

Te Huia Train Viability Report

**A Financial and
Environmental Analysis**

January 2022



Te Huia
Connecting **Waikato & Auckland**

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Te Huia Train Viability Report – A Financial and Environmental Analysis

Executive Summary

Key Findings

1. Patronage KPIs

- Half of year 1 predictions made in the business case
- Commuter only trips average 30 passengers per journey for a 20% load factor
- Weekend trips average 146 passengers per journey for a 74% load factor
- Overall load factor is 26%

2. Financial Factors

a. Capital Cost

- Local government ratepayers – \$12.2 million
- Central government taxpayers – \$85.8 million
- Total capital cost – \$98.0 million

b. Operational subsidy

- Average subsidy per passenger for the first year of operation will be \$282.39 per one way ticket
- Passenger fare was \$12
- Total subsidy budget for the next 3 years is \$23.3 million

c. Comparison to driving – per trip from Hamilton to Auckland

- Car (using IRD figures) – \$48
- Te Huia (\$282+\$12) – \$294

3. Environmental Factors

a. CO2 emissions per person (Hamilton to Papakura)

- Car (assuming 1 person per vehicle) – 19.9kg per person
- Te Huia (using current patronage) – 31.6kg per person

4. Journey Times – one way to Auckland City

- Car – 91 minutes
- Te Huia – 145 minutes

5. Congestion reduction – 0.13% less northbound traffic on SH1

Foreword

This report presents an analysis of the financial and environmental performance of the Te Huia rail service over the course of its operation to date, as well as looking at its proposed plans and budgeted funding over the coming years of its 5-year trial period. By assessing and evaluating the rail service's performance to date and measuring these results against some of the key performance indicators laid out in the project's initial business case, a clearer picture can be painted around the viability of Te Huia's future and whether the current level of government funding is justifiable or attainable in the long-term.

Below are some of the key points outlined in the report:

- A brief history and background of the Te Huia project
- The proposed benefits that the Waikato Regional Council were looking to provide through the service's implementation
- A full breakdown of the patronage figures of the train to date, splitting up the weekday, weekend and commuter figures to provide the average load factors of the service to date
- A breakdown of the operational subsidies/government funding of the service by organisation from 2021/22 through until 2023/24.
- Calculating the total subsidy per passenger carried in 2021/22
- Estimating the total subsidy per passenger carried in 2022/23 using three different possible scenarios
- A financial comparison between the Te Huia service and travelling by motor vehicle
- An analysis of the carbon dioxide emissions of the Te Huia train
- An environmental comparison between the Te Huia service and travelling by motor vehicle
- A comparison of journey times and reliability of using the service as opposed to travelling by motor vehicle
- A consideration of the project's success as a means of reducing congestion along the Hamilton-Auckland corridor

Part 1: Introduction

The Te Huia train project is an intercity passenger rail service implemented in 2021 between Hamilton and the Auckland region. The service is currently being run by the Waikato Regional Council (WRC) on a 5-year trial basis in an effort to improve quality of life, safety and the economic and environmental performance of a region which has been experiencing rapid growth and development in recent years.

The project has been funded to date through the combination of local government (HCC, WRC & WDC) and the Waka Kotahi NZ Transport Agency (NZTA), with \$85.8 million coming from the NZTA and \$12.2 million coming from local government¹. The WRC proposed the project with the intention of improving the overall transport infrastructure available to the two cities as well as the urban settlements in between, with the specific goals of decreasing travel times, improving transport reliability and providing greater attractiveness for social and economic growth along the Hamilton-Auckland corridor (Gonzalez & Garrett, 2018).

After being initially planned to launch in March 2020, the project experienced extensive delays over the course of 2020 due to the COVID-19 pandemic as well as the delayed supply of equipment and the need for track redevelopment. As a result, Te Huia was finally launched on 6 April 2021 and was in full service for 19 weeks until being forced to temporarily cease operations on 18 August 2021 due to the nationwide lockdown. Over this period of time, the service ran from the Hamilton railway station in Frankton through

¹ Figures correct as of 20 December 2021 (Waikato Regional Council, 2021)

to Papakura, operating two return services on weekdays and one return service on selected Saturdays.

Given the high public and media profile of the rail service, as well as the fact that it has been funded so heavily by central and local government, there has been a large amount of commentary around its performance to date.

