



Government Support Measures for Domestic Air Connectivity



Case-Specific Policy Analysis

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The International Transport Forum

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Case-Specific Policy Analysis Reports

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Executive Summary

Background

This report reviews government support measures for domestic air connectivity in Australia, Canada, Japan, Norway, Sweden, and the United States. It analyses different approaches to providing regional connectivity in terms of their effectiveness in achieving government policy goals as well as delivering value-for-money. The study was commissioned by the United Kingdom's Department for Transport (DfT), as part of the Department's evidence base gathering to support the upcoming UK Aviation Strategy in 2019.

Ensuring sufficient levels of domestic air connectivity can be important for governments for a number of economic, social, and strategic reasons. Air connectivity delivers significant economic benefits to the users of aviation, enables economic growth, helps develop efficient supply chains and fosters creation of regional business hubs, including in tourism. In the more remote areas, air connectivity can play an important social role in providing access to essential services such as healthcare. The reason for government interest in domestic air connectivity may also be strategic. Provision of adequate connectivity from remote regions to centres of activity may make remote regions more attractive to economic investment, maintaining populations of those regions and rebalancing the national economy away from its centres.

Over the past few decades, deregulation of aviation has delivered significant benefits to passengers and to freight shippers. The level of available services has dramatically increased and ticket prices now are a fraction of what they were prior to deregulation. It has not, however, always ensured connectivity to all regional communities. This is because operating in the thinner markets, characteristic of many domestic routes, is less profitable than operating routes with higher traffic volumes. Long-haul routes also tend to be more profitable than short-haul domestic routes and capacity constraints at some national hubs have led to crowding out of the more marginal routes, many of them domestic. In the regulated era, services in thin domestic markets were often cross-subsidised from other routes in the network.

Key findings

In order to sustain or improve domestic connectivity levels, governments across the OECD have made or facilitated investments and established policies to support the aviation sector. Investments to increase the size of the local market, notably through improvements to surface access, can help increase demand at regional airports. Investments in new capacity at constrained national hub airports may create opportunities to protect domestic routes that would otherwise be swapped for more profitable long-haul services.

Lowering airport visit costs may increase the number of domestic routes that airlines can operate profitably. Reductions can also be applied to other charges related to aircraft operations. Where there are uncertain levels of demand for routes to smaller airports, start-up funding can incentivise the provision of new domestic services. Governments can also provide direct subsidies to airlines for operating selected domestic routes. If domestic connectivity to a congested, slot-coordinated airport is lacking, safeguarding slots for domestic routes might be considered. Any capacity increases at such congested sites offer a rare opportunity to make such decisions prior to slots having been allocated to

airlines. In all these cases, however, safeguarding slots has a significant opportunity costs as capacity will not be used to deploy the most valuable services.

Approaches to supporting domestic air connectivity and the level of support provided vary considerably across the OECD, including among the six countries examined for this report. In Norway, Sweden, Canada, and to some extent Japan, domestic air connectivity policy is part of a broader transport strategy that includes other transport modes. In Australia and the USA, it is considered a separate policy area not integrated with policies for other transport modes. In Canada support for domestic air connectivity is limited to safety-related capital funding for regional airports. In Australia, monopoly rights are granted to airlines operating particular routes in Western Australia, slots are earmarked for regional services at Sydney Airport, and the Remote Air Services Subsidy Scheme (RASS) is available to airlines that offer weekly services to remote communities. The governments of Norway and the USA support extensive domestic air connectivity programmes. Subsidies are provided through Public Service Obligations (PSOs) in Norway and the Essential Air Service program in the USA. Sweden operates a smaller network of PSOs than Norway. Finally, in Japan the government subsidises routes to remote regions, provides reductions in landing charges at small airports, and offers aviation fuel rebates and asset tax breaks. At Tokyo's Haneda airport, slot allocation rules favour domestic connections.

Policy recommendations

Establish explicit domestic transport connectivity objectives

Governments need to be clear about their domestic connectivity objectives and consider the country's connectivity needs across all modes including road, rail and maritime transport. Connectivity needs should be considered in the context of how improved connectivity can support local, regional, and national socio-economic strategies.

Assess the impacts of potential intervention in the aviation market

The effect of any potential government interventions on existing air connections, both domestic and international, should be fully considered. Subsidised routes may cannibalise other connections in the network. They may also adversely impact other transport modes.

Monitor and periodically evaluate the effectiveness of support for domestic air connectivity

All support measures should also be periodically evaluated against objectives and intended outcomes. This could include sun-setting clauses for support measures.

Make the award of subsidies transparent

When tendering contracts for services supported by subsidy, governments should conduct transparent selection and award processes and publish the results and criteria for award, working in collaboration with local authorities and other stakeholders.

Keep support programmes simple

Governments should keep the complexity of support programmes to manageable levels and employ only a small number of the most effective measures.

Provide incentives to create value-for-money

Local communities should have skin in the game. Ideally, they should contribute financially to the support measures to avoid perverse incentives to ask for support for non-essential connections. Local government involvement in securing and demonstrating interest from local businesses and airlines for a route can also increase the likelihood of successful operation of the route and deliver better value for money.

Weigh the benefits of safeguarding slots at congested airports against the costs of denying them to more profitable services

To improve domestic connectivity at congested slot-coordinated airports, policy-makers may consider safeguarding a proportion of slots for domestic connections. At congested sites, however, this means that the safeguarded slots will not be used to provide other, more profitable connections and hence the overall economic efficiency and connectivity will be reduced. These negative consequences need to be considered alongside the benefits of establishing domestic connections.

Glossary of Terms and Acronyms

ACI – Airports Council International, trade association for airport operators, see: www.aci.aero/

ANS – Air Navigation Services

APD – Air Passenger Duty, an excise duty levied on the carriage of passengers flying from UK airports, see: <https://www.gov.uk/guidance/rates-and-allowances-for-air-passenger-duty>

ATC – Air Traffic Control

CBA – Cost-benefit analysis

CRS – Computer Reservation System

DfT – The UK Department for Transport, see:

<https://www.gov.uk/government/organisations/department-for-transport>

Domestic air connectivity (also: regional connectivity) – the degree to which a country has internal air transport links from one part of the country to another. This will be affected by the frequency and capacity of services and the number of different routes available. Generalised cost models can be used to fully capture time and cost options for passengers between their origin and final destination.

DoT – The United States Department of Transportation, see: <https://www.transportation.gov/>

EAS – The Essential Air Service programme. A US policy put in place to guarantee that small communities that were served by certificated air carriers before airline deregulation maintain a minimal level of scheduled air service, see: <https://www.transportation.gov/policy/aviation-policy/small-community-rural-air-service/essential-air-service>.

EPNdB – Effective Perceived Noise in decibels

FAA – United States Federal Aviation Administration, see: <https://www.faa.gov/>

Hub airport – Major network carriers operate global hub-and-spoke networks, in which they route their traffic through one or more major airports ('hubs'), with feeder traffic from other airports in the network ('spokes'). Hub airports thus maximise the choice of direct destinations to the passenger.

FY – Fiscal Year (Japan). In Japan, the FY runs from April until March the following year.

HSR – High-speed rail

IATA – International Air Transport Association, trade association for airlines, see:

www.iata.org/Pages/default.aspx

ITF – International Transport Forum at the OECD, see: www.itf-oecd.org/

JCAB – Japan Civil Aviation Bureau, see: http://www.mlit.go.jp/koku/15_hf_000020.html

JJ Merger – Merger of Japan Airlines and Japan Air System

JNR – Japanese National Railways

JR Group – Japan Railways Group

Kl – kilolitre

Km – kilometre

KPI – Key Performance Indicator

LCC – Low-cost carrier

Lifeline service – Services on which local communities rely for provision of important services. For example, according to the EU interpretive guidance on Public Service Obligations, lifeline services enable members of a community to “participate in cultural, economic and social life of their Member State”.

Local route – For the purpose of this report, the local routes category comprises all domestic connections apart the ones that the report calls trunk routes.

MLIT – Ministry of Land Infrastructure, Transport and Tourism in Japan, see: <http://www.mlit.go.jp/en/index.html>

MoT – Former Japanese Ministry of Transport. The Ministry was integrated with other ministries to become MLIT in 2001.

MTW – Maximum Take-off Weight

New entrant (also: new airline) – In the context of Chapter 4, the definition pertains to slot allocation at Haneda Airport, Japan, and comprises those airlines that started their operations after 1997.

NMTC – Norwegian Ministry of Transport and Communications, see: <https://www.regjeringen.no/en/dep/sd/id791/>

NSW – New South Wales

OECD – Organisation for Economic Co-operation and Development, see: www.oecd.org/

OD – Origin and Destination

PAX – Passengers

PSO – Public Service Obligation. In the European Economic Area governments use a PSO to procure a scheduled air service on a route that is deemed vital for the economic and social development of the region, but at the same time it is unprofitable for any airline to operate that route under competitive market conditions, see: https://ec.europa.eu/transport/modes/air/internalmarket/pso_en

RASS - Remote Air Services Subsidy Scheme, from the Government of Australia, see: <https://infrastructure.gov.au/aviation/regional/rass.aspx>

Remote Island (Japan) – MLIT defines “remote islands” as islands other than Honshu, Hokkaido, Shikoku, Kyushu and Okinawa (i.e. the biggest islands in Japan).

