

Murray Basin Rail

Which path to 2035?

'Transporting more freight via rail represents one of the most effective means of achieving the Australian Government's legislated emissions reduction target of 43% by 2030'

'The future of freight October 2023' Rail Freight Productivity Review

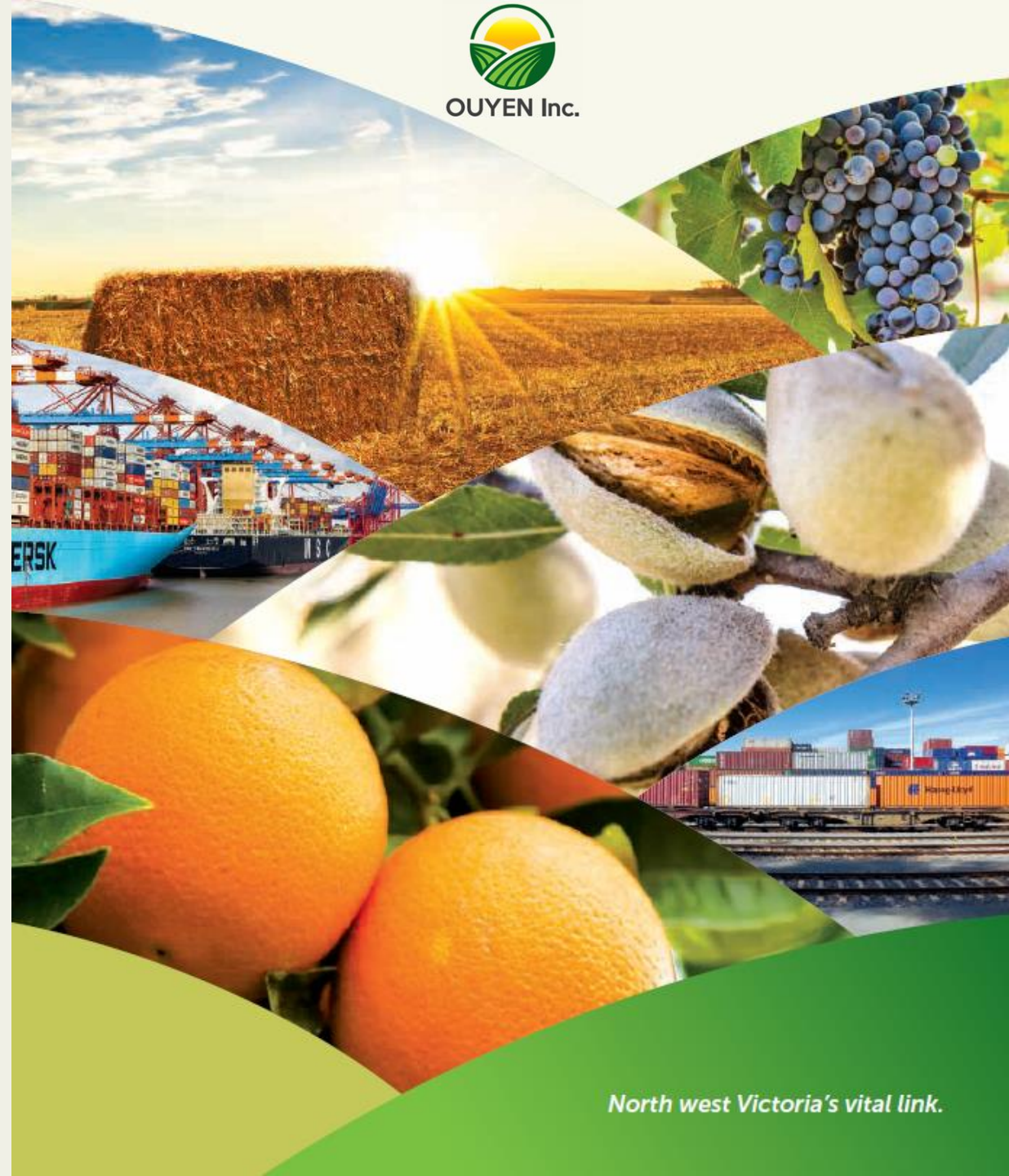
'Importantly, we've set an emissions reduction target of 75-80 per cent by 2035'

Victoria's 2035 Emissions Reduction Target – Victorian Government

'The Murray Basin Freight Rail Network region is of national importance. In 2019 it became a mix of broad and standard gauges, causing significant interoperability issues. For the ten years to 2035 alone, it is forecasted that 72% of the 39.5 million tonnes of freight suitable to rail, will go by road, needing at least 542 million truck kilometres.'

This report outlines a new project: Murray Basin Rail Mark II. It and a number of complementary projects, will see the volume of 'rail freight' going by road, reduce from 72% to 35%.'

Report author; Michael P. O'Callaghan Chartered Accountant



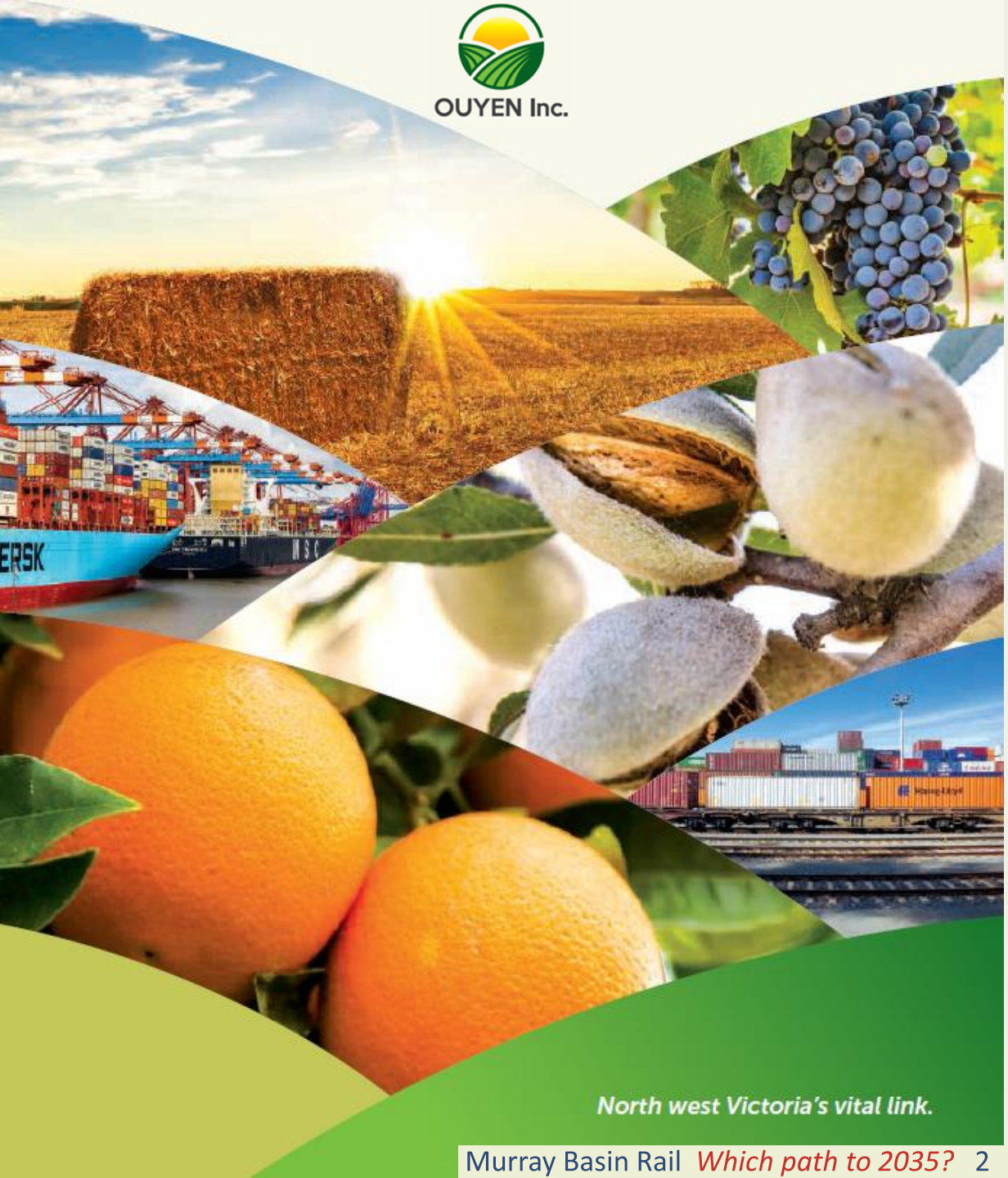
North west Victoria's vital link.

Murray Basin Rail *Which path to 2035?*

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North west Victoria’s vital link.

Murray Basin Rail *Which path to 2035?*

Executive Summary

A large Australian food bowl and an area of internationally significant critical mineral sand and rare earths, does not have an efficient and effective rail system.

The Murray Basin Freight Rail Network (MBFRN) region is forecasted, over the ten years to 2035 alone, to produce at least 39.5 million tonnes of freight that is suited to rail. 72% of it will go by road, requiring 542 million truck kilometres that will emit 823,751 tonnes of carbon and need an equivalent of 8.2 million trees planted as an offset.

Transport & Agriculture are the third and fourth highest carbon emitters in Australia, and as it stands, our farmers, will find it difficult to afford the transition to net zero emissions. 'Paddock to port freight costs are relatively highest for grains and fruit/vegetables, which represent 27.5% and 21% of Gross Value of Farm Production' (Deloitte AE 2019). It impacts export trade. These are the crop types in the MBFRN region.

