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LANDCORP

REGIONAL CLUSTER ANALYSIS

PHASE 5 REPORT

JULY 2016

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1.0

1 INTRODUCTION

This report presents the findings of the final phase of the Regional Cluster Analysis being performed on the behalf of LandCorp and the State Government. This work builds on the findings of the 'Regional Centres Cluster Analysis Phase 3' report, which provides an introduction to concepts regarding the identification and development of industry cluster activity and presents potential areas of specialisation (and potential weaknesses) of each RCDP2 – Phase 1 centre when considering clusters of state and regional significance. This previous report should be referred to in conjunction with the results provided here-within.

The Regional Cluster Mapping Project is intended to assist in the development of the Regional Centres Development Plan Phase Two – Regional Centres (RCDP2) Growth Plans by providing an understanding of state and regionally significant clusters and the role each centre plays in this network of activity. The Phase 5 report provides additional further detailed analysis of the network effects of clusters and resulting opportunities and constraints that may be considered in developing cluster related initiatives and projects.

Broadly the report is structured in the following manner:

- Chapter 2 provides a basic outline of the Driver Capacity model of economic development
- Chapter 3 provides the concepts that form the basis of the analysis undertaken and are important for the correct interpretation of the results and findings
- Chapter 4 presents a brief explanation of the regional versus centre base analysis conducted, with complete regional results provided within the appendices of this report
- Chapters 5 to 8 present the findings of both the hypothetical cluster growth case studies as well as further Driver Capacity analysis based on the findings of the previous phases of analysis
- Chapter 9 provides conclusions and recommendations for the use of the cluster analysis findings and further general commentary on the inclusion of a cluster based approach to centre based economic development

1.1 USE OF REGIONAL CLUSTER ANALYSIS REPORTS

The Regional Cluster Analysis presented in the Phase 3 and Phase 5 reports applies a cluster identification process adapted from internationally recognised methods and is based the following principles:

- In adapting the cluster definitions from international systems, cluster categories have been based on groupings of ANSIC 4 industry classifications. These cluster classifications are based on industries related by common activities, output, skills and position in supply chain networks. This system covers the full spectrum of industry categories, a list of ANZIC 4 classifications used to define each cluster is provided in Appendix 5 and 6 of the Phase 3 report.
- Clusters are broadly categorised as Local and Traded. This important distinction separates local population driven clusters from clusters serving wider markets subject to external competition, be they inter-regional, state-wide, national or international.
- The analysis concentrates on Traded clusters as the drivers for economic growth. The definition of Traded clusters captures the output of goods and services that attracts external income to a region. Traded clusters are therefore considered to be the 'engines' of regional economies, while Local clusters are considered to be the 'foundation' of local economies.
- In considering opportunities for growth, cluster development seeks to 'build on what you have'. The identification of State and Regionally Significant clusters investigated in this study therefore concentrates on areas of existing specialisation, measured by regional and centre level Employment Concentration Factors (ECFs). This approach does not preclude the identification of small or developing clusters, but requires that clusters display regional or centre based concentrations that are above national averages.
- The investigation conducted in the Phase 5 report (presented here within) builds on this initial identification process by investigating workforce and supply chain linkages. The distribution of employment of centre based residents has been investigated to provide insights into the flow of labour to regional activity. In addition, clusters linked to Regionally Significant clusters by supply chain inputs have been investigated to understand potential flow-on effects of cluster growth and the distribution of this growth.
- Considering the above, the ultimate application of the analysis is recommended to be the identification of 'on-the-ground' areas of existing specialisation and the framing of this activity in the wider network of workforce linkages, supply chain linkages and wider regional and state significant activity.

  By doing so this study encourages the development of cluster growth initiatives aimed at attracting investment in complementary, industry focussed projects as a means producing growth at a regional and state level. This approach should be considered in a complementary suite of economic development approaches used in the formation of the RCDP2 Growth Plans.

2.0

2 DRIVER CAPACITY MODEL OF ECONOMIC DEVELOPMENT

Central to the understanding of a regional economy's current and future economic performance are the interrelated concepts of 'capacity' and 'drivers' of transformation (see Figure 1).

Figure 1. Capacity-Driver model for transformative change

Source: Pracsys 2015

Drivers refer to the trends and behaviours that determine demand for goods and services in the economy. Capacity describes the ability of an area to take advantage of these drivers for the benefit of the local economy. Disruption of the 'business as usual' path of development and the facilitation of transformational change in a regional economy requires consideration of both driver and capacity factors effecting regional clusters in order to understand future potential competitive advantages and support achievement of strategic aspirations.

Within this study, opportunities and constraints for the four regional centres are examined in the context of drivers and capacity to guide for potential areas of further investigation.

3.0

3 CONCEPTS

3.1 REGIONAL CLUSTER ANALYSIS

A detailed description of the cluster filtering process is provided in the Phase 3 report. This process has been used to identify Regionally significance clusters that are the focus of subsequent centre level investigation. Regionally significant clusters are based on a combination of factors however the primary considerations are that:

- At a regional level, the clusters display growth that outperforms national averages
- At a regional level, concentration of employment is at or above national averages

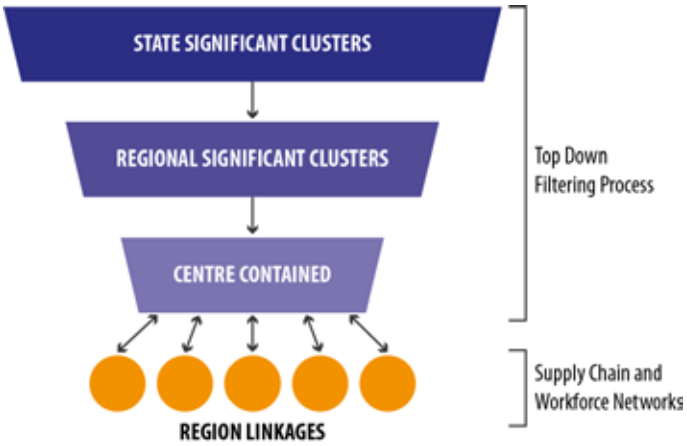
This filtering process is aimed to identify areas of growth and reasonable existing strength within each region. Importantly, total employment quantum is not a primary consideration in this process, rather concentration of employment is used as a primary measure in order to identify areas of specialisation when compared to national economic activity. In Phase 3, the role of the RCDP2 Centres in these Regionally significance clusters were then investigated by reviewing centre level employment concentration, where high centre level concentrations are identified this indicates that the centre plays an important role in a cluster of regional (and often State) significance. Based on cluster development theory, these areas of strength and specialisation within each centre may present key areas for investigation as growth initiatives or cluster related projects are likely to have a relatively large effect for regional, and potentially, the statewide economy.

In expanding on this initial phase of analysis, the objective of this final phase of regional cluster analysis is to develop an understanding of the primary network connections in terms of supply chain and workforce linkages. All regionally significant clusters have been investigated in order to establish:

- Clusters with strong supply chain connections (via input/output data), and
- Clusters with significant workforce connections to centre based residents

This analysis provides a view of how networks of clusters may be affected by particular initiatives or projects, and how a centre based workforce and population may be supported by building on or strengthening links to regionally based activity. This process is represented in Figure 2.

Figure 2. Regional Cluster Analysis process flow



Source: Pracsys 2016

3.2 SUPPLY CHAIN ANALYSIS AND MULTIPLIERS

To investigate the degree of business to business linkages between regional clusters, supply chain analysis has been conducted based on regionalised National Accounts (Input/Output) data. Supply chain analysis seeks to provide a quantified estimate of the 'flow-on' effect of an increase in output in one part of the economy, reflecting the fact that businesses and clusters form a complex network of interactions and that intervention in one or multiple clusters will inevitably have effects in other areas of the economy. From a network analysis perspective, the strength of supply chain linkages between clusters provides insights into the potential effect of initiatives on a connected spectrum of clusters. This information lends itself to the informed development of supply chain augmentation, shared infrastructure and centre-to-region cluster initiatives that seek to increase a centre's role in regionally significant clusters.

The analysis of the regionalised input/output tables examined both direct impacts based on industry outputs and indirect and induced impacts through the use of multipliers. The impact analysis used multipliers to estimate the aggregate effect that an injection of economic activity could have on both regions and centres. The impact modelling calculates a series of average and aggregate measures attributable to employment within the specified clusters, enabling the potential economic impact of scenarios to be assessed.

3.2.1 Use and Limitations of Multipliers

Though multipliers are still widely used, they have inherent limitations and shortcomings when used in detailed impact analysis. A large portion of these shortcomings revolve around assumptions concerning unlimited supply of various economic inputs such as land labour and capital, as well as the assumption of constant prices. The ABS production of multipliers was discontinued due to ongoing debate regarding their suitability for the tasks to which they are most commonly applied. Despite discontinued supply from the ABS they are still widely used to for impact analysis. Given these shortcomings, they have not been applied in the traditional sense to build a benefits case based on impacts of specific projects. Instead they are intended to be used to investigate relative effects in a comparative way and to inform the identification of areas of further investigation. The multipliers presented in this report cannot be used for the purpose of quantifying project level impacts on a case by case basis (e.g. for business case development). In reality, concerted efforts would be required to achieve the full potential multiplier effect as cluster inputs (e.g. labour and goods & services) can often readily be sourced as imports from beyond particular centres and regions.

Case studies have been used to illustrate the comparative centre level and regional level impact of particular initiatives, with consideration to the likely scale of impact of the example projects. For the purposes of comparison, the case studies presented are based on the simple assumption of a 10% increase in the output of a cluster (the Growth cluster). Centre level impacts can be compared to regional level impacts depending on the

perceived nature of project or initiative i.e. if it is aimed at developing activity on a centre level only, or if it is likely to link to and impact regional level activity. Ultimately the relative merits of individual initiatives or projects will need to be assessed, for example, by considering the degree of impact, required level of investment and likelihood of success. This aspect of assessment is outside the scope of this study.

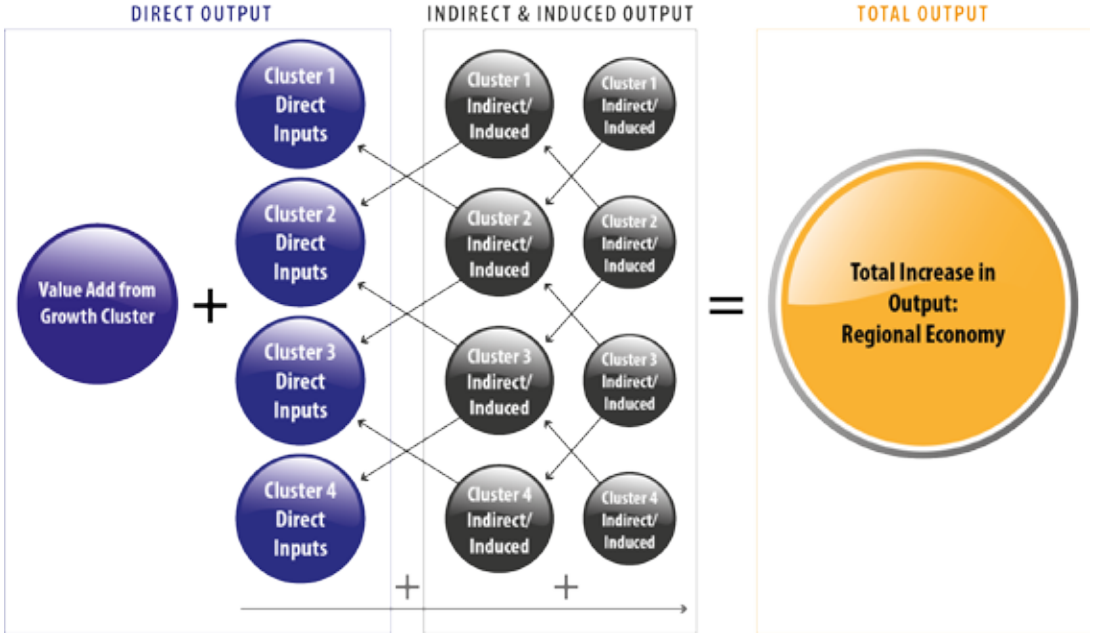
The regional multipliers presented are formed through a combination of:

- The potential increases of direct input from Linked clusters given current levels of input to the Growth cluster
- The potential indirect and induced effect in the economy as a whole due to these increases

This flow-on effect of growth in any one cluster due to supply chain linkages is represented in Figure 3.

While the measures provided are an indication of the possible total output in the regional economy due to the 10% increase in the Growth cluster, the impact analysis does not consider factors of influence or control that effect the ability to intervene in particular industries – for example, growth in mining is heavily influence by global commodity markets which are outside the sphere of influence or control of government or regional businesses. This does not preclude the opportunity to support such clusters where favorable conditions exist. In addition, there is a possible leakage of total output to other regions through capacity constraints and competition, particularly in traded clusters which are subject to completion from beyond a region.

Figure 3. Total potential growth in output as a result of supply chain linkages between clusters



Source: Pracsys 2016

These driver and capacity side factors are further explored for each centre/region in order to provide insights and commentary into potential areas of intervention.

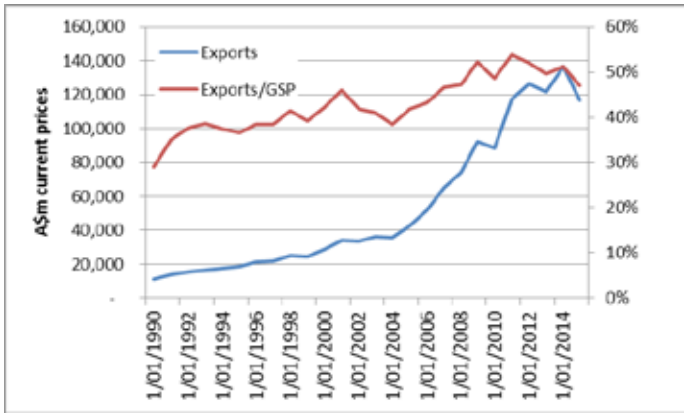
3.2.2 Role of Traded and Local Clusters in Regional and State Economic Development

As discussed in the Phase 3 Report, analysis has been focused primarily on Traded clusters within regions and centres due to the export nature of these clusters and their ability to attract revenue to a region. Traded clusters have the ability to grow based on some form of comparative or competitive advantage. By comparison, Local clusters are primarily population driven in nature, requiring population growth in order to establish a sustainable increase in cluster output. Essentially, growth in Traded clusters provides the stimulus for the economy to sustain a greater population, which then provides an increased need for Local clusters to service the additional population.

This being said, as Local industries play a pivotal role in providing the necessary services to sustain a population, an underperforming Local cluster (for instance Local Health Services) can constrain the ability for economic growth within a region or centre. In such instances it is important to address the deficiency in order to facilitate potential economic growth. While Local clusters generally have a high degree of connection to other local businesses (represented in high mulitpliers), these clusters are driven by population growth or growth in Traded clusters and therefore should not be a primary focus of economic development initiatives unless they are found to be under-represented and form a potential constraint to economic development.

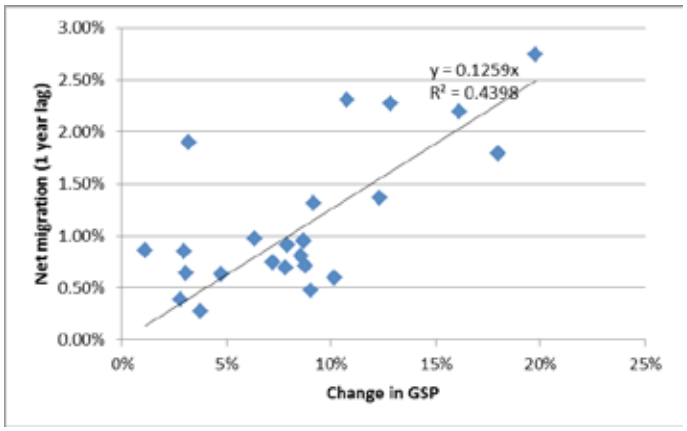
The historical correlation of export and gross state product (GSP) support this position, as shown in Figure 4. This indicates that growth in the Traded economy (in the form of increased exports) is a significant driver for growth in output. Data also shows that GSP is positively correlated with annual migration, demonstrating the impact of economic growth in attracting population growth (as shown in Figure 5).

Figure 4. Western Australian export growth



Source: ABS (2015)

Figure 5. Changes in annual migration and GSP



Source: ABS (2015)

Considering state-wide impact, the development regional initiatives that demonstrate a significant impact at the state level can be difficult due to the high concentration of population in the Perth and Peel region. This is further compounded by the size of resource based clusters such as Metal Mining and Oil and Gas Production and Transportation. Within the findings presented, comparisons against regional and state indicators are provided to provide context and scale to the results. On a case-by-case basis, results show that cluster initiatives would need to produce significantly higher growth than the base line used in this analysis (10%) to achieve state level impact, however it should also be considered that many initiatives will have an impact that is broader than simply the centre scale and that the combined effect of multiple initiatives and cross-regional coordination of initiatives would inevitably have a larger effect.

4.0

4 REGIONAL AND CENTRE BASED ANALYSIS

To undertake analysis at the relevant spatial area input/output tables have been 'regionalised' resulting in a matrix of transactions that represents each regional economy. This process allowed for analysis to be conducted at the regional level with a much greater degree of accuracy and relevance than would otherwise be possible. In this way the analysis was used to indicate the likely structure of the local economy, including the major inputs and outputs of each industry, whilst also allowing for a high level impact analysis based on an exogenous source of demand or an increase in production.

Exogenous sources of demand were assumed to only be applicable to the traded economy. This is because Local clusters are assumed to be population driven and therefore exogenous demand shocks would have a minimal effect, unless population grows (or declines). This is in contrast to Traded clusters, which are generally export industries that use comparative or competitive advantages of a region to satisfy a strategic demand that extends beyond the region. Growth in Traded clusters provides a leveraging effect on the rest of the economy as new money flows into the relevant region, raising incomes and fueling growth in the rest of the economy. This leverage effect is further detailed and quantified in the following sections.

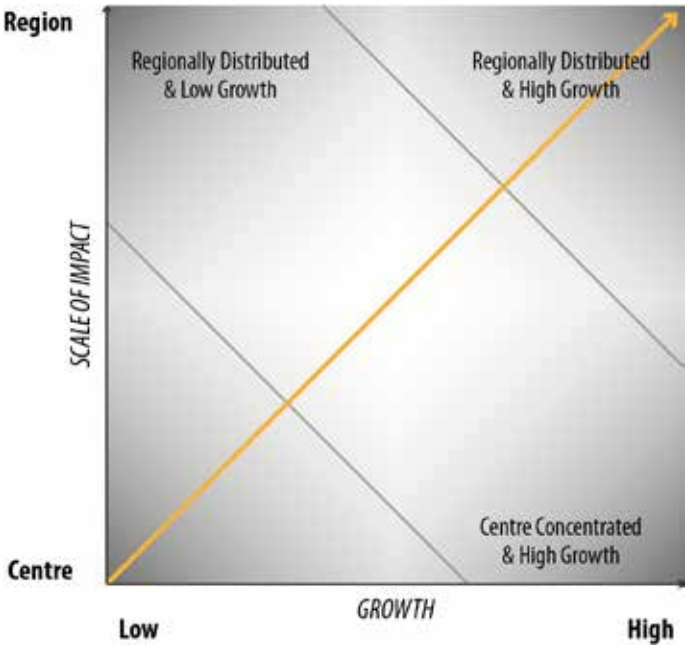
When considering initiative or project opportunities, the recommended use of the results presented in this report is to consider:

1) If it is likely that the particular initiative or project will have a largely centre, or wider regional impact

2) The level of growth than may be expected in the influenced clusters

This approach is represented in Figure 6. The goal of initiatives or projects should ideally be to achieve a regionally distributed impact and a high level of growth. In practice, this may require a coordinated program approach including a range of initiatives and a complementary suite of projects.

Figure 6. Consideration of likely scale and level of growth



Source: Pracsys 2016

5.0

5 BROOME - KIMBERLEY

5.1 CLUSTER NETWORKS

5.1.1 Supply Chain Impact

The Kimberley input/output table was used to estimate region specific multipliers for both total output and total employment. These multipliers provide an overall estimate of the proportional economic impact of growth within each cluster on wider economy. Specific linked clusters are examined in Section 5.1.2.

Figure 7. Kimberley total output multipliers (ranked)

Traded Industries	Regional Multiplier
Education and Knowledge Creation	1.75
Construction Products and Services	1.71
Water Transportation	1.67
Transportation and Logistics	1.65
Hospitality and Tourism	1.58
Non-metal Mining	1.54
Agricultural Inputs and Services	1.53
Fishing and Fishing Products	1.38
Metal Mining	1.38
Performing Arts	See Hospitality and Tourism

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

Figure 8. Kimberley total employment multipliers (ranked)

Traded Industries	Regional Multipliers
Construction Products and Services	3.65
Metal Mining	2.18
Water Transportation	1.92
Transportation and Logistics	1.73
Agricultural Inputs and Services	1.46
Fishing and Fishing Products	1.40
Non-metal Mining	1.38
Education and Knowledge Creation	1.35
Hospitality and Tourism	1.28
Performing Arts	See Hospitality and Tourism

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

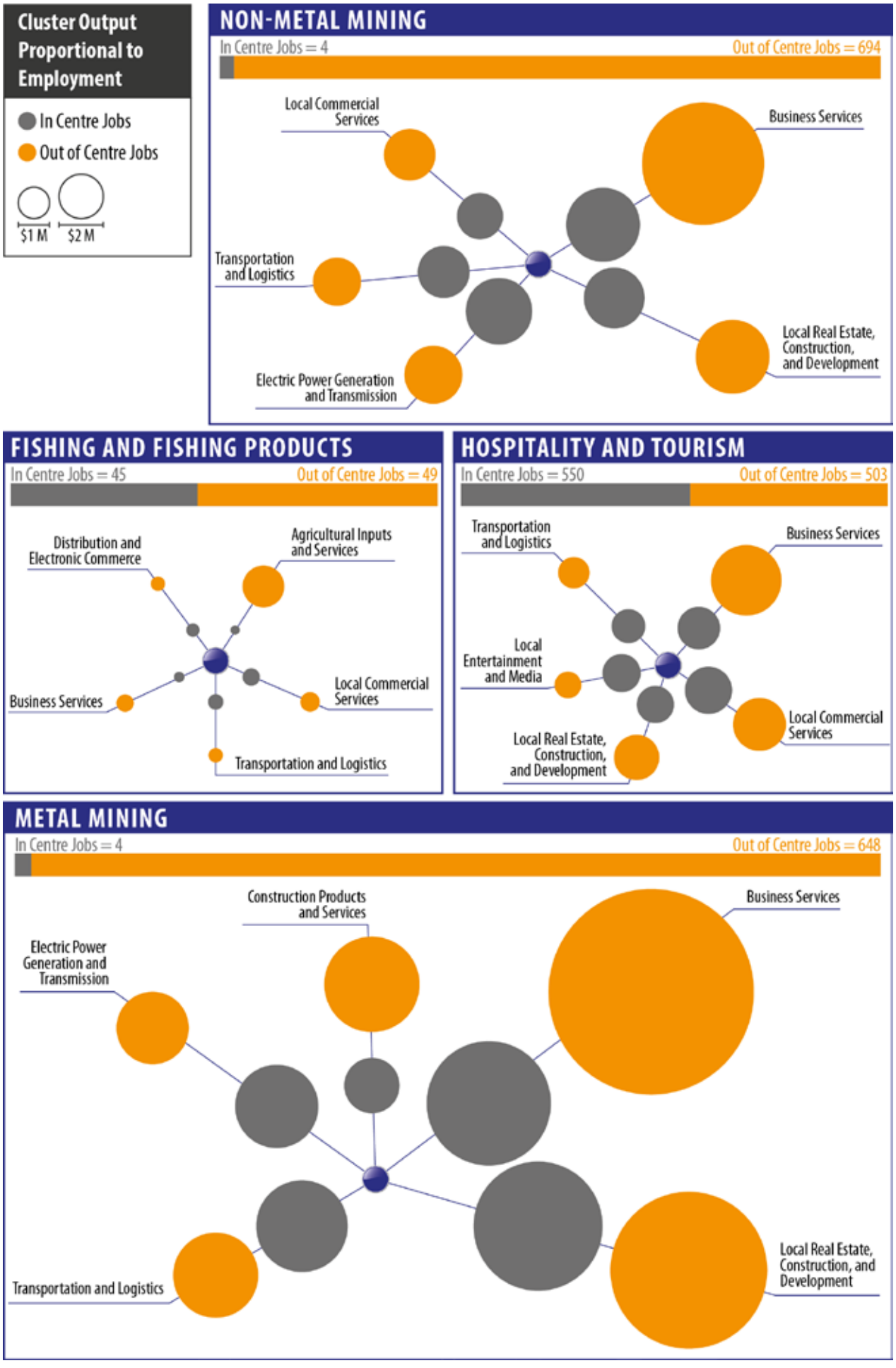
The total output multipliers provide the estimated potential dollar increase in output from all industries in the region's economy per dollar of increased output in the relevant industry. The majority of the top clusters generate indirect and induced output greater than 50% of the direct increase in their output (e.g. for a $1.00 increase in Non-Metal Mining there would be an extra $0.54 of output generated in all other industries). The employment multiplier indicates the estimated additional quantum of employment supported per direct job generated through direct output in the cluster (e.g. for every 10 jobs created in the Non-Metal Mining industry there are approximately 4 additional jobs created in other industries). This demonstrates the ability of Traded clusters to generate greater employment in the broader economy. The ability to directly influence or support particular clusters must also be considered.

These multipliers are useful for the high level comparison of industry clusters and represent the potential impact of growth in a particular cluster that may be achieved given the current status-quo i.e. current industry and employment mix. Particular initiatives may significantly alter the status quo in a range of industries and this must be considered when interpreting these results

5.1.2 Supply Chain Networks

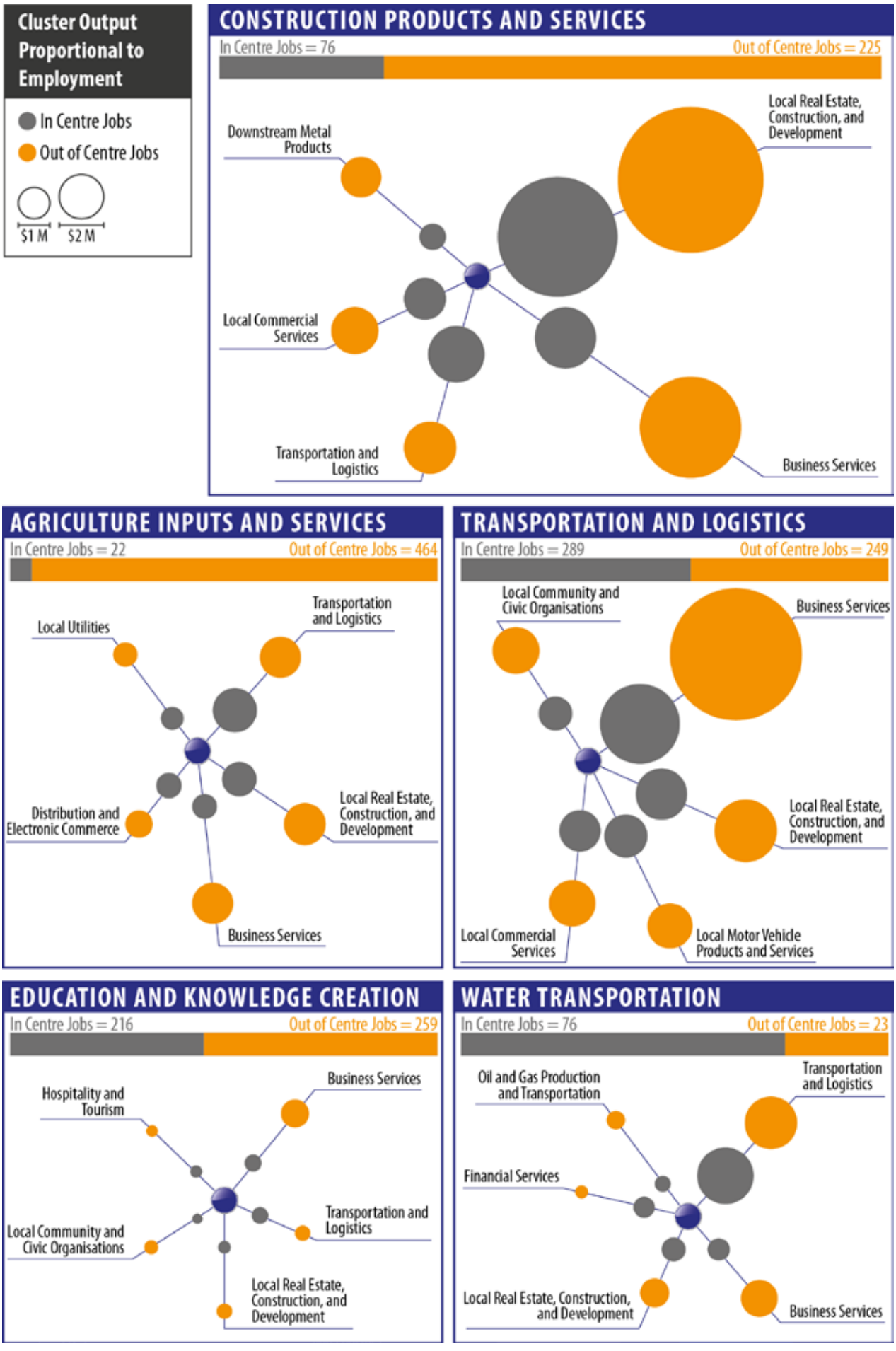
Figure 9 displays the top five inputs for each of the Regionally Significant clusters and provide an understanding of the clusters that are likely to be most impacted by growth in these identified clusters. In-centre and out-of-centre cluster scales are provided in order to support the development of cluster network based initiatives. Here out-of-centre employment refers to employment within the region but outside of Broome, this may either be widely distributed employment or employment within other regional centres. Where a cluster displays a strong connection to another cluster based largely outside of the centre, further investigation into these connections is warranted. This is supported by the subsequent analysis of workforce linkages.

Figure 9. Broome supply chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 9. Broome supply chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

5.1.3 Workforce Linkages

Workforce linkages have been investigated in order to establish the presence of major out-of-centre employers of centre based residents. This information provides alternative opportunities for building on existing workforce connections that extend beyond the centre. In such cases the development of regionally based clusters is likely to have a significant impact on centre based population and income. Figure 10 provides both the scale of resident employment by industry and the proportion of these residents working beyond the centre.

This data shows that the following clusters out-of-centre clusters are significant employers for Broome residents:

- Agricultural Inputs and Services
- Non-metal Mining
- Metal Mining

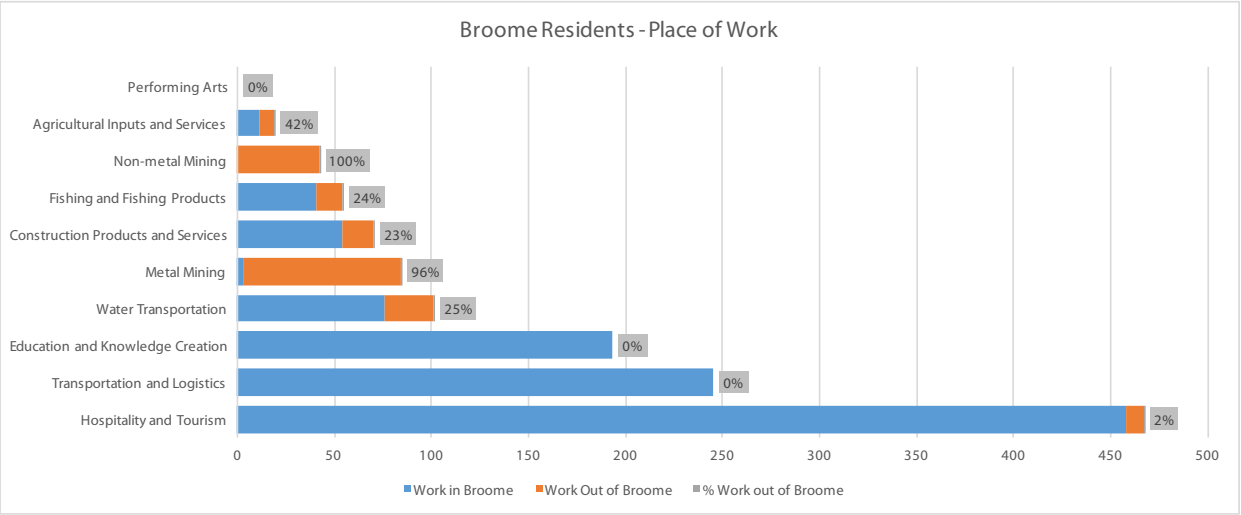
Apart from these regionally distributed, land based clusters, employment in Regionally Significant clusters is largely self-contained for the Broome centre.

5.2 POTENTIAL DRIVERS FOR FUTURE GROWTH

Based upon the analysis and consultation conducted, a number of potential future drivers for growth for the Broome Regional Centre have been identified. Drivers that represent opportunities around which more detailed examination may be warranted include:

- A defined role for Broome in food export supply chains (Agricultural Inputs and Services, Fishing and Fishing Products, Food Processing and Manufacturing, Livestock Processing, Transportation and Logistics and Water Transportation)
- Continued development of greater Broome's multi-day tourism value proposition (Hospitality and Tourism, Water Transportation)

Figure 10. Proportion of Broome residents working outside of the centre (for Regionally Significant clusters)



Source: Pracsys 2016, ABS Census 2011

- Development of regional traded activities out of existing high-performing Local clusters (Local Education and Training, Local Health Services and Local Community and Civic Organisations)

With the exception of the opportunity to expand the reach of Local clusters, these initiatives broadly reflect growth in a range of the major traded clusters where an existing centre specialisation has been shown to exist (refer to Figure 11).

Figure 11. Broome ECFs in Regionally Significant Traded clusters

Statewide and Regionally Significant Traded Clusters	Regional Output ($m)	Broome ECF	Centre Specialisation
Metal Mining	1,381	0.02	N
Transportation and Logistics	304	1.87	Y
Hospitality and Tourism	243	3.85	Y
Construction Products and Services	225	0.44	N
Non-metal Mining	161	0.12	N
Agricultural Inputs and Services	145	0.16	N
Education and Knowledge Creation	68	1.35	Y
Fishing and Fishing Products	66	10.60	Y
Water Transportation	33	2.22	Y
Performing Arts	-	Refer to Hospitality and Tourism	-

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

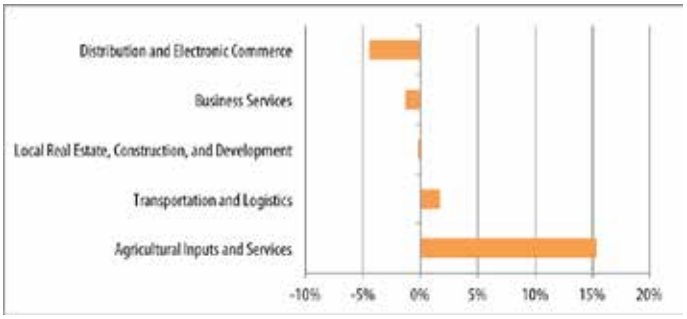
5.2.1 A Defined Role for Broome in Food Export Supply Chains

Demand from new markets for live cattle and processed beef products could represent a major driver for Broome's ongoing development as a major food export hub. This may occur as a response to market liberalising initiatives such as the China Free Trade Agreement that has resulted in the raising of discretionary import safeguard triggers and removal of tariffs for proteins. Opportunities may also exist for the Kimberley Beef herd to take advantage of fluctuations in overall market supply (such as this years shortage of livestock in Australia and the USA) to realise increased value for export products.

Likewise, continued development of markets for niche, high quality agricultural/horticulture crops may allow for moderate expansion of existing activities, or development of new products. This may particularly be the case if the capacity of Broome International Airport as a direct linkage to international markets can be realised (for low volume high value products), alongside the utilisation of the port for bulk exports.

Drivers such as these may allow for Broome to take advantage of potentially high-performing sectors of the economy such as agricultural inputs and services that modelling suggests currently delivers greater output for inputs into agriculture compared to the state average. Refering to Figure 12, a large potion of inputs are sourced from within the regional Agricultural Inputs and Services cluster compared to the state average, indicating that many parts of the supply chain network are present at a regional level.

Figure 12. Agriculture – Inputs in the Kimberley Region Minus Statewide Inputs



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

5.2.2 Continued Development of Greater Broome's Multi-day Tourism Value Proposition

Consultation in Broome suggested that a potential future driver for the Centre's tourism cluster would be the expansion of its value proposition to include a more diverse range of easily accessible high-quality experiences within and around Broome. This would allow for capture of expenditure from tourism from a range of sources, including:

- Attraction and retention of tourists for additional nights within Broome
- Capture of greater expenditure per visit through the offer of different high-value experiences
- Development of a proposition that encourages cruise ship operators to expand on-land offerings
- Encouragement of the attraction and retention of passing backpacker and caravan traffic
- The potential justification of direct international flights to Broome

This potential driver could have a significant impact on the Traded economy of Broome, in particular in regards to employment and small business development.

5.2.3 Development of Traded activities out of Existing Local Clusters of Activity

Broome plays a critical role in supporting communities throughout the Kimberley in delivery of a wide range of goods and services including community services, health, and education, as demonstrated in the Broome ECF for each cluster.

Figure 13. Broome Centre local cluster concentrations

Local Clusters	ECF
Local Community and Civic Organizations	1.66
Local Education and Training	1.20
Local Health Services	1.27

Source: Pracsys 2016, ABS Census 2011

Whilst these activities are defined as Local clusters, in that they service the Kimberley region, the innovations required by public, private and community stakeholders in service delivery are likely to be highly applicable to other communities and markets. These may therefore be drivers for endogenous development of Traded activity into the future.

5.3 CAPACITY TO ACCOMMODATE FUTURE GROWTH

5.3.1 Retention of Professional Population

Historic data suggests that Broome experiences difficulty in retaining pools of professional labour. The ABS census of population shows that between the 2006 and 2011 only 37% of workers lived in the Shire of Broome for the both Census points. This is the second lowest of the four Phase I regional growth centres (after Kalgoorlie Boulder with 34%). These difficulties are even more pronounced in the professional segment of the workforce with the lowest retention rate (31%). This points to both an undeveloped urbanisation economy or potentially a lack of opportunities to grow professionally.

When the data is examined in more detail, the three groups of professionals with the lowest retention rates were:

- Design, engineering, science and transport professionals (23%)
- Health professionals (24%)
- Legal, Social and Welfare Professionals (26%)

Overall this equates to a minimum turnover of 929 professionals within Broome over a five-year period.

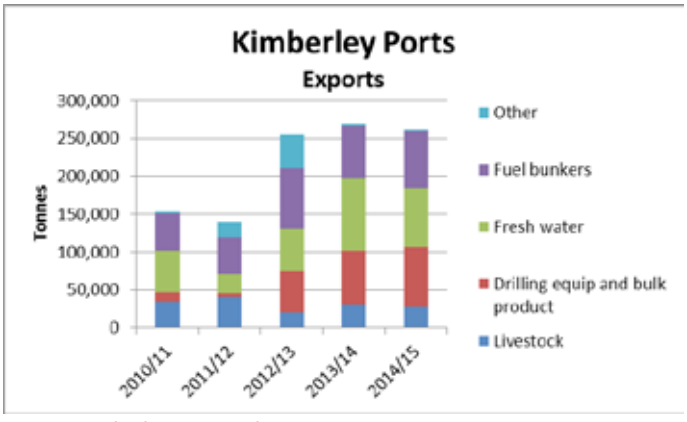
Initiatives to address this turnover are likely to be critical to future growth in Broome for a variety of reasons as these employment subgroups are:

- A major contributor to the social infrastructure of the region through the delivery of health and community services
- A major source of expenditure for local businesses including retail, entertainment and construction activities
- A future source for endogenous development of traded activities that may develop into future clusters of export activity

5.3.2 Capacity in Port for Other Activities

Consultation in Broome suggested that there was significant conjecture over the capacity of Broome Port to accommodate a full range of economic activities – with some stakeholders observing that there was a crowding out of other activity to high-value oil and gas traffic in recent years. This is reflective in available data that shows that export trade across all Kimberley Ports has become heavily focused on inputs required by offshore oil and gas projects (fuel, water and drilling equipment) (refer to Figure 14).

Figure 14. Kimberley Port exports 2010-2015



Source: Kimberley Ports Authority

With the downturn in oil and gas exploration and development activity, some stakeholders suggested that capacity now existed and was being marketed in the Port for other goods and services. This capacity represents a potential opportunity for other projects, be they mineral or food related, to efficiently access South East Asian markets.

5.3.3 Intermittent and Slow Road Network

Consultation suggested that the road network around Broome was challenged with seasonal inundation and ageing infrastructure that mean that commercial and personal travel can be slow and frustrating. This has potentially impacted upon the value proposition of surrounding natural assets such as Cape Leveque as a tourism asset with the potential to improve the value proposition of the greater Broome area.

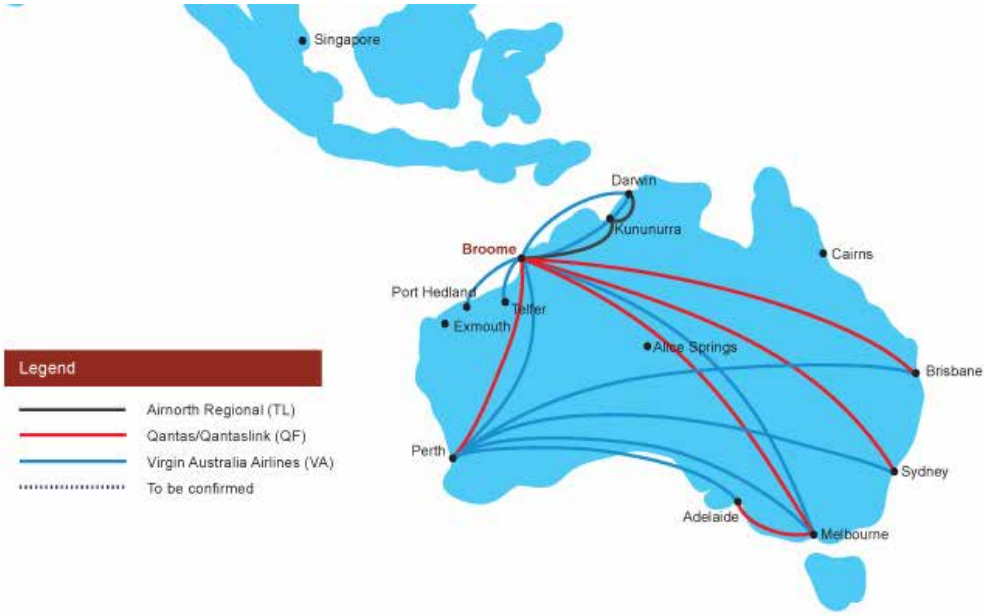
Uncertainty over road access also has the potential to impact upon the feasibility of export projects relying on regular access to the Port. This can have the consequence of lowering the viability of a project, or requiring a solution that may bypass Broome (such as FIFO servicing).