Ring-fencing (also safeguarding) of airport slots – In the context of this report, ring-fencing or safeguarding of slots refers to administratively reserving slots for operation of domestic or regional services.

Route – One route constitutes two flights – from the origin to the destination and back.

RRF – Regional Ringfence, ensures regional airlines are assured a certain number of slots at Sydney Airport.

RW – Runway

SARS – Severe Acute Respiratory Syndrome

SCASDP – Small Community Air Service Development Program, see: <https://www.transportation.gov/policy/aviation-policy/small-community-rural-air-service/SCASDP>

Slot – In the IATA Worldwide Slot Guidelines, a permission given by a coordinator for a planned operation to use the full range of airport infrastructure necessary to arrive or depart at a Level 3 airport on a specific date or time, see: www.iata.org/policy/infrastructure/slots/Pages/slot-guidelines.aspx

Trunk routes – Main air transport routes, attracting high level of demand and profitability. In the case of Japan, trunk routes include those located between airports in Tokyo (HND, NRT), Osaka (ITM, KIX), Sapporo (CTS), Fukuoka (FUK), and Naha (OKA).

TW – Taxiway

WSG – Worldwide Slot Guidelines, a set of standards for the management of airport slots produced by IATA member airlines and the community of airport coordinators, see:

www.iata.org/policy/infrastructure/slots/Pages/slot-guidelines.aspx

IATA airline and airport codes used in the report

Japan Airlines

ADO – Air Do Airlines

ANA – All Nippon Airways

CI – China Airlines

JAL – Japan Airlines

JAS – Japan Air System

SFJ – StarFlyer Inc.

SKY – Skymark Airlines

SNJ – Solaseed Air

TDA – Toa Domestic Airlines

Japan airports

CTS – Sapporo New Chitose Airport, Hokkaido, Japan

FSZ – Mt. Fuji Shizuoka Airport, Shizuoka, Japan

FUK – Fukuoka Airport, Fukuoka, Japan

HND – Tokyo International Airport, commonly known as Haneda Airport, Tokyo, Japan

KIX – Kansai International Airport, Osaka, Japan

KOJ – Kagoshima Airport, Kagoshima, Japan

NGO – Chubu Centrair International Airport, Aichi, Japan

NKM – Nagoya Airfield, Toyoyama, Japan

NRT – Narita International Airport, Chiba, Japan

OKA – Naha Airport, Okinawa, Japan

SDJ – Sendai International Airport, Miyagi, Japan

TDA – Toa Airways

UKB – Kobe Airport, Hyōgo, Japan

Norway airports

ANX – Andøya

BJF – Båtsfjord

BNN – Brønnøysund

BVG – Berlevåg

FDE – Førde

FRO – Florø

HAA – Hasvik

HFT – Hammerfest

HOV – Ørsta-Volda, Hovden

HVG – Valan, Honningsvåg

LKL – Banak, Lakselv

LKN – Leknes

MEH – Mehamn

MJF – Mosjøen

MQN – Mo i Rana

OSY – Namsos Høknesøra

NVK – Narvik

RET – Røst

RRS – Røros

RVK – Rørvik

SDN – Sandane

SKN – Stokmarknes, Skagen

SOJ – Sørkjosen

SOG – Sogndal

SSJ – Sandnessjøen

SVJ – Svolvær, Helle

VAW – Vardø, Svartnes

VDS – Vadsø

VRY – Værøy

Sweden airports

KRN – Kiruna

LLA – Luleå

UME – Umeå

OSD – Åre Östersund

ARN – Stockholm Arlanda

BMA – Stockholm Bromma

GOT – Göteborg Landvetter

VBY – Visby

RNB – Ronneby

MMX – Malmö

PJA – Pajala

GEV – Gällivare

HMV – Hemavan

AJR – Arvidsjaur

VHM – Vilhelmina

LYC – Lycksele

SFT – Skellefteå

OER – Örnsköldsvik

KRF – Kramfors Sollefteå

SDL – Sundsvall-Härnösand

EVG – Sveg

MXM – Mora

BLE – Borlange

TYF – Torsby

HFS – Hagfors

VST – Stockholm Västerås

KSD – Karlstad

ORB – Örebro

NYO – Stockholm Skavsta

NRK – Norrköping

LPI – Linköping City

THN – Trollhättan-Vänersborg

JKG – Jönköping

GSE – Gothenburg City

OSK – Oskarshamn

VXO – Växjö Kronoberg

HAD – Halmstad

KLR – Kalmar

AGH – Ängelholm-Helsingborg

KID – Kristianstad

United States airports

JFK – New York John F. Kennedy International

LGA – New York LaGuardia

DCA – Washington Ronald Reagan National

EWR – Newark Liberty International

ORD – Chicago O’Hare International

Chapter 1. Government Support Measures for Domestic Air Connectivity

This chapter summarises discussions at the Expert Workshop on Government Support Measures for Domestic Air Connectivity that took place in September 2018 at the OECD Headquarters in Paris. The workshop gathered government and industry representatives as well as independent experts (see Annex 1 for the list of participants) who discussed best practices in designing and implementing measures supporting domestic air connectivity.

During the workshop, the participants discussed the effectiveness of policy measures supporting domestic air connectivity (and the effectiveness of these policies) in Australia, Canada, Japan, Norway, Sweden and the USA.

Background: The domestic air connectivity challenge

According to ACI World¹ in 2017 the global aviation industry accommodated over 8.2 billion passengers and over 118 million metric tonnes of cargo on more than 95 million flights. Global revenue passenger kilometres have doubled every 15 years since the 1960s and are expected to grow at around 4.3% per annum until 2030 (ITF, 2017).

The rapid growth of aviation industry would have not been possible without significant progress on liberalisation of international air service agreements that began with the US Airline Deregulation Act in 1978 and the deregulation of the aviation market in EU in 1987. Drastic changes in route structures and widespread adoption of the hub-and-spoke system enabled large savings and efficiencies for the aviation industry. So-called legacy carriers have developed their hub-and-spoke networks and, depending upon their business models, joined global alliances with other partners to extend their reach around the world. New entrants have emerged, such as big players in the Middle East and low-cost carriers, which led to significant reduction of air fares and increased choice for passengers. A study conducted a few years after the Airline Deregulation Act of 1978 was put in place in the United States showed significant consumer welfare gains translating into approximately USD 6 billion of savings on air fares annually and observed a 25% lower fare per passenger mile than in the EU (Morrison and Winston, 1986). On international routes, the US air transport reform led to an estimated average price decrease of approximately 35% (Dresner and Tretheway, 1992).

Although less dramatically, European air fares decreased when the EU dismantled national air transport barriers and opened the market for competition in 1993. Further gradual deregulation was enacted until 1997. Especially since the entry and rapid growth of low-cost carriers in the early 2000s, market shares of different airlines shifted significantly. As a result, the market share of incumbent carriers in the EU declined from 78% to 60% between 1998 and 2008 (Reichmuth et al., 2008) and reached 58% in 2017 (Akgüç et al., 2018). New entrants have put competitive pressures on the industry, driving down prices: the minimum price for a ticket from Paris to Milan dropped from more than EUR 400 in 1992 to EUR 25 in 2017 (European Commission, 2017).

The total number of passengers flying on US airlines nearly more than in forty years, from approximately 275 million in 1978 to nearly 750 million in 2006 (Goetz and Voeles, 2009) and to 965 million in 2017². Morrison (2001) estimated that the effect of Southwest Airlines' operation in 1998 alone saved passengers USD 12.9bn, equal to 20% of the airline industry's domestic scheduled passenger revenue

that year. This estimate is derived from direct savings due to Southwest's low fares as well as the effect that competition from Southwest had on other airlines' fares.

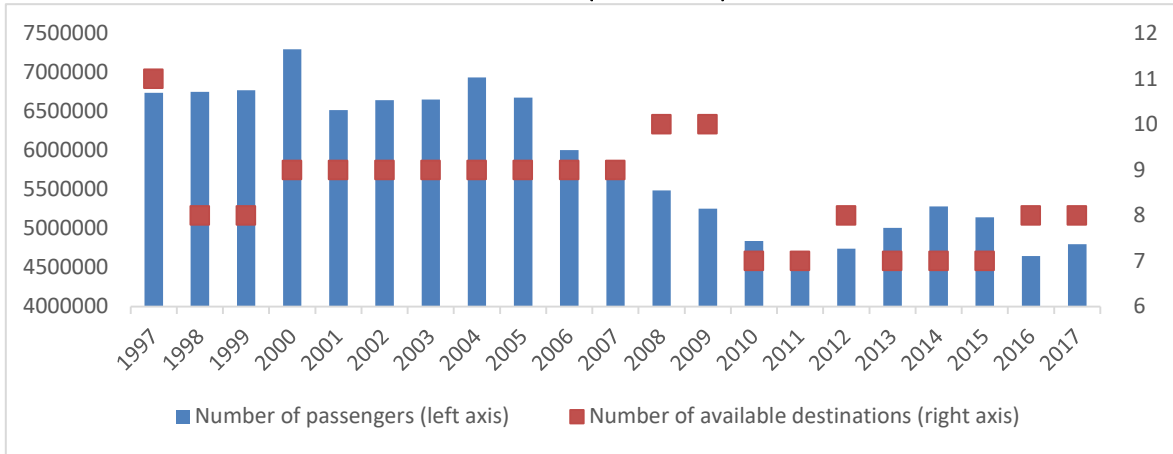
The participants mentioned the following challenges to domestic air connectivity::

Regulatory impediments. In the past, an excess of caution by regulators meant that some services that could have been viable were not permitted as governments tended to be more concerned about preserving the existing route networks than increasing the scope of future networks. Where regulations are still in place or governments take an active role in deciding where airlines can and cannot fly, outcomes are likely to be sub-optimal. Nowadays, the experts agreed regulatory impediments to domestic air services are rather uncommon across the OECD. More broadly, regulatory impediments may also exist in relation to potential future deployment of technologies that could potentially facilitate domestic and other types of connectivity (e.g. use of drones or electric aircraft). Policy-makers should anticipate such opportunities and consider how deployment of new technologies could be facilitated.

