

# Intermodal freight hub: Delivering sustainable growth in rail



*This is a summary of KiwiRail's Master Plan for an intermodal freight hub – a high-capacity, technologically-advanced facility that efficiently connects the rail network with road freight. The Master Plan can be used to plan for the future development of regional, intermodal freight hubs to support the sustainable growth of rail in New Zealand.*

*It will help KiwiRail identify a site near Palmerston North to locate a planned regional freight hub for the Manawātū.*

## Project background

As population and freight volumes in New Zealand grow, and our need to reduce carbon emissions intensifies, rail presents a sustainable alternative to increasing road freight.

Regional freight hubs support an efficient transport network and the sustainable growth of rail throughout New Zealand.

Rail has a number of environmental benefits, including 66% fewer emissions per tonne carried compared to road freight. It also helps avoid further congestion of the road network and reduces road maintenance costs.

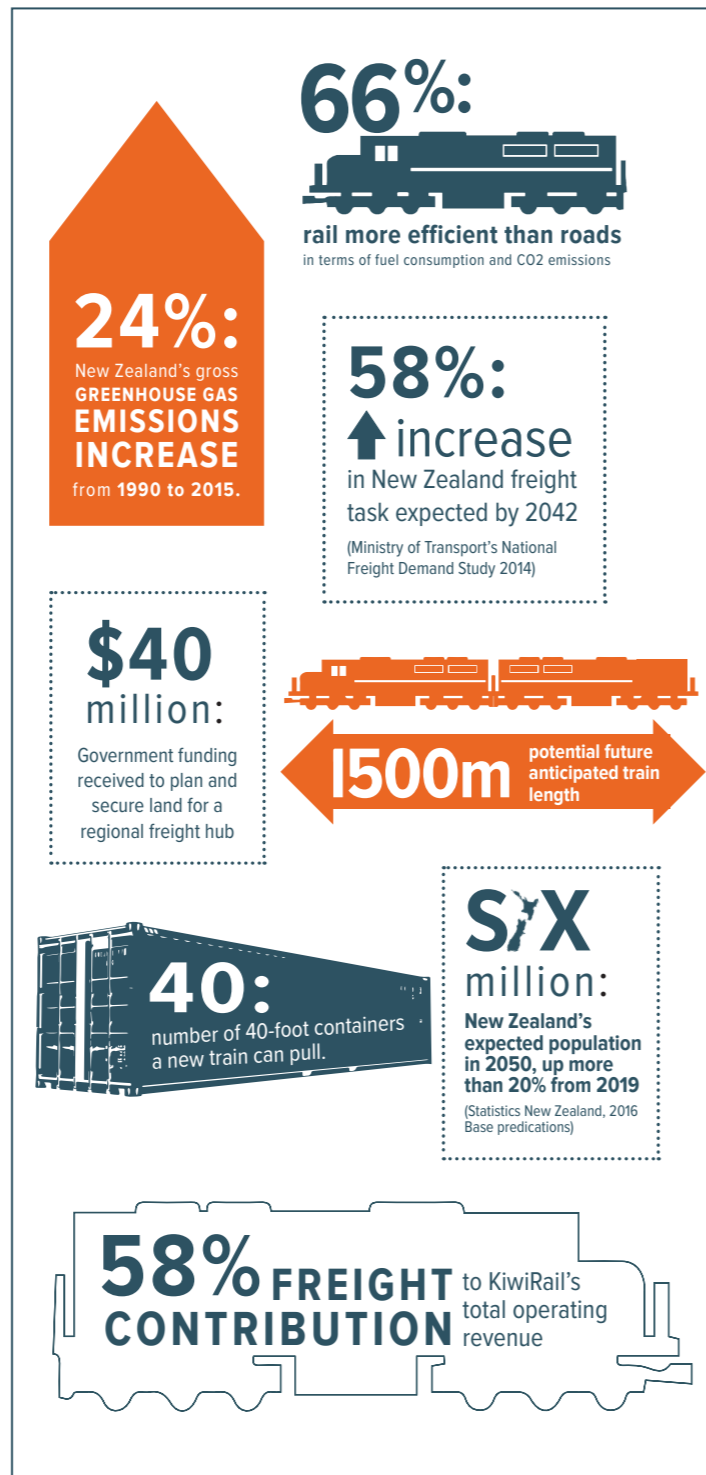
Rail currently carries about 17 per cent of New Zealand's freight task. To enable higher volumes to be carried by rail, investment is needed in the network infrastructure – particularly facilities that accommodate longer and heavier trains, which will contribute to operating efficiencies of scale. Future trains could be up to 1500 metres long and comprise up to 40 wagons.

KiwiRail has been funded through the Provincial Growth Fund (PGF) to develop a Master Plan for a new concept Intermodal Hub design. It will support the introduction of higher-capacity trains and efficiently connect and integrate with road freight operators and road networks.

PGF funding of \$40 million, awarded in November 2018, allows for KiwiRail to identify, and purchase the land required for a regional freight hub near Palmerston North using this Master Plan as a template. Securing land now is a vital step in enabling future growth.

With rail freight nationally forecast to grow by 58% between 2014 and 2042, a large network facility with an efficient modern design is required to achieve improved speed connectivity, capacity, and to reduce double handling.

The Master Plan has been modelled on lower central North Island freight demands to identify future hub requirements, including recommended size and layout.



## What is Master Planning?

Master Planning is a process that defines and quantifies the requirements of a development in an integrated way.

The first step in planning a fit-for-purpose hub anywhere is to develop a Master Plan that meets KiwiRail's future operational, technical and safety requirements. This ensures the hub contributes to the local community and New Zealand as a whole.