5.3.4 Utilisation of Broome International Airport

Broome International Airport represents a major regional asset that currently is potentially not utilised to its full potential. Despite having the infrastructure and approvals for international flights, current flights are only between Australia centres (refer to Figure 15).

Justification for the introduction of new flights is highly challenging, with demand often being a case of multiple dependencies – investment in tourism infrastructure cannot occur without the guarantee of access to markets, and flights

Figure 15. Broome International Airport Flights



Source: Broome International Airport (2016)

cannot be justified without the demand generated by infrastructure/attractions. Likewise, the value-added benefits associated with flights, such as the utilisation of excess capacity for freight export of foods, relies on an anchor market. Regardless of the challenges, the international airport is likely to be required to play a significant role if Broome's potential as a major northern city with strong linkages into Asia is to be realised.

5.4 OPPORTUNITY CASE STUDY

Based on the analysis conducted it was possible to construct a case study examining the combined effect of cluster growth. All Growth Centre lead consultants were requested to provide a limited number of potential growth clusters for this purpose. Through consultation, the case study agreed upon for Broome was the development of a sealed road to access Cape Leveque, approximately 200km north of Broome on the Dampier Peninsula. Such a development would aim to cut travel times to the cape, which currently stand at around three hours. This would allow 'day trip' access, which is an important factor for increasing cruise-based tourism in Broome and surrounds.

Traded clusters in Broome clusters likely to be directly influenced by such a development would include:

- Hospitality and Tourism – due to direct increased demand for services
- Water Transportation – due to the increased presence of cruise ships and utilisation of the port

The analysis estimated the direct impact of a 10% increase in total output for each of these chosen clusters and the indirect and induced impact on the remainder of the centre and regional economy. Importantly this does not represent the likely impact for the project, rather the this level of growth is used for the purposes of direct comparison and the ability to simply scale results.

At a regional level the direct impact would be expected to be distributed between Broome and Cape Leveque based operators with Broome representing a major base for operations within the region. In addition, as the majority of additional visitors are expected to be generated from cruise ship operations the effect of this project will likely be wider than Broome and Cape Leveque. For example, other major ports for cruise ship operations within WA include Perth (Fremantle), Geraldton, Busselton and Albany. Consequently, efforts to improve tourism in any of these centres may have an effect on all as a combined offering.

5.4.1 Hospitality and Tourism – Broome

In the Regional Centre of Broome, Hospitality and Tourism has an estimated total output of $65m and is a major employer with a workforce of approximately 550 persons. The results presented in this report and the prior Phase 3 report also show that:

- The cluster is a comparative area of specialisation of both the region and centre, with ECFs of 2.83 and 3.85 respectively
- Broome forms the base for a large portion of regional employment, accounting for 52% of employment within this cluster
- Very few residents of Broome employed in the cluster work outside of Broome, with 2% out-of-centre employment

- Major clusters linked by supply chain include Business Services, Local Commercial Services, Local Real Estate Construction and Development, Local Entertainment and Media, and Transportation and Logistics

Level of Impact

Using the multipliers presented above, the impact of a 10% increase in the cluster was assessed for Broome. The analysis used the Kimberley total output and employment multipliers of 1.58 and 1.28. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $6m in the total output of the Hospitality and Tourism cluster, equating to 55 additional jobs. Using these multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster attributable to a direct 10% increase in the chosen cluster and immediate input clusters. The contribution of Broome to the total output of the Kimberley economy is estimated at $10m, with a total potential increase of 66 jobs.

Figure 16. Hospitality and Tourism 10% increase impact - Broome

Broome Hospitality and Tourism	Direct Output (10%)	Indirect and Induced Output	Total Output
Output ($)	$6m	$4m	$10m
GVA ($)	$3m	$2m	$5m
Employment	55	10	66

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes, at a regional level 10% growth in the Hospitality and Tourisms Cluster corresponds to the following estimated impact (refer to Figure 17). Considering the centre versus regional effect, it is likely that centre based results would more indicative of the impact within the Kimberley region unless a rational for direct impact on the wider Kimberley region can be established. Full (hypothetical) regional results are provided in Appendix 1.

Figure 17. Hospitality and Tourism 10% increase impact - Kimberly

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$14m	$8m	$22m
GVA ($)	$7m	$5m	$12m
Employment	105	22	127

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

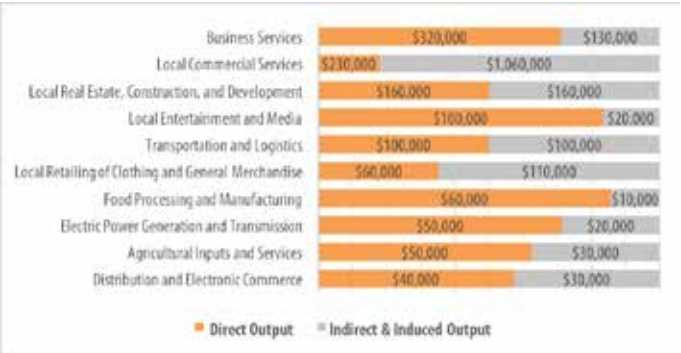
The top 10 clusters linked by input were analysed in terms of increase in direct output attributable to the hypothetical 10% increase in the Hospitality and Tourism cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

Figure 18. Input clusters to Hospitality and Tourism, direct impact – Broome

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated. Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 19. Input clusters to Hospitality and Tourism indirect Impact – Broome



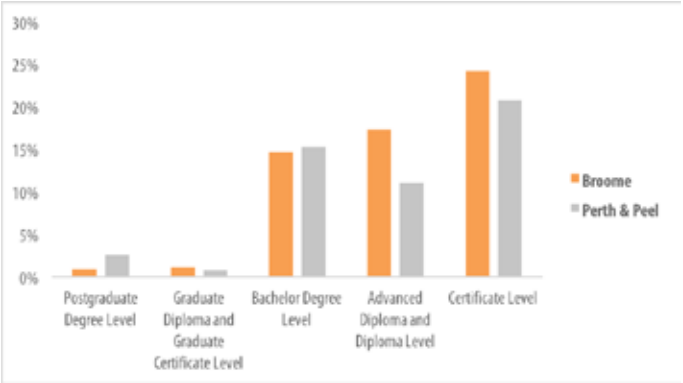
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The figures presented are based on current proportions of regional and centre employment across all clusters. The results quantify the possible flow through effect of the growth of the Hospitality and Tourism cluster and highlight particular clusters that are most likely to benefit from this growth. This is particularly true of Local clusters, which in their nature cannot easily be sourced from beyond the region. Considering linked Traded clusters, more attention must be paid to capture this potential locally as many of these inputs can readily be sourced from other regions and major centres, such as Perth or Darwin. If these supporting Traded clusters are not well represented locally this is the likely outcome, highlighting the benefit of a coordinated approach considering cluster network connections.

Workforce Considerations

The average salary for the cluster, in the centre, is $46,000, slightly higher than the regional average. Education levels for the workforce of this cluster within Broome are relatively high with 58% holding formal training or tertiary education, compared to 51% in Perth and Peel (Figure 20). While the levels are weighted towards certificate and diploma level qualifications, this indicates a highly skilled workforce, particularly when considering the nature of the industry.

Figure 20. Hospitality and Tourism level of education - Broome



Source: Pracsys 2016, ABS Census 2011

Compared to Perth and Peel, Broome has a particularly high concentration of personnel with a background in Food, Hospitality and Personal Services (Figure 21). Interesting, Engineering and Related Technologies and Education fields also feature highly. The underlying reason for this is unclear, however this may be reflective of specialised tourism services.

Figure 21. Hospitality and Tourism field of education – Broome

Source: Pracsys 2016, ABS Census 2011

5.4.2 Water Transportation – Broome

In the Regional Centre of Broome, Water Transportation has an estimated total output of $4m, employing approximately 76 persons according to the ABS. The results presented in this report also show that:

- The cluster is a comparative area of specialisation of both the region and centre, with ECFs of 1.56 and 2.22 respectively
- Broome forms the base for a large portion of regional employment, accounting for 77% of employment within this cluster
- Relatively few residents of Broome employed in the cluster work outside of Broome, with 25% out-of-centre employment
- Major clusters linked by supply chain include Transportation and Logistics, Business Services, Local Real Estate Construction and Development, Financial Services and Oil and Gas production, and Transportation

Level of Impact

The impact of a 10% increase in the cluster was assessed for Broome. The analysis used the Kimberley total output and employment multipliers for the cluster of 1.67 and 1.92. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $4m in the total output of the Water Transportation cluster, equating to 8 additional jobs. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster's presence in Broome (Figure 22). The potential contribution of Broome to the total output of the Kimberley economy is estimated at $6m, with a total increase of 14 employment opportunities.

Figure 22. Water Transportation 10% increase impact - Broome

Broome Water Transportation	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$4m	$2m	$6m
GVA ($)	$2m	$1m	$3m
Employment	8	6	14

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes, at a regional level 10% growth in the Hospitality and Tourisms Cluster corresponds to the following estimated impact. Considering the centre versus regional effect, it is likely that centre based results are indicative of the impact within the Kimberley region as other Kimberly based ports are not likely to be impacted by increased tourism. Full (hypothetical) regional results are provided in Appendix 1.

Figure 23. Water Transportation impact - Kimberley

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$7m	$5m	$12m
GVA ($)	$3m	$2m	$5m
Employment	10	12	22

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

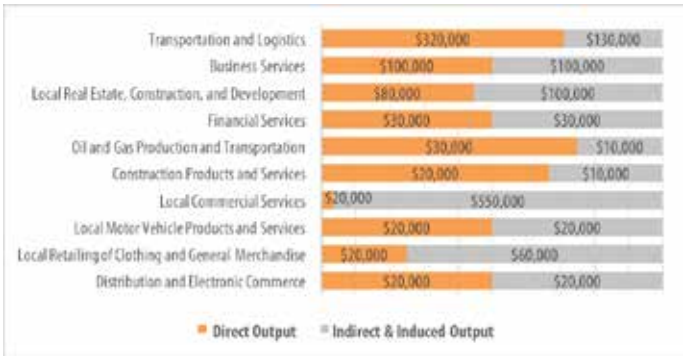
The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Water Transportation cluster (Figure 24). Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

Figure 24. Input clusters to Water Transportation direct impact – Broome

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated (Figure 25). Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 25. Input clusters to Local Hospitality Establishments indirect impact – Broome



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

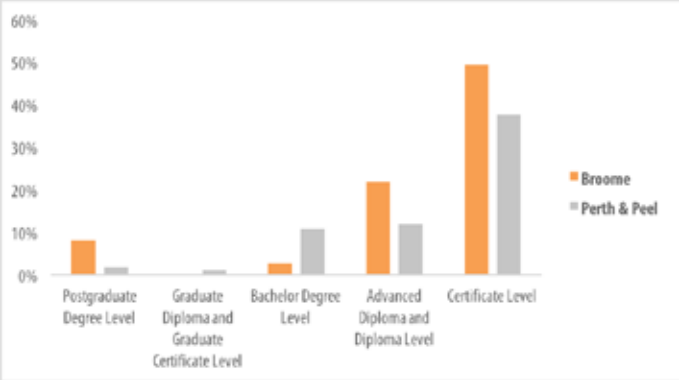
These results highlight Transportation and Logistics is an important linked cluster for the Water Transportation Cluster within Broome.

Workforce Considerations

The average salary for the cluster, in the centre, is $77,000, slightly lower than the Kimberley average of $81,000. Education for this cluster within Broome is higher than the Kimberley average with 11% of employees having a bachelor degree or higher. Education for this cluster within Broome is significantly higher than within Perth and Peel with 83% holding formal training or tertiary education, as compared to 64%. Broome as a particular high quotient of personnel with postgraduate level qualifications.

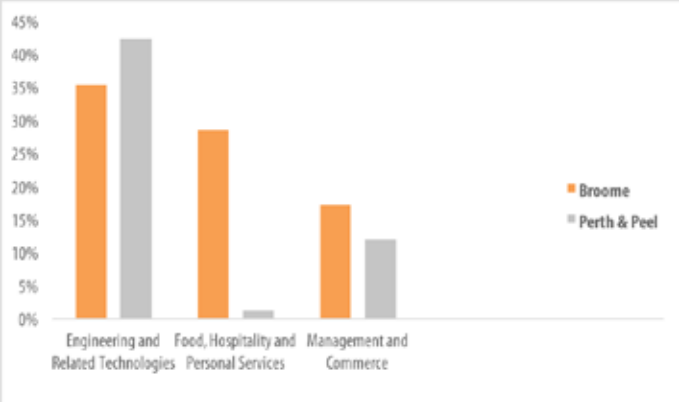
Importantly, there are a high proportion of personnel with Food, Hospitality and Personal Services backgrounds. This result indicates that within Broome, the Water Transportation is largely based on food and tourism. This supports the connection of this cluster with the other clusters used for this case study.

Figure 26. Water Transportation education level - Broome



Source: Pracsys 2016, ABS Census 2011

Figure 27. Water Transportation field of study – Broome



Source: Pracsys 2016, ABS Census 2011

5.4.3 Results in Context

Cluster Business Concentrations

ABR data has been interrogated to provide concentrations of businesses in each centre and surrounds. This data provides registered business locations by ANZSIC 2 industry classifications (however not all businesses may be captured). Here Local Hospitality Establishments refers generally to food and beverage outlets, including café and restaurants, and Hospitality and Tourism refers generally to accommodation and tour operators. From this data clear trends can be seen in groupings of businesses within each cluster indicating a level of natural agglomeration, which would be expected in a centre of this size.

It can be seen that businesses in the clusters considered tend to be tightly grouped in and around the historical centre of Broome. Taking a wider view of the region there are very few registered business locations within the ABR data set used, as displayed in Figure 32. It is likely that this data set does not capture all businesses within the region, but despite this, the results indicate that Broome would be the major beneficiary of increased activity in the region and that increased activity may also be supported by the development of further formal businesses on the peninsula or other attractions within the Broome surrounds.

Figure 28. Broome Hospitality and Tourism business locations

Source: Australian Business Register (2015)

Figure 29. Broome Local Hospitality business locations

Source: Australian Business Register (2015)

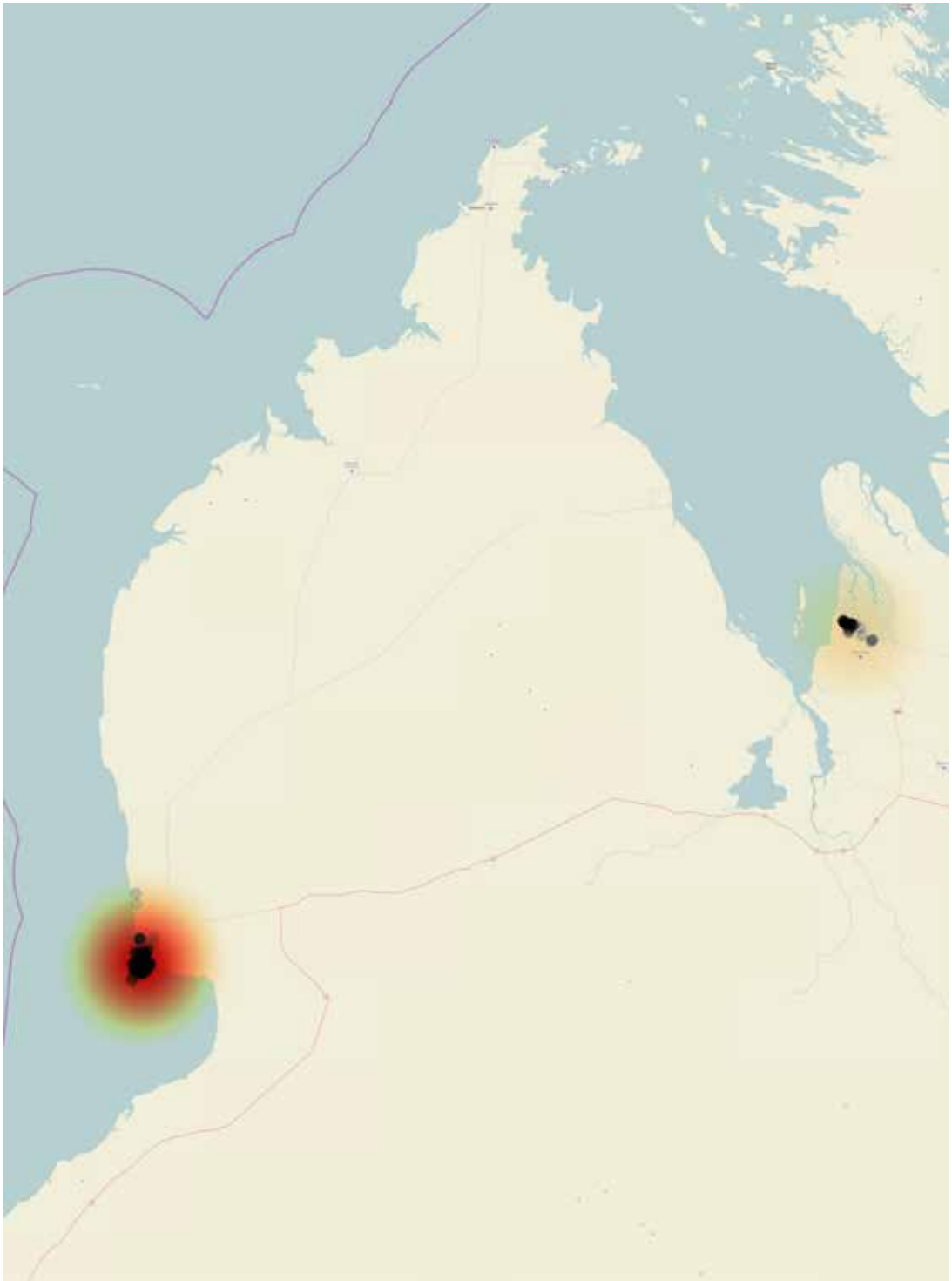
Figure 30. Broome Water Transportation business locations

Source: Australian Business Register (2015)

Figure 31. Broome all case study business locations

Source: Australian Business Register (2015)

Figure 32. Broome and surrounds, all case study business locations



Source: Australian Business Register (2015)

Combined Employment and Output

The potential combined centre effect of hypothetical 10% growth scenarios for the selected clusters totals 80 jobs. Similarly, the total combined output contribution is approximately $16 million. These results are compared to total regional and state employment and output in Figure 33.

Figure 33. Case study impact relative to total Region and State employment and output

	Employment	% Impact	Output	% Impact
Centre Based Contribution	80	-	$16m	-
Regional Total	15,000	0.5%	$11,000m	0.15%
State Total	980,000	negligible	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

It may be considered that the total impact if the case study presented is may be slightly larger than a pure centre level impact given the degree of connection to regional (Cape Leveque) tourism businesses, however further investigation would be required to confirm the level of impact beyond Broome centre.

It must be re-iterated all figures are purely hypothetical and are provided for the sake of comparison only. While these figure are high level, all are produced using a consistent method are therefore directly comparable to others produced in this report. No assessment can be made at this stage on the likely impact or relative merits of particular initiatives based on these figures and any future assessment would require detailed investigation including an in-depth assessment of project feasibility and rational. Having said this is can be seen that to achieve regional or state significant impact the total growth required far exceeds the assumed 10% baseline.

6.0

6 BUNBURY – SOUTH WEST

6.1 CLUSTER NETWORKS

6.1.1 Supply Chain Impact

The South West input/output table was used to estimate region specific multipliers for both total output and total employment. These multipliers provide an estimate of the proportional economic impact of growth within each cluster on the wider economy. Industries have been ordered by their Employment Concentration Factor based on the analysis conducted in earlier phases of the project. Specific linked clusters are examined in Section 6.1.2.

Figure 34. South West total output multipliers (ranked)

Traded Industries	Regional Output Multiplier
Livestock Processing	2.34
Wood Products	2.25
Construction Products and Services	2.11
Business Services	1.93
Food Processing and Manufacturing	1.89
Hospitality and Tourism	1.84
Coal Mining	1.82
Agricultural Inputs and Services	1.73
Upstream Metal Manufacturing	1.72
Forestry	1.68
Electric Power Generation and Transmission	1.55

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

Figure 35. South West total employment multipliers (ranked)

Traded Industries	Regional Employment Multiplier
Construction Products and Services	6.13
Coal Mining	3.47
Livestock Processing	2.72
Upstream Metal Manufacturing	2.46
Food Processing and Manufacturing	2.24
Wood Products	2.14
Electric Power Generation and Transmission	2.07
Business Services	1.94
Forestry	1.89
Agricultural Inputs and Services	1.69
Hospitality and Tourism	1.56

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

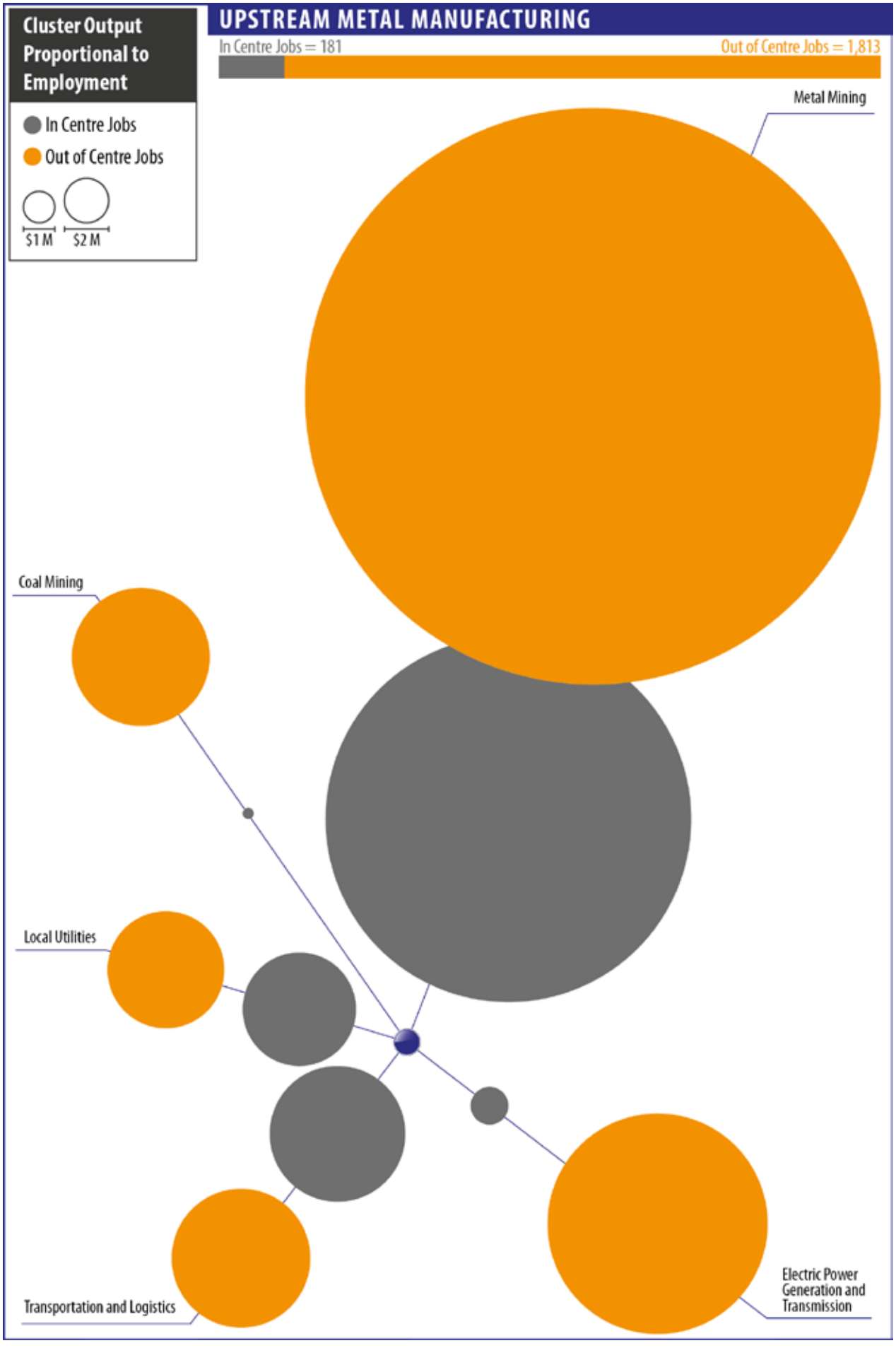
The total output multipliers provide the estimated potential dollar increase in output from all industries in the region's economy per dollar of increased output in the relevant industry. The majority of the top industries generate indirect and induced output greater than 50% of the direct increase in their output (e.g. for a $1.00 increase in Forestry there would be an extra $0.68 of output generated in all other industries). The employment multiplier indicates the additional quantum of employment supported per direct job generated in the cluster (e.g. for every 10 jobs created in the Forestry cluster there is the potential creation of approximately 9 jobs in other clusters in the region). This demonstrates the ability of Traded clusters to generate greater employment in the broader economy noting that the ability to directly influence or support particular clusters must also be considered.

These multipliers are useful for the high level comparison of industry clusters and represent the potential impact of growth in a particular cluster that may be achieved given the current status-quo i.e. current industry and employment mix. Particular initiatives may significantly alter the status quo in a range of industries and this must be considered when using these results.

6.1.2 Supply Chain Networks

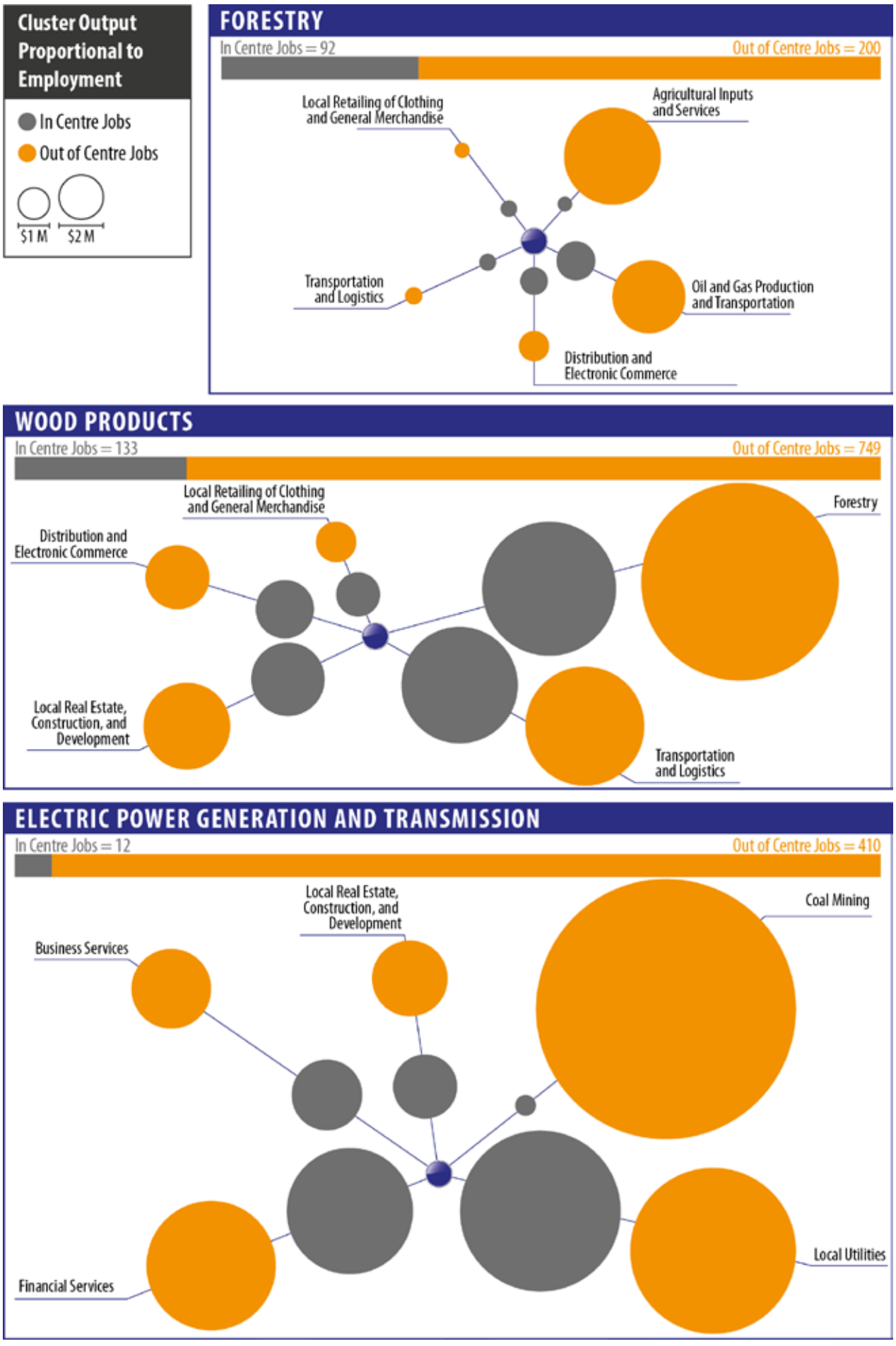
The figures below display the top five inputs for each of the Regionally Significant clusters and provide an understanding of the clusters that are likely to be most impacted by growth in these identified clusters. In-centre and out-of-centre cluster scales are provided in order to support the development of cluster network based initiatives. Here out-of-centre employment refers to employment within the region but outside of Bunbury, this may either be widely distributed employment or employment within other regional centres Where a cluster displays a strong connection to another cluster based largely outside of the centre further investigation into these connections is warranted. This is supported by the subsequent analysis of workforce linkages.

Figure 36. Bunbury supply chain network for Regionally Significance clusters



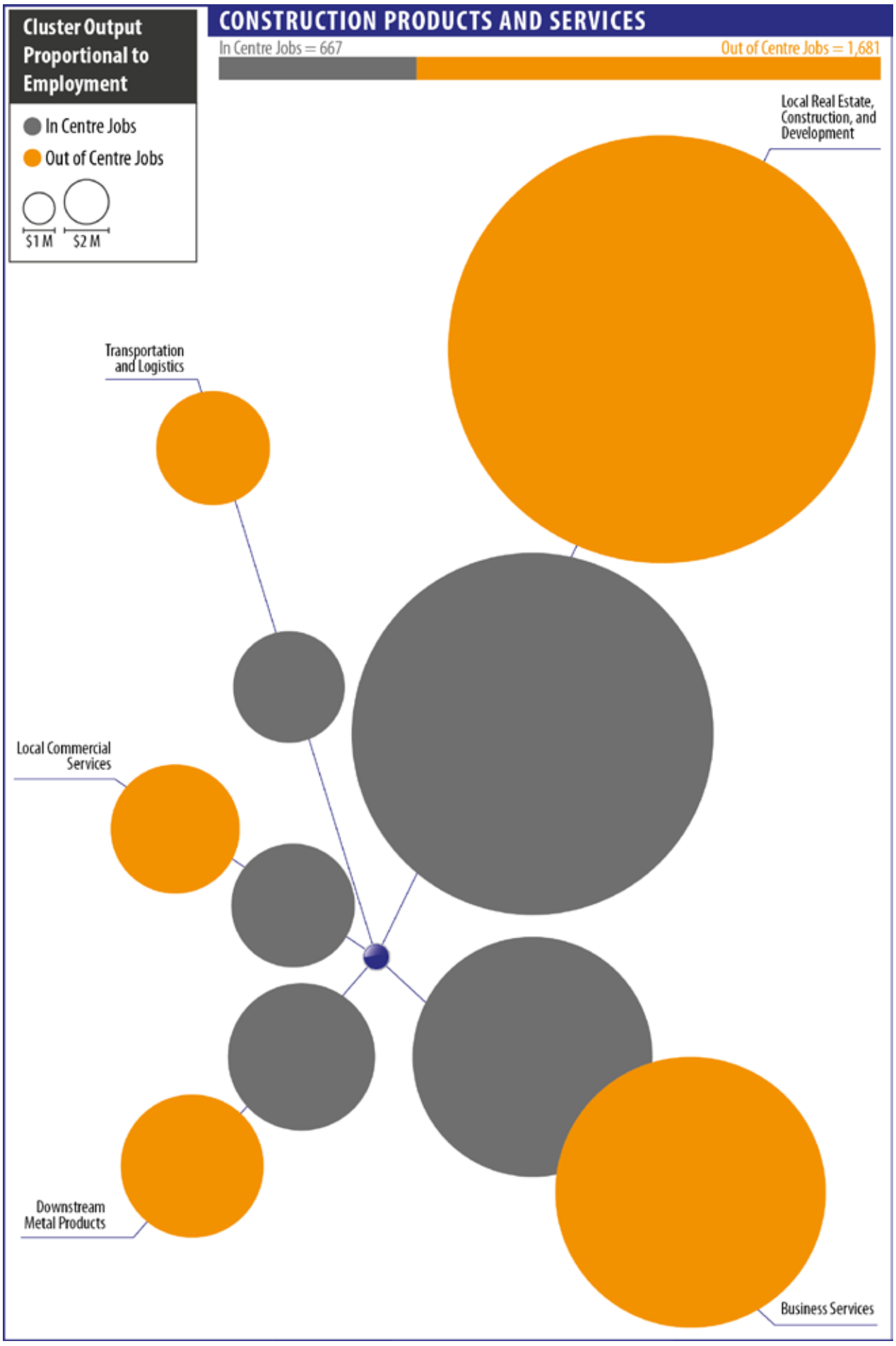
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 36. Bunbury supply chain network for Regionally Significance clusters



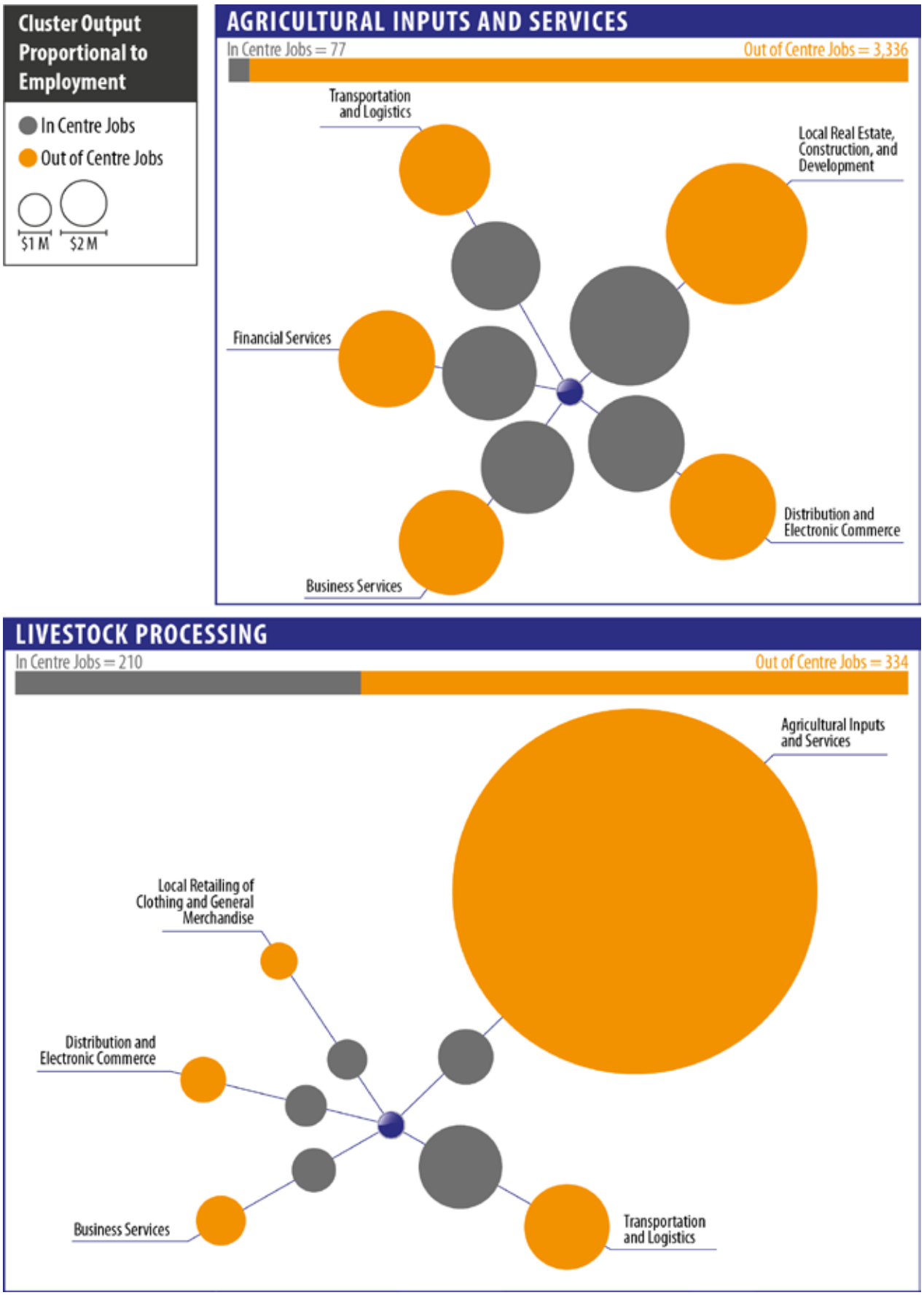
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 36. Bunbury supply chain network for Regionally Significance clusters



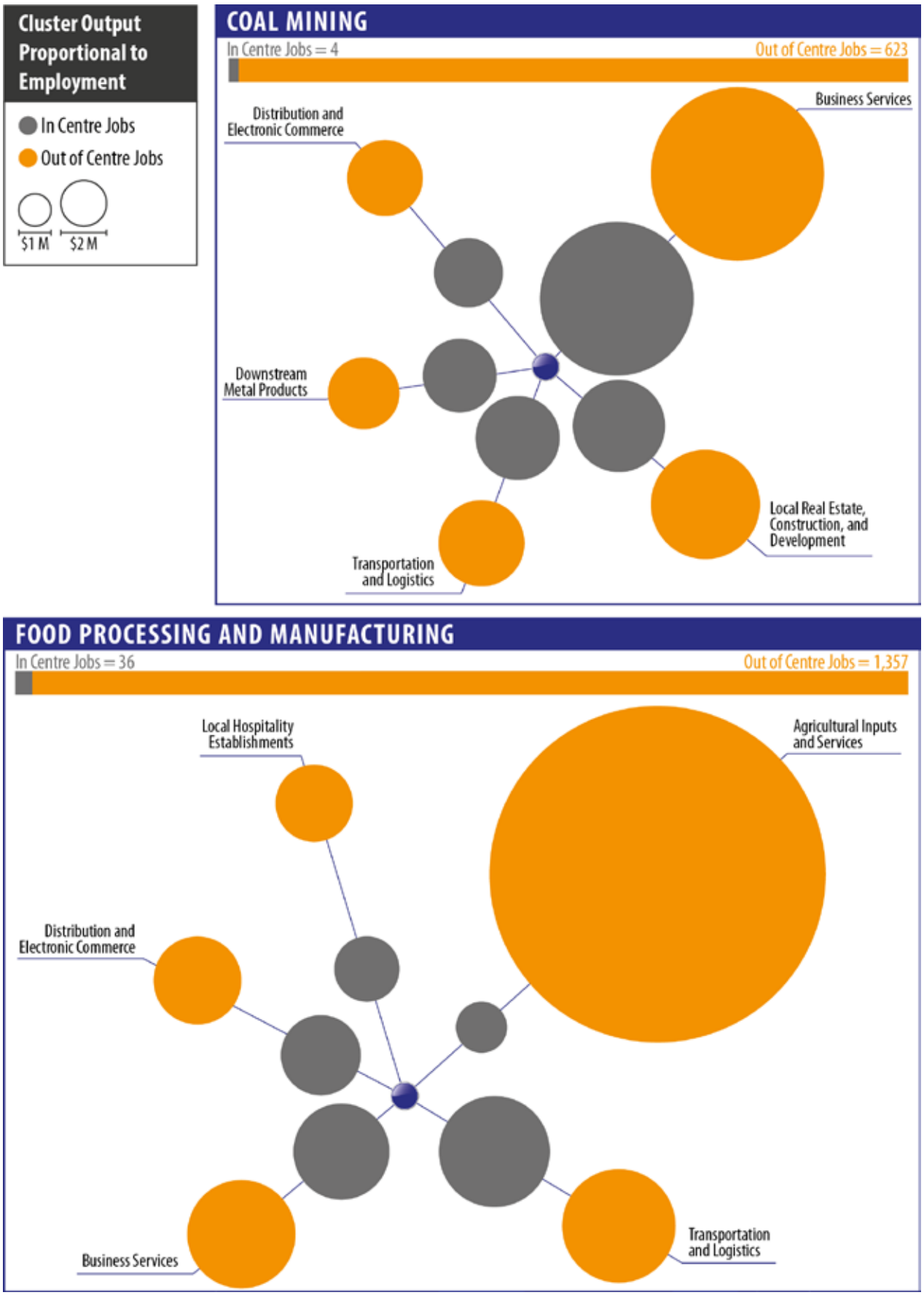
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 36. Bunbury supply chain network for Regionally Significance clusters



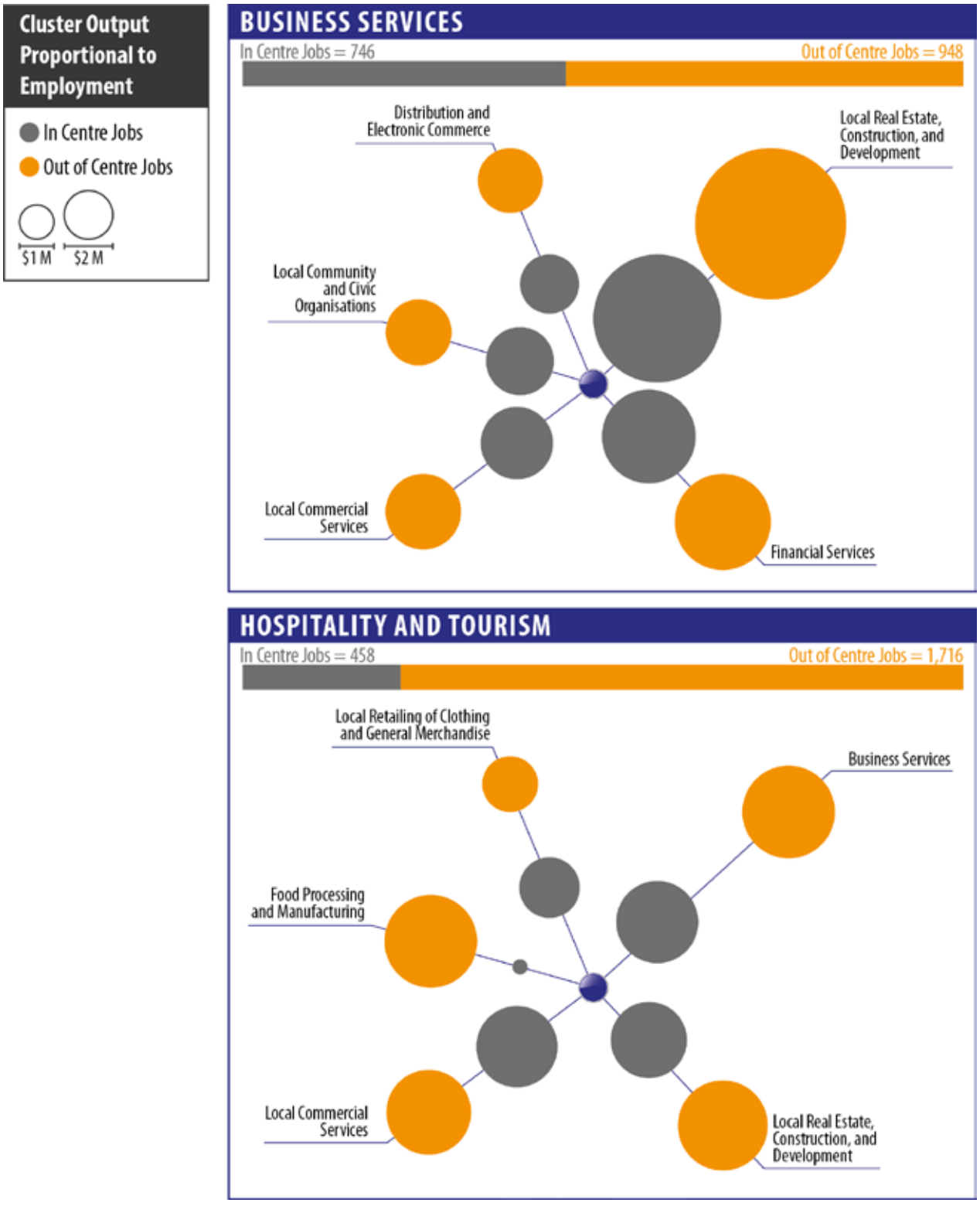
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 36. Bunbury supply chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 36. Bunbury supply chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

6.1.3 Workforce Linkages

Workforce linkages have been investigated in order to establish the presence of major out-of-centre employers of centre based residents. This information provides alternative opportunities for building on existing workforce connections that extend beyond the centre. In such cases the development of regionally based clusters is likely to have a significant impact on centre based population and income. Figure 37 provides both the scale of resident employment by industry and the proportion of these residents working beyond the centre.

