

# **Appendix E**

**Technical Assessment - Rail**

# 1015 - PNCC Te Utanganui Master Plan

Rail Input



# Engineering Realised

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PNCC Question & Answers

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*Document History and Status*

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## Question 1

*What specific barriers do you see that would stop the creation of an integrated freight network that minimises double handling (air, rail, road)?*

An integrated freight network, from the perspective of rail, requires a 'systems thinking' approach where the railway is viewed as a 'system of many systems' with each element part of the larger and more complex whole. The operation of the rail hub is in it self is a complex collection of modes, e.g. trucks, rail, machinery etc. which require detailed planning in order to achieve a 24/7 operation. In turn, the railhubs' activities must be coordinated and planned with a broader picture together with air/road and rails. The below points list potential barriers to an integrated freight network:

- **Disruptions and slowdowns** caused by the mixture of public road traffic combining with the road freight traffic. This can cause traffic delays for the entire operation of the freight hub.
- **Incorrect forecasts and/or traffic modelling** for rail freight are used. This could lead to a less optimised design, decreasing freight throughput by slowing down the supply chain, creating capacity issues, and/or increasing the amount of handling necessary.
- **Changing political views on Freight modal shift** (i.e. deciding to use trucks instead of trains). Though unlikely, it could potentially happen after a change in government(?). Possible reasons for the decline in rail freight could be, decreased funding for rail, incentives for other modes of transport, and new government privatising rail.
- **Complaints/resistance/backlash from community** groups, residents, and/or public figures that oppose the rail (operation) freight hub.
- **Lack of end-user 'buy-in' using the proposed modal of transport.** This all depends on the costs/fee implemented on the end-user. Results in sub-optimisation (i.e. benefits for the single user but not the entire system)
- **Lack of focus on futureproofing specifically in regards to technological change** and new technical developments, e.g. Self driving vehicle, automization could be a positive change to a subsystem but negative for the whole, of transport mode may disrupt a part of the freight system.

## Question 2

*Can you describe the frequency of rail services today via the existing Kiwirail site and how that would change. E.g. you mentioned much longer trains. Would that mean fewer trains per day? We care because of the potential impact the new rail hub and ring road may have in isolating Bunnythorpe from the rest of the city if not planned carefully.*

Based on the KiwiRail S92 section response<sup>1</sup>: the most current train frequency data, Palmerston North handled nearly 12,000 trains in 2019-20. Nearly 11,100 were freight trains and shunts (local feeder trains). The remainder were passenger and work trains.

Trains in Palmerston north Year 2019-2020

<i>Train type</i>	<b>Number of trains</b>
<i>Freight and shunts</i>	11092
<i>Passenger</i>	659
<i>Work trains</i>	202
<b>Total</b>	<b>11953</b>

As Palmerston North is at a major junction, it serves trains to and from north, south, west, and east: Auckland, Hamilton, and Tauranga; Karioi (pulp mill); Longburn, Wellington and the South Island; Whanganui, Hawera, and New Plymouth; Napier Hastings and Pahiatua. About 22% of trains pass through Palmerston North, mainly Auckland-Wellington trains, but including some from Longburn to Taranaki, and Whanganui to Wellington. These trains can also pick up or drop off traffic in Palmerston North. The remainder either originated or terminated at Palmerston North. Even if they did that, much of the freight they carried is likely to have been moved further on different trains.

Route Distribution of PN freight trains and shunts

<i>Route</i>	<b>Percentage (in both directions)</b>
<i>NIMT North (incl Karioi)</i>	32.7
<i>Whanganui/Taranaki</i>	19.6
<i>Hawkes Bay and Pahiatua</i>	16.0
<i>NIMT South (incl Longburn)</i>	31.7
<b>Total</b>	<b>100.0</b>

The current maximum train length on North Island Main Trunk (NIMT) north of Palmerston North is 900m. In 2019-2020, the maximum train length at Palmerston North was 895m and 13 trains in each direction were over 800m long.

## Future traffic and implications

A 50% increase in tonnage/business is expected by 2050 which is when the rail hub is expected to reach capacity. Allowing train lengths to increase to 1500m will allow for a near 65% increase in capacity per service. Services to Wellington and on branch lines will still be restricted to 900 m, thus increased demand will be fulfilled by increased service frequency.

<sup>1</sup> KiwiRail NoR, Economic Development Impact February 2021, by Richard Palin

KiwiRail has in their NOR 2020 designed the yard to accommodate 1500m long trains. The 1500m trains would be an increase of two thirds i.e. 1.67 times. In principle, for a given tonnage there could be 40% fewer trains running if the larger trains can be run. Alternatively this would free up line capacity for 67% higher tonnage<sup>2</sup>. Not all trains are likely to be able to use the 1500m length. It is impracticable to fill each train to the maximum every day of the year as demand fluctuates.

