ACIL ALLEN CONSULTING

REPORT TO

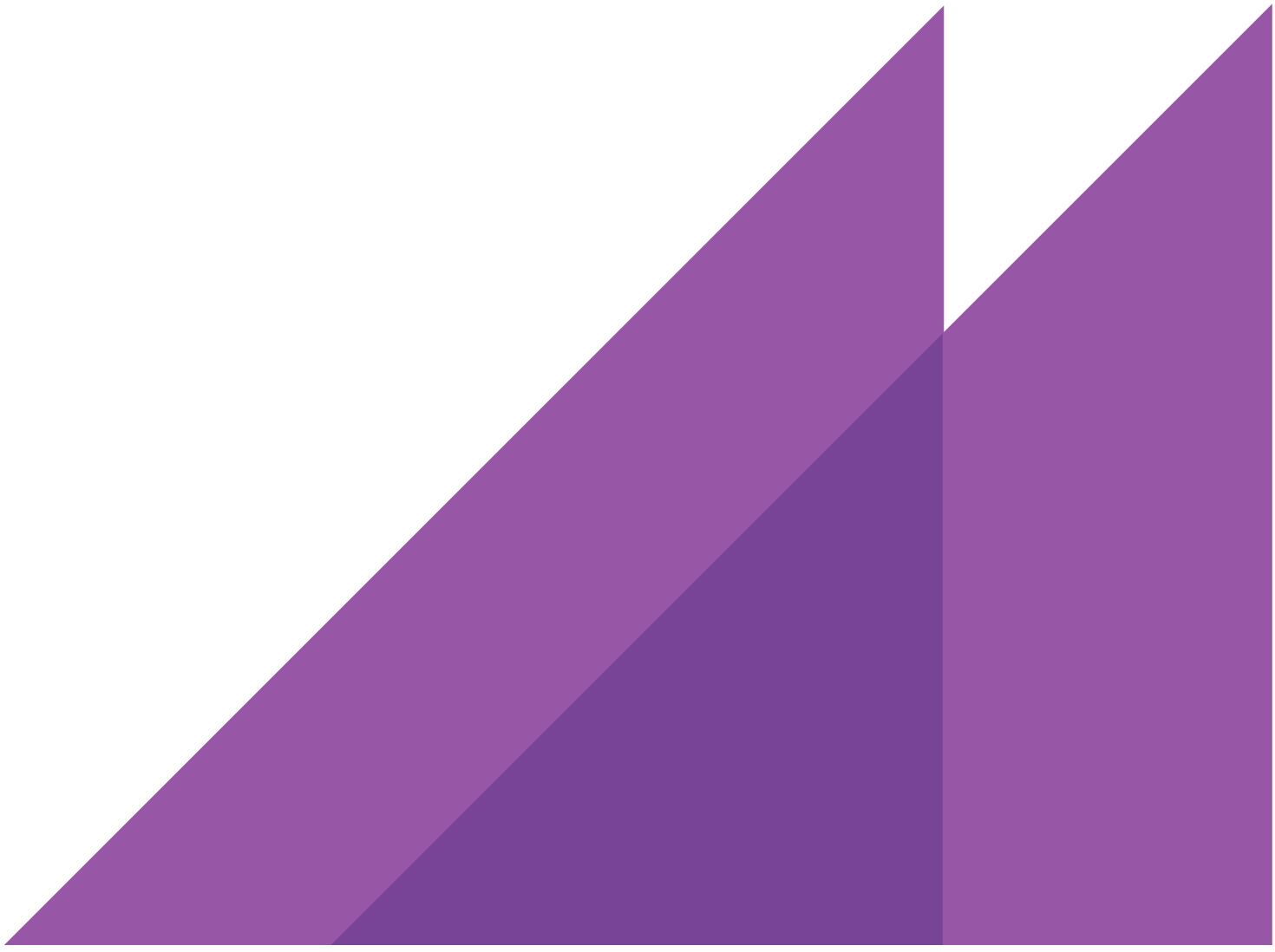
DEPARTMENT OF AGRICULTURE AND FOOD, WESTERN AUSTRALIA AND MEAT AND LIVESTOCK AUSTRALIA

18 APRIL 2016

NORTHERN BEEF INFRASTRUCTURE AUDIT

INFRASTRUCTURE PLAN AND BUSINESS CASE SUMMARIES

PHASE 4 FINAL REPORT



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C O N T E N T S

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1 INTRODUCTION

The Department of Agriculture and Food, Western Australia (DAFWA) is leading Northern Beef Futures, a four year $15 million project funded by the State Government's Royalties for Regions program, to transform Western Australia's northern beef industry through improving markets, businesses and productivity. The Northern Beef Futures project will support the success of the beef industry to capture new market opportunities, particularly in Asia, and secure sustainable growth.

ACIL Allen Consulting (ACIL Allen) has been commissioned by DAFWA and Meat and Livestock Australia (MLA) to conduct an audit of infrastructure supporting the beef industry in the Pilbara and Kimberley regions, referred to as the northern beef region.

The aim of the Northern Beef Infrastructure Audit is to determine constraints and opportunities and from them identify projects that will encourage and support the development of the beef industry in the northern beef region. The Audit has been conducted in four phases. A comprehensive report has been produced for each of Phases 1 to 3 and is available from DAFWA and MLA on request.

Phase One: Infrastructure audit and stakeholder consultation

The approach for Phase One of the Northern Beef Infrastructure Audit was to undertake a desktop analysis of the existing industry and its supporting infrastructure to gain an overview of the industry and the policy context in which it operates. The report also identified the key infrastructure that supports the northern beef industry in terms of its current status and any plans for its development.

The results of the desktop analysis were presented at three invited industry workshops that were held in Port Hedland, Broome and Perth. The aims of the workshops were to identify projects that would enable the development of the industry and to prioritise their importance in terms of the project's need and the value that it would deliver.

Phase Two: Modelling of cattle flows across the supply chain and industry growth scenarios

The approach for Phase Two of the Northern Beef Infrastructure Audit was to analyse cattle data provided from the National Livestock Identification System (NLIS) in order to understand the metrics of the northern beef industry in terms of turnoff, supply chains and the transport routes that cattle take to market. This data was also used as a base from which projections of future turnoff in the industry were made which were used in later Northern Beef Infrastructure Audit phases to understand potential flows of cattle from the region.

Consultation was undertaken with key infrastructure providers and infrastructure users such as road transport companies and shipping companies in order to understand the dynamics of the industry, to better inform the outcomes of the priority projects identified in Phase One, and to assist in identifying constraints associated with current and future infrastructure that supports the industry. This information was used to conduct a map and gap analysis of current and future infrastructure and to identify a priority set of projects for further investigation.

Phase Three: Analysing the impact of infrastructure improvements on the supply chain

Phase Three of the Northern Beef Infrastructure Audit combined consultation with modelling of the transport flows of cattle in the northern beef region. The aim of the approach was to model the impact of various projects on current and projected flows of cattle in the region assuming a least cost transport model and an optimal cattle allocation. Each project has been presented in a business case format and in the case of priority projects, cattle flow modelling has been included in order to show the impact of the project on the transport costs for the northern beef industry.

Phase Four: Develop Northern Beef Infrastructure Plan

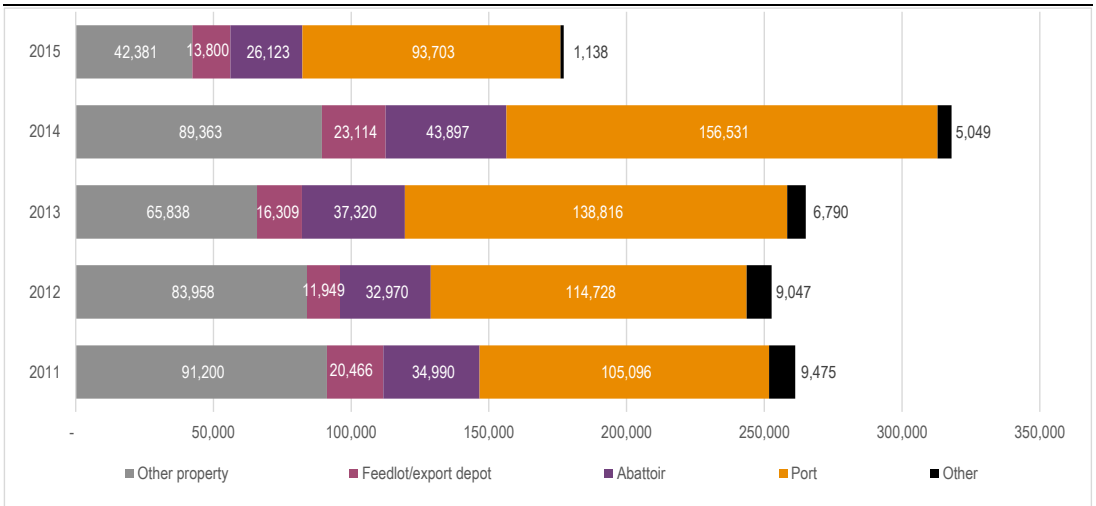
The final phase involves developing a 10 year Northern Beef Infrastructure Plan to create a framework for implementing the priority projects identified. The Plan summaries the key findings from phases one to three (this chapter) and then discusses the rationale for the 15 priority projects (Chapter 2) and what implementation is required (Chapter 4). The Plan concludes with a summary of the priority projects. Feedback on the draft Plan from consultations with lead agencies, the project reference group and a presentation to the Northern Beef Reference Group was used to finalise the Plan.

1.2 Key findings

Typically, there are two main routes to market for cattle from the northern beef region. The first is cattle destined for the live export trade and the second main route to market is to an abattoir for slaughter. A number of cattle also travel between farming properties. There are marked differences between the supply chains for cattle from the Pilbara and Kimberley regions with cattle from the Kimberley region tending to follow a more direct route to their end destinations while cattle from the Pilbara region tend to follow a supply chain that involves more intermediate destinations and a greater number of these cattle travel to the south west of Western Australia.

An analysis of NLIS data found that turnoff from the northern beef industry in 2014 was 318,000 cattle which includes some interstation transfers. Around 54 per cent or 179,500 of these cattle entered the live export market while 44,000 were slaughtered in all of the nine cattle abattoirs located in Western Australia as illustrated in **Figure 1.1** which shows the final destination of cattle from the northern beef region by year. A total of 89,400 cattle from the northern beef region travelled to another farming property as their final destination in 2014. These cattle are typically held on farming properties before being entering the live export or slaughter market. A small amount of cattle are held on properties for breeding purposes.

FIGURE 1.1 FINAL DESTINATION OF CATTLE: NORTHERN BEEF REGION: TOTAL



SOURCE: ACIL ALLEN FROM NLIS DATA. NOTE: OTHER INCLUDES SALEYARDS AND BUYERS AGENTS. NOTE: 2011 AND 2012 DATA MAY BE UNDERESTIMATED. 2015 IS PART YEAR ONLY.

The key supply chain route for cattle from the northern beef region is to the Port of Broome as either a direct transfer or after stopping at one or more export depots along the way. In 2014, the Port of Broome exported 99,795 cattle from the northern beef region which represents almost all of the cattle exported through the Port.

Around 160,000 cattle from the northern beef region travel along supply chain routes that lead outside of the region to their final destination (**Table 1.1**). In 2014, 97,000 cattle exited the region via the Great Northern Highway, 32,000 via the North West Coastal Highway and 32,000 travelled interstate. The majority of cattle that travelled to the south west of Western Australia were destined for abattoirs (44,000), the live export trade (43,500) and other farming properties (28,500).