The scope of the Murray Basin Rail Project (MBRP) was revised in 2020 resulting in the abandonment of 3 of the projects 5 stages because they could not be 'justified on a value for money basis' and the potential for freight train disruption to an increased number of passenger train services at Ballarat. This report outlines real and affordable solutions to these key issues.

Today, trains on one half of the MBFRN are stranded on broad gauge which is not used for freight by any other Australian

state. And trains on the other half of the network can no longer travel direct to port but are instead detoured an extra 260 km per round trip. While some espouse that the longer route provides more train paths, that advice is akin to saying trains along the Indian Pacific corridor would be better served going via Melbourne. The repercussions are significant. There are network resilience issues as that experienced with the late February 2024 bushfires when grain and intermodal trains were suddenly stranded. There are issues with rail interoperability, extensive road damage, ESG obligations, road safety, reduced competition, high carbon emissions and paddock to port costs as well as suspension of \$100+ million in rail related projects including the Sunraysia Mallee Port Link and GrainCorp's Project Regeneration.

Following an extensive study, this report highlights:

- the key metrics stemming from the 2020 rescoped MBRP
- a small net gain of freight on rail, but the volume of 'rail freight' going by road is set to increase by 31% by 2035.
- the rise in intermodal freight volumes and how they will soon overtake bulk grain exports (wheat, barley and canola)
- further Government investment in standardising the network etc., will improve freight volumes on rail by 135%

This report includes a new rail network project, Murray Basin Rail Project Mark II, a new intermodal facility, Sunraysia Mallee Port Link and an outline of the enormous benefits they will bring to Victoria, the nation and the environment.

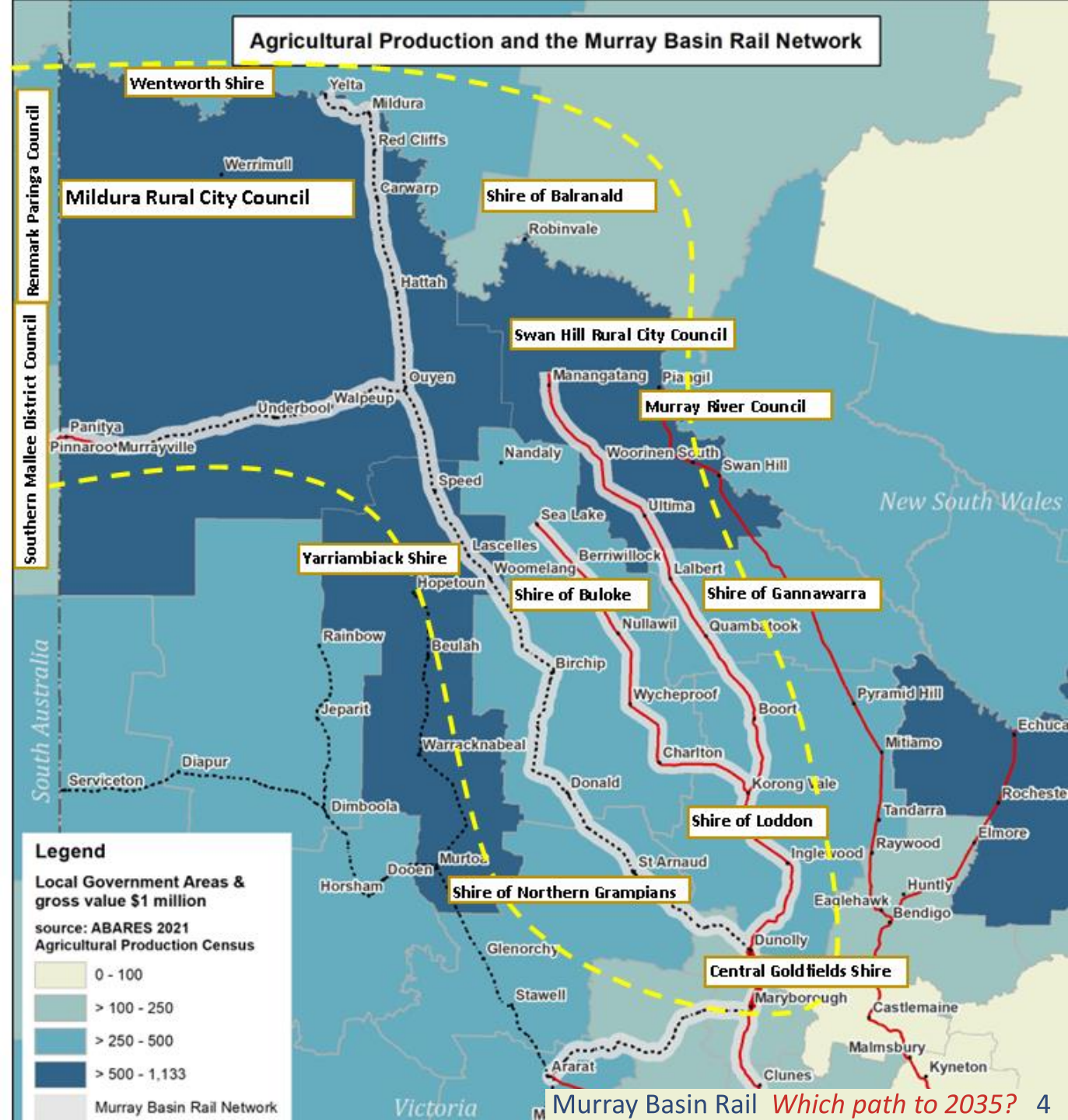


Murray Basin Rail

Arguably Australia's biggest food bowl and export powerhouse

The region straddles;

- **3 states** (NW Victoria, SW NSW, NE Sth Aust) and
- **13 municipalities**, in part or whole.
- Mildura Rural City Council Local Government Area (LGA)
Australia's highest agricultural producing LGA (ABARES Ag. census 2021)
- **Other very high Ag producing municipalities** in the Murray Basin Rail area; refer ABARES ag census map →
- Northwest Victoria (Mildura)
Australia's most significant horticulture growing region (Hort. Innovation 2023)
- **Big grain & hay producing region**
Mallee & Loddon seen as a **premium export wheat and hay growing regions**
- Irrigated production; **Pinnaroo & Riverland SA** region exports via the Port of Melbourne = opportunities

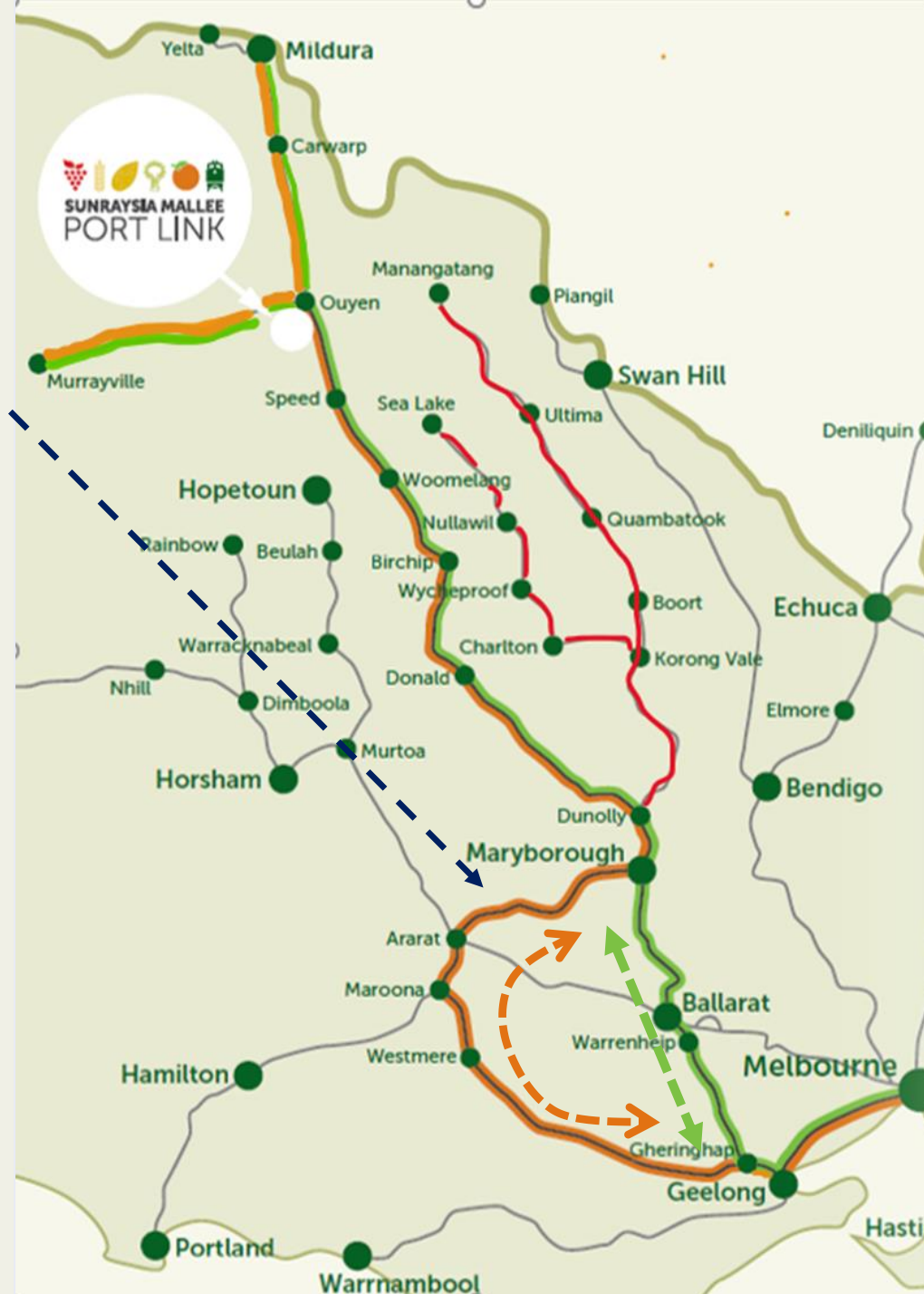


Murray Basin Rail

What happened?

