# Is the Last Plane Out of Sydney Almost Gone?

## Aviation & Regional Development in NSW

Bachelor of Planning Thesis Project | 3416727 | Tim Smith

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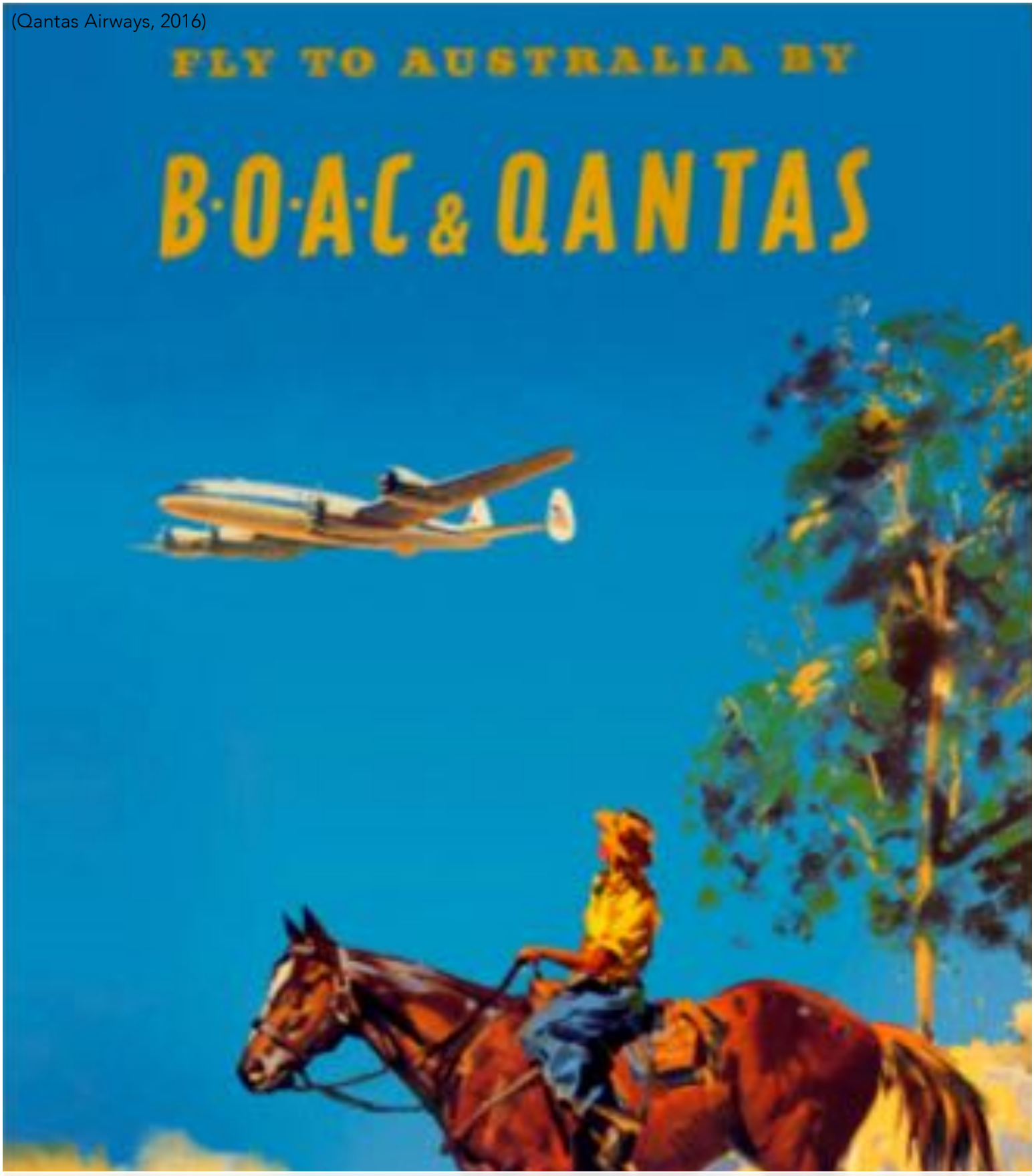
## Abstract

Capital city connections to regional and remote areas of New South Wales provide accessibility to countless services and facilitate connections between producers and global markets. However, regulatory and market driven factors have led to a recent destabilisation of the regional aviation scene, contributing to termination of some long established routes and a lack of confidence in route profitability by carriers. This has in turn had a perceived impact on economic certainty and local quality of life in some of Australia's most vulnerable areas. This research investigates the connection between intrastate Regular Public Transport air services, and the economic and social performance of regional centres. The study is informed by literature on the impact of transport in regional areas and the planning significance of such connectivity, as well as the current economic environment and government policies. A quantitative analysis of relationships between passenger flows and regional economic indicators is reported with a range of in-depth interviews also informing the findings. The thesis argues that for the continued wellbeing of regional New South Wales, increased political and systemic recognition of the varied benefits of aviation services is essential in order to avoid continued service decline, market failure and regional disinvestment.

## Key Acronyms

| | |
|---|---|
| ABS | Australian Bureau of Statistics |
| ACT | Australian Capital Territory |
| AT Act | *Air Transport Act 1964* |
| CASA | Civil Aviation Safety Authority |
| EU | European Union |
| FIFO | Fly In Fly Out |
| IATA | International Air Transport Association |
| KSA | Sydney Kingsford Smith Airport |
| JRPP | Joint Regional Planning Panel |
| LCC | Low Cost Carrier |
| LGA | Local Government Area |
| MP | Member of Parliament |
| NSW | New South Wales |
| PWC | Price Waterhouse Coopers |
| PT Act | *Passenger Transport Act 2014* |
| TfNSW | Transport for New South Wales |
| RAAA | Regional Aviation Association of Australia |
| Rex | Regional Express Airlines Pty Ltd |
| RPT | Regular Public Transport |
| UCL | Urban Centres and Localities Level Data |
| UNSW | University of New South Wales |
| WSA | Western Sydney Airport |




(Qantas Airways, 2016)

# 1.0 Introduction

## 1.1 Problem Setting

At the core of modern urban Australia is a connection to its regional heartlands, and transport linkages to these areas have helped to develop and shape the Australian identity. Transport connections foster this relationship, providing vital services to facilitate economic and social links between some of Australia's most isolated areas and larger urban coastal centres. The origins of the New England Highway in connecting the wool stores of regional New South Wales (NSW) or the enabling of the first Ghan Railway service in 1951 from Adelaide to Darwin (Great Southern Railway 2016) demonstrate the way in which transport infrastructure has shaped the function and form of Australia's remote communities.

In an aviation context, after undertaking a 51 day journey in 1919 by car from Katherine in the Northern Territory to Longreach in remote Queensland, W. Hudson Fysh stated that he was *"convinced of the important part aircraft would eventually play in transporting mail, passengers and freight over the sparsely populated and practically roadless areas of western and northern Queensland and North Australia"* (Qantas Airways 2016). Fysh later went on to found and establish Qantas Airways, an airline that has become symbiotic with the Australian identity.

Thought circles have acknowledged significant social and economic benefits of providing transport to regional areas (Knowles, Shaw et al. 2008), as the provision of transport facilitates access to larger markets and the salability of higher numbers of goods and services produced. Similarly, regional transport linkages enable access to culture, health, education and governance services to all members of a society (Halpern and Bråthen 2011). Regional airlines are able to cover the most difficult of these services, connecting geographically isolated communities with metropolitan centres at an unmatched speed and efficiency for the transport of persons and high value cargo (Baker and Donnet 2012). Over time, this leads to a strong relationship being developed between regions and centres, and fosters an environment which depends on Regular Public Transport (RPT) air services to deliver this relationship. The social benefit of services also cannot be overlooked in this discussion, with such flights playing an important role in the social inclusion and development of regional communities (Merket 2013).

A period of widespread legislative and political change was initiated in the 1980s and 1990s, including the deregulation of many flight routes through amendments to the *Air Transport Act 1964*, additional restrictions around the operations of Sydney Airport, as well as privatisation of major airports / airlines and dedication of most regional airports to Councils (Bureau of Transport and Communications Economics 1995). This represented an unprecedented shakeup of the industry, and has resulted in strong ongoing debate as to whether the changes have resulted in long term benefits or losses to regional NSW.

On one hand, many official government sources have reported long term improvements in the quality of service across NSW (Bureau of Transport and Communications Economics 1995, Colless 2014, Department of Transport 2014, Department of Infrastructure and Regional Development 2015), noting an improvement in the average fares, a maintenance of state wide seat capacity, a lack of opposition from local authorities and stakeholders during policy consultation periods, and an improvement in on-time performance figures as evidence of the continued success of such a system.

However, other indicators have suggested that the market has not maintained the purported stability of the regional aviation sector, with regional airlines regularly going bankrupt in recent years (AAP General News Wire 2013), major airlines reducing regional capacity and frequency due to lack of revenue in a volatile unprofitable market (Virgin Australia 2016), and new airline players finding it difficult to provide profitable regional services to major airports (Regional Aviation Association of Australia 2013, Brederick 2016). This is especially apparent in volatile fringe markets, with a reduction in destinations across the state officially acknowledged (NSW Government 2007), and with some reports noting a 37% decrease in the number of destinations serviced by RPT routes in a relatively short 10 year period to 2014 (Colless 2014).

Regional communities are in many cases raising the issue of deteriorating regional service quality, with the Sydney Morning Herald reporting on the conditions of regional flights as recently as 17 October 2016. Moree GP Les Woollard was quoted in the article as stating that

*"to have a link to a major capital city from an isolated town is believably good and unbelievably sensible"*, but expressed concern that *"*[air] *services are disappearing to smaller towns. It makes life more difficult."* The importance of flights in this article are expressed as comparable to the *"lifeblood of the bush"*, however the condition of such services is confirmed as vulnerable in the current operating environment (O'Sullivan 2016).

If the current system is not working effectively to deliver the established social and economic benefits, this is of significant concern to the planning profession. Freestone (2009) notes the vital link between aviation planning and city / regional planning, and the social / economic benefits delivered by regional flights are no exception to this relationship. Accordingly, this study seeks to establish exactly what relationship exists between the impacts of aviation and the planning system in NSW.

This introductory chapter has been structured to initially outline the problem setting, as well as the justification for this research (Section 1.2). The problem statement, and five research objectives (Section 1.3), as well as the proposed methodological approach (Section 1.4) and connections between the proposed methodology and the research objectives (Section 1.5) have then been provided. Finally, a research disclaimer (Section 1.6) and an outline of the thesis structure (Section 1.7) complete the chapter.

## 1.2 Justification

There is a noticeable lack of literature detailing the link between the performance of regional economies and the condition of regional flight services. Looking more broadly, Maude (2004) identifies a lack of research into the larger issue of regional development in Australia, which could go some way to explaining a lack of research on this subject area.

This is not an issue endemic to Australia, with a noticeable gap in international literature on the roles and responsibilities of regional aviation, as well as global trends in terms of service capacity and certainty (Chi 2011). A vast majority of nationalities across the world do not require the provision of regional intrastate air services, due to a number of factors which can be briefly summarised as (1) countries insufficient in size to justify services, (2) countries of insufficient individual wealth to sustain services, or (3) countries having high quality alternative

transport options to render the use flight unnecessary. Each of these reasons have been further explored in Chapter 2. In some cases such as within the European Union (EU), policy has been used to disincentivise regional aviation transport over other modes (European Union 2011).

Kirkby (2016) identifies a significant disconnect between various levels of governance and regional bodies on this issue, which has to date left the significant social and economic benefits of regional aviation largely unacknowledged through governance. Therefore, in light of data being available, and the issue of deteriorating service quality being noticeably present in government documentation and academic literature, it appears that the benefits of regional services are great in a planning sense, but the continued certainty of such services is not ensured.

## 1.3 Problem Statement and Research Objectives

This thesis seeks to answer the following research question:

> *Does the current regulatory system adequately provide for the operations of regional flights in NSW?*

Given the uncertainty surrounding the changing environment of regional aviation services out of Sydney Kingsford Smith Airport (KSA) since 1996, the continued provision of such services to some centres in NSW is currently unclear, and many centres have lost services without later re-engagement with regional flights (Transport for NSW, 2016). The social and economic benefits of such services have also only been partially acknowledged in academic literature and government documentation, and this thesis aims to unpack whether the existing system of laws and regulations across various government legislation is sufficient to acknowledge these benefits.

The following research objectives have been proposed which will answer the overarching questions raised by this study:

1. Investigate the social and economic benefits arising from the provision of aviation services to regional communities.
2. Identify the broader network flows across NSW in an aviation and economic context.

3. Evaluate the merit and value of such services on a social and economic basis.
4. Examine the relationship between aviation patronage numbers and economic performance in NSW between 1996 and 2011.
5. Highlight areas of future concern in the continued provision of services, and determine potential solutions to arrest any decline in the assurance of regional service provision continuation.

## 1.4 Methodological Approach / Data Sources

Ward (2014) notes that the methodology of a built environment dissertation research project needs to be formed around the key questions which are to be resolved. A combination of data sources have been proposed as part of the methodology for this project. This approach is unique in that it enables the research to draw on the benefits of both quantitative and qualitative analysis (Boyce and Neale 2006). Specifically, this project will make use of three research methods, being a review of existing academic and relevant policy literature, a comparative statistical analysis; and a series of in-depth interviews. Each method is described in further detail below.

### Review of Literature

A review of academic literature provides a first step in the theoretical understanding and discussion of the issue. The literature review establishes the major authors in the subject areas of transport and regional development, use of regional aviation and transport flows analysis. In doing so, this review has drawn upon journals such as *Australian Planner, Geographical Research*, *International Planning Studies*, *Journal of Air Transport Management*, *Journal of Planning Literature*, *Journal of Regional Science*, *Journal or Rural Studies*, *Journal of Transport Geography*, and *Urban Studies*. The intention of this literature review is to identify gaps in the existing research, and has provided the framework for the remainder this project.

Additionally, policy analysis has been brought into the methodology of this project, in order to establish the views of various government bodies on the issue at hand. Specifically, this includes a review of the various reports and minutes prepared in accordance with the NSW State Working Aviation Group, the Air Transport Counsel, the Department of Planning and

Environment, Transport for NSW, the Regional Aviation Association of Australia (RAAA) and various local Councils.

### Comparative Statistical Analysis

A key part of this research project will be a comparative analysis between the Australian Bureau of Statistics (ABS) census data for the 1996, 2001, 2006 and 2011 Australian Census years, and the Transport for NSW 'Electronic Publication E2015-18 Intrastate Aviation Summary'. This comparative analysis will look at the passenger transport flow changes between a series of indicative regional aviation flight routes in NSW, and compare these to key economic indicators for each selected regional centre. As part of this process, any statistically significant relationship between the datasets will be identified. Three indicators have been selected to explore the statistical impact of aviation patronage, being base population change, unemployment rate change, and household median weekly income change.

Several different scales were contemplated as part of this project methodology, with each tested to determine their accuracy. Specifically, the Urban Centres and Localities (UCL) level data standardised under the 2006 Australian Census, an assumed catchment area of each airport, measured at the SA2 data level, and Local Government Area (LGA) level data were all contemplated. An indicative map demonstrating the geographical scale of each of these has been provided in **Figure 1.01**. Ultimately, it was determined for the reasons outlined below that LGA level data was most suitable for the quantitative analysis contained within this project.


**Figure 1.01 –** Comparison of UCL, LGA and Catchment level data (Source: Author/Google Maps)

The initially preferred scale for airport data measurement was at the Urban Centres and Localities (UCL) level, which is a census data level measured at an urban scale across each regional centre. However, this method of data selection proved unsuitable for two primary reasons. Initially, UCL data is considered by the ABS to comprise *"Australian population centres with populations exceeding 200 persons"* (Australian Bureau of Statistics 2011). This data measurement is based on *persons* and not on *geographical area*, which creates issues in terms of data consistency from year to year. In application, it was uncovered that this measurement of data was unsuitable by virtue of the dataset changing without specific publically available rationale provided by the ABS, which in turn made assessment of the data at an NSW level near impossible. Additionally, the intention of this project is to measure the benefits delivered by regional flights to *regional areas*, and the use of UCL data analysis would have only been able to paint the picture of *regional centre* performance. This meant that by default, data analysis would only be able to indicate the closest centre performance, and would fail to capture larger trends throughout regional NSW.

Airport catchment was also considered as an alternative option for consideration in the proposed data analysis, being a geographical distance from an airport that people were willing to travel for a service. This option was found to be difficult in a regional context for a

number of reasons, which rendered it unsuitable for this research. Initially, there is insufficient data regarding what exactly the catchment of each airport is. What data does exist is in commercially sensitive in nature, such as commercial booking patterns, or frequent flyer program analysis. Additionally, airport catchments vary from airport to airport, and are highly dependent on the nature of the regions themselves in which they are located. The ambiguity of what a region constitutes has been discussed further in Chapter 2. The use of a standardised measurement of 'airport catchment' is inaccurate, as it would fail to capture the geographic, economic and opportunity cost factors which generally define an airport catchment in application (Brederick 2016, Lodge 2016).

Ultimately, the measurement of data at an LGA level was selected for this project as the basis for economic data measurement. This was not initially the preferred unit of data measurement, due to concerns surrounding the reliability of political boundaries in data measurement. However, in application, the use of LGA based data facilitated the delivery of data consistency over a longer time period than any other geographical scale, with measurements back to 1996 possible under this scale. Additionally, Airports and Councils have both been historically positioned to service one major traditional town. Essentially, the reasoning behind this choice is the historic nature of regional Australian airports having been built to service one specific town, which is reflected in the geographic distribution of major airports (Brown and Sherrard 1951, Stevens, Baker et al. 2007). This historical pattern has meant that each airport surveyed is also in the same town as the Council administration, and both are generally located close to the centre of the LGA. It is also important to note that it is historically the Council who act as the body for the administration of airports and the provision of services, and accordingly it is appropriate for data to be measured in a geographical scale comparable to the administrative scale of the body which controls the airport.

However, in order to ensure the reliability of the data at hand, the following rules were established in the selection of LGAs for assessment:

- The LGA must have received services through each census date between 1996 and 2011.

- The LGA must not have an area of more than 20000km$^2$, to avoid situations where the size of the Council exceeds any possible airport catchment.
- The major urban area of the LGA must not comprise a centre which is located on both sides of a state boundary, in order to ensure that the data captured is not reflective of development in the neighbouring state.
- The LGA must not be located in any of the Metropolitan City, Central Coast, Hunter or Illawarra regions, due to the minimal impact that airports have in regions close to major centres (further discussed in **Chapter 3**).

The application of these rules resulted in the selection of LGAs in accordance with **Figure 1.02**. The vast majority of LGAs which were discounted were due to a lack of service maintenance throughout the full research period. This substantial loss in services has been separately discussed in **Chapter 4**. Additionally, the LGA of Coffs Harbour was also discounted from the calculations by virtue of a series of administrative boundary realignments in 2004 rendering the data that did exist over that area unreliable for the purposes of this assessment.

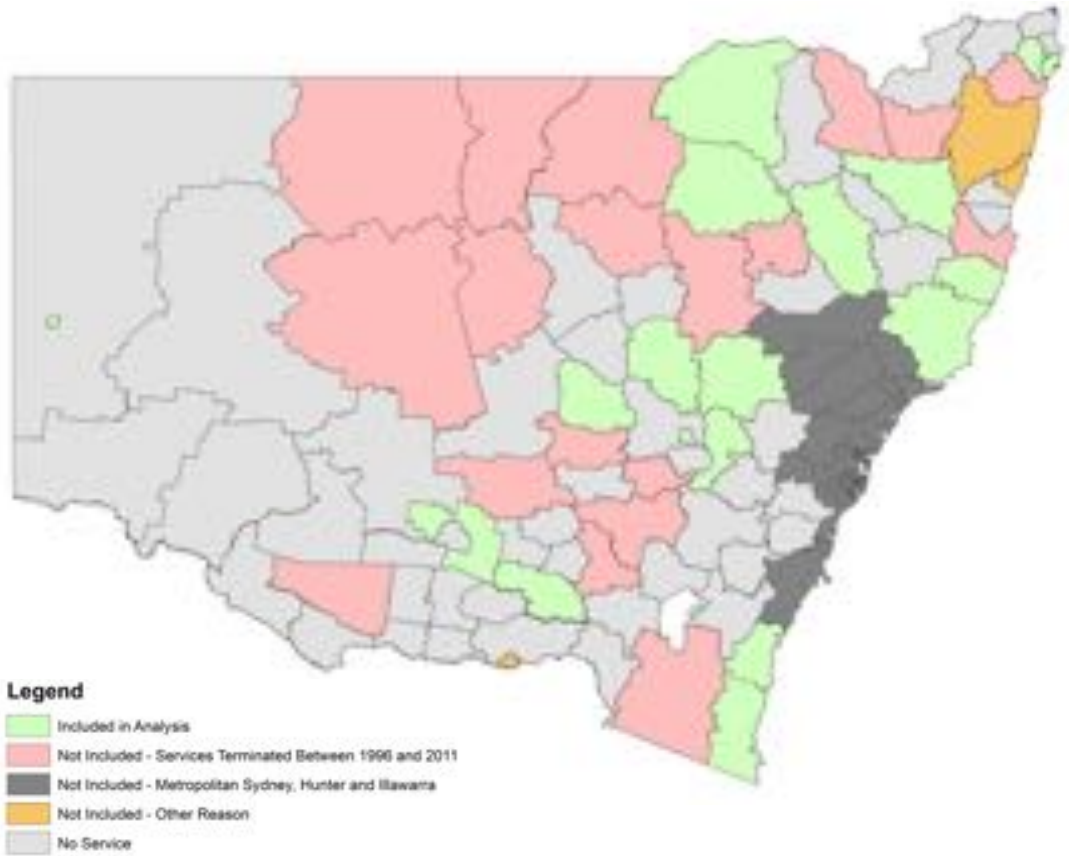



**Figure 1.02 –** Selection criteria for LGAs (Source: Author)

The nineteen LGAs which resulted from the above ruleset have been outlined in Table 1.01 below. It is important to note that due to this research seeking to identify growth / reduction in airport size on a percentage basis between census periods, the base size of the airport, patronage level or any nearby centre has not been considered under this assessment.

**Table 1.01 –** Selected Councils for assessment

| Council | NSW Region | Airport | IATA Code* |
|---|---|---|---|
| Armidale Regional Council | New England North West | Armidale | ARM |
| Ballina Shire Council | North Coast | Ballina | BNK |
| Bathurst Regional Council | Central West and Orana | Bathurst | BHS |
| Bega Valley Shire Council | South East Tablelands | Merimbula | MIM |
| Broken Hill City Council | Far West | Broken Hill | BHQ |
| Eurobodalla Shire Council | South East Tablelands | Moruya | MYA |
| Griffith City Council | Riverina Murray | Griffith | GFF |
| Lismore City Council | North Coast | Lismore | LSY |
| MidCoast Council | North Coast | Taree | TRO |
| Moree Plains Shire Council | New England North West | Moree | MRZ |
| Narrandera Shire Council | Riverina Murray | Narrandera | NRA |
| Narrabri Shire Council | New England North West | Narrabri | NAA |
| Orange City Council | Central West and Orana | Orange | OAG |
| Parkes Shire Council | Central West and Orana | Parkes | PKE |
| Port Macquarie-Hastings Council | North Coast | Port Macquarie | PQQ |
| Tamworth Regional Council | New England North West | Tamworth | TMW |
| Wagga Wagga Council | Riverina Murray | Wagga Wagga | WGA |
| Dubbo Regional Council | Central West and Orana | Dubbo | DBO |
| Mid Western Regional Council | Central West and Orana | Mudgee | DGE |

*International Air Transport Association

In order to ensure that the results of this study are reflective of the different regions within NSW, Table 1.02 confirms that the proportion of centres selected from each region are generally consistent with the total number of centres across each region of NSW have received RPT services in the past 20 years, within a 2% margin.

