# Determination of PZ1&2 stand-alone projects for Hunter Valley Access Undertaking

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# EXECUTIVE SUMMARY

## E.1 Background

In October 2015 the Australian Competition and Consumer Commission (ACCC) released a draft determination assessing the Australian Rail Track Corporation's (ARTC's) compliance with the Hunter Valley Access Undertaking (HVAU) financial model for the 2013 calendar year.

ACCC's determination recommended some adjustments to the application of the 'ceiling limit test' within the HVAU financial model. The ceiling limit in the HVAU requires that "access revenue from any access holder or group of access holders must not exceed the economic cost of those segments, which are required on a stand-alone basis for the access holders or group of access holders". The adjustments were required because the ACCC considered that the Pricing Zone 1 (PZ1) and Pricing Zone 2 (PZ2) access holders were being asked to pay more than their standalone costs. We understand that the interpretation of standalone costs which was adopted by the ACCC is not supported by Idemitsu, however, for the purposes of this report, Idemitsu has instructed Lunarr to adopt an approach which is consistent with that of the ACCC. That is, standalone costs are taken to exclude all costs which could have been avoided in the absence of demand from PZ3, rather than only the direct costs of PZ3 customers within PZ1.

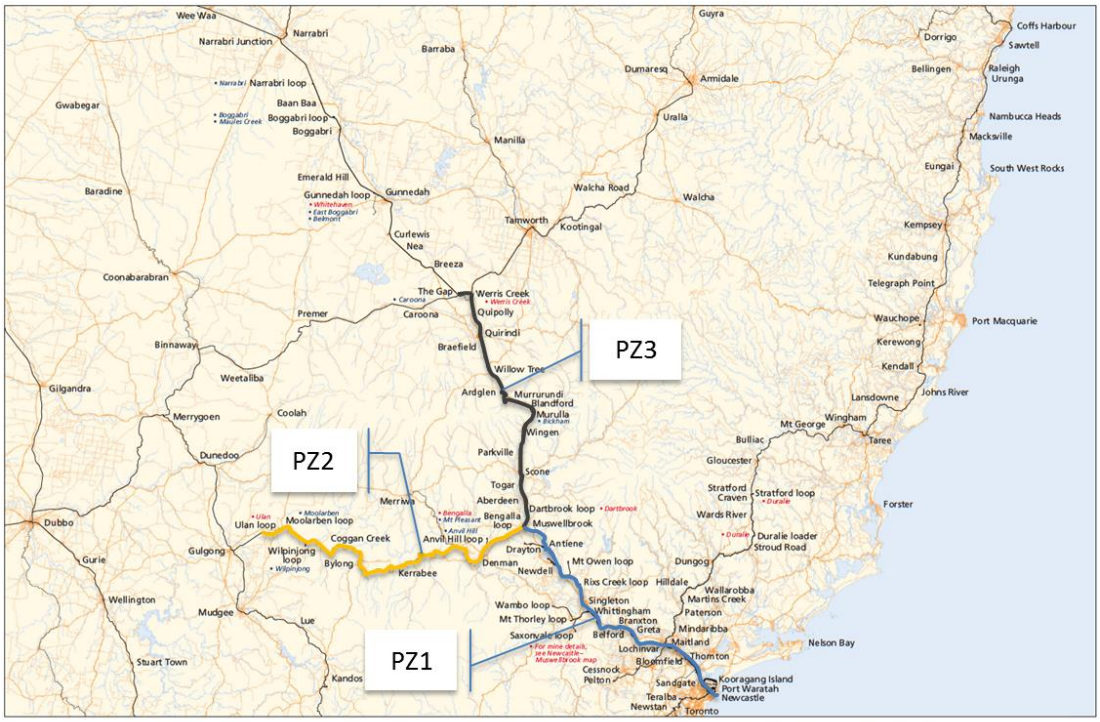


*Figure 2. The Hunter Valley coal rail network (Newcastle to Narrabri and Ulan) and other railways in the area. Existing coal mines serviced by rail loops and sidings along this network are shown in red and proposed mines are shown in blue.*

**Figure 1 Pricing Zones on the Hunter Valley rail network (map sourced from ARTC 2006-2011 Hunter Valley Corridor Capacity Strategy)**

A critical input into the calculation of the stand-alone costs of PZ1&2 users is the consideration of major capital projects. This report reviews the major capital projects which, in the report prepared for the ACCC by WIK-Consult (WIK), contributed to the calculation of PZ3 incremental costs. In the WIK report, capital projects with a total value of $777.6m were identified as having an element of PZ3 incremental cost. A share of the cost of these projects was therefore notionally allocated to PZ3, and was deducted from the PZ1/2 standalone cost. This report focusses on WIK's assessment of major capital projects to identify whether all of the projects which WIK identified as being incremental could in fact have been avoided in the absence of demand from PZ3. Projects which

would have been required in the absence of demand from PZ3 form part of the PZ1&2 standalone cost and should not be notionally allocated between PZ1/2 and PZ3.

## E.1 The brief and our response

Idemitsu's brief to Lunarr Advisory (LA) and The Simulation Group was to:

"Review the Major CAPEX projects that are identified by WIK and assess whether any of these projects would have been required on a stand-alone basis for PZ1&2 access holders (that is, in the absence of demand from PZ3) to inform Idemitsu's response to the ACCC's draft determination assessing ARTC's compliance with the HVAU in 2013."

In responding to this work, LA and The Simulation Group:

- constrained the analysis to projects of value greater than $10m as these make up 98% of the total set of relevant projects for 2013.
- utilised capacity and demand data available from a desk-top study of available reports, and did not independently conduct any capacity analysis or modeling.

## E.2 The approach

A series of approaches were considered to determine which projects should be considered as not stand-alone for the PZ1&2 access holders. Ultimately it was determined that no particular approach was ideal and that given the various strengths and weaknesses associated with each approach a multi-faceted technique had the most merit. This involved looking at each project from a range of angles (one qualitative, three quantitative) to take a view, on balance, based on the outcomes of all these approaches as to whether the project should be considered as stand-alone.

At least equal merit was placed on the single qualitative (written evidence based) approach against the combination of all three of the quantitative approaches. Given the binary yes/no nature of the quantitative approaches and the issues associated with each, relying on a single quantitative approach to lead to a recommendation was not considered to be prudent.

The various approaches are summarised in Table 1 below.

| Method | | Test of PZ1/2 stand alone |
|---|---|---|
| Qualitative Assessment | | Expert view of the drivers for the project, based on a review of project documentation, indicates that the project was not predominantly driven by demand. This indicates that the project would have proceeded in the absence of PZ3. |
| Quantitative assessments | Trigger project basis | Forecast PZ1&2 demand for the year of project completion, as forecast at the time of project commitment, exceeds forecast capacity in the absence of the project. |
| | Actual Use basis | Actual PZ1&2 volumes at time of ceiling test (in this case, 2013) exceeds capacity in the absence of the project |
| | Expected Use basis | Forecast PZ1&2 demand at time of ceiling test (in this case, 2013), as forecast at the time of project commitment, exceeds capacity in the absence of the project. |

Table 1 Summary of assessment approaches

## E.3 The outcomes

The multi-faceted approach utilised in this assessment and shown in Table 2 below identified that all but one of the nine major capital projects assessed were likely to have been required to support PZ1/2 demand in the absence of demand from PZ3.

Note that this analysis did not include a series of projects of value less than $10m, which together total $13.8m. No recommendation is made in this report as to whether this collection of minor projects should be considered as stand-alone to the PZ1&2 access holders or not.

In the following table, ticks indicate that a project may be a considered as an incremental demand based project, based on a specific assessment methodology, while crosses indicate that the project was required on a stand-alone basis by PZ1/2 either based on PZ1/2 demand or due to other (non-demand related) drivers.

| Projects | Value | Qualitative assessment | Trigger project basis | Actual use basis | Expected use basis | Recommended PZ3 incremental? (i.e. NOT PZ1&2 stand-alone) | Summary of recommendation |
|---|---|---|---|---|---|---|---|
| 357901 - Antiene to Grasstree Stage 1 duplication - 0961 | $42.7 | ✔ | ✖ | ✖ | ✖ | ✖ | Duplication of single track is often predominantly conducted to improve capacity and there is also strong evidence in the documentation that this project was demand driven.<br><br>However PZ1&2 demand alone for all approaches was consistently higher than the documented capacity of the line section without the project. |
| 388401 - St Helliers to Muswellbrook Duplication | $31.4 | ✖ | ✖ | ✖ | ✔ | ✖ | The documentation clearly states that duplication of this section provides capacity well in excess of demand requirements but that cost synergies with Antiene to Grasstree Stage 1 duplication (above) warrant this project.<br><br>This position is backed up by 2 of the 3 quantitative approaches confirming that total demand was less than capacity without the project |
| 6928 - Drayton Junction Upgrade (Capital) | $19.9 | ✖ | ✖ | ✖ | ✖ | ✖ | There is sufficient evidence in the documentation that this project is predominantly an asset renewal (non-growth) project and to the extent that it would also support longer term growth than the project rationale focuses on the growth requirements of producers on the Drayton branch (PZ1 producers).<br><br>All three quantitative approaches reinforce that the project would still have been required on a stand-alone basis for the PZ1&2 producers. |
| 346801 - Newdell Junction Upgrade | $15.7 | ✖ | - | ✔ | ✖ | ✖ | As per Drayton Junction there is good evidence in the documentation that the immediate major driver for this project is for asset renewal (non-growth) to improve reliability and maintainability rather than capacity. Where the project does provide capacity benefits, these are much more significant for the PZ1 branch line producers.<br><br>The quantitative analysis is mixed, providing no clear position on whether the project should be considered PZ1&2 stand-alone or not.<br><br>Allocation of this project is marginal but considered PZ1&2 stand-alone taking into account similarities with Drayton Junction upgrade project. |
| 5811 - Nundah Third Track - All Phases | $77.8 | ✔ | - | ✖ | ✔ | ✔ | Clearly a demand driven project aimed at improving headways on capacity constraining location (Nundah Bank), generally reinforced by quantative analysis. |

| Projects | Value | Qualitative assessment | Trigger project basis | Actual use basis | Expected use basis | Recommended PZ3 incremental? (i.e. NOT PZ1&2 stand-alone) | Summary of recommendation |
|---|---|---|---|---|---|---|---|
| 358401 - Bi-Dir signalling Maitland to Branxton - 946/947 | $45.9 | ✖ | ✖ | ✖ | ✖ | ✖ | Strong evidence in documentation that the major driver for this project is improved maintenance rather than capacity and is therefore stand-alone.<br><br>All quantative approaches indetify that PZ1&2 demand was consistently higher than the documented capacity of the line section without the project in any case. |
| 3585 - Maitland to Minimbah Third Road – Stage 1 – All Phases | $146.4 | ✔ | ✖ | ✖ | ✖ | ✖ | Clearly a demand driven project aimed at improving headways on the capacity constraining Minimbah Bank.<br><br>However, all quantative approaches show that PZ1&2 demand alone was well in excess of documented capacity without the project and hence project is stand-alone. |
| 5255 - Maitland to Minimbah Third Road – Stage 2 – All Phases | $353.2 | ✖ | ✖ | - | ✖ | ✖ | Strong evidence that the primary driver for this project was to reduce maintenance impacts and the increase the operational flexibility of the network.<br><br>Reinforced by 2 of 3 quantative approaches identifying that PZ1&2 demand is sufficient to drive the project in any case. |
| 8665 - No.3 Departure Road at KCT | $30.8 | ✖ | ✖ | ✖ | ✖ | ✖ | Good evidence that the project was essentially a supply-chain efficiency improving initiative not directly linked to supporting demand.<br><br>Reinforced by the quantitative analysis where all three approaches identify that there was insufficient demand to cause the project. |
| Other Projects of value < $10m | $13.8 | Not assessed | | | | | |
| **TOTAL** | $777.6 | | | | | | |

Table 2 Summary of assessment of whether projects are standalone to the PZ1&2 access holders

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# 1 Background

In October 2015 the Australian Competition and Consumer Commission (ACCC) released a draft determination assessing the Australian Rail Track Corporation's (ARTC's) compliance with the Hunter Valley Access Undertaking financial model for the 2013 calendar year.

ACCC's determination recommended some adjustments to the application of the 'ceiling limit test' within the HVAU financial model. These adjustments were required because the ACCC considered that some access holders were being asked to pay more than their standalone costs.

Clause 4.3 (a) of the Hunter Valley Coal Network Access Undertaking (23 June 2011) states:

"In relation to Segments identified as forming part of Pricing Zone 1 and 2 in Schedule E, Access revenue from any Access Holder, or group of Access Holders must not exceed the Economic Cost of those Segments which are required on a stand alone basis for the Access Holder or group of Access Holders ("Ceiling Limit")."

ACCC's recommended adjustment to ARTC's application of the ceiling limit test relates to the calculation of access revenue applied to Access Holders from Pricing Zones 1 (PZ1) and Pricing Zone 2 (PZ2) of the Hunter Valley (HV) network (see Appendix A for a map of these pricing zones.)

To assess compliance against this clause for this portion of the network, ARTC calculates the economic cost of the portion of the network within pricing zone 1 and 2 on a stand-alone basis and compares this against the access revenue from the access holders within this zone. ARTC identified that the economic cost exceeded the access revenue by $19,602,862 in 2013 for this portion of the network. ACCC's separate calculation to inform their draft determination identified that the short-fall was $7,517,892.