This paper consists of five sections.

Part 1 provides an introduction to the rail project and outlines the main scope of this report.

Part 2 provides a financial analysis of the project which looks at an overview of some of the data which was recently released by the WRC to the public in December 2021, with the aim of providing a clearer picture behind the funding of Te Huia to date as well as looking at the proposed use of future funds. A key focus of this analysis will be structured around the patronage figures of the service to date – looking at how the public has responded to its implementation and whether the current level of usage makes the project viable for the future.

Part 3 will analyse the sustainability aspect of the project, looking specifically at whether it has been a successful, more environmentally-friendly alternative to other forms of transportation thus far and whether this will remain the case into the future. One of the main goals of the rail service is to reduce carbon emissions by decreasing the number of cars on State Highway 1 along the Hamilton-Auckland corridor and, given the current worldwide focus on sustainability, it is of great importance to ensure that new transportation projects are achieving these goals.

Part 4 will evaluate the practicality of the service, looking at the reliability of the service and its average journey time in comparison to other modes of transport, as well as evaluating its successfulness to date when it comes to decreasing congestion along State Highway 1.

Part 5 will provide a conclusion of the key findings.

Part 2: Financial Analysis

Patronage Figures by Weekday/Weekend/Commuter Services

The patronage data of a passenger transportation service such as this one are of significant importance when evaluating its financial performance. Given that the project is government funded to maintain its financial viability, revenue from fares and on-board services is negatively correlated with funding required. In other words, if fare revenue was to decrease due to a lack of patronage, the project would require greater funding from government in order to meet its financial shortfalls.

The daily patronage figures of the service to date are displayed in full in Appendix 1. A brief breakdown summary of the key statistics is shown in the table below:

	Weekday Service	Saturday Service	Overall Average
Passengers per Journey	34.15	145.94	38.70
Daily Patronage	136.59	291.88	148.75
Load Factor	23.23%	74.08%	25.97%

They show that the load factor of the weekday service has been 23.23%, equating to an average of 34.2 passengers per journey. Each weekday service has a seating capacity of 147 passengers. For the duration of 2021, Te Huia ran four of these weekday services daily, meaning that the average daily weekday patronage was 136.6.

Demand as a Leisure service for families

On the Saturday service, the load factor ran at 74.08%, equating to 145.9 passengers per journey with each journey capable of carrying 197 passengers due to an extra carriage being employed. Te Huia only ran two of these services each Saturday – one return trip to Auckland from Hamilton – equating in an average daily weekend patronage of 291.9. It is worth noting that the Saturday service only ran on eight occasions out of the 19 weeks that the service was in operation.

Despite being setup with the intention of being a commuter-orientated service, Te Huia has proven significantly more popular with leisure users and families, with the average passengers per service being over four times greater on Saturdays compared to on

weekdays. Similarly, there was a noticeable spike in patronage during the school holiday periods, showing that the service possesses an attractiveness to families but this also reduces the margins of weekday services due to the cheaper child and family fares available, slightly misrepresenting the commuter load factor in the process.

Low demand as a Commuter Service

When only considering the 15 weeks in which the weekday service was operative outside of the school holiday period and being used purely as a commuter service as it was planned to be, the average daily patronage was 119.7, or 59.9 each way, equating to an average total load factor of 20.36%.

KPIs

The WRC set out average patronage targets for the first three years of Te Huia’s operation in its business case, hoping to gain an average total weekday patronage of 240 in its first year and increase this to 320 in its second year of service (Gonzalez & Garrett, 2018). **This means that the current passenger level is half of the predictions made in the initial business case.**

Proposed Operational Subsidies

Te Huia’s financial forecasts for the current year and the next two years show the following proposed levels of funding:

Organisation	2021/22	2022/23	2023/24
Waka Kotahi NZTA	\$4,714,453	\$6,763,189	\$6,440,127
Waikato Regional Council	\$1,531,892	\$1,565,307	\$1,617,369
Waikato District Council	\$220,000	\$227,000	\$234,000
Total	\$6,466,345	\$8,555,496	\$8,291,496

1. Taken from the updated budgeted forecasts in Te Huia’s financials (Waikato Regional Council, 2021). Correct as of 26 November 2021.

Over this three-year period, the Te Huia project will be funded by \$23.3 million from central and local government. Waka Kotahi NZTA will provide 76.9% of this funding with the Waikato Regional Council and the Waikato District Council providing 20.2% and 2.9% respectively.

