

Whanganui to Motueka Ferry Service – Feasibility Study

Peer review (updated)

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Peer review of *Whanganui to Motueka Ferry Service - Feasibility Study*

1. Murray King & Francis Small Consultancy Ltd and Ian Wallis Associates Ltd have been commissioned by Vapour Ltd on behalf of the Whanganui District Council to review the report on the proposal to establish this service by Walbran Transport Analysis Ltd and Sofos Ltd. The review is not intended to redraft the report, but to assist the Council to assess the project in relation to other regional development schemes, and to highlight those areas that might need greater precision, greater certainty, or more information before the Council proceeds to the next stage.
2. We have met with the authors of the report and they have provided some clarifications of their proposal. These clarifications are reflected in this report.
3. The areas covered in this review are:
 - The number of areas identified as uncertain or incomplete in the report
 - The demand calculations, principally for freight
 - Distance and time comparisons
 - Fuel consumption
 - Impact on State Highways
 - Port development
 - Consenting and iwi issues
 - Impact on communities
 - Resilience
 - Passengers
 - Financial analysis
 - Economic analysis
4. On each of these we will present conclusions relating to the work done in the report, and recommendations for further work required.

Uncertain or incomplete areas

5. The report contains an unusually large number of areas “parked” for future study, and some critical assumptions. We understand that this report is a preparatory report to the final business case, and is written to judge the project feasibility rather than be a definitive exploration of all issues. That step is intended to be done for the business case. Nevertheless, the number of parked issues suggests that there are risks to the conclusions in the report, including the conclusions as to feasibility, and some are of significance in themselves. The report would be better characterised as a pre-feasibility report.
6. The “parked” areas include:
 - Ship type (3.2.1) – this depends on whether the passenger market is addressed as well as freight. This decision is deferred to the next stage of the proposal. Until then it will be difficult to be precise on the cost of the ship, its crewing, its survey schedule, or availability.

- Availability of the service during survey. The survey required every 2-3 years for passenger ships, though only 5-yearly for freight, could mean the absence of the ship for more than a month. The report notes that the absence of the ship for survey will mean a gap in the service, which will have to be backed up by existing operators. How to cope during outages is an issue needs more attention, especially if it affects demand.
- The dry docking choice between Sydney and Asia – 3.2.5. An Asian dock will add considerably to the time a ship is out of service; this is more important if passengers are to be carried.
- The free use of the terminal in return for building it – s 3.3.9. This is a critical assumption in the report. To achieve this will require a strong contract with the river or foreshore authority and other local authorities. The potential for future administrations or generations to change their minds (or be forced to by legal action) must be ruled out. Some authorities may not even be able to bind themselves in this way. The Talley example is useful, but the works there are of a much smaller scale. There should be a fuller account on how protection against charging berthage or other usage fees is to be achieved.
- Potential investors in the service – section 3.4.5. Optimism at this stage may wither when concrete proposals are available.
- Uncertainty as to impact on SH4 – “awaiting information”, s 3.5.1.2. See below “impact on State Highways”.
- The assumptions about the future of the existing fleets in 4.2. If the existing operators can see their way to reducing their fleets, that suggests there is too much capacity at the moment. It is not explained how that action will create a gap in the market for a Whanganui ferry. While the gap left by withdrawing a ship might open up a particular time slot, if there is enough traffic for that time slot then why would the existing operators not continue to fill it? And if there is not enough traffic, then how would it help the proposal, especially as the existing operators would seek to tweak their service times to retain as much as possible?
- As well, the assumption that rail capacity on the Strait would not be able to be economically replaced by a road bridging operation is based on rail traffic being “low value commodities” unable to bear the extra costs. This assumption is not always true, and one of the routes where it is doubtful is inter-island, where the low value commodities go by non-ferry ships. The interisland traffic on rail is similar to that on road, mainly made up of relatively high value manufactured and retail goods from Auckland to Christchurch.
- The use of dated “bottom up” surveys, which “will need to be refreshed” – see Demand Calculations, below.
- The comment (section 5) on the fact that High Productivity Motor Vehicles can be used on SH1 but not parts of the report’s proposed route needs an analysis of the importance of this problem. The competitiveness of the Whanganui route would be undermined if a lot of traffic travels in HPMV. While the type of traffic moving inter-island may not use the weight concessions of HPMV, the length concessions (allowing more cubic capacity) may be important.
- Section 6.2 reports that it took 20 years for Bluebridge to establish its current market share. There is no reflection on this in the report in relation to the optimism of a two year ramp up for the proposed operation.

Demand calculations

7. The demand is the most critical area of the report. On it depends the conclusion that the project is viable. It is worth looking at the calculations to see if they are supportable.
8. The report considers the likely demand from two perspectives, top down and bottom up. Top down looks at the overall demand between the regions the ferry might serve, and the bottom up considers individual transport operators' likelihood of using the service.
9. The top down view takes the road traffic flows from the National Freight Demand Study of 2014 ("NFDS"), which is a Ministry of Transport publication, and a credible source. It takes the flows between regions that are considered likely to be better served by the proposed ferry. In principle these are those Whanganui and north and Motueka and south. The report however includes Gisborne and Hawkes Bay to and from all South Island regions. In the North Island the Whanganui route is 60km shorter between these regions and Canterbury and south. However this is outweighed by the increased South Island distance, Motueka to Christchurch being 82km shorter than Picton-Christchurch.
10. There is thus a time penalty for traffic from these regions to Canterbury and south, and the traffic is unlikely to shift. The quantities moving are however small.
11. The patterns of freight movement are more complicated when movements just to and from the top of the South Island are considered. For such movements all traffic from the North Island to Tasman and Nelson (and vice versa) is quicker by the new service, except to or from most of the Wellington region. This is also true for Marlborough traffic to or from Taranaki, the Whanganui area, and the northern North Island. However, on advice from Midwest that the premium freight rate for the ferry would outweigh the shorter distance savings, we have not included this Marlborough traffic. Most of Manawatu and all the eastern regions are closer to Blenheim via Picton, and this traffic is also excluded.
12. The report includes Whanganui-Manawatu and Tasman-Nelson-Marlborough in the freight catchment in Table 1. Based on shares of 2016 GDP,¹ traffic to or from Marlborough is 37% of the TNM total. On the same basis, about 70% of the Whanganui-Manawatu region is in Manawatu District and east and south. It is said in section 10 that the inclusion of Marlborough with TMN is offset by ignoring West Coast traffic, but there is hardly any West Coast traffic, and not enough to offset the traffic to or from Marlborough.
13. The northern North Island to Canterbury and south dominates the traffic between the islands. There is however a reasonable amount moving between other regions for which the Whanganui route is shorter.
14. For Manawatu, the time savings from the area around and south of Palmerston North, and some distance north, as well as the area east of the Manawatu Gorge, would be similar to those from Gisborne and Hawkes Bay, and freight is unlikely to transfer except to and from Tasman and Nelson. The map in Figure 2, and the description of what is included in 11.2.2.1 are unclear as to

