

Appendix F NZIER Economics Assessment



ARL Fast Track

Economic cost of transporting waste in Auckland

NZIER report to Waste Management NZ

16 June 2026

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New Zealand Institute of Economic Research (NZIER) is an independent, not-for-profit economic consultancy that has been informing and encouraging debate on issues affecting Aotearoa New Zealand, for more than 65 years.

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We are unique in that we reinvest our returns into public good research for the betterment of Aotearoa New Zealand.

Our expert team are based in Auckland and Wellington and operates across all sectors of the New Zealand economy, combining their sector knowledge with robust economic logic, models and data, and an understanding of the linkages between government and business to help our clients and tackle complex issues.

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Key points

NZIER has assessed the costs of transporting waste from across the Auckland region to the proposed application Project site in the Wayby Valley against the counterfactual that the Project does not proceed, which would likely result in approximately 559,316 tonnes of additional waste being transported to the Hampton Downs landfill in north Waikato every year. This assessment calculates the vehicle kilometres travelled (VKT), the aggregated cost based on the per-kilometre cost, and the emissions from this transport activity.

We also provide commentary on the outlook for waste generation in Auckland, the economic context for landfill operations, and the economic costs and benefits of the two options for waste disposal in Auckland after 2035.

We have assumed that waste volumes will grow at 1.0 percent per annum for our modelling below, giving a total of about 1.6 million tonnes of Class 1 and 2 waste that will go to landfill from the Auckland region in 2035.

There are two possible scenarios for landfill capacity in 2035:

- 1 The Project is developed and commissioned so that it will accept waste, or
- 2 The Project is not developed. In this case, WMNZ will seek to use the capacity available to it at Whitford and Puwera (a combined total of 437,469 tonnes per annum), with the remainder to be transported to Hampton Downs in the north Waikato.

We modelled the economic costs of transporting waste across Auckland to the possible landfill sites for these two scenarios, based on VKT comparisons. The key findings for each scenario are shown in Table 1 below. In summary, if the Project site proceeds, there is a direct saving of \$17.3 million per annum. There is also a reduction in emissions from the trucking activity of 3.7 million kilograms CO₂-e per annum.

Table 1 Comparison of scenarios

Per annum

	Scenario 1 – with Project	Scenario 2 – no Project	Difference
Volume of waste (tonnes)	1,596,785	1,596,785	
Number of truck loads	66,533	66,533	
Vehicle kilometres travelled (VKT) (round trips)	7,488,773	9,522,047	2,033,274
Total cost (\$)	\$63,654,574	\$80,937,403	\$17,282,829
Total emissions (kg CO ₂ -e)	13,629,568	17,330,126	3,700,559

Source: NZIER

Our transport modelling provides a high-level assessment of the economic costs and benefits of proceeding with the Project site development, compared with the counterfactual of transporting about 73 percent of Auckland's waste to Hampton Downs. Our estimates support the case for developing and commissioning the Project site. There is



also potential to reduce consumer costs by minimising transport costs by transporting waste to the Project site, rather than to Hampton Downs or Puwera.

Our model does not capture the impact of increased trucking activity to Hampton Downs on roading congestion across Auckland or the impact of increased trucking to Puwera over the Brynderwyn Hills. Increasing road congestion will reduce economic output in Auckland and New Zealand by reducing regional employment and productivity, and disrupting regional and national supply chains.

We have not modelled the wider economic (market) benefits for the Auckland region of developing the Project site. Based on our working knowledge of New Zealand's economic structure and its interactions, we anticipate economic benefits from the work to develop the Project site and its infrastructure for the Auckland regional and the New Zealand economies. These include providing employment and capital investment.

Once the site is operational, the operations will retain employment and operational expenditure in the Auckland region.



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1 Introduction

NZIER has been engaged by Waste Management New Zealand (WMNZ) to provide a technical memorandum for the proposed new solid waste management and disposal facility in the Wayby Valley, north of Auckland ('ARL' or 'Project').

The Project will involve constructing, operating, closing and providing aftercare for a new 24 Mm³ landfill facility and associated infrastructure at Wayby Valley, Wellsford. Ngāti Manuhiri are Project partners and will work with WMNZ on the proposed management and mitigation measures. Once landfilling ceases, the land will be returned to Ngāti Manuhiri as tāngata whenua.

The new landfill will be a Class 1 landfill, as defined in the Technical Guidelines for Disposal to Land (WasteMINZ Technical Guidelines)¹, accepting municipal solid waste. This includes residential and commercial waste, construction and demolition waste, some industrial wastes that meet acceptance criteria, and contaminated soils. Following waste settlement, the landfill cap surface will have a maximum height of 205 m RL.