Subsidy per Passenger Breakdown FY 2021/22

A breakdown of the subsidy per passenger carried portrays a clearer perspective around the levels of taxpayer funding that the project requires for operation. **A full breakdown of these figures and projected passenger figures can be found in Appendix 2.** The projected passenger numbers for the remainder of 2021/22 are based off of the observed patronage figures from 2021, with the assumption that the load factor to date will remain the same over the remaining 10 weeks of operation. A summary of the key statistics FY 2021/22 are shown below:

Total Projected Passengers FY 2021/22	22,899	
Budgeted Funding 2021/22	FY	Per Passenger (one-way)
WRC Rates	1,531,892	66.90
NZTA Income	4,714,453	205.88
WDC Rates	220,000	9.61
Total	6,466,345	\$282.39

Assumes no further delays between restart on 24 January 2022 and 31 March 2022
Assumes that load factor figures remain the same after restart

Based off of the present load factor, Te Huia will carry 22,899 passengers in total over the 12-month period from 1 April 2021 to 31 March 2022. Altogether, the average subsidy per passenger for the year will be \$282.39, compared to Te Huia's concession fare from Auckland to Papakura which is only \$12.

It is worth noting that this number is much higher than anticipated due to lower passenger numbers caused by delays and lockdown restrictions.

Given these restrictions, the service will only end up being operative for 29 weeks of the year, assuming no further suspensions or delays before April 2022. Because of this, a look at the proposed subsidy per passenger for the following year, based off the project's budget forecast, is likely to provide a more accurate depiction given that this is currently planned to be the service's first full year in operation.

Subsidy per Passenger Breakdown FY 2022/23

Below provides a look at the projected subsidy per passenger figures for next year, beginning on 1 April 2022. Three different scenarios are provided to predict the total number of passengers that the service will carry over the year, ranging from a best-case scenario to the worst-case scenario. A key factor in these predictions is the Te Huia phased improvement plan which is scheduled to begin in 2022. Phase 2 of the plan involves increasing the daily frequency of weekday services from four to six while Phase 3 involves adding an additional two services on Saturday as well as introducing two Sunday services, increasing the frequency of services from two to six per weekend. These improvements are scheduled to begin on 1 May 2022, according to Te Huia's financial report (Waikato Regional Council, 2021). This means that a constant load factor in 2022/23 will result in a greater number of passengers carried over the course of the year. The following scenarios consider this. It is also important to consider that a concession fare from Hamilton to The Strand in Auckland costs each passenger \$18 one-way.

a) Scenario One: Commuter Load Factor increases from 20% to 25%

Scenario one is a best-case scenario for Te Huia's performance in 2022/23. This assumes that the load factor for weekend travel remains the same, meaning that three times as many passengers are carried over each operative weekend given the increased number of services, and that the commuter load factor rises from 20.36% to 25% on the weekday service. This would equate to the average patronage increasing from 120 to 221 per day during non-school holiday periods.

These projections would see the rail service carrying 72,836 passengers during the year, meaning that the subsidy per passenger per one-way journey would work out at \$117.46.

A breakdown of this subsidy is shown below:

Scenario One: Total Projected Passengers FY 2022/23		72,836	
Budgeted Funding 2022/23		FY	Per Passenger (one-way)
WRC Rates		1,565,307	21.49
NZTA Income		6,763,189	92.86
WDC Rates		227,000	3.12
Total		\$8,555,496	\$117.46
<p>Assumes that phases 2 and 3 begin in May 2022 as stated in Financial Report Assumes that load factor figures remain the same for weekend trips and commuter load factor increases by 5% Assumes same days in operation as 2021/22 (i.e., every second weekend, no service on public holiday weekends)</p>			

b) Scenario Two: All Load Factors remain the same

Scenario two is the most likely of the three scenarios and assumes that the overall load factor of both the weekday and the weekend services remains constant in 2022/23. This means that the overall passenger numbers will rise in proportion with the number of additional services provided which is possible due to the greater convenience and flexibility provided by these extra services as well as the fact that they now go through to Auckland City.

This outcome would mean 63,382 passengers were carried in total over the course of the year, meaning the subsidy per passenger per one-way journey would equate to \$134.98.