¹ MBIE "Modelled Territorial Authority GDP"

whether the area around Palmerston North is excluded. Hawkes Bay and Poverty Bay are however not excluded. Traffic from these regions has to pass near to Palmerston North on a route to Whanganui, and should be treated the same as for Palmerston North.

15. Thus of the 2.07 million tonnes of road freight identified for 2021, about 1.83m is to or from regions that the new ferry could serve. The report does not claim all this addressable traffic would use the new service, but rather a proportion of it. Section 11.2.2.1 shows that the report assumes 75% of the “local” region’s traffic would transfer to the new ferry, and 25% of the long distance market, resulting in a 23-26% share of the total market, reflecting the dominance of the long distance market. “Local” has an extended definition, as it includes both the regions adjacent to either terminal, and as well those with one end or the other in the opposite island’s terminal region, such as Auckland to Nelson and Canterbury to Whanganui.
16. The following table sets out the detail of the traffic (our assessment, based on the report, p 24).

Table 1: Market size by regional group

Route	Addressable Million tonnes	Factor %	Net Million tonnes
Northern NI – Canterbury and S	1.51	25	0.378
Northern NI – Northern SI	0.13	75	0.14
Taranaki, Manawatu/Wgi, HB – Northern SI	0.038	75	0.04
Taranaki and Whanganui – Canterbury and S	0.157	75	0.118
Total	1.83		0.62

17. This shows the significance of the Auckland –Christchurch market and the relative insignificance of the immediate hinterland of the ferries. Even though the former market is very large, the proposers have chosen only to claim 25% of it. This may be a reasonable, conservative assumption. So might be the 75% claimed for the traffic between the two immediate hinterlands. But the 75% claim for traffic that has one end of its route in Christchurch or Auckland, especially if the transport decisions could made there without regard to local interests, is too optimistic. There is no evidence shown for any of these proportions.
18. The average load on the ship is assumed to be 600 trucks per week², over 51 weeks, and each hauling 16 tonnes. This amounts to 489,500t, which is some 131,000 tonnes less than shown in the table. The table would need to be scaled back to meet the ship’s assumed load. This could be done proportionately, or by reducing the 75% claim for the longer haul traffic outside the immediate hinterlands, or by assuming all of the surplus is taken of the northern North Island – Canterbury and south route. Midwest has since chosen the latter: given the scale of this traffic, that is an unlikely scenario.
19. Nevertheless, despite this assumption and despite the low proportion claimed of the traffic on the Auckland – Christchurch route, the route still accounts for 50% of the traffic that would use the service. All this traffic would head north out of Whanganui (and vice versa) as would the traffic between the northern North Island and the Northern South Island, another 20%. The ratio between traffic on the road north of Whanganui and the rest is thus about 70:30; that is, 70 trucks

² Assumption 2 in section 10, introductory words, already includes an allowance for lower demand in the weekends in the 50 truck average load.

a day would initially use this route. Similarly the ratio of trucks going via the Motueka Valley road and the rest is about 75:25. The economic analysis appendices show traffic doubling between 2026 and 2028; most of the increase would be on these routes.

20. Waikato traffic is about 2 hours closer to Wellington than Auckland. The arguments about Whanganui being attractive because it enables a return trip within driving hours, something less easily done for Wellington, are unlikely to apply to the Waikato. Waikato generates about 9% of the addressable traffic, 156,000t. There is an argument for excluding this from the addressable market too, which would reduce it to 1.68mt. For the purposes of this review, it remains treated as addressable.
21. Traffic from parts of Waikato and Bay of Plenty will not benefit from the shortcut that Auckland and central Waikato has via SH4. It is likely to come south along SH1 to Marton. While that is still a shorter route than via Wellington, it is only marginally so and it may also not transfer, especially given the shorter sea voyage via Picton, and the assumption in the report that the Motueka ferry would charge a premium for time savings. For the purposes of this review, however, this traffic is also treated as addressable.
22. Traffic from Auckland does have a clear distance saving. From Auckland to Castlecliff is 452km, whereas Auckland to the Wellington ferries is 641km, a difference of 189km. The difference in the South Island routes of 82km longer does not outweigh this.
23. The 2012 figures in the NFDS are increased by 15% to give a 2021 estimate. This is a reasonable, in fact conservative, view of the growth as set out in the NFDS for the main commodities involved.
24. The report would have benefitted from a review of the commodities that flow between the islands. This information is available from the NFDS. It shows that the principal interisland commodity is manufacturing and retail, which is time sensitive. It also shows there are other commodities that need some analysis as to whether the proposed ferry route is attractive, eg livestock and fertiliser.
25. The overall conclusion of this analysis is that the addressable market, measured top down, is about 1.83mt, and potentially less; rather than the 2.07mt assumed in the report.
26. Table 1 in the report translates 2.07m t into 2541 truck movements per week. The proposed service assumes 600 trucks per week. This is nearly 24% of the total demand, and the reduced addressable market would mean the proposed service would capture over 25% of that market.
27. The report itself proposes that the addressable market is 1584 truck units a week (5.4) although it does not say how this figure was derived. 600 trucks is nearly 38% of this estimate.
28. Either share is ambitious for a start-up, and is not justified by the report. The conclusions of the report need to be tested against a lower figure, or at least a long build up to 25% (longer than the 2 years of unspecified build up noted in 11.3). The economic analysis appendices show the opposite, the addition of a new ship in 2026 and the doubling of the traffic by two years after that, which appears unrealistic.