TABLE 1.1 ESTIMATIONS OF CATTLE FLOWS OUTSIDE OF THE NORTHERN BEEF REGION

	2011	2012	2013	2014	2015
To south west via North West Coastal Highway	23,000	19,000	27,000	32,000	6,000
To south west via Great Northern Highway	97,000	77,000	88,000	96,000	50,000
To Northern Territory	40,000	43,000	20,000	32,000	21,000

SOURCE: ACIL ALLEN FROM NLIS DATA

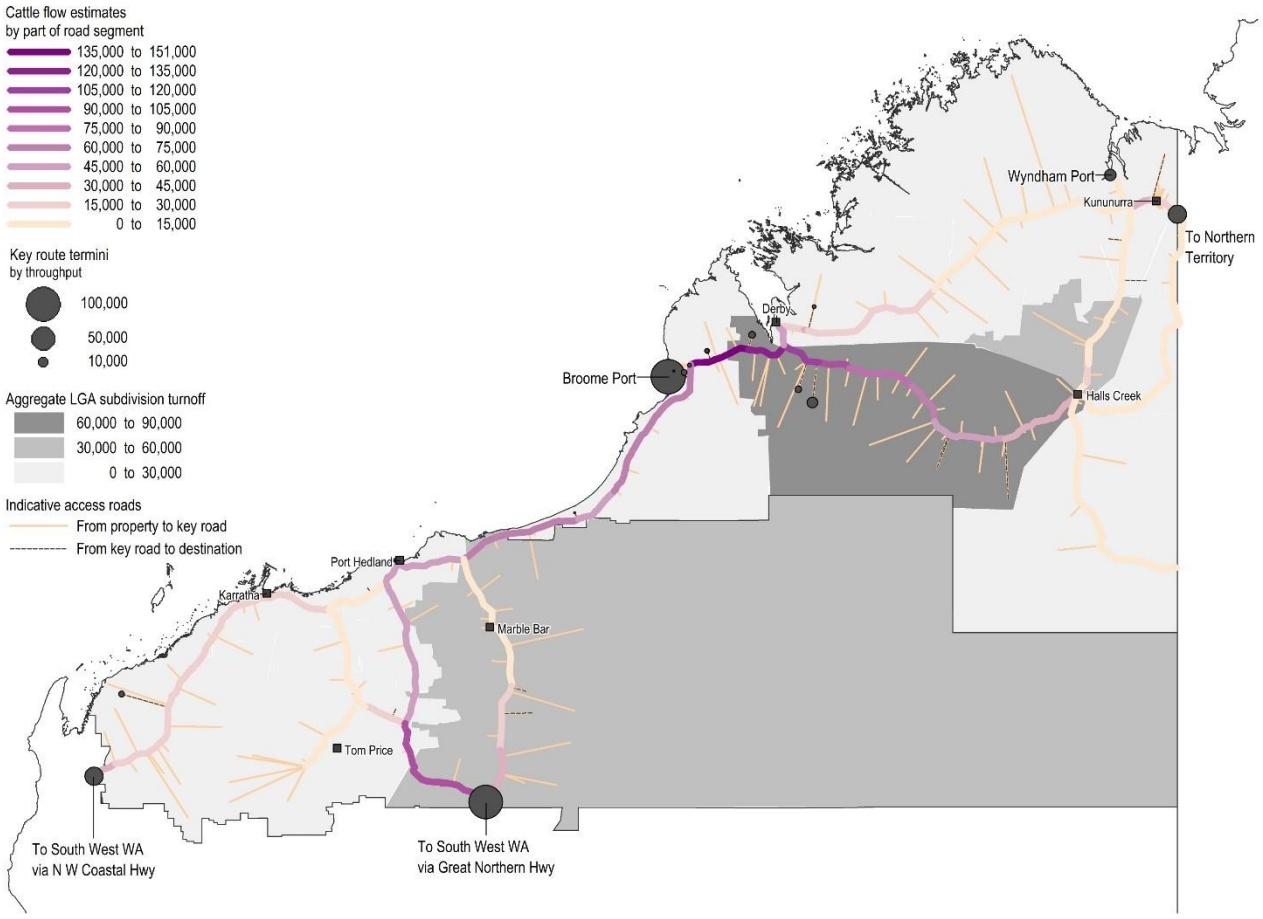
In order to understand which road transport route that cattle take **from** their property of origin along the supply chain to their final destination, ACIL Allen has developed a model of transport flows that assumes a least cost transport route. Note that this analysis only includes flows from properties in the northern beef region and does not include flows of cattle **into** the region. The results of the analysis are presented **Figure 1.2** for 2014. The Figure shows that the majority of cattle in the northern beef region are farmed in the area surrounding the Great Northern Highway from Halls Creek to Broome. Larger numbers of cattle are also produced in the region to the north of Halls Creek and in the area around Marble Bar.

Key transport routes are shown on the map and the level of shading indicates the number of cattle that travel along these routes. In summary, it can be seen that the largest number of cattle from the northern beef region travel from the Halls Creek area along the Great Northern Highway to the Port of Broome. There are also smaller flows of cattle along the Gibb River Road to the Port as well as cattle that travel from the area around Port Hedland and from the Nullagine Road along the Great Northern Highway to the Port. This analysis confirms the importance of the Port to the northern beef region.

There are large numbers of cattle that travel along unsealed roads including the Gibb River Road, the Duncan Highway and the Tanami Road in the Kimberley region and the Nullagine Road in the Pilbara region. The primary unsealed routes are the Gibb River Road and the Nullagine Road. The flows along these routes are a result of the location of nearby pastoral properties that have no other option than to send cattle to market along these roads.

The Figure also shows that large flows of cattle that exit the northern beef region via the Great Northern Highway and the North West Coastal Highway.

FIGURE 1.2 CATTLE FLOW ESTIMATES BY ROAD SEGMENT: NORTHERN BEEF INDUSTRY (2014)



SOURCE: ACIL ALLEN CONSULTING ANALYSIS OF NLIS DATA

Growth scenarios

In order to model the impact of future cattle numbers in the northern beef region on supporting infrastructure, a series of scenarios of turnoff from the industry in 2020 and 2025 was developed. The baseline turnoff for these scenarios is 292,000 cattle which is the average of the turnoff for 2013 and 2014 being the two years for which full NLIS data is available. There are four scenarios that represent different growth in cattle numbers:

- Status quo – this projection takes the long term historical growth figures and extrapolates them resulting in an estimated turnoff of around 292,000 cattle per annum that is slightly below current turnoff of 318,000 (2014)
- Efficiency gains – this projection was extracted from CSIRO work (CSIRO, 2014) and assumes improvements in production efficiency which results in increases in turnoff of 17 per cent in the Pilbara region and 29 per cent in the Kimberley region by 2025 resulting in an additional 73,000 cattle above the baseline
- Production gains – this projection identifies a number of mosaic agriculture leases that are currently turning off low numbers of cattle and assumes that their production will increase to result in an additional 60,000 cattle in the regions by 2025
- Efficiency and production gains – this scenario assumes that both the efficiency scenario and the production scenario will eventuate resulting in an additional 133,000 cattle in the northern beef region by 2025 above the baseline.

Note that the scenarios are purely for the basis of modelling how different turnoffs may impact the demand for beef related infrastructure. They are not forecasts of cattle turnoff in the northern beef

region and should not be considered as such. Furthermore, they do not consider regulations on stocking rates by the Pastoral Lands Board that ensure that pastoral land is managed in an ecologically sustainable manner.

Priority projects

A set of priority projects was identified and developed through consultation. These projects tended to focus around the key areas of:

- Reducing transport costs through more efficient road and port networks
- More efficient biosecurity infrastructure
- Access to and from markets in the east of Australia
- Improvements to communications including better mobile and data coverage
- Development of alternative supply chains through the development of an abattoir in the North West
- Attracting more live cattle exports from the regions through improved port handling facilities as well as biosecurity facilities and holding yards close to ports which provides the ability to accumulate cattle ready for export close to ports.

Transport routes

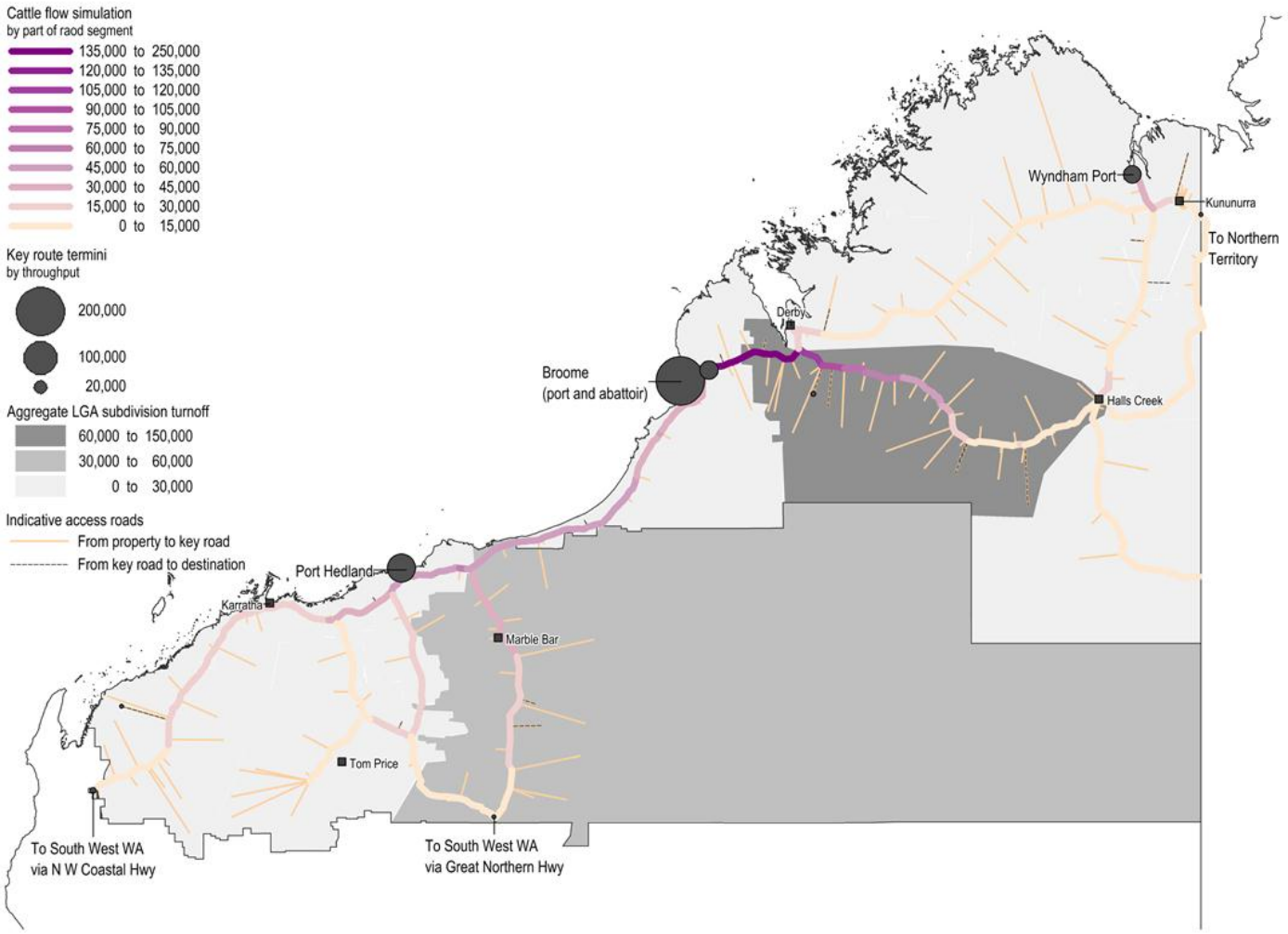
The cattle transport simulation model developed by ACIL Allen selects the **lowest cost transport option** from a set of predetermined routes to a final destination. Potential relationships between cattle producers, road transport companies, exporters and/or infrastructure owners or any other non-cost driven preferences such as relationships between cattle producers and other members of the supply chain, are not taken into account. Furthermore, potential infrastructure capacity constraints or other bottlenecks are not simulated. If applicable, they are discussed together with modelling results. This means that the throughput estimates of key infrastructure based on the lowest transport cost options should be regarded as the **market potential** or **throughput potential** of the associated infrastructure.

The development of the identified priority projects can result in a change in existing cattle transport flows. This occurs because of the creation of a new market destination which attracts a share of the northern beef turnoff away from another piece of infrastructure. Alternatively, an improvement in an existing piece of infrastructure such as the upgrade of a road or port facilities may result in efficiency gains allowing them to attract a greater share of the northern beef market. ACIL Allen assessed the impacts of these priority projects by developing a model of the flows of cattle in the northern beef region to key final destinations and their associated transport cost.

Potential future cattle flows

Assuming a scenario of efficiency gains over ten years and the completion of all priority projects as well as allowing the flow of some cattle to the south of the northern beef region to account for non cost driven preferences results in a flow of cattle similar to that in **Figure 1.3**. Comparing **Figure 1.2** to **Figure 1.3**, shows that the construction of priority projects, results in more cattle remaining in the northern beef region with the focus on Broome as the location of an abattoir and the key live export port for the region.