**Table 1.02 –** Division of Councils for assessment by region

| NSW Region | No. Centres Selected | % Centres Selected | % Total State Services |
|---|---|---|---|
| North Coast | 4 | 21% | 21% |
| New England North West | 4 | 21% | 19% |
| Central West and Orana | 5 | 26% | 24% |
| South East Tablelands | 2 | 11% | 13% |
| Riverina Murray | 3 | 16% | 17% |

| NSW Region | No. Centres Selected | % Centres Selected | % Total State Services |
|---|---|---|---|
| Far West | 1 | 5% | 7% |
| Total | 19 | 100% | 101%* |

*Additional percentage point a result of rounding to the nearest whole number.

The three selected economic indicators have been chosen in order to test a variety of different potential economic impacts arising from aviation patronage. Initially, population growth has been selected as one measurement unit, so as to reflect the notion of people and jobs following one another, as discussed by Hoogrsta (2005) and in Chapter 2 of this research. The improvement in population numbers of a centre would be indicative of improved economic performance by virtue of additional people in an area having an intrinsically positive impact on the level of economic activity that occurs within that area. This is confirmed by Becker *et al* (1999), as well as Huang *et al* (Huang and Xie 2013).

The second tested economic indicator is the unemployment rate, which is an established measurement of economic performance both within thought circles (Sheilds 1989) as well as regularly through Australian news sources and the Australian Government (Janda 2016). Thirdly, income per household change over the study period was selected, which represented the combined income of all persons in each household. This has been proven to indicate positive performance in the wider economy by Honkkila (2013), amongst others (e.g. Irawan, Hartono et al. 2012). The relevant schedules from each Census corresponding to the above indicators have been referenced in Table 1.03 below.

**Table 1.03 –** References for each census dataset

| Dataset | 1996 | 2001 | 2006 | 2011 |
|---|---|---|---|---|
| Population Growth | B01 | B01 | B01A | B01A |
| Unemployment Change | B18 | B22 | B36 | B37 |
| Household Income Change | B32 | B33 | B28 | B28 |

## In Depth interviews

Ten in-depth interviews have been conducted as part of this research project, with the primary intention of providing qualitative level insight to the quantitative comparison provided above. Boyce and Neal (2006) note that interviews are an appropriate mechanism of expanding on and providing context to quantitative data, and the structure of this research has been

selected in order to reflect this. It is noted that all interviews except for two were held in person on site, which included the researcher travelling to Brisbane, Cowra, Dubbo and Toowoomba. This was undertaken so as to obtain the best possible quality interview data in researching the project, as well as to experience first hand the nature of regional flight by comparison to other modes. Due to time constraints of Warrick Lodge and the airport interviewee in interview availability, their interviews were required to be held over the phone.

In each interview, the questions have been molded to the experience of each interviewee, and questions left at a generally broad level to encourage the interviewee to expand on the discussion at hand as they saw fit. The interview questions cover the following subject areas:

- Current analysis of the aviation / regional development systems.
- The relationship between regional airlines and various other stakeholders during the establishment and ongoing management of aviation routes.
- Ongoing holistic development or regional NSW, and relationship to connected areas.
- The initial and ongoing impacts of route operations on regional populations.
- The impact of the existing aviation regulatory system on route feasibility.

Each interview has been conducted within the parameters of the ethics approval by the University of New South Wales (UNSW) Built Environment and Human Ethics Advisory Panel (Ref: 145066) and was recorded with consent obtained from all participants. Interview participants have been selected along the common theme of having active connections to both the private and public sides of regional development in NSW. However, to ensure a variety of perspectives a range of different participants has been selected including Urban Planners, Airline Network Managers, Council Economic Development Officers and Airport Operators. Interviews were additionally sought with the aviation management team at Transport for NSW, however they were unavailable during the period of this research, with a representative confirming that the department is closed between August and the end of October. Accordingly, no interview has been able to be provided from Transport for NSW, with this lack of availability informing part of this study in **Chapter 3**. Each of the selected participants has been detailed, and their selection justified in **Table 1.04**.

**Table 1.04** – Selected interviewees

| Participant | Position | Justification |
|---|---|---|
| Kate Alberry | Environmental Services and Planning Director **Cowra Shire Council** | Kate Alberry is a Senior planner at Cowra Shire Council, who oversees both strategic and statutory planning work in and around Cowra. Kate has extensive experience in the planning behind the ongoing operation of smaller NSW centres such as Cowra. Kate also was involved in the working group who drafted the Draft Central West and Orana Regional Plan, which has been recently exhibited by the Department of Planning and Environment (DPE). Kate also draws on her experience as a planner at Kempsey Shire Council previously, being a similar sized town on the NSW North Coast which also lost services during the period of 1996-2011. |
| Paul Brederick | Managing Director for Airlines **Jetgo** | Paul Brederick is a chief financial investor and company manager at Jetgo, and has a wealth of experience in the development of NSW and Australian regional Aviation Systems. His experience includes a role as the CEO of Aviation Australia, as well as part of the RAAA who undertook extensive discussions with Sydney Airport around regional access to Sydney through the process of planning for the currently applicable legislation over the airport. |
| Ponie De Wet | Business Development Officer **Cowra Shire Council** | Ponie De Wet is Cowra Council's Business Development Officer, who oversees the commercial development of Cowra as a region. De Wet has recently managed a project to subdivide Torrens Title allotments at Cowra Airport (which does not receive any RPT services) with the intention of sparking commercial interest in the airport, the town and the region. |
| Phil Gregory | General Manager **Brisbane West Wellcamp Airport** | Phil Gregory is the General Manager of Brisbane West Wellcamp Airport, and played a fundamental role in the planning and construction of the airport. He continues to oversee the day to day operations of the airport, and was responsible for the attraction of airlines to the new regional airport. Phil continues to manage the ongoing relationship with airlines in the provision of additional / expanded services to Brisbane West Wellcamp. |
| Steven Jennings | Manager City Strategy Services **Dubbo Regional Council** | Steven Jennings is a senior planner at Dubbo Regional Council, who plays a leading role in the strategy of the City of Dubbo as well as the wider region. Included in this strategy has been an ongoing focus on the attraction and maintenance of air services to ensure economic prosperity to the area. |
| Gordon Kirkby | Chair **Western Region Joint Regional Planning Panel** | Gordon Kirkby is the Chair of the Western Region Joint Regional Planning Panel, overseeing large scale development proposals in greater western NSW. Gordon has the unique perspective of seeing the economic impact of major proposals across western NSW, without being specifically aligned with any one Council area or centre. Additionally, Gordon is a regular government client of regional flights, and is able to understand the user perspective |

| Participant | Position | Justification |
|---|---|---|
| | | benefits of such a transport arrangement. |
| Warrick Lodge | General Manager, Network Strategy and Sales **Regional Express Airlines** | Warrick Lodge is the General Manager of scheduling, pricing, revenue management, sales and commercial analysis at Regional Express Airlines (Rex). He is directly responsible for the monitoring of market performance and identification of market opportunities in regional Australian aviation. Warrick has more than 24 years of network planning experience in regional Australian aviation. |
| Mark Rundle | Planning Development Manager **Wagners** | Mark Rundle is the Planning Development Manager of Wagners, with a leading management role in the development and ongoing planning management of Brisbane West Wellcamp Airport. Mark has managed, planned for and benefitted from the process of using regional air travel to act as a catalyst for economic activity. Mark additionally is the Toowoomba president of the Toowoomba branch of the Urban Development Institute of Australia (UDIA QLD). |
| Asked not to be named | **Capital City Airport Manager** | The interviewee oversees the management of stakeholders at a major Australian airport. |
| Asked not to be named | **Department Manager, Australian Airline** | The interviewee is a head domestic flight planners at an Australian airline, who is frequently involved in the consultation process which is associated with changes to specific regional routes. |

## 1.5 Connection to Research Objectives

The proposed research has been designed around the research objectives which it intends to achieve, with each method proposed in correlation with one or more specific objectives. Table 1.05 below provides a breakdown between each research objective, and the methodology of research which will be primarily used to investigate.

**Table 1.05 –** Analysis of research proposed against research objectives

| Objective | Proposed Research | Chapter |
|---|---|---|
| 1) Investigate the social and economic benefits arising from the provision of aviation services to regional communities. | Literature review | Chapters 2, 4 |
| 2) Identify the broader network flows across NSW in an aviation and economic context. | Comparative Statistical Analysis | Chapter 5 |
| 3) Evaluate the merit and value of such services on a social and economic basis. | Literature review In-depth Interviews | Chapters 2, 4 |
| 4) Examine the relationship between aviation patronage | Comparative | Chapter 5 |

| Objective | Proposed Research | Chapter |
|---|---|---|
| numbers and economic performance in NSW between 1996 and 2011. | Statistical Analysis | |
| 5) Highlight areas of future concern in the continued provision of services, and determine potential solutions to arrest any decline in the assurance of regional service provision continuation. | Literature Review<br>Policy Review<br>In-depth Interviews<br>Statistical Analysis | Chapters 2, 3, 4, 5 |

## 1.6 Research Disclaimer

As the researcher for this project, it is my responsibility to identify any potential biases that I may bring to the project at hand. I am currently a student undertaking a Bachelor of Planning Undergraduate Degree at the University of New South Wales (UNSW). I was born and raised in Sydney, and have limited experience in planning for regional NSW. However, it was this apparent lack of official attention in the planning system to transport infrastructure in regional New South Wales (including the provision of flights) which sparked my interest in this specific debate. I have always had a strong interest in the integration of planning and aviation, and this thesis has been an output of that. My family also has a strong history of involvement and ongoing interest in the aviation industry, due to previous and current working commitments with Qantas Airways.

Since 2014, I have complemented my studies at UNSW with experience at JBA Urban Planning Consultants (JBA), where I have undertaken extensive experience in metropolitan Sydney project based planning work. I have also undertaken limited levels of regional work, limited largely to the Hunter Valley and the Illawarra. As part of this research, I will be interviewing Gordon Kirkby who holds dual roles as a Director at JBA, as well as the Chair of the Western NSW Joint Regional Planning Panel.

Whilst my personal viewpoints and experience could potentially influence the final outcomes of this study, my research has been designed in such a manner to minimise this potential as much as practicable. Specifically, the following has been undertaken in order to ensure this:

- I have acknowledged any potential biases I may bring to the study upfront, enabling a high level of awareness of such issues to others and myself throughout the study.
- The scope of this study has been organised so that findings are quantitative in nature, with in depth interviews of others provided to detail potential reasoning behind these results.
- I have avoided any specific bias towards one airline over others, by acknowledging that all airlines provide a different product set in a regional NSW context and interviewing a range of small, medium and large players in the NSW regional market.
- The scope and discussion of my interview with Gordon Kirkby has been strictly limited to discussion regarding the high level strategic direction of regional NSW witnessed within his role as the Joint Regional Planning Panel (JRPP) Chair. Although I do not believe that it would have influenced the results of this discussion, as an added security I deliberately specified in the interview that the discussion will be limited to his work at the JRPP.
- Interview participants have been specifically chosen through a range of town planning and non-planning professions, so as to provide a balanced view of the issue at hand, and avoid a situation biased by one single profession.

### Limitations of Research

The proposed research comprises a mixed approach included data analysis, in depth interviews and a review of literature. This methodology has been selected to provide the most clarity on the information at hand, whilst balancing this against the short term nature of the UNSW Bachelor of Planning Thesis, with research occurring over one university semester. The proposed data analysis provides a high level assessment of the relationship between the NSW Intrastate Regional Aviation Statistics dataset against economic indicators. As the objective of this research is to provide an overview of the differences in this relationship across NSW, a quantitative multivariate approach has been selected in order to balance the need to ensure comparability across the various regions of NSW, whilst still providing valuable data analysis.

The proposed in depth interviews have been selected across a wide range of stakeholders. The interviewees under this subject have included airline senior managers, local Council officers, an airport development manager and the chair of the Western NSW Region Joint

Regional Planning Panel. Specifically, the interviews have been divided into Council staff at airports who do have services (Dubbo), and do not (Cowra). Additionally, as discussed previously managers from small and large carriers throughout the industry have been selected to identify issues at all points of the market.

### Ethical Considerations

This research project is considered to be relatively low risk in nature, given the relatively uncontroversial nature of the content proposed, and the proposed methodology of quantitative analysis supported by in-depth interviews. In accordance with Bryman and Bell's Principles of Ethical Consideration (2007), the following precautions will be taken as a part of this study and its associated works, in order to ensure that ethical practice is followed throughout the work:

- Full consent has been obtained from all participants.
- The ability of interviewees to withdraw their consent at a later date has been verbally reiterated throughout interviews. This request will be honoured if it is received.
- Likewise, any request by sources to be anonymous in their involvement has been similarly honoured.

## 1.7 Thesis Structure

The structure of this thesis is set out below, detailing each chapter:

- *Chapter 2 (Theoretical Understanding)* comprises a detailed analysis of the existing academic and policy information available. This research focuses on the relationship between infrastructure and regional areas, the importance of transport infrastructure to regional areas, an overview of transport flows analysis methodology development in recent years, and an introduction to the contextual issues faced in regional NSW in recent years.
- *Chapter 3 (The NSW Regional Aviation Scene)* provides an overview of the current regulatory and economic environment in which the NSW regional aviation sector operates, including a discussion of major economic regions and ports.
- *Chapter 4 (Qualitative Analysis)* details the range of viewpoints from various industry stakeholders uncovered during the in-depth interviews held, which is tied back to the outcomes of Chapters 2 and 3 previously.

- *Chapter 5 (Quantitative Analysis)* outlines the quantitative results found under this study, detailing the comparison between aviation patronage and economic indicators throughout NSW.
- *Chapter 6 (Conclusions and Recommendations)* summarises the findings throughout this study. Based on the findings throughout this project, a series of recommendations have been made for areas that could benefit from further research or change.


(Tamworth City Council, 2016)

# 2.0 Theoretical Understanding

The relationship that exists between the provision of aviation services and the economic health of regional NSW is underpinned by the broader, complex relationship between the provision of transport infrastructure and wider economic development. However, what constitutes a region, or such a transport connection exactly must be examined prior to any further analysis. This chapter shall initially establish the framework for use of the term 'region' in a NSW context. This will be built upon through an analysis of the symbiotic relationship between regional areas and transport linkages. The role that transport connections play in the development and sustainability of regional areas will then be explored, including the benefits that are specifically generated from aviation connections. This thesis will then undertake an analysis of aviation transport flows analysis established in previous studies, before finally considering the various externalities that affect the NSW regional aviation environment.

## 2.1 Transport and Regions

### Defining a Region

There is a long-standing lack of clarity in regards to the distinction of what exactly comprises a 'region', when compared to both other regions, or compared to other land classification terms. Collits (2008) discusses the question of what a region comprises in an Australian context, asserting that the definition of regions is political in nature, with differences in the term used by each of the major political parties. On one hand, the Liberal National Coalition (Coalition) has historically referred to 'regions' as non-metropolitan bodies, which Collits determines is a consequence of the National Party influence in the Coalition. This has been continued into the most recent Coalition government, with the 'State of the Regions' Report referring to non-metropolitan areas only, and avoiding the definition of specific regions beyond a statewide level. Compared to this is the definition of 'region' used the Australian Labor Party (ALP), which extends use of the word to both rural and metropolitan contexts.

Additionally, Collits notes that many regions do not have set boundaries, and rather are defined by their common values. In this light, it is not uncommon to see regions which overlap, areas which align with multiple regions, or areas that don't identify with any one specific region (Johnston, Haggett et al. 1986). Allen et al (1998) supports this, noting that

regions are open networks, which are not bound to one geographical area and stretch across space in a variety of ways.

For the purposes of this study, 'regions' have been aligned with the recently released draft Regional Plans for NSW. This has enabled the economic review, qualitative and quantitative analysis is be compartmentalised according to the political and economic boundaries of regional NSW in a manner which is consistent with current draft public policy. Given the established consistently changing political definition of a 'region' in Australia, the most appropriate definition is the most recently applied use of the term in policy, which in this case is in the draft Regional Plans. This chosen division of the state has been further discussed in Chapter 3.

### The Transport Region Relationship

The relationship between transport and the planning of regions is symbiotic in nature, and pivotal to the survival of economies outside of urban areas. The idea that *"transport is fundamental to geography, and geography is fundamental to transport"* (Knowles, Shaw et al. 2008; pp. xvii) has led to the development of centres which are based around regional historical transport infrastructure in NSW.

The urban layout of modern NSW is a product of this historic relationship. Jeans (1972) confirmed that the oldest settlements were formed around the provision of large landholdings and the roads which serviced them. Later, Jeans described the provision of railways through NSW meaning that *"inland producers could market their goods more cheaply and buy their equipment at lower prices."* He went on to point out that *"speed and lower costs reduced the isolation of inland life and made it easier to obtain the necessities for a comfortable home"* (pp. 183), which in turn made development in areas which had access to transport infrastructure preferable from a quality of life perspective. Taylor (1912) also argued this position, stating that railway lines *"have been constructed* [in NSW] *from time to time with the progress of settlement and trade"*, which again confirms this historic interrelationship. It was these areas which benefitted from the highest level of accessibility for the movement of people and goods within the surrounding region and further abroad (Troye 1995). Lichfield (1981) acknowledged upfront the requirement for planners to account for transport

requirements of an area, and similarly for transport system designers to acknowledge the environmental planning processes of a locality as a manner of resolving this conflict at an early stage, as it is without this dual consideration that issues in the operation of communities arise.

Current industry thinking continues to acknowledge the interplay of planning and transportation in a regional context, largely in the context of automobile dependence. Knowles, Shaw et al (2008) highlighted the lack of public transport services as a present barrier faced by regional communities. Gray (2004) takes this one step further, providing a sliding scale of vehicle dominance ranging from A1 (Rural area close to major conurbation) to C3 (Extremely isolated settlements or households). As regions become more isolated in nature, Gray asserts a correlative reduction in the proportion of dwellings which are located within a 13 minute walk of an hourly public transport service.

Knowles, Shaw et al. (2008) provide an overview of the transport-planning relationship across all modes, and the impact which each of these modes have on the environment they operate within. Aviation is discussed as a mode of transport which affects the layout of urban areas, however this discussion is limited to an international / trunk domestic scale, and fails to acknowledge aviation as a source of rural public transport. The closest mention is that of the 'big bus' or 'coach', which performs a similar role to flight, but with stark differences in speed and amenity.

## 2.2 Importance of Transport Connections to Regions

### Public Benefits of Connections to Regions

*Economic Benefits*

It is widely accepted that transport infrastructure investment leads to economic growth (Frischmann 2012, Marshall 2012). Benefits from such services are outlined by Frischmann, and include employment capacity increases, improvements to productivity, as well as improvements to the quality of service and the environment. The notion of transport as the 'maker or breaker of cities' is also strongly reiterated by Colin Clark's article in the 1965 Town Planning Review (Tewdwr-Jones, Phelps et al. 2013), whereby it was noted that the control of land uses would then able to affect travel demand through space.

This understanding is already reflected through elements of the NSW transport delivery system, with cost benefit analyses being undertaken as part of an official economic appraisal process required for any transport proposal in NSW (Transport for NSW 2013). Additionally, there is a general consensus that airport development can stimulate and promote such economic growth (Goetz, Stephen et al. 1997, Kasarda 2008, Freestone and Wiesel 2014, Jonas, Goetz et al. 2014).

When interviews were undertaken for the development of the 'Regional Economic Development Strategy for the Central Western Region of NSW' (Murphy, Sproats et al. 1991), a dependence on transport links for economic performance was revealed. Many businesses interviewed noted issues pertaining to the run down nature of the rail network, the limited nature of air services, the higher cost of freight transport and communications, and the difficulty of attracting and maintaining a skilled workforce outside of urban areas. These issues, they noted, made doing business more expensive and less competitive on a national and international scale. This interrelationship was reiterated through the notion of 'economic infrastructure' (Beer, Bolam *et al.* 1994), which argues that the removal or quality reduction of transport infrastructure to regions can have a corresponding reduction in economic performance. Beer *et al.* note that this process tends to be overlooked retrospectively, or both factors put down to a collective downturn in the wider regional economy. It is through this reduction, Beer notes, that regional Australia is at an economic disadvantage, as these services act as a 'lifeline' to the local economy.

These issues can all be either directly or indirectly attributed to lower transport provision in regional areas. Interestingly, Murphy et al. (1991) noted that an ongoing reduction in the quality and quantity of passenger transport services (as opposed to freight) was particularly damaging to regional economies, as firms heavily relied on such services in the movement of clients and staff. This is in stark contrast to other texts, which mention infrastructure as being required for the movement of both people and goods equally in a regional context.

*Social Benefits*

The provision of transport infrastructure has also been acknowledged to deliver social benefits to regional communities. Transport connections to larger or capital cities will enable access to a higher level of service above that offered locally, which generally comprises *"a base hospital … one or more high schools, a TAFE and possibly part of a university"* (Beer, Bolam et al. 1994:117). As regional communities lack the proximity to higher order services which urban areas benefit from, access to such services is in many cases contingent on access to transport (Holyoak, Spandonide et al. 2015). In a regional context, various studies have indicated a link between accessibility and poverty, whereby transport is identified as an essential component of sustained poverty alleviation (van de Walle 2001, Lombard and Coetzer 2013). The economic activity outlined above has a similar positive impact on jobs growth, average income and access to goods and services in regional areas. An established link also exists between lack of access to services in rural areas and mental health. Known as the 'Tyranny of Distance' (Kinhill Engineers Pty Ltd 1993), mental health issues prevail in situations where individuals are unable to access the educational, social, mental and physical health services which tend to be more broadly offered in larger cities (Dudley, Kelk et al. 1997, Morrell, Taylor et al. 1999). This is consistent with the Federal Government's findings in its investigations into the social benefits of high speed rail in NSW, which delivers comparable social benefits through the provision of high speed transport to regional areas (Australian Government 2011).

## Public Benefits of Aviation Connections

In addition to regional benefits outlined above, the scope can be further narrowed down to the benefits provided to an area from aviation services specifically. These benefits fall under the larger term of 'catalytic impacts', where the benefits felt from the wider role of aviation are felt across a region (York Aviation 2004).

*Economic Benefits*

Economic benefits arising from aviation services are well established and are widely acknowledged (Rochat 2005, Minato and Morimoto 2011, Regional Aviation Association of Australia 2011, Freestone and Wiesel 2014, Ryerson and Woodburn 2014). Noting that economic development of an area is within the broad interests of the public (Redondi, Malighetti et al. 2013, pp. 87), the provision of aviation services can work towards this. The

International Civil Aviation Organisation (Rochat 2005, pp. 5) provides a high level breakdown of the catalytic benefits specifically from aviation services, which is reproduced in **Figure 2.01**, and discussed in further detail below.