This data shows that the Bunbury residents have strong connections to clusters that distributed more widely within the region and that the distribution of Regionally Significant cluster activity warrants further investigation in the context of centre employment and income:

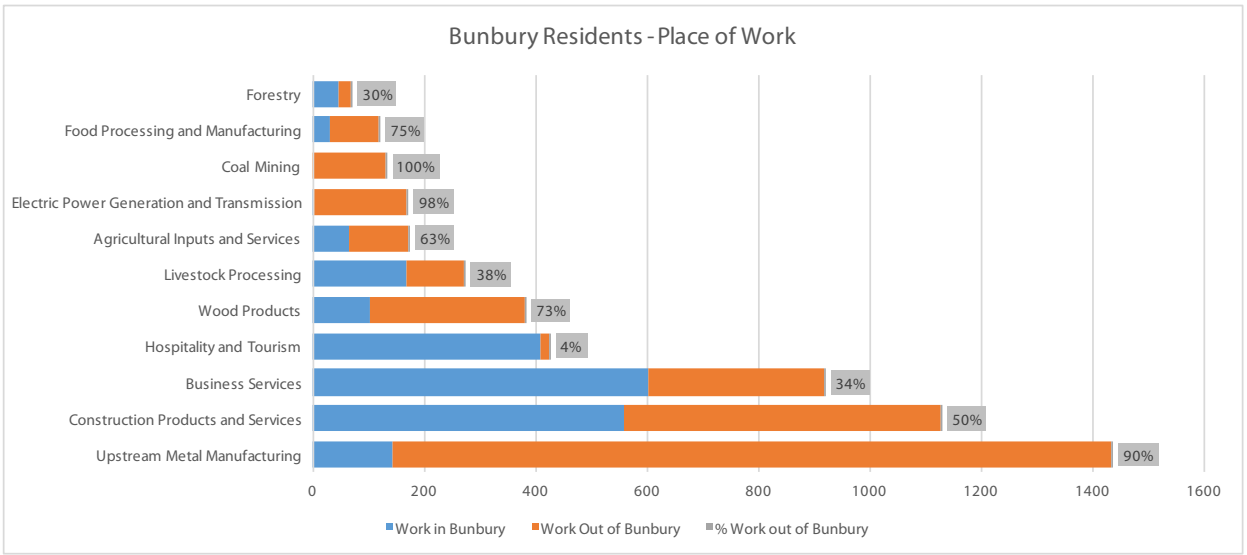
6.2 POTENTIAL DRIVERS FOR FUTURE GROWTH

Based upon the analysis and consultation conducted within the Regional Cluster analysis, a number of potential future drivers for growth have been identified. These drivers represent opportunities around which more detailed examination may be warranted. Identified future drivers include:

- Leveraging inefficiencies in the Perth and Peel metropolitan area (see relevant clusters in Section 6.2.1)
- Value-adding of regional exports (see relevant clusters in Section 6.2.2)

These drivers are therefore provided by considering the role that Bunbury plays both as a centre and in its relationship to the wider region.

Figure 37. Proportion of Bunbury Residents working outside of the centre (for Regionally Significant clusters)



Source: Pracsys 2016, ABS Census 2011

The Greater Bunbury centre specialisations are presented for consistency in . While ECFs are a useful tool in understanding the key industries that exist within the centre (by place of employment) these results should be viewed in conjunction with the Figure 37, which demonstrate that Greater Bunbury has strong workforce linkages to more distributed cluster activity in the Bunbury surrounds.

Figure 38. Bunbury ECFs in Regionally Significant Traded clusters

Statewide and Regionally Significant Traded Clusters	Regional Output ($m)	Bunbury ECF	Centre Specialisation
Upstream Metal Manufacturing	2,415	0.69	N
Construction Products and Services	1,642	0.96	N
Agricultural Inputs and Services	1,003	0.14	N
Business Services	917	0.47	N
Electric Power Generation and Transmission	808	0.35	N
Food Processing and Manufacturing	761	0.18	N
Coal mining	657	0.19	N
Hospitality and Tourism	308	0.79	N
Livestock Processing	285	3.86	Y
Wood Products	257	1.67	Y
Forestry	93	5.22	Y

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

6.2.1 Leveraging Inefficiencies in the Perth and Peel Metropolitan Area

A number of relevant gaps have been identified in the make-up of the South-West economy in both Traded and Local professional cluster activities, including:

- Distribution and electronic commerce (Traded)
- Financial services (Traded)
- Business services (Traded)
- Local commercial services (Local)

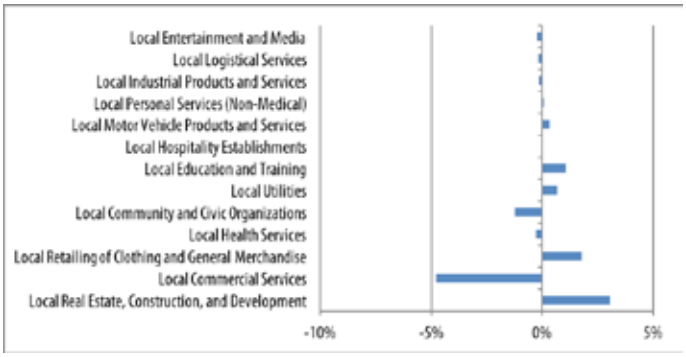
The regional gaps in these cluster groupings is the largest observed across all of the Phase 1 RCDP centres, with the contribution to output shown in Figure 39 and Figure 40.

Figure 39. Main traded cluster contribution in the south west region minus statewide cluster contribution

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These results are likely representative of the strong links and proximity between the region and the large metropolitan area of Perth and Peel. Whilst this remains a significant threat to the growth of the Bunbury economy (with these largely centre-based activities representing significant areas of leakage outside of the Region), they may also represent opportunities

Figure 40. Local cluster contribution in the south west region minus statewide cluster contribution



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

for future development. This is particularly the case if externalities associated with city growth and system disruption (such as congestion, pollution, labour shortages and monopolies) impact on the productivity of firms locating in Perth and Peel. If these externalities impact upon productivity to a greater extent than the benefits of being part of an agglomeration (such as labour pooling, knowledge spill-overs and forwards/backward linkages), firms may seek to move to more productive locations.[1]

Bunbury may represent a compelling location choice if it can offer a more productive alternative, building on characteristics including the relative proximity to markets, availability of a stable workforce, and capacity of infrastructure. If found to represent a true opportunity the locational criteria of firms should be investigated to establish methods of attracting firms to Bunbury centre. For example, while inconclusive, a potential constraint raised during consultation is the lack of water pressure within Bunbury centre. This creates the need to add tanks to multi-storey buildings for fire fighting purposes, which is prohibitively expensive. This would in turn limit the density that can be achieved within the centre and the lack of large offices may form a disincentive to large firms wishing to locate within the centre.

1 Overman, H., Gibbons, S. and Tucci, A. "The Case for Agglomeration Economies.", Manchester Independent Economic Review, April 2015.

6.2.2 Value-Adding to Regional Exports

Bunbury is a very significant regional centre that plays a major role in providing for the local consumption needs of the South-West region's population and providing inputs into surrounding traded activities. Local cluster concentrations are generally high for the centre, with the notable exception of Business Services (as above), this indicates that Bunbury serves as a major population driven service centre for the wider South West region. The centre however has a limited Traded economy of its own. Depending on the spatial area considered (Bunbury Centre versus Greater Bunbury) high concentrations of Regionally Significant clusters are limited to:

- Hospitality and Tourism (Bunbury Centre)
- Wood products (Bunbury Centre and Greater Bunbury)
- Forestry (Greater Bunbury)
- Livestock Processing (Greater Bunbury)

Outside of this selection of clusters, Bunbury tends to display low concentrations of Traded activity.

Sustaining future growth of Bunbury into the future is unlikely to occur in servicing the population driven (Local) activity or the wider Traded activity dispersed throughout the greater South West region. The weaker the spatial relationship between Bunbury and regional traded activities, the more likely that inputs (including labour, services and goods) can be more efficiently sourced from other areas. This means that the centre will be

continuously exposed to leakage to suppliers of key industry inputs located elsewhere in the region or in Perth unless increased levels of Traded based activity are attracted the centre (Greater Bunbury).

International experience suggests that this is most likely to be based upon the implicit comparative advantages of the centre or the region where centre to region links have been established. Replacing/augmenting parts of the Perth metropolitan traded economy may also present an opportunity where the opportunity exists (see Section 6.2.1), particularly where this addresses underlying needs or inefficiencies.

When considering centre and regional Traded activity that may form a basis for value adding activity in Bunbury, three of the largest regional sectors of activity (by employment) represent those with the most potential. These are*:

- Food production (including Agricultural inputs and services, food processing and manufacturing and livestock processing)
- Hospitality and tourism
- Business services

(*Mining-related sectors including coal mining and upstream metal manufacturing have not been identified given their capital investment in existing locations and stage in product life cycle.)

Of these, hospitality and tourism and food production show degrees of specialisation within the centre. Business services may represent an opportunity for augmentation if businesses or professionals can be attracted to use Bunbury as a base. Building a stronger presence in these areas will require Bunbury to carve out a specific role in future export value chains. These need to achieve productivity outcomes that build on existing regional and local advantages including:

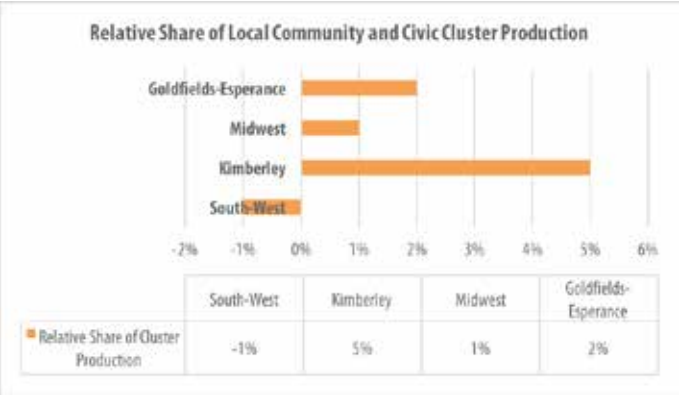
- Infrastructure (e.g. Bunbury Port and Kemerton Industrial Area)
- Linkages to state, national and international export markets
- Local knowledge base associated with specific products, techniques and technologies
- The scale, stability and skills of the local workforce

6.3 CAPACITY TO ACCOMMODATE FUTURE GROWTH

6.3.1 Community and Civic Capital

A potential capacity issue arising from the cluster analysis undertaken is the low contribution that community and civic organisations plays within the South West economy. This cluster is very significant as it contributes to the social and cultural capital that acts as a precursor to the attraction and retention of a skilled workforce, investors and consumer-base. The South-West is the only of the four regions in this study to show under-contribution in the analysis. Figure 40 illustrates this point showing that Local Community and Civic Cluster production is lower (relatively) as a share of local cluster production than that of the State economy.

Figure 41. Share of relative production comparison (State vs Region)



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

At a centre level, Bunbury displays a higher than average employment concentration within this cluster, with facilities and services such as government agencies/administration, business and professional associations, law and order, social assistance services and sports and physical recreation administration all well represented. This suggests that Bunbury plays an important role in providing community and civic amenity for the region, a position that can be built upon by adding further amenity. It is important to note that efforts to further strengthen this Local cluster would should be founded on the ability of this cluster to support increased Traded activity rather than forming a driver in its own right.

6.3.2 Port Capacity and Function

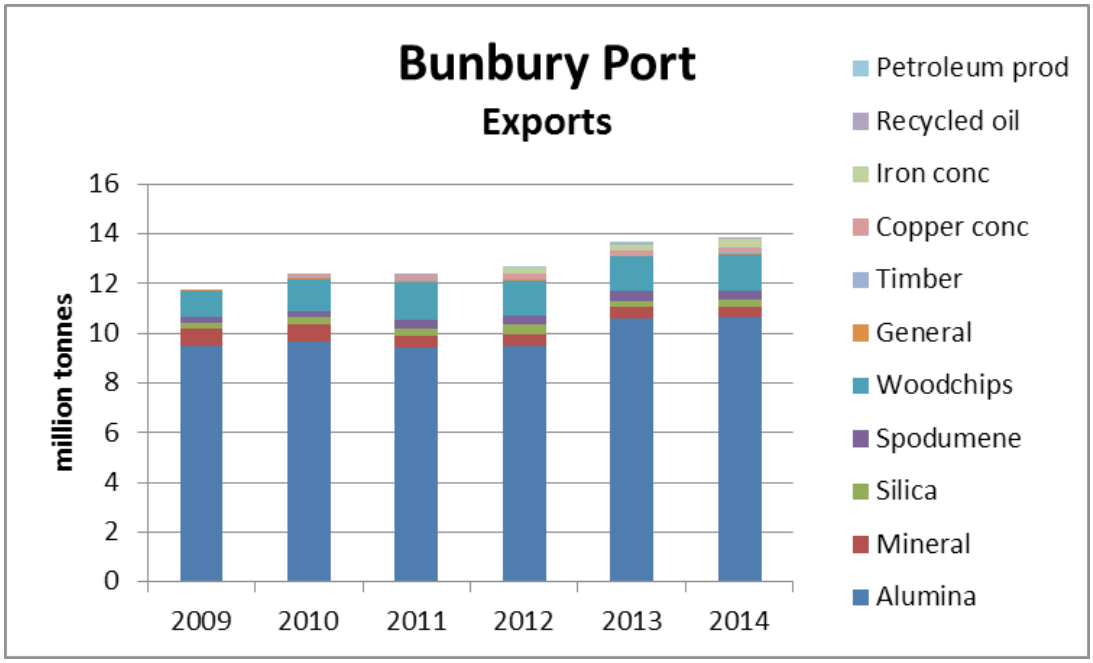
Bunbury Port represents one of the most significant pieces of trade logistics infrastructure in the South West. It current acts primarily as an export port (refer to Figure 42) with Alumina from Alcoa and Worsley Alumina representing the majority of its exports (refer to Figure 43).

Opportunities may exist to leverage the capacity of this infrastructure to act as an in-bound port for Western Australia. This would potentially entail developing capacity for container offloading and storage, as well as freight processing and laydown.

Figure 42. Bunbury import and export volumes 2002-2011

Source: Bunbury Port Authority

Figure 43. Bunbury Port exports by type 2009-2014



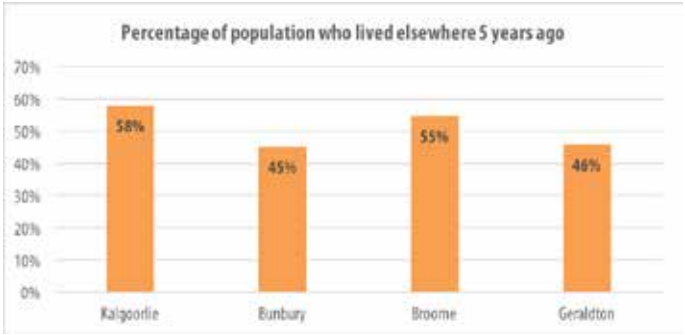
Source: Bunbury Port Authority

There may also be opportunities to utilise port capacity in alternative export products from the South West, Great Southern, Wheatbelt and Peel regions. In particular, this capacity, if leveraged, could address the absence of raw and value-added food exports (including grains, fruit and vegetables, meat and dairy). This may require container infrastructure, as well as local secondary food manufacturing industries (i.e. further development of Food Processing and Manufacturing, and Livestock Processing clusters).

6.3.3 Population Scale and Stability

The relative stability of the Bunbury population represents an opportunity to build a pool of cluster-specific labour focused on the needs of the existing and future South West Traded economy. Figure 44 shows the percentage of the population that lived elsewhere from each regional growth centres local government area. As shown, Bunbury has the steadiest population of the 4 centres with approximately 45% population living elsewhere in the last 5 years. This is in contrast to Kalgoorlie which had almost 60% of its population living elsewhere.

Figure 44. Population turnover



Source: ABS Census (2011)

This labour capacity would likely build upon existing regional Traded activities and, in particular, could take advantage of low/unskilled labour that can still be trained to meet specific industry niches.

Likewise, the scale of the Bunbury and the greater South West population represents an opportunity to continue to position Bunbury as an active and vibrant regional service centre that meets the full range of consumption needs of the population, however growth in this area is dependent on population growth in the region. Anecdotally, the centre already is strongly positioned in a number of areas including comparison retail, secondary education and healthcare. This is evidenced by two major sub-regional shopping centres with approximately 17,000m^2 and 22,000m^2 of retail floorspace indicating spending significant enough to support a number of comparison retail outlets. Education is similarly well serviced with at least 10 schools (primary and secondary) as well as a TAFE and university campus. Similarly, Bunbury has its own regional hospital with private component. Similarly, ECF's for these Local clusters (Local Retailing, Local Education and Training, and Local Health Services) are high in Bunbury at 1.39, 1.38, and 1.25 respectively. It is noteworthy that the Traded equivalent of the Local Education and Training Cluster, being Education and Knowledge Creation (capturing largely tertiary education) is low by comparison, with an ECF of 0.78 and there may however be opportunities to build a more compelling value proposition in areas such as local commercial services, entertainment and tertiary education.

These elements may also contribute to a virtuous cycle that builds on the social and human capital required as precursors to endogenous development of traded activities. Importantly, population driven economic growth in Local clusters will inevitably be limited by a lack of employment opportunities if not matched by growth in Traded clusters. This highlights the need to seek markets outside Bunbury's existing catchment typified by the under-performance of Bunbury's university campus, which was raised during the regional consultation process.

6.4 OPPORTUNITY CASE STUDY

Based on the analysis conducted it was possible to construct a case examining the combined effect of cluster growth. All Growth Centre lead consultants were requested to provide a limited number of potential growth clusters for this purpose. Through consultation, the case study agreed upon for Bunbury was the development of a marina providing both commercial and tourism based operations. The Traded clusters likely to be influenced by such a development would include:

- Hospitality and Tourism – with the marina forming a tourism attractor for the centre
- Water Transportation – with the incorporation of a vessel servicing function

Of these, Hospitality and Tourism has been previously identified as an area of relative specialisation for both the region and centre. The ECF for Water Transportation is currently 0.48 (approximately 67 employees) based on current port operations, indicating a lack of specialisation in this cluster.

For the purposes of comparison, the analysis was used to estimate the direct impact of a 10% increase in total output for each of these chosen clusters and the indirect and induced impact on the rest of the regional economy.

Considering the potential scale of impact, this type of project would likely support additional visitation in Bunbury centre, however it may be considered that the overall contribution to an increase in total regional output (by increasing total regional tourism) may be limited as a stand-alone project. The role of the facility in the wider South-West Hospitality and Tourism cluster would require further investigation.

6.4.1 Hospitality and Tourism – Bunbury

In the Regional Centre of Bunbury, Hospitality and Tourism has an estimated total output of $76m, employing approximately 458 persons. The results presented in this report also show that:

- The cluster is a comparative area of specialisation of the region, but underperforms when considering Greater Bunbury, with ECFs of 1.40 and 0.79 respectively
- Bunbury holds a relatively low portion of regional employment, accounting for 21% of employment within this cluster
- Very few residents of Bunbury employed in the cluster work outside of the centre, with 4% out-of-centre employment
- Major clusters linked by supply chain include Business Services, Local Real Estate Construction and Development, Local Commercial Services, Food Processing and Manufacturing, and Local Retailing

Level of Impact

Using the multipliers presented above, the impact of a 10% increase in the cluster was estimated for Bunbury. The analysis used the South West total output and employment multipliers of 1.84 and 0.56 respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $8m in the total output of the Hospitality and Tourism cluster, equating to 46 additional jobs. Using the multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster (Figure 45). The contribution of Bunbury to the total output of the South West economy is estimated at $14m, with a total increase of 69 employment opportunities.

Figure 45. Hospitality and Tourism impact - Bunbury

Bunbury Hospitality and Tourism	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$8m	$6m	$14m
GVA ($)	$4m	$3m	$7m
Employment	46	23	69

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes, at a regional level 10% growth in the Hospitality and Tourisms Cluster corresponds to the following estimated impact. Given Bunbury's share of regional employment it can be interpreted that at a centre level the case study example may form a significant attractor, however if regional level impact is desired the Hospitality and Tourism cluster for the South-West may be better served by projects that seek to improve inter-state and overseas visitors through coordinated initiatives or a combined suite of projects across multiple centres. Full (hypothetical) regional results are provided in Appendix 2.

Figure 46. Hospitality and Tourism impact – South West

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$14m	$8m	$22m
GVA ($)	$7m	$ 5m	$12m
Employment	220	22	242

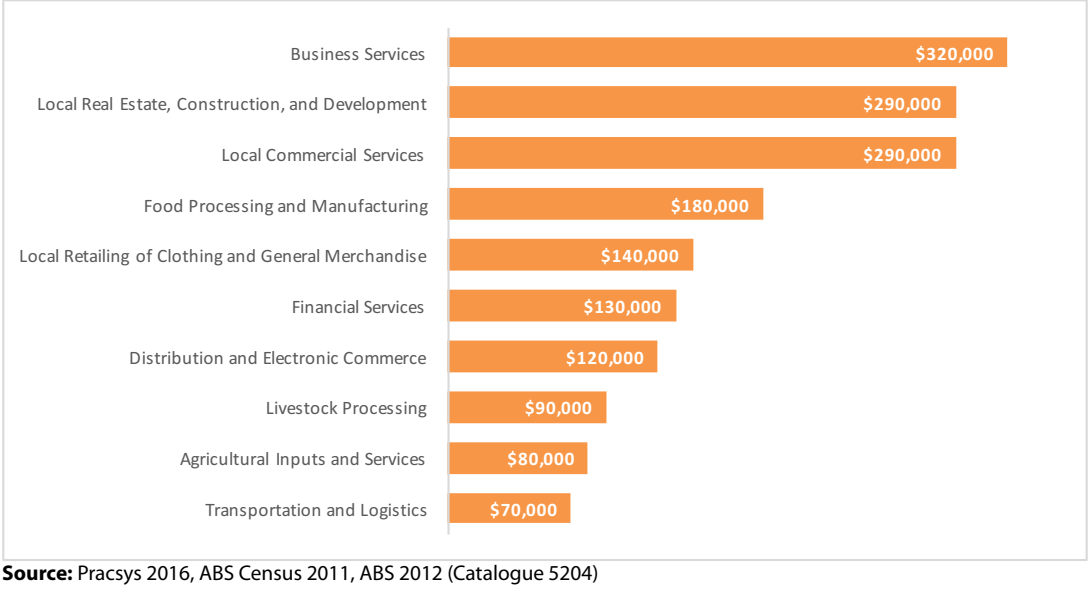
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Alternatively, the lack of diversity in entertainment, restaurant and bars that would likely be provided in such a project may represent a current constraint to Bunbury serving as a 'second city' via the ability to attract and retain skilled personnel in the face of competition from Perth. This project may also be considered to act as a capacity building project in this areas, however to reiterate, such projects should be conducted in conjunction with driver projects within Traded clusters. Like all initiatives, detailed assessment of local impacts, cost to benefits and feasibility would be required to provide a true assessment.

The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Hospitality and Tourism cluster (Figure 47). Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

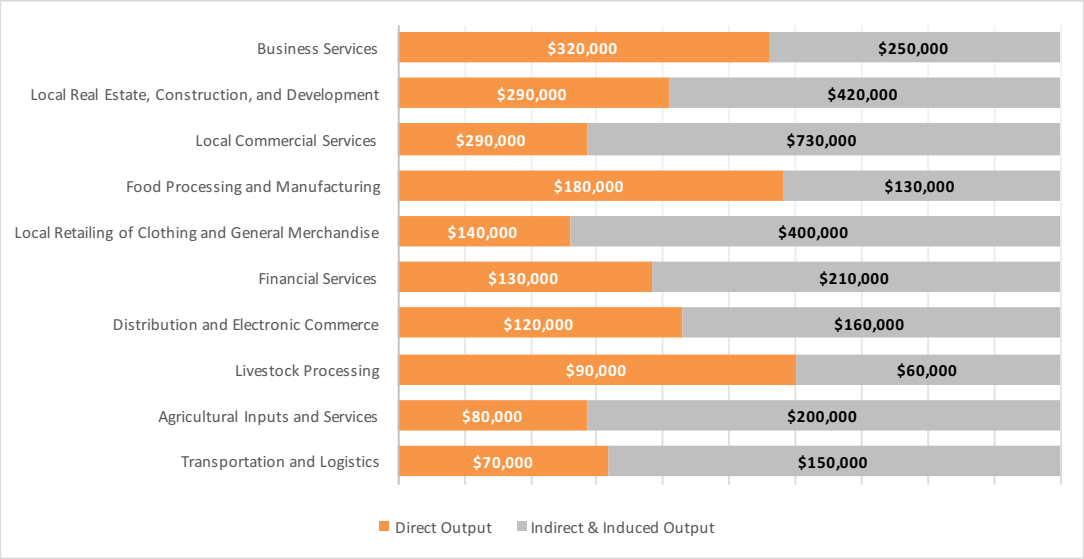
These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated (Figure 48). Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 47. Input clusters to Hospitality and Tourism direct impact – Bunbury



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 48. Input clusters to Hospitality and Tourism Indirect Impact – Bunbury



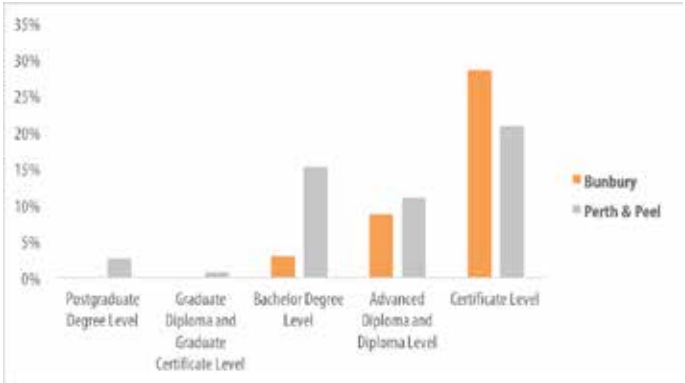
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Workforce Considerations

The average salary for the cluster in the centre is $35,000, slightly higher than the regional average. The education level for this cluster in Bunbury is more concentrated in at the Certificate Level, and is significantly lower at bachelor degree level and above, when compared to Perth and Peel. Overall, 41% of personnel have formal training or tertiary education within Bunbury compared to 51% in Perth and Peel.

This results indicate that this cluster does not rely heavily on a highly skilled labour pool and that the attraction and retention of a skilled personal not likely to present a constraint to growth. For example, links to higher education and research facilities may be less important than links with vocational training institutions. Conversely the work force required for this cluster will be more sensitive to factors such as local housing affordability, although it is highly likely that a young, transient workforce would form a large component of the labour pool.

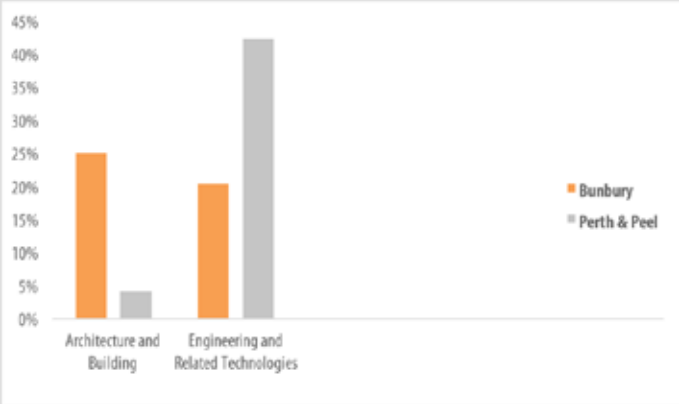
Figure 49. Hospitality and Tourism level of education - Bunbury



Source: Pracsys 2016, ABS Census 2011

The top 5 fields of education for this cluster differ between Bunbury and Perth with Society and Culture being the most prominent field for Bunbury.

Figure 50. Hospitality and Tourism field of education – Bunbury



Source: Pracsys 2016, ABS Census 2011

6.4.2 Water Transportation – Bunbury

In the Regional Centre of Bunbury, Water Transportation has an estimated total output of $3m, employing approximately 67 persons according to 2011 ABS data. The results presented in this report also show that:

- The cluster is not a specialisation of the region or centre (despite the presence of the port), with ECFs of 0.39 and 0.48 respectively
- Bunbury holds a very high portion of regional employment, accounting for 87% of employment within this cluster
- Very few residents of Bunbury employed in the cluster work outside of Bunbury, with 0% out-of-centre employment
- Major clusters linked by supply chain include Transportation and Logistics, Local Real Estate Construction and Development, Business Services, Financial Services, and Oil and Gas Production and Transportation

Level of Impact

The impact of a 10% increase in the cluster was assessed for Bunbury. The analysis used the South West total output and employment multipliers for the cluster of 1.68 and 1.29. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $332,000 in the total output of the Water Transportation cluster, equating to 7 additional job. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster's presence in Bunbury. The potential contribution of Bunbury to the total output of the South West economy is estimated at $559,000, with a total increase of 8 employment opportunities.

Figure 51. Water Transportation Impact - Bunbury

Bunbury Water Transportation	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$300,000	$200,000	$500,000
GVA ($)	$100,000	$100,000	$200,000
Employment	7	1	8

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes, at a regional level 10% growth in the Hospitality and Tourisms Cluster corresponds to the following estimated impact. Full (hypothetical) regional results are provided in Appendix 2.

Figure 52. Water Transportation 10% Increase Impact – South West

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$2m	$2m	$4m
GVA ($)	$1m	$1m	$2m
Exports ($)	$100,000	-	$100,000
Employment	8	5	13

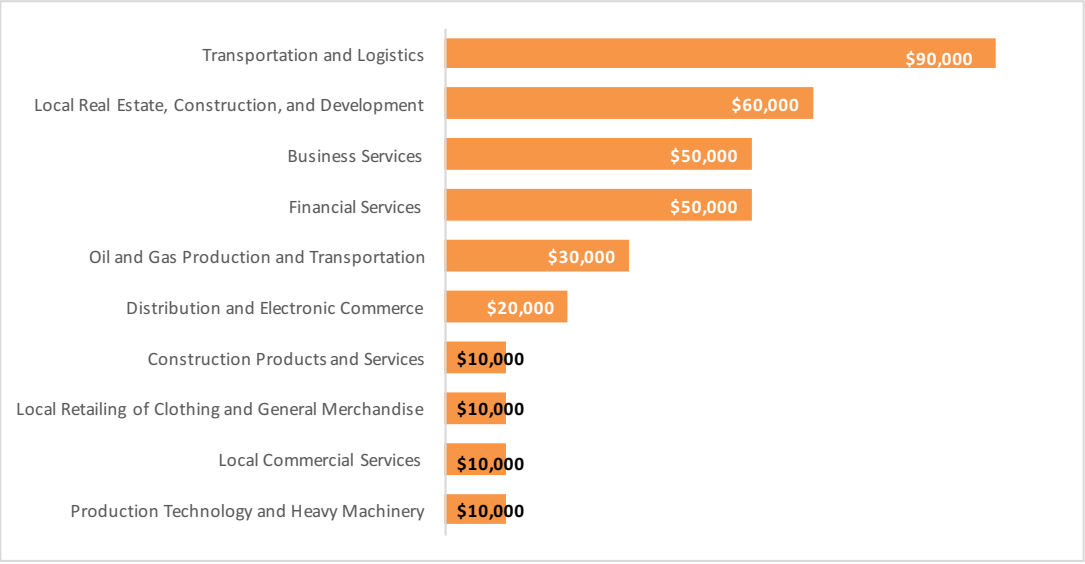
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Water Transportation cluster (Figure 52). Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated (Figure 54). Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

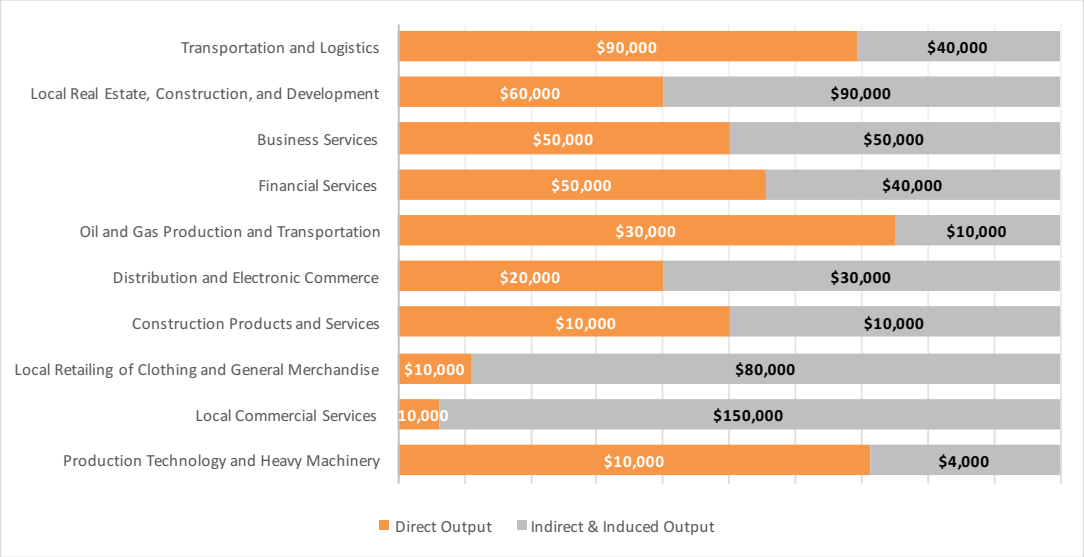
The result show that despite the presence of a port in Bunbury, employment in the Water Transportation cluster is currently at very low levels both in Bunbury and the South-West more generally. This indicates that many industries within this cluster classification are not present locally, likely due to the relative distance of Perth based facilities. Non port and marine freight related industries within this cluster include shipbuilding, boatbuilding and repair services and water transport services. Such industries may be able to develop as a consequence of a marina development if incorporated into detailed design and planning, but their size will be limited by the local demand generated by the facility e.g. through private vessels and tourism oriented operations.

Figure 53. Input clusters to Water Transportation direct impact – Bunbury



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 54. Input clusters to Water Transportation indirect impact – Bunbury



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

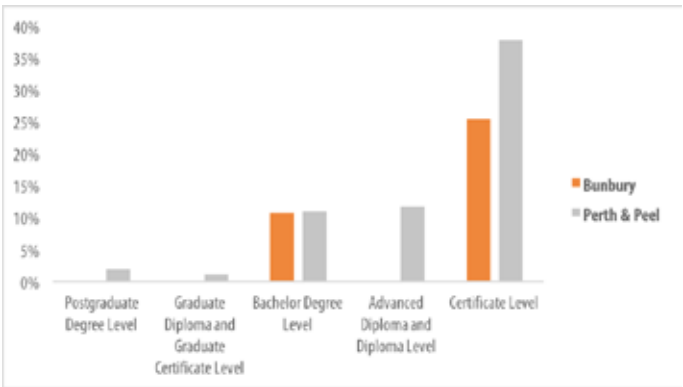
Workforce Considerations

The average salary for the cluster, in the centre, is $67,000, approximately the same as the South West average. Education for this cluster within Bunbury are significantly lower than within Perth and Peel with 36% of personnel holding formal training or tertiary level education compared to 64% respectively.

This cluster relies more heavily on a larger proportion of tertiary educated and vocationally personnel and skills may therefore be a more significant consideration for growth in this cluster. This is reflected in the narrow fields of field of study relevant to this cluster, which would likely reflect fields such as offshore engineering and naval architecture.

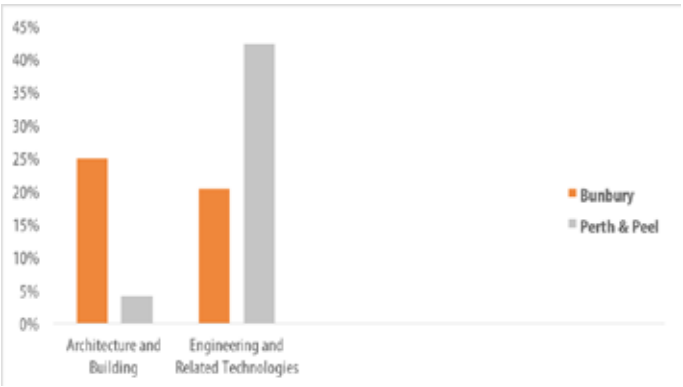
The top two fields of study for the cluster were the reversed for Bunbury compared to the South West region with a higher proportion of employed people educated in Architecture and Building (Figure 56).

Figure 55. Water Transportation education level - Bunbury



Source: Pracsys 2016, ABS Census 2011

Figure 56. Water Transportation field of study – Bunbury



Source: Pracsys 2016, ABS Census 2011

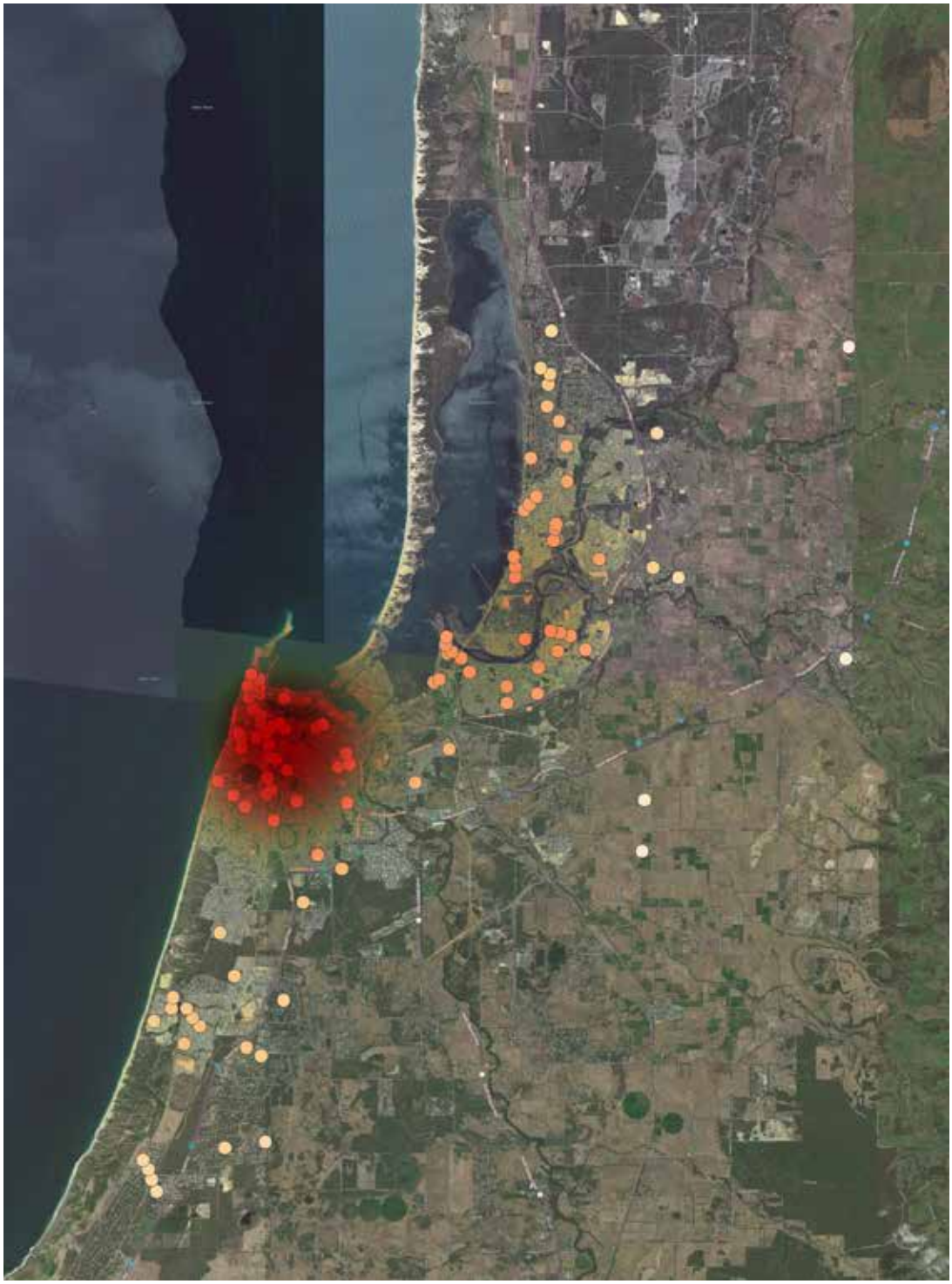
6.4.3 Results in Context

Cluster Business Concentrations

ABR data has been interrogated to provide concentrations of businesses in each centre and surrounds. This data provides registered business locations by ANZSIC 2 industry classification (however not all businesses may be captured). Clear trends can be seen in groupings of businesses within each cluster indicating a level of natural agglomeration. Businesses within the Local Hospitality Establishments cluster have been added for mapping purposes given that this may form a major component of the case study project.