29. The bottom up analysis derives from earlier investigations for a ferry on a slightly different route. It is from a number of interviews, but is dated and needs upgrading to today and the specifics of this ferry route. It contains views about the value of time that cover a very wide range, which might be taken as a warning to give it little weight. It concludes that 1070 truck units a week are “likely” to use the service. Given that the proposed service is assumed to carry 600 trucks per week, this would mean that over half of these “likely” trucks do turn up.
30. The report asserts that the benefits of a shorter route to trucking operators could in part be captured by the ferry operator. It proposes “sharing” the benefit by adding a 20% premium to the Cook Strait rates. We would regard that as unstable and likely to be eroded.
31. There is only a brief mention of a competitive reaction from the incumbent ferry operators, and that is to dismiss it (8.3). Some attempt to meet the prices offered by the new service should be expected.
32. The assumption that the ferry will generate only minimal freight to or from its immediate port regions (5.3) is reasonable. However, 3%, which is 18 trucks a week (9 return trips) might be generous.
33. Overall, if the price is adjusted downwards by 10% as a proxy for the risk of benefit sharing not working, and the incumbents reacting, the income is reduced by about \$2.8m (using the parameters discussed below in “Financial Analysis”). Of course, this 10% figure is an assumption, but it does illustrate the sensitivity of the proposal to the demand assumptions.

Distance and time calculations

34. Distance is an important parameter used to compare the proposal with existing Cook Strait operations. It is important in terms of the operating costs of vehicles, and in terms of its contribution to time.
35. Sea distance is not highlighted in the report. The comparisons of distance focus on land distance. This is said to be 198 km shorter in the North Island and 82 km longer in the South, net 116km shorter, than the route via Wellington and Picton.
36. The following table sets out the road distances assumed in the report, along with some recalculated ones.

Table 2: Road Distances

Route	Report distances (km)	Actual distances	Difference
Auckland- Wellington	643	641	2
Picton-Christchurch	336	336	
Total existing route	979	977	2
Auckland-Whanganui	445	452	7
Motueka-Christchurch	418	418	
Total proposed route	863	870	7
Saving	116	107	9 (i.e extra km)

37. The column labelled actual distances is derived from the AA’s online distance calculator³, which appears to be the source of the original data. The differences are thus due to differing assumptions:
- The Wellington point is central Wellington in the report; a weighted average of the Interislander and Bluebridge ferry terminals in the “Actual”. The difference is minor.
 - The Whanganui point is central Whanganui in the report, and Castlecliff in “Actual”
 - The Motueka-Christchurch distance in the report is measured via the Motueka Valley Road. This is not the route proposed elsewhere in the report, which is by SH60 to SH6 and then south through Hope (see 3.5.1). This route is 15km longer than the Motueka Valley route. We understand however that the intention is that trucks for south of Tasman will use the shorter valley route.
38. The North Island road distance is thus 189km shorter via Whanganui. But in the South Island the route is 82km longer. The total road distance is 107km shorter compared with the report’s stated 116km (3.5.1). While not a large discrepancy it needs to be clarified.
39. For the Auckland traffic, the report is correct in suggesting the proposed route is shorter in terms of land distances. But the sea distance is longer. Wellington-Picton is 53 nautical miles, or 98km. Whanganui to Motueka is 115 nm or 213 km, or about 115km longer. This cancels out the net gain in road distance. It will moreover be slower; at the proposed 19 knots the ship will take about 6.5 hours to run the route (allowing for manoeuvring time at each end), compared with 3.4⁴ for the Picton route, and compared with about half the time on land.
40. Overall times for the proposed service are likely to be:

Table 3: Transit times

Section	Time (Hours and decimals)	
	Estimated	Midwest estimate
Auckland -Castlecliff	6.4	6.2
Assembly of cargo at Castlecliff	1.0	1.0
Sea	6.5	6.5
Unloading at Motueka	0.5	0.5
Motueka-Christchurch	6.1	5.6
Total for proposal	20.5	19.8
Auckland –Wellington	8.6	9.7
Assembly	1	1
Sea	3.4	3.4
Unloading at Picton	0.5	0.5
Picton-Christchurch	4.8 ⁵	4.6
Total for existing route	18.3	19.2
difference	2.2	0.6

³ Except for the Picton-Christchurch route. The calculators now show the alternative route via Murchison, so the Midwest report’s number is used.

⁴ The Interislander sailings vary in journey length from 3 to 3.5 hours; Bluebridge is 3.5 hours. 3.4 is an approximate average.

⁵ Calculated using the same average speed as for the Motueka route, a conservative assumption

41. The proposed service is on our estimate 2.2 hours or 2 hours 12 minutes longer. Our estimated road times are based on available car times increased by 10% for trucks' lower maximum speed and lower performance on grades. That gives an average speed of 70km/h in the South Island, 71km/h via SH4, and 74km/h via SH1 in the North Island, which appear reasonable. The Midwest estimate is only 36 minutes longer. It is based on information supplied by trucking companies. The difference is most noticeable on the Motueka –Christchurch leg, which translates as trucks only taking 6 minutes longer than cars, which does not seem reasonable; and the Auckland-Wellington leg, where trucks are assumed to be 24% slower than cars. This is ostensibly because of congestion, which also affects cars, and should already be in the AA calculation.
42. While the extra time taken may not impact on drivers, given the assumption that most freight will be unaccompanied, the proposed route is likely to take longer than the current route, but not by much. In terms of the freight being hauled, the proposed route does not offer an advantage, and may be at a disadvantage. Whether the time difference is valuable depends on the ability to leave Auckland at a convenient time and still get to Christchurch in the right timegate, typically about 6am, in time to deliver to retail stores or manufacturing plants before they open. Working back from 6 am means a departure from Auckland at 10:30 the previous day for the Interislander and 10 am for the proposed service (without taking account of the actual ferry timetables). It would not appear to be a significant difference.
43. These numbers may not be the precise values for time taken. However the report should have analysed the full route in terms of time to see if the route had any advantage over the existing route, beyond the time saving on land.
44. It could be difficult to arrange the return sailing at a convenient time for truckers. The proposal is to initially run one return ferry trip per day. That return trip takes a minimum 15 hours including an hour for loading/ unloading, so there is no prospect of having more than one return sailing in a day. Using the example of a 10am departure from Auckland, the sailing ex Whanganui would be at 5:15pm. The return sailing need not be immediate, and the layover at each end could be up to 5 hours (10 hours if all taken at one end). The report says that this time will allow for maintenance so more is likely to be taken in Whanganui. With say a two hour layover at Motueka, the return would be at 1:45am day 2, implying a departure from Christchurch before 7pm and an arrival into Auckland at 3pm. Even with a 10 hour layover at Motueka a return truck trip would not be possible, as it takes about 14 hours for the truck to go to Christchurch, unload/load, return and be loaded on the ship.
45. On this example there would be a 13 hour truck layover in Christchurch, and more than a 3 day round trip for a truck. On the existing services this could be achieved more quickly, as the shorter sea distance means more frequent sailings and moreover there are 5 ships in operation, giving a good choice of return sailing times. With the proposal to haul mainly unaccompanied vehicles, this may not matter for drivers, but the poor turnaround of equipment will raise truckers' costs, and make the proposed service less attractive. It could thus have implications on the demand for the service, as truckers seek to maximise turnaround –eg, having return trips via the existing ferries and giving the Midwest operation less northbound traffic. Or potentially the existing operators could offer round trip rates to capture the key southbound leg.
46. The long layover issue might also influence the ability of trucking companies to improve driver utilisation by arriving in one truck at Whanganui and departing northbound in another a short

