Future Domestic Air Network Analysis
Stage 1
29/01/2016
Prepared for:

New Zealand Airport Association
Ministry of Transport

Date: 29/01/2016
Contact Persons:

Lawrence McIlrath
Mobile: 021 042 9157

Dave Park
Mobile: 021 902 748

Version  Date  Change
First Draft  14/07/2015  Comments received from NZ Airports via emails on the 21/09/2015 and 29/09/2015. Appendix 9 summarises the comments and our response
Second Draft  19/11/2015
Final  29/1/2016  Final comments from NZ Airports via email (19/01/2016). This amendments captures some final comments from NZ Airports and the clarification of some of our initial responses.

Disclaimer

Although every effort has been made to ensure accuracy and reliability of the information contained in this report, Market Economics Limited, Astral Limited nor any of their employees shall be held liable for the information, opinions and forecasts expressed in this report.
Executive Summary

New Zealand’s air transport network is a vital part of the economy. It facilitates a range of connections, allowing people and cargo to move between different cities and towns. Economic, social and technological trends are changing aviation and how it interacts with the wider business environment. Understanding these forces, and the flow-on effects, is critically important when seeking to optimise the domestic air network. This research is the first stage of an investigation into the future of New Zealand’s (NZ) domestic air network. It seeks to identify the key issues affecting, and driving the network’s performance. Market Economics Limited (M.E) and Astral Limited were commissioned to undertake the first stage of this research.

The research used both quantitative and qualitative research techniques and the findings of these two approaches were integrated to provide a detailed picture of the key relationships in the domestic air network. These relationships were identified using statistical analysis techniques, particularly Factor Analysis (FA). A diverse range of information sources were consulted, including: published information (e.g. Statistics New Zealand), purchased information (e.g. Sabre® GDD), private information (e.g. airport’s financial statements). This information was combined with interviews and surveys. All airports included in our study were invited to participate in the research. Some respondents requested confidentiality so the results are presented in a way that limits the ability to identify specific respondents. With reference to the airlines, we invited more than 10 of NZs airlines to participate in the study. Only a small number of airlines replied so the airlines’ responses presented in this report should not be viewed as representative of the airline industry per se.

CURRENT SITUATION

The current situation is described in terms of airport infrastructure, routes flown and aircraft/fleet characteristics and operating costs.

Airport Infrastructure

New Zealand is relatively well endowed with aerodromes. There are 175 aerodromes (of all types) listed in the New Zealand Aeronautical Information Publication. This study has focused on those aerodromes with schedule passenger services. It also includes some that have recently lost air services.

These aerodromes range from large international facilities such as Auckland International Airport Limited (AIAL) through to small grass facilities such as Waiheke Island. The terminal capacity at the aerodromes is generally matched to the types of aircraft providing services and their frequency of operation. Some of the smaller aerodromes in our study did not have terminals at all. Generally, the runways are adequate for the typical in-service (and likely future) propeller powered regional aircraft. Only the very small (10) aerodromes (runways shorter than 1,200m) are inadequate for larger turbo-prop aircraft that tend to have favourable cost per seat characteristics ($/seat). These aerodromes are unlikely to grow substantially in the near future or compete for additional schedule services from the major airlines.

For reliability of service in poor weather conditions, aerodromes require an instrument approach. Previously, most general aviation aircraft and small airports were equipped for basic instrument

---

1 The study included 37 airports and these were selected based on whether there was scheduled service operating from the airport or not.
approaches. However, with the move to New Southern Sky (NSS), aircraft will eventually need to be equipped for satellite based area navigation (RNAV) approaches. All but four of the aerodromes in this study have RNAV approaches available. RNAV approaches do not require any ground based infrastructure, at least for daytime operations. The cost and long term issues of availability of ground based navigation aids under the NSS programme were highlighted as possible barriers to the development of air services to small communities. The extent of possible barriers will depend on CAA’s decision on ‘sole means’ GPS based navigation which, at the time of writing has not been released.

Overall aerodromes reported their facilities to be currently adequate, although about 40% indicated terminal expansion would be required in 5-10 years depending on the growth that is achieved. A small number indicated that their facilities are currently under pressure and in need of investment to expand. Lack of apron space, and the need to keep up with costly routine maintenance (such as resurfacing of tarmac areas), were common themes reported in the survey.

**Route Network & Airlines**

The NZ domestic air transport network services most of regional New Zealand. It is possible to connect between virtually all regional towns through the country using air travel (even if the connections are not convenient). Air New Zealand (AirNZ) and JetStar services provide the core connections with the smaller, geographically dispersed centres serviced by the independent operators. Around half (45%) of domestic passenger movements occur between the hub\(^2\) airports, with almost half (52%) occurring between the hub airports and the regional centres. Less than 5% of the total passenger movements take place on the wider network (this includes the independent operators).

Clearly, the network is operated on a hub-and-spoke configuration with few non-stop, point-to-point services between regional centres but good connections between regional centres and hub airports. This pattern is typical of airline operations world-wide.

Air NZ and JetStar operate jets on the trunk routes. Below this, Air NZ operates the largest fleet of regional aircraft. The independent operators operate 61 per cent of the fleet but they provide only 15 per cent of the available seating capacity. The most notable feature of the scheduled airline landscape (excluding Air NZ and JetStar) is its fragmented nature. This group is characterised by:

- Low fleet numbers and capacity per operator.
- High average fleet age and lack of fleet renewal.
- Narrow local area of scheduled operations.
- No interline arrangements with major carriers.
- No apparent strategic co-operation or partnerships between operators.

This situation has existed for many years and has resulted in the weak independent airline sector apparent today. In our view, this situation has arisen, in part, due to the market dominance of Air NZ whereby the independent operators have been relegated to smaller, niche routes. This may change with Air NZ’s withdrawal from some regional routes. However, the financial resources that are/would be required to take up the opportunities may limit independent airlines’ ability to capture them. These operators are facing a number of challenges including:

\(^2\) Auckland, Wellington and Christchurch
• High per seat operating costs,
• Lack of suitable aircraft,
• Inadequate marketing, and
• A combination of the above factors.

The independent operators use older aircraft due to the very low ownership costs and the high cost of equivalent new/replacement aircraft. As aircraft utilisation is low for most independent operators the higher costs of ownership of more modern aircraft are very difficult to cover.

**Operating Costs (excluding jets)**

Expressing operating cost\(^3\) in terms of seats (cost per seat) makes it possible to identify the cost competitiveness of different aircraft. The overall observation is that smaller planes are more expensive to operate on a per seat basis than the larger plans. The average cost per seat for three size categories is:

- <10 seat planes $134.20/seat/hour,
- 10-20 seat planes $121.90/seat/hour,
- >20 Seats $95.60/seat/hour.

While larger planes (> 20 seats) are more expensive to operate with the average cost per hour coming in at $4,725, the cost can be spread over more seats. Therefore, the larger planes can be up to 27.5% more cost effective to operate than 10-20 seat airplanes. For example, an ATR72 is up to 67.7% more cost effective to operate than a B1900 (on a per seat basis).

*This cost difference has been influential in driving some of the recently announced route changes as it has a substantial impact on the overall profitability.* The following example highlights the potential effect on route profitability\(^4\) of using different aircraft.

**Example: Profitability effect of shift to a larger aircraft**

Assuming a route has 50,000 passenger movements per year and that the fare is $160.

- Using B1900s the overall profit potential is estimate at $78,000/year.
- Using a Q300 with a reduced schedule (only 25,000 passenger movements) will return a profit of $1.1m.

It is not always possible to shift to a larger airplane. Based on a high-level assessment of the general costs of operating an aircraft, the minimum sector volume of around 35,000 passengers are needed for a 33 seat aircraft, increasing to between 45,000 and 55,000 for a 50-seat plane. However, the routes will need to slot into the wider network to maintain effective aircraft utilisation.

---

\(^3\) Excluding items such as insurance, offices, lease payments.

\(^4\) In this example, the profit is the revenue (fare multiplied by the number of seats) less the operating costs. The operating costs include the costs associated with ‘flying the plane’ and other variable fees. It excludes fixed airline costs such as office, ticking systems, lease costs, insurances etc.
**Travel time comparison**

The cost of travelling is part of the decision making process when evaluating alternative transport modes and different markets are influenced by different aspects. Leisure travellers tend to be price sensitive whereas business travellers are more focused on the ‘time-savings’ and convenience. However, both markets are price sensitive – business travellers will only travel if the benefit outweighs costs. Using a scenario approach to compare the total costs of travelling from Rotorua to Auckland, we estimate the cost differential between driving and flying at $102 (favouring flying) for the business market. This is because the total travel time is around 5.7 hours (by road) vs 2.2 hours (by air). In addition, the business traveller would ‘save 3.5 hours’ by travelling by air. For the leisure traveller, under a low-fare situation, air travel is the cheapest option. If the number of people in the party travelling together increases (e.g. a family), then travelling by road becomes the cheapest option. If there are four people travelling together, then the cost difference is over $625 (air travel more expensive than travelling by road).

If this example is changed to reflect a situation where a person travels from Whakatane to Rotorua (to travel to Auckland) then the total road travel cost is estimated at $865 (Whakatane-Auckland) and the air travel (Whakatane-Rotorua by road and then fly to Auckland) costs is estimated at $665 – a $200 differential for a business person. This is the value of the travel but is likely to understate the ‘perceived value’ of time to the business traveller meaning that there is likely to be a strong bias for the air travel option.

**UNDERLYING DRIVERS**

Demand for air travel is determined by a number of factors ranging from local demographic features, the local economy and the cost to service routes, to name a few. To identify the relative importance of these and other factors, the team used a statistical tool\(^5\) to identify the unobserved relationships between 121 individual factors. These factors covered the following areas:

- Passenger movements,
- Population,
- Economic activity,
- Route economics
- Airport features.

Following the analysis, the key factors were grouped into common themes. The resulting themes, or drivers, include:

1. Route characteristics,
2. Connectivity (international and domestic),
3. Local economy and employment, and
4. Local population.

\(^5\) We used Factor Analysis
While the sequence of the drivers may vary slightly, these drivers are consistently identified irrespective of the group\(^6\) of routes selected.

The first observation from the analysis is that the core driver of the route network is **route characteristics and airlines ability to return a profit on different routes**. Route characteristics, as used here, relates to:

- The number of passengers,
- The cost of operating the aircraft, and
- The total fare.

This suggests that the shape of the network is influenced by airlines’ activities in response to the market conditions. Airlines will focus their efforts on routes where they can operate profitably. Essentially, this driver encapsulates an airline’s ability to generate profit on a particular route (group of routes, network) based on the characteristics of that route (i.e. the passenger demand, type of plane it can operate and the asking price it can charge for a seat).

The second driver relates to **connectivity** – that is the number of direct and indirect connections that can be made from the different airports. Around 11\(^{\text{th}}\) of the international connections do not terminate (or start) at the hub airports. This suggests that that the domestic air network enables important linkages for NZ’s regions to access international connections. This also implies a level of connectedness between the domestic and international services.

The **regional economy and the associated employment base** is the next driver. In essence, this driver highlights the role of the domestic air network in linking parts of the NZ economy. Our analysis suggests that the size and structure of the local economy is a key determinant of air transport activity. It is not only the size of the economy, but also the relative size of business service type activities (and similar sectors) that influences demand for air travel between regions. Interestingly, the economic and employment factors are more important than total population size. **This suggests that interregional economic connections and trade are important drivers of air travel between city/town pairs.** Other important relationships that were identified include:

- There is a positive relationship between a region’s **service and knowledge based sectors**\(^7\) and movements to, and from, that region. This implies that the air transport linkages are likely to be to areas with ‘high value economies’ and not necessarily to high ‘employment’ areas.
- With regard to air travel between regions, the sizes of **primary sector** activities (agriculture, forestry and mining) and **utilities** (e.g. electricity), do not have a strong influence on overall travel demand (relative to knowledge-based sectors). This suggests that these types of activities do not necessarily generate a large demand for air transport.
- **Regional tourism spending** is an important factor (domestic and international spending are both important).
- There is a relationship between domestic air movements (passengers) to a region, and the size of a region’s accommodation and food service sector (in GDP terms). This underscores the air networks **relationship with domestic tourism**.

\(^6\) All the routes combines or the routes excluding the trunk routes.

\(^7\) Public administration and safety, professional, scientific and technical services, financial and insurance services, health care, social assistance, arts and recreation services, and administrative and support services
The final driver is population. The low position of this driver compared to the other driver has a number of underlying causes that can be linked back to the different air travel markets e.g. leisure/personal or business. The business market is related to the economic sectors and GDP as discussed above. Personal travel is influenced by, amongst other things, the willingness and ability to pay. In turn, this is a function of household income, which is affected by economic activity. In other words, households’ ability (and willingness to pay for airfares) to travel by air is directly influenced by the size and structure of the local economy, not simply how many people live in an area.

OUTLOOK FOR THE NEXT 5 YEARS

The outlook for the next 5 years is summarised below. This outlook is based on the movements that are expected for the main drivers identified above. We see the outlook for the domestic air network as follows:

ROUTE CHARACTERISTICS

Air NZ and JetStar have both made a number of announcements about the level of service and we expect that there will be strong market activity as these players position themselves on the key regional routes. Air NZ has rationalised some routes, and JetStar is entering some regional routes. The entry of JetStar into the domestic regional-to-hub market will offer travellers a choice of airlines. The JetStar codeshare arrangements with the Qantas/OneWorld and Emirates networks should make those services attractive to travellers beyond New Zealand due to the additional access to international connections that will be offered. In the short term, JetStar’s entry will lead to aggressive competition on the relevant routes. In the long term, prices will trend towards the average (sustainable) levels.

The recent changes announced by Air NZ to migrate its fleet to a larger platform, is introducing a range of changes at the regional level. Moving to a larger platform (Q300 vs Beach 1900) means that scheduling will change – less frequent services so reducing choice. Travellers are likely to respond by shifting their travel behaviour to match the new servicing schedules. The may be a small decline in overall demand due to a reluctance to change. Some smaller routes will also be dropped from the network (i.e. route rationalisation). We anticipate that once this current round of change has been introduced, that the network would remain relatively stable in the near term.

With reference to regional services where Air NZ has signalled its exit, we anticipate the emergence of a regional service(s) on those routes. This will be most likely be offered by independent operators. The long-term sustainability of those routes, and the operators, are questionable if current price-demand patterns hold. If the independent operators can increase fares while maintaining sufficient loads, then those routes should remain viable over the short to medium term. History has shown the challenges associated with the smaller, regional routes with attempts to set up competing airlines, servicing the regional routes failing over time. In addition, Air NZ’s moves to larger aircraft (with lower cost per seat characteristics) means that it can offer lower fares on the competing routes.

---

8 This relates to the ‘drive and fly routes’ such as Whakatane-Rotorua drive and then fly to Auckland option.
Currently there is little competition between airlines on the small routes e.g. Cook Strait routes and to/from Great Barrier Island. This situation is expected to remain a feature of the regional air network.

Airport developments

The development cycle of regional airport facilities seen in the period 1990-2012 appears to now be at, or nearing an end, except possibly for Queenstown airport. During this period a number of regional airport runways were extended to accommodate 737-300 and later 737-800/A320 aircraft. Major development plans are largely confined to the international airports, Auckland, Wellington, Christchurch and Queenstown. As the domestic regional air transport network, outside the trunk routes is entirely operated by turbo prop or piston propeller aircraft the aerodrome infrastructure are much less than is required with jets. For this reason, it appears likely regional services will remain turbo-prop or piston for the next 5 years at least. This means that the route economies are unlikely to change materially over the short term.

INTERNATIONAL CONNECTIONS

While the world economy is in better shape than it was 4 to 5 years ago, there are a number of challenges to be faced. The NZ tourism market (and the international connections) is subject to global economic conditions. As economic activity improves (or deteriorates) so too does the number of people deciding to travel on long haul tourist visits.

New Zealand’s international tourism market has seen some very strong growth since the Global Financial Crisis with visitor arrivals up 5.3% (year-on-year until December 2014). The number of visitors from China continues to grow. According to the MBIE, the outlook for international tourism is positive but it is tempered by risks such as a potential slowdown in Europe (e.g. Greek issues) a slowdown in the Chinese economy and security issues. Nevertheless, the consensus forecast is for international visitor arrivals to continue to grow at around 4% per year. This outlook is supported by soft global oil prices, international airlines adding flights to NZ and a strong dollar.

This positive outlook will flow through to opportunities to build and develop the visitor attractions (and products) at the regional levels. Given that international connections account for over 10% of the traffic on the domestic network, growth in the international connections is likely to spill over and affect the domestic network.

REGIONAL ECONOMIES & DOMESTIC CONNECTIONS

Most regions have detailed economic growth and development plans and central government is also supporting some regions to develop growth plans and strategies. Many of NZ’s regional economies are resource-based (primary sectors/agriculture) and the regions are seeking to grow these key sectors while also attempting to diversify (to reduce economic risks). In some cases, the airports and air connectivity are viewed as a key part of the economic landscape and future prosperity. This suggests that from a regional perspective, it is likely that regions will continue to ‘value’ their airports.
In terms of the regional economic outlook, most regions have seen a drop off in confidence. This is mainly because of weak agricultural commodities prices. If the weak prices and downbeat outlook persist, then this will invariable spill over into regional economic performance. In turn, this is likely to suppress growth in demand for air travel from the regional centres. On the positive side, there are some sources of growth. The historically strong growth in immigration is likely to continue to support growth and development in Auckland. Low interest rates will also support business and economic activity in Auckland and the rest of the country. Rebuilding Christchurch will also continue to support economic activity even if the rebuild is peaking. Overall, the outlook for the regional economies around NZ is mostly on the upside with average growth expected in the short term. For the domestic air network, this implies that it is unlikely that there will be a ‘step-change’ in the growth profile. Instead, historic (long-term average) growth levels are expected.

The main urban centres, Auckland, Christchurch and to some extent Wellington, are currently in a strong positions. In the short term, this is likely to support travel demand growth to and from these cities as their growth is being driven by immigration, construction and the rebuild.

With reference to domestic connections, one possible driver of ‘new routes’ between regions is the level of trade between regions (not currently serviced by point-to-point services). Our analysis suggests that the distribution of interregional (between-region) trade\(^9\) matches passenger movements on the domestic air network. There is a link between interregional activity and air traffic between those regions but this is also influenced by distance. This means that the demand for new point-to-point services between the smaller economies is likely to be limited. We do not expect any ‘new point-to-point services’ to emerge in the next 5 years or so. If any new routes emerge, they are likely to be approached in a cautious manner.

**Population**

Population is strongly correlated with economic activity. According the Statistics New Zealand, the country’s population is projected to grow from the current 4.5m to between 4.7m and 4.8m by 2020. More than half of the growth is expected to occur in Auckland and around 16% of the growth is expected in Canterbury. This is followed by Waikato and then Wellington.

Immigration is likely to remain a key source of population growth over the short term. The historic pattern of migrants settling in the large cities is likely to remain. Therefore, the demand for air travel is likely to remain associated with the key centres.

It is important to notice the uneven nature of the growth outlook – i.e. concentrated in the large cities. The implications for air travel demand are that, over the short term, the routes connecting the large centres will continue to experience growth. The routes associated with the medium size cities connecting to the hub cities are expected to show expand in line with the growth in the service sectors in the regional towns. However, connections to the smaller regions are likely to suffer from low growth.

---

\(^9\) As measured using intermediate demand between NZ's 16 regions.
CONCLUSION

Apart from the two high profile changes (Air NZ stopping some services and JetStar’s entry into regional routes), it is difficult to see any significant changes in the regional turbo-prop services fleet.

The current hub-and-spoke configuration of the network is likely to remain in place:

- Most of the growth on the network is likely to be concentrated on the main truck routes.
- At the second level (the ‘spokes’), the outlook for these segments is somewhat varied and will depend on the economic fortunes of individual regions.
- The third level (regional, point-to-point services) can at best be explained as marginal and these routes will face difficult trading environments. These routes are delivering value to the regional economies because they are connecting the small regions with other economic regions. The low margins on these routes mean that the independent operators are finding it difficult to renew and upgrade their fleets. This may become an issue in the future.

Potential Policy Questions

In the next five years, there are likely to be a number of areas that will require attention. These areas are associated with the overall network and its performance. These include:

- **Network configuration**: The airports are expensive infrastructure enabling the overall network and it is necessary to define a long-term vision for NZ’s airports, highlighting the optimal network configuration. In this context, optimal relates to the balance between regional ‘wants’, ‘needs’ and ability to pay for airport facilities. Where there is a mismatch between the need for facilities and regional financial capability, alternative funding mechanisms will need to be explored.

- **How to grow passenger volumes** – Airlines and airports have different views about how best to stimulate growth. Airlines tend to focus on the infrastructure and terminal development where the airlines focus on destination market. The means that there are a number of policy questions in this area, including:
  - What is the role of airports to deliver a high quality tourist experience?
  - What is the role of airlines in informing planning for infrastructure expansion and development activities?

- **Sector collaboration** – there may be some (small) opportunities to develop specific point-to-point services. These services are likely to be driven by specialist, cross-region collaborative opportunities. It is currently not known what these opportunities are, or what needs to be done to unlock them.

- **Airfreight** – there is a general information gap about the flow of airfreight around the country. This is a known gap and it would add to the understanding of air transport’s role in economic development and activity if this gap was addressed.

- **Financial health and sustainability** – over the longer term, some of the smaller airports are likely to face financial pressures. This will lead to questions about the need for, and viability of, the airports. Stakeholders are likely to assess the effects and impacts of airports by asking questions such as ‘who pays for the airport?’ and ‘who benefits from the airport?’ These are important questions as they can be used to inform where the funding/financing burden should fall.
‘Invisible’ uses – the air transport network and airport network enables a range of other public services such as patient transfers and emergency services to be delivered. If the airport network’s configuration changes then health and emergency service providers’ ability to provide services is impacted. It is necessary to understand these relationships as part of any discussion about the future network configuration.

Improving the performance of independent operators – the independent operator sector is delivering important linkages across and between regional NZ. The potential role of this sector in the wider network, its growth potential, role and measures needed to lift its performance will need to be understood.