FIGURE 1.3 CATTLE FLOW ESTIMATES BY ROAD SEGMENT: NORTHERN BEEF INDUSTRY (EFFICIENCY GAINS 10 YEARS)



SOURCE: ACIL ALLEN CONSULTING MODELLING

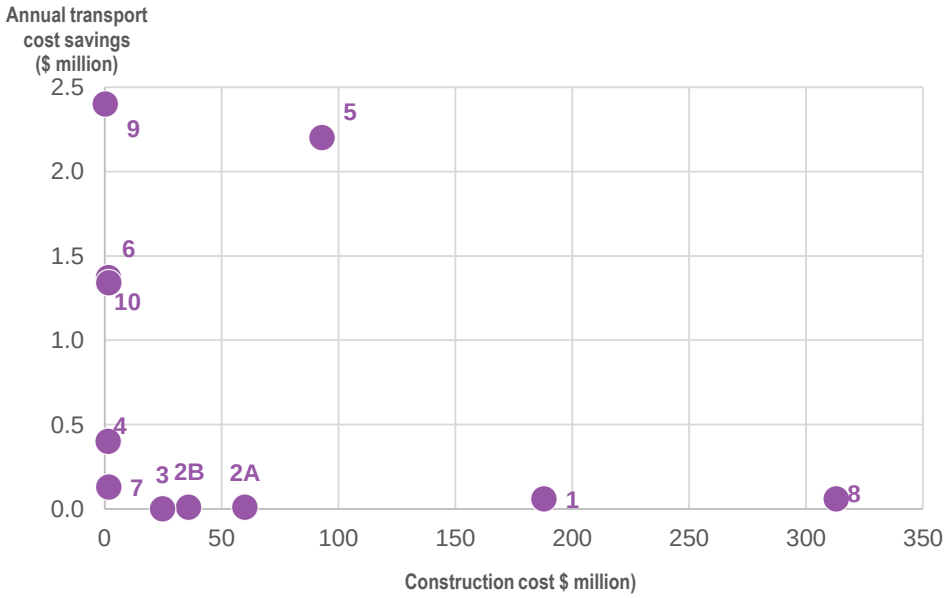
Transport cost analysis

Most of the priority projects analysed result in transport savings to the northern beef industry as well as employment benefits in the construction and operation phases. There are also benefits specific to each project such as improved transport efficiencies, improved animal welfare outcomes, potential for improved cattle performance, occupational health and safety benefits, and biosecurity benefits. In the case of the construction of an abattoir, there are significant employment benefits as well as the generation of new markets and value adding opportunities which lead to the diversification of the regional economy.

The current overall transport cost for the northern beef industry is significant because of the distances that cattle must travel from their property of origin to their final destination. Modelling has shown that this overall cost can be lowered through infrastructure improvements. The largest transport cost savings from the projects modelled were a result of improvements to the Port of Port Hedland which allow the resumption of cattle exports at the Port. Assuming that there are no restrictions to exports through the Port, optimal savings of $2.4 million per annum would result under the base case. Other significant savings flow from the construction of an abattoir in the north west which results in optimised savings of $2.4 million per annum. The construction of washdown facilities with associated export accredited holding yards also provide significant cost savings to the northern beef industry of over $1.3 million for each facility, assuming an optimal model and market requirements for trucks to be washed between loads.

Figure 1.4 compares the estimated annual savings potential with the expected construction cost of each modelled project and **Table 1.2** compares the capacity and road transport cost savings estimated by simulations of the priority projects identified in the Northern Beef Infrastructure Audit.

FIGURE 1.4 ANNUAL TRANSPORT SAVINGS POTENTIAL VS CONSTRUCTION COST



Note: Numbers in plot refer to ID in **Table 1.2**

SOURCE: ACIL ALLEN MODELLING

TABLE 1.2 SIMULATION RESULTS SUMMARY

ID	Project	Capacity	Construction cost	Savings potential (flat scenario)	Relative savings (flat scenario)	Per head savings (flat scenario)	Per head savings (E&M 10 scenario)
			$ million	$ million		$	$
1	Upgrade GNH	NA	188	0.06	1%	0.20	1.02
2	Duncan Highway*	NA	36 (B) – 60 (A)	0.01	1%	0.04	0.86
3	Port of Wyndham upgrades	NA	1.5	0.40	5%	1.30	0.30
4	Upgrade road to Wyndham	NA	24.8	NA	NA	NA	NA
5	North West Abattoir - Broome*	76 to 100,000 head p.a.	93	2.20	28%	7.70	8.60
6	Broome washdown and yards*	440 to 660 trucks p.a.	1.7	1.37	17%	4.71	NA
7	Halls Creek washdown & yards	50 trucks p.a.	1.8	0.13	NA	14.9	NA
8	Nullagine/Marble Bar Road	NA	313	0.06	1%	0.21	1.03
9	Port Hedland loading facilities**	65 to 100,000 head p.a.	0.3	2.40	23%	8.15	9.00
10	Port Hedland washdown & yards*	320 to 440 trucks p.a.	1.8	1.34	17%	4.60	NA

*SOURCE: ACIL ALLEN MODELLING * CONSTRUCTION COST ARE ESTIMATED ** INCLUDED IN ALL OTHER ASSESSMENTS AS OPERATIONAL*

The plots indicate that projects which improve infrastructure at key aggregation points in the supply chain such as an abattoir or improvements to ports, generate higher savings and benefits than projects whose impacts are localised. The Figure also shows that the construction cost of the road projects do not compare favourably to the expected generated transport savings.

1.3 Plan structure

The identified priority projects vary considerably in terms of stage of development, impact and urgency. The purpose of this Plan is to present the priority projects and to outline what is required to realise each project to guide industry and Government over the next ten years.

The Plan is structured into three key chapters:

— Chapter Two provides an overview of projects in terms of their urgency, impact and stage of development
— Chapter Three outlines the pathways for developing the priority projects
— Chapter Four provides business case summaries for each priority project
— Chapter Five provides business case summaries for other projects.

2 OVERVIEW: PRIORITY INFRASTRUCTURE PROJECTS

Fifteen priority projects (**Table 2.1**) have been identified to develop the northern beef industry through their potential to improve value adding capacity in the region; increase the efficiency of existing transport infrastructure, and meet market and regulatory standards such as biosecurity obligations. The rationale for these projects is based on their potential impact, development stage and urgency.

TABLE 2.1 NORTHERN BEEF INFRASTRUCTURE PRIORITY PROJECTS AND OBJECTIVES

Project	Value adding	Transport efficiency	Meeting standards
Establish enduring liaison channels at Northern beef ports	✓	✓	✓
Kimberley region			
Establish enduring liaison channels at Broome and Wyndham ports	✓	✓	✓
Great Northern Highway upgrades (Halls Creek and Warmun)		✓	✓
Upgrade Duncan Highway		✓	✓
Upgrade the road to Port of Wyndham	✓	✓	✓
Upgrades at Port of Wyndham	✓		✓
Abattoir in West Kimberley	✓	✓	
Broome holding yard and washdown facility	✓	✓	✓
Halls Creek holding yard and washdown facility		✓	✓
Upgrade Tanami Road		✓	✓
Improve Broome Port access road and truck stop adjacent to port	✓	✓	✓
Pilbara region			
Establish enduring liaison channels at the port of Port Hedland	✓	✓	✓
Marble Bar Road upgrade		✓	✓
Port Hedland live export loading facility upgrades and truck stop	✓	✓	✓
Port Hedland holding yards and washdown facility.	✓	✓	✓
Extending road train access south from Wubin to Muchea		✓	✓
Great Northern Highway truck stops between Cue and Wubin		✓	✓

SOURCE: ACIL ALLEN CONSULTING

2.1 Impact

Value adding capacity

There are several identified projects which have the ability to add to the capacity of the northern beef region. The most significant is the construction an abattoir to which will create a new value chain within the region and generate transport savings. A Kimberley abattoir is more likely to be feasible given higher production in the region and the Colourstone Abattoir near Broome is currently under construction.

More broadly infrastructure which increases the ability to hold cattle in the region is important so the industry can better the control the quality specifications and timing on when cattle are sent to market. This constraint is greater in the Pilbara region. Improving the holding yards at currently underutilised Pilbara (Port Hedland) and Kimberley (Wyndham) ports will retain a greater proportion of the live exports within the northern beef region and reduce industry transport costs. Secondary value adding opportunities such establishing feedlots (potentially with the holding yards) and a feed pellet plant in the region may also arise.

Transport efficiencies

Transport is a significant cost to the industry due to the large distances that cattle are moved. The most cost-effective way to improve transport efficiencies is to increase live exports from all three existing live export ports in the region. The simulation results show that greater use of Port Hedland and Wyndham for live exports will potentially generate $2 million of savings over ten years from transport costs alone while maintaining Broome as the largest live export port in the northern beef industry. Once established the Colourstone Abattoir at Broome will generate $2.2 million of transport savings over ten years.

Improving the road network will reduce travel times and improve occupational health and safety and animal welfare outcomes. The relative benefit to industry for the priority road improvements identified are considerably less than port and holding yard upgrades because of the large cost involved and only a portion of the industry benefits from the sections improved. This is illustrated by total transport savings of less than $180,000 over ten years from implementing the Great Northern Highway, Duncan Highway and Marble Bar Road upgrades. Overall while road improvements will benefit the industry they are insufficient to justify upgrades in their own right. Rather they will need to contribute to the business case for improvements based on increase road usage by all users. If live exports through Port of Wyndham increase, the access road will also need to be improved to cater for the increased traffic.

Market and regulatory requirements

Increasing market and biosecurity requirements are expected by stakeholders to require additional infrastructure in the Pilbara and Kimberley regions, including truck washdowns and AQIS accredited holding yards. As well as addressing these requirements they also have benefits of reduced freight costs, and in some cases, community benefits as a result of trucks carrying less animal waste through populated areas.

The priority projects, assuming all are constructed over the coming decade, will result in changed flows of cattle transport in the northern beef region. These changes will primarily be a result of the location of processing facilities near Broome which will draw cattle away from existing slaughter facilities, and the resumption of significant numbers of live cattle exports at Port Hedland and Wyndham, which not only increase the numbers of cattle that remain in the region but create a redistribution of cattle within the region. For example, live exports at Port Hedland will reduce the number of cattle travelling from the Pilbara region northwards to the Port of Broome and to southern ports and abattoirs. Improvements to some roads such as the Marble Bar Road will also result in changed cattle flows from a reduction in the number of cattle travelling along the Great Northern Highway in favour of the upgraded Marble Bar Road. The reduced transport distances will also improve animal welfare outcomes through shorter travel times. The changed flow where cattle move to the least cost transport destination in the northern beef region in 2024 is illustrated in **Figure 1.3**.

2.2 Stage of development

The priority infrastructure projects are at different stages of development. **Table 2.1** categorises each project into one of three development stages:

— **Un-scoped**: the site, technical specifications, costings, approvals, ownership and finance of the project are yet to be determined and require further investigation

— **Scoped**: project feasibility has been completed and the design, costings, approvals, ownership and finance have been completed or are in progress

— **In progress**: the project is committed and scheduled to be completed in the next five years

In progress projects

There are three projects in progress. The Colourstone abattoir is being constructed and reported to be ready for commissioning in 2016. Pilbara Ports Authority have designed and committed funding to improve the temporary loading infrastructure required for live exports from the berth at Port Hedland. Main Roads WA in currently upgrading the Great Northern Highway to extend triple road train access from Wubin to Muchea.

TABLE 2.2 DEVELOPMENT STATUS OF PRIORITY INFRASTRUCTURE PROJECTS

Project	Un-scoped	Scoped	In progress
Kimberley region			
Establish enduring liaison channels at Broome and Wyndham ports	✓		
Great Northern Highway upgrades (Halls Creek to Warmun)		✓	
Upgrade Duncan Highway		✓	
Upgrade the road to Port of Wyndham		✓	
Upgrades at Port of Wyndham	✓		
Abattoir in West Kimberley			✓
Broome holding yard and washdown facility	✓		
Halls Creek holding yard and washdown facility	✓		
Upgrade Tanami Road		✓	
Improve Broome Port access road and a truck stop adjacent to port		✓	
Pilbara region			
Establish enduring liaison channels at the port of Port Hedland	✓		
Marble Bar Road upgrade		✓	
Port Hedland live export loading facility upgrades and truck stop			✓
Port Hedland holding yards and washdown facility.	✓		
Extending road train access south from Wubin to Muchea			✓
Great Northern Highway truck stops between Cue and Wubin	✓		

SOURCE: ACIL ALLEN CONSULTING

Scoped projects

Main Roads WA has undertaken preliminary design and costings for the priority road projects that come under its jurisdiction. All the Main Roads WA projects are costed at P90 standard with all cost estimations completed in 2015. All are dependent on receiving funding and as such there is no defined timing for any of the projects however it is likely that some projects will proceed within the next five years as they are considered regional priorities by Main Roads WA. For example, it is likely that some sections of the Marble Bar Road will be upgraded as they are relatively straight forward to deliver, and are able to be staged if full funding is not available. Business cases are yet to be developed for the Great Northern Highway projects.

The 40 km section of the Duncan Highway is a Shire of Halls Creek project that has not been funded and no design works or business case is available. No cost estimates have been undertaken and ACIL Allen estimated costs based on the sealing of other dirt roads included in this study. The upgrade of the Tanami Road is also a Shire project and cross jurisdictional matter. Funding is currently being sought for this project from Infrastructure Australia with a business case and cost estimate at P90 level developed in 2015. Delivery of the road will be dependent on receiving funding for its construction.

Kimberley Ports Authority have committed to improving the access road and constructing a truck stop adjacent to the Broome Port. The design, costings and approvals are currently underway and the upgrades are scheduled to be completed within the next five years subject to receiving the required level of funding. Cost estimates have not yet been undertaken however the Port estimates the cost of this project to be in the order of $500,000 to $1 million.