Airport access at slot-constrained airports. A lack of access to slot at extremely constrained airports may be an impediment to domestic connectivity. Airports that are not congested or slot controlled have the physical capacity to accommodate regional air services, and thus connectivity is not an issue from an access perspective. At airports where slots are allocated to ration capacity, however, regional air connectivity often loses out. This is because high-volume services, often served by relatively large aircraft, generate a higher yield per slot and hence the willingness to pay for scarce slots to run such services tends to be much greater than in the case of operating domestic routes. This implies that long-haul connections tend to crowd out domestic services. This challenge to domestic connectivity, experts agreed, is expected to intensify: EUROCONTROL (2018) forecasts that by 2040 1.5 million flights³ will not be accommodated at European airports due to capacity constraints (and up to 3.7 million in the strongest growth forecasts).

The trend of domestic routes being crowded out is visible at the most congested airport in Europe, Heathrow, where the number of domestic routes from the airport has fallen from 11 in 1997 to 8 in 2017 and passenger numbers on these routes have fallen from over 650 000 per year to less than 500 000 (Figure 1.1). Although this trend causes a reduction of intra-regional and domestic connectivity at the airport, it tends to strengthen the route network of low-cost airlines and competing hub airports (Redondi and Gudmundsson, 2016). Regional carriers are often forced to use spare capacity at secondary airports such as London Stansted. Other regional connections are provided by low-cost carriers to secondary airports or by rail such as a Lufthansa fare to German cities which includes a combined airline and train ticket from the airport of origin via Frankfurt to another German city.

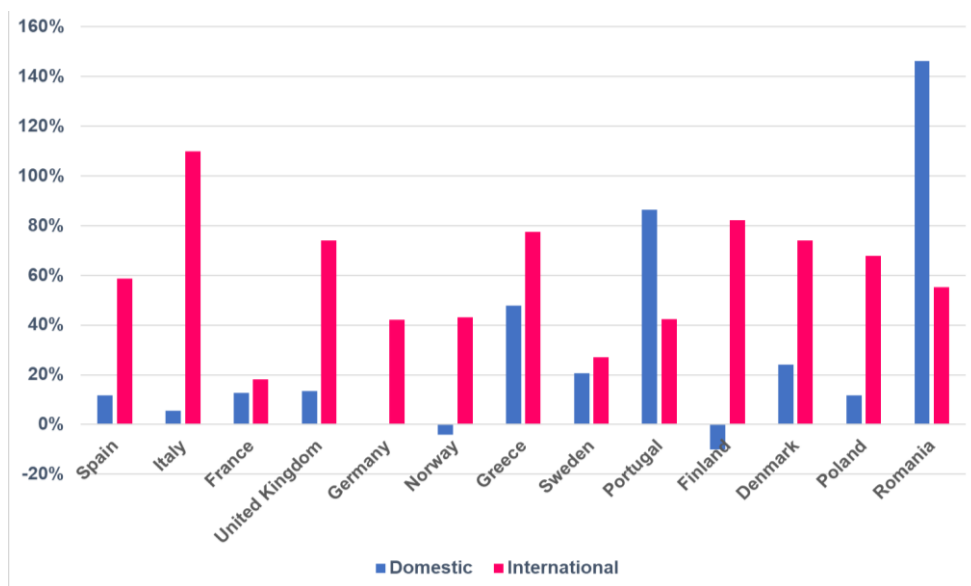
Figure 1.1. Domestic air passengers per year and number of domestic destinations available weekly from Heathrow (1997-2017)



Source: DfT analysis of CAA data.

In April 2012, a report by the EU Parliamentary Committee of Transport and Tourism noted that European regions were losing direct links to some of the most congested airports and urged the European Commission and member states to promote connections between congested main airports and regional airports (European Parliament, 2012). Since 2012 across Europe, while OD international traffic continues to grow strongly, domestic traffic has been stable or declining in major markets, see Figure 1.2. In Europe, for airports with more than 25 million passengers per annum between 1997 and 2017 while total passenger growth has reached 96% on average, domestic passenger growth has been 40%, leading to a reduction in the proportion of domestic passengers at these airports.⁴ While there was a debate among the participants whether these trends indicated domestic air connectivity problems or merely domestic market reaching its saturation point in Europe, there were voices that the capacity crunch expected in the future will put strains at airports possibly similar to those at Heathrow.

Figure 1.2. Change in OD passenger traffic, by domestic and international routes (2012-2017)



Source: IATA Economics using DDS.

Cost of service. The cost of providing regional air services tends to be higher, both for airports and airlines. With fewer passengers across whom fixed costs are spread and with higher per passenger operating costs of small aircraft, the financial viability of regional services can be an impediment to domestic connectivity. Small regional services often generate the lowest return on assets deployed and airlines have a responsibility to shareholders, not governments, creating a reduced incentive to operate these routes. This means that air carriers often have little incentive to operate more marginal routes.

Domestic connectivity may also have suffered due the success of low-cost carriers. While LCCs have led to tremendous connectivity improvements across regions, their business model is most often based on one type of narrow-body aircraft with 150-200 passenger capacity. Such a business model is not suitable for running many remote routes, as they do not attract sufficient load factors for such aircraft. Some participants remarked that in the USA there is a trend of some travellers driving very long distances to airports where low-cost carriers operate to get a low fare. This “leakage” from air links via regional feeder carriers has put further competitive pressure on network carrier feeder services. Another challenge to running thin domestic routes is the difficulty of keeping adequate frequencies on such routes to increase yields.

As domestic routes are often marginal, their existence may be threatened by adverse economic conditions. A number of case studies from the US reveal this difficulty. For example, a rise in fuel costs and drop in passenger demand in 2008 made US Essential Air Service (EAS) subsidies insufficient to cover the costs agreed in contracts with air carriers. 17 communities in 10 US states lost service after Mesa Air Group shut down Air Midwest (Mettrass-Mendes and Neufville, 2010). Service to those communities was ultimately restored, through selection of replacement carriers.

Domestic air connectivity objectives

Governments are interested in air connectivity, i.e. in how well their national aviation systems connect the users of aviation to different destinations, because it delivers significant economic benefits to the users of aviation (passengers and freight shippers); to the aviation industry (including airports, airlines, and aircraft manufacturers); and to the wider economy by facilitating tourism, inward foreign direct investment and supporting trade in goods and services. Air connectivity provides for the movement of people and exchange of knowledge, improves productivity and supports a country’s integration into the global economy.

According to Brueckner (2003) a 10% increase in passenger enplanements leads to a 1% increase in employment in service related industries in US metropolitan areas. Reducing travel times to large metropolitan areas can be a significant driver of higher growth in GDP per capita at the regional level (Ahrend and Schumann, 2014). Surveys of factors important to location decisions by international firms generally find accessibility to be of great importance, both to local and international destinations. This conclusion is reflected in numerous studies examining the determinants of the location of large firms’ headquarters across a range of countries. For example, Bel and Fageda (2008) concluded that direct aviation connectivity is an important factor to firms’ relocation decisions.

The impact of lower travel costs due to better connectivity (direct user benefits) ripples through the rest of the economy. For example, businesses benefit from lower travel costs and they may see profits increase or can pass on the lower costs to their clients. Most of these wider economic benefits are just a pass-through of lower travel costs to actors elsewhere in the economy: they are already captured by measuring direct user benefits. However, improvements in connectivity may also generate additional benefits in the wider economy in case of market imperfections. Examples of additional wider economic benefits are agglomeration effects. Connectivity growth in an airport region may lead to a higher density

of economic activities in that region. In particular, low travel time to a major airport is a major determinant of business location for hospitality and conference serving sectors, as well as finance and other professional services, which have high rates of business travel (ITF, 2017). Concentration of economic activities can reduce (spatial) market imperfections and result in higher productivity, for example because of knowledge and technology spill-overs, a pooled labour market, and access to a larger diversity of products and inputs (Burghouwt, 2017).

Apart from the economic benefits of air connectivity, it also plays a very important social role for communities in remote areas. These communities often do not have direct access to essential services, such as healthcare, education, social services, and hence have to rely on being connected to services in bigger centres of population. As access to such services can be critical (in particular in relation to hospital treatments), the connections that provide access to such services are sometimes referred to as ‘lifeline services’. The term ‘lifeline services’ is often used by policymakers when providing rationale for programmes supporting domestic connectivity. For example, according to the EU interpretive guidance on Public Service Obligations, lifeline services enable members of a community to “participate in cultural, economic and social life of their Member State.”⁵

The considerations by governments to facilitate minimum connectivity levels may go beyond the social rationale of providing communities with what is perceived to be essential connectivity to meet certain social needs. The reason for supporting domestic connectivity may be more strategic: Provision of adequate connectivity from remote regions to centres of activity may make remote regions more attractive to current and potential inhabitants, hence maintaining populations of those regions. This may be a particularly important consideration for border regions, where disputes over territory may make maintaining a centre of population important. Governments may also have strategic plans to rebalance their economies and foster economic activity outside of the current centres of activity. Providing links to remote locations may be an important part of such strategies.