Scenario Two: Total Projected Passengers FY 2022/23	63,382	
Budgeted Funding 2022/23	FY	Per Passenger (one-way)
WRC Rates	1,565,307	24.70
NZTA Income	6,763,189	106.70
WDC Rates	227,000	3.58
Total	\$8,555,496	\$134.98
<p>Assumes that phases 2 and 3 begin in May 2022 as stated in Financial Report Assumes that load factor figures remain the same even after additional trips added in May Assumes same days in operation as 2021/22 (i.e., every second weekend, no service on public holiday weekends)</p>		

c) Scenario Three: Passengers carried per day remains the same

Scenario three assumes that the daily patronage remains the same in 2022/23. Given the additional services that are planned for implementation in May 2022 and the improvements in furthering the line to Auckland City, patronage remaining constant would be unlikely and would likely be a worst-case scenario for Te Huia.

This would result in 37,918 passengers for the year, equating to a subsidy per passenger total of \$225.63.

Scenario Three: Total Projected Passengers FY 2022/23	37,918	
Budgeted Funding 2022/23	FY	Per Passenger (one-way)
WRC Rates	1,565,307	41.28
NZTA Income	6,763,189	178.36
WDC Rates	227,000	5.99
Total	\$8,555,496	\$225.63
<p>Assumes that phases 2 and 3 begin in May 2022 as stated in Financial Report Assumes that load factor figures remain the same after additional trips added (meaning higher total passenger numbers) Assumes same days in operation as 2021/22 (i.e., every second weekend, no service on public holiday weekends)</p>		

Cost Comparison to Driving

The IRD's cost per kilometre rates for calculating allowable expenses for diesel vehicles in 2020/21 were as follows:

Tier 1 (first 14,000kms): \$0.79/km

Tier 2 (after 14,000kms): \$0.27/km

These rates are a liberal estimate of the total expenses involved with running a car and are usually used under the assumption of the vehicle being brand new, meaning the true cost of driving is not likely to be as high as using these figures might suggest. However, this is the most accurate blanket prediction that can be applied for diesel vehicles across the board.

The average expected cost of travelling by car from the Hamilton CBD to the Auckland CBD is \$48.04 – around one-third of the estimated cost of the subsidy per passenger of using Te Huia.

A full breakdown of this calculation can be found in Appendix 3.

Again, this is a relatively liberal estimate to compare with, given the fact that not all Te Huia passengers travel from the Hamilton station through to the Strand as some passengers will board or disembark at different stations along the journey.

Part 3: Environmental Analysis

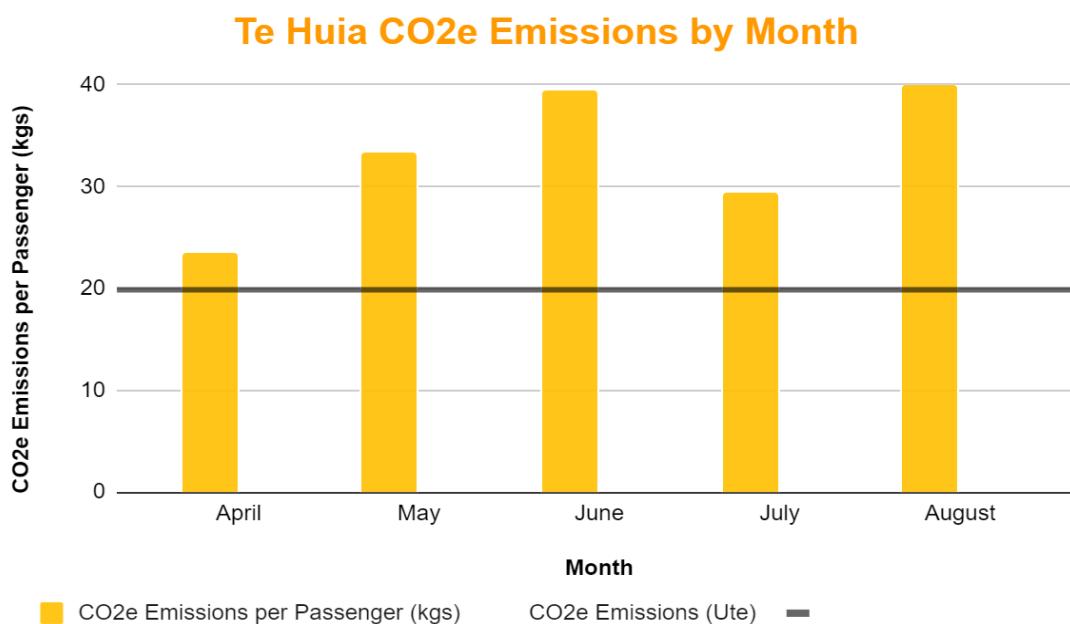
One of the notable goals of the Te Huia project was to decrease both carbon dioxide (CO₂) emissions and congestion across the region by taking vehicles off of State Highway 1. This is also a key priority for the majority of modern-day public transportation projects, with the sustainability of every new endeavour being placed under the microscope.