This increase in the traffic will have implications for the current public transport in the area as detailed in the following sections.

#### *Current Public Transport*

This route currently utilises the Clevely Line level crossing, which will close due to the location of the Rail Freight Hub (RFH). Therefore, the bus route will be redirected to follow the perimeter road. It is expected this alternative route will be roughly 200m longer than the existing route and will result in an increase in travel time of less than 15 seconds from the Roberts Line/Railway Road intersection to the Kimbolton roundabout in Feilding. This redirected route will trigger the relocation of the Bunnythorpe stop on Dutton Street to an appropriate alternative location to be confirmed in consultation with PNCC and HRC.

This rerouting will also provide PNCC with the opportunity to investigate the inclusion of stops around the NEIZ and RFH, ensuring safer and efficient access to two large workforces, thus increasing public transport coverage.

(Stantec, Regional Freight Hub- Integrated Transport Assessment, October 2020, pp. 84-85)

#### *Existing Yard, building and operation (Tremain Avenue)<sup>3</sup>*

- Multiple freight partners (end users)
- Split across various buildings and sites
- Disjointed operation
- Building and infrastructure is near the end of its lifetime. 40+buildings.
- Operation: Fragmented layout. Difficulties in operation by accommodating (breaking up train) or building trains of 800m long trains.
- Safety concerns (level crossing, multiple users – mixed operation, traffic)



<sup>2</sup> KiwiRail Regional Freight Hub Section 92 Response, Economic Development Impact February 2021, Richard palin

<sup>3</sup> Business Case 2018: KiwiRail Palmerston North Regional Economic Growth Hub

Palmerston North Rail Yard, 4 June 1964

#### *Level Crossing Delays*

Currently the 900m train lengths could cause a delay ranging between 41-108 seconds (for the first vehicle at the level crossing), based on speeds between 30-80 km/h. Using the same speed range, the delay for the longer 1500m trains can be estimated to be between 68–180 seconds (for the first vehicle at the level crossing). The results show that the longer trains could cause an increase in travel times ranging from less than 30 seconds to just over one minute for the first vehicle at the level crossing. This travel time delay will apply to all road users (including pedestrians and cyclists) utilising this level crossing in future.

(Stantec, Regional Freight Hub- Integrated Transport Assessment, October 2020, pp. 79-80)

#### *Walkways, Cycleways and Reaction*

The RFH provides an opportunity for additional recreational areas around the RFH, with the design of the perimeter road. There is also an opportunity for other recreational tracks, such as around the stormwater ponds. The RFH is not expected to disrupt any existing or planned walking and cycling routes (there are not many existing routes surrounding the site).

(Stantec, Regional Freight Hub- Integrated Transport Assessment, October 2020, p. 85)

## **Future Passenger Rail Opportunities**

The new rail freight hub could better allow for the future possibility of commuter passenger rail between Palmerston North and Bunnythorpe and other townships in the surrounding area, such as Feilding, Ashhurst, Levin, and Shannon.

Better passenger rail connectivity in Palmerston North central, suburbs, and/or Massey University, could be done by the creation of new heavy rail corridors, or interurban/stadtbahn lines (light rail trains that can run on road running light rail lines, and on heavy rail corridors/track).



### Question 3

What is the current mix of product types through the Kiwirail hub (e.g. mostly containers?) and is that expected to stay the same or change?

The below tables outlines different categories of yard facilities, usage and the mix of expected goods and commodities. The tables differentiate between the current hub vs. the new hub.

#### Existing hub (Tremain Ave.)

The existing KiwiRail land in Palmerston North is about 40 hectares in area and includes the existing freight hub yard and rail station. The existing hub contains the following facilities: <sup>4</sup>

#### New Rail Hub (Railway Rd.)

The future Freight Hub will include the following key elements and associated works:<sup>5</sup>

Network Services Depot	Network services facilities
Marshalling Yard including arrival/departure tracks.	Marshalling yards
Container terminal	Container terminal
Wagon and Locomotive storage tracks.	Wagon storage
Maintenance facilities for wagon and locomotives.	Maintenance
Operation and administration office areas	Operation and administration office areas
Staff facilities including parking	Staff facilities including parking
	Bulk liquid storage
	Freight forwarding facilities
	Log handling