Box 1.1 provides a summary of different policy objectives that governments may have to support domestic air connectivity.

Box 1.1. Domestic air connectivity objectives

Economic objectives:

- ✓ Connecting all regions into national and global economic and political centres
- ✓ Enabling access to and exporting of natural resources
- ✓ Enhancing mobility of labour
- ✓ Enhancing productivity and investment

Social objectives:

- ✓ Access to healthcare
- ✓ Access to social services
- ✓ Access to education
- ✓ Access to social networks, family, friends

Strategic objectives:

- ✓ Economic rebalancing
- ✓ National unity

The participants agreed that the first step of any successful government domestic air connectivity support programme needs to have clearly defined objectives.

Assessing domestic air connectivity

The experts at the workshop agreed that every assessment of whether the government should support provision of domestic air connectivity needs to be conducted across all transport modes and consider the impacts of any prospective policies on the entire transport network.

- **Assess domestic connectivity across all transport modes.** Air connectivity is only part of the picture of a nation's transport infrastructure. In order to make effective policy decisions, the entire domestic connectivity picture needs to be considered, in particular in terms of any planned improvements in domestic connectivity by other modes. For example, Clewlow, Sussman, and Balakrishnan (2012) demonstrate that new high-speed rail connections reduced domestic air connectivity at Frankfurt International Airport and at Paris Orly. Where citizens have on balance benefitted from such changes they should be welcomed by policy-makers.

In relatively big countries where remote regions are difficult to reach by road transport, the interaction between air transport and high-speed rail may be of particular relevance. These two modes of travelling are the only two realistic options for fast travel over long distances. In Japan, for example, on distances over 1 000 km air transport is the dominant transport mode, whereas rail is slightly more utilised than air travel on distances between 700 and 1 000 km.

Such multimodal considerations are very much at the centre of transport strategies in most of the countries discussed at the workshop. As the following chapters discuss in greater detail, in Canada, Norway, Sweden, and to some extent Japan, domestic air connectivity is part of a broader transport strategy that includes other transport modes. In Australia and the USA, however, where there is little competition for domestic air connectivity from rail over large distances, domestic air connectivity is considered as a separate policy area.

- **Consider the impact of support policies on the entire transport network.** The experts agreed that any kind of intervention in the market for aviation is likely to have unintended consequences. In particular, safeguarding slots for domestic routes at congested airports tends to be an effective policy mechanism for ensuring domestic connections, but its use implies that scarce, valuable slots cannot be used by airlines to deploy routes with a higher overall benefit to the users of aviation. Moreover, subsidising routes may put up prices on domestic destinations. This can happen if, for example, a carrier establishes a monopoly position and is able to unreasonably increase ticket prices, while subsidisation may also dampen incentives for the carrier to be more cost efficient. The cost of such policies, in terms of the impact on the connectivity offered by the system and prices for the consumers need to be considered.

Intervention by subsidising a new domestic route, may cannibalise the traffic on other existing routes, thereby limiting the benefit of the subsidisation and potentially causing a reduction in overall connectivity. Some experts suggested that full passenger choice modelling should be undertaken to understand the likely effects on connectivity by these interventions.

Some experts suggested that a requirement to perform a comprehensive analysis of connectivity needs across all transport modes as well as a cost-benefits analysis (CBA) of any potential support policies would help policy-makers make decisions on the level and form of support for domestic air connectivity. Norway and Sweden have frameworks in place that aim at assessing regional

connectivity needs across all relevant transport modes and compare the costs (in terms of public expenditure) and benefits (in terms of meeting connectivity standards and resulting generalised travel costs) of implementing PSOs to enhance connectivity outcomes. These frameworks could be expanded to capture all costs and benefits relevant to decision making (see Chapter 3 for a discussion). Policy assessments should consider the impact and opportunity cost of any support policies on the users of aviation, the aviation industry, the environment, and the wider economy. In particular, they should consider the type of travellers who would be using the service (business, leisure) to determine the potential benefit of running the route and the second order impacts on the transport network.

Establishing criteria to guide the choice and level of support for domestic air connectivity

Once policy-makers have agreed on a set of objectives to be fulfilled by their domestic transport networks and assessed the level of domestic connectivity across all modes, the objectives can then be used to form a set of criteria for determining an adequate level of service for a community and when to intervene in the market. Objectives and criteria are set in this way in Norway and Sweden with the aim of ensuring that decisions are not overtly influenced by political considerations and that the government funds are disbursed in an effective way. In Norway the four main criteria are:

- Access to the capital city;
- Access to an airport with international services;
- Access to advanced healthcare (a larger hospital);
- Access to the county administration.

These criteria are considered on balance and a weighted average of travel time for the inhabitants in the area concerned is applied. Whether the transport network provides adequate levels of connectivity and hence meets the criteria set out above is considered across all transport modes to determine whether procuring a PSO indeed fills a certain connectivity gap. This is discussed in more detail in Chapter 3 of this report. In a nutshell, each community is ranked according to whether a full level of service for a community is established, the criteria are partly fulfilled, or current service levels do not fulfil the criteria. These criteria were used in the current tender, running from the 1st of April 2016 until the 31st of March 2020, for the PSO routes in southern Norway.

It is clearly important to set criteria as closely as possible to the objectives and that the criteria should be compatible. This is particularly important when it comes to combining economic criteria with social ones. A service that will meet an objective of connecting communities to lifeline services may not be effective in delivering economic growth to the region. Weighing criteria could help ensure realistic expectations with respect to the outcomes of the concerned policies. To ensure that support policies are successful, policy-makers needs to be clear about the intended outcomes and how these can be achieved through the programme.

Some support measures are directly targeted at specific connectivity outcomes, e.g. to connect remote regions with the capital city. While there may be important reasons behind such a specific target, the participants agreed that the broadest possible range of options should be considered when deciding on which routes to support. This implies using less specific criteria. For example, the Essential Air Service (EAS) programme in the USA aims to provide regional airports with access to the national network, rather than directly to the capital. For that reason, when deciding on the connections to support, the

government reviews both onward connectivity and interline agreements at a selection of hub airports. In Norway too, many PSOs connect regional airports to secondary cities in Norway, provided they offer regular services to Oslo or other hubs abroad.

Supporting domestic air connectivity: A toolkit of measures

When a government has considered other transport modes and decided that improvements in domestic air connectivity are the best way to improve the overall connectivity level, before resorting to government intervention, it is important to consider how governments can encourage better domestic air connectivity outcomes through removing any potential existing impediments to the aviation sector. Burghouwt (2017) provides an overview of different policy levers that government can use to support aviation connectivity more broadly. The following policy levers are relevant to enhancing domestic air connectivity outcomes.

Investments to increase size and strength of the local market. Investments by governments to enable better access to airports, particularly in surface access to regional airports, can strengthen their catchment areas, potentially improving demand for domestic connections from those airports. To some extent this can also be achieved by improving airside and landside of airports in order to provide better passenger experience and decrease the amount of time that passengers need to spend at the airport before taking the flight. Such investments may potentially lead to consolidation of regional airports in case this leads to overlapping catchment areas. Increasing the catchment area of airports and making them more attractive destinations will provide airlines with greater opportunities to grow their network, both domestically and internationally.

Removing capacity constraints at airports. This is particularly relevant for major national hubs that tend to operate within physical or policy-induced capacity constraints. As already explained in previous sections, capacity constraints can be an impediment for domestic operations at such hub airports, and removing them could foster better domestic air connectivity outcomes. The provision of capacity in order not to forgo connectivity growth should be considered by governments. The same is true for airspace capacity and efficiency as delays will increase costs for airlines and reduce the number of profitable routes. Limits on capacity such as noise quotas should be evaluated regularly to maximise efficiency.

Other measures available to governments to support domestic air connectivity entail intervention in the market for aviation. These can be broadly divided into two categories: Reduction of costs for domestic routes and protection of market access for domestic routes.

Reduction of costs for domestic routes. Lowering airport visit costs and ensuring effective airport charges for domestic services may increase the number of domestic routes profitable to airlines. When governments have influence on airport visit costs, whether through government ownership of airports as in Norway, through economic regulation, or allowing competitive constraints on an airport's pricing behaviour, governments can help ensure that fees and charges are at levels that could incentivise airlines to deploy more domestic routes.

Within the European Union and EFTA area, guidelines on State aid put in place limitations on public support to airport so as to not distort the market. Operating aid is prohibited to airports with more than 3 million passengers per year, and investment aid is prohibited to airports with more than 5 million passengers per year. For small airports below the EU state aid thresholds, governments can provide investment and operating aid to ensure that the airport remains financially viable even if it is unable to set charges at a level that would recover costs. For larger airports, governments have limited policy options. Airport operators also can put in place incentives or discounts for domestic flights, as long as the

terms are non-discriminatory. As outlined in Chapter 4, airport landing charges for certain domestic routes in Japan are significantly lower than for other services, in order to support such services. The discounts on the landing charges generally increase the thinner the domestic route is.