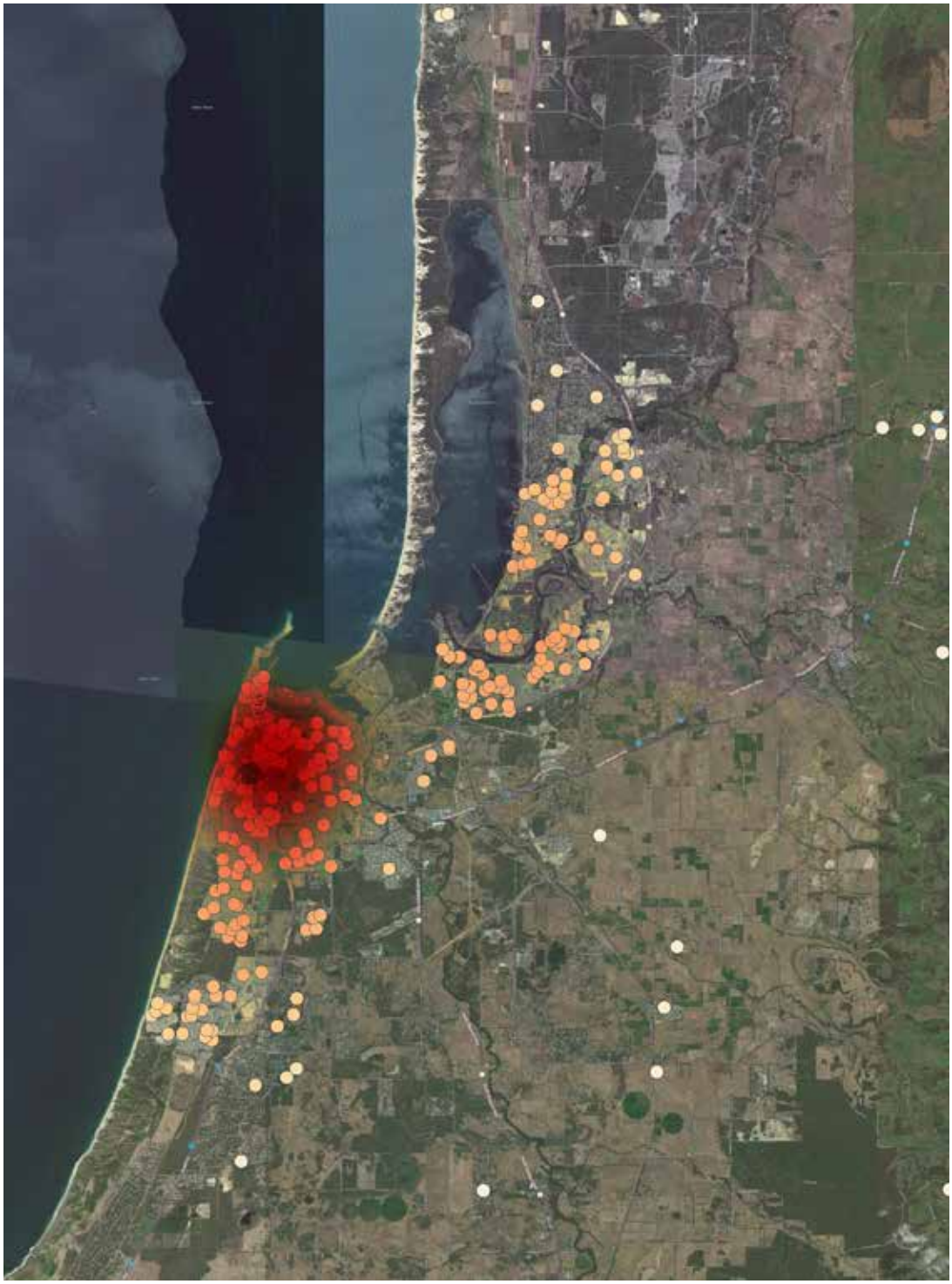
Considering the regional distribution of these clusters, it is apparent that the centres of Busselton, Dunsborough, and Margaret River also play dominant roles, largely on the basis of the Hospitality and Tourism and Local Hospitality Establishment clusters. These centres (and other smaller centres and regional attractions) form a network of offerings within the region. This distribution reinforces the fact that centre scale projects should be viewed in the context of their connections to regional activity and assessed (partly) on their ability to increase overall regional activity, for example, through increased interstate and overseas visitor market share.

Figure 57. Greater Bunbury Hospitality and Tourism business locations



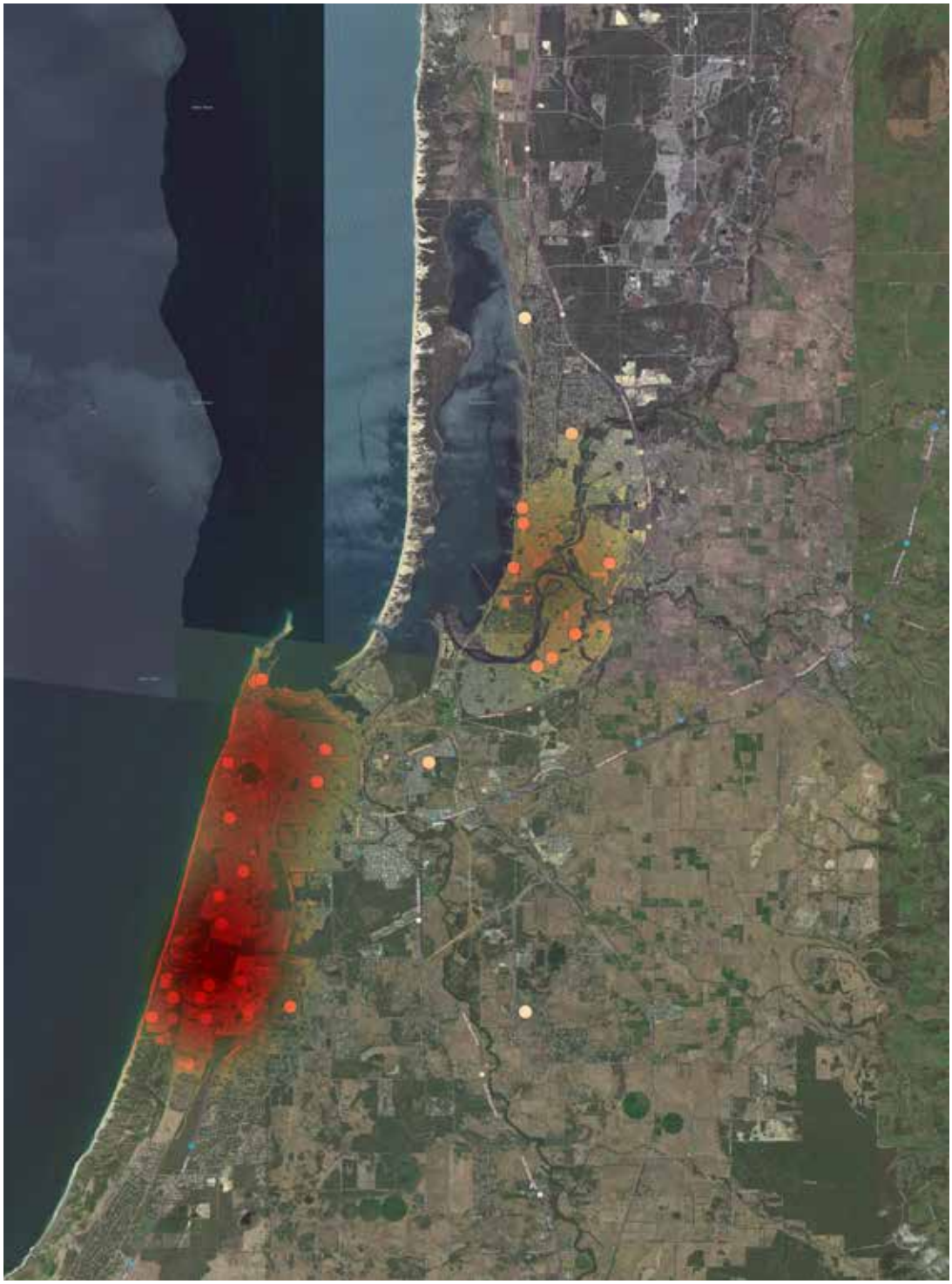
Source: Australian Business Register (2015)

Figure 58. Greater Bunbury Local Hospitality business locations



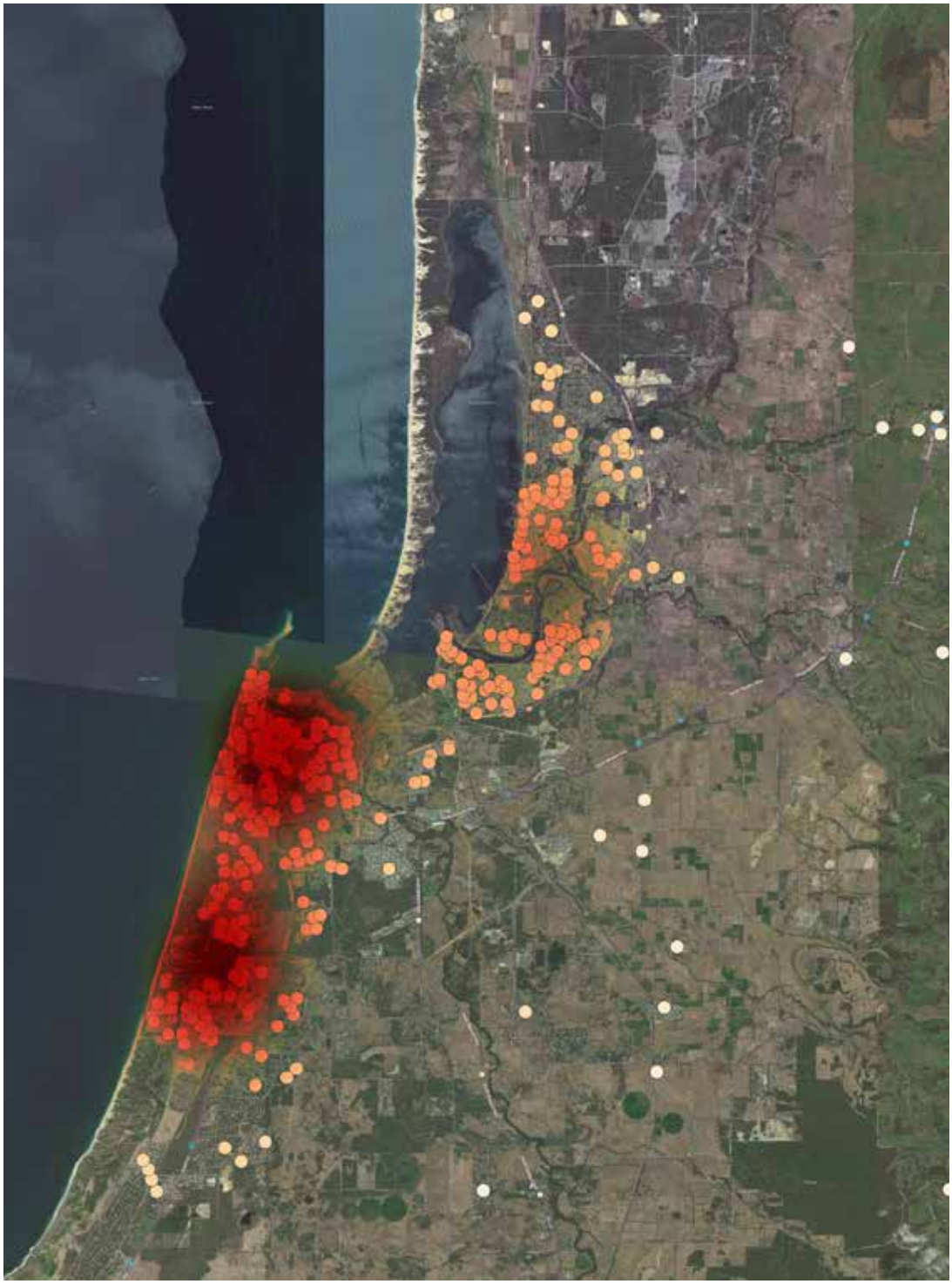
Source: Australian Business Register (2015)

Figure 59. Greater Bunbury Water Transportation business locations



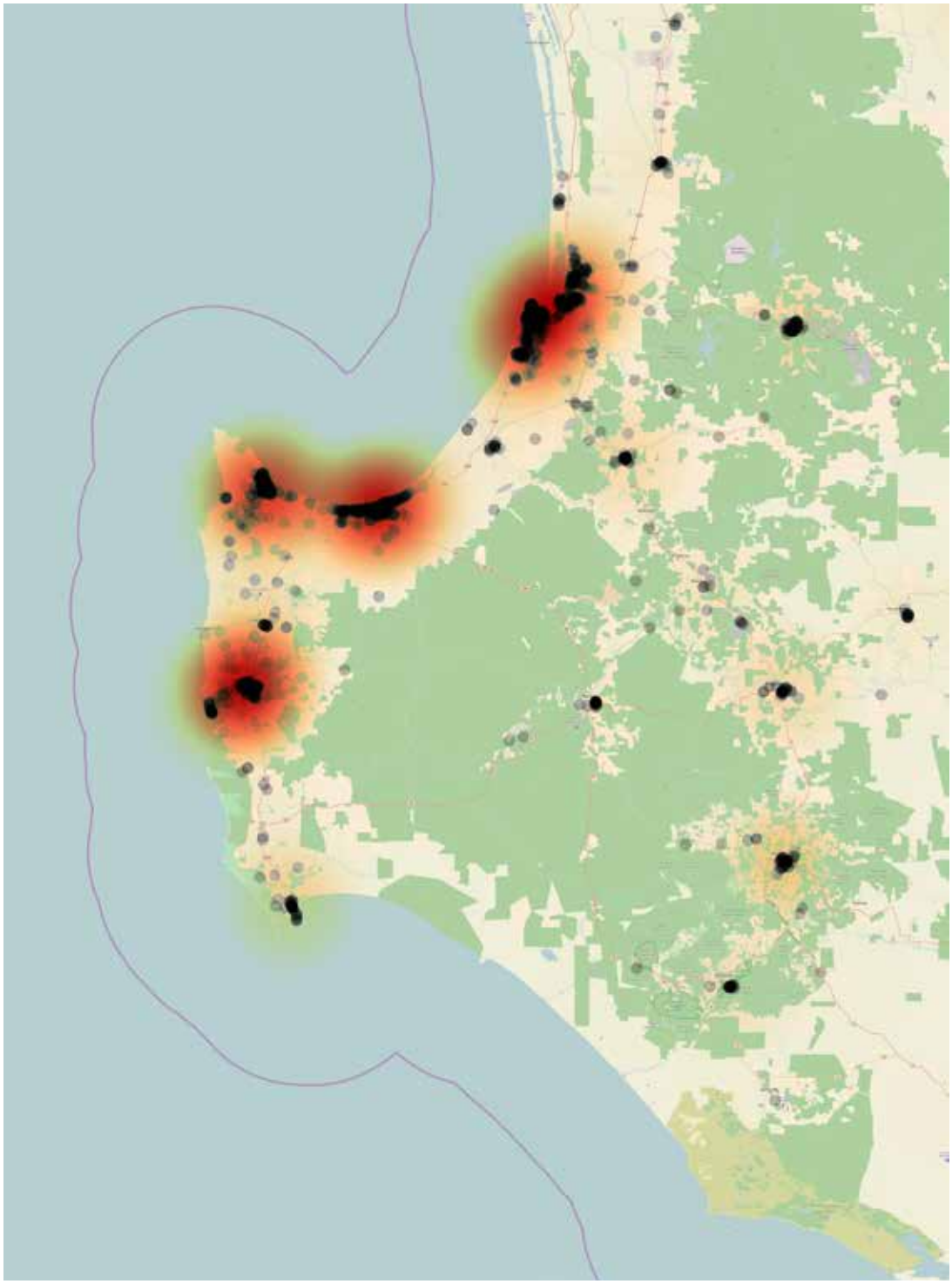
Source: Australian Business Register (2015)

Figure 60. Greater Bunbury all case study business locations



Source: Australian Business Register (2015)

Figure 61. Greater Bunbury and surrounds, all case study business locations



Source: Australian Business Register (2015)

Case study impact relative to total Region and State employment and output

The potential combined effect of the hypothetical 10% centre level growth scenario results combined gross employment contribution totals 237 jobs. Similarly, the total combined output contribution is approximately $41.5 million. These results are compared to total regional and state employment and output in Figure 62.

Figure 62. Case study impact relative to Region and State

	Employment		Output	
Case Study Contribution	77		$14.5m	
Regional Total	60,000	0.13%	$37,000m	0.04%
State Total	980,000	negligible	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

It is considered unlikely that the case study project used will have a wider regional effect.

It must be re-iterated all figures are purely hypothetical and are provided for the sake of comparison only. While these figure are high level, all are produced using a consistent method are therefore directly comparable to others produced in this report. No assessment can be made at this stage on the relative merits of particular initiatives based on these figures and any future assessment would require detailed investigation including an in-depth assessment of project feasibility and rational. Having said this is can be seen that to achieve regional or state significant impact the total growth required far exceeds the assumed 10% baseline.

7.0

7 GERALDTON: CLUSTER GROWTH IMPACTS

7.1 CLUSTER NETWORKS

7.1.1 Supply Chain Impacts

The Mid West input/output table was used to estimate region specific multipliers for both total output and total employment. These multipliers provide an overall estimate of the proportional economic impact of growth within each cluster on wider economy. Specific linked clusters are examined in Section 7.1.2.

Figure 63. Mid West total output multipliers

Traded Industries	Total Output (per $)
Construction Products and Services	1.84
Water Transportation	1.76
Transportation and Logistics	1.74
Downstream Metal Products	1.73
Business Services	1.70
Non-metal Mining	1.62
Hospitality and Tourism	1.61
Agricultural Inputs and Services	1.57
Metal Mining	1.56
Fishing and Fishing Products	1.44

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

Figure 64. Mid West total employment multipliers

Traded Industries	Additional Jobs per Direct Job
Construction Products and Services	4.32
Metal Mining	2.71
Downstream Metal Products	2.17
Water Transportation	2.11
Transportation and Logistics	1.84
Business Services	1.65
Non-metal Mining	1.54
Agricultural Inputs and Services	1.52
Fishing and Fishing Products	1.50
Hospitality and Tourism	1.39

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

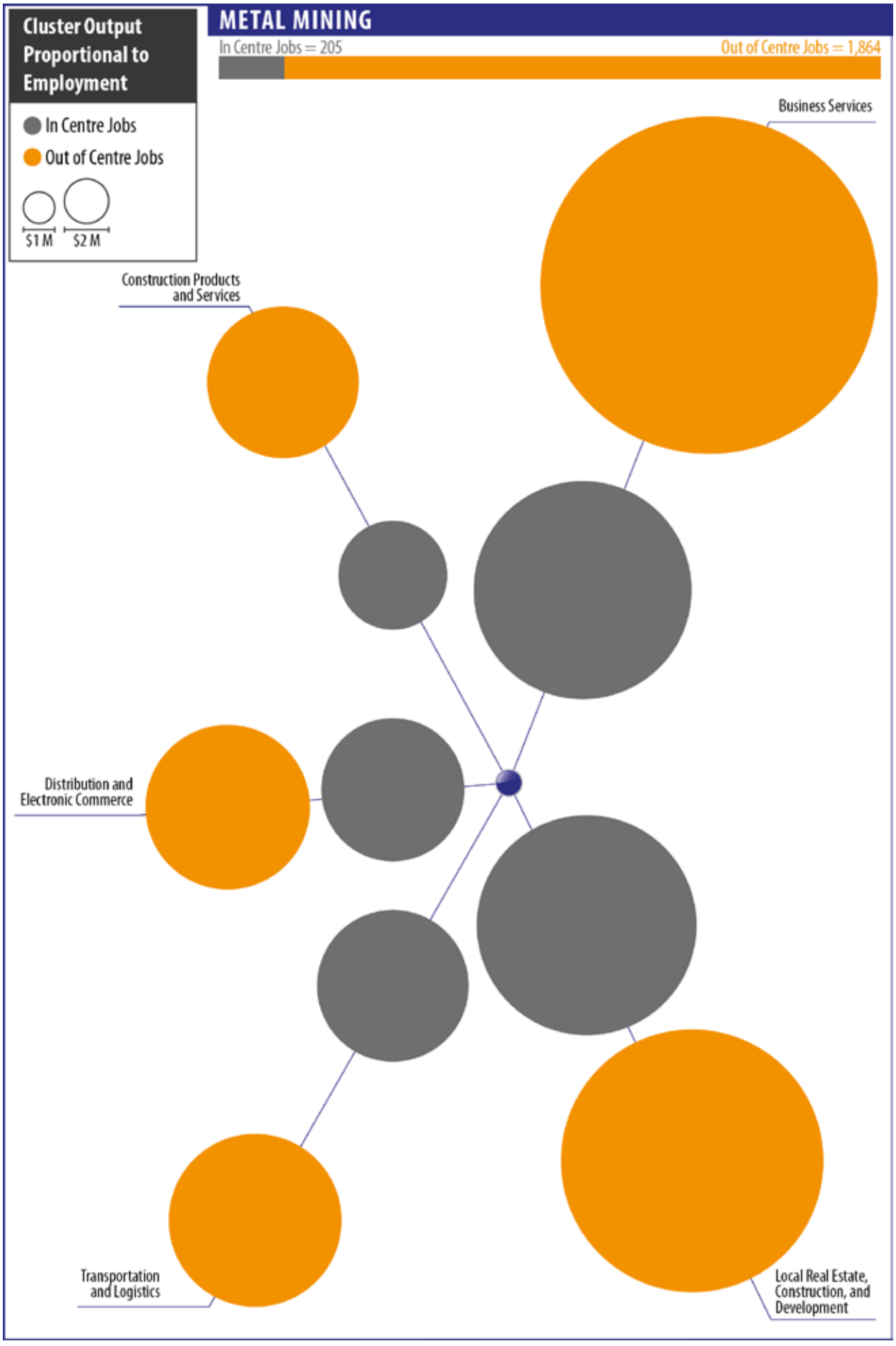
The total output multipliers provide the estimated potential dollar increase in output from all industries in the region's economy per dollar of increased output in the relevant industry. The majority of the top industries generate indirect and induced output greater than 50% of the direct increase in their output (e.g. for a $1.00 increase in Mining there would be an extra $0.56 of output generated in all other industries). The employment multiplier indicates the additional quantum of employment supported per direct job generated through direct output in the industry (e.g. for every 10 jobs created in the Forestry industry there are approximately 17 additional jobs created in other industries). This demonstrates the ability of Traded clusters to generate greater employment in the broader economy noting that the ability to directly influence or support particular clusters must also be considered.

These multipliers are useful for the high level comparison of industry clusters and represent the potential impact of growth in a particular cluster that may be achieved given the current status-quo i.e. current industry and employment mix. Particular initiatives may significantly alter the status quo in a range of industries and this must be considered when using these results.

7.1.2 Supply Chain Networks

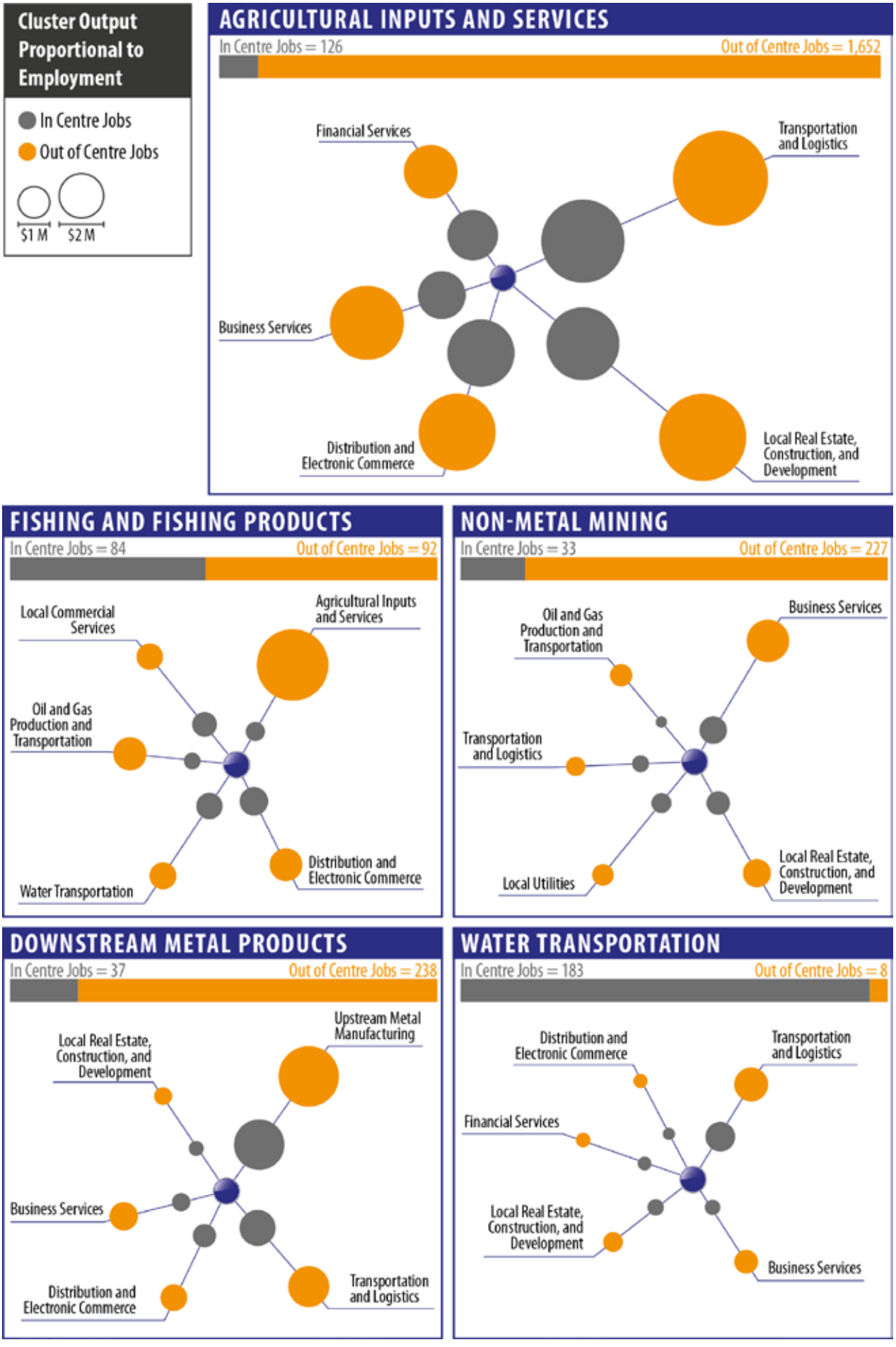
The figures below display the top five inputs for each of the Regionally Significant clusters and provide an understanding of the clusters that are likely to be most impacted by growth in these identified clusters. In-centre and out-of-centre cluster scales are provided in order to support the development of cluster network based initiatives. Here out-of-centre employment refers to employment within the region but outside of Geraldton, this may either be widely distributed employment or employment within other regional centres Where a cluster displays a strong connection to another cluster based largely outside of the centre further investigation into these connections is warranted. This is supported by the subsequent analysis of workforce linkages.

Figure 65. Geraldton Supply Chain network for Regionally Significance clusters



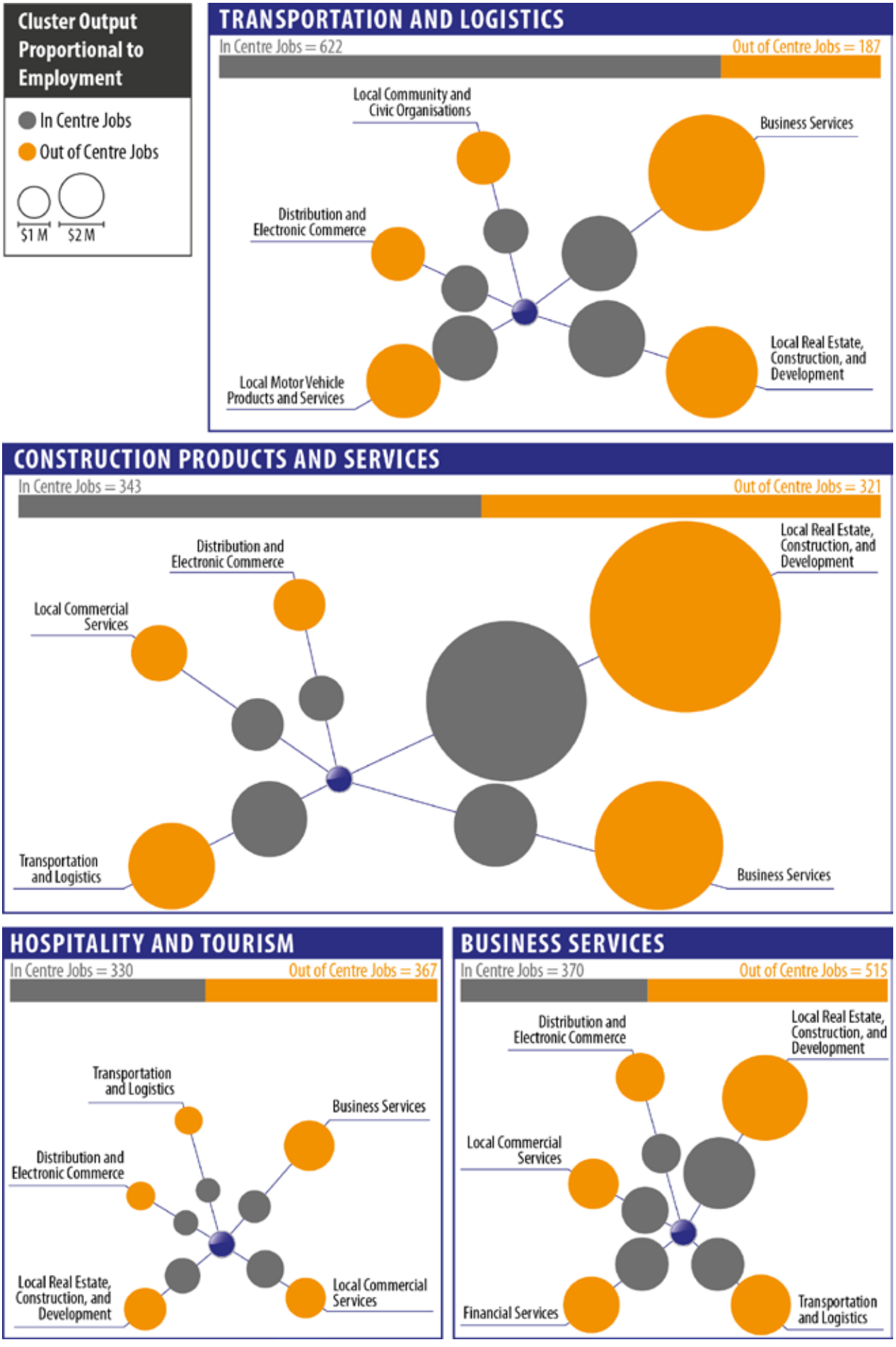
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 65. Geraldton Supply Chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 65. Geraldton Supply Chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

7.1.3 Workforce Linkages

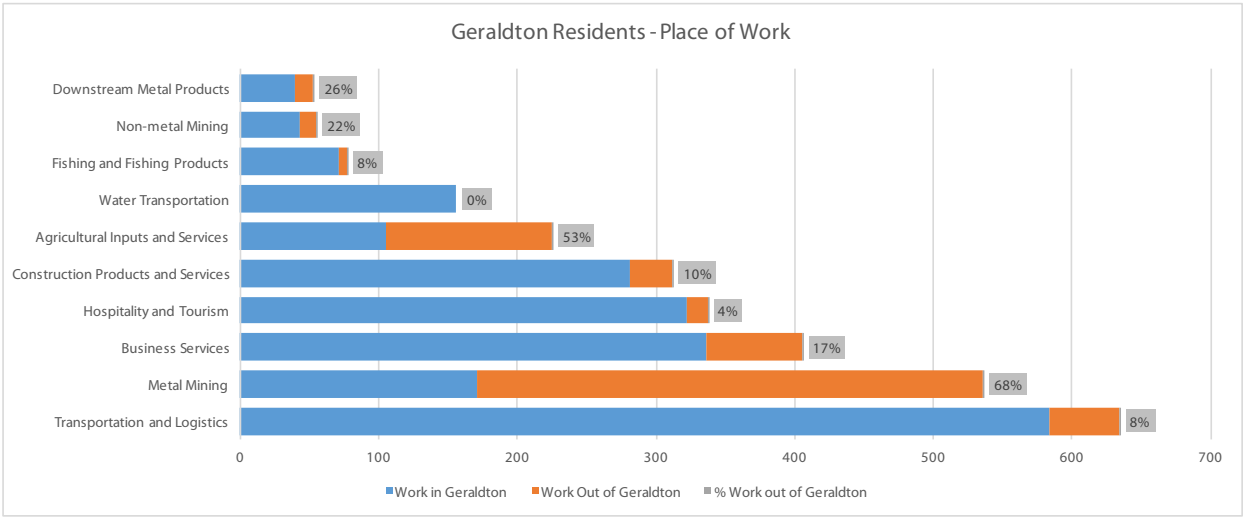
Workforce linkages have been investigated in order to establish the presence of major out-of-centre employers of centre based residents. This information provides alternative opportunities for building on existing workforce connections that extend beyond the centre. In such cases the development of regionally based clusters is likely to have a significant impact on centre based population and income. Figure 66 provides both the scale of resident employment by industry and the proportion of these residents working beyond the centre.

This data shows that, with the exception of Agricultural Inputs and Services and Metal Mining (being regional land based clusters), Geraldton residents are largely employed within the centre itself.

7.2 POTENTIAL DRIVERS FOR FUTURE GROWTH

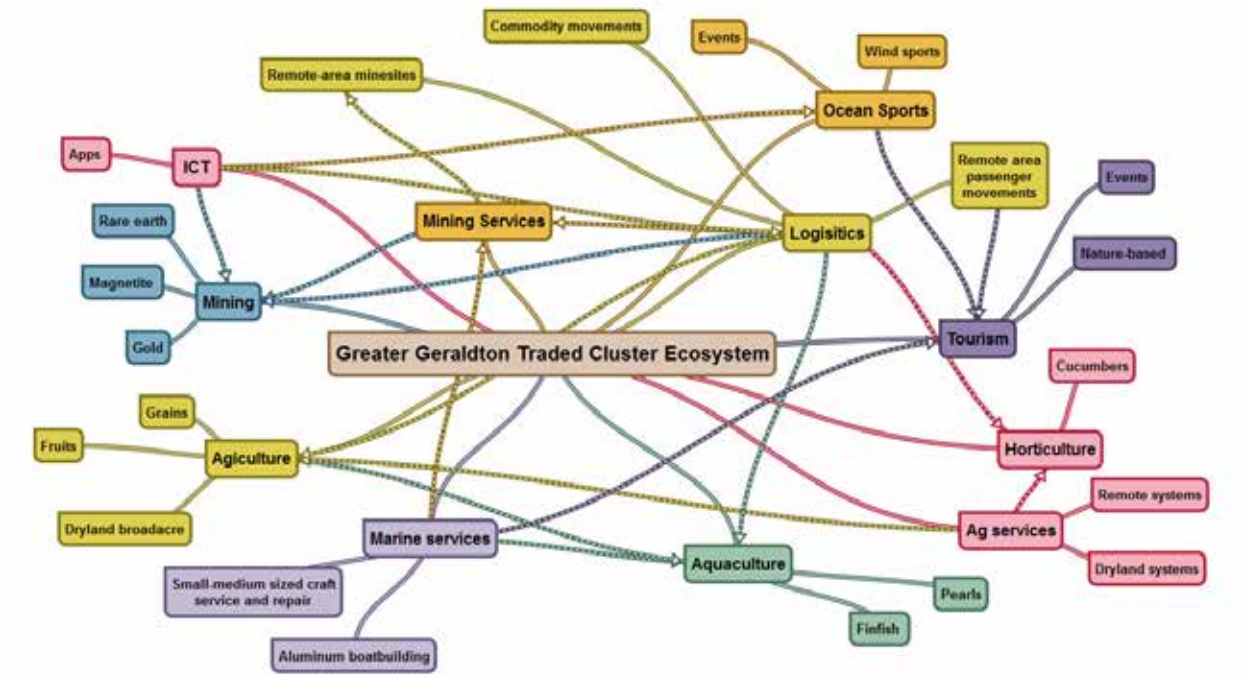
Based upon the analysis and consultation conducted within the Regional Cluster analysis, a number of potential future drivers for growth for the Geraldton Regional Centre have been identified. This was realised through a round of consultation with individual cluster groups representing mining services, horticulture and wind tourism. These cluster definitions represent a necessary departure from the analytical cluster definition system to the formation of 'on-the-ground' clusters defined at a (more detailed) level relevant to the specialisations of the centre and region. They form potential sub-categories of the Metal Mining and Non-Metal Mining, Agricultural Inputs and Services, and Hospitality and Tourism clusters identified within the Phase 3 report. As a result of this consultation an indicative potential cluster ecosystem for Geraldton was envisaged, with key initial clusters and activities identified to drive initial change.

Figure 66. Proportion of Geraldton residents working outside of the centre (for Regionally Significant clusters)



Source: Pracsys 2016, ABS Census 2011

Figure 67. Potential Geraldton cluster ecosystem



Source: Pracsys (2016)

Drivers that represent opportunities to deliver initial growth within this ecosystem include:

- Increased market scale for food production and processing activities
- Increased market scale for marine services activities
- Increased export throughput and value add for greater Mid-West, Wheatbelt and Gascoyne exports
- Increased attraction to major tourism assets (Abrolhos and wind)

These initiatives broadly reflect growth in a range of the major Traded activities where an existing centre specialisation has been shown to exist or where connections to regionally significant clusters can be strengthened (Figure 68).

Figure 68. Geraldton Traded cluster output, concentration and specialisation

Regionally Significant Traded Clusters	Regional Output ($m)	Geraldton ECF	Centre Specialisation
Metal Mining	4,435	0.41	N
Agricultural Inputs and Services	551	0.39	N
Construction Products and Services	467	0.86	N
Transportation and Logistics	462	1.73	Y
Business Services	441	0.41	N
Downstream Metal Products	169	0.41	N
Hospitality and Tourism	143	0.99	Marginal
Fishing and Fishing Products	121	8.50	Y
Water Transportation	63	2.29	Y

*Indicates state significance (otherwise of regional significance only)

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

7.2.1 Increased Market Scale for Food Production and Processing Activities

The Mid West region has long been associated with food products such as seafood and grains. Geraldton's role in these traditional food activities has been reinforced by its Port. The Geraldton Fisherman's Cooperative oversees the capture and export of approximately 60% of the State's annual 6,000 tonnes of produce. The Western Rock Lobster fishery, along with the fishing boat harbour, is home to 156 commercial pens, lifting facilities, and a wharf for commercial fishing operators. In addition to substantial aquatic exports, the port's bulk grain facilities exported 1,746 million tonnes of grain (wheat, barley lupins and canola) in 2014-15, representing a substantial contribution to the local economy.

In recent times Geraldton's food production role has expanded with a vibrant horticulture precinct developing east of Geraldton. The most recent high profile investment into this emerging cluster has been a $2.85m project by 4 Ways Fresh focusing on cucumber production.

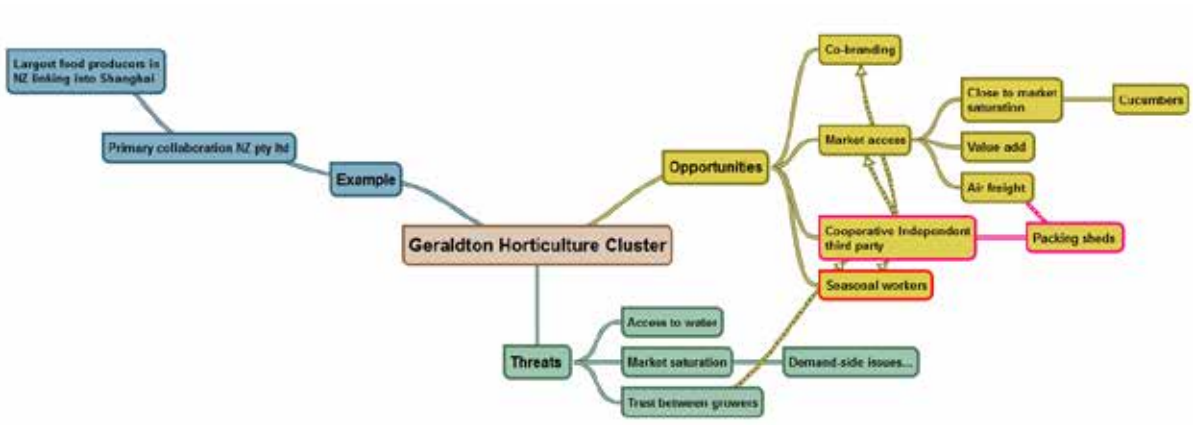
All of this activity forms a significant driver opportunity for growth in Geraldton's food exports which builds on an established brand of high-quality produce. Drivers for development of this opportunity would likely be market-side, with cluster consultations identifying significant potential for expansion of export markets for specific, targeted produce.

The potential opportunities and constraints identified during the workshop with horticulture stakeholders are outlined in Figure 69.