#### Land Use Categorisation of existing traffic generating activities at the existing freight yard

Gate	Intersection Name	Land Use Category	Area at existing freight yard	Approx. Area (m <sup>2</sup> )
Gate 1	Tremain Avenue/Matthews Avenue	Depots	KiwiRail Network depot	19,440
Gate 2	Tremain Avenue/Toll Access	Freight Forwarders	Toll	14,930
		Freight Forwarders	Hall	9,725
Gate 3	Tremain Avenue/North Street	Container Terminal	KiwiRail Container terminal	22,750
		Freight Forwarders	Mainfreight	36,200
Gate 4	Tremain Avenue/Log Access	Depots	KiwiRail Mechanical depot	36,200
		Depots	KiwiRail North of mech depot	9,890
		Logs	Logs	14,700

(Stantec, Regional Freight Hub- Integrated Transport Assessment, October 2020, p. 35)

The September 2019 gate volumes do not show variations throughout the year due to the one-week duration of the traffic count. Therefore, rail freight commodities through Palmerston North for 2018 were

<sup>4</sup> KiwiRail Masterplan report April 2020

<sup>5</sup> KiwiRail NoR Form 18 23<sup>rd</sup> October 2020

used to calibrate the surveyed vehicle volumes, based on the assumption that the rail commodity throughput has a direct correlation with vehicle traffic demand.

The analysis showed that September was below the average month for freight throughput, representing 86% of the average month. Therefore, it was assumed that the September 2019 traffic counts represent 86% of average traffic through the site and the surveyed volumes were scaled to match the average month.

(Stantec, Regional Freight Hub- Integrated Transport Assessment, October 2020, p. 37)

**Traffic Demand at the existing freight yard by Land Use grouping**

<i>Land Use</i>	<i>Daily Traffic Demand (vpd)</i>	
	<i>Surveyed</i>	<i>Scaled</i>
<i>Depots</i>	750	850
<i>Freight Forwarders</i>	2,450	2,850
<i>Container Terminal</i>	300	350
<i>Logs</i>	150	150
<b><i>Total</i></b>	<b>3,650</b>	<b>4,200</b>

(Stantec, Regional Freight Hub- Integrated Transport Assessment, October 2020, p. 37)

Based on the provided information from the KiwiRail NoR and the summary outlined above, the new rail hub will provide extensive capacity increase to accommodate to handle more/longer trains and freight. It is expected that the new proposed railway will accommodate of additional commodities such as liquid storage to the yard.

## Question 4

*Will rail freight be consolidated at Palmerston North, or is it primarily a rail head for getting products up north or to the south from Palmerston North?*

It has been identified that 76% of rail traffic is through traffic. <sup>6</sup>

The other 24% of rail traffic is divided equally between having its origin or destination as Palmerston North.

Freight Train Movements North and South of Palmerston North

<i>Direction of Movement</i>	<i>Total Freight Train Movements 2018</i>
<i>North (through Bunnythorpe)</i>	5969
<i>South (to Napier and to Wellington)</i>	5788

(Stantec, Regional Freight Hub- Design, Construction and Operation, October 2020, p. 23)

## Question 5

*Identify any (high-level) additional/potential rail spatial requirements to succeed.*

New hub needs to make sure there is rail access to similar existing hub. Additional triangle track.

Requirements around level crossing in Bunnythorpe and southern part of the rail hub and efficient in safety. (roading infrastructure)

Passenger traffic. Future station will require different requirements.

## Question 6

*What are your views on how rail and road freight will be prioritised relative to creating a community at Bunnythorpe and/or people getting around?*

NA

The answer requires a holistic approach not only covering transport planning but as well as understanding the development of the community.

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<sup>6</sup> KiwiRail, NOR 2020

## **Additional comments on Scenarios**

### **Scenario: High Growth with New Kiwirail Hub, with regards to need of extra industry land**

The rail lines through any urban or non-urban area in general divide and restrict movements between geographical areas. A railway corridor can be a high-risk environment if not mitigated properly. Railways through non-urban environments act as a barrier where they have the potential to cause mortality in wildlife, severely disrupt animal movement and increase the risk of local extinction. In addition, the movement of trains, in specific long freight trains, at speed requires lengthy stopping distances.

With regards to future intensive train operation in and outbound of the railhub, any new additional development of industrial land to the east of the existing NEIZ is recommended to be connected through grade separation between road and rail traffic. It is expected the rail hub will be in full operation by 2050 with train operation 24/7. An at-grade crossing will increase the likelihood of road/rail incidents and delays, and disruptions to the operation of the railhub due to signalling arrangements at the at-grade level crossing.