Reductions can also be applied to other charges related to aircraft operations. In the UK, PSO routes are exempt from the Air Passenger Duty. In Japan, there is a reduction on aviation fuel tax of almost 50% for services to remote islands, and a smaller reduction on other domestic routes. They also give a tax break on the fixed asset tax (1.4%) for aircraft which are used on domestic routes. Governments can also subsidise en-route air navigation service charges for regional services as it currently happens in Australia.

Where there are uncertain levels of demand for routes to smaller airports, start-up funding can incentivise the provision of new domestic routes. This funding can come from airports, governments, tourist boards, and chambers of commerce (and, in the case of EEA countries, it has to comply with EU State Aid regulations). For example, the US Department of Transportation runs the Small Community Air Service Development Program (SCASDP)⁶ which may involve revenue guarantees, financial assistance for marketing programmes, start-up costs, and research studies (Box 1.2). The SCASDP has issued 384 grants throughout the program's history. Among those grants, 166 primary routes (routes that were directly funded by SCASDP grants as part of the grant's scope) lasted for longer than a year.⁷ Some participants stressed the importance of local communities "having their skin in the game" by providing part of the funding and so having incentives to pitch successful projects for important connections.

Box 1.2. Small Community Air Service Development Program (SCASDP)

The SCASDP is a grant program designed to help small communities address air service and airfare issues. A grant applicant can self-identify its air service deficiencies and propose an appropriate solution. Grants can be used to provide, among other things, revenue guarantees, financial assistance for marketing programs, start-up costs and studies. In FY 2017, 16 grants were awarded ranging in size from USD 275 000 to USD 850 000, although there is no limit to the size of a grant which has been as high as USD 1.6 million in the past.

Example of previous grants:

1. 2015 Redmond, Oregon:

- **Aim:** This grant sought USD 500 000 in federal funds to recruit an airline to initiate service to Phoenix, Arizona, on a daily basis. The grant was matched by USD 175 000 in community funding.
- **Result:** Within months of signing their SCASDP Grant, the community was successful in recruiting American Airlines to begin service to Phoenix. The community used their matching funds to establish a marketing program to support the new service. Marketing campaigns were launched in both Redmond and Phoenix, taking advantage of the tourism potential of each destination to create two-way traffic on the route.

2. 2014 Bozeman, Montana:

- **Aim:** This grant sought USD 750 000 in federal funding to recruit an airline to commence a service to a southern US destination. The grant was matched by USD 855 000 in community funding.
- **Result:** The community worked quickly to come to an agreement with American Airlines to begin daily, seasonal service to Dallas Fort Worth International Airport. Marketing funds were

used to promote and inform the community of the new route. Service commenced in June of 2016.

The route was an immediate success. By May 2017, American Airlines announced that the service would be expanded to operate on a year-round basis.

Protection of market access for domestic routes. Another policy lever, that is the most effective one in terms of ensuring the envisaged domestic connectivity levels, is for governments to (a) provide subsidies for domestic routes and (b) safeguard slots for domestic routes at congested slot-coordinated airports.

Providing subsidies for a particular service may divert demand from other connections, which in some cases may lose their economic viability as a result. Moreover, if carriers are given monopoly rights to a route, they may not be looking for ways to increase cost effectiveness.

Earmarking scarce airport capacity for domestic connections will have a significant opportunity cost as that capacity will not be allocated to services that will most likely have a higher overall benefit to the users of aviation and the broader economy. Safeguarding slots will have an impact on the overall connectivity of the national airport system. Moreover, as domestic routes tend to use smaller aircraft that also implies that capacity at the congested airport will not be used in the most efficient way.

These potential consequences of support policies, including their indefinite or permanent continuation, need to be carefully considered alongside their beneficial outcomes. Such assessments are generally absent from decision-making processes.

Subsidising domestic connections

The US Government and governments in Europe both provide subsidies to airlines in order to ensure services are provided on particular routes. Public Service Obligations (PSOs) are subsidies for routes that airlines service in the Europe, with procurement governed under EU Regulation 1008/2008, Articles 16-18. All PSOs are published in the Official Journal of the European Union, but approval from the European Commission is not required. There are currently 176 PSO routes operating in the EU (excluding PSO routes operated in Norway, which is a country outside of the EU, but within the EEA).

The Essential Air Service (EAS) program in the US subsidises links to the national aviation system for about 60 communities in Alaska and 113 communities in the 48 contiguous states, Hawaii, and Puerto Rico. The EAS program began in 1978. At the time, the US Government was concerned that, after the passage of the Airline Deregulation Act, some communities would lose all air service as airlines could discontinue service to communities with low traffic levels or limited potential for profitability. The EAS program ensures that eligible communities would retain a link to the National Air Transportation System, which in practice means smaller communities and their airports have access to the national network via larger hub airports. The EAS program initially had a term (“sunset”) of 10 years. It was extended a number of times and the sunset date was lifted, thus, the program continues indefinitely.

Generally, outside of Alaska and Hawaii, the program subsidises two round trips a day with 50-seat aircraft or three to four round trips a day with 8- or 9-seat aircraft. DOT considers interline agreements among carriers and the onward connectivity provided at different hub airports when choosing to which hubs to link communities.

PSOs in Europe have a different rationale. Article 16 of Regulation 1008/2008 states that a member state may impose a PSO with respect to scheduled air services between an airport in the community and an airport:

- serving a peripheral region in its territory;
- serving a development region in its territory or a thin route to any airport on its territory, when the route is being considered vital for economic and social development of the region which the airport serves.

Carriers that operate routes under PSOs can receive financial compensation to cover operational losses and/or be granted a route monopoly to protect them from price competition for a period of up to four years, after which the situation shall be reviewed.

The PSO regime is compatible with European slot regulations in that slots may be reserved for PSO routes at congested airports, if there are available slots in the pool. Governments must also take into account the proportionality between the PSO and the economic development of the region concerned and alternative modes of transport, in particular when existing rail services serve the envisaged PSO route with a travel time of less than three hours. These are areas which were mentioned by experts as important to take into account.

In comparison to the EAS program, however, European countries that impose PSOs are not encouraged to assess the potential connectivity improvements beyond the direct connectivity impacts.

When providing subsidies for air services, policy-makers need to strike a balance between enabling an airline to run a route profitably, but at the same time avoiding paying excessive subsidies. Policy-makers have a number of tools to help achieve that, including establishing eligibility criteria that address subsidies per passenger, distance from the nearest hub, or passenger volumes. Funding for the EAS network increased by 600% between 1996 and 2016 in constant 2016 dollars⁸; the US has attempted to reduce costs and strike this balance with a USD 200 per person subsidy cap since 1990 in the 48 contiguous states (states excluding Alaska and Hawaii), unless the communities are located more than 210 miles from the nearest FAA defined large or medium hub airport⁹. This cap can and has been waived under certain circumstances.

Despite the difficulty in reducing the overall cost, the number of communities eligible for the EAS funding has been reduced significantly from over 700 in 1978 when the Airline Deregulation Act was passed to about 340 in 2016. In 2012, the Congress limited eligibility for EAS subsidies to those communities that were receiving subsidised services anytime between 30 September 2010 and 30 September 2011 (except for Alaska and Hawaii). The number of EAS subsidised communities has increased from 97 in the 48 contiguous states, Hawaii and Puerto Rico and 41 in Alaska in 1986 to 113 in the contiguous states, Hawaii and Puerto Rico and 60 in Alaska in 2018.¹⁰

A comparison of subsidies granted under the PSO regime in Europe by Williams and Pagliari (2004) reveals significant differences among and within countries in terms of the levels of average subsidy per passenger. For example, the Islands of Orkney and Shetland are very similar in terms of sector distance. However, in 2000 the average subsidy per passenger awarded in Shetland (EUR 83) was over double that in Orkney (EUR 40). In this case, the difference may be explained by different traffic volumes: services within Orkney had higher traffic volumes, which would allow for better utilisation of aircraft and economies of scale. The authors remark that more competitive PSO tendering processes tend to drive down subsidies per passenger, highlighting the importance of competitive tendering processes.

Safeguarding slots for domestic routes at congested slot-coordinated airports

A slot is an authorisation to land or depart an aircraft at a specific time at a specific airport. One slot is required for a landing and another (at a different time) is required for a take-off. Administrative slot allocation is the most commonly used method of allocating scarce airport capacity among airlines. The US airports are a notable exception: Apart from three slot-coordinated airports (JFK, LGA and DCA), big congested hubs in the USA are not slot-coordinated. Regulations for how slots are allocated are most commonly based on the World Slot Guidelines (WSG) published by the International Air Transportation Association (IATA). National governments have scope to add local rules or adapt the application of the guidelines when creating their national procedures. The WSG allow for local rules to be added in order to ensure market access for airlines to provide regional services.

At Sydney Airport a pool of slots is administratively reserved for operation of regional and intra-NSW services. The Regional Ring Fence (RRF) was introduced as part of the legislative arrangements prior to the privatisation of Sydney Airport in 2002. In recognition of the importance of providing air connectivity to regional communities, the RRF reserves approximately 25% of slots in the peak time of the day. The flights operated within the RRF carry approximately 5% of all passengers during the peak time.