Airports and air travel by themselves are key parts of regional economies, contributing to, and supporting economic growth and competitiveness. However, airport assets are expensive and they need to be actively managed and integrated into regional development activities to ensure that the maximum value is derived (returned) from these economic assets. From a regional development perspective, having an airport and quality connections are important because it enables trade. However, just having an airport is not a recipe for regional economic development success and prosperity.
## Contents

1 **INTRODUCTION** ........................................................................................................... 1  
1.1 **PROJECT OBJECTIVES** .......................................................................................... 1  
1.2 **PROJECT APPROACH** .......................................................................................... 2  
1.3 **AREAS COVERED** .................................................................................................. 4  
1.4 **REPORT STRUCTURE** .......................................................................................... 1  

2 **CURRENT SITUATION** ................................................................................................. 2  
2.1 **AIRPORT INFRASTRUCTURE** .................................................................................. 2  
2.2 **ROUTE NETWORK** ................................................................................................. 5  
2.3 **FLEET CHARACTERISTICS** .................................................................................... 8  
2.4 **RECENT ANNOUNCEMENTS** .................................................................................. 14  
2.5 **OTHER CONSIDERATIONS** .................................................................................. 16  
2.6 **CURRENT PERSPECTIVES** ................................................................................... 20  
2.7 **CONCLUDING REMARKS** ................................................................................... 24  

3 **UNDERLYING DRIVERS** .............................................................................................. 26  
3.1 **RELATIONSHIP WITH SURROUNDING AREAS** .................................................... 26  
3.2 **KEY DRIVERS** ...................................................................................................... 29  
3.3 **OTHER OBSERVATIONS** ....................................................................................... 34  
3.4 **POLICY LANDSCAPE** ............................................................................................ 35  
3.5 **KEY POINTS** ......................................................................................................... 39  

4 **OUTLOOK FOR KEY DRIVERS** .................................................................................... 41  
4.1 **ROUTES CHARACTERISTICS** ................................................................................. 41  
4.2 **CONNECTIONS** ..................................................................................................... 43  
4.3 **REGIONAL ECONOMIES** ....................................................................................... 45  
4.4 **POPULATION** ........................................................................................................ 47  
4.5 **CONCLUDING REMARKS** ..................................................................................... 49  

5 **CONCLUSIONS** ............................................................................................................ 51  
5.1 **HUB-AND-SPOKE STRUCTURE & COMPETITION** ............................................... 51  
5.2 **FLEET, COSTS AND INFRASTRUCTURE** ............................................................... 53  
5.3 **POTENTIAL POLICY QUESTIONS** ......................................................................... 54
Figures

FIGURE 1-1: AREAS COVERED................................................................................................................ 1
FIGURE 2-1: SHARE OF PLANES BY SEATS (EXCL. JETS)................................................................. 8
FIGURE 2-2: SHARE OF SEATS (BY PLANES SIZE; EXCL JETS) ...................................................... 8
FIGURE 2-3: AGE DISTRIBUTION OF THE FLEET (EXCL AIR NZ AND JetSTAR) ............................. 9
FIGURE 2-4: COST/AIRCRAFT TYPE (VARIABLE COSTS) .................................................................. 12
FIGURE 2-5: DISTRIBUTION OF COST PER SEAT ............................................................................. 14
FIGURE 2-6: MEDICAL FLIGHTS (REGIONAL CONNECTIONS) .......................................................... 17
FIGURE 3-1: EMPLOYMENT RELATIVE TO PASSENGER MOVEMENTS (LOG SCALE) ................. 27
FIGURE 3-2: POPULATION RELATIVE TO PASSENGER MOVEMENTS (LOG SCALE) ................. 27
FIGURE 3-3: PASSENGERS RELATIVE TO FIRMS .............................................................................. 28
FIGURE 3-4: FACTOR ANALYSIS – RESULT SUMMARY ................................................................. 30
FIGURE 4-1: SHARE OF INTERREGIONAL TRADE BETWEEN REGIONS ....................................... 47
FIGURE 4-2: NZ POPULATION PROJECTIONS ................................................................................. 48

Table

TABLE 2-1: AERODROME FEATURES................................................................................................. 3
TABLE 2-2: SCHEDULED DOMESTIC AIRLINES ............................................................................... 5
TABLE 2-3: TYPICAL AIRCRAFT VALUES AND REPLACEMENT COSTS. .......................................... 10
TABLE 2-4: POTENTIAL COSTS (ROAD VS AIR TRAVEL) .............................................................. 19
TABLE 3-1: KEY DRIVERS .................................................................................................................... 31
TABLE 3-2: REGIONAL BREAKDOWN OF STARSHIP AIR AMBULANCE FLIGHTS (3 MONTHS) ....... 38
Appendices

APPENDIX 1: FACTOR ANALYSIS............................................................................................................ 57
APPENDIX 2: AIRPORTS INCLUDED IN THE STUDY .................................................................................... 58
APPENDIX 3: DISTRIBUTION OF AIRCRAFT COSTS (VARIABLE) .......................................................... 59
APPENDIX 4: TREND IN JET FUEL (NZ$ PER BARREL) ............................................................................. 60
APPENDIX 5: PROFIT POTENTIAL ON REGIONAL ROUTES BASED ON CURRENT FLEET USAGE .......... 61
APPENDIX 6: FACTORS INCLUDED IN THE FACTOR ANALYSIS ............................................................ 62
APPENDIX 7: FACTOR ANALYSIS RESULTS (INCLUDING ROUTE FEATURES) ...................................... 63
APPENDIX 8: POPULATION GROWTH PROJECTIONS ............................................................................. 64
APPENDIX 9: RESPONSE TO COMMENTS ................................................................................................ 65
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC</td>
<td>Accident Compensation Commission</td>
</tr>
<tr>
<td>ADS-B</td>
<td>Automatic Dependent Surveillance</td>
</tr>
<tr>
<td>AIAL</td>
<td>Auckland International Airport Limited</td>
</tr>
<tr>
<td>AIP</td>
<td>Aeronautical Information Publication New Zealand</td>
</tr>
<tr>
<td>Air NZ</td>
<td>Air New Zealand</td>
</tr>
<tr>
<td>ASK</td>
<td>Available seat kilometers</td>
</tr>
<tr>
<td>ATC</td>
<td>Air Traffic Control</td>
</tr>
<tr>
<td>ATCS</td>
<td>Air Traffic Control Service</td>
</tr>
<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
</tr>
<tr>
<td>DHB</td>
<td>District Health Boards</td>
</tr>
<tr>
<td>DTS</td>
<td>Domestic Travel Survey</td>
</tr>
<tr>
<td>FA</td>
<td>Factor Analysis</td>
</tr>
<tr>
<td>GDD</td>
<td>Global Demand Data (Sabre)</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GFC</td>
<td>Global Financial Crisis</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
</tr>
<tr>
<td>IFR</td>
<td>Instrument Flight Rules</td>
</tr>
<tr>
<td>ILS</td>
<td>Instrument Landing System</td>
</tr>
<tr>
<td>IVS</td>
<td>International Visitor Survey</td>
</tr>
<tr>
<td>M.E</td>
<td>Market Economics</td>
</tr>
<tr>
<td>MBIE</td>
<td>Ministry for Business Innovation and Employment</td>
</tr>
<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MOT</td>
<td>Ministry of Transport</td>
</tr>
<tr>
<td>NDB</td>
<td>non-directional (radio) beacons</td>
</tr>
<tr>
<td>NSS</td>
<td>New Southern Sky</td>
</tr>
<tr>
<td>NZ</td>
<td>New Zealand</td>
</tr>
<tr>
<td>NZ Airport</td>
<td>New Zealand Airport Association</td>
</tr>
<tr>
<td>OE</td>
<td>Overseas Experience</td>
</tr>
<tr>
<td>OIA</td>
<td>Official Information Act</td>
</tr>
<tr>
<td>PAX</td>
<td>Passenger/s</td>
</tr>
<tr>
<td>RNAV</td>
<td>Area Navigation</td>
</tr>
<tr>
<td>TA</td>
<td>Territorial Authority</td>
</tr>
<tr>
<td>VFR</td>
<td>Visual Flight Rules</td>
</tr>
<tr>
<td>VOR</td>
<td>VHF Omnidirectional Range</td>
</tr>
</tbody>
</table>
1 Introduction

New Zealand’s domestic air transport network is a vital part of the economy. The network facilitates a range of connections allowing people and cargo to move between different cities and towns, thereby linking productive activities across space. The network is dynamic, with feedbacks between components as well as the environment within which it operates. Economic, social and technological trends are changing aviation and how it interacts with the wider business environment. Understanding these dynamic forces, and the flow-on effects, is critically important when seeking to optimise the air network in the short, medium and long term. This research is the first stage of an investigation into the future of New Zealand’s (NZ) domestic air network.

The New Zealand (NZ) domestic air network is an essential piece of the country’s transport system. The airports enable air movements between cities, unlocking business opportunities and facilitating social connections. NZ’s airports and airline industries are both facing a range of pressures that will influence their future viability and ability to service NZ communities. The Ministry of Transport (MoT) and the New Zealand Airport Association (NZ Airports) have joined forces to establish a staged research programme, seeking to shed light on the forces affecting NZ’s domestic air routes. This report summarises the findings of stage 1 of the research. This stage focuses on the current situation, identifies the key issues affecting and driving the network’s performance. Market Economics Limited (M.E) and Astral Limited were commissioned to undertake this first stage of the research.

1.1 Project Objectives

In New Zealand, there is a need to identify the medium to long term trends and drivers that are likely to shape the domestic air network and air transportation. This research focuses on the current situation and the short term outlook (next 5 years or so). Subsequent research stages may consider a longer term focus (e.g. 10 to 20 years). A number of project objectives guided this research. In summary, the project objectives included:

- To review the current network and to draw out the insights, issues and considerations, focusing on the airport infrastructure and aircraft servicing the routes.
- To assess the current levels of service provided by air carriers on different routes and to explore the issues affecting performance on the main routes and city-pairs.
- To explore the issues affecting airlines’ ability to deliver services e.g. ticket costs and peer-to-peer arrangements (e.g. code sharing).
- To explore and highlight air transportation’s interactions with areas that they service, by assessing the catchments, service densities and cost implications (on different air sectors).
- To identify the key drivers of the network and to understand the immediate outlook for the route configuration.
- To highlight potential policy issues.

Ultimately, the core deliverable of stage 1 is to provide a picture of New Zealand’s domestic air network, including the linkages between airports, their services and infrastructure and to identify the drivers of the air transport network.
1.2 Project Approach

This research called for a staged approach and used both quantitative and qualitative research techniques. The findings of the two approaches were integrated, to provide a detailed picture of the factors influencing the domestic air network.

1.2.1 Quantitative Process

The quantitative process consisted of two parts, data gathering and analysis. During the first part, the team collected large datasets and after interrogating these datasets, extracted the relevant data. The resulting data was entered into a statistical programme to identify the key (unobserved) relationships between data points. These relationships were identified using Factor Analysis (FA) (see Appendix 1). The following data sources were used to populate the dataset used in the FA:

- Statistics New Zealand data,
- Business Demography Survey,
- Regional GDP datasets,
- Census data (2001, 2006 and 2013),
- Ministry for Business, Innovation and Employment,
- Tourism data sourced from the International Visitor Survey (IVS) and the Domestic Travel Survey (DTS),
- Sabre® Global Demand Data (GDD),
- International Air Transport Association,
- Airports’ Financial Plans and Reports.

An important source was the flight and route information sourced from Sabre® Global Demand Data (GDD). This information forms a central pillar of the assessment, as it provides a breakdown of passenger (PAX) movements on different routes, connecting movements and average fares (in US$)\(^{10}\). The Sabre® data covered the 2014 calendar year. However, this data does not cover all routes. It does not include the smaller independent operators\(^{11}\). This information gap was addressed by reviewing route information, passenger schedules, and ticket prices as well as aircraft information sourced from the independent. The resulting dataset was used to complete a high-level assessment of the relative financial performance of different routes. This information was combined with estimates of aircraft operating costs to identify the profit differential of shifting to another aircraft platform.

The quantitative process was supplemented with an interview and survey process.

1.2.2 Surveys and interview

As part of this study, the team invited all the airports included in this study (see Appendix 2), to complete a survey. In some cases, the airports’ responses were followed up with an interview (telephonic or physical).

\(^{10}\) Where necessary the US$ is converted to NZ$ using the average exchange rate of the study period.

\(^{11}\) The regional airlines.
In addition, airlines operating scheduled flights were also invited to complete a survey. Again, some of these airlines were interviewed. In addition to interviewing the airports and airlines, we completed a review of the regional economic development plans and programmes and Council Long Term Plans. In some cases this was followed up with telephone calls to verify and confirm some of the findings. In total, the team gathered information from 37 airports and 10 airlines. We also reviewed the economic development strategies and plans of 14 individual regions. Our review also included a number of territorial authority (TA) level strategies, plans and reports. With reference to the survey and interview process, as far as the team is aware, all relevant airports and airlines were invited to participate in the research. Some respondents requested that we keep their responses confidential and others did not participate in the research. More than 85% of airports participated in the research but only a small number of airlines replied. Nevertheless, we used the inputs that we received and inferred the wider implications from this. Of course, the limited response means that we report the views of the minority. These views are therefore not representative of the whole airline industry and should not be viewed as such.

The surveys and interviews were designed to identify the key issues that are currently affecting the domestic air network’s performance from the airports’ and airlines’ perspective. This was done by exploring:

- Market issues,
- Aircraft fleet considerations,
- Air transport issues,
- Technology factors,
- Infrastructure and facility issues, and
- Linkages to other transport modes.

As part of the survey and interview process, the team also liaised with the Civil Aviation Authority (CAA) and reviewed CAA information, particularly their publically available information i.e. Aeronautical Information Publication New Zealand (AIP).

Other sources reviewed and used during the interview and survey process include:

- Airports’ Master Plans,
- Regional economic development plans and programmes,
- Councils’ Long Term Plans,
- A selection of District Plans,
- MBIE’s Regional Economic Activity Report,
- National Freight Demand Study,
- Tourism Forecasts (MBIE),
- Airports’ Statement of Intent (where relevant), and
- CAA documents.

1.2.3 Synthesis and Findings

During the final stage, the team summarised the analysis, identified the issues and explored the relationships and wider implications of the current trends. The core issues were identified after considering the following aspects:
- The network’s current relative structure (size and distribution),
- The performance of routes relative to the communities they service,
- The short term outlook for domestic air transport and airports based on expected movement(s) in the drivers and factors influencing the drivers,
- Aircraft fleet and technical factors,
- Other considerations such as policy and operational issues that could influence the outlook.

The findings were interpreted to provide some high-level policy questions that could form the basis for additional research. Delivering specific recommendations are however, beyond the scope of this study.

We note that the New Zealand air transport and airport sector is diverse with many role-players. An important observation about the NZ air transport market is that it is dominated by a single, large player – Air New Zealand. This dominant position translates into a number of potential market and economic efficiency issues. These aspects are beyond the scope of this report.

1.3 Areas Covered

The research covers a wide range of topics and uses statistical tools to identify the underlying relationships between different variables. The variables have been selected in a way that captures both supply and demand side aspects of the domestic air network. Figure 1-1 shows the different areas considered and included in the study:

- The air transport features including aspects around the total passenger movements on the different routes (sourced from SABRE® GDD), the estimated revenue per route (SABRE® GDD), the fleet considerations (focusing on the regional routes), spatial considerations and cooperation between airlines (based on interviews with airlines);
- The catchment features (of both the origin and destination in the city-pairs). The analysis covers six different spatial scales. The spatial scales are used in a way that provides multiple perspectives on the relationships between air transport (passenger movements) and the catchment features. In addition, the analysis used the different spatial scales to identify any thresholds or catchment related features. The following features are included: employment, number of businesses, economic sectors, Gross Domestic Product (GDP) and tourism spending (including both domestic and international tourist spending on 5 different tourism products).
- The alternative to air transport. Given, that air transport is predominantly focused on passenger movements, we included the time (in minutes) to travel between city pairs in the analysis. In addition, we estimated the potential cost of travelling by road, in order to compare the cost of road travel against air transport. This comparison was done for a selection of routes to determine if any substantial cost and time differences exist.

---

12 The spatial scales cover different ‘bands’ around the airports – in close proximity to the airport using the Area Unit within which the airport is located, within 5km from the airport, within 5-10km, within a 10-15km area and further than 15km from the airport. The territorial authority area and regional council areas are also included. These two spatial definitions are used together with the GDP and tourism spending datasets.
Figure 1-1: Areas Covered

**Catchment features**
- Close to Airport (<5km)
- 5-10km
- 10-15km
  - Territorial Authority Area

**Air transport features**

**Movements between city-pairs**

**Alternatives**
- Travel time (road: minutes)
- Total trip cost ($) Vehicle operating cost Value of time

**GDP** (16 sectors)

**Population**
- Employment
- Number of businesses
- Retail Turnover (Spending)
- Tourism (Spending)
- Regional Area

**Astral**
- Aviation consultants
1.4 Report structure

The rest of the report is structured as follows:

Section 2 describes the current situation. It covers airport infrastructure aspects, fleet characteristics, general route characteristics and the wider landscape. This section summarises the survey and interview findings by highlighting the airports’ and airlines’ perspectives.

In Section 3, we explore the key relationships between the airports, airlines and communities as identified using Factor Analysis.

Section 4 discusses the outlook for the each of the identified key drivers, with a focus on the implications for the domestic air network.

The report concludes with Section 5. In this section, we summarise the key findings in terms of the network’s outlook and we provide some high-level policy questions.
2 Current Situation

Airports and airlines provide essential services to New Zealand’s regions by connecting people and business. The air network is described in terms of airport facilities, the aircraft fleet and passenger movements. This discussion provides a basic understanding of the domestic air network and the current pressure points in the system. The discussion combines information from the surveys, interviews and published information. This section describes the current situation using the following headings:

- Airport infrastructure,
- Route network,
- Aircraft fleet characteristics,
- Recent Announcements,
- Other considerations, and
- Current perspectives.

2.1 Airport Infrastructure

New Zealand is relatively well endowed with aerodromes, some 175 of all types being listed in the NZAIP.\textsuperscript{13} Aerodromes can be either certificated by the Civil Aviation Authority (CAA) under Rule Part 139 or non-certificated.\textsuperscript{14} Certificated aerodromes have higher design and operational standards. Only certificated aerodromes can receive regular air transport operations from aircraft with a capacity of more than 30 passenger seats. That said, the operational safety record of non-certificated aerodromes since the rule’s inception in 1993 has been good.

The study has focused on 37 aerodromes, largely those that have scheduled air services. This includes some aerodromes that have recently lost air services. These aerodromes range from large international facilities such as Auckland International Airport, through to small grass facilities such as Waiheke Island. A breakdown of the various aerodrome types and their facilities is shown in Table 2-1. The table shows the airports:

- Certification Levels: Part 139 certificated.
- International Civil Aviation Organisation (ICAO) Code.
- Approach type.
- Maximum Aircraft Size (terminal).
- Runway features, and
- Operation Type.

Terminal capacity is generally matched to the types of aircraft servicing the aerodromes and their frequency of operation. Some of the smaller aerodromes in our study did not have terminals at all. The terminal capacity is presented in terms of the maximum aircraft size (in terms of passengers).

\textsuperscript{13} New Zealand Aeronautical Information Publication.

\textsuperscript{14} The term “aerodrome” is the generic name used by ICAO and CAA to describe facility for fixed wing aircraft. An aerodrome can range in size from a major international airport to a small grass airstrip.
### Table 2-1: Aerodrome Features

<table>
<thead>
<tr>
<th>Aerodrome</th>
<th>Part 139 certified</th>
<th>ICAO Code</th>
<th>Approach type</th>
<th>Maximum aircraft size (seats)</th>
<th>Length</th>
<th>Runway Width</th>
<th>Surface</th>
<th>Operation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardmore</td>
<td>No</td>
<td>3C</td>
<td>Yes</td>
<td>30 1,411 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auckland</td>
<td>Yes</td>
<td>4F</td>
<td>Yes Yes Yes</td>
<td>400+ 3,535 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chatham</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>50 1,360 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christchurch</td>
<td>Yes</td>
<td>4F</td>
<td>Yes Yes Yes</td>
<td>300 3,288 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dunedin</td>
<td>Yes</td>
<td>4D</td>
<td>Yes Yes Yes</td>
<td>180 1,900 46 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gisborne</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>50 1,310 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Barrier</td>
<td>No</td>
<td>2B</td>
<td>Yes Yes Yes</td>
<td>15 930 9 Sealed</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamilton</td>
<td>Yes</td>
<td>4D</td>
<td>Yes Yes Yes</td>
<td>70 2,059 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hokitika</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>70 1,233 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invercargill</td>
<td>Yes</td>
<td>4D</td>
<td>Yes Yes Yes</td>
<td>70 2,210 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaitaia</td>
<td>No</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>19 1,402 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerikeri</td>
<td>Yes</td>
<td>2C</td>
<td>Yes Yes Yes</td>
<td>50 1,190 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masterton</td>
<td>No</td>
<td>3B</td>
<td>Yes</td>
<td>9 1,205 23 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milford Sound</td>
<td>No</td>
<td>1B</td>
<td>Yes</td>
<td>15 772 16 Sealed</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Napier</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>70 1,750 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nelson</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>70 1,347 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Plymouth</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>70 1,310 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Shore</td>
<td>No</td>
<td>1A</td>
<td>Yes</td>
<td>9 738 9 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palmerston Nth</td>
<td>Yes</td>
<td>4C</td>
<td>Yes Yes Yes</td>
<td>70 1,902 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paraparaumu</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>50 1,187 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picton</td>
<td>No</td>
<td>2A</td>
<td>Yes</td>
<td>15 780 12 Sealed</td>
<td>*No No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queenstown</td>
<td>Yes</td>
<td>4C</td>
<td>Yes Yes Yes</td>
<td>180 1,839 30 Sealed</td>
<td>Yes *yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotorua</td>
<td>Yes</td>
<td>4C</td>
<td>Yes Yes Yes</td>
<td>70 1,843 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stewart Island</td>
<td>No</td>
<td>1A</td>
<td>Yes</td>
<td>9 620 16 Sealed</td>
<td>No *yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takaka</td>
<td>No</td>
<td>2A</td>
<td>Yes</td>
<td>9 832 12 Sealed</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taupo</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>19 1,386 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tauranga</td>
<td>Yes</td>
<td>4C</td>
<td>Yes Yes Yes</td>
<td>70 1,825 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timaru</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>19 1,280 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiheke Island</td>
<td>No</td>
<td>1A</td>
<td>Yes</td>
<td>15 630 30 Grass</td>
<td>No No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wanaka</td>
<td>No</td>
<td>3C</td>
<td>Yes</td>
<td>19 1,200 30 Sealed</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wanganui</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>19 1,372 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wellington</td>
<td>Yes</td>
<td>4E</td>
<td>Yes Yes Yes</td>
<td>180 1,815 45 Sealed</td>
<td>Yes *yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westport</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>15 1,280 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whakatane</td>
<td>No</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>50 1,280 31 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whangarei</td>
<td>Yes</td>
<td>2C</td>
<td>Yes Yes Yes</td>
<td>50 1,097 30 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whitianga</td>
<td>No</td>
<td>3A</td>
<td>Yes</td>
<td>9 1,526 18 Grass</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodbourne</td>
<td>Yes</td>
<td>3C</td>
<td>Yes Yes Yes</td>
<td>50 1,425 45 Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Generally, runways longer than 1,400m make up 41% of the 37 aerodromes in the study and are adequate for all the typical in-service, and likely future, propeller powered regional aircraft. Runways between 1,200m and 1,399m long are generally adequate for services provided by 50 seat aircraft, such as the Bombardier Q300 operated by Air New Zealand and Qantas Link. Together, with the +1,400m runways this totals 73% of the 37 studied. The remaining 10 (27%) aerodromes' runways are less than 1,200m long, which is generally inadequate for turbo-prop aircraft with more than 19 seats, other than specialist short take-off and landing aircraft.

These aerodromes are most at risk of not being able to accommodate aircraft of a standard acceptable to the major airlines for interline carriage of their passengers, a source of revenue that can provide both steady business for the aircraft operator and deliver international tourists to regions trying to grow their tourist market. These short runways are however located in areas with small total passenger demand, so this limitation is not a surprise.

For reliability of service in poor weather conditions, aerodromes require an instrument approach. Previously, most general aviation aircraft and small airports were equipped for basic instrument approaches. However, with the move to New Southern Sky (NSS), progressive withdrawal of non-directional (radio) beacons (NDB)
as the basic instrument approach navigation aid is occurring, requiring aircraft to be equipped for area 
satellite based navigation (RNAV) approaches. All but four of the aerodromes in this study have RNAV 
approaches available. RNAV approaches do not require any ground based infrastructure, at least for daytime 
operations, the required flight procedure being designed by the Airways Corporation. The operator needs 
to be approved by the CAA for RNAV operations.

All weather services also require a sealed runway. Of the aerodromes in our study, only two (Waiheke Island 
and Whitianga) are unsealed.

Night lighting is required for night operations. Some 78% of the aerodromes are equipped for, and have 
night operations. A notable exception is Queenstown airport, which plans to facilitate night operations in 
the future. The remainder of the non-night approved aerodromes are in the sub 1,200m category. Modern 
LED lighting systems are relatively cheap and easy to install. However, appropriate flight procedures for night 
operations to ensure terrain avoidance have to be developed, which, is often a limiting factor. Runway 
lighting which, is able to be activated by the pilot of inbound aircraft by radio, is very important for medical 
flight operators using aerodromes without air traffic control (ATC) and for late night flights outside ATC hours 
of service. Aerodrome electrical systems can be expensive to maintain due to deterioration in cabling and 
light fittings over time. Backup power is required under CAA aerodrome design standards, however many 
small aerodromes lack this.15 Flights can still operate to aerodromes lacking backup power, provided an 
alternate aerodrome with backup power is available and nominated by the pilot in the flight plan.16 The main 
regional aerodromes all have backup power.

Most aerodromes reported their facilities to be generally adequate, although about 40% indicated terminal 
expansion would be required in the next 5-10 years.

Terminal capacity was not uniformly reported on by the respondents. However, 73% of the aerodromes 
included in this study, are known to have terminal facilities, albeit some inadequate to meet demand. Only 
two of the aerodromes with runways of 1,200m or more do not have “common use” terminals available to 
any operator, these being Whitianga and Ardmore. Local operators at these locations tend to use their own 
facilities for handling their passengers. In the sub 1,200m group, five of the ten aerodromes (50%) have only 
very basic facilities that are airline specific, the most notable being Great Barrier aerodrome, which has high 
numbers of passengers in the summer months.

Lack of apron space and the need to keep up with costly routine maintenance (such as resurfacing of tarmac 
areas) were common themes reported in the survey. Several airports reported inadequate runway lengths, 
which are difficult to address due to site constraints.

**Key Point:** In summary, all the studied aerodromes are adequate for the types of operation currently 
occurring, or likely to occur in the future. Some aerodromes mentioned inadequate terminal facilities and 
aircraft parking space issues. Issues around long-term availability of ground based navigation aids under the 
NSS programme, were also raised.