WMNZ landholdings in the Wayby Valley area comprise a total area of 1020 ha, with the landfill footprint being approximately 60 ha. The WMNZ landholdings have been divided into five general areas; the Eastern Block, the Western Block, the Southern Block, the Waiwhiu Tributary Block and the Waiteraire Tributary Block. The proposed works will involve the following:

- **Site Access and Operation:** Construction of site access roads, weighbridges, and a vehicle wheel wash.
- **Landfill development:** Major earthworks and the installation of environmental management systems, including a landfill lining system and collection networks for leachate, stormwater, and landfill gas (LFG).
- **Leachate and landfill gas management:** A dedicated leachate management system and a LFG treatment facility, including a LFG flare and a LFG waste-to-energy plant.
- **Support infrastructure:** Facilities for site staff, plant maintenance, and water supply.
- **Terrestrial, freshwater and wetland biodiversity measures:** This includes native revegetation, and weed and animal pest management programme to offset or compensate for residual adverse effects on terrestrial, freshwater and wetland ecology.

This memorandum provides an outline of the initial findings of the NZIER's assessment of the economic cost of transporting waste across the Auckland region. It has been prepared for inclusion in an application for Ministerial referral of the Project under the Fast-track Approvals Act 2024 ('FTAA'). Specifically, this memorandum responds to the requirements under section 3.4 of the Fast-track Approvals Referral Application Form and section 13(4)(h) of the FTAA. A full description of the draft proposal is included in the accompanying information attached to the application form for the referral.

NZIER has assessed the costs of transporting waste from across the Auckland region to the proposed Project site compared with the counterfactual that the Project does not proceed,

¹ Technical Guidelines for Disposal to Land, WasteMINZ, September 2023, Revision 3.1.



and the balance of waste is transported to the Hampton Downs landfill in north Waikato.² This assessment calculates the vehicle kilometres travelled (VKT), the aggregated cost based on the per-kilometre cost and the emissions from this transport activity.

We also provide commentary on the outlook for waste generation in Auckland, the economic context for the operation of landfills and the economic costs and benefits of the two options for waste disposal in Auckland after 2035.

This report should be read in conjunction with the separate report: *Effect on landfill gate prices of Auckland Regional Landfill: Report for Waste Management New Zealand*, NERA, 29 April 2026.

2 Waste disposal and landfills in Auckland

There are currently two Class 1 landfills within the Auckland region – Redvale and Whitford. The first is owned and operated by WMNZ, and the second is a joint venture between WMNZ and the Auckland Council. There are two Class 1 landfills in the adjacent regions: Hampton Downs in the north Waikato and Puwera in Northland (see Table 2). Waste from the Auckland region is currently sent to all these landfills.

Table 2 Auckland and adjacent region landfills, as at January 2026

Region	Landfill	Owner	Consent until	Km from Akld CBD	Annual capacity available	Current waste volume (from Auckland) per annum
Auckland	Redvale	WMNZ	2028	29	640,000	577,906
Auckland	Whitford ¹	WMNZ/AC	2041	32	350,000	217,643
Waikato	Hampton Downs	Enviro NZ	2036	70	600,000	600,000
Northland	Puwera	Whangarei District Council & Northland Waste	2038	175	87,469	50,000

¹ Consented capacity to increase annual tonnage disposal by 100,000 tonnes.

Source: Tonkin + Taylor; NERA³ and NZIER

Waste is collected across Auckland from households and businesses. It can be taken to a transfer station for sorting and consolidation before shipping to the landfill, or trucked directly to the landfill. Figure 1 depicts the waste haulage routes to the Redvale, Whitford and Hampton Downs landfills as at 2026.

² Some waste will be transported to Whitford and Puwera in line with the capacity of those sites to received waste.

³ NZIER has worked with NERA to develop the working assumptions for this report and their work for WMNZ.

Figure 1 Auckland waste haulage routes



Source: WMNZ

3 The problem

The resource consent for the Redvale landfill (which currently accepts around 577,906 tonnes of waste per annum) is due to expire in 2028. This means that there will be a shortfall in landfill capacity in the immediate Auckland region.

WMNZ is currently seeking to extend the resource consent for Redvale to meet the shortfall in landfill capacity, pending the development of the Project site at Wayby Valley by 2035. However, the Redvale landfill site has a physical capacity constraint and cannot be extended indefinitely.

If the proposed Project site is not developed, there will be a shortfall in the landfill capacity in the Auckland region, equivalent to about 50 percent of the waste that WMNZ consigns to landfill from the Auckland region, or about 40 percent of the total waste to landfill from the Auckland region.

