and of the large former ***New Zealand Electricity Department substations***. Changes in local reticulation systems should also be represented in the listings if significant examples of older systems remain.

Any early bulk ***oil and petrol storage and distribution facilities*** on the Christchurch side of the Port Hills should be identified for possible listing. (Early service stations are mentioned under the earlier chapter on transport.)

Bibliographic note

The major works by Pollard on the gasworks and Alexander on the Municipal Electricity Department are indispensable sources for general historical background and detailed information about structures and sites associated with gas and electricity. The booklet in the City Council's *Architectural Heritage* series on utilities buildings is an exemplary example of an investigation of specific structures and buildings based on sound general background information. Donaldson's *History of Municipal Engineering* also touches on aspects of energy supply and distribution in Christchurch.

Further research

No authoritative, comprehensive work on the supply and distribution of coal to Christchurch homes and industries exists.

The general background information available on the coal gas and electricity supply industries needs to be applied to specific sites, features and buildings, along the lines of the City Council's publication on electricity substations.