# 2 Summary of the aspects of the ACCC determination relating to this work

The ACCC determination dated 30 October includes the following high-level summary of the determination:

> "The Australian Competition and Consumer Commission (ACCC) has conducted an assessment of the Australian Rail Track Corporation's (ARTC's) compliance with the financial model in the Hunter Valley Coal Network Access Undertaking (HVAU) for the period 1 January 2013 to 31 December 2013 (the 2013 calendar year). The ACCC's Draft Determination is that ARTC has:
>
> - Demonstrated the prudency of its net capital expenditure and has rolled forward the amount into its regulatory value of assets in accordance with the HVAU financial model, subject to correction of an error related to disposals.
> - Demonstrated the efficiency of the majority of its operating expenditure that informs its revenue allowance in accordance with the HVAU financial model, with some further information required from ARTC before the ACCC can form a view on the remaining expenditure.
> - Not complied with respect to its application of the ceiling limit test in the HVAU financial model because some Access Holders are being asked to pay more than their standalone costs.
>
> The ACCC is now seeking submissions from interested parties on any aspect of this Draft Determination by 27 November 2015. Details on how to make a submission are provided in chapter 1."

It is dot-point three of the above summary that is the consideration of this report.

The view taken by the ACCC on standalone costs was informed by an assessment of these stand-alone costs conducted by WIK-Consult (WIK). WIK is an economic consultancy firm based in Germany.

WIK performed an assessment of the standalone costs associated with the PZ1 and PZ2 access holders and identified that these standalone costs were equal to $285,447,550 in 2013, compared to ARTC's estimate of $297,532,519.

The impact of this assessment is summarised in the following table extracted from the ACCC determination. Note that Constrained Network refers to the PZ1 and PZ2 portion of the network.

| 2013 | ARTC ($) | WIK ($) |
|---|---|---|
| **Total efficient costs of the Constrained Network (including direct costs associated with PZ3 producers)** | 300 030 434* | 300 030 434* |
| **less direct costs associated with PZ3 producers** | 2 497 914 | |
| **less incremental costs associated with PZ3 producers** | | 14 582 884 |
| **Costs of the Constrained Network to be recovered from Constrained Coal Customers** | 297 532 519 | 285 447 550 |
| **Revenue received from Constrained Coal Customers** | 277 929 657 | 277 929 657 |
| **Shortfall in revenue from Constrained Coal Customers** | 19 602 862 | 7 517 892 |

* As previously noted, this figure is subject to change due to revisions related to prudency of capital expenditure.

# 3 Scope of this assessment

## 3.1 The Brief

Idemitsu's brief to Lunarr Advisory and The Simulation Group was to:

"Review the Major CAPEX projects that are identified by WIK and assess whether any of these projects would have been required on a stand-alone basis for PZ1&2 access holders (that is, in the absence of demand from PZ3) to inform Idemitsu's response to the ACCC's draft determination assessing ARTC's compliance with the HVAU in 2013. "

## 3.2 Our response to the brief

This study is not intended to provide a recommendation on all of the stand-alone costs for the PZ1 and PZ2 access holders on the HV network. This report uses a range of approaches to take a view on an important contributor to these stand-alone costs; that is the major capital projects within the PZ1 portion of the HV network (the portion used by all three sets of access holders).

### 3.2.1 Components of PZ1&2 stand-alone costs

As discussed in Section 2, in June 2015 the ACCC commissioned WIK Consult to review ARTC's annual compliance submission as provided under Section 4.10 of the Hunter Valley Access Undertaking (HVAU) for the 2013 calendar year, particularly the approach used by ARTC to allocate its costs between the different Pricing Zones (PZ) of its Hunter Valley rail network. The outcomes of this work were summarised in a report entitled "Assessment of the Incremental Costs of Pricing Zone 3 Access Holders' Use of Pricing Zone 1 and 2 of the Australian Rail Track Corporation's Hunter Valley Rail Network" in September 2015. This report shall be referred to as 'The WIK Report' throughout this document.

The WIK Report refers to the following relevant clauses of the HVAU:

**4.2 Floor Revenue Limits**

(a) Access revenue from every Access Holder must at least meet the Direct Cost imposed by that Access Holder.

(b) For each Segment or group of Segments, Access revenue from Access Holders should, as an objective, meet the Incremental Cost of those Segments ("**Floor Limit**").

**4.3 Ceiling Revenue Limits**

(a) In relation to Segments identified as forming part of Pricing Zone 1 and 2 in Schedule E, Access revenue from any Access Holder, or group of Access Holders must not exceed the Economic Cost of those Segments which are required on a stand alone basis for the Access Holder or group of Access Holders ("**Ceiling Limit**").

The WIK Report estimates PZ3 incremental costs. These incremental costs are subtracted from the total costs of the PZ1&2 portion of the Hunter Valley network to arrive at an estimate for the stand-alone cost for PZ1&2 Access Holders (PZ1&2 Ceiling Limit). This may not represent the true economic cost for the PZ1&2 network on a stand-alone basis which is the subject of this report.

The WIK report divided PZ3 incremental costs into four main components as shown in Figure 2 below.

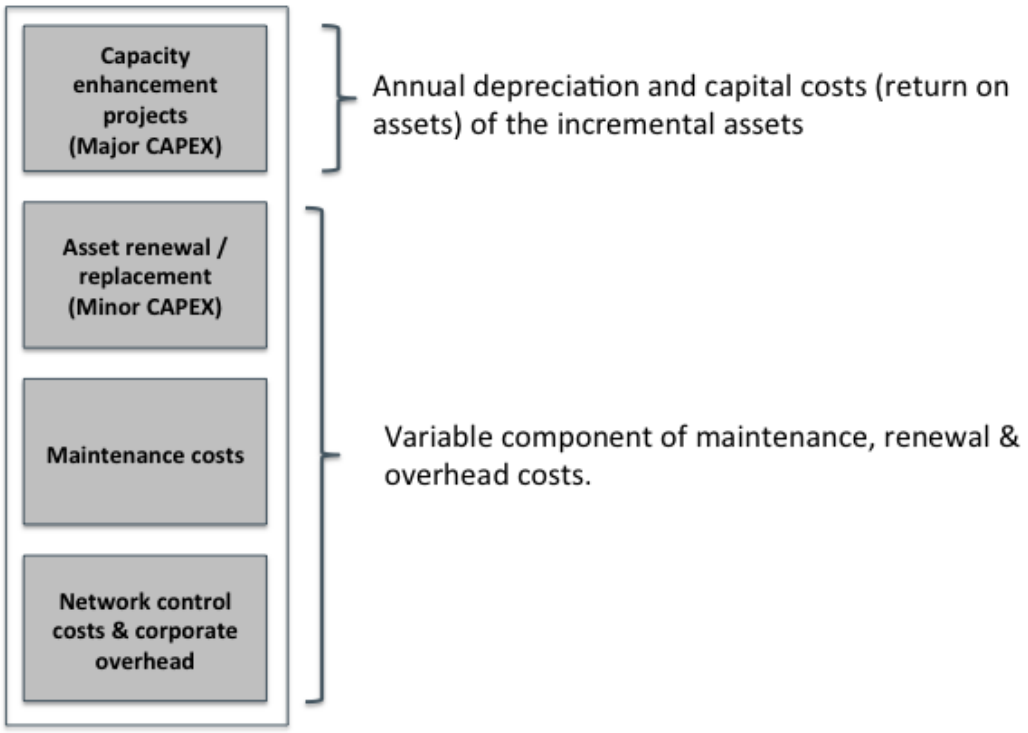


**Figure 2 Breakdown of PZ3 Incremental costs in WIK analysis**

### 3.2.2 Constrained to the Major CAPEX portion of incremental costs

ACCC provided Idemitsu with some summary data used by WIK for the calculation of these incremental costs. Based on this summary data an estimate was conducted of the relative contribution of each of the above components on the overall PZ3 incremental cost. This contribution is shown in Figure 3 below.

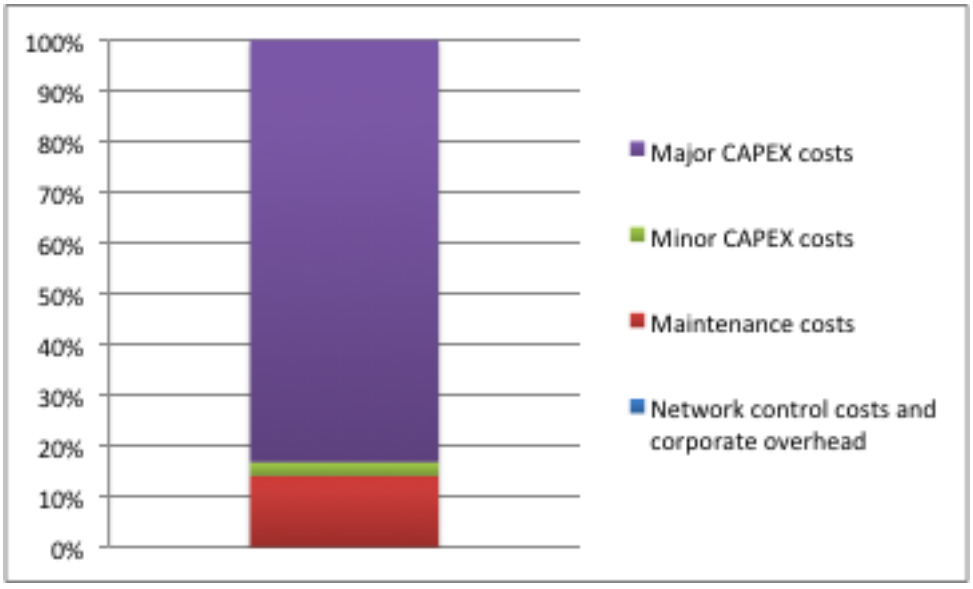


**Figure 3 Estimated contribution of each component of PZ3 incremental costs**

The estimate determined that the Major CAPEX projects make up approximately 80% of WIK's overall estimate of the incremental costs. As such, the decision was made that this technical assessment will focus on the Major CAPEX portion of the PZ3 incremental cost estimate.

### 3.2.3 Constrained to projects of value greater than $10m

The WIK Report identifies 27 relevant projects that contribute towards PZ3 incremental costs in the 2013 calendar year. An analysis was conducted which identified that there are a number of projects of very small value and that many of the projects were actually stages of the same project. Overall 98% of the total capital cost for the 27 relevant projects was covered by the 9 projects of value greater than $10 million. The results of this analysis are shown in Figure 4 below.

As such in the interests of time and efficiency, this analysis was also constrained to projects of value greater than $10m.

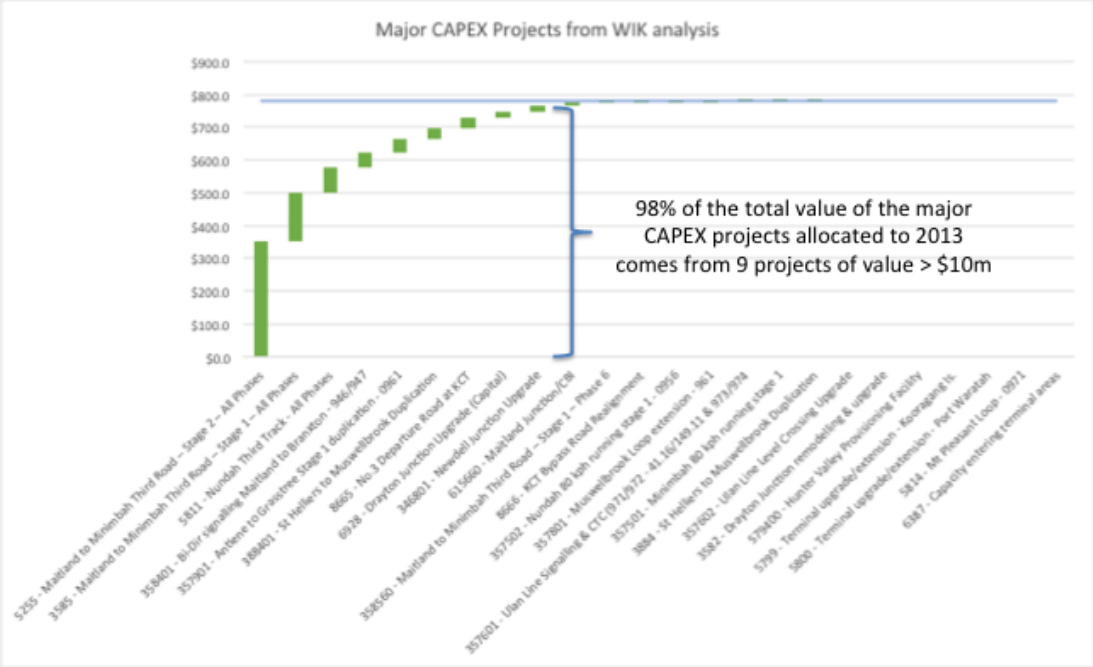


**Figure 4 Waterfall diagram of Major CAPEX projects in the WIK model**

A map showing the location, cost and delivery date of these projects is shown in Appendix B.

### 3.2.4 Identification of projects within the PZ1 portion of the HV network that are not PZ1&2 stand-alone

The Ceiling Limit in the HVAU requires that "access revenue from any access holder or group of access holders must not exceed the economic cost of those segments, which are required on a stand-alone basis for the access holders or group of access holders".

The determination of incremental costs for PZ3 is the mechanism employed by ARTC to determine this Ceiling Limit for PZ1&2 (i.e. the stand-alone cost for PZ1&2 is assumed to be the full costs of the PZ1&2 portion of the network minus the PZ3 incremental costs).

Under this approach the major CAPEX projects considered to be part of the PZ3 incremental costs should not include any projects, which are required by PZ1&2 on a stand-alone basis. As such, the focus of this analysis and this report is on identifying those projects which were included within the WIK analysis but which would have been required by PZ1&2 on a stand-alone basis within the PZ1 portion of the HV network.

The PZ1 portion of the network is the only section utilised by all three access holders and hence the area of contention.