A summary of the status of each of the priority road projects identified in the Northern Beef Infrastructure Audit are presented in **Table 2.3**.

TABLE 2.3 NORTHERN BEEF INFRASTRUCTURE AUDIT: PLANNED AND COMMITTED PROJECTS

Project	Proponent	Cost	Expected timing	Key project requirements
Kimberley region				
Upgrade section of GNH between Halls Creek and Warmun	Main Roads WA	SLK 2922-2930 - $17.7M (P90 Sept 2015) SLK 2934-2940 - $11.0M (P90 Sept 2015) SLK 2941-2950 (Inc. replacement of Frog Hollow Bridge) –$24.1M (P90 Sept 2015)	Dependent on funding	Business case
Upgrade 40km of Duncan Highway	Shire of Halls Creek	Estimated by ACIL Allen at between $36 million and $60 million	Unknown	All design works and business case
Upgrade access road to Port of Wyndham	Main Roads WA	$38.85M (P90 Oct 2015)	Dependent on funding	Funding
Upgrade Tanami Road WA section only	Shire of Halls Creek	$272 million (P90, July 2015)	Dependent on funding	Funding
Improvements to the Broome Port access road and a truck stop adjacent to Broome Port	Kimberley Ports Authority	$500,000 to $1 million	Dependent on funding	Business case and concept design
Pilbara region				
Upgrade Marble Bar/Nullagine Road	Main Roads WA	$313 million (P90 December 2015)	Funding not yet approved.	Design works

SOURCE: ACIL ALLEN CONSULTING

Un-scoped projects

Upgrading holding yards and establishing additional washdown facilities in the Kimberley and Pilbara are un-scoped and at the pre-feasibility stage.

At Wyndham a study has identified that environmental and animal welfare constraints limit usage of the yards. The remediation costs are large and further investigation is required as to whether an alternative site may be more cost-effective, particularly if greater utilisation of the Port for live exports require an increase in holding capacity and a site that allows a longer operating season. This investigation could also establish the feasibility of a feedlot at the Port.

At Broome a new holding yard, separate from existing facilities, and a washdown facility is required to meet market standards and strengthen biosecurity preparedness. Site selection, technical design, approvals, costings and governance are yet to be completed.

There is also potential to integrate and upgrade the Halls Creek holding yard and Ruby Plains washdown into a single facility. Further analysis is required as to when demand for this facility will arise, which is linked to the Tanami Road upgrade and to a lesser extent the Duncan Highway, and whether upgrades at Wyndham and Broome are more cost-effective in the short and long term.

There is scope to upgrade the capacity and standard of the Port Hedland holding yards through further development of the existing operational yard or establishing a new yard. This may include a washdown facility. Limited consideration has been given to new site other than the Port Lumsden expansion at Port Hedland which has the potential to include dedicated live export yards and loading facilities.

2.3 Urgency

The biggest priority for the northern beef industry is to make better use of its existing infrastructure, particularly at Wyndham and Port Hedland which are underutilised. While both Wyndham and Port Hedland have infrastructure constraints the existing yards and port facilities have the existing capacity to significantly increase live exports. The immediate constraints lie more around information sharing and coordination between the port, exporters and cattle producers. This suggests that re-establishing and then maintaining effective liaison between the parties immediately is paramount so that live exports through these ports increase in 2016.

The successful commissioning of the Colourstone Abattoir in 2016 to create a new value chain located in the region is also a priority. If the abattoir does not proceed there will be considerable delay and potentially significant additional capitalisation.

Improving holding yards and introducing additional washdown facilities is important to the industry's development because they will provide the required increase in capacity, ability to meet market and regulatory standards, and strengthen biosecurity preparedness. None of the priority projects are at a stage where either industry or Government are able to commit and invest. Each priority project requires further development through feasibility studies to a level where the most suitable options and timing are known.

The industry is fortunate that a number of the priority road upgrade projects are well developed so they can be readily promoted and implemented as Western Australian and Commonwealth Government funding opportunities arise. Of the road projects identified, the business cases for the Duncan Highway, Wyndham access road and Broome Port access road upgrades are the highest priority so they are can be readily implemented.

3 IMPLEMENTATION

The Northern Beef Infrastructure Audit found that while the northern beef industry will benefit from new and upgraded infrastructure, many of these projects require further development, and there is much, if not more, to be gained from making greater use of existing assets. To achieve this, industry and Government need to collaboratively pursue a four pronged strategy over the next ten years to implement the Northern Beef Infrastructure Plan.

3.1 Establish enduring supply chain liaison channels at northern ports

Increasing live exports from Pilbara and Kimberley ports will benefit the industry through lower transport costs and improved animal welfare arising from shorter transport distances.

At present existing infrastructure and Port Hedland and Wyndham are underutilised. A disconnect between the ports, exporters, holding yards and cattle producers mean that operational issues, such as working at heights on trucks when loading cattle, are not readily resolved when cattle are exported through Wyndham, Broome and Port Hedland. In addition there is a perception by some that Port Hedland and Wyndham are closed for live export, which is not the case, but has contributed to a decline in usage and lack of infrastructure recapitalisation.

The consultations associated with developing this Plan have already improved understanding and communication between the parties' at all three ports and stimulated interest in exporting through Wyndham and Port Hedland in 2016. It is essential that this momentum is maintained by (re)establishing an enduring liaison channels at each port.

The specifics of each channels should be at the discretion of the stakeholders at each port given they face different issues. However the imperative is that it is established and continues. In the long term the liaison channels should be led by the ports. During the set-up phase, DAFWA and the relevant Regional Development Commission should provide assistance.

3.2 Ensure priority infrastructure projects are investment ready

The majority of projects are currently at the pre-feasibility development stage and require further investigation before either Government or industry can invest in them. The imperative is to ensure that a feasibility study and/or detailed business case is developed for these projects within a year.

The highest priority projects (based on the impact and urgency discussion in Chapter Two) for which a business case needs to be developed are:

- Wyndham holding yards and access road
- New Port Hedland holding yards and washdown facility
- Broome holding yards and washdown facility.

A feasibility study is also required for the Halls Creek holding yards and washdown facility because its timing is related to the upgrade of Wyndham holding yards and the Broome holding yards and washdown facility.

The feasibility study for dedicated truck stops on the Great Northern Highway between Cue and Wubin should be deferred. Cessation of the large construction phase in the mining industry is likely to reduce heavy vehicle traffic on the Great Northern Highway in the medium term. This means further investigation is a lower priority.

3.3 Promoting investment in priority projects

The priority projects can be broadly grouped as:

- Roads: which are the responsibility of Local, State and Commonwealth Governments
- Ports: which are the responsibility of Government Trading Enterprises (e.g. Pilbara Ports and Kimberley Ports or leaseholders (i.e. Cambridge Gulf Limited at Wyndham)
- Dedicated beef industry infrastructure such as holding yards which are the responsibility of industry.

The ports and dedicated beef infrastructure operate on a commercial basis and as such the principle is that the associated priority projects should be financed and operate on a cost recovery basis.

3.3.1 Roads investment

The priority road upgrades will benefit the beef industry but also need to benefit other users to justify the investment. Consequently the northern beef industry needs to collaborate with other industries and Government to ensure beef benefits are integrated into the broader business case for each upgrade and promoted to the Western Australian and Commonwealth Governments. In the short term this involves targeting the Northern Australia Beef Roads initiative but over the next decade should include all Government initiatives relating to roads and the development of regions and Northern Australia.

3.3.2 Ports and dedicated beef supply chain infrastructure

The development and investment needs of the in-port infrastructure and associated cattle yards and washdown facilities differ across the three major live export ports in the northern beef region.

3.3.3 Broome infrastructure

At Broome, the port facilities are separately located and owned from the holding yards. As such the proposed access road improvements and new truck stop adjacent to the port can be developed independently by Kimberley Ports in conjunction with the Shire of Broome and Main Roads WA.

The holding yards and washdown facilities will require a co-investment model as well as development of technical specifications and approvals. The co-investment model is required because part of the rationale for the new yards, and to a lesser degree the washdown facility, will also provide a quarantine facility to manage biosecurity incursions if required. This requires further analysis on how industry and Government will co-invest in the capital and operational costs as part of developing the business case after which investment can be sought. Northern Beef Futures has $1 million in funding toward the domestic holding yards facility which will shortly be release via an EOI grants process.

3.3.4 Wyndham infrastructure

At Wyndham, the loading facilities and holding yards are both located at the Port which is managed by Cambridge Gulf Limited under lease. While the loading facilities are adequate, the holding yards have environmental constraints which require resolution. Furthermore the access road will need to be upgraded if there is a sustained increase in live exports and further road improvements may be required if the holding yards are relocated (e.g. Wyndham by-pass road).

Detailed investigation for the need for alternative locations for the existing holding yards and the associated implications for the road network and the Port's commercial leasehold are required to determine what the best development approaches are before a detailed business case can be developed.

3.3.5 Halls Creek infrastructure

The holding yards and washdown facility located separately around Halls Creek are not operational. There are potential efficiency gains in co-locating the yards and washdown together in one location. However it is unclear whether there is sufficient demand now or in the future to cover the capital and operational costs. Furthermore the biosecurity risk might be adequately addressed by the infrastructure located at Broome and Wyndham, particularly while the Tanami Road and Duncan Highway are not upgraded.

These uncertainties can be initially addressed through a limited feasibility study. The study should be conducted at the same time as the business cases for the Broome holding yards and washdown facility and the Wyndham holding yards are developed.

3.3.6 Port Hedland infrastructure

The Port Hedland infrastructure is similar to Broome in that the loading facilities and holding yards are separately located and owned. Pilbara Ports has committed to improving the loading facilities at the shared berth which will remove some of the immediate constraints. In the longer term the Port is considering developing Port Lumsden which may include a dedicated loading berth, holding yards and washdown facility. It is not expected this development will occur over the next decade. There is also interest from Minderoo in export live cattle through the port at Onslow which is also managed by Pilbara Ports.

Of the two cattle yard facilities, one holding yard lease has been recently been renewed by the Town of Port Hedland and the other privately operated holding yard lease has been forfeited. The capacity and standard of the Shire yard will need to increase to achieve greater live export volumes in line with market and regulatory requirements. The location of a washdown facility at Port Hedland has not been investigated and it is not known whether the existing yards could incorporate such a facility.

As a result the investment case for improving infrastructure in Port Hedland will need to be developed in two stages. The first should involve a feasibility study that outlines how the standard and capacity of the existing and potentially new holding yards can be improved within a decade (possibly including a new washdown facility) while taking into consideration the longer potential of Port Lumsden. A business case for the improving holding yards are the current or an alternative location can then be developed to seek investment.

3.4 Tracking progress

3.4.1 Project management

Each of the priority projects needs to be monitored to ensure that they are progressing through their development stages so that they are completed within the decade. To achieve this, the Plan identifies key stakeholders to lead the projects as shown in **Table 3.1**. The role of the project leads is to ensure the project happens which may, but not necessarily, require them manage and/or deliver the project. This includes monitoring progress, addressing issues arising and reporting to the Plan's governance group. Reporting should be on a quarterly for at least the first two years and then annually.

The Kimberley and Pilbara Cattlemen Association will also play an important role in advocating for the priority projects and potentially partnering with the lead organisations. DAFWA is an industry development rather than infrastructure focused organisation. As such its role is to facilitate rather than lead the priority projects through the Northern Beef Futures program. This includes administering the seed funding available for infrastructure through Northern Beef Futures.