7.2.2 Increased Market Scale for Marine Services Activities

Geraldton's history as a fishing community has, over time, led to the development of a significant marine services cluster of activities. This cluster is concentrated in Geraldton Port, with both Geraldton Fisherman's Coop and Geraldton Boat Lifters able to provide the

Figure 69. Opportunities and Constraints Identified by Geraldton Horticulture Stakeholders



Source: Pracsys (2016)

substantial infrastructure required to service small to medium sized fleets of commercial vessels. In addition, Geraldton has a significant history of boat fabrication, with at least five manufacturers producing and exporting commercial and pleasure craft from the centre.

Feedback from industry suggests that this cluster has capacity for significant growth. There is an opportunity to absorb certain marine services from Fremantle port as its marine services infrastructure experiences substantial growth pressures, particularly when the proximity advantage to the north-west is considered. This would require that infrastructure for management of larger vessels be developed and expanded, allowing for servicing of oil and gas support vessels that are currently bypassing Geraldton for Perth. Feasibility studies would need to investigate the commercial viability of such a role.

7.2.3 Increased Export Throughput and Value-Add for Greater Mid-West, Wheatbelt and Gascoyne Exports

When considering the exports being produced in the Mid West, and in particular those flowing through the Geraldton Port, it is clear that there may be opportunities to develop value-adding activities as most exports are being processed to higher value products at their destination markets (Figure 70).

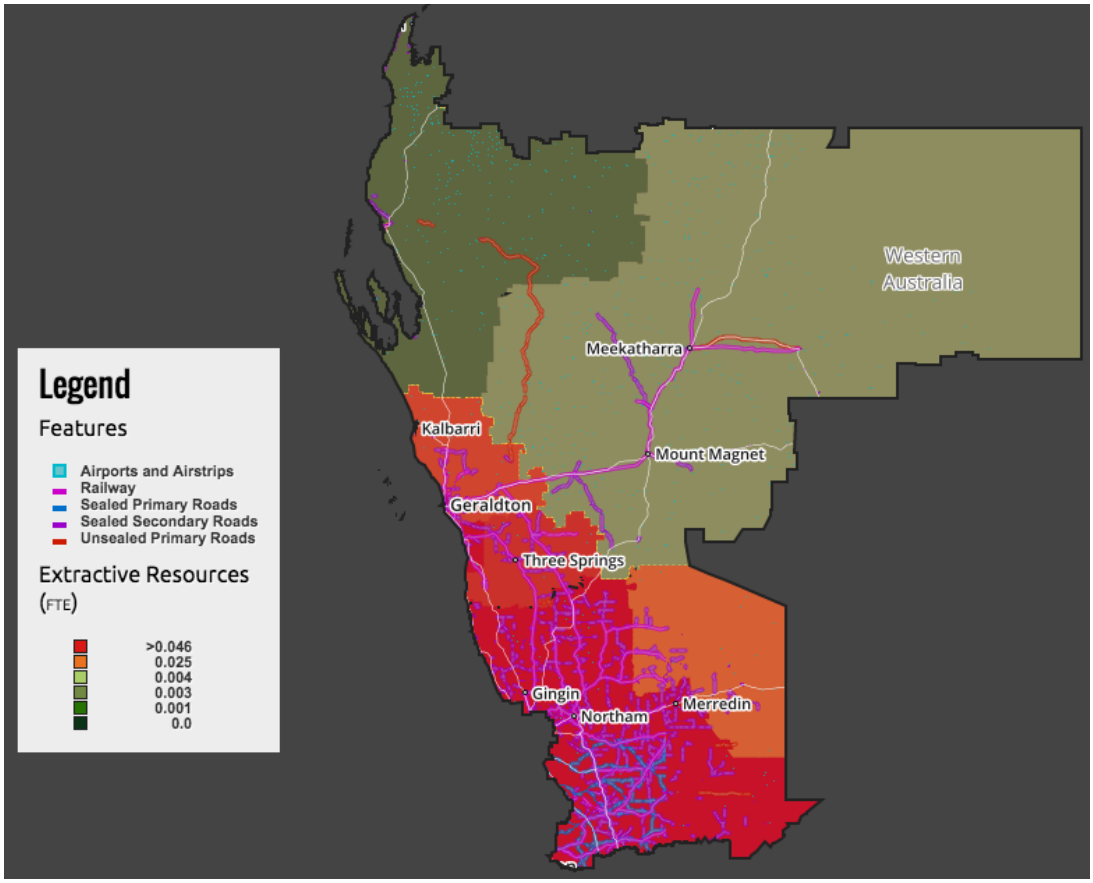
Figure 70. Geraldton Port export tonnages (March 2015-16)

Geraldton Port Export	Export Tonnes
Wheat	1 ,138,242
Lupins	84,553
Canola	103,461
Copper Cons/Ore 2	250,029
Zinc Cons/Ore/HPM	202,433
Mineral Sands	258,994
Bulk/Bagged Mineral Sands	206,638
Talc	65,695
Iron Ore	9,765,894
Soda Ash	18,319
Stockfeed	1,760
Livestock	8,075
Total	10,965,851

Source: Mid West Ports (2016)

This opportunity is particularly prevalent when considering potential export products from surrounding Regions such as the Wheatbelt and Gascoyne. Figure 71 shows the relative employment levels of extractive resource clusters (Metal Mining and Non-Metal Mining) and the supporting transport infrastructure in the regional development areas of the Wheatbelt, Gascoyne and Midwest.

Figure 71. Transport infrastructure



Source: ALCES (2016)

As shown, there are major transportation linkages from all three regional development areas leading into the Midwest. This illustrates the current use of Geraldton in servicing export needs for surrounding areas and regions. As with Section 7.2.1, the immediate driver for growth in the space is likely to be expansion and diversification of food products across multiple regions including cluster-related activities, such as:

- Gascoyne food bowl development
- Dryland and rangelands product diversification
- Raising of discretionary import safeguard triggers and removal of tariffs for proteins as a result of free trade agreements
- Mid West horticultural expansion
- Analysis on alternative types of agricultural production including new technology and growing techniques
- Analysis of market demand for different produce

The identification of differentiated products and markets where exports can be developed to meet specific needs rather than being added to international bulk commodity pools will be key for the development of value adding initiatives.

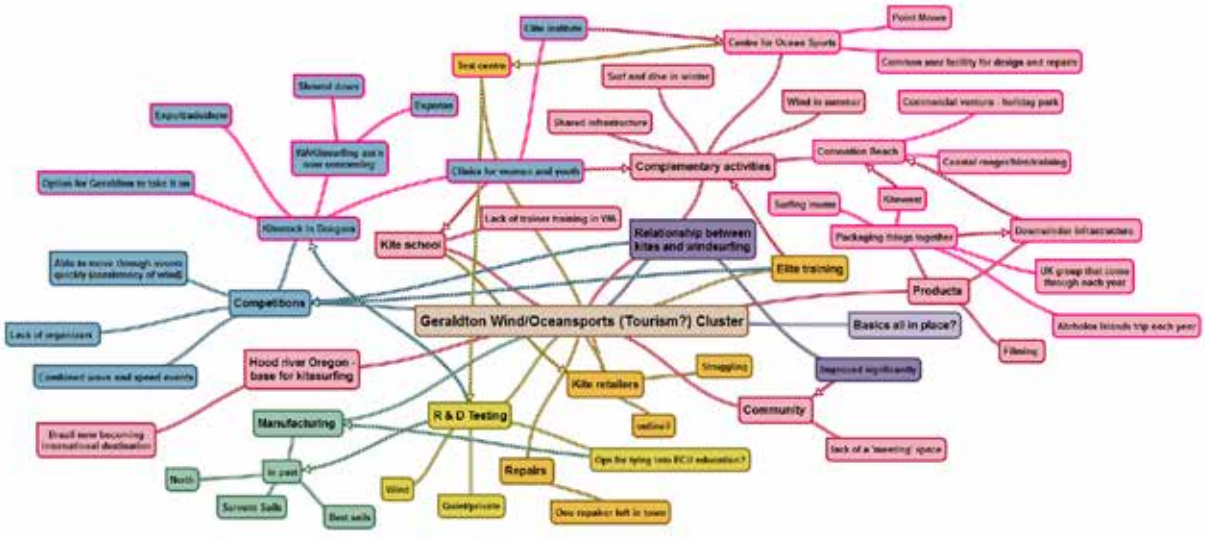
7.2.4 Increased Demand for Major Tourism Assets

Geraldton has some major tourism assets that may drive future cluster growth, if the capacity of the region to respond to such growth is developed. Industry consultation in particular focused on the potential of wind tourism, with kitesurfing developing into a major international tourism sport. Geraldton has long been recognised as a major destination for wind sports – with significant competition events being held in and around Geraldton since the 1980s. Feedback suggested that drivers in this space were likely to be largely endogenous (internal to Geraldton), with the wind resource being leveraged by local entrepreneurs as the basis for a sustained advantage for their firms. Importantly, feedback strongly suggested that scale would be critical for this driver to be leveraged. Solo operators are likely to have little impact as the overall value proposition for wind tourists is unlikely to change dramatically. Instead this will require a collective effort by a number of parties who work, effectively, as a cluster to build the overall value proposition of the region for this market. That is to say that it may require substantial marketing efforts as well as concerted efforts to develop and promote high quality events that would increase Geraldton's standing as a destination.

The opportunities and constraints identified by key stakeholders associated with wind tourism is outlined in Figure 72.

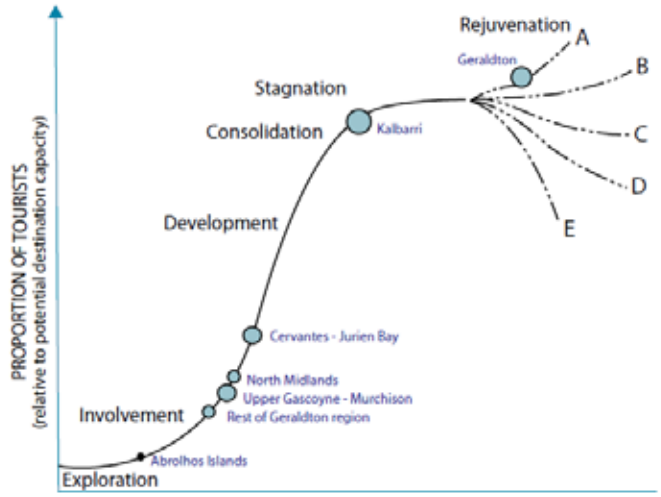
Another potential driver for investment and growth within the Hospitality and Tourism cluster in Geraldton is the development of the Abrolhos islands as a tourism destination. This was identified within the Mid West Development Commission's Tourism Strategy (2016) as a key tourism opportunity with a focus on maritime history and nature-based experiences. The potential tourism destination was marked as being in its early-stages (Figure 72); however, with a coordinated effort, it is believed to be a significant opportunity given the scale of aligned infrastructure and activities presently available to sustainably develop the asset.

Figure 72. Geraldton Windsports Tourism Opportunities and Constraints



Source: Pracsys (2016)

Figure 73. Lifecycle of Mid West Tourism Assets



Source: Mid West Development Commission Tourism Strategy (2014)

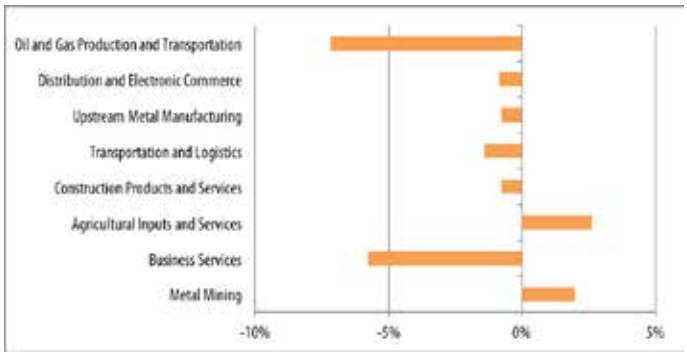
7.3 CAPACITY TO ACCOMMODATE FUTURE GROWTH

7.3.1 Trade and Local Input Clusters

A potential capacity constraint to the Mid West is the performance of the key support clusters that potentially provide capacity to effectively and efficiently respond to economic development opportunities. In particular, modelling suggests that a range of Traded clusters, including Business Services and Transportation and Logistics, and Local clusters, such as Local Real Estate, Construction and Development, appear to be underperforming in regards to output when compared to state averages (Figure 73 and Figure 74).

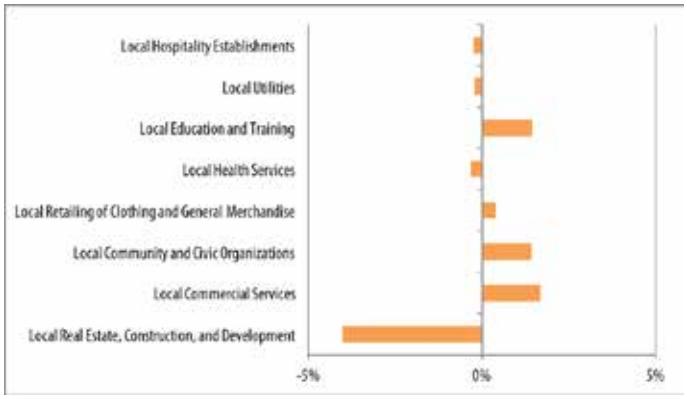
The implications of this are two-fold. It may limit the region's competitiveness if the capacity for renewal and efficient movement of goods are limited by a lack of activities in these clusters. It may also represent a significant leakage of these services to other regions. This may mean that opportunities are being missed by local industry to meet a need, and that the community is missing out on employment opportunities.

Figure 74. Main traded cluster contribution in the Mid West region minus State-wide cluster contribution



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 75. Local cluster contribution in the Mid West region minus statewide cluster contribution



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

7.3.2 Leveraging Natural Capital

The natural capital base of Geraldton is the primary source of its historic growth and development. As discussed in Section 7.2, assets like wind and the Abrolhos may

be leveraged to take advantage of market demands. Likewise, the climate of Greater Geraldton (high hours of sunshine with low risk of cyclones) represents a significant opportunity around which horticulture cluster activities can be expanded.

7.3.3 Population Scale and Stability

The relative stability of the Geraldton population (42% turnover rate) represents an opportunity to build a pool of cluster-specific labour focused on the needs of the existing and future Mid West traded economy. This labour capacity would likely build upon existing regional Traded activities and could especially take advantage of low/unskilled labour that can still be trained to meet specific industry niches. Industry consultation suggested that this advantage was already being leveraged by a niche (sub) cluster of mining services activities focusing on remote area minesite relining.

7.3.4 Technological Capacity

The Square Kilometre Array project located within the Murchison, has meant that Geraldton has access to significant technological capacity that is yet unavailable to other Regions. In particular, Geraldton's NBN infrastructure represents capacity that is can be leveraged through opportunities across all existing and emerging clusters. While internet speed is unlikely to represent a driver for investment and cluster growth in its own right, access means that a very significant barrier to growth is addressed.

7.4 OPPORTUNITY CASE STUDY

Based on the analysis conducted it was possible to construct a case study examining the combined effect of cluster growth. All Growth Centre lead consultants were requested to provide a limited number of potential growth clusters for this purpose. Through consultation, the case study agreed upon for Geraldton was the development of food related clusters. This approach represents a broad cluster based initiative rather than a specific project. Under the analytical system used the related clusters are:

- Agricultural Inputs and Services
- Fishing and Fishing Products
- Water Transportation

As identified in the Phase 3 report, Agricultural Inputs and Services) and Fishing and Fishing Products are both significant clusters for the Mid West region with fisheries being an important area of specialisation for the centre.

The analysis estimated the direct impact of a 10% increase in total output for each of these chosen clusters and the indirect and induced impact on the rest of the regional economy. Reviewing the distribution of employment and output (in Figure 65) for these clusters indicates that Agricultural Inputs and Services is likely to have largely regional effect, while Fishing and Fishing Products and Water Transportation are likely to have a mixed regional level and centre level impact. This balance will ultimately be influenced by the nature and location of the projects chosen within this initiative.

Agriculture Inputs and Services – Geraldton

In the Regional Centre of Geraldton, Agriculture Inputs and Services has an estimated total output of $34m, employing approximately 126 persons. The results presented in this report also show that:

- The cluster is an area of specialisation of the region but not the centre (due to the nature of the cluster), with ECFs of 3.29 and 0.39 respectively
- Geraldton holds a low portion of regional employment, accounting for 7% of employment within this cluster
- A large number of Geraldton residents employed in the cluster work outside of the centre, with 53% out-of-centre employment, showing that the centre is connected to this largely regional cluster by workforce (rather than place of employment)
- Major clusters linked by supply chain include Transportation and Logistics, Local Real Estate Construction and Development, Distribution and Electronic Commerce, Business Services, and Financial Services

Level of Impact

The impact of a 10% increase in the cluster was assessed for Geraldton. The analysis used the Mid West total output and employment multipliers of 1.57 and 1.52. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $3m in the total output of the Agriculture Inputs and Services within the centre, equating to 13 additional jobs. Using the multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster. The contribution of Geraldton to the total output of the Mid West economy is estimated at $5m, with a total increase of 19 employment opportunities.

Figure 76. Agriculture Inputs and Services impact - Geraldton

Geraldton Agriculture Inputs and Services	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$3m	$2m	$5m
GVA ($)	$2m	$1m	$3m
Employment	13	6	19

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes the (hypothetical) regional level results are presented below. This cluster has the potential to have a wider regional impact depending on the nature of the potential projects.

Figure 77. Agriculture Inputs and Services impact – Mid West

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$47m	$27m	$74m
GVA ($)	$21m	$14m	$35m
Exports ($)	$33m	-	$33m
Employment	180	90	270

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Agriculture Inputs and Services cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

Figure 78. Input clusters to Agriculture Inputs and Services direct impact – Geraldton

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked Clusters were further examined and the approximate indirect and induced impact on their output was calculated (Figure 79). Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 79. Input clusters to Local Hospitality Establishments indirect impact – Geraldton

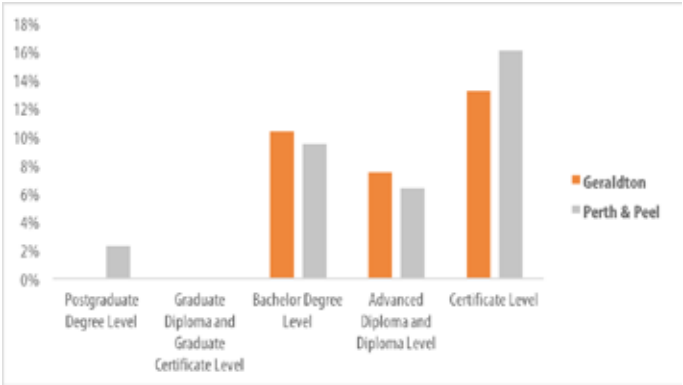
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These results confirm that Transportation and Logistics is an important supporting cluster for Agriculture Inputs and Services as the nature of the cluster results in the need to move bulk produce and goods

Workforce Considerations

The average salary for the cluster, in the centre, is $33,000, slightly lower than the regional average. The education level for this cluster in Geraldton comparable to Perth and Peel with the exception of those with postgraduate level education. Total percentage of personnel with formal education or training is 31% in Geraldton compared to 33% in Perth and Peel.

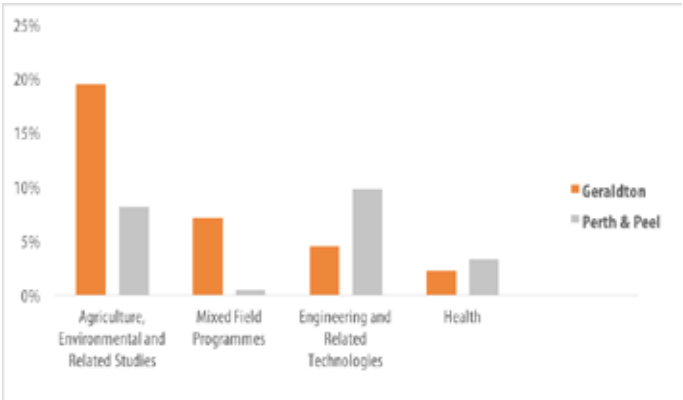
Figure 80. Agriculture Inputs and Services level of education - Geraldton



Source: Pracsys 2016, ABS Census 2011

Comparing the top five fields of study, Geraldton displays high levels of education in Agriculture, Environmental and Related Studies as may be expected.

Figure 81. Agriculture Inputs and Services field of education – Geraldton



Source: Pracsys 2016, ABS Census 2011

Fishing and Fishing Products – Geraldton

In the Regional Centre of Geraldton, Fishing and Fishing Products has an estimated total output of $48m, employing approximately 84 persons according to the ABS. The results presented in this report also show that:

- The cluster is a strong area of specialisation of the region and the centre, with ECFs of 9.14 and 8.50 respectively
- Geraldton holds a reasonable portion of regional employment, accounting for 48% of employment within this cluster
- Very few Geraldton residents employed in the cluster work outside of the centre, with 8% out-of-centre employment, showing that the centre is connected to this largely regional cluster by workforce (rather than place of employment)
- Major clusters linked by supply chain include Agricultural Inputs and Services, Distribution and Electronic Commerce, Water Transportation, Oil and Gas Production and Transportation and Local Commercial Services

Level of Impact

The impact of a 10% increase in the cluster was assessed for Geraldton. The analysis used the Mid West total output and employment multipliers of 1.44 and 1.50. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $5 m in the total output of the Fishing and Fishing Products cluster, equating to 8 additional jobs. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster's presence in Geraldton The contribution of Geraldton to the total output of the Mid West economy is estimated at $7m, with an increase of 15 employment opportunities.

Figure 82. Fishing and Fishing Products impact - Geraldton

Geraldton Fishing and Fishing Products	Direct	Indirect and Induced	Total
Output ($)	$5m	$2m	$7m
GVA ($)	$3m	$1m	$4m
Employment	8	7	15

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes the (hypothetical) regional level results are presented below. As this cluster is largely centre based a regional level impact may be considered to be less likely depending on the nature of the potential projects.

Figure 83. Fishing and Fishing Products impact – Mid West

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$10m	$4m	$14m
GVA ($)	$5m	$2m	$7m
Exports ($)	$9m	-	$9m
Employment	18	14	32

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

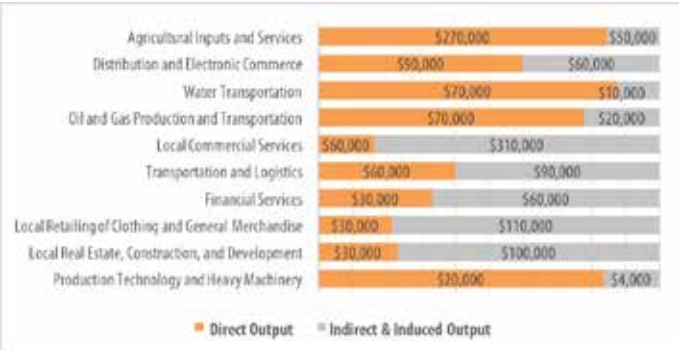
The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Fishing and Fishing Products cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

Figure 84. Input clusters to Fishing and Fishing Products direct impact – Geraldton

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked Clusters were further examined and the approximate indirect and induced impact on their output was calculated. Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 85. Input clusters to Fishing and Fishing Products indirect impact – Geraldton



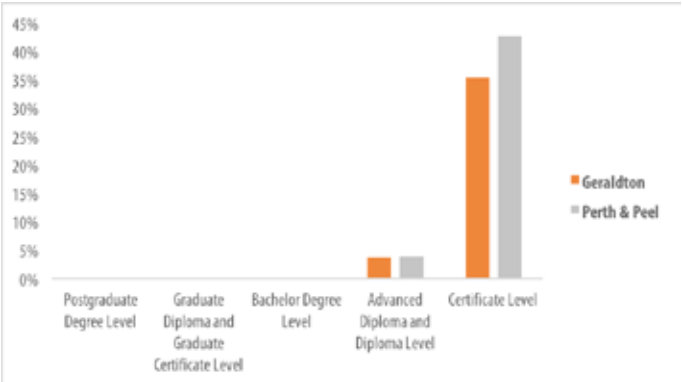
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Of the directly linked clusters Agricultural Inputs and Services has the largest degree of connection based on the level of input provided to Fishing and Fishing Products cluster

Workforce Considerations

The average salary for the cluster, in the centre, is $70,000, slightly higher than the Mid West average. Higher levels of education are not a significant pre-requisite for activity in this cluster, more-so for Geraldton.

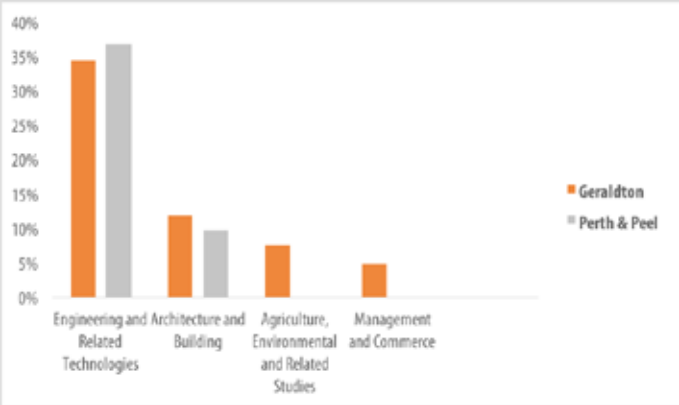
Figure 86. Fishing and Fishing Products level of education – Geraldton



Source: Pracsys 2016, ABS Census 2011

The top fields of study for the cluster were the similar for Geraldton and the Mid West region with a notable higher proportion of Management and Commerce backgrounds. When compared to Perth and Peel both Agriculture, Environmental and Related Studies and Management and Commerce fields had a higher representation in the centre (Figure 87).

Figure 87. Fishing and Fishing Products field of education – Geraldton



Source: Pracsys 2016, ABS Census 2011

Water Transportation – Geraldton

In the Regional Centre of Geraldton, Water Transportation has an estimated total output of $25m, employing approximately 183 persons according to the ABS. The results presented in this report also show that:

- The cluster is an area of specialisation of the region and the centre, with ECFs of 2.29 and 2.01 respectively
- Geraldton holds a very high portion of regional employment, accounting for 96% of employment within this cluster
- Very few Geraldton residents employed in the cluster work outside of the centre, with 0% out-of-centre employment, showing that the centre is connected to this largely regional cluster by workforce (rather than place of employment)
- Major clusters linked by supply chain include Transportation and Local Commercial Services, Business Services, Local Real Estate, Construction and Development, Financial Services, and Distribution and Electronic Commerce

Level of Impact

The impact of a 10% increase in the cluster was assessed for Geraldton. The analysis used the Mid West total output and employment multipliers for the cluster of 1.76 and 2.11. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $3m in the total output of the Water Transportation cluster, equating to 18 additional jobs. Using the multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster's presence in Geraldton. The potential contribution of Geraldton to the total output of the Mid West economy is estimated at $4m, with a total increase of 24 employment opportunities.

Figure 88. Water Transportation impact - Geraldton

Geraldton Water Transportation	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$3m	$2m	$5m
GVA ($)	$ 1m	$1m	$2m
Employment	18	6	24

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes the (hypothetical) regional level results are presented below. As this cluster is largely centre based a regional level impact may be considered to be less likely depending on the nature of the potential projects.

Figure 89. Water Transportation impact – Mid West

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$3m	$2m	$5m
GVA ($)	$1m	$1m	$2m
Exports ($)	$20,000	-	$20,000
Employment	19	7	26

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Water Transportation cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

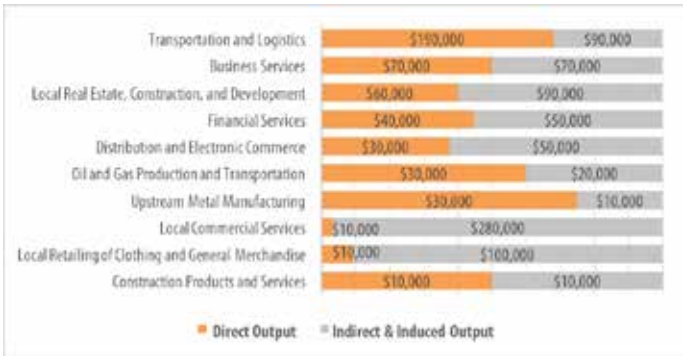
Figure 90. Input clusters to Water Transportation direct impact – Geraldton

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated. Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Of the directly linked clusters Transportation and Logistics has the largest degree of connection based on the level of input provided to the Water Transportation cluster.

Figure 91. Inout clusters to Water Transportation indirect impact – Geraldton

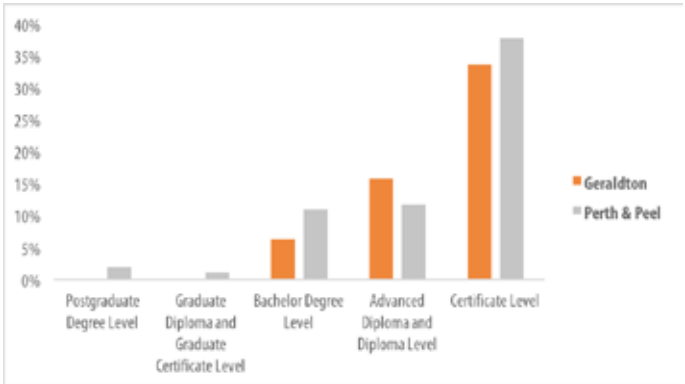


Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Workforce Considerations

The average salary for the cluster, in the centre, is $78,000, approximately the same as the Mid West average. Similar to the other regions and Perth and Peel, this cluster relies more heavily on formal education and training. Geraldton itself has slightly lower levels of education within this cluster with 56% of personnel holding certificate level education or higher compared to 64% for Perth and Peel.

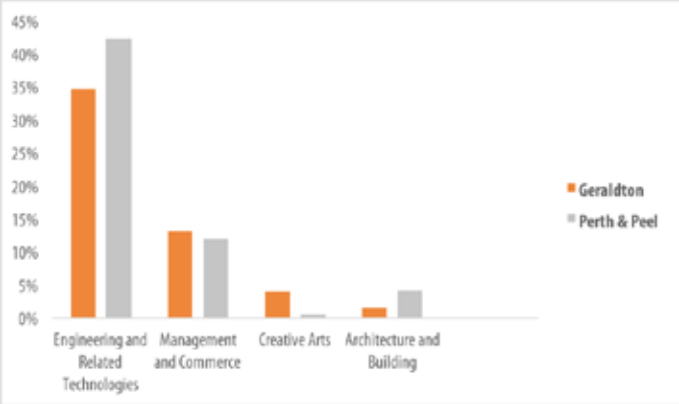
Figure 92. Water Transportation education level - Geraldton



Source: Pracsys 2016, ABS Census 2011

Considering the top fields of study for this cluster, proportions are comparable to those in Perth and Peel.

Figure 93. Water Transportation field of study – Geraldton



Source: Pracsys 2016, ABS Census 2011

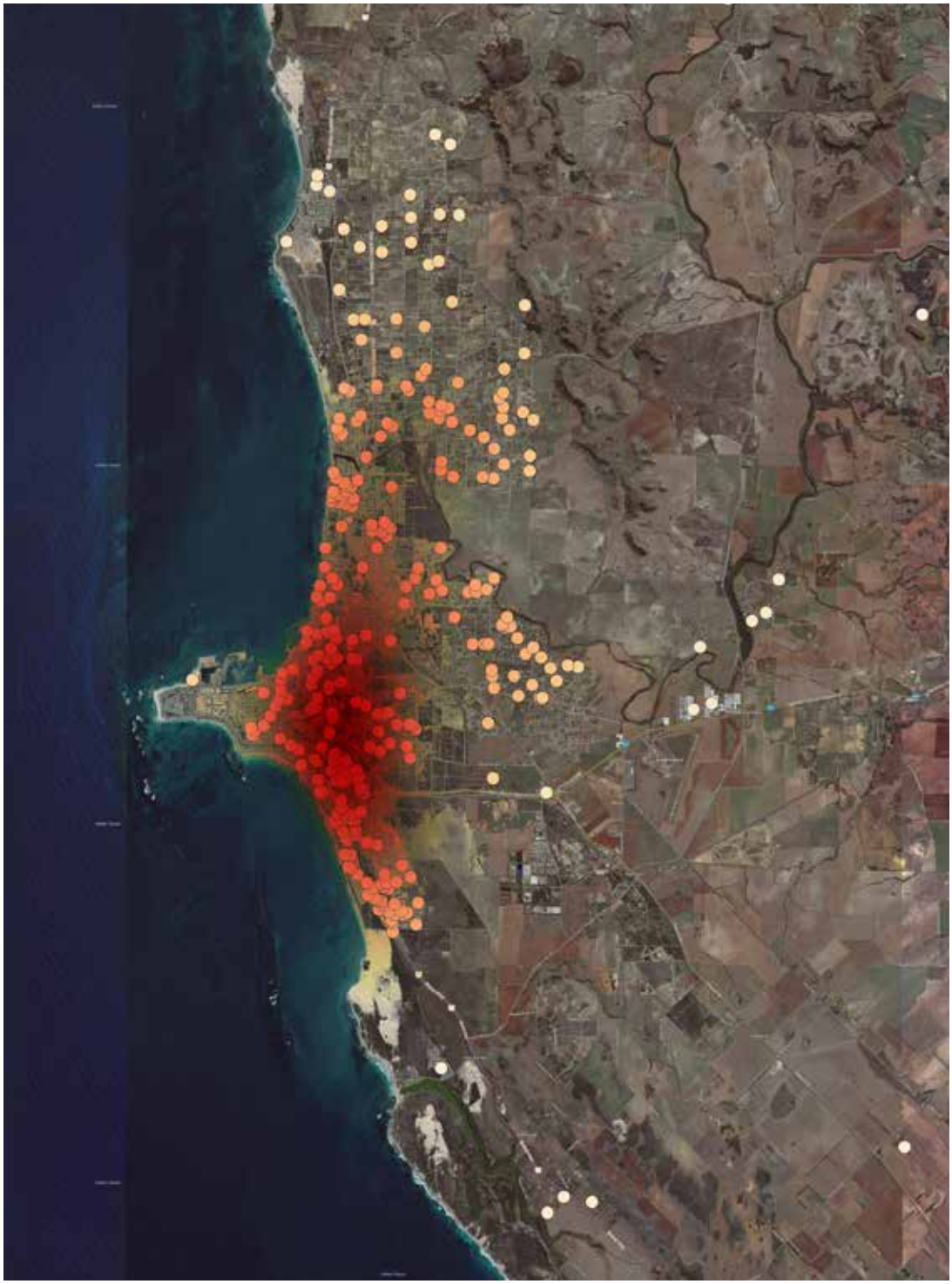
7.4.1 Results in Context

Cluster Business Concentrations

ABR data has been interrogated to provide concentrations of businesses in each centre and surrounds. This data provides registered business locations by ANZSIC 2 industry classification (however the data may not capture all businesses). Clear trends can be seen in groupings of businesses within each cluster indicating a level of natural agglomeration.

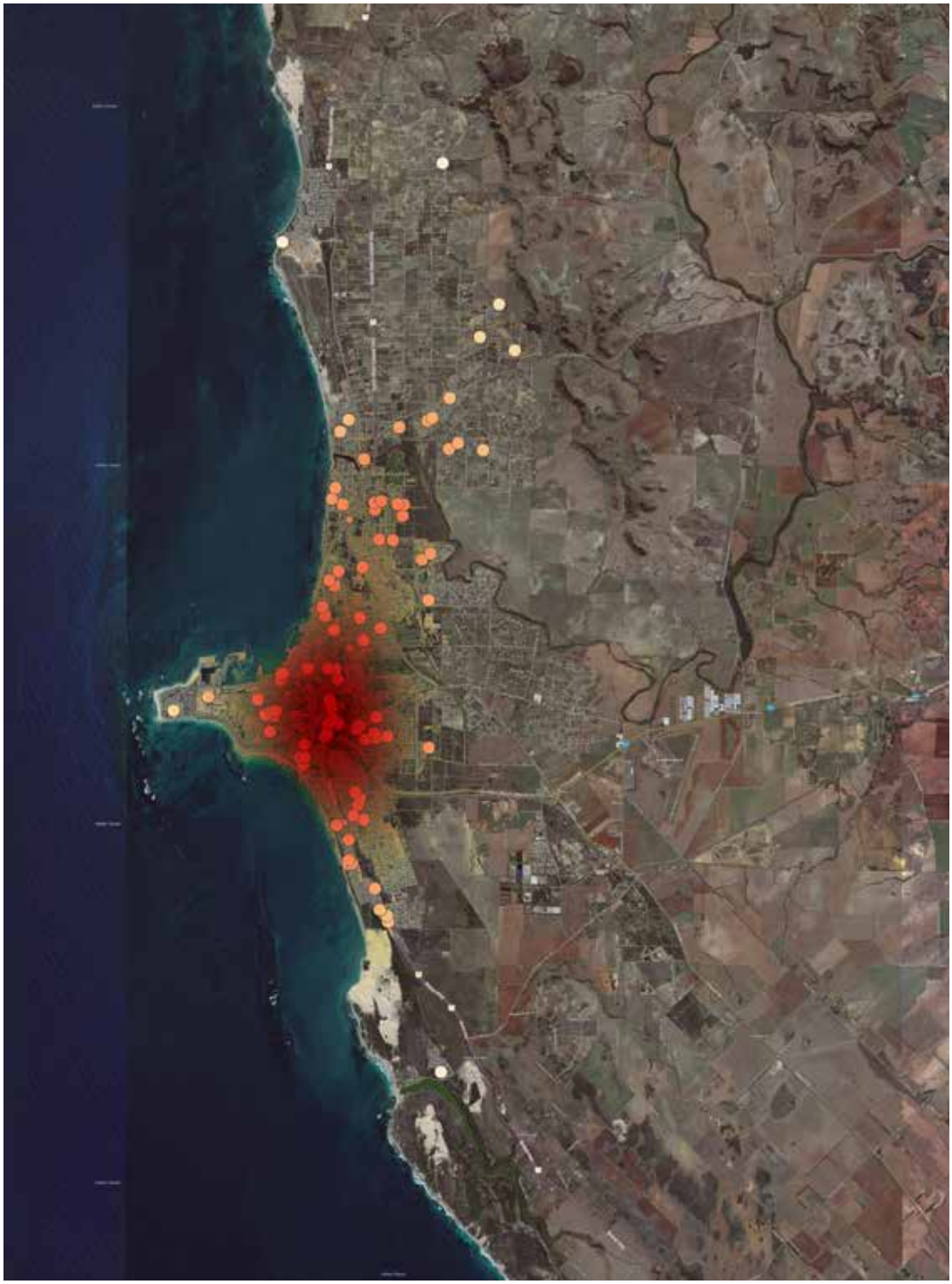
Considering the regional distribution of business within the selected clusters, the distributed (out-of-centre) effect of the inclusion of Agricultural Inputs and Services can clearly be seen. While specific projects were not considered for this case study an area for potential project development may lie broadly in creating increased agricultural and fisheries output or value add, logistics associated with bringing these products to market and in increasing the capacity of the port to cater to this increased level of activity.