### 3.2.5 Assessment based on demand zones

This assessment was conducted by segmenting the section of the network under consideration (the PZ1 section from Muswellbrook to the Newcastle Ports) into demand 'zones'. Each zone represents an area of differing tonnage demand (i.e. the boundaries of the zone occur when additional demand is introduced on to the main trunk corridor through a branch line).

This zoned approach is required as firstly any capacity benefit attributable to a project must be matched to the demand that requires that capacity in order for the demand to be met. Capacity provided in one section of the network will not be beneficial to demand in another section of the network if that demand does not pass through the section in which the capacity is provided.

Secondly if a project provides an uplift in capacity, this is of no benefit if the same level of demand must pass through a location where the capacity remains lower than that provided by the project (i.e. if there remains a bottle-neck of lower capacity that the same level of demand must pass through).

The projects were then grouped into each of these segments and for the quantitative analysis considered within the context of this zone. For example:

1. Existing capacity of Zone 1 commences at 50 MTPA, then Project A increases capacity by 20 MTPA, then Project B elsewhere within the same zone addresses the next most significant bottle-neck, increasing capacity by a further 10 MTPA. The capacity of the zone increases from 50 to 70 to 80 MTPA.
2. Project C which increases capacity in Zone 2 has no impact on capacity within Zone 1.
3. Project D which is within Zone 1 increases the capacity of a different section of Zone 1 from 100 MTPA to 115 MTPA. The capacity of Zone 1 remains at 80 MTPA.

The demand zones that were utilised for this analysis are shown in Figure 5 below.

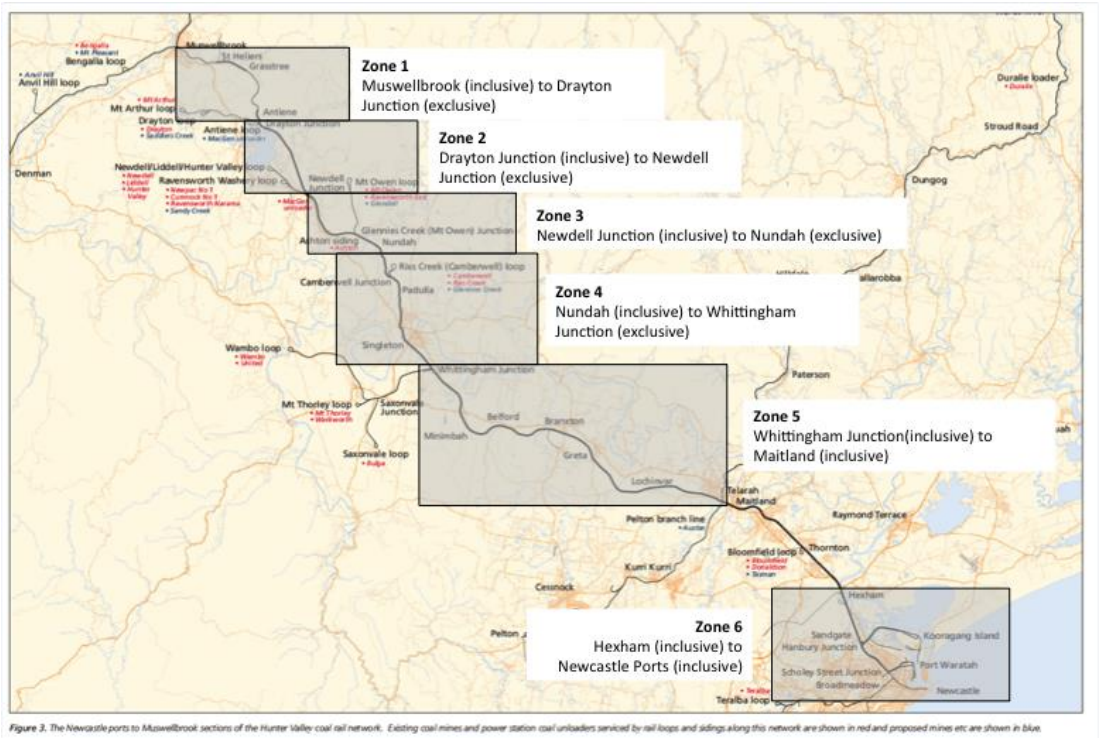


Figure 5 Demand and capacity zones used for quantitative analyses

### 3.2.6 Based on a desk-top study of available reports, not capacity modelling

This analysis was based upon a comprehensive review of available information from ARTC and other sources. However it relied fully on the analyses, forecasts, capacity estimates and rationales described in these documents. An independent assessment of capacity or demand was not conducted as part of this work.

Information relied upon in this report includes:

- Hunter Valley Corridor Capacity Studies
- ARTC annual reports
- HVCCC Master Plans
- Project Assessment and Project Approval reports submitted to the Rail Capacity Group (RCG)
- RCG Monthly reports
- ARTC HVAU annual compliance statements
- ACCC determinations and associated submissions

Note that in some cases, conflicting estimates of capacity provided by projects or demand occur between the source documents. In these cases, the most relevant document was chosen as the over-riding source. For example, the document closest to the time of project approval was used to determine the coal tonnage demand that the approval was based upon.

A full list of evidence used for this analysis is included in Appendix C.

# 4 Considerations in determining stand-alone projects

Determining a set of stand-alone projects for the PZ1 portion of the Hunter Valley network is highly complex. There are a range of often conflicting considerations influencing the result, including the following:

- **Project allocations should be on a stand-alone basis.** In accordance with the economic principals, a project should only be allocated to a group of access holders if that project is required to support the demand of those access holders. If a project would not have existed with only the demand from those access holders on the network (not stand-alone) then those access holders should not be attributed the cost of that project.
- **Rail capacity often comes in large increments.** The capacity of the rail system can be driven by a relatively low number of 'bottle-necks' (e.g. a critical single line section, a constraining headway where trains are travelling slowly up a steep grade). Removing or relieving these bottlenecks (eg. Duplicating track, reducing grades or providing additional tracks up steep grades) can create a step change increase in capacity.

  If a network is operating at, or near it's capacity limit as dictated by a single bottleneck, then a relatively small increase in demand can drive the need for a large project to relieve this bottleneck. Once conducted, this project can then provide a significant step change in capacity. It may not be appropriate to allocate the full cost of the project and all of the incremental capacity to the access holder that caused this small increase in demand.
- **The beneficiaries of a project may differ from those that drove the need for the project**. When the business case for a project is developed, it may be driven by the forecast demand from a set of particular access holders. However, this demand may not come to fruition and demand from other producers may come to the forefront. As such, a project driven by a given need at a given time may be attributed to a set of users, however the ultimate beneficiaries of the project may differ from those upon which the rationale of project was based.
- **The perceived driver for a project can be heavily time dependent.** Whilst access holders operate within the capacity confines of the existing network the incremental cost of providing additional capacity over and above this existing capacity may not be allocated to any particular access holder. However, at some point an access holder will create demand that exceeds this existing capacity. The allocation of an access holder to this 'tipping point' is highly time dependent and may be driven more by chance than a long-term requirement for infrastructure capacity.
- **Impact of the legacy network.** The legacy network in place prior to the commencement of the HVAU may provide excess capacity in some locations and inadequate capacity in others. Access Holders utilising some sections of the network may not be allocated a cost to increase demand if their demand still sits within the capacity of the legacy network and this legacy network is considered a base-line prior to allocation of stand-alone projects. However, in other locations a small increase in demand may drive the need for a large stand-alone project.

In order to deal with these considerations, there are a number of approaches that could be taken to determine the set of PZ1&2 stand-alone projects for the Hunter Valley network.

However, there are generally trade-offs involved with any approach, where one set of considerations are well dealt with, at the expense of others. This report identifies a set of

potential approaches, discusses their acceptability taking into account the above considerations and makes a recommendation on the set of PZ1&2 stand-alone projects based upon a combination of all of the approaches.

# 5 The WIK approach

### 5.1.1 Description of approach

WIK considered that major capital projects (Major CAPEX) are "almost all asset enhancement driven projects propelled by the need for a higher network capacity due to higher transport volumes needed". They also considered that projects predominantly focussed on maintenance efficiencies increase operational flexibility and are therefore also a form of capacity enhancement.

WIK's assessment is that projects are generally not required in the case of no increase of traffic volume and so are generally 100% volume related, hence incremental.

Gross Tonne Kilometres (GTK) was used as main parameter to allocate costs rather than Train km as some major CAPEX investments increase capacity by increasing volumes rather than the number of trains (e.g. increase of axle load, increase of length of trains).

In general, the WIK approach while detailed in terms of the calculations to allocate incremental cost was governed by a very high-level view around project allocations to access holders, that being that all projects are required by all access holders.

### 5.1.2 Allocation of incremental projects for this approach

As all projects were allocated as being incremental in nature by WIK, the total of non-standalone projects was all of those of relevance to the 2013 ceiling test. Note however that this included only investments since 2008 due to limitations in the data available as noted by WIK in their report. The total value of all the projects considered by WIK as not PZ1&2 stand-alone was $777.6m.

Table 3 below shows the set of projects that were allocated as PZ3 incremental projects (and hence not a stand-alone PZ1&2 project) using the WIK approach.

| Projects that are not PZ1&2 stand-alone | Capital Cost ($m) |
|---|---|
| 5255 - Maitland to Minimbah Third Road - Stage 2 - All Phases | $353.2m |
| 3585 - Maitland to Minimbah Third Road - Stage 1 - All Phases | $146.4m |
| 5811 - Nundah Third Track - All Phases | $77.8m |
| 358401 - Bi-Dir signalling Maitland to Branxton - 946/947 | $45.9m |
| 357901 - Antiene to Grasstree Stage 1 duplication - 0961 | $42.7m |
| 388401 - St Helliers to Muswellbrook Duplication | $31.4 |
| 8665 - No.3 Departure Road at KCT | $30.8m |
| 6928 - Drayton Junction Upgrade (Capital) | $19.9m |
| 346801 - Newdell Junction Upgrade | $15.7m |
| 615660 - Maitland Junction/CBI | $9.8m |
| 358560 - Maitland to Minimbah Third Road - Stage 1 - Phase 6 | $1.9m |
| 8666 - KCT Bypass Road Realignment | $1.4m |
| 357502 - Nundah 80 kph running stage 1 - 0956 | $0.3m |

| | |
|---|---|
| 357801 - Muswellbrook Loop extension - 961 | $0.2m |
| 357601 - Ulan Line Signalling & CTC | $0.2m |
| 357501 - Minimbah 80 kph running stage 1 | <$0.1m |
| 3884 - St Helliers to Muswellbrook Duplication | <$0.1m |
| 357602 - Ulan Line Level Crossing Upgrade | <$0.1m |
| 3582 - Drayton Junction remodelling & upgrade<br>358200 - Drayton Junction remodelling & upgrade | <$0.1m |
| 579400 - Hunter Valley Provisioning Facility | <$0.1m |
| 5799 - Terminal upgrade/extension - Kooragang Is. | <$0.1m |
| 5800 - Terminal upgrade/extension - Port Waratah | <$0.1m |
| 5814 - Mt Pleasant Loop - 0971 | <$0.1m |
| 6387 - Capacity entering terminal areas | <$0.1m |
| Total | $777.6m |

**Table 3 Set of incremental PZ3 projects using WIK approach**

### 5.1.3 Benefits of this approach

The WIK approach employs a straight-forward view of project accountability, which is that most projects are required by all access holders (unless clearly for a segment of the network not utilised by an access holder) and are of benefit to all users of that segment of the network.

The WIK approach takes a long-term approach to project allocation in that it takes the view that all projects are of long-term benefit to all applicable access holders and hence should be allocated across all applicable access holders.

### 5.1.4 Issues with this approach

WIK identified in their report that the economic concept of Total Service Long Run Incremental Cost (TSLRIC) measures the difference in cost between producing a service and not producing it. It also discusses how this is consistent with approaches used by the ACCC in other industries, quoting the ACCC statements in postal regulation: "Another way of considering incremental cost is to ask what costs would be avoided, in the long run, if the service were no longer offered."

The interpretation of this definition in the context of this assessment, is that the projects that should be attributable to PZ3 access holders as incremental PZ3 projects are the projects that could be avoided if the PZ3 access holders did not offer services on the network.

The WIK analysis does not identify which projects could be avoided in this instance and therefore does not appear to adequately identify the economic cost of PZ1&2 access holders on a stand-alone basis as per Clause 4.3 (a) of the HVAU.

# 6 The approach adopted for this study

## 6.1 Combining various approaches

A series of approaches were considered to determine which projects should be considered as stand-alone for the PZ1&2 access holders. Ultimately it was determined that no particular approach was ideal and that given the various strengths and weaknesses associated with each approach a multi-faceted technique had the most merit. This involved looking at the project from a range of angles (one qualitative, three quantitative) to take a view, on balance, based on the outcomes of all these approaches as to whether the project should be considered as stand-alone.

At least equal merit was placed on the single qualitative (written evidence based) approach against the combination of all three of the quantitative approaches. Given the binary yes/no nature of the quantitative approaches and the issues associated with each, relying on a single quantitative approach to lead to a recommendation was not considered to be prudent.

The various approaches are summarised in Table 4 below.

| Method | | Test of PZ1/2 stand alone |
|---|---|---|
| Qualitative Assessment | | Expert view of the drivers for the project, based on a review of project documentation, indicates that the project was not predominantly driven by demand. This indicates that the project would have proceeded in the absence of PZ3. |
| Quantitative assessments | Trigger project basis | Forecast PZ1/2 demand for the year of project completion, as forecast at the time of project commitment, exceeds forecast capacity in the absence of the project. |
| | Actual Use basis | Actual PZ1/2 volumes at time of ceiling test exceeds capacity in the absence of the project |
| | Expected Use basis | Forecast PZ1/2 demand for the year of assessment (in this case, 2013), as forecast at the time of project commitment, exceeds capacity in the absence of the project. |

Table 4 Summary of assessment approaches

## 6.2 Qualitative approach

### 6.2.1 Description of the approach

The first approach involves a review of the documentation underpinning the planning, development and approval of a project to ascertain what the predominant driver for the project was and whether this driver leads one to consider if the project should be stand-alone or not. This is referred to as the 'qualitative assessment'.