TABLE 3.1 ALLOCATION OF PROJECT MANAGEMENT RESPONSIBILITY

Project	Stakeholder organisations
Kimberley region	
Enduring supply chain liaison at Broome port	Kimberley Ports, KDC
Enduring supply chain liaison at Wyndham port	CGL, KDC, Kimberley Ports
Great Northern Highway upgrades (Halls Creek to Warmun)	MRWA
Upgrade Duncan Highway	Shire of Halls Creek
Upgrade the road to Port of Wyndham	MRWA
Upgrades at Port of Wyndham	Kimberley Ports, CGL, KDC
Abattoir in West Kimberley	KDC
Broome holding yard and washdown facility	DAFWA, RDAK, KDC, RBGs
Halls Creek holding yard and washdown facility	DAFWA, KDC, RBGs
Upgrade Tanami Road	KDC, Shire of Halls Creek
Improve Broome Port access road and truck stop at port	Kimberley Ports, KDC
Pilbara region	
Enduring supply chain liaison at Port Hedland port	Pilbara Ports, PDC
Marble Bar Road upgrade	MRWA, PDC
Port Hedland live export loading facility upgrades and truck stop	Pilbara Ports, PDC
Port Hedland holding yards and washdown facility	PDC, Pilbara Ports, RBGs
Extending road train access south from Wubin to Muchea	MRWA
Great Northern Highway truck stops between Cue and Wubin	MRWA, PDC

SOURCE: ACIL ALLEN CONSULTING

CGL = CAMBRIDGE GULF LIMITED; DAFWA = DEPARTMENT OF AGRICULTURE AND FOOD, WESTERN AUSTRALIA; KDC = KIMBERLEY DEVELOPMENT COMMISSION, MRWA = MAIN ROADS WA; PDC = PILBARA DEVELOPMENT COMMISSION; RBG = REGIONAL BIOSECURITY GROUP, RDAK REGIONAL DEVELOPMENT AUSTRALIA KIMBERLEY

3.4.2 Recommended Plan governance

Governance of the Plan lies with the organisations responsible for each of the priority projects. It is recommended that implementation oversight is led separately in the Kimberley and Pilbara regions given Northern Beef Futures will cease in 2018 which is well before the 10 year planning horizon is complete. An informal governance group of the major stakeholders (**Table 3.1**) should be led by a relevant regional agency, for example, a Development Commission. The wider group of stakeholders, including peak industry bodies, should be engaged through the priority projects as required. The suggested governance group membership is:

— **Kimberley**: Kimberley Development Commission, Kimberley Ports (and Cambridge Gulf Limited), Main Roads, DAFWA – Northern Beef Futures, and Kimberley Pilbara Cattleman's Association, Regional Development Australia.

— **Pilbara**: Kimberley Development Commission, Pilbara Ports, Main Roads, DAFWA – Northern Beef Futures, Kimberley Pilbara Cattleman's Association, Regional Development Australia.

The role of the governance group is oversee implementation and adaptation of the Plan. The key tasks of the group are:

— Meet regularly to track progress of the projects and address issues arising (twice a year for the first two years (at least) and then as required with a minimum of once per year)

— Advise Northern Beef Futures on allocation of the Infrastructure Fund

— Review the Plan to identify which projects should be adapted or cease and to identify new projects

Communicate progress to and where required and seek advice from stakeholders on projects or the Plan.

The lead regional agency should chair the governance group for their respective region and provide the secretariat for the first two years. Northern Beef Futures will assist with initial establishment of the group. After two years the members will review the chair, membership and secretariat. The following key performance indicators will be used to measure the performance of the Plan:

- Project progress towards completion within 10 years
- Governance group attendance and performance (qualitative assessment)
- Increase in production (annual turn-off) and cattle either exported or slaughtered in the region.

It is recommended the cattle flow modelling used to develop the Plan is updated annually using NLIS data to report on the last performance indicator. The updated modelling can also be used to develop scenarios and analyse additional projects as required.

3.5 Northern Beef Futures Infrastructure Seed Funding

Under Northern Beef Futures, up to $1,600,000 of seeding funding is available for infrastructure through Royalties for Regions. Of this $1,000,000 is committed to establishing biosecurity holding yards at Broome (which is part of the Broome holding yards and wash down facilities priority project in this Plan). Responsibility for allocating the remaining $600,000 seed funding lies with DAFWA as manager of Northern Beef Futures.

The purpose of the seeding funding is to provide a catalyst that accelerates the realisation and/or magnifies the impact of infrastructure projects. Given that most priority projects need further development, the seed funding will target activities that make infrastructure projects "investment ready".

DAFWA will allocate the seed funding through a targeted call and assessment of proposals. The targeted call will involve Northern Beef Futures consulting with the lead organisations in **Table 3.1** and the Kimberley Pilbara Cattleman's Association to discuss the scope and potential cost of a project that addresses one or more of the 15 priority projects. Additional projects identified during these discussions may also be considered suitable and included in the proposal submissions if required.

Following the initial consultations, DAFWA will call for proposals over 2016. The proposals should be no longer than five pages and include:

- Project title
- Proponent and other partner organisation
- Budget, including the amount of seed funding sought and other cash contributions
- Alignment with the Northern Beef Infrastructure Plan priority projects (or a justification if it does not)
- Objectives, approach, timing and deliverables.

Once the proposals are received the proposals will be assessed against the following criteria:

- Does the proposal address the Northern Beef Infrastructure Plan priority projects?
- To what degree does the proposal accelerate realisation of the infrastructure?
- Would the proposed activities happen without seed funding?
- Is the proposal feasible?
- Is the proposal (and infrastructure) supported by stakeholders?
- Does the proposal overlap with other proposals and is there benefit in combining proposals?

DAFWA will select which proposals will be funded up to a total of $600,000 and contract the successful proponents to deliver the project. A report summarising the proposals received and rationale for selecting the successful proposal will be produced and provided to all applicants.

4 BUSINESS CASE SUMMARIES: PRIORITY INFRASTRUCTURE PROJECTS

The priority projects in full and business cases are provided in the Northern Beef Infrastructure Audit Phase Three report and include an outline of their description and needs, as well as information regarding their location, costings, ownership and benefits where benefits have been described in terms of:

- Transport efficiencies and savings
- New markets
- Perceived animal welfare outcomes
- Occupational health and safety benefits for road users and others
- Regional benefits such as employment creation, population retention and community benefits.

It is recommended this report is read in full for further detail regarding the priority projects.

4.1 Upgrade sections of the Great Northern Highway between Warmun and Halls Creek

Situation analysis

The Great Northern Highway forms part of the interstate route linking Perth and Western Australia to Darwin and the Northern Territory. It provides access between towns in the Kimberley region including Fitzroy Crossing and Halls Creek. It is also a strategic freight and tourist route. There are safety issues associated with the narrow sealed pavement on the Great Northern Highway between Halls Creek and Warmun. There is a need to widen the seal of this section of the Great Northern Highway to improve safety and to increase the efficiency of the Highway.

Main Roads WA have identified three priority projects along the stretch of the Great Northern Highway between Warmun and Halls Creek comprising 24km of road works (SLK 2922-2930, SLK 2934-2940 and SLK 2941-2950 which includes the replacement of Frog Hollow Bridge).

Ownership

Great Northern Highway is owned and operated by Main Roads WA.

Cost

Main Roads WA have estimated the cost of the three sections of works is $188 million:

SLK 2922-2930 - Estimated cost $17.7 million (P90 Sept 2015)

SLK 2934-2940 - Estimated cost $11.0 million (P90 Sept 2015)

SLK 2941-2950 including Frog Hollow Bridge – Estimated cost $24.1 million (P90 Sept 2015).

Timing

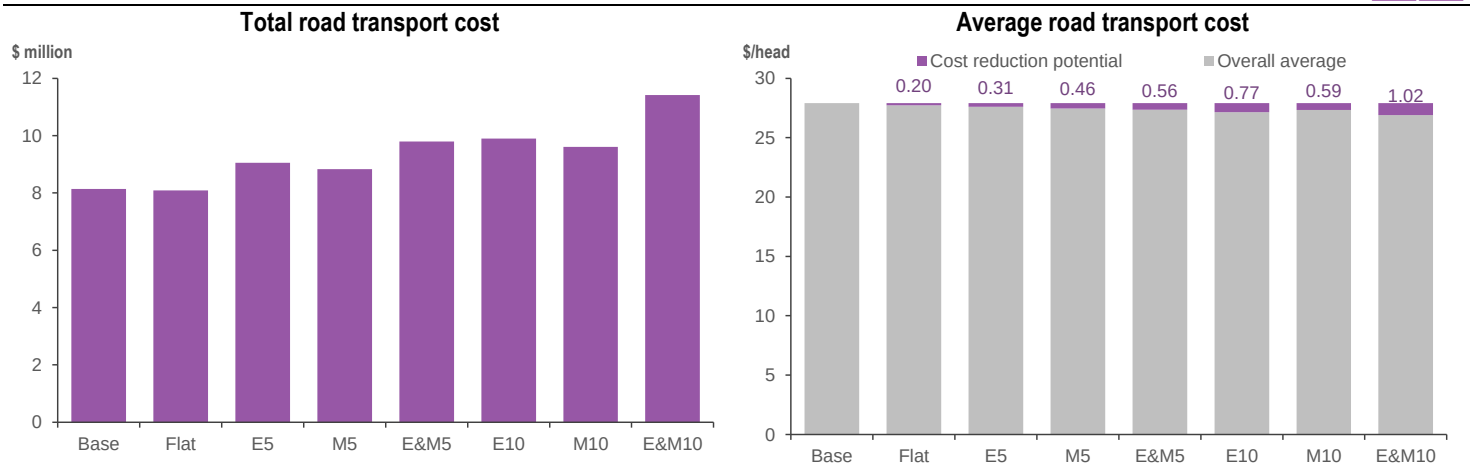
Timing for the construction of this project is dependent on sourcing the required level of funding.

Total road transport savings potential

As the upgrades to the Great Northern Highway are not expected to result in an increase in the throughput along the Highway, all potential cost savings are to be attributed to time savings. The simulated overall optimal costs savings from upgrading the Great Northern Highway under the base case is $60,000.

The per-head savings of 20 cents per head are equally low. It is worth noting that the simulated per-head savings increase as the level of turnoff increases however even under the most optimistic growth scenario, they remain comparatively low at $1.02 per head as illustrated in **Figure 4.1**.

FIGURE 4.1 GREAT NORTHERN HIGHWAY UPGRADE SIMULATION SUMMARY



SOURCE: ACIL ALLEN MODELLING

Risks

The potential risk associated with this project is the ability to obtain funding to construct the project.

Requirements for progressing infrastructure

All three stages of this project have designs completed however no business case has yet been completed for this project. The project is not funded and Main Roads WA is currently seeking funding through the Northern Australia Beef Roads Fund to construct this project. All stages of the project have a high degree of project readiness which means that they could proceed to construction within three to six months of being awarded funding.

4.2 Upgrade Duncan Highway

Situation analysis

The Duncan Highway is an unsealed road around 441km in length. It originates from the Victoria Highway near the Northern Territory and Western Australian border and joins the Great Northern Highway in Halls Creek. It is primarily a road train route and is a significant access road for several Aboriginal communities.

The road is generally constructed to the standard of a formed road with gravel sheeting applied over some sections. It crosses numerous watercourses with most water crossings constructed from local material at stream bed level and are subject to scouring and washout after heavy rainfall. The road can be closed for extended periods during the wet season (Main Roads Western Australia, 2014).

Description of required infrastructure

The sealing of the Duncan Highway for a 40km stretch from the town of Halls Creek to the intersection with the Buntine Highway is required to improve its formation and reduce the periods of closure.

Future demand

Simulations undertaken by ACIL Allen suggest that the increase in average speed triggered by the upgrade is unlikely to have an effect on the throughput of the segment of the Duncan Highway.

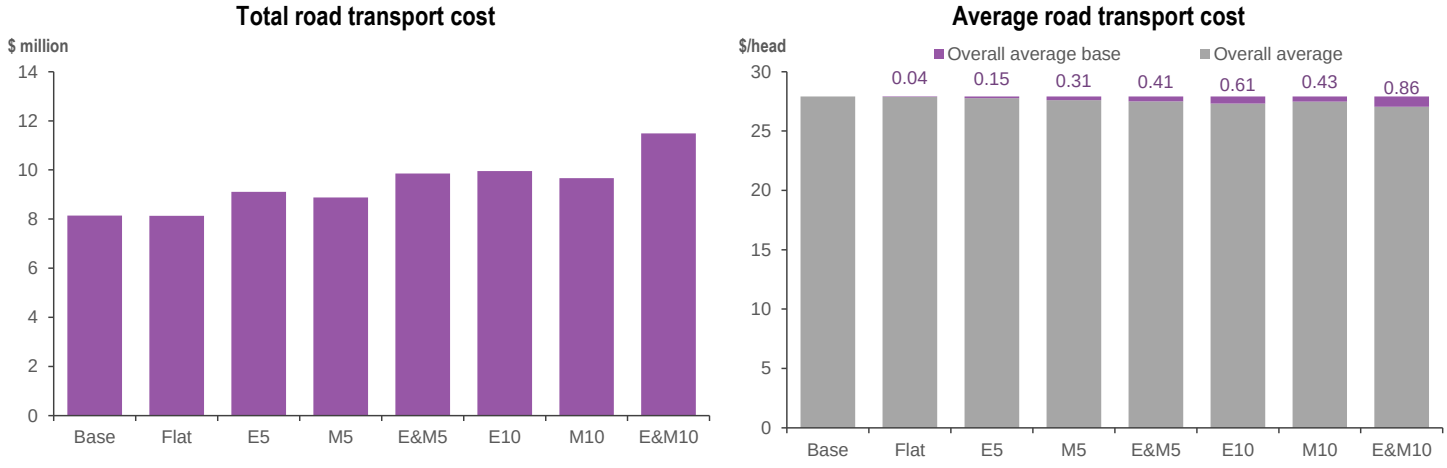
Ownership

The Duncan Highway is owned and operated by the Shires of Wyndham East Kimberley and Halls Creek. This section of the highway is owned and operated by the Shire of Halls Creek.

