542/1354

Ferry Moorhouse Designation 4 Laning

COSTS

Total	Renewal	Backlog	Unallocated	Growth
$14,756,572	$2,951,314	$5,076,261	0	$6,728,997

COST ALLOCATION

Primary Driver:	Increasingly high delays and long queues with existing cross section. Road cross section inconsistent with road hierarchy status.
Secondary Driver:	
Capacity discussion:	
References:	

ATTRIBUTES

Project Manager:	David Robinson, Paul Roberts
Work Planned:	Four laning of the Moorhouse – Ferry corridor from Fitzgerald to just east of Aldwins.
Location:	Moorhouse Ave and Ferry Road from Fitzgerald Ave to just east of Aldwins Road.
Special features being addressed:	Mediation of City Plan reference requires Council to consider narrow median in final design – 2/7/2003 memo City Plan to City Streets PL/CP 368,369,370,371,387,388.
A statement of the outcomes being addressed (LoS, Community Outcomes):	Road network capacity & safety Moorhouse – Ferry is a major arterial to Aldwins.
Options considered:	Various cross sections as part of the process of defending the designation against a City Plan reference to the Environment Court.
Implications of not doing the project:	Increasingly high delays and long queues with existing cross section. Road cross section inconsistent with road hierarchy status.

Linkages with other projects:	Major sewer or stormwater upgrade along this route – Project should be timed to coincide with or follow.
Location of other relevant supporting information:	Transport & City Streets Unit Electronic Files - S:\Traffic Analysis\Dave R\F\Ferry Rd Designation - Randolph to Wilsons Paper Files – Transport Planning File – Ferry Road Designation.

IN THE ENVIRONMENT COURT

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of a reference pursuant to Clause 14 of the First Schedule to the Act
BETWEEN	L J Hood & I A Ward (RMA 1180/99);
	I S & R J Cumberpatch (RMA 1197/99);
	L J Hoskin (RMA 1198/99);
	The Friends of Edmonds Factory Garden (RMA 1199/99);
	W L G & T J A Marshall (RMA 1200/99);
	Charleston Neighbourhood Association (RMA 1201/99)
	Referrers
AND	Christchurch City Council
	Respondent

STATEMENT OF EVIDENCE BY DAVID MURRAY ROBINSON
TRANSPORTATION PLANNING ENGINEER
FOR THE CHRISTCHURCH CITY COUNCIL

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1.0 Introduction

1. My full name is David Murray Robinson. I am employed as a Transport Planning Engineer with the City Streets Unit of Christchurch City Council. I hold a Bachelor of Engineering Degree with honours in Civil Engineering from the University of Canterbury, NZ, and have been professionally engaged in transport planning and traffic engineering for almost 14 years in both public and private sectors. During this time I have worked on a wide variety of transportation studies and traffic engineering projects.

2. Since July 2002 I have had responsibility in the Council's City Streets Unit as transport planning leader for the transport team considering the road widening designation on Ferry Road between Wilsons Road and Randolph Street. The purpose of the designation being to allow for the four laning of this section of road. My role includes the responsibility for overseeing the Council team and external consultants considering the designation.

3. I am familiar with the subject section of Ferry Road having made specific site visits in a professional capacity, and in addition I possess a good awareness of the form and function of Ferry Road and the arterial road network through long-standing residence in Christchurch.

4. This hearing covers an appeal by the referrers against the decision of the Christchurch City Council to uphold the road widening designation to allow the four laning of Ferry Road between Wilsons Road and Randolph Street at the Proposed City Plan hearings.

2.0 The Purpose Of This Evidence

5. I have been asked by Mr Campbell, Planner, Christchurch City Council to provide transport planning and traffic engineering evidence on the road widening designation on Ferry Road from Wilsons Road to Randolph Street. Mr Campbell is providing planning evidence for the Christchurch City Council.

6. In my evidence I will refer to the road widening designation on Ferry Road from Wilsons Road to Randolph Street as the Ferry Road designation or designation, and I will refer to the adjoining road widening designation on Moorhouse Avenue from Fitzgerald Avenue to Wilsons Road as the Moorhouse Avenue designation. The relevance of the Moorhouse Avenue designation is explained in this evidence.

7. In outline I intend to cover in my evidence:
   - The location of the Ferry Road designation generally and the Ferry Road designation as set out in the Proposed Christchurch City Plan
   - The existing traffic management and adjoining landuse along the subject section of Ferry Road and along Moorhouse Avenue
   - The proposed four laning scheme for Ferry Road developed to date
   - The matters to be considered under section 171 of the Act

- Why the designation is reasonably necessary for achieving the objectives of the public work for which the designation is sought
- How adequate consideration has been given to alternative sites, routes, or methods of achieving the public work
- Why the nature of the public work means that it would be unreasonable to expect the Christchurch City Council, as the requiring authority, to use an alternative site, route, or method.
- The relevant provisions of policy statements and plans.
- Other relevant statutes
- The principal matters raised in references against the designation
- Additional matters raised in the references and submissions
- My conclusions and recommendations

8. In my evidence I summarise and do not intend to repeat word for word the full description of the traffic analyses undertaken. The 'Ferry Road Designation - Traffic Modelling Report' in **ANNEXURE** 1 covers an assessment of the area wide economics of four laning Ferry Road between Wilsons Road and Randolph Street and an assessment of Linwood Avenue and Brougham Street as alternatives routes which the referrers have specifically raised as alternatives. Mr Penny's evidence specifically assesses the capacity and efficiency benefits in the Ferry Road corridor, while Mr Facey's evidence covers the safety benefits of the four laning provided for by the designation.

9. The designation has four interdependent objectives for providing four traffic lanes on the subject section of Ferry Road and these are discussed further in the evidence. They are:
   - To bring this section of road up to the standard of a major arterial road which is it's classification in the Proposed City Plan, and
   - To complete the major arterial route between Moorhouse Avenue (major arterial) west of Fitzgerald Avenue and Aldwins Road (major arterial) / Ensors Road (major arterial), and
   - To direct through traffic along the major arterial route and away from the local road section of Ferry Road between Wilsons Road and Fitzgerald Avenue, and
   - To provide safely and efficiently for the traffic volumes that major arterial roads carry.

10. In my evidence I conclude, from a transport planning and traffic engineering perspective that:
   - The designation is the only way of meeting the four interdependent objectives.
   - The Ferry Road designation passes the tests set out in sections 171(1)(a-d) of the Act.
   - There are no other matters raised in the submissions or references of sufficient weight not to uphold the Ferry Road designation.

3.0 Description of Designation(s)

Location

11. The subject section of Ferry Road is in the inner south eastern suburbs of Christchurch City, and is approximately 1.9 km southeast of Cathedral Square in the centre of the City at its closest point and lies between the suburbs of Charleston to the south and Phillipstown to the north. See Annexure 2 for maps showing the location of the Ferry Road designation. See Annexure 3 for the Proposed City Plan provisions below.

Ferry Road And Moorhouse Avenue Designations

12. The Ferry Road and Moorhouse Avenue designations were "rolled over" as existing designations from the Transitional Plan to the Proposed City Plan under clause 4 of the first schedule of the Act, in an unmodified form.

13. The Moorhouse Avenue designation is relevant in that it will, together with the Ferry Road designation, allow for the completion of the major arterial link between the major arterials of Moorhouse Avenue and Fitzgerald Avenue west of the Falsgrave Street / Fitzgerald Avenue / Moorhouse Avenue intersection and the Aldwins Road and Ensors Road major arterials north and south of the Aldwins Road / Ensors Road / Ferry Road intersection respectively.

14. The Ferry Road designation is defined in the Proposed Christchurch City Plan in:
    - Volume 3, section 12 - Designations, attachment 3, page 12/7
    - Volume 3, section 12, - Designations, appendix 2, pages 12/40 and 12/41
    - Planning Maps, pages 40A and 47A

    The designating authority and road classification are *"CCC – major"* (major arterial)
    The extent of work and work type are *"Wilsons Road to Randolph Street – 4 lanes E"* (existing designation)
    The duration of designation is *"10 years"*

15. The adjoining Moorhouse Avenue designation which is not subject to any references is set out in the Proposed Christchurch City Plan in:
    - Volume 3, section 12 - Designations, attachment 3, page 12/9
    - Volume 3, section 12, - Designations, appendix 2, page 12/60
    - Planning Maps, pages 39A and 40A

    The designating authority and road classification are *"CCC – major"* (major arterial)
    The extent of work and work type are *"Fitzgerald Avenue to Wilsons Road – 4 lanes E"* (existing designation)
    The duration of designation is *"10 years"*

16. The Ferry Road designation is shown in plan layout in Annexure 3. The designation generally adds 10 metres width to the existing road reserve of approximately 20 metres width between Wilsons Road and Aldwins Road. The designation varies in width from around 1.0 metre to 12 metres. The designation is on the southern side of Ferry Road west of Olliviers Road, on both sides between Olliviers Road and Ryan Street and then mainly on the north side eastwards as far as Aldwins Road. The designation then tapers back 0 metres at the existing 20 metre road reserve at Randolph Street.

17. The Moorhouse Avenue designation is also shown in plan layout in Annexure 3. It adds about 11 metres to the existing road reserve of approximately 20 metres width between Fitzgerald Avenue / Falsgrave Street and Wilsons Road / Ferry Road. The designation is typically 10.9 metres wide and is completely on the southern side of Moorhouse Avenue, aligning with the Ferry Road designation to the east.

Status In Roading Hierarchy

18. Ferry Road (Moorhouse Avenue to Aldwins Road) and Moorhouse Avenue (Fitzgerald Avenue to Wilsons Road) are classified as major arterial roads in the Proposed City Plan in:
    - Volume 2, section 8 - Special Purpose Zones, Appendix 3, page 8/53 and 8/56 respectively
    - Volume 2, section 8 - Special Purpose Zones, Appendix 4, pages 8/59 and 8/64

19. Ferry Road (Aldwins Road to Randolph Street) is classified as minor arterial road in the Proposed City Plan in:
    - Volume 2, section 8 - Special Purpose Zones, Appendix 3, page 8/53
    - Volume 2, section 8 - Special Purpose Zones, Appendix 4, pages 8/59 and 8/64

20. The Proposed City Plan discusses the function of major arterial roads on page 7/6,

    "Major arterial roads are the dominant elements of the roading network connecting the major localities of the region, both within and beyond the main urban area, and link to the most important external localities. Some major arterials, particularly some State Highways, serve an important by-pass function within the City, directing traffic through the district to areas beyond. Major arterials roads cater especially for longer trips and generally link to other arterial roads (minor and major) *and collector roads. They will be constructed and managed to minimise their local access function."*

4.0 Existing Traffic Management And Adjoining Land Use

21. This section describes the location of Ferry Road, its function within the existing road hierarchy, the existing traffic management and adjoining land use along the designated section that is the subject of this hearing. It also describes the adjoining designated section of Moorhouse Avenue. Annexure 2 includes the local area map with showing the side street and cross street locations. Annexure 4 contains traffic count information and Annexure 5 the information sheets detailing the traffic management.

Ferry Road

22. Beginning at the eastern end of the designated section. Between Randolph Street and Hart Street, Ferry Road has a cross section consisting of two traffic lanes, with parking and cycle lanes on both sides of the road. The kerb and channel in this section was replaced as part of a 1995 project. There are commercial properties on both sides of the road. This part of Ferry Road is designated a minor arterial road. The latest traffic count in September 2001 shows the road carrying approximately 19,350 vehicles per day (vpd) on an average weekday (Monday to Thursday).

23. Between Hart Street and Isabella Place lies the major intersection of Ferry Road with Aldwins Road / Ensors Road. This intersection was the subject of a major improvement in the late 1980's which provided for separate right turn bays so that there would be three lanes (left, through and right) on both Ferry Road approaches together with bus bays. This remains the current road cross section. There are commercially zoned properties on both the northern and southern sides of the road. East of Aldwins Road, Ferry Road is designated a minor arterial road and to the west as a major arterial road (as far as its intersection with Moorhouse Avenue). Ferry Road carries approximately 23,100 vpd west of Aldwins Road (October 2000 count). Aldwins Road carries approximately 21,200 vpd (October 2001 count) immediately north of Ferry Road whilst the latest traffic count indicates Ensors Road carries approximately 17,400 vpd (September 1999 count) south of Ferry Road. As noted previously, both Aldwins Road and Ensors Road are classified as major arterial roads in this area.

24. The section of Ferry Road between Isabella Place and Wilsons Road was remarked in 1999 to include cycle lanes. A cycle lane was provided on the south side between Osbourne Street and Wilsons Road, and on the north side between Ryan Street and Wilsons Road. No cycle lanes were provided east of Osbourne Street and Ryan Street over this section. The existing solid median islands provided at Olliviers Road, and between Mathesons Road and Wilsons Road which serve to ban right turns in and out of Olliviers, Mathesons, and Leyden Street were however retained. The carriageway in this section is still bordered by covered deep dish channel with the road surface and footpath almost flush with each other. The 1999 marking project also formalised the informal parking zones which overlap the footpath, by outlining them with white painted lines providing 2.4 metre wide footpaths, 2 metre wide parking areas, 1.5 metre wide cycle lanes and 3 metre wide traffic lanes. This remains the current road cross section in this area.

25. On the south side there are three local streets, Osbourne, Grafton and Barbour Streets leading into the Charleston neighbourhood area. On the north side towards the eastern end is the Edmonds Factory Gardens, the site of the former Edmonds Factory. Also on the north side is Ryan Street, a cul de sac used to access Linwood High School, whilst Bordesley Street, Ollivers Road, Mathesons Road and Leyden Street lead into the Phillipstown neighbourhood area.

26. On the south side between Isabella Place and Osbourne Street, local shops, residential properties and a motel have frontage access onto Ferry Road. Between Osbourne and Grafton Street there are mainly commercial properties which form part of the local shopping area including a dairy, medical centre and video store. Also there is the Te Wai Pounamu Maori Cultural Centre. From Grafton to Wilsons Road there are further commercial properties.

27. On the northern side from Ryans Road to Bordesley Street there are mainly residential properties along with an Orion electrical substation. From Bordesley Street to Olliviers Road there is a mixture of residential and commercial properties including a funeral directors and a car sales yard. The section from Olliviers Road through Leyden Street to Wilsons Road includes a boat yard, church, commercial businesses, local shops, and residential houses and flats.

28. The current configuration of the Ferry Road / Moorhouse Avenue / Wilsons Road intersection has been in place for over 10 years. In the early 1990's the intersection was realigned so that Ferry Road east (major arterial) would be more directly aligned with Moorhouse Avenue (major arterial). Ferry Road west is classified as a local road. The median islands banning right turns at Leyden Street, Barbour Street, Grafton Street and Olliviers Road were installed at this time. This remains the current road cross section with the more recent addition of the cycle lanes as noted above.

29. Historic traffic growth on Ferry Road is discussed in section A Further Assessment Of Alternative Routes. Ferry Road is a reasonably major recreational and commuter cycle route between the central city and Sumner. Mr Facey's evidence notes that there are about 380 cyclists using Ferry Road each weekday. Environment Canterbury's metro-info website indicates that are only two bus routes using the subject section of Ferry Road, the number 31 from Sumner and the 32 from Mt Pleasant. The number 30 from Sumner runs via Linwood Avenue. Pedestrian numbers crossing the subject section of Ferry Road are discussed in An Assessment Of Other Methods Of Four Laning Ferry Road.

Moorhouse Avenue

30. In a westbound direction between Wilsons Road and Fitzgerald Avenue, Moorhouse Avenue has one lane wide enough for traffic and cyclists with parking also provided at the kerbside. In an eastbound direction there are two traffic lanes that have insufficient space for cyclists, although a sideline has been marked, and there is also no room to provide for kerbside parking. Separating the traffic in both directions is a double yellow line. The south side of Moorhouse Avenue is dominated by car sales yards with a handful of commercial and residential properties. On the northern side there are commercial properties including a petrol station and car sales. The latest traffic count in September 2001 shows Moorhouse Avenue as carrying approximately 15,400 vpd east of Fitzgerald Avenue.

5.0 The Proposed Four Laning Scheme Developed To Date

31. A four laning scheme proposal has been developed and has previously been made available to the referrers as part of ongoing consultation and dialogue. The scheme is included in plan layout in Annexure 6 with some minor modifications and is discussed further below after consideration of the cross section.

32. The cross section proposed for the four laning of Ferry Road is Option 9 as set out in Annexure 9. The other cross sections are discussed later in the section An Assessment Of Other Methods Of Four Laning Ferry Road. The proposed cross section uses the road widening designation to provide four traffic lanes, two cycle lanes, a solid median, parking, bus stops, footpaths and landscaping opportunities. The two cycle lanes are 1.5 metres wide, whilst the two kerbside traffic lanes would be 3.1 metres wide and the inner traffic lanes 3.4 metres including a 0.2 metres edge-line to the median. A 4 metre wide solid median would separate directional traffic flows. The 4 metre wide median allows turning bays at the intersections to be constructed. It also allows u-turn bays to be provided without having to provide space at the far kerb line for vehicles to complete their u-turn as has had to be provided in Fendalton Road with a 3.4 metre solid median.

33. The carriageway excluding approach lanes at the intersections and any indented parking bays or bus stops takes up 20 metres in total, leaving around 5 metres either side of the carriageway alignment. Parking would be provided in bays inset into the footpath and berm area as would bus stops. The insets are approximately 2.0m to 2.5m wide. Inclusive of the parking bays and bus bays the carriageway is approximately 24-25 metres wide which is consistent with the standards in the Proposed City Plan - Section 8, Appendix 2, page 8/51, (Annexure 3).

34. The preferable footpath width in a residential area is 1.8-2 metres, meaning at least 4.3-4.5 metres of the 5 metres available at parking bay locations would be required in the residential areas. In commercial areas footpaths are typically 3.0 metres wide. This requires 5.5 metres at the parking bay locations which is more than the 5 metres available, meaning either the centreline of the roadway is offset or a 2.5 metre footpath is provided. Infrastructure such as lighting poles, telephone boxes and bus shelters also have to fit into the footpath area. Between parking bays the footpath would remain 1.8–3.0 metres wide against the property boundaries with the area to the kerbline either as landscaping or grass berms.

35. I am also informed by Warren Lloyd, Traffic Engineer, City Solutions Unit, Christchurch City Council that it is good practice for a continuous straight road reserve boundary to be formed to avoid potential unsafe dark corner areas that would otherwise form if property boundaries were staggered.

36. Turning to the plan layout in Annexure 6 which shows the full four laning scheme for Moohouse Avenue and Ferry Road between the Falsgrave Street / Fitzgerald Avenue / Moorhouse Avenue intersection at the western end and the Ferry Road / Randolph Street intersection at the eastern end. The colour aerial photos over which the plan scheme are laid are not individually dated. However, 20% of the city flown each year, and therefore the aerials are no older than five years old.

37. The first sheet, Sheet O-O, shows the western end of the scheme. The key in the top right hand corner of the sheets indicate the meaning of the coloured lines that define the scheme. Provisionally no parking is provided on the northern side of Moorhouse Avenue, as is the existing situation. This is, however, subject to further consultation with the adjoining property owners.

38. The second sheet, Sheet A-A, shows the remainder of Moorhouse Avenue and the Ferry Road / Moorhouse Avenue / Wilsons Road intersection. The widening allows two full straight through lanes on both the approach and departure sides of the intersection.

39. The third sheet, Sheet B-B, extends from west of Mathesons Road to east of Olliviers Road. Provisionally no parking has been provided west of Olliviers Road on the north side while there are parking bays on the southern side. The proposed locations of parking bays through the scheme have been based on kerbside parking usage surveys undertaken by the Council. If parking is provided in the final design on the northern side west of Olliviers Road, then the carriageway will need to be realigned southward in that section.

40. In the case of the four laning of Fendalton Road, which commenced construction in September 2002 there was a considerable increase in the amount of parking provided in the final design over that proposed in the initial scheme after consultation with adjoining property owners and occupiers. The same changes are quite possible with this scheme.

41. Sheet B-B also shows two of the three proposed u-turn facilities in the central median marked with yellow diagonal lines. South of Ferry Road, the Charleston area has access to the arterial road network (Ferry Road , Wilsons Road and Ensors Road) via several streets, eg Charles St and Laurence St. Theoretically there is no need to provide any median openings as all the streets within Charleston are connected. See the local area map in Annexure 2 for the Charleston area.

42. In the Phillipstown ares, north of Ferry Road, Ryan St is a cul de sac with access to Ferry Road only, whilst Bordesley St has access to Ferry Road and Harrow St only. Other streets in Phillipstown have access to the arterial road network via Ferry Road, Harrow Street and the Ferry Road / Wilsons Road / Moorhouse Avenue intersection via Nursery Road. See the local area map in Annexure 2 for the Phillipstown area. Therefore, at a minimum, one u-turn bay east of Ryan Street (eastbound to westbound) and one u-turn bay west of Bordesley Street (westbound to eastbound) are required to maintain full accessibility to the local suburban areas adjoining Ferry Road.

43. The fourth sheet, Sheet C-C, extends from west of Bordesley Street to east of Isabella Place. The carriageway alignment proposed to date has been swung to the south side within the designation especially opposite Ryan Street. This has been to avoid the electrical substation northeast of Osbourne Street, and to minimise the impact on the Edmonds Factory Garden. If it proves cost effective, the opportunity exists to relocate the electrical substation which would allow the carriageway to be moved further north without further impacting on the Edmonds Factory Gardens. I am informed by Warren Lloyd, Traffic Engineer, City Solutions Unit, Christchurch City Council, that

the cost to relocate a substation when Lincoln Road was four laned in the late 1990's was in the order of $300,000. The only parking bays in this section are opposite Bordesley Street.