This assessment generally considered whether a project is predominantly demand driven (i.e. it is funded based on a clear need to support additional capacity for coal tonnages) or whether the need for the project is more general (i.e. it is needed to improve maintenance or operational efficiencies or reduce system delays for the coal supply chain which may have a more indirect positive impact on capacity).

Under this approach:

- Those projects which are predominantly demand driven are not considered to be PZ1&2 standalone using this methodology alone. For these projects, quantitative methods are used to determine whether the projects are PZ1&2 standalone projects.
- Those projects which are required for more general system efficiency improvements would be considered AS stand-alone (i.e. the need for the project is not directly related to the tonnage requirement of any set of access holders and would have been built in any case if the PZ3 demand had not been present).

### 6.2.2 Benefits of this approach

The benefit of this approach is that it attempts to capture the key driver behind a project in order to determine whether a project is stand-alone. That is, when the project was approved, what did the decision makers within the governance process around the project believe the project would achieve for the supply chain. This intent or rationale for the project provides strong guidance as to whether a project should be considered as stand-alone or not, as it was on this basis that the project was funded.

### 6.2.3 Issues with this approach

The issue with this approach is that it is, of-course, at least partially subjective. To help mitigate against this subjectivity, reference is made to the source documentation to support any position taken.

## 6.3 Trigger project approach

### 6.3.1 Description of the approach

For this approach a project is considered to be PZ1&2 stand-alone if PZ1&2 forecast demand alone (as known at the time of project approval) at the time of project completion is sufficient to create the project need. Forecasts of demand at project completion from the time of the project approval are used for this assessment as this is considered the basis upon which the project was funded.

If total demand (PZ1+PZ2+PZ3) is insufficient to cause the project then the project must have been required for reasons other than just demand and, as such the project would have been required in any case as a PZ1&2 stand-alone project.

### 6.3.2 Benefits of this approach

This approach is based around the simple assumption that the project was funded on the basis of supporting the demand that was forecast to be in place when the project was due to be completed. Given this forecast demand at the time of project completion was one of the key inputs used as the basis for funding the project it should be used to determine if a project is stand-alone or not.

### 6.3.3 Issues with this approach

This approach suffers from the following issues:

- **Major beneficiary of the project may not be allocated project cost**

  Firstly, as the project is allocated to the access holders that originally caused the project, then consequential users of the capacity provided by the project are able to do so with no cost of the project allocated to them. This could lead to a situation where a major user of the capacity generated by the project is allocated no cost of the project as although their incremental demand at the time was within the existing capacity limits of the system, at a later time (once the project was approved) their demand increased significantly.

In a worst-case scenario a particular set of access users may not be allocated any cost for capacity enhancing projects as in every instance the timing of their demand may have been such that a set of users did not cause the project, but this set of users had sufficient demand after the approval of the project to become a major beneficiary of the capacity benefits provided by the project.

- **Access holder with small incremental demand may cause large project**

  Another issue with this approach is that if the system is operating at close to capacity, then a project may be allocated to a set of access holders that are responsible for only a small incremental increase in demand, even though this project provides substantially higher capacity than that required by that access holder. This allocation is enduring based on a 'snap-shot' of forecast demand at the time of the project approval.

## 6.4 Actual Use allocation

### 6.4.1 Description of the approach

Rather than attempting to allocate a project to a set of access holders using forecast demand from each set of access holders at the time of project approval, this approach assesses actual usage of capacity in the year in which the ceiling test limit is being applied to determine if a project is required on a stand-alone basis by a set of access holders or not.

This approach takes the view that no matter what rationale was used to originally fund the project; it is the actual usage of the capacity that is important in terms of allocating it to a set of access holders.

Under this method, if PZ1&2 actual demand alone is sufficient to drive the need for the project, then it is a PZ1&2 stand-alone project.

As per the Trigger Project approach, it also takes the view that if total actual demand (PZ1+PZ2+PZ3) is insufficient to cause the project then the project must be required for reasons beyond just demand and, as such the project would have been required in any case as a PZ1&2 stand-alone project.

### 6.4.2 Benefits of this approach

This approach attempts to identify if an asset is required on a stand-alone basis for a set of access holders based on the actual usage of the asset, rather than being concerned with the original rationale for the project.

This approach is also more adaptable to market conditions it does not burden an access holder with the on-going cost allocation of a project based on forecasts and market conditions which may have changed significantly since the project was conceived and approved. It allows the access holders that require a project to be re-defined based on updated market conditions and tonnages.

### 6.4.3 Issues with this approach

This approach suffers from the following issues:

- **Lack of certainty of future cost allocation**

  With this approach the allocation of a project to a set of access holders is recalculated for each compliance year. This means that there is less certainty in the on-going allocation of costs associated with major CAPEX projects into the future. This may make investment decisions for access holders more challenging.

- **Instigators of a project may not be allocated the cost of a project**

As this approach utilises actual demand rather than forecast demand, a situation could arise where a project is commissioned and funded based upon the demand of a set of access holders, but in the longer term this set of access holders are not allocated the cost of this project as this demand failed to eventuate. Other access holders therefore essentially carry some of the risk of an access holder failing to adequately utilise a project.

- **Allocation of projects as stand-alone or not can be driven by small incremental tonnages**

  As per the previous approaches, a project may be allocated to a set of access holders that are responsible for only a small incremental increase in demand, even though this project provides substantially higher capacity than that required by that access holder. However, unlike the previous approaches this allocation is re-assessed yearly rather than being set based on the forecast demand at the time of project approval.

## 6.5 Expected Use allocation

### 6.5.1 Description of the approach

This approach is a combination of the Trigger Project approach and the Actual Use approaches described above, in that it:

- Allocates projects as being stand-alone or not based on forecast tonnages not actual tonnages (as per the Trigger Project approach), but it;
- Makes the assessment based upon forecast tonnages for the year in which the ceiling test is being applied, rather than the year in which the project was planned to be implemented.

This means that rather than there being fixed allocation as for the Trigger Project approach, a project cost allocation is re-assessed every year.

This is based upon the rationale that the determination of whether a project should be stand-alone or not should be:

- Based upon the forecast tonnages at the time of project approval, rather than actual tonnages as this was the rationale for the project being funded, but;
- That this should not simply be based on the forecast tonnages that occur on the year of implementation but considered independently for each year throughout the life of the project.

### 6.5.2 Benefits of this approach

Similar to the Trigger Project approach, this approach utilises the original rationale for the project when determining if a project is stand-alone or not, but unlike these approaches, it does not consider solely the first year of the project implementation to determine this. Instead it looks at the forecast made at the time of project approval for the year in which the ceiling test limit is being assessed.

This has the benefit of considering that the rationale for a project is not simply the demand in the first year of implementation but for each year of its operation.

### 6.5.3 Issues with this approach

This approach suffers from the following issues:

- **Forecasts may not extend far enough into the future**

  This approach relies on forecasts made at the time of project approval for the year in which the ceiling limit test is being assessed. Whilst forecast data was available for

2013 for all of the projects under consideration from the year in which the approval was made, in later years this will not always be the case. When the end of the forecast period is reached, an agreed proxy will need to be used such as the last year of the forecast or an average of all of the years.

- **Allocation of projects as stand-alone or not can be driven by small incremental tonnages**

  As per all of the previous approaches, a project may be allocated to a set of access holders that are responsible for only a small incremental increase in demand, even though this project provides substantially higher capacity than that required by that access holder. However, this allocation is updated yearly based on the updated forecast demand for that year rather than being fixed.

# 7 Analysis of candidate projects

## 7.1 Antiene to Grasstree Stage 1 duplication

The Antiene to Grasstree Stage 1 duplication project was one of two projects aimed resolving a key capacity constraint in the PZ1 portion of the network, that is the two single line sections between Antiene and Muswellbrook.

### 7.1.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

Single line sections:

- create a significant capacity constraint in railways as trains travelling in both directions must utilise the same track.
- cause scheduling constraints as the schedule for trains travelling in one direction must be designed taking into account the schedule for trains in the other direction.
- cause system reliability issues as any delay to a train travelling in one direction is likely to be transferred to trains travelling in the other direction.

In the case of the Antiene to Grasstree Stage 1 duplication project, the primary rationale for the project was to improve capacity. The Antiene to Grasstree single-line section section was slightly longer than the single-line section between St. Heliers and Muswellbrook and so was the governing bottleneck in this zone of the network.

Within the Hunter Valley Corridor 2007–2012 Capacity Strategy in introducing the project the statement is made "The capacity of these single track sections is significantly lower than the capacity of the rest of the Newcastle–Muswellbrook line, and well below the demands forecast within the next five years as a result of new mine developments along the Ulan line (see Chapter 7) and the Muswellbrook–Werris Creek–Narrabri lines (see Chapter 8)."[1]

This is clear evidence that this project was predominantly driven by demand and that a driver for the project could be either PZ2 or PZ3 demand, or a combination of both.

The qualitative analysis therefore demonstrates that this project is a candidate for being a **non-standalone PZ1&2** project.

**Quantitative analyses**

For each of the three quantitative approaches, the demand from the combination of PZ1&2 producers was sufficient to drive the project. The estimated capacity of this zone of the network prior to the project was 35 MTPA. The demand from PZ1&2 ranged from 50 – 83 MTPA depending on the approach. This analysis demonstrates that whilst the broad rationale for the project was predominantly the increased tonnages resulting from PZ2 and PZ3 producers, in practice the total tonnages from PZ2 and PZ1 alone were sufficient to drive the need for the project.

Table 5 is a summary of the analysis carried out on Antiene to Grasstree Stage 1 Duplication.

[1] P.18 of 2007-2012 Hunter Valley Corridor Capacity Strategy

### *Antiene to Grasstree Stage 1 duplication*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $42.7 | 2007 | 2008 | 2009 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 1 | 35 | 65 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| Whilst duplication of track can provide significant benefits in system reliability and efficiency it is generally predominantly done to provide an increase in capacity (and this is reinforced in the documentation for this project). As the project is there to support demand, it may not be required on a stand-alone basis. | Candidate for incremental project? |
| | Yes |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 50 | Yes | 40 | Yes | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 55 | Yes | 40 | Yes | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 83 | Yes | 46 | Yes | No |

**Table 5 Summary of analysis for Antiene to Grasstree Stage 1 Duplication**

### 7.1.2 Summary of outcome

In summary the Antiene to Grasstree Stage 1 Duplication project is considered to be stand-alone to the PZ1&2 producers.

This is because whilst this project was predominantly driven by demand and this demand was seen as coming from PZ2 and PZ3 producers, there is strong evidence from the quantitative analysis (all 3 approaches) that demand from PZ1 and PZ2 alone was sufficient to cause the project.

## 7.2 St Helliers to Muswellbrook Duplication

The St Helliers to Muswellbrook Duplication project was the second of two projects aimed resolving a key capacity constraint in the PZ1 portion of the network, that is the single line sections between Antiene and Muswellbrook.

### 7.2.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

As described above, the primary rationale for these projects was to support demand. However, as the single-line section between Antiene and Grasstree was longer than that between St Helliers to Muswellbrook it is the Antiene and Grasstree section which is the governing capacity bottle-neck in this zone of the network.

There is substantial discussion in the documentation on whether the duplications in this zone should be staged (i.e. only the Antiene to Grasstree section done) to provide some capacity benefit or whether the whole section should be duplicated to provide a much more substantial benefit.

In this discussion it is acknowledged that full duplication would provide greater capacity than needed. Within the Hunter Valley Corridor 2006–2011 Capacity Strategy the statement is made "The full duplication option would technically provide a jump in capacity from the current nominal 35 mtpa to about 120 mtpa, making the limiting constraints the limited capacities of the Ulan and Werris Creek/Gunnedah lines."[2]. 120 MTPA was well in excess of the forecast demand for that section of the network. The same strategy forecast 90 MTPA by 2015 in that section.[3]

The decision to implement this project was essentially based on construction cost efficiencies, mainly the avoided demobilisation/mobilisation costs and increased economies of scale.

The 2007–2012 Hunter Valley Corridor Capacity Strategy says "The choice between a staged approach and full duplication as a single project essentially depends on their costs, with the savings achieved by delaying expenditure being offset by the additional construction costs of fragmented projects with greater mobilisation costs and fewer economies of scale."

"ARTC is therefore proceeding with the full duplication as a single but staged project. It will, however, continue to monitor the timing gap and relative costs of the two approaches, to ensure the lowest cost solution is ultimately adopted. "[4]

There is therefore good evidence that the decision to proceed with this project was not predominantly driven by demand but by project construction efficiencies associated with another project. Once the decision had been made to construct the 'sister' project (the Antiene to Grasstree Stage 1 duplication as described in 7.1), it is therefore likely that this project would have been implemented independent of demand.

As the previous analysis determined that the Antiene to Grasstree Stage 1 duplication is a PZ1&2 stand-alone project, the qualitative analysis does not consider this to be a candidate for being a PZ3 incremental project.

**Quantitative analyses**

The quantitative analysis generally reinforces the view taken in the qualitative analysis above that the project was not driven by demand. 2 of the 3 analytical approaches identified that total demand (PZ1,PZ2 & PZ3) was less than the capacity of that section of the network without the project. The only approach that identified that PZ3 demand would drive the need for the project was the Expected Use basis, showing that by 2013 it was expected that the capacity benefits of the project would begin to be utilised, but this demand did not eventuate.