The majority of aerodromes in the study are owned by local councils. Several also have a proportion of Crown 
ownership and only a few are privately owned. With reference to local council involvement in aerodromes 
and airfields around NZ, our interactions with a selection of the councils revealed that they generally view

---

15 AC139-6 paragraph 8.1.1
16 CAR91, 91.405(c)
aerodromes as economic assets. In most cases, the facilities are held via some form of a council controlled organisation (i.e. at arm’s length from council). This implies that in most cases the airports and related facilities are treated as commercial entities without direct financial i.e. ratepayer funding.

2.2 Route Network

The NZ domestic air network services most of regional New Zealand. It is possible to connect between almost all regional towns through the country by way of connecting flights (even if the connections are not convenient). **Air New Zealand (Air NZ) and JetStar services provide the core connections with the smaller, geographically dispersed centres serviced by the independent operators.** In addition to Air NZ, there are a number of regional airlines servicing separate, regional markets (see Table 2-2). In this report, we refer to these as ‘independent operators’.

### Table 2-2: Scheduled domestic airlines

<table>
<thead>
<tr>
<th>Airline</th>
<th>Area of operations</th>
<th>Aircraft17</th>
<th>Count</th>
<th>Type</th>
<th>Seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air New Zealand</td>
<td>Trunk</td>
<td>A320</td>
<td>13</td>
<td>Jet</td>
<td>171</td>
</tr>
<tr>
<td>JetStar</td>
<td>Trunk</td>
<td>A320</td>
<td>5</td>
<td>Jet</td>
<td>180</td>
</tr>
<tr>
<td>Mt. Cook Airline</td>
<td>Nationwide</td>
<td>A320</td>
<td>13</td>
<td>Twin turboprop, pressurised</td>
<td>68</td>
</tr>
<tr>
<td>Air Nelson</td>
<td>Nationwide</td>
<td>Q300</td>
<td>23</td>
<td>Twin turboprop, pressurised</td>
<td>50</td>
</tr>
<tr>
<td>Eagle Air</td>
<td>Nationwide</td>
<td>Beech 1900D</td>
<td>14</td>
<td>Twin turboprop, pressurised</td>
<td>19</td>
</tr>
<tr>
<td>Air Chatham</td>
<td>Selected regional Chatham islands</td>
<td>Convair 550</td>
<td>3</td>
<td>Twin turboprop, pressurised</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metro IV</td>
<td>1</td>
<td>Twin turboprop, pressurised</td>
<td>18</td>
</tr>
<tr>
<td>Air2There</td>
<td>Cook Strait</td>
<td>B200 KingAir</td>
<td>1</td>
<td>Twin turboprop, pressurised</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C208 Caravan</td>
<td>1</td>
<td>Single t-prop, unpressurised</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PA31 Navajo</td>
<td>2</td>
<td>Twin piston, unpressurised</td>
<td>8</td>
</tr>
<tr>
<td>Great Barrier</td>
<td>Upper North Island</td>
<td>BN2A Islander III</td>
<td>3</td>
<td>Tri piston, unpressurised</td>
<td>18</td>
</tr>
<tr>
<td>Airlines</td>
<td>Great Barrier Island</td>
<td>BN2A Islander</td>
<td>2</td>
<td>Twin piston, unpressurised</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Auckl-Grt Brr. Island</td>
<td>BN2A Islander</td>
<td>5</td>
<td>Twin piston, unpressurised</td>
<td>9</td>
</tr>
<tr>
<td>FlyMySky</td>
<td>Cook Strait</td>
<td>Pilatus PC12</td>
<td>1</td>
<td>Single turboprop, pressurised</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C208 Caravan</td>
<td>5</td>
<td>Single t-prop, unpressurised</td>
<td>13</td>
</tr>
<tr>
<td>SoundsAir</td>
<td>Bay of Plenty</td>
<td>Pa23 Aztec</td>
<td>11</td>
<td>Twin piston unpressurised</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Cook Strait-Tasman</td>
<td>PA34 Seneca</td>
<td>1</td>
<td>Twin piston unpressurised</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PA32 Cherokee</td>
<td>1</td>
<td>Single piston unpressurised</td>
<td>5</td>
</tr>
<tr>
<td>South East Air</td>
<td>Southland Stewart Island</td>
<td>BN2A Islander</td>
<td>2</td>
<td>Twin piston unpressurised</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PA32 Cherokee</td>
<td>1</td>
<td>Single piston unpressurised</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: the table shows only the main types of aircraft that are being used by the airlines and the fleets are subject to change.

Some airlines operate primarily charter operations with only very limited or seasonal scheduled services. These are advertised on their websites, but there may be instances where this will not be the case.

---

17 A listing of all the aircraft operators certificated by CAA for air fixed wing transport operations within New Zealand under CAA Rule Parts 119, 121, 125, 129 and 135 was reviewed, and those currently operating scheduled services were identified from their websites.
2.2.1 Passenger movements

The passenger movements on the network reflected in this report is for the 2014 calendar year and have been sourced from Sabre® GDD\(^{18}\). The independent operators’ information was estimated by assessing their fleet, scheduled flights and potential loadings. Based on the Sabre® GDD data, there were over 30m PAX movements across NZ in 2014. This captures all movements including:

- Total PAX movements on the domestic network (20.8m) of which,
- Approximately 1.9m PAX movements were by way of 1 connection,
- Around 31,100 PAX movements by way of two, or more, connections, and
- Of the PAX on the domestic network, 652,500 PAX were outbound on international flights, and 458,900 were international PAX that were inbound.

In terms of the international PAX movements (NZ to overseas and vice versa), there were an estimated 4.62m outbound PAX and 4.65m inbound PAX during 2014. Almost two-thirds (63.6% and 64.9%) of the movements (outbound and inbound) were through Auckland International Airport\(^{19}\). This is followed by Christchurch International Airport, capturing 15.4% and 14.6% of the international movements respectively. Wellington International Airport, Queenstown International Airport and Dunedin International Airport are the remaining international airports. The Wellington and Queenstown airports captured 9.2% and 4.7% of inbound passengers respectively. The corresponding outbound percentages are 9.4% and 4.7%. Dunedin serviced around 1.5% of international movements (inbound and outbound).

In addition to these movements, a number of passengers would ‘start’ their international journey at another airport. The main airports used for these connections generally relate to the larger urban centres including Nelson, Napier, Palmerston North and New Plymouth with each accounting for around 0.7% of inbound and outbound movements. Other important connecting airports include Hamilton, Tauranga, Blenheim, Gisborne, Rotorua and Whangarei. These airports service between 0.2% and 0.4% of international travellers (inbound and outbound).

Air NZ services dominate passenger movements across NZ. The smaller airlines linking the regional centres provide additional passenger movements. Based on the type of aircraft (seats) and flight frequency on an annual basis, the regional airlines provide further capacity of around 275,000 seats per year. This is around 1.4% of the network-wide PAX movements.

2.2.2 Airline Operators

Air NZ is delivering a nationwide service connecting the main centres, to and from regional centre to regional centre via hubs at Auckland, Wellington and Christchurch airports. The network is characterised by the a ‘hub-and-spoke’ pattern with few non-stop, point to point services between regional centres but good connections between regional centres and hub airports. This pattern is typical of airline operations worldwide.

\(^{18}\) We note that the total passenger movements are estimated by Sabre® and are higher than the 2012 IATA estimates. We compared the ‘per airport’ figures and the Sabre data, with the Sabre data being consistently higher. We compared the two datasets and found that at the airport level the correlation coefficient was 0.998 meaning that there is a close match between the two datasets. We used the Sabre data because it is more current. In addition, we elected to use Sabre where possible to ensure that we use a consistent dataset across all airports.

\(^{19}\) We note that the totals (based on Sabre GDD) are lower than the figures published by AIAL and the other large airports.
Air NZ and JetStar operate jets on the trunk routes. Below this, Air NZ currently has 61% (54 aircraft) of the scheduled turbo-prop and piston aircraft fleet. Combined, the independent operators have approximately 39% (35 aircraft; understood to be regularly used on scheduled services). Taken on a capacity basis, the difference is much more marked. Air NZ accounts for 85% of seat capacity and the independents 15%. On an available seat kilometre (ASK) basis, the Air NZ capacity share would be substantially over 85% due to the higher daily utilisation on their fleet compared to that obtained by the independents.

The most notable feature of the scheduled airline landscape in New Zealand is the fragmented nature of providers below the Air NZ group airlines. The independent operators are characterised by:

- Low fleet numbers and capacity.
- High average fleet age and lack of (inability to affect) fleet renewal.
- Narrow local area of scheduled operations.
- No interline arrangements with major carriers, and
- No apparent strategic co-operation or partnerships between the operators.

The fragmented nature of the independent operators can be attributed to:

- The types of aircraft operated, typically unpressurised and slow aircraft, unsuitable for network wide operations,
- The providers being typically owner operators with limited resources to expand and service network wide operations, including sales and marketing,
- Established geographic niches and customer bases not necessarily scalable to a larger network, and
- A desire by the owners to remain small and ‘under the radar’ of the dominant carriers to avoid risk of an aggressive response.

This situation has existed for many years and has, at least in part, resulted in the weak independent airline sector apparent today. Below the independent scheduled operators, are a number of operators that have CAA certification for air transport operations, however these operators only provide charter and in some cases air ambulance and flight training services. Others operate tourist related flights (e.g. sightseeing) and services. These charter and sightseeing services are beyond the scope of this research.

Historically, some of the non-scheduled operators have operated scheduled services, for example Mainland Air between Oamaru and Christchurch, and Air Napier to various eastern North island destinations. It is understood these services were terminated due to a lack of patronage and economic factors, which could include aspects such as:

- High per seat operating costs,
- Lack of suitable aircraft,
- Inadequate marketing,
- Small markets, or
- A combination of all factors.

---

20 The smallest of which is Eagle Airlines, operating 19 seat Beech 1900Ds.
2.3 Fleet characteristics

The bulk of NZ air travel takes place on the main trunk routes. These are serviced by jets: Airbus A320 and Boeing 737-300, as well as ATRs (turbo-prop aircraft). Excluding jets on the trunk routes, the aircraft fleet servicing domestic routes, has historically been divided into two distinct groups:

- The Air NZ fleet, comprising of modern pressurised turbo-prop aircraft, ranging from 68 seats down to 19 seats. The average age of this fleet is approximately 10 years. This is reducing, as new ATR72-600 aircraft come in and older B1900D aircraft are removed.
- The independently owned fleets. These are comprised of much older aircraft, ranging from 50 seat pressurised twin turbo-prop aircraft down to single piston-engined propeller aircraft seating 3 passengers. The average age of this fleet is approximately 41 years, with the oldest aircraft being 60-70 years. The average age of this fleet is increasing, as there are few additions or retirements. The second group can be further divided into several subgroups:
  - Pressurised twin-engine turbo-prop aircraft – comprised of several 50 seat Convair and 19 Seat Metro aircraft. These aircraft are operated with two pilots under instrument flight rules (IFR), under most weather conditions.
  - Small twin-engine turbo-prop aircraft, typically seating 10 or fewer passengers, either pressurised or unpressurised. Usually, these aircraft are operated with a single pilot under IFR. Unpressurised aircraft can have terrain-based route restrictions.
  - Small single engine turbine aircraft, typically seating around 10 passengers, operated by a single pilot under IFR. Route restrictions apply to unpressurised aircraft.
  - Small piston engine aircraft seating five to nine passengers, operated by a single pilot under IFR. These are almost all unpressurised and can be limited by atmospheric icing conditions when operating under IFR.
  - Small single piston engine, single pilot, operable only by day under visual flight rules (VFR). In this way, these aircraft do not provide an all-weather service and are not suited to operate on scheduled flights.

The distribution of planes in terms of seats, and capacity, is shown in Figure 2-2 and Figure 2-3. The majority (75%) of the fleet is over 40 years of age, only 12% being less than 20 years old.

Figure 2-2: Share of Planes by Seats (Excl. Jets)  
Figure 2-3: Share of Seats (by Planes Size; Excl Jets)

---

21 Trunk routes are those connecting Auckland, Wellington-Christchurch, Dunedin and Queenstown currently operated by Air New Zealand and JetStar, using 170-180 seat Airbus A320 aircraft. These routes account for approximately 80% of air passenger travel within New Zealand.
From the figures, it is clear that the bulk of the aircraft operated independently are small – 59% have less than 9 seats and account for 39% of total available seats.

Very recently, plans to start regional services have been announced by three airlines, all using relatively modern twin engine pressurised turbo-prop aircraft types. These aircraft are used in New Zealand currently, or have been used, in the recent past.

Technical factors affecting the independently owned fleets are:

- Aircraft age,
- Availability and cost of replacement aircraft,
- Runway length requirements, and
- Navigation and surveillance systems.

These are discussed below.

**Aircraft age**

Although most aircraft used by independent operators are no longer in production, these aircraft generally can be operated indefinitely\(^{22}\) as they are simple and were manufactured in sufficiently large numbers to ensure a steady supply of parts. Most are supported by Original Equipment Manufacturers (OEMs) and third parties with continuing airworthiness data. Age issues (see Figure 2-3) mostly relate to passenger perception and limit the ability to codeshare (carry passengers on behalf of) with major airlines who usually have a limit on aircraft age for interline operations.

Figure 2-3: Age Distribution of the Fleet (Excl Air NZ and JetStar)

![Age Distribution of the Fleet](image)

Changes to aircraft navigation and surveillance requirements under NSS may present problems to older aircraft, depending on the degree of commonality with the corresponding USA ‘Next Gen’ ATC system requirements. Although, because most of these aircraft are manufactured in the USA and continue flying

---

\(^{22}\) Assuming that they can be upgraded or retrofitted to ensure that avionic and navigation standards are achieved.
there in large numbers, avionics equipment retrofit options are being developed, at least for use in the US 'Next Gen’ environment.

Current indications suggest there will be significant technical differences between NSS and ‘Next Gen’. This is expected to become clearer later in the year when surveillance and navigation system technical decisions are made on NSS.

The requirement for ground based navigation aids will also depend on the CAA's decision of the use of satellite-based navigation as ‘sole means' i.e. additional ground navigation aids are not required. A decision permitting satellite based navigation as ‘sole means’ would likely hasten the removal of ground based aids and disadvantage small aircraft operators who cannot obtain, for either technical or economic reasons, suitable satellite navigation equipment for their aircraft. CAA and Airways Corporation are very aware of the issues small operators face and will be working with them over the next 5 years to minimise the potential impact of NSS changes on their operations.

Availability and cost of replacement aircraft

The independent operators use older aircraft due to comparatively low ownership costs on the one hand, and the high cost of equivalent new aircraft, on the other. Some examples are given in Table 2-3.

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Possible replacement</th>
<th>Typical cost ($USD)</th>
<th>New replacement</th>
<th>Used (age)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convair 580</td>
<td>ATR42</td>
<td>$17m</td>
<td></td>
<td>$5m</td>
</tr>
<tr>
<td>Metro IV*</td>
<td>Saab 340</td>
<td>Not available</td>
<td></td>
<td>$2m</td>
</tr>
<tr>
<td>KingAir B200</td>
<td>KingAir B250</td>
<td>$5.2-$7.6m</td>
<td></td>
<td>$3m</td>
</tr>
<tr>
<td>KingAir C90*</td>
<td>Pilatus PC12</td>
<td>$4.6m</td>
<td></td>
<td>$2.5m</td>
</tr>
<tr>
<td>BN2A Islander III*</td>
<td>Evektor EV-5523</td>
<td>$6.5m</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>BN2A Islander*</td>
<td>-</td>
<td>$2.8m</td>
<td></td>
<td>$1.5m</td>
</tr>
<tr>
<td>Cessna C208</td>
<td>Cessna C208</td>
<td>$2.02m</td>
<td></td>
<td>$1.25m</td>
</tr>
<tr>
<td>PA31 Navajo*</td>
<td>-</td>
<td>$4m</td>
<td></td>
<td>$0.8m</td>
</tr>
<tr>
<td>PA23 Aztec</td>
<td>Beech Baron G58</td>
<td>$1.35m</td>
<td></td>
<td>$0.9m</td>
</tr>
</tbody>
</table>

* no equivalent western manufactured aircraft of similar capacity is available new

An issue facing all western air service providers, is the lack of new aircraft designs or production aircraft in the 15-40 seat twin turbo-prop pressurised segment, and in the twin piston engine 7-15 seat range. In short, there are none. Various Chinese, Russian and Indian aircrafts are in production or under design, but their ability to meet accepted western aircraft certification and safety standards is often problematic. In addition, the cost of new aircraft is prohibitive (Table 2-3), yet new aircraft are needed to improve passenger appeal, and modern avionics equipment is required to enhance safety standards, and provide an OEM integrated navigation and surveillance capability for NSS. As aircraft utilisation is low for most independent operators, the higher costs of ownership of more modern aircraft are very difficult to cover.

23 New design due in service by 2018.

24 An example is the Xian MA60 aircraft, introduced to Tonga in 2013 by the Chinese Government, which was refused a type certificate acceptance by New Zealand CAA on the grounds that it did not meet an acceptable certification standard. The aircraft has since been withdrawn from service.
There do not appear to be any radical new designs or ‘technology disruptors’ on the horizon, either in engines or airframes. The development of electric aircraft is hampered by battery mass and volume, and aircraft piston engines have not experienced the same technological leaps in fuel economy and reliability that automotive engines had had in recent years. Similarly, small turbo-prop engines powering most sub-50 seat aircraft are still variants of the Pratt and Whitney Canada PT6 engine that first flew more than 40 years ago.

The most recent advances have been in airframes, where various types of composite materials are replacing traditional aluminium structures. In terms of avionics, the shift has been towards Liquid Crystal Display (LCD) and Global Positioning Systems (GPS) based systems similar to those found in large airliners. While the prices of these technologies have decreased, they are not always suitable for retrofit. However, these advances alone are not sufficient to make new designs readily available or affordable to independent operators.

Runway length requirements

As mentioned in Section 2.1, services to aerodromes with short runways (below 1,200m in length) can generally only be operated by aircraft with up to 19 seats. This is because of specific take-off weight restrictions applying to larger aircraft, limiting the payload that can be carried. This immediately increases the costs of servicing those communities, as the operating cost per seat increases rapidly with reducing passenger capacity (as discussed in the next section).

As 27% of the aerodromes included in this study, have runways shorter than 1,200m, unless lengthened, services are likely to be operated by older small aircraft with relatively high per seat ticket prices. However, lengthening the runway adds cost to the aerodrome operation, and does not guarantee larger aircraft will be used as this also depends on market size and sensitivity to flight frequency. For example, business markets usually require frequent flights between cities, whereas routes with predominantly tourist and leisure markets are usually less frequency sensitive.

Navigation and surveillance systems

In common with most countries New Zealand is about to embark on the most significant upgrade to its air traffic control navigation and surveillance systems New Southern Sky (NSS) since the introduction of primary and secondary surveillance radar over 30 years ago.

2.3.1 Operating Costs (excluding jets)

The cost of operating aircraft varies greatly depending on the type of plane. Expressing operating cost in terms of seats ($/ seat), makes it possible to identify the relative cost competitiveness of different aircraft. Figure 2-4 shows the variable operating cost for the type of aircraft being operated on the regional routes around NZ. The following cost components are included:

- Crew cost,
- Fuel,
- Maintenance (parts and labour),
- Overhaul reserves (engine, prop and undercarriage), and
- Other fees (e.g. landing fees, Airways fees, PAX service fees and handling agent charges).
Jets are not included in this assessment because they operate on the trunk routes and they have substantially greater seat capacity, lowering their cost per seat\(^\text{25}\).

The smaller planes have a lower cost base (in absolute terms) with the (total) variable cost structure shifting up as planes increase in size. In the sub 10 seat class, the overall cost per hour is below the NZ$1000/h mark, with the B90 and PC12 coming in at over $1,000 per hour. In this group, the cost per seat is variable but the average cost per seat is $134.20 (per hour). The next group is 10-20 seat planes. In this case, the cost per hour ranges between $1,000 and $2,500. The cost per seat in this class is not as diverse as the small planes. In this group, the average cost per seat is $121.90. The extra seats allow these planes to return better cost characteristics. On a per seat basis, this group is 10.1\% more cost efficient than the small group.

The larger planes (more than 20 seats) are more expensive to operate with the average cost per hour coming in at $4,725. However, this cost can be spread over more seats. On a per seat basis, the average cost is $95.60. This is 27.5\% more cost effective than the 10-20 seat class.

Comparing the costs of the B1900 and the ATR72 reveals that while the overall cost (in absolute terms) is higher for the ATR ($2,463 vs $5,257), the cost per seat is substantially (67.7\%) lower with the ATR’s cost per seat estimated at $77.30 compared to $129.70 for the B1900. This cost difference has been influential in driving some of the recently announced route changes. When considering the different routes around NZ and comparing the potential effect of shifting onto a larger aircraft then the implications becomes clear.

**Example 1:**  Effect of moving to another aircraft type on profitability:  Assuming a route has 50,000 passenger movements per year and that it is currently serviced using B1900’s. If the B1900D is substituted with a larger Q300 then the profit potential of that route will also shift. Part of the shift will be due to passengers now not using air travel because of scheduling issues. Using a ticket price of $160, the B1900D

\[^{25}\text{The cost per seat varies depending on configuration and aircraft type. The cost per seat ranges between $50-}$\]$65/seat/hour.}
will return a profit\textsuperscript{26} of around $78,000/y compared to the Q300’s profit of $1.1m/y (this is assuming that only half of the passengers remain on the route; if more passengers remain on this route then the profit would be higher). Clearly, the cost per seat is a key consideration.

**Example 2: Minimum Passengers:** Based on a high-level assessment of the general costs of operating an aircraft, the minimum sector volume for cost-effective services is estimated at around 35,000 passengers. This is based on four flights per day (two inbound and two outbound) for a 33 seat aircraft. This would combine attractive fares with a minimum frequency of service on an aircraft type airlines may use to interline. For a Q300 type plane, this comparative figure is likely to be in the order of 45,000 to 55,000 passengers. The decision to service a particular city-pair is also influenced by the ability to maximise aircraft utilisation. This example does not consider the potential to use the asset on other routes for the remainder of the day.

Other points to note are:

- The lower cost per seat characteristics mean that airlines would be in a better position to reduce fares when attempting to keep/develop total passenger demand on the route (to overcome resistance to scheduling changes),
- The large planes are more fuel-efficient meaning that the airline(s), and the specific routes, would be less exposed to commodity price volatility.

This suggests that the economics of the fleet is an important element in whether a particular area is serviced (or not).

It is worth noting that the independent operators tend to use the smaller planes. The cost features of smaller planes are such that they do not leave operators with a large margin to absorb any price increases arising from changes in input costs (e.g. fuel charges, airport fees or labour costs). Coupled with travellers’ price sensitivity, the independent operators are put in a difficult position because of a general inability to increase fares without losing patronage.

The operators of these aircraft generally lack the financial and technical resources to step up to larger and more economic aircraft. They would also need to change their business models to achieve the higher utilisation required to cover their fixed costs and move to higher volume routes to fill the seat capacity. Until there is a break through in aircraft technology, substantially reducing the seat costs of small (10-20 seat) aircraft, it is difficult to see the smallest regional centres obtaining improved air services.

The airlines indicated that they face high levels of competition and that it is crucial to keep costs to a minimum. Figure 2-5 shows the relative distribution of costs on a per seat basis (see Appendix 3 for a more detailed breakdown of these costs per aircraft type). The largest cost is fuel that accounts for 28 per cent of variable costs (Appendix 4 shows the trend in jet fuel (per barrel) over the past 15 years). This is followed by maintenance costs (25%), and fees (21%). Fees include, landing fees, Airways fees, PAX service fees and agent charges. These charges are however, beyond the direct control of airlines.

In addition to the variable charges, airlines also face a number of ‘fixed costs’ which are incurred irrespective of passenger numbers. These costs include:
- Insurance,
- CAA changes, and

---

\textsuperscript{26} Profit is used loosely and in this calculation costs associated with ground staff, airline overheads and other costs are not considered.
• Maintenance Control.

Relative to the variable costs, these fixed costs can increase the total cost of operating an aircraft (on a per seat basis) by around 5.5%. For the larger and (more valuable) aircraft, the insurance component can increase this additional cost by up to 16%. These costs are exclusive of the lease and/or capital costs. The capital cost can be around 12% of the variable cost (and up to 60% of the variable costs\textsuperscript{27}).

The independent operators are using smaller planes on the point-to-point routes. Our analysis suggests that these smaller routes are marginal, with small (relative) profits. Some of the routes are being operated at a loss (see Appendix 5). We expect these smaller, loss-making routes to disappear in the short term unless they have some strategic value for the airline operating them.