time later. This would undermine one of the reasons given for the attractiveness of the proposed service, a round trip within drivers' hours.

47. We understand that northbound traffic might involve different trucks setting off from Christchurch earlier. For them the same problem arises, and their southbound leg may be more attractive through the existing route. A sophisticated truck operator would be able to integrate the two routes to maximise its efficiency, but that still implies use of the alternative route.
48. Further analysis of the time gate issue, and the impact of overall return journey time, needs to be undertaken before the demand assumptions can be regarded as firm.

Fuel consumption

49. The fuel savings calculations are aimed at comparing the existing route, road and ferry, with the proposed route. These are largely expressed in the difference in CO₂ and particulates produced.
50. The authors calculate the fuel savings brought about by the shorter road distance. They do not take account of the fact that the route they propose is hillier and more sinuous than the SH1 route, which makes calculations on average fuel consumption figures unreliable.
51. They also imply that their hypothesis is because sea transport is more fuel efficient than land transport, the addition of a longer sea leg will also save fuel, and are confounded when their own analysis does not confirm this view (9.4 and 10.2.4).
52. The explanation of this conundrum is that the claims for maritime fuel efficiency are typically based on conventional ships hauling bulk cargoes, or very large container ships, where the fuel costs are spread over many tonnes or containers.
53. RoRo ferries are not very economical in fuel terms because they are designed for quick transit with rapid loading and unloading, as part of a longer land route. That is why they are found on the shortest sea routes. Land transport is also typically much faster so a longer route bypassing what could be done on land is less attractive.
54. In this case the loading assumptions spell out why the fuel economy is poor. A large vessel is carrying only 50 vehicles each hauling 16 tonnes. This gives a payload of only 800 tonnes of freight. With a crossing using 13800 litres of fuel (11.1.7) and being 213km long, this amounts to 8 litres per 100 ntkm, or 3.6 MJ/tkm, worse than rail and road transport.
55. The Appendix in the report on the ferry CO₂ assumes the proposed ferries are more fuel efficient than current ones. The assumption of 180m long ships is said to be similar to the current ships, but the fuel burn assumed is much less. The assumption is that the new ferries burn 2250 litres per hour, and a 6 hour transit will burn 13500 litres. Note that this is different from the 13800 litres above.⁶ If the existing ferries burnt at the same rate, their 3 hour crossing would burn 6750 litres. Yet the analysis assumes 9000 litres. This results in a comparison more in favour of the proposed ferries. This discrepancy has been corrected by Midwest in its revised appendices.

⁶ At 19 knots the ferries will take just over 6 hours, and manoeuvring time at each end would extend this, probably to 6.5 hours. However, that manoeuvring will be at much reduced power so a 6 hour burn is reasonable. For the same reason it is assumed that the existing ferries take 3 hours with 0.4 manoeuvring.

56. The foot of the CO₂ calculation sheet claims a saving, but in reality this is a cost of the proposal, as the proposed ferry burns more fuel than the existing ones per crossing (because it is more than twice as long). In any case it is entirely additional as no existing ferry is saved. This appears to have been corrected in the summary at the start of Appendix E, because it shows a negative net CO₂ gain.
57. There is no real claim to be made in favour of this proposal on fuel efficiency grounds.

Impact on State Highways

58. The report states that the likely preferred route for those using the ferry is via SH1/39/3/4 in the North Island, and SH 60/6/65/7/1 in the South Island. These are realistic routes. We understand though that SH60 is not the proposed route: rather the Motueka Valley route is assumed. As the recent experience with SH6 after the Kaikoura Earthquake shows, the South Island routes are not designed for substantial heavy vehicle traffic.
59. The same is likely to be true of SH4. The report notes NZTA advice that one of their counting stations, Aberfeldie, shows this road only handles 169 trucks per day. In fact the next station north, at Kakatahi, handles only 125 heavy vehicles per day, and the range in the rural parts of the route between Whanganui and Raetihi is from 125-182.
60. The report is inconsistent in its assessment of the numbers of trucks likely to use SH4. Following the assumption that a lot of traffic will be local or for Taranaki, the piece on SH4 implies that most traffic will take other routes. It suggests 15-20 vehicles a day per day (3.5.1). The discussion above suggests rather more will use the route. That calculation shows that 70 of the hundred trucks per day will go/come from north, and 30 would be local. This makes the comparison with the NZTA truck count more problematic, as 70 trucks implies an increase in heavy vehicle numbers of 38-56% on the rural parts of the route to Raetihi. Moreover, since the NZTA definition of a heavy vehicle is one over 3.5t, and since most of the ferry traffic on this route will be very large trucks, the increase in these trucks is likely to be starker. Most of the increase from the doubling of the traffic between 2026 and 2028 will be on this route.
61. The lack of concern over extra trucks in the South Island is surprising, especially given the impact on the chosen route that the closure of SH1 is having. About 75 of the 100 trucks per day will use the Motueka Valley road/SH6/7 route. The existing heavy traffic on the Motueka Valley part of this route is likely to be lower than that on SH4, so the impacts are likely to be greater, and need more in-depth evaluation.
62. The report counts the costs the extra traffic imposes on the roads through the use of procedures and values in NZTA's Economic Evaluation Manual. These are largely average values for the roading system. It is appropriate to use them for incremental changes in traffic on a road, but may not be appropriate for large step changes. NZTA and Tasman District may need to spend substantially more on upgrading the routes than shown in the EEM based analysis. While this is not a cost to the ferry operator or its users, it is a cost to the nation and should be properly assessed.