Cost

The cost to upgrade the 40km section of the Duncan Highway are not known but is estimated to be $36 to $60 million based on costed estimates to upgrade unsealed roads in the northern beef region.

FIGURE 4.2 DUNCAN HIGHWAY 40KMN SECTION UPGRADE SIMULATION SUMMARY



SOURCE: ACIL ALLEN MODELLING

Total road transport savings potential

The optimal simulated transport costs savings of this project under the base case are $11,000 or 4 cents per head of cattle rising to 86 cents per head under a high growth scenario as illustrated in **Figure 4.2**. The simulation only captures turnoff from properties in the northern beef region. The upgrade is likely to result in increased cattle flows along the entire length of the Highway including flows of cattle into Western Australia resulting in additional benefits.

Benefits

The construction of this project will have benefits in the form of improved travel efficiency for users of the road as well as savings in maintenance costs. There will be benefits from a lower number of accidents and a reduced severity of accidents along this stretch of Highway. Other road users such as residents of adjacent Aboriginal communities and pastoral stations, and the mining and tourist industries could benefit.

There will be benefits in the construction phase of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project.

The northern beef industry will benefit from reduced transport costs. There will also be associated animal welfare benefits from reduced travel times and stress associated with travelling along unsealed roads. Occupational health and safety benefits will also arise as a result of reduced travel times for

drivers and hazards associated with travelling on unsealed roads. The sealing of the road opens the opportunity increased flows of cattle from the Northern Territory to Western Australia.

Requirements for progressing infrastructure

The project is not funded. Funding will need to be sought from the Shire to conduct an engineering study for this work, potentially through the Northern Beef Futures Seed Funding grant.

4.3 Upgrade the road to Port of Wyndham

Situation analysis

This section of the Great Northern Highway is the only sealed road linking Wyndham to the State road network. Main Roads WA reports that heavy vehicles make up 30 per cent of traffic on this section of the road (Main Roads Western Australia, 2014) as a result of vehicles accessing the Port of Wyndham. The Port handles nickel concentrate, live cattle, explosives, diesel, and crude oil shipments and until February of 2015, iron ore shipments.

The Northern Australia Infrastructure Audit identifies the upgrades to the Port of Wyndham road as a priority project in the Northern Australia Infrastructure Audit (Infrastructure Australia, 2015).

Description of required infrastructure

The Port of Wyndham road has inadequate seal width which has resulted in excessive edge wear and shoulder deterioration. There is a need to upgrade this road by improving the geometry and increasing the seal and formation widths.

Future demand

Main Roads WA reports that the road upgrade is needed to meet the expected demand placed on this section of the road network due to economic development of the region resulting in an increase of heavy vehicles and freight movement to and from the Port of Wyndham (Main Roads Western Australia, 2014, p. 8). Future demand is expected to be a result of growth in existing trade particularly in products produced by the expanded Ord Irrigation District. The future potential throughput at the Port of Wyndham ranges from around 25,000 northern beef cattle under the flat growth scenario to nearly 32,500 cattle in a high growth scenario assuming a least cost transport model.

Ownership

The road is owned and maintained by Main Roads WA.

Cost

Main Roads WA estimates this project to cost $24.8 million (Preliminary July 2013).

Timing

The project is 12 to 24 months away from being project ready and the estimated time for the construction of the works is 9 to 10 months. The project is not dependent on the completion on other works however it will benefit the upgrades at the Port of Wyndham.

Benefits

The construction of this project will have benefits in the form of improved travel efficiency for users of the road as well as savings in maintenance costs. There will be benefits from improved road safety due to a lower number of accidents and a reduced severity of accidents along this stretch of road. There will be benefits in the construction phase of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project.

The northern beef region will benefit from the project in terms of improved road transport efficiencies. There will also be improved occupational health and safety as well as animal welfare outcomes. The road improvements benefit from the upgrades at the Port of Wyndham.

Requirements for progressing infrastructure

Main Roads WA has completed a business case for this section of road as well as a selection study report. A preferred alignment has been selected.

4.4 Upgrades at Port of Wyndham

Situation analysis

Port of Wyndham is operated by Ord River District Co-operative LTD (now CGLtd) under an Operating Agreement with the Department of Planning. It is the only deep-water port between Broome and Darwin. Exports include live cattle, nickel, produce from the Ord River irrigation area. Imports include diesel, ammonium nitrate for the mining industry, and general cargo.

Cattle exported through the Port are primarily sourced from cattle stations in the East Kimberley and are exported mainly to Indonesia, Malaysia and the Philippines with some shipments to the Persian Gulf. Cattle exports through the Port have been declining over the five years to 2013-14 as illustrated in Table 4.1 but have recovered in the current financial year.

TABLE 4.1 LIVE CATTLE EXPORTS: PORT OF WYNDHAM

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Cattle (head)	78,182	62,307	34,485	28,204	17,257	38,904

SOURCE: MEAT AND LIVESTOCK AUSTRALIA, 2014

The current holding yards at the Port have a capacity of 10,000 cattle per year. The Department of Environmental Regulation requires that the yards must undertake improvements in order to be environmentally compliant. In addition, there is an industry preference to undertake upgrades of the loading facilities.

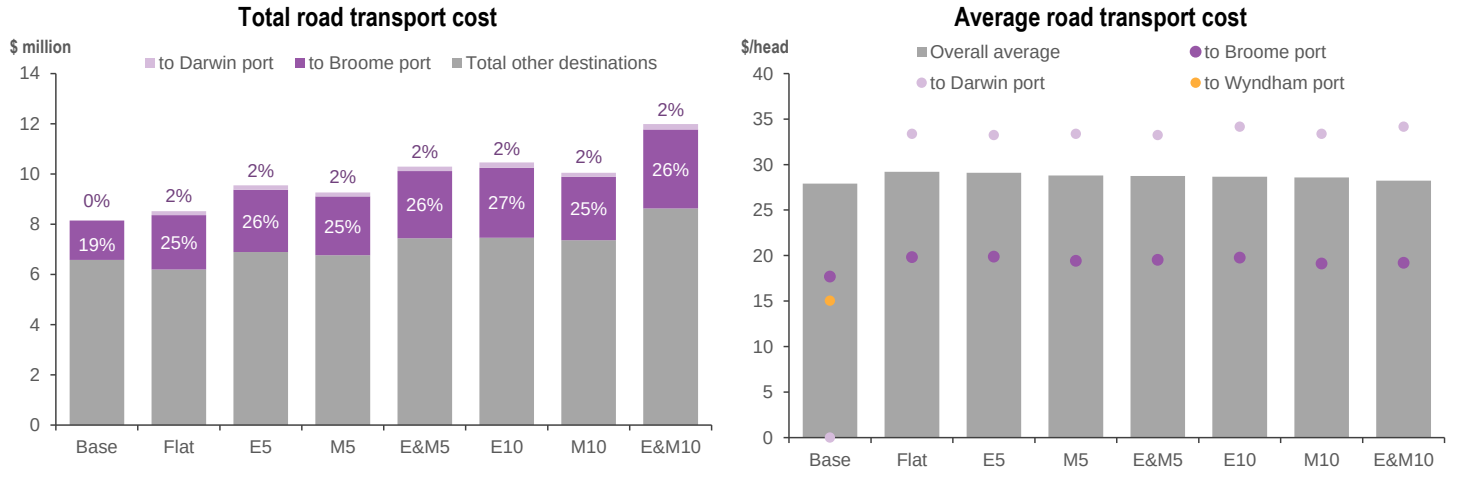
Future demand

Modelling forecast that the Port will receive similar numbers of cattle under all growth scenarios ranging from around 25,000 cattle from the northern beef region under the flat growth scenario to nearly 32,500 cattle under an optimistic scenario.

Ownership

The Port of Wyndham is currently operated by Cambridge Gulf Limited (CGL) under a lease agreement with the Western Australian Government that is due to expire in on the 30 June, 2019. Under this lease, CGL owns the cattle yards.

FIGURE 4.3 PORT OF WYNDHAM UPGRADE SIMULATION SUMMARY



SOURCE: ACIL ALLEN MODELLING

Cost

The cost to upgrade the cattle yards and loading facilities at the Port are unknown.

Total road transport savings potential

The total transport savings to the northern beef region of not having to transport cattle to alternative ports under the flat growth scenario is $370,000 as illustrated in **Figure 4.3**.

Benefits

There will be benefits in the construction phase of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project.

The northern beef region will benefit from the improved loading times and better animal welfare outcomes. The new holding yards will result in the ability to accumulate greater numbers of cattle and will therefore have the potential to better meet the requirements of the live export trade. New yards will improve animal welfare outcomes and there will be environmental benefits.

Requirements for progressing infrastructure

A business case for development and funding is required. Upgrades to the Port of Wyndham must be in accordance with the regulations of various government agencies and inconsideration of industry demand.

4.5 Abattoir in North West to improve value adding and market diversity

Situation analysis

There is currently no operating abattoir in the northern beef region. The Colourstone Abattoir is currently under construction near Broome and is due for completion in 2016. It is located on freehold land approximately half way between Broome and Derby. The abattoir is expected to operate weekdays for 44 weeks of the year with the exception being the wet season in January and February. It has a design capacity of 350 cattle per day or an annual capacity of around 77,000 cattle. In addition, the site will include an independent power generation system and a waste water treatment plant. There is a need for a sealed turnoff from the Great Northern Highway to the Abattoir. There are also options for additional supporting infrastructure that will benefit the Abattoir including power transmission to allow the Abattoir to run off mains electricity.

Ownership

The Colourstone Abattoir is owned and operated by the Kimberley Meat Company. The access road to the Abattoir will be joint owned and operated by the Shire of Derby/West Kimberley.

Market potential

Modelling suggests an optimal market potential of 76,000 cattle per year under a flat growth scenario to 110,000 cattle under a very high growth scenario. Based on current turnoff, the abattoir could capture almost all of northern beef cattle that are currently slaughtered, or around 44,000 cattle. The reason is that there are no competing abattoirs in an almost 1,000km radius of Broome.

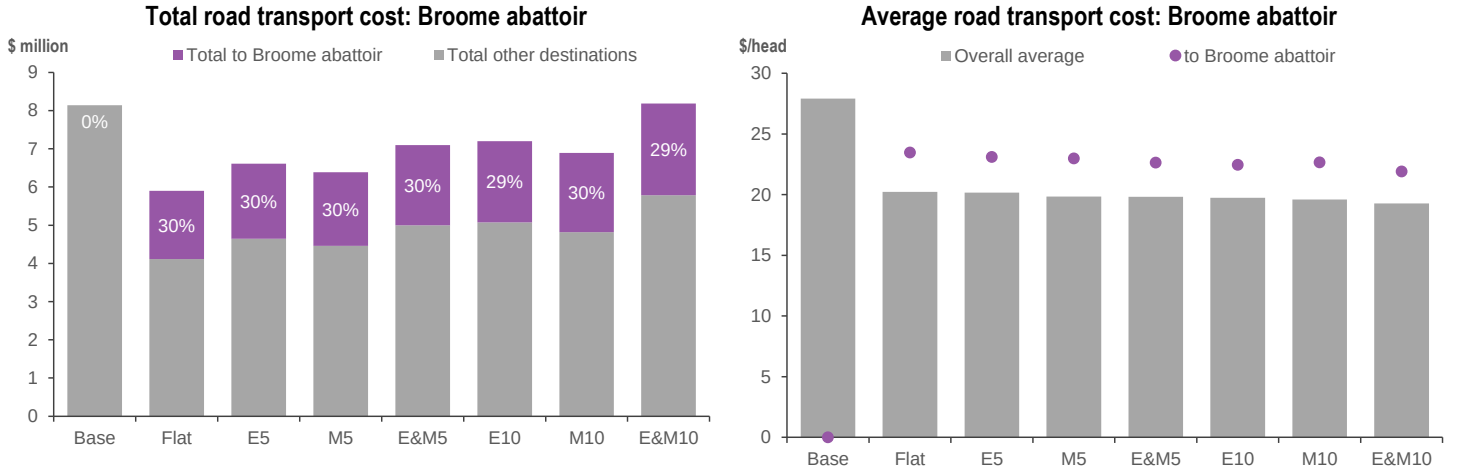
Cost

The cost to construct the Colourstone Abattoir is more than $40 million (ABC Rural, 2015) and the cost to construct the access road is $3 million (The West Australian, June 25, 2015).

Total road transport savings potential

An abattoir in Broome would reduce transport costs for the northern beef region by more than half the current cost to transport cattle to an abattoir. This represents an optimal transport saving of around $2.2 million per annum based on a flat growth turnoff scenario and a least cost transport model (**Figure 4.4**).