44. The fifth and final sheet, Sheet D-D, extends from west of the Aldwins Road / Ensors Road / Ferry Road intersection to east of Randolph Street. The widening allows two full straight through lanes on both the approach and departure sides of the intersection.

45. The final scheme design is still subject to:

- Determining whether or not it is cost effective to move the electrical substation. If it is then the opportunity exists to move the carriageway alignment north at that location.
- A base pickup of all underground services and mapping of their exact locations so that the alignment can be cost effectively located with respect to these services.
- Further consultation with adjoining property owners and occupiers with regards to the location and number of on street parking spaces and therefore alignment of, and the width required for the carriageway and footpath. As noted above, in the case of the four laning of Fendalton Road which commenced construction in September 2002 there was a considerable increase in the amount of parking provided in the final design over that proposed in initial designs.
- Determining the final location of the u-turn bays.
- Further input from the community and elected members of the Christchurch City Council into the four laning project between now and when construction commences.
- Detailed design and costings being taken into consideration, including such items as bus shelter and street lighting pole locations.
- A safety audit of the scheme.
- Possible changes in roading standards. The designation has a ten year life from the time the Proposed City Plan becomes operative. I am informed by Ivan Thomson, Senior Planner – Planning Policy, Christchurch City Council that the Proposed City Plan may not become operative until around the end of 2004 due to the outstanding references yet to be heard. Construction could, therefore, be as far as away as the beginning of 2014. The analysis in this evidence has assumed the Proposed City Plan is operative at the end of 2003.

46. Subject to the above, there may opportunities to reduce the amount of property required in certain locations, subject to a resource consent. However, any change in the road reserve boundary proposed by the designation would be subject to, and limited by the standard practice of determining a straight continuous road reserve boundary alignment to avoid potential dark corners that can be unsafe areas between staggered property boundaries. The current designation already allows for the formation of a straight continuous road reserve boundary.

6.0 Matters For Consideration Under Section 171 Of The Act

47. S174 of the RMA concerns appeals on designations and states:

> *"…*
>
> *4) In determining an appeal* (on a designation)*, the [Environment Court] shall have regard to the matters set out in section 171 and may*
>
> *(a) Confirm or cancel a requirement; or*
>
> *(b) Modify a requirement in such manner, or impose such conditions, as the [Court] thinks fit."*

48. S171 of the RMA concerns recommendations by territorial authorities on designations and states:

> *"171 Recommendation by territorial authority*
>
> *(1) [Subject to Part 2, when] considering a requirement made under section 168, a territorial authority shall have regard to the matters set out in the notice given under section 168 (together with any further information supplied under section 169), and all submissions, and shall also have particular regard to—*
>
> *(a) Whether the designation is reasonably necessary for achieving the objectives of the public work or project or work for which the designation is sought; and*
>
> *(b) Whether adequate consideration has been given to alternative sites, routes, or methods of achieving the public work or project or work; and*
>
> *(c) Whether the nature of the public work or project or work means that it would be unreasonable to expect the requiring authority to use an alternative site, route, or method; and*
>
> *[(d) All relevant provisions of any national policy statement, New Zealand coastal policy statement, regional policy statement, proposed regional policy statement, regional plan, proposed regional plan, district plan, or proposed district plan.]*
>
> *(2) After considering a requirement made under section 168, the territorial authority shall recommend to the requiring authority that the requiring authority either—*
>
> *[(a) Confirm the requirement, and any conditions as to duration, with or without modification and subject to such conditions as the territorial authority considers appropriate; or]*
>
> *(b) Withdraw the requirement.*
>
> *(3) The territorial authority shall give reasons for a recommendation made under subsection (2)".*

49. In my evidence below, I cover matters raised by s171(1)(a-d). Mr Campbell's evidence covers Part II of the RMA with respect to the Ferry Road designation.

50. Relevant to this consideration is the case law presented by the Environment Court decision on Bungalo Holdings Limited vs North Shore City Council (**A52/01**), which concluded that:

- It is not up to the Court or territorial authority to evaluate the Requiring Authorities objectives;
- It is appropriate to consider both designation as a planning procedure and the particular work associated with the designation in assessing whether "the designation" is reasonably necessary to achieve the objectives; and

- It is appropriate in assessing a requirement, to consider the extent of land (proposed to be) designated.

51. Also relevant is that under statute, the onus is not to prove that the best option has been selected, but merely that sufficient consideration has been given to alternatives viz*:*

> *"..requires consideration of whether the requiring authority has acted arbitrarily of given only given cursory consideration to the alternatives"*

[Porirua City Council vs. Transit New Zealand (**W052/01**) and the Bungalo case above (**A052/01**)]

7.0 Designation Reasonably Necessary For Achieving Objectives – RMA s171 (1)(a)

52. Subsection (a) of s171(1) "Recommendation by territorial authority" of the RMA requires the territorial authority to have particular regard to:

> *"(a) Whether the designation is reasonably necessary for achieving the objectives of the public work or project or work for which the designation is sought; [and]"*

53. The Proposed City Plan by stating the extent of work and work type as *"4 lanes"* for the Ferry Road designation defines the method by which the objective(s) of the public work will be achieved, i.e. to provide four traffic lanes on Ferry Road from Wilsons Road to Aldwins Road.

54. The remaining part of the Ferry Road designation from Aldwins Road to Randolph Street allows the four lane cross section to merge into the two lane cross section east of Aldwins Road.

55. The designation has four interdependent objectives for providing four traffic lanes on the subject section of Ferry Road. They are:

- To bring this section of road up to the standard of a major arterial road which is it's classification in the Proposed City Plan, and
- To complete the major arterial route between Moorhouse Avenue (major arterial) west of Fitzgerald Avenue and Aldwins Road (major arterial) / Ensors Road (major arterial) / Ferry Road east of Aldwins (minor arterial), and
- To direct through traffic along the major arterial route and away from the local road section of Ferry Road between Wilsons Road and Fitzgerald Avenue and other local streets, and
- To provide safely and efficiently for the traffic volumes that major arterial roads carry.

Arterial Roading Standards

56. The Proposed City Plan defines the roading hierarchy standards for roads in Christchurch in Volume 3, Section 8, Appendix 2 – Roading Hierarchy Standards, page 8/51. The table is not subject to any references and sets out the following requirements for urban major arterial roads:

> *"Typical total daily traffic flows (VPD) > 12,000".*
> *"Road widths(m) Minimum 30 Maximum 40"*
> *"Roadway widths(m) Minimum 24 Maximum 34"*
> *"Minimum lanes 4"*
> *"Number of Footpaths 2"*
> *"Median Yes"*
> *"Amenity strip Yes"*
> *"Parking Yes"*
> *"Cycle facilities Yes"*
> *"Access controls Yes"*

57. Major arterial roads, urban and rural, are the only roads in the table that are specified with the minimum number of lanes as four lanes.

58. The table identifies that a 30m road (reserve) width as a minimum is required if four traffic lanes are to be provided on a major arterial road (along with other requirements such as cycle facilities and parking). The proposed roadway (carriageway) width of about 25m is also consistent with the tabled standards. I note that there are no outstanding references on this section of the Proposed City Plan.

59. The Proposed City Plan also defines the roading hierarchy standards for urban minor arterial roads in Section 8, Appendix 2 – Roading Hierarchy Standards, page 8/51. As previously noted Ferry Road from Aldwins Road to Randolph Street is an urban minor arterial road.

"Typical total daily traffic flows (VPD) – 3,000 to 15,000"
"Road widths(m) Minimum 20 Maximum 30"
"Roadway widths(m) Minimum 14 Maximum 22"
"Minimum lanes 2"
"Number of Footpaths 2"
*"Median *"*
"Amenity strip Yes"
"Parking Yes"
"Cycle facilities Yes"
"Access controls Yes"
" means that the provision of those facilities is allowed for in the standards for road design and construction and/or shall be considered as conditions of consent on subdivision roading under Clause 5.2 of these rules"*

The designation conforms to the maximum road (reserve) width.

60. Given the above, I consider that the designation is reasonably necessary to achieve the objective of four laning in terms of the roading hierarchy standards set out in the Proposed City Plan.

61. From a purely transport perspective there are no particular or unique features that suggests deviation from the standards should be considered. Different cross sections have been considered later in this evidence as an assessment of alternative methods of four laning. Exceptions to the standards do occur. For example, the Blenheim Road Deviation designation requirement is one (still subject to recommendation by a commissioner at the time of writing). It is a rather unique case, in terms of incorporating an overbridge. It would not make economic sense to provide for kerbside parking along such a corridor, to achieve a corridor width in compliance with the requirements of the Proposed City Plan, when the cost of the (bridge structure) is in the region of $2,000 a square metre.

62. There are major arterials in Christchurch that have road (reserve) widths less than the minimum 30 metres required by the Proposed City Plan. However, it is not economically viable to bring all these roads up to the Proposed City Plan standards at once. This can only be achieved as and when funding is available, and as and when traffic safety and traffic efficiency issues arise.

Completion Of The Major Arterial Route

63. The next objective is the completion of the major arterial route between Moorhouse Avenue west of Fitzgerald Avenue and Aldwins Road / Ensors Road / Ferry Road east of Aldwins. The road network in Christchurch is classified in the Proposed City Plan as major arterials, minor arterials, collector roads and local roads. To quote from the Proposed City Plan, volume 2, page 7/6,

> *"For over 25 years the City has adopted, and continued to develop, a hierarchy of roads. Each road is generally classified with respect to its planned traffic function and surrounding land uses. The highest classified roads (major arterials) provide for the greatest level of movement with a minimum access function, while local roads provide for very little through movement, but have a major access function. In this way the hierarchical network provides for the efficient and safe movement of people and goods, while reducing the conflicts which arise between traffic requirements and the environment of surrounding areas."*

64. Moorhouse Avenue between Deans Avenue and Fitzgerald Avenue is part of the inner ring (orbital) road of major arterials (Fitzgerald Avenue, Bealey Avenue, Deans Avenue, Moorhouse Avenue) which provides for major traffic movements around the edge of the central city. Radiating out from this inner ring road are the connecting radial arterials, such as the Moorhouse Avenue (east of Fitzgerald) / Ferry Road route. These radials carry traffic to, from and between the central city, inner ring road, suburban areas and major regional facilities like the international airport and port of Lyttleton. See Annexure 8 for a diagram showing the radial arterials.

65. The majority of movements along Ferry Road are between Ferry Road west and east of Aldwins Road. Ferry Road east of Aldwins Road serves the suburb of Woolston suburb, the hillside suburbs of Mt Pleasant, Sumner – a major recreational destination in the weekends, and Port Lyttelton via Tunnel Road. See Annexure 8 for a diagram showing Ferry Road as a route.

66. The movement between Aldwins Road and Ferry Road is also significant. The right turn from Aldwins Road into the subject section of Ferry Road is a very significant 40% of the southbound flow of Aldwins Road in the morning peak hour. In the evening peak hour the left turn from the subject section of Ferry Road into Aldwins Road is also high at 26% of the eastbound flow. The Aldwins Road route serves Eastgate Mall – one of the five biggest malls in Christchurch, and the suburbs of Wainoni, Aranui, South New Brighton / Southshore, New Brighton, Queenspark / Parklands. See Annexure 8 for the traffic count information.

67. As can be seen from route diagram in Annexure 8, the subject section of Ferry Road is carrying traffic to and from a wide range of areas in eastern Christchurch. A sector analysis of the vehicle trips occurring in the evening peak hour has been carried out using the calibrated Christchurch Transport Study (CTS) traffic model by dividing Christchurch into 10 sectors, with one local sector around Ferry Road, one central city sector and the other eight sectors fanning out from the central city. See the sector diagram in Annexure 8. The CTS traffic model is reported on in the Annexure 1, as is the full sector analysis in Annexure 1, table 7 and 8. It confirms the high percentage of trips occurring along the subject section of Ferry Road from the central city to the eastern and south east sectors. Table 1 below is a summary of that table giving the percentages to and from each sector rather than every sector to sector movement. This table also illustrates the same trend.

Table 1 – Vehicle Trips Using Subject Section Of Ferry Road In The Evening Peak Hour		
	From %	To %
Central City Sector	30%	12%
Local Sector	9%	10%
Southeast Sector	23%	38%
Eastern Sector	7%	16%
Northeast Sector	2%	5%
Northern Sector	2%	3%
Northwest Sector	3%	3%
Western Sector	8%	7%
Southwest Sector	5%	3%
Southern Sector	10%	4%

68. The sector table in the report in Annexure 1 has been summarised further below in table 2. The sectors have been compressed into the local sector and "other" sectors. The table shows that 77% of trips are through trips along the subject section of Ferry Road.

Table 2 **-** % Of Through Vehicle Trips On Subject Section Of Ferry Road	
	% Of trips
Local to Local Trips	1%
Local to Other Trips	8%
Other to Local Trips	9%
Other to Other Trips I.e. Through Vehicle Trips	82%

69. These percentages demonstrate the significant proportion of traffic using Ferry Road are through vehicle movements and reflects the major arterial function of the road which is to carry a high proportion of through traffic.

70. Given the above, I believe that the designation is reasonably necessary to achieve the objective of completing the major arterial route between the major arterial Moorhouse Avenue (major arterial) west of Fitzgerald Avenue to Aldwins Road (major arterial).

Directing Traffic Away From Local Roads

<u>The Local Road Section Of Ferry Road</u>

71. Turning to the third objective. Council has over a long period continued to downgrade from through traffic routes to local roads or to completely close them to vehicle traffic, the roads that run across the diagonal of the otherwise mainly grid network near the central city. These diagonal roads are shown in Annexure 9.

72. Ferry Road north of Wilsons Road is classified as a local road in the Proposed City Plan and is not part of the arterial network. To quote from the Proposed City Plan, volume 2, page 7/6,

"Local Roads – Local roads make up the balance of city roads and lie between the 'corridors' of arterial roads as part of neighbourhood areas. These roads function almost entirely as access ways and are not intended to act as through routes for motor vehicles. These roads may also act as cycle routes and provide areas of open space. In extreme cases they may function as pedestrian malls or parking precincts by the banning of through traffic."

73. The turning movements observed at the Ferry Road / Moorhouse Avenue / Wilsons Road intersection, see table 3 and Annexure 9, show that the westbound right turn from Ferry Road (major arterial) east of Wilsons Road into Ferry Road (local road) north of Wilsons Road is a significant movement.

Table 3 - Turning Movements Westbound From The Subject Section Of Ferry Road			
	Left turn into Wilsons Road	Through movement into Moorhouse Avenue	Right turn into Ferry Road (local)
Morning Peak Hour – vehicles	81	691	461
Morning Peak Hour- %	7%	56%	37%
Evening Peak Hour – vehicles	42	476	390
Evening Peak Hour- %	5%	52%	43%

74. In a westbound direction both Ferry Road (Aldwins to Wilsons) and Moorhouse Avenue (Wilsons to Fitzgerald) have one midblock lane. Four laning of Ferry Road (Aldwins to Wilsons) and Moorhouse Avenue (Wilsons to Fitzgerald) will increase the capacity and efficiency of the major arterial route to cater for through traffic relative to the local section of Ferry Road.

75. A similar argument exists for eastbound traffic. The observed turning movements, table 4 and also see annexure 9, show that the eastbound left turn from Ferry Road (local) north of Wilsons Road into Ferry Road (major arterial) east of Wilsons Road is also significant movement.

Table 4 - Turning Movements Eastbound Onto The Subject Section Of Ferry Road			
	Left turn from Ferry Road (local)	Through movement from Moorhouse Avenue	Right turn from Wilsons Road
Morning Peak Hour - vehicles	180	196	21
Morning Peak Hour- %	45.3%	49.4%	5.3%
Evening Peak Hour - vehicles	565	843	102
Evening Peak Hour- %	37%	56%	7%

76. In an eastbound direction Ferry Road (Aldwins to Wilsons) has one midblock lane and Moorhouse Avenue (Wilsons to Fitzgerald) has two midblock lanes. Four laning of Ferry Road (Wilsons to Aldwins) will again increase the capacity and efficiency of the major arterial route to cater for through traffic relative to the local section of Ferry Road.

77. If the Moorhouse Avenue / Ferry Road route was four laned to provide additional capacity along the arterial network, the Council would be more able to further pursue downgrading the local section of Ferry Road north of Wilsons Road through to south of St Asaph. The current daily traffic flow of

around 11650 vpd (November 2001) east of Fitzgerald makes it impractical at the moment. The traffic count is included in Annexure 9.

Local Roads In General

78. As noted in paragraph 72 above, local roads are not intended as though traffic routes. As traffic flows continue to grow over time, so does traffic congestion. The higher the levels of congestion, the more likely are vehicle drivers to seek bypasses of the congestion via local roads. In the case of the subject section of Ferry Road the local streets of Phillipstown and Charleston are the areas affected. The effects on these areas include a reduction in safety and loss of residential amenity. The four laning of the subject section of Ferry Road using the designation will provide better travel times on Ferry Road and therefore reduce the amount at "rat running" likely to occur relative to it remaining as a two lane road. This also has a financial benefit for the Christchurch City Council in that fewer local area traffic management measures such as speed humps are demanded by the community.

79. I believe that the designation is therefore also reasonably necessary to achieve the objective of four laning in terms of directing through traffic along the major arterial route and away from the local roads of Phillipstown and Charleston and the local section of Ferry Road.

Traffic Safety And Efficiency

80. The final objective as stated in paragraph 55 is to provide safely and efficiently for the traffic volumes that major arterial roads carry.

81. Mr Facey's evidence covers, amongst other safety aspects, the traffic safety of Ferry Road for both the existing road layout and if it is upgraded to a major arterial layout. The evidence shows that there are approximately $2.1m, net present valve (npv) of safety benefits if Ferry Road is four laned using the designation.

82. The "Ferry Road Designation – Traffic Modelling Report" by John Falconer, Transport Planning Engineer, City Streets Unit, Christchurch City Council attached as Annexure 1, covers an assessment of alternative routes and also estimates the benefits for four laning the subject section of Ferry Road using the designation. The report estimates the travel time and vehicle operating costs at $36.1m npv, the project costs at estimated at $10m npv and the benefit/cost ratio at 3.6 for immediate construction. If construction is delayed until 2013, then the benefit / cost ratio rises to 4.7. The analysis uses Transfund New Zealand standard procedures[1] for assessing roading projects. The analysis is summarised in table 16 of Annexure 1.

83. Also, the historical traffic growth trend analysis, paragraph 151, shows that before 2013, Ferry Road will most likely be operating in congestion conditions exceeding those on Papanui Road, one of the most congested two lane roads in Christchurch. Paragraph 151 further shows that the degree of saturation (volume/capacity) on one of the key intersections on Papanui road exceeds practical

[1] Project Evaluation Manual including updates to date, Transfund New Zealand, Project Evaluation Manual, May 1997

capacity (0.9 capacity) for almost 7 hours per weekday. From a traffic efficiency perspective this should be zero. Travel delays plotted against degree of saturation are hyperbolic[2], see Annexure 12. Once the degree of saturation exceeds around 0.7, travel delays begin to increase rapidly.

84. Furthermore, Mr Penny's evidence has assessed the four laning of Ferry Road using a detailed traffic simulation model in the local area of Ferry Road. The results of the simulation modelling summarised in the tables of Mr Penny's evidence clearly indicate the travel time savings gained from the four laning provided for by the designation. Based on the Transfund procedures I have estimated the value of the travel time savings from those tables at $39m npv in the conservative case, which does not allow for traffic that will reroute to Ferry Road if it is four laned. Allowing for the rerouted traffic the travel time savings are $71m npv. The travel benefits from the CTS traffic model, as above were estimated at $36.1m npv. The results are of a similar magnitude which should be expected and confirms the need for the four laning, however they are not directly comparable as:

- Most importantly, traffic simulation models are inherently more sophisticated as they model individual vehicles. They can model queue build up and the interference effects those queues have on the capacity of turning lanes, on other traffic, and on the operation of other intersections. They are also able to model complex traffic signal phasings. The higher the level of congestion, the more significant these effects are.
- The areas the models cover are different. The traffic simulation model covers the local area around Ferry Road while the CTS traffic model covers urban Christchurch and outlying satellite towns. Computers are not yet fast enough

85. Given the above, I believe that the designation is reasonably necessary to achieve the objective of four laning in terms of providing safely and efficiently for the traffic volumes that major arterial roads.

[2] Research Report ARR180, Calibrating Sidra, 2nd Edition, page 26, R Akcelik, Australian Road Research Board, 1992.

8.0 Adequate Consideration Of Alternatives – RMA s171 (1)(b)

86. Subsection (b) of s171(1) "Recommendation by territorial authority" of the RMA requires the territorial authority to have particular regard to:

> *"(b) Whether adequate consideration has been given to alternative sites, routes, or methods of achieving the public work or project or work; [and…]"*

87. Consideration of alternative sites, routes or methods is discussed below in terms of:

- An assessment of the designation alignment - alternative sites
- The long history of the Ferry Road designation and the history of the status of Ferry Road
- A further assessment of alternative routes
- An assessment of other methods of four laning Ferry Road
- An assessment of other methods

An Assessment Of The Designation Alignment – Alternative Sites

88. By the time the designation was placed in the 1972 District Scheme, see Annexure 11, careful consideration would have been given the effects of the road widening on each property and the location of any buildings. The designation alignment would have been chosen to minimise the effects on properties by retaining as many of the buildings as possible and therefore minimising the number of property owners required to relocate. The designation alignment is overlaid on aerial photos in Annexure 10**.** The designation is shown in blue and properties close to the designation are marked in pink in their surveyed location. The colour aerial photos over which the plan scheme is laid cover the whole city with 20% of the city flown each year. The aerials are therefore no older than five years old.