In the form of containerised traffic, with straddle trucks or similar, to and from the KiwiRail Hub, industrial traffic may require specialised industry class transport with higher requirements of grade separation and high clearance.

Maintenance of the railway requires extensive planning and time to be carried out. A block of the line may have implications for disrupting transport modes acting in or around the railway corridor, i.e. levelled crossings.

Based on the current landscape and geotechnical conditions on the west side of the current NEIZ being in a floodplain, it is understood from that perspective that it is more appropriate to expand any industrial development to the east of the railway corridor. In this case, it is recommended that traffic crossing the railway shall be grade-separated to maximise the efficiency of the road network and maintain productivity for freight users

From a perspective of rail operation, industrial land expansion is best to be developed and grow on one side of the rail corridor to avoid any disruptions.

### **Scenario: High Growth New Kiwirail Hub, with regards to need of extra housing**

This scenario assumes the perspective that the development of Palmerton North becomes more urbanised, requiring more housing. Some area of concern in residential area along railway corridors are listed below:

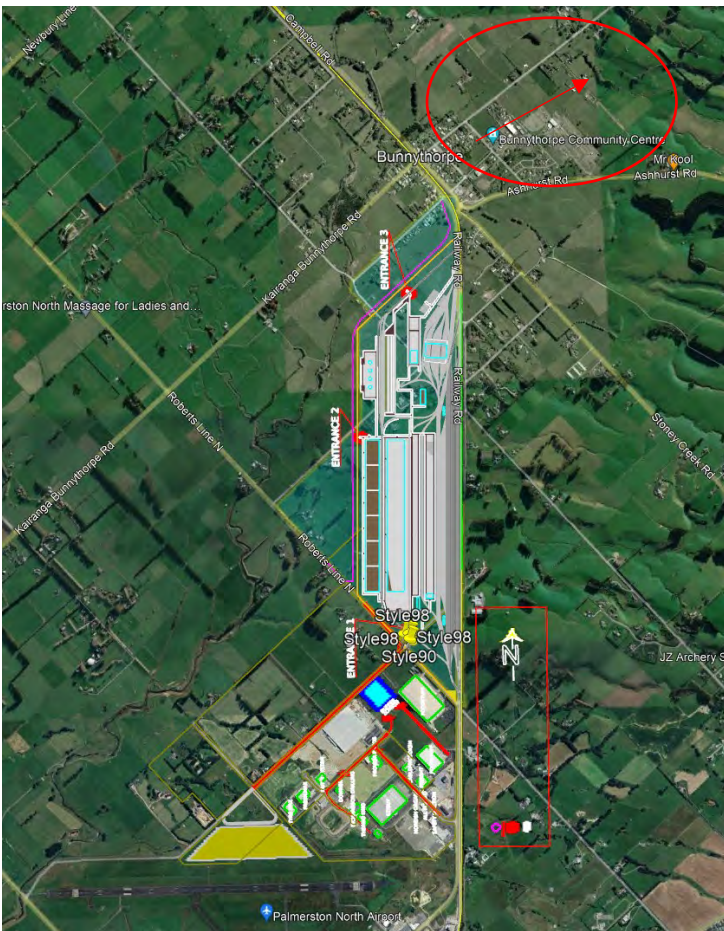
Trespassing on railway land can place a significant risk to the safety of individuals and the movement of trains and their passengers in this environment.

People and railroads are becoming more closely intertwined as rail facilities develop. Residents and workers living and working nearby these facilities (such as rail tracks and yards) may be adversely affected by the noise and vibration caused by train operations, including train whistling, wheel squealing and idling of locomotives relocating of cars in yards. Based on the current information provided by KiwiRail, it has been noted that the concentration of points and switches (the ladder tracks) are located on the north and south side of the Rail Hub. It is expected that traffic through these areas will generate a higher noise level.

Moreover, the construction and maintenance of rail infrastructures such as signals, tracks, and buildings can further complicate the problem of noise and vibration. Several railroad initiatives are intended to minimise the adverse impact of their operations on nearby residents, such as track lubrication and anti-idling devices for locomotives.

The issue of safety should be considered in the development of new areas in proximity to existing railway operations. This includes the danger of train derailments impacting homes and lives, the construction of new grade crossings, and adjacent land uses that create trespassing issues across railways.

Development of residential areas in or around Bunnythorp needs to consider the proximity to the rail corridor, which is currently cutting through the community. Any further residential development will have greater impact and discomfort as the train traffic to and from the Rail hub will increase in the future.



From a Rail perspective, any future development of Bunnythorp should be focused to the North East of the railway corridor, keeping the residential area on one side.

## Scenario without New Kiwirail Hub

No Comments