Table 6 is a summary of the analysis carried out on St Helliers to Muswellbrook Duplication.

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[2] p.22 of 2006-2011 Hunter Valley Corridor Capacity Strategy
[3] Figure 15, p.42 of 2006-2011 Hunter Valley Corridor Capacity Strategy
[4] p.19 2007–2012 Hunter Valley Corridor Capacity Strategy

## *St Helliers to Muswellbrook Duplication*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $31.4 | 2007 | 2008 | 2009 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 1 | 65 | 120 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| There is good evidence that the decision to proceed with this project was not predominantly driven by demand but by project construction efficiencies associated with another project. Once the decision had been made to construct the 'sister' project (the Antiene to Grasstree Stage 1 duplication), it is therefore likely that this project would have been implemented independent of demand. | Candidate for incremental project? |
| | No |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 50 | No | 40 | No | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 55 | No | 40 | No | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 83 | Yes | 46 | No | Yes |

**Table 6 Summary of analysis for St Helliers to Muswellbrook Duplication**

### 7.2.2 Summary of outcome

In summary the St Helliers to Muswellbrook Duplication project is considered to be stand-alone to the PZ1&2 producers.

There is good evidence from both the documentation and the quantitative analysis that the primary driver for this project was not demand, but cost synergies associated with nearby Antiene to Grasstree Stage 1 duplication. Once the decision had been made to construct the Antiene to Grasstree Stage 1 duplication (a PZ1&2 stand-alone project), it is therefore likely that this project would have been implemented independent of demand. As such St Heliers to Muswellbrook Duplication is also considered to be a stand-alone project.

## 7.3 Drayton Junction Upgrade

The Drayton Junction Upgrade project was a relatively low cost project ($19.9m) involving the replacement of the turn-outs and cross-overs that link the Drayton Branch line to the main trunk line between Muswellbrook and the Newcastle Ports.

### 7.3.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

The project was predominantly driven by an immediate desire to improve the performance and maintainability of these turn-outs, whilst acknowledging that this would provide some longer term capacity benefits. This is evidenced by the following statements from the 2009-2018 Hunter Valley Corridor Capacity Strategy: "Newdell and Drayton Junctions also have high maintenance turnouts, necessitating excessive track maintenance and producing additional train delays."[5] "Although the existing junctions have adequate capacity for the immediate future, renewal of the junctions is highly desirable as a way of reducing the impacts of infrastructure maintenance and reliability downtimes."[6]

The 2012-2021 Hunter Valley Corridor Capacity Strategy (the year the project was approved) reinforces that the immediate need for the upgrade of this junction is to improve maintainability, but also identifies that the upgrade will support longer term growth for PZ1 producers: "Drayton Junction has slow-speed high-maintenance turnouts rated at 40 km/h. While the main short-term issue is the unreliability, cost and possession time for maintenance of these turnouts, the significant contracted volume growth from the Drayton branch will place increasing pressure on this junction."[7]

Later in the same document under a further rationale for the project it states:" Contracted volumes from the Drayton branch are expected to increase significantly as the Mount Arthur North mine expands."[8] further emphasising that it is the growth needs of PZ1 producers that drive the longer term needs for the project.

In summary there is sufficient evidence in the documentation that this project is predominantly an asset renewal (non-growth) project and to the extent that it would also support longer term growth than the project rationale focuses on the growth requirements of producers on the Drayton branch (PZ1 producers).

As such, the qualitative analysis concludes that this is a PZ1&2 stand-alone project and is not a candidate for being an incremental project.

**Quantitative Analyses**

For the qualitative analysis, 2 of the 3 approaches (those which use forecast demand to allocate a project) identified that PZ1&2 demand alone was sufficient to drive the need for the project. The remaining (Actual Use) approach identified that there were insufficient total tonnages actually railed in the year of the assessment (2013) to cause a direct demand need for the project and as such the project would now only be warranted in terms of its reliability and maintainability benefits.

All three quantitative approaches therefore reinforce that the project would still have been required on a stand-alone basis for the PZ1&2 producers.

Table 7 is a summary of the analysis carried out on Drayton Junction Upgrade.

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[5] p.16 2009-2018 Hunter Valley Corridor Capacity Strategy
[6] p.17 2009-2018 Hunter Valley Corridor Capacity Strategy
[7] p.21 2012-2021 Hunter Valley Corridor Capacity Strategy
[8] p.23 2012-2021 Hunter Valley Corridor Capacity Strategy

### *Drayton Junction Upgrade*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $19.9 | 2012 | 2012 | 2013 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 2 | 80 | 120 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| There is sufficient evidence in the documentation that this project is predominantly an asset renewal (non-growth) project and to the extent that it would also support longer term growth than the project rationale focuses on the growth requirements of producers on the Drayton branch (PZ1 producers). | Candidate for incremental project? |
| | No |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 105 | Yes | 85 | Yes | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 70 | No | 55 | No | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 105 | Yes | 85 | Yes | No |

**Table 7 Summary of analysis for Drayton Junction Upgrade**

### 7.3.2 Summary of outcome

In summary the Drayton Junction Upgrade project is considered to be stand-alone to the PZ1&2 producers.

There is sufficient evidence in the documentation that this project is predominantly an asset renewal (non-growth) project and to the extent that it would also support longer term growth than the project rationale focuses on the growth requirements of producers on the Drayton branch (PZ1 producers).

All three quantitative approaches reinforce that the project would still have been required on a stand-alone basis for the PZ1&2 producers.

## 7.4 Newdell Junction Upgrade

This is a very similar project to the above Drayton Junction Upgrade (see Section 7.3), involving the replacement of the turn-outs and cross-overs that link the Newdell Branch

line to the main trunk line between Muswellbrook and the Newcastle Ports. It is also relatively low cost ($15.7m).

### 7.4.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

The rationale for this project is virtually the same as for Drayton Junction, in that it is required due to an immediate desire to improve the performance and maintainability of these turn-outs, whilst still providing some longer term capacity benefits.

This is clear in the 2009-2018 Hunter Valley Corridor Capacity Strategy: "**Newdell and Drayton** Junctions also have high maintenance turnouts, necessitating excessive track maintenance and producing additional train delays."[9] "Although the existing junctions have adequate capacity for the immediate future, renewal of the junctions is highly desirable as a way of reducing the impacts of infrastructure maintenance and reliability downtimes."[10]

Also as per Drayton Junction the documentation also discusses the longer term demand benefits of the junction upgrade. The 2007–2012 Hunter Valley Corridor Capacity Strategy states: "It is proposed that Newdell Junction should also be renewed with 1:18 turnouts, again raising the junction speeds for trains moving onto and off the branch line to the Ravensworth and Newdell/Liddell/Hunter Valley loops from 25 km/h to 60 km/h."[11]

There is less available evidence that where the project does provide demand benefits these benefits are largely for the branch line (PZ1) producers. The 2007–2012 Hunter Valley Corridor Capacity Strategy states: "This would reduce the junction time for a loaded train leaving the branch line from around 4½ minutes to around 2¼ minutes, thereby effectively doubling the number of branch line trains able to be handled or permitting an extra 15 northbound main line coal trains per day."[12]

This points to a significant capacity benefit for the branch line (PZ1) producers, but does also demonstrate some capacity benefit to the broader set of producers using the main trunk line (albeit for empty trains travelling back to the mine for which the network is generally less capacity constrained).

On balance, the documentation review suggests that this project is a PZ1&2 stand-alone project due to the strong similarities with the Drayton Junction upgrade project in being predominantly driven by maintainability requirements. Where the project does assist demand there is also evidence that the demand benefit is largely for the branch line (PZ1) producers.

**Quantitative Analyses**

The quantitative analysis provides mixed outcomes:

- The Trigger Project approach identifies that total forecast demand (including PZ3) was on the brink of causing the project, emphasising that the demand need may not have been strictly immediate.
- The expected forecast demand at the time of the ceiling test (2013) identified that PZ1&2 demand on a stand-alone basis would have been easily sufficient to cause the project.
- The Actual Use approach identified that PZ3 tonnages would be required to warrant the project and hence the project would not be stand-alone.

Table 8 is a summary of the analysis carried out on Newdell Junction Upgrade.

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[9] p.16 2009-2018 Hunter Valley Corridor Capacity Strategy
[10] p.17 2009-2018 Hunter Valley Corridor Capacity Strategy
[11] p.16 2007–2012 Hunter Valley Corridor Capacity Strategy
[12] p.16 2007–2012 Hunter Valley Corridor Capacity Strategy

## *Newdell Junction Upgrade*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $15.7 | 2009 | 2010 | 2011 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 3 | 90 | 120 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| On balance, the documentation review suggests that this project is a PZ1&2 stand-alone project due to the strong similarities with the Drayton Junction upgrade project in being predominantly driven by maintainability requirements. Where the project does assist demand there is also evidence that the demand benefit is largely for the branch line (PZ1) producers. | Candidate for incremental project? |
| | No |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 90 | Marginal | 72 | No | Marginal |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 100 | Yes | 85 | No | Yes |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 160 | Yes | 125 | Yes | No |

**Table 8 Summary of analysis for Newdell Junction Upgrade**

### 7.4.2 Summary of outcome

Allocation of this project is marginal but considered PZ1&2 stand-alone taking into account similarities with Drayton Junction upgrade project.

As per Drayton Junction there is good evidence in documentation that the immediate major driver for this project is for asset renewal (non-growth) to improve reliability maintainability rather than capacity. Where the project does provide capacity benefits, these are much more significant for the Newdell branch line (PZ1) producers.

The quantitative analysis is mixed, providing no clear position on whether the project should be considered PZ1&2 stand-alone or not.

## 7.5 Nundah Third Track

The Nundah third track project is aimed at resolving a key capacity constraint on the main trunk line between Muswellbrook and Maitland. This is caused by the relatively steep grades between Glennies Creek Junction and Camberwell Junction (the 'Nundah Bank')

slowing trains down thereby increasing the minimum separation between trains (the minimum headways). The Nundah Third Track provides an additional track up the steep grade allowing alternate trains to be directed to different tracks, so that following trains can be operated closer together.

### 7.5.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

There is strong evidence that this project was predominantly caused by a desire to increase capacity. The 2009-2018 Hunter Valley Corridor Capacity Strategy states "The capacity of Nundah bank is reached in Q1 2012 if there is no port capacity constraint and Q3 2012 under the assumed port capacity expansion program. However, demand is very close to capacity for 2011."[13]. The 2011-2020 Hunter Valley Corridor Capacity Strategy states "Provision of a third track will allow alternate trains to be directed to opposite tracks, effectively doubling the capacity."[14]

Given that the project is clearly aimed at improving capacity and that the demand arises from a combination of PZ1, PZ2 and PZ3 producers, this project is a candidate for being a an incremental project.

**Quantitative Analyses**

As per the previous project, the outcomes from the quantitative analysis were mixed but tend to reinforce the qualitative conclusions:

- The Trigger Project basis identified that total demand would be on the brink of capacity without the project, but that PZ3 demand would have been required to lift demand to this brink of capacity.
- The Expected Use basis identified that the forecast tonnages for 2013 made at the time would have required PZ3 tonnages to exceed capacity without the project and therefore cause the project.
- The Actual Use basis identified that actual total tonnages in 2013 would not have been sufficient to cause the project and hence the project was actually being used for purposes other than capacity improvement (provides improved reliability and maintainability) and hence would be classed as PZ1&2 stand-alone.

Table 9 is a summary of the analysis carried out on Nundah Third Track.

[13] p.13 2009-2018 Hunter Valley Corridor Capacity Strategy
[14] p.17 2011-2020 Hunter Valley Corridor Capacity Strategy

## *Nundah Third Track - All Phases*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $77.8 | 2011 | 2012 | 2013 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 4 | 140 | 200 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| There is strong evidence that this project was predominantly caused by a desire to increase capacity. | Candidate for incremental project? |
| | Yes |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 140 | Marginal | 120 | No | Marginal |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 105 | No | 90 | No | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 150 | Yes | 128 | No | Yes |

**Table 9 Summary of analysis for Nundah Third Track - All Phases**

### 7.5.2 Summary of outcome

In summary the Nundah Third Track project is considered to not be stand-alone to the PZ1&2 producers.

This is because the documentation clearly demonstrated that this is a demand driven project and the quantitative analysis generally reinforced that a combination of PZ1, PZ2 and PZ3 demand was sufficient to drive the need for the project.

## 7.6 Bi-Directional signalling Maitland to Branxton

This project converts the signalling on the tracks in this heavily trafficked section of the main corridor from uni-directional to bi-directional. This allows trains to be operated in both directions on both lines providing increased flexibility with the operating of trains through that region particularly if one track is not available either due to an asset failure or during maintenance.

### 7.6.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

There is good evidence in the documentation that the predominant driver for this project is to improve the maintainability and operability of the network and to reduce the impact of train delays and asset failures, rather than to support demand.

Firstly, the rationale for this project is described in both the 2006 and 2007 ARTC Hunter Valley Corridor Capacity Strategies under a chapter headed "Reducing maintenance impacts and increasing operational flexibility".

Within this chapter in the 2006-2011 Hunter Valley Corridor Capacity Strategy it states: "For the purpose of modelling rail network capacity, track closures for maintenance have been assumed to require the same amount of time as at present. In practice, however, there will be pressure for greater amounts of track time to be available for maintenance, because of the increased track maintenance requirements. This means it will be necessary to develop ways of increasing the amount of maintenance work able to be carried out in any given track closure time and/or to provide a further small increase in track capacity to cater for essential maintenance activities."[15]

It then goes on to say, when discussing this project and the alternative project of constructing a third track that: "For both of these options a secondary benefit would be the ability generally to recover from train or track failures more quickly than with a single track or uni-directional tracks."[16] This demonstrates the operability improvements that the project was intended to provide as well as the maintainability improvements.