Port development

63. At both ends of the route essentially new ports are proposed in tidal areas. Both will require extensive dredging, which the report recognises. The Motueka port site is at present just tidal mudflats. There appears to have been no professional maritime advice taken on the feasibility and costs of these facilities, as this was not funded at this stage.
64. Such advice needs to be obtained, and is intended for the next stage of the proposal. The proposed funders for the next stage include the Councils. The Councils at either end also have an interest in ensuring the project is viable and sustainable, so that it is not abandoned leaving the councils to clean up, or does not crowd out other better uses of the port areas.
65. Such advice may also indicate physical obstacles to feasibility, or significant changes required to the footprint of the port. Even though a 10% change in port costs only impacts profitability by \$0.07m, there is no guarantee that the change will be limited to 10%, and the amount may be important given other sensitivities.
66. It is also proposed that the port be a private port for the benefit of the developer. There is no analysis as to how this fits with the Councils' mandate and policies; indeed it is sold as a way of avoiding costs for Councils. They may not be able to, or inclined to, reserve part of their estate for private use. Similarly a private port may raise competition law issues.

Consenting and iwi issues

67. The report is virtually silent on the issues around obtaining consents for the project. In the tables in sections 1, 2 and 13 they are mentioned, with the expectation that they will be dealt with over the next year, following further funding.
68. We feel that the consenting process could involve significant effort, time, and cost, and potentially be a serious obstacle to the project, or at least put significant and potentially unacceptable conditions on it. Moreover the process has to be carried out in parallel in two different places, which might mean incompatible conditions are imposed. At the very least a feasibility study should have noted it in more detail, and pointed out the risks, especially as the works and operations are in sensitive areas.
69. Both proposals involve significant works in, and modification to, the coastal marine area, a zone recognised in the Resource Management Act as a particularly sensitive one. In Whanganui's case, the report suggests there will be impacts on river flow and on the southern bank because of redirected flows (11.2.3.1). In the case of Motueka, most of the development will be in the CMA. In Whanganui, the actual berthing structures may be outside the CMA, but there will be substantial dredging and river control works within it. In any case the RMA regards river beds as just as sensitive as the CMA.
70. Section 15 of the RMA basically precludes any development in a coastal marine area unless authorised by a national environmental standard, a rule in a regional coastal plan, or a resource consent. Decisions on the use of the CMA are for regional councils to make, so Horizons in the north Island and Tasman as a unitary council in the South. Section 13 has similar provisions with

respect to beds of rivers. This adds another layer of bodies to convince, especially in the North Island.

71. While there is analysis of the regions' transport plans, there is no analysis of the impact on the project of coastal plans or other regional plans. The letter of support from Horizons is similarly only related to transport plans.
72. Moreover the presence of endangered or iconic species, such as the godwit in the Motueka area, could also raise obstacles to the ports, and certainly will draw environmental protest.
73. As well, the topic of dredging tends to be sensitive in itself, especially in terms of where the dredged material is disposed of. Already in the Whanganui area there are protests about seabed disturbance for the mining of ironsand. Dredging and disposing of a million cubic metres of material will not be a trivial issue.
74. The Whanganui River has just been granted legal personal status, by the Te Awa Tupua (Whanganui River Claims Settlement) Act 2017. Exactly what implication this will have for activities in the river is unknown, but it is likely that any work will need the approval of the body set up under that Act to be the human face of the river ("Te Pou Tupua"). This body has all the powers necessary to achieve this purpose, and could conceivably simply say "no".
75. Actions affecting the river will have to take account of the Act. Section 12 defines the river ("Te Awa Tupua") not just in terms of its physical elements, but also its less tangible, cultural, values:

Te Awa Tupua is an indivisible whole, comprising the Whanganui River from the mountains to the sea, incorporating all its physical and metaphysical elements.

76. A number of Acts are listed in Schedule 2; people exercising or performing a function, power, or duty under these in relation to the river must either "recognise and provide for" or "have particular regard to" its legal personal status and the "intrinsic values that represent the essence" of the river, as set out in s 13. The RMA is listed in Schedule 2, and the framers of plans under it have to comply with the "recognise and provide for" obligation, and decision makers in other RMA contexts (such as those considering a resource consent) have to "have particular regard to" the status and values. These obligations permit (but do not oblige) decision makers to consider the status and values as determining factors when making a decision.
77. Section 62 provides for a special Te Awa Tupua hearings panel to hear certain applications for resource consents, including those relating to erecting structures, reclamations, and disturbing the bed of the river (through for example dredging).
78. A "collaborative group" is set up under s 64 to review "existing and possible future" activities on the surface of the river; regulatory provisions for managing and controlling activities, relationship with activities on land, public health and safety, the health and wellbeing of the river, and any other relevant matters, and how to improve and coordinate all of these.
79. Section 69 contains acknowledgements of the Crown's deleterious actions in the past, including empowering the erection of jetties, removing gravel, and clearing the river for navigation, and s

70 contains an apology for them. Clearly the Act contemplates at least involvement of iwi in such developments from now on.

80. Creation of a port will be one of the first, if not the first, major changes proposed for the river since the Act was passed, and will be a learning curve for all involved. It is likely to involve appeals at all levels. While in the end port development may not be prevented, the process is likely to be prolonged, and the proposal should have recognised this.