89. I have reviewed the designation alignment. It is my professional opinion that careful consideration was given to the designation alignment when it was put in place. For example, if the designation was on the southern side of Ferry Road between Aldwins Road and Randolph Street (Sheet F-F) then a number of commercial buildings on that side would have required removal to accommodate the road widening. The designation is completely on the northern side of Ferry Road at that location and does not affect any buildings.

90. The location of the Ferry Road designation is also constrained at its western end by the need for it to align with the Moorhouse Avenue designation at the Wilsons Road intersection, (Sheet B-B) and to provide the maximum possible offset from the angled north-western intersection leg (Ferry Road, Fitzgerald to Wilsons) to align the intersection geometrically. To achieve these objectives the designation is completely on the south side of Ferry Road at Wilsons Road.

91. The Moorhouse Avenue designation is completely on the south-side of Moorhouse Avenue between Fitzgerald Avenue to Wilsons Road. This is because it needs to align with Moorhouse Avenue west of Fitzgerald Avenue (Sheet A-A) and be integrated with the required intersection layout at Wilsons

Road. The southern side designation also mitigates the overall (adverse) effect of the designation on existing property by retaining as many of the buildings as possible.

92. Between Wilsons Road and Aldwins Road the Ferry Road designation stays on the southern side through to Grafton Street, is on both sides of the road through to half way between Ryan Street and Isabella Place and is then on the northern side to Randolph Street. This alignment again minimises the number of buildings affected by the designation between Wilsons Road and Aldwins Road (Sheet C-C, Sheet D-D and Sheet F-F). Mr Campbell's evidence discusses the specific number and location of buildings that are affected by the designation.

93. I am informed by Warren Lloyd, Traffic Engineer, City Solutions Unit – Christchurch City Council, that the designation alignment requires the removal of three substantial trees. It might be noted however that none of these trees has protected status in the Proposed City Plan. Mr Craig's evidence covers the landscaping opportunities provided by the designation to replace these trees and also discusses the effects on Edmonds Gardens landscaping with respect to the Ferry Road designation.

94. Having reviewed the designation, I am of the opinion that the designation as set out in the Proposed City Plan minimises the effects on adjoining properties, in that it both minimises the land requirement and limits the number of buildings affected. Varying the designation alignment would have greater effects in that more buildings would have to be removed or more properties affected. Where existing building setbacks will not comply with City Plan setback requirements in relation to the designation the opportunity exists for the property owner to stay or for Council to shift the building on the property or purchase the full property. Compensation for these effects is available and governed by other statutes.

95. I believe that adequate consideration has been given to alternative sites for the designation alignment through the consideration given to it's location when it was included in the 1972 District Scheme and through the above review.

Historical Assessment Of Alternative Routes

96. The road widening designation on Ferry Road from Wilsons Road to Randolph Street has a long and considered history. The following commentary includes edited sections of a paper[3], see Annexure 11, compiled by Malcolm Douglass formally the Chief Executive of the Canterbury United Council and the Assistant Director Of Planning at the Canterbury Regional Planning Authority.

97. One of the early mid 1940s documents was the 'Final Report of the Christchurch Metropolitan Planning Committee' 22 January 1948. This report noted that in respect of travel to the South East '

> *"The road connecting the Port of Lyttelton, which should be the best in the district, is probably the worst."……"Although the site of the tunnel (road) entrance has not yet been finally determined the approximate position of the approach road from the Port Hills Road is indicated on the plan (included in the report) and the extensions planned to link to Ferry*

Road and Linwood Avenue, with a further road more or less parallel to Linwood Avenue connecting Tuam Street via Harrow Street and Marcroft Street (was also included).'

That 1948 Plan also showed Ferry Road as one of the major radial highways serving the metropolitan area.

98. In 1953 the Town and Planning Act (TPCA) was passed into statute.

99. The route parallel to Linwood Avenue (noted and shown in the 1948 Plan as Road Improvement No 37) was never built. This meant a greater reliance on Opawa Road/Port Hills Road and Ferry Road improvements to service the south east sector including access toward Sumner and Lyttelton.

100. The Christchurch Regional Planning Authority report 'Ferry Road As A Major Traffic Route' Report MTP No 138-27th September 1960 was prepared in the context of the submissions on the preparation of the Christchurch District Scheme (Section One Zoning) plan. That report recognised both the need for widening from frontage properties (assumed initially as 25 links or 5 metres on each side of the street) and also the need to restrict the frontage of ribbon development of commercial and industrial character.

101. The report and Authority conclusion was:

"That the preferred solution to the problem of catering for this traffic is by improvements to Ferry Road" and

"For Ferry Road to be retained as a major traffic route it will require widening of parts and the progressive application of parking and stopping restrictions in others. It would be unsound to permit in the meantime development of land uses along its frontage that would themselves suffer from such restrictions and which on the other hand would prejudice and make more difficult the improvements and restrictions necessary for the free flow of traffic."

This report was signed by the Regional Planner, Nancy Northcroft, adopted by the Authority and became the basis of the submissions to the City Council's District Scheme for both limitation of commercial zoning and support for the subsequent road widening.

102. I am informed by Mr Campbell that the first district plan for Christchurch became operative in March of 1962. Ferry Road appears in this first district plan in section one (zoning), scheme statement and code of ordinances, clause 11, page 9,

*"**11.** FERRY RD. As directed by the Town and Country Planning Appeal Board a building line is to be imposed on Ferry Road to provide for the ultimate widening of the street by 30 feet between Wilsons Road and the Tunnel Road junction. The actual location of the building line restriction i.e. whether it will be on one and/or partly on both sides of the street will be publicly notified in the City of Christchurch District Scheme, Section Two."* In the district plan the building line restriction extended through Woolston to Tunnel Road approximately 2.27 km further east of Randolph Street along Ferry Road. See Annexure 11.

[3] Ferry Road As A Major Traffic Route – Chronology Of Regional Decisions 1960 –1990 - Unpublished report, R CCC Ferry Rd Hstry.3.9.02.Doc, Douglass Consulting Services Ltd, Christchurch, September 2002

103. Also in 1962 the first transport plan for Christchurch urban area was developed and was released for public comment in September of that year. The 1962 Christchurch Master Transportation Plan[4] (MTP) was important in that it was the first systematic and comprehensive assessment of the future transport needs in Christchurch. The plan noted on page 9 that,

> "*In the past, decisions on future roading and transport requirements have been based on little more than information gathered from traffic counts."*

The plan, page 9, later goes on to say

> *"It was for these reasons that it was decided to carry out a systematic investigation, based on an Origin and Destination Survey, that would enable the growth and development of traffic to be related to the growth and development of the city, and thereby provide a more reliable basis for the Plan."*

104. The Master Transport Plan, and subsequent reviews through the 1970's and 80's provided the key network structure and basis for the major changes that have occurred to the Christchurch road network since then.

105. With respect to Ferry Road the MTP in figure 12, Network of Major Roads, showed it's full length as a major road but of a lower hierarchy than Port Hills Road/Brougham Street route and Linwood Avenue. See Annexure 11.

106. The Christchurch Master Transport Plan confirmed the need for the widening of Ferry Road and Moorhouse Avenue from Fitzgerald Avenue Road to Randolph Street in Table III, Schedule Of Proposed Works – Christchurch Master Transportation Plan, page 53, in the left column headed

> *"Major proposals for new routes and the up-grading of existing routes expected to be required within the planning period.", " 118. Widen Moorhouse Avenue – Ferry Road between Fitzgerald Avenue and Manning Place."*

Manning Place is on the opposite side of the road to Randolph Street and it's intersection with Ferry Road is about 50m further east.

107. The planning period was defined as approximately the next 20 years, MTP page 47, through to about 1980 with a projected population for the urban area of 311,450, table A, page 11. The Christchurch City population[5] in 1996 was 309,030 and in 2001 it was 316,227 indicating that the population projection used in the 1962 Master Transportation Plan has only recently been passed.

108. The MTP in table 1, page 42, included the following commentary on Ferry Road.

> *"Radials Within the Catchment Area*
>
> *8.2 Ferry Road - Main Road to Sumner*
>
> *Section of Radial For Individual Consideration*
>
> *8.2.1 Wilsons Road to Aldwins Rd-Ensors Rd.*
>
> *Situation on Section of Radial 'as is' in 1980*
>
> *seriously over-loaded*
>
> *Situation on Section of Radial 'as is' beyond 1980*

[4] 1962 Christchurch Master Transportation Plan, Christchurch Regional Planning Authority, September 1962.

***"

"Commentary

Note (b) The southern part of this Sector will, in 1980, be in serious difficulties, but if Ferry Road is widened in accordance with the Christchurch City Council proposals it should be satisfactory. Beyond 1980 ,however, further relief would eventually be needed to meet anticipated increases.

NB The inner sector will carry part of the traffic from the Tunnel Road."

MTP Page 39,

*"The symbol *** is used to denote a traffic volume which was well above the possible capacity"*

109. The MTP also noted in column 2, page 53, under the heading *"Provisions that can be foreseen as logical developments beyond the present planning period", "119. Widen Ferry Road between Manning Place and Tunnel Road."*

110. There were no submissions, comments or objections, by the City Council or members of the public, to the status of Ferry Road as identified in the MTP.

111. It is important to note that the designation from Wilsons Road to Randolph Street is part of a larger project from Fitzgerald Avenue to Randolph Street. Secondly the MTP involved the development of a coherent network wide strategy or plan to cater for future traffic growth. This process to develop the plan provided the opportunity for alternatives sites, routes, or methods to the Ferry Road designation to be proposed. The adopted plan however confirmed the need for the widening.

112. The Tunnel Road motorway standard connection to the Port of Lyttelton was built and opened in 1964 and the connection to Ferry Road was made at a new roundabout linking across to Dyers Road.

113. The subsequent regional road classification plan produced in 1966 showed the length from Moorhouse/Fitzgerald Avenues as far east as Aldwins/Ensors Roads intersection as a major arterial, planned for widening to four lanes with a median divided carriageway. This gave it the same status, over this inner 1.2 kms, as Brougham Street and Linwood Avenue.

114. In around 1969[6] Ferry Road became part of the State Highway system due to its connection to Tunnel Road to service the Port of Lyttleton. The subsequent construction of the Brougham Street expressway connection to the Port via Opawa Road/Port Hills Road in lieu of the proposed motorway system saw the state highway relocated in around 1992.[7]

115. Page 83 of the 1967 "Red Book" [8] indicates that Section Two of the 1962 Christchurch District Planning Scheme was under preparation. The City Council had central government agreement to

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[5] http://www.ccc.govt.nz/Census/population.asp

[6] Gazette Notice 17 July 1969, No 43, p1338 - Email communication with Lindsay Joyce, Christchurch Regional Office, Transit New Zealand.

[7] Gazette Notice 18 June 1992 No.90, p2064 - Email communication with Lindsay Joyce, Christchurch Regional Office, Transit New Zealand.

[8] Christchurch Development, Christchurch City Council, 1st Edition, June 1967.

prepare the scheme in two sections. The "Red Book" was released as a precursor to section two of the district planning scheme. Page 2 notes

> *"It's purpose is to give as simply as possible, some background and recommendations as a basis for the Town Planning Scheme for the City of Christchurch."*

Figure 52, page 54 of the "Red Book" shows Moorhouse Avenue and Ferry Road from Fitzgerald Avenue to Aldwins Road as an expressway and the overlay indicates this section for road widening as works required in planning period up to 1985. See Annexure 11.

116. The Master Transport Plan received formal status (under the 1953 TPCA) as a regional scheme when the Christchurch Regional Planning Scheme, Section Two: Communications[9], dealing exclusively with transport became operative in December 1971. Figure 2 and map 4-sheet 1 of the Scheme identified motorways, arterials(major arterials) and the lesser primary roads(minor arterials). Moorhouse/ Ferry between Fitzgerald Avenue and Aldwins/Ensors Roads is shown as an arterial road. The Scheme identifies on its programme maps, map 4-sheet 7, the widening for Ferry Road as being necessary at the end of Period V, at that time anticipated to be post 1990 when the population had risen to 400,000, page 13. See Annexure 11. In this respect however, it is very pertinent to note that when the 1962 MTP was prepared it was anticipated that vehicle availability by the end of Period V would be only 500 vehicles per 1000 population. However the figure is now in excess of 700[10]. Whilst the population has not (yet) grown to the level anticipated in the MTP, as requiring this improvement of Ferry Road, it is clear that the current car population exceeds the threshold anticipated. (400,000x500/1000=200,000 c.f 316,227*762/1000=240,965).

117. From that time the Regional Scheme became a guiding scheme requiring adherence in the preparation of District Schemes. The road proposals in the Regional Scheme were, with a few exceptions, included in the Christchurch City District Scheme.

118. The Second Section of the 1962 District Planning Scheme never eventuated and instead was incorporated into the City of Christchurch District Planning Scheme which was publicly notified 1968 and became operational in 1972. In this scheme the subject part of Ferry Road was designated for 'roading' and notated in appendix one and on planning map 6D of this scheme accordingly. See Annexure 11. This document and the regional plan were coincident in their provisions for the subject section of Ferry Road. The City Council programme for the widening of Ferry Road identified it to be constructed beyond 1985.

119. The next major review of transportation in Christchurch was the Second Transport Study which began in 1969. In 1975 Report 210, Summary Report and Recommendations[11] was released. See Annexure 11.

[9] Christchurch Regional Planning Scheme – Section Two – Communications – Scheme Statement – Code Of Ordinances – Christchurch Regional Planning Authority, 1971

[10] Email communication, Richard Earl, Information and monitoring team, Christchurch City Council.

[11] Second Transport Study - Summary Report and Recommendations – Report No 210, Canterbury Regional Planning Authority, June 1975.

120. The Second Transport Study was another opportunity for alternatives sites, routes, or methods to the Ferry Road designation to be proposed, but it is notable that this study again confirmed the need for the widening. Page 2 of the Study Summary Report says about the study:

> *"In particular it has more thoroughly tested modified road networks and the best sequence of road improvement considering the likely availability of funds and National Roads Board grants."* It goes on to say, page 2, *"The plan re-defines programmes of work for the next three development periods and retains adequate options for further extensions beyond that time.*(beyond period IV)*"*

The three development periods were period II with Christchurch urban population of 320,000 by 1980, period III with Christchurch urban population of 360,000 by 1990 and period IV with Christchurch urban population of 400,000 by 1999.

121. The need for the Ferry Road designation was confirmed in attachment 2, page 64 of the summary report under the major heading,

> *"Network Improvements To End Of Period III (For Internal Area Population of 360,000 and Wider Area Population of 110,000 likely by 1990)"*

and minor heading,

> *"Major Arterials – Construct or widen to 4 lane Divided Carriageways"*

and sub heading

> *"Later"*, *"Ferry Rd (S.H.74) – Wilsons to Ensors , Rd. Authy. M.W.D.* (Ministry of Works and Development)".

122. The need for the Moorhouse Avenue designation was also confirmed in attachment 2, page 67 of the summary report under the major heading,

> *"Network Improvements To End Of Period IV (For Internal Area Population of 400,000 and Wider Area Population of up to 200,000 likely by 1999)"*

and minor heading,

> *"Major Arterials – Construct or widen to 4 lane Divided Carriageway"*

and sub heading,

"Early", *"Moorhouse Ave (S.H.74) – east of Fitzgerald Ave to Wilsons Rd, Rd. Authy. C.C.C.*"

123. The 'Road Network For Planning Protection' map was included in 1978 Second Transport Study Report 209[12] - Review Of Road Improvements and shows both Moorhouse Avenue and the subject section of Ferry Road as major arterials. See Annexure 11

124. In 1977 the Town and Country Planning Act 1977 was passed into statute. Page 17 of the Canterbury Regional Planning Scheme, 2nd Review, Section 2 Transport, Jan 1990 notes with respect to the Act,

> *"Section(1) of the Town and Country Planning Act 1977 requires that the Crown and every local authority and public authority having jurisdiction within this region shall adhere to the provisions of an approved regional planning scheme"*.

125. In 1979 the District Scheme, Second Review was notified. The Ferry Road designation was carried over for the subject land but removed or reduced to intersection widening on parts of Ferry Road further east. The designation is discussed in chapter 11 on page 36 of the Scheme and the designation shown on planning map 6D. Page 185 sets out the development of the planning period roading network and indicates designated roading improvements. The Moorhouse Avenue 4 laning (Fitzgerald to Wilsons), Ferry Road 4 laning (Wilsons to Ensors) and Ferry Road (Intersection taper Ensors Road to Randolph Street) four laning are set down to occur early in the planning period which is defined as to a main urban area population of 360,000. See Annexure 11.

126. In 1980 the Urban Transport Act was passed into statute. On page 2 the 1990 Regional Planning Scheme, Second Review[13] notes of the Act,

> *"Urban Transport planning responsibilities are conferred on the Canterbury United Council by the Urban Transport Act 1980."* And *"The Act requires the Canterbury United Council* (CUC) *to prepare an Urban Transport Scheme for the Canterbury Urban Transport Area. This plan will consist of the Transport Section of the Regional Planning Scheme and an Operational Plan"*

127. In December 1980 a formal Draft Scheme, under the provisions of the TCP Act 1977, was published. This remained on hold until 1986 when an amended Proposed Scheme known as Report No 365 was adopted on 28 May 1986. That Proposed Scheme had a more generalised approach to the proposed programme into first priority, second priority and long term works. There was a further period of uncertainty during the local and central government restructuring and reform processes of 1986 to 1989 and then, finally, on the 15 January 1990 after a genesis lasting 20 years the Canterbury Regional Planning Scheme Section 2 – Transport was approved. See below for discussion.

128. During the 1980's the CUC set up the Transport Study Working Group which reported in 1985. Part of its terms of reference was:

- *"To investigate the provisions of the City Scheme and Regional Scheme reviews and reconcile their provisions, or highlight the differences;*
- *To expedite the preparation of the Proposed Review of Section Two of the Regional Scheme;…"*[14]

However the focus on the study was solely on the north of Christchurch, specifically variations of the proposed northern arterial or motorway. The regional planning maps from 1980 included in the report continued to show Moorhouse Avenue and the subject section of Ferry Road as major arterials. See Annexure 11.

129. In 1986 the District Scheme, Second Review became operative and is the current Transitional Plan. The Ferry Road designation was carried over and retained from the 1979 notified scheme without modification. Designated land is discussed on page 59 of the Scheme and the designation shown on planning map 10 along with the Moorhouse Avenue designation. Appendix U, page 205 sets out the

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[12] Second Transport Study – Review Of Road Improvements – A Consideration Of Major Road Network Elements – Report No. 209, Canterbury Regional Planning Authority, September 1978.

[13] Canterbury Regional Council – Canterbury Regional Planning Scheme , Second Review, Section 2 Transport, approved Jan 1990.

development of the planning period roading network and indicates designated roading improvements. The Moorhouse Avenue 4 laning (Fitzgerald to Wilsons), Ferry Road 4 laining (Wilsons to Ensors) and Ferry Road (Intersection taper Ensors Road to Randolph Street) four laning are set down to occur early in the planning period which is defined as to a main urban area population of 360,000. See Annexure 11.

130. In 1988 the CUC produced it's Operational Plan[15] as required by the Urban Transport Act. The operational plan and the transport section of the Regional Planning Scheme made up the Urban Transport Scheme. The Operational Plan included on page 26 a diagram of the arterial road network this time showing Moorhouse Avenue and the subject section of Ferry Road as minor arterials. See Annexure 11.

131. The Transit NZ Act 1989 saw the establishment of Transit New Zealand (TNZ) and later on Transfund New Zealand to manage the land transport programme with funding based on benefit / cost analyses for TNZ and for territorial local authorities if they seek approximately 50% subsidy. Projects receiving subsidy funding also have to state how they comply with the relevant regional land transport strategy.

132. The 1986- 1989 local government reforms saw the formation of the Canterbury Regional Council to replace the Canterbury United Council and amalgamation of several councils and boroughs into current Christchurch City Council.

133. In 1990 the Canterbury Regional Council produced the Regional Planning Scheme - Second Review, Section 2 –Transport[16] superseding the previous Section Two: Communications which became operative in 1971.

134. The 1990 Regional Planning Scheme again confirmed the requirement for the Ferry Road designation. Regional planning map no.2 sheet 3 again shows Moorhouse Avenue and Ferry Road from Fitzgerald Avenue to Aldwins Road as major arterial roads. This is also shown in the schedule B: part 2 under major arterial roads on page B7. Regional planning map no.2 sheet 5 shows the Ferry Road designation as a second priority works to widen to 4 lane. This is also shown in the schedule D: programme of road network improvements, page D4,

"Ferry Road Wilsons Road – Aldwins Road 4 lane divided".

See Annexure 11.

135. The RM Act was passed into statute in 1991.

136. The Transit NZ Act (1992 Amendment) required the Canterbury Regional Council to produce a Regional Land Transport Strategy (RLTS). The 1993 –1998 RLTS was released in October 1993[17].