Figure 94. Geraldton Agriculture Inputs and Services business locations



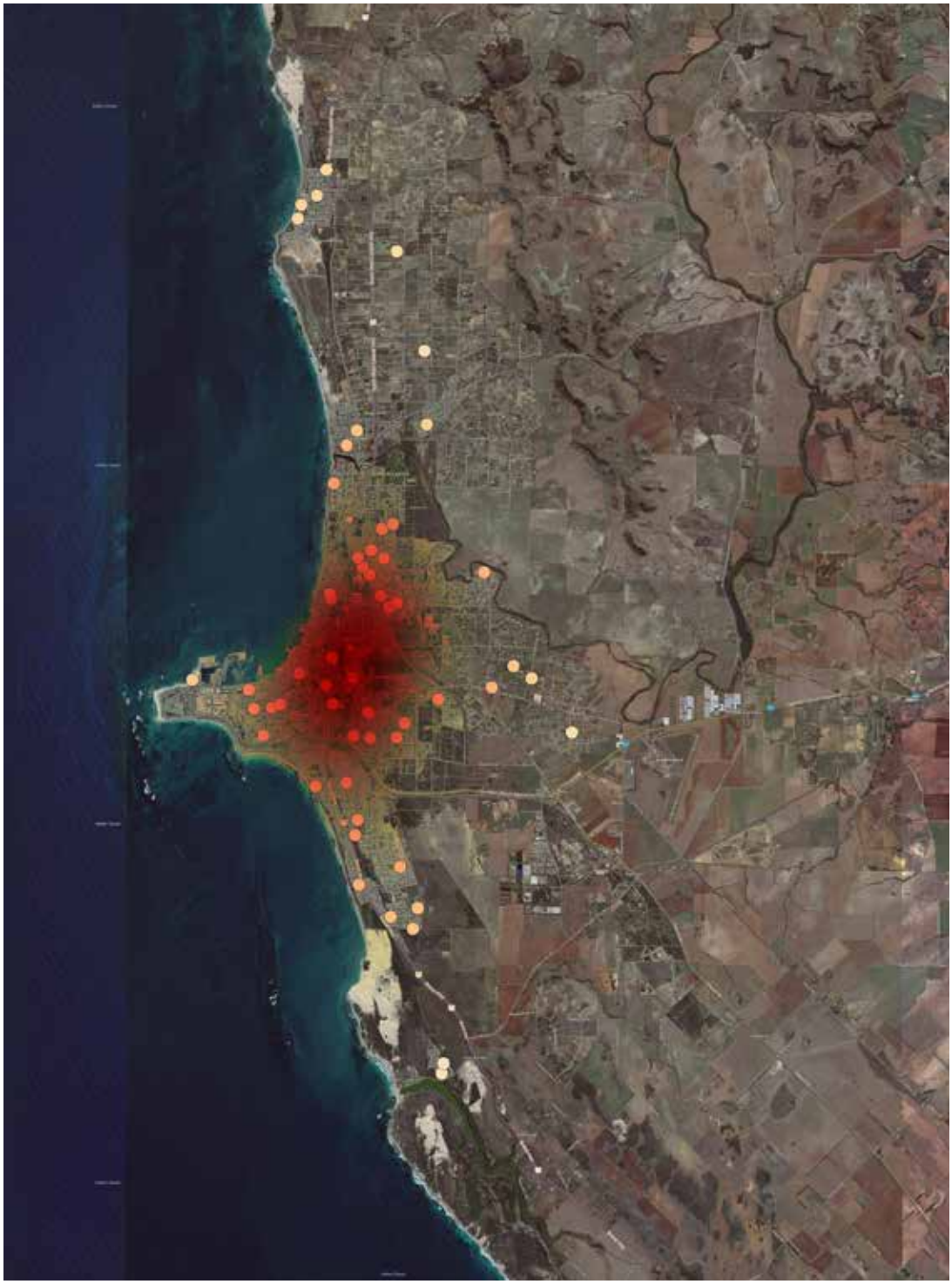
Source: Australian Business Register (2015)

Figure 95. Geraldton Fishing and Fishing Products business locations



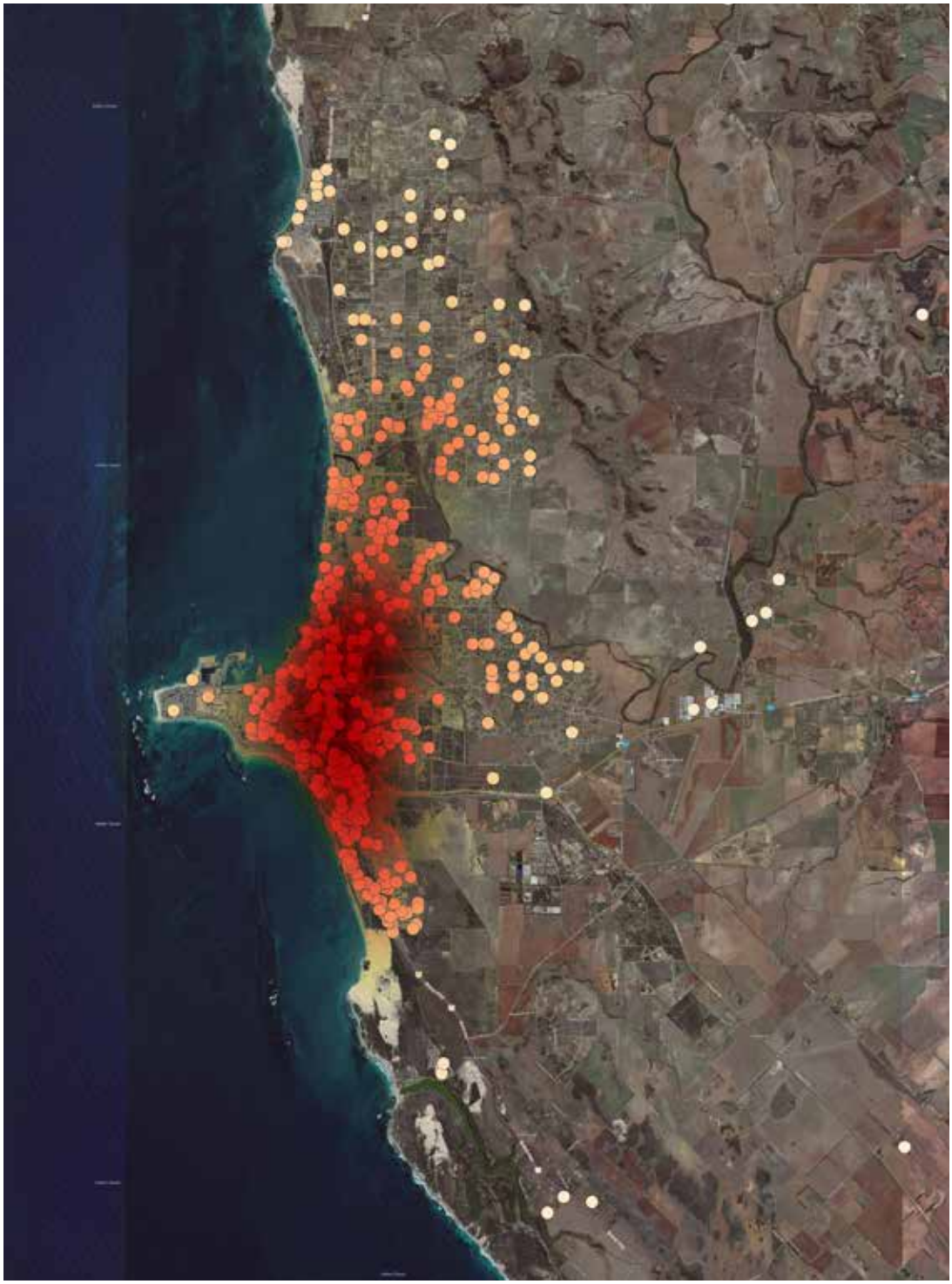
Source: Australian Business Register (2015)

Figure 96. Geraldton Water Transportation business locations



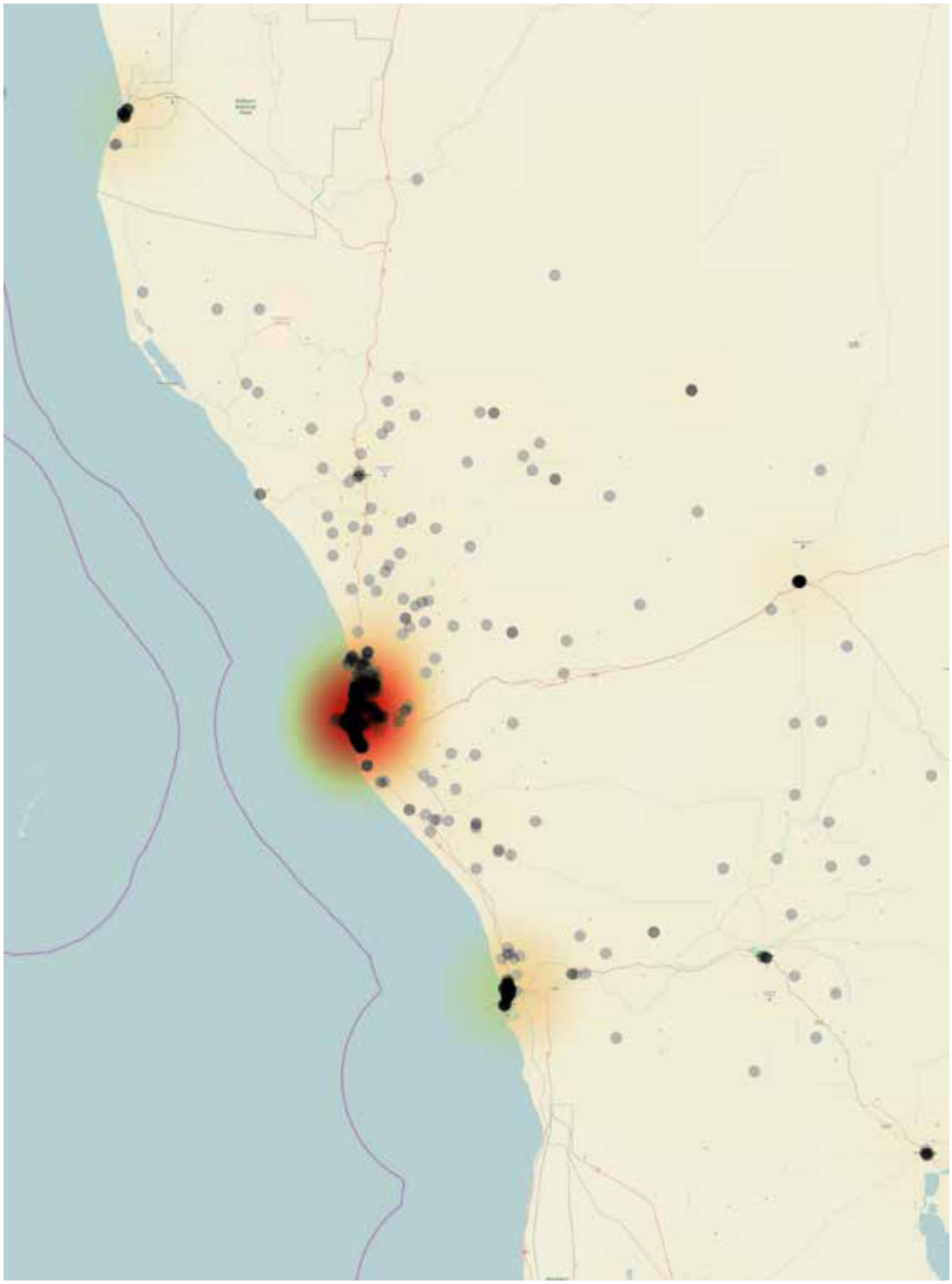
Source: Australian Business Register (2015)

Figure 97. Geraldton all case study business locations



Source: Australian Business Register (2015)

Figure 98. Geraldton and surrounds, all case study business locations



Source: Australian Business Register (2015)

Combined Employment and Output

The potential combined effect of hypothetical 10% centre level growth scenarios for the three clusters the combined gross employment contribution totals jobs. Similarly, the total combined output contribution is approximately $million. These results are compared to total regional and state employment and output in Figure 99.

Figure 99. Case study impact relative to total Region and State employment and output

	Employment		Output	
Case Study Contribution	58	-	$17m	-
Regional Total	23,000	0.25%	$16,700m	1.02%
State Total	980,000	negligible	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Considering the clusters that make up this case study example, it is considered plausible that a wider regional effect can be achieved based on the connection of Agricultural Inputs and Services to the centre based clusters, however the scale of this effect is dependent on nature of potential projects. Regional level results are provided for comparison purposes.

Figure 100. Case Study Impact relative to Region and State

	Employment		Output	
Case Study Contribution	328	-	$93m	-
Regional Total	23,000	0.01%	$16,700	0.55%
State Total	980,000	negligible	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

It must be re-iterated all figures are purely hypothetical and are provided for the sake of comparison only. While these figure are high level, all are produced using a consistent method are therefore directly comparable to others produced in this report. No assessment can be made at this stage on the relative merits of particular initiatives based on these figures and any future assessment would require detailed investigation including an in-depth assessment of project feasibility and rational. Having said this is can be seen that to regional or state significant impact the total growth required far exceeds the assumed 10% baseline.

8.0

8 KALGOORLIE – GOLDFIELD ESPERANCE

8.1 REGIONAL ECONOMIC IMPACT

8.1.1 Supply Chain Impact

The Goldfields input/output table was used to estimate region specific multipliers for both total output and total employment. These multipliers provide an overall estimate of the proportional economic impact of growth within each cluster on wider economy. Specific linked clusters are examined in Section 8.1.2.

Figure 101. Goldfields total output multipliers

Traded Industries	Regional Multiplier
Downstream Metal Products	1.63
Construction Products and Services	1.59
Transportation and Logistics	1.55
Metal Mining	1.52
Business Services	1.50
Non-metal Mining	1.47
Hospitality and Tourism	1.47
Agricultural Inputs and Services	1.41

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

Figure 102. Goldfields total employment multipliers

Traded Industries	Regional Multiplier
Construction Products and Services	3.48
Metal Mining	2.34
Downstream Metal Products	1.93
Transportation and Logistics	1.60
Business Services	1.44
Non-metal Mining	1.41
Agricultural Inputs and Services	1.38
Hospitality and Tourism	1.30

Note: Multipliers provided are for comparison purposes only and cannot be used for initiative or project level impact assessment

Source: Pracsys 2016, ABS 2012 (Catalogue 5246)

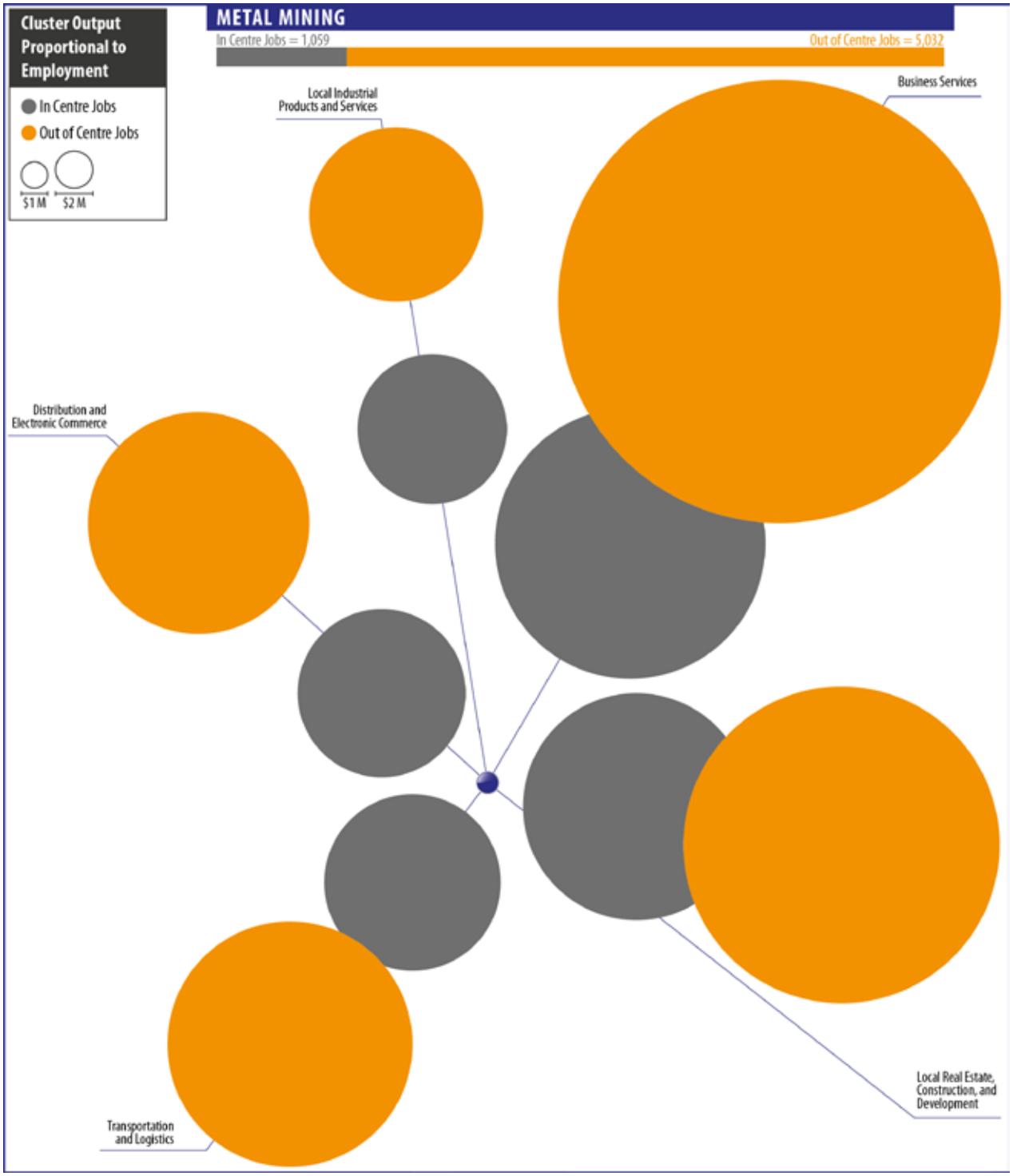
The total output multipliers provide the dollar increase in output from all industries in the region's economy per dollar of increased output in the relevant industry. The majority of the top industries generate indirect and induced output greater than 50% of the direct increase in their output (e.g. for a $1.00 increase in Metal Mining there would be an extra $0.52 of output generated in all other industries). The employment multiplier indicates the additional quantum of employment supported per direct job generated through direct output in the industry (e.g. for every 10 jobs created in the Metal Mining industry there are approximately 13 additional jobs created in other industries). This demonstrates the ability of Traded clusters to generate greater employment in the broader economy. The ability to directly influence or support particular clusters must also be considered.

These multipliers are useful for the high level comparison of industry clusters and represent the potential impact of growth in a particular cluster that may be achieved given the current status-quo i.e. current industry and employment mix. Particular initiatives may significantly alter the status quo in a range of industries and this must be considered when interpreting these results.

8.1.2 Supply Chain Networks

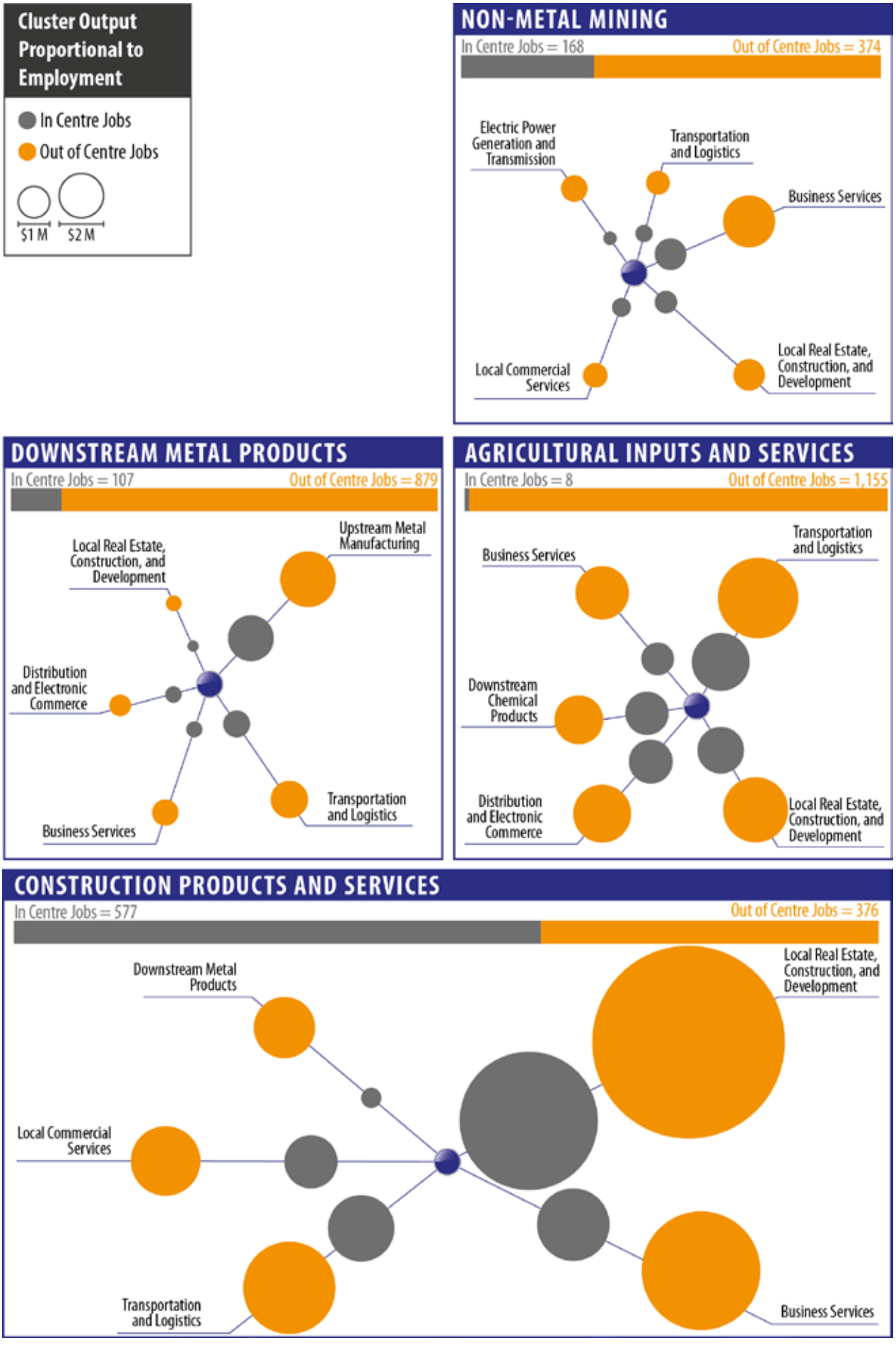
The figures below display the top five inputs for each of the Regionally Significant clusters and provide an understanding of the clusters that are likely to be most impacted by growth in these identified clusters. In-centre and out-of-centre cluster scales of employment and output are provided in order to support the development of cluster network based initiatives. Here out-of-centre employment refers to employment within the region but outside of Kalgoorlie, this may either be widely distributed employment or employment within other regional centres Where a cluster displays a strong connection to another cluster largely based outside of the centre further investigation into these connections is warranted. This is supported by the subsequent analysis of workforce linkages.

Figure 103. Kalgoorlie supply chain network for Regionally Significance clusters



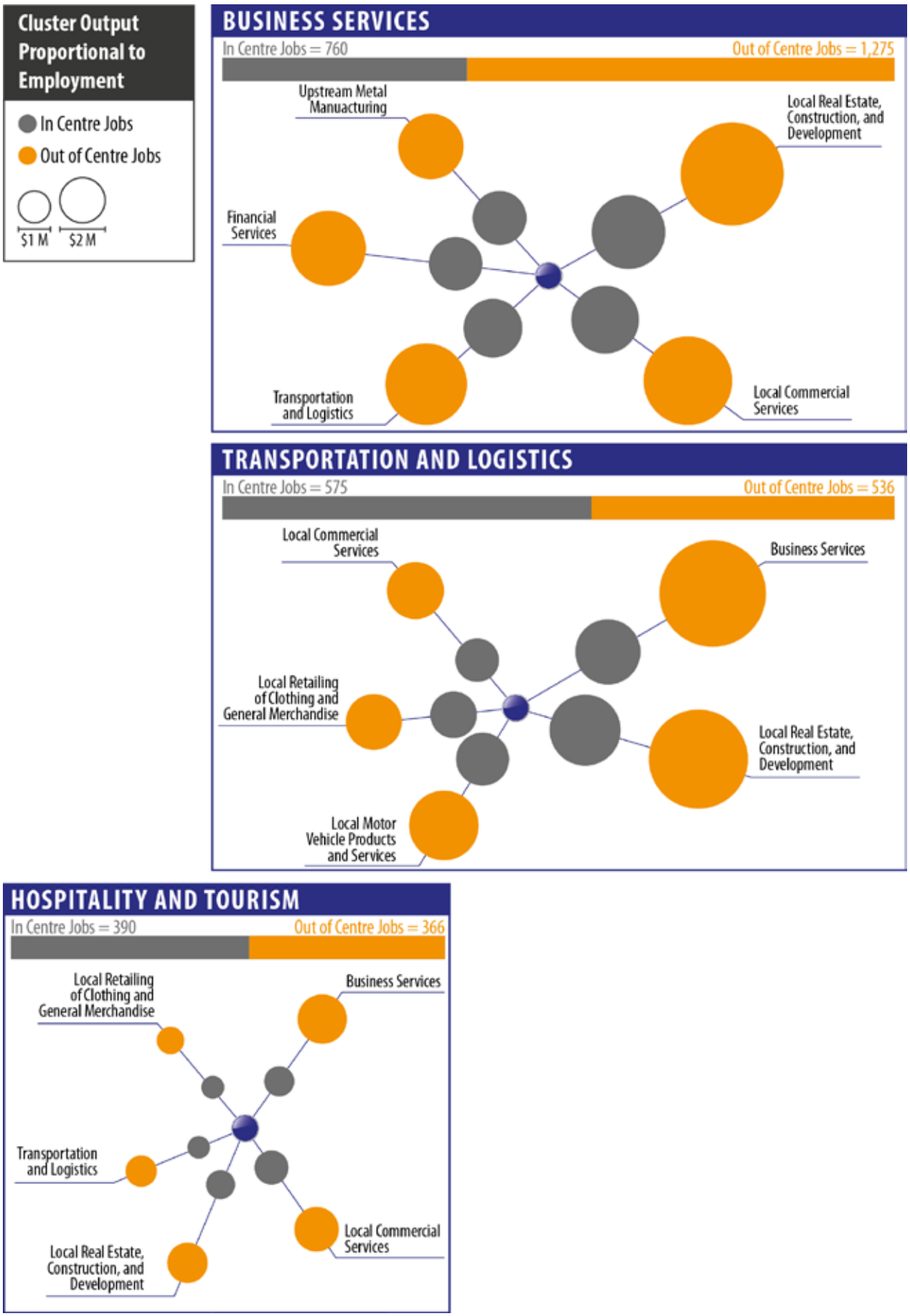
Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 103. Kalgoorlie supply chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 103. Kalgoorlie supply chain network for Regionally Significance clusters



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

8.1.3 Workforce Linkages

Workforce linkages have been investigated in order to establish the presence of major out-of-centre employers of centre based residents. This information provides alternative opportunities for building on existing workforce connections that extend beyond the centre. In such cases the development of regionally based clusters is likely to have a significant impact on centre based population and income. Figure 104 provides both the scale of resident employment by industry and the proportion of these residents working beyond the centre.

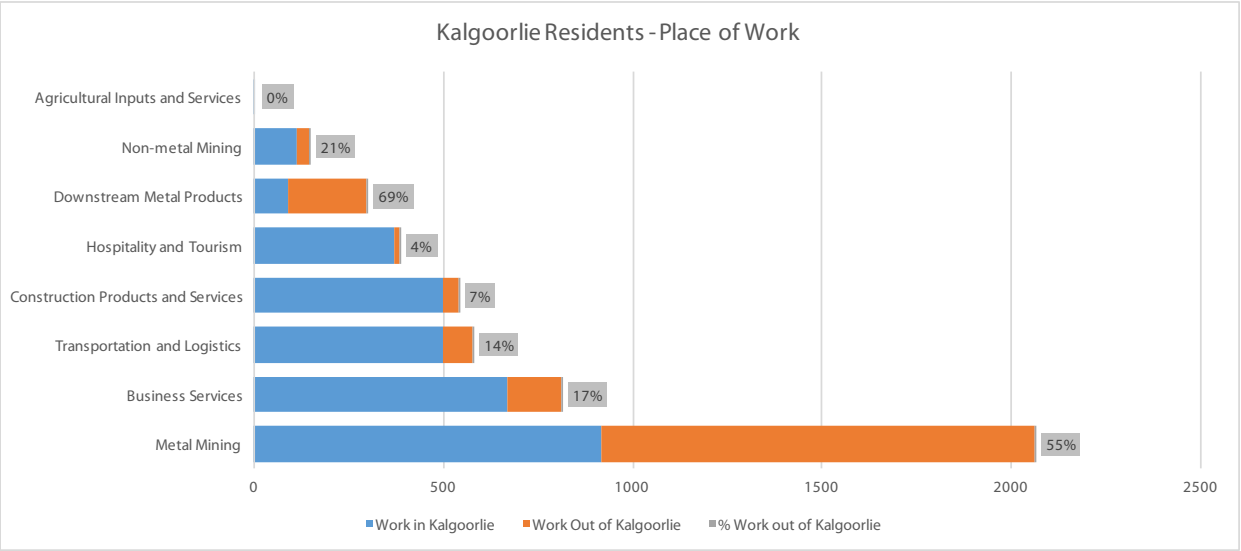
The results show that, with the exception of Downstream Metal Products and Metal Mining, employment within the Regionally Significant Traded clusters is largely self-contained within Kalgoorlie.

8.2 POTENTIAL DRIVERS FOR FUTURE GROWTH

Based upon the analysis and consultation conducted within the Regional Cluster analysis, a number of potential future drivers for growth for the Kalgoorlie Regional Centre have been identified. Drivers that represent opportunities around which more detailed examination may be warranted include:

- External demand for minerals (Metal Mining and Non-metal Mining)
- Demand for supply chain linkage activities (Transportation and Logistics, Construction Products and Services, and Downstream Metal Products Traded clusters)
- Attraction to major tourism assets (Hospitality and Tourism)

Figure 104. Proportion of Kalgoorlie residents working outside of the centre (for Regionally Significant clusters)



Source: Pracsys 2016, ABS Census 2011

These initiatives broadly reflect growth in a range of the major traded activities where an existing centre specialisation has been shown to exist.

Figure 105. Goldfields Esperance output compared to Kalgoorlie ECFs for Regionally Significant Traded clusters

Statewide and Regionally Significant Traded Clusters	Regional Output ($m)	Kalgoorlie ECF	Centre Specialisation
Metal Mining	12,965	2.35	Y
Business Services	1,020	0.92	Marginal
Transportation and Logistics	657	1.76	Y
Construction Products and Services	624	1.60	Y
Downstream Metal Products	588	1.32	Y
Agricultural Inputs and Services	377	0.03	N
Hospitality and Tourism	157	1.30	Y
Non-metal Mining	128	2.30	Y

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

8.2.1 External market demand for gold and nickel

It should be acknowledged that the most obvious driver for future growth in Kalgoorlie is also the source of its historic growth, that is, discovery and exploitation of deposits of minerals and metals demanded by external markets.

Figure 105 and Figure 106 show both proposed and under development mines, and currently operating mines. Input from stakeholders suggests that for growth in this area to occur, substantial new deposits will need to be discovered and developed as current deposits are mature and will require technological advancement to remain a high contributor to the local economy. Dependence on this driver for future growth (or even to sustain existing conditions) is therefore considered risky. As shown, there are vastly more operating mines than those proposed or under development. This points to a significant shift and potential cliff in investment and employment that could potentially have detrimental effects on the economy.

Figure 106. Proposed and under development mines

Source: ALCES (2016)

Figure 107. Operating Mines

Source: ALCES (2016)

8.2.2 Demand for Supply Chain Linkage Activities

Despite the vulnerabilities associated with continued reliance on mineral discovery and exploitation for the future growth in Kalgoorlie, associated industries may be potential drivers for such growth. In particular, there may be opportunities to build on strong concentration in transportation and logistics, construction products and services, and downstream metal product manufacturing traded clusters. Consultation suggested that expansion and linkage with other relatively remote regional resource markets both in Australia, and throughout the southern hemisphere, may represent a significant opportunity around which markets could be developed.

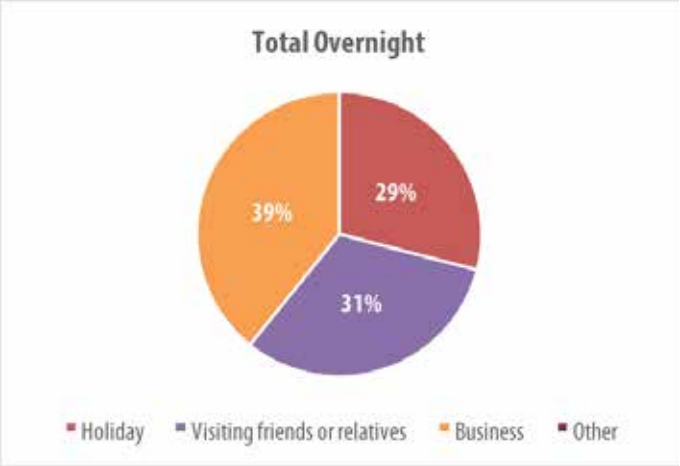
Another opportunity that has been given significant attention in recent years is the potential to utilise Kalgoorlie's geographic position as a meeting point for cross-continental transport infrastructure as the basis for an inland logistics hub. Whilst there was considerable skepticism as to the current state of the project amongst stakeholders attending consultations workshops, a refined, lean project focusing on Kalgoorlie as a central point linking regional ports and clusters seeking eastern markets may represent a significant driver for investment. This would be dependent on the results of a feasibility study to determine if the project could be commercially viable and thus funded by public and private sources.

Finally, leveraging the international networks of the Kalgoorlie School of Mines alumni also represents a potential driver for future growth. In particular, linking the extensive international network of graduates and academics to Kalgoorlie-based mining service enterprises may achieve significant agglomeration benefits usually associated with geographic clusters. This would require a combination of the incubation of local resources service enterprises and the development of meaningful international networks that incorporate flows of information and capital.

8.2.3 Attraction to Major Tourism Assets

Business and recreation tourism represents a significantly concentrated cluster of activity within Kalgoorlie. The cluster has an ECF of 1.3 and estimated direct output of $157M per annum representing a substantial contribution to the local economy. Importantly 71% of tourism visitation is associated with business or visiting family and friends, with the remaining 29% associated with holidays.

Figure 108. Reasons for Visiting for Kalgoorlie Boulder 2014



Source: Tourism Research Australia (2014)

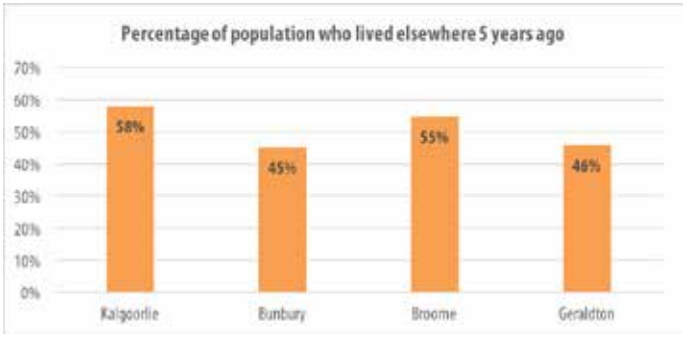
The holiday tourism segment represents a relatively low proportion but significant scale of visitors (43,000 overnight visits per annum). This segment may be a potential driver for future growth for the 304 tourism businesses operating within the LGA, if an improved value proposition is developed to attract more visitors, retain visitors for a greater length of time and/or capture greater spend per visit. Consultation with industry suggested that development of indigenous tourism products, heritage and industry related infrastructure and activities and utilisation of the Centre's natural capital to meet new niche markets (e.g. a drone racing aerodrome catering for drone racing enthusiasts) may represent potential opportunities to expand the tourism value proposition of the centre.

8.3 CAPACITY TO ACCOMMODATE FUTURE GROWTH

8.3.1 Retention of Professional Population

Consultation raised a significant capacity challenge to the development of local clusters of activity. One point that was raised by multiple stakeholders was the attraction and retention of high-skilled individuals to the community. Anecdotally it was suggested that attraction and retention of health and education professional was particularly challenging. This is evidenced in historic data that shows that between the years of 2006 and 2011 only 28% of 'professionals' lived in the City of Kalgoorlie Boulder for both Census dates. This is the lowest of the four Phase I regional growth centres, with Bunbury and Geraldton both retaining 48% of professionals over the same period (Figure 109).

Figure 109. Population Turnover



Source: ABS Census (2011)

When the data is examined in more detail, the three groups of professionals with the lowest retention rates was:

- Design, engineering, science and transport professionals (23%)
- Education professionals (27%)
- ICT professionals (24%)

Overall this equates to a minimum turnover of 1,544 professionals within Kalgoorlie Boulder over a five-year period.

Initiatives to address this turnover are likely to be critical to future growth in Kalgoorlie for a variety of reasons as this subset of employment is:

- Largely responsible for the development of local human capacity through their roles in educating and training the existing and future workforce
- A major source of expenditure for local businesses including retail, entertainment and construction activities
- A future source for endogenous development of traded activities that may develop into future clusters of export activity

8.3.2 Leverage Natural Capital in Different Ways

Consultation suggested that the very high concentration of resource and related industries in Kalgoorlie potentially has had a 'crowding out' impact on other potential opportunities in the region. This is likely due to high value industries outbidding for key inputs such as land, labour and capital. These are particularly important in areas of low availability such as Kalgoorlie. In particular, the opportunity to leverage the natural capital of the region for renewable energy, water, food and tourism-related industries was discussed as areas that have received limited consideration in recent times.

8.3.3 Reliability/Quality of Road Linkages

Consultation suggested that a potential capacity constraint to the further development of Kalgoorlie as a logistics hub to industry throughout the interior of Western Australia is the weather dependence of roads. This was reported to impact on the ability of operators to access and service remote operations, with alternative servicing arrangements instead being made (e.g. utilising FIFO arrangements via airstrips). Of particular note, one road to the North was mentioned several times as being often unusable which ensured that servicing operations could not occur with the reliability and speed demanded by high output industry such as mining.

8.4 OPPORTUNITY CASE STUDY

Based on the analysis conducted it was possible to construct a case examining the combined effect of cluster growth. All Growth Centre lead consultants were requested to provide a limited number of potential growth clusters for this purpose. Through consultation, the case study agreed upon for Kalgoorlie was the joint development of tourism and related centre amenity. These was considered appropriate given the relative under-performance of many Local clusters within the centre, and high resident turnover, which may pose a constraint to the development of the Hospitality and Tourism. The clusters likely to be influenced by such an initiative would include:

- Hospitality and Tourism
- Local Hospitality Establishments
- Local Retailing of Clothing and General Merchandise

The analysis estimated the direct impact of a 10% increase in total output for each of these chosen clusters and the indirect and induced impact on the remainder of the centre and regional economy. Importantly this does not represent the likely impact for the initiative, rather than this level of growth is used for the purposes of direct comparison and the ability to simply scale results.

While specific projects within this initiative are unclear at this stage it can be assumed that the impact will be largely centre based given the likely lack of significant activity within Hospitality and Tourism within the Goldfields region (with Esperance being a largely unconnected region and centre). It also represents an effort to grow Local clusters in tandem with a key Traded cluster, recognising that in this case the size and offerings of Local linked clusters may form a significant constraint to growth.

Hospitality and Tourism – Kalgoorlie

In the Regional Centre of Kalgoorlie, Hospitality and Tourism has an estimated total output of $60m, employing approximately 390 persons. The results presented in this report also show that:

- The cluster is a moderate area of specialisation of the region and the centre, with ECFs of 1.02 and 1.30 respectively
- Kalgoorlie holds reasonable portion of regional employment, accounting for 52% of employment within this cluster
- Very few Kalgoorlie residents employed in the cluster work outside of the centre, with 4% out-of-centre employment
- Major clusters linked by supply chain include Business Services, Local Commercial Services, Local Real Estate, Construction and Development, Transportation and Logistics, and Local Retailing of Clothing and General Merchandise

Level of Impact

The impact of a 10% increase in the cluster was assessed for Kalgoorlie. The analysis used the Goldfields total output and employment multipliers of 1.47 and 1.30. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $6 m in the total output of the Hospitality and Tourism cluster, equating to 39 additional jobs. Using the multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster. The contribution of Kalgoorlie to the total output of the Goldfields economy is estimated at $9m, with an increase of 49 employment opportunities.

Figure 110. Hospitality and Tourism impact - Kalgoorlie

Kalgoorlie Hospitality and Tourism	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$6 m	$3m	$9m
GVA ($)	$3 m	$2m	$5m
Employment	39	10	49

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

For comparison purposes, at a regional level 10% growth in the Hospitality and Tourisms Cluster corresponds to the following estimated impact (refer to Figure 110). As discussed above it has been assumed that projects within this Cluster will have a solely centre focus.

Figure 111. Local Hospitality Establishments impact – Goldfields Esperance

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$12m	$6m	$18m
GVA ($)	$6m	$3m	$9m
Employment	95	21	116

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 cluster linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Hospitality and Tourism cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

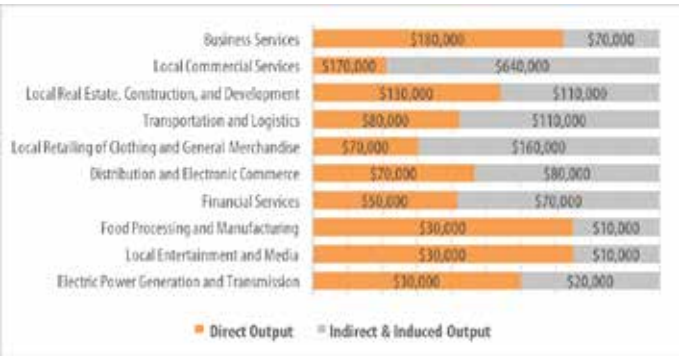
These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated. Indirect and induced impact in this context indicates

the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 112. Input clusters to Hospitality and Tourism direct impact – Kalgoorlie

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Figure 113. Input clusters to Hospitality and Tourism indirect impact – Kalgoorlie

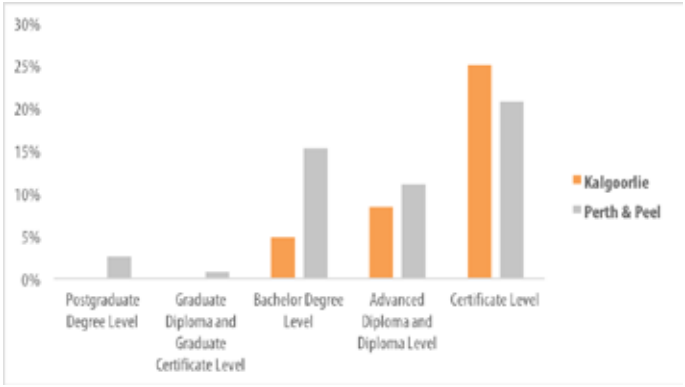


Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Workforce Considerations

The average salary for the cluster, in the centre, is $32,000, slightly lower than the regional average. Education for this cluster within Kalgoorlie is slightly higher than the Goldfields average with 5% of employees having a bachelor degree (Figure 114). Education for this cluster within Kalgoorlie is slightly lower than that of Perth and Peel with 5% of employees having a bachelor degree compared to 10% in the benchmark (Figure 114).

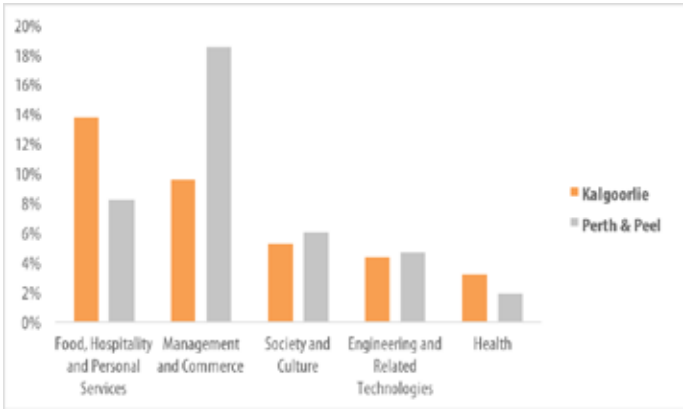
Figure 114. Hospitality and Tourism level of education - Kalgoorlie



Source: Pracsys 2016, ABS Census 2011

The top 5 fields of study for the cluster were mostly the same for Kalgoorlie and the Goldfield regions although Food, Hospitality and Personal Services had a higher concentration (Figure 115). This is especially the case when compared to Perth and Peel which has a much higher concentration of persons with a background in Management and Commerce.

Figure 115. Hospitality and Tourism field of education – Kalgoorlie



Source: Pracsys 2016, ABS Census 2011

Local Hospitality Establishments – Kalgoorlie

In the Regional Centre of Kalgoorlie, Local Hospitality Establishments has an estimated total output of $60m, employing approximately 461 persons according to the ABS. The results presented in this report also show that:

- The cluster is under-represented in both the region and the centre, with ECFs of 0.66 and 0.83 respectively
- Kalgoorlie holds reasonable portion of regional employment, accounting for 48% of employment within this cluster
- Very few Kalgoorlie residents employed in the cluster work outside of the centre, with 0% out-of-centre employment
- Major clusters linked by supply chain include, Local Real Estate, Construction and Development, Livestock Processing, Business Services, Transportation and Logistics, and Distribution and Electronic Commerce

Level of Impact

The impact of a 10% increase in the cluster was assessed for Kalgoorlie. The analysis used the Goldfields total output and employment multipliers of 1.52 and 1.21. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $6m in the total output of the Local Hospitality Establishments cluster, equating to 46 additional jobs. Using the multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster's presence in Kalgoorlie. The contribution of Kalgoorlie to the total output of the Goldfields economy is estimated at $9m, with an increase of 56 employment opportunities.