81. There will also need to be wider consultation with iwi at both ends of the route, at an early stage.

Impacts on communities

82. The proposal imposes costs on settlements that will not benefit from it, for example towns along SH4. Most of these costs are captured by the analysis of pollution, noise, and accidents in the report, but there should also be provision for consultation with the communities. For some the increased traffic might result in pressure on NZTA to improve roads or build bypasses.

83. In Whanganui itself, the same considerations apply to the largely residential route along SH4 (Anzac Parade and Putiki Drive) to the junction with SH3. Extra traffic of up to 70 trucks a day (and more from 2026) will cause disquiet with the residents, and may also need some intersection improvements, eg where SH4 meets SH3.

84. A further issue arises with Heads Road in Whanganui, from SH3 to the port at Castlecliff. This is a Council road, whereas all the other parts of the route are State Highways. Increased traffic on the road to the port could increase the Council's maintenance costs, although the road is built to a high standard already. The report suggests that these impacts would be resolved by having NZTA declare the road a State Highway, much as roads to other ports. There is no guarantee that NZTA would so declare the road, and in fact not all "last mile" sections of road to ports are State Highways (eg Wellington).

Resilience

85. The authors rightly point out that the proposal will provide an alternative service to that across Cook Strait, which could be valuable in the event of serious disruption to the Wellington or Picton terminals. As well, the presence of a pair of ferry terminals that could accept the current Cook Strait ships could also be of value.

86. However they are not the only solution, and in an emergency Wellington and Picton can simply be by-passed, by direct shipping from Auckland to Christchurch, which are the principal origin and destination respectively for interisland ferry traffic. This is inconsistent with the evaluative method for resilience used in the report, which requires there be no reasonable alternative. Even if both ports are busy, they should be able to cope with a temporary ferry outage. Moreover there are other port options in both islands.

87. As well, there are moves to bolster the resilience of the existing terminals, leaving only major upthrust under one of the terminals in Wellington as the reason for an alternative. The report assumes both terminals would be out for a year every 100 years.

88. There is also no consideration given to the resilience risks of the ports in the proposal itself. For instance, floods on the Whanganui River could close the port to navigation, and potentially destroy the infrastructure. The littoral drift of sand at both ends may also close the ports from time to time.
89. The resilience benefit is of no value to the developer, except as a remote likelihood of a sudden increase in traffic. It is an economic benefit, which would have to be funded (turned into cash) by a public body to be of value to the developer, which appears unlikely.
90. There is a value claimed for resilience in the report. It is calculated by a 1% probability per annum that the Cook Strait ferry would be unavailable, and the revenue lost. That probability implies that over 100 years both sets of ferries would be out of action for a year, without a reasonable alternative. It is somewhat simplified and what amounts to a 1 in 100 year probability of a major event is too harsh. On the other hand, Table 3 below suggests the arithmetic undercounts this benefit. The report would be stronger if there was a more developed argument about resilience.

Passengers

91. The report sees carriage of passengers as a later stage in the development of the service. Carrying passengers adds considerable cost. This review has thus focussed on the initial freight service, and only a few comments on passengers are offered here.
92. Passengers are noted as being 65% domestic and 35% international on the existing route. The domestic passengers are also noted as being from the bottom of the North Island and the top of the South Island. While part of the top of the South Island will be covered by the proposed service, the area around Whanganui is more sparsely populated than areas closer to Wellington, which is likely to significantly restrict the domestic passenger market. Only 10% of the country's population is in the Taranaki – Whanganui – Manawatu areas, according to the consultant's report in Appendix A. In fact, it is only 7.5%. By comparison, just under 10% live in greater Wellington alone.
93. More likely is the international market, and the idea of a round trip on different ferry routes opening up a new tourist route is plausible and worth further work. The consultants do note however that changing the existing touring route "would require a long term effort over a very long period". It is unlikely to help the proposed ferry revenue much; even after catering for passengers there will be a long lead time to build up this revenue.
94. There is as well little consideration of the attractiveness of a 6.5 hour crossing in open water. The current operators have a crossing time about half that, and about a third is in enclosed waters, which for the greater part are scenic and an attraction in themselves. At each end of the proposed service it will immediately be in open water, largely well off the coast and out of sight of land apart from high mountains. Such a crossing would be one to be endured, and there has to be doubt as to its attractiveness.
95. Carriage of passengers will require a timetable that is attractive to them. Such a timetable could be different to that which would suit freight. The juggling of the different time demands for freight and passengers is a problem for existing Wellington to Picton operators, and they have more sailing times available to make the problem manageable. With just one ship the problem

for the Whanganui service would be very hard to solve. This is adverted to in section 3.2.4, and it is assumed a compromise is possible. It does not however analyse the impact on each of the two markets (freight and passenger) that the compromise would have.

96. Passengers thus may not be as useful a market as the report implies.

Financial Analysis

97. The sensitivity of the financial analysis to risks is redacted in the report, and which risks have been taken into account is not clear. We also understand that the commercial analysis will be developed further in the next stage.

98. The financial analysis is the one that counts, as that shows the costs and benefits the developer of the port can be expected to incur and gain. At present there is a profit margin shown of \$5-10m which could easily be eroded by the risks set out above. The elements of this are not revealed.

99. The assumptions in the report (11.2.4) suggest rates of \$1000 per truck or more. 50 trucks per sailing would generate \$50,000. On a 6 day weekly basis, this amounts to \$600,000 a week. This is based on about 25% of the addressable market. If the service only managed to get 20%, then the average revenue per sailing would drop to \$40,000 and weekly to \$480,000, a reduction of \$120,000. On the 51 week per year basis used in the report, this would amount to \$6.12m drop in revenue, a serious dent in the \$5-10m profit. A further 5% reduction in market share would make the service unviable. It should be noted that the costs of operation will be largely fixed and will not vary with traffic, so the revenue line is a critical one.

100. The price premium assumption is also sensitive, as noted above. A 10% reduction in price would reduce income and profit by \$3.1m. Not achieving the premium at all would be significantly worse. Combined with the lower traffic levels this would total \$8.6m, making the operation marginal.

101. The project is thus sensitive to these risks and they need to be resolved in more detail before a developer will proceed to investigate the proposal thoroughly. This is recognised by the report in section 12, but leaving a firm analysis of the revenue risk until a later stage means a critical uncertainty is not yet resolved. This may also be a sensitivity for the required funders for the next stage.