Were these slots not ring-fenced, more profitable routes would tend to be favoured over those to remote regions as these tend to raise less revenue and incur higher costs per passenger. By not allocating the slot to the most economically efficient route, the overall welfare level is reduced. If the airport is severely capacity constrained this implies that the opportunity cost could be large. Although estimating the potential opportunity costs would be very useful to decision makers, the experts noted they are often not calculated prior to, or after slots being ring-fenced.

The experts also noted that new available capacity and hence a newly available pool of slots at an airport provides an opportunity to safeguard slots without distorting the existing route network. It does not, however, eliminate the problem of significant opportunity cost that will be incurred due to inefficient allocation of what might be expected to become a scarce resource. The participants also discussed the issue of whether carriers should be allowed to keep the slots from the ring-fence if they decide to cease operating the routes as intended by the policy-maker.

At Sydney Airport, rights to slots ring-fenced for domestic connections are given in perpetuity to the carriers providing these connections. The slot provisions require these carriers to use at least 80% of their NSW regional slots in any given schedule period, otherwise the slots will be returned to the regional slot pool for alternate NSW intra-state regional use. Moreover, the slots can be redeployed from one regional city to another without losing precedence.¹¹ This means that in practice the connections to specific destinations are not guaranteed despite the RRF.

In Japan, usage of slots at congested airports is subject to legal exemptions, most importantly for domestic routes safeguarded at Haneda airport. Haneda is the mega-hub airport located in Tokyo and is considered to be the focal point of national connectivity policy making. This has led to a number of unique measures intended to sustain local routes without losing flexibility of the network. Under the One Frequency Rule (see Chapter 4), if an airline is the only one operating a route to a specific domestic destination and wants to discontinue the route, it has to notify the Japan Civil Aviation Bureau (JCAB). The JCAB then tenders for an alternative service provider to use that slot to fly that specific route (without a subsidy being provided). Another carrier can then take over that slot and fly the designated route. If, however, an alternative airline is not found, the route is discontinued and the slot is returned to the slot pool. While the One Frequency Rule does not guarantee the continuation of a certain route, it increases the chances it is preserved. An example of this is the route from Haneda to Yamagata which

was preserved in 2003 as operation of the route went from ANA to JAS (that is currently merged with JAL). However in 2015 the Haneda-Oshima route, previously operated by ANA, was discontinued as no airline followed up to fly the route.

Routes to remote destinations with frequency of three or fewer per day are grouped together. The carrier can switch to operating one remote route to another provided they both belong to the same group – this feature of the system is called the Three Frequency Rule. The system gives airlines some flexibility as to which domestic routes are operated.

According to the participants, one way of ensuring continuity of service could potentially be to grant slots to the regional authorities to which the service is established. Some experts suggested that the regional authority could then choose which connections to the region are the most essential ones, hence preserving flexibility in the system while ensuring the services to the region are provided. Should the regional authority find no substitute service, then the slot would be returned to the general slot pool and used more efficiently.

Some experts suggested that, at a capacity constrained airport, where two or more pairs of slots become available at the same time they could be allocated together or as a bundle, with the understanding that they could keep all slots only if one or more of the pairs were used for domestic routes. Since slots at congested airports can be very valuable (slot pairs traded at Heathrow for GBP 15.4 million in 2013 according to CAPA¹²), this may present an interesting proposition to airlines. A potential challenge to such a system, however, would be that not all carriers could compete for such bundles – foreign carriers may not be able to operate domestic routes due to laws, regulations and restrictions within international Air Services Agreements.

Overview of support for domestic air connectivity in a selection of OECD countries

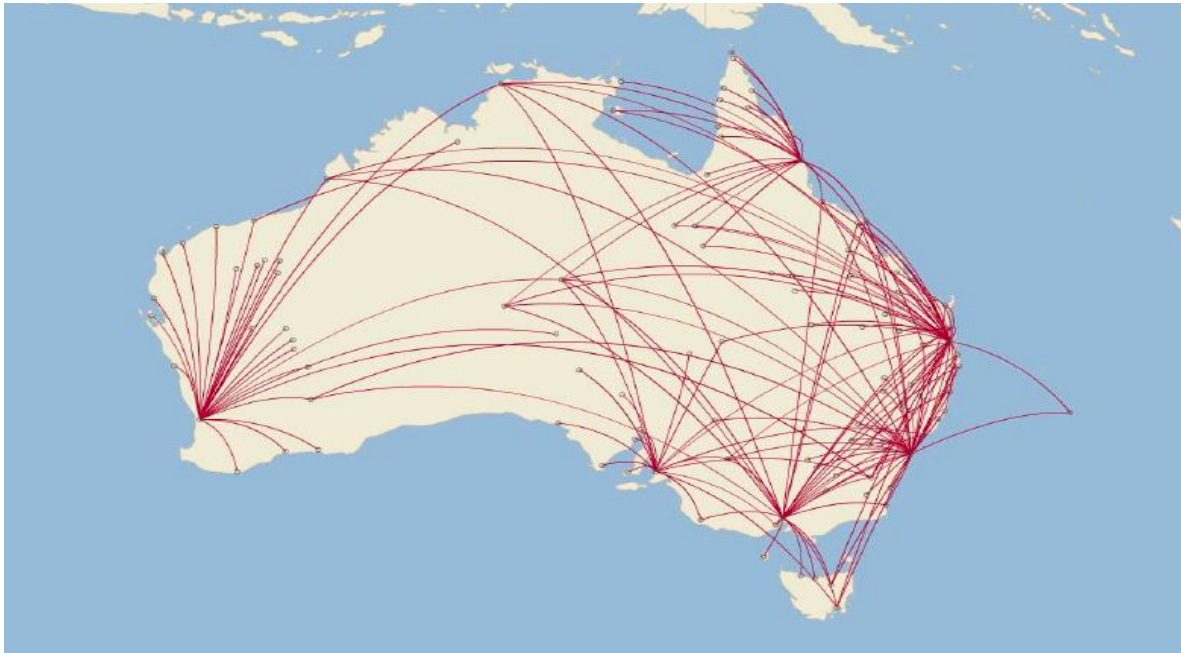
This section outlines the most important details of the support measures for domestic air connectivity in a selection of six OECD countries. More details behind these policies are set out in chapters 2, 3, and 4 of this report. The policies reviewed range from almost no support in Canada (where government support is limited to safety-related capital funding for regional airports) to extensively subsidised route networks in Norway and the USA.

Australia

Policy-making with respect to transport connectivity does not rely on a single comprehensive legislative act covering all transport modes. Each mode is dealt with individually in separate legislation.

Australia supports domestic air connectivity through several initiatives. In Western Australia, there are regulated intra-state routes that provide air carriers with a monopoly to serve particular routes. At Sydney Airport, a pool of slots is ring-fenced for regional services within New South Wales. In addition, Queensland has a Local Fare Scheme which offers subsidisation of airfares for eligible residents in remote communities of up to AUD 400 for return travel to particular destinations. The federal government subsidises the en-route air navigation charges for regional and remote services, provides targeted infrastructure investment for remote airstrips, and subsidises services to remote destinations through the Remote Air Services Subsidy (RASS) scheme. The RASS scheme is applied to weekly services connecting 266 communities in Australia.¹³ The domestic route network from non-hub airports in Australia is depicted in Figure 1.3.

Figure 1.3. Domestic route network in Australia



Note: Connections between airports that serve 5 million or more passengers per annum were excluded from the analysis. Source: InterVISTAS’ analysis of Innovata Schedules accessed via Diio. Data from August 2018.

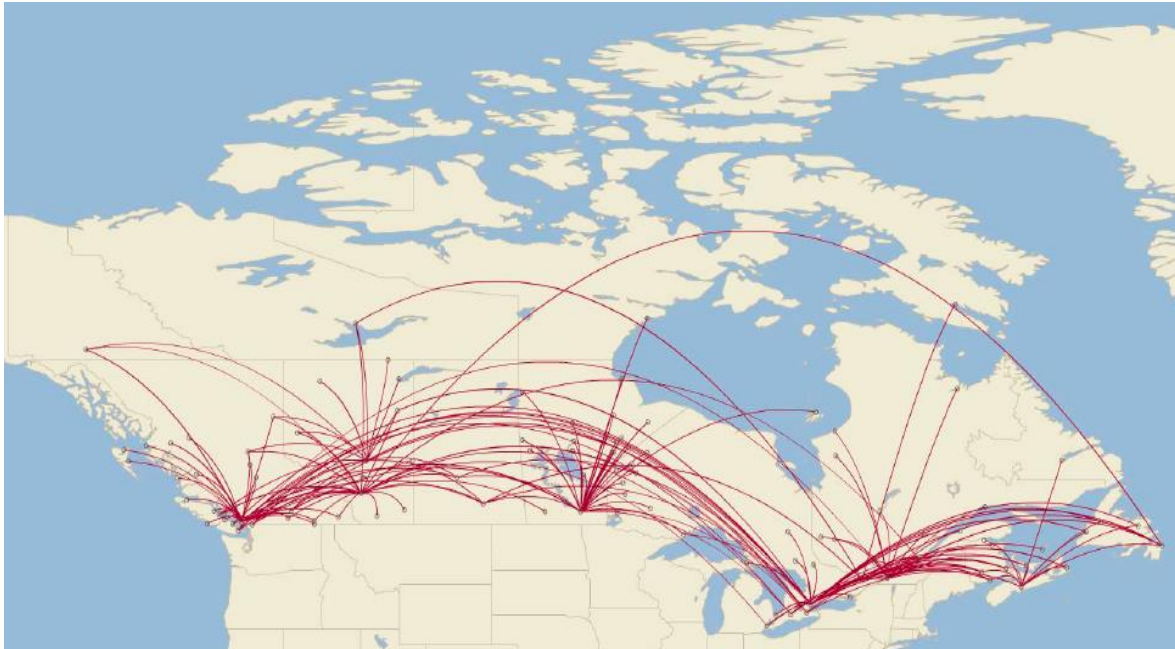
Canada

Canada has a comprehensive national transport policy act that covers all modes of transportation. Since 1967, Canada explicitly states its national transportation policy, which is intended to ensure a “competitive, economic and efficient national transportation system” wherein all modes of transport “serve the needs of its users, advance the well-being of Canadians and enable competitiveness and economic growth in both urban and rural areas throughout Canada.” (Government of Canada, 2018) Any considerations of regional air connectivity are thus an inherent part of Canada’s national transportation policy-making across all transport modes.