When considering the operating costs and the overall investment required to acquire (or expand) an aircraft fleet, it becomes clear that the barriers to entry are relatively high. These barriers are particularly acute for the independent operators due to the associated financing costs.

2.4 Recent Announcements

Having a range of aircraft sizes from 19 to 68 seats, enables the smaller centres to be serviced efficiently with relatively frequent flights that appeal, in particular to business travellers. Fares tend to be high in comparison with main trunk jet services, frequently blamed on lack of competition in the regions, but as described earlier, the economics of operating small aircraft, especially aircraft with less than 50 seats, are economically marginal to run on a per seat basis.

The independent operators are totally focused on serving particular geographic areas where they have a competitive advantage over surface transport or where there is no Air New Zealand service. Often these are point-to-point services such as Kapiti Coast to Nelson and Blenheim, or Tauranga to Gisborne, avoiding the main hubs. Recently services have commenced between regional airports and alternative airports at the hubs, for example Tauranga to North Shore.

Route developments

In November 2014, Air NZ announced the removal of the 19 seat B1900D aircraft from its fleet by August 2016, and an increase in its 68 seat ART-72 fleet. Some routes operated by the B1900D aircraft have already

\textsuperscript{27} For the more expensive (and newer) planes.
been terminated completely, and others have had B1900Ds replaced by 50 seat Bombardier Q300 aircraft, usually at reduced daily frequencies.

Since Air New Zealand announced the withdrawal of its B1900D services, several independent operators have ‘stepped up’ to provide replacements services. For example, Sounds Air operating a Westport-Wellington service and Air Chathams operating a Whakatane-Auckland service. These services generally started via a request for proposal (RFP) process initiated by the local councils. It is understood that at least some of these services involve an under-write by the local council. This follows overseas patterns where local air services are sometimes subsidised by federal, state or local governments.

Very recently, JetStar and two new start-up airlines Kiwi Regional Airlines and OriginAir have announced the commencement of new regional services due to start in August, September and December 2015 respectively.

It is understood JetStar flights will be operated by five Australian Registered 50 seat Q300 aircraft, Kiwi Regional by 32 seats Saab 340 aircraft and OriginAir by two 19 seat Jetstream 31/32 aircraft. Possible JetStar regional destinations include Hamilton, Rotorua, New Plymouth, Napier, Palmerston North, Nelson and Invercargill, connecting to one or more of JetStar’s current domestic jet destinations (this is discussed in more detail later). Kiwi Regional has plans to operate Dunedin to Queenstown and Nelson to Hamilton. OriginAir will initially operate between Nelson and Palmerston North, with Nelson to Wellington being added later.

It seems unlikely that the entry of JetStar to regional routes will assist the smaller centres, as 50 seat aircraft are too big for the potential demand on those smaller routes and also may require the provision of an air traffic control service (ATCS) at the small centres. Furthermore, should increased security measures require passengers on 50 seat aircraft (or even aircraft down to 19 seats) to be screened, then ticket prices will have to be increased to cover the additional cost. These increases could erode any price-based competitiveness that air travel may enjoy over other transport modes.

Despite this, the introduction of competition on routes served by 50 and 68 seat aircraft is likely to result in lower fares, which is beneficial to travellers. The lower fares may translate into additional demand for air travel. It is important to recognise that this may also result in neither airline earning an economic profit, causing an eventual reduction in capacity/flight frequency or the exit of one operator from the market.

Route development among the independent operators is difficult to predict. Some of the recently initiated services are at risk of failure due to the use of unsuitable aircraft, the cost of meeting future NSS requirements, lack of sustained demand or withdrawal of local council financial support.

One change that may emerge, is a reduction in flights from smaller regional centres to the main hubs, due to the cost of accessing the hubs. Some of the airlines mentioned that it appears that the larger airports are actively discouraging smaller aircraft from accessing their services. For the independent operators, this means that they can grow their services through:

- Development of satellite hub aerodromes for independent operators (e.g. Ardmore, North Shore and Whenuapai for Auckland, and Paraparaumu for Wellington).
- An increase in services to regional hubs (e.g. Hamilton, Rotorua, Palmerston North), from which passengers can be connected to main hubs by larger aircraft or carried onwards to other regional centres by other independent operators.

Development of satellite hub aerodromes will incur significant infrastructure cost and will require new ground transport connections, and airspace allocation to be established. This may not be an optimal use of

---

28 More adjustments of this nature are expected. This is due to the Air NZ’s removal of its B1900D fleet.

29 Source: company websites and media reports.
economic resources given the small size of the New Zealand market and the opportunities will need to be assessed in detail.

Development of regional hubs is possibly a more financially efficient outcome, as those airports are generally underutilised and already have the services and infrastructure required (e.g. ATS). However, it may require some aerodromes to reduce conflicting activities (e.g. flight training) to enhance the safety of air transport operations. This has already happened at Paraparaumu where helicopter and fixed wing flight training has largely been removed, and gliding will also be exiting the aerodrome within the next year.

Development of regional hubs would present an opportunity for the independent airlines to work together and, if they have suitable service standards, to interline with the large airlines serving those regional centres.

2.5 Other considerations

Two other aspects that need consideration are medical flights and connections, and the resilience of the network. These aspects are discussed below.

2.5.1 Medical flights

Medical flights take place for two purposes:

- Emergency services, and
- Patient transfers to centres where specialist services are available.

These two aspects are briefly discussed below.

Emergency Services

Patients are transferred by air for emergency purposes (serious accidents and illnesses) and for specialist treatment purposes. Patients being flown for specialist treatment may use scheduled airline flights. Patients needing intensive care are flown in chartered ‘air ambulance’ aircraft, enabling them to remain in stretchers, and be accompanied by medical staff and have access to life-support technologies. These flights may be between main centres, or between small regional airports and main centres.

Emergency air ambulance flights are mostly performed by helicopter. Given the location of the accident or illness, the patient is usually away from an airport and the time to get the patient to hospital is of the essence. Many hospitals are now set up with helipads to facilitate direct point-to-point transfer in the fastest way. Some fixed wing aircraft are used where a helicopter is not suitable, for example, where the aircraft must be pressurised for the medical comfort of the patient, and where the patient is transferred to a larger hospital/medical facility. For example, ill or injured children are often flown to Starship hospital in Auckland, from hospitals less equipped for paediatric care.

Fixed wing air ambulance flights are generally conducted using pressurised twin-engine turbine aircraft, although single engine aircraft such as the Pilatus PC12 are used extensively overseas. Flights can operate to

---

30 A 2008 survey found there were at that time at least 41 helicopters and 13 fixed wing aircraft providing air ambulance services.
or from any suitable aerodrome, therefore, reduction in services or closure of an aerodrome can affect the operation of services by fixed wing aircraft (but not by helicopter). As transfer by fixed-wing, aircraft is generally much cheaper than by helicopter, a reduction in aerodrome availability would generally lead to greater use of helicopters and increased costs for the affected District Health Boards (DHB), rather than cessation of medical air transfer services to those locations.

**Medical Transfers**

The New Zealand Airports Association surveyed DHBs on their use of scheduled airline and fixed-wing air ambulance services via an Official Information Act (OIA) request earlier this year. There is limited information about the exact scale of the transfers across the entire country and the collected data has some gaps. Nevertheless, we used the available data to identify some key points.

The available data indicates approximately 70% of fixed wing transfers are done using scheduled airlines, although for transfers between main centres and small regional airports about 50% are on chartered flights. This is probably because the level of scheduled services to small regional airports is not sufficient for medical transfer purposes, due to either scheduled flight frequency or the aircraft type used.

Figure 2-6 shows the relative use of medical transfers. Most (33% of total reported usage) are between trunk airports and small regional ports, although there is a large unknown component where neither sending nor receiving airport was provided by the DHB, just the total usage. Usage between hub port and large regional centres is much smaller (7%) and from trunk to trunk is about 26%.

Using information from the Nelson Marlborough District Health Board (NMHB), suggests that medical passengers form a small portion of total passengers. For example, on the Blenheim-Christchurch route, around 0.63% of the passengers are medical passengers. The NMHB does not report patients and support staff separately. The ratio of support staff to patient varies between 0.4 and 2.6 implying that the total number of patients could be between 68 and 161. In the case of Nelson, the overall number of medical passengers is higher and the available information suggests that, on the Nelson-Wellington route between, 0.3% and 0.6% of the passengers are patients. On the Nelson-Christchurch route, the estimated figures are 0.5% and 1.1%. Overall, these are relatively small portions of the total passenger figures on these routes. In terms of the demand for patient transfers, it is important to note that the transfers are from the regions to the large, urban hubs where the specialist services are located. The direction of this travel is as expected because specialist services are normally located at the large health facilities (hospitals), which are in turn, located in the cities. New Zealand’s main health centres are located in Auckland, Christchurch and Wellington. Shifts in the technology used in the health care sector are likely to increase the use of remote assessments. However, in some cases, it may not be possible to treat a patient(s) using the remote assessments.
technology and the patients are likely to remain reliant on air travel for fast and convenient transportation to the large health centres.

This underlines the important role of small regional airports to the fixed wing medical flight service suggesting the cost impact of reduced availability of small airports, requiring increased helicopter use, could be significant for the DHB's. Scant data was available on medical flights for ACC purposes, so these are not included in this overview.

2.5.2 Airport network resilience

The existing domestic aerodrome network has good resilience for flight disruptions. For A320 and Boeing 737 operations, there are a number of aerodromes with adequate runways and navigation aids for unplanned diversion use. However, some of the alternative airports lack terminal space for passenger handling and no ground support equipment for security screening services. The instrument landing systems (ILS) at Auckland, Wellington and Christchurch, and the backup provided by self-contained RNP navigations systems on the aircraft that do not require ground navigation aids to be available, add to their resilience.

The turbo-prop and piston-engine aircraft operate to a number of airports that do not have ILS. IFR take-offs and landings are being performed using other ground based navigation aids supplemented by GPS. However, because CAA has not approved ‘sole means’ navigation using GPS systems for approach and landing, either the destination or the alternate aerodrome must have a ground based radio navigation aid. This may be problematic for operations at smaller aerodromes as ground based radio navigation aids are withdrawn progressively under NSS. The CAA is aware of this situation and is currently considering sole means navigation approvals.

Generally adequate reserve fuel loads can be carried on small propeller aircraft to enable a wide choice of alternate aerodromes without adversely affecting payloads able to be carried.

Single engine IFR operations require special consideration during flight planning of en-route emergency landing aerodromes. If the trend towards using these types of aircraft (primarily the Cessna C208 and Pilatus PC12) continues among the small operators, then more consideration may have to be given to the resilience of the network when widespread weather systems or GPS unavailability (for example due to space weather) effectively close small aerodromes.

Changing circumstances

An increase in aviation security alert level could result in passenger screening being extended down to include aircraft with 20 or more seats as is typical in other countries. This would impose considerable difficulty (and cost) on many smaller airports, which would require changes to terminal layouts and increased staffing to meet the requirements. Police presence would also be required. Typically the extra staffing adds $6-10 to ticket prices and in a highly price sensitive market this can depress air travel demand. If the requirement were to be bought in urgently, services to some small aerodromes may have to cease until adequate means of compliance can be implemented. It is also unlikely that the small aerodromes would have the financial means to respond in a short space of time.

---

31. ILS is a precision ground based landing approach aid that enables aircraft to land in very poor weather conditions. All NZ IFR air transport aircraft from jets to small piston-engine aircraft are fitted with ILS equipment.
32. Currently in New Zealand, screening only applies to aircraft with 90 or more seats.
2.5.3 Travel Costs Comparison

The cost of travelling is part of the decision making process when evaluating alternative transport modes. The airlines have indicated that they observe different markets in terms of the ‘type of traveller’. The two important markets are:

- Business travel, and
- Leisure or personal travel.

These two segments’ decisions are influenced by different motivating factors. Leisure travel tends to be relatively price sensitive whereas business travel is more focused on the ‘time-savings’ relative to driving as well as connectivity and convenience. However, both markets are price sensitive – business travellers will only travel if the benefit outweighs costs. In 2013, this ‘expected return’ was estimated at around 10%. Similarly, leisure/personal travellers are also sensitive to costs. Table 2-4 illustrates the potential range of costs that could be incurred for a person travelling by road vs air for a business or a leisure trip. The figures in brackets show the ‘high price’ fares. This example is for a hypothetical situation when travelling between Rotorua and Auckland.

Table 2-4: Potential Costs (Road vs Air Travel)

<table>
<thead>
<tr>
<th>Item</th>
<th>Home</th>
<th>Air</th>
<th>Home</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time (minutes; return)</td>
<td>342</td>
<td>80</td>
<td>340</td>
<td>80</td>
</tr>
<tr>
<td>Extra time (check-in and travel/taxi)</td>
<td>-</td>
<td>90</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>Total travel time (minutes)</td>
<td>342</td>
<td>170</td>
<td>340</td>
<td>170</td>
</tr>
<tr>
<td>HR Cost per hour ($/h) (^1)</td>
<td>37</td>
<td>37</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

**Transport Costs**

<table>
<thead>
<tr>
<th>Item</th>
<th>Business</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport (Cost/km or Fare (^2))</td>
<td>340</td>
<td>188 (428)</td>
</tr>
<tr>
<td>Parking (^3)</td>
<td>-</td>
<td>16</td>
</tr>
<tr>
<td>Taxi (AIAL - CBD)</td>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>

**Cost Breakdown ($)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Business</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Cost (time x cost)</td>
<td>211</td>
<td>105</td>
</tr>
<tr>
<td>Transport Costs</td>
<td>340</td>
<td>250 (366)</td>
</tr>
<tr>
<td>Total Costs</td>
<td>$551</td>
<td>$449 ($681)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Leisure</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time (minutes; return)</td>
<td>340</td>
<td>80</td>
</tr>
<tr>
<td>Extra time (check-in and travel/taxi)</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>Total travel time (minutes)</td>
<td>340</td>
<td>170</td>
</tr>
<tr>
<td>HR Cost per hour ($/h) (^1)</td>
<td>37</td>
<td>37</td>
</tr>
</tbody>
</table>

**Transport Costs**

<table>
<thead>
<tr>
<th>Item</th>
<th>Leisure</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport (Cost/km or Fare (^2))</td>
<td>170</td>
<td>188 (428)</td>
</tr>
<tr>
<td>Parking (^3)</td>
<td>-</td>
<td>16</td>
</tr>
<tr>
<td>Taxi (AIAL - CBD)</td>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>

**Cost Breakdown ($)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Leisure</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Cost (time x cost)</td>
<td>61</td>
<td>30</td>
</tr>
<tr>
<td>Transport Costs</td>
<td>340</td>
<td>250 (366)</td>
</tr>
<tr>
<td>Total Costs</td>
<td>$401</td>
<td>$374 ($374)</td>
</tr>
</tbody>
</table>

1 – based on NZTA Economic Evaluation Manual and Updated to Q2-2015
2 – Based on charge per km as published by IRD
3 – Air NZ.
4 – Based on Airport Website

This example shows that due to the ‘value of time’; a business traveller is likely to use air travel as travel preference (over road travel). This is even before allowing for external factors such as convenience and the potential effects of fatigue (due to driving) on the businessperson. If the most expensive fare is applied (+$210), then the difference in total travel cost (road vs air) is $102\(^3\). Comparing the total travel time (5.7 hours vs 2.2 hours) shows that by using air transport, the businessperson would ‘save’ 3.5 hours that could

---

\(^3\) If this example is changed to reflect a situation where a person travels from Whakatane to Rotorua (to travel to Auckland) then the total road travel cost is estimated at $865 and the air travel costs is estimate at $665 – a $200 differential.
be used for other productive (work) activities. This means that a businessperson is likely to select the air travel as the main option.

With reference to the leisure market, this markets’ value of time is substantially lower than the business travel market and the effect of this is shown in the above table. Road travel appears to be a cheaper transport option when considering the total costs. Under the ‘low fare’, the direct costs (fuel and travel costs vs fare) is weighted to air transport but the other costs (e.g. taxis), make air travel uneconomical. Further, if there are multiple travel companions travelling together, then road transport becomes substantially more cost effective. If there are four people travelling together, then the cost difference is over $625 (air travel more expensive than travelling by road). The overall effect of the cost differential, between driving and flying, manifests through the level of demand for air service between remote (geographically isolated) areas. However, just because an area is geographically isolated does not mean that there will be strong demand for air travel. There has to be some motivation for travellers to interact (transact) with that (another) region.

The above analysis implies that the business travellers would be less price sensitive (relative to leisure travellers). International studies have found that this is the case and that the business market is less price sensitive than the leisure market. A 2008 study by IATA\(^{34}\) has estimated the price elasticities for short haul flights are\(^{35}\):

- Business market \(-0.7\),
- Leisure and personal market \(-1.5\).

As with most goods and services, the relationship between price and quality is important and in the context of the domestic air network, it is an important factor. Businesses seek to maximise profits and the airlines are no different. However, demand sensitivity is likely to counter airlines ability to increase fares\(^{36}\). This implies that airlines have an incentive to set prices in a way (at a level) that would maximise yields (loadings and pricing). We note that Air NZ is a large, and in many cases the only, operator on some routes. Assessing their pricing and market behaviour was however beyond the scope of our assessment.

### 2.6 Current Perspectives

As mentioned earlier, we surveyed and interviewed a number of airports and airlines to get their perspectives on the following areas:

<table>
<thead>
<tr>
<th>Airlines</th>
<th>Airports</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Market issues</td>
<td>• Current infrastructure, facilities and adequacy</td>
</tr>
<tr>
<td>• Constraints</td>
<td>• Constraints to growth and development plans</td>
</tr>
<tr>
<td>• Developments</td>
<td></td>
</tr>
</tbody>
</table>

---

\(^{34}\) IATA quotes a 2002 study by Gillen, Morrison and Stewart. We did not find any more recent studies covering price elasticities. A number of recent studies look at price elasticities but they tend to be region-specific and we could not use these studies in this context.

\(^{35}\) Price elasticity shows how demand changes as the price of a good/service changes. In this case, the demand will decline with price increases. In the case of the business market, if the price increase by 10%, then demand will decrease by 7%. For the leisure market, a 10% increase in prices will lead to a 15% decline in demand.

\(^{36}\) A 2007 study by InterVistas Consulting for IATA states that: “All of the studies reviewed, spanning a period of over 25 years, found that there was a significant demand response to changes in airfares, such that increases in airfare lead to lower passenger traffic demand. The consistency of result strongly indicates the effect of higher costs, that are passed onto passengers will result in a decline in demand.”
The responses have been reviewed and are summarised below. Some respondents have requested confidentiality. Therefore, no reference is made to any specific respondent. Only the key points are highlighted.

2.6.1 Airport perspectives

We had a good response from the airports and their responses are summarised below.

Current infrastructure, facilities and adequacy

From an infrastructure perspective (excluding terminals), an important focus of airport management is ensuring that that they, at a minimum, keep core infrastructure to CAA standards. From the terminal side, a number of airports indicated that they are encountering capacity constraints of some sort, during peak periods. While the airports would like to invest in additional terminal infrastructure, the overall costs, availability of funding and the link between additional terminal space and ongoing growth is dampening the appetite to investment. Accessing funding is seen as a key constraint.

From our survey, upgrading airport facilities was seen as a tool to increase airline services and passenger movements as well as the overall attractiveness of the airport to future business development. In this way, through improved facilities, airports hope to attract and grow airline services.

With reference to the core airport infrastructure (e.g. runways), all of the respondents indicated that maintaining infrastructure is a critical issue that requires substantial investments. For example, one respondent indicated that the cost of some renewal works is estimated to be in excess of $2m. When considering that average total (annual) expenditure for similar-size airports is around $2.1m, then the scale of the renewal works, and the potential impact on airports’ ongoing financial viability, becomes apparent.

Key points:

- From a core infrastructure perspective, the domestic air network appears to be well serviced. Core infrastructure is not inhibiting growth.
- Some of the smaller regional airports will face increasing costs and financial viability issues, arising from the need to undertake expensive and unavoidable infrastructure spending.

Constraints & Development Plans

The survey suggests that most of the airports have a good handle on, and understanding of, the factors constraining growth. It also appears that most airports are actively managing constraints by engaging with relevant parties, or by forming collaborative arrangements with other stakeholders. Some of the issues raised as constraints relate to the planning environment and spatial planning philosophies.

The main issue constraining airport growth (by way of infrastructure investment) is passenger movements and the (low) level of growth. Over 90% of airports cited the desire to upgrade facilities; however, 80% of airports indicated that they could not justify the investment. There appears to be a disconnect between airports and airlines in terms of how to grow passenger volumes. Airports tend to view terminals and airport

---

facilities as the key, whereas airlines viewed developing the ‘regional product’ as a mechanism through which to drive passenger growth. This tension is understandable because both sides are essentially seeking to grow their respective businesses by focusing on the core components. It is argued that both aspects have to be addressed and developed in an integrated fashion.

The level of service offered by airlines was highlighted as a possible constraint. In some cases, the potential level of service is constrained by certification limitations (e.g. operational curfews).

Connecting into the hub airports was seen as one option to grow passenger movements. In turn, it was mentioned that this would unlock additional economic and business activity in the regions. Those surveyed maintained that better connections between the hub and regional airports would align with regional economic development agendas. However, it was not always possible (or desirable) for airports to influence the decisions of neighbouring airports.

In terms of airports’ development plans, the responses can be grouped into two groups: infrastructure development and passenger attraction. The infrastructure development includes aspects related to property/real estate improvements, runway, air traffic control and navigation and terminal developments. Some of the airports are actively pursuing a ‘property development role’ to maximise the value for the land resource. In most of these cases, efforts are targeting firms that use air transport services and/or providing services to air transport to invest in the real estate development. In most cases, such development is not directly related to passenger services but is related to air transport and airport activities.

From our survey, we also found that there is a level of competition between airports to attract passengers from nearby towns (with their own airports). There are not many of these cases, but it appears that the issue driving this competition revolves around the interplay between convenience and costs and the different traveller markets – business and leisure. The business market is less cost sensitive, but is time sensitive and these travellers seek to minimise disruption to their working days and therefore, are (more) willing to pay for the convenience of specific travel times. The leisure market is more price-sensitive and is likely to place more emphasis on the total (trip) costs. This implies that airports will need to be acutely aware of the needs (and preferences) of the different markets when putting measures in place to attract (or retain) passengers.

Airports need to interface with different traffic modes. The respondents didn’t raise traffic issues in their immediate vicinity as a constraint or issue. The performance of the road network in the wider context was however highlighted as a potential issue. In Auckland, for example, the Waterview Tunnel and Kirkbride intersection projects are expected to improve and enhance travel to Auckland Airport. Road network reliability and predictability are seen as key aspects.

Road improvements however, may lead to reductions in air travel demand from the smaller centres. For example, road improvements currently underway in Bay of Plenty, Kapiti Coast-Wellington will reduce travel times to the airports from outlying locations. This will make it attractive for passengers to drive to the larger centre to take advantage of a greater choice of flights, which are not available from their local aerodrome. In this way, they may bypass smaller, local airports.

Some of the airports and airlines mentioned the possibility of developing rail links to airports and using public transport to enable passengers to access the airport. The general response regarding rail links was that they require substantial capital investments, and that the patronage numbers tend to be insufficient to sustain rail services to airports over the medium to long term.
Key points:

- The planning environment can support or undermine airports’ growth plans.
- Some tension exists between airports and airlines about how to grow passenger numbers.
- Some airports are seeking to use their land resource to develop additional related industries to lift revenues.
- Different passenger markets (e.g. business vs leisure) have different demand drivers that sit on a spectrum covering cost and convenience.
- Transport linkages at the airports are important, but the airports suggest that the transport issues are not (just) in close proximity to the airports. Transport network efficiency in the wider context is viewed as crucial.
- From the airports’ perspective, the government’s investments in improving regional road links are putting air travel and road travel on an equal footing when users evaluate their travel options. In some cases, air travel might now be at a competitive disadvantage.

2.6.2 Airline perspectives

The response from the airlines was limited so the perspectives\(^\text{38}\) presented below are based on a small sample and do not necessarily reflect the industry’s views.

### Market issues

The underlying market issue affecting airlines is ongoing drive to deliver a quality air service, at an affordable price level. This is the number 1 issue driving virtually all of the actions and activities of the NZ airlines. Ultimately, an airline’s decision to service (or withdraw) a particular route is influenced by the cost base of that route relative to the number of passengers on that route. However, some of the smaller towns and regions cannot sustain the level of passengers needed to maintain a viable operation. If the cost base cannot be managed then the airlines will eliminate that service. Our interactions with the airlines suggest that they are highly cost conscience and, while they will take a long term view, if a route is unprofitable then the airlines will move out of it. It has been suggested that once a particular route has been dropped, then it is unlikely that the routes will be reinstated in the short term. This implies that the decision to cease operating on routes is not taken lightly and the potential effects on the wider airline network (e.g. international and domestic connections) are included in the evaluation process.