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[14] 1985 Summary Report – Discussion Document – A review of planning for St Albans / Avonside / Madras and Barbadoes St road proposals – Transport Study Working Group, Report 322, Canterbury United Council, May 1985

[15] Canterbury Urban Transport Approved Operational Plan 1988-1993, Canterbury United Council, November 1988

[16] Canterbury Regional Planning Scheme – Second Review – Section 2 – Transport, Canterbury Regional Council, January 1990

137. The roading hierarchy map on page 89 of the 1993-1998 RLTS is quite different to the previous planning maps in Section 2 of the 1990 Regional Planning Scheme. The section of Ferry Road subject to the designation is shown as a minor arterial, but then again so are Aldwins Road, Ensors Road and Linwood Avenue (Hargood to Gloucester) which were also major arterials. There are many other differences as well such as Riccarton Road, and the Whiteleigh, Clarence, Straven, Idris, Heaton, Innes route shown as major arterials. These roads were never previously major arterials nor are they now in the Proposed Plan or current RLTS. I believe in this respect the map is deficient. The important point is that the subject part of Ferry Road was shown as part of the arterial network.

138. Designations are not explicitly mentioned anywhere in the 1993-1998 RLTS nor is a forward programme of proposed works. The RLTS was essentially a policy document and devolved forward planning to the District Plans through such policies as, page 73,

> *"Protect Canterbury's strategic transport infrastructure and safeguard land and transport corridors needed for future strategic transport requirements",* and commentary such as *"District Plans should recognise long term, strategic transport needs. These needs should be clearly signalled"*

See Annexure 11.

139. The Proposed City Plan was publicly notified in June 1995. The Ferry Road designation was rolled over from the Transitional Plan, and has been discussed with respect to the Proposed City Plan in 3.0 Description of Designation(s).

140. The Christchurch City Council confirmed the Ferry Road designation subject to conditions after the Proposed City Plan hearings in mid 1998 in it's Council decision on roading designations[18], 8th May 1999. It is that decision that is the subject of this case. See Annexure 11.

141. The most recent 2002 – 2007 Regional Land Transport Strategy[19] (RLTS) was published in March 2002. The section of Ferry Road subject to designation is part of the non strategic local road network as defined by the RLTS. The non strategic local road network includes both minor and major arterials and collector roads that are not part of the strategic road network, page 28, see Annexure 11:

> *"Non-strategic local roads*
> *Other roads not listed in the strategic road schedule (see Appendix 1) are non-strategic local roads. These roads provide a range of functions from the movement of local urban traffic on local arterials, through to providing access and services to local property, as well as serving as community spaces. In many cases, they also provide access for tourists and those accessing recreational opportunities."*

142. Also on page 28, the 2002 – 2007 RLTS is supportive of the Ferry Road designation in terms of:

> *Policy 2.2: Support the maintenance and enhancement of non-strategic local roads*

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[17] Canterbury Regional Land Transport Strategy 2002 –2007, Environment Canterbury, March 2002
[18] City Plan Hearings Committee – Council Decision – Council Requirements For Roading And Cycleway Designations, Christchurch City Council, 8th May 1999
[19] Canterbury Regional Land Transport Strategy 2002 –2007, Environment Canterbury, March 2002

Methods

2.2.1 Maintain or enhance non-strategic local roads to standards consistent with their function. [Responsibilities: Territorial Authorities]"

143. Given the above, I believe that adequate consideration has been given to alternative routes through the long history of the designation, the various reviews of the arterial road network and it's retention in district schemes since 1962. The designation has consistently been seen as needed in the population range of about 310,000 to 360,000 in urban Christchurch which is consistent with the current population of 316,227 in 2001 and planning period projection of 358,600 people in 2021[20].

A Further Assessment Of Alternative Routes

144. Notwithstanding the above, given specific matters raised by the referrers I wish to discuss in more depth whether there may be any alternative routes that could carry future traffic volumes in a safe and efficient manner, instead of using the safety and capacity provided by four laning Ferry Road using the Ferry Road designation. Three alternatives are discussed:

- A new arterial route
    a. This would entail construction of a new major arterial connection between the Ferry / Moorhouse / Wilsons intersection and Aldwins / Ensors / Ferry intersection, and
- Improvement of other existing arterial routes as proposed by the referrers
    a. The Rutherford Street, Garlands Road, Brougham Street route.
    b. The Humphreys Drive - Linwood Avenue route

These alternatives are shown in Annexure 12.

145. <u>A New Arterial Route</u>

146. On inspection there does not appear to be any reasonable local alternatives to the Ferry Road designation for a new arterial route, that would efficiently serve the pattern of traffic movements that are served by the existing route.

147. Any new route would need to connect between the Ferry / Moorhouse / Wilsons intersection and Aldwins / Ensors / Ferry intersection. The distance between these intersections is only about 770m. Ferry Road is surrounded on both sides by the inner suburbs of Phillipstown and Charleston and is almost the shortest route between these two intersections. Any new major arterial connection would be longer in distance, constrained geometrically by the need to align with these two intersections and would have significant effects on the surrounding neighbourhoods. The previous discussion on the designation alignment in the section An Assessment Of The Designation Alignment – Alternative Sites has already shown that the designation alignment limits the effects on adjoining properties in the area.

148. <u>Improvement Of Other Existing Arterial Routes</u>

149. Linwood Avenue and Brougham Street have been specifically raised in all the references[21]

> *"Adequate consideration has not been given to existing alternative routes /road, i.e. Linwood Avenue and Brougham Street. These developed traffic routes successfully carry the present loads and have the capacity for future loads. There is a limited amount of land available for development to the east of the city and additional traffic volumes from this can be absorbed by the existing road options."*

150. Firstly with respect to land development in the east of Christchurch. The "Ferry Road Designation - Traffic Modelling Report" attached as Annexure 1 separates out the forecast development in the area east of the Ferry Road designation in the southeast sector has defined in Annexure 8 of this evidence. The table in the report shows that the percentage forecast growth in this area is very similar to that predicted for the whole of the larger Christchurch area. The growth is driven by existing zoned but vacant land, hillside residential development and increased densities in existing areas.

151. Secondly with respect to traffic growth. The historic traffic growth rates along Ferry Road are shown in the table below. The growth rates are consistently in the range of 200 to 350 vehicles per year. A similar growth rate exists on Aldwins Road which also feeds a significant proportion of traffic onto and off the subject section of Ferry Road, see paragraph 66. Note that Aldwins Road is a four laned road. The table below shows the growth rate and the predicted daily traffic flows in 2027 which is 25 years from now and the end of the current planning period. It also shows the flows in 2038 which is 2013 plus a 25 year planning period. This is based on the designation having a life of 10 years and the Proposed City Plan becoming operative in 2004. The Ferry Road count site locations are shown in Annexure 12.

Table 5 - Historic Growth Rates In Daily Traffic Along Ferry, Aldwins And Papanui Road

	Growth Rate (vehicles)	Last Daily Traffic Count	Trend Line Count At 2002	Predicted Count In 2013	Predicted Count In 2027	Predicted Count In 2038
Ferry Road West of Aldwins	333	23114 (2000)	24842	**28505**	**33167**	**36830**
Ferry Road East of Randolph	214	21255 (2001)	21853	24207	**27203**	**29557**
Ferry Road East of Hargood	209	17008 (2000)	17946	20247	23175	25476
Ferry Road West of Tunnel	356	16924 (2000)	18174	22086	**27065**	**30978**
Aldwins Road South of Linwood	375	26682 (2001)	28798	32920	38165	42287
Papanui Road South of Harewood	357	26959 (2000)	27995	31920	36917	40843

[20] http://www.stats.govt.nz/domino/external/pasfull/pasfull.nsf/web/Reference+Reports+Demographic+Trends+2001+Downloadable+Excel+table(s)?open

[21] L.J.Hood & I.A.Wood -RMA 1180/99, I.S & R.J Cumberpatch RMA 1179/99, L.J Hoskin RMA 1198/99, The Friends Of Edmonds Gardens – RMA 1199/99, W.L.G & T.J.A Marshall RMA 1200/99, Charleston Neighbourhood Group – RMA 1201/99

Papanui Road is included in the table as it is one of the most congested roads two lane roads in Christchurch and provides very poor traffic efficiency during the evening peak period and most of the day. The Heaton / Innes / Papanui intersection operates above it's practical capacity for almost 7 hours a weekday. See Annexure 12. As can be seen in table 5, traffic volumes on the subject section of Ferry Road are likely to exceed the current Papanui Road daily traffic flows and therefore similar levels of congestion before 2013. This further confirms the need for the four laning of the subject section of Ferry Road as was found in the section Historical Assessment Of Alternative Routes and in the section Traffic Safety And Efficiency.

152. Thirdly an assessment of the Brougham Street and Linwood Avenue routes as alternative routes. The analysis below assesses projects of similar magnitudes in cost against four laning Ferry Road using the Ferry Road designation which is estimated at $10m. There are three and a half other objectives for four laning Ferry Road using the Ferry Road designation as discussed in 55, the half being safety, the other half , economic efficiency. Transfund New Zealand no longer provide subsidy funding of projects strictly on a benefit / cost ratio and there is no absolute cut off level to meet. The Council also has the option to fund the project completely itself. Also in terms of the assessment of alternatives there is no requirement to choose the optimal option. In terms of economic efficiency, the four laning of Ferry Road needs to retain a benefit / cost ratio exceeding one when assessed against other alternatives.

153. It is important to note that Brougham Street is a state highway. The road controlling authority is Transit New Zealand (TNZ), who are financially responsible for the road. Christchurch City Council do not have direct control or a right to determine what happens on Brougham Street. Any changes would have to be with TNZ's agreement. I am informed my Tony Spowart, Project Manager, Transit New Zealand that there have been no recent transportation studies of Brougham Street and Transit New Zealand have no plans for any major works on Brougham Street. The only recent study with any consideration of Brougham Street was the Southern Arterial Study[22] which very briefly discussed the possible overloading effects on Brougham Street with the construction of the Southern Arterial which is likely to begin within the next five years.

154. Ferry Road, west of the Aldwins / Ensors / Ferry intersection, is part of the radial arterial road network and to the west provides an arterial link to Moorhouse Avenue which is part of the inner orbital ring road around the central city. From there direct access to the southern part of the central city, Sydenham, and to both Lincoln Road and Blenheim Road arterials further to the west is possible. To the east, Ferry Road provides an arterial connection to the minor arterial section of Ferry Road east of Aldwins Road along which are the areas of Woolston and Ferrymead, and also access to the Port of Lyttelton via Tunnel Road. See Annexure 12.

155. Linwood Avenue, northwest of the Aldwins / Buckleys / Linwood intersection, as also part of the radial arterial road network and to the northwest provides an arterial link to Fitzgerald Avenue, the inner orbital ring, road via Avonside Drive, Gloucester Street and Hereford Street. From there direct access to the central and northern parts of the central city, Linwood, and to Whitmore Street to the

[22] Christchurch SH73 Southern Arterial – Wigram – Halswell Transportation Study – Final Report – September 1999

north is possible. To the east Linwood Avenue provides an arterial connection southeast of Aldwins Road along which are the areas of South Linwood and Bromley.

156. East of Aldwins Road, both Linwood Avenue and Ferry Road provide arterial access to and from the hill and seaside suburbs east of the Ferrymead Bridge. See Annexure 12.

157. Brougham Street, just west of the Brougham / Ensors intersection is part of State Highway system, is part of the City's main orbital arterial ring road, and is almost parallel to Ferry Road at that point. To the west it forms an arterial link as part of the ring road and links to Waltham, Sydenham, Addington and Spreydon. From there it provides direct access to the state highway system heading south and to Akaroa. To the east Brougham Street provides an arterial link to the Port of Lyttelton via the state highway along Opawa Road. It also links with the remainder of the main ring road along Garlands Road and Rutherford Street which crosses Ferry Road to the west of Tunnel Road. See Annexure 12.

158. The last traffic count on Ferry Road west of Aldwins Road, as previously noted, shows that it is carrying on average 23,100 vpd. See Annexure 4.

159. There is no equivalent traffic count on Linwood Avenue west of Aldwins Road. The nearest count station is north of Chelsea Street which is south of Aldwins Road. The most recent reliable count shows Linwood Avenue carrying 26,000 vpd in 1996. A more recent count was affected by road works. Using the counts north of Chelsea Street and the intersection turning movements at the intersections I estimate however that Linwood Avenue now carries in the order of 27,300 vpd west of Aldwins Road. See Annexure 12.

160. The last traffic count (2002) on Brougham Street west of Ensors Road (east of Opawa Road) shows that it is carrying on average 32,200 vpd. See Annexure 12.

161. Vehicle drivers choose between these three arterial roads depending on which is the most convenient route between their trip origin and destination. There is a degree of connectivity between the Linwood Avenue route and Ferry Road route, especially from east of the Ferrymead Bridge that allows some drivers to have a choice between routes on longer distance trips. However the traffic counts around the Ferrymead Bridge show that there is a clear preference for Ferry Road as a route, with approximately 60% of the traffic on the Bridge choosing the Ferry Road route, with the remainder choosing the Humphreys Drive (Linwood Avenue) route. See Annexure 12.

162. Part of the reason for this is that Linwood Avenue is about 1.19 km north of Ferry Road west of Aldwins Road. This implies a vehicle driver would have to deviate up to 2 * 1.19 km = 2.38 km each trip to use Linwood Avenue as an alternate route to Ferry Road.

163. Brougham Street is about 0.89 km south of Ferry Road west of Aldwins Road. This implies a vehicle driver would have to deviate up to 2 * 0.89 km = 1.78 km each trip to use Brougham Street as an alternate route to Ferry Road.

164. One possible way of increasing the attractiveness of the Brougham Street or Linwood Avenue routes would be to increase the speed limit to reduce the travel time for those options. The household interview surveys that form the basis of the CTS traffic model[23] used in Christchurch show that the average vehicle trip length is approximately 5.96 km, see Annexure 12 for the surveyed trip lengths. This is a very conservative estimate of trip length as the distribution is significantly skewed towards the short end, with a smaller number of much longer trips in the tail of the distribution raising the average trip length above the median trip length.

165. Conservatively assuming that a vehicle driver has to deviate only half the maximum distance using the Linwood Avenue or Brougham Street route, i.e. 0.89 km or 1.19 km respectively, between their trip origin and trip destination, my analysis in Annexure 12 shows that the running speed (excluding intersection delays) on Linwood Avenue and Brougham Street would have to rise from the existing 60 kmh along the majority of their lengths to about 70kmh throughout the journey for them to be viable potential alternative routes offering a similar overall journey time to that afforded by Ferry Road.

166. Mr Facey's evidence discusses the safety aspects of an increased speed limit on these routes and shows that it would be unsafe to do so.

167. Another possible way of increasing the attractiveness of the Brougham Street route or Linwood Avenue routes would be to increase the capacity of these routes to reduce intersection delays. This could be done either by either grade separation (the main traffic movement is bridged over or tunnelled under the intersection) of key intersections and/or by providing more traffic lanes in either direction.

168. The Moorhouse Avenue over-bridge at the Colombo Street / Moorhouse Avenue intersection shows that a road corridor width of around 40 metres is required to have grade separation of the through movement and also provide a left and right turning lane at the intersection. I have estimated that it may be possible to construct in a width of 36.5 metres at a minimum. The grade separated section is also approximately 270 metres in length. I am informed by Warren Lloyd, Traffic Engineer, City Solutions, Christchurch City Council that the Colombo/Moorhouse grade separation is geometrically substandard based on current standards and that any grade separation would have to be 350 metres long. A similar level of provision would be required if grade separation was contemplated at the major intersections along either Linwood Avenue or Brougham Street.

169. Inspection of the traffic counts along Brougham Street south of the area of the Moorhouse Avenue and Ferry Road designations show that the Brougham Street / Waltham Road intersection has the most through vehicle movement along Brougham Street and would therefore benefit the most from grade separation. See Annexure 12 – Brougham Street As A Route diagram for the intersection location.

170. Brougham Street is approximately 31.7m wide in the vicinity of Waltham Road. The grade separation would require a new designation of up to 8.3m in total width placed along up to 350 metres of

[23] Christchurch Transport Study – Revised Vehicle Driver Model – Calibration And Validation Report, Christchurch City Council,

Brougham Street. Additionally some designation may be required at each end to merge and diverge four at grade lanes into four grade separated and two at grade. Typically the taper length would be around 85m length, making the full designation possibly up to 520m long (the Ferry Road designation is about 770m long) The grade separation is shown in Annexure 12.

171. The cheapest method of construction is to use earth filled embankments for the bridge ramps and to only bridge over the intersection. The cost of grade separating the Brougham / Waltham intersection is of the order of $6.7m. See Annexure 12.

172. The summary table, table 25 in the traffic modelling report in Annexure 1 shows that the benefits cost ratio for the four laning of Ferry Road with the grade separation in place, is 2.30 if constructed this year, and 2.40 if constructed within the life of the designation in 2013 assuming the Proposed City Plan becomes operative in 2004. The benefit / cost ratio significantly exceed one (excluding safety and intangible benefits) and therefore is still economically efficient construct the Ferry Road four laning provided for by the designation. The grade separation of the Brougham / Waltham intersection does not provide an alternative to using the designation to four lane Ferry Road.

173. The major constraint along the Linwood Avenue route is the Aldwins Road / Buckleys Road / Linwood Avenue intersection. See Annexure 12 – Linwood Avenue As A Route diagram for the intersection location. Linwood Avenue is 30 metres wide west of the intersection and east of the intersection varies from 50 metres down to 27 metres at the intersection. The grade separation would require a new designation of up to a maximum of 13.0 metres in total width placed over the first 60 metres east of the intersection. The road corridor is already wide enough further east of the intersection. West of the intersection a designation up to 10 metres wide would be required over 350/2 = 175 metres of Linwood Avenue. Additional designation may be required at the western end to merge and diverge four at grade lanes into four grade separated and two at grade. Typically the taper length would be around 85m length, making the full designation possibly up to 320m long. The grade separation is shown in Annexure 12. Grade separating this intersection would have a significant impact on the shops fronting Linwood Avenue west of Aldwins Road on the northern side of the road as they would have to be demolished.

174. The cost of grade separating the Aldwins / Buckleys / Linwood intersection is of the order of $8.7m. See Annexure 12. It is more expensive due to the increased property costs.

175. The summary table, table 25 in the traffic modelling report in Annexure 1 shows that the benefits cost ratio for the four laning of Ferry Road with the grade separation in place, is 2.08 if constructed this year, and 2.57 if constructed within the life of the designation in 2013 assuming the Proposed City Plan becomes operative in 2004. The benefit / cost ratio significantly exceed one (excluding safety and intangible benefits) and therefore is still economically efficient construct the Ferry Road four laning provided for by the designation. The grade separation of the Aldwins / Buckleys / Linwood intersection does not provide an alternative to using the designation to four lane Ferry Road.

176. The above analysis confirms that grade separation of the key intersections on the alternative routes would not be sufficient to remove the need for the Ferry Road designation.

177. Adding additional lanes to the Linwood Avenue route or Brougham Street route is another possible option. Below I have assessed the effect of completing the Linwood Avenue route or Brougham Street route as four lane arterials as alternative routes.

178. The Brougham Street route has four traffic lanes west of Ensors Road. East of there through to the Brougham / Garlands / Opawa intersection on the Brougham Street Expressway there are two traffic lanes. However the road reserve is about 31 metres across. The existing corridor was planned to be wide enough to accommodate 4 lanes without further property acquisition. A bridge across the Heathcote River would need to be duplicated. See Annexure 12.

179. Transit New Zealand have recently upgraded the Brougham / Garlands / Opawa intersection with traffic signals from the previous roundabout which was operating above it's capacity during the peak traffic periods.

180. The road reserve on Garlands Road is 20m wide . A 10m designation would be required if it was to be upgraded to 4 traffic lanes. Garlands Road is classified as a minor arterial in the Proposed City Plan., which allows a maximum road (reserve) width of 30m. See Annexure 12. Residential and industrial properties would be affected by a designation. A new bridge across the Heathcote River would be required.

181. The road reserve on Rutherford Street is 20m wide. A 10m designation would also be required if it was to be upgraded to 4 traffic lanes. Rutherford Street is classified as a minor arterial in the Proposed City Plan, which allows a maximum road (reserve) width of 30m. Residential and industrial properties would be affected by a designation. Bridge widening across the Heathcote River would be required. See Annexure 12.

182. The cost of the Brougham Street upgrade is of the order of $19.9m. See Annexure 12.

183. The summary table, table 25 in the traffic modelling report in Annexure 1 shows that the benefits cost ratio for the four laning of Ferry Road with the Brougham Street route upgrade in place, is 3.35 if constructed this year, and 3.04 if constructed within the life of the designation in 2013 assuming the Proposed City Plan becomes operative in 2004. The benefit / cost ratio significantly exceed one (excluding safety and intangible benefits) and therefore is still economically efficient construct the Ferry Road four laning provided for by the designation. The Brougham Street route upgrade does not provide an alternative to using the designation to four lane Ferry Road.

184. The Linwood Avenue route has four traffic lanes west of Aldwins Road through to Gloucester Street. From Gloucester Street north to Avonside Drive there are two traffic lanes. East of Aldwins Road there are four traffic lanes through to Hargood Street. East of Hargood Street there are two traffic lanes to Dyers Road and then two traffic lanes on Humphreys Drive through to the Ferrymead Bridge.