The documentation does include some evidence that the project will also provide capacity benefits. In the 2007-2012 Hunter Valley Corridor Capacity Strategy it states: "Analysis of the capacity benefits of bi-directional signalling has been undertaken by both ARTC and the Hunter Valley Coal Chain Logistics Team. The analysis suggests that bi-directional signalling of the Maitland – Branxton section would deliver at least 1.5 million tonnes of capacity that will contribute directly to increasing the capacity of the entire coal chain, as it will feed trains to the port unloaders when they would otherwise be idle."[17]

The Hunter Valley Corridor Capacity Improvement Strategy from 2005 also has a table that shows a 5 MTPA capacity improvement from the project.[18]

However the modelled capacity benefits of the project are relatively minor and this is portrayed more as an ancilliary benefit to the main purpose of improving maintainability and operability.

Overall the documentation provides good evidence that the main driver for this project was to improve the maintainability and operability of the network and to reduce the impact of train delays and asset failures, not demand and is therefore a PZ1&2 stand-alone project.

**Quantitative Analyses**

All of the quantitative analysis approaches identified that PZ1&2 demand alone was sufficient to cause the project. This implies that to the extent that demand may have been a contributor to the cause of the project, it would have been driven by PZ1&2 demand alone in any case.

Table 10 is a summary of the analysis carried out on Bi-Directional signalling Maitland to Branxton project.

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[15] p.33 2006-2011 Hunter Valley Corridor Capacity Strategy
[16] p.33 2006-2011 Hunter Valley Corridor Capacity Strategy
[17] p.29 2007-2012 Hunter Valley Corridor Capacity Strategy
[18] p.34 Hunter Valley Corridor Capacity Improvement Strategy V4 24 May 2005

## *Bi-Directional signalling Maitland to Branxton*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $45.9 | 2007 | 2008 | 2009 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 5 | 85 | 90 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| Overall the documentation provides significant evidence that the main driver for this project was to improve the maintainability and operability of the network and to reduce the impact of train delays and asset failures, not demand and is therefore a PZ1&2 stand-alone project. | Candidate for incremental project? |
| | No |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 100 | Yes | 90 | Yes | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 140 | Yes | 125 | Yes | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 153 | Yes | 116 | Yes | No |

**Table 10 Summary of analysis for Bi-Directional signalling Maitland to Branxton**

### 7.6.2 Summary of outcome

In summary the Bi-Directional signalling Maitland to Branxton project is considered to be stand-alone to the PZ1&2 producers.

This is because there is good evidence in documentation that the main driver for this project was to improve the maintainability and operability of the network and to reduce the impact of train delays and asset failures, not demand.

Secondly, all the quantitative approaches identify that PZ1&2 demand is higher than the capacity of the line section without the project, which implies that to the extent that demand may have been a contributor to the cause of the project, it would have been driven by PZ1&2 demand alone in any case.

## 7.7 Maitland to Minimbah Third Road – Stage 1

The Maitland to Minimbah Third Road – Stage 1 is a similar project to the Nundah Third Track. The 'Minimbah Bank' is section of track with relatively steep grades between Whittingham Junction and Minimbah. As per the Nundah Bank, the steep grade causes trains to slow down in this region increasing the minimum separation between trains (the minimum headways). The Maitland to Minimbah Third Road – Stage 1 provides an additional track up the steep grade allowing alternate trains to be directed to different tracks, so that following trains can be operated closer together.

### 7.7.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

Similar to the Nundah Third Track project there is good evidence that the need for this project was predominantly driven by demand.

The 2009-2018 Hunter Valley Corridor Capacity Strategy states: "The current configuration on the three banks provides sufficient theoretical capacity to last until NCIG Stage 1 ramps-up to around 10 mtpa, which is assumed to be in Q2 2010. At this time the capacity of Minimbah bank will be reached. The 2007 – 2012 Strategy recommended that a third road be constructed on Minimbah bank with completion in late 2009."[19]

The new track installed by the project was also less steep (at a reduced grade of 1/100) and would climb to a lower elevation than the existing set of tracks. This provided some ancillary benefits in improving transit time and reducing fuel consumption.[20]

The 2007-2012 Hunter Valley Corridor Capacity Strategy provides some analysis of when capacity would be exceeded with or without the project and concludes: "This theoretical analysis suggests that it is necessary to act to provide additional capacity on Minimbah bank in advance of the increase in coal loader capacity in Q4 2009."[21]

Given that the project is clearly aimed at improving capacity and that the demand arises from a combination of PZ1, PZ2 and PZ3 producers, this project is a candidate for being an incremental project.

**Quantitative Analyses**

The quantitative analysis reinforced the need for the project being predominantly driven by demand as described in the documentation utilised by the qualitative analysis.

However, all three quantitative approaches also identified that demand from PZ1&2 alone exceeded the capacity of that section of the network without the project and as such the project was required on a stand-alone basis for these producers.

Table 11 is a summary of the analysis carried out on Maitland to Minimbah Third Road – Stage 1.

[19] p.13 2009-2018 Hunter Valley Corridor Capacity Strategy
[20] p.13 2009-2018 Hunter Valley Corridor Capacity Strategy
[21] p.13 2007-2012 Hunter Valley Corridor Capacity Strategy

## *Maitland to Minimbah Third Road – Stage 1*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $146.4 | 2009 | 2010 | 2011 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 5 | 90 | 140 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| Similar to the Nundah Third Track project there is good evidence that the need for this project was predominantly driven by demand. | Candidate for incremental project? |
| | Yes |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 155 | Yes | 137 | Yes | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 140 | Yes | 125 | Yes | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 215 | Yes | 182 | Yes | No |

**Table 11 Summary of analysis for Maitland to Minimbah Third Road - Stage 1**

### 7.7.2 Summary of outcome

In summary the Maitland to Minimbah Third Road – Stage 1 project is considered to be stand-alone to the PZ1&2 producers.

This is because whilst the project is clearly a demand driven project aimed at improving headways on the capacity constraining Minimbah Bank, all three quantitative approaches identified that PZ1&2 demand alone was well in excess of documented capacity without the project.

## 7.8 Maitland to Minimbah Third Road – Stage 2

The Maitland to Minimbah Third Road – Stage 2 was a major project involving the construction of a third track from Minimbah (the top of the Minimbah Bank) all of the way to Maitland - a distance of approximately 23 km.

### 7.8.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

As per the Bi-Directional signalling Maitland to Branxton project, this project is also initially described in the 2006 and 2007 ARTC Hunter Valley Corridor Capacity Strategies under a chapter headed "Reducing maintenance impacts and increasing operational flexibility" also implying that a predominant driver for this project is to improve the maintainability and operability of the network and to reduce the impact of train delays and asset failures, rather than to directly support demand.

The predominant need for this project being for reasons other than rail capacity is reinforced by:

- **The Phase 3 Project Assessment Report / Phase 4 Project Approval document[22]:**

  "The primary objective is to reduce the effects of non aligned railway maintenance between Maitland and Minimbah and other parts of the network to offset non aligned maintenance. In addition the third track aims to provide the ability to re-sequence trains between Maitland and Minimbah to improve operational performance along the route." [23]

- **The 2009-2018 Hunter Valley Corridor Capacity Strategy:**

  "A third road in the vicinity of Allandale bank is required around 2016 though the Minimbah – Maitland third road discussed in section 9 will address this constraint and is proposed for completion by early 2012 **for reasons other than pure capacity**."[24]

  "The third road will also serve to further reduce the impact of maintenance on the throughput of the port unloading facilities, as it will allow two tracks to remain open at all times. In doing so it potentially delivers benefits from a "whole-of-chain" perspective **that are not immediately identifiable as track capacity benefits.**"[25]

  "The HVCCLT has analysed this issue and suggested it would be desirable to accelerate delivery of the third road to Q1 2011. However it is not realistic to expect that construction could be completed in this timeframe due to the scope of issues involved in the project. The HVCCLT has concluded that **this will not impact total capacity** but may result in an increase in the vessel queue as a result of greater peaking than would be the case with a full third road."[26]

- **The 2011- 2020 Hunter Valley Corridor Capacity Strategy:**

  "Though this track is **technically not required for capacity purposes**, it provides the least cost method of providing incremental capacity to the network from a holistic perspective. In addition, it will provide valuable opportunities to queue and resequence trains during disruption."[27]

Whilst the predominant need for the project is clearly for maintenance and train operational purposes, there is also evidence that the project provides capacity benefits. The RCG Phase 3 Project Assessment Report / Phase 4 Project Approval document includes an analysis of the capacity benefits of the project as demonstrated through modelling[28].

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[22] This is the final submission provided to the RCG (the Rail Capacity Group – the peak governance body in approving projects to be funded) prior to funding for construction
[23] p.2 Maitland to Minimbah Third Track RCG submission to endorse the completion of Phase 3 Project Assessment, and Phase 4 Project Approval and the Phase 5 budget.
[24] p.14 2009-2018 Hunter Valley Corridor Capacity Strategy
[25] p.28 2009-2018 Hunter Valley Corridor Capacity Strategy
[26] p.29 2009-2018 Hunter Valley Corridor Capacity Strategy
[27] p.11 2011-2020 Hunter Valley Corridor Capacity Strategy
[28] p.32 Maitland to Minimbah 3rd track Stage 2 Phase 3 – Project Assessment Report, Phase 4 – Project Approval

On balance, it is clear that the predominant driver for this project was to reduce maintenance impacts and to increase the operational flexibility of the network. As the predominant need for the project is not to support demand it is considered as still being necessary on a stand-alone basis for the PZ1&2 producers.

**Quantitative Analyses**

The quantitative analysis identified that to the extent demand may have been a contributor to the need of the project, forecast of demand from the PZ1&2 producers at the time of project approval was sufficient to cause the need for the project, reinforcing the stand-alone nature of this project for the PZ1&2 producers.

The actual use analysis identified that actual demand is only on the brink of existing capacity at the time of the assessment of the ceiling test. This identifies that as the 2013 actual tonnages are substantially less than forecast at the time of project approval, the project is predominantly now being utilised to provide maintenance and operational benefits to the overall network and hence still required on a stand-alone basis.

Table 12 is a summary of the analysis carried out on Maitland to Minimbah Third Road – Stage 2.

## *Maitland to Minimbah Third Road – Stage 2*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $353.2 | 2010 | 2012 | 2013 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 5 | 140 | 170 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| On balance, it is clear that the predominant driver for this project was to reduce maintenance impacts and the increase the operational flexibility of the network. As the predominant need for the project is not to support demand it is considered as still being necessary on a stand-alone basis for the PZ1&2 producers. | Candidate for incremental project? |
| | No |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 215 | Yes | 187 | Yes | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 140 | Marginal | 125 | No | Marginal |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 215 | Yes | 182 | Yes | No |

**Table 12 Summary of analysis for Maitland to Minimbah Third Road – Stage 2**

### 7.8.2 Summary of outcome

In summary the Maitland to Minimbah Third Road – Stage 2 project is considered to be stand-alone to the PZ1&2 producers.

This is through a combination of the qualitative analysis (which provides strong evidence that the primary driver for this project was to reduce maintenance impacts and the increase the operational flexibility of the network) and the quantitative analysis which demonstrates that forecast demand from PZ1&2 producers alone at the time of project approval would have been sufficient to cause the project in any case.

## 7.9 No.3 Departure Road at KCT

This project provided an extra 'departure road' at the PWCS Kooragang Island coal terminal through the acquisition and reconfiguration of a track previously used by Pacific National for provisioning (fuelling etc.) trains. Departure roads are used to hold trains once they leave the dump station at the port so that they can be allocated a clear run through the network on departure from the terminal. The project lifts the total number of departure roads at KCT from 8 to 9 reducing congestion in this area and improving network efficiency.

### 7.9.1 Analysis of whether project is stand-alone

**Qualitative Analysis**

This project is one of a suite of projects all aimed at improving terminal efficiency and reducing congestion as described in the 2013 ARTC Hunter Valley Corridor Capacity Strategy under the chapter heading of "Terminals, congestion and system issues".

In introducing these projects the document states: "There are, however, a number of operational challenges that potentially constrain capacity and for which the provision of additional track is one potential mitigation. 'Congestion' has become a common term used to describe these challenges, which include resequencing, provisioning, crew changes, brake tests, roll-by inspections, empty train holding and the management in general of peaks and troughs caused by the demand profile. These challenges are whole-of-chain issues …".[29]

The chapter heading that this project sits under and the description above provides evidence that the project was developed to solve system related congestion issues rather than directly to support demand.

However in the Kooragang Departure Road 3 Project Closeout Report a consequential capacity benefit is also identified: "Completion of this project has resulted in a nominal capacity benefit of at least 606,000t in the 12 months since commissioning as a result of avoiding the network congestion that was previously generated by loaded trains waiting at KCT Dump Station 2 for a free departure road."[30]

The 2013 ARTC Hunter Valley Corridor Capacity Strategy also says "In seeking to mitigate congestion it is important to understand that these 'congestion' issues are system issues for which additional rail infrastructure is one option to enable the full capacity of the rail network to be realised." [31]

The above statements imply that the system has a latent capacity that cannot be fully exploited due to the presence of congestion. By reducing congestion, some of this latent capacity is freed up.

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[29] p.26 2013-2022 Hunter Valley Corridor Capacity Strategy
[30] p.3 Kooragang Departure Road 3 Project Closeout Report September 2015 Revision 4
[31] p.26 2013-2022 Hunter Valley Corridor Capacity Strategy

In summary, there appears sufficient evidence that the project was not introduced to directly meet a demand or capacity target, but that it was intended to improve the efficiency of the existing supply chain and free up existing latent capacity by reducing congestion.