The interaction points between airlines, airports and passengers (and clients) are all viewed as points in the ‘value chain’ and the whole chain needs to be efficient. From the responses, the following five factors affecting demand have been identified:

- Fare price is ranked as the most important issue affecting demand. According to the airlines, air travellers are highly sensitive to price movement.
- New Zealand’s international reputation as a tourist destination is a key asset that is being levered to attract foreign visitors. Demand generation and stimulation through promotions by agents such as Destination New Zealand, in offshore markets is proving successful.
- The performance of the regional economies and household incomes, and

\(^{38}\) Air New Zealand provided a detailed response that is summarised here. The independent operators’ responses are included where it differs from the Air NZ view or where it adds another point of view.
- Airline capacity on the routes.

In terms of cost drivers, the areas identified by the respondents can be grouped as follows:
- Aircraft maintenance.
- Affordability of aircraft financing.
- Non-controllable aspects such landing charges and government/regulatory fees.
- Navigation and avionic replacements, upgrades and maintenance costs.

The relationship between aircraft economics (revenue potential vs route costs) is the first factor, which influences airlines’ decisions about their activity on a particular route (the potential profit implications of using different aircraft platforms has been discussed in section 2.3.1).

**Constraints**

The constraints airlines face are for the most part similar to those faced by most businesses: accessing and developing new markets and growing revenue streams while managing costs. In the NZ context, managing these factors has an added level of complexity arising from the country’s small aviation market.

Some of the smaller airports and airlines are also competing with the ‘drive market’. Improvements in the road network will add another substitute offer to the market. Other shifts in technology (Skype calls and virtual meetings) are also reducing the overall demand for business travel.

The cost of replacing/renewing the fleet is an important issue for independent operators. In most cases, these costs are prohibitive, meaning that these independent operators are caught in a cycle where they are using old planes, with low profitability characteristics on small volume routes. Combined, this means that these operators do not have the cash flow to ‘upgrade’ to newer, more efficient planes.

**Developments**

From Air NZ’s perspective, domestic demand (with the exception of in-bound tourism) is expected to grow at (or around) the rate of economic growth, and respond to changes in economic geography over time (both nationally and regionally). In terms of technology, the landscape is viewed as relatively stable over the next 10 years at which point it may be possible to add a 90 seat platform (turbo prop) to the fleet.

Technological developments are expected to change the face of air travel. This will require airports and airline operators to embrace new technologies to retain some sort of competitiveness. One of the respondents stated that the likelihood of technological advances changing the airport experience is high – technology will change the level of infrastructure required as features such as online checking and advanced passenger processing will become more common. These changes will require investment and will need a level of commitment from airlines.

**2.7 Concluding Remarks**

The domestic air network has a number of key features. One of the most important factors influencing its shape is the cost features of different aircraft. At the micro level, the independent operators appear to be locked into a situation where they operate aged fleets, have limited ability to access hub airports, operate comparatively inefficient aircraft and fly on ‘low volume routes’.
The trunk routes, and the routes linking regional airports to the main hubs, account for the bulk of all movements. This configuration reflects a hub-and-spoke network and the recent announcements by the large airlines support a continuation of this structure.

With reference to the fleet-airline relationship, a central motivator for airlines is the cost-base of any aircraft. This relationship has been a key feature of airline behaviour, as they pro-actively manage their cost basis. Costs are viewed as a critical factor influencing their ability to compete on the regional routes because passengers often differentiate between services based on price.

Infrastructure wise, there does not appear to be any substantial deficits, or bottleneck in the network. However, some of the independent operators have indicated that they are facing hurdles when attempting to secure apron space. Airports seek to maximise their own revenues and will, therefore, naturally seek to optimise the use of airport infrastructure.
3 Underlying Drivers

Airports and air transport services form two parts of a larger system that is geared towards servicing passengers. A close link exists between the level of service offered to communities and the characteristics of those communities. This section highlights the wider relationships between the areas being serviced and the airlines activities. Cities and large urban centres are increasingly seen as economic growth drivers. Linking cities and regional service centres is an important role of the domestic air network. It is therefore, important to understand the interplay between catchments and air transport services.

This section provides insights into this interplay. The wider relationships and interactions between the drivers of demand, and the passenger movements were reviewed to identify the key drivers.

3.1 Relationship with surrounding areas

The NZ domestic air transport network consists of multifaceted and complex components and each part has a role to play in serving demand. Demand for air travel is determined by factors such as:

- The size of the local population,
- The economic activity in the local market,
- The cost and convenience of flying,
- The availability of alternative transport modes, and
- The relative cost and convenience of alternative transport options (relative to air travel)

In addition, the ability and willingness of airlines to service markets and provide point-to-point services at specific pricing points, also influence the domestic air transport network. As part of our research we analysed the relationships between airports, passenger movements, the regional economy(ies) and population(s). Catchments were described using employment, population and businesses as indicators. The key sources used for this section were:

- Statistics New Zealand’s, population, employment and business information, and
- Sabre® Global Demand Data (GDD) passenger data.

As part of this analysis, a range of ratios were calculated and evaluated. The results are summarised in Figure 3-1 to Figure 3-3. The figures use a log scale. This makes it easier to interpret them. The shaded areas show the top and bottom 33%. The diagonal line (45 degrees) is included as a guide to assist with the interpretation. If the observations are clustered around the 45-degree line, then a one-to-one relationship exists between the variables.

The figures show the passenger movements (sourced from Sabre (GDD)) through each airport relative to one of three variables (employment, firms and population). The assessment used different spatial scales (as explained in Section 1.3). The following figures show the result for the territorial authority within which each airport is located.
Figure 3-1: Employment relative to Passenger Movements (log scale)

Figure 3-2: Population relative to Passenger Movements (log scale)
There are a number of observations from the above figures:

- In all three cases, the number of passenger movement is above the 45-degree line (the red line on the figures). This suggests a one-to-one relationship between the variable and passenger numbers is not explicitly clear. This implies that there are other factors affecting the number of passenger movements at the local level, which are not ‘captured’ when relating PAX to employment, firms and population.

- As expected, the hub airports are in the top position across all variables. The smallest areas in terms of the variables are Kaitaia, Masterton and Timaru. These three areas fall below the 45-degree line suggesting that they have low level of passenger movements relative to the population and employment.

- In terms of the relationship between passengers and the variables (of the three graphs above), a number of key points can be observed. These include:
  - **Auckland:** on a per firm basis, there are fewer passenger movements than expected. Wellington, on the other hand, has more passengers than expected. These observations can be explained by the nature of firms in these two cities. Auckland has a large number of small firms that have been set up to focus specifically on servicing the local economy. Examples include construction/building companies and other trade companies. The multitude of small firms is changing the relationship shown in the figure (number of firms: passenger numbers). The government’s presence in Wellington means that the city has a relatively small count of firms (but the associated employment figures are high). This is skewing the results somewhat.
  - **Queenstown** has a high number of passenger movements relative to the three variables. A potential explanation of this anomaly is Queenstown’s strong tourist sector. The city and its immediate surroundings is NZ’s premier tourism destination, attracting a large number of visitors (relative to the population size). Some international visitors access Queenstown directly via overseas links. However, a large portion of tourists (domestic and international) uses the domestic network.
- Hokitika is another outlier. Relative to the area’s employment, number of firms and population, it has a high level of passenger movements. A possible reason for this is type of economic activity that dominates this area (tourism activities). Hokitika is also located in a relatively isolated part of NZ. This isolation, together with the type of activity is combining to generate demand for air links with economic centres (e.g. Christchurch).

- Nelson is another area with higher than expected passenger movements when comparing it against the area’s employment, number of firms and population. The Nelson area has a high level of air passenger movements because of its unique location at the top of the South Island. It is the largest economic centre at the top of the South Island and is relatively difficult to access via road transport from the surrounding urban areas. Similarly, air transport is the only way to conduct business with the lower North Island with the linkages into the bottom of the North Island.

- These points suggest that across TA’s, the significance of domestic air travel remains low for areas with populations less than 25,000.

The above suggests that employment, number of firms and population, and passenger numbers are related but these relationships are not ‘one-to-one’. In addition, these observations suggest that in some cases, there are unique aspects that influence the demand for air travel. The relative isolation (and difficult accessibility of an area via road) of an area is an example of such an aspect. Combined, these observations suggest that the domestic air network, and passenger movements, are influenced by other factors, which are beyond the scale of an area’s population or economic size.

### 3.2 Key Drivers

As mentioned above, demand for air travel is determined by a number of factors ranging from local demographic features, the local economy and the cost to service routes. Of course, these factors interact with each other and a shift in one might have a direct or indirect impact on another. In addition, there might be correlation between some factors but not others. For example, in any region there is a relationship between employment and economic activity (GDP). It is expected that passenger movements are related to, and influenced by, factors such as the type of economic activity (e.g. tourism, agriculture and manufacturing) and socio-economic features (e.g. household income), as well as spatial patterns (e.g. distance from the airport). In addition to the demand side, air travel is also affected by the supply side. The supply side is affected by aspects such as costs, scheduling constraints, fleet characteristics and so forth.

The demand and supply side factors interact with each other, influencing each other by way of feedbacks. These feedbacks are dynamic, changing the relative importance of factors over time. Identifying the importance of the factors can be done using different statistical techniques. We used Factor Analysis to identify the key relationships (Appendix 1 provides a high-level introduction of Factor Analysis). One hundred and twenty one (121) factors were identified and included in the analysis. The factors covered the following broad areas:

- **Passenger movements**: Passenger movements included movements on the domestic network as well as inbound and outbound connections (international and domestic).

- **Population numbers**: Total population in the local authority area, the region, in close proximity to the airport, within 5km, between 5-10km from the airport and within 15km of the airport.

---

39 This relates to short term interactions such as one-or two day visits that require fast and convenient two-way travel.
- **Economic activity** is included by way of different metrics including employment, Gross Domestic Product (of the associated region), total employment per sector, tourism spending in the area (broken down by international and domestic tourists).
- **Route economics** (costs and ticket prices), and
- **Airport features** (specifically the airport’s income and expenditure).

The analysis considers all possible destination town/city pairs (including those connected via a connecting flight) and it distinguishes between the towns/cities in terms of which town/city is the origin and which is the destination. The analysis has been completed for different parts of the route network, such as the entire network, the network excluding the trunk routes (Auckland, Wellington and Christchurch) and the regional routes. This distinction is important because, after initial model runs, we have found that the trunk routes are disproportionately large, ‘drowning out’ any finer observations about the regional component of the domestic air network. Figure 3-4 shows the summary results of the factor analysis. Note that this figure shows the ‘headline values’ using 34 parameters (summarising the 121 factors used in the analysis). Appendix 7 shows the same data but with the passengers, costs and revenue potential included. These three factors out-weight the other factors obscuring some of the other, finer details in the analysis.

---

40 The spatial distribution around the airport was included using the same zones as those used for population.
The analysis results were reviewed and grouped into common themes. These themes as presented here, encapsulate a wide range of factors (and data\textsuperscript{41}). We have identified five themes that capture the key drivers of the domestic air network (see Table 3-1).

**Table 3-1: Key drivers**

<table>
<thead>
<tr>
<th>Entire network</th>
<th>Regional network (Excluding trunk routes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route characteristics</td>
<td>Route characteristics</td>
</tr>
<tr>
<td>Connectivity (domestic and international)</td>
<td>Connectivity (Domestic)</td>
</tr>
<tr>
<td>Local economy and employment</td>
<td>Local economy and employment</td>
</tr>
<tr>
<td>Local population</td>
<td>Local population</td>
</tr>
</tbody>
</table>

The first observation from the analysis is that the core driver of the domestic air network is route characteristics. This includes:

- The (potential) number of passengers,
- The cost of operating the aircraft, and
- The potential fare (revenue).

From an economic and business perspective, the high ranking of routes and route economics is intuitive because if a particular route were uneconomical, then any private sector operator would terminate that service and redeploy resources to profitable routes. The opposite is also to be expected where airlines would seek to maximise their market share and revenue (and profit) on successful routes. In the case of the domestic route network, this is clearly seen in the large routes between the three largest cities. In other words, airline behaviour and their ability to generate a profit on a particular route is the first driver of the domestic air network.

The second important driver affecting the overall domestic route network is connectivity – domestic and international. Around 11% of the international connections do not terminate (or start) at the hub airports. This suggests that that the domestic air network provides important links for NZ’s regions to access international connections. This is a key theme for both the entire network (i.e. including the trunk routes) and the regional network. International connectivity plays an important role because of the nature of international travel. New Zealand residents wishing to travel offshore can access international connections through the hub airports, but in some cases the practicalities of international travel necessitates using connecting flights within NZ before travelling abroad (and returning). It is also apparent that there are a number of different markets (traveller types) and they tend to act differently. For example, a business traveller is more likely to use a connecting flight (to a hub airport) to access the long haul flights, seeking to minimise travel time and inconvenience. In contrast a leisure traveller, such as an individual heading on an ‘overseas experience’ (OE), will probably seek to minimise total travel costs at the expense of convenience.

\textsuperscript{41} Appendix 6 lists the different factors included in the analysis.
Inbound travellers (international visitors) are another aspect of international connectivity. Again, inbound tourists have different characteristics, requiring different air travel products. In some cases, the domestic air network distributes visitors within NZ upon their arrival (or link them to outbound services at the end of their visits).

The propensity of international tourists to require airline links to the regions is driven by a number of factors including:

- The characteristics of the tourist segment, for example inbound Asian tourists tend to travel in organised groups with itineraries prepared in their home countries whereas Australian and European tourists are more inclined to explore by rental car or camper van.
- The tourists' awareness of the attractions of a region, which may be very limited given destination marketing is usually extensively funded and influenced by the dominant international carriers, particularly the home country carrier/s.
- Language and cultural issues, especially to more remote areas where foreign non-English speaking travellers may feel less comfortable.
- The ease of booking flights, but this is more likely to be a factor for those organising their own itineraries. The cost of hosting in a major airline reservation system is very high for independent operators trying to attract tourists to their home region. Similarly an independent operator seeking interline agreements with a large inbound airline may find the associated costs and reservation systems requirements prohibitive, and there is little incremental traffic incentive for the large airline to provide leverage.
- Airfares: Interline and codeshare agreements usually provide the traveller with a significant cost saving compared to booking the international and regional fares separately. However as a result, the independent operator is likely to have to discount the regional fare substantially.

The domestic air network is a key part of the overall visitor experience. It is important to realise that visitors include a range of visitor types and is not just ‘holidaying visitors’. Business travel and visiting friends and relatives (VFR) are two other important market segments, from which regions are actively seeking to extract maximum value. International business travel is another segment. This segment has high economic value because of the economic value associated with exports. Growing NZ exports is one of the key areas associated with the Business Growth Agenda (BGA) acknowledging the economic importance of exporting.

In terms of the third driver, there is a different observation for the entire network relative to the regional network. **For the entire network, domestic connections are the third driver and for the regional network, the local economy and employment is comparatively more important.** For the entire network, the role of the domestic connections is a key feature because it is relatively large in terms of passenger movements (and revenue). An analysis of the Sabre® data suggests that in the December 2014 year:

- 45% of domestic passenger movements were (single sector movements) between the hub airports,
- 52% of the passenger movements were regional movements from regional airports linking into, and out of, the hub airports (Auckland, Christchurch and Wellington), and
- 3% of the movements were directly between regional airports.

These proportions highlight the hub-and-spoke nature of the NZ domestic network and underscore the importance of the domestic connections when considering the overall network. If the analysis focuses on the regional component (excluding the hub routes, which account for 45% of traffic), then other important factors emerge (as shown in Table 3-2).
The size and structure of local economies and employment transpires as a key determinant of activity on the domestic network. It is interesting to note that economic factors and employment are more important than total population size. This suggests that interregional economic connections and trade are important factors influencing the level of demand for air travel between city/town pairs. While the size of the regional economies is an important factor, the type of economic activity (economic sectors) in the regions is more important. The analysis suggests that:

- There is a positive relationship between a region’s service sectors and movements to, and from, that region. Sectors with a strong revealed relationship with domestic air travel include:
  - Public administration and safety,
  - Professional, scientific and technical services,
  - Financial and insurance services,
  - Health care, social assistance, arts and recreation services, and
  - Administrative and support services.

- These sectors (especially professional, scientific and technical services) are associated with the knowledge economy. It is important to note that the knowledge economy is generally located in cities, and because of economic processes such as knowledge spill-over, agglomeration advantages and labour market dynamics, these activities are likely to remain concentrated in the areas where there is scale.

- Related to the size of the economy is employment. The analysis suggests that while the overall size of the labour force is important, the value created by a region (i.e. GDP), is comparatively more important than the number of people employed. This implies that the air transport linkages are more likely to be to areas with ‘high value economies’ and not necessarily to high ‘employment’ areas.

- Domestic tourism spending in a region is an important factor. Domestic spending is slightly more important (in the Factor Analysis sense) than international spending.

- There is a relationship between domestic air movements (passengers) to a region and the size of a region’s accommodation and food service sector as expressed in terms of GDP. This highlights the air networks relationship with domestic tourism.

- The links between air travel, to and from a region, and the size of primary sector activities (agriculture, forestry and mining) and utilities (e.g. electricity) are not as strong as knowledge based sectors. This suggests that agriculture-based activities do not necessarily generate (comparatively) large demand for air transport. This is important because NZ regions are largely agriculture based.

The final driver identified is the population. The relatively low position of this driver compared to the other drivers, has a number of underlying causes that can be linked back to the different markets for air travel – personal, leisure and business. The business market is related to the economic sectors and GDP, as discussed above. Personal travel is influenced by, amongst other things, the willingness and ability to pay. In turn, this is a function of household income, which is affected by economic activity. In other words, households’ ability (and willingness) to pay airfares is influenced by the size and structure of the local economy.

In addition to the above key drivers of the domestic air network, a number of other observations were made during the analysis and interview process. These are summarised below.
3.3 Other observations

Clearly, the domestic air network covers most regions. In addition to the above points, a number of other observations were made during the research process. These observations are summarised below.

Relationship between airports, and local and regional authorities.

The hub airports, and some of the larger regional airports, are facing development pressures. These pressures are coming from competing land uses, current development initiatives (airport driven and non-airport driven) and council planning processes. Our interactions with airports, councils and economic development agencies have revealed a diverse approach to managing airport infrastructure.

There is a consensus that airports and air transport linkages are critical to ensuring regional economic competitiveness. However, there appears to be conflicting views on how to position and use airport (and airport related) infrastructure and development opportunities to deliver economic growth. For example, in some cases there are stakeholders that regard the airport location as competing with the Central Business District (CBD) for real estate investment. It was mentioned that efforts to highlight the ‘aviation specific focus’ of the proposed airport development, were insufficient to shift local policy. In other cases, the relationship between councils and the airports has been described as ‘highly cooperative, supportive and enabling’.

Location of airport relative to population

As part of our analysis, we included data showing the number of people, businesses and employees in varying degrees of proximity to the airport.

The analysis suggests that there is little relationship between the number of passengers moving through an airport and:

- the number of people living close to the airport,
- the number of employees working in any of the above zones, or
- the number of firms in the specified zones.

The analysis does however suggest (as highlighted above) that the overall size of the economy (and population) drives passenger movements. This means that airports draw passengers from a relatively large area (or catchment) and this has implications for supporting infrastructure (e.g. parking facilities), services (taxi services and public transport services) and transport infrastructure (roads). The same observation holds for businesses located close to airports, with the difference being that a portion of firms that are located close to airports are located there because of the access to air transport. This points to a need to have good connections between the airport and the surrounding catchment.

---

42 We used the following spatial areas: in the immediate surrounds, less than 5km from the airport, between 5km and 10km from the airport, and within 10km and 15km from the airport.
**Competition between airports**

During the survey and interview process, a level of competition between airports became evident. Some of the respondents indicated that there were definite (and in some cases explicit) efforts to attract passengers from neighbouring towns (with airports). The strategies being used to do this vary, but tend to focus on:

- Building awareness of the services offered by the competing airport (e.g. billboards and advertisements in the local newspapers)
- Seeking ways to lift the convenience of accessing services. Some airports are exploring possibilities to reduce parking prices to improve the overall cost competitiveness of their ‘whole service’.
- Lobbying relevant transport authorities to improve the transport linkages between neighbouring towns. The underlying motivation for this lobbying appears to be based on attempts to increase the ‘reach’ and catchments beyond the immediate town by ‘reducing the time and cost spent to travel between the towns’.
- In some cases, the airports are also exploring the business opportunity of setting up or collaborating with transport companies, to provide a ‘bus or shuttle service’ that will deliver passengers to the airport. Such a service will be seeking to remove the inconvenience of driving between the towns. It is not clear how advanced these investigations are but from our understanding they were at an ‘idea stage’. No formal investigations or discussions have been undertaken.

**Business development**

As mentioned in section 2.6.1, there appears to be diverging views between airports and airlines about how best to stimulate passenger movements on routes. Airports tend to focus on enabling the flight movements whereas the airlines tend be engaged in ‘destination marketing’ type activities. Examples of this include Wellington Airport’s drive to extend its runway to attract long haul flights to Wellington. On the airline side, Air NZ is collaborating with Tourism NZ on a campaign to attract at least 7,000 additional visitors to New Zealand over the upcoming shoulder season. The campaign is being driven through a combination of marketing and public relations activities, including leading Japanese travel TV shows, newspapers, trade publications and digital channels – offering travellers a special all-inclusive airfare starting from ¥88,000 (NZ$1,066) to New Zealand. This campaign supports the Tourism Industry Association’s Tourism 2025 framework for growth.

We note that the hub airports do collaborate with regional tourism agencies to stimulate passenger growth. This raises questions about the need for, and desirability of, some form of collaboration between the regional airports and airlines in growing the capability of the overall network, and how best to achieve such growth. It also raises questions about the return to the airport network of the marketing investment.

**3.4 Policy Landscape**

In addition to the above drivers, the overall policy landscape within which the domestic air transport network operates is another potential source of change. In New Zealand, the air transport industry is regulated by way of different authorities. These include the Civil Aviation Authority (CAA) and the Commerce Commission. In addition, there are a number of government departments/ministries responsible for overseeing air transport and setting the policy landscape. These include the Ministry of Transport and the New Zealand Transport Authority (NZTA).
Currently, the focus is on modernising NZ’s air navigation system and this is being done under the ‘New Southern Sky’ (NSS) project (as introduced earlier). As mentioned, under this proposal, all aircraft wanting to operate in controlled airspace would need operational ADS-B equipment by December 2021. This process is currently underway and is expected to influence the navigation and surveillance systems. These potential shifts are likely to have differing impacts across the aviation sector.

The domestic air network also enables and facilitates a range of other public services (as pointed out in sections 2.5.1 and 2.5.2, which highlighted the link to medical flights and network resilience). These two areas fall outside policy area of the MoT or NZTA but fall under the Ministry of Health (and the regional District Health Boards) and the Ministry of Civil Defence and the Local Councils. With reference to the civil defence aspect\(^3\), airports are viewed as ‘lifeline utilities’ as defined in Schedule 1 of the CDEM Act. ‘They are needed to move personnel and equipment that are needed to carry out repairs and restore lifeline services’. The Act lists the following as Lifeline Utilities (Schedule 1 of the CEDM ACT 2002, Part A).

2) The company (as defined in section 2 of the Auckland Airport Act 1987) that operates Auckland international airport.

3) The company (as defined in section 2 of the Wellington Airport Act 1990) that operates Wellington international airport.

4) The airport company (as defined in section 2 of the Airport Authorities Act 1966) that operates Christchurch international airport.

5) The entity (being an airport authority as defined in section 2 of the Airport Authorities Act 1966, whether or not it is also an airport company as defined in that section) that operates the primary airport at Bay of Islands, Blenheim, Dunedin, Gisborne, Hamilton, Hokitika, Invercargill, Napier, Nelson, New Plymouth, Palmerston North, Queenstown, Rotorua, Tauranga, Wanganui, Westport, Whakatane, or Whangarei.

The Act (Schedule 1 (60)) also highlights the duties of lifeline utilities as follows:

Every lifeline utility must—

(a) ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency;

(b) make available to the Director in writing, on request, its plan for functioning during and after an emergency;

(c) participate in the development of the national civil defence emergency management strategy and civil defence emergency management plans;

(d) provide, free of charge, any technical advice to any Civil Defence Emergency Management Group or the Director that may be reasonably required by that Group or the Director;

(e) ensure that any information that is disclosed to the lifeline utility is used by the lifeline utility, or disclosed to another person, only for the purposes of this Act.