4 Waste disposal in 2035

There will still be a need for landfill capacity to accommodate waste from the Auckland region over the next few decades. There are currently no viable alternatives for waste disposal (NZIER 2024).

The rate of growth in the volume of Class 1 and 2 waste⁴ generated in the Auckland region has declined relative to population growth so that waste per capita is estimated to have

⁴ A Class 1 Landfill is a site that accepts Municipal Solid Waste (MSW). A Class 1 Landfill generally also accepts construction and demolition (C&D) waste, some industrial wastes and contaminated soils. A Class 2 construction and demolition (C&D) Landfill is a site that accepts non-putrescible wastes including C&D wastes, managed fill material, controlled fill and clean fill material (Waste Management Institute New Zealand (WasteMINZ) 2023, 10).



been relatively stable at 0.8 to 1 tonne per capita since about 2007 (Auckland Council 2023).

Although the total volume of waste has also declined on a trend basis, it fluctuates from year to year. There are a number of possible reasons (Auckland Council 2023, 29). Changes in economic activity could be the primary driver of changes in the volume of Class 1 and 2 waste, although other factors, including changes in the rate of housing construction and waste from natural disasters such as the Anniversary Weekend floods and Cyclone Gabrielle, will also contribute to fluctuations in waste volumes.

The decline in Class 1 and 2 waste per capita since 2018 indicates that, more recently, the population has grown faster than total waste tonnage, and that some waste minimisation has occurred. However, waste volumes are expected to increase in line with population growth. Auckland Council's most recent forecasts are for 0.8 percent per annum growth in Class 1 waste (Auckland Council 2024).

Table 3 provides estimates of the volume of waste generated in the Auckland region using growth rates of 0.8 percent, 1.0 percent and 1.4 percent per annum. These are compared with Stats NZ medium population projections for Auckland⁵ over the same period and imply that waste is growing at a slower rate than the population. We have assumed that waste will grow at 1.0 percent per annum for our modelling below, giving a total of about 1.6 million tonnes of Class 1 and 2 waste to go to landfill from the Auckland region in 2035. This is a conservative estimate of waste volume growth over the next 10 years and allows for some waste minimisation.

Table 3 Growth assumptions in Auckland waste volume, 2025–2035

Growth rate per annum	Current volume (tonnes per year)	2035 (tonnes per year)	Increment to 2035 (tonnes)	Volume per capita (tonnes)
0.8%	1,445,549	1,565,446	119,897	0.77
1.0%	1,445,549	1,596,785	151,236	0.78
1.4% (WMNZ, 2019)	1,445,549	1,661,163	215,614	0.85

Source: NZIER

5 The options in 2035

As noted in Table 2, waste generated in the Auckland region currently goes to one of four landfill sites. One of these sites will no longer accept waste after 2035, if not earlier. There are two possible scenarios for landfill capacity in 2035:

- 1 The Project is developed and commissioned so that it will accept waste, or
- 2 The Project is not developed. In this case, WMNZ will seek to use the full capacity available to it at Whitford and Puwera, with the remainder transported to Hampton Downs in the north Waikato.

⁵ Stats NZ Subnational population projections, by age and sex, 2023(base)-2053.

Table 4 summarises the capacity and estimated waste volume allocated to each landfill site across Auckland under these scenarios.

Table 4 Capacity and estimated annual waste disposal volumes, as at 2035

Tonnes per year

Landfill	Current (2025) annual waste volume (from Auckland)	2035 annual waste volume (from Auckland)	
		Scenario 1 With Project	Scenario 2 No Project
Redvale	577,906		
Whitford	217,643	350,000	350,000
Hampton Downs	600,000	600,000	1,159,316
Puwerā	50,000	0	87,469
ARL Project		646,785	0
Total	1,445,549	1,596,785	1,596,785

Source: NERA, NZIER

6 Assessing economic impact

The economic impact of landfills is driven by the collection and transport of waste, as well as the operation of the landfill site. Transport impacts include emissions and the risk of road accidents⁶ (European Commission 1997, 16). The efficient operation of landfills is now largely a given in OECD countries. Although waste minimisation measures are reducing waste per capita, there is still a need for landfill capacity. This requirement remains even when alternative waste-disposal methods, such as incineration, are used. Increasingly, it is the absence of landfill capacity (whereby waste must be transported over longer distances and through urban areas) that is likely to have the greater economic impact by increasing costs and decreasing efficiency in economic activity.