On balance, whilst marginal, the quantitative analysis suggests that the project was essentially a supply chain efficiency improving initiative and therefore not directly linked to demand and so a PZ1&2 stand-alone project.

**Quantitative Analyses**

All three forms of the quantitative analysis identified that total demand was well short of the existing capacity of that section of the network and as such reinforces that the project was not implemented to support demand but to improve the efficiency of the existing network and hence was a PZ1&2 stand-alone project.

Table 13 is a summary of the analysis carried out on No.3 Departure Road at KCT.

## *No.3 Departure Road at KCT*

| Value | Approved | Constructed | Implemented | Year of assessment |
|---|---|---|---|---|
| $15.4 | 2013 | 2013 | 2013 | 2013 |

| Assumed zone capacities | | |
|---|---|---|
| Zone | Zone capacity prior to project | Zone capacity after project |
| 6 | 181 | 182 |

| Qualitative assessment - assessment of documentation | |
|---|---|
| On balance, whilst marginal, the quantitative analysis suggests that the project was essentially a supply chain efficiency improving initiative and therefore not directly linked to demand and so a PZ1&2 stand-alone project. | Candidate for incremental project? |
| | No |

| Trigger Project basis - Forecast demand at project completion | | | | |
|---|---|---|---|---|
| Total demand on completion | Total demand driven? | PZ1&2 demand on completion | PZ1&2 demand driven? | Incremental project? |
| 150 | No | 134 | No | No |

| Actual Use basis - Actual Demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total actual demand | 2013 Total demand driven? | 2013 PZ1&2 actual demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 150 | No | 134 | No | No |

| Expected Use basis - Forecast demand for year of assessment | | | | |
|---|---|---|---|---|
| 2013 Total forecast demand | 2013 Total demand driven? | 2013 PZ1&2 forecast demand | 2013 PZ1&2 demand driven? | Incremental project? |
| 150 | No | 134 | No | No |

**Table 13 Summary of analysis for No.3 Departure Road at KCT**

### 7.9.2 Summary of outcome

In summary the No.3 Departure Road at KCT project is considered to be stand-alone to the PZ1&2 producers.

This is based on qualitative evidence that the project was essentially a supply-chain efficiency improving initiative not directly linked to supporting demand. This is reinforced by the quantitative analysis where all three approaches identify that there was insufficient demand to cause the project.

# 8 Summary of outcomes

The multi-faceted approach utilised in this assessment identified only one project out of the nine assessed within the PZ1 section of the HV network as not being stand-alone for the PZ1&2 access holders. This was the Nundah Third Track project valued at $77.8m. The outcomes of this analysis are summarised in Table 14 below.

Note that this analysis did not include a series of projects of value less than $10m, which together total $13.8m. No recommendation is made in this report as to whether this collection of minor projects should be considered as stand-alone to the PZ1&2 access holders or not.

| Projects | Value | Qualitative assessment | Trigger project basis | Actual use basis | Expected use basis | Recommended PZ3 incremental? (i.e. NOT PZ1&2 stand-alone) | Summary of recommendation |
|---|---|---|---|---|---|---|---|
| 357901 - Antiene to Grasstree Stage 1 duplication - 0961 | $42.7 | ✔ | ✖ | ✖ | ✖ | ✖ | Duplication of single track is often predominantly conducted to improve capacity and there is also strong evidence in the documentation that this project was demand driven.<br><br>However PZ1&2 demand alone for all approaches was consistently higher than the documented capacity of the line section without the project. |
| 388401 - St Helliers to Muswellbrook Duplication | $31.4 | ✖ | ✖ | ✖ | ✔ | ✖ | The documentation clearly states that duplication of this section provides capacity well in excess of demand requirements but that cost synergies with Antiene to Grasstree Stage 1 duplication (above) warrant this project.<br><br>This position is backed up by 2 of the 3 quantitative approaches confirming that total demand was less than capacity without the project |
| 6928 - Drayton Junction Upgrade (Capital) | $19.9 | ✖ | ✖ | ✖ | ✖ | ✖ | There is sufficient evidence in the documentation that this project is predominantly an asset renewal (non-growth) project and to the extent that it would also support longer term growth than the project rationale focuses on the growth requirements of producers on the Drayton branch (PZ1 producers).<br><br>All three quantitative approaches reinforce that the project would still have been required on a stand-alone basis for the PZ1&2 producers. |
| 346801 - Newdell Junction Upgrade | $15.7 | ✖ | - | ✔ | ✖ | ✖ | As per Drayton Junction there is good evidence in the documentation that the immediate major driver for this project is for asset renewal (non-growth) to improve reliability and maintainability rather than capacity. Where the project does provide capacity benefits, these are much more significant for the PZ1 branch line producers.<br><br>The quantitative analysis is mixed, providing no clear position on whether the project should be considered PZ1&2 stand-alone or not.<br><br>Allocation of this project is marginal but considered PZ1&2 stand-alone taking into account similarities with Drayton Junction upgrade project. |
| 5811 - Nundah Third Track - All Phases | $77.8 | ✔ | - | ✖ | ✔ | ✔ | Clearly a demand driven project aimed at improving headways on capacity constraining location (Nundah Bank), generally reinforced by quantative analysis. |

| Projects | Value | Qualitative assessment | Trigger project basis | Actual use basis | Expected use basis | Recommended PZ3 incremental? (i.e. NOT PZ1&2 stand-alone) | Summary of recommendation |
|---|---|---|---|---|---|---|---|
| 358401 - Bi-Dir signalling Maitland to Branxton - 946/947 | $45.9 | ✖ | ✖ | ✖ | ✖ | ✖ | Strong evidence in documentation that the major driver for this project is improved maintenance rather than capacity and is therefore stand-alone.<br><br>All quantative approaches indetify that PZ1&2 demand was consistently higher than the documented capacity of the line section without the project in any case. |
| 3585 - Maitland to Minimbah Third Road – Stage 1 – All Phases | $146.4 | ✔ | ✖ | ✖ | ✖ | ✖ | Clearly a demand driven project aimed at improving headways on the capacity constraining Minimbah Bank.<br><br>However, all quantative approaches show that PZ1&2 demand alone was well in excess of documented capacity without the project and hence project is stand-alone. |
| 5255 - Maitland to Minimbah Third Road – Stage 2 – All Phases | $353.2 | ✖ | ✖ | - | ✖ | ✖ | Strong evidence that the primary driver for this project was to reduce maintenance impacts and the increase the operational flexibility of the network.<br><br>Reinforced by 2 of 3 quantative approaches identifying that PZ1&2 demand is sufficient to drive the project in any case. |
| 8665 - No.3 Departure Road at KCT | $30.8 | ✖ | ✖ | ✖ | ✖ | ✖ | Good evidence that the project was essentially a supply-chain efficiency improving initiative not directly linked to supporting demand.<br><br>Reinforced by the quantitative analysis where all three approaches identify that there was insufficient demand to cause the project. |
| Other Projects of value < $10m | $13.8 | Not assessed | | | | | |
| **TOTAL** | $777.6 | | | | | | |

Table 14 Summary of assessment of whether projects are standalone to the PZ1&2 producers

# Appendix A – Hunter Valley pricing zones

(Map sourced from ARTC 2006-2011 Hunter Valley Corridor Capacity Strategy)


*Figure 2. The Hunter Valley coal rail network (Newcastle to Narrabri and Ulan) and other railways in the area. Existing coal mines serviced by rail loops and sidings along this network are shown in red and proposed mines are shown in blue.*

# Appendix B – Major CAPEX Projects location, cost and completion data

(Map sourced from ARTC 2006-2011 Hunter Valley Corridor Capacity Strategy)

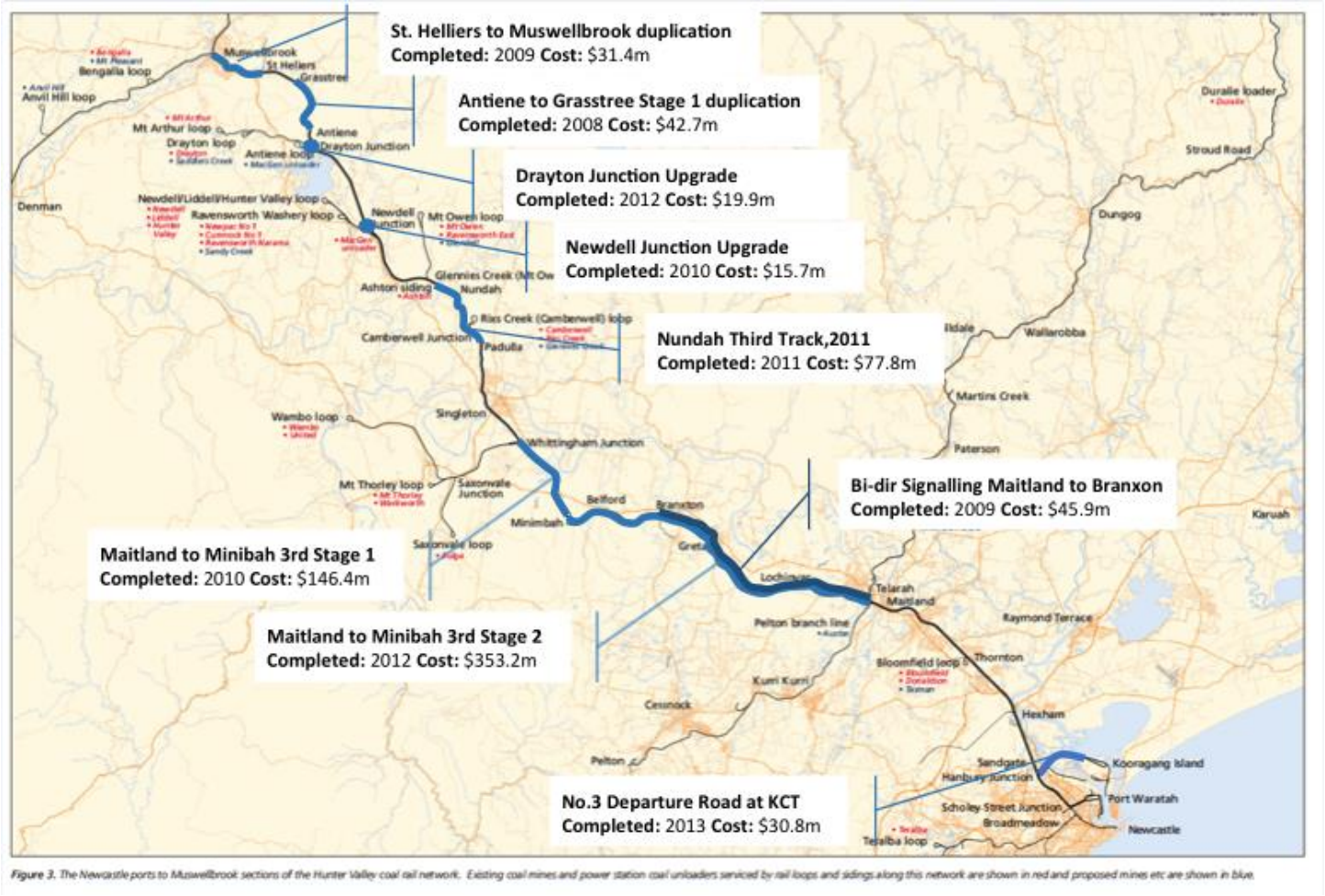


*Figure 3. The Newcastle ports to Muswellbrook sections of the Hunter Valley coal rail network. Existing coal mines and power station coal unloaders serviced by rail loops and sidings along this network are shown in red and proposed mines etc are shown in blue.*

# Appendix C – Evidence Base

## C.1 Capacity based evidence

Information on the capacity of the section of the network both prior to and after the implementation of the project was gathered from a number of sources. Where possible, this information was obtained directly from the relevant project approval documentation. The Phase 3 – Project Assessment / Phase 4 – Project Approval Report as submitted to the RCG was considered the most preferred information to determine the capacity benefits of the project as this submission generally included a business case with this information included that formed part of the project approval. If such a document was not available then the most relevant corridor strategy document was utilised.