Each journey that Te Huia made in 2021 from Hamilton through to Papakura used 1,221kg CO₂e (carbon dioxide equivalent). This means that when the service was in operation, it would use 4,884kg CO₂e on weekdays and 2,442kg CO₂e on Saturdays. **A full breakdown of the CO₂e emissions by day and by month can be found in Appendix 4.**

The total average CO₂e emissions per passenger carried by Te Huia for 2021 was **31.55kg.**

This is a large quantity when compared with the emissions of New Zealand's three most popular diesel utility vehicles which use an average of 19.87kg CO₂e on a comparative journey by road from the Hamilton railway station in Frankton through to the Papakura railway station².

Assuming that every patron in 2021 were to take their own vehicle on this route instead of using the Te Huia service, driving this route would have resulted in a **37% decrease in CO₂e emissions.**



Above is a graph showing Te Huia's average CO₂e emissions per passenger by month. The bolded black line shows the average CO₂e used by a utility vehicle on the same route from Frankton to Papakura via State Highway 1.

As displayed on the graph, for all five months that Te Huia has been in operation to date, it has turned out to be a more environmentally damaging alternative to commuting by road.

² Based on the carbon emissions of the most recent models of the Ford Ranger, Mitsubishi Triton and Toyota Hilux. Figures taken from (Rightcar, 2021). The journey by road from Frankton to Papakura is 95.7km.

Part 4: Practicality

Average Journey Times

Te Huia's full service in 2021 from Hamilton through to Papakura had a timetabled running time of 98 minutes while the extended service through to the Strand in Parnell starting in January 2022 is estimated to take 145 minutes. It should be noted that both the Hamilton railway station and the Strand are located 2km from their cities respective CBDs, meaning that additional travel time may need to be considered by commuters on either end of the journey.

In comparison, the journey by car from Frankton via SH1 takes 71 minutes to Papakura and 91 minutes to the Auckland CBD in standard traffic conditions³. The total variation in journey time using the Te Huia service is clearly much smaller than when travelling by road, particularly during standard commuter hours where congestion can lead to a significant rise in journey time.

This greater certainty in arrival time at the destination is a notable advantage for using the train service, with on-time reliability being 96% in 2021, 1% above the performance target (Moore, 2022).

However, the fact that **the return trip to Auckland takes up to 108 minutes longer than travelling by car** is likely to cause inconvenience amongst commuters, particularly those who are travelling daily.

Congestion Avoidance

One of the key purposes laid out in Te Huia's single stage business case was to decrease congestion along the Hamilton-Auckland corridor in an effort to better productivity and increase quality of life in the region. According to the business case, as of 2017, there were 44,312 northbound vehicles on SH1 at Bombay every day, with the WRC hoping that Te Huia would decrease this total by 87 in its first year of operations in an effort to improve congestion (Gonzalez & Garrett, 2018). In reality, this number ended up being much lower due to the patronage of the service being below its initial targets, working out to a reduction of around 59 northbound vehicles per weekday, assuming that all

³ According to Google Maps in standard traffic conditions

passengers were to individually commute as an alternative to the train service. **This means that the implementation of the service has caused the total daily northbound traffic to decrease by 0.13%.**

Part 5: Conclusion

It is undisputed that the Te Huia project as a whole has been handed a number of issues and difficult situations right from its infancy through to its most recent delays in late 2021. It can be argued that the project is still yet to have a fair opportunity for its viability to be determined due to its stop-start operations, the current uncertainty of customers when it comes to public transport in the modern-day climate and the success of the recent service improvements still yet to be quantified.