Figure 116. Local Hospitality Establishments impact - Kalgoorlie

Kalgoorlie Local Hospitality Establishments	Direct	Indirect and Induced	Total
Output ($)	$6m	$3m	$9m
GVA ($)	$3m	$2m	$5m
Employment	46	10	56

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Regional level results are not provided as they are not applicable in for the development of Kalgoorlie based Local clusters.

The top 10 clusters linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Local Hospitality Establishments cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

Figure 117. Input clusters to Local Hospitality Establishments direct impact – Kalgoorlie

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated. Indirect and induced impact in this context indicates

the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

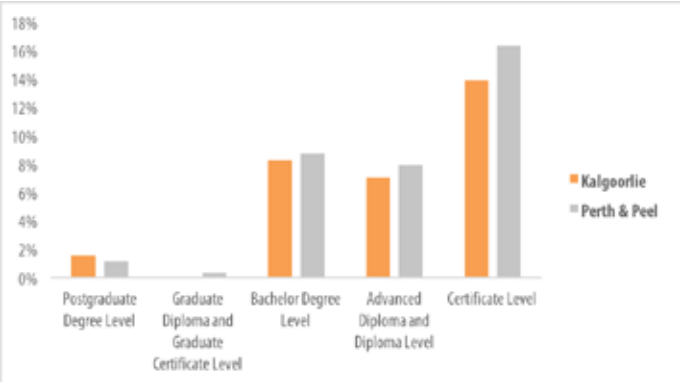
Figure 118. Input clusters to Local Hospitality Establishments indirect impact – Kalgoorlie

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Workforce Considerations

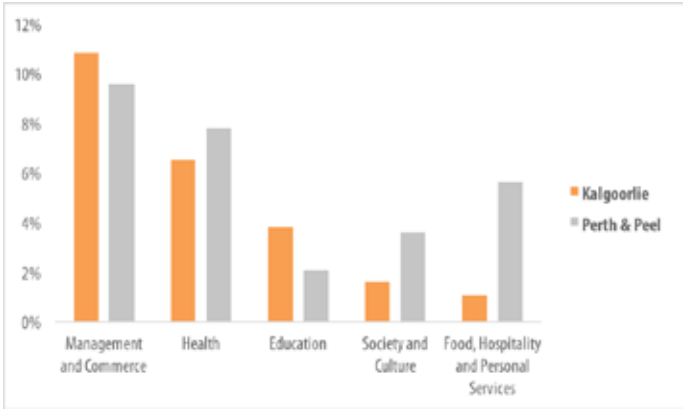
The average salary for the cluster, in the centre, is $24,000, lower than the Goldfields average, though similar to the Perth & Peel average. Education for this cluster within Kalgoorlie is slightly higher than the Goldfields average with 10% of employees having a bachelor degree or higher (Figure 119). Tertiary education levels within the centre are approximately the same as Perth and Peel.

Figure 119. Local Hospitality Establishments level of education - Kalgoorlie



Source: Pracsys 2016, ABS Census 2011

Figure 120. Local Hospitality Establishments field of education – Kalgoorlie



Source: Pracsys 2016, ABS Census 2011

The top 5 fields of study for the cluster were the same for Kalgoorlie and the Goldfield regions although Food, Hospitality and Personal Services had a higher concentration in the greater region (Figure 120). The top fields of study were less skewed in the centre than in Perth and Peel.

Local Retailing of Clothing and general merchandise – Kalgoorlie

In the Regional Centre of Kalgoorlie, Local Retailing of Clothing and General Merchandise has an estimated total output of $149 m, employing approximately 375 persons according to the ABS. The results presented in this report also show that:

- The cluster is under-represented in the region and an average performer in the centre, with ECFs of 0.55 and 1.00 respectively
- Kalgoorlie holds reasonably high portion of regional employment, accounting for 70% of employment within this cluster
- Very few Kalgoorlie residents employed in the cluster work outside of the centre, with 2% out-of-centre employment

- Major clusters linked by supply chain include, Local Real Estate, Construction and Development, Business Services, Transportation and Logistics, Local Commercial Services and Distribution and Electronic Commerce

Level of Impact

The impact of a 10% increase in the cluster was assessed for Kalgoorlie. The analysis used the Goldfields total output and employment multipliers for the cluster of 1.55 and 1.24. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $15m in the total output of the Local Retailing of Clothing and General Merchandise cluster, equating to 38 additional jobs. Using the multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster's presence in Kalgoorlie. The potential contribution of Kalgoorlie to the total output of the Goldfields economy is estimated at $23m, with a total increase of 66 employment opportunities.

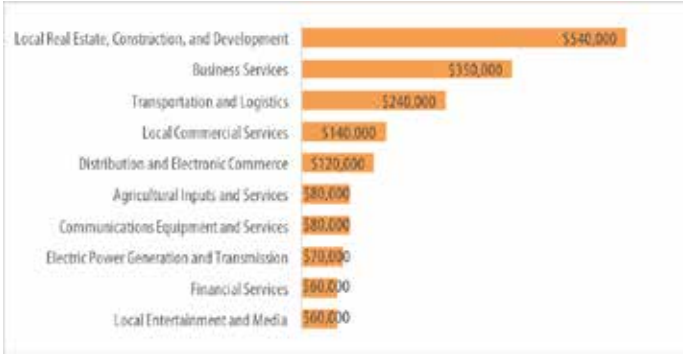
Figure 121. Local Retailing of Clothing and General Merchandise impact - Kalgoorlie

Kalgoorlie Local Retailing of Clothing and General Merchandise	Direct Output	Indirect and Induced Output	Total Output
Output ($)	$15m	$8m	$23m
GVA ($)	$9m	$5m	$14m
Employment	38	28	66

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 cluster linked by input were analysed in terms of increase in direct output contributable to the hypothetical 10% increase in the Local Retailing of Clothing and General Merchandise cluster. Direct impact in this context refers to an estimate of the total input required from secondary industries in order to satisfy a 10% increase in output in the study industry.

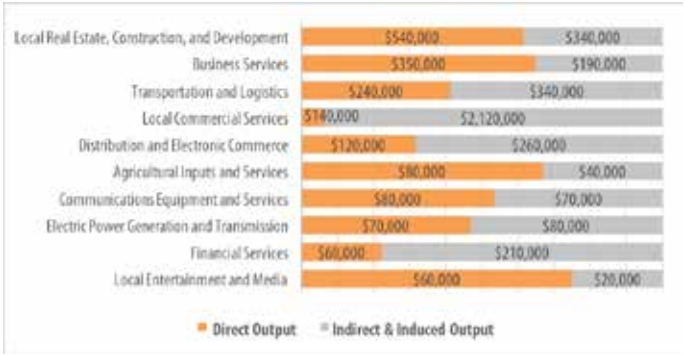
Figure 122. Input clusters to Local Retailing of Clothing and General Merchandise direct impact – Kalgoorlie



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

These linked clusters were further examined and the approximate indirect and induced impact on their output was calculated. Indirect and induced impact in this context indicates the total impact on the greater regional economy from the increased input of a secondary industry required in order to satisfy a 10% increase in the study industry.

Figure 123. Input clusters to Local Retailing of Clothing and General Merchandise indirect impact – Kalgoorlie

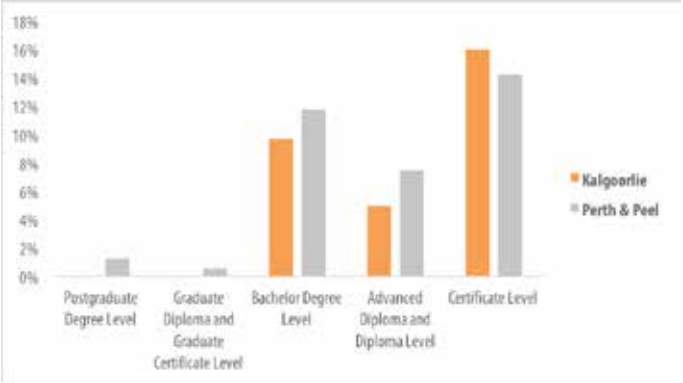


Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

Workforce Considerations

The average salary for the cluster, in the centre, is $31,000, slightly lower than the Goldfields average of $32,000. Education for this cluster within Kalgoorlie is higher than the Goldfields average with 10% of employees having a bachelor degree or higher (Figure 124).

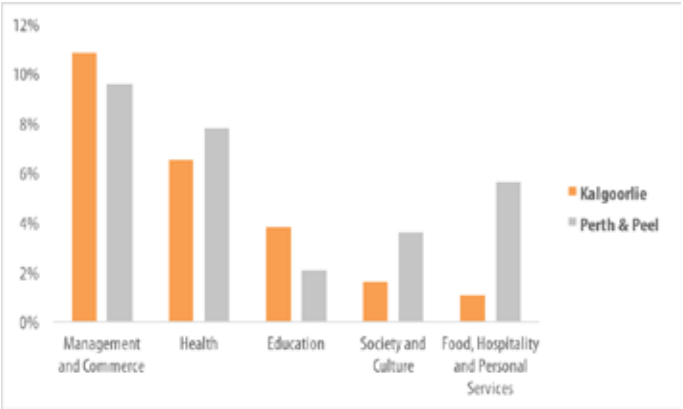
Figure 124. Local Retailing of Clothing and General Merchandise level of education - Kalgoorlie



Source: Pracsys 2016, ABS Census 2011

The top 5 fields of study for the cluster were the same for Kalgoorlie and the Goldfield regions although Food, Hospitality and Personal Services had a higher concentration in the greater region (Figure 125).

Figure 125. Local Retailing of Clothing and General Merchandise field of education – Kalgoorlie



Source: Pracsys 2016, ABS Census 2011

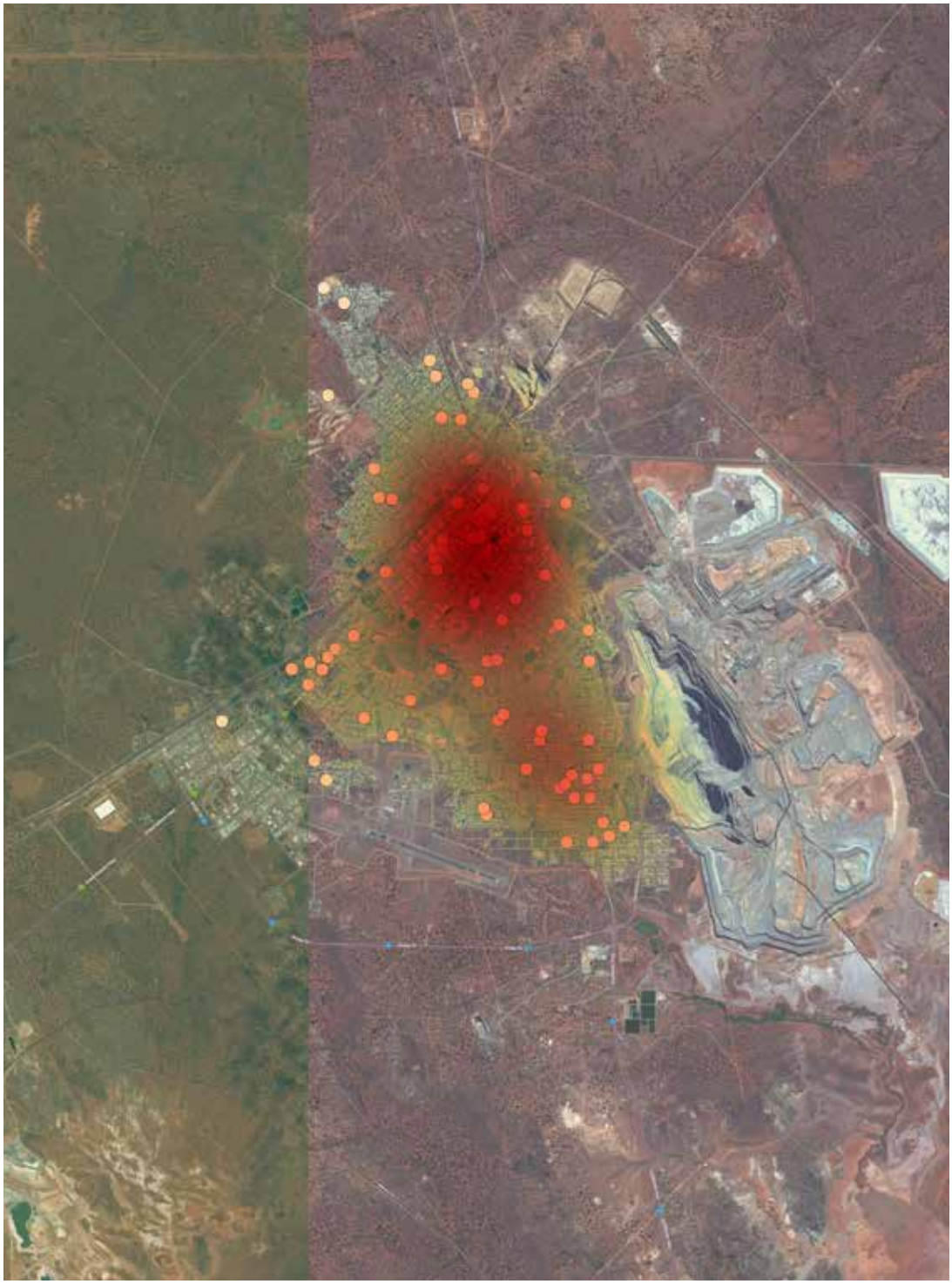
8.4.1 Results in Context

Cluster Business Concentrations

ABR data has been interrogated to provide concentrations of businesses in each centre and surrounds. This data provides registered businesses by ANZSIC 2, as well as their locations. At this stage it does not provide additional information such as the number of FTEs per business. Clear trends can be seen in groupings of businesses within each cluster indicating a level of natural agglomeration.

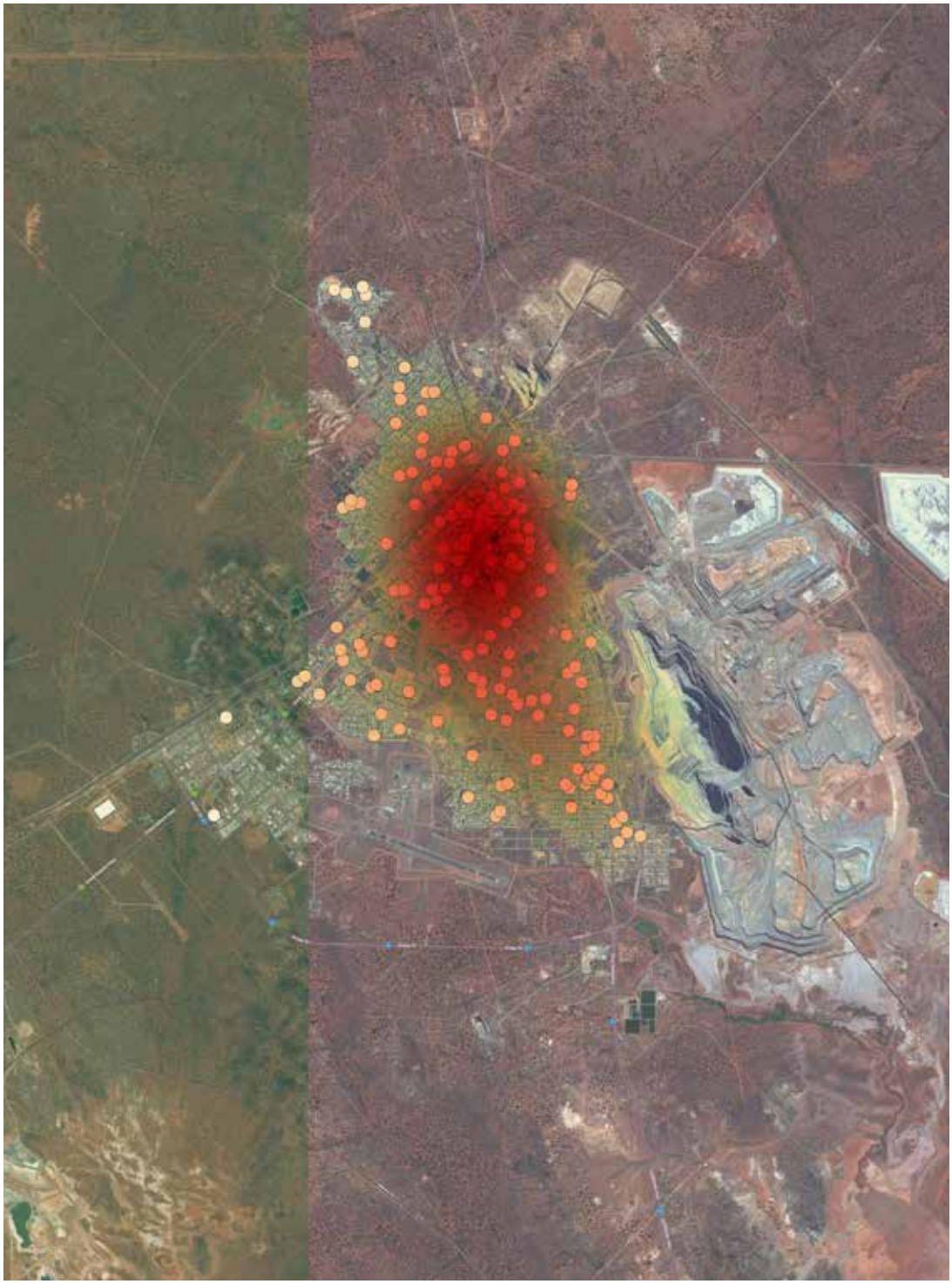
As the major centre within the Goldfields region, Kalgoorlie is the location for the vast majority of businesses within the selected clusters.

Figure 126. Kalgoorlie Hospitality and Tourism business locations



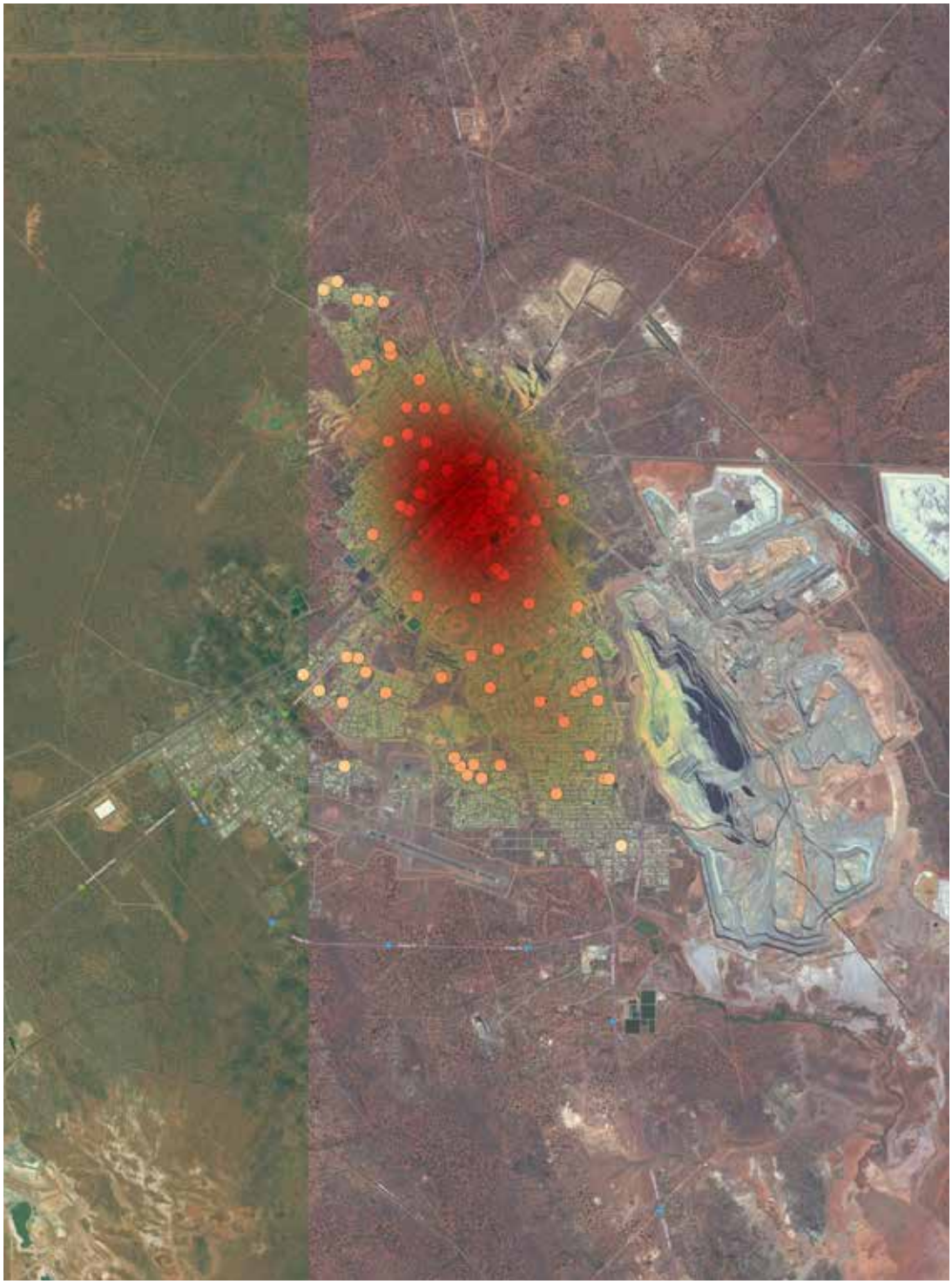
Source: Australian Business Register (2015)

Figure 127. Kalgoorlie Local Hospitality business locations



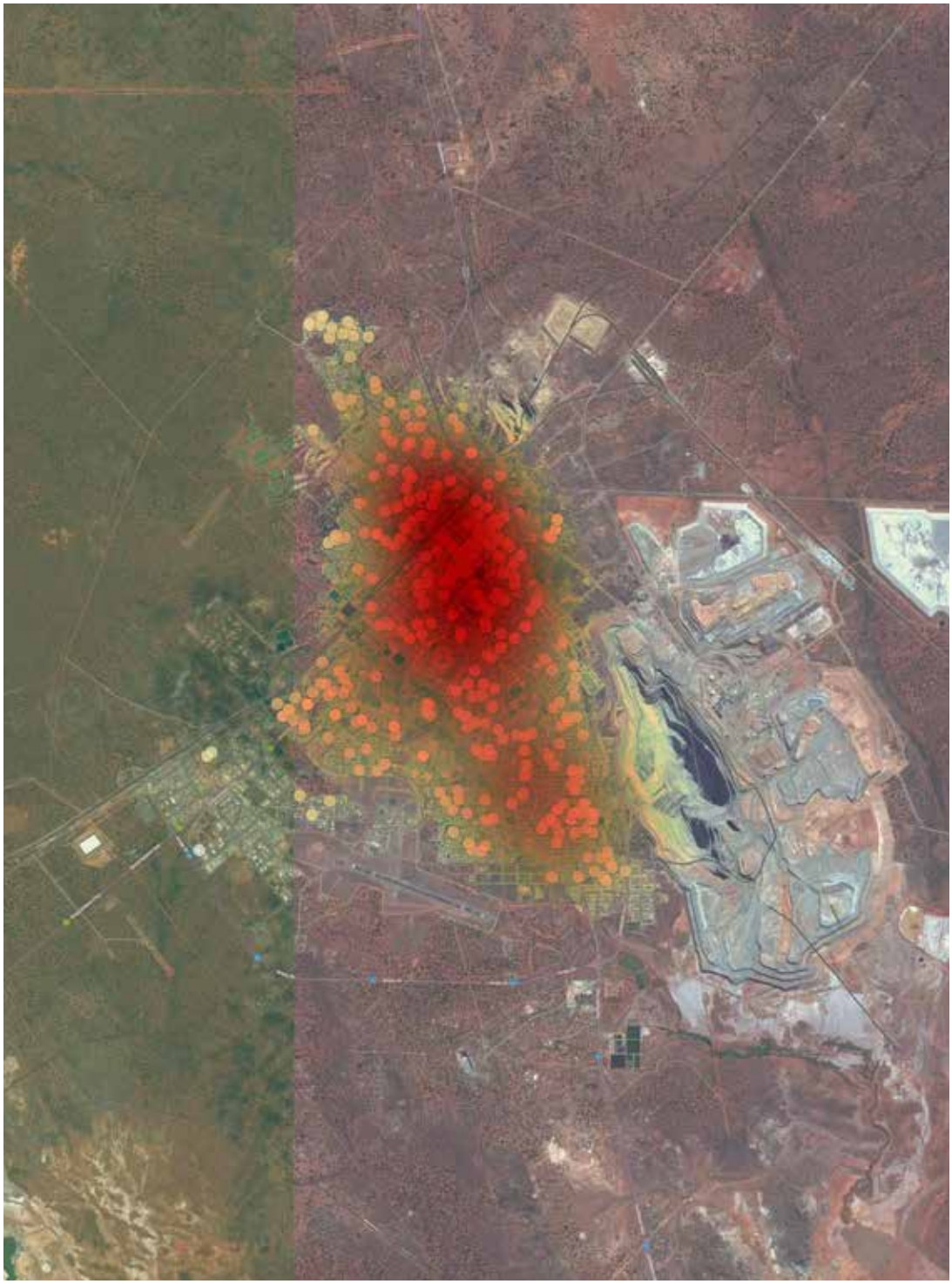
Source: Australian Business Register (2015)

Figure 128. Kalgoorlie Local Retailing business locations



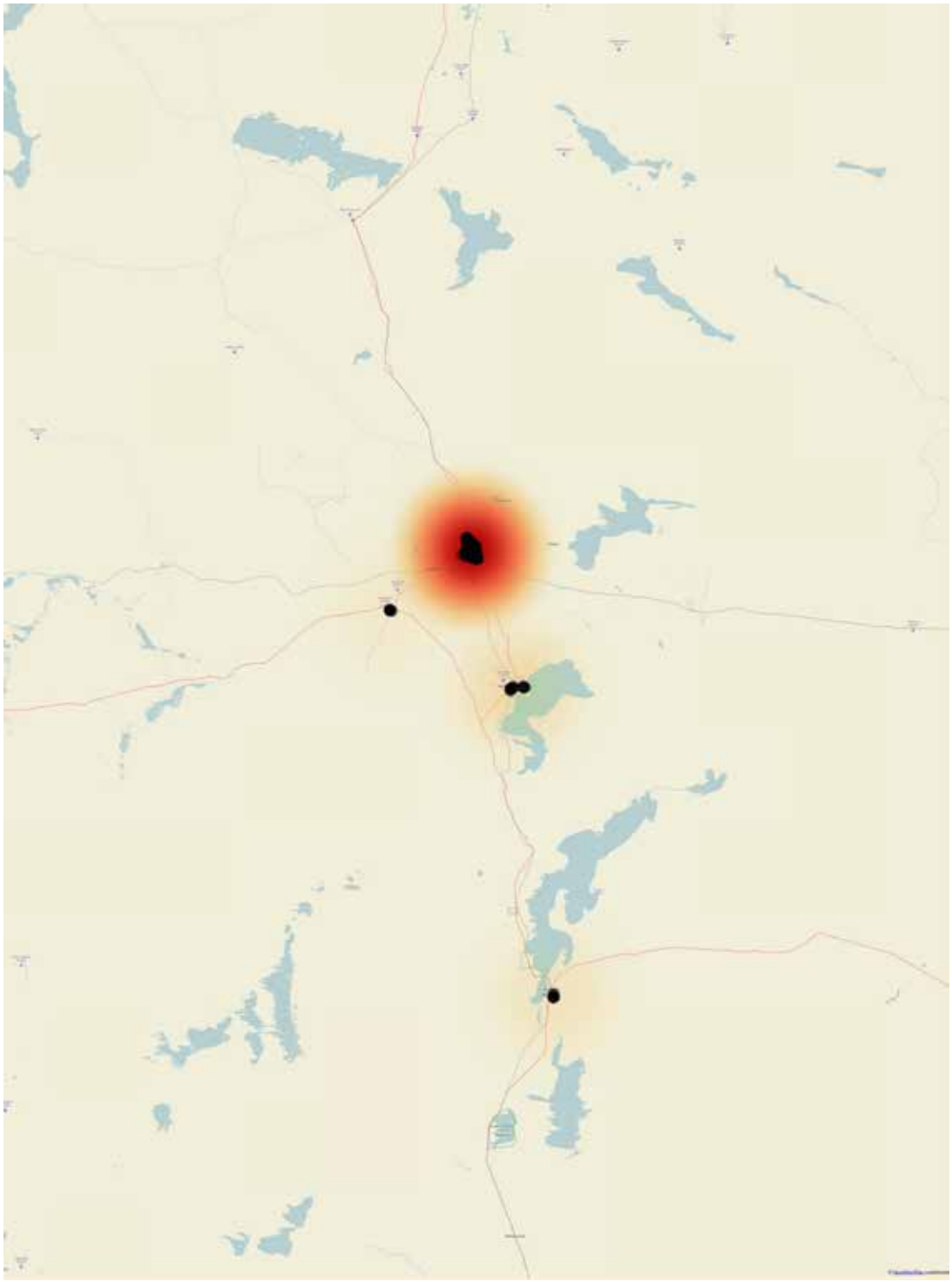
Source: Australian Business Register (2015)

Figure 129. Kalgoorlie All Case Study business locations



Source: Australian Business Register (2015)

Figure 130. Kalgoorlie and surrounds, all case study business locations



Source: Australian Business Register (2015)

8.4.2 Combined Employment and Output

The potential combined effect of hypothetical 10% centre level growth scenarios for the three clusters totals 171 jobs. Similarly, the total combined output contribution is approximately $41. These results are compared to total regional and state employment and output in Figure 131.

Figure 131. Case study impact relative to total Region and State employment and output

	Employment		Output	
Case Study Contribution	171	-	$41m	-
Regional Total	29,000	0.6%	$26,000m	0.16%
State Total	980,000	0.02%	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The impact of this case study initiative is not expected to extend beyond the centre level.

It must be re-iterated all figures are purely hypothetical and are provided for the sake of comparison only. While these figure are high level, all are produced using a consistent method are therefore directly comparable to others produced in this report. No assessment can be made at this stage on the likely impact or relative merits of particular initiatives based on these figures and any future assessment would require detailed investigation including an in-depth assessment of project feasibility and rational. Having said this is can be seen that to regional or state significant impact the total growth required far exceeds the assumed 10% baseline.

9.0

9 ONGOING USE OF A CLUSTER APPROACH

The Regional Cluster Analysis presented here-within (and in the Phase 3 Report) provides top-down insights that, to be applicable in the context of Regional Growth Centres, need to be tested, confirmed and expanded upon through ground-up consultation and analysis. Such consultation will allow for a greater understanding of current activity, networks, and opportunities may be present within existing or emerging clusters. The question then remains as to what options are available to intervene in cluster systems for the benefit of regional centres and communities. The answer is likely depend on regional priorities, characteristics, capabilities and available resources.

This chapter provides an overview of alternative approaches to the application of a cluster approach, with a proposed logic flow offered as the basis for cluster-oriented RCDP2 projects for use as required by the Growth Centre teams.

9.1 BENEFITS OF CLUSTER DEVELOPMENT

Apart from the analysis and reporting benefits of grouping industry classifications by linkages, the primary benefit of cluster based economic development approaches is in identifying existing or emerging networks of communication and collaboration, formalising their structure and communication channels, and providing them with support, thereby empowering the development of business lead initiatives.

For government bodies supporting cluster organisations, the formalisation and central coordination of activity allows for the measurement of impacts of funded initiatives and projects. An important consideration for government is the avoidance of subsidisation of particular industries through the achievement of measured industry growth. For example, subsidisation can be minimised by tying funding to defined performance indicators as is the trend through the introduction of measures such as the recent Department of Treasury Sunset Clauses. Cluster organisation reporting structures allow for the direct measurement of increases in growth through programs of related projects. In a similar manner, project specific benefit realisation plans are becoming more commonplace in both Federal and State level grant programs.

The development of central cluster bodies around informal groups of businesses and organisations therefore serves to both encourage the development of initiatives in a coordinated manner, as well as adding a layer of accountability to the allocation of funding. That being said, the ultimate intention of establishing cluster bodies worldwide is to create self-sustaining systems that work to attract private investment based in cluster competitiveness and the ultimate aim of initiatives should be to provide support in achieving this outcome.

9.2 ALTERNATIVE APPROACHES TO CLUSTER POLICY AND INITIATIVES

9.2.1 Learnings from the US

In 2011, Brookings and the Rockefeller Foundation launched the Project on State and Metropolitan Innovation (PSMI), a five-year initiative to expand economic growth and opportunity in metropolitan regions. Over the last four years, the project has worked with 22 metropolitan regions and seven states to create

and deploy economic development strategies. An audit of the program (Brookings-Rockefeller 2015) provides some insights into formulas for success.

The program is based on a theory of change that focusses on initiating a shift away from previous US economic development thinking:

… Based on consumption and consumer debt, real estate development, and competition to attract new firms based on costs alone—strategies that have generated low-wage jobs, unsustainable growth, and limited opportunities for people and communities in many regions.

The new strategy instead focuses on:

…Growing and retaining higher-quality jobs in more innovative, productive industries; expanding opportunities for workers at all levels; and increasing incomes, economic resilience, and inclusion.

The key learnings after 5 years of implementation are relevant to the development of the RCDP2 Growth Plans:

1. Leaders need to be able to work across programmatic and jurisdictional boundaries to implement the new model, both strategically and organisationally, but such "galvanizing" leaders are in short supply.
2. The work is long term and systemic, but funding is short term and programmatic, requiring regional leaders to cobble together programmatic grants on a long-term basis.
3. Dedicated staff are essential to the core team guiding the work, but sites are challenged to secure sustained funding for "backbone" organisations or intermediaries.
4. Systems change requires a holistic approach, but moving on too many fronts can overwhelm the effort. Focusing on single projects is more feasible but reduces the potential for broader impact and transformation of systems.
5. Entrenched interests and systems resist change, and many public resources are constrained by established programs.
6. A natural process of entropy arises from inevitable changes in leadership, the economic and political landscape, and priorities in organisations and funders, increasing the challenge of sustaining long-term efforts.

Although not exclusively focused on Traded clusters, the program has identified the 'importance of traded sectors and advanced industries'.

As a result, Brookings' presentation of the essential drivers of economic growth and opportunity has evolved. More recently, governance and spatial efficiency have been recast as underlying conditions or enablers for economic growth, and trade is given more prominence in the framework. In the latest iteration of the model, three drivers are positioned as key: innovation, trade, and talent.

9.2.2 Creation of Clusters versus Supporting Existing Activities

The Cluster Initiative Greenbook 2.0, published in 2013, describes an in-depth analysis of cluster initiatives across 356 cluster initiatives in 50 countries. A core discussion point within the study was whether cluster policy was more likely to be beneficial if focused on creating new clusters or leveraging existing clusters of activity. The Greenbook suggested that;

These two sets of approaches have radically different implications for policy practice. The first leads to policies that try to create clusters, that have to intervene early and massively to shape an emerging economic geography profile, and that encourage zero-sum competition between locations. The latter one leads to policies that leverage existing clusters that have developed naturally, that work consistently over time and with modest resources, with a view to better use existing government programs rather than distributing new funds, and that encourage specialisation, linkages, and competition across locations.

On this basis the paper suggested that;

The emerging hypothesis is that cluster policy is significantly more likely to be beneficial if it is focused on leveraging rather than creating clusters. The alternative approach is very risky and as the old-style big push, industrial policy approaches subject to many potential pitfalls. In essence, governments lack the knowledge to evaluate where new clusters could emerge in welfare enhancing ways given the appropriate policy intervention. Governments can, however, respond to the market signals of clusters that have already emerged, and work with them to address existing externalities.

9.2.3 Inter vs Intra-Regional Approaches

The RCDP2 cluster analysis offers insights into similarities and differences between the economies of Western Australia's regions including that:

- Metal mining is the primary export in the state and in all regions except the South West
- Oil and gas is the second ranked export cluster in the state but does not feature in RCDP2 Phase I Regions save for the Midwest where it ranks 6th
- Upstream metal manufacturing is the next most prevalent export cluster in the state and ranks 1, 2 or 3 in all regions except the Kimberley
- Agriculture features in the top 6 export clusters across the state and in all regions but represents less than 10% of export value in all cases
- Hospitality and tourism is the next most prevalent export, ranking between 4 and 9 in the regions
- The clusters that provide the main inputs to the primary export clusters are (unsurprisingly) very similar across the state

Given the similarities between regions and their contribution to the state as a whole, it is important to identify the optimum scale for cluster-based initiatives. Whether cluster coordination should be a centre-based regional initiative (an intra-regional approach), an inter-regional initiative involving cooperation between regions, or a state level initiative working independent of individual regions

is an issue to be resolved by the program before the Growth Plans are finalised. The appropriate approach will depend on many factors, including whether identified clusters are already self-organising, the perceived complexity of inter-regional arrangements, and perhaps most relevant, the role of the State Government in any cluster development initiatives. It is presently unclear how the State will be engaged in the implementation of the Growth Plans.

9.3 PRECURSORS TO CLUSTER INITIATIVE DEVELOPMENT

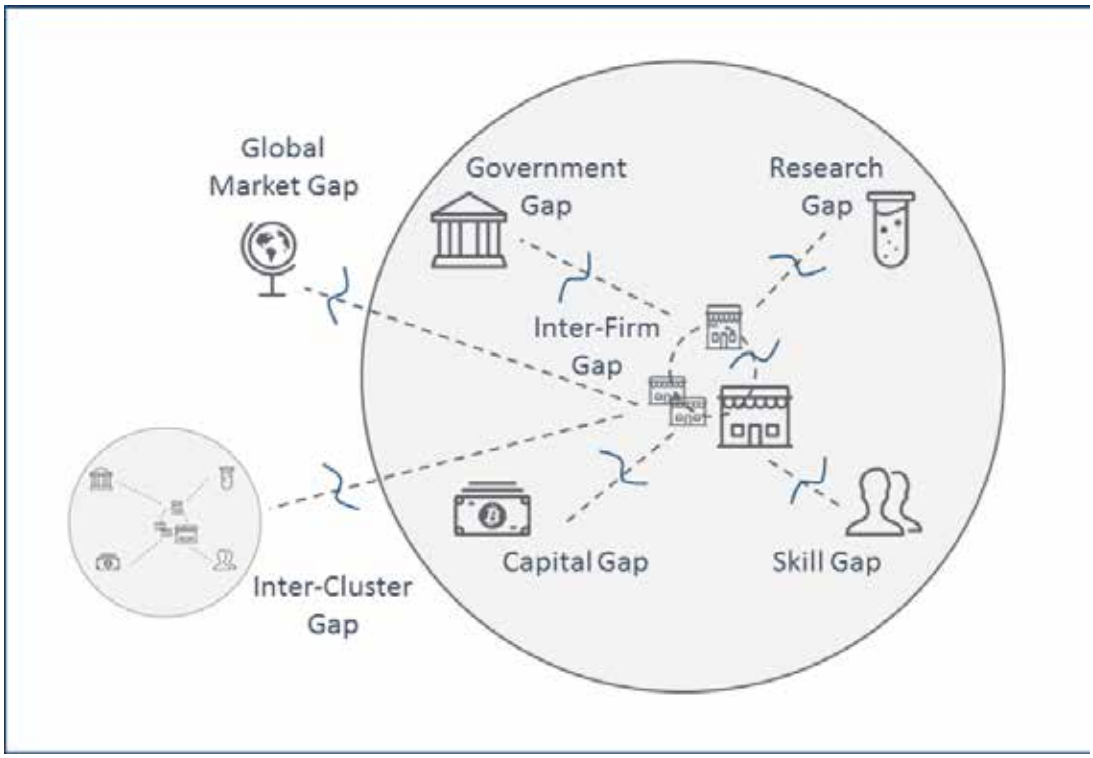
Prior to design of a cluster initiative, it is useful to consider cluster behaviour through three broad questions. These are:

- What gaps need to be bridged to enhance cluster performance?
- What is the level of cluster engagement and buy in?
- What is the level of maturity in cluster activity?

9.3.1 Gap Model for Cluster Initiative Design

The Cluster Greenbook puts forward the 'cluster gap model' as a useful framework for considering the roles of cluster initiatives, and what area of focus may be most impactful in a given situation (Figure 132).

Figure 132. Gap model for cluster activities



Source: Cluster Initiative Greenbook 2.0 (2013)

This model supposes that the role of any cluster initiative is to bridge one or more of the seven gaps that may exist between cluster actors to enhance the performance of the cluster. Five of these gaps are considered to be internal to an economy and relate to linkages between cluster firms and:

- Other cluster firms
- Education institutions
- Research institutions
- Capital providers
- Government agencies

In addition, the model identifies two external gaps that also need to be bridged, between cluster firms and global markets, and cluster firms and other related clusters of activity (which is the focus of the supply chain analysis presented).

In the context of RCDP2 Centre program, this model is useful in identifying the needs of traded clusters in centres and where resources may be best directed in meeting these needs. In particular, the inter-cluster gap is relevant as it may be through building inter-cluster linkages across regions that sustained growth may best be achieved. An example of this may be the development of linkages across food clusters that exist or are developing in the Kimberley, Gascoyne, Mid West and Great Southern to develop supply chains that can deliver sufficient scale, high-quality differentiated produce to target export markets year-round.

9.3.2 Cluster Engagement and Buy-In

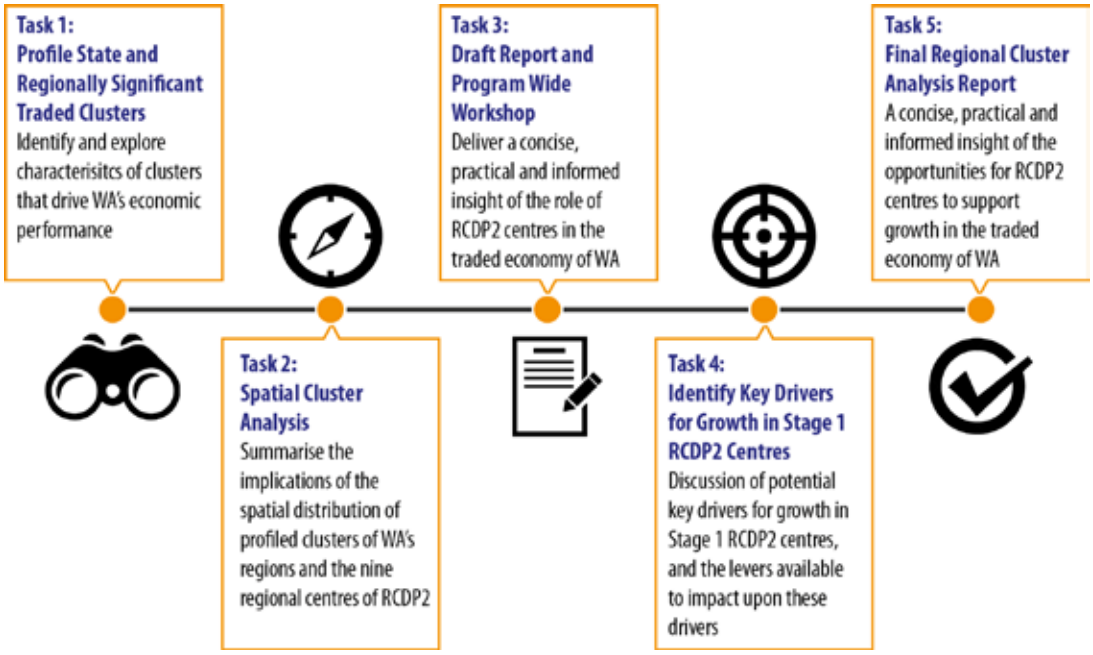
Regardless of the philosophy of an ultimate cluster/industry development approach, the level of engagement and buy-in that private stakeholders have will be core to the success of any strategy. Where engagement, buy-in and trust between stakeholders in strong existing clusters is high, cluster-oriented initiatives are more likely to be effective. Where these precursors do not exist, other capacity-side strategies may be more appropriate.