FIGURE 4.4 ROAD TRANSPORT COST: BROOME ABATTOIR



SOURCE: ACIL ALLEN MODELLING

Benefits

There will be benefits in the construction phase of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project. There will be long term job creation in the operations phase of the project of around 60 staff. The northern beef region will benefit in terms of the economic diversification of the regions and the creation of a significant number of jobs in a new industry (meat processing).

The northern beef region will benefit from transport savings and achieving higher cattle performance:

- providing a market for some classes of cattle for which it is currently not financially viable to transport to existing abattoirs for processing
- an ability to fatten cattle beyond live weight restrictions in the live export market enabling pastoralists to potentially receive higher prices
- providing a new market destination in the northern beef region
- Improved animal welfare outcomes from reduced travel times.

Requirements for progressing infrastructure

The Colourstone Abattoir is currently under construction and is due for completion in April 2016. Funding has been announced for the construction of the access road however construction has not yet commenced. In order for other infrastructure such as a transmission line to proceed, the private operator would need to build a business case for its development.

4.6 Broome holding yard and truck washdown facility

Situation analysis

In the northern beef region, the only common washdown facility is located at the Kununurra Quarantine and Inspection Facility. There is a disused washdown facility located at Halls Creek and some trucking companies own their own washdown facilities. The demand for washdown facilities in the northern beef region is growing due to a number of key factors including:

- The development of the mosaic agriculture in the region which represents large investments and a corresponding increase in truck and related vehicle traffic associated with the transport of live cattle and other goods such as fertilisers and equipment required to operate these systems. Common user washdown facilities are required to help protect these investments from bio security risks.
- The increase in cross border traffic associated with the transport of cattle throughout the north of Australia as the region develops its road, port and processing infrastructure.

— The potential requirement by overseas markets for trucks to be washed down prior to vessel loading.

There is also the need for an additional export accredited holding yard near to Broome to allow for cattle with different market requirements to be held separately from the existing holding yards and to serve as a quarantine facility in the event of a biosecurity outbreak.

Demand

Modelling suggests a future throughput potential for the Port of Broome of between 89,000 and 138,000 northern beef cattle per year. This lower estimate of throughput is slightly lower than for current levels of throughput as it assumes that the Port of Port Hedland is operational and therefore attracts some cattle from Broome.

Cost

Based on the construction of similar facilities, the wash-down only project would cost around $1.7 million to construct.

Total road transport savings potential: Washdown facility

Modelling suggests that under an optimal flat growth scenario, the northern beef industry would save between $8.2 million and $7.5 million in road transport costs for the establishment of a washdown facility in Broome. This estimate assumes the construction of a washdown facility in Broome only and includes the initial construction cost and all recurring operating and maintenance costs not covered by the facilities' revenue.

Benefits

There will be benefits in the construction and operation phases of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project.

The washdown facility would add to the northern beef industry by assisting in addressing biosecurity issues, improving or sustaining the performance of cattle by reducing the incidences of soiling, improving transport efficiencies by removing waste from trucks, and by better meeting export market requirements. An additional set of holdings yards will benefit the industry by providing the ability to separate cattle with different market requirements and in the event of a disease outbreak.

Requirements for progressing infrastructure

A key step for progressing this project is determining the market requirement for a washdown facility. The identification of a site comprising of suitable unencumbered land with consideration given to strategic transport routes, and access to water and energy is also required.

It is understood that the Northern Beef Futures has $1 million available as grant to progress the development of two domestic holding yard facilities in the northern beef region.

The construction and operation of a washdown facility must be in accordance with the regulations of various government agencies dependent on which site is selected for the facility.

4.7 Halls Creek holding yards and truck washdown facility

Situation analysis

In the Pilbara and Kimberley regions the only common washdown facility is located at the Kununurra Quarantine and Inspection Facility. There is a disused washdown facility located at Halls Creek which is no longer operational. The demand for washdown facilities in the northern beef region is growing due to a number of key factors including:

— The development of the mosaic agriculture in the region which represents large investments and a corresponding increase in truck and related vehicle traffic associated with the transport of live cattle and other goods such as fertilisers and equipment required to operate these systems. Common user washdown facilities are required to help protect these investments from bio security risks.

— The increase in cross border traffic associated with the transport of cattle throughout the north of Australia as the region develops its road, port and processing infrastructure. This is particularly of

interest to Halls Creek due to the potential upgrades of the Tanami Road and the Duncan Highway which could result in more interstate traffic.

Location analysis

Consultation suggested a suitable site for a Halls Creek washdown facility would be on the Great Northern Highway close to the intersection of the Tanami Road near Halls Creek to service traffic travelling along the Great Northern Highway, the Tanami Road and the Duncan Highway.

Ownership

The facility should be owned by a private operator and operated on a cost recovery basis.

Cost

Based on the construction of similar facilities, the project would cost around $1.8 million to construct.

Benefits

There will be benefits in the construction and operation phases of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project.

The washdown facility would add to the northern beef industry by assisting in addressing biosecurity issues, improving or sustaining the performance of cattle by reducing the incidences of soiling, improving transport efficiencies by removing waste from trucks, and by better meeting export market requirements. An additional set of holdings yards will benefit the industry by providing the ability to separate cattle with different market requirements and in the event of a disease outbreak.

Requirements for progressing infrastructure

A key step for progressing this project is determining the market requirement for a washdown facility and holding yard. The identification of a site comprising of suitable unencumbered land with consideration given to strategic transport routes, and access to water and energy is also required.

The construction and operation of a washdown facility must be in accordance with the regulations of various government agencies dependent on which site is selected for the facility.

4.8 Marble Bar Road upgrade

Situation analysis

The Marble Bar Road extends from Newman and the Great Northern Highway in the south, to east of Port Hedland in the north. The Road services the major township of Nullagine and nearby pastoral stations and Aboriginal communities. It is a critical access road for mining operations in the East Pilbara and is a major freight route for the northern beef industry.

The 181km section of the Marble Bar Road from the Roy Hill Road turnoff and Ripon Hills Road is unsealed. The road crosses several rivers and floodplains and is susceptible to closure for an average of 15 days per year (2008 - 15) (Main Roads WA, Department of Transport, 2015).

Description of required infrastructure

The upgrade would require sealing the road to a width of 9 m comprising of two 3.5 m traffic lanes and two 1 m adjacent sealed shoulders on an 11 m pavement. The road geometry is designed to generally have 110km per hour speed limit with some 90km per hour sections. The waterways design standard has a serviceability which will result in the expected closure of the road once every ten years. The upgrade has been divided into twelve sections.

Ownership

The Marble Bar Road is owned and maintained by Main Roads WA.

Cost

The cost to upgrade the Marble Bar Road has been estimated by Main Roads WA at $313 million (P90 December 2015) comprising of twelve costed stages.

Timing

The Marble Bar Road upgrade is currently unfunded and as such there is no defined timing for this project. The most likely stage to proceed is the Roy Hill North stage which comprises of sealing 15km of road from 120-135 SLK which is a section located north of the Roy Hill Road and south of Bonney Downs Station. This section will be designed in 2016, is relatively straight forward to deliver, and is able to be staged if full funding is not available.

Total road transport savings potential

Modelling estimated overall transport costs savings of $61,000 for the northern beef region under the base case, equivalent to savings of 21 cents per head of cattle or $1.03 per head under the most optimistic growth scenario assuming a least transport cost model.

Benefits

The upgrades to the Marble Bar Road will provide a sealed road connecting Newman and Port Hedland. The upgrade will benefit the communities and businesses along the road including the town of Nullagine, pastoral properties and the mining industry, notably the Roy Hill mine.

The construction of this project will have benefits in the form of improved travel efficiency and safety as well as savings in maintenance costs. There will be benefits in terms of a reduction in traffic on the Great Northern Highway between Port Hedland and Newman. There will be benefits in the construction phase of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project.

The northern beef region will benefit from the project in terms of improved road transport efficiencies resulting in small cost savings to the industry.

Requirements for progressing infrastructure

A draft business case has been developed for this project. This project is not fully funded and has not yet been fully designed. Some design work will be undertaken in 2016.

4.9 Port of Port Hedland upgrades

Situation analysis

The Port of Port Hedland is operated by the Pilbara Ports Authority. It is Australia's largest export port by annual throughput and the largest bulk minerals port in the world. Live cattle exports at the Port have been variable in recent years and from 2011-12 to 2012-13 there were no cattle exports. Livestock are currently exported through Berth 3 and prior to export, cattle are held at either the Shire holding yards or the privately owned Hedland Export Depot. A variety of livestock ships visit the Port with capacity of up to 18,000 cattle however, the Port mainly exports small numbers of cattle (around 2,000 per ship) as 'top ups' to larger shipments of cattle, or to small vessels.

Description of required infrastructure

There are several infrastructure projects currently planned by the Port:

Truck stop – a truck stop and queuing area to allow trucks to turn safely to access the Port and if required, to queue to allow more efficient loading at the Port.

Berth infrastructure - upgraded cattle loading infrastructure and the use of Berth 3, Berth 1 and Berth 2. The upgrade includes a dual level loading ramp to facilitate loading from both truck decks directly to the livestock vessel resulting in loading efficiencies and the ability to service larger vessels.

Lumsden Point development - The Pilbara Ports Authority and the Western Australian Department of Commerce have investigated the development of a general cargo handling and marine services

facility at Lumsden Point, located in Port Hedland's inner harbour with the potential for cattle holding yards and associated export facilities and the direct loading of cattle onto livestock vessels.

Demand

Modelling suggests a future throughput potential for the Port of just over 65,000 cattle per year for the flat growth scenario and 100,000 cattle under the most optimistic growth scenario. This is equivalent to 22 per cent of cattle from the region or 35 per cent of all live exports from the region.

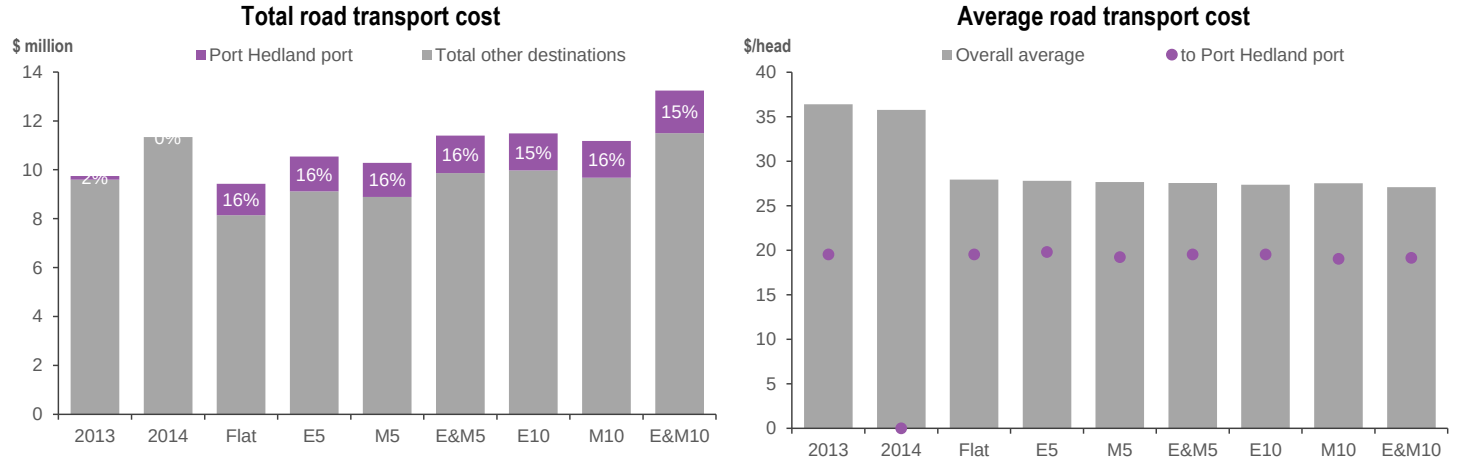
Ownership

The Port is owned and operated by the Pilbara Ports Authority and the access road to the Port where the truck stop would be located is owned and operated by the Town of Port Hedland.

Cost

The estimated cost to upgrade the existing berths is $300,000 and the Lumsden Point development is $393 million (2014). No costings have been undertaken for the truck stop.

FIGURE 4.5 PORT OF PORT HEDLAND SIMULATION SUMMARY



SOURCE: ACIL ALLEN MODELLING

Total road transport savings potential

Modelling found that optimised cattle exports at Port Hedland have the potential to lower the average per head road transport cost in the northern beef region from current levels of around $36 per head to under $28 per head (**Figure 4.5**). Note that the change in cattle flows triggered by the renewed use of the Port of Port Hedland would require a new set of holding yards in Port Hedland.

Benefits

There will be benefits in the construction and operation phases of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project. The economy of the Pilbara region will be diversified. Upgrades to the Port would add to the northern beef industry by providing another port option in the region, reducing transport costs across the industry, and potentially increasing the number of cattle exported from the region by reducing the costs to transport cattle to a port.