However, using the current trends alone to analyse its financial and environmental performance displays the clear fact that the service in its current form is not achieving any of the goals that it was intended to.

Even when ignoring the \$68.7 million of capital expenditure to date⁴, the project continues to use an excessive amount of government funding in order to carry out its operations, an extravagant amount when compared with the costs of alternative modes of transport.

While the intention of taking cars off of State Highway 1 to decrease the region's carbon footprint as well as its roading congestion was strong in theory, the reality has been that the Te Huia service has not yet proved popular enough with patrons to achieve either of these two goals. Given that 2022 will be the first year of Te Huia being in full operation, there is an opportunity for growth in passenger numbers which may create a much greater argument for the future benefit of the project.

However, if the coming year continues the trend of modest patronage figures, the project's future viability should come up for extensive debate.

⁴ Figures correct as of 20 December 2021 (Waikato Regional Council, 2021)

Summary Table of Median Projections		
	2021/22	2022/23
Number of passenger journeys	592	1496
Operational subsidy per passenger per one-way journey	\$282.39	\$134.98
Additional cost per passenger (compared to driving) ⁵	\$246.35	\$104.94
Additional CO2 emitted per passenger to date (compared with driving)	11.68kg	-
Additional time per journey (compared to driving)	54 minutes	
Decrease in SH1 congestion during weekdays	0.13%	0.20%

References

Gonzalez, J., & Garrett, M. (2018). *Report to Council*. Waikato Regional Council.

Moore, R. (2022, January 24). Delayed start for Hamilton-Auckland train Te Huia's first day back. *Waikato Times*.

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Waikato Regional Council. (2021). *External Committees Updates*. Hamilton, NZ: WRC.

⁵ Includes operational subsidy and the ticket fare (2021/22 – Hamilton to Papakura, 2022/23 – Hamilton to Auckland City)

Appendices

Appendix 1: Patronage Data to Date

		Weekday commuter but note it includes school holiday traffic with child fares that significantly reduce margins			Saturday service with child fares therefore reduced margins. No Sunday service offered currently		
		4 trips of 147 seats per day 588 seats per day			2 trips of 197 seats per day 394 seats per day		
Day		Actual Passengers	Capacity	Load Factor - %	Actual Passengers	Capacity	Load Factor - %
April							
1	n/a						
2	n/a						
3	n/a						
4	n/a						
5	n/a						
6		269	588	46%			
7		124	588	21%			
8		115	588	20%			
9		102	588	17%			
10	Saturday				No service		
11							
12		112	588	19%			
13		113	588	19%			
14		108	588	18%			
15		130	588	22%			
16		126	588	21%			
17	Saturday				397	394	101%
18							
19		183	588	31%			
20		148	588	25%			
21		234	588	40%			
22		278	588	47%			
23		269	588	46%			
24	Saturday				No service		
25					on Anzac weekend		

26	Anzac weekend									
27		299	588	51%						
28		315	588	54%						
29		267	588	45%						
30		266	588	45%						
		3458	10584	33%		397	394	101%	3855	10978 35%
May										
1	Saturday					No service				
2										
3		131	588	22%						
4		94	588	16%						
5		118	588	20%						
6		114	588	19%						
7		158	588	27%						
8	Saturday					232	394	59%		
9										
10		124	588	21%						
11		143	588	24%						
12		126	588	21%						
13		110	588	19%						
14		149	588	25%						
15	Saturday					No service				
16										
17		128	588	22%						
18		111	588	19%						
19		138	588	23%						
20		245	588	42%						
21		121	588	21%						
22	Saturday					306	394	78%		
23										
24		130	588	22%						
25		113	588	19%						
26		82	588	14%						
27		114	588	19%						
28		131	588	22%						
29	Saturday					No service				
30										

31		102	588	17%						
		2682	12348	22%		538	788	68%	3220	13136 25%
June										
1		100	588	17%						
2		122	588	21%						
3		128	588	22%						
4		140	588	24%						
5	Saturday					No service				
6						on Queens				
7	Queen's Birthday Monday					Birthday				
8		129	588	22%		weekend				
9		113	588	19%						
10		94	588	16%						
11		126	588	21%						
12	Saturday					No service				
13										
14		158	588	27%						
15		94	588	16%						
16		103	588	18%						
17		113	588	19%						
18		137	588	23%						
19	Saturday					172	394	44%		
20										
21		104	588	18%						
22		135	588	23%						
23		105	588	18%						
24		97	588	16%						
25		141	588	24%						
26	Saturday					No service				
27										
28		122	588	21%						
29		114	588	19%						
30		111	588	19%						
		2486	12348	20%		172	394	44%	2658	12742 21%