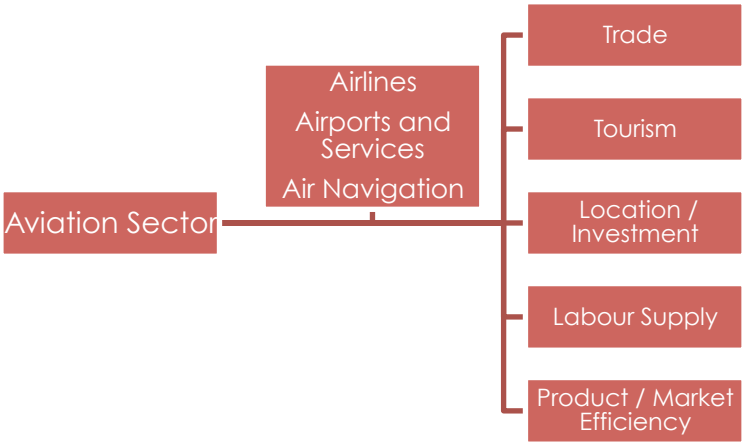



**Figure 2.01** – Catalytic impacts arising from aviation industry (Rochat 2005)

Initially, the aviation industry produces highly skilled and high paying direct and indirect employment opportunities, with GDP per air transport worker three and a half times the global average employee (Rochat 2005). Essentially, the aviation industry brings high paying jobs to regional areas in relatively large numbers. Air transport additionally provides direct and fast access to the global market, and can work to generate tourism. This benefit specifically works two ways, boosting tourism investment out of local centres, as well as industry investment through greater access to firms. Additionally, air transport over longer distances facilitates efficiencies in the supply chain, opening the size of potential markets for producers. Such services can additionally improve the competitiveness of the regional economy on a global offering scale (Gordijn and van de Coevering 2006). In short, regional air transport is an agent of globalisation, linking regional areas to the global economy, spurring innovation, employment and connectivity. Kasarda and Lindsay (1977) assert the role of the airport as a node in the context of the relative isolation of regions and remote areas, in order to *"keep workers, suppliers, executives in touch with the global market"*. This is supported by the RAAA, who state that *"regional airline and general aviation operators… provide vital passenger, freight and aero-medical services to regional Australia"* (Regional Aviation Association of Australia 2010).

*Catalytic Social Benefits*

Aviation services also facilitate the delivery of a range of social benefits to regional areas, above and beyond those offered by other modes of transport linkages. Rochat (2005) identifies air transport as a method of providing access to areas which are inaccessible through other modes by virtue of physical barriers. He also identifies air transport as able to

provide time dependent public services, such as the transportation of medical supplies or public services. Beyond this, the provision of regional services can increase tolerance and acceptance of diverse populations through exposure, as well as the level of access which regional populations receive to art, culture and political activities. This in turn has a positive impact on social inclusion and development of the community as a whole (Merket 2013). The Federal Government has acknowledged the regional benefits of flight throughout its Regional Aviation Access Program (Department of Infrastructure and Regional Development 2015). Similarly the Australian Airports Association (Deloitte Access Economics 2012) acknowledged the social role which airports play through the connection of people who would otherwise be geographically separated, providing vital services to the community, the provision of training facilities in and around airports, and the work of airport bodies with the local community.

This social importance is furthered by the resilience of regional air services in extreme circumstances. Road and transport is often limited or dangerous in regional areas due to the long distances involved (Holyoak, Spandonide et al. 2015). This is compounded with issues of poor regional road / rail conditions, and elevated chances of the journey being affected by weather events (Merket 2013, Redondi, Malighetti et al. 2013, Holyoak, Spandonide et al. 2015). Together, these issues necessitate specifically the use of aviation as a transport option, even when compared to other modes.

## 2.3 Global Application of Regional Aviation

The use of aviation to deliver public transport access to regional communities is not widespread, due to a range of inhibitory factors which result in most access being provided by other transport modes. As part of this review, the various governmental factors which inform the use of aviation in a regional sense will be examined. Part of the reasoning behind a lack of information pertaining to regional air services as a method of intra-state transport is that there are only a very small number of regions in the world which require such service provision. These regions generally meet one or more of the following criteria, outlined by Merket (2013):

- Large distances between airports;
- Territorially remote settlements, separated by physical barriers;
- Sufficient incomes to sustain such a service over other modes; and
- Areas subject to restricting weather events (snow, flooding, desert heat, etc).

Due to the features outlined above, many countries do not elect to use aviation as a method of regional transport. For example, the European Union notes in the Transport White Paper (2011) that the aviation industry is inherently global, and as a result of this *"high speed rail should absorb much medium distance traffic"* (2011:7). This underpins the view of many governments that air transport is not required, due to the ability of other modes of transport to undertake such transport with higher capacity or lower cost. In stark contrast to this, Transport Canada's leading strategic document, the Report on Plans and Priorities (2015) specifically identifies government responsibility in ensuring the maintenance of *"ports and airports, [to] support essential services in remote communities"* (2015: 32). This is generally representative of the larger land mass, very low population and extreme weather conditions faced by remote regions of Canada (Metrass-Mendes, de Neufville et al. 2014). The United States, another large major developed country with a strong regional network, has progressively removed regulation from the market, instead leaving the network provision to the market. The American Deregulation Act of 1978 nominated the control of fares, routes and capacity of all airline routes to the private sector, and abolished state powers to reintroduce economic restrictions on any routes, which included routes to regional and remote airports (Dempsey 2014).

## 2.4 Transport Flows Analysis

### The Movement of Jobs / People Relationship

Due to the focus of this thesis on the movement of people and the performance of economies in regional centres, the question of whether people follow jobs, or jobs follow people becomes inherently significant. This question has been the subject of significant discussion in recent years, but has not been resolved to date (Hoogstra, Florax *et al.* 2005). Generally, academics have asserted one of four possible hypotheses:

(Hoogstra, Florax et al. 2005)

(1) *Both $a_2$ and $b_2$ are not statistically significant or do not display the theoretically expected positive sign.*

*"jobs do not follow people nor do people follow jobs"* E.g.: (Schmitt, Henry et al. 2002)

(2) *Only $b_2$ is statistically significant, suggestive of unidirectional causality running from population to employment.*

*"jobs follow people"*, **Example:** (Edmiston 2003)

(3) *Only $a_2$ is statistically significant, suggestive of unilateral causality running from employment to population.*

*"people follow jobs"*, **Example:** (Mulligan, Vias et al. 1999)

(4) *Both $a_2$ and $b_2$ are statistically significant, suggestive of dual or bi-directional causality*

*"jobs follow people and people follow jobs"*, **Example:** (Arauzo-Carod 2002)

Where:

$a_2$ = employment growth

$b_2$ = population growth

Hoogstra *et al* (2005) seeks to unpack the extensive literature available on this subject with q quantitative approach, collectively analysing the outcomes of works published on the subject. Under this meta review process, article conclusions have been categorised into one of the four potential outcomes noted above. These results have been summarised in **Figure 2.02**, comprising a meta review of 308 study results reported on the matter under various other peer reviewed articles.

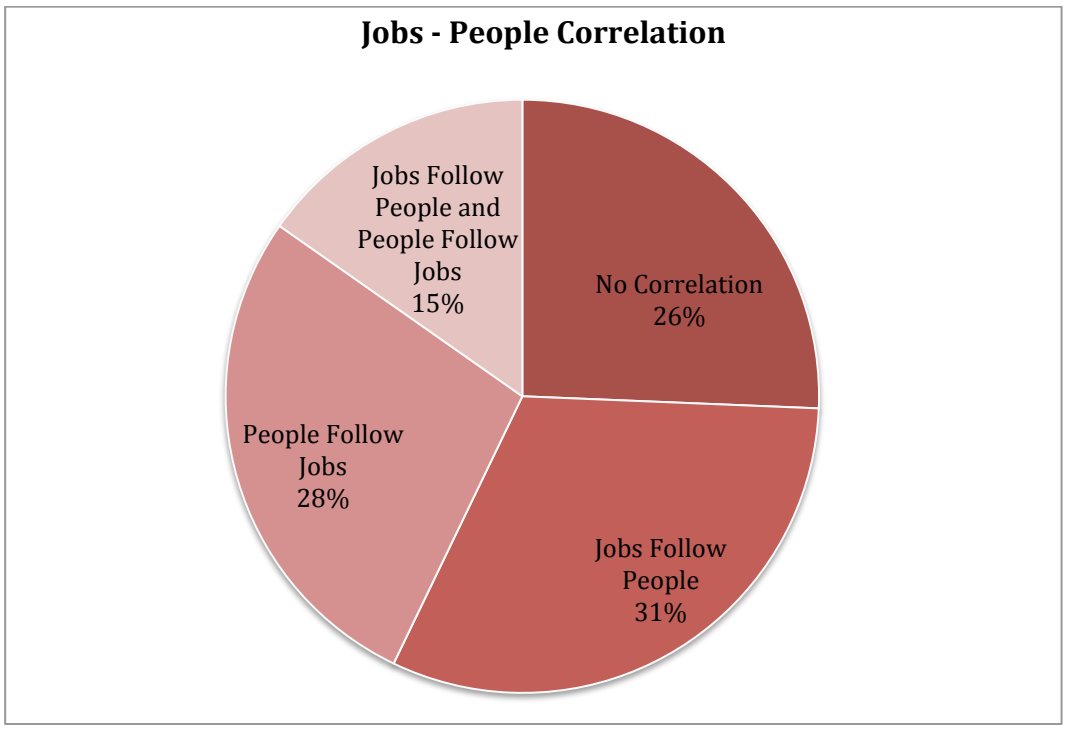



**Figure 2.02 –** Findings of Hoogstra et al (2005) comparison of the 'jobs vs people' relationship

This metadata suggests no single unified result on the order of influence between population and employment growth, however does suggest a strong correlation between the two factors.

This is partially attributed to the varying contexts of different studies, as well as different methodologies used throughout the study. This includes specific note that the results from the United States, and results from outside of the United States differ significantly in the conclusions drawn, highlighting the national differences between various studies.

Movement analysis, as is proposed as part of this research, is a key element to this overarching question. Regional passenger flows relates strongly to 'jobs', by way of economic growth spurring regional inbound tourism growth, migration, business and government travel, and regional outbound leisure travel, and business travel. 'Jobs' is also relevant to the economic performance of a given centre over a set time period. 'People' refers to population growth of a given centre over a set time period. Given the regional Australian context of this study, one of the key elements of this research will be to determine whether there is a 'jobs' led, or a 'people' led correlation in regional growth across NSW. The data outlined in this section suggests that there is currently no clear indicator as to which is the factor of causality, however given the different factors affecting the urban areas which are the scope of this thesis, differing results may occur.

### Lack of Clarity Around Movement Analysis

In a metropolitan sense, airline capacity / patronage growth has been found to be a contributor to economic growth in a number of studies of metropolitan cities. This includes Irwin and Kasarda (1991) who determined that in US cities airline network growth is a cause, rather than a consequence, of economic growth. Green (2007) and Chi (2011) similarly found that passenger boardings promoted economic and population growth in city areas. Hall and Hesse (2012) mention broadly the impact of regions by aviation transport links in a regional context, looking at Chicago as a specific case study (Hall and Hesse 2012).

However, there is a lack of clarity when this relationship is tested in a rural context, due in part to the lack of information available on the topic. On one hand, Rasker et al (2009) concluded that in the case of specifically high amenity rural areas, access to aviation services is pivotal in the facilitation of economic growth. In this study, Rasker et al deduced the growth as being a result of employees willing to travel and do business over further distances to other areas of similar 'economy specialisations'. Against this, Isserman (2001) concluded that distance to

such services was relatively unimportant in the development of rural areas, and would continue to become less relevant over time. Fangwu (2016) notes that this lack of consistency in findings continues, and confirms that it is largely due to a lack of research in this area. Other journal articles look at such a link from only the perspective of one industry, such as in the case of Bieger and Wittmer (2006), who investigated the relationship only in the case of the tourism industry, and did not look at the performance of the wider economy across all industries.

Taking the planning – aviation relationship analysis one step further, when analysed in a context of the rural to urban context, information becomes increasingly difficult to locate. Chi (2011) notes this lack of information, with Reynolds-Feighan (2000) being one of the only authors on the subject. Reynolds-Feighan looked into the relationship between smaller and larger centres following the progressive deregulation of flights across the United States, beginning in 1978. However, the focus of this study was the relationship between passenger numbers and route regulation only, and did not address regional economies beyond basic 'population per passenger boarding' figures.

### Transport Flows Methodology

As part of any analysis of aviation networks needs to be an underpinning discussion as to how exactly to measure the relationship between the flows of people, and the growth of areas. Lansing et al. (1961) provided one of the first papers which sought to resolve this, which was formed on the basis of the air corridor being the independent variable, with city pair distances, populations, and family incomes exceeding $10,000 USD within each airport 'catchment' at either end of the flight corridor all being separately input. The dependent variable was the number of passenger movements between the subject cities, as compared against other city pair flight corridors. It was through this that Lansing found that passenger volume was a product of two cities' distance, population and affluence. This method provided a solid early method of measuring such flows, however was generally broad in nature and required the user to identify / weight 'other factors' in the calculations, leaving the results largely open to individual interpretation.

Green (2007) looked at the correlation between population growth between 1990 / 2000, and the number of boardings per capita per airport. Figure 2.03 demonstrates the visualisation

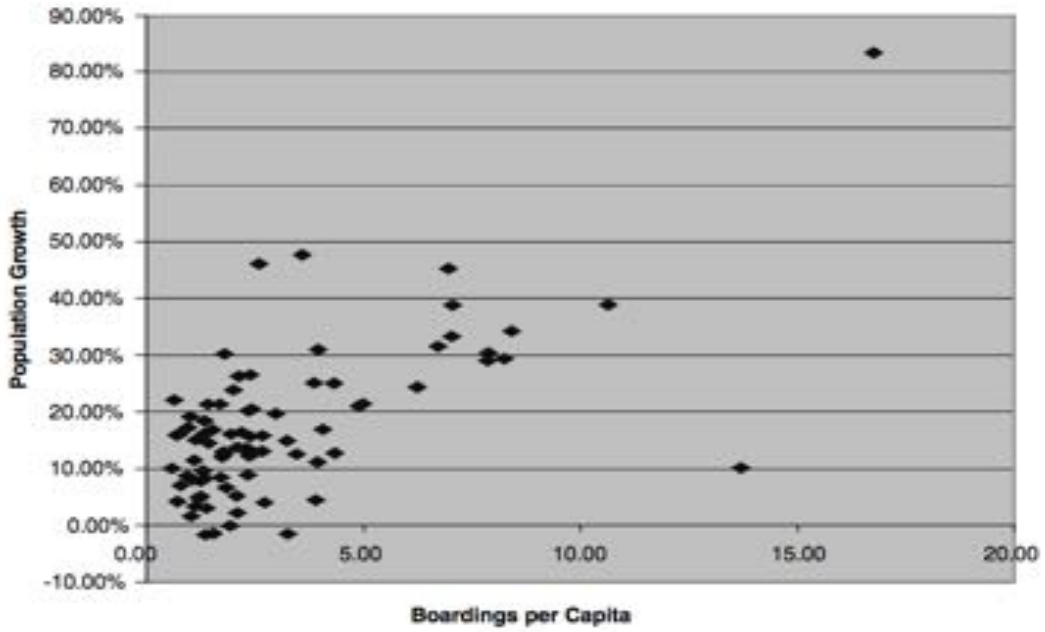



**Figure 2.03 -** Visualisation of boardings per capita vs population growth (Green 2007)

of these correlations by Green.

This method enables simplicity in the findings, and importantly places all tested centres in a consistent scale from which they can be measured, thus enabling the identification of trends on a visual scale. By identifying growth factors by percentage rather than numerical improvements additionally enables comparability in the dataset applicable. Green also notes that expanded in depth analysis can be undertaken, however this would similarly require the addition of variable figures in a manner similar to Lansing above.

Zachary Neal (2010, 2014) reinvigorated and updated discussions on the topic, which has largely been avoided in discussions in recent years. Specifically, earlier theories around the behavioural patters and measurement techniques of aviation passenger flows were discussed in a modern context, in order to reflect changes in the United States domestic aviation industry. Neal's work went sought to create a model for aviation networks analysis (2014), which processes data from the US Bureau of Transportation Statistics, in order to provide detailed visualisations of passenger network flows. This datum is useful for a range of reasons across a broad range of industries, including the planning profession. Although the program

is not available or applicable in an Australian context, the availability of such data processing does highlight the value of such data. Neal notes (2014: 148) *"studies of innovation have demonstrated that the impact of new ideas hinges upon the network through which they are transmitted. Network data may offer insight into how innovative urban policies spread between cities, or how innovative policies spread between cities, or even how tastes for new music and clothing styles spread"*, while discussing the potential uses for the data program. It is this application which underpins the importance of studying transport flows such as these to the planning industry. This model is additionally difficult to translate to this thesis by way of US network comprising many different interconnected cities, as opposed to the NSW regional system of one major city and a series of smaller centres relying on connections to the capital. The differences in the nature of this data are highlighted in **Figure 2.04**, which visually demonstrates the issue in comparing a network system (such as the United States) to a 'hub and spoke' system (such as regional NSW).

To date, there are noticeable gaps from a review of the applicable transport flow literature. Initially, much of this research into transport flows tends to be within the largely urban context of travel between two or more comparably sized cities, which results in a gap in writing surrounding the transport flows dynamic between a larger and a smaller centre.

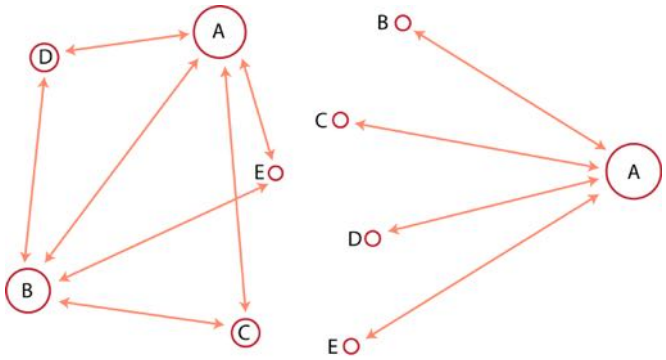



**Figure 2.04 –** Comparison of regional aviation networks between the United States (left) and NSW (right) (Source: Author).

Chi (2011) consciously goes some way in addressing this, by looking at the transport flows measurements in Wisconsin at urban, suburban and rural scales. Chi made specific reference to the distinction between flows of a metropolitan and rural area in such calculations, and developed the following formula for determining improvement of various airports, which included an accessibility factor:

$$Airport\ improvement = log\left(\frac{1}{d_a^2} \times \frac{Boardings\ [Later\ Year]}{Boardings\ [Earlier\ Year]}\right)$$

Where: $d_a$ = Distance to the nearest airport

This model was able to determine changes in accessibility of regional and rural areas over time, however fell short of actually being able to draw out conclusions over what caused the changes in accessibility and passenger flows. Rather, Chi's work used the change in passenger numbers as a manner of drawing a conclusion as to the regularity of flights at an airport, which was assumed to have a corresponding impact on the accessibility and usefulness of the airport in and of itself.

Chi's argument that improved passenger flows are an indicator of improved airport service ties airport service to a number of flights that leave a given centre on any given day. This research intends to take this a step further, by comparing the change in patronage at the regional centres of NSW with other economic indicators. By bringing in factors such as population change, economic performance and average income, this thesis is able to draw information regarding the performance of the regions themselves rather than relying on the assumption that increased passenger flows are representative of an inherently better performing region.

## 2.5 Australian Transport Flows Context

### NSW Context

As discussed above, the unique nature of regional networks makes commentary difficult to translate between regional network systems worldwide, and NSW is no exception. In an NSW sense, the current system comprises a mix of regulated (i.e. controlled by exclusivity licenses from TfNSW) and deregulated (i.e. open to free market operation) routes, which have been generally serviced by a small number of relatively large airlines. This has led to two specific issues being identified by the NSW State Aviation Working Group (2007), unique to regional NSW:

- *Instability occurs on routes within approximately 1 hours journey by road to the nearest alternative regional airline service and / or routes trading below 6,000 passengers per annum.*
- *The aerospace industry is no longer mass producing aircraft of the type needing to be replaced* [in NSW] *(twin piston engine 6-10 seats). Where more technologically capable*

*aircraft (single and twin turboprops of 8-15 seats) are produced, they are much more costly, and lower volume routes are too small to make their operation viable.*

The combination of most literature being focused within the analysis of large cities in the United States, some guidance can be drawn to an NSW regional context. However, inherent differences in the relationship between the makeup of the aviation industry, the form and function of regional NSW, and the regulatory and physical environments within which each country operates mean that existing measures may not be able to be directly applied to NSW. One example of this is in Canada, where regional services are measured as between 1,000 and 200,000 passengers per annum (Metrass-Mendes, de Neufville et al. 2014). In Australia, this definition has no minimum value, and a maximum value of 50,000 passengers per annum (Transport for NSW 2016). Similarly, the deregulated nature of the US aviation industry comprises a similarly prohibitive factor in comparing to an NSW context. Accordingly, passenger flow dependency, and the unique low population density nature of Australia have all been factored into the proposed methodology.

### Neoliberal Governance

In an Australian context, one more factor which requires review and acknowledgement in order to gain an understanding of the theory behind this topic area is the privatisation movement. Principally, in response to concerns regarding the stability of the Australian economy at the time (Sherlock 1999) as well international trends and pressures of this time (Fairbrother, Svensen et al. 2013), the Federal government sought to privatise government functions on the basis of whether they could stimulate market competition and boost the performance of the wider Australian economy. In the mid 1990's, the Howard government articulated three main tests for any privatisation venture to satisfy:

1. *Privatisation must be in the public interest, there should be benefits for consumers and increased competition.*
2. *Employees should be offered preferential access to shares.*
3. *Quality must improve overall, and rural and remote areas should not suffer deterioration in services.*

(Aulich and O'Flynn 2007)

Australian major city airports were progressively privatised between 1997 and 2003 (Aulich and Hughes 2013), and regional airports were divested to local Councils. The Tourism and

Transport Forum notes (2007, pp. 6) that despite the portrayal of privatisation as beneficial to Australia at a macroeconomic level, the impact on regional aviation destination variety has been generally negative, with *"the average number of domestic destinations directly served by the participating airports reduced during the post privatisation period"*. It states that this reduction *"can be explained by the regional and domestic market consolidation and possibly route rationalisation"*. The NSW Aviation Working Group identified a similar reduction in destinations over the same period (NSW Government 2007), with particular regard to a reduction in destination numbers.

### Externalities

Finally, the relationship between transport and regional centres has been additionally affected by factors external to the core planning-transport relationship. These have been outlined primarily by Shaw and Sidaway (2010), who noted 'Three Tracks' which have affected the transport tourism relationship.

The 'first track' is the changing relationship between tourism and travel in recent years, with tourism encompassing travel for leisure or religious reasons (Shaw and Sidaway 2010). An increase in the number of tourist based travellers is strongly evident through raw passenger numbers, as well as economy wide changes such as the rise of low cost leisure carriers and tourist precincts. Whyte and Prideaux (2015) have reviewed the impact on the rise of low cost carriers within Queensland, and the impact that this has had on total passenger numbers, as well as mode share for intra-state leisure travel throughout the state. This study ultimately found a strong growth to leisure destinations in Queensland due to the lowered overall cost of vacations enabled by lower airfares. This resulted in a mix of additional generated passenger growth who otherwise would not have travelled, as well as growth arising from a reduction in the use of other modes, namely use of full service airlines, long distances coaches and private vehicle trips.

The 'second track' comprises the impacts which geopolitical movements have on aviation patronage across the globe. In essence, this necessitates review of numeric changes in flights with major global or regional shocks. Shaw and Sidaway urge readers to consider that *"transport and travel concerns are at the heart of geopolitical thinking and practice"*

(2010:507). The example which Shaw and Sidaway note which is relevant to this study is the impact of the 11 September, 2001 terrorist attacks on aviation confidence at a global scale (2010), and changes such as these need to be considered as part of any analysis of aviation patronage or growth rates.

Finally, the 'third rack' comprises the increasing role of ports in a globalised world, as places of strategic exchange and growth of ideas both between and an origin area and the port city, as well as between the origin area and the areas beyond the port city across the globe. The value which arises from movement of people and goods beyond the state capital city over the period between 1996 and today has grown with the significance of Sydney as a global city. In 2016, Sydney has more access to global markets than it has previously received through the growth of passenger and freight networks, and the globalisation of business operations over this period. The value and impacts of all three of these major external changes will need to be considered part of the larger changes to the layout of the regional aviation scene in NSW.