185. Transit New Zealand and Christchurch City Council have programmed funds in the 2002/03 year to upgrade the Dyers / Linwood intersection with traffic signals from the existing roundabout which is operating above it's capacity during the peak traffic periods This will increase the efficiency and convenience of Linwood Avenue as a route for those trips that do have a choice between Ferry Road and Linwood Avenue.

186. Christchurch City Council has funds allocated in it's capital works programme to upgrade the Ferry / Humphreys intersection from a priority give way control to a signalised intersection over the financial years 02/03 to 03/04. This will increase the efficiency and convenience of Ferry Road as long queues of traffic will no longer form eastbound on Ferry Road at Humphreys Drive. This will in-turn increase the efficiency and convenience of Ferry Road eastbound as a route for those trips that do have a choice between Ferry Road and Linwood Avenue.

187. The Ferrymead Bridge is also in the capital works programme to be upgraded. However this scheme would not affect route choice between Linwood Avenue and Ferry Road.

188. The road reserve on Humphreys Drive is mainly 20m wide but varies from about 14m to 40m as it runs along the Estuary shoreline. Over most of Humphreys Drive a 10m designation would be required if it was to be upgraded to 4 traffic lanes. Humphreys Drive is classified as a major arterial in the Proposed City Plan. A designation would affect either the Avon and Heathcote Estuary or the Charlesworth Tidal Wetlands adjoining Humphreys Drive. Commercial properties at the southern end would also be affected. See Annexure 12.

189. The road reserve on Linwood Avenue from Humphreys Drive to Dyers Road is 30m wide. No designation would be required if it was to be upgraded to 4 traffic lanes. This section of Linwood Avenue is classified as a major arterial in the Proposed City Plan. See Annexure 12.

190. The road reserve on Linwood Avenue from Dyers Road to Hargood Street is 30m wide. No designation would be required if it was to be upgraded to 4 traffic lanes. This section of Linwood Avenue is classified as a major arterial in the Proposed City Plan. See Annexure 12.

191. The road reserve from Hargood Street through to Gloucester Street is 30m to 50m wide. The road reserve on Linwood Avenue from Gloucester Street to Avonside Drive is 30m wide. No designation would be required if it was to be upgraded to 4 traffic lanes although a significant number of trees would be affected. Linwood Avenue is classified as a major arterial in the Proposed City Plan. See Annexure 12.

192. The cost of the Linwood Avenue upgrade is of the order of $15.5m. See Annexure 12

193. The summary table, table 25 in the traffic modelling report in Annexure 1 shows that the benefits cost ratio for the four laning of Ferry Road with the Linwood Avenue route upgrade in place, is 3.35 if constructed this year, and 3.04 if constructed within the life of the designation in 2013 assuming the Proposed City Plan becomes operative in 2004. The benefit / cost ratio significantly exceed one

(excluding safety and intangible benefits) and therefore is still economically efficient construct the Ferry Road four laning provided for by the designation. The Linwood Avenue route upgrade does not provide an alternative to using the designation to four lane Ferry Road.

194. Both the Brougham Street and Linwood Avenue (Humphreys Drive end) route options affect adjoining properties. Widening of Humphreys Drive would affect the Estuary or adjoining wetlands. Both options are also more expensive. The effects of these works would, clearly I believe, be significantly greater than completing the four laning on Ferry Road.

195. Given the above, I believe that adequate consideration has been given to alternative routes through this analysis and the long history of the designation. There are no reasonable alternative routes to the designation.

An Assessment Of Other Methods Of Four Laning Ferry Road

196. Nine cross section options have been developed to assess alternative methods of four laning Ferry Road. These cross sections are appended in Annexure 7 and briefly described below. All options developed provide for specifically marked on road cycle lanes in both directions. This is consistent with policy in the transport section of the Proposed City Plan to provide for cyclists needs when roads are improved.

Options Within Existing Road Reserve

197. Option 1 – Within the existing road reserve only the existing deep dish channel on Ferry Rd would be replaced and the existing two traffic lanes would be retained. This is considered a "do minimum" option given the Council's desire to eventually replace all deep dish channel with flat channel drainage. The central flush median would be retained and parking formalised on the carriageway instead of partially on the footpath and the footpaths each narrowed from 2.8m to 2.5m. This does not achieve the standard for a major arterial road as defined by the Proposed City Plan.

198. Option 2 – Within the existing road reserve four traffic lanes of 3.25m would be provided with a double yellow line separating directional traffic flows. There would be no on street parking. This does not achieve the standard for a major arterial road as defined by the Proposed City Plan.

199. Option 3 - Within the existing road reserve four traffic lanes would be provided with a 1m wide flush median separating traffic flows in each direction. Provision of a flush median would necessitate 3.0m wide traffic lanes. There would be no on street parking. This does not achieve the standard for a major arterial road as defined by the Proposed City Plan.

200. Option 4 - Within the existing road reserve a three lane tidal flow facility would be installed, where the middle lane would operate in the direction of peak traffic. Parking bays would be inset to a wider footpath on one side of the road. This does not achieve the standard for a major arterial road as defined by the Proposed City Plan.

201. Mr Penny's and Mr Facey's evidence also comment on these options from a capacity and safety perspective and they are not considered appropriate options.

Options Requiring Widening Of The Existing Road Reserve

202. Option 5 – Using the road widening designation, four traffic lanes and on street parking would be provided with a 2.5m wide flush median separating traffic flows in each direction. The existing flush median along Ferry Road is slightly narrower in width than would be provided with this option. The footpath and berm area is shown as varying from the 1.2m legal minimum through to using the full designation width. Mr Facey's evidence shows that the existing mid-block crash rate along Ferry Road is approximately double the typical mid-block crash rate for an arterial road (without a solid median). From a safety perspective this option is still not a desirable cross section as it would not address this safety issue.

203. Option 6 – Using the road widening designation, four traffic lanes and on street parking would be provided with a 2.5m solid median separating traffic flows in each direction. The footpath and berm area is shown as varying from the 1.2m legal minimum through to using the full designation width. This option does not allow u-turn bays to be adequately included which would severely restrict accessibility to the local neighbourhoods either side of Ferry Road. From an accessibility perspective this is not a suitable cross section.

204. Option 7 – This cross section is that adopted for the four laning of the major arterial Fendalton Road, which commenced construction in September 2002. Using the full 30m road widening designation four traffic lanes were provided with a 3.4m wide solid median separating traffic flows in each direction. Limited on street parking was provided in inset parking bays. The 3.4m wide median was chosen to minimise the effects on the substantial existing planting along the road. This cross section requires u-turn bays to have additional space at the far kerb line for vehicles to complete their u-turn. Because of this and the fact that Ferry Road does not have the substantial planting that Fendalton Road has, this option is not considered suitable.

205. Option 8 – This cross section was adopted on the major arterial Blenheim Road when the median was widened for safety reasons in the late 1990's. Cycle-lanes were also provided and most parking removed Four traffic lanes already existed within the road reserve that varies from a minimum of about 24.4m up to about 30m (one section also includes a slip road and is about 34m wide where residential houses are set back). A new wider 3.4m solid median was constructed to separate traffic flows in each direction. Parking was provided in inset parking bays with very narrow footpaths where the road reserve was wider than the minimum 24.4m. Only where the road reserve was wider again were there landscaping opportunities in the footpath berm area. Blenheim Road has very mixed adjoining land uses being part industrial / part commercial / part residential in nature with few pedestrians. Ferry Road is part residential / part commercial and has greater pedestrian activity. Landscaping is very important to the 'Garden City'. One of the Proposed City Plan transport policies is:

> *"7.1.8 - To maximise planting and landscaping associated with roading improvements, to avoid, remedy or mitigate their impact on the environment"*

For this reason this option is not considered suitable.

206. Option 9 - This cross section has been proposed for the four laning of Ferry Road as has been previously discussed, but is repeated here for completeness. Using the road widening designation four traffic lanes and cycle lanes would be provided. Cycle lanes are 1.5m wide. The two kerbside lanes would be 3.1m wide and the inner lanes 3.4m including a 0.2m edge-line to the median. A 4m wide solid median would separate directional traffic flows. The 4m wide median allows turning bays at the intersections to be constructed. It also allows u-turn bays to be provided without having to provide space at the far kerb line for vehicles to complete their u-turn as has had to be provided in Fendalton Road.

207. The carriageway excluding approach lanes at the intersections and any indented parking bays or bus stops takes up 20m in total, leaving around 5m either side of the carriageway alignment. Parking would be provided in inset bays into the footpath and berm area as would bus stops. The insets are approximately 2.0m to 2.5m wide. Inclusive of the parking bays and bus bays the carriageway is 25m wide which is consistent with the standards in the Proposed City Plan - Section 8, Appendix 2, page 8/51, as appended in Annexure 3.

208. The preferable footpath width in a residential area is 1.8m-2m, meaning at least 4.3m-4.5m of the 5m available at parking bay locations would be required in the residential areas. In commercial areas footpaths are typically 3.0m wide. This requires 5.5m at the parking bay locations which is more than the 5m available, meaning either the centreline of the roadway is offset or a 2.5m footpath is provided. Infrastructure such as lighting poles, telephone boxes and bus shelters also have to fit into the footpath area. Between parking bays the footpath would remain 1.8m – 3.0m wide against the property boundaries with the area to the kerbline either as landscaping or grass berms.

209. I am also informed by Warren Lloyd, Traffic Engineer, City Solutions Unit, Christchurch City Council that it is good practice for a continuous straight road reserve boundary to be formed to avoid potential unsafe dark corner areas that would otherwise form between staggered property boundaries.

Community Severance Of The Options

210. There is one issue of potential effects not covered by the other expert evidence in relation to the different cross section options and that is the issue of community severance. I wish to briefly discuss the issue with respect to the options and the ability for the community to cross Ferry Road. Community severance occurs when a barrier of some form is placed between parts of the community. It is defined in Transfund's Project Evaluation Manual[24], page A8-40, as *"Community severance is the dislocation and alienation a community feels as a result of roads which sever communities or hinder access. It includes the effect of traffic on security and mobility of people, particularly pedestrians and cyclists and the consequential effects on their movement patterns and interaction."*

[24] Project Evaluation Manual, including amendments to date, Transfund New Zealand, 1997

211. The pedestrian surveys in Annexure 13 break Moorhouse Avenue and the subject section of Ferry Road into a series of sections. The surveys show that Ferry Road is heavily crossed especially at the western end with up to 50 movements per hour between Barbour Street and Grafton Street from 14:30 pm to 15:30 pm.

212. Option 1- With the least traffic capacity there will be fewer available gaps between vehicles to cross the road when traffic is moving. Crossing one half of the road may be easier when vehicle flows have stopped due to long traffic queues from the intersections in the vicinity of the intersections. Average traffic speeds would also be their lowest. Pedestrians are able to cross one lane at a time to the central flush median, however vehicles also have access to the flush median and pedestrians are right to feel more vulnerable than when protected with a solid refuge, or median.

213. In table 6 below, I have assessed each option relative to option 1 in terms of community severance based on relative measures of; the volume of traffic passing by, average vehicle speeds, available gaps in the traffic for pedestrians to use to cross, the number of additional traffic lanes that need to be crossed at once, and whether there is a safe median refuge half way across the road.

Table 6 – Community Severance Assessment (- = more severance, + = less severance)

	Traffic Volume	Vehicle Speeds	Gaps In Traffic	Additional lanes to cross at once	Median (none, flush or solid)	Community Severance
Option 1 – 2 lanes Do Minimum	0	0	0	0	0	0
Option 2 - 4 lanes Double yellow line	-	-	+	---	Na	----
Option 3 - 4 lanes 1m flush median	-	-	+	---	Na(<2m)	----
Option 4 – 3 lanes Tidal flow	-	-	+	--	Na	---
Option 5 – 4 lanes 2.5m flush median	-	-	+	-	0	--
Option 6 – 4 lanes 2.5m solid median	-	-	+	-	+	-
Option 7 – 4 lanes Fendalton Road	-	-	+	-	+	-
Option 8 – 4 Lanes Blenheim Road	-	-	+	-	+	-
Option 9 – 4 lanes Ferry Rd Proposal	-	-	+	-	+	-

214. The table indicates that options 2 to 5 would increase the community severance the most and that options 6 to 9 increase it the least amount. The possibility also exists during the detailed design phase to assess whether or not pedestrian signals could also be included somewhere in the mid-block area of Ferry Road between Wilsons Road and Aldwins Road. This would further reduce any

community severance effects. The ability to install them would depend on whether they can be coordinated with adjoining traffic signals so as not to induce additional congestion, and whether they can be located in an area where they will be well used. Tim Hughes, Safety Engineer, Land Transport Safety Authority comments (email communication),

> *"One reason for the*ir*(ere) apparent safety may be that the traditional warrant requires high vehicle and pedestrian numbers before mid-block signals are warranted. Such signals are therefore only likely to be installed where they will be well used, and where traffic will become accustomed to stopping.*
>
> *So provided they are located where they will be frequently used, mid block signals seem to be a good choice for multilane roads, where zebra crossings are known to be dangerous."*

215. Mr Penny's evidence discusses the traffic efficiency and capacity of the different options. Mr Facey's evidence covers the traffic safety the options. Both show that the proposed Ferry Road cross section is one of the best, if not the best option.

216. I believe that adequate consideration has been given to alternative methods of four laning Ferry Road, and the proposed option is the most appropriate.

An Assessment Of Other Methods

217. This evidence has already dealt with alternative methods or cross sections to provide four laning Ferry Road. Mr Campbell's evidence covers the issue of resource consent vs designation as an alternative method. This section discusses more general methods.

218. As previously noted the designation has four interdependent objectives for providing four traffic lanes on the subject section of Ferry Road. They are:

- To bring this section of road up to the standard of a major arterial road which is it's classification in the Proposed City Plan, and
- To complete the major arterial route between Moorhouse Avenue (major arterial) west of Fitzgerald Avenue and Aldwins Road (major arterial) / Ensors Road (major arterial) / Ferry Road east of Aldwins (minor arterial), and
- To direct through traffic along the major arterial route and away from the local road section of Ferry Road between Wilsons Road and Fitzgerald Avenue and other local streets, and
- To provide safely and efficiently for the traffic volumes that major arterial roads carry.

219. Two other methods are often raised as alternatives:

- Improve public transport, cycling and walking facilities
- Not to build or widen any roads as they simply induce more traffic.

220. Neither of these methods address any of the reasons in the first three bullet points above and nor do they address the existing safety issues on Ferry Road raised by Mr Facey in his evidence.

221. Christchurch City Council does have objectives and policies for improving public transport, cycling and walking facilities in Volume 2 – Section 7 – Transport of the Proposed City Plan. They are important modes of transport that help limit the number of vehicles on the road, particularly during peak periods. The Regional Land Transport Strategy[25] states on page 7,

> *"Within Christchurch, the 1996 Census information for journey to work showed that 78% of people drove cars to work with only 5% travelling as passengers. Bus passengers made up 4% of those travelling to work, 5% walked and 8% rode a bicycle."*.

Without these modes another 17% of people could be travelling to work by car adding to the existing congestion. This would be a significant adverse effect on the safety and efficiency of the road network.

222. However there are reasons why these are treated by Council as integral and not exclusive alternative methods to road widening or road building. Firstly I will discuss alternative modes as alternative methods.

223. Christchurch is a low density almost circular city with a very many trip origins and destinations. Relative to two compact high density areas separated by a single transport corridor, Christchurch's layout is very inefficient for public transport to service and therefore relatively inefficient for potential users compared to travel by car.

224. Cycling is limited as an alternative mode by the weather, the inability to carry a more than a pack-full of goods, physical ability and distance. Trip length surveys indicate few cyclists travelling further than 8km. See Annexure 14.

225. Walking is also limited as an alternative mode by the weather, the inability to carry a more than a pack-full of goods, physical ability and distance. Trip length surveys indicate few pedestrians travelling further than 2km. See Annexure 14.

226. Now I will to discuss the effects of not building or widening roads. Traffic growth is driven by two interconnected factors that Christchurch City Council has very little, if no control over; population growth and increasing vehicle availability per 1000 head of population.

227. Christchurch's population is predicted to increase by 13% from 316,700 in 1996 to 358,600 in 2021 in the territorial local authority area.[26]. See Annexure 14.

228. The number of registered vehicles per 1000 head of population continues to increase.

Motor Vehicle Registrations In Christchurch				
Year	1939	1959	1971	2001
Vehicles per 1000 population	179(a)	307(a)	455(b)	762(b)

(a) Derived from Christchurch Master Transport Plan 1962

[25] Canterbury Regional Land Transport Strategy 2002 –2007, Environment Canterbury, March 2002

[26] http://www.stats.govt.nz/domino/external/pasfull/pasfull.nsf/web/Reference+Reports+Demographic+Trends+2001+Downloadable+Excel+table(s)?open

(b) Personal communication regarding census data, Richard Earl – Monitoring and research team, Christchurch City Council.

229. The final issue with respect to road widening or road building is the pricing of travel. Vehicle drivers and ratepayers pay to use the road system through petrol taxes and rates. This is a form of average pricing where the cost does not relate to which road is used nor the time of day it is used. Travel is one of the few remaining commodities that does not have peak pricing. As an example, power and telephone services are commonly charged at higher rates during the peak periods. Therefore, it can be said that travel in Christchurch during the peak periods is effectively under priced and there is a higher demand for travel than if it was priced. Singapore is a good example of where travel pricing occurs. Drivers have to pay to cross a central cordon into the central business district during peak periods. The price is regularly reviewed and is set at a level such that the travel demand is just below the capacity of the road system. In Christchurch travel is rationed by the congestion and delays that drivers impose on one another.

230. There is currently no legislation in New Zealand that allows travel on urban road networks to be charged for. With continuing increases in travel demand through the factors noted above and only nominally viable alternative modes, also as noted above, there is no option to continued road building or road widening of the arterial road network to increase the road system capacity and safety as travel time (vehicle driver and passengers), vehicle operating costs and crash costs have an economic cost to New Zealand. For roading projects these costs are defined in Transfund's Project Evaluation Manual[27]

231. The introduction of travel pricing or congestion charging as it is also known, would cause some people to change their peak period travel behaviour. Some people would change their mode of travel, some would ride share in vehicles, while others would change the time of day they travelled and thereby lower peak period travel demand. However, it is worth noting that even if road pricing was introduced into New Zealand it would not completely stop the need to build or widen roads as cities populations continued to grow.

232. In summary, I believe that more than adequate consideration has been given to alternative sites, routes and methods to the designation, and in my opinion, the threshold test noted in paragraph 51 should be passed with some ease.

[27] Project Evaluation Manual, including amendments to date, Transfund New Zealand, 1997

9.0 Nature Of Work - Unreasonable To Use An Alternative – RMA s171(1)(c)

233. Subsection (c) of s171(1) "Recommendation by territorial authority" of the RMA requires the territorial authority to have particular regard to:

"(c) Whether the nature of the public work or project or work means that it would be unreasonable to expect the requiring authority to use an alternative site, route, or method; and"

234. This section discusses the Ferry Road designation in relation to whether the nature of the public work or project or work means that it would be unreasonable to use an alternative site, route or method.

235. The nature of the public work is road widening to provide safely and efficiently for traffic. From that perspective, road widening designations are flexible in terms of their locations.

236. However the Ferry Road designation exists to bring Ferry Road, which is classified as a major arterial road as part of the classified road network up to the standard specified by the Proposed City Plan. In this respect the designation is tied to this specific road corridor. Neither the major arterial status of Ferry Road (Wilsons to Aldwins), the arterial road network, nor the standards set out in the Proposed City Plan are subject to any outstanding references.

237. Road widening with the installation a central median, by it's nature is also the most cost effective way of achieving additional road capacity and safety. From this perspective it would be unreasonable to use a road tunnel or long elevated roadway along Ferry Road as the costs are likely to be at least a magnitude greater. Bridge structures are very approximately $2000/m2. As an example, an elevated roadway along Ferry Road would be approximately 770m long and 17m wide using a jersey median barrier and would have a cost of about $26m. Property would still need to be taken to provide at-grade property access via slip lanes running parallel to the bridge structure. Tunnels are more expensive again. Using earth filled embankment structures would be cheaper but it would still be necessary to bridge over short sections to provide at-grade access from both directions and property would still be required.. Any type of bridge would be very visually intrusive on adjoining properties.

238. Alternative sites, routes and methods have been considered in the last section. The analysis showed that they do not provide reasonable alternative means and therefore in my opinion the objectives of the four laning provided for by the designation can only be provided for using the existing designation.

10.0 Relevant Provisions Of Policy Statements and Plans– RMA s171 (1)(d)

239. Subsection (d) of s171(1) "Recommendation by territorial authority" of the RMA requires the territorial authority to have particular regard to:

> *"(d) All relevant provisions of any national policy statement, New Zealand coastal policy statement, regional policy statement, proposed regional policy statement, regional plan, proposed regional plan, district plan, or proposed district plan."*

240. This section discusses the Ferry Road designation in relation to these provisions.

National And Coastal Policy Statements

241. Currently there is no national transport strategy or national policy statement which needs to be taken into consideration in this case, nor is the Ferry Road designation located such that the New Zealand Coastal Policy Statement is relevant.