								Passengers	Capacity	LF	
June											
Quarter											
Total		8626	35280	24%		1107	1576	70%	9733	36856	26%
		Weekday Commuter results				Weekend results			Overall Load factor		
July											
1		113	588	19%							
2		98	588	17%							
3	Saturday					395	394	100%			
4											
5		123	588	21%							
6		102	588	17%							
7		84	588	14%							
8		111	588	19%							
9		120	588	20%							
10	Saturday				school holidays	No service					
11											
12		150	588	26%							
13		149	588	25%							
14		196	588	33%							
15		178	588	30%							
16		122	588	21%							
17	Saturday						No service				
18											
19		151	588	26%							
20		141	588	24%							
21		162	588	28%							
22		159	588	27%							
23		190	588	32%							
24	Saturday					333	394	85%			
25											
26		104	588	18%							
27		113	588	19%							
28		116	588	20%							
29		115	588	20%							
30		132	588	22%							
31	Saturday					254	394	64%			
		2929	12936	23%		982	1182	83%	3911	14118	28%

August													
1													
2		114	588	19%									
3		59	588	10%									
4		111	588	19%									
5		96	588	16%									
6		99	588	17%									
7	Saturday					246	394	62%					
8													
9		106	588	18%									
10		101	588	17%									
11		118	588	20%									
12		127	588	22%									
13		126	588	21%									
14	Saturday					No service							
15													
16		113	588	19%									
17		112	588	19%									
18	Lockdown Begins												
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
		1282	7056	18%		246	394	62%		1528	7450	21%	
September													
1	Lockdown												
2													

3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
		0	0	0%		0	0	0%	0	0	0%
									Passengers	Capacity	LF
September Quarter Total		4211	19992	21%		1228	1576	78%	5439	21568	25%
		Weekday Results				Weekend Results			Overall Load Factor		
									Passengers	Capacity	LF

2021 Overall Totals											
		12837	55272	23%		2335	3152	74%	15172	58424	26%
		Weekday Results				Weekend Results			Overall Load Factor		

Appendix 2a: Subsidy per Passenger 2021/22

Operating Weekdays		142
Total Weekday Journeys		568
6 April 2021 - 17 August 2021 (actual journeys)		376
24 January 2022 - 31 March 2022 (projected journeys)		192
Capacity per Journey		147
Weekday Load Factor		23.23%
Passengers		
per journey		34.15
per day		136.59
2021/22 projected total		19396
Operating Weekends		12
Total Weekend Journeys		24
6 April 2021 - 17 August 2021 (actual journeys)		16
24 January 2022 - 31 March 2022 (projected journeys)		8
Capacity per Journey		197
Weekend Load Factor		74.08%
Passengers		
per journey		145.94
per Saturday		291.88
2021/22 projected total		3503
Total Projected Passengers FY 2021/22		22899
Budgeted Funding 2021/22	FY	Per Passenger (one-way)
WRC Rates	1,531,892	66.90
NZTA Income	4,714,453	205.88
WDC Rates	220,000	9.61

Total	6,466,345	282.39
Assumes no further delays between restart on 24 January 2022 and 31 March 2022		
Assumes that load factor figures remain the same after restart		

Appendix 2b: Subsidy per Passenger 22/23

Operating Weekdays/year	237	
Total Weekday Journeys	1386	
1 April 2022 - 30 April 2022 (Phase 1B)	72	
1 May 2022 - 31 March 2023 (Phases 2+3)	1314	
Capacity per Journey	147	
Weekday Load Factor	23.23%	
Passengers		
per journey	34.15	
per day (in phases 2+3)	204.89	
per year	47329.27	
Operating Weekends/year	19	
Total Weekend Journeys	110	
1 April 2022 - 30 April 2022 (Phase 1B)	2	
1 May 2022 - 31 March 2023 (Phases 2+3)	108	
Capacity per Journey (assuming extra carriage)	197	
Weekend Load Factor	74.08%	
Passengers		
per journey	145.94	
per Saturday (in phases 2+3)	583.75	
per Sunday	291.88	
per year	16053.14	
Total Projected Passengers FY 2022/23	63382.40	
Budgeted Funding 2022/23	FY	Per Passenger (one-way)
WRC Rates	1,565,307	24.70
NZTA Income	6,763,189	106.70
WDC Rates	227,000	3.58
Total	8,555,496	134.98