## 2.6 Conclusion

This chapter has investigated the relevant theoretical information surrounding the concept of regional aviation and planning, looking at the relationship from several aspects. Initially, ambiguity of 'regions' as a concept has been explored, including the lack of any such definition within an Australian context. This in turn has formed the basis of the proposed adoption of the most recently exhibited public regional policy for the purpose of regional divisions under this project, being the draft exhibited Regional Plans for NSW, and has been further discussed in Chapter 3. The importance of transport connections to regions has then been established on both economic and social grounds. This has been extended to an aviation context, including a discussion of the benefits provided by aviation services which cannot be provided at the same standard by any other mode of transport in regional NSW. As part of this benefits analysis, the lack of apparent media which discusses specifically the role of regional flights is raised, and this lack of discussion is explored in a global context. This chapter has been concluded with an analysis of historic analysis of regional transport flows, as well as recent developments in transport flow trends throughout Australian aviation.


# 3. The NSW Regional Aviation Scene

Air Transport policy in NSW has been the subject of considerable change in recent years, in response to a number of sharp industry and environmental adjustments. The typical operation of regulated and deregulated intrastate airline routes in NSW has been acknowledged across the government as one which requires reform, and which does not adequately meet the needs of the industry or general public in its current form (Standing Committee on State Development 2014). Accordingly, this chapter outlines the existing regulatory environment in which intrastate aviation in NSW operates, including the operation of flights under the *Air Transport Act 1964* (AT Act) and the *Passenger Transport Act 2014* (PT Act), the various legislative requirements surrounding the management of landing and takeoff slots at Sydney Kingsford Smith Airport (KSA), and the 2014 Legislative Council enquiry into the operation of passenger transport services in NSW.

In the second part of the chapter, this issue is has also been examined from a planning policy perspective, with the Draft Regional Plans for NSW reviewed to determine the major economic drivers for each NSW region, as well as the level of acknowledgement of the impact that the regional aviation sector has on the surrounding economies within each plan.

## 3.1 Regulatory Environment of Intrastate Aviation

### Air Transport Act 1964

At its highest level, aviation transport falls under the Constitution of Australia, Clause 92 determines intrastate trade to be an issue of state and territory government (Commonwealth of Australia 2010), meaning that the operation of intrastate air routes falls under the domain of the NSW Government. Historically, the government has enforced control of regulated and deregulated route coordination through the AT Act. The main focus of the AT Act relates to procedures of the 'State Aviation Working Group', a committee of airline industry stakeholders who are tasked with the control of air route regulation in NSW. Specifically, Clause 4A is of significance, which allows for recommendations to be made around deregulation of routes under the Act, with the following matters given weight in decision-making:

a) *the needs of the public of NSW as a whole, and of the public of any area or district, for air transport services along the routes concerned,*

b) *fostering competition between airlines in relation to the routes concerned,*

c) *the effect, if any, on the maintenance and development of adequate and reasonable public air transport services within NSW, of the operation of aircraft over the routes concerned,*

d) *the effect, if any, on the economic development of, or on the environment in, any are or district within NSW, of the operation of aircraft over the routes concerned* (NSW Legislation, 2016).

The above threshold test includes a broad public benefit test, as well as a broad economic test in the determination of routes as regulated or deregulated. However, it importantly only has power in the determination of route regulation policy, and is not of the scope to ensure that services are actually provided. Transport for NSW (TfNSW) is the principal government body in the enforcement of this act and the issuing of NSW licenses. Under the current legislation, TfNSW has the responsibility and right to select which routes are regulated or deregulated out of recommendations of the State Aviation Working Group, provided that the policy thresholds selected are consistent with the overarching objectives outlined above. Currently TfNSW notes that the following policy applies:

- *the threshold for a route being allocated to one licensed operator only is that the route operates at or below 50 000 passengers per annum;*
- *a five-year licence term currently applies;*
- *where regulated routes exceed the 50 000 level during the licence term, the five-year commitment takes precedence over deregulating the routes; and*
- *regulated route licences will run their full term, subject to licence conditions.*

This policy has had three previous iterations since 1996, undergoing four rounds of review. In 2001, following the collapse of Ansett Australia, Price Waterhouse Coopers (PWC) undertook a review of the existing level of regional route regulation. The main PWC report findings were as follows:

- *In terms of providing a commercial return to operators, it was considered that there was scope for two airlines only on routes with a volume in excess of approximately 100,000 passengers per annum*

- *In the range 100,000 to 65,000 … one carrier with full time aircraft and another with partly committed aircraft*
- *Between 65,000 and 35,000 … one operator using 36 seat aircraft full time*
- *Between 35,000 and 6,000 … one carrier using 19 seat aircraft*
- *Below 6,000 passengers per annum … only small 9-12 seat aircraft would be viable, generally feeding into larger regional centres.* (NSW Government 2014)

These requirements, which were more onerous than any other subsequent requirements, were substituted just a year later in 2002 with a flat 50,000 person passenger movement requirement, above which any route could be deregulated. This was a significant simplification of the controls around which applied to the regulation of intrastate routes. In 2006, the initial State Aviation Working Group was formed, and met to discuss potential changes to the 2002 Guideline (NSW Government 2007). Out of this meeting, the following recommendations were adopted:

- *A five year licence period be adopted for regulated routes.*
- *The 50 000 person passenger threshold be maintained.*
- *Three routes be deregulated*

It is noted that the Minister for Transport deregulated nine further routes the year after this review, without requiring a second meeting of the State Aviation Working Group. In 2014 a meeting was not held on the basis of TfNSW declaring it unnecessary (NSW Government 2014).

### Passenger Transport Act 2014

In 2012, a review was undertaken of Transport Laws across NSW, which intended to bring together the powers of various authorities under the single umbrella of TfNSW. As part of this review, the TfNSW proposed repeal of the AT Act, disbandment of the State Aviation Working Group and empowerment of the Minister to enact changes to the regulatory system. Following this review, legislation surrounding the control of regulated air routes was brought in under the PT Act, with the intention of clarifying the role of TfNSW in the route selection process (Transport for NSW 2015). In the amendments to the act which followed this review,

Clause 44(2) specified that the following matters were considered important factors in assessing applications for air route licences:

> *(a) the air transport service needs of the public in relation to the route concerned and whether the grant of the licence will meet those needs.*
>
> *(d) the effect, if any, on the economic development or on the environment of any area within NSW, of the operation of aircraft by the applicant over the proposed routes.*

However, two key issues surrounding route sustainability present themselves with the above amendments. Initially, these assessments are only to be made following the receipt of an application to operate an air service, meaning that the research around the public or economic benefits arising from a service are only considered once a tender for a service has been submitted. Additionally, the legislation under the *Passenger Transport Act 2014* has been added to the existing legislation under the AT Act, and has not superseded it as intended. This essentially means that the recently introduced additional legislation adds to further restrict the manner in which regulated routes can operate, rather than simplifying the process as was intended (TfNSW 2015). Essentially, this is due to the principal rationale behind this review being a simplification of the existing administrative system, rather than a review of the sustainability of the system itself.

### Slot Management at Sydney Airport

The other key pieces of legislation, which affect the provision of aviation services throughout NSW, are the *Sydney Airport Demand Management Regulations 1998* and the *Sydney Airport Slot Management Scheme 2013*. These two pieces of legislation work together to control demand management of aircraft at KSA through a maximum cap of 80 aircraft movements per hour and strictly limiting the vast majority of operations to between 6:00am and 11:00pm each day. Additionally, the above legislation manages the assignment of aircraft 'slots' whereby each aircraft is assigned a landing and a taking off time period from KSA which they must make all reasonable measures to adhere to in order to avoid penalties which can be financial, or include the loss of that slot (Australian Government 2013).

There are also very specific regulations surrounding the provision and management of slots through each slot management 'season', which is aligned with the northern summer and

winter periods and is reviewed every six months. The biannual management of slots occurs under the *Sydney Airport Slot Management Scheme 2013*, and allows for the rearrangement of slot holdings, with applications sorted by the following order:

1. Historical Precedence
2. Size of aircraft (with preferences going to larger aircraft)
3. Any flights affected by curfews

Included in this scheme are a minimum number of dedicated 'Permanent Regional Services Slots', which are provided under the Slot Management Scheme specifically for services which take off and land in NSW. These existing slots are not associated with a specific destination, but rather allow for a proportion of the overall flights to and from KSA to be occupied by regional services. The definition of 'historical precedence' is of particular relevance under the *Sydney Airport Slot Management Scheme 2013*, as it outlines the exact nature in which the Regional Services Slots capping system works. Traditionally, an operator is given 'historical precedence' to a slot if:

- *the corresponding slot series in the previous equivalent scheduling season was allocated to the operator; and*
- *the operator satisfied the 'lose it or use it' test and any 'size of aircraft' test that applied in relation to that slot series.*

(Australian Government 2016)

However, caveats apply to this definition, which note that the concept of historical precedence does not apply to either:

- *a slot for which the operator has applied to conduct a service with an aircraft that has less than 18 passenger seats; or*
- *a slot in the peak period slot for which the operator has applied to conduct a regional service; (unless the slot is a permanent regional service slot).*

Essentially, this relegates the issue of regional service provision to a very low priority level. This is due to slot determination priority being required to follow the following order in accordance with Clause 16 of the *Sydney Airport Slot Management Scheme 2013*:

1. *Slots retained with historical precedence.*
2. *Slots allocated to new entrants and incumbent operators.*
3. *Slots allocated to regional service operators.*

In this way, the provision of regional services outside of the Permanent Regional Service Slots is extremely difficult, as it is given the lowest order of priority through the assessment process. The following additional 'Priority of Application' subclauses add additional complications in the establishment of new regional routes into or out of Sydney Airport:

- *23(b) – an application for a slot to provide an international service takes priority over one for a slot to provide an interstate or a regional service.*
- *22(c) – an application for a slot to provide an interstate service takes priority over one for a slot to provide a regional service.*
- *22(e) – an application for a slot to operate a larger aircraft takes priority over one to operate a smaller aircraft.*
- *22(h) – any other application for a slot to provide a general aviation service or a non-scheduled service takes priority over an application to provide a regional service.*
- *24(b) – an application for a slot to provide a service on a route which no service is operating takes priority over an application for a slot to provide a service on a route on which there already is a service.*

The above subclauses work to entice regional service operators to operate under the Permanent Regional Service Slots, which are open to historical precedence. This is achieved through the reduction in the priority of regional services outside the dedicated slots to time periods where all other regular scheduled passenger services have been serviced. However, the concept of historical takes ultimate precedence, meaning that the above only Clauses are only activated when there are two challenging bids for a previously open slot at Sydney Airport. The likelihood of this occurring, especially during the highly sought after peak periods, is minimal and reducing each year as additional slots at Sydney Airport become occupied. By current estimates, it is understood that approximately 400 slots are dedicated as Permanent Regional Service Slots, representing approximately 10% of all flight movements to and from KSA (O'Sullivan 2016). As a result, the intention of this legislation to provide for a

'use it or lose it' component in order to entice the provision of regional services has instead resulted in an inflexible cap which limits ongoing access for regional services to KSA. For example, in the most recent scheduling season, it has been confirmed by multiple sources that Virgin Australia Regional is due to lose three of its six weekly slots on the Sydney-Tamworth service, despite the airline not wanting to reduce service frequency (O'Sullivan 2016).

This legislation also includes 'ringfencing provisions', which have been created to *"ensure that current peak regional services cannot be progressively moved out of [peak] hours in favour of international or interstate services"* (pp. 25, Australian Government 2013). This is ensured by only allowing a regional slot to be 'swapped' with a non-regional service if the second slot is within 30 minutes of the dedicated regional slot, and has ensured the maintenance (but not growth) of regional service movements during peak periods.

### Legislative Review

In October 2014 a review was conducted of the provision of regional aviation services in NSW. This review came shortly after the collapse of Brindabella Airlines in December 2013, and was undertaken by the Standing Committee on State Development, and chaired by Rick Colless MLC. The review investigated a series of concerns in the regional aviation industry in NSW, with discussion followed around the four following points:

1) *Cost of access to Sydney Airport, regional NSW airports and other landing fields.*
2) *Financial management and viability matters impacting on RPT operators.*
3) *Economic impact on regional communities of gaining or losing RPT services.*
4) *Potential for development of future modern RPT aviation.*

Where possible, my research has sought to acknowledge and build upon the research undertaken by the Standing Committee. However, other portions of the standing committee report looked at issues which are outside the scope of this project, mainly surrounding the ongoing costs of regional aircraft to operate, and the ongoing management of airport costs at various regional and metropolitan ports. Whilst these factors may indirectly influence the ability of airlines to offer services to regional NSW, these have not been looked at independently and in their own right under this project, which approaches the issue from a

planning perspective, rather than a purely operational or financial one. Additionally, the economic impact assessment undertaken relied purely on quotes of Councils in the dollar impact of economic output generated by the provision of services, with the Standing Committee not undertaking economic work in its own right. This project provides a review of the primary regional data obtained from TfNSW and Census data, which is a different approach to that undertaken in this Standing Committee.

It is also important to note that this Standing Committee released and endorsed its final findings in NSW state parliament in October 2014. These findings included a series of 23 recommendations, many of which were formulated around a request for the federal government to make changes to the slot arrangement scheme legislation which applies over KSA. In the two years since the release of these findings, political appetite to enforce the recommendations of the review has been low. The applicable legislation has not been publically contemplated for change in this time, and federal Transport Minister Darren Chester has stated that *"the current arrangement seeks to strike a balance between ensuring access to Sydney Airport for regional communities, and maximising airport capacity by processing larger aircraft"* (O'Sullivan 2016). This has reaffirmed the position that any changes to the regional aviation scene are not going to occur at a federal level under the current political climate.

Similarly, many changes and outputs which TfNSW were recommended to produce have not eventuated. Enquiries made to the aviation Department at TfNSW revealed that the Department has been closed since late August and will not be reopening until late October, meaning that this change occurring currently is considered to be unlikely.

## 3.2 Overview of Regional NSW

The role of regional transport connections has been widely but variably discussed in the recently exhibited Draft Regional Development Plans for NSW. Analysis of these considerations is divided into the recently exhibited 'regions' so as to enable consistency between these findings and current draft government policy, as well as to provide an overarching view of the relevant economic drivers of each region. There are ten regions which from the basis of the various strategic plans currently being produced by the DPE at a

regional level. Six of these regions are examined in further detail, and have formed the basis of the quantitative analysis in **Chapter 4**. In accordance with the methodology outlined in **Chapter 1**, four regions have not been included in this analysis, being 'Metropolitan Sydney', 'Hunter City', 'Central Coast' and 'The Illawarra' due to their proximity to metropolitan Sydney limiting the potential impact of air services (Kirkby, 2016).

### North Coast

The North Coast region comprises the coastal corridor between Taree and Tweed Heads, extending approximately 200km inland. This region includes a series of tourist driven economies which include Port Macquarie, Coffs Harbour, Ballina, Byron Bay and Tweed Heads, which have resulted in a significant increase in the scale and affordability of flights over the past decade, as a result of Low Cost Carriers (such as Jetstar and Tigerair) operating from Sydney to coastal airports. The current operating environment of these centres tends to be a mix of traditional turboprop mainline airline services (Qantas and Rex) and more recently establish narrowbody jet services initiated by LCCs. In contrast to this, the inland economies such as Taree, Grafton and Lismore continue to play more of a traditional regional role, with major industries including farming, some mining and other similar industries with a primary resource focus. Services are generally continuing to / from these centres, however these have been weakening in recent years due to the relative opportunity cost of users being able to drive 1-2 hours to a coastal airport, where they can be afforded cheaper flights (Brederick 2016). These centres tend to only be serviced by smaller propeller based aircraft.

The Draft North Coast Regional Plan makes specific reference to the importance of aviation precinct development in the attraction of regional flights (Planning and Environment 2016), noting that an emphasis should be placed on developing the area surrounding coastal airports with *"compatible and complementary industry and business uses"* in order to improve patronage. The plan also acknowledges the role that the proximity of the Gold Coast Airport plays to the region. The plan references the potential of growth in services at 'other ports' of the North Coast (Taree, Kempsey, Grafton, Casino and Lismore) to be limited, noting that the role of these airports should be to provide other aviation related services (e.g. training, aircraft manufacture, agricultural aviation) to ensure their financial sustainability.

## New England North West

The New England North West region is defined generally as the area immediately west of the Great Dividing Range in northern NSW, and is characterised a strong agricultural, mining and logistics basing. Larger centres in the region such as Tamworth and Armidale also benefit from some tourism trade.

Historically, this area was serviced by a higher number of smaller regional carriers including Brindabella, Hazelton Airlines, Aeropelican and Tamair, however market changes have reduced the focus to a small number of larger centres being serviced by the three major airlines (Qantaslink, Rex and Virgin Australia Regional). The Strategic Regional Land Use Plan for New England North West, which is the current strategic document covering the region, only references flight as playing a role as part of the growth of Fly In Fly Out (FIFO) work arrangements. The role of RPT services is not acknowledged in this plan at all.

## Central West and Orana

The Central West and Orana region is located at the geographic centre of NSW, embracing the major centres of Dubbo, Orange, Bathurst and Parkes. This region has robust agricultural, mining and logistics activity, underpinned by a service and tourism orientation within the major centres which has translated to very strong economic performance in recent years (Jennings 2016). Services to these centres comprise trunk regional services from Qantaslink and Rex, as well as additional services by smaller carriers such as Flypelican.

The Draft Central West and Orana Regional Plan provides for a specific action surrounding the protection of regional services through local planning controls. This plan describes the provision of regional services as 'crucial' by virtue of the opportunity cost of driving to the Coast from the Central West and Orana by comparison to more accessible regions. This plan also makes uniquely makes specific reference to the speed of air travel, and the ability of air travel to boost tourism business and health services in a manner which other modes can not. The plan notes the desirability for strategic planning to be undertaken by airport operators and the NSW Government in order to identify opportunities for investment and long term

airport expansion. However, the extent of this planning appears to be limited to Airport Masterplan development, or land use systems which avoid the approval of development which encroaches on air corridors. Reference is also made in this plan to the maintenance and increase of the number of slots at KSA dedicated to regional services to 20%. This figure is inconsistent with the current established slot dedication levels of 22% throughout each scheduling season, or specifically 26% of morning peak slots, or 33% of evening peak slots (Standing Committee on State Development, 2014).

### Far West

No plan has been developed to date for the Far West. Very low populations and large land areas mean that few industries tie this entire area together, and the majority of land remains unincorporated territory, which is unzoned and owned by the Crown. Cobar and Broken Hill are the main centres, which each receive services to Sydney via Dubbo. Direct services to Sydney are difficult to sustain due to the large distances required, and the generally very low population bases.

### Riverina-Murray

The Riverina-Murray region is located at the southern edge of NSW, and shares interstate borders with both Victoria and the Australian Capital Territory (ACT). Major centres in the region, including Albury, Wagga Wagga and Griffith all receive ongoing high quality transport services. Some smaller secondary centres also receive services, although in this context the proximity to Canberra and Melbourne from parts of the Riverina-Murray region needs to be acknowledged as in some cases primary the primary transport connection (Alberry 2016).

Uniquely, the Riverina-Murray Draft Regional Plan makes reference to the public benefit that RPT services and airport operations provide through the maintenance and support of infrastructure for essential community services such as the Royal Flying Doctor Service. Similarly to other plans, the Riverina-Murray Draft Regional Plan also makes reference to the requirement of Councils to prepare strategies which avoid encroachment of incompatible development on air corridors, and reaffirms the support of the NSW Government of the

maintenance and increase in the number of slots at KSA for regional services to 20%. This requirement of Councils to prepare strategies is a weaker requirement than that required under the Central West and Orana Plan, whereby Councils are required to incorporate such provisions into the planning *systems*.

### South East and Tablelands

The South East and Tablelands region comprises the southernmost coastal portion of the state, as well as the hinterland to the north and east of the ACT. Regional airline services are comparatively few in this region, due to the proximity to Canberra Airport. In the Draft South East and Tablelands Plan, the protection of growth of Canberra as a priority for trade and tourism in the region is acknowledged throughout. Some reference is also made to the tourism prospects afforded by other airports in the region, making specific reference to Moruya as an opportunity airport.

## 3.3 Conclusion

This chapter outlines the mix of different regulatory, environmental and policy conditions which have lead to the formation of the current regional aviation scene of regional NSW. Current intrastate aviation legislation can be divided into two key pieces of legislation, which largely duplicate one another. Additionally, current service provisions are controlled by access to aircraft slots at KSA, which have strict regulations to disincentivise regional aviation aircraft movement growth (although not passenger growth) beyond current levels. This has been compounded by a new strategic planning direction through release of the various Draft Regional Plans across NSW. However, discussion around the role of planning in the regional aviation scene is very uneven, which brings into question whether there is high level direction in the role of planning in the provision of regional air transport infrastructure. When combined with the preceding Theoretical Understanding (**Chapter 2**), this chapter illustrates an inherent lack of cohesion in the current system, whereby the regional aviation industry appears to fall somewhere in between the definitive roles of several government administrative bodies. Given the significant established importance of such services, government policy is outdated and in many cases lacks connection with the operational reality of such services


(Bidgee, 2012)

# 4.0 Qualitative Analysis

This chapter outlines the findings of ten in-depth interviews with key stakeholders, which included a range of people in government and non-government roles who have been involved in the coordination, planning and provision of aviation services, or involved in the performance and health of economies in regional NSW. This chapter has been formatted so as to be consistent with the methodology contemplated in Chapter 1, and interviewees have been each given an associated acronym in accordance with Table 4.01 below.

**Table 4.01** – Interviewee references used in this chapter

| Interviewee | Relevant Position | Interview Reference | Group |
|---|---|---|---|
| Paul Brederick | Network Planner, Jetgo | N1 (Airline Network Planner 1) | Airline Planners |
| Warrick Lodge | Network Planner, Rex | N2 (Airline Network Planner 2) | |
| Asked not to be named | Network Planner, Australian Airline | N3 (Airline Network Planner 3) | |
| Kate Alberry | Environmental Services and Planning Director, Cowra Shire Council | C1 (Council Staff Member 1) | Council Staff Members |
| Ponie De Wet | Business Development Officer, Cowra Shire Council | C2 (Council Staff Member 2) | |
| Steven Jennings | Manager City Strategy Services, Dubbo Regional Council | C3 (Council Staff Member 3) | |
| Phil Gregory | General Manager, Brisbane West Wellcamp Airline | A1 (Airport Manager 1) | Airport Managers |
| Asked not to be named | Airport Manager | A2 (Airport Manager 2) | |
| Mark Rundle | Planning Development Manager, Wagners | A3 (Airport Development Manager) | |
| Gordon Kirkby | Chair, Western Region JRPP | J1 (Joint Regional Planning Panel Chair) | N/A |

The interviews undertaken have been designed to inform the aims of this thesis discussed in Chapter 1, and in order to do so the following themes have been generally adhered to:

- Health of regional NSW economies.
- Health of regional NSW aviation
- Impacts of flights to regional NSW.
- Airline-government relationship during route establishment.
- Ongoing airline-government relationship.
- Acknowledgement of regional flights in the planning system.

- Regulatory barriers to regional flights.

## 4.1 Health of Regional NSW

### Health of Regional NSW Economies

Almost every interviewee confirmed that regional NSW is generally performing well in an economic sense, with strong growth in larger regional urban areas confirmed by airline network planners, as well as all Council staff members. Reference was made to the 'Evocities' program by C2 and C3 as partial justification for this growth, which is a multi-Council led association which intends to assist NSW cities towards being sustainable urban areas in their own right (Evocities 2016).