Mildura & Murrayville rail corridors:

- pre 2019 trains travelled direct to port via Ballarat.
- Conversion to standard gauge (SG) started on the northern section.
- The scope of works was revised in 2020 and conversion of the Ballarat corridor to SG was abandoned. (it remains broad gauge).
- since 2019, trains are detoured around Ballarat adding 260 kilometres per round trip. This has;
 - ↑ running costs
 - severely impacted train cycle times
 - ↓ supply chain resilience
 - thwarted economic development
 - ↑ freight on road



Despite improved train weight capacity and number of train paths:

- **GrainCorp has suspended its ~ \$55 million Project Regeneration** = No upgrade of train loading equipment at 4 sites = ↓ grain on rail & eventual demise
- Birchip Grainflow, as an example; the detour has ↑ rail distance by 40%. It **no longer has an efficient 24 hour train cycle to Geelong** = ↑ grain on road
- **Sunraysia Mallee Port Link is suspended.** For Mildura RCC LGA and Sunraysia; **'80% of intermodal freight will continue on road** (GHD Advisory)
- **No contingency route to any port** during maintenance and emergencies e.g. Feb 2024 bush fires near Ararat, at least 3 trains stranded & others cancelled
- Some **mineral sand mining disincentivised**

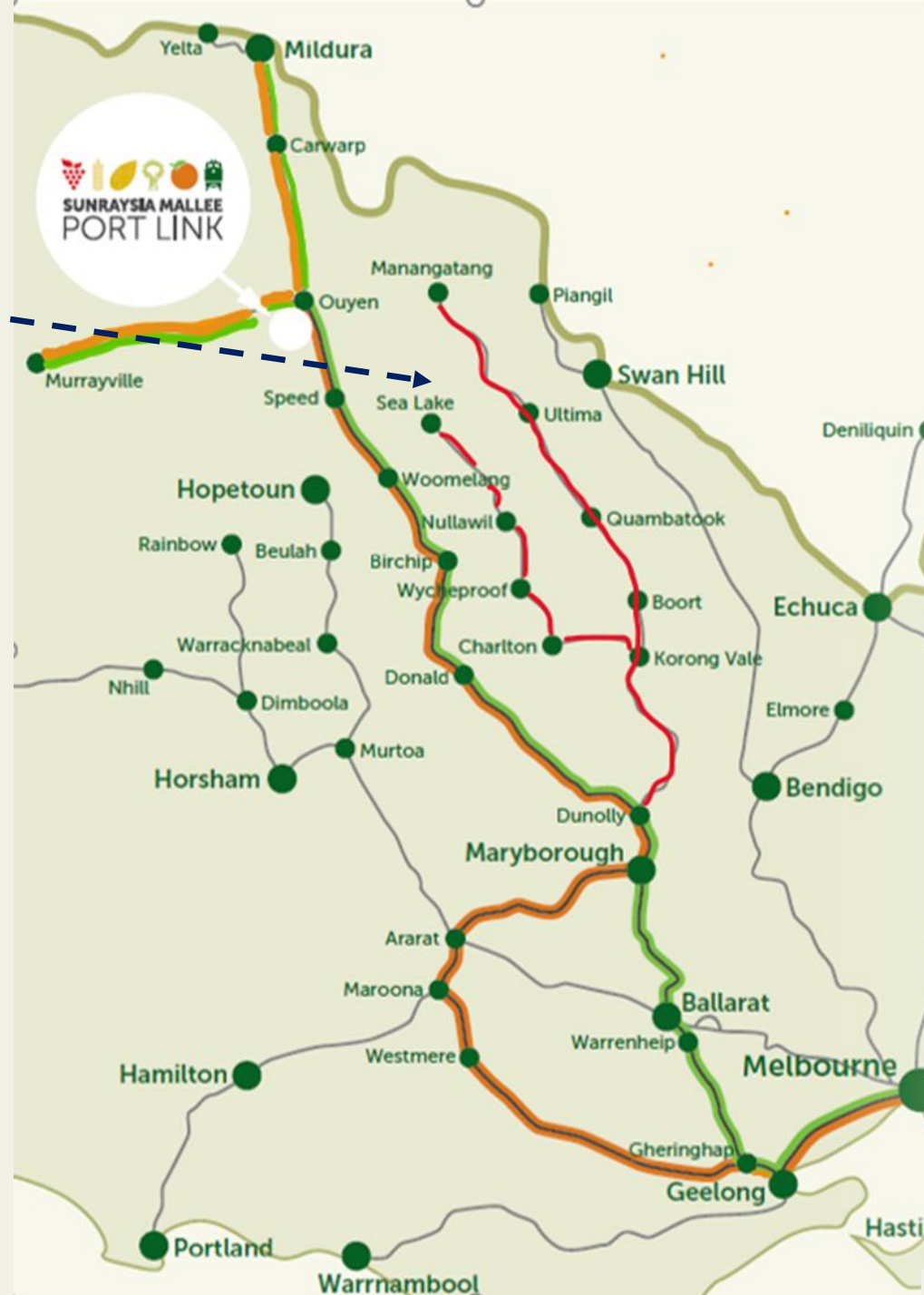
Murray Basin Rail

What happened?

Sea Lake & Manangatang lines.

They were not converted from broad gauge (BG) to standard gauge (SG) causing **interoperability issues** including;

- No other state uses BG for freight = **'old' specialised equipment and ↓ competition**
- Large grain companies **now need both SG & BG train equipment** = ↑ cost
- Ultima intermodal; **uncertain**; limited use of BG trains = ↑ cost
- **GrainCorp suspended Project Regeneration** = no upgrade of train loading equipment at another four sites = ↓ grain on rail
- **Cannot access Portland on SG; huge problem for mineral sands and grain** = ↑ freight on road and ↓ port competition
- Not sustainable



Conclusion

Government objectives not met

None of the four Government objectives outlined in the Murray Basin Rail Project Final Business Case August 2015, can be achieved, under the 2020 revised scope of works.

Rail industry prioritise full standardisation

'The future of freight' October 2023 Rail Freight Productivity Review priority items include;

- 'Fixing productivity incl. train cycle times is considered a priority for freight on Murray Basin'
- 'High priority infrastructure gap project - convert remaining lines of the Murray Basin Rail Project to standard gauge'

Murray Basin Rail

Grain – export wheat barley & canola

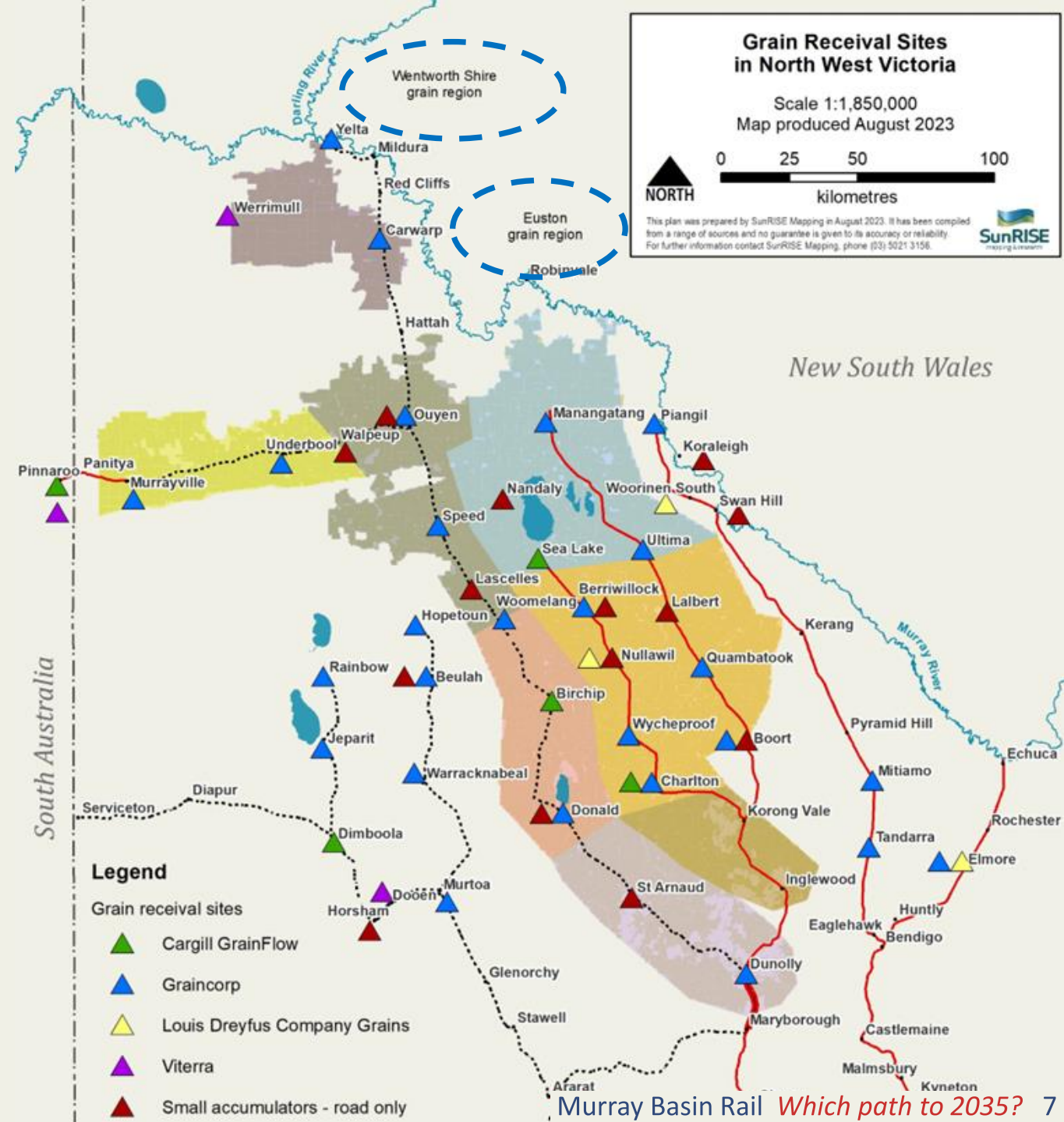
Research methodology

In depth analysis and ten year forecast to 2035 to quantify:

- volumes suitable for rail transport, but going by road and
- what full standardisation of the network would achieve

The study involved:

- splitting the study area into ten regions
- Wentworth & Euston – not big volumes to southern ports; used ABARES Ag census & other sources
- other eight regions;
 - Sunrise Mapping & Research specific information
 - calculated arable land
 - area planted to wheat, barley & canola
 - yields - average
- forecasting % export & % by road including why
- comparison with other data and reports
- GRDC information – re; yields, volumes produced & domestic consumption, climate change impact etc
- Discussions with farmers, brokers, handlers and traders



Murray Basin Rail

Intermodal freight (shipping container)

Grapes, almonds, hay, citrus, wine, salt, grain & pulses, stone fruit, meat, vegetables, machinery, farm inputs

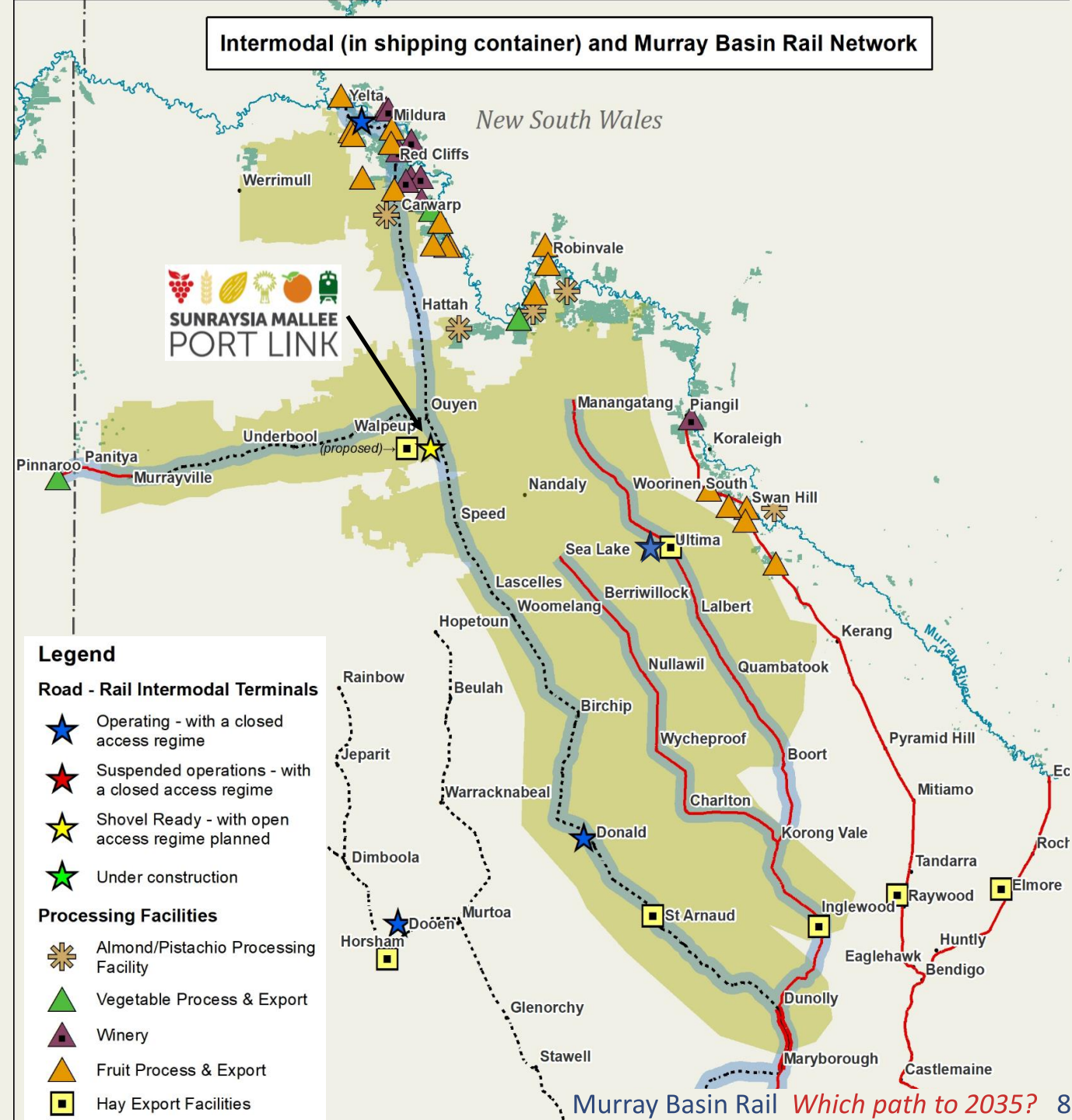
Research methodology

In depth analysis and ten year forecast to 2035 to quantify:

- volumes suitable for rail transport, but going by road and
- what full standardisation of the network would achieve

The study involved;

- splitting the study area, in general, along municipal areas
- Sunraysia & Mildura Rural City Council LGA; > 1 million tonnes by 2023 (GHD Advisory 2021)
- Hort Innovation forecasts (2023) & other
- Swan Hill Rural City Council; Agriculture Census data (2021 ABARES), local knowledge and Sunraysia overlap
- Review Shire of Buloke; PeaCo - Donald (Merbein train) Salt from Sea Lake (road), grain from Access Grain Nullawil (road) hay & other grain (road)
- Discussions with growers, commodity industry leaders, freight accumulators and exporters
- Intermodal freight such as hay etc from southern regions Inglewood etc not included as not deemed suitable for rail due to proximity to port



Murray Basin Rail

The Murry Basin region is an area of internationally significant critical mineral sand and rare earth elements

Research methodology

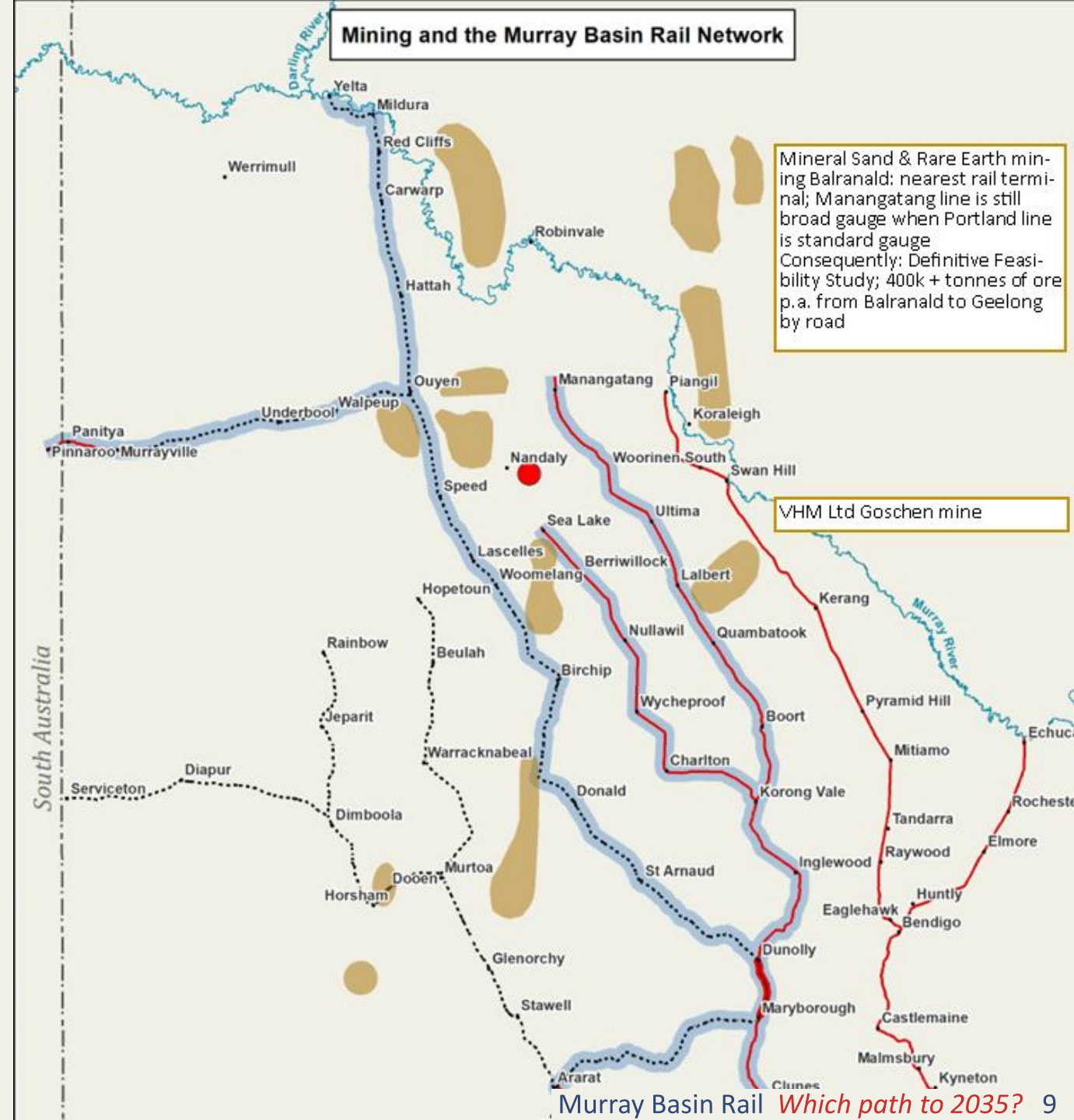
Analysis and ten year forecast to 2035 to quantify:

- volumes suitable for rail transport, but going by road and
- what full standardisation of the network would achieve

The study;

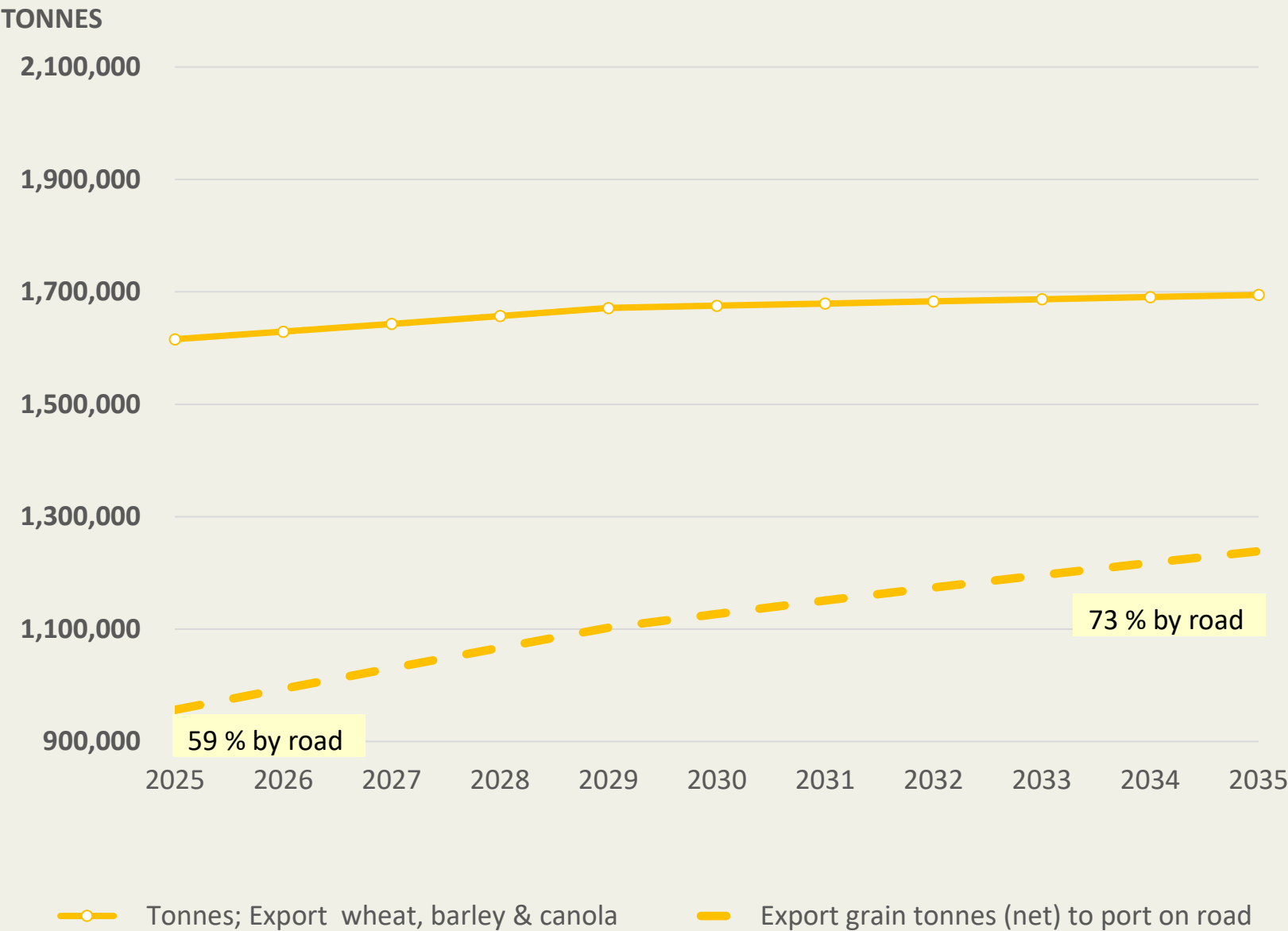
- encountered difficulty ascertaining volumes and timing.
- only included those with a Definitive Feasibility Study;
 - Iluka Resources Balranald
 - VHM Ltd at Lalbert (may use Ultima Intermodal)
- did not include future mining at Euston, Donald, and north of Wentworth

The forecasted numbers, in regard to mineral sand and rare earth elements, are most likely understated



Murray Basin Rail– without full standardisation etc

Forecast of freight suited to rail, but going by road



Export wheat, barley & canola produced;

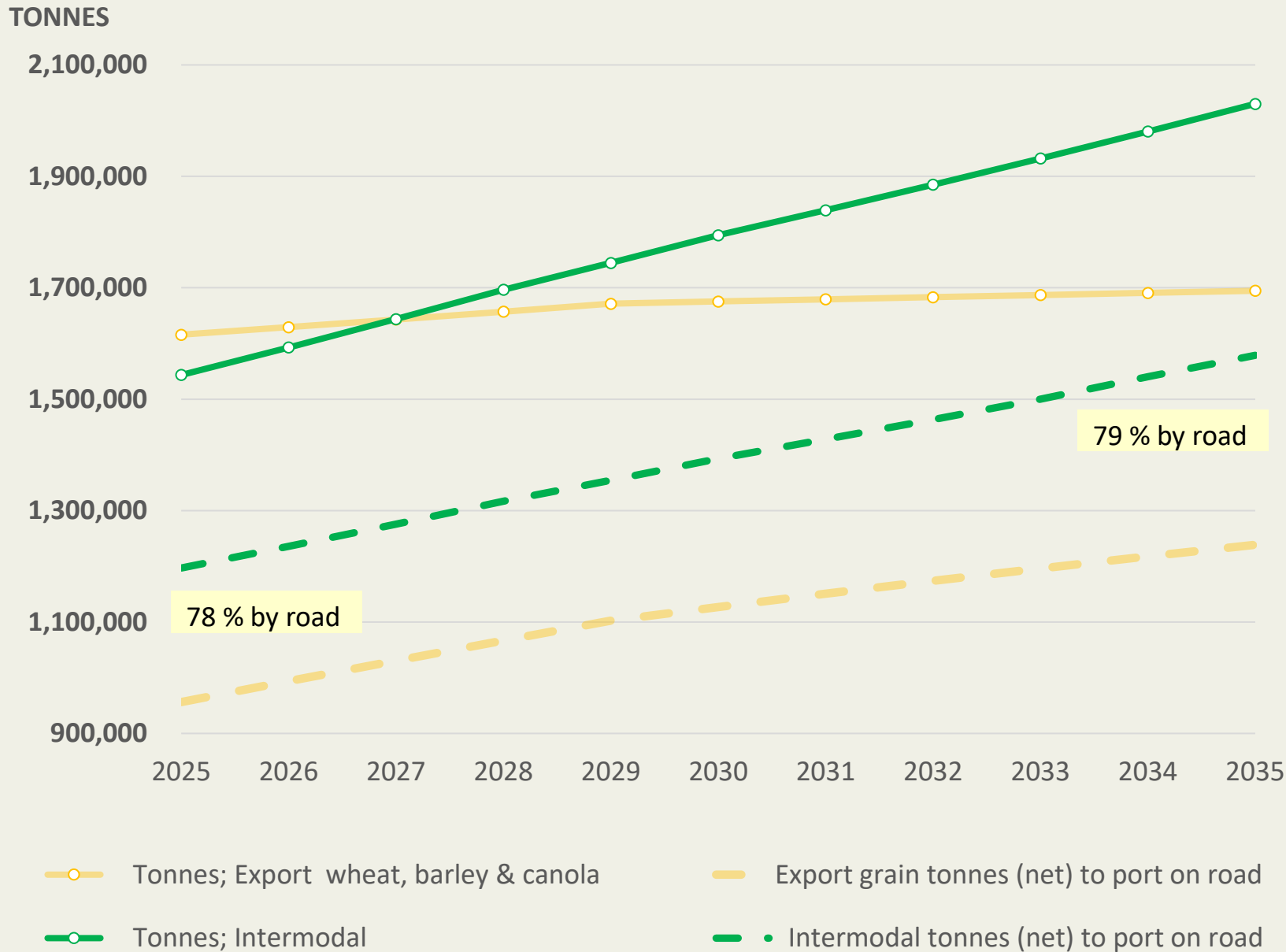
- Yield growth to slow.
- Export bulk volumes in South East Australia to flatten somewhat; increased domestic consumption including stock & poultry feed
- Continued increase in volumes exported in shipping containers

Export grain on trucks set to increase.