Regional Policy Statements And Plans

Regional Policy Statement

242. The first provision in the RPS that is relevant is policy 1 of chapter 12, Settlement And The Built Environment (personal emphasis):

> *"Policy 1*
>
> *Promote settlement and* ***transport patterns*** *and built environments that will:*
>
> ***(a) result in increasingly effective and efficient use of resources, particularly energy.***
>
> ***(b) reduce the rate of use of non-renewable energy sources.***
>
> ***(c) minimise the adverse effects of emissions into the atmosphere resulting from the use of motor vehicles*** *and building heating.*
>
> *(d) incorporate energy efficient approaches to building orientation, form and design."*

243. With respect to a) above, the comments below on adverse effects of emissions note how the four laning provided for by the Ferry Road designation leads to reduced fuel consumption. This is a more efficient use of energy. Ferry Road is the shortest travel route between the arterial roads at each end of it. In this respect it is an effective use of resources to upgrade it to four lanes.

244. With respect to b) above, the comments below on adverse effects of emissions also note how the four laning provided for by the Ferry Road designation leads to reduced fuel consumption and therefore a reduction in the rate of non-renewable energy sources. Being close the central city, approximately 1.9km southeast of Cathedral Square and pointing towards the eastern coastline which restricts further urban expansion the Ferry Road designation cannot induce development of satellite commuter suburbs that could be seen to increase the rate of use of non renewable energy sources.

245. The adverse effects of emissions can be localised (carbon monoxide CO, nitrous oxides NO_x, particulates PM_x, volatile organic compounds VOC and sulphur dioxide SO_2), or global (carbon dioxide $C0_{2)}$. Local vehicle emission rates are at their lowest in free flowing traffic conditions compared to congested conditions according to the VFECS report, pages 53-55[28], see Annexure 15. Mr Penny's evidence shows the reduction in congestion in the Ferry Road corridor with the four laning allowed for by the Ferry Road designation. It is also worth noting that there are no national standards for local emissions to determine when adverse effects begin, although I understand there are guideline levels.

246. Carbon dioxide does not have the localised adverse effects of the other emissions. However, the VFECS report also comments on page 106 with respect to $C0_2$ emissions,

> *"The emphasis upon traffic management to reduce emissions is also directly supportive of policy to reduce fuel consumption… …The fuel consumption rates in interrupted traffic flow increase by 50% to 100% in congested conditions."*

$C0_2$ emissions are directly proportional to fuel consumption. As noted above the four laning provided for by the Ferry Road designation reduces traffic congestion.

247. The next relevant provisions in the RPS are in Chapter 13 Air:

> *"Policy 2*
>
> *Promote measures that reduce emissions from the use of carbon based fuels"*
>
> *"Policy 9*
>
> *Promote measures to reduce emissions, or mitigate the effects of carbon dioxide from the use of carbon based fuels."*

248. The commentary above covers the issue of the reduced emissions that will result from the four laning provided for by the designation. It is worth noting that a unit of carbon based fuel that is burnt for energy will always produce the same unit of carbon based emissions, it is only the proportions of the different emissions that changes as well as the amount of oxygen and nitrogen from the atmosphere that combines with them. The rate of emissions can change but not the amount (excluding oxygen and nitrogen added from the atmosphere).

249. Again I would question the relevance of carbon dioxide emissions without a national policy statement. However, because of the Council's transport policy,

> *"7.1.8 - To maximise planting and landscaping associated with roading improvements, to avoid, remedy or mitigate their impact on the environment"*

Council would seek to maximise the landscaping associated with the four laning, which can act as a carbon sink to help mitigate the carbon dioxide emissions.

250. The proposed cross section also provides more than the minimum legal width footpaths and also provides specific cycle lanes, thus promoting these modes that don't produce carbon dioxide(except what we breath out) and reduce emissions. The Sustainable Transport and Utilities Committee of the

Council has also informally asked that forms of bus priority be looked at with the four laning. This is likely to be as simple as extending the green traffic signal when a bus is approaching an intersection travelling in the peak direction of travel . In this manner a mode that produces fewer emissions per person travelling is being promoted. The low number of bus routes and movements on Ferry Road is unlikely to justify more substantial bus priority.

251. The next relevant provisions in the RPS are in Chapter 15 Transport:

> *"Objective 1*
> *Enable a safe, efficient and cost-effective transport system to meet present and future regional, inter-regional and national needs for transport."*
> *"Policy 1*
> *Protect Canterbury's existing transport infrastructure and land transport corridors necessary for future strategic transport requirements by avoiding, remedying, or mitigating the adverse effects of the use, development or protection of land and associated natural and physical resources on the transport infrastructure."*
>
> *"Objective 2*
> *Avoid, remedy, or mitigate the adverse effects on the environment of transport use and provision."*
> *"Policy 2*
> *Promote the use of transport modes which have low adverse environmental effects."*
> *"Policy 3*
> *Promote changes in movement patterns, travel habits and the location of activities, which achieve a safe, efficient and cost-effective use of the transport infrastructure and reduce the demand for transport."*

252. In terms of policy 1 the designation clearly achieves this. I would also argue that while the Brougham Street / Opawa Road / Port Hills route, as outlined in Annexure 12, is the main strategic route to the Port of Lyttelton, the whole of Ferry Road has a strategic role in that it provides direct access to Tunnel Road, which is a motorway standard route to the Port and is of a higher standard than the Opawa/Port Hills Road route. The subject section of Ferry Road is also part of the over-dimension vehicle route network. Vehicles that are too large to travel to the Port of Lyttelton through the Lyttelton Road Tunnel via Tunnel Road do so via Ferry Road. The route takes them through to Sumner and to Port Lyttelton via Evans Pass Road. See Annexure 12.

253. In respect to policy 2, I have commented above on the provisions made for pedestrians, cyclists and public transport in the four laning proposal provided for by the designation.

254. Turning to policy 3. The explanation for the policy states,

> *"The demand for transport may be reduced by a wide range of means including:*
> *(1) controlling the use, development and protection of land, such as the containment of urban areas*

[28] Local Air Quality Management – Impacts From The Road Transport Sector, Vehicle Fleet Emissions Control Strategy, Final Report,

(2) encouraging increased use of more energy efficient transport modes"

(3) increasing public awareness on environmental issues and transport options

(4) promoting or facilitating increased substitution by telecommunications, for example, "telecommuting".

With respect to (3) I have commented above on the provisions made for pedestrians, cyclists and public transport in the four laning proposal provided for by the designation. The other means can be promoted independently of the designation.

255. The explanation further states with respect to travel habits,

"People have an important role to play as individuals. Any steps that people can take to minimise the use of their own cars, for example, by car pooling, and actions by local authorities to encourage this will help reduce the demand for transport and assist energy conservation and reduce exhaust emissions."

The designation does not preclude Council independently promoting such measures as car pooling.

256. With respect to movement patterns and achieving a safe, efficient and cost effective use of the transport infrastructure in policy 3. Road users whose movement patterns will include the subject section of Ferry Road will have a safe and efficient route to travel along using the four laning provided by the designation. The economic analysis contained in the traffic modelling report in Annexure 1 establishes that the designation has a benefit/cost ratio well exceeding one, and therefore shows that it is a cost effective use of transport infrastructure to cater for movement patterns.

Proposed Canterbury Natural Resources Regional Plan

257. The Chapter 3 of the Proposed Canterbury Natural Resources Regional Plan[29] is also relevant. The first relevant policy, AQL3 page 3-12, falls under objective AQL1, page3-7.

258. *"Objective AQL1 Objective for localised air quality*

Localised contaminant discharges into air do not, either on their own or in combination with other discharges, result in significant adverse effects on the environment, including:

(a) adverse effects on Tangata Whenua from the loss of air's taonga; and

(b) adverse effects on human health and safety; and

(c) offensive or objectionable odours; and

(d) diminished visibility, as a consequence of human activities; and

(e) corrosion and soiling of structures, not being property owned by those causing the discharge; and

(f) adverse effects on health and functioning of ecosystems, plants and animals; and

(g) contamination of water."

259. *"Policy AQL3 Promote measures to address motor vehicle exhaust emissions*

(a) Promote traffic management that avoids the occurrence of localised air quality problems associated with exhaust emissions from motor vehicles.

Table 4.5 and pages 53 –55, Ministry Of Transport, November 1998

(b) Promote initiatives to reduce the occurrence of smoky motor vehicle exhaust emissions."

260. The proposed method for territorial authorities to implement this policy is, page 3-13:

"Method AQL3(e) Territorial authorities

Territorial authorities in the preparation, variation, change or review of their district plans and through the exercise of their functions shall:

(i) implement traffic management control measures to reduce traffic congestion; and

(ii) support and encourage the use of low emission modes such as walking, cycling and public passenger transport and give consideration to these modes at all stages of the planning process including subdivision; and

(iii) encourage patterns and forms of urban settlement and infrastructure that decrease production of motor vehicle exhaust emissions and decrease the demand for motorised transport; and

(iv) develop zoning and density provisions which will encourage more public transport, cycling and walking-supportive development patterns and environments; and

(v) review parking requirements and private vehicle parking pricing in areas identified as being public transport nodes or corridors; and

(vi) develop and utilise design guidelines that direct land use planning away from development which creates dependency upon private motor vehicles, and towards development which is in support of public transport; and

(vii) adopt the provisions of the Canterbury Regional Land Transport Strategy."

With respect to (i) the evidence of Mr Penny's evidence shows the reduction in congestion in the Ferry Road corridor that will occur with the four laning provide for by the designation. I have discussed (ii) with respect to the RPS. With respect to clauses (iii) *"transport infrastructure"* and (vii) I have discussed the designation with respect to the RLTS as part of the section 7 under the heading Historical Assessment Of Alternative Routes, and I discuss it further in the section 11.0 Other Relevant Statutes. The designation is consistent with the current RTLS[30]. Clauses (iv) - (vi) are not relevant to the designation.

261. The next relevant policy, AQL20 page 3-49, falls under objective AQL3 page 3-35.

262. *"Objective AQL3 Objective for ambient air quality in Christchurch*

In the Christchurch Clean Air Zones 1 and 2, improve current poor winter ambient air quality so that by the year 2012 there is a reduction in the concentration of PM10 to less than 50 µg/m3 (24 hour average), with no more than one annual exceedence (averaged over three years), so as to reduce nuisance effects and adverse effects on human health."

263. *"Policy AQL20 Promote measures to address discharges to air from motor vehicles in the Christchurch Clean Air Zones 1 and 2.*

(a) Promote a nationally co-ordinated initiative to reduce the adverse effects of motor vehicle exhaust emissions. This initiative shall:

[29] Proposed Canterbury Natural Resources Regional Plan, Environment Canterbury, June 2002

(i) develop national motor vehicle exhaust emission criteria; and

(ii) encourage the use of transport fuels or energy sources which minimise contaminant discharges to air; and

(iii) promote the use of vehicle technologies which minimise contaminant discharges to air; and

(iv) promote the use of efficient and well-maintained vehicles; and

(v) encourage the use of modes of transport that have low or no emissions.

(b) Promote land use planning that results in land use patterns encouraging less polluting methods of transportation.

(c) Promote traffic management that avoids the occurrence of ambient air quality problems associated with exhaust emissions from motor vehicles."

264. The proposed method for territorial authorities to implement this policy is:

"Method AQL20(g) Territorial authorities

Christchurch City Council in the preparation, variation, change or review of its district plan and through the exercise of its functions shall:

(i) implement traffic management control measures to reduce traffic congestion; and

(ii) support and encourage the use of low emission modes such as walking, cycling and public passenger transport and give consideration to these modes at all stages of the planning process including subdivision; and

(iii) encourage patterns and forms of urban settlement and infrastructure that decrease production of motor vehicle exhaust emissions and decrease the demand for motorised transport; and

(iv) develop zoning and density provisions which will encourage more public transport, cycling and walking supportive development patterns and environments; and

(v) review parking requirements and private vehicle parking pricing in areas identified as being public transport nodes or corridors; and

(vi) develop and utilise design guidelines that direct land use planning away from development which creates dependency upon private motor vehicles, and towards development which is supportive of public transport; and

(vii) adopt the provisions of the Canterbury Regional Land Transport Strategy.

The proposed methods are identical to Method ALQ3 above which I have already discussed.

District Plans

265. It remains to consider the Ferry Road designation with respect to the Proposed City Plan and the Transitional Plan.

Transitional City Plan

266. The Transitional City Plan has in chapter 3 – General planning objectives, page 7, the transport objective of,

[30] Canterbury Regional Land Transport Strategy 2002 –2007, Environment Canterbury, March 2002

"9.4 Transport

To establish and maintain a safe and efficient system for the movement of people and goods and to protect living and working areas from the undesirable effects of excessive traffic"

The Transitional City Plan has in chapter 11 – Transportation, page 35, the transport objective of,

"37.1 Objective

The primary transportation objective is to establish and maintain a safe and To establish and maintain a safe and efficient system for the movement of people and goods and at the same time to protect living and working areas from the bad effects of excessive traffic"

The economic analysis contained in the traffic modelling report in Annexure 1 establishes that the designation has a benefit/cost ratio exceeding one, and therefore shows that four laning provided for by the designation increases the efficiency of the system. Mr Facey's evidence shows that the mid-block crash rate is about twice the national average rate and that the four laning proposed cross section provides significant safety benefits. Compared to not widening Ferry Road, increased capacity on Ferry Road will also reduce the amount of "rat running" traffic through the local suburban streets helping protect the adjoining areas from the undesirable effects of excessive traffic. In this respect the designation is consistent with these objectives.

267. There are no further transport objectives or policies in chapter 11 of the Transitional City Plan. The plan in chapter 11 goes on the discuss a range of transport issues. I have noted those most relevant to the designation.

268. *"37.2 Future transport options".* In particular it states,

"Because of the radial nature of the City and the fact that as yet only a small proportion of employment has decentralised, people live at locations often many kilometres from their place of work. Reliance on private motor transport of one form or another is therefore expected to continue."

269. *"37.3 Population and vehicle growth".* Note worthy is,

"The growth in mobility, measured as cars per 100 persons, has been significant during that period.",

in reference to the table showing cars/100 people in 1966 as 29 and in 1976 as 41.

270. *"37.4 Level of service".* With respect to the inner suburbs it states,

"The inner urban area (within 3.5km of Cathedral Square) to be maintained at level of service C based on average Monday to Thursday traffic."

The table in that section defines, 800 vph > level of service C < 1200 vph. The latest traffic count on Ferry Road, Annexure 4, shows level of service C is exceeded 11 hours out of 12 from 6.00 am to 6.00 pm.

271. *"37.5 Development of the network".* This section states with respect to forward planning,

"The adoption of the medium growth scenario, *results in a reduction in the scale of the network at the end of the planning period from that in the 1972 scheme. In addition it has meant an extension in the time available for the development of some facilities."*

The medium growth scenario is a forward demographic projection developed by Statistics New Zealand. The medium is the most likely scenario. High and low scenarios are also developed. Page 4 of the Transitional Plan shows that the Christchurch urban area population had decreased at the 1981 census for the first time since 1945. The medium growth scenario probably also reflected this slowdown.

272. *"37.6 The development periods".* The Ferry Road four laning is later noted, in appendix U, page 205, to occur in the early planning period. This section says of this,

> *"Early planning period improvements are works necessary to accommodate growth to an Urban Area population of 360,000. Substantial commitments towards the provision of these works will be required by the time the population reaches 360,000."*

It is of interest that the 2021 population projection for Christchurch is 358,000. See Annexure 14.

273. *"37.7 Programme of works".* This section notes,

> *"The programme for the development of the principal road network during the three periods is in Appendix U."*,

and,

> *"This programme represents the needs as presently understood but will require continual revision. Any slowing of the programme with respect to population and vehicle use will led to a lower level of traffic convenience, and ultimately additional costs to the community."*

274. The next section *"38 Modes of transport"* follows with an introduction, discussion of public transport, rail transport, sea transport, air transport, bicycles and private vehicles. Under *"38.7 Private vehicles"* it notes,

> *"Although the other modes all contribute to the mobility of people and goods within the City the vast majority of trips will occur in a motor car, van or truck. For this reason transportation planning for Christchurch places great emphasis on the development of the road network. However, improvements primarily designed for the car or truck will also generally result in significant benefits to public transport and even bicycle traffic. The establishment of a well defined hierarchy of roads also allows the introduction of relatively traffic free residential communities …"*

275. Section *"39 The elements of the transport network"* follows with an introduction, and discussion of the roading hierarchy. The subject section of Ferry Road is defined as a major arterial in appendix T, Under *"39.3 Major arterials (expressways)"* it notes,

> *"These are the dominant elements of the network.* (note: controlled access arterials and motorways are either also major arterials or considered more dominant) *Except in the case of limited access roads, property access is permitted under conditions aimed at preserving road safety and efficiency. Generally there will be some restrain on parking along these roads, … …Arterial roads will not usually be less than 31m metres wide and traffic travelling in opposite directions will generally be separated by a dividing strip (median)…"*

Section 39 continues on to discuss other issues not relevant to the designation.

276. Section *"40 Major roading proposals"* follows with an introduction, and then discussion of each of the major roading proposals. Of the subject section of Ferry Road it states,

> *"40.13 Moorhouse Avenue – Ferry Road Much of the 1972 Scheme road widening designation has been removed from properties along Ferry Road* (east of Randloph Street). *However, a high standard connection between Moorhouse Avenue and the Opawa-New Brighton Expressway is still considered essential to maintain an acceptable level of traffic service along this already well established route. Construction of Moorhouse Avenue east of Fitzgerald Avenue and Ferry Road between Wilsons Road and Ensors Road to four lane median divided carriageway standards is considered necessary within the early planning period…."*

I concur with this analysis.

277. Sections *"41 Environmental area studies"* and *"42 Parking, access and loading"* are not relevant to the designation.

Proposed City Plan

278. The over-riding transport objective of the Proposed City Plan is, page 7/3,

> *"An efficient, safe and sustainable transport system in the City which provides for ease of accessibility for people and goods"*
>
> This main objective is broken down into sub-objectives and then policies.

A Sustainable Transport System

279. The first sub objective is, page 7/3,

> *"A sustainable transport system – 7.1 A safe, efficient and sustainable transport system"*

The first policy grouping is,

> *"Minimising adverse effects"*

The first policy is, page 7/4,

> *"7.1.1 To remedy, mitigate or avoid the adverse effects of the use of the transport system"*

Mr Penny's evidence and the traffic modelling report attached in Annexure 1 show the increased efficiency or decreased congestion provided by the four laning of Ferry Road relative to not widening the road. I have discussed above, with respect to the RPS, the reduction in emission rates that comes with reduced congestion. Mr Facey's evidence also shows the reduction in crash costs associated with the four laning provide for by the designation. In this respect the designation mitigates, remedies or avoids congestion, emission and safety effects that occur now and in the future without the four laning.

280. The next two policies are not relevant to the Ferry Road designation, and are,

> *"7.1.2 To promote integration of transport and land use planning"*
>
> *"7.1.3 To promote integration of the planning, management, and operation of all elements of the transport system"*

281. The fourth policy is,

"7.1.4 To make efficient use of the transport system, particularly it's infrastructure"

The designation is efficient use of transport infrastructure in that it is the most direct connection between the arterial road network at each end, and in that the benefit/cost ratio for the four laning provided by the designation exceeds one as shown by the traffic modelling report attached in Annexure 1.

282. The fifth and final policy under the grouping of 'minimising adverse effects' is,

"7.1.5 To encourage change in the transport system towards sustainability"

I have already commented with respect to the RPS on the provisions made for alternative modes of transport with the four laning provide for by the designation.

283. The second policy grouping is,

"Integrated Sustainable Transport Strategy"

And the first policy and only policy is, page 7/4,

"7.1.6 To develop a long term integrated strategy for transport"

The regional land transport strategy (RLTS) is the mechanism through which this should occur. I have discussed the designation with respect to the RLTS as part of section 7 and discuss it further in section 11. The designation is consistent with the current RTLS[31] and with policies in the previous RLTS[32] which was current when the Proposed City Plan was notified.

284. The following policy grouping is,

"Amenity"

The policies are, page 7/4,

"7.1.7 To design new roading works to visually complement or improve the area"

"7.1.8 To maximise planting and landscaping associated with roading improvements, to avoid, remedy or mitigate their impact on the environment""

Mr Craig's evidence comments on these policies.

285. The fourth and final policy grouping under the sub-objective *"A sustainable transport system – 7.1 A safe, efficient and sustainable transport system"* is,

"Street Trees"

The first and only policy is, page 7/5,

"7.1.9 To provide for the protection of street trees of high quality, recognising their contribution to the character of areas and to reinforce the 'Garden City' identity of Christchurch"

Mr Craig's evidence comments on this policy.

<u>*Road Network*</u>

286. The second sub objective is, page 7/6,

"Road Network 7.2 An efficient and effective road network that allows the City to function and develop with minimal conflict between land uses, traffic and people""

[31] Canterbury Regional Land Transport Strategy 2002 –2007, Environment Canterbury, March 2002

Under this sub-objective the policies are grouped. The first policy grouping is,

"Hierarchy of roads"

And the first and only policy is,

"7.2.1 To continue to plan, build, maintain, and manage the operation of the roads in Christchurch as a hierarchical network comprised of roads of different classifications, and to recognise the different functions and roles of roads and their environmental impacts within those classifications "

The designation is a completely consistent with this policy. As a major arterial it is expected as a permitted baseline to carry high traffic volumes and have environmental impacts associated with these types of roads.