Economic analysis

102. The economic analysis, set out in section 10 of the feasibility study report, provides estimates of the scheme costs and benefits from the national economic perspective (irrespective of which party pays the costs or will receive the benefits). It is intended to be consistent with the procedures set out in NZTA's Economic Evaluation Manual (EEM).

103. Table 4 (following) provides a summary of the feasibility study economic evaluation results, as updated, together with our comments on them. On a discounted basis over a 40 year evaluation period, the study report estimates benefits of \$1674 million and comparable costs of \$561 million, giving a benefit: cost ratio (BCR) from the national economic perspective of about 3.0.

(We note that, in the initial feasibility study draft, discounted benefits were estimated at \$901 million and the BCR at 1.6.)

104. Our review of these results (as given in the table 4 commentary column) has reached the following main findings:

- The largest single benefit component (G) relates to employment benefits, accounting for 49.8% of the total benefits. This estimate is based on creation of 115 direct jobs (mostly in the Whanganui and Motueka areas) associated with the first ferry, and an additional 80 jobs with the second ferry. Further, is estimated that these 'direct' jobs will give rise to about three times that number of 'indirect' jobs. We understand that job creation is not regarded as a legitimate national economic benefit under the EEM procedures. Even if it were judged to be legitimate, we consider that the quantum of the benefits is considerably overstated.
- The next largest benefit component (B) relates to truck travel time and associated vehicle operating cost savings, accounting for 35.2% of the total benefits. Our analysis indicates that these benefit estimates should be reduced by about 15%, as the estimated reduction in road travel distances is over-stated. There are also some questions as to the validity of the unit cost rate applied.
- The remaining benefit items together account for only 15% of the total benefits. We have not analysed these in detail, but note in the table our reservations on some of them.
 - We have not been in a position to review the validity of the cost estimates, as very little information is being provided on this aspect.

Item/reference	Feasibility study estimates (\$M) - 40 years, 6%pa discount rate		Commentary
	Undiscounted total	Discounted total	
Benefits			*EEM SP8 (Freight Transport Services) "provide a simplified method of appraising the economic efficiency of...sea freight transport services", for situations where (i) "there are costs to users which may offset the difference between road and sea freight rates" (ii) the primary benefits are road maintenance, renewal and improvement cost savings..... and road traffic reduction benefits" and (iii) the route from which heavy vehicles are removed is primarily rural". These procedures seem appropriate for the economic evaluation for this project, but have not been used. If the proposals are to be submitted to NZTA for funding, some explanation would be required as to why the SP8 procedures have not been used (and, in fact, why some procedures from SP2, which is designed to assess the economic efficiency of bridge replacements on low-volume roads, have been adopted in preference.

	Feasibility study estimates (\$M) - 40 years, 6%pa discount rate		
Item/reference	Undiscounted total	Discounted total	Commentary
A: Accident benefits (10.2.1)	274	92	<p>*Not checked analyses in detail.</p> <p>*However analysis results do not appear plausible and therefore some further justification/explanation is needed:</p> <p>(i) AKL – CAN movements: road distance per trip reduced by 11%, associated crashes reduced by 57%.</p> <p>(ii) TAR – N/T movements: road distance per trip reduced by 57%, associated crashes reduced by 89%.</p>
B: Travel time/VOC benefits (10.2.2)	1729	589	<p>*Based on average road distance reduction of 172 km (one-way trip), which is the estimated weighted average of the the distance saving for inter-island freight traffic to/from the Tasman and Nelson districts (278 km, 38% of total) and traffic to/from areas further south (Canterbury etc), including to/from the northern North Island (107-108 km, 62% of total).</p> <p>*Our own analyses estimate that the weighted average road travel distance would reduce by 147 km, i.e. 14.5% less than the proponent’s estimate. This would reduce the \$589M discounted total benefits against this item to \$503M, a reduction of some \$86M (about 5% of the total discounted benefits estimate).</p> <p>*Distance savings have been multiplied by a unit costs factor of \$3.05/vehicle km, taken from EEM SP2 for HCV11 trucks. As noted above, it is not clear that this factor is appropriate in this application: further explanation/justification for its use is required.</p> <p>*To the extent that this factor relates to trucks with typical operating speeds, it may be unduly high for application in this case, where (as we understand) savings in road travel time under the new ferry option are less than proportional to the savings in road travel distance (ie the average road travel speeds under the ferry option will be lower than under the present routings).</p>
C: Road user (decongestion) benefits (10.2.3)	427	126	<p>*Relates to decongestion benefits in the Wellington region only.</p> <p>*In practice any decongestion benefits from reduced truck traffic in the region will be sensitive to ferry sailing times and therefore truck arrival/departure times from the ferry terminal: this does not appear to have been explicitly taken into account.</p> <p>*We also note that the truck travel distance on the WLG road network appears to have been taken as 80 km: this may be regarded as somewhat extreme</p>

	Feasibility study estimates (\$M) - 40 years, 6%pa discount rate		
Item/reference	Undiscounted total	Discounted total	Commentary
			(on the high side), but depending on the area on which the GW modelling has been based
D: CO2 benefits (10.2.4)	13	-4	*This negative result is claimed to be counter-intuitive; but would appear to reflect that the proposed ferry operation will not be particularly fuel-efficient (relative to truck travel). *Given the small magnitude (+/-) of these benefits, we have not analysed this item in detail
E: Particulate reductions (10.2.5)	40	14	*Based on route distance operated through urban areas. *This estimate appears plausible, but we have not analysed in detail (given its small contribution to total benefits).
F: Resilience benefits (10.2.6)	61	25	*Calculated for year 1 as 1% of annual fare revenue earned on the Cook Strait ferry services (on basis that ferry operations would be out of action for 1% of time over the evaluation period). *The annual benefits (reflecting fare revenues) have not been increased in future years; and in fact the 1% probability is been progressively reduced (by a compound factor of 0.99 applied annually) for future years. The rationale for this is unclear.
G: Employment benefits	2293	833	*Employment benefits have been estimated on the following basis: (i) new jobs associated directly with the post-ferry services estimated at 115 for the first ferry, 185 for both ferries (ii) employment multiplier on these direct jobs taken as 4.0 (ie 3 indirect jobs per one direct job) (iii) average employment costs \$80,000 per job (iv) by applying the above factors, total annual employment benefits calculated for first ferry at \$36.8 M pa, both ferries at \$59.2 M pa. *In our view, these benefits are not appropriate for inclusion in an EEM appraisal: (i) EEM (A10.2) states that the following wider economic benefits (WEBs) are/may be applicable in the NZ context: <ul style="list-style-type: none"> • <i>Agglomeration, where firms and workers cluster for some activities that are more efficient when spatially concentrated;</i> • <i>imperfect competition, where a transport improvement causes output to increase in sectors where there are price cost margins; and</i> • <i>increased labour supply, where a reduction in commuting costs removes a barrier for new workers accessing areas of employment.</i>