- Revised MBRP = some **small short-term gains** on getting grain onto rail
- **But, grain on rail is forecast to reduce by 31% over the ten-years to 2035**
- suspension of Graincorp’s \$55 million Project Regeneration,
- the long detour crippling train cycle times e.g. Grainflow Birchip
- having two different rail gauges and needing two lots of rail equipment
- road transport incentivised with HPFV’s and improved weights limits on bridges etc.
- The cost savings presented by the original MBRP (and GrainCorp) cannot be delivered. A growing generation of producers are losing confidence in rail transports ability to provide improved farm gate returns

Murray Basin Rail– without full standardisation etc

Forecast of freight suited to rail, but going by road



Intermodal freight; production to grow

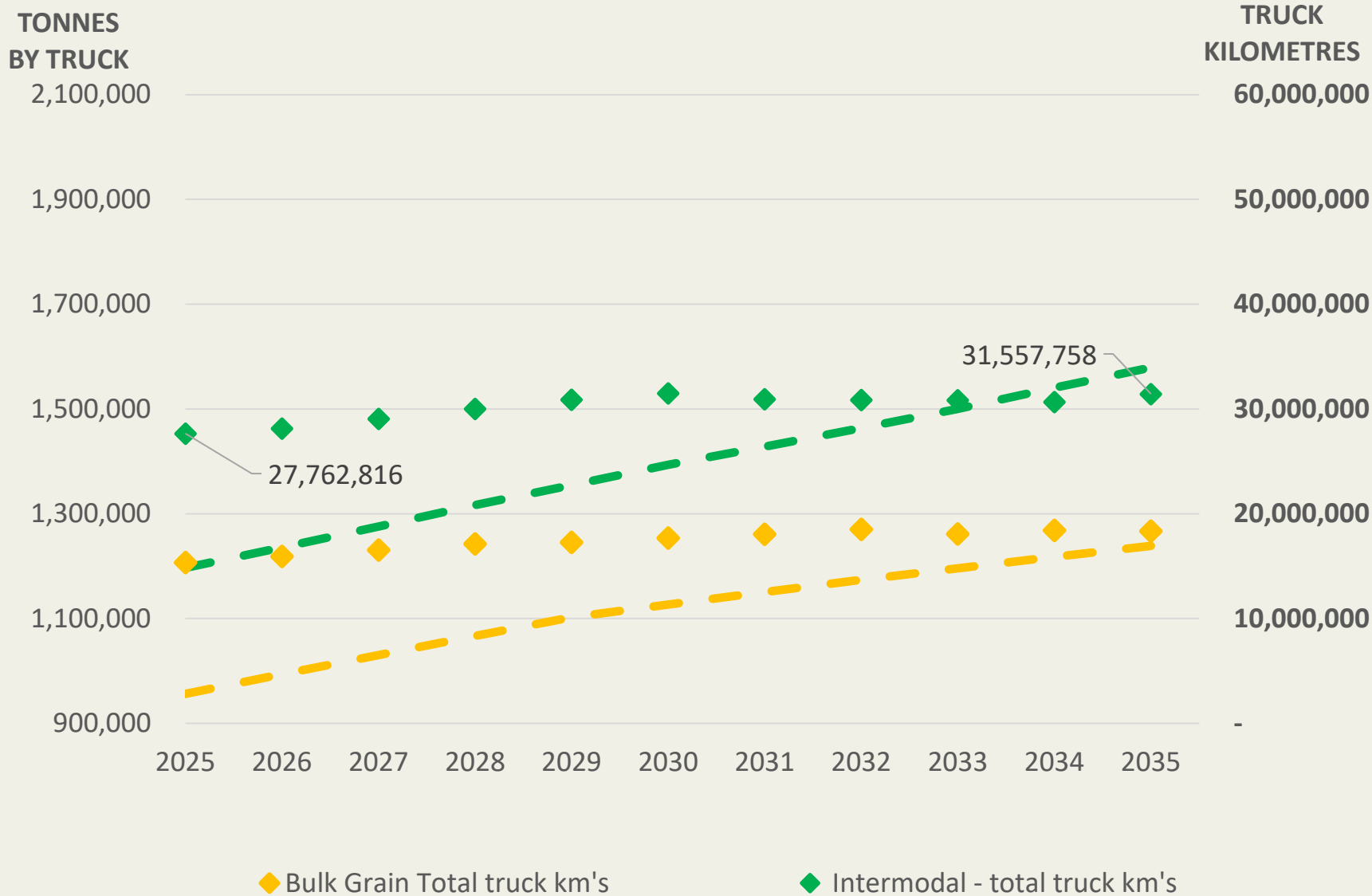
- Hort. Innovation report 2023; forecast increases to 2030; grapes up 30% and almonds up 42%
- Forecast commodity movements at the Port of Melbourne suggest that... wheat, cereal and other agricultural products will almost double by 2060. (*Victorian Freight Plan 2018-50 P.19*)
- Continued growth in containerised grain exports and emerging businesses e.g. salt
- Forecast does not include SA opportunities

Why so much intermodal freight on road?

- Despite a forecasted 30% increase in tonnes on rail using existing intermodal facilities and assuming the MSIS subsidy is renewed (risk), the tonnes on road is forecasted to increase by 32%
- Existing rail connections are a significant distance from the product and/or are in the opposite direction to the port (GHD),
- New intermodal rail facilities disincentivised; long detour has disrupted train cycle times,
- By 2035 >80% of intermodal freight ex Sunraysia & Mildura RCC LGA will still go by road.

Murray Basin Rail – without full standardisation

Forecast of freight suited to rail; but going by road & truck kilometres needed



Intermodal freight truck kilometres;

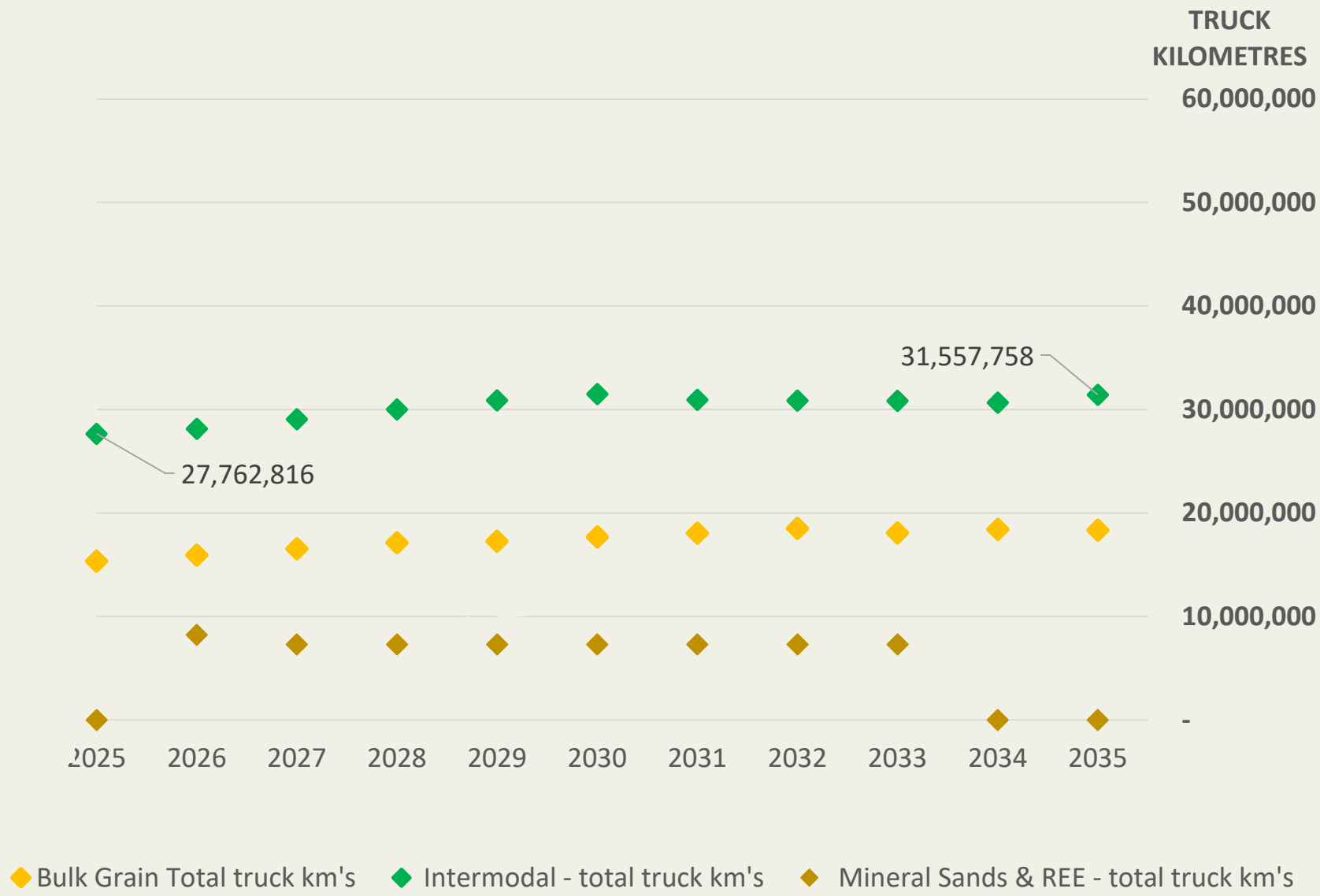
- As mentioned previously, the volume of intermodal freight on road to port will increase by 32%. This extra weight on roads will incur additional maintenance
- Further adoption of HPFV's and anticipated improved weight limits on bridges etc., will see truck kilometres increase by 14%

Export grain truck kilometres

- Despite less grain going by rail, the increased use of HPFV's and anticipated improved weight limits on bridges etc., will see a moderate increase in truck kilometres.