---

Clearly, the potential role of the airport network in the event of an emergency is acknowledged and reflected. While the importance of the airport infrastructure is clearly noted, in itself it is not regarded as a driver of the networks’ future domestic (passenger) movements. Business as usual operation of airport infrastructure (in a commercial sense) and the availability of infrastructure during an emergency have distinctly different requirements. It may be possible to maintain an ‘emergency ready’ facility consisting mainly of runway infrastructure without terminal space. In the aftermath of Hurricane Katrina some regional airports were used for emergency services because the airfields (runways) were undamaged. However, terminal facilities were damaged. It is however not clear (and it is beyond the scope of this research) what the funding requirements (who pays) would be to provide emergency-ready infrastructure that might not be used. Continuing to operate a financially unviable airport to provide a civil defence and emergency management alternative is not an option. This points to the need for a regional level risk assessment to identify the potential role of regional airports in supporting disaster relief and post-emergency recovery activities.

The Ministry of Health

The Ministry of Health (MoH) is the government’s principal advisor on health and disability policy. The MoH also provides ‘border health protection’ services, the purpose of which is to manage public health risks so that the travelling public can have confidence that they will not be exposed unnecessarily to hazards. Border health measures exist to protect human health and safety on an international scale. Border health protection services include both scheduled and unscheduled services, and due to the international connection, they are likely to remain focused on the airports offering international connections. The MoH also oversees the Emergency Ambulance Service (EAS) of which the air ambulance forms a part. The air ambulance service uses a range of aircraft including helicopters (rotary) and aeroplanes (fixed wing). Skyline Aviation and Life Flight Trust are the two largest (fixed wing) air ambulance service. These two services provide 24/7 nationwide air ambulance service transporting critically ill patients who require urgent specialist medical care which is often only available at the largest hospitals. The services they provide include:

- Neonatal transfers,
- Emergency transfers,
- Inter-hospital transfers, and
- Organ transfers.

Most of these transfers occur from provincial NZ centres because of the way the referral system works. MoH information shows that a substantial portion of NZ intensive care throughput is in smaller and/or provincial hospitals. The availability of intensive care is key to maintaining access to a range of medical and surgical services at these hospitals. The configuration of intensive care services needs to be aligned with medical and surgical specialty services in order to maintain access to safe, effective services appropriate to population need. According to the Ministry, it seeks to support safe access to services in peripheral hospitals while ensuring timely access to tertiary-level care for those who need it, by using a network of links between units.

---

44 Pathogenic, biological, chemical or radiological.
45 Life Flight flies approximately 200 premature babies to specialist hospital care.
46 Inter-hospital Transfer (IHT) Services for accident-related patients (within 24 hours) and medical-related patients within (three hours) who need a higher level of care following arrival at hospital by ambulance.
that is operated by way of referral protocols, clinical support, and general oversight between individual clinicians. The Ministry also actively uses aeromedical services as part of managing the services.

In terms of the overall population catchments per service, a broad guideline shows that the tertiary service centres (e.g. Wellington Hospital) service populations of around 1,000,000. In the case of Wellington Hospital, it is responsible for intensive care patients in those regions who cannot access the care they require locally and it covers the following seven public hospitals:

- Wairau,
- Nelson,
- Masterton,
- Wanganui,
- Palmerston North,
- Hutt, and
- Taranaki.

Wellington Hospital uses Life Flight to perform the necessary emergency air transfers via plane or helicopter with specialist medical teams on-board.

Apart from the conventional health facilities, Starship Children’s Health in Auckland provides a wide range of complex medical, surgical, cardiac and mental health services for children and young people throughout New Zealand and the South Pacific. Starship is New Zealand’s largest paediatric facility providing inpatient, outpatient, day-stay and community settings. In the 2012/13 financial year, Starship treated 31,457 emergency patients (of a total of 120,000 patients). The Starship National Air Ambulance Service\(^\text{47}\) flies top medical experts to life-threatening emergencies around the country. The Starship Air Ambulance transports around 60-65 patients to Starship every quarter.\(^\text{48}\) Table 3-2 shows the regional breakdown of flights.

Table 3-2: Regional Breakdown of Starship Air Ambulance Flights (3 months)

<table>
<thead>
<tr>
<th>Location</th>
<th>Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northland</td>
<td>2</td>
</tr>
<tr>
<td>Waikato</td>
<td>13</td>
</tr>
<tr>
<td>Bay of Plenty</td>
<td>13</td>
</tr>
<tr>
<td>Taupo/Rotorua</td>
<td>4</td>
</tr>
<tr>
<td>Taranaki</td>
<td>3</td>
</tr>
<tr>
<td>Gisborne</td>
<td>3</td>
</tr>
<tr>
<td>Manawatu-Wanganui</td>
<td>3</td>
</tr>
<tr>
<td>Hawke’s Bay</td>
<td>2</td>
</tr>
<tr>
<td>Wellington</td>
<td>7</td>
</tr>
<tr>
<td>Nelson</td>
<td>1</td>
</tr>
<tr>
<td>Canterbury</td>
<td>7</td>
</tr>
<tr>
<td>Southland</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
</tr>
</tbody>
</table>

Source: Starship Website

\(^{47}\) Operated by Skyline Aviation

\(^{48}\) Undated.
The split between helicopter and fixed wing transfers is not known but it can be assumed that only those trips that are relatively short (e.g. Waikato-Auckland or Northland-Auckland) would have been undertaken via helicopter. Therefore, around three quarters of the flights could be by way of fixed wing aircraft.

The factors and considerations affecting the medical services are beyond the scope of this research. It is well known that, medical services tend to be located in the larger cities and that services are delivered using a hierarchy. In turn, the larger facilities are located in the large centres because this is where the population (need) is concentrated and where support services (e.g. laboratories) are found. Further, cities are also more successful (relative to regional towns) in attracting talent and a labour pool.

**Implication:** The above highlights the facilitated effects of the airports. It can be argued that if the airports and airport facilities were not available then patients would have been transported via another mode, such as helicopter or road ambulance. In some cases, however, practical limitations would have limited the medical usefulness of such alternatives, i.e. the total trip time is too long. The potential role of the medical flights in shifting the overall character of the overall domestic network is limited. This is mainly due to its scale. It is acknowledged that the value of the service is high and critical. In the short term, there does not appear to be any emerging forces that would radically change how these services are being delivered. One possible source of change could be a shift in government policy frameworks and positions. Our inquiries with the MoH did not yield any indication of imminent or planned change.

3.5 **Key points**

The analysis suggests that the shape of the network is affected by both demand and supply side drivers. On the supply side, the analysis suggests that the main driver is the airlines’ ability to *profitably service* a route. The main driver of the domestic air network is the fleet and route economics. Over time, the relationship between the revenue potential and overall cost of some of the smaller aircraft has shifted, to make the smaller planes comparatively uncompetitive. This is reflected by the recent announcements as outlined in Section 2.

This is followed by connectivity – that aspect has a supply and a demand component. From a supply perspective, the connections are valuable to airlines because they offer ability to transport passengers to other destinations (i.e. they contribute to sales). On some of the regional routes, 1 in 10 passengers are ‘connecting’ to other flights. Again, this highlights the hub-and-spoke configuration of the domestic air network and the integrated nature of the flights. The ability of airlines to offer connections to other parts (within the constraints of the route and flight economics) of the network was another key driver of the overall domestic air network. From a demand perspective, around 10 per cent of the movements on the domestic network is related to an international connection (inbound or outbound). This is an important demand component and highlights the movements on the wider network (especially the trunk routes) that are enabled (and demanded) by the network.

The relationship between the domestic air network and the regional economies has been identified as another driver of the domestic air network. However, there does not appear to be a linear relationship between the size of the economy and passenger services. In the larger economies, there are comparatively more connection (passenger movements) than expected (based on the size of the economy). This implies that the smaller regional economies are serviced from the larger economies underscoring regional economic
linkages. The analysis suggests that the type of economic activity is important. Regions with business services (and similar type activities) revealed a high level of connections to other regions with similar economies. In other words, the size and structure of the economies are two important drivers of the domestic network’s shape.

Conversely, the regions with strong agricultural sectors did not reveal a strong relationship with air transport. Closer inspection revealed that in most cases, these regions have small economies that are closely linked to the rural sectors. This is an important observation because most of NZ’s regional economies have strong links to agriculture and other primary industries, meaning that large parts of the rural economies do not have a high degree of demand for air transport. By extension, the towns servicing the rural economies are relatively small and, by themselves, do not have large business service sectors demanding high levels of air connectivity.
4 Outlook for Key Drivers

In this section, the outlook for the drivers identified in the preceding sections is described and translated into the implications for the domestic air network over the next 5 years or so. It is not our intention to forecast or project future passenger levels on the network. We comment on the outlook for the identified drivers, and the key features of the overall network. The drivers are discussed using the broad grouping identified in the preceding sections.

4.1 Routes characteristics

Air NZ and JetStar have both made a number of announcements about the level of service and this will have an ‘almost immediate’ effect on the costs (prices) and availability of seats on the regional routes. The entry of JetStar to the domestic regional-to-hub market will provide a choice of airline to travellers beyond the trunk. The JetStar code share connections to the Qantas/Oneworld and Emirates networks should make those services attractive to travellers beyond New Zealand. In effect, this will increase the competition on the affected routes.

In the short term, we do not see any step changes or substantial shifts in the domestic air network’s configuration. This is because it is unlikely that there will be any new aircraft platform coming online to change the cost/seat characteristics of the routes. For the next 5 years, at least, the regional services are likely to be delivered using turbo-prop aircraft. As discussed earlier in this report there are no breakthrough technologies expected in the next 5 years that will alter the types of aircraft currently operating.

Congestion of hub airports, especially at peak times, is likely to encourage independent operators to explore the opportunity to by-pass the hubs, instead developing services to satellite airports or setting up new networks based on regional hubs. The short-term effect of such efforts are likely to be small in comparison to the overall network.

Airlines are expected to remain highly cost sensitive, pushing back on any cost increase (via fees or regulatory charges). The airlines will continue to drive per seat operating costs as low as possible, commensurate with their fleet utilisation.49 This indicates service levels, in terms of in-flight service, is likely to remain at a basic level except where there is a significant business travel market prepared to pay a premium for additional services. As airlines seek to manage their costs through selecting the most appropriate fleet configuration, there will be some scheduling impacts across the network. From a passenger perspective, a shift to a larger aircraft (fewer flights serving the same number of passengers) is likely to reduce choice (i.e. which flight to use). Such a shift would reduce overall convenience but because passengers would still be able to travel by air, they are unlikely to shift to other transport modes. There might be a drop-off in demand due to passengers changing their overall travel pattern (e.g. overnighting vs single day trips or combining trips) but the total scale of such change is likely to be influenced by the make-up of the market.

---

49For example the major airlines have aircraft with more seats and high daily aircraft utilisation, favouring younger aircraft with higher fixed costs but lower per hour operating costs. The independent operators have lower utilisation and fewer seats to spread high fixed costs over, but can accept the higher hourly operating costs of less efficient and higher maintenance aircraft.
4.1.1 Planned airport developments

The development cycle of regional airport facilities (specifically runway infrastructure) seen in the period 1990-2012 appears to now be at, or nearing an end. During this period, a number of regional airport runways were extended to accommodate 737-300 and later 737-800/A320 aircraft. These airports included Queenstown, Rotorua, Tauranga, Palmerston North, Napier, Dunedin and Invercargill. Aside from Queenstown, jet services have now ceased at all these airports.

Major development plans are largely confined to the international airports, namely Auckland, Wellington, Christchurch and notably Queenstown, which has been in a constant development state since the introduction of 737-200 services in 1997. At the regional level, a number of airports have embarked on facility improvements, or have signalled their intention to invest in facilities. Examples include Blenheim, Nelson, New Plymouth, Invercargill and Napier.

As the domestic regional air transport network, outside the trunk routes is entirely operated by turbo prop or piston propeller aircraft, the aerodrome infrastructure are much less than is required with jets. As a result, little, other than life cycle replacement of facilities and incremental development, appears likely to occur in the domestic airport scene.

The airport survey results cite cost as the major disincentive to development. There is considerable pressure from the dominant airlines against what is seen as inappropriate infrastructure development, which could result in increases in airport charges, which, in the airline's view would, be better spent on regional marketing initiatives to simulate travel into the regions.

This presents a development dilemma for airports best addressed via a partnership approach between the stakeholders.

4.1.2 Navigation and surveillance systems

In common with most countries NZ is about to embark on the most significant upgrade to its air traffic control navigation and surveillance systems (‘New Southern Sky’, NSS). This move is mandated by ICAO and, in simple terms, moves away from traditional radars as a means for ATC to monitor aircraft locations (surveillance) and aircraft navigation by means of ground based radio navigation aids, to GPS based ‘Automatic Dependent Surveillance (ADS-B) and navigation systems. While offering a leap forward in system cost savings, through removal of mechanical radar array systems with inherent range limitations, these systems are totally dependent on the integrity of the satellite system, effectively a ‘single point of failure’. Full discussion of NSS is beyond the scope of this report, suffice to say the project potentially will cause difficulties for the independent operators that are recognised by the CAA and will require careful management.

The core issues are:

- The potential risks to the robustness of system if it has a ‘single point of failure’. This risk consequently exposes the air network,

---

50 Trunk routes are those connecting Auckland, Wellington-Christchurch, Dunedin and Queenstown currently operated by Air New Zealand and JetStar using 170-180 seat Airbus A320 aircraft.

51 Possible exceptions could be Whangarei where site limitations are driving the airport’s owner to consider developing a complete new airport on a new site, the first “green fields” development of a new aerodrome for air transport services since Auckland Airport in the 1960s and Auckland where a new runway may be constructed together with a new domestic terminal to accommodate traffic growth.

52 Refer http://www.caa.govt.nz/nss/nss_home.htm
Availability and cost of the required aircraft equipment, and suitability for retrofit. Current upgrades cost typically US$50-60,000 per aircraft for the independent operators, but design innovation is providing cost reductions over time. A major cost driver is the expense of equipment certification to aviation standards.

The continued need for ground based backup surveillance and navigation systems unless ‘sole means’ GPS based operations are approved. ‘Sole means’ approval removes the requirement for ground based systems, albeit possibly with operating limitations yet to be determined, but it does not address the equipment availability issue.

The implications for the shape of the domestic air network in the future. It is likely it will be uneconomic to re-quip a number of older aircraft in the fleet to meet the ideal NSS technology requirements. This will mean either services to locations where those aircraft operate will be reduced, or dropped entirely, or the ideal NSS technology platform will have to be modified by retaining at least a basic level of traditional ground based navigation aids to enable continued operation of those aircraft. In particular, the retention and development of point-to-point services such as between Bay of Plenty and the Eastern North Island, Great Barrier Island, Stewart Island and satellite Auckland airports could be affected. Inevitably more passengers would be forced to hub and spoke travel with the mainline carriers, or to other modes of travel.

Air travellers have come to expect ever-reducing fares and schedules that are virtually 100% reliable. If there is a travel disruption passengers now have a low tolerance for delays any longer than an hour or two. This requires the use of modern aircraft by airlines that have relatively deep resources and considerable expertise in network operations. It also requires codeshare partners to work together seamlessly to transfer passengers across networks.

### 4.2 Connections

The connectivity offered by the air network is one of the key drivers of the relative performance. Intuitively, international tourism is a central part of this driver. While the world economy is in better shape than it was 4 to 5 years ago, there are a number of challenges to be faced. The NZ tourism market (and the international connections) is subject to global economic conditions. As economic activity improves (or deteriorates) so too does the level of tourists deciding to travel on long haul flights. The NZ tourist market is an important part of many regions. In 2015, international tourists spent some $10bn in NZ and domestic tourists spend over $12.9bn. This spending flows through the NZ economy (and the regions) generating economic activity in the tourist related business as well as the wider economy (through supply chains and economic linkages). The direct Value Added (VA) of the tourist spending is estimated at $10.6bn (around 4.9% of national GDP) and the indirect VA is estimated as $7.9bn (3.7% of GDP). While the international connections associated with NZ air network is beyond the scope of this study, it clearly affects the regional and national economies. Some of the flow on effects will affect the domestic network through the regional supply chains.

New Zealand’s international tourism market has seen strong growth since the Global financial Crisis (GFC), with visitor arrivals up 5.3% (December year until 2014). The number of visitors from China continues to grow. According to the MBIE, the outlook for international tourism is positive. This optimism is however tempered somewhat by:

- The slowdown in the Chinese economy,
- The ongoing economic turmoil in Europe and tensions with Greece,
- Growing security concerns, and
- The slow growth of the Australian economy.
Nevertheless, the consensus forecast is for the international visitor arrivals to continue to grow at around 4% per year. Arrivals are expected to reach 3.6m by 2020, up from 2.9m in 2014. Key features of the outlook include:

- The number of international holidaymakers has been flat in recent years, but is expected to show strong improvement in the next 5 years.
- Australia is New Zealand’s largest visitor market, providing over 1.2m visitors in 2014. This market is expected to grow at around 3% per year for the next 5 years.
- The Chinese market is also expected to grow strongly. However, there could be some shocks and volatility. Under a low growth scenario, total arrivals from China are projected to grow by 7.3% per annum. The base (normal) outlook is for growth of 11.6% per year. The growth in arrivals from the Chinese market is greater than any other markets.
- The impact of a strong New Zealand Dollar on the competitiveness of the tourism sector is likely to diminish somewhat as the currency weakens.
- The soft global oil price has helped boost international tourism. Prices are expected to remain soft for the next two years before moving up. Cheaper oil prices flow through into lower airfares, supporting additional travel.
- Airlines adding additional international connections will continue to play an important role in bringing visitors to NZ.

The above suggests that the short-term outlook for international connections and visitors is positive. The stable growth outlook will provide some opportunities to build, and develop the visitor attractions (and products) at the regional levels. These opportunities arise from the link that international connections provide to and from NZ’s regions. The outbound travel, (regional) New Zealand residents wishing to travel overseas are connected to international connections by way of the domestic network. In other words, the regional air network plays an important role in opening up international travel.

With reference to New Zealanders wishing to travel abroad, this market consists of the holiday, visiting friends and relatives, business and other market components. There are a range of factors and reasons for international travel, including:

- The level of disposable income that is available for travelling,
- The exchange rate (as this influences the ability to spend offshore),
- Business opportunities,
- The success of destination marketing, and
- Airline routes, airfares, availability and capacity.

The first three factors are, to a degree, influenced by the health of the NZ economy and the economic conditions in the regions. The outlooks for the regional economies are discussed in the next section.

---

4.3 Regional Economies

The size and structure of the regional economies are important determinants of the demand for air travel. There are a number of development initiatives taking place around NZ’s regions. A review of regional development strategies and action plans revealed that virtually all regions seek to optimise and develop their natural endowments and develop business opportunities around those endowments. The identified opportunities are diverse and vary in scale. In most cases, the natural resource base (agriculture) is identified as a potential driver of growth. Transport and connectivity is highlighted as a key crosscutting issue. The emphasis is connectivity through road and rail links with less emphasis on airports. The airport infrastructure (and air connectivity) is however viewed as a key part of the economic landscape with a clear role in enabling fast, and convenient connections. The airports are seen as an asset to use to develop and maintain regional competitiveness. This means, that going forward, councils are likely to place extra emphasis on the importance of the air connections to their development efforts.

Regional economic outlook
The outlook for NZ’s regions is currently uncertain with global factors weighing on confidence. The drop in commodity prices (especially dairy) has seen a pullback in regional confidence. The pullback has been from high levels and remains in positive territory but it may turn negative, at which point it could lower regional outlooks. The outlook for each region is summarised below:

- Northland – has seen strong economic growth and a lift in tourism activity. This region has been an ‘underperformer’ in terms of overall growth and is lagging behind the rest of the country in terms of overall growth performance.
- Auckland – The economy is growing strongly across a broad range of sectors. Construction activity is strong and household confidence levels are high. As the largest regional economy, it has strong links with other regions.
- Waikato – The regions rural economy is a predominantly dairy centred, although dairy growth has slowed and future growth could be constrained by a lack of new dairy conversion opportunities. The region has seen some strong growth but the outlook for this region is clouded by another year of low dairy pay-out and the prospect of a drought year.
- Bay of Plenty – The region is benefitting from a spill-over of residential demand from Auckland. Business confidence remains reasonably high. The region has a high degree of specialisation in horticulture.
- Gisborne – Businesses in this region are growing pessimistic about future activity. This is due to uncertainties in the overall economic outlook. The regional economy has comparative advantages in primary sector activities (forestry, logging, sheep and beef and grain farming).
- Hawke’s Bay – Business confidence levels in this region are on par with national levels. The region is one of NZ’s key horticulture and viticulture regions. Sheep, beef cattle and grain farming, and agricultural services are also regional strengths, with about 70 per cent of total land area used for pastoral farming. The region specialises in food and beverage manufacturing, having several large multinational food processing companies.
- Taranaki – The region has some high-value support industries, including transport, machinery and equipment manufacturing, specialist engineering and construction. However, this region’s economic drivers of oil (and gas) and dairying are facing strong headwinds. Nonetheless, confidence levels are remaining in positive levels.

Sourced from: ANZ Business outlook, Westpac Economic Outlook, MBIE – Regional Economic Activity Reports 2014,
**Manawatū-Wanganui** - The Manawatū-Wanganui region is one of the lower income, and slower growing regions in New Zealand. However, economic outcomes vary across the region. The region has fertile, productive land, with about 80 per cent of its area being grassland. Agricultural production has been the foundation for a strong food innovation and agri-business research hub in Palmerston North. The outlook for this region is relatively stable.

**Wellington** – This region is unchanging with the large government sector providing some stability (even though this sector has been constrained over the past 5 years or so). The labour force is concentrated in professional, scientific and technical services and financial and insurance services sector is important. A number of NZ’s large firms are head quartered in Wellington. The region specialises in information, media and telecommunications, particularly in technology, internet and library services, and has the highest concentration of web and digital companies in New Zealand.

**Nelson-Marlborough-Tasman** – This regional economy is diverse and provides many consumer and business services to Tasman and Marlborough. A high proportion of employment is in health care and social assistance, retail, and professional, scientific and technical services sectors. Professional, scientific and technical services, and administrative and support services have been the fastest growing sectors in Nelson over the past 10 years. The outlook for this region is for it to remain a relatively slow grower with some sectors growing relatively fast.

**West Coast** – The region has faced a number of challenges, most notably the Pike River Mine collapse and recent mining closures, and a fall in international tourism in the aftermath of the Canterbury earthquakes. Mining has also been hit by a downturn in world commodity prices, resulting in job losses. Dairying has performed strongly over the past decade, but the slowdown in commodity prices will also have a negative impact on this region. The West Coast population has remained stagnant over the past decade, although migration patterns have shown some volatility, largely in response to events in the mining industry.

**Canterbury** – The Canterbury and Christchurch economies have been expanding in response to the earthquake rebuild. The region is also developing opportunities in high value manufacturing, agri-technology and exports. The outlook for the region is solid even when the rebuild activity is expected to come down from the peak levels.

**Otago** – Business confidence across Otago remains higher than almost all other regions, and overall economic activity has been solid over the past year or so. The region’s natural resources provide a strong primary sector base, hydropower generation and a strong tourist offer. These factors will continue to be positive aspects for the region, keeping its outlook positive.

**Southland** – The Southland economy has a number of characteristics putting it on a solid footing. The region’s economy is based on its natural asset base – particularly water. The region has a large dairy industry and some high profile industries (e.g. Tiwai Point Aluminium Smelter). Most of this region’s recent growth has been from the existing sectors.

The following key points are extracted from the regional outlook:

- The regions are expected to remain **relatively stable in terms of underlying growth**. However, some of the smaller regions are likely to face increasing pressure in short term.
- Most of the regions have a **strong reliance on the natural resource base** (agriculture). This is exposing some regions to the global drop in commodity prices. This is likely to have material effects on the economic performance of regional towns and their economies.
- The **main urban centres**, Auckland, Christchurch and to some extent Wellington, are currently in a **strong position**. In the short term, this is likely to support travel demand to and from these cities.
4.3.1 Inter-regional trade

The second aspect to consider when assessing the outlook for the regional routes is the level of trade between individual regions. Using M.E’s Multi-Regional Input Output tables, the share of overall trade between different regions can be estimated (Figure 4-1).

Figure 4-1: Share of interregional trade between regions

The distribution of interregional trade generally matches passenger movements on the domestic air network. As the scale of interregional activity decreases, so too does the level of passenger movements between those regions. A large portion of trade takes place between Auckland and Waikato, but due to geographical proximity, and the improving road network, most of this trade is facilitated by the road network. An implication of the above pattern is that, from an economic activity perspective, the demand for point-to-point services between the smaller economies is likely to be limited. Further, the larger regions are interacting with the other large regions. The associated air routes are also well catered for.