Requirements for progressing infrastructure

The Port Authority advises that berth improvements and preferably the truck stop will take place for the 2016 live export season. The Lumsden Point Project is currently not fully funded however concept and design work is largely complete and the Project has received environmental approval.

4.10 Port Hedland holding yards and truck washdown facility

Situation analysis

In the northern beef region the only common washdown facility is located at the Kununurra Quarantine and Inspection Facility. There is a disused washdown facility located at Halls Creek and some trucking companies own their own washdown facilities. The demand for washdown facilities in the northern beef region is growing due to:

- The development of the mosaic agriculture in the region which represents large investments and a corresponding increase in truck and related vehicle traffic associated with the transport of live cattle and other goods such as fertilisers and equipment required to operate these systems. Common user washdown facilities are required to help protect these investments from bio security risks.
- The increase in cross border traffic associated with the transport of cattle throughout the north of Australia as the region develops its road, port and processing infrastructure.
- The potential requirement by overseas markets for trucks to be washed down prior to vessel loading.

There is an industry preference for two operational holding yards at Port Hedland. Operating yards are located on 6ha around 30km from the Port with the capacity for 6,000 cattle. It includes a single loading facility, yards and a feedlot. A second set of yards located on 140ha at South Hedland is not operating. They include a dual loading ramp, yards and a feedlot with a capacity of 6,000 cattle.

Demand

Modelling suggests a future throughput potential for the Port of Port Hedland of just over 65,000 cattle per year for the flat growth scenario and 100,000 cattle under an optimistic scenario.

Ownership

The facility should be owned by a private operator and operated on a cost recovery basis.

Cost

Based on the construction of similar facilities, the project would cost around $1.8 million to construct.

Total road transport savings potential

Holding yards - Modelling of optimal cattle exports at the Port of Port Hedland found the average road transport cost in the northern beef region will fall from current levels of $36 per head to under $28. Washdown facility - Under a flat growth scenario, modelling found that the northern beef industry would save between $8.0 million and $7.3 million with a washdown facility in Port Hedland. This estimate assumes a new washdown facility in Port Hedland only and includes the construction cost and all recurring operating and maintenance costs not covered by its revenue.

Benefits

There will be benefits in the construction and operation phases of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project. The washdown facility would add to the northern beef industry by assisting in addressing biosecurity issues, improving or sustaining the performance of cattle by reducing the incidences of soiling, improving transport efficiencies by removing waste from trucks, and by better meeting export market requirements. Additional holdings yards will benefit the industry by supporting the export of live cattle from the Port of Port Hedland as well as providing the ability to separate cattle with different market requirements and in the event of a disease outbreak.

Requirements for progressing infrastructure

A key step for progressing this project is determining the market requirement for a washdown facility and holding yards. The identification of a site comprising of suitable unencumbered land with consideration given to strategic transport routes, and access to water and energy is also required. The construction and operation of a washdown facility must be in accordance with the regulations of various government agencies dependent on which site is selected for the facility.

5 BUSINESS CASE SUMMARIES: OTHER INFRASTRUCTURE PROJECTS

5.1 Develop Onslow Port

Situation analysis

The Port of Ashburton is being developed by Pilbara Ports Authority (PPA) as a multi-user port with common-user infrastructure to support the export of LNG and downstream hydrocarbon products. The initial port infrastructure constructed by Chevron Australia for the Wheatstone Project, consists of a product loading facility, materials offloading facility, shipping channel and related onshore facilities.

Description of required infrastructure

There is some indication from industry that cattle holding yards and loading facilities be constructed at Onslow Port to service small cattle vessels. The port would export cattle from a yet to be constructed export accredited cattle yards and feedlot around 15 km from the Port and located on the lease held by Minderoo.

Ownership

On completion of construction and commissioning of the port in approximately mid to late 2018, the common-user infrastructure will be owned and operated by the PPA. Ownership of the cattle yards and loading facilities is yet to be determined.

Cost

The cost to construct the facilities is unknown but is likely to be in excess of $500,000.

Benefits

There will be benefits in the construction and operation phases of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project. The project would add to the economic diversification of the west Pilbara region.

The project would result in benefits to the northern beef region for cattle produced in the west Pilbara in terms of reduced transport times and associated animal welfare and occupational health and safety benefits.

Requirements for progressing infrastructure

The completion of construction, commissioning and handover of common-user port facilities in approximately mid to late 2018 needs to occur before any third party can use the port. The designated use of the wharf for hydrocarbon related cargoes would need to be changed by amending the Ashburton North State Development Agreement to allow live export use. A business case for the project has not been completed and funding has not been secured.

5.2 Upgrade single lane bridges on the Great Northern Highway in the Kimberley region

Situation analysis

The Great Northern Highway is the main freight route linking the south and north of the State. It forms part of the interstate route linking Perth and Western Australia to Darwin and the Northern Territory. The road comprises of a number of single lane bridges and floodways or crossings which require traffic to slow down on approach. During the wet season the floodways are at risk and Main Roads WA has estimated that these crossings close for one day of the year at each site.

Description of required infrastructure

The Main Roads WA Kimberley region bridge and floodway strategy which includes:

Bow River Bridge (817A) reconstruction - SLK 3008.0 to 3010.5

4 Bridges Development –the replacement of four bridges and floodways in the Shire of Halls Creek and construct primerseal approaches: Bridge 1253 – Sally Downs (SLK 2912.5), Bridge 1254 – Bottle Tree Bore (SLK 2885.5), Bridge 1255 – Nellies Spring (SLK 2870.0), and Bridge 1257 – Un-named Creek (SLK 2881.6).

Ownership

Main Roads WA owns and operates the Great Northern Highway.

Cost

The estimated cost for the Bow River Bridge is $38.5 million (P90 Sept 2015) and the 4 Bridges Development is $73.13 million (P90 July 2012).

Benefits

The construction of this project will have benefits in the form of improved travel efficiency, savings in maintenance costs, and benefits from improved road safety due to a lower number of accidents and a reduced severity of accidents. There will be benefits in the construction phase of the project in terms of job creation, improved job security in the region and improved skills from the experience of working on the project. The northern beef region will benefit from the project in terms of improved road transport efficiencies particularly from a reduction in road closures.

Requirements for progressing infrastructure

The Bow River Bridge has all development works complete including its design works however there is no business case available. The 4 Bridges development has no business case available.

5.3 Upgrade Tanami Road

Situation analysis

The 1,010km Tanami Road runs from Alice Springs in the Northern Territory to the Great Northern Highway just north of Halls Creek. 753km is unsealed between Halls Creek and Yuendumu in the Northern Territory. The condition of the unsealed section of the road varies from gravel to unformed road with poor sight lines, corrugated surfaces, washouts and excessive dust generation.

Description of required infrastructure

Sealing of 313km of the Tanami Road from Halls Creek to the Northern Territory border to a 7m wide seal on a 9m formation including drainage.

Future demand

The road currently provides access to communities, the mining and pastoral industries and the tourism sector. The most significant development along this route is Newmont's Granites gold.

Ownership

In Western Australia the road is maintained by the Shire of Halls Creek.

Cost

The total cost estimate to construct the Tanami Road is $680 million (P90, July 2015) with the Western Australian section estimated at $272 million (Shire of Halls Creek, 2015).

Benefits

The construction of this project will have benefits in the form of improved travel efficiency, savings in maintenance costs and improved road safety. Other road users such as residents of adjacent Aboriginal communities, pastoral stations, the mining industry and tourists will benefit. It could also increase the flow of traffic between Western Australia and the rest of Australia. There will be benefits in the construction phase of the project in terms of job creation, improved job security and improved skills.

The northern beef industry will benefit from reduced transport costs and improved travel times. There will also be associated animal welfare benefits and occupational health and safety benefits. The sealing of the road opens the opportunity for new markets for cattle from the northern beef region.

Requirements for progressing infrastructure

The project is not funded and funding is currently being sought from Infrastructure Australia.

5.4 Broome Port access road and truck stop

Situation analysis

There is currently non dedicated cattle truck staging area that allows trucks to accumulate and enter the Port of Broome to allow for an efficient loading of cattle. At present, road trains must turn and back on to the wharf to discharge the cattle. The number of triple road trains can range from 50 - 100 road trains per vessel. Whilst there is an attempt to stage the timing of trucks to meet the loading requirements of the livestock vessel there are inefficiencies with trucks arriving early creating congestion or late creating additional loading times.

Future demand

Modelling suggests a future throughput potential for the Port of Broome of nearly 89,000 northern beef cattle per year for the flat growth scenario and 138,000 cattle for an optimistic scenario.

Ownership

Ownership of Port Drive transitions from Main Roads WA to the Kimberley Ports Authority approximately 500m from the export wharf abutment.

Cost

The Kimberley Ports Authority has estimated the cost in the order of $500,000 to $1 million.

Benefits

The project would have benefits in the form of improved road safety. There will be benefits in the construction phase of the project in terms of job creation, improved job security and improved skills. There will be benefits to the northern beef industry in terms of improved cattle loading rates at the Port and associated improved animal welfare outcomes.

Requirements for progressing infrastructure

The Kimberley Ports Authority have commenced conceptual designs of the proposed development solutions for this project. A business case including a cost estimate has not been completed. Funding is currently being sought through the Northern Australia Beef Roads Fund.

5.5 Extending road train access south

Situation analysis

Main Roads WA is currently undertaking a major upgrade of the Great Northern Highway between Muchea and Wubin. A Road Train Assembly Area will be near Muchea which will provide an alternative to Wubin and will facilitate the future use of longer combination vehicles between Muchea and Wubin (Main Roads WA, 2015, p. 4.28).

Future demand

In 2014, approximately 96,000 cattle travelled along this route. This is equivalent to 900 trucks assuming a B-Double truck configuration and 450 trucks assuming a Type-2 truck configuration.

Ownership

Main Roads WA owns and operates the Great Northern Highway.

Cost

The project is estimated to cost $449.6 million. Funding of $420 million has been secured.

Timing

Main Roads WA has advised that construction packages will be delivered between 2016 and 2019.

Benefits

The project will have benefits in the form of improved travel efficiency, savings in maintenance costs and improved road safety. There will be benefits in the construction phase of the project in terms of job creation, improved job security and improved skills. The northern beef industry will benefit from reduced transport costs. There will be animal welfare benefits and occupational health and safety benefits.

Requirements for progressing infrastructure

Design packages for the funded sections will be released over the four years to 2019 (Main Roads WA, 2015). Funding for the Bindoon Bypass and the Bindoon Hills packages are not yet secured.

5.6 Dedicated truck stops on the Great Northern Highway

Situation analysis

There is a preference for additional truck stops along the Great Northern Highway between the towns of Cue and Wubin to allow trucks to rest up without coming into conflict with other road users.

Future demand

In 2014, approximately 96,000 cattle travelled along this route. This is equivalent to 900 trucks assuming a B-Double truck configuration with a capacity of 105 cattle or 450 trucks assuming a Type-2 truck configuration with a capacity of 210 cattle.

Location analysis

The Livestock Rural Transport Association provided a list of general locations to Main Roads WA.

Ownership

The truck stops along the Great Northern Highway are owned and operated by Main Roads WA.

Cost

Main Roads WA has estimated that each bay would cost in the order of $500,000.

Timing

Once funds have been received, the approvals process and construction period takes around twelve to eighteen months.

Benefits

The project will assist in reducing driver fatigue, improve occupational health and safety, and reduce conflict with other road users.

Requirements for progressing infrastructure

Main Roads WA has advised that the first requirement is to identify a site and then funding will be sought from the Heavy Vehicle Safety and Productivity Program.

5.7 ICT improvements

Situation analysis

Infrastructure Australia found that in 2011 the Pilbara and Kimberley region had poor broadband availability and very poor broadband quality. In addition, 60 – 80 per cent of households in the regions had no mobile coverage (Infrastructure Australia, December 2014). Since that time there have been a number of improvements to ICT in the regions including the part roll out of the National Broadband Network (NBN). In addition the Mobile Communications Project and the subsequent Mobile Telecommunications Project has increased the level of mobile telephone coverage.

Description of required infrastructure

Improved broadband availability to assist in communications and business activities.

Future demand

The Infrastructure Australia report found that broadband generates substantial benefits in terms of economic growth, employment, productivity, welfare and investment. Another report found that mobile telecommunications enhanced business productivity (Deloitte Access Economics, February 2013). Infrastructure Australia found that the volume of data downloaded over the Internet has increased rapidly over time and is expected to continue growing strongly over the 2011-31.

Benefits

ICT is important to the development of the northern beef region, but the biggest gains are likely to come from on-farm application.

Timing

The rollout of the NBN and the Mobile Telecommunications Project are ongoing.

Requirements for progressing infrastructure

The Mobile Black Spot Programme will allow the public to nominate locations for telecommunications infrastructure to address mobile black spots.

6

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