287. The second policy grouping is,

"Planning the network"

The first policy, page 7/7, is not relevant to the Ferry Road designation,

"7.2.2 To protect the function of the road network and the environment of adjacent land uses from the adverse effects of high traffic generators"

288. The second policy is,

"7.2.3 To plan legal and paved roads widths to reflect the differing functions of various elements of the road hierarchy."

The designation is consistent with this policy in that it allows the subject section of Ferry Road to be widened to include four traffic lanes, cycle lanes, a solid median, parking and footpaths.

The Proposed Plan also comments on page 7/7, *"Extra road widths allow for increased opportunities for planting, as do medians on major arterial roads."*

289. The third and final policy under this grouping is,

"7.2.4 To take account of social and environmental impacts as well as economic benefits when planning changes to the road network."

The economic benefits of the four laning provided for by the designation are laid out in the traffic modelling report in Annexure 1. The report shows that the benefit/cost ratio exceeds one and is therefore economically efficient. The environmental and social effects are covered by Mr Craig's evidence (landscape), Ms Ross's (heritage), Mr Campbell's (building setbacks). I have discussed environmental emissions with respect to the RPS. Compared to not widening Ferry Road, increased capacity on Ferry Road will also reduce the amount of "rat running" traffic through the local suburban streets, which is an environmental benefit. In terms of social effects my evidence is the section on alternative sites covers the issue of community severance and concludes that the four laning cross sections that include medians minimise the additional severance when compared to the other cross sections.

290. The next and third policy grouping is not relevant the Ferry Road designation,

"Land use control"

The first and only policy is, page 7/7,

[32] Regional Land Transport Strategy - 1993-1998, Canterbury Regional Council, October 1993.

"7.2.5 To control the establishment of land use activities to achieve compatibility with the roads they front by avoiding, remedying or mitigating the effects which each has on the other."

291. The fourth policy grouping is,

"Public participation"

The first and only policy is, page 7/9,

"7.2.6 To encourage public participation in the planning of transport and roading improvements to avoid, remedy, or mitigate adverse effects and make use of local knowledge."

At least two meetings with the referrers have been held to date with either Peter Atkinson or Mike Calvert, Transport Policy Engineers, City Streets Unit, Christchurch City Council. Christchurch City Council is through this policy committed to community consultation on roading projects. People in the area of the subject section of Ferry Road, as with all other roading projects the Council undertakes, would be invited to participate via the consultation process to provide input into the final design details.

292. The fifth and final policy grouping is,

"Central city access""

The first and only policy is, page 7/9,

"7.2.7 To provide a high standard of access for people to, from and within the central city""

The Ferry Road designation is consistent with this policy in that it ensures a high standard of access to and from the central city for vehicles, cycles and public transport.

Public Transport

293. The third sub objective is, page 7/10,

"Public Transport 7.3 Recognition of the public transport needs of people throughout the City and provisions for meeting those needs."

Under this sub-objective the policies are grouped. The first policy grouping is,

"On-street facilities"

The first and only policy is,

"7.3.1 To provide on-street facilities, where appropriate, to encourage the more efficient operation of public transport, including pull-in areas, taxi stands, clearways and areas for exclusive use by buses and taxis."

The proposed four laning cross section provided for by the Ferry Road designation allows for bus bays (pull in areas) to be constructed.

294. The second policy grouping is not relevant to the Ferry Road designation,

"Planning"

The two policies are,

"7.3.2 To develop, with the Canterbury Regional Council and public transport operators, a strategy to ensure the public transport needs of the City are met."

"7.3.3 To plan and develop an efficient pattern of public transport routes and associated terminus facilities which best serve the public's needs."

295. The third policy grouping is,

"Preferential traffic management"

The first and only policy is, page 7/11,

"7.3.4 To investigate measures to give preference to public transport, particularly during peak hours"

I have commented previously with respect to the RPS that Sustainable Transport and Utilities Committee of the Council has also informally asked that forms of bus priority be looked at with the four laning. This is likely to be as simple as extending the green traffic signal when a bus is approaching an intersection travelling in the peak direction of travel because of the low number of bus route along Ferry Road.

296. The fourth and final fifth policy groupings are not relevant to the Ferry Road designation,

"Park and ride"

"7.3.5 To investigate the opportunities for park and ride facilities within the City."

"Tourist transport"

"7.3.6 To support the development and operation of various types of tourist transport."

<u>*Cyclists*</u>

297. The fourth sub objective is, page 7/12,

"Cyclists 7.4 Provision for the safe movement of cyclists and actively encouraging cycling as a means of transport."

Under this sub-objective the policies are grouped.

298. The first three policy groupings not relevant to the Ferry Road designation,

"Safety education"

"7.4.1 To provide and support cycle safety education programmes."

"Links in subdivisions"

"7.4.2 To require the inclusion of safe cycle links, where appropriate, in new subdivisions"

"Parking"

"7.4.3 To provide convenient, safe cycle parking in public areas."

"7.4.4 To require the provision of an adequate number of safe, covered customer and staff cycle parks in association with non-residential development."

299. The fourth policy grouping is, page 7/14,

"Network development"

The first and only policy is,

"7.4.5 To continue to develop a clearly identified cycle network throughout the City by:

(a) providing safe, convenient cycle routes for school children

(b) using the secondary road network and using and creating vehicle free routes where possible; and

(c) making special provision for cycle commuters on some arterial roads to allow direct access to the central city."

(d) selecting cycle routes and enhancing additional routes to increase the safety and pleasantness of the network."

The four laning proposed cross section provided for by the designation is consistent with (a),(c) and (d). With respect to (b), Ferry Road is a major recreational and commuter cycle route between the central city and Sumner that cannot be catered for on the secondary road network.

300. The fifth and final policy grouping is, page 7/14,

"Road design"

The first and only policy is,

"7.4.6 To design roading improvements to take account of cyclists and their needs."

The four laning proposed cross section provided for by the designation is allows for on road cycle lanes which is consistent with this policy.

<u>*Pedestrians*</u>

301. The fifth sub objective is, page 7/15,

"Pedestrians 7.5 The safe movement of pedestrians in a pleasant environment.""

Under this sub-objective the policies are grouped. The first policy grouping is,

"Facilities"

The first and only policy is,

"7.5.1 To improve and develop pedestrian facilities throughout the City."

The four laning proposed cross section provided for by the designation will allow the parking areas that currently intrude into the footpath area to be separated from the footpath. The 4m wide solid median will provide the safest mid road crossing point for pedestrians who choose to cross the road away from the traffic signals at the intersections. The potential also exists in the detailed design to include street furniture. In this respect the designation is consistent with this policy.

302. The second and third policy groupings are not relevant to the Ferry Road designation,

"Links in subdivisions"

"7.5.2 To require the inclusion of safe pedestrian links, where appropriate, in new subdivisions and developments."

"Mobility impaired"

"7.5.3 To ensure that access and movement to buildings and throughout the City be reasonably available for people with mobility, including people and disabilities"

303. The fourth policy grouping is, page 7/16,

"Safety"

The first and only policy is,

"7.5.4 To reduce the conflict between vehicles and pedestrians throughout the City by providing pedestrian facilities."

The four laning proposed cross section provided for by the designation will allows a 4m wide solid median that will provide the safest mid road crossing point for pedestrians who choose to cross the

road away from the traffic signals at the intersections. In this respect the designation is consistent with this policy.

Off street parking and loading

304. The sixth sub objective, policy groupings and policies are not relevant to the Ferry Road designation.

Safety

305. The seventh sub objective is, page 7/19,

> *"Transport Safety 7.7 The maintenance and improvement of transport safety throughout the City""*

Under this sub-objective the policies are grouped. The first policy grouping is,

> *"Road safety"*

The first policy is,

> *"7.7.1 To continue a substantial programme of traffic improvements, principally for safety reasons"*

Mr Facey's evidence shows that the mid-block crash rate is about twice the national average rate and that the four laning proposed cross section provides significant safety benefits. In this respect the designation is consistent with this policy. However, the designation is being carried out for other objectives as well that have already been outlined elsewhere in this evidence.

306. The second, third and fourth policies are nor relevant to the Ferry Road designation,

> *"7.7.2 To continue a implement and support road safety education campaigns"*
>
> *"7.7.3 To assist and cooperate with Police Department safety enforcement measures"*
>
> *"7.7.4 To support and co-ordinate traffic safety measures initiated by concerned organisations within the City."*

307. The second policy grouping is not relevant to the Ferry Road designation,

> *"Air and rail safety"*
>
> *"7.7.5 To provide protection of air corridors for aircraft using Christchurch International Airport and Wigram Airfield through height and use restrictions."*
>
> *"7.7.6 To maintain and improve the safety of railway level crossings"*

308. The third policy grouping is,

> *"Accident data investigation"*

The first and only policy is, page 7/20,

> *"7.7.7 To continue to review accident data to enable:*
>
> *(a) 'black spots' and 'black routes' in the road network to be recognised, investigated and improved; and*
>
> *(b) trends to be followed to evaluate the success of safety works undertaken."*

Mr Facey's review of the crash (accident) data has lead to the recognition of the subject section of Ferry Road as being a black route in terms of the mid-block crash rate. The designation allows this situation to be improved. In this respect the designation is consistent with this policy.

309. The fourth and fifth policy groupings are not relevant to the Ferry Road designation,

"Traffic management"

"7.7.8 To continue to prepare and implement Local Area Traffic Management Schemes and Neighbourhood Improvement Plans in consultation with residents and other local interest groups"

"Hazardous substances"

"To promote the use of rail, arterial roads and roads in industrial areas, for the transport of hazardous substances."

310. The eighth and final sub objective is, page 7/21,

"Access to the City 7.8 Recognition of the need for regional, national and international links with the City and provision of those links.""

311. The first and second policy groupings are not relevant to the Ferry Road designation,

"Airport services"

"Bus services"

312. The third policy grouping is, page 7/23,

"Transport links"

The first and only policy is,

"7.8.4 To ensure high quality transport links between rail, road, port and airport facilities and the City for passengers, freight, employees and visitors."

I have already noted with respect to the RPS that I would argue that while the Brougham Street / Opawa Road / Port Hills is the main strategic route to the Port of Lyttelton, the whole of Ferry Road has a strategic role in that it provides direct access to Tunnel Road, which is a motorway standard route to the Port and is of a higher standard than the Opawa/Port Hills Road route. Also, the subject section of Ferry Road is part of the over-dimension vehicle route network. Vehicles that are too large to travel to the Port of Lyttelton through the Lyttelton Road Tunnel via Tunnel Road do so via Ferry Road. The route takes them through to Sumner and to Port Lyttelton via Evans Pass Road. In this respect the designation is consistent with this policy.

313. The fourth and final policy grouping is not relevant to the Ferry Road designation,

"Rail corridors"

"7.8.4 To provide for the protection of railway corridors for transport purposes."

314. Having considered the relevant provisions of the above documents I believe that the analysis shows that the designation on the whole consistent with them.

11.0 Other Relevant Statutes

Local Government Act

315. Section 319 of the Local Government Act 1974 gives the Council the powers to undertake works in road reserve.

316. Section 319 specifically allows amongst other thing:

> *"The council shall have power in respect of roads to do the following things:*
>
> *…*
>
> *(e) To increase or diminish the width of any road subject to and in accordance with the provisions of the [district plan], if any, and to this Act and any other Act:,*
>
> *(f) To determine what part of a road shall be a carriageway, and what part a footpath or cycle track only:*
>
> *…"*

317. Clause (f) give the Council the right to determine how the road cross section is laid out within the legal road reserve. This suggests that the cross section design may be less of a consideration under the RMA in terms of the designation, although this evidence does discuss different cross section options and the reasons for the cross section that is proposed for Ferry Road.

318. Clause (e) gives the Council the right to widen a road in accordance with the district plan and any other act, so in this case the RMA is relevant. The Proposed City Plan sets out those standards in Part 8, Appendix 2 (pg 8/51) of the Plan in terms of road reserve widths, carriageway widths, medians etc. As previously noted these standards are not subject to any references and require a minimum 30m road reserve width for major arterial roads.

319. Section 591A gives the Council the right to make bylaws specifically related to parking without limiting Section 684 which gives the Council the right to make bylaws. Section 591A specifically allows the Council to prohibit parking if it is likely to cause a nuisance or danger:

> *"(d) Prohibiting or restricting parking (being the stopping or standing of a vehicle for a period in excess of that specified in the bylaws) on specified roads or part of roads in residential areas by specified classes of vehicles (not being motorcars or motor cycles as defined in [subsection (5)]), either generally or at specified times, where in the council's opinion such parking is likely to cause a nuisance or danger:"*

Public Works Act

320. The Public Works Act 1981 lays down the framework for dealing with land required for public works and right to compensation to the current owners

Transit New Zealand Act And Land Transport Act

321. The Transit New Zealand Act is important with respect to its requirement for district roading programmes to state how they comply with the regional land transport strategy.

> *"[42H District roading programmes*
>
> *(1) Each financial year, every territorial authority shall prepare a district roading programme for the next year in relation to its district….*
>
> *….*
>
> *(d) State how each output and capital project complies with the relevant regional land transport strategy; and…"*

At this time it is still uncertain as to when construction of the Ferry Road four laning would occur within the 10 year life of the designation, and Christchurch City Council has yet to commit funds to it in it's five year capital works programme. However I have compared the project against the current RLTS[33] further below.

322. The Land Transport Act 1998 is important with respect to its requirement for regional land transport strategies to be prepared. Canterbury Regional Council's Regional Policy Statement includes reference to the Regional Land Transport Strategy as a method of implementation but only for the Regional Council itself. However section 74(2) of the RMA states:

> *(2) In addition to the requirements of section 75(2), when preparing or changing a district plan, a territorial authority shall have regard to—*
>
> *…*
>
> *(b) Any—*
>
> *(i) Management plans and strategies prepared under other Acts; and*
>
> *…"*

323. The 1993 – 1998 Regional Land Transport Strategy[34] (RLTS) is the only version that the Christchurch City Council could have had regard to with respect to the Ferry Road designation in the time frame applying to its hearings and decisions on the Proposed City Plan. The Plan was notified on 24 June 1995, hearings took place between 1996 and 1998, and most of the decisions were issued in May 1999. The 1993 – 1998 Regional Land Transport Strategy was prepared under the requirements of the Transit New Zealand Amendment Act 1992.

324. The application of section 74(2) turns on the words *"shall have regard to".* Case law indicates that the decision maker needs to show that they have considered the relevant matters, subject to that section, but that the weight given to it may vary according to the circumstances, and it may be found to be not relevant at all. It does not have the same weight as the words "shall take account of", whereby a decision maker's discretion is specifically limited, **Haddon v Auckland RC A077/93**.

325. The 1993 –1998 RLTS is supportive of different road standards for different road functions

> *7.1 Land Transport Network Operational Strategy"*
>
> *7.1.1 Road Network Management Strategies*
>
> *7.1.1 (1) Transport Strategies and Programmes*
>
> *Transport strategies and programmes should support a road hierarchy through:*

[33] Canterbury Regional Land Transport Strategy 2002 –2007, Environment Canterbury, March 2002

….

- *Differentiation of road standards by function to encourage use of arterial roads in preference to local roads*

…"

326. It is also supportive of a roading hierarchy:

> *"Land Transport Planning*
>
> *"7.5 (2) Road Hierarchy and Land Use Controls*
>
> *A road hierarchy should be defined which differentiates national, arterial and local traffic functions. …."*

In terms of implementation it goes on the say,

> *"In regard to Strategy(2)* (7.5(2)) *the Transport Section of the proposed RPS proposes the identification of the strategic transport infrastructure and services through regional transport planning. Defining a roading hierarchy that is consistent with this is a role recommended for District Plans"*

327. The roading hierarchy map on page 89 of the 1993-1998 RLTS is quite different to that adopted in the Proposed City Plan, see Annexure 11. The section of Ferry Road subject to the designation is shown as a minor arterial, but then again so are Aldwins Road, Ensors Road and Linwood Avenue (Hargood to Gloucester) which are major arterials in the Proposed City Plan. There are many other differences as well such as Riccarton Road, and the Whiteleigh, Clarence, Straven, Idris, Heaton, Innes shown as major arterials. These roads were never previously major arterials nor are they now in the Proposed Plan or current RLTS. I believe in this respect the map is deficient. It is also quite different to the previous planning maps in the Canterbury Regional Planning Scheme - Second Review - Section 2 Transport - Regional Planning Map No2 Sheet 3, January 1990 and the map on page 26 of the Canterbury Urban Transport Approved Operational Plan 1988 –1993, see Annexure 11. In my opinion the RLTS map is deficient.

328. Designations are not explicitly mentioned anywhere in the RLTS nor is a forward programme of proposed works. The RLTS was essentially a policy document and devolved forward planning to the District Plans through such policies as,

> *"Protect Canterbury's strategic transport infrastructure and safeguard land and transport corridors needed for future strategic transport requirements",* and commentary such as *"District Plans should recognise long term, strategic transport needs. These needs should be clearly signalled",* page 73. See Annexure 11.

329. I have discussed above *"shall have regard to"* in respect to the RLTS. Furthermore the implementation noted above is tied back to the RPS.

330. It is also important to note that even if Ferry Road was shown as a minor arterial road in the 1993-1998 RLTS, that the Proposed City Plan standards set out in Part 8, Appendix 2 (pg 8/51) of the Plan

[34] Regional Land Transport Strategy - 1993-1998, Canterbury Regional Council, October 1993.

in terms of road reserve widths, carriageway widths, medians etc. allow for a maximum road (reserve) width on a minor arterial of 30m.

331. The most recent RLTS, 2002 –2007 Regional Land Transport Strategy was published by the Canterbury Regional Council in March 2002 and prepared under the Land Transport Act 1998. The RLTS defines a strategic road network of which the section of Ferry Road subject to designation is not part of, see Annexure 11. The strategic road network is defined as

> *"Strategic road network*
>
> *The strategic road network, see Appendix 1, is that part of the network designed to efficiently carry through traffic (rather than local traffic) linking regionally important destinations such as major localities of regional development, recreation, commercial and industrial facilities as well as ports and airports. It is designed to connect various parts within the region and connect to the rest of New Zealand. Maintaining this network is critical to the region's welfare but must be done in a manner that supports wider planning, transport and land use objectives."*

332. The section of Ferry Road subject to designation is part of the non strategic local road network as defined by the RLTS which includes both minor and major arterials that are not part of the strategic road network.

> *"Non-strategic local roads*
>
> *Other roads not listed in the strategic road schedule (see Appendix 1) are non-strategic local roads. These roads provide a range of functions from the movement of local urban traffic on local arterials, through to providing access and services to local property, as well as serving as community spaces. In many cases, they also provide access for tourists and those accessing recreational opportunities."*

333. The 2002 – 2007 RLTS is supportive of the Ferry Road designation in terms of:

> *Policy 2.2: Support the maintenance and enhancement of non-strategic local roads*
>
> *Methods*
>
> *2.2.1 Maintain or enhance non-strategic local roads to standards consistent with their function. [Responsibilities: Territorial Authorities]"*

12.0 Matters Raised In The References Against The Designation

334. Charleston Neighbourhood Association (RMA 1201/99), Friends of Edmonds Factory Gardens (RMA 1199/99), Hoskin (RMA 1198/99), Cumberpatch (RMA 1197/99), Marshall (RMA 1200/99), and Hood & Ward (RMA 1180/99) all raise the same reasons for their references. The references are included in Annexure 16.

335. The first reason given is that *"The designation is not reasonably necessary as the volumes of traffic, now and in the future, do not place demands or loadings on the road that cannot be adequately accommodated within the existing legal roadway through improved roading profile and lane definition without the need for the taking of land, removal of established trees and devaluation of existing residential properties"*

336. The evidence in the section An Assessment Of Other Methods Of Four Laning Ferry Road shows that options within the existing roadway are not appropriate. The evidence of Mr Penny shows that future traffic growth cannot be accommodated within the existing legal roadway. Property owners are fully compensated for land taken for road widening purposes.

337. The second reason given is that *"Adequate consideration has not been given to existing alternative routes /road, i.e. Linwood Avenue and Brougham Street. These developed traffic routes successfully carry the present loads and have the capacity for future loads. There is a limited amount of land available for development to the east of the city and additional traffic volumes from this can be absorbed by the existing road options."*

338. The evidence in sections Historical Assessment Of Alternative Routes and A Further Assessment Of Alternative Routes show that alternative routes have been adequately considered and do not remove the need for the Ferry Road designation. The latter section also shows that future land use growth in the east of the City shows similar rates of increase as the rest of the urban area overall. The historical traffic growth analysis in paragraph 151 further confirms that the additional traffic volumes cannot be absorbed by the existing road.

339. The third reason given is that *"It is not unreasonable to expect Christchurch City Council to develop further Linwood Avenue and Brougham Street and improve/redefine traffic lanes to the existing legal road width of Ferry Road without the unnecessary cost both financial, social and environmentally, of road widening.*

340. The evidence in sections Historical Assessment Of Alternative Routes and A Further Assessment Of Alternative Routes show that alternative routes have been adequately considered and do not remove the need for the Ferry Road designation. The Christchurch City Council is financially responsible for the designation, and in this respect, it is the Council's decision whether or not it is an unnecessary cost. Council by defending the designation has indicated that it does not believe that this is the case. I have discussed the social impacts with respect to community severance and the environmental effects with respect to vehicle emissions. The analysis showed that the proposed four laning option

minimises community severance compared to other four laning options. The evidence also showed that the four laning provided for by the designation reduces vehicle emissions. Other environmental and social effects are covered by Mr Craig's evidence (landscape), Ms Ross's (heritage), Mr Campbell's (building setbacks).