A summary of the data source for the capacity based evidence is included in Table 15 below.

| Project | Data source | | | | |
|---|---|---|---|---|---|
| | Value | Approval Date | Completion Date | Zoned Capacity prior to the project | Zoned Capacity after the project |
| Antiene to Grasstree Stage 1 duplication | **$42.7** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 20 | **2008**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 10 & 11 | **35 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Table A | **65 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page 23 |
| St Helliers to Muswellbrook Duplication | **$31.4** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 20 | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 10 & 11 | **65 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page 23 | **120 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page 23 |
| | | | | | |

| Project | Value | Approval Date | Completion Date | Zoned Capacity prior to the project | Zoned Capacity after the project |
|---|---|---|---|---|---|
| Drayton Junction Upgrade (Capital) | **$19.9** | **2012**<br>Drayton Junction RCG Submission Phase 5 - signed.pdf - Page 5 | **2013**<br>ARTC 2013 Annual Report Page 25 | **80 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Table A | **120 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Table A |
| Newdell Junction Upgrade | **$15.7** | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 17<br>RCG Monthly Report November 2010.pdf Page 7 | **2010**<br>ARTC 2010 Annual Report Page 4 & 22 | **90 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Table A | **120 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Table A |
| Nundah Third Track - All Phases | **$77.8** | **2011**<br>Nundah Bank Project - Phase 4-6 - RCG Submission - 31 August 2011.pdf Page 5<br>&<br>3 3 1 Nundah Bank Project - Post Implementation Review Report.pdf - Page 5 | **2012**<br>3 3 1 Nundah Bank Project - Post Implementation Review Report.pdf – Page 5 | **140 Mtpa**<br>5255 - M2M P3 RCG Submission.pdf – Page 42 Section 6.4 Business case<br>&<br>Nundah Bank Project - Phase 4-6 - RCG Submission - 31 August 2011.pdf - Page 17 - Section 3.2: Project benefits | **200 Mtpa**<br>Nundah Bank Project - Phase 4-6 - RCG Submission - 31 August 2011.pdf - Page 17 - Section 3.2: Project benefits |

| Project | Value | Approval Date | Completion Date | Zoned Capacity prior to the project | Zoned Capacity after the project |
|---|---|---|---|---|---|
| Bi-Dir signalling Maitland to Branxton | **$45.9** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 29 | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 10 & 11<br>&<br>ARTC 2009 Annual Report Page 19 | **85 Mtpa**<br>Hunter Valley Corridor Capacity Improvement Strategy v4 25052005 – Page 34<br>(Existing Capacity) | **90 Mtpa**<br>Hunter Valley Corridor Capacity Improvement Strategy v4 25052005 – Page 34<br>(Relative improvement from the bi-directional signalling of 5 Mtpa) |
| Maitland to Minimbah Third Road – Stage 1 | **$146.4** | **2009**<br>RCG Monthly Report November 2010.pdf Page 6 | **2011**<br>RCG Monthly Report July 2011-2.pdf – Page 9 | **90 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Table A | **140 Mtpa**<br>HUNTER VALLEY COAL NETWORK CAPACITY IMPROVEMENT STRATEGY • 2006–2011 Page iv Fig C &<br>5255 - M2M P3 RCG Submission.pdf – Page 42 |
| Maitland to Minimbah Third Road – Stage 2 | **$353.2** | **2010**<br>M2M3T RCG Submission 3 March 2011 Rev 5.pdf – Page 7 | **2012**<br>RCG-Monthly Report- Dec 2012.pdf – Page 19 | **140 Mtpa**<br>5255 - M2M P3 RCG Submission.pdf – Page 42 Section 6.4: Business case | **170 Mtpa**<br>5255 - M2M P3 RCG Submission.pdf – Page 42 Section 6.4: Business case |
| No.3 Departure Road at KCT | **$30.8** | **2013**<br>Kooragang Departure Road 3 - Project Closeout Report (Update 2).pdf – Page 5 Section 2.3: Time Performance | **2013**<br>Kooragang Departure Road 3 - Project Closeout Report (Update 2).pdf – Page 5 Section 2.3: Time Performance | **181.4 Mtpa** | **182 Mtpa**<br>Kooragang Departure Road 3 - Project Closeout Report (Update 2).pdf – Page 3 Section 2.1: Performance against Planned benefits – Additional 606 ktonnes |

**Table 15 Evidence source for capacity based information**

## C.2 Demand based evidence

### *Trigger Project Approach*

For these approaches both total forecast demand and PZ1&2 demand is required (as known at the time of project approval) at the time of project completion.

As such generally the ARTC Corridor Strategy report from the year in which the project was approved was used to obtain these demand forecasts. In some cases, the corridor strategy report may not have been finalised at the time of project approval (depending on how early the project was approved during the year or how late the corridor strategy was finalised in the year). However, it is considered likely that even if the corridor strategy was not finalised the tonnage forecast information would have been available at the time of project approval.

The analysis only used the contracted demand and ignored the prospective demand. It is important to note that the quality of the data available for individual line sections does vary based on the quality of the charts in the reports but the best estimate was made for the information available.

A summary of the reports and information is provided in below.

| Project | Data source | | | |
|---|---|---|---|---|
| | Value | Approval Date | Completion Date | Forecast Demand on completion date |
| Antiene to Grasstree Stage 1 duplication | **$42.7** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 20 | **2008**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 10 & 11 | **Total Demand: 50 Mtpa (2009)**<br>**PZ1&2 Demand: 40 Mtpa**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| St Helliers to Muswellbrook Duplication | **$31.4** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 20 | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 10 & 11 | **Total Demand: 50 Mtpa (2009)**<br>**PZ1&2 Demand: 40 Mtpa**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| | | | | |

| Project | Data source | | | |
|---|---|---|---|---|
| | Value | Approval Date | Completion Date | Forecast Demand on completion date |
| Drayton Junction Upgrade (Capital) | **$19.9** | **2012**<br>Drayton Junction RCG Submission Phase 5 - signed.pdf - Page 5 | **2013**<br>ARTC 2013 Annual Report Page 25 | **Total Demand: 105 Mtpa (2013)**<br>**PZ1&2 Demand: 85 Mtpa**<br>Hunter Valley Corridor 2011-2020 Capacity Strategy - Consultation Document<br>Figures 16 – 18<br>Note: 2012 Report does not contain the necessary charts, hence why 2011 report was used |
| Newdell Junction Upgrade | **$15.7** | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 17<br>RCG Monthly Report November 2010.pdf Page 7 | **2011**<br>ARTC 2010 Annual Report Page 4 & 22 | **Total Demand: 90 Mtpa (2011)**<br>**PZ1&2 Demand: 72 Mtpa**<br>Hunter Valley Corridor 2009-2018 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| Nundah Third Track - All Phases | **$77.8** | **2011**<br>Nundah Bank Project - Phase 4-6 - RCG Submission - 31 August 2011.pdf Page 5 &<br>3 3 1 Nundah Bank Project - Post Implementation Review Report.pdf - Page 5 | **2012**<br>3 3 1 Nundah Bank Project - Post Implementation Review Report.pdf – Page 5 | **Total Demand: 140 Mtpa (2013)**<br>**PZ1&2 Demand: 120 Mtpa**<br>Hunter Valley Corridor 2011-2020 Capacity Strategy - Consultation Document<br>Figures 16 – 18 |
| Bi-Dir signalling Maitland to Branxton | **$45.9** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 29 | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 10 & 11<br>&<br>ARTC 2009 Annual Report Page 19 | **Total Demand: 100 Mtpa (2009)**<br>**PZ1&2 Demand: 90 Mtpa**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document<br>Figures 18 - 20 |
| | | | | |

| Project | Data source | | | |
|---|---|---|---|---|
| | Value | Approval Date | Completion Date | Forecast Demand on completion date |
| Maitland to Minimbah Third Road – Stage 1 | **$146.4** | **2009**<br>RCG Monthly Report November 2010.pdf Page 6 | **2011**<br>RCG Monthly Report July 2011-2.pdf – Page 9 | **Total Demand: 155 Mtpa (2011)**<br>**PZ1&2 Demand: 137 Mtpa**<br>Hunter Valley Corridor 2009-2018 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| Maitland to Minimbah Third Road – Stage 2 | **$353.2** | **2010**<br>M2M3T RCG Submission 3 March 2011 Rev 5.pdf – Page 7 | **2013**<br>RCG-Monthly Report-Dec 2012.pdf – Page 19 | **Total Demand: 215 Mtpa (2013)**<br>**PZ1&2 Demand: 187 Mtpa**<br>Hunter Valley Corridor 2009-2018 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| No.3 Departure Road at KCT | **$30.8** | **2013**<br>Kooragang Departure Road 3 - Project Closeout Report (Update 2).pdf – Page 5 Section 2.3: Time Performance | **2013**<br>Kooragang Departure Road 3 - Project Closeout Report (Update 2).pdf – Page 5 Section 2.3: Time Performance | **Total Demand: 185 Mtpa (2014)**<br>**PZ1&2 Demand: 162 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |

**Table 16 Evidence source for demand based information**

### *Actual Use Approach*

The actual use approach utilises the actual contracted demand for the year in which the ceiling test limit is being applied to allocate projects as stand-alone or not. To determine this the ARTC corridor strategies were used for that particular year. So, for example, to determine the actual contracted demand for 2013, tonnage data from 2013 was extracted from the 2013 – 2022 Hunter Valley Corridor Capacity Study.

A summary of the reports and information is provided in below.

| Project | Data source | |
|---|---|---|
| | **Value** | **Actual demand data in 2013** |
| Antiene to Grasstree Stage 1 duplication | **$42.7** | **Total Demand: 55 Mtpa (2013)**<br>**PZ1&2 Demand: 40 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| St Helliers to Muswellbrook Duplication | **$31.4** | **Total Demand: 55 Mtpa (2013)**<br>**PZ1&2 Demand: 40 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| Drayton Junction Upgrade (Capital) | **$19.9** | **Total Demand: 70 Mtpa (2013)**<br>**PZ1&2 Demand: 55 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| Newdell Junction Upgrade | **$15.7** | **Total Demand: 100 Mtpa (2013)**<br>**PZ1&2 Demand: 85 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |

| | | |
|---|---|---|
| Nundah Third Track - All Phases | **$77.8** | **Total Demand: 105 Mtpa (2013)**<br>**PZ1&2 Demand: 90 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| Bi-Dir signalling Maitland to Branxton | **$45.9** | **Total Demand: 140 Mtpa (2013)**<br>**PZ1&2 Demand: 125 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| Maitland to Minimbah Third Road – Stage 1 | **$146.4** | **Total Demand: 140 Mtpa (2013)**<br>**PZ1&2 Demand: 125 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| Maitland to Minimbah Third Road – Stage 2 | **$353.2** | **Total Demand: 140 Mtpa (2013)**<br>**PZ1&2 Demand: 125 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |
| No.3 Departure Road at KCT | **$30.8** | **Total Demand: 150 Mtpa (2013)**<br>**PZ1&2 Demand: 135 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |

**Table 17 Evidence source for demand based information**

### *Expected Use Approach*

The Expected Use approach utilises forecast demand for the year of the assessment made at the time of project approval. As such, similarly to the Trigger Project approach, generally the ARTC Corridor Strategy report from the year in which the project was approved was used to obtain these demand forecasts.

A summary of the reports and information is provided in below.

| Project | Data source | | |
|---|---|---|---|
| | Value | Approval Date | Forecast Demand in 2013 |
| Antiene to Grasstree Stage 1 duplication | **$42.7** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 20 | **Total Demand: 83 Mtpa (2013*)**<br>**PZ1&2 Demand: 46 Mtpa**<br>Hunter Valley Corridor 2006-2011 Capacity Strategy - Consultation Document<br>Pages i - iv<br>*2007 Report did not contain data for 2015, 2006 report was used in its place |
| St Helliers to Muswellbrook Duplication | **$31.4** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 20 | **Total Demand: 83 Mtpa (2013*)**<br>**PZ1&2 Demand: 46 Mtpa**<br>Hunter Valley Corridor 2006-2011 Capacity Strategy - Consultation Document<br>Pages i - iv<br>*2007 Report did not contain data for 2015, 2006 report was used in its place |
| Drayton Junction Upgrade (Capital) | **$19.9** | **2012**<br>Drayton Junction RCG Submission Phase 5 - signed.pdf - Page 5 | **Total Demand: 105 Mtpa (2013)**<br>**PZ1&2 Demand: 85 Mtpa**<br>Hunter Valley Corridor 2011-2020 Capacity Strategy - Consultation Document<br>Figures 16 – 18<br>Note: 2012 Report does not contain the necessary charts, hence why 2011 report was used |

| | | | |
|---|---|---|---|
| Newdell Junction Upgrade | **$15.7** | **2009**<br>2009-2018 HUNTER VALLEY CORRIDOR CAPACITY STRATEGY - CONSULTATION DOCUMENT Page 17<br>RCG Monthly Report November 2010.pdf Page 7 | **Total Demand: 160 Mtpa (2013)**<br>**PZ1&2 Demand: 125 Mtpa**<br>Hunter Valley Corridor 2009-2018 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| Nundah Third Track - All Phases | **$77.8** | **2011**<br>Nundah Bank Project - Phase 4-6 - RCG Submission - 31 August 2011.pdf Page 5 &<br>3 3 1 Nundah Bank Project - Post Implementation Review Report.pdf - Page 5 | **Total Demand: 150 Mtpa (2013)**<br>**PZ1&2 Demand: 128 Mtpa**<br>Hunter Valley Corridor 2011-2020 Capacity Strategy - Consultation Document<br>Figures 16 – 18 |
| Bi-Dir signalling Maitland to Branxton | **$45.9** | **2007**<br>Hunter Valley Corridor 2007-2012 Capacity Strategy - Consultation Document Page 29 | **Total Demand: 153 Mtpa (2013*)**<br>**PZ1&2 Demand: 116 Mtpa**<br>Hunter Valley Corridor 2006-2011 Capacity Strategy - Consultation Document<br>Pages i - iv<br>*2007 Report did not contain data for 2015, 2006 report was used in its place |
| Maitland to Minimbah Third Road – Stage 1 | **$146.4** | **2009**<br>RCG Monthly Report November 2010.pdf Page 6 | **Total Demand: 215 Mtpa (2013)**<br>**PZ1&2 Demand: 182 Mtpa**<br>Hunter Valley Corridor 2009-2018 Capacity Strategy - Consultation Document<br>Figures 18 – 20 |
| Maitland to Minimbah Third Road – Stage 2 | **$353.2** | **2010**<br>M2M3T RCG Submission 3 March 2011 Rev 5.pdf – Page 7 | **Total Demand: 215 Mtpa (2013)**<br>**PZ1&2 Demand: 182 Mtpa**<br>Hunter Valley Corridor 2009-2018 Capacity Strategy - Consultation Document Figures 18 - 20 – Note: There was no 2010 Report, hence 2009 Report was used in its place. |

| | | | |
|---|---|---|---|
| No.3 Departure Road at KCT | **$30.8** | **2013**<br>Kooragang Departure Road 3 - Project Closeout Report (Update 2).pdf – Page 5 Section 2.3: Time Performance | **Total Demand: 150 Mtpa (2013)**<br>**PZ1&2 Demand: 134 Mtpa**<br>Hunter Valley Corridor 2013-2022 Capacity Strategy - Consultation Document<br>Figures 15 – 17 |