However, when asked to discuss the growth of smaller centres in NSW, respondents were largely divided. On one hand, C1 and C3, who are both local government planners, noted existing and future potential growth in the smaller centres across the region. C1 pointed to significant enquiries and expansion plans from major local employers as an indicator for future growth in the area. However N3, as well as both J1 and C2 highlighted the notion that smaller regional towns are generally stable in an economic growth sense, experiencing neither growth nor decline in the medium to longer term. Specifically, C2 noted that *"Cowra's economy, like a lot of other regional towns, is flat – some years up, other years slightly down, but in the long run generally flat"*. C2 expanded on this, confirming that a lack of growth in regional centres was not necessarily bad in itself, rather was just the nature of smaller centres in NSW. N2 was of the belief that regional NSW was currently at the end of a downturn, and would soon return to growth.

The airline network planners, as well as C2 and C3 all pointed to the diversity of the NSW economy as a basis for current positive trends in employment and growth, with C3 asserting that regional communities have a tendency to be resilient, and that the current changes to the economy were proving to have positive impacts on regional NSW. N1, C2 and C3 all made reference to the agricultural sector remaining constant in the area of 1-2% growth per annum. also noted a reduction in the employment capacity of farming due to the rollout of machinery reducing the human labour requirements in the agricultural sector. However, C3, C2 and J1 all

noted that this process had been coupled with a growth in the health and services sectors of regional economies, particularly in larger centres. In terms of regional performance differences, in his capabilities at the JRPP, J1 noted strong performance across the North Coast and South Coast, as areas which had experienced strong tourism and retiree led residential growth in recent years.

### Health of Regional NSW Aviation

When the scope of the question was narrowed from a general discussion around the NSW economy to a query regarding the health of regional flights specifically, interview respondents generally confirmed similarities to the economic conditions discussed above. C1, C2, C3, A1 and J1 all noted that the conditions of flights in larger regional centres appeared to be performing strongly. C3 confirmed that in the case of Dubbo the current focus is on *"trying to get people to stay longer in Dubbo, above the current nights per visitor figure of 2.4-2.5 nights per person"*. In this case, a clear strategy to continue growth and capitalise on the aviation presence has been undertaken at Dubbo, and discussions between the airlines and the Council are said to be lively and ongoing. In a situation where the route had been performing less well, the focus would likely be on route sustainability, rather than additional growth in desired sectors. A2 pointed to an increases in passenger numbers across NSW to all regional destinations as an indicator for improved health of the system.

Similarly to the economy generally, a different situation was noted across the board for the condition of flight services to smaller centres. N2 and N3 both noted that regional flights generally have very low profit margins relative to domestic interstate or international flights, which was coupled with a consumer perception that such flights were lucrative for airlines. C3 confirmed this, noting that the issue of smaller regional centre profitability *"has to do with how low the profit margins are for regional airlines"*. C1 and J1 both asserted that in the current environment, smaller destinations are not adequately serviced by regional flights, while N1 and C2 pointed out that it tends to be the smaller towns that are the first to lose their services in a difficult operating environment. This is confirmed in the quantitative data analysis (**Chapter 5**), the Theoretical Understanding (**Chapter 2**) as well as the recent movement of Virgin Australia to cut capacity to its regional markets as a result of the wider business underperforming generally (Virgin Australia 2016).

C1 also questioned whether an increase in flights to smaller destinations would destabalise the current larger centre routes, given that there has been a relative increase in the catchment of these centres as fewer destinations have been serviced by regional flights in recent years. C1 and C2 both noted that if they needed to travel from Cowra to Sydney quickly for business, then they would drive to Orange or Bathurst and fly in from there, thus becoming a part of the catchment which would not have occurred if Cowra had a separate service.

## 4.2 Impacts of Flights to Regional NSW

All interviewees acknowledged a strong connection between regional areas and the flights which serve them in an economic sense, as well as a social sense. However, beyond this there were differing views as to the specific benefits which flights brought to regional areas, as well as the exact manner in which those benefits manifested.

Initially, when asked to describe the nature in which regional flights would deliver economic or social benefits, almost all respondents agreed that this was through the flow of people and information between KSA and regional NSW. N1, N3, J1, C2, C3 and N2 all noted that this flow was twofold, comprising both persons leaving the regional centre to access wider and higher order services which a larger metropolitan area has on offer, and persons in larger cities looking to either service or access the regional market. A lack of higher order firms in regional centres was a common theme of discussion amongst J1, C1, C2 and N2. C2 pointed out that the average regional centre would be lacking higher order education services such as university, advanced medical services and many larger firms, including accountancies and legal offices. J1 additionally asserted that an ongoing trend towards the globalisation of major firms in larger cities had resulted in a movement towards increased trade to and from the capital city to access branches of such firms for local businesses. On this point, C3 agreed with the notion that traffic between the centre and the capital was bidirectional, however identified the reasoning behind this as a factor of the increased growth and independence of Dubbo as its own higher order city. As a result of this, trade between Dubbo and Sydney was increasing in its own right, however over time less and less people were required to access Sydney due to a lack of services within Dubbo.

In many cases, J1, A3 and C2 noted the provision of aviation services also gives local firms access to larger labour markets, client networks and even some trade opportunities. C2 in particular observed the difficulty which regional areas have in retaining skilled youth. He stated, *"young people are leaving town, and although the opportunity of them is returning here, there are no skilled jobs for them to go in to."* This confirms the notion of labour markets being difficult to retain young people in regional NSW highlighted by Murphy, Sproats et al. (1991). Following on from this, J1 and A3 additionally asserted that the direct jobs generated by regional flight networks tended to be higher paying in nature. The benefits of this type of employment then would flow through the rest of the economy more broadly.

The question of whether the airline or the centre was the instigator of the relationship drew wider range of responses. C3 saw the relationship as *"less than significant"* given the large size of Dubbo as a regional centre and a Council, but confirmed his opinion that there was definitely some form of flow on effect from the airline towards the economy of the regional centre. N2, C2 and N3 saw flights as an indicator of economic performance, with N2 describing the flight system as like a 'Barometer' of the performance of the wider urban area. N3 stated that *"airlines and hotel vacancy rates are two of the key leading economic indicators in an area"*. He used Perth as an exemplar of this phenomenon, reflecting on a severe shortage of accommodation and a very high level of flight profitability and capacity during the mining boom, which then reversed as the regional employment prospects reduced in the years that followed. This is supported by the quantitative analysis in Chapter 5, which demonstrates a statistically significant link between flight patronage and population growth, and indicates a potential linkage between flight patronage and household income increase.

N2 and N3 also pointed out that it was in the interests of the airlines to see their destinations grow over time. N2 saw this as a situation where the airline would need to continually be reviewing and updating its data, whilst making sure that the regional centre had key industries which were either stable or growing. He mentioned that as part of their ongoing correspondences, major stakeholders including any business council and large employers were continually in discussions with the airline, a process which the airline saw benefit from as they could discern the general tone of the business environment. N3 took this one step

further, going so far as to require a business plan from the local area which identified what areas of major growth were going to occur in that area and be the focus of Council's policy over the coming years. He argued that the airline saw this *"as a self fulfilling action, and in their best interests to do so"*, given that economic growth in the area would in turn supplement existing earnings on the subject air route.

When specifically asked about the social benefits which arise from the provision of flights, all respondents agreed that such a link did exist. However, when questioned on what form those social benefits would take, there appeared to be less awareness of specific social benefits of flight, particularly when compared to other modes. J1, C1 and C2 noted access to higher order health services as a major benefit, and six different respondents noted the importance of flight to economic growth on the basis of such growth being socially beneficial to the wider economy. However, this was generally the limit of each benefit which each interviewee was able to provide. When compared to the extensive social benefits outlined in Chapter 2, interviewees generally were unable to mention more than a couple such benefits, suggesting a potential shortfall in the awareness of social benefits arising from flight by interview respondents.

### Relative Impact of Flights

Several respondents drew comparisons between the value of regional flights and other modes of regional transport. As has been discussed in Chapter 2, a range of benefits is specifically delivered in the case of regional flights above and beyond those which can be offered by other modes. Generally, the discussion was not surrounding whether one mode was more or less effective than any other mode in servicing regional areas, rather that different modes offered complementary services and would ideally be provided together to offer the user additional choice. J1 acknowledged that when discussing the role of road transport against air transport, stating that *"the two go hand in hand"*. Out of this, J1 hypothesized, there could be additional benefits to aviation service patronage and profitability generated from the economic activity generated by the construction of road infrastructure. Likewise, an improvement in air connectivity would provide a high speed service to an area from Sydney which could have a similar impact on economic activity, meeting different needs to any road based works. It was for this reason that J1 didn't believe

that aviation could be offered in place of other modes. Similarly, C2 identified the role of aviation as meeting specific economic and social needs which centered around the fast movement of people as the primary priority. He drew on the current inland rail corridor in planning, as well as the strategic location of Cowra at the intersection of a number of major highways, and concluded that ideally all three modes would be offered hand in hand to provide a suite of services to local businesses and people. It was his belief that this concurrent service offering would achieve the greatest return to Cowra.

This notion also fed into the decision making of airline network planners as well, but with a different perspective and underlying rationale. N1 and N3 both pointed to the opportunity cost of alternate routes as a key factor in the route decision making process. N1 stated, that as part of the route planning process *"the distance to a cheap nearby flight service"* and *"what makes the ground route different"* were both factors which affected the provision of services to one centre over another. In this case, Jetgo was looking at the areas where the transport opportunity cost is the highest as the basis for providing services, in order to be able to obtain the highest yield from passengers. In many ways, this opinion was in opposition to the planners and economic officers above who aimed for a joined approach in the provision of infrastructure, signaling a disconnect between the two groups of interviewees.

## 4.3 Airline-Government Relationships During Route Establishment

A key element of interview discussions focused around the dynamics and processes of the relationship which was established between airlines and the various levels of governance. It was generally accepted amongst all Council staff, N1, and A3 that a strategic government approach was important in identifying the appropriate level of service for an area, however the airline network planners all noted that the state government tends not to get heavily involved in the pre-flight commencement discussions, especially outside of the regulated route process. This is particularly relevant around the provision of services in the deregulated route system, as well as the provision of regional services across state boundaries. Instead, the current system comprises a mix of the airlines, local Councils and Airports doing the upfront economic work required to confirm the potential profitability and service requirements of specific regional centres. All three airline planners interviewed confirmed that it is helpful when a Council or Airport does the upfront strategic work, however the occurrence of this is

sporadic and random when divided by port. A1 and A3 confirmed that in attracting airlines to operate at Brisbane West Wellcamp, the initial work and lobbying was almost entirely undertaken by the airport.

Where this notion of the airport acting in a proactive manner fails is when the airport does not have the resources or the inclination to undertake a separate assessment, and is left without guidance or experience on how to manage the relationship with airlines. C2 described an experience of being approached by email from an airline considering the provision of prospective services to Cowra. C2's key issue with the approach undertaken was that Council needed airlines to provide *"numbers which* [Council] *can build upon in establishing a service"*. Without a starting point to work off as a base, C2 found negotiations to be unproductive and ultimately unsuccessful. C3 held a similar opinion on this issue, stating that *"an airline will come with an offer, and the Council needs to weigh up this benefit"*. He also considered that *"the airlines should not take future potential benefits* [which arise out of negotiations] *into account at the negotiation / planning stage"*. However, N1 held a different view to this, stating that *"the airline is the partner and cannot be expected to carry all the* [financial] *risk."*

The other key point raised by respondents in the route establishment phase is that the process is influenced strongly by local politics. In many cases, the notion of bringing in a new regional aviation route is often instigated by the Mayor or the elected Member of Parliament (MP). Every respondent raised the notion of flights having a heavily political connection except for C1, A1 and A2. C2 attributed this to the highly visible nature of regional aviation, when compared to other potential government projects. C2 used the example of a sewage treatment project, arguing that when evaluating the needs of different projects the approach is historically *"to look at the structural things that need to be addressed, but also look at it from a political perspective into something that will have very good political outcomes"*. In this example, C2 pointed out that a sewerage treatment plant would have a structural benefit, but not a political benefit. However flight would lead to a benefit on both structural and political fronts. This is also evidenced through the nature of press releases made by TfNSW for the provision of new or changed services in recent years comprising statements from the Minister for Transport, as well as the local Member of Parliament (TfNSW 2016). Likewise,

when questioned about the relative proactivity of Dubbo Airport to other centres in attracting and maintaining regional services, C3 explained that a former Mayor had provided strategic direction to establish and maintain regional flights. This in turn led to the Council undertaking consultancy work around potential patronage numbers and the suitability of their facilities to support such services. This high level direction could have been a strong factor in the subsequent growth and expansion of Dubbo Airport, by comparison to other airports in the region.

## 4.4 Ongoing Airline-Government Relationships

Beyond the establishment of routes, all applicable respondents were also asked of any ongoing communications between airlines and government, in terms of the nature and frequency of such discussions. Principally, such interactions related to an airline looking to alter the existing service offering in some manner.

J1, C2 and A3 differentiated regional flights from other modes by virtue of the comparatively low level of infrastructure provision required for regional flights, particularly in cases where an airport already has the required infrastructure to commence additional RPT services. J1 explained, *"the mobile nature of aircraft … are much less limiting due to the relatively low level of infrastructure required"*. This means that the provision of flights is not limited to where historical infrastructure networks are located, as is the case in many rail / road routes for which connections are based on the relevant capital city, as a result of historic colonial competition (Jeans 1972). In turn, networks can be formed around the most feasible corridor, rather than simply where infrastructure is already available. This flexibility has largely been focused to date on deregulated routes, with N1 pointing out that the interstate nature of Jetgo's regional services has meant that by default all routes are deregulated. In his position, regulated routes provided inherent barriers to entry, in that the requirements of Councils and TfNSW tended to be higher than when providing routes on a deregulated corridor. However, even within the regulatory system the flexibility of aviation is still notable, as evidenced by the inclusion of Brisbane West Wellcamp by Rex on the regulated Western 2 Route, which services regional Queensland. Although this route is governed by the Queensland state government rather than the NSW state government, it is a strong indicator of potential flight flexibility even under a regulated system.

However, a key recurring theme in the ongoing relationship of services and a region is that although the airlines may want to change or alter services to better meet a market, slot access strongly constrains the potential for this to occur. All airline network planners surveyed noted that when a carrier wishes to change the flight timing of a service to better meet the needs of the community, they are often limited by the timings at which they can take off and land from KSA. N2 noted that this has occurred during both the process of transitioning from one tender agreement to another, and within the confines of a tender period on regulated routes. N1 noted that this occurs on an ongoing basis in the case of deregulated routes.

## 4.5 Acknowledgements of Regional Flights in the Planning System

A systemic shortfall has been acknowledged of the role of regional flights in the planning system at Chapter 3, and the three town planners interviewed confirmed that this is the case. J1 and C1 acknowledged that there has been little recognition of the role that regional aviation flights play in the social and economic development of regional and remote areas. C3 noted that there was some acknowledgement of this role, however he mentioned that this role was largely in relation to the strategic preservation of airport lands and their surrounds for appropriate development. It was the view of C3 that planning could not do anything more than that without stepping outside of its own boundaries as a profession.

C1 noted that the economic data which underpinned the current Local Environmental Plan in Cowra did not consider the airport as a major economic driver, meaning that very little planning had been undertaken on the role of the airport to date. By extension of this, regional aviation benefits had similarly not been accommodated for in Cowra, which is possibly reflective of the lack of any airline presence in Cowra in recent times. Given that the last flight to Cowra was in 2001, this seems appropriate. However, C1 did note that with some present masterplanning and subdivision works being undertaken by C2 at Cowra Airport, this could be revisited in the near future. C1 also mentioned the Draft Central West and Orana Regional Plan, and her role as part of the planner group who developed that plan. C1 noted that the objective of the plan had historically been in regards to trade towards Sydney, and that connections to other cities tended not to be acknowledged, even if it would make more economic sense for the trading partner to be elsewhere than Sydney. In this case, C1 noted

the connection of Cowra to Canberra, which made more sense as a trade partner than Sydney. C2 confirmed this view.

Finally, J1 and C2 both questioned the potential role that planning could play in promoting connectivity in regions, whether by air or other modes. J1 pointed out that he *"hadn't seen it ever stated in a planning context the important role that regional airlines play"*, while C2 pointed out that more often than not, a 'regional' discussion tends to be focused still on the Metropolitan Sydney area in strategic documentation, rather than regional NSW. This ties back to the lack of a fixed definition for regions addressed at Chapter 2.

## 4.6 Regulatory Barriers to Regional Flights

### Weaknesses of regulation in the tender process

One of the key identified areas of weakness in the intrastate regulatory system was in regards to the system of allocation for regulated routes within NSW. C2, as well as all airline network planners identified a disconnect between the legislative requirements of regulated routes and the level of service that an airline could feasibly provide. N1 and N3 both noted that the overly cumbersome cost of the tender process often exceeded the benefits that exclusivity in servicing a marginally profitable route could generate.

Even N2, whose airline does bid for and often win regional contracts, noted that their official position is for all markets to be deregulated, as the current system of regulated routes has resulted in a lower quantum of routes being serviced than would be serviced in a deregulated environment. N2 also considered that recent actions by TfNSW to seek out public comment on the desired preferences of transport routes by local communities had resulted in a 'wish list' of requirements that could not ever be provided in a feasible manner by airlines. This in turn, resulted in community and Council expectations exceeding the level of service which the airline can provide for, ultimately resulting in a lack of bids during in the Tender process.

Pre-airline negotiation community consultation has tended to produce results similar to that undertaken with the Narrabri community (see Figure 4.01), where the community has outlined expectations that are in excess of what the current market based system can afford

or provide. In this case, the community's expectations of two 30 seat return flights per weekday and an additional Sunday service would result in the provision of 31,200 aircraft seats per annum, however historically the Sydney-Narrabri corridor has averaged to achieve patronage of only 10,000-15,000 passengers per annum, dependent on year. This means that the proportion of seats fulfilled on any given flight (seat loading) in a scenario where 31,200 seats are provided is unlikely to exceed 40-50% judging by historical seat occupation statistics, which is well below historically sustainable levels. This lack of financial suitability is additionally evidenced by the lack of any services to Narrabri in the two years since this publication.

**Narrabri - Council and community representatives**

| Topic | Comments |
|---|---|
| Pricing | Competitive, reasonable pricing of tickets |
| Flight frequency/schedule | Reliable service<br>One return flight early AM and one return flight late PM on weekdays<br>One flight ex Narrabri Friday PM to Sydney and return flight late PM Sunday evening<br>Triangulation service with other regional destinations would be accepted but not preferred. |
| Aircraft preference | Modern turbo-prop aircraft with minimum seating capacity of 30 (which could potentially increase via fly in fly out passengers) |
| Baggage | Flexible baggage policies, including reasonable limits and onward connections if possible |
| On-board facilities | In-flight catering preferred with toilet facilities. |

**Figure 4.01 –** Sydney-Narrabri Air Route Community Consultation Outcomes (TfNSW 2016)

N2 asserts that the effect of such consultation is that *"licensing carries political issues, where local government and regional communities have a certain viewpoint to a service because it is licensed."* He explains that licensing means that the expectation increases from the community and the Council, *"as though licensing is a guarantee to make the route profitable."* Given that the NSW system only provides protection of a carrier as the sole operator, it is unlikely that the current system will have such an effect. On this point, N2 explains that *"although the protection of regulated routes stops competition, the change in dynamics of those thin routes will never be viable with competition anyway,"* which brings into question the necessity of route regulation on a corridor which would never have been able to sustain competition from the outset.

This desire for carriers to not operate regulated routes has also been reflected in a recent announcement on the Sydney-Mudgee route. In this announcement the Minister for Transport and Infrastructure Andrew Constance and the Member for Dubbo Troy Grant said *"the*

*deregulation of the Sydney-Mudgee route has enabled FlyPelican to begin services today."* In the press release, it is also acknowledged by TfNSW that *"all intrastate air routes are presumed to be regulated, creating costly red tape for airlines wanting to provide a service,"* (TfNSW 2016) which reflects the awareness of TfNSW of the route sustainability issues hindered by regulation which that same regulation is intended to facilitate. N3 additionally pointed out a time delay component of regulation in catching up to the market position, with the mining boom throughout parts of western NSW and across Australia as a recent example of this. On this point, he believed that *"the key challenge with the regulation system is that regulation isn't quick enough to respond to economic changes"*. The commencement or conclusion of industry sector booms are an example of this, where the government regulation fixes airlines through financial penalty and potential public relations fallout into the continued provision of a service at a level which isn't matched with market demand, and results in the airline losing money on the route rather than reevaluating the required service level for the airline to provide a service level which is more financially sustainable. N1 and N3 deemed unsustainable regulatory obligations such as this to require airlines to develop a risk adverse approach towards tenders and other calls for regulated routes. They note that airlines require flexibility in the provision of services, particularly to accommodate how the market changes to a specific destination over a five year tender period.

### Security / Infrastructure Costs

A second key issue raised by several interviewees was the prohibitive nature of security and infrastructure costs, particularly during the route establishment phase. Security regulations are set out at a federal level by the Civil Aviation Safety Authority (CASA), however the costs for the enforcements of security regulations are borne by the individual airport. In the majority of these cases, the airport passes this cost onto the airlines through a passenger tax. N1 identified security screening as *"also being a prohibitive cost"* in the process of commencing air services to a new or resumed destination in regional NSW. C3 asserted that a lack of infrastructure in place to provide flights in terms of security, lighting, facilities and the like meant that *"there may be half a million dollars worth of upgrades to an airport which hasn't been used for RPT in a number of years"*, and that *"it will be up to the Council if they want to make such upgrades, however* [in terms of smaller Councils] *they probably won't be able to afford it."* Interestingly, C3 noted that there was money available in terms of federal

government grants for the above infrastructure work, which had contributed to the 2014 expansion of Dubbo Airport. However he elaborated on this, explaining that *"a lot of the smaller Councils' staff and knowledge capacity won't be enough to chase these grants."* C3 believed that the grant selection process required resources which exceeded the capacity of smaller Councils. Due to the nature of Jetgo's 36 seat jets triggering additional security requirements when compared to a similarly sized propeller plane, N1 also noted this as an area of financial concern in the establishment of an air route. N1 recounted past issues where Jetgo had intended to establish a service, however *"the cost of security screening is a major barrier to improved regional air services."* N1's suggested solution to this was a nationalisation of security costs to reflect its status as a national issue, rather than the costs being borne on a port by port basis.

### Sydney Airport Slot Access Issues

The other major issue which was raised throughout the interview process concerned access to Sydney Airport. As discussed extensively at **Chapter 3**, access to Sydney Airport is regulated through a slot mechanism, which provides a range of rules around the dedication of slots for regional services, which are currently manifested in the form of a maximum cap in the peak periods. Essentially, the current system heavily favours existing carriers on regional routes, as the current system of slot allocation is dedicated to the carrier, rather than the destination. This has lead to an operating environment where the incumbent airline on a regulated route can be the only one which has the slots to service a specific destination, meaning that if that airline does not seek to renew the application to operate that route, then the flight times are lost with the carrier. This process has occurred numerous times in recent years, with N1, N2 and C2 all confirming an incumbent bias in the tender selection process, as a result of slot access arrangements.

## 4.7 Conclusion

Across the range of people interviewed for this project, a two-tiered pattern of economic growth was identified. In larger centres, possibly by way of the Evocities program, economic performance was strong, expanded service and health sectors were underpinning growth and larger urban areas were developing in a larger trend towards self-sustainability. However, smaller centres across the state tended to be stable in population and economic condition,

which reflected a seeming lack of interest in development of such centres. This was also apparent when the scope of questioning was narrowed to the specific conditions of regional flight, in which the respondents detailed a similar trend of growth in the provision of services larger centres and stability or decline in services to smaller centres.