The Master Planning process included:

- Freight information sourcing and analysis
- Developing rail criteria for assessment i.e. 'must haves'
- Developing and assessing various concept options
- Finalising a preferred concept

Developing the Master Plan was supported by research about how to meet current freight demand in the central North Island, freight and operational requirements, and future rail needs to 2050.

Inputs to the Master Plan included:

- The opportunity to contribute to carbon emissions reduction targets and support New Zealand's action on climate change
- Performance and operational constraints related to the existing lower central North Island hub in Palmerston North
- Forecasted commodities and volumes for freight
- Forecasted train equipment, size and operations
- Rail network and hub operational requirements
- Requirements of KiwiRail's freight partners
- International best practice
- Zero harm – safety and environmental requirements

## Identifying a preferred concept

The goal of the Master Plan was to create a design that deploys innovative solutions to optimise every asset and process in the rail network and terminal operations – for safe, efficient and cost-effective freight movement.

The preferred concept worked up in the Master Plan includes:

- The components required in a new Intermodal Hub
- The size of each component; and
- A recommended layout for these components

The selection of an appropriate site will be based on the preferred concept developed in this plan, and aligned to national and regional transport and economic development strategies. Some adjustment may be required to accommodate site specific constraints.

## How will intermodal freight hubs deliver value for New Zealand?

By investing in better rail solutions we are contributing to a cleaner, safer, more sustainable New Zealand distribution economy.

Of all the transport modes, rail has, in recent years, demonstrated the greatest ability to make sharp improvements in speed, cost, capacity and carbon emission reductions.

To realise this value, the rail network requires freight hubs where every asset and process is designed to achieve improved speeds, capacity and connectivity.

We have ensured operational efficiencies and benefits can be achieved with this freight hub design through a comprehensive review of best practice internationally and insights gained from KiwiRail's staff and freight partners.

Future efficiencies incorporated into the Master Plan process to realise value include:

- The use of more efficient and higher horsepower locomotives
- Marshalling a new fleet of wagons capable of higher loads – more capacity, with stronger couplers and axles
- Ability for longer trains up to 1500 m to operate on the North Island Main Trunk Line
- Optimising of locomotive power requirements (HPT)
- Seven-day operations cycle
- Balancing traffic/power in two directions
- New partnership opportunities and integration with freight forwarders

## How will KiwiRail choose the site for a regional freight hub near Palmerston North?

Coupled with the Master Plan, KiwiRail will use the following broad criteria to guide the search for a preferred site near Palmerston North:

- Connectivity: proximity to the rail network; road access – ideally several connections from the site roadway to the local road network
- Strategic alignment: recognises spatial and transport plans and strategies (including NZTA's planned road to divert heavy road traffic from central Palmerston North)
- Environment: social and environmental impacts – including minimising negative impacts to water, vegetation, wildlife, visual effects
- Resilience: avoid hazards such as flood plains
- Engineering: including ground conditions and services
- Community: social cohesion and property matters
- Mana whenua values and engagement

## Next steps are:

- Investigations and assessments for the development of a new hub near Palmerston North to meet central North Island freight demand. This involves working with key stakeholders, including freight customers, councils and mana whenua
- Confirming preferred site. This includes seeking stakeholder/public feedback
- Consenting and land purchase: including designating the land for rail purposes under the Resource Management Act

# Intermodal freight hub: Master Plan

Intermodal hubs are a critical piece of infrastructure in accommodating the longer, heavier trains that will enable a greater use of rail to meet growing freight demand. This design concept shows how components can be appropriately sized and located to maximise on-site and network efficiencies to enable growth.

## What are the typical components of a future freight hub?

1. Designated safe working zones in **all** yards – Zero Harm
2. Arrival/Departure yard – centrally located; eight tracks each with capacity for 1500m trains
3. Marshalling yard – 15 tracks, including two back shunt tracks
4. Wagon storage yard – with 100 wagon capacity
5. Container terminal – minimum 28,000sqm
6. Maintenance Facilities: wagons, diesel/electric locomotives and Network Services work equipment – centrally located on site
7. KiwiRail terminal operations
8. Freight Forwarding facilities with rail access and private siding options
9. Log loading
10. Multi-purpose silo tanks

## What are the requirements for the hub?

Through the Master Plan process we developed key criteria for a fully integrated, multimodal freight hub. The following requirements helped define the recommended size and layout of components:

Co-locate and directly partners KiwiRail equipment maintenance, network services and freight operations  
→ **Operational efficiency and promoting team culture; maximise safety**

Co-locate commercial services (private sidings) including the Container Terminal, freight forwarding and log loading  
→ **Allow for efficient management of truck traffic generated by these customers; maximise safety**

Within the commercial zone, log-loading should be separated from other commercial services  
→ **Reduce noise and debris effects from logs**

Safely integrate terminal train traffic with vehicular/truck traffic  
→ **Improved safety outcomes**

Arrivals/Departures and Marshalling Yards to be centrally located  
→ **Accessible for all services**

Arrivals/Departures need to be able to accommodate 1500 metre trains  
→ **Service high-capacity trains with optimal efficiency**

Provide for locomotive setoffs and fuelling at both ends of the track  
→ **Reduce waiting time at the terminal**

Provide Back Shunt tracks for the Marshalling Yard  
→ **Marshal trains simultaneously without splitting a long train**

Provide two 900-metre loading/unloading tracks for the main Container Terminal  
→ **Efficiency to load and unload separate trains simultaneously**

Provide a single 1500m storage track at the Container Terminal  
→ **Locating a train here reduces demand on the Marshalling Yard**

Provide two 450-m log loading tracks  
→ **Reduce demand on the Marshalling Yard.**

Provide flexibility for a full range of future rail uses