In Canada there are no subsidy programmes for regional air services to improve regional connectivity. The only support Canada provides is limited safety-related capital funding for regional airports that can potentially lower the costs of providing airport services from and to those airports. Canada occasionally launches ad hoc infrastructure programmes that can improve the economics of smaller airports, but funding under such programmes is uncertain.

The domestic route network from non-hub airports in Canada is depicted in Figure 1.4.

Figure 1.4. Domestic route network in Canada



Note: Connections between airports that serve 4 million or more passengers per annum were excluded from the analysis.

Source: InterVISTAS' analysis of Innovata Schedules accessed via Diio. Data from August 2018.

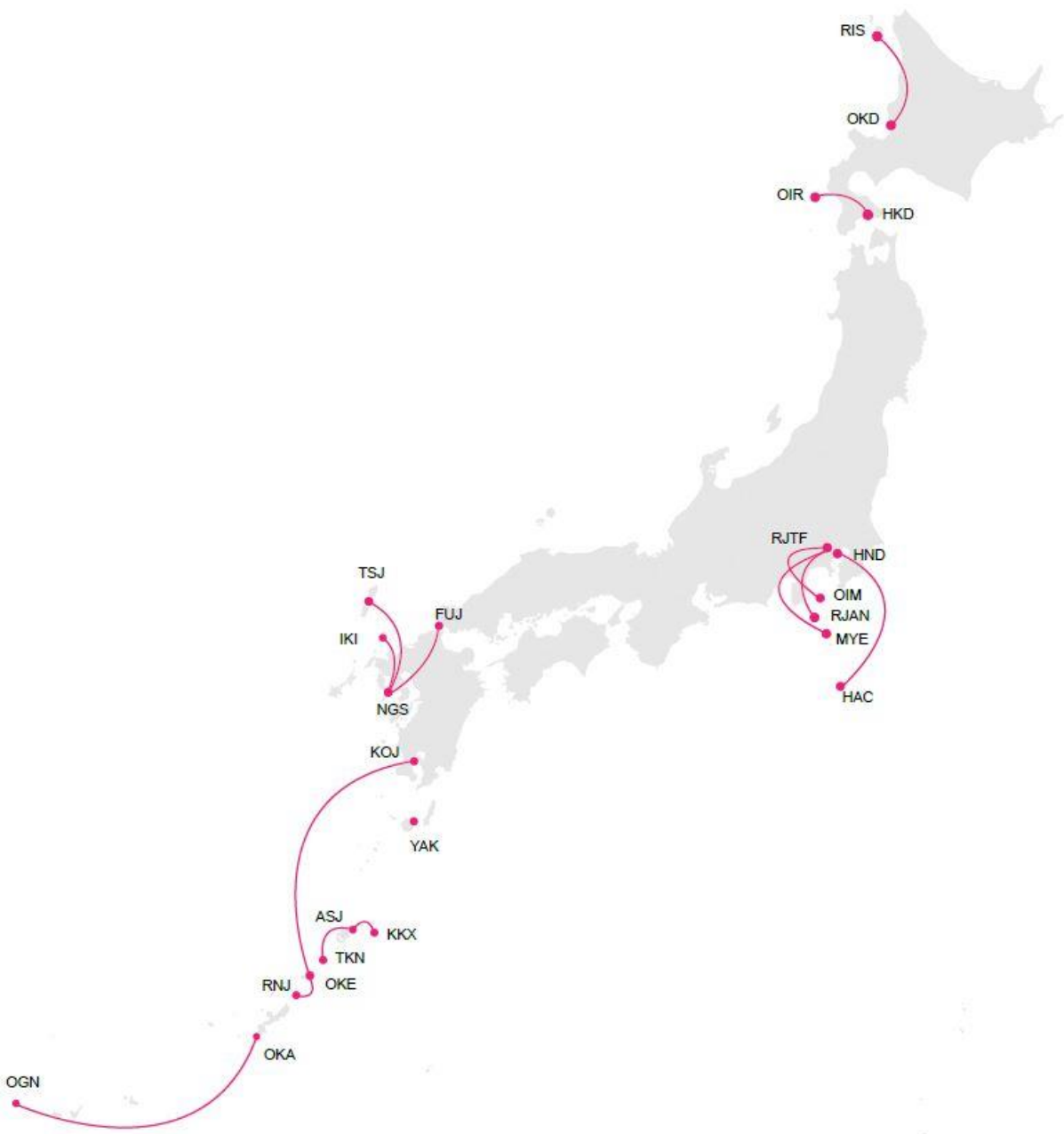
Japan

In Japan, domestic connectivity is considered across all transport modes. The decision to lift the demand-supply test (and therefore allow companies to create new routes without the need to prove there is demand) across the entire transport sector in 1996 was the first integrated policy decision across all transport modes. In 2011, domestic land, sea, and air transport support measures were consolidated into a uniform subsidy scheme.

In the 2017 fiscal year, the Japanese government subsidised airline operations on 14 remote island routes (see Figure 1.5). Moreover, a national border remote island grant to reduce air transport costs is provided for the residents of remote islands. As already mentioned, at Haneda slots are safeguarded for domestic connectivity, with One and Three Frequency Rules guiding slot allocation for particular domestic routes (see Chapter 4). Moreover, reductions in the level of airport landing charges, fuel tax rates and fixed asset tax rates are provided for services to remote destinations. Several local governments have also invested in regional airlines to support connectivity to and within their regions.

The domestic route network in Japan is depicted in Figure 1.5.

Figure 1.5. Domestic routes that are subsidised in Japan



Norway

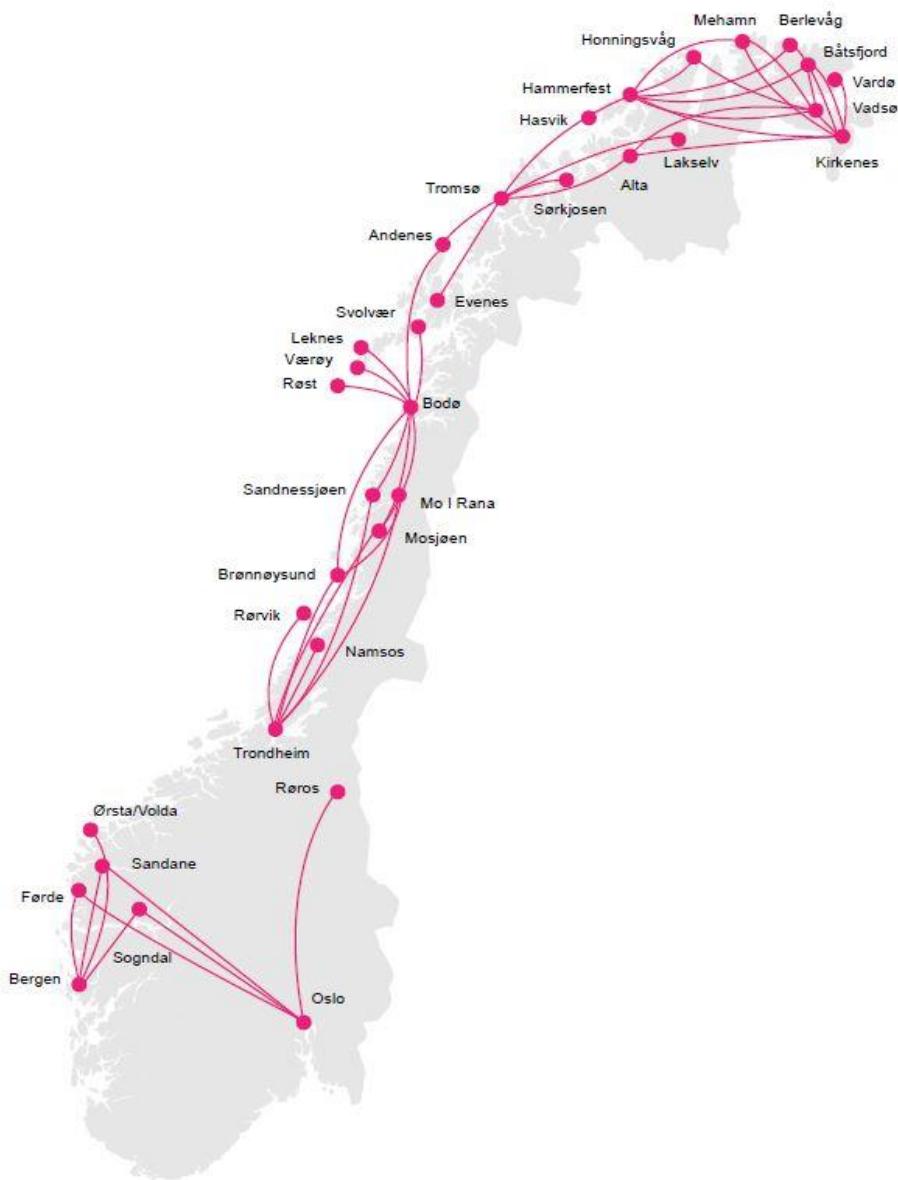
Norway has a highly connected domestic aviation market with three domestic routes among the ten busiest routes in Europe.¹⁴ The government supports connectivity with an extensive PSO network of around 60 routes (the largest in Europe), with average sector lengths of 200km. The network serves around 1 million passengers a year, i.e. about 10% of domestic seats at a cost of around NOK 765 million

in 2017. Norwegian PSOs do not connect passengers between regional destinations and Oslo only, but also between regional destinations and larger regional airports in Tromsø, Bodø, Trondheim, and Bergen.