341. The fourth reason given is that *"The Christchurch City Council District Plan Transport Objective of 'an efficient safe and sustainable transport system in the City which provides for ease of accessibility for people and goods' can be achieved without needless road widening and the resulting loss of land and amenities."*

342. The analysis of the Proposed City Plan policies in the section District Plans shows that the four laning provided for by the Ferry Road designation is consistent with the policies set out under the Transport Objective.

13.0 Additional Matters Raised In The References And Submissions

343. W L G & T J A Marshall (RMA 1200/99) raise the additional matter of traffic noise in their reference stating,

> *"The Resources of our Reasoning is that the Traffic ROAR on Ferry Road, is Home Invasion Transmitted"*

344. It is my understanding that the RMA does not cover noise from moving vehicles, nor is there any policies in the Proposed City Plan relating to traffic noise. However, below I have provided a rough order analysis of the likely effect on traffic noise of widening Ferry Road to four lanes using the designation.

345. The surface on Ferry Road from Mathesons Road to Aldwins Road is old chip seal and the average weekday traffic volume 23,100 vpd. In 1995 a survey[35] of traffic noise was undertaken in Christchurch. The most relevant survey was on Pages Road between Woodham Road and Kearneys Road which at the time had a chip seal that had been laid in 1993 and had an average daily traffic flow of 19,634 vehicles per day. The L10(18hr) dBA noise level was 67.03 dBA. (dBA – decibels using the A scale)

346. The report notes that, page 1, *"The L10 level (representing the level of noise equalled or exceeded for 10% of the measurement time) correlates well with subjective response and is used for the quantification of many types of intrusive noise".* It goes on to say *"The L10(18hr) reading is a common measurement index for traffic noise. Hourly L10 values are gathered from 6am to 12 midnight, and arithmetically averaged… …the final estimated L10(18hr) being this average level minus 1 dBA."*

347. I am informed by Steve McNeill, Asset Management Engineer, City Streets Unit, Christchurch City Council that Ferry Road is widened to four lanes a P11 (friction course now known as open graded porous asphalt) surface would be laid. The closest survey result is Riccarton Road – Railway to Manderville, 23,837 vpd and a L10(18hr) dBA noise level of 64.83 dBA. The rule of thumb in the report is, page 2, *"As a guide, doubling traffic volumes will result in a +3 dBA increase …"*. Inverting this, a halving of the traffic volume results in a 3 dBA decrease in noise. The P11 surface provides a drop of 2.2 dBA over the chipseal surface. Assuming the effect is linear then the new road surface would be equivalent to a 37% drop in traffic volumes.

348. The analysis above is of a rough order only because it doesn't take account of:

- The fact that some vehicles will be closer the property boundaries with four laning.
- Any differences in the distance to the traffic streams from the microphone in the surveys.
- Increases in traffic flows.

However, the difference of 2.2 dBA is significant compared to the rule of thumb. This suggests that the traffic noise may be better and is unlikely to be worse than at present with the four laning.

349. The Council's City Streets Unit Asset Management Plan[36] includes in table 4.1.5, page 4-7 an indication of the traffic volume required to reach 65 dBA on different road surfaces. The table indicates that a volume of 25,000 vpd is required on P11 to reach 65 dBA and only 5000 vpd on chipseal. This again indicates that the traffic noise may be better and is unlikely to be worse than at present with the four laning. See Annexure 17.

350. I.S & R.J Cumberpatch in their submission, S3410, to the Proposed City Plan hearings state *"The widening of Ferry Road is unnecessary – Better utilisation of the existing road width / carriageway would provide suitable vehicle ways*. *Widening the road will destroy the residential character and diminish the value and usefulness of some of these properties.".* See Annexure 17 for the referrers submissions to the Proposed City Plan.

351. The section of evidence headed An Assessment Of Other Methods Of Four Laning Ferry Road addresses the issue of why the existing road width is not appropriate. Property owners are fully compensated for the land taken for roading purposes under the Public Works Act. From this perspective the value of the property is not diminished. Where the Proposed City Plan building setbacks would no longer be met the property owner has the option to have the whole property purchased, or in some cases it may be possible to relocate the building on the site. Mr Campbell's evidence covers the number of buildings affected and Mr Craig's evidence the residential character with respect to landscape.

352. L.J. Hoskin S3411, J Hoskin S3382, Friends of Edmonds Factory Garden S3412, Charleston Neighbourhood Association S3413, W L G & T J A Marshall S3394 and S3414, and I.A Ward S3398, in their submissions to the Proposed City Plan hearings state *"The widening of Ferry Road is unnecessary – It will severely effect many properties by reducing their site area and bringing the roadway closer to the houses and buildings. Better utilisation of the existing road width / carriageway would provide suitable vehicle ways for the traffic*. *Traffic presently travels too fast on this stretch of Ferry Road and increasing the width will only add to this problem."*

353. As previously noted property owners are fully compensated for the land taken for roading purposes under the Public Works Act. From this perspective the value of the property is not diminished. Where the Proposed City Plan building setbacks would no longer be met the property owner has the option to have the whole property purchased, or in some cases it may be possible to relocate the building on the site. Mr Campbell's evidence covers the number of buildings affected.

354. The closest speed count available of Ferry Road is that east of Randolph Street. The speed histograms in Annexure 17 show that:

- The 85th percentile speed is 50 kph in both directions. The 85th percentile is normally higher than the posted limit. Note, however that the close proximity of the Aldwins Road traffic signals affect the westbound data.
- The speed of traffic on a four laned Ferry Road is likely to rise. However Mr Facey's evidence clearly indicates a net safety improvement from the four laning.

[35] Traffic Noise Measurements-Christchurch City 1995, Malcolm Hunt Associates, March 1995.

355. L.J Hood's submission S3383, to the Proposed City Plan hearings states *"The widening of Ferry Road is unnecessary – all traffic developments have reduced traffic flow on Ferry Road; it is not the arterial route it once was. The widen(*ing) *would destroy several property frontages from a design and amenity point of view (for no good reason). We do not want the streetscape of Aldwins Road and the fences at the front door effect. The council has been very active in the Charleston area encouraging its regeneration and residential character. Major road widen*(ing) *would be counter productive."*

356. The historic traffic count data analysis in paragraph 151 shows that traffic flows on Ferry Road have continued to increase over time. The traffic modelling report, see Annexure 1, also shows that the CTS traffic model predicts a continuation of this traffic growth on Ferry Road into the future. L.J Hood's comment that Ferry Road *"is not the arterial route it once was."* is true to the extent that the state highway was removed from Ferry Road in 1992 as I have noted in the section Historical Assessment Of Alternative Routes. However, as I have previously stated Ferry Road still has a strategic role in that it provides direct access to Tunnel Road, which is a motorway standard route to the Port and is of a higher standard than the Opawa Road/Port Hills Road route. The subject section of Ferry Road is also part of the over-dimension vehicle route network. Vehicles that are too large to travel to the Port of Lyttelton through the Lyttelton Road Tunnel via Tunnel Road do so via Ferry Road. The route takes them through to Sumner and to Port Lyttelton via Evans Pass Road. See Annexure 12.

357. L.J Hoskin included a presentation, see Annexure 16, with the submission to the Proposed City Plan. The first six points are on behalf of the Charleston Neighbourhood Association.

358. The first point discusses trees and historic properties on which is outside my area of expertise.

359. The second point notes,

> *"The Charleston area of Linwood would be cut off from the rest of the suburb by 4 lane highways on 3 sides."*

It is a statement of fact that Charleston would have four lane roads on three sides, being Brougham Street, Ensors Road and Ferry Road. I have discussed the issue of community severance in the section An Assessment Of Other Methods Of Four Laning Ferry Road and conclude the proposed four laning cross section has the least effect.

360. The third point raises vehicle emissions. I have covered this issue in paragraph 245.

361. Points four and five again raise community severance issues. As noted above have discussed this in the section An Assessment Of Other Methods Of Four Laning Ferry Road. I have specifically discussed the possibility of installing pedestrian signals to further mitigate these concerns in paragraph 214

[36] City Streets Asset Management Plan, Christchurch City Council, September 1998

362. The next six points are concerns of the Friends of Edmonds Factory Gardens. The first point discusses the Gardens and is outside my area of expertise.

363. The next point raises the issue of parking outside the Gardens and notes there is a large parking area at the rear of the Gardens. The proposed scheme, Annexure 6, has no parking outside the Gardens on Ferry Road.

364. The fifth point raises the issue of Linwood High School students crossing a four lane road. I am informed by Tim Hughes, Safety Engineer, Land Transport Safety Authority that High School students generally aren't a safety concern crossing four lane roads, it is the elderly and young children that are at risk.

365. The final point raises the issue of traffic from Ryan Street, a cul de sac, not being able to turn right. I have discussed the need for a u-turn bay east of Ryan Street in paragraph 42.

366. The next six points are concerns of John and Jenny Hoskin. The first point raises the issue of land use growth in the east of Christchurch, completing the ring road first and traffic growth generated by road building since the second world war. I have discussed the projected land use growth in the east of Christchurch which is predicted to be at similar rates to the whole urban area in paragraph 150. The Woolston – Burwood Expressway Stage 2 is being constructed now to provide a limited access road link to replace the current residential street link. The ring road will be fully complete once this is in place. This has been taken account of in the assessment of alternative routes. With respect to road building inducing traffic, the far greater effect has been population growth and a rise in the standard of living. Legal roadway gives any person the right to pass and re-pass and the mode of travel is an individual's choice.

367. The second point raises the issues of Papanui Road only being a two lane road and crashes on Ferry Road. I have discussed Papanui Road in paragraph 151 and noted from a traffic efficiency perspective that the congestion on the road is unacceptable. Mr Facey's evidence shows there are more than $2m npv in safety benefits from the four laning of Ferry Road.

368. The third point raises the issue of Linwood Avenue and Brougham Street as alternative routes. The analysis in the sections Historical Assessment Of Alternative Routes and A Further Assessment Of Alternative Routes has shown that they do not remove the need for the Ferry Road designation.

369. The fourth point raises the issue of prompting public transport, cycling and walking over the car and quotes from Holland's national policy. It also notes the reduction in heavy traffic on Ferry Road and says that overall traffic has dropped. I have discussed the limits on these modes of travel, especially due to the way travel is currently priced in New Zealand in section An Assessment Of Other Methods. It is interesting to note that the Netherlands (Holland) is planning to be one of the first countries in the world to introduce nationwide road pricing (congestion charging). Traffic flows were around 20,400 on Ferry Road in 1971 before the four laning and realignment of Ensors Road and the four laning of Aldwins Road. The volumes dropped to a low of 17,900 in 1982 see Annexure 17.

370. R.J and I.S Cumberpatch also made a presentation to the Proposed City Plan hearings. With respect to transport their presentation raises the issues of:

- Brougham Street and Linwood Avenue as alternative routes, vehicle emissions, and land use growth, which I have covered in my evidence.
- The financial cost of road building which I have discussed in paragraph 340
- The four laning not being consistent with transport policies in the Proposed City Plan. My analysis in the section District Plans, shows the designation is consistent with the Propsed City Plan transport policies.
- Where there is information that shows that Ferry Road needs to be widened. From a safety and efficiency perspective, Mr Facey's evidence, Mr Penny's evidence, the traffic modelling report in Annexure 1 and the historical growth analysis in paragraph 151 show why the four laning is required.
- The good design of the four laning for Fendalton Road. The proposed cross section for Ferry Road is very similar to this.
- A 24 metre carriageway being unnecessary. The analysis in section An Assessment Of Other Methods Of Four Laning Ferry Road shows it is necessary.

14.0 Conclusions and Recommendations

371. In conclusion, from a transport planning and traffic engineering perspective, I believe that:

- The designation is the only way of meeting the four interdependent objectives laid out previously in the evidence in paragraph 9.
- The Ferry Road designation passes the tests set out in sections 171(1)(a-d) of the Act.
- There are no other matters raised in the submissions or references of sufficient weight not to uphold the Ferry Road designation.

372. From a transport planning and traffic engineering perspective, my recommendations to the Court on the Ferry Road designation is that:

- The designation be upheld in full without modification.

373. If the Court decides to uplift the designation then my recommendations to the Court on the Ferry Road designation is:

- That the Ferry Road designation from Wilsons Road to Barbour Street be retained to allow the transition to be constructed between the four lanes on Moorhouse Avenue that can be constructed using the Moorhouse Avenue designation and the existing two lanes on Ferry Road.

Annexure 1 – Ferry Road Designation Traffic Modelling Report

An Assessment Of The Area Wide Economics Of Four Laning Ferry Road Between Wilsons Road And Randolph Street

An Assessment Of Linwood Avenue And Brougham Street As Alternative Routes

Annexure 2 – Location Of Subject Section Of Ferry Road

Map Of The Location Of The Ferry Road Designation In Christchurch

Map Of The Location Of The Ferry Road Designation Relative To The Central City

Map Of The Local Area Around The Ferry Road Designation

Annexure 3 – Proposed City Plan – Ferry / Moorhouse Designations & Road Hierarchy

Proposed City Plan Cover

Ferry Road And Moorhouse Avenue Designations

Volume 3, section 12 - Designations, attachment 3, page 12/7

Volume 3, section 12 - Designations, attachment 3, page 12/9

Volume 3, section 12, - Designations, appendix 2, page 12/40

Volume 3, section 12, - Designations, appendix 2, page 12/41

Volume 3, section 12, - Designations, appendix 2, page 12/60

Planning Map, page 39A

Planning Map, page 40A

Planning Map, page 47A

Ferry Road And Moorhouse Avenue Roading Hierarchy Classifications

Volume 3, section 8, - Special Purpose Zones, appendix 3, page 8/53

Volume 3, section 8, - Special Purpose Zones, appendix 3, page 8/56

Volume 3, section 8, - Special Purpose Zones, appendix 4, page 8/59

Volume 3, section 8, - Special Purpose Zones, appendix 4, page 8/64

Roading Hierarchy Standards

Volume 3, section 8, - Special Purpose Zones, appendix 2, page 8/51

Annexure 4 – Traffic Count Information

Summary Diagram Of Key Counts

Ferry Road East Of Randolph Street

Ferry Road West Of Aldwins Road

Aldwins Road North Of Ferry Road (North Of Matlock)

Ensors Road South Of Ferry Road (Southwest Of Sullivan)

Moorhouse Avenue East Of Fitzgerald Avenue

Annexure 5 – Existing Traffic Management

East Of Aldwins Road / Ensors Road / Ferry Road Intersection

Aldwins Road / Ensors Road / Ferry Road Intersection

Moorhouse Avenue to Ryan Street Cycle lanes

Ferry Road / Moorhouse Avenue / Wilsons Road Intersection Improvements

Annexure 6 – Proposed Four Laning Scheme Developed To Date

Sheet O - O

Sheet A – A

Sheet B - B

Sheet C - C

Sheet D - D

Annexure 7 – Cross Section Options

Option 1 – Existing 20m Road Reserve - Renew Similar Layout To Existing

Option 2 – Existing 20m Road Reserve - Four Lanes With No Flush Median

Option 3 – Existing 20m Road Reserve - Four Lanes With 1 Metre Flush Median

Option 4 - Existing 20m Road Reserve – Tidal Flow

Option 5 – Using Designation – 2.5 Metre Flush Median

Option 6 – Using Designation – 2.5 Metre Solid Median

Option 7 – Using Designation – Fendalton Road Layout

Option 8 – Using Designation – Blenheim Road Layout

Option 9 – Using Designation – Proposed Ferry Road Cross Section

Annexure 8 – Ferry Road – Completion Of The Major Arterial Route

Inner Ring Road And Radial Arterials

Completion Of The Major Arterial Route

Vehicle Trips Using Ferry Road By Sector

Aldwins Road / Ensors Road / Ferry Road Intersection – Morning Peak Hour Traffic Count

Aldwins Road / Ensors Road / Ferry Road Intersection – Evening Peak Hour Traffic Count

Annexure 9 – Ferry Road – Directing Traffic Away From Local Roads

Local Section Of Ferry Road And Diagonal Road Downgrades

Ferry Road / Moorhouse Avenue / Wilsons Road – Morning Peak Hour Traffic Count

Ferry Road / Moorhouse Avenue / Wilsons Road – Evening Peak Hour Traffic Count

Ferry Road – East Of Fitzgerald Avenue

Annexure 10 – Ferry Road Designation Overlaid On Aerial Photos

Sheet A - A

Sheet B - B

Sheet C - C

Sheet D - D

Sheet E - E

Sheet F - F

Annexure 11 – Historical Assessment Of Alternative Routes

Ferry Road As A Major Traffic Route – Chronology Of Regional Decisions 1960 – 1990

Relevant Excerpts From:

Christchurch District Planning Scheme – Section 1 – Operative 1-4-1962

Master Transport Plan – C.R.P.A –1962

"The Red Book" – Christchurch Development – C.C.C – 1967

Christchurch Regional Planning Scheme – Section 2 – C.R.P.A – 1971

Christchurch District Planning Scheme – Operative 1972

Summary And Recommendations – Second Transport Study – C.R.P.A - 1975

Review Of Road Improvements – Second Transport Study – C.R.P.A - 1978

Christchurch District Planning Scheme – Notified 1979

1985 Summary Report – Transport Study Working Group – C.U.C - 1985

Christchurch District Planning Scheme: 2nd Review – C.C.C – Operative 1986

Canterbury Urban Transport Approved Operational Plan 1988 – 1993 - C.U.C – 1988

Canterbury Regional Planning Scheme – 2nd Review – C.R.C - 1990

Regional Land Transport Strategy 1993 –1998 – C.R.C - 1993

Council Decision – Requirements For Roading And Cycleway Designations - C.C.C - 1999

2002 – 2007 Regional Land Transport Strategy – Ecan - 2002

Annexure 12 – Assessment Of Alternative Routes

Alternative Routes To Ferry Road

Ferry Road Traffic Count Locations

Ferry Road West Of Aldwins Traffic Growth

Ferry Road East Of Randolph Traffic Growth

Ferry Road East Of Hargood Traffic Growth

Ferry Road West Of Tunnel Traffic Growth

Aldwins Road South Of Linwood Traffic Growth

Papanui Road South Of Harewood Traffic Growth

Heaton / Innes / Papanui Intersection Weekday Degree Of Saturation Plot

Research Report ARR 180 – Calibrating Sidra – ARRB – Relevant Excerpt

Ferry Road As A Route

Linwood Avenue As A Route

Brougham Street As A Route

Linwood Avenue West Of Aldwins Traffic Count Estimate

Linwood Avenue South Of Aldwins Traffic Growth

Brougham Street West Of Ensors (East Of Opawa) Traffic Count

Ferry / Humphreys Route Choice

CTS Revised Vehicle Driver Model Trip Length Distributions

Running Speed Analysis For Brougham Street And Linwood Avenue

Brougham / Waltham Grade Separation

Annexure 12 – Assessment Of Alternative Routes Continued

Grade Separation Costing

Aldwins / Buckelys / Linwood Grade Separation

Brougham Street Route – Brougham Expressway

Brougham Street Route – Garlands Road

Brougham Street Route – Garlands Road / Rutherford Street

Route Upgrade Costs

Linwood Avenue Route – Humphreys Drive

Linwood Avenue Route – Humphreys Drive / Linwood Avenue

Linwood Avenue Route – Linwood Avenue To Dyers Road

Linwood Avenue Route –Dyers Road To Hargood Street

Linwood Avenue Route –Gloucester Street to Avonside Drive

Annexure 13 – Pedestrian Surveys

Moorhouse Avenue – Fitzgerald to Lancaster

Moorhouse Avenue / Ferry Road – Lancaster to Grafton

Ferry Road – Grafton To Ryan

Ferry Road – Ryan to Manning

Annexure 14 – Alternative Methods

Cycle And Walk Trip Lengths - Integrating Land use, Transport And The Environment – Better Practice Guide – Draft

Population Projection to 2021 – Statistics New Zealand

Annexure 15 – Relevant Policy Statements And Plans

Local Air Quality Management – VFECS Final Report – Relevant Excerpts

Annexure 16 – References

L J Hood & I A Ward - (RMA 1180/99)

I S & R J Cumberpatch - (RMA 1197/99)

L J Hoskin - (RMA 1198/99)

The Friends of Edmonds Factory Garden - (RMA 1199/99)

W L G & T J A Marshall - (RMA 1200/99)

Charleston Neighbourhood Association - (RMA 1201/99)

Annexure 17 – Additional Matters Raised In References And Submissions

Asset Management Plan – City Streets Unit – C.C.C – 1998 – Relevant Excerpts

Speed Histogram – Ferry Road Eastbound – East Of Randolph

Speed Histogram – Ferry Road Westbound – East Of Randolph

S3382 - Jennifer Hoskin

S3383 – Lisle John Hood

S3394 – Messers William L.G Marshall And Thomas James Allison Marshall

S3398 – Anna Ward

S3410 – I.S And R.J Cumberpatch

S3411 – L.J Hoskin

S3412 – Friends Of Edmonds Factory Garden

S3413 – Charleston Neighbourhood Assn

S3414 – Messers William L.G Marshall And Thomas James Allison Marshall

Ferry Road West Of Ensors - Traffic Count 1971

Ferry Road West Of Ensors - Traffic Count 1982