Murray Basin Rail – without full standardisation

Forecast of freight suited to rail; but going by road & truck kilometres needed

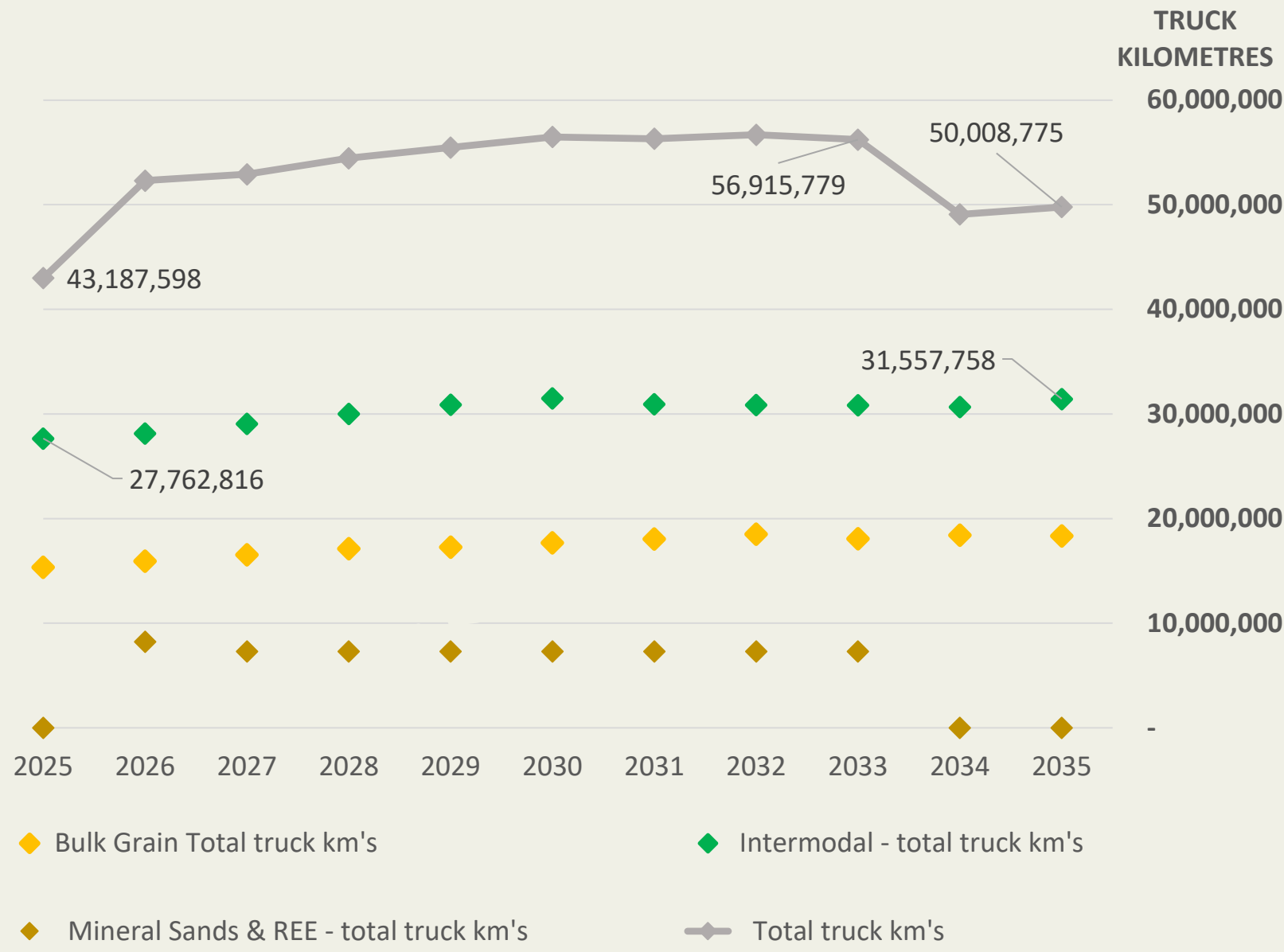


Add mineral sands truck kilometres

- only includes those with a DFS; Balranald & Lalbert,
- does not include Euston or Donald etc., (the forecast is most likely to be understated)

Murray Basin Rail – without full standardisation

Forecast of freight suited to rail; but going by road & truck kilometres needed

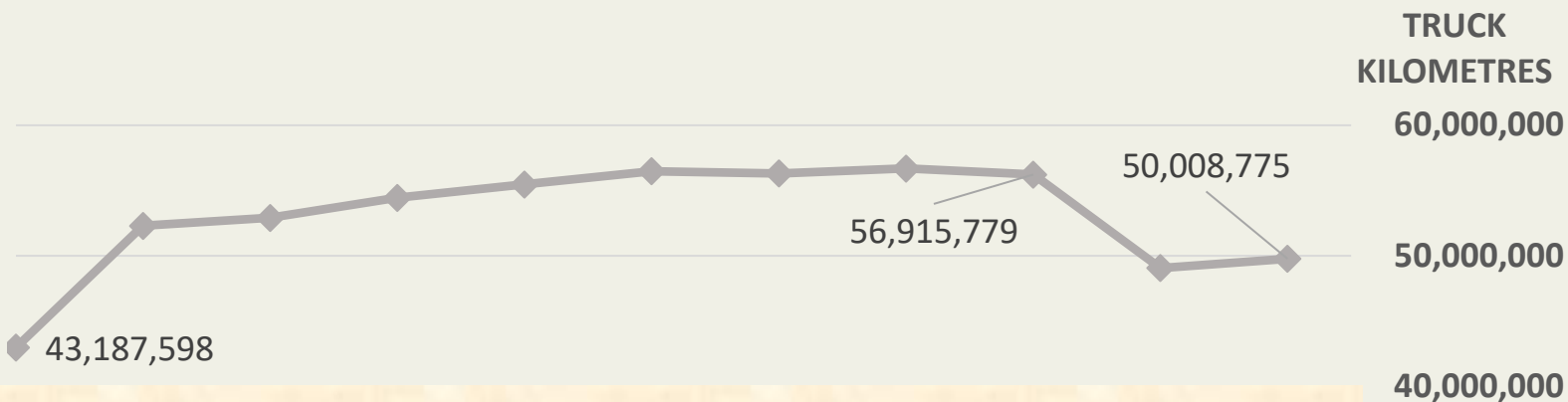


Total Truck kilometres

- are being somewhat curbed by the uptake of HPFV's which will continue over the ten years to 2035 with improved weight limits; bridge upgrades etc.
- After that **it is expected that truck kilometres will climb significantly**

Murray Basin Rail – without full standardisation

Forecast of freight suited to rail; but going by road & truck kilometres needed



- 10 year conservative forecast to 2035 alone; **for freight suited to rail;**
- 39.5 million tonnes with 72% to go by road
 - 542 million truck kilometres
 - 664,107 truck trips
 - 5.1 potential fatalities
 - 174 potential hospitalised injuries
 - 823,751 tonnes of carbon emissions
 - \$152 million, at least, needed in road maintenance
 - \$300+ million lost opportunity in economic input (primary)
 - Multiple grain accumulation sites no longer using rail
 - Mineral sand & rare earth mining disincentivised
- And the subsequent 10 years to 2045 will see much higher truck km

Murray Basin Rail

Reasons for revising the MBRP scope of works in 2020	What this study has identified
<ul style="list-style-type: none">• Benefits from standardisation can largely be achieved by enhancing the existing standard and broad-gauge Network	<ul style="list-style-type: none">• Significant & ongoing benefits are not achievable from the existing network <i>None of the four initial MBRP Government objectives have or will be achieved with the existing network.</i> <i>By 2035 the net volume of rail freight on trains will increase by a mere 5%. Export grain on rail will reduce by 31% but this will be offset by a generous forecast increase of 32% in intermodal freight (on the basis that the MSIS subsidy is continued)</i> <i>Full standardisation of the network and other works will see freight on rail increase by 135% for the ten years to 2035 alone. (refer pages 17-19)</i>
<ul style="list-style-type: none">• Freight train disruption to an increased number of passenger train services (in Ballarat)	<ul style="list-style-type: none">• Ouyen Inc solution <i>allows a 1,200 m long freight train to travel through the ‘freight and passenger train overlap section’ in under 5 minutes at 40km /hr (DPT advise that it is very similar to what they had in mind)</i> <i>Note: In response to Government comments on the MBRP and not being able run more freight trains through Ballarat due to increased passenger services, the Convenor of the Ballarat Public Transport Users Association said “..that's not really accurate” (Ballarat Courier 2.5.2022)</i>
<ul style="list-style-type: none">• Full standardisation cannot be justified on a <u>value for money</u> basis <i>Money; \$1 billion was quoted by the Victorian Government.</i> <i>Value; 375k tonnes p.a. of additional grain onto rail *</i> <i>* 2015 MBRP business case objective: 500k tonnes of grain p.a. to be added to rail (no other product was quantified). Sources have indicated while the Revised MBRP would get up to 125k tonnes p.a. of additional grain onto rail, the cost of full standardisation could not be justified for the remaining 375k tonnes p.a. Other products were supposedly not quantified</i>	<ul style="list-style-type: none">• New project, Murray Basin Rail Mark II is value for money <i>Money; \$412,053,000 (refer to next page)</i> <i>Value; 1,471 k tonnes p.a. (10-year ave. to 2035) of additional freight onto rail *</i> <i>* 492k tonnes of grain p.a., 659k tonnes of intermodal freight p.a., (from existing terminals and proposed Sunraysia Mallee Port Link & hay facility) and 320k tonnes of mineral sand p.a.</i>