The impacts of such flights were strongly agreed by all respondents to have some social and economic significance, with benefits facilitated by the flow of people. Most respondents were able to list significant economic benefits which arose from the provision of regional flights, and how such flights would benefit the region. However, when questioned on additional specific social benefits provided by flight, many respondents were unaware of the full range of benefits which are delivered by airline routes as a method of regional transport. Respondents also compared the role of flight to other modes, with government staff generally preferring that flight be offered as part of a suite of modes. Against this, the airline network planners tended to prefer for a higher modal opportunity cost, meaning that they prefer to locate in areas which do not benefit from other high quality transport options.

In regards to the communication systems between airlines and government, upfront economic work on the feasibility of routes was seen as a major attractor of airlines to a specific destination. Additionally, strategic work on the ability to provide flights, as has been undertaken for other modes of public transport, was seen as something which would be beneficial to the ultimate delivery of flights to a destination. The terms upon which an airline could negotiate with a Council was not information which smaller Councils tended to be aware of, which had led to missed opportunities on the provision of services. All three urban planners interviewed confirmed an almost non-existent recognition of benefits provided from regional flights in the current planning system. Conflicting views were held around the role that planning could play in the provision of services, with opinions ranging from only working around airport land preservation, through to strategic and statutory recognition. Three areas of regulatory shortfall were additionally identified by respondents, relating to issues around the flexibility and marketability of the current tender process, security and infrastructure costs acting as an inhibitor for a destination to be added to the NSW network, and slot access issues to KSA as a result of outdated legislation.

(Bidgee, 2016)

# 5.0 Quantitative Analysis

The quantitative analysis reported in this chapter addresses the study objective to examine the relationship between aviation patronage numbers and economic performance over the fifteen years between 1996 and 2011. In this chapter, air route patronage figures are correlated against three economic indicators - namely population growth, unemployment rate change and income change at a household level. These three indicators have been selected as a result of the methodological research undertaken as part of **Chapter 1.** Initially, the transport patronage data is analysed at **Section 5.1**, including a detailed exploration of key trends arising from the dataset. At **Section 5.2**, the income growth, household income growth and unemployment change datasets are each analysed in a manner similar to that undertaken for the patronage data. The statistical significance of the relationship between each indicator and airline patronage growth are then discussed at **Section 5.3**, and the relationships further discussed at **Section 5.4.**

## 5.1 Transport Improvement

This study provides a comparative analysis of the performance of different regional air routes in NSW, and compares the dataset against major economic indicators. In order to undertake such work, the various ports within the state need to be standardised in terms of patronage improvement comparison. As a result of this, the methodology at Chapter 1 has been formulated in such a manner that enables meaningful comparison of patronage data, through:

- the removal of airline routes that are unsuitable for analysis, through a series of set rules for selection;
- the even distribution of centres amongst the regions of NSW; and
- the measurement of airline patronage improvement as a percentage improvement over the first year of study (1996); and

For this, proportionate airport improvement was identified as the manner which would best standardise the results, whereby a percentage change in passenger numbers at five year intervals was the subject of analysis. A variation of Chi's formula, discussed in Chapter 2, is seen as the ideal manner to deliver such results. Airport distance was considered an irrelevant factor in this research, and percentage improvement was identified as a preferable unit of measurement to logarithms, which resulted in the below adaptation of Chi's formula:

$$Airport\ improvement^{Per\ annum} = \frac{\left(\frac{Boardings\ [Later\ Year]}{Boardings\ [Earlier\ Year]}\right)}{a}$$

$Where\ a = selected\ number\ of\ years\ in\ study$

To provide an adequate mix of shorter and longer term coverage, this data has been analysed on an ongoing five year period through the subject fifteen years, as well as averaged out between the two end periods of 1996 and 2011. Accordingly, '*a*' is selected as both five years, and fifteen years for this study. In light of this, the transport patterns of each of the nineteen routes studied have been reproduced in **Table 5.01**.

**Table 5.01** – Per annum patronage growth of selected airports.

| Airport | Regulation Status | Patronage Growth (5 Year) (% per annum) | | | Patronage Growth (1996-2011) (% p.a.) |
|---|---|---|---|---|---|
| | | 1996-2001 | 2001-2006 | 2006-2011 | |
| Armidale | Deregulated | 2.57 | 6.44 | 4.77 | **5.65** |
| Ballina | Deregulated | 1.50 | 44.74 | -2.29 | **13.87** |
| Bathurst | Regulated | -3.62 | 16.46 | 2.44 | **4.50** |
| Broken Hill | Regulated | -6.20 | 11.87 | 17.69 | **7.15** |
| Dubbo | Deregulated | -0.22 | 12.98 | 0.15 | **4.30** |
| Griffith | Deregulated* | 0.07 | 21.17 | -1.02⁺ | **6.40** |
| Lismore | Deregulated* | -5.07 | 20.77⁺ | -5.56 | **0.35** |
| Merimbula | Regulated | -3.71 | 38.74 | -1.11 | **8.40** |
| Moree | Regulated | -0.13 | 2.31 | 2.96 | **1.82** |
| Moruya | Regulated | -2.98 | 22.28 | 1.21 | **6.05** |
| Mudgee | Regulated | -4.36 | 11.26 | 7.28 | **4.53** |
| Narrandera | Regulated | -5.41 | 19.79 | -4.13 | **1.01** |
| Narrabri | Regulated | 1.06 | 0.28 | 2.15 | **1.22** |
| Orange | Deregulated* | 2.82 | 9.78 | 1.21⁺ | **5.35** |
| Parkes | Regulated | -5.31 | 31.25 | 0.27 | **6.05** |
| Port Macquarie | Deregulated | 3.40 | 7.22 | 15.01 | **11.92** |
| Tamworth | Deregulated | 2.05 | 2.65 | 8.85 | **5.33** |
| Taree | Regulated | -5.95 | -9.35 | 22.66 | **-1.35** |
| Wagga Wagga | Deregulated | 0.33 | 12.51 | 2.69 | **5.83** |

*Destination was deregulated during the fifteen year assessment period.

⁺First census year following deregulation

The above range of destination patronage changes demonstrates generally improving patronage across the nineteen selected centres, which is supportive of the 'tiered growth' notion raised in the qualitative analysis. This demonstrates a number of routes performing very well (such as Port Macquarie and Ballina), a large majority of routes performing well (such as Orange), and then some routes performing poorly (such as Taree). As discussed in the methodology of this project, almost half of the overall routes in NSW had to be discounted as flights were terminated to those destinations. It is reiterated that this summary should not be seen as an indication of the general state of the network, rather an analysis which demonstrates what relationship exists between airline patronage and economic indicators, which cannot be investigated statistically where flights have been terminated. It is for this reason that a generally positive skewed growth is demonstrated in the above table.

The inconsistency of capacity growth or reduction, and significant impacts of capacity changes become immediately apparent when the above data is analysed. In situations where only a small number of carriers service a destination, this is due to the changes that one carrier makes to their network at any given time having a strong and ongoing impact. Examples of this include the expansion of Jetstar to Ballina (Jetstar Australia 2010) being reflected in the 2006-2011 growth rate of 44.74%, the increase of services to Parkes by Rex in late 2004 (Regional Express Airlines 2004) being reflected in the 2001-2006 growth rate of 31.25%, and a reduction in the capacity of services to Lismore by Rex in 2014 (Dobney 2014) being reflected in a reduction in the 2006-2011 growth rate of -5.56%. These changes are the result of single commercial decisions which is outside of the control of governance, but have significant and noticeable impacts on the capacity provided throughout NSW.

Table 5.01 additionally brings into question the consistency of the route deregulation process in NSW currently. All three of the routes which were deregulated followed a relatively short period of five years of strong growth, and did not reflect longer term or more consistent growth patterns. Not only did all three of the routes which were deregulated in this period experience a slowdown in growth in the period following deregulation, all three routes were contracted in capacity in that same five year period. This pattern of route patronage contraction was experienced in Griffith (-1.02% p.a.), Lismore (-5.56% p.a.) and Orange (-1.21%

p.a.), and the census period in which the flight is deregulated have been identified in **Table 5.01** above for comparison.

In essence, the main question which the analysis of patronage data produces is whether there are sufficient grounds to deregulate a route based purely on passenger patronage numbers. Given that the number of passenger numbers is as much an indicator of route patronage as it is of route demand, the commercial decisions of single airline bodies can result in significant changes to the overall capacity of routes. Additionally, where routes are deregulated on this basis, it tends to be based on route patronage performance over a relatively short period of time. One further case study on this point is the recent deregulation of the Sydney-Mudgee corridor by TfNSW. In this case, TfNSW appears to have deregulated the route as a manner of attracting Flypelican services, with no proven route sustainability data available at all (TfNSW 2016). The specifics surrounding the deregulation and route announcement on the Sydney-Mudgee corridor has been discussed previously at **Chapter 5**, as part of the qualitative analysis undertaken for this project.

### Externalities in the 2001-2006 Study Period

**Table 5.01** and **Figure 5.02 both** additionally highlight one additional point of interest in the data analysed, being a consistent drop in capacity in the period of 2001-2006. This is in accordance with a period of aviation turmoil in NSW, brought on by the consequential events of the terrorist attacks on 11 September 2011, and the collapse of Ansett Airlines (Shaw and Sidaway (2010). Specifically, these externalities had the impact of essentially 'shaking up' the established regional carrier system, with routes operated by Ansett owned Hazleton and Kendell Airlines impact the most. External data outliers on previous Hazleton / Kendell Airlines routes are evident in centres such as Parkes, Lismore and Narrandera, and have been acknowledged by this study.

### Discount of Terminated Destinations

Analysis of terminated services is also an important factor when studying the health of the regional aviation system. Given that 24 of 53 intrastate regional destinations lost services in the period between 1996 and 2011 (45.3%) and 26 out of 53 destinations lost services in the period from 1996 to 2015 (49.1%), a loss of almost half of all destinations is of importance in

this research project despite being inadequate to contribute to the longitudinal trends traceable over the full decade and a half.

In light of this, Figure 5.02 delineates, over the period of 1996 to 2011, the status of all areas which have received services during this timeframe. This analysis includes services which were both commenced and terminated in this time period. Note that no services were commenced in this time period which survived beyond 2011, meaning that all surviving services at the time of writing have existed since prior to 1996. Two key conclusions can be derived from this visual representation. The first is that a significant number of overall services have been terminated in this period, with particular concentrations in the North Coast and New England North West regions. This is consistent with the findings on the health of the regional aviation system discussed at Chapters 2 and 3, whereby the New England North West was shown to be generally weak in nature, and the North Coast was demonstrated as generally acting as a dichotomy of economically stronger coastal centres, and weaker inland centres.

The second key finding is that a number of services were commenced and later terminated over this period within the Riverina Murray region of NSW, with six of seven such services located in this region. The seventh service, to Cowra, is technically included as part of the Central West and Orana region, but is adjacent to the Riverina Murray and could arguably form part of either region. It was not able to be uncovered what the reasoning was for this service change, however this could the subject of additional research.


**Figure 5.01** – Outline of service status in NSW between 1996-2011 (Source: Author)

An examination of relationship between total passenger numbers and the number of destinations serviced can explore this area further. Many government reports, including the 2015 'State of the Regions Report' (Australian Government, 2015) identify increasing passenger patronage on regional routes collectively as an indicator for positive performance. This is true, in that the total number of passengers between KSA and all airports across NSW combined has increased over the fifteen year period. However, this is not reflective of the most pressing issue in the NSW regional aviation system at the moment, which surrounds the *number of destinations* as opposed to the *number of passengers*. Figure 5.03 depicts this relationship over the past nineteen years, and demonstrates an apparently inverse trend between the number of passengers, and the number of destinations over this period.

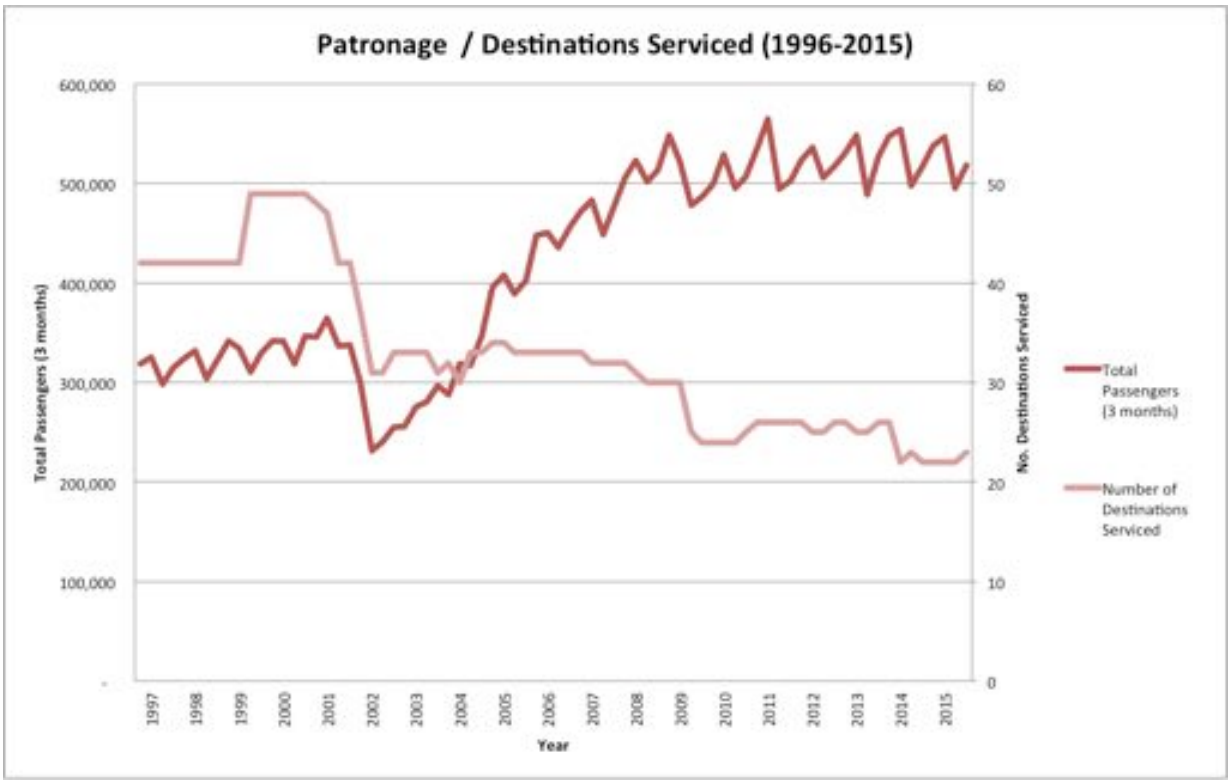



**Figure 5.02 –** Comparison of total passenger numbers vs. number of destinations serviced.

## 5.2 Economic Performance

An analysis of the economic performance of NSW has also been undertaken as part of this chapter, which in accordance with the methodology at **Section 1.4** has been divided into population growth, change in average income per household, and change in unemployment in order to identify economic trends. For the purposes of these results, the data has been divided into individual centres, and the subsequent discussion has referred to the performance of each region. This has been summarised in **Table 5.02** below. To ensure consistency, these datasets have been analysed over the same period of 1996-2011, and within the same set of destinations as identified by the flight patronage research above.

**Table 5.02** – Comparison of economic indicators and regional centres ( 1996-2011)

| Airport | NSW Region | Population Growth (1996-2011, % p.a.) | Unemployment Change (1996-2011, % p.a.) | Household Income Change (1996-2011, $ p.a.) |
|---|---|---|---|---|
| **Armidale** | New England North West | 0.87 | 0.27 | 26.07 |
| **Ballina** | North Coast | 0.88 | 0.41 | 35.33 |
| **Bathurst** | Central West Orana | 0.94 | 0.39 | 35.27 |
| **Broken Hill** | Far West | -0.89 | 0.39 | 25.73 |

| Airport | NSW Region | Population Growth (1996-2011, % p.a.) | Unemployment Change (1996-2011, % p.a.) | Household Income Change (1996-2011, $ p.a.) |
|---|---|---|---|---|
| Dubbo | Central West Orana | 0.38 | 0.22 | 33.07 |
| Griffith | Riverina Murray | 0.86 | 0.01 | 31.00 |
| Lismore | North Coast | -0.03 | 0.39 | 20.47 |
| Merimbula | South East Tablelands | 0.72 | 0.44 | 29.87 |
| Moree | New England North West | -0.90 | 0.39 | 30.20 |
| Moruya | South East Tablelands | 1.16 | 0.80 | 25.60 |
| Mudgee | Central West Orana | 0.48 | 0.39 | 35.27 |
| Narrandera | Riverina Murray | -1.16 | 0.19 | 10.67 |
| Narrabri | New England North West | -0.56 | 0.25 | 25.27 |
| Orange | Central West Orana | 0.8 | 0.25 | 37.40 |
| Parkes | Central West Orana | -0.22 | 0.33 | 15.47 |
| Port Macquarie | North Coast | 1.69 | 0.61 | 29.13 |
| Tamworth | New England North West | 0.33 | 0.31 | 23.87 |
| Taree | North Coast | 0.65 | 0.33 | 24.67 |
| Wagga Wagga | Riverina Murray | 0.47 | 0.27 | 26.07 |

## Population Growth

Population growth across each of the nineteen identified Local Government Areas (LGAs) has generally corresponded with the wider regional economic conditions identified across NSW at **Chapters 3** and **4.** Coastal regions of the state are seen to be performing the strongest, with significant population growth rates recorded in Port Macquarie and Ballina, as well as along the South Coast. The Central West and Orana also reported growth, albeit at a slower rate. However some LGAs reported negative growth over this period, throughout the New England North West, Riverina Murray and Far West regions. The smallest growth tended to be in the less populated, more isolated LGAs of the state, away from major economic hubs. **Figure 5.04** below translates the above table to a visual context.

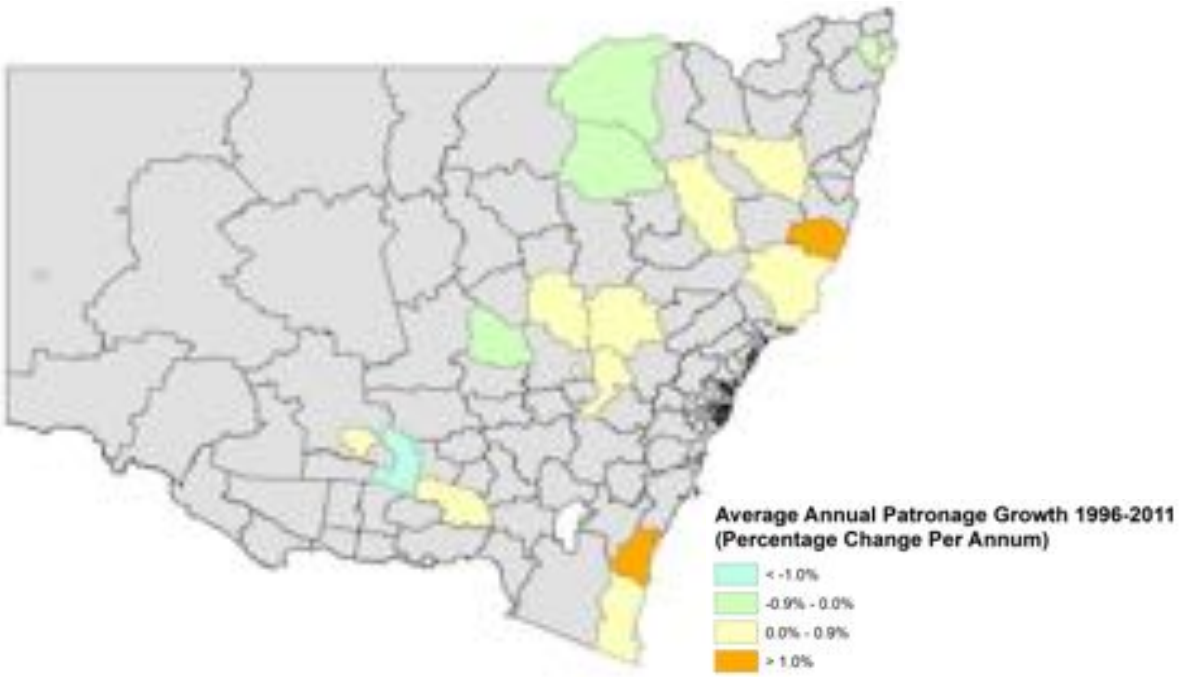



**Figure 5.03 –** Change in population in NSW (1996-2011) (Source: Author)

## Unemployment Change

Unemployment rates have significantly reduced across regional NSW between 1996 and 2011, with some centres reporting average year on year reduction in unemployment in the vicinity of 0.8%. Unemployment changes across NSW are mapped in Figure 5.05 below. Similarly to the boosts in population, the strongest reductions in unemployment were in the North Coast and South East and Tablelands, although lesser reductions were also experienced throughout the New England North West, Central West and Orana, and Far West regions. Important to note is the similar dichotomy of strong growing centres in the North Coast (Port Macquarie and Ballina) against the much weaker performance of adjacent centres (Lismore and Taree). The Riverina Murray reported the weakest reductions in unemployment, which was again similar to the population growth rate dispersion.

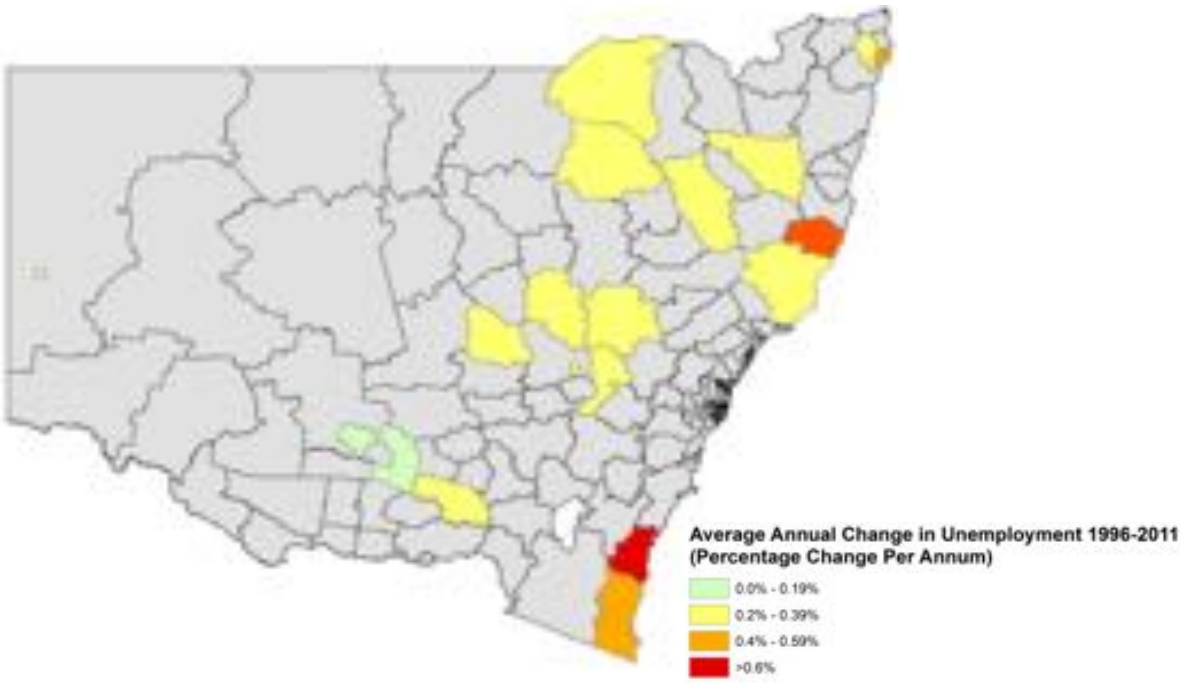



**Figure 5.04** – Change in unemployment in NSW (1996-2011) (Source: Author)

## Household Income Change

The third indicator measured across NSW was household income, with change measured in dollars per household, per annum (**Figure 5.06**). The variation between stronger and weaker economies in the North Coast continued with this analysis, with Port Macquarie and Ballina reporting stronger income gains than Lismore and Taree. However, the strongest gains in income per household were in the Central West and Orana, with all four LGAs in this region reporting improvements in household income which were in the top two brackets of measurement. The South Coast, Far West and New England North West reported similarly strong results in regards to household income growth. The Riverina Murray reported a strong contrast in growth, with Griffith and Wagga Wagga both reporting amongst the highest levels of growth, whilst Narrandera reported the weakest level of growth of any of the measured LGAs.