There may be some opportunities to link different tourist areas such as Rotorua and Queenstown\(^5\). However, there is no information about the flow and circulation of tourists through the country limiting our ability to quantify or qualify the scale of these opportunities.

4.4 Population

The fifth driver of passenger demand on different routes is population. Population is strongly correlated with economic activity and in NZ, there is often a mismatch between total labour requirements and labour availability. According to Statistics New Zealand, the country’s population is projected to grow from the current 4.5m to, between 4.7m and 4.8m by 2020 (see Figure 4-2).

\(^5\) Based on anecdotal evidence and discussions with the airports.
More than half of the growth is expected to occur in Auckland and around 16% of the growth is expected in Canterbury. This is followed by Waikato and then Wellington. In the Canterbury context, almost half (46%) of the growth is expected in Christchurch City – the region’s economic centre. Some of the small towns around Christchurch are expected to show some of the highest growth in NZ. Selwyn District and Waimakariri Districts are projected to record some of the highest growth of all districts in the next 5 years. Some of this growth is to cater for the displacement effects associated with the earthquakes but some of this is directly related to strong population growth (associated with the rebuild).

Population growth in regional NZ is projected to remain relatively flat. Over the next five years, the median growth rate across all districts is projected at 2.2%. The flat population growth in the regions, combined with the strong growth in the cities, mean that passenger demand growth is likely to be concentrated on the existing trunk routes and the connections to the largest cities and towns.

Immigration is likely to remain a key source of population growth over the short term. However the historic pattern of migrants settling in the large cities is likely to remain. Therefore, the demand for air travel is likely to remain associated with the key centres.

---

56 Appendix 8 shows the projected growth rates for each district in NZ over the next 5 years; the appendix shows the low, medium and high projections; these figures are sourced from SNZ.
4.5 Concluding Remarks

The outlook for the domestic air network is a function of the demand for air travel that comes from the regions. While the trends over the past few years have shown strong upward momentum after the Global Financial Crisis, there are a number of risks that are likely to constrain the ongoing upward momentum. These two key factors are:

- The fall in commodity prices, particularly dairy prices, and
- The global economic situation (e.g. Greece and Chinese economies)

The business confidence in rural NZ (specifically farmers) has fallen to the lowest levels in almost 10 years and recent surveys suggest that more than half of farmers expect conditions to worsen. A third of farmers expect conditions to remain the same. While the analysis suggests that the primary industries are not a core driver of demand for air travel, in regional NZ, the primary sector is directly linked to the fortunes and business confidence levels. The subdued sentiment in dairying (and other primary sectors) is having flow on effects to other parts of regional economies. In turn, this is likely to suppress growth in demand for air travel from the regional centres.

On the positive side, there will be some sources of growth. The historically strong growth in immigration is likely to continue to support the growth and development in Auckland. Low interest rates will also support the economic activity in Auckland, as well as the rest of the country. Rebuilding Christchurch will also continue to support economic activity.

It is however, important to notice the uneven nature of the growth outlook. The flow on effects of dairy price movements on the cities are likely to be muted by the ongoing construction activities. The implications for the air travel demand are that, over the short term, the routes connecting the large centres will continue to experience growth. The routes associated with the medium size cities, connecting to the hub cities, will have some varied growth depending on the region’s exposure to the dairy downturn and the degree to which a region is diversified. However, connections to the smaller regions are likely to suffer from low (to zero) growth with difficult conditions.

The recent changes announced by Air NZ, with its move to migrate it fleet to another platform (with more capacity) is likely to introduce a range of changes at the local level. Moving to a larger platform (Q300 vs Beach 1900) means that the scheduling will face some significant changes. Similarly, some smaller routes will also be dropped from the service. We anticipate that once this current round of change has been introduced, that the network would remain relatively stable in the near term.

With reference to the new airlines entering (or expanding) the market (JetStar and the regional airlines offering replacement services on the routes that Air NZ had exited from), it is expected that JetStar would enter on the largest regional routes. According to media reports, seven cities are being considered for four possible positions. These are:

- Invercargill,
- Hamilton,
- Rotorua,
- New Plymouth,
- Napier,
- Palmerston North, and
- Nelson.
Based on the number of passengers on different routes (with the hub airports), the potential for international (and domestic) connections and the profit potential, we envisage that the following cities would be selected:

- Napier,
- Nelson,
- New Plymouth,
- Palmerston North.

JetStar could include a much wider set of criteria and also consider other strategic aspects, which may not be reflected above. Nevertheless, we expect the above areas to be included in the final selection. The other airports mentioned may become viable over the medium term but this will be subject to economic conditions, the development of new economic opportunities in those regions. An important determinant of this will be the global dairy prices over the medium.

With reference to the regional airlines, our analysis suggests that the smaller routes have poor economic profiles due to the types (size) of aircraft that could realistically service existing demand levels. Further, the demand is not expected to change markedly in over the short term. If the global risks eventuate, then the demand for air travel in the smaller regions may be undermined and the effects will be felt in these areas first before spreading to the larger regions. This will put extra pressure on the regional airlines profitability and sustainability. The thin profit margins also mean that some movement is expected at the regional level.
5 Conclusions

The NZ domestic air network services most parts of the country with all towns with a population over 20,000 being serviced. There are currently a number of changes that are being introduced with the two high profile changes relating to:

- Air NZ changing the platform it is using to service regional airports (and ceasing some services), and
- JetStar entering the regional market.

These two changes are (and will) having a marked effect on the domestic network. However, beyond these changes, there is little evidence to suggest that large, wholesale changes to the domestic route network are imminent. Overall it is difficult to see any significant changes in the regional turbo-prop services fleet composition other than any of the ‘new’ airlines introducing more 20-50 seat twin turbo-prop aircraft on the regional routes. Whether the market is large enough to satisfy the return expectations of the larger airlines is debatable. Therefore, the smaller regional routes are likely to remain unattractive for the large airlines. The independent operators are likely to remain active in their current areas in spite of the poor relative operating economics of smaller aircraft. This means at best a continuation of the ageing aircraft services to smaller regional centres, and at worst a reduction or elimination of those services.

5.1 Hub-and-spoke structure & Competition

The current hub-and-spoke configuration of the network is likely to remain firmly in place due to:

- New Zealand’s city-region relationships with the core cities and the regions,
- The passenger volumes between regional centres generally not favouring the use of larger (50 seat plus) aircraft with much more favourable operating economics,
- The preference of the dominant carriers to provide/feed to their hub cities and trunk and international networks, and
- The possible withdrawal of ground based navigation aids from smaller aerodromes under NSS

Given NZ’s economic geography and the economic outlook for the three main cities, it is expected that the passenger growth will be focused on these city-pairs.

At the second level is the ‘spokes’ of the network – the connections between the hub airports and from the regional centres. These connections (to the three hub airports) account for 52 per cent of domestic passenger movements. The outlook for this segment is somewhat varied, and will largely depend on the economic fortunes of the individual regions. The entry of JetStar into the regional route market is likely to stimulate competition on the relevant routes. This is also likely to stimulate some spill over benefits (price effects) onto other routes where there might be a ‘drive market’. For example in some cases, travellers may not commute to neighbouring towns to access air travel because the total cost (road plus air travel plus any allowance for inconvenience) is greater than the alternative service. However, a new player entering the market, and a drop in prices are likely to incentivise passengers from neighbouring towns to now ‘commute’ to access the air service. In turn, this may have the effect of lowering the prices associated with the alternative service. Generally, this is a positive effect for consumers as they benefit from lower prices. Over the longer term, we expect that prices would stabilise at ‘normal’ levels. Deep discounts to capture/retain market share would not be sustained in the long term. The level of competition in the domestic market is
likely to intensify on the routes where new services have been introduced\textsuperscript{57}. The remaining, smaller regional routes are unlikely to see additional competition by way of Air NZ entering new regional routes or an independent operator attempting to open up a new route in competition with Air NZ. On the routes without competition, it is likely that the airlines servicing those routes would seek to minimise costs while maximising revenue. There may be some aspects of monopolistic behaviour\textsuperscript{58}.

International feed traffic is valuable as it provides additional passengers on regional-hub routes. Linking into these valuable routes (and connections) requires the use of aircraft that are acceptable to major international airlines. As more foreign airlines are attracted to New Zealand, codeshare opportunities will increase. However, to make use of these opportunities, the regional airlines will need to have suitable aircraft.

At the third level are the regional, point-to-point services that are being delivered by the independent operators. Most of these routes can at best be explained as marginal. This is because of the characteristics of the fleet being used. At this third level, the fleet is old with relatively high cost structures\textsuperscript{59}. Presently, these routes are delivering services by directly linking smaller regional economies. The low margins on these routes means that the independent operators are finding it difficult to renew and upgrade their fleets.

The NZ domestic aviation market is small and it is unrealistic to expect it to support competing airlines beyond the trunk and possibly the major region-to-hub routes. History has shown this with a number of attempts to set up competing airlines\textsuperscript{60}, such as SPANZ, Ansett New Zealand and Origin Pacific failing over time. By contrast, a number of small ‘niche’ airlines, as described in section 2.2.2, have survived for long periods due to their scale and geographically focused operation not being sufficient to attract a competitive response from the dominant carriers.

Currently there is little competition between airlines except on the trunk routes. This situation will change with the announcement of regional services by JetStar to four larger centres, but will likely remain for smaller regional centres in the near future.

In the short term, we do not envisage any large shifts in the regional network. Air NZ’s exit from some routes is opening the door for independent operators to fill the gap. The long term viability of these routes will need to be market tested. Our analysis suggests that over the medium term, the operators of these services are likely to face substantial price and cost pressures. The new entry independents appear to replicate the models of the existing independents, offering only local services. There does not appear to be any evidence of collaboration with existing independent operators. However, their choice of twin turbo-prop pressurised aircraft may facilitate code share arrangements with larger partners which could offer opportunities for further growth. Combined, these factors are likely to see the hub-and-spoke pattern remain in place.

Access to the larger hub (and second tier) airports is not guaranteed. Some of the airports are actively limiting independent operators (with small planes) access to their facilities. It is argued that airport facilities can be used more efficiently to service larger aircraft. There may be limited scope for a ‘sub-hub network’ to form but this will require independent operators and small airports to collaborate. Over the long term (more than 5 years) an opportunity to link the geographically isolated networks operating in the Bay of Plenty and the middle of NZ areas could emerge. Such linking could unlock inter-regional trade between these areas but this is not a short term opportunity.

\textsuperscript{57} This relates to the route announcements by JetStar.

\textsuperscript{58} Assessing the potential (or current) for monopolistic behaviour was beyond the scope of this report.

\textsuperscript{59} Mainly due to an old fleet with small planes (i.e. high $/seat characteristics).

\textsuperscript{60} Since preparing the draft report, one of the recently announced airlines have already reduced some of the capacity it is offering on some routes.
5.2 Fleet, Costs and Infrastructure

The outlook for the fleet, costs and infrastructure is presented below.

**Fleet considerations**
The fleet that is being used on the regional routes by the independent operators is dated and it is unlikely that this feature will change in the short term. There is little incentive, or ability, to recapitalise the fleet. However, the age of the fleet is an issue that will need to be addressed at some stage. Presently no disruptive technologies are on the horizon suggesting few radical shifts in terms of the costs and efficiency constraints that the independent operators will face.

**Costs**
From a cost perspective, there are items that place a disproportionate burden on smaller, independent operators. These include charges relating to CAA fees, Airways charges and airport fees. Most of these charges are unavoidable. Another example is the new technology related to NSS that will add to the cost base airlines face. Individually, these fees and charges are manageable but the cumulative effects are material and not insubstantial. We anticipate that these costs are likely to remain at roughly the same level over the next 3-5 years with the exception of one-off costs associated with NSS. Airlines are likely to continue to seek new avenues to lift revenue while reducing costs. Where airlines are unable (or unwilling) to avoid or absorb a new cost (or cost increase) they are likely to pass this on via fare increases.

The elasticity of air travel with respect to ticket price is about between -0.7 and -1.5, and fuel costs represent about 10% of total operating costs\(^61\), so doubling fuel costs\(^62\) or comparable fees would reduce demand by between 7% and 15% (Davidson, Wit and Dings 2003). However, such a scenario is unlikely to occur in the short term. BMI Research\(^63\) is projecting a modest, L-shaped price recovery with annual price inflation of between 3.0% and 3.8% out to 2019. This follows the drop-off in process from around NZ$150/barrel (February 2014) to around NZ$104/barrel (June 2015).

In terms of the other key cost items, such as labour, maintenance and other fees, we do not see any ‘above trend’ movements in the short term. The most obvious area where there might be some cost items is in the navigation area (as already discussed ion above).

**Infrastructure**
Overall, there are no major deficits in aerodrome infrastructure. This suggests that airport infrastructure is not constraining the development and growth of regional air links. However, the cost burden on aerodrome owners to maintain the facilities will be exacerbated by any reduction in air services to airports. The cost to maintain airport infrastructure is substantial. The smaller regional airports, with Council ownership, are likely to face increasing pressures to justify their expenditure (and investments), through the Statement of Intent processes. While not an issue in the next five years or so, we expect that some councils may start to consider the possibility and profitability of selling off underperforming airport assets, in part or in full. There were

---

\(^61\) This should not be confused with total variable cost as reported in Section 2.3.1. Fuel is around 28% of variable cost.

\(^62\) This assumes that the airlines passes the total increase on to passengers via ticket prices.

\(^63\) Accessed from BMI Research: http://www.bmiresearch.com
some high level suggestions that councils may start to think about using the airport property base to stimulate economic development opportunities. These are however longer-term ambitions.

In summary then the main technical issues facing regional air transport in New Zealand, looking ahead five years are:

- New Southern Skies requiring considerable capital investment by independent operators to achieve compliance,
- The ageing aircraft fleet, and
- The lack of new cost-effective twin turbo-prop pressurised aircraft in the 10-30 seat size range that can offer the potential for ‘step change’ in services to smaller centres.

### 5.3 Potential Policy Questions

In the next five years, there are likely to be a number of areas that will require attention. These areas are associated with the overall network and its performance. It is beyond the scope of this report to put forward any suggestions at an airport level. Therefore, the following should be viewed as a list of potential policy questions that would need to be assessed in the short to medium term.

- **Network configuration:** The NZ domestic network consists of different parts, all contributing towards its performance. The airports are immovable and expensive infrastructure enabling the overall network. It is necessary to define a long-term vision for NZ’s airports, highlighting the optimal network configuration. In this context, optimal relates to the balance between the regional ‘wants’, ‘needs’ and ability to pay for airport facilities. In addition to the regional perspectives, a national, overarching perspective should be captured to reflect the strategic priorities (e.g. civil defence planning). Where there is a mismatch between the need for facilities and regional level financial capability, alternative funding mechanisms will need to be explored. As part of establishing what the optimal configuration would look like, the opportunity costs and trade-offs of alternatives would need to be assessed and compared.

- **Growing passenger volumes** – The analysis and interviews suggest that the airlines and airports have different views about how best to stimulate growth. Airports tend to focus on the infrastructure and terminal development, whereas the airlines focus on destination market. It is important to note that if the airport infrastructure is insufficient to cater for the passenger growth, then it would not support airlines’ marketing efforts. In fact it would undermine efforts to deliver a quality tourist product. This means that there are a number of policy questions in this area, including:
  - What is the role of airports to deliver a high quality traveller experience?
  - What is the role of airlines in informing planning for infrastructure expansion and development activities?

- **Sector collaboration** – There may be some (small) opportunities to develop specific point to point services but these services are likely to be driven by specialist, cross regional collaborative opportunities. Finding these opportunities and exploring ways to unlock them will be the first requirement in establishing the overall demand for interregional flights. The role of air travel in stimulating and supporting regional trade is well documented. The question is however, what are the specific opportunities that could be unlocked by air transport and then the next question relates to who the role-players are (should be) to translate the opportunity in to a specific project(s).

- **Air freight** – There is an information gap about the flow of air freight around the country. This is a known gap and it would add to the understanding of air transport’s role in economic development and activity if this gap was addressed. While most of air transport’s value is delivered through connecting people, it can be argued that freight movements also deliver some value. Normally,
only goods that are high value (and time sensitive) are transported via air. This suggests that the overall value of these goods is likely to be important in the regional contexts. However, little information is available about air freight. i.e. if goods are flown between NZ’s regions or if the cargo on the domestic route is predominantly destined for international (export) markets.

- **Financial health and sustainability** – Over the longer term, it is envisaged that some of the smaller airports are likely to face financial pressures. These pressures will arise from the combination of rising costs, pressures on revenues and competition. NZ’s unbalanced growth is likely to result in a situation where the top (large) airports grow and get bigger while the smaller airports contract and potentially close down (this is unlikely to happen in the next 5 years). Over time, the need to maintain infrastructure by way of spending will lead owners (e.g. council and the Crown) to assess their ability to support (financially or otherwise) local airports. If they cannot afford to provide financial support, then the airports are likely to reach a point where it would be uneconomical to reinvest in them. This could lead to closures. There may be opportunity to explore public private partnership-type agreements to support the airports going forward. In some cases, this might not be politically palatable. Nevertheless, it will be necessary to explore other ways funding airports if they are not self-sustainable. Part of such an assessment is likely to focus on understanding the ‘who pays for the airport?’ and ‘who benefits from the airport?’ questions.

- **‘Invisible uses’** – The air transport network and airport network enables a range of other public services such as patient transfers and emergency services to be delivered. If the airport network’s configuration changes then health and emergency service providers’ ability to provide services is impacted. It may be possible to make alternative arrangements, but these may not always be practical. For example if fixed wing services are no longer available (due to an airport not operating any longer) then a helicopter service could be used. However, this is likely to at an increased cost. In addition, some District Health Boards (DHBs) are using commercial air services to transport patients to the larger medical facilities where specialist services are available. If the smaller/regional airports are not available, then the DHBs will need to find alternative ways to transfer patients. In some cases, practical alternatives may not exist. In light of NZ’s aging population the future need for health related transfers is likely to increase. From a health sector perspective, a minimum level of service⁶⁴ may be preferable and this level of service, together with the future demand, need to be identified.

- **Regulatory costs:** with the rising in security risks, there might be a situation where security is needed at all regional airports. This scenario will impose a range of ‘new’ costs on airports and operators. It will be necessary to explore different options for recovering the costs. For example, the costs could be recovered from taxpayers (i.e. central government pays for the service), ratepayer funding (e.g. a general rate across all ratepayers or a targeted rate on businesses only) or a special levy (such as a departure tax or travellers). These options all have strengths and weaknesses that will need to be assessed to identify the most cost effective and equitable approach.

The NZ domestic air network supports and enables wide-ranging activities. The network assists and supports regional economic activity by enabling connections between regions. However, the bulk of these connections are on a hub-and-spoke basis, suggesting that the connections between the regions and the large cities forms a key focus. Airports and air travel by themselves are key parts of regional economic growth and competitiveness and can assist regions to build and grow their economies. However these assets are expensive and need to be actively managed and integrated into regional activities to ensure that the maximum value is derived from these economic assets. From a regional development perspective, access to the domestic air network is a strategic asset that has to be integrated with the total development efforts. A

---

⁶⁴ Number of airports around the country with some level of connectivity to the hub airports.
well-functioning airport, with high quality air linkages, can make a real difference to regional economic competitiveness and prosperity.
Appendix 1: Factor Analysis

Factor analysis is used to reduce the number of variables and to detect structure in the relationships between variables. The concept of FA based on the assumption that multiple variables (can) have similar patterns of responses because they are all associated with some latent (not directly measured) factor. With FA the aim is to identify this latent factor. It is important to note that there are two concepts here: variables and factors. The variables are the observed dat. The factors are identified by assessing using the explained the variation in the variables in the dataset. Each factor captures a certain amount of the overall variance in the observed variables.

For example, when analysing regional economic performance, most assessments will show a clear correlation between GDP levels and employment growth. However this correlation does not explain the driver/cause of the growth and it could be driven by an uncorrelated factor. Identifying the uncorrelated factor(s) holds the key to isolating the cause. This identification process is done by undertaking the FA and then assessing the factor loadings (the results of the factor analysis) to identify the ‘common aspects’ associated with the factors.
### Appendix 2: Airports included in the study

<table>
<thead>
<tr>
<th>Airport Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardmore Airport</td>
</tr>
<tr>
<td>Auckland International Airport</td>
</tr>
<tr>
<td>Chatham Islands Airport</td>
</tr>
<tr>
<td>Christchurch International Airport</td>
</tr>
<tr>
<td>Dunedin International Airport</td>
</tr>
<tr>
<td>Gisborne Airport</td>
</tr>
<tr>
<td>Great Barrier Island Airport</td>
</tr>
<tr>
<td>Hamilton International Airport</td>
</tr>
<tr>
<td>Hawkes Bay Airport (Napier)</td>
</tr>
<tr>
<td>Hokitika Airport</td>
</tr>
<tr>
<td>Invercargill Airport</td>
</tr>
<tr>
<td>Kaitaia Airport</td>
</tr>
<tr>
<td>Kerikeri Airport</td>
</tr>
<tr>
<td>Marlborough Airport (Woodbourne; Blenheim)</td>
</tr>
<tr>
<td>Masterton (Hood) Aerodrome</td>
</tr>
<tr>
<td>Milford Airport</td>
</tr>
<tr>
<td>Nelson Airport</td>
</tr>
<tr>
<td>New Plymouth Airport</td>
</tr>
<tr>
<td>North Shore Airport</td>
</tr>
<tr>
<td>Palmerston North International Airport</td>
</tr>
<tr>
<td>Paraparaumu (Kapiti Coast) Airport</td>
</tr>
<tr>
<td>Picton Airport</td>
</tr>
<tr>
<td>Queenstown Airport</td>
</tr>
<tr>
<td>Richard Pearse Airport (Timaru)</td>
</tr>
<tr>
<td>Rotorua Regional Airport</td>
</tr>
<tr>
<td>Steward Island (Ryans Creek) Airport</td>
</tr>
<tr>
<td>Takaka Airport</td>
</tr>
<tr>
<td>Taupo Airport</td>
</tr>
<tr>
<td>Tauranga Airport</td>
</tr>
<tr>
<td>Waiheke Airport</td>
</tr>
<tr>
<td>Wanaka Airport</td>
</tr>
<tr>
<td>Wanganui Airport</td>
</tr>
<tr>
<td>Wellington International Airport</td>
</tr>
<tr>
<td>Westport Airport</td>
</tr>
<tr>
<td>Whakatane Airport</td>
</tr>
<tr>
<td>Whangarei District Airport</td>
</tr>
<tr>
<td>Whitianga Airport</td>
</tr>
</tbody>
</table>
Appendix 3: Distribution of Aircraft Costs (Variable)
Appendix 4: Trend in Jet Fuel (NZ$ per Barrel)

Source: Downloaded from: [http://www.indexmundi.com/commodities/?commodity=jet-fuel&months=360](http://www.indexmundi.com/commodities/?commodity=jet-fuel&months=360) (date 18/11/2015)
## Appendix 5: Profit potential on regional routes based on current fleet usage

<table>
<thead>
<tr>
<th></th>
<th>Ardmore</th>
<th>Auckland</th>
<th>Blenheim</th>
<th>Chathams</th>
<th>Gisborne</th>
<th>Great Barrier</th>
<th>Hamilton</th>
<th>Napier</th>
<th>Nelson</th>
<th>Picton</th>
<th>Takaka</th>
<th>Taupo</th>
<th>Tauranga</th>
<th>Wellington</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blenheim</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chathams</td>
<td>-</td>
<td>-</td>
<td>1,010,500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Christchurch</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,261,100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Great Barrier</td>
<td>281,800</td>
<td>707,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hamilton</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,083,500</td>
<td>247,400</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kaitaia</td>
<td>-</td>
<td>886,700</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Napier</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>601,600</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nelson</td>
<td>-</td>
<td>-</td>
<td>827,800</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>North Shore</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,286,200</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Paraparaumu</td>
<td>-</td>
<td>-</td>
<td>820,800</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rotorua</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,047,200</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tauranga</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>515,400</td>
<td>16,100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wellington</td>
<td>-</td>
<td>-</td>
<td>945,300</td>
<td>1,385,100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,342,700</td>
<td>972,500</td>
<td>11,000</td>
<td>1,879,200</td>
</tr>
<tr>
<td>Westport</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Whakatane</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>428,700</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Whangarei</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>29,200</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Whitianga</td>
<td>542,400</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(98,500)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>203,200</td>
</tr>
</tbody>
</table>