If the volume of Class 1 and 2 waste per capita remains relatively constant in Auckland over the next 15 years it does not imply that the economic costs will remain constant. The economic impact of managing waste to landfill varies depending on the combination of collection points (including transfer stations), transportation modes and routes, and the operation of the landfill sites. Diverting waste to alternative landfill sites, whether existing or yet-to-be-developed, will change the economic costs and benefits.

The direct economic costs include operating landfill sites, transport costs, investing in existing or new landfill sites, and lost revenue if a landfill is not operational. These are costs customers absorb in the prices they pay for waste disposal, and hence, increased costs are assumed to be borne by the wider economy.

⁶ The risk of road accidents is greater where individuals can 'bring' their waste for disposal at landfills.

Constructing and operating landfill sites can yield direct economic benefits from employment and input expenditures, and may reduce customer costs by reducing the cost of transporting waste to landfills outside the region.

Indirect economic costs (or benefits) arise from downstream economic effects. These include:

- changes in demand for services to support the operation of the landfill
- changes in demand for services, such as housing and education, by those employed in the construction or operation of the landfill
- the impact of changing the pattern of transport activity on the Auckland road system.

These impacts flow through other sectors of the economy and affect the allocation or use of resources, such as roading, productivity and economic efficiency. The greatest impact is on the Auckland regional economy, but it also has a wider impact on the New Zealand economy as a whole.

7 Economic cost of transporting waste in the Auckland region

NZIER has been asked to provide an estimate of the annual economic costs of transporting waste generated in the Auckland region to the available landfills under the 2035 scenarios outlined in section 5, Table 4. This is a very high-level estimate of transport costs. This could be developed in more detail using computational general equilibrium (CGE) modelling, in future stages of this application, should it be accepted.

We have based our estimate on the VKT by trucks transporting waste generated in the Auckland region to landfill. We have calculated the total trucking costs per annum, using the cost per kilometre. Similarly, we have calculated the total CO₂ emissions per annum. We then compare the difference in these costs under the two scenarios.

The results of our modelling represent the base case in 2035. The volume of waste generated in the Auckland region may change over time in response to changes in the costs of transporting waste and gate fees at landfills, as well as shifts in the pattern of waste generation.

We modelled two possible scenarios for the disposal of Auckland waste to landfill in 2035 (summarised in Table 4):

- 1 The Project site is commissioned in 2035 and starts accepting waste. Under this scenario, Whitford will accept waste up to its consented capacity of 350,000 tonnes per annum, Hampton Downs will accept a similar volume of waste to current levels, and waste will no longer be transported to Puwera (in Northland). The Project landfill will accept the difference.
- 2 The Project site is not operational in 2035. The options for disposing of Auckland-generated waste are to send 350,000 tonnes per annum to Whitford landfill. The expected residual will be transported to Puwera and Hampton Downs (in north Waikato).



Waste is transported to landfill from various sites across Auckland. The transport routes are optimised to minimise the travel distance. We have applied some simplifying assumptions about the transport routes when calculating the VKT under the different scenarios:

- Waste that is transported to Whitford and Hampton Downs originates in the Auckland CBD, i.e. south of the Auckland Harbour Bridge.
- The additional waste that will be transported to Whitford is assumed to start from the North Shore Refuse Transfer Station.
- Waste that will be transported to the Project site is assumed to be generated on the North Shore, with a starting point in the North Shore Refuse Transfer Station.
- In the event that the Project site does not proceed, it is assumed the waste generated on the North Shore will be transported to Hampton Downs, with a starting point in the North Shore Refuse Transfer Station.
- Waste that is transported to Puwera also has a starting point in the North Shore Refuse Transfer Station, although this may overestimate the travel distance.
- We expect that the Warkworth-Wellsford realignment road will be completed by 2035. The information provided by NZTA does not provide enough detail for us to determine how that project will affect travel distance. It may reduce the travel distance from the North Shore Refuse Transfer Station by a few kilometres. In our view, the primary impact of the realignment road will be to improve traffic flow on this route and so reduce the potential congestion caused by additional waste trucks travelling on it.

Our modelling assumptions are set out in Table 5. In addition to the assumptions on travel distances set out above, the key points are:

- Our modelling is based on the assumption that 350,000 tonnes of waste will be allocated and transported to the Whitford landfill; 600,000 tonnes will continue to be transported to Hampton Downs from South Auckland under both scenarios.
- The principal additional cost is in trucking waste to landfills.
- The total waste has not been disaggregated into Class 1 and/or Class 2.
- Each landfill uses the same truck(s) in its fleet to transport the waste, with an average load of **24 tonnes per truck**.
- This model estimates the annual cost in current (2026) dollars at **\$8.50 per truck kilometre**.
- The model estimates emissions using a rate of **1.82 kilogram CO₂-e per truck kilometre**.
- We have not included an assessment of the direct costs of processing waste at the landfills.