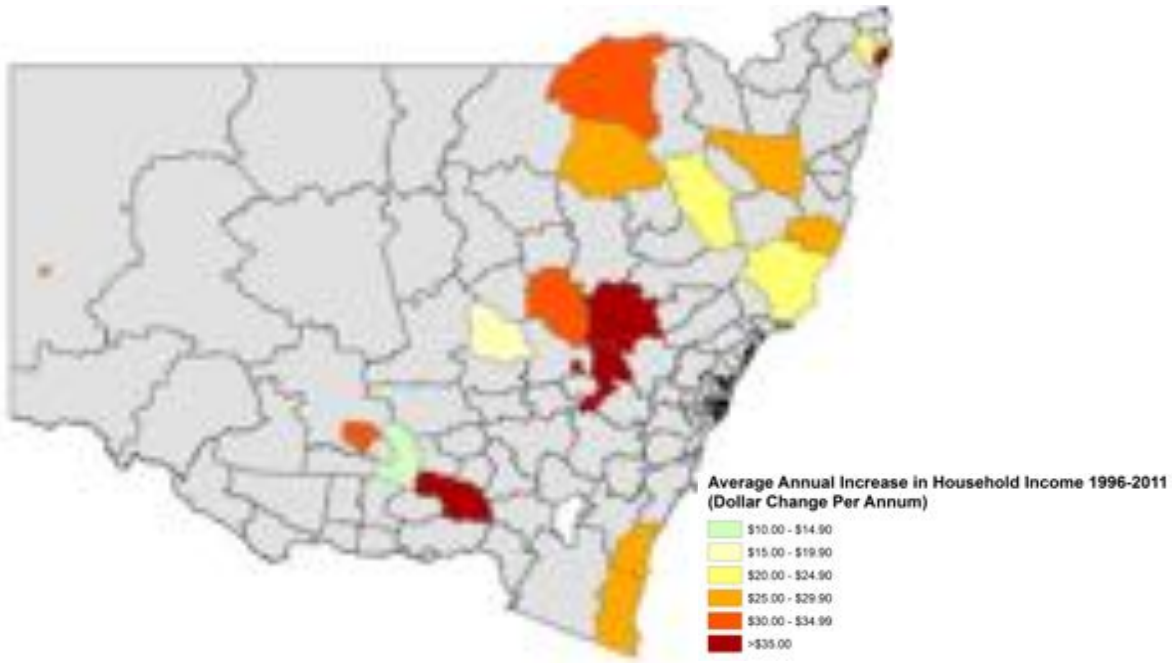



**Figure 5.05 –** Change in Household Income (1996-2011) (Source: Author)

## 5.3 Exploration of the Patronage – Economic Growth Relationship

Correlation analysis was conducted on each of the datasets outlined at Section 5.2 against the patronage data previously provided at Section 5.1. A two tailed hypothesis Pearsons test was applied to determine significance of each bivariate relationship using SPSS. In line with Washington and Karlaftis' (2011) perspective on analysis methods for transportation data, the use of Pearsons Correlation with a two tailed hypothesis is appropriate. The purpose of this significance test has been to determine any relationship between economic performance and airline patronage growth at a statewide level, in line with the objectives of this study. In light of this research, Table 5.03 provides a summary of the statistical significance of each data set analysed.

**Table 5.03** – Statistical significance results of each tested bivariate relationship

| Relationship | Pearsons Correlation | Statistical Significance* |
|---|---|---|
| Population Growth to Airline Patronage Growth | 0.521 | 0.022 |
| Average Household Income Change to Airline Patronage Growth | 0.377 | 0.07 |
| Unemployment Rate Change to Airline Patronage | 0.352 | 0.139 |

* Probability of rejecting a null hypothesis

When air route patronage data was compared at an LGA level against population growth between 1996 and 2011, a statistically significant correlation was able to be determined, which demonstrates a moderate relationship between the two dataset. On this basis, it is apparent

that there is a positive relationship between the growth of airline patronage, and population growth in regional NSW at an LGA basis.

Correlation analysis was unable to demonstrate a statistically significant relationship between average household income growth and airline patronage growth. However, Chow (1996) argues that a test of 0.05 significance is not a steadfast rule to determine a correlation in the case of transport data analysis. In this case, the existence of a trend between income change and airline patronage growth, although not statistically significant, should not be discounted as an indicator that such a correlation does exist. Accordingly, this potential relationship has been acknowledged as an area which could be the subject of additional research at **Section 5.4**.

No correlation was able to be demonstrated between a change in unemployment rates and airline patronage. Although a rough general trend could be analysed, it is not of a level which could be considered statistically significant, and accordingly should be seen as indicative only.

In light of these results, further analysis has been undertaken between Population Growth and Airline Patronage Growth at **Section 5.4**.

## 5.4 Relationship Between Patronage and Economic Performance

In light of the above analysis, it has been demonstrated that there is a moderate positive correlation between population growth and flight patronage growth. As demonstrated in the in-depth interviews at **Chapter 4**, almost all correspondents supported the idea of a positive correlation between patronage on regional flights and economic activity in centres.

The economic benefits of regional flights were discussed at depth at **Chapter 2**, and are supported by Hoogstra's (2005) meta-analysis of the Jobs-People relationship, as well as this quantitative analysis. Further to this, **Figure 5.07** breaks the relationship down into each surveyed LGA, and demonstrates that 13 of 19 centres are in a situation of airline patronage and population both increasing. In 6 of 19 centres, population growth is decreasing while airline patronage is increasing, however it is important to note that population growth in these centres is less than 1% per annum in all centres except for one (Narrandera). In all but one of

these centres, airline patronage growth is also very low, with five centres including airline patronage growth of less than 2% per annum. The exception to this is Parkes, which has experienced airline patronage growth of 6.05% per annum over this period, but population growth of -0.22% per annum. This spatial analysis demonstrates that a majority of centres support Hoogstra's findings that the movement of people and jobs are interrelated.


**Figure 5.06** – Geographic application of relationship findings of this study (Source: Author)

The significance of the Airline Patronage – Population Growth relationship is furthered when expressed in the form of a scatter plot graph. Figure 5.08 demonstrates that a positive relationship is identifiable in the subject nineteen centres, and a positive trend line illustrates the relationship which exists between the two variables. In support of the above commentary, the vast majority of centres with negative population growth tend to be at the lower end of airline patronage growth, and a cluster of centres are located in a similar area of experiencing patronage growth of 4-8% per annum, balanced against population growth of 0.25-1.25% per annum.

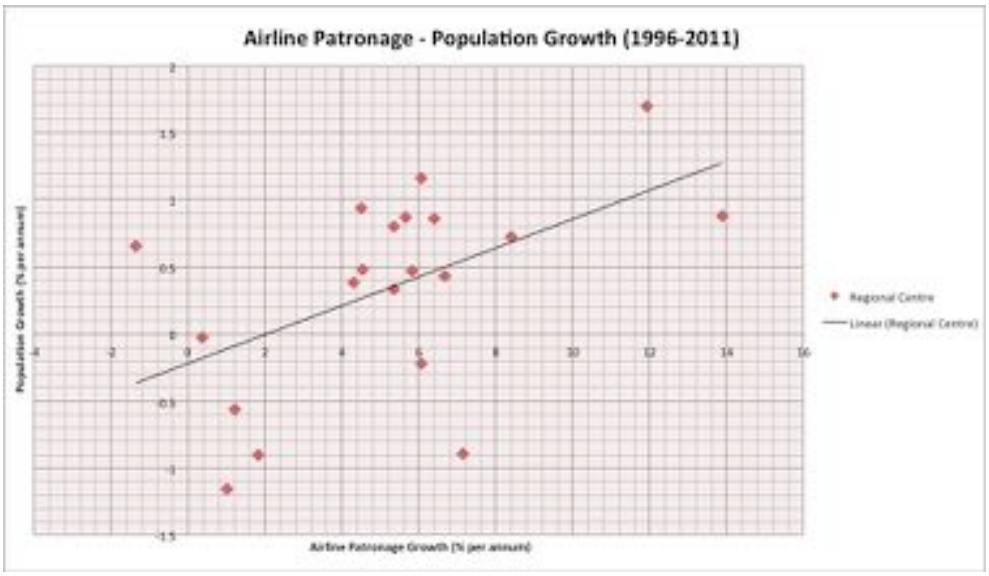



**Figure 5.07** – Comparison of airline patronage and population growth (Soruce:Author)

Also significant in this analysis is a review of the relationship between household income growth and airline patronage over this period. Although not proven to be statistically significant, this relationship was shown to have a high likelihood of a potential relationship existing, and this can be seen in Figure 5.09 below. Similarly to the relationship between airline patronage and population growth, the relationship between airline patronage and household income growth, when graphically represented, demonstrates a general positive growth trend, with economies which have reported higher patronage growth rates also exhibiting generally larger increases in income per household.

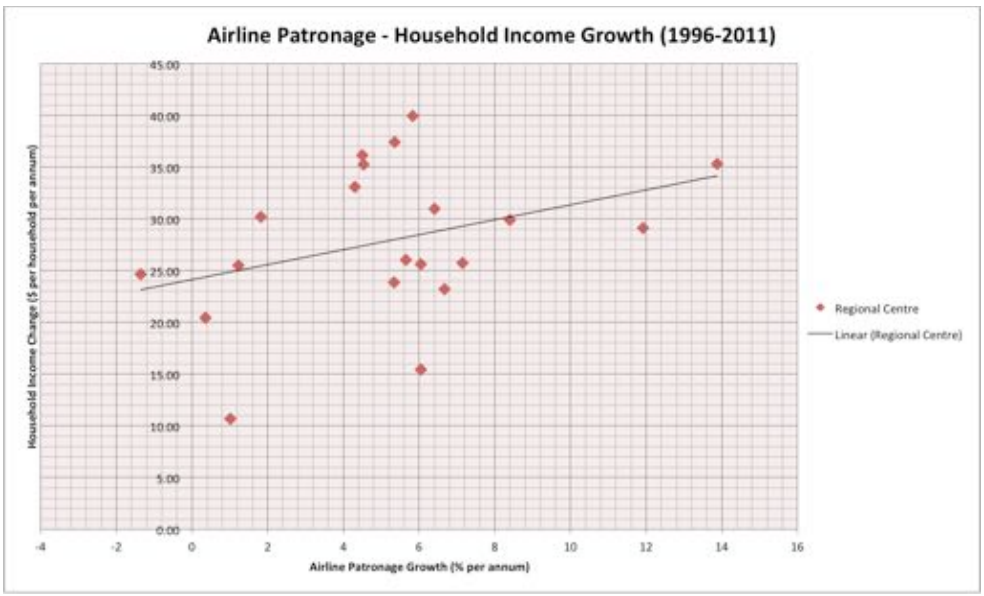



**Figure 5.08 –** Comparison of airline patronage and household income growth.

Finally, the relationship between airline patronage growth and unemployment rate changes has been illustrated in **Figure 5.10**. Although a generally positive relationship may be visually identifiable, there are obvious and significant outliers to this specific dataset. This can largely be attributed to the significant variation in unemployment rates throughout NSW, with **Table 5.02** demonstrating significant changes in unemployment over this period. Very high unemployment rates on the NSW north coast in the 1990's can partially be attributed to this lack of significance, with centres including Kempsey (19.5% unemployment), Port Macquarie (16.1% unemployment), Taree (14.3% unemployment) and Lismore (14.1% unemployment) exhibiting rates far above the national unemployment rate at the time of **8.6%** (Australian Bureau of Statistics 2016). Accordingly, the improvement of the unemployment rate in the region over the following years was disproportionate to patronage growth, which could be attributed to a very high starting rate of unemployment. The regionalisation of the North Coast flight offerings, comprising a strong growth in coastal airport activity at Port Macquarie and Ballina balanced against lesser growth rates at inland airports of Taree, Lismore and Kempsey could have also contributed to a lack of significance due to relative mobility of the workforce as opposed to place of residence; that is, people are more willing to travel to other LGAs to work, than they are to move to another LGA to live. This would be captured in data such as this, where areas with lower population growth are able to still find employment outside of their LGA, with employees willing to travel to a neighbouring centre to undertake work.

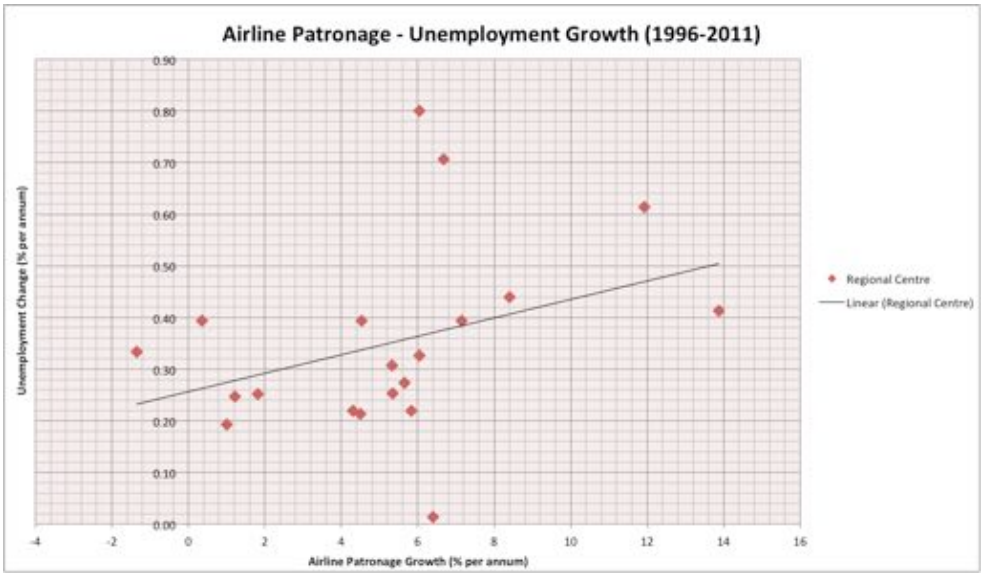



**Figure 5.09** – Comparison of airline patronage and unemployment rate change

## 5.5 Conclusion

In order to uncover the nature of the relationship between airline patronage growth and economic performance, this study has included a correlative analysis between patronage and three key economic indicators, being population growth, unemployment rate change and income per household change. Each of these indicators was tested against nineteen centres in NSW, so as to determine whether economic performance and airline patronage growth could be linked to one another, to provide statistical depth to the qualitative discussion undertaken at Chapter 4.

In this analysis, three different relationships were drawn between each of the three indicators. A moderate positive statistically significant relationship was deduced when airline patronage was compared to population change, indicating that population and airline patronage are likely to increase together in the medium term. This supports the findings of Hoogstra (2005) that people and economic activity are intrinsically linked.

The relationship between airline patronage growth and income per household growth does appear to exist, however is not sufficient in nature to be statistically significant. Further research may be able to prove this relationship as statistically significant, and given that the relationship is significant to the 0.07 level, Chow (1996) asserts that such a relationship should still carry some level of weight in any analysis.

The relationship between unemployment rate change and airline patronage appears to be evident but is not statistically significant, which could be due to a range of factors which include regional unemployment at the North Coast in the 1990s, and the mobile nature of workforces across regions as opposed to residential habitation.

# 6.0 Concluding Remarks

## 6.1 Research Findings

This research has sought to resolve the following research question:

> *Does the current regulatory system adequately provide for the operations of regional flights in NSW?*

Under this key research question, five objectives framed the different aspects of this project. These objectives were the basis for the theoretical analysis, policy review, quantitative and qualitative research. This chapter responds to each of the aims of this research, and assess the extent to which the project objectives have been fulfilled. From this, a series of recommendations are derived, as well as concluding remarks.

## 6.2 Research Objectives

Each of the research objectives outlined in **Chapter 1** have been addressed throughout this project. A summary of the findings of each objective has been provided below:

### Objective 1) Investigate the social and economic benefits arising from the provision of aviation services to regional communities.

A range of social and economic benefits have been identified through the theoretical understanding, qualitative and quantitative analyses in this project (Chapters 2, 4 and 5). Economic benefits of regional connections have been established and well founded in literature, with regional connections principally providing access to higher order services and labour markets for firms. In the case of the NSW, the use of flight as a mode of transport provides particular additional benefits to a time conscious market, in a manner which other modes could not achieve. This was confirmed through qualitative research, with each respondent agreeing that aviation provided economic benefits to local communities above and beyond other modes. This was also confirmed quantitatively through the linkage of flight patronage growth and economic activity in **Chapter 5**.

Social benefits were also acknowledged and reaffirmed. The established social benefits of flight are many and varied in nature, but principally focus around provision of access to higher order health, justice and cultural services above those provided locally. This also was

established in this theoretical understanding in **Chapter 2,** and confirmed in the qualitative analysis undertaken in **Chapter 4**.

### Objective 2) Identify the broader network flows from Sydney across NSW in an aviation and economic context.

This research has identified the nature of network flows across NSW, in order to understand the current operating environment of regional aviation across the state. In order to achieve this, an overview has been provided of the economic condition of the various regions throughout NSW (**Chapter 3**) and a high level analysis of the regional flight route conditions across NSW provided (**Chapter 4**). Broadly speaking, there is an established dichotomy of service conditions which has been reiterated by the views of the interview participants. Where services have been traditionally strong, they have continued to grow at an ongoing sustainable rate. This has included larger inland centres, as well as coastal towns which have benefited from tourism booms. However, where services have been traditionally weaker in smaller inland centres, many of these services have been ceased entirely, and it is well within the realm of possibility that additional services will cease in the coming years to these smaller townships.

### Objective 3) Evaluate the merit and value of such services on a social and economic basis.

Out of the initial investigation undertaken under Objective 1, it was then identified that a merit assessment of such services be undertaken under this project. The qualitative and quantitative research undertaken as part of this project established that services carried a very high level of social and economic significance, which was contrasted against a very low level of regulatory and scare systemic acknowledgement of such benefits. In response to this objective, recommendations have been made to realign the governmental system with the level of significance which such services provide at **Section 6.3**.

### Objective 4) Examine the relationship between aviation patronage numbers and economic performance in NSW between 1996 and 2011.

The project sought to comparatively analyse aviation patronage growth against population growth, unemployment rate change and income per household change from 1996 to 2011.

This research uncovered a statistically significant correlation between population growth and airline patronage growth, as well as an indicative correlation between household income growth and airline patronage growth. Subject to further detailed research, it can be preliminarily accepted that in the case of NSW, there is a correlation between economic performance and the patronage of regional flights.

Objective 5) Highlight areas of future concern in the continued provision of services, and determine potential solutions to arrest any decline in the assurance of regional service provision continuation.

Through the qualitative and quantitative research undertaken, it is clear that the continued provision of RPT services to non-trunk destinations in NSW is under threat. The policy review (**Chapter 3**) has established that the current regulatory system is ill equipped to handle a continued decline in services, which would adversely impact vulnerable regional communities.

In light of this established decline in the number of regional destinations which currently receive RPT services, a number of recommendations to the manner in which the current system works and is administrated are provided in **Section 6.3**. These recommendations have been structured to facilitate stabalisation if not reversal of the service level decline in NSW since 1996.

## 6.3 Recommendations

Recommendations are focused around three central areas, which have been determined in accordance with the objectives of this study. Specifically, these areas of focus relate to the holistic assessment of air requirements in NSW, reform of regulations around the provision of services, and a rationalisation and redistribution of the responsibility divide between the private sector and the various levels of government in the provision of regional aviation services.

### Holistic Assessment of Air Requirements in NSW

A consistent message uncovered is that the state government is currently not undertaking enough work to fulfill its role as a facilitator of RPT services to regional NSW. This is evidenced through the policy review (**Chapter 3**) and qualitative findings (**Chapter 4**), which determine that the current system is unnecessarily complicated and that the role that TfNSW currently

plays appears to be ad-hoc in nature, lacking any underpinning strategy towards the treatment of regional aviation in NSW. A very recent example of this is the deregulation of the Sydney-Mudgee corridor on the basis that regulation is overly cumbersome, contrasted against public consultation for the Sydney-Narrabri corridor which determined what level of service should be provided in a regulated environment without any consultation of airlines to determine the profitability of such a service. Councils often do not have the resources to undertake such an assessment, and it is outside of the jurisdiction of the federal government as it relates to a matter of intrastate trade. Accordingly, it is proposed that the NSW Government undertake this work at a state level to determine the current and future requirements of regional NSW aviation.

Recommendation: That TfNSW and the DPE undertake a joint assessment to acknowledge the merit provided by aviation services to regional communities, and undertake an assessment of the level of service required to each regional NSW centre through tests of (a) operational feasibility, (b) social and economic impact and (c) service opportunity cost. The resulting document should form the basis of future route negotiations between airlines and Councils, through an official facilitation process set up and overseen by TfNSW.

### Regulatory Reform

TfNSW has itself acknowledged the complexity of the current regulatory system, and all airline network planners interviewed made particular note of the current system as a disincentive to the introduction of new services, or in some cases even just the maintenance of existing services. When investigated as part of the policy review in **Chapter 3**, it became immediately apparent that the current system is in dire need of reform, with duplicate legislation, contradictory requirements and intrinsic barriers plaguing the current system in a manner which makes the establishment of new regional destinations virtually impossible.

Specifically, weaknesses in the current policy include a slot management scheme at KSA which caps regional slots at a maximum level which now has no further capacity in the peak periods, a tender awards system which places bias on existing carriers over new entrants, a transport administration body which fails to acknowledge the potential value of alternate flight options

to airports which are not KSA, and a series of planning documents for regional NSW which deliver an inconsistent message in the value of regional flights. The current position of TfNSW to increase the number of peak hour slots at KSA dedicated to regional services by five per hour (Constance 2016) does not solve the key issue raised out of this thesis, being that the number of *destinations* is declining in NSW, rather than simply the number of *services*. Similarly, waiting *"until the problem will be fixed when the new Western Sydney Airport* (WSA) *is open"*, the current preferred option of the Federal Government, is also not a viable option for regional communities given the rate of route decline in recent years, and the significant wait period ahead of the opening of WSA (Constance 2016).

Recommendation: That a range of existing regulations be reformed to ensure ongoing clarity for all stakeholders, and remove current barriers to entry for new carriers or routes. This reform is required to ensure that the route establishment process is as easy as practicable, with the intention of ultimately stabilising or reversing the ongoing cessation of destinations in NSW. Specifically, it recommended that reform of slot management legislation applying to Sydney Airport be requested from the Commonwealth as a matter of priority, in order to ensure the continued and improved potential for growth of regional services to a range of destinations. Route administration should also move to a position of default deregulation, with TfNSW remaining involved as a facilitator in order to avoid negotiations between airlines and Councils failing for avoidable reasons. Similarly, the current systemic preference for services to terminate at KSA should be replaced with a merit assessment for services to terminate at any large regional hub, or interstate on a case by case basis. Where tenders are issued, these should be legally associated with a slot at Sydney Airport, to avoid the existing incumbent bias in route selection, which favours airlines which already have regional slots for use.