*Note: The values in parentheses indicate additional data or notes.*
## Appendix 6: Factors included in the Factor Analysis

<table>
<thead>
<tr>
<th>Domestic PAX</th>
<th>Node_2_Pop in AU</th>
<th>Node_1_Intl_Tour_Retail sales - fuel and other automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Connections – 1st Connection</td>
<td>Node_2_Pop in 5km</td>
<td>Node_1_Intl_Tour_Other passenger transport</td>
</tr>
<tr>
<td>Domestic Connections – 2nd Connection</td>
<td>Node_2_Pop in 10km</td>
<td>Node_1.Dom_Tour_Accommodation</td>
</tr>
<tr>
<td>Domestic Connections – 3rd Connection</td>
<td>Node_2_Pop in 15km</td>
<td>Node_2_GEO in RC</td>
</tr>
<tr>
<td>Node_1_Intl_Inbound PAX (Destination)</td>
<td>Node_2_Pop in TA</td>
<td>Node_1.Pop in AU</td>
</tr>
<tr>
<td>Node_1_Intl_Outbound PAX (Origin)</td>
<td>Node_2_Pop in RC</td>
<td>Node_1.Pop in 5km</td>
</tr>
<tr>
<td>Node_2_Intl_Inbound PAX (Destination)</td>
<td>Node_1.Primary_Sectors_GDP</td>
<td>Node_1.Pop in 10km</td>
</tr>
<tr>
<td>Node_2_Intl_Outbound PAX (Origin)</td>
<td>Node_1.Manufacturing_GDP</td>
<td>Node_1.Pop in 15km</td>
</tr>
<tr>
<td>Domestic Revenue</td>
<td>Node_1.Utilities_GDP</td>
<td>Node_1.Pop in TA</td>
</tr>
<tr>
<td>International Outbound - ($) 1st (in NZ Connection)</td>
<td>Node_1.Construction_GDP</td>
<td>Node_1.Pop in RC</td>
</tr>
<tr>
<td>International Outbound - ($) 2nd Connection (in NZ Connection)</td>
<td>Node_1.Wholesaling_GDP</td>
<td>Node_1.Dom_Tour_Other tourism products</td>
</tr>
<tr>
<td>International Outbound - ($) 3rd Connection (in NZ Connection)</td>
<td>Node_1.Retail_GDP</td>
<td>Node_1.Dom_Tour_Food and beverage serving services</td>
</tr>
<tr>
<td>International Inbound - First (in NZ Connection)</td>
<td>Node_1.Accommodation and Food Services_GDP</td>
<td>Node_1.Dom_Tour_Retail sales - other automotive</td>
</tr>
<tr>
<td>International Inbound - 2nd Connection (in NZ Connection)</td>
<td>Node_1.Transport, Postal and Warehousing_GDP</td>
<td>Node_1.Dom_Tour_Retail sales - fuel and other automotive</td>
</tr>
<tr>
<td>International Inbound - 3rd Connection (in NZ Connection)</td>
<td>Node_1.Financial and Insurance Services_GDP</td>
<td>Node_1.Dom_Tour_Other passenger transport</td>
</tr>
<tr>
<td>Node_1.Intl_Inbound PAX (Destination)</td>
<td>Node_1.Rental, Hiring and Real Estate Services_GDP</td>
<td>Node_2.Intl_Tour_Accommodation</td>
</tr>
<tr>
<td>Node_1.Intl_Outbound PAX (Origin)</td>
<td>Node_1.Professional, Scientific and Technical Services_GDP</td>
<td>Node_2.Intl_Tour_Other tourism products</td>
</tr>
<tr>
<td>Node_2.Intl_Inbound PAX (Destination)</td>
<td>Node_1.Administrative and Support Services_GDP</td>
<td>Node_2.Intl_Tour_Food and beverage serving services</td>
</tr>
<tr>
<td>Node_2.Intl_Outbound PAX (Origin)</td>
<td>Node_1.Public Administration and Safety_GDP</td>
<td>Node_2.Intl_Tour_Retail sales - other</td>
</tr>
<tr>
<td>Node_1_MEC at AU</td>
<td>Node_1.Education and Training_GDP</td>
<td>Node_2.Intl_Tour_Retail sales - fuel and other automotive</td>
</tr>
<tr>
<td>Node_1_MEC in 5km</td>
<td>Node_1.Health Care, Social Assistance, Arts and Recreation Srvs_GDP</td>
<td>Node_2.Intl_Tour_Other passenger transport</td>
</tr>
<tr>
<td>Node_1_MEC in 10km</td>
<td>Node_1.Information Media, Telecommunications and other Services_GDP</td>
<td>Node_2.Dom_Tour_Accommodation</td>
</tr>
<tr>
<td>Node_1_MEC in 15km</td>
<td>Node_2.Primary_Sectors_GDP</td>
<td>Node_2.Dom_Tour_Other tourism products</td>
</tr>
<tr>
<td>Node_1_MEC in TA</td>
<td>Node_2.Manufacturing_GDP</td>
<td>Node_2.Dom_Tour_Food and beverage serving services</td>
</tr>
<tr>
<td>Node_1_MEC in RC</td>
<td>Node_2.Utilities_GDP</td>
<td>Node_2.Dom_Tour_Retail sales - other automotive</td>
</tr>
<tr>
<td>Node_2_MEC at AU</td>
<td>Node_2.Construction_GDP</td>
<td>Node_2.Dom_Tour_Retail sales - fuel and other automotive</td>
</tr>
<tr>
<td>Node_2_MEC in 5km</td>
<td>Node_2.Wholesaling_GDP</td>
<td>Node_2.Dom_Tour_Other passenger transport</td>
</tr>
<tr>
<td>Node_2_MEC in 10km</td>
<td>Node_2.Retail_GDP</td>
<td>Road_Travel_time_(mins)</td>
</tr>
<tr>
<td>Node_2_MEC in 15km</td>
<td>Node_2.Accommodation and Food Services_GDP</td>
<td>Node_1.Airport_Revenue</td>
</tr>
<tr>
<td>Node_2_MEC in TA</td>
<td>Node_2.Transport, Postal and Warehousing_GDP</td>
<td>Node_1.Airport_Expenses</td>
</tr>
<tr>
<td>Node_2_MEC in RC</td>
<td>Node_2.Financial and Insurance Services_GDP</td>
<td>Node_2.Airport_Revenue</td>
</tr>
<tr>
<td>Node_1_GEO at AU</td>
<td>Node_2.Rental, Hiring and Real Estate Services_GDP</td>
<td>Node_2.Airport_Expenses</td>
</tr>
<tr>
<td>Node_1_GEO in 5km</td>
<td>Node_2.Professional, Scientific and Technical Services_GDP</td>
<td></td>
</tr>
<tr>
<td>Node_1_GEO in 10km</td>
<td>Node_2.Administrative and Support Services_GDP</td>
<td></td>
</tr>
<tr>
<td>Node_1_GEO in 15km</td>
<td>Node_2.Public Administration and Safety_GDP</td>
<td></td>
</tr>
<tr>
<td>Node_1_GEO in TA</td>
<td>Node_2.Education and Training_GDP</td>
<td></td>
</tr>
<tr>
<td>Node_1_GEO in RC</td>
<td>Node_2.Health Care, Social Assistance, Arts and Recreation Srvs_GDP</td>
<td></td>
</tr>
<tr>
<td>Node_2_GEO at AU</td>
<td>Node_2.Information Media, Telecommunications and other Services_GDP</td>
<td></td>
</tr>
<tr>
<td>Node_2_GEO in 5km</td>
<td>Node_1.Intl_Tour_Accommodation</td>
<td></td>
</tr>
<tr>
<td>Node_2_GEO in 10km</td>
<td>Node_1.Intl_Tour_Other tourism products</td>
<td></td>
</tr>
<tr>
<td>Node_2_GEO in 15km</td>
<td>Node_1.Intl_Tour_Food and beverage serving services</td>
<td></td>
</tr>
<tr>
<td>Node_2_GEO in TA</td>
<td>Node_1.Intl_Tour_Retail sales - other</td>
<td></td>
</tr>
</tbody>
</table>

GEO – Geographic units (Count of businesses); MEC – Modified Employee Count
Appendix 7: Factor Analysis Results (Including Route Features)
## Appendix 8: Population Growth Projections

(Based on Statistics NZ data)

<table>
<thead>
<tr>
<th>Low in Population (2015-2020)</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Far North district</td>
<td>100</td>
<td>1,200</td>
</tr>
<tr>
<td>Whangarei district</td>
<td>1,700</td>
<td>3,700</td>
</tr>
<tr>
<td>Kaipara district</td>
<td>400</td>
<td>800</td>
</tr>
<tr>
<td>Auckland</td>
<td>114,900</td>
<td>141,100</td>
</tr>
<tr>
<td>Thames-Coromandel district</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>Hauraki district</td>
<td>300</td>
<td>200</td>
</tr>
<tr>
<td>Waikato district</td>
<td>3,400</td>
<td>5,100</td>
</tr>
<tr>
<td>Matamata-Piako district</td>
<td>0</td>
<td>1,000</td>
</tr>
<tr>
<td>Hamilton city</td>
<td>9,200</td>
<td>12,300</td>
</tr>
<tr>
<td>Waipa district</td>
<td>1,700</td>
<td>2,700</td>
</tr>
<tr>
<td>Otorohanga district</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>South Waikato district</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>Waitomo district</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Taupo district</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>Western Bay of Plenty district</td>
<td>900</td>
<td>2,000</td>
</tr>
<tr>
<td>Tauranga region</td>
<td>6,100</td>
<td>9,200</td>
</tr>
<tr>
<td>Rotorua district</td>
<td>1,300</td>
<td>200</td>
</tr>
<tr>
<td>Whakatane district</td>
<td>900</td>
<td>0</td>
</tr>
<tr>
<td>Kawerau district</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Opotiki district</td>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>Gisborne district</td>
<td>400</td>
<td>600</td>
</tr>
<tr>
<td>Wairoa district</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Hastings district</td>
<td>800</td>
<td>2,200</td>
</tr>
<tr>
<td>Napier region</td>
<td>200</td>
<td>1,400</td>
</tr>
<tr>
<td>Central Hawke's Bay district</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>New Plymouth district</td>
<td>2,100</td>
<td>4,100</td>
</tr>
<tr>
<td>Stratford district</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>South Taranaki district</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>Ruapehu district</td>
<td>800</td>
<td>500</td>
</tr>
<tr>
<td>Wanganui district</td>
<td>1,300</td>
<td>100</td>
</tr>
<tr>
<td>Rangitikei district</td>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>Manawatu district</td>
<td>400</td>
<td>1,000</td>
</tr>
<tr>
<td>Palmerston North city</td>
<td>1,300</td>
<td>3,200</td>
</tr>
<tr>
<td>Taumaru region</td>
<td>600</td>
<td>200</td>
</tr>
<tr>
<td>Horowhenua district</td>
<td>700</td>
<td>200</td>
</tr>
<tr>
<td>Kapiti Coast district</td>
<td>700</td>
<td>1,800</td>
</tr>
<tr>
<td>Porirua city</td>
<td>400</td>
<td>1,700</td>
</tr>
<tr>
<td>Upper Hutt city</td>
<td>600</td>
<td>1,400</td>
</tr>
<tr>
<td>Lower Hutt city</td>
<td>1,800</td>
<td>700</td>
</tr>
<tr>
<td>Wellington region</td>
<td>5,300</td>
<td>9,300</td>
</tr>
<tr>
<td>Masterton district</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>Carterton district</td>
<td>400</td>
<td>600</td>
</tr>
<tr>
<td>South Wairarapa district</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>Tasman district</td>
<td>600</td>
<td>1,900</td>
</tr>
<tr>
<td>Nelson city</td>
<td>900</td>
<td>2,200</td>
</tr>
<tr>
<td>Marlborough district</td>
<td>200</td>
<td>800</td>
</tr>
<tr>
<td>Kaikoura district</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Buller district</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>Grey district</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Westland district</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Hurunui district</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Waimakariri district</td>
<td>3,400</td>
<td>6,700</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>9,700</td>
<td>19,200</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>6,400</td>
<td>9,700</td>
</tr>
<tr>
<td>Ashburton district</td>
<td>1,600</td>
<td>2,400</td>
</tr>
<tr>
<td>Timaru district</td>
<td>400</td>
<td>1,400</td>
</tr>
<tr>
<td>Mackenzie district</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Waimate district</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Chatham Islands Territory</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Waitaki district</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Central Otago district</td>
<td>400</td>
<td>1,000</td>
</tr>
<tr>
<td>Queenstown Lakes district</td>
<td>2,700</td>
<td>3,900</td>
</tr>
<tr>
<td>Dunedin city</td>
<td>300</td>
<td>2,500</td>
</tr>
<tr>
<td>Clutha district</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Southland district</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>Gore district</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Invercargill city</td>
<td>300</td>
<td>1,000</td>
</tr>
</tbody>
</table>
## Appendix 9: Response to Comments

<table>
<thead>
<tr>
<th>Abbreviated comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Can the conceptual approach to the research be summarised, perhaps as a diagram, to assist the reader to see its scope and coverage?</td>
<td>Included in Section 1.3</td>
</tr>
<tr>
<td>2. Can the key outcomes of the factor analysis be included in quantified terms (perhaps in graphical form)?</td>
<td>Included in Section 3.2</td>
</tr>
<tr>
<td>3. Will the considerable (forecasted) future growth of international travellers entering through the gateway airports affect the domestic network? What is the role of the leisure traveller in shaping the network?</td>
<td>International connections (inbound and outbound) account for around 11% of the traffic on the domestic network. It is likely that an increase in international traffic will have a flow on effect on the domestic network by increasing demand. In terms of the role of leisure travel, we do not have sufficient information to understand how the individual sub-markets (e.g. business, leisure) perform or contribute to the network.</td>
</tr>
<tr>
<td>4. Have high airfares shaped the network in terms of demand and passenger volumes? What is the outlook for fares on routes that are facing JetStar competition and routes that do not have contestability?</td>
<td>Price is always an issue. We have included examples of price elasticity and the potential effects on demand (see Section 2.5.3 and 5.2). Regarding competition from JetStar, this is discussed in Section 5.1.</td>
</tr>
<tr>
<td>5. What is the future of the Q300, as the smallest turboprop aircraft favoured by major airlines? Is it possible to identify (e.g., from its current route allocations) the annual passenger volume threshold (or other factors) at which the Q300 becomes viable?</td>
<td>We did not review the outlook of different aircraft types. We did however, look at their cost features (per seat) as presented in section 2.3.1. We have included a high level assessment of the minimum passenger numbers</td>
</tr>
<tr>
<td>6. Can another round of route rationalisation by Air NZ be reasonably expected (given the movement towards larger aircraft and other factors)? What are the characteristics of routes/locations likely to be in this category? Is there a ‘watch list’ that could be identified, based on current driving factors?</td>
<td>Air NZ is very focused on costs meaning that they could respond (swiftly) to any sudden market shift. They could respond by dropping routes so another round of rationalisation is not impossible. However, given their recent announcements and changes, we think it is unlikely that they would undertake another round of rationalisations (on top of the recent announcements). Further, their ongoing investment in fleet upgrades suggests that some stability in the short term. If there were any further rationalisations, these were likely to affect the routes with the smallest passenger numbers. Based on the Sabre data, the ‘bottom 25%’ of routes (passengers and Revenue) are all associated with Air NZ recent changes. The routes above this level (25%-50%) are likely to be constantly reviewed by Air NZ (as part of normal business practices. Examples include some routes through Wanganui, Taupo, Kerikeri, Whangarei and Hokitika.</td>
</tr>
<tr>
<td>7. Is the network able to be divided into commercially sustainable routes, and socially supported routes?</td>
<td>We did not set the analysis up to undertake this sort of analysis. We focused on the drivers (i.e. what is driving supply and demand). In order to assess the network from a ‘social perspective’ one would need to first define ‘social’ and the context within which this is applied.</td>
</tr>
<tr>
<td>8. Are the factors driving social infrastructure for air transport different from the factors for commercial/profitable routes? What are the drivers for airports and air routes that have social infrastructure characteristics?</td>
<td>We do not see airports as ‘social infrastructure’. Social infrastructure typically includes assets that accommodate social services e.g. schools, universities, hospitals, prisons and community housing, bus stops, and water treatment plants. We included an overview of the hospital and medical flights using available information. Based on the available data, a small portion of passenger demand comes from the health sector (transfers). Emergency transfer services are explored and forms a small component of the overall network (see Section 2.5.1). While these services are invaluable and critically important, we do not see them as a driver of the size and shape of the overall network.</td>
</tr>
<tr>
<td>9. Can the existing ‘socially supported’ airports be identified with current data?</td>
<td>We did not set the analysis up to undertake this sort of analysis. We focused on the drivers (i.e. what is driving supply and demand). In order to assess the network from a ‘social perspective’ one would need to first define ‘social’ and the context within which this is applied.</td>
</tr>
<tr>
<td>10. Can the driving forces be separated into structural factors versus factors that are subject to commercial influence or other national or local policy?</td>
<td>It would be better to look at the factors from a supply and demand perspective. The factors are discrete ‘areas’ driving (influencing/affecting) the network. What the analysis suggests is that the airlines service (supply) to passengers (demand) is a key driver that is shaping the network.</td>
</tr>
<tr>
<td>11. Can ‘route characteristics’ as a major factor be unbundled in a way that would allow readers to consider the component factors</td>
<td>We have more detail in the report (Section 3.2). The route characteristics factor encapsulates the airlines ability to generate a profile based on the potential number of passengers, the cost of the aircraft that can be used to service a route and the potential fares. How these aspects manifest (and combine) is the first (and arguably the most important) factor shaping the network. This can be thought of as the supply side. In turn, the other drivers influence demand side. We have included some additional details about what is covered. However, the route characteristics factor is about the potential to return a profit (revenue) on a particular route and this is really driven by total demand (passengers), the type of aircraft that can be...</td>
</tr>
</tbody>
</table>
12. Has the dominant role of Air NZ in shaping the current network been sufficiently described (e.g., its preference to hub through Auckland, and its management of supply to maintain fare levels)? Is the arrival of an apparently well-resourced regional competitor likely to change the influence of Air NZ over the network?

The role of airlines and how they react, or respond, to market conditions, is one of the key drivers. It was beyond the scope of our research to investigate on Air NZ’s market position, operational strategies and supplier management arrangements. We did comment on the potential effects of JetStar on competition on the regional routes.

13. What would be the likely impact of significant cost increases e.g., fuel, air navigation re-equipment?

The outlook for jet fuel prices over the next 5 years is stable so we did not go into a lot of detail about the potential effects of a substantial increase in fuel prices. However, a short description of the potential effect on demand has been included by looking at price elasticities. We also commented on the potential effects of NSS (navigation) on the independent operators.

14. Is the current flurry of third level airline innovation and expansion likely to result in the independents having a larger role in the future network?

The financial viability of independent operators will need to be market tested over the medium term. The combined issue of the fleet characteristics (old and aging aircrafts) and small (low passengers) routes clouds the outlook for new market entrants.

15. Could the boundaries of airport catchments used for analysis be explained more?

This has been included (see Section 1.3).

16. Could the axis of the graphs on pages 27-28 be explained further? In particular, what is meant by the use of ‘different spatial scales’?

We have provide some more explanation around these graphs. The spatial scales are explained in Section 1.3.

17. Changes in navigation technology are identified in the report – but the implications of these changes on the shape of the network in future are not drawn out.

Comment included in the report. This relates to the NSS aspect. The costs are mostly one-off and could be very difficult (expensive) for the independents to implement.

18. The dominance of Air New Zealand is identified and quantified in the report – but the influence of this on the shape of the network is not clear. The report identifies (page 30) that airlines behaviour is a key driver of the domestic air network. The history of regional airlines in NZ seems to suggest that, for extended periods, competition has been reduced, capacity restrained, and returns maximised.

The reasons for this are highlighted in the report (See Section 5.1)

19. Although a ‘hub-and-spoke’ pattern is typical of airline operations worldwide (p.9) what are the reasons for concluding that this pattern is “likely to remain firmly in place”?

We have included some of the potential reasons for the fragmentation (see Section 2.2.2). We did not look at historic role and impact of regulation on the network. It was beyond our scope to determine if an alternative development path would have been followed if a different regulatory approach and/or level of protection were in place.

20. The third level (independent) airlines are described as fragmented, but the reasons for this has not been discussed. It seems this is probably due as much to the dominant position and market power of the dominant provider as the inherent characteristics of the smaller airlines. If there were a different level of protection against abuse of market power, would the development of the network follow a different path?

We have included additional comments about this aspect (Sections 2.2.2 and 5.1)

21. The report suggests that competing airlines have failed over time, but there is also a long history of niche airlines operating for extended periods

The jets operate on the main routes (a small portion of the actual routes) and the research focuses on the overall network. We did however cover the costs of jets (they are around $50-60/seat), considerably cheaper than any of the other aircraft types discussed.

22. Commentary on fleet costs tends to overlook the main trunk routes and the A320 sized aircraft.

We have included a section dealing with ‘travel cost comparisons’ comparing a ‘fly trip’ with a ‘drive and fly trip’. Airfares are only one aspect affecting of the overall network. The overall network is about both demand elasticity and supply elasticity. With reference to the comment about cost differences between the trunk and regional routes (relative to operating costs) this points to Air NZ pricing behaviour, which is beyond the scope of this report.

23. The terms of reference (in 4(B)) seek description of travel costs and impacts. Very little of the report deals with travel cost (fare to the traveller) and impacts – and in particular any observation as to whether the difference in main trunk fares (where there is competition) and regional to hub fares is adequately explained by the differences in seat operating costs.

We’ve expanded our discussion to clarify this link

24. The mechanisms by which connectivity drives relative performance ((Section 4.2) are not very clear.

25. The access and visibility (through airline/travel agent distribution channels) of regional destinations to international passengers is a barrier to travel to those

We did look at code sharing and expanded the report. The issue is the safety and securing requirements (and the independent operators cannot (do not want to?) meet the requirements.
destinations, which has not been sufficiently examined. It seems likely this is a competitive strategy of the dominant airline.

26. Inter-regional trade is examined (4.3.1) but tourism flows are not similarly examined by the independent operators (an aged fleet with high $/seat costs). Air NZ’s competitive strategy and activities are beyond the scope of our study.

27. Geographic isolation and access by road to large centres has not been examined as a factor shaping the network. For example, Nelson is relatively isolated. Does this affect propensity to fly? This has been included in the analysis by using the time it takes to travel (by road) between city-pairs as an indicator of relative isolation.

28. The relative proximity of airports has not been examined. This appears to be a factor in the withdrawal of Air New Zealand from Whakatane and Kaitaia. Proximity has been included in the analysis. We have considered travel time (per road) as part of the analysis.

29. Is the total cost of travel (airfares, parking, driving time and costs) a factor?

30. The report correctly identified the regional airports likely to be attractive to JetStar. Are there others that may prove viable in 4-5 years? As part of identifying the four options for JetStar’s entry, we prepared a short list (shown in the draft report). However, the selected ones were substantially ahead of the other candidate airports. This means that it is unlikely that these options would be taken up in the short term.

31. The frequency and convenience of flights (from a passenger perspective) are not discussed. This also relates to types of passenger – e.g. business versus leisure – and the differing requirements of each. Is there available data (or reasonable assumptions) on types of passenger?

32. Some aspects of future cost changes have been identified and discussed, but not all, and the overall implications seem to merit more discussion. What would happen if fuel prices return to the higher levels of a few years ago? Will new navigation technologies have a material impact on airline costs? If the security charges currently levied at five domestic airports were applied at regional airports, would it affect viability?

33. What is the extent of council investment and support for their airports (and air routes)? Is this a factor affecting the shape of the network? This has been included in the report (Section 2.1 and 3.3).

34. The report concludes (section 4.5) that connections to smaller centres are likely to suffer from low growth – is there an airline business model. Is it possible to identify a population or economic threshold that could sustainably support an ‘independent’ service? The issue of low growth in the smaller centres is an observation about the ‘quality’ of one of the drivers. We did not investigate different airline models so we can only speculate about what sort of model could be suitable and whether council support would be needed. Nevertheless, our analysis did highlight the issues faced by the independent operators (an aged fleet with high $/seat costs). Air NZ’s move showed that there is a mismatch between supply (and the expected/required return) and demand. We did look at the threshold issue from multiple angles but it not possible to define a robust threshold. There are simply ‘too many moving parts’.

35. Some important data has been drawn together to support this report. Could some of that material be included as appendices that not only help the reader to follow the discussion and conclusions, but also form material resources for anyone wanting to examine insights in greater detail? This will be done via a separate Excel workbook.