Table 5 Modelling assumptions

Region	Landfill	Km from Akld CBD	Km from NS transfer station	Annual capacity available	Waste volume (from Auckland)	
					Scenario 1 with Project	Scenario 2 no Project
Auckland	ARL Project	72.5	55.9		646,785	
Auckland	Whitford	30.2		350,000	350,000	250,000
Auckland	Whitford		42			100,000
Waikato	Hampton Downs	71.9		800,000	600,000	600,000
Waikato	Hampton Downs		85.2			559,316
Northland	Puwerā	175	134	87,469		87,469
Total					1,596,785	1,596,785

Source: WMNZ, NZIER, NERA

Table 6 presents the results of our modelling of transporting waste under the two scenarios. Scenario 1, where the Project site is commissioned for use, is the lower cost option for the Auckland region. If the Project site proceeds, there is a direct saving of \$17.3 million per annum. Using the Treasury's 8 percent discount rate, the net present value (NPV) of this annual saving over a 35-year period is estimated at approximately \$201.4 million. There is also a reduction in emissions from the trucking activity of 3.7 million kilograms CO₂-e per annum.

Table 6 Comparison of scenarios

Per annum

	Scenario 1 – with Project	Scenario 2 – no Project	Difference	NPV
Volume of waste (tonnes)	1,596,785	1,596,785		
Number of truck loads	66,533	66,533		
Vehicle kilometres travelled (VKT) (round trips)	7,488,773	9,522,047	2,033,274	
Total cost (\$)	\$63,654,574	\$80,937,403	\$17,282,829	\$201,400,000
Total emissions (kg CO ₂ -e)	13,629,568	17,330,126	3,700,559	

Source: NZIER

Table 7 shows that, assuming an average truck capacity of 24 tonnes per truck, there are 266 truck movements per day across all landfill sites under each scenario. The difference is that under scenario 1, where the Project proceeds, the pattern of truck movements will be more dispersed. This reduces the potential for increased congestion on the Auckland Harbour Bridge and the western and southern road system.



Table 7 Truck movements per day

	Scenario 1 – with Project	Scenario 2 – no Project
ARL Project	108	
Whitford	58	58
Hampton Downs	100	193
Puwera		15
Total	266	266

Source: NZIER

8 Regional and national economic benefits of the ARL project

Our transport modelling provides a high-level assessment of the economic costs and benefits of proceeding with the Project site development, compared with the counterfactual of transporting more than 70 percent (i.e. 73 percent) of Auckland's waste to Hampton Downs. Our estimates support the case for developing and commissioning the Project site.

Our model does not capture the impact of increased trucking activity to Hampton Downs on roading congestion in Auckland. Increasing road congestion will reduce economic output in Auckland and New Zealand by reducing regional employment and productivity, and disrupting regional and national supply chains (NZIER 2017).

We have not modelled the wider economic (market) benefits for the Auckland region of developing the Project site. Based on our working knowledge of New Zealand's economic structure, we anticipate economic benefits from the work to develop the Project site and its infrastructure for the Auckland and New Zealand regional economies. These include providing employment and capital investment.

Once the site is operational, its operations will retain employment and operational expenditure in the Auckland region. There is also potential to reduce customer costs by minimising transport costs by sending waste to the Project site rather than to Hampton Downs or Puwera.



Table 8 summarises these factors in an investment logic format.

Table 8 Investment logic map

	Scenario 1 – Project proceeds	Scenario 2 – No Project
Site(s) available	Yes	Yes
Capacity for waste	Yes	Yes
Resource consent	Consented	No Project consent. Other landfills may need a new consent/extension to consent.
Site infrastructure investment	Infrastructure to be constructed	Infrastructure in place
Transport management	Minor increase in traffic to north Auckland (refer traffic memo) ⁷	Significant increase in traffic to Hampton Downs
Economic costs	Less than minor increase in truck traffic in the northern part of Auckland, and offset by improved roading	Truck traffic patterns, an increase in roading congestion across the Harbour Bridge and from west Auckland Potential reduction in Auckland region employment as the development and operation of landfills are outside the region
Economic benefits	Employment on site development and for operations Lower cost for Auckland customers	Existing assets Increased cost for Auckland customers
Risks	Negative community response	Increased roading congestion Auckland largely dependent on landfill capacity outside Auckland region

Source: NZIER, NERA

⁷ ARL Fast Track – Integrated Transport Memorandum, Don McKenzie, 9 February 2026

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