Murray Basin Rail Mark II

Full rail gauge standardisation of the whole network plus other works - summary

- **528.3 kilometres of rail converted from broad gauge (BG) to standard gauge (SG):**
 - Sea Lake & Manangatang to Dunolly (most bitumised level crossings already have the third rail installed)
 - Maryborough to Gheringhap. (Note: dual gauging is expensive; upfront and ongoing. It also restricts passenger train speeds, adding ten minutes to the Maryborough to Ballarat trip. On the Ballarat to Gheringhap/ Nth Geelong line, broad gauge V/Line Velocity passenger trains etc travel to and from Ballarat for maintenance because it is 'convenient', as the line sees very little traffic. A large consulting firm study in 2022 concluded there is significant spare capacity on the Ballarat to Melbourne line for the transfer of these empty carriages etc., but it would need to be scheduled)
- **Ballarat Freight – Passenger train separation - per Ouyen Inc plan (or similar)**
 - allow a 1.2 kilometre long freight train to pass through passenger train overlap section in less than 5 minutes at 40 km/hr ensuring no disruption to passenger train services
 - remove one level crossing in Ballarat
 - new equipment at Ballarat.
- **Convert Maryborough passenger train to standard gauge.** Undertake works at Geelong for potential SG passenger train service
- **10 passing loop extensions** – to cater for 1.2 kilometre long freight trains (most have not changed since the steam train era)
- **Replace non-convertible concrete sleepers with standard or dual gauge** at the new Tourello passing loop and approx. 22 kilometres on the Sea Lake line as well as multiple other locations
- **Track remedial works**

Budgeted cost; \$412,053,000

Sunraysia Mallee Port Link – intermodal rail terminal

GHD Advisory business case, May 2021, key findings:

- ‘Existing rail connections are a significant distance from the product and/or are in the opposite direction to the port’
- ‘Freight Demand – there is a significant gap in intermodal freight services market
 - 1 million tonne of intermodal freight by 2023 (in Mildura RCC LGA & Sunraysia)
 - 80% : 800,00 tonne to be transported via road to port requiring 19 million truck kilometres p.a. and will not change significantly under the Revised MBRP plan
 - The terminal’s location near the base of a significant freight catchment ‘funnel’ has a diversified range of irrigated and dry land produce which will ensure all year-round freight demand and train utilisation, lowering freight costs by rail’
- ‘A project which is economically viable’
- ‘There is strong support from the road transport industry’
- ‘highly efficient and cost effective by providing the shortest truck trip to rail and attaining a 24-hour train cycle to the PoM via the direct rail route, with a capability to provide five services per week’

Cost \$46,000,000 (2021 GHD Advisory business case \$42,000,000 + cpi)

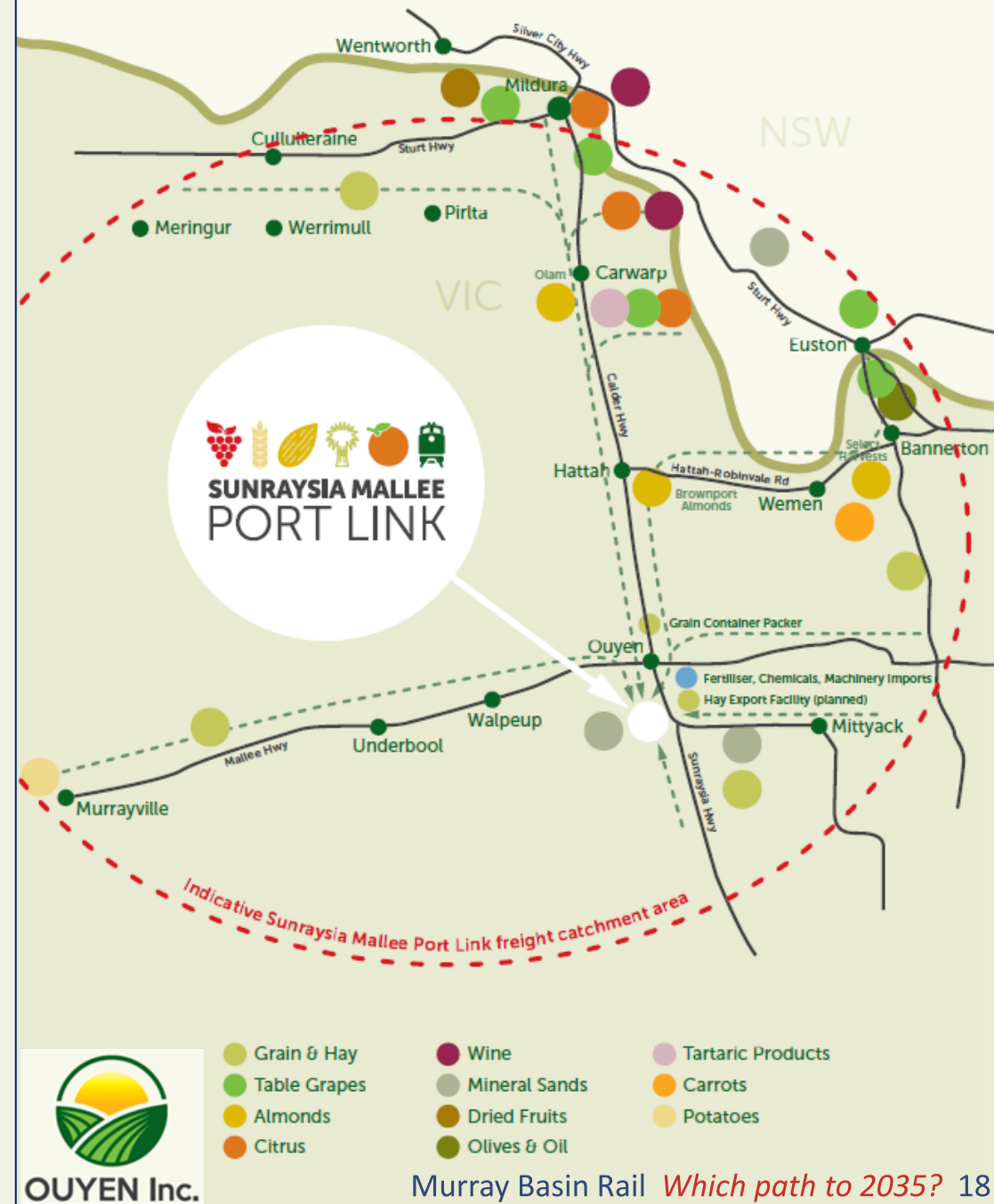
Additional opportunities identified since the 2021 business case;

- Large enterprises with irrigated crops from S.A’s Pinnaroo and Riverland regions with significant exports through the Port of Melbourne

Project status; shovel ready since 2022 - awaiting reinstatement of the direct rail route to the Port of Melbourne, via Ballarat.

It would be ideal if it were to operate on a similar basis to the Australian Government owned National Intermodal, as an open access intermodal terminal precinct. This vital element, for all operators, current and potential, ensures they operate on a level playing field. To achieve this, funding is sought from the Victorian and Australian Government on a similar basis to that provided to the Wimmera Intermodal Freight Terminal at Dooen.

A project that truly synchronises road, rail and sea transport.



Murray Basin Rail Mark II – full standardisation and other

Cost of projects and benefits for the ten years to 2035 alone

	Murray Basin Rail Mark II	Sunraysia Mallee Port Link	Total
Cost of Projects	\$ 412,053,000	\$ 46,000,000	\$ 458,053,000
	90%	10%	100%
Benefits of new projects; ten years to 2035 alone			
Mode shift; road to rail: Total tonnes^	9,928,343	4,778,064	14,706,407
Reduction in truck trips	226,554	114,574	341,128
Reduction in truck kilometres	163,743,028	99,221,008	262,964,036
% of the total reduction in truck km	62%	38%	100%
Reduction in Co2 emissions; net tonnes	233,349	141,399	374,748
Reduction in trees needed for Co2 offset	2,333,490	1,413,990	3,747,480
\$ Reduction in full social cost of road crash fatalities, serious injuries, other injuries & damage to property	\$ 42,560,937	\$ 25,790,039	\$ 68,350,977
\$ Reduced freight & handling costs	\$ 119,140,000	\$ 57,337,000	\$ 176,477,290
\$ Economic input: excl. freight savings	* \$ 100,000,000	\$ 86,250,000	\$ 186,250,000
\$ Reduction in road maintenance	\$ 45,848,048	\$ 27,781,882	\$ 73,629,930

Note

^ 492k tonnes of grain p.a., 659k tonnes of intermodal freight p.a. (from existing terminals and proposed Sunraysia Mallee Port Link & hay facility) and 320k tonnes of mineral sand p.a.

* broad estimate only

Other items to be considered;

- The increased potential cost of rail crash fatalities, injuries and damage to property need to be considered.
- Other benefits not listed above include reduced noise pollution and air quality and impact on health, especially considering a majority of intermodal freight trucks from NW Victoria travel to Melbourne’s western suburbs.

‘the Commonwealth is responsible for funding and investing in nationally significant freight infrastructure’
(Victorian Infrastructure Plan 2017 P.11)

If the Federal Government were to fund 50% of these projects, the cost to the Victorian Government would be the same as one of its 110 metro level crossing removals

Sunraysia Mallee Port Link figures allow for a five year ‘ramp up phase’ from 2026 to 2030.

The amount of ‘rail freight’ going by road will reduce from 72% to 35% and cut freight costs while generating significant economic benefits