	Feasibility study estimates (\$M) - 40 years, 6%pa discount rate		
Item/reference	Undiscounted total	Discounted total	Commentary
			<p>The employment benefits claimed in this case do not appear to fall within any of these three categories.</p> <p>*EEM also notes that: <i>“Great care is required to ensure that the estimates for wider economic benefits are truly additional to conventional benefits to avoid double counting. As an example, business travel time savings can result in productivity and output increases. These are a direct user benefit and any wider economic benefits for increased productivity have to be additional to these direct user benefits.”</i></p> <p>*We also note that the assumptions on benefits made in the appraisal are regarded as extreme. For example, it would seem most unlikely (in a competitive/commercial environment) that the addition of 115/185 direct jobs for the new ferry services would not be partly offset by a reduction of jobs associated with the existing inter-island services.</p> <p>*From our discussions on this matter with NZTA staff, it appears that there is some ongoing debate about how employment generation should be treated in EEM appraisals. It may be worthwhile for the scheme proponents to discuss this matter with NZTA staff before proceeding further.</p>
Total benefits	4837	1674	
Costs			
Implementation and operational costs		561	<p>*It is assumed that these costs include all item set out in section 11 of the feasibility study report, including all port development costs, vessel capital costs and annual operating/maintenance costs.</p> <p>*Based on annual costs of freight-only ferry for first 5 years, then 2 ferries operating in subsequent years</p>
Benefit: cost ratio (BCR)		2.98	

105. For this project, we understand that any funding applications to governments would relate only to a contribution of funds for further investigation studies and business case preparation, and that the project (if it proceeds) would be otherwise financed on a fully commercial basis. This makes the BCR appraisal of less relevance than would be the case for typical government-funded transport projects.

106. We would note that the BCR results provide no guidance on the financial viability of the project. A substantial portion of the benefits relate to economic cost items which are not able to be captured (e.g. by a developer) in financial terms.
107. We also note there may be stimulus to local industry in having better access to markets, as well as in terms of local job generation. This is correctly regarded as a bonus by the report, as the opportunities of closeness to market for Whanganui and Motueka are likely to be small.

Conclusion

108. There may be a sufficient market available to this ferry route, at rates that make it profitable, but the case is not sufficiently made out by the report. A significant number of gaps need to be filled before a developer would proceed, and some of them need filling before the funders are likely to assist with the next stage, so there can be more certainty with the feasibility of the project.

Appendix: Authors' brief CVs

Murray King

Murray is an independent consultant specialising in transport, particularly freight, based in Wellington. He has a BA (Hons), First Class and a PhD from Victoria University of Wellington (on the trucking industry) and also an LLM (Distinction). He holds a practising certificate as a barrister. He has had 45 years' experience in land transport, including rail, trucking, shipping and buses, mainly as an executive with Tranz Rail Ltd and its predecessors. He is particularly interested in rail and road law, economics, safety, heritage, and environmental impact. He was one of the authors of the 2008 and 2014 *National Freight Demand Studies*, and of a 2016 report on international air freight for the Ministry of Transport. He has recently worked on a report for ECan, on freight data gaps, and has worked on a number of projects for the Waikato and Greater Wellington Regions. He is currently working on an NZTA project on the value of time and reliability for freight.

He is a certificated hearings commissioner for council RMA hearings. He has been a Board Member of Land Transport NZ, and has had an active involvement with regional councils' transport committees, including Horizons. He is Chairman of the Rail Heritage Trust of NZ, and is a past national president of the Chartered Institute of Logistics and Transport, of which he is a Fellow. He is as well a Fellow of the Institute of Management NZ, and a Companion of the Institution of Professional Engineers NZ.

Ian Wallis – Transport Economist/Planner

Present Position:

Ian Wallis Associates Ltd (Wellington, NZ) - Principal

Education:

MA (Hons, Mathematics and Mechanical Sciences), University of Cambridge (UK)

MSc (Hons, Transportation and Traffic Planning), University of Birmingham (UK)

Professional Affiliations:

Institution of Civil Engineers - Member

Institution of Highways and Transportation - Member

Institution of Engineers, Australia - Member

Institute of Professional Engineers, New Zealand - Member

Institute of Logistics and Transport - Member

Career Summary

Ian has more than 35 years' experience as a transport economist, planner and policy analyst. His professional career was based initially in the UK, then in Australia and since 1989 in New Zealand. Prior to establishing his own consultancy business in 2007. Ian Was Director/Project Manager for the NZ transport consultancy businesses of Travers Morgan (1989-96) and Booz Allen Hamilton (1997-2007). Ian has undertaken transport planning, policy and economic studies in many countries, including NZ, Australia, UK and several European, Middle East and Asian countries.

Relevant areas of experience and achievement include:

- Undertaken/managed numerous NZTA research projects over the last 15-20 years, including many in the areas of travel behaviour and economic appraisal methods. Played major roles in over 10 research projects on the valuation of travel time and reliability savings, mostly for NZTA.
- Undertaken numerous other projects involving research and the application of transport economic appraisal methods, including: inputs to UK DfT 'state- of-the-art' review of transport appraisal methods (2013), development of Australian National Guidelines for Transport System Management – Urban Transport Appraisal (lead researcher/author, 2007 and 2014/15), and numerous inputs to the development of the EEM appraisal procedures.
- Directed/managed multiple consultancy projects relating to the NZ freight sector, and currently managing NZTA project examining freight sector valuations of travel time savings and reliability improvements for heavy truck and rail freight traffic in NZ.