Assumes that phases 2 and 3 begin in May 2022 as stated in Financial Report		
Assumes that load factor figures remain the same after additional trips added (meaning higher total passenger numbers)		
Assumes same days in operation as 2021/22 (i.e., every second weekend, no service on public holiday weekends)		

Appendix 3: Cost Comparison of Driving

- Hamilton CBD to Auckland CBD – 121km
- Assumes commuter making a round-trip on every weekday of the year excluding school holidays (237 round-trips)

$121\text{km} \times 237 \times 2 = 57,354\text{km}$

Tier 1 Costs: $14,000\text{km} \times \$0.79 = \$11,060$

Tier 2 Costs: $43,354\text{km} \times \$0.27 = \$11,705.58$

Total Costs = \$22,770 (4sf)

Total Cost per one-way journey = $\$22,770 / (237 \times 2) = \mathbf{\$48.04}$

Appendix 4: Carbon Dioxide Emissions

Day		Actual Passengers	CO2 Emissions		
April					
1					
2					
3					
4					
5					
6		269	4884		
7		124	4884		
8		115	4884		
9		102	4884		
10	Saturday				
11					
12		112	4884		

13		113	4884		
14		108	4884		
15		130	4884		
16		126	4884		
17	Saturday	397	2442		
18					
19		183	4884		
20		148	4884		
21		234	4884		
22		278	4884		
23		269	4884		
24	Saturday				
25					
26					
27		299	4884		
28		315	4884		
29		267	4884		
30		266	4884		
		<u>3855</u>	90,354	23.44	kgs per person
May					
1	Saturday				
2					
3		131	4884		
4		94	4884		
5		118	4884		
6		114	4884		
7		158	4884		
8	Saturday	232	2442		
9					
10		124	4884		
11		143	4884		
12		126	4884		
13		110	4884		
14		149	4884		
15	Saturday				
16					
17		128	4884		
18		111	4884		
19		138	4884		
20		245	4884		

21		121	4884		
22	Saturday	306	2442		
23					
24		130	4884		
25		113	4884		
26		82	4884		
27		114	4884		
28		131	4884		
29	Saturday				
30					
31		102	4884		
		<u>3220</u>	107,448	33.37	kgs per person
June					
1		100	4884		
2		122	4884		
3		128	4884		
4		140	4884		
5	Saturday				
6					
7	Queen's Birthday Monday				
8		129	4884		
9		113	4884		
10		94	4884		
11		126	4884		
12	Saturday				
13					
14		158	4884		
15		94	4884		
16		103	4884		
17		113	4884		
18		137	4884		
19	Saturday	172	2442		
20					
21		104	4884		
22		135	4884		
23		105	4884		
24		97	4884		
25		141	4884		
26	Saturday				
27					

28		122	4884		
29		114	4884		
30		111	4884		
		<u>2658</u>	105,006	39.51	kgs per person
July					
1		113	4884		
2		98	4884		
3	Saturday	395	2442		
4					
5		123	4884		
6		102	4884		
7		84	4884		
8		111	4884		
9		120	4884		
10	Saturday				
11					
12		150	4884		
13		149	4884		
14		196	4884		
15		178	4884		
16		122	4884		
17	Saturday				
18					
19		151	4884		
20		141	4884		
21		162	4884		
22		159	4884		
23		190	4884		
24	Saturday	333	2442		
25					
26		104	4884		
27		113	4884		
28		116	4884		
29		115	4884		
30		132	4884		
31	Saturday	254	2442		
		<u>3911</u>	114774	29.35	kg per person
August					

1					
2		114	4884		
3		59	4884		
4		111	4884		
5		96	4884		
6		99	4884		
7	Saturday	246	2442		
8					
9		106	4884		
10		101	4884		
11		118	4884		
12		127	4884		
13		126	4884		
14	Saturday				
15					
16		113	4884		
17		112	4884		
18	Lockdown Begins				
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
		1528	61050	39.95	kg per person
Total FY 2021		15172	478,632	31.55	kg per person