### Rationalisation of Airline Responsibilities in Regional NSW

As discussed throughout this thesis, the role of TfNSW in the aviation transport system is currently ad-hoc in nature, and many stakeholders central to the concept of regional aviation are unsure of what role exactly TfNSW plays in the system. As the administrator of transport services, TfNSW needs to play a much more active role in ensuring the continued provision of aviation services. To demonstrate the current mismatch between the governance role in

aviation and in other modes of transport, **Figure 6.01** below demonstrates a level of consistency in various modes of privately operated transport in recent years, and contrasts that against the confusing and difficult system which regional aviation services operate within.

Recommendation: That TfNSW undertake a detailed review of the sustainability of the current aviation transport financing model, and potentially redistribute responsibilities in a manner similar to what it has previously done with other modes of public transport. As a specific matter of importance, given the absence of profitable aircraft in the 6-8 seat range established by the Aviation Transport Working Group (2007) amongst others, it is recommended that TfNSW undertake further research to investigate the financial sustainability of a 'purchase and leaseback' system of operation for small 6-8 seat aircraft, leased to airlines on an 'at cost' basis. Additional research is also recommended in regards to a more centralised and financially sustainable model of security cost coverage, than the current 'Council / airline pays' policy.

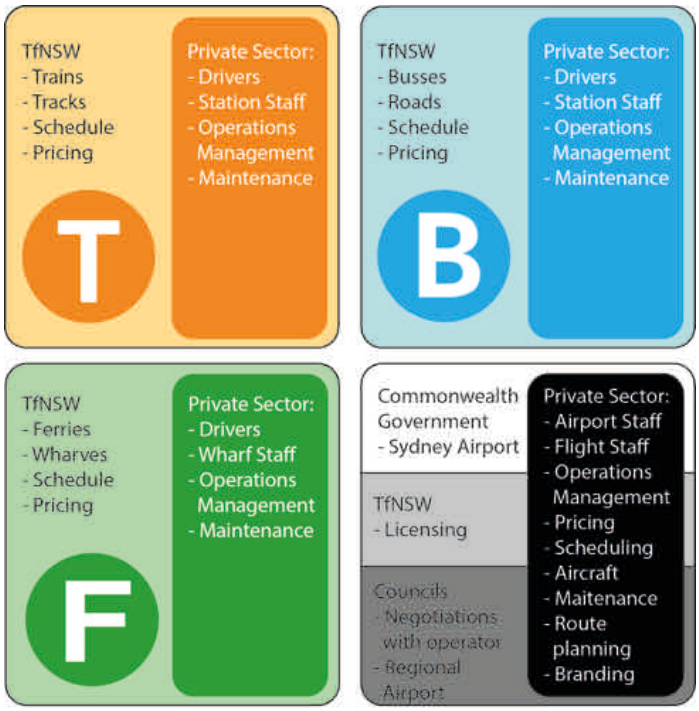



**Figure 6.01 –** Demonstration of the TfNSW model of operation for various modes of public transport

## 6.4 Concluding Remarks

Aviation connections between Sydney and the rest of NSW have been proven to be vital to the economic performance of regional areas, as well as the social wellbeing of regional Australians. However, given the ongoing systemic issues surrounding the continued provision of flights, the current regulatory system does not acknowledge, or cater to these benefits sufficiently.

Accordingly, this thesis has looked at the role that regional aviation plays in NSW from a planning perspective, examining the existing operating environment, the acknowledgement

of benefits derived from such service operations and current regulatory barriers to continued operations. This project has looked extensively at available literature on the topic, as well as undertaken a review of applicable policy over the past twenty years, a series of in-depth interviews and a quantitative analysis in order to evaluate the overarching research question. Ultimately, it is considered that the current regulatory system *does not adequately provide for the operations of regional flights in NSW*. Through this project it has been identified that such flights are highly important to regional NSW, but the various administrative bodies which oversee over the various aspects of the regional aviation sector have insufficiently addressed this. Several competing regulatory systems have provided systemic barriers to the expansion of existing services, and have all but eliminated the prospect of resumption for the exceptionally high number of terminated services in recent years. A series of recommendations have been provided to arrest the ongoing decline in services, and foster the continued provision and growth of vital community RPT services into the foreseeable future to ensure a productive and liveable future for non-metropolitan NSW.

# 7.0 References and Appendices


AAP General News Wire (2013). Brindabella Airline Placed into Receivership. AAP General News Wire. Sydney, Australia, Australian Associated Press Pty Limited.

Allen, J., et al. (1998). "Beyond the Territorial Fix: Regional Assemblages, Politics and Power." Regional Studies **41**(9): 1161-1175.

Arauzo-Carod, J. M. (2002). "Determinants of Population and Jobs at a Local Level. An Application for Catalan Municipalities." Working Paper.

Aulich, C. and M. Hughes (2013). "Privatizing Australian Airports: Ownership,Divestment and Financial Performance." Public Organisation Review **13**(2): 175-184.

Aulich, C. and J. O'Flynn (2007). "John Howard: The Great Privatiser?" Australian Journal of Political Science **42**(2): 365-381.

Australian Bureau of Statistics (2011). Urban Centres and Localities (UCLs) and Significant Urban Areas (SUAs). A. B. o. Statistics. Canberra, Australia, Australian Federal Government.

Australian Bureau of Statistics (2016). "Employment and Unemployment." Retrieved 15 October 2016, from http://www.abs.gov.au/Employment-and-Unemployment.

Australian Government (2011). High Speed Rail Study - Phase 1. D. o. I. a. Transport. Canberra, Australia.

Australian Government (2013). Sydney Airport Slot Management Administration Manual. Department of Infrastructure and Transport. Canberra, Australia, Australian Government**:** 1-74.

Baker, D. and T. Donnet (2012). "Regional and remote airports under stress in Australia." Research in Transportation Business & Management **4**: 37-43.

Becker, G., et al. (1999). "Population and Economic Growth." The American Economic Review **89**(2): 145-149.

Beer, A., et al. (1994). Beyond the Capitals: Urban Growth in Regional Australia. Canberra, Australia, Australian Government Publishing Service.

Bieger, T. and A. Wittmer (2006). "Air Transport and tourism - Perspectives and challenges for airlines and governments." Journal of Air Transport Management **12**(1): 40-46.

Boyce, C. and P. Neale (2006). "Conducting In-Depth Interviews: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input." Pathfinder International Tool Series(2): 1-16.

Brederick, P. (2016). Thesis Interview 3. T. Smith. Sydney, Australia, UNSW.

Brown, A. and H. Sherrard (1951). Town and Country Planning. Carlton: Melbourne University Press.

Bryman, A. and E. Bell (2007). Business Research Methods. Oxford, United Kingdom, Oxford University Press.

Bureau of Transport and Communications Economics (1995). Regulation of Domestic Aviation in Australia 1990-1995. B. o. T. a. C. Economics. Canberra, Australia, Australian Government.

Chi, G. (2011). "The Impacts of Transport Accessibility on Population Change Across Rural, Suburban and Urban Areas: A Case Study of Wisconsin at Sub-county Levels." Urban Studies **49**(12): 2711-2731.

Chow, S. (1996). Statistical Significance. Canada, SAGE.

Colless, R. (2014). Regional Aviation Services, Standing Committee on State Development. N. L. Council. Sydney, Australia, NSW Legislative Council**:** 1-172.

Collits, P. (2008). "The Howard Government and Regional Development." Australasian Journal of Regional Studies **14**(3): 287-312.

Commonwealth of Australia (2010). "Commonwealth of Australia Constitution Act." Retrieved 4 August 2016, from file:///Users/TimRamsay/Downloads/2012_Australian_Constitution.pdf.

Constance, A. (2016). Scrap the cap at Sydney Airport so regional NSW towns aren't cut off. Sydney Morning Herald. Sydney, Australia, Fairfax Media.

Deloitte Access Economics (2012). Connecting Australia - The economic and social contribution of Australia's Airports.

Dempsey, P. S. (2014). "Federal Preemption of State Regulation fo Airline pricing, Routes and Services: The Airline Deregulation Act Symposium." Aviation and Space Law **10**: 435-445.

Department of Infrastructure and Regional Development (2015). Regional Aviation Access Program - Consolidated Program Guidelines. Canberra, Australia, Australian Federal Government.

Department of Transport (2014). Frequently Asked Questions - Review of Regulated Regular Public Transport (RPT) Air Routes in Western Australia. D. o. Transport. Perth, Australia, Western Australian Government, Department of Transport.

Dobney, C. (2014). Rex Airlines slashes services to Lismore. Echo Net Daily. Byron Bay, Australia.

Dudley, M., et al. (1997). "Suicide among young rural Australiand 1964-1993: a comparison with metropolitan trends." Soc Psychiatry Psychiatr Epidemiol **32**: 251-260.

Edmiston, K. D. (2003). "The Net Effects of Large Plant Locations and Expansions on Country Employment." Journal of Regional Science **38**: 109-136.

European Union (2011). White Paper - Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system. Eurpean Commission. Brussels, European Union,.

Evocities (2016). "Evocities - Regional City Living." Retrieved 28 September 2016, from http://evocities.com.au/.

Fairbrother, P., et al. (2013). "The Withering Away of the Australian State: Privatisation and its Implications for Labour." Labour and Industry: A Journal of the Social and Economic Relations of Work **8**(2): 1-29.

Fangwu, W. (2016). Exploring Airport Access and Accessibility: Regional and National Perspectives. Proquest Dissertations Publishing.

Freestone, R. (2009). "Planning, Sustainability and Airport-Led Urban Development." International Planning Studies **14**(2): 161-176.

Freestone, R. and I. Wiesel (2014). "The Making of an Australian 'Airport City'." Geographical Research **52**(3): 280-295.

Frischmann, B. (2012). Infrastructure: The Social Values of Shared Resources, Oxford: Oxford University Press.

Goetz, A. R., et al. (1997). Denver International Airport: Lessons Learned. New York, McGraw-Hill.

Gordijn, H. and P. van de Coevering (2006). Aviation as Public Transport: Which Regions are Underserved. Association for European Transport and Contributors. The Hague, The Netherlands, Netherlands Institute for Spatial Research.

Gray, D. (2004). "Rural Transport and Social Exclusion: Developing a Rural Transport Typology." Built Environment **3**: 172-181.

Great Southern Railway (2016). "The Ghan - Trains." Retrieved 29 August 2016, from http://www.greatsouthernrail.com.au/trains/the_ghan/.

Green, R. (2007). "Airports and Economic Development." Real Estate Economics **35**(1): 91-112.

Hall, P. and M. Hesse (2012). Cities, regions and flows - Routledge Studies in Human Geography. New York, Routledge.

Halpern, N. and S. Bråthen (2011). "Impact of airports on regional accessibility and social development." Journal of Transport Geography **19**(6): 1145-1154.

Holyoak, N., et al. (2015). Forecasting Transport Demands and Mobility in Remote Australia. Australasian Transport Research Forum 2015. Sydney, Australia, Flinders University, South Australia
Curtin University, Western Australia.

Honkkila, J. and K. Ilja (2013). "Mico and macro analysis on household income, wealth and saving." IDEAS Series from RePEc.

Hoogstra, G., et al. (2005). Do 'jobs follow people' or 'people follow jobs'? A meta analysis of Carlina Mills Studies. 45th Congress of the European Regional Science Association. Amsterdam, The Netherlands.

Huang, T.-H. and Z. Xie (2013). "Population and economic growth: a simultaneous equation perspective." Applied Economics **45**(27): 3820-3826.

Irawan, T., et al. (2012). "Infrastructure Improvement and its Impacts on the Indonesian Economic Performance." Journal of Indonesian Economy and Business **27**(3): 293-302.

Irwin, M. and J. Kasarda (1991). "Air Passenger Linkages and Employment Growth." American Sociological Review(August): 524-237.

Isserman, A. (2001). "Competitive Advantges of Rural America in the Next Century." International Regional Science Review **24**(1): 38-58.

Janda, M. (2016). Unemployment rate nears three year low, despite loss of 3,900 jobs: ABS. ABC News. Canberra, Australia.

Jeans, D. N. (1972). An historical geography of New South Wales to 1901. Sydney, Australia, Reed Eduction

Jennings, S. (2016). Thesis Interview 8. Bachelor of Planning T. Smith. Sydney, Australia, UNSW.

Jetstar Australia (2010). Christmas comes early for Ballina and Byron Bay with Jetstar. Melbourne, Australia, Qantas Group.

Johnston, R., et al. (1986). The Dictionary of Human Geography. Oxford, Basil Blackwell.

Jonas, A. E. G., et al. (2014). "City Regionalism as a Politics of Collective Provision; Regional Transport Infrastructure in Denver, USA." Urban Studies **51**(11): 2444-2465.

Kasarda, J. (2008). The Evolution of Airport Cities and the Aerotropolis. London, UK, Insight Media.

Kasarda, J. D. and G. Lindsay (1977). Aerotropolis: the way we'll live next. New York, Farrar, Straus and Giroux.

Kinhill Engineers Pty Ltd (1993). A Strategy for Balanced State Development in NSW. E. a. T. Department of Employment. Canberra, Australian Government Publishing Service.

Kirkby, G. (2016). Thesis Interview 1. UNSW. T. Smith. Sydney, Australia.

Knowles, R., et al. (2008). Transport Geographies: Mobilities, Flows and Spaces. Oxford, UK, Blackwell Publishing.

Lichfield, N. (1981). Traffic, Transportation and Urban Planning. London, United Kingdom, George Goodwin Limited.

Lombard, P. and L. Coetzer (2013). "The Estimation of the Impact of Rural Road Investments on Socio-Economic Development." Roads for Water.

Marshall, T. (2012). Planning Major Infrastructure: A Critical Analysis. Florence, GB, Routledge.

Maude, A. (2004). "Regional Development processes and Policies in Australia: A Review of Research 1990-2002." European Planning Studies **12**(1): 3-26.

Merket, R. H., D. A. (2013). "The Importance of Completeness and Clarity in Air Transport Contacts in Remote Regions in Europe and Australia." Transportation Journal **52**(3).

Metrass-Mendes, A., et al. (2014). Air Accessibility in Northern Canada: Prospects and Lessons for Remote Communities. Engineering Systems Division. Massachusetts, Masssachusetts Institute of Technology**:** 1-23.

Minato, N. and R. Morimoto (2011). "Designing the commercial sustainability of unprofitable regional airports using system dynamics analysis." Research in Transportation Business & Management **1**(1): 80-90.

Morrell, S., et al. (1999). "Urban and rural suicide differentials in migrants and the Australian-born, New South Wales, Australia 1985-1994." Social Science and Medicine **49**: 81-91.

Mulligan, G. F., et al. (1999). "Initial Diagnositvs of a Regional Adjustment Model." Environmental and Planning A **31**: 855-876.

Murphy, T., et al. (1991). Regional Economic Development Strategy for the Central Western Region. C. W. R. D. Board. Sydney, Australia, NSW Government,.

Neal, Z. (2010). "Redefining the Air Traffic Approach to City Networks." Urban Studies **47**(10): 2195-2215.

Neal, Z. (2014). "AIRNET: A Programme for Generating Intercity Networks." Urban Studies **51**(136-152).

NSW Government (2007). New South Wales Aviation Working Group. N. M. o. Transport. Sydney, Australia, NSW Government.

NSW Government (2014). Inquiry Into Regional Aviation Services. NSW Government. Sydney, Australia, NSW Government,.

O'Sullivan, M. (2016). Sydney Airport cap curbs flights to regional towns. Sydney Morning Herald. Sydney, Australi, Fairfax Media.

Qantas Airways (2016). "The Inspiration - The Qantas Story." Retrieved 29 August 2016, from http://www.qantas.com/travel/airlines/history-inspiration/global/en.

Rasker, R., et al. (2009). "The economic importance of air travel in high-amenity rural areas." Journal of Rural Studies **25**: 343-353.

Redondi, R., et al. (2013). "European connectivity: the role played by small airports." Journal of Transport Geography **29**: 86-94.

Regional Aviation Association of Australia (2010). Massive Sydney Airport price increase will harm regional services. T. Mathews. Canberra, Australia, Regional Aviaiton Association of Australia.

Regional Aviation Association of Australia (2011). RAAA Submission to the Productivity Commission Economic Regulation of Airport Services Public Inquiry. E. R. o. A. S. The Commissioner. Canberra, Australia, Regional Aviation Association of Australia.

Regional Aviation Association of Australia (2013). Call for Action on Regional Aviation Policy. Canberra, Australia, Regional Aviation Association of Australia**:** 1-18.

Regional Express Airlines (2004). Rex Boosts Parkes Services. P. Leate. Sydney, Australia, Regional Express Airlines.

Reynolds, F., A. (2000). "The US Airport Hierarchy and Implications for Small Communities." Urban Studies **37**(3): 557-577.

Rochat, P. (2005). The Economic and Social Benefits of Air Transport. A. T. A. Group. Geneva, Switzerland.

Ryerson, M. S. and A. Woodburn (2014). "Build Airport Capacity or Manage Flight Demand? How Regional Planners Can Lead American Aviation Into a New Frontier of Demand Management." Journal of the American Planning Association **80**(2): 138-152.

Schmitt, B., et al. (2002). "Urban Growth Impacts on Rural Population and Employment in Export and Service Industries in Functional Economic Regions." Working Paper.

Shaw, J. and J. Sidaway (2010). "Making Links: On (re)engaging with transport and transport geography." Progress in Human Georgraphy **35**(4): 502-520.

Sheilds, J. (1989). Conquering unemployment: the case for economic growth. Houndmills, Basingstroke, Hampshire, Macmillan in association with Employment Institute.

Sherlock, S. (1999). The Privatisation Debate and Labor Tradition, University of Newcastle.

Standing Committee on State Development (2014). Report 38 - Regional Aviation Services. N. L. Council. Sydney, Australia, NSW Legislative Council.

Stevens, N., et al. (2007). "Understanding the Australian Airport Metropolis." SOAC 2007. Retrieved 6 September 2016.

Taylor, J. M. (1912). Geography of New South Wales. Sydney, Australia, Angus and Robertson Pty Ltd.

Tewdwr-Jones, M., et al. (2013). The planning imagination: Peter Hall and the study of urban and regional planning, Taylor and Francis.

Transport Canada (2015). Transport Canada's 2015-16 Report on Plans and Priorities. F. G. o. Canada. Ottawa, Canada.

Transport for NSW (2013). Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives. T. f. NSW. Sydney, Australia, NSW Government.

Transport for NSW (2015). "NSW Passenger Transport Legislation Review." Retrieved 20 September 2016, from http://www.transport.nsw.gov.au/about/legislation/nsw-passenger-transport-legislation-review.

Transport for NSW (2016). "Regional air legislative and policy framework." Retrieved 6 June 2016, from http://www.transport.nsw.gov.au/operators/regional-air/legislative-and-policy-framework.

Troye, P. (1995). Australian Cities: Issues, Strategies and Policies for Urban Australia in the 1990s. Cambridge, UK, Cambridge University Press.

TTF Australia (2007). Assessing the Impact of Airport Privatisation: Final Report. Sydney, Tourism and Transport Forum.

van de Walle, D. (2001). Choosing Rural Road Investments to Help Reduce Poverty. World Bank. Vietnam, World Bank.

Virgin Australia (2016). Virgin Australia Holdings Limited (ASX:VAH) Trading Update for Third Quarter Ending 31 March 2016. D. Keighery. Brisbane, Australia, Virgin Australia.

Ward, K. (2014). Researching the City. London, United Kingdom, SAGE Publications Ltd.

Washington, S. and M. Karlaftis (2011). Statistical and Economic Methods for Transportation Data Analysis. Florida, USA, Taylor and Francis Group.

Whyte, R. and B. Prideaux (2015). "The Growth in Low-Cost Carrier Services in Queensland: Implications for Regional Tourism Destinations." Tourism Recreation Research **33**(1): 59-66.

York Aviation (2004). "The Social and Economic Impact of Airports." ACI Europe.

## Chapter Cover References:

Bidgee (2012) *'Qantaslink with Qantas at the International Terminal, Sydney Airport*, Accessed: 20 September 2016, Available: <https://commons.wikimedia.org/wiki/File:QantasLink_(VH-QOC)_Bombardier_Dash_8_Q400_at_the_domestic_terminal,_with_Qantas_(VH-OQL)_Airbus_A388_at_the_international_terminal_in_the_backgound,_at_Sydney_Airport.jpg>

Bidgee (2016) '*Virgin Australia Regional Airlines ATR72-600 at Wagga Wagga Airport*, Accesssed: 15 October 2016, Available: <https://commons.wikimedia.org/wiki/File:Virgin_Australia_Regional_(VH-FVN)_ATR_72>

Eyre (2016) "*May 2016*", Accessed: 10 September 2016, Available: <http://www.aviationwa.org.au/aircraft-photos-movements/2016-2/may-2016/>
Nearmap (2016) '*Photomaps - Nearmap'*, Accessed: 20 September 2016, Available: <http://www.nearmap.com.au/>

Qantas Airways (2016) '*The Qantas Story'*, Accessed: 1 September 2016, Available: <http://www.qantas.com/travel/airlines/history/global/en>

Tamworth City Council (2016) '*Tamworth Airport'*, Accessed: 12 September 2016, Available: <http://www.tamworth.nsw.gov.au/Council/Council-Enterprises-and-Venues/Tamworth-Regional-Airport/Tamworth-Regional-Airport/default.aspx>

# Appendix A – Project Information Statement, Consent of Interviewees



## PROJECT INFORMATION STATEMENT

UNSW THE UNIVERSITY OF NEW SOUTH WALES
BUILT ENVIRONMENT

Date: 30 August 2016
Project Title: Comparative analysis of aviation patronage and regional economies in NSW

Approval Number: 145066

**Participant selection and purpose of study**
You are invited to participate in a study which seeks to determine the relationship between aviation patronage and regional economic development in NSW. You were selected as a possible participant in this study because of your extensive knowledge and involvement in the regional NSW aviation sector.

**Description of study**
If you decide to participate, we will undertake a 1 hour one on one interview, in which I am to determine how your involvement in the industry takes form. Specifically, this will include questions around the notion of We cannot and do not guarantee or promise that you will receive any benefits from this study.

**Confidentiality and disclosure of information**
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission, or except as required by law. If you give us your permission, we plan to use the results of this discussion to inform and supplement patronage and economic growth data analysis which is being analysed as part of this thesis project.

**Your consent**
Your decision whether or not to participate will not prejudice your future relations with The University of New South Wales or other participating organisations. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice by completing the statement below and returning this entire form to either Tim Smith or Robert Freestone.

If you have any questions, please feel free to ask Tim Smith (Ph: 0429 008 963, E: tim.rs@live.com.au). If you have any additional questions later, Dr Christine Steinmetz (Ph: 02 9385 7417, E: c.steinmetz@unsw.edu.au) will be happy to answer them.

Tim Smith
Bachelor of Planning Student at NSW

**REVOCATION OF CONSENT.** Project Title: Comparative analysis of aviation patronage and regional economies in NSW
(Please send this entire form to the above address.)
I hereby wish to withdraw my consent to participate in this research project. I understand that such withdrawal will not jeopardise my relationship with The University of New South Wales, other participating organisations or other professionals.

..... ..... .....
Signature Please PRINT name Date

Complaints may be directed to the Ethics Secretariat, The University of New South Wales, SYDNEY 2052 AUSTRALIA (phone 9385 4234, fax 9385 6648, email : ethics.sec@unsw.edu.au).

Bachelor of Planning Thesis Project

Timothy Smith
3416727