9.3.3 Strategic Starting Point

Initial consultation with regional stakeholders and industry representatives across each RCDP2 Phase I Centre suggested that identified traded clusters were at a variety of different starting points in cluster organisation and behaviour. These ranged from a strongly independent focus on firm-level activity through to support of long-standing formal arrangements that have worked for generations for the benefit of export industry enterprises within a given location/cluster of activity (e.g. agricultural/ fishing cooperatives). A model outlining the potential range of maturity in cluster activity is outlined in Figure 133.

It will be important for RCDP2 Centres to have a clear understanding of the characteristics (maturity) of existing cluster behaviour prior to design of interventions as this, along with the strategic aspirations of the Region, will have a bearing on the types of actions that may be effectively undertaken in the short, medium and long term.

Figure 133. Phases of cluster maturity



Source: Pracsys (2016)

9.4 LOGIC FLOW FOR CLUSTER PROJECT DEVELOPMENT

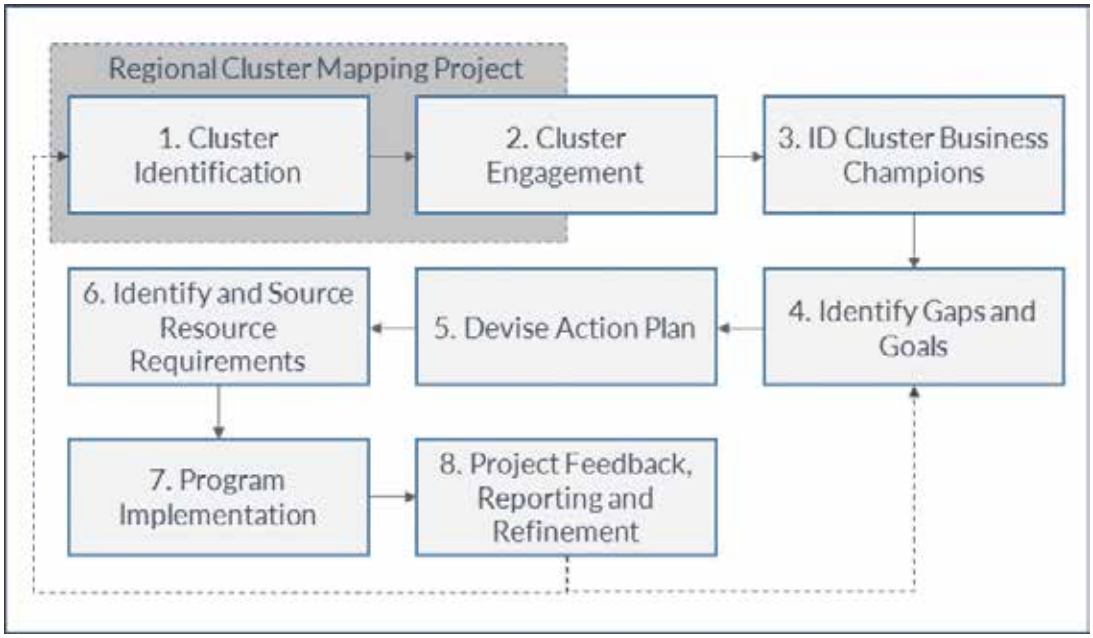
Based upon an understanding of the broad approaches to cluster policy, and local context (through answering questions outlined in Section 9.3, RCDP2 centres will be in a position to decide whether tailored cluster initiatives are an area of focus for their Centre. The structure and resourcing of these initiatives will depend largely on each Centre's context and strategic objectives. For those that do choose to prioritise a cluster-based approach, the logic flow described in Figure 134 represents a stepped out methodology that applies the Cluster Gap Model to a structured strategic process.

Resources provided through the Regional Cluster Mapping Project form a basis for cluster identification and profiling, with the Regions' having access to shared model of State and Regionally significant clusters, and interactions with each subject Regional Centre. The methodology suggests that RCDP2 Centres build upon this understanding with ground-up consultation and cluster engagement to clearly identify champions, and understand the gaps and goals of key actors operating within each traded cluster. It is only based upon this understanding that an action plan is formed, with project resourcing (human and financial) and implementation structures linked directly to the needs of cluster requirements. Finally, structures are put in place upfront to collect

and collate information as to the efficacy of the Plan's actions, with governance systems being able to pivot resources and focus to new areas of need.

It is important to re-emphasise that this methodology is focused specifically on economic development initiatives stemming from a focus on Traded clusters. Such an approach is likely to form one component of a comprehensive package of growth plan initiatives, with other activities focusing on areas including local cluster performance, innovation systems, risk management and governance structures, activity centre performance and general human capital development.

Figure 134. Potential Cluster Initiative Logic Flow



Source: Pracsys (2016)

10.0

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A1

APPENDIX 1: KIMBERLEY REGIONAL RESULTS

11.1 REGIONAL CASE STUDY COMPARISON

The following results are based on analysis of the Broome case study conducted at the regional level.

11.1.1 Hospitality and Tourism

Hospitality and Tourism is a Traded cluster with current total output of approximately $141m.

The analysis provides estimated total output and employment multipliers of 1.58 and 1.28 within the South West region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $14m in the total output of the Hospitality and Tourism cluster, equating to 105 additional jobs. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster. The increase in total output of the Kimberley economy is estimated to be $22m, with a total of 127 jobs supported in the broader economy.

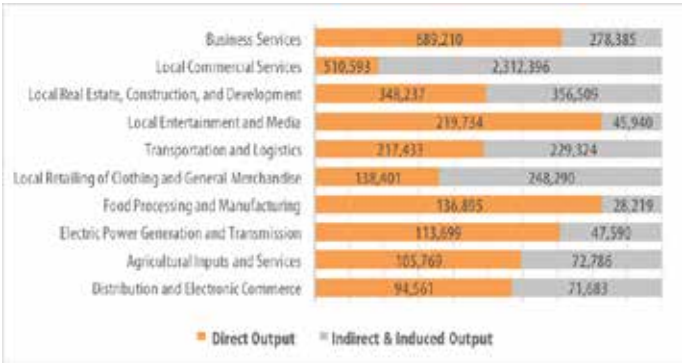
Figure 135. Hospitality and Tourism 10% increase impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$14m	$8m	$22m
GVA ($)	$7m	$5m	$12m
Exports ($)	$9m	-	$9m
Employment	105	22	127

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Hospitality and Tourism in the Kimberley were analysed and the approximate indirect and induced impact on their output was calculated.

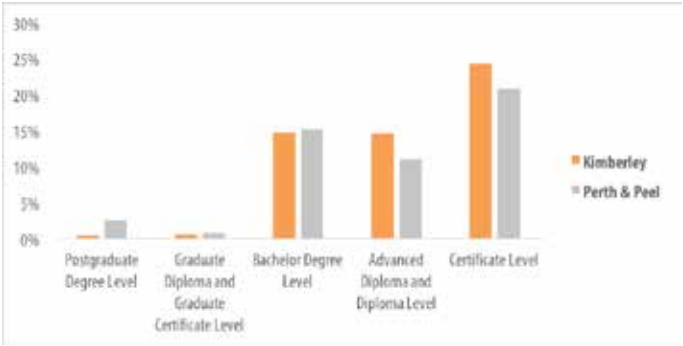
Figure 136. Input clusters to Hospitality and Tourism



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 1,053 with an average salary of $44,000, slightly higher than the Perth & Peel average of $41,000. Education level within the industry is similar to that of Perth & Peel with only 32% having obtained an advanced diploma or higher Figure 137.

Figure 137. Hospitality and Tourism level of education



Source: Pracsys 2016, ABS Census 2011

The top 2 fields of study for the Kimberley were the same as Perth & Peel, although Kimberley had a lower proportion of employed persons with a background in Management and Commerce.

Figure 138. Hospitality and Tourism field of education

Source: Pracsys 2016, ABS Census 2011

11.1.2 Water Transportation

Water Transportation is a Traded cluster with current total output of approximately $70 m in the Kimberley Region.

The analysis provided estimated total output and employment multipliers of 1.67 and 1.92 within the Kimberley region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $7m in the total output of the Water Transportation cluster, equating to 10 additional jobs. Using multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster Figure 139. The increase in total output of the Kimberley economy is estimated to be $12m, with a total of 22 jobs supported in the broader economy.

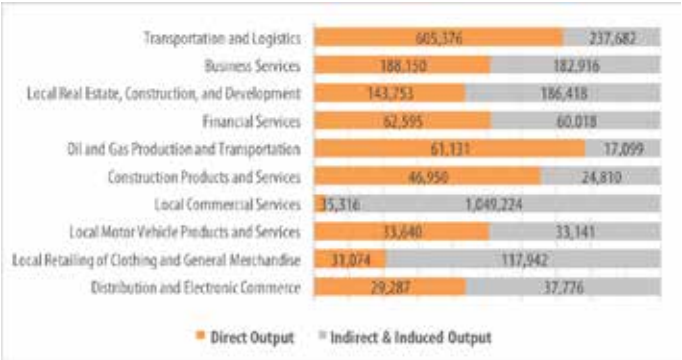
Figure 139. Water Transportation impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$7m	$5m	$12m
GVA ($)	$3m	$2m	$5m
Exports ($)	$5m	-	$5m
Employment	10	12	22

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Water Transportation in the Kimberley were analysed and the approximate indirect and induced impact on their output was calculated.

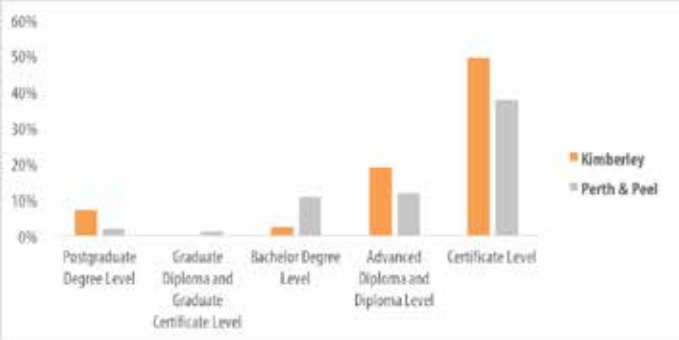
Figure 140. Input clusters to Water Transportation



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 99 with an average salary of $81,000, higher than the Perth & Peel average of $71,000. Education levels within the cluster are differ on average to those of Perth & Peel with 7% having Post Graduate Degrees compared to 2% in the benchmark area.

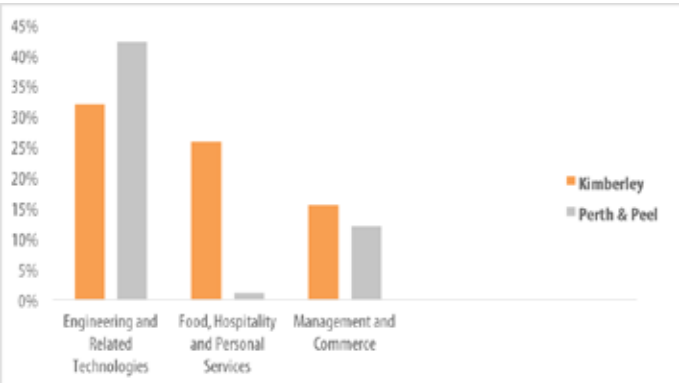
Figure 141. Water Transport level of education



Source: Pracsys 2016, ABS Census 2011

The fields of study for Water Transportation were concentrated in three subject matters in the Kimberley. A notable difference with Perth & Peel was the high proportion of employed persons with a background in Food, Hospitality and Personal Services.

Figure 142. Water Transportation field of education - Kimberley



Source: Pracsys 2016, ABS Census 2011

11.2 COMBINED EMPLOYMENT AND OUTPUT

The potential combined effect of hypothetical 10% centre level growth scenarios for the selected clusters totals 197 jobs. Similarly, the total combined output contribution is approximately $42m (Figure 143).

Figure 143. Case study impact relative to Region and State

	Employment		Output	
Case Study Contribution	149	-	$34m	-
Regional Total	15,000	0.99%	$11,000m	0.31%
State Total	980,000	0.02%	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

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APPENDIX 2: SOUTH WEST REGIONAL RESULTS

12.1 REGIONAL CASE STUDY COMPARISON

The following results are based on analysis of the Bunbury case study conducted at the regional level.

12.1.1 Hospitality and Tourism

Hospitality and Tourism is a Traded cluster with current total output of approximately $308 m in the South West Region.

The analysis provides estimated total output and employment multipliers of 1.84 and 2.56 within the South West region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $3m in the total output of the Hospitality and Tourism cluster, equating to 166 additional jobs. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster. The increase in total output of the South West economy is estimated to be $57m, with a total of 259 jobs supported in the broader economy.

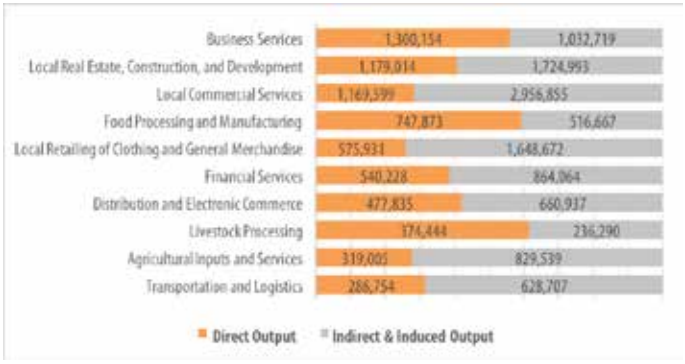
Figure 144. Hospitality and Tourism impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$14m	$8m	$22m
GVA ($)	$7m	$5m	$12m
Exports ($)	$9m	-	$9m
Employment	220	22	242

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Hospitality and Tourism in the South West were analysed and the approximate indirect and induced impact on their output was calculated.

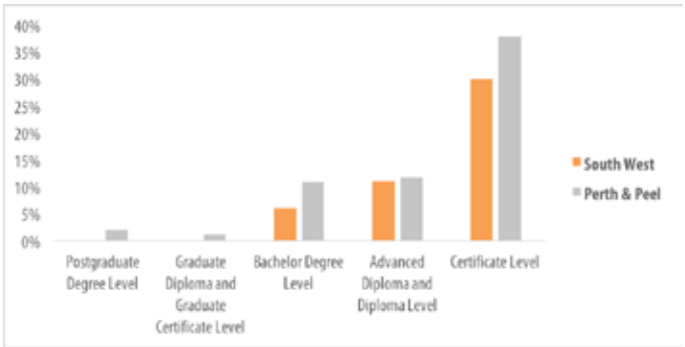
Figure 145. Input clusters to Hospitality and Tourism



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 2,174 with an average salary of $33,000, lower than the Perth & Peel average of $41,000. Education level within the cluster is lower than that of Perth & Peel with 11% having obtained an advanced diploma or higher.

Figure 146. Hospitality and Tourism level of education



Source: Pracsys 2016, ABS Census 2011

Of the top fields of study for the South West four were the same as Perth & Peel, although each had a lower proportion in the South West Region.

Figure 147. Hospitality and Tourism field of education – South West

Source: Pracsys 2016, ABS Census 2011

12.1.2 Water Transportation

Water Transportation is a Traded cluster with current total output of approximately $22 m in the South West Region.

The analysis provided estimated total output and employment multipliers of 1.68 and 2.29 within the South West region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $2m in the total output of the Water Transportation cluster, equating to 8 additional jobs. Using multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster. The increase in total output of the South West economy is estimated to be $4 m, with a total of 13 jobs supported in the broader economy.

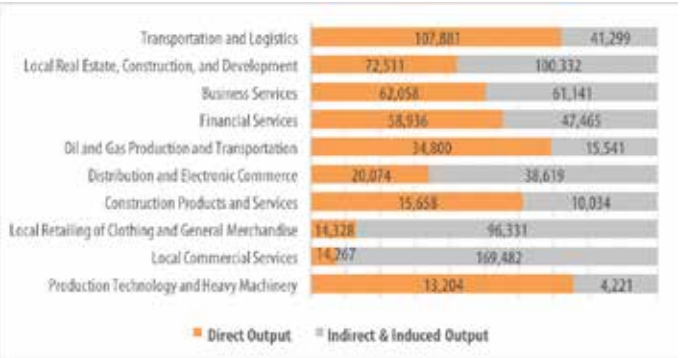
Figure 148. Water Transportation 10% increase impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$2m	$2m	$4m
GVA ($)	$1m	$1m	$2m
Exports ($)	$100,000	-	$100,000
Employment	8	5	13

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Water Transportation in the South West were analysed and the approximate indirect and induced impact on their output was calculated (Figure 149).

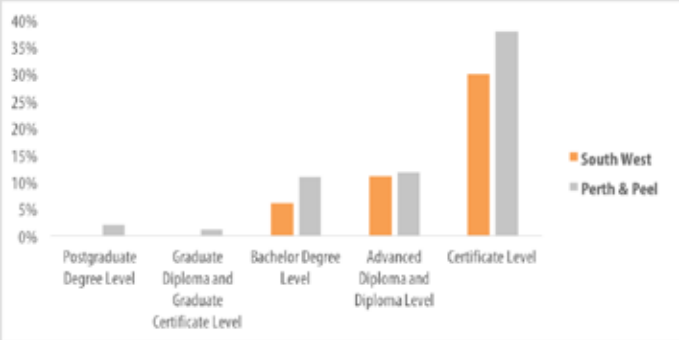
Figure 149. Water Transportation



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 77 with an average salary of $67,000, lower than the Perth & Peel average of $71,000. Education levels within the cluster are lower on average to those of Perth & Peel with 6% having achieved Bachelor Degrees or higher compared to 14% in the benchmark area.

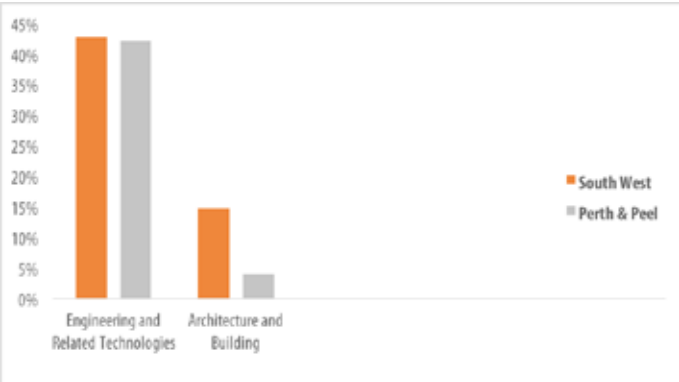
Figure 150. Water Transport level of education



Source: Pracsys 2016, ABS Census 2011

The fields of study for Water Transportation were concentrated in two subject matters in the South West. A notable difference with Perth & Peel was the higher proportion of employed persons with a background in Architecture and Building (15%) (Figure 151).

Figure 151. Water Transportation field of Education – South West



Source: Pracsys 2016, ABS Census 2011

12.2 COMBINED EMPLOYMENT AND OUTPUT

The potential combined effect of hypothetical 10% centre level growth scenarios for the three clusters totals 637 jobs. Similarly, the total combined output contribution is approximately $93 million. These results are compared to total regional and state employment and output in Figure 152.

Figure 152. Case study impact compared to Region and State

	Employment		Output	
Case Study Contribution	255	-	$26m	-
Regional Total	60,000	%0.43	$37,000m	0.07%
State Total	980,000	%0.03	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

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APPENDIX 3: MID WEST RESULTS

13.1 REGIONAL CASE STUDY COMPARISON

The following results are based on analysis of the Geraldton case study conducted at the regional level.

13.1.1 Agriculture Inputs and Services

Agriculture Inputs and Services is a Traded cluster with current total output of approximately $473m in the Mid West Region.

The analysis provides estimated total output and employment multipliers of 1.57 and 1.52 within the Mid West region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $47m in the total output of the Agriculture Inputs and Services cluster, equating to 180 additional jobs. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster (Figure 153). The increase in total output of the Mid West economy is estimated to be $74 m, with a total of 270 jobs supported in the broader economy.

Figure 153. Agriculture Inputs and Services impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$47m	$27m	$74m
GVA ($)	$21m	$14m	$35m
Exports ($)	$33m	-	$33m
Employment	180	90	270

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

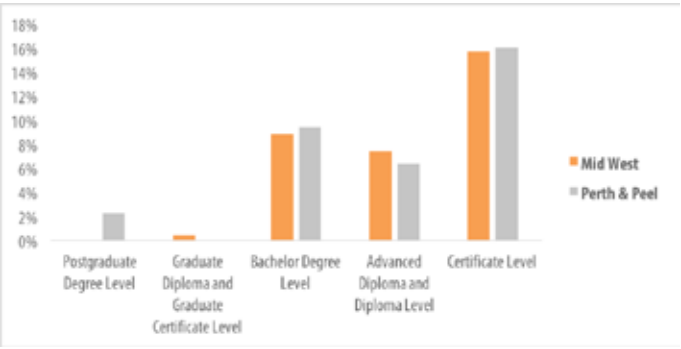
The top 10 secondary clusters that provide input into Agriculture Inputs and Services in the Mid West were analysed and the approximate indirect and induced impact on their output was calculated.

Figure 154. Input clusters to Agriculture Inputs and Services

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 1,778 with an average salary of $38,000, lower than the Perth & Peel average of $46,000. Education level within the cluster is similar to that of Perth & Peel with 9% having obtained Bachelor Degree or higher compared to 11% in the benchmark.

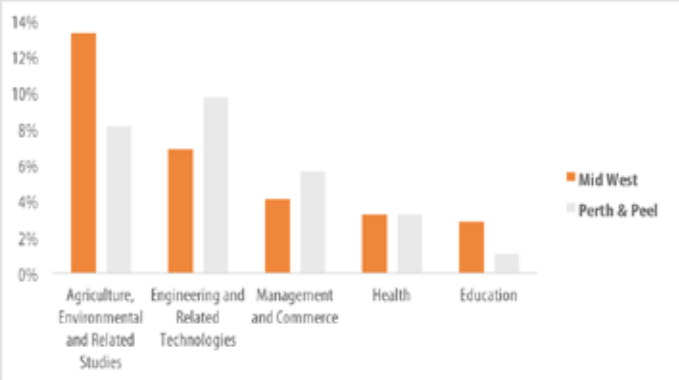
Figure 155. Agriculture Inputs and Services level of education



Source: Pracsys 2016, ABS Census 2011

Of the top 5 fields of study for the Mid West four were the same as Perth & Peel, with similar proportions in each region.

Figure 156. Agriculture Inputs and Services field of education – Mid West



Source: Pracsys 2016, ABS Census 2011

13.1.2 Fishing and Fishing Products

Fishing and Fishing Products is a Traded cluster with current total output of approximately $99m in the Mid West.

The analysis provided estimated total output and employment multipliers of 1.44 and 1.50 within the Mid West region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $10 m in the total output of the Fishing and Fishing Product cluster, equating to 18 additional jobs. Using multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster. The increase in total output of the Mid West economy is estimated to be $14 m, with a total of 32 jobs supported in the broader economy.

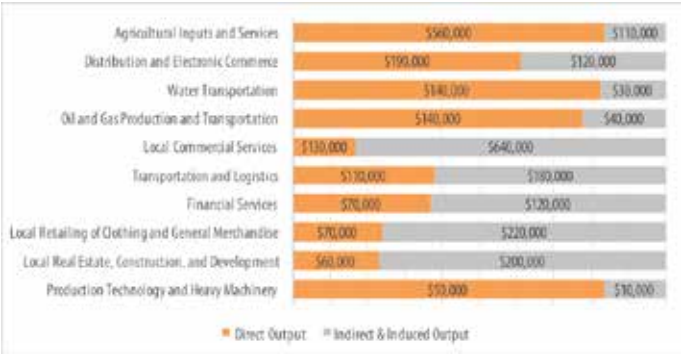
Figure 157. Fishing and Fishing products impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$10m	$4m	$14m
GVA ($)	$5m	$2m	$7m
Exports ($)	$9m	-	$9m
Employment	18	14	32

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Fishing and Fishing Products in the Mid West were analysed and the approximate indirect and induced impact on their output was calculated.

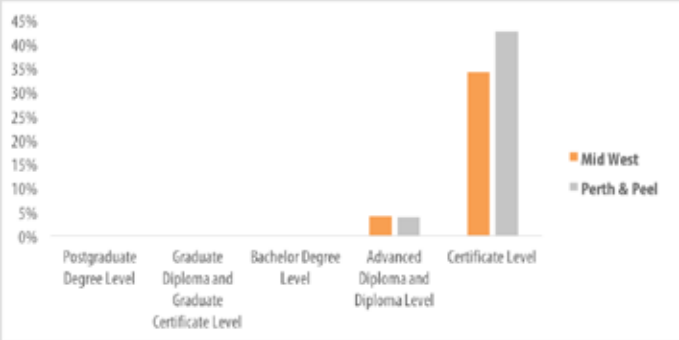
Figure 158. Input clusters to Fishing and Fishing Products



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 176 with an average salary of $67,000, higher than the Perth & Peel average of $57,000. Education level within the industry is lower in both the Mid West and Perth and Peel with no persons in the Regions having a Bachelor Degree or higher.

Figure 159. Fishing and Fishing Products level of education



Source: Pracsys 2016, ABS Census 2011

The top 2 fields of study for Fishing and Fishing Products were the same between the South West and Perth & Peel, with similar proportions. There was a greater diversity of backgrounds in the Mid West than in the benchmark.

Figure 160. Fishing and Fishing Products field of education

Source: Pracsys 2016, ABS Census 2011

13.1.3 Water Transportation

Water Transportation is a Traded cluster with current total output of approximately $27 m in the Mid West Region.

The analysis provided estimated total output and employment multipliers of 1.76 and 2.11 within the South West region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $3 m in the total output of the Water Transportation cluster, equating to 19 additional jobs. Using multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster. The increase in total output of the Mid West economy is estimated to be $5m, with a total of 26 jobs supported in the broader economy.

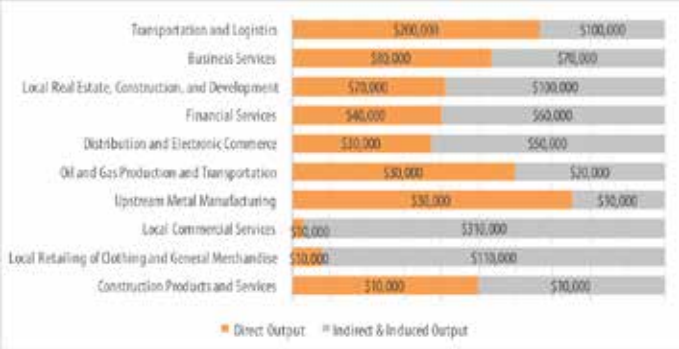
Figure 161. Water Transportation impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$3m	$2m	$5m
GVA ($)	$1m	$1m	$2m
Exports ($)	$20,000	-	$20,000
Employment	19	7	26

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Water Transportation in the Mid West were analysed and the approximate indirect and induced impact on their output was calculated.

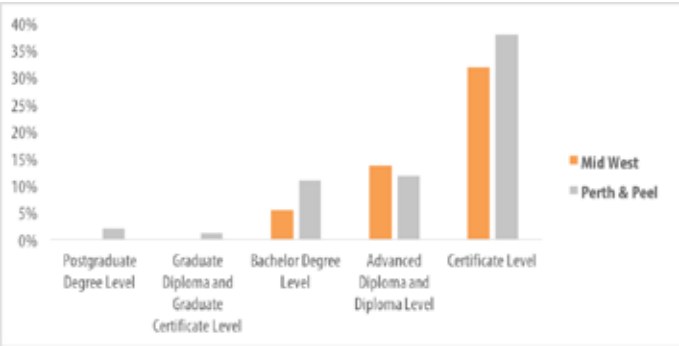
Figure 162. Input clusters to Water Transportation



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 191 with an average salary of $77,000, higher than the Perth & Peel average of $71,000. Education levels within the cluster are lower on average to those of Perth & Peel with 5% having achieved Bachelor Degrees or higher compared to 14% in the benchmark area.

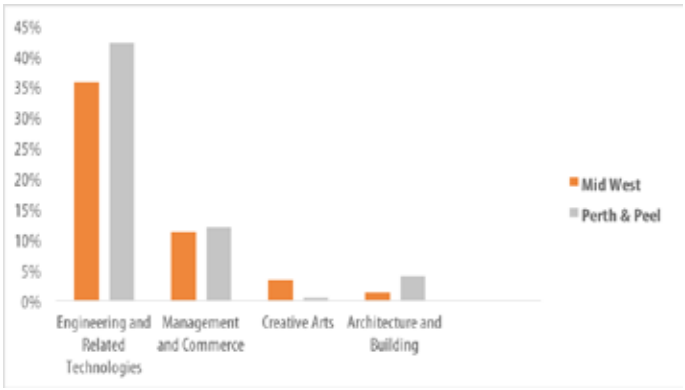
Figure 163. Water Transport level of education



Source: Pracsys 2016, ABS Census 2011

The fields of study for Water Transportation were similar between the Mid West and Perth & Peel, with the only notable difference being a lower proportion of Engineering and Related Technologies in the Mid West.

Figure 164. Water Transportation field of education – Mid West



Source: Pracsys 2016, ABS Census 2011

13.2 COMBINED EMPLOYMENT AND OUTPUT

The potential combined effect of hypothetical 10% centre level growth scenarios for the three clusters totals 328 jobs. Similarly, the total combined output contribution is approximately $93 million. These results are compared to total regional and state employment and output in Figure 165.

Figure 165. Case Study Impact relative to Region and State

	Employment		Output	
Case Study Contribution	328	-	$93m	-
Regional Total	23,000	0.01%	$16,700	0.55%
State Total	980,000	negligible	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

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APPENDIX 4: ESPERANCE GOLDFIELDS REGIONAL RESULTS

14.1 REGIONAL CASE STUDY COMPARISON

The following results are based on analysis of the Kalgoorlie case study conducted at the regional level.

14.1.1 Hospitality and Tourism

Hospitality and Tourism is a Traded cluster with current total output of approximately $112 m.

The analysis provided estimated total output and employment multipliers of 1.47 and 1.30 within the Goldfields region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $11m in the total output of the Hospitality and Tourism cluster, equating to 76 additional jobs. Using multipliers it was possible to measure the indirect and induced impacts of the additional output from the cluster. The increase in total output of the Goldfields economy is estimated to be $16m, with a total of 93 jobs supported.

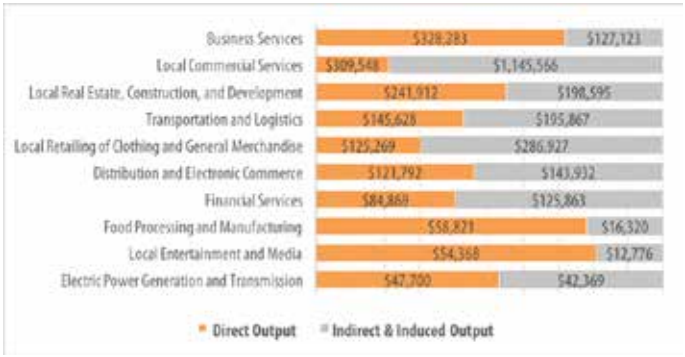
Figure 166. Hospitality and Tourism impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$11m	$5m	$16m
GVA ($)	$5m	$3m	$8m
Exports ($)	$5m	-	$5m
Employment	76	17	93

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Hospitality and Tourism in the Goldfields were analysed and the approximate indirect and induced impact on their output was calculated.

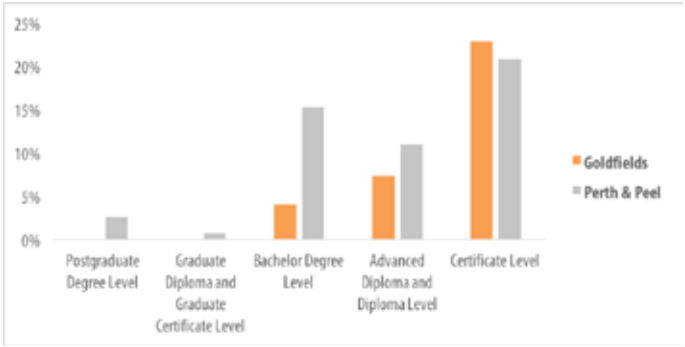
Figure 167. Input clusters to Hospitality and Tourism



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 756 with an average salary of $35,000, slightly lower than the Perth & Peel average of $41,000. Education level within the industry is lower on average than that of Perth & Peel with only 4% having obtained bachelor degrees or higher.

Figure 168. Hospitality and Tourism level of education



Source: Pracsys 2016, ABS Census 2011

The top 5 fields of study for the Goldfields were the same as Perth & Peel, with a slight variation in order, although most were lower in proportion than the benchmark.

Figure 169. Hospitality and Tourism field of education – Goldfields

Source: Pracsys 2016, ABS Census 2011

14.1.2 Local Hospitality Establishments

Local Hospitality Establishments is a Local cluster with current total output of approximately $118m.

The analysis provided estimated total output and employment multipliers of 1.52 and 2.21 within the Goldfields region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $12m in the total output of the Local Hospitality Establishments cluster, equating to 95 additional jobs. Using multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster. While there could be significant benefits to a 10% increase in this cluster, the local nature of the cluster indicates that significant population growth would be needed to sustain increased levels of output.

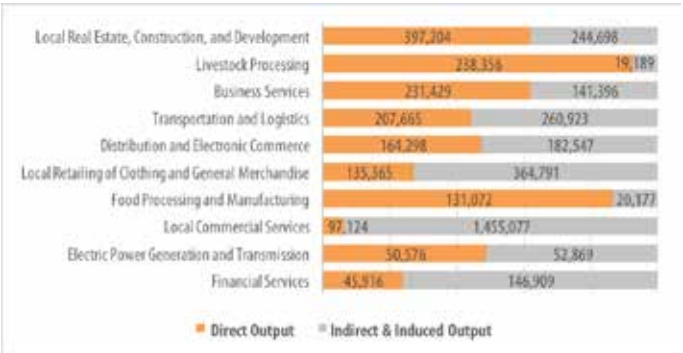
Figure 170. Local Hospitality Establishments impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$12m	$6m	$18m
GVA ($)	$6m	$3m	$9m
Exports ($)	$400,000	-	$400,000
Employment	95	21	116

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Local Hospitality Establishments in the Goldfields were analysed and the approximate indirect and induced impact on their output was calculated.

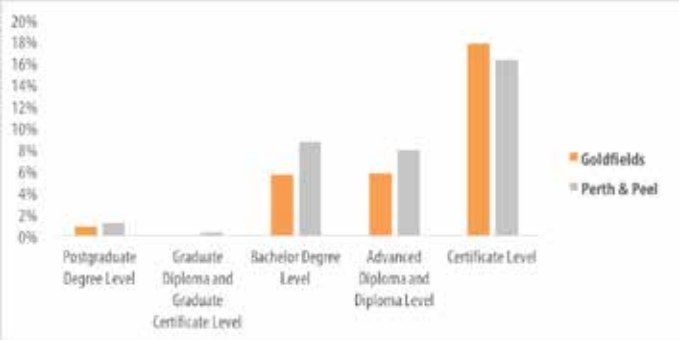
Figure 171. Input clusters to Local Hospitality Establishments



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 952 with an average salary of $33,000, higher than the Perth & Peel average of $25,000. Education level within the industry is slightly lower on average than that of Perth & Peel with 7% having obtained bachelor degrees or higher compared to 10%.

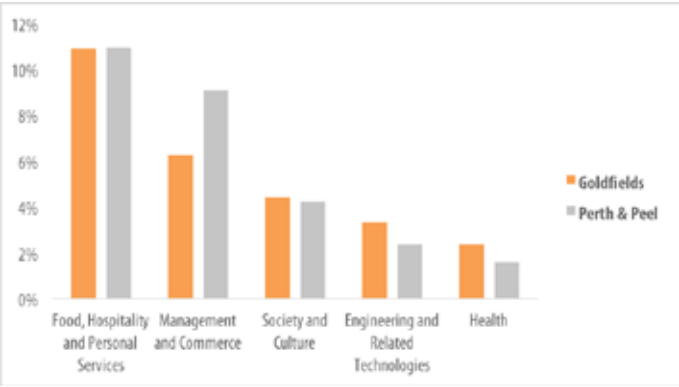
Figure 172. Local Hospitality Establishments level of education



Source: Pracsys 2016, ABS Census 2011

The top 5 fields of study for Local Hospitality Establishments were the same for Goldfields and Perth & Peel, with similar proportions, apart from Management and Commerce which was slightly higher in Perth and Peel.

Figure 173. Local Hospitality Establishments field of education – Goldfields



Source: Pracsys 2016, ABS Census 2011

14.1.3 Local Retailing of Clothing and General Merchandise

Local Retailing of Clothing and General Merchandise is a Local cluster with current total output of approximately $246m.

The analysis provided estimated total output and employment multipliers of 1.55 and 1.24 within the Goldfields region, respectively. Through an increase of 10% in the total output within this cluster there would be an estimated direct increase of $38 m in the total output of the Local Retailing of Clothing and General Merchandise cluster, equating to 54 additional jobs. Using multipliers it was possible to estimate the indirect and induced impacts of the additional output from the cluster. While there could be significant benefits to a 10% increase in this cluster, the local nature of the cluster indicates that significant population growth would be needed to sustain increased levels of activity.

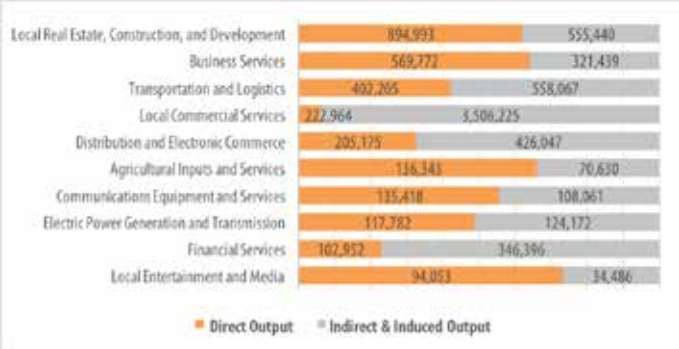
Figure 174. Local Retailing of Clothing and General Merchandise impact

Economic Metric	Direct	Indirect and Induced	Total
Output ($)	$26m	$13m	$38m
GVA ($)	$14m	$7m	$21m
Exports ($)	0	-	0
Employment	54	46	100

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

The top 10 secondary clusters that provide input into Local Retailing of Clothing and General Merchandise in the Goldfields were analysed and the approximate indirect and induced impact on their output was calculated.

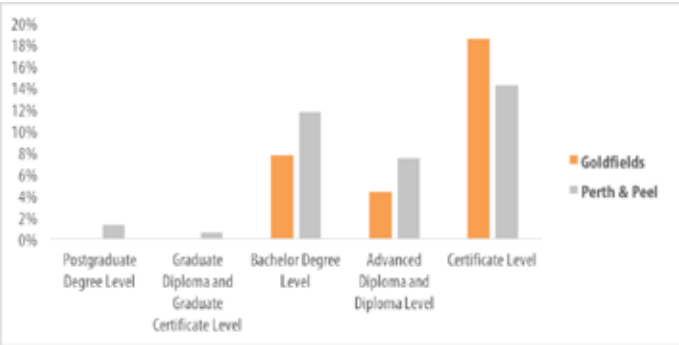
Figure 175. Input clusters to Local Retailing of Clothing and General Merchandise



Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)

According to ABS Census total employment in the cluster is approximately 539 with an average salary of $32,000, higher than the Perth & Peel average of $29,000. Education levels within the cluster are lower on average than that of Perth & Peel with 8% having obtained bachelor degrees or higher compared to 14%.

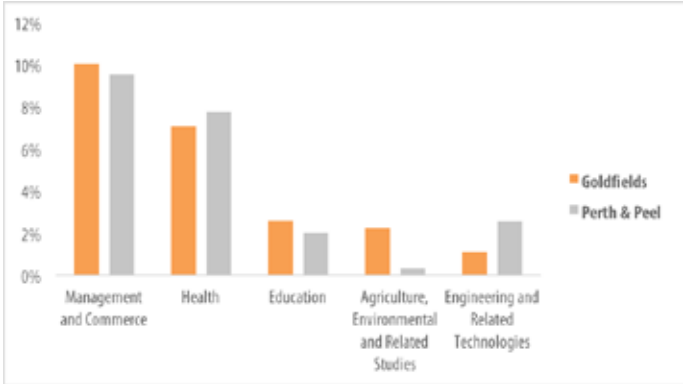
Figure 176. Local Retailing of Clothing and General Merchandise level of education



Source: Pracsys 2016, ABS Census 2011

The top 2 fields of study for Local Retailing of Clothing and General Merchandise were the same for Goldfields and Perth & Peel, with similar proportions.

Figure 177. Local Retailing of Clothing and General Merchandise field of education – Goldfields



Source: Pracsys 2016, ABS Census 2011

14.2 COMBINED EMPLOYMENT AND OUTPUT

The potential combined effect of hypothetical 10% centre level growth scenarios for the three clusters totals 309 jobs. Similarly, the total combined output contribution is approximately $72 million. These results are compared to total regional and state employment and output in.

Figure 178. Case study impact relative to Region and State

	Employment		Output	
Case Study Contribution	309	-	$72m	-
Regional Total	29,000	1.06%	$25,900m	0.3%
State Total	980,000	0.03%	$709,000m	negligible

Source: Pracsys 2016, ABS Census 2011, ABS 2012 (Catalogue 5204)