As explained in Chapter 3, the government support for air transport services is rooted in transport policy objectives which are derived from overarching political objectives across all transport modes. In Norway, the three main objectives set out by the National Transport Plan, are (NMTC, 2017):

- Improve accessibility for passenger and freight transport throughout the country, where reduced travel time is a sub-objective,
- Reduce the number of traffic accidents,
- Reduce GHG emissions in line with low-emission objectives and reduce other negative impacts on the environment as well.

Figure 1.6. PSO route network in Norway



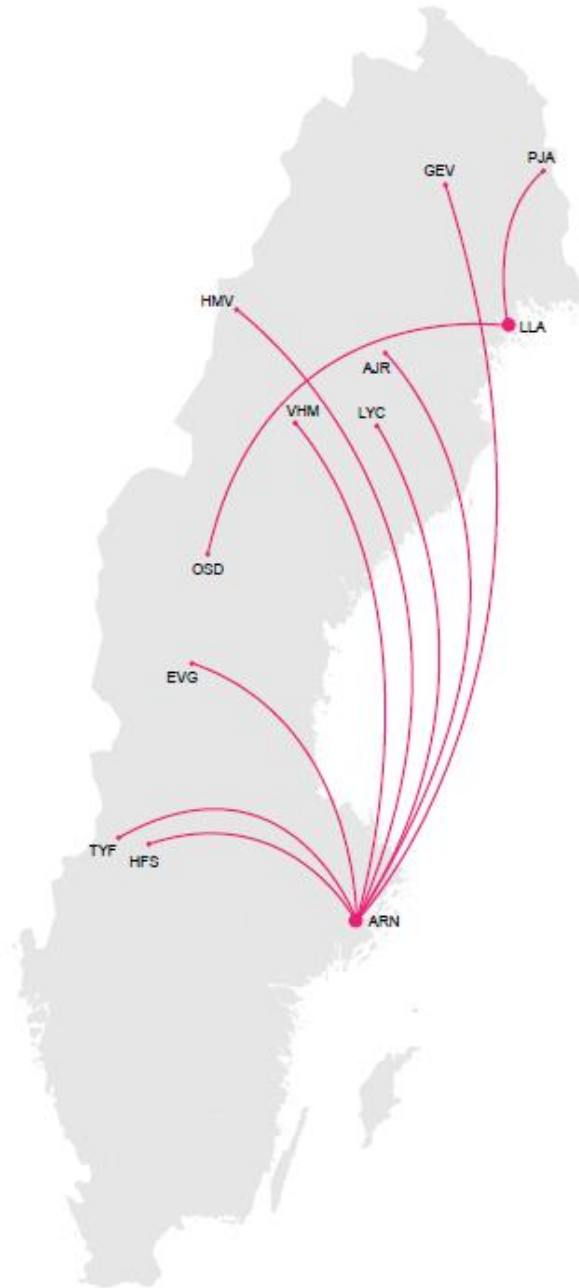
Sweden

With 10 designated routes in 2017, the PSO network in Sweden is not as extensive as the one in Norway. Eight of these routes connect regional destinations to Sweden’s national hub, Stockholm Arlanda. This is to a large extent due to the concentration of the Swedish population in the south of the country. In 2017, PSO routes served 123,000 passengers at a cost of SEK 85-90 million.

Domestic connectivity objectives are explicitly mentioned by the Swedish transport plan (Trafikverket, 2017). According to the Plan, transport policy should support equality of opportunity and treatment among the citizens. In detail, the relevant functional objectives with respect to connectivity are:

- The quality of business-related transports should be improved, thereby strengthening the international competitiveness,
- Augmented connectivity within and between regions, and between Sweden and other countries.

Figure 1.7. PSO route network in Sweden



USA

The United States supports air connectivity to regional airports with its Essential Air Service (EAS) program. The program currently subsidises carriers providing service to 63 communities in Alaska at a cost (annual contract subsidy rate) of almost USD 23 million per year, and to 111 communities outside of Alaska at a cost of over USD 293 million per year (US DoT, 2017). United States practice tacitly encourages regional air services at DCA airport, which has a certain number of slots allocated for “commuter” services. The US DoT also provides assistance via the Small Community Air Service Development Program (SCASDP) that provides revenue guarantees, marketing support, assistance with start-up costs, and covering costs of research studies for deployment of particular routes.

Like Australia, the United States does not have a comprehensive transport policy act. Policy making relies on numerous individual acts dealing with different transport modes through different federal support programmes and specific regulatory restrictions regarding, for example, safety and security.

Figure 1.8 Routes from non-hub airports in the United States of America



Note: Connections between airports that serve 25 million or more passengers per annum were excluded from the analysis.

Source: InterVISTAS’ analysis of Innovata Schedules accessed via Diio. Data from August 2018. Flights to/from Puerto Rico were excluded from the analysis.

The way forward: Designing support measures for domestic air connectivity

The experts at the workshop agreed on the following elements for a successful decision-making process for deciding on subsidies for routes to enhance domestic air connectivity. The first stage of the process should be evidence gathering, assessing the expected benefits from the intervention and the modal alternatives for enhancing connectivity. All stakeholders should be able to contribute, including local authorities, chambers of commerce, airlines, and local communities. Secondly, trust and credibility should be built between partners, with arrangements to share risk and funding responsibilities to avoid incentivising local stakeholder to request more support than is really needed. Thirdly, there should be an

appraisal stage, during which the value for money (VFM) for each route should be assessed and compared with other routes. Where some routes are more cost-effective than others this should be recognised and part of the decision making process. Finally, the routes do not have to be procured individually. Although the benefits and value for money of each route should be considered separately, it often makes sense to procure several routes at the same time as this would drive the economies of scale and attractiveness of the support programmes to airlines.

The experts agreed that the following aspects of policy design were most helpful in fostering an effective and efficient system to support domestic air connectivity.

Governments need to be clear about their domestic connectivity objectives. The objectives need to be considered across all transport modes

Governments should be clear on what their objectives are. If there are multiple objectives then policy-makers need to carefully consider whether these are compatible and if they can be realistically jointly achieved at the same time. Clearly stating all objectives will enable governments to make informed trade-offs between the policies available to promote domestic connectivity. This will also enable effective evaluation of the success of any support policies in the future.

A government's objective should be to optimise domestic connectivity across all modes of transport. Cost-benefit analysis (CBA) should be undertaken on the effect that air connectivity may have on road, rail and sea connectivity, in order to avoid adverse consequences.

Norway and Sweden are examples of countries that have overarching objectives for connectivity across modes. Building on these objectives, they have created criteria to assess domestic connectivity across transport modes to identify gaps in coverage.

When devising support policies, governments should consider the potential detrimental impacts of market interventions on national connectivity

When slots at congested airports are ring-fenced for domestic connectivity, as has been done at Sydney Airport, there is likely to be a significant opportunity cost of not operating the routes with higher value to the users of aviation and the broader economy. Ring-fencing of slots can be perceived as a distributive policy, which redistributes a scarce resource (capacity at a congested airport) to travellers on domestic routes. Analysis should be undertaken on the opportunity cost of any potential support policies and governments should be clear about the trade-offs they are making.

Moreover, when incentivising connections to one hub to provide travellers from the regions with international connectivity, governments should also consider the effect that will have on existing connections to other hub airports. These effects should be weighed carefully by governments. If providing connections to a national hub will imply lost connectivity to any foreign hubs, the benefits and losses should be carefully considered.

Possible impacts on other relevant transport modes should also be considered. For example, Japan consolidated domestic land, sea and air transport support measures into a uniform subsidy scheme, which enables the government to consider effects among the transport modes simultaneously and minimise unwanted impacts.

Governments should establish decision-making frameworks that are transparent and collaborative

A transparent process is the best way to build confidence in decision-making with communities, airports, airlines, and other stakeholders. Governments should be transparent about the predicted and actual cost of interventions and the effects they will have on existing networks. They should also be transparent when allocating money or resources. Where possible, bids for government support should be published online. Participants will be able to see why decisions are made and this reduces the risk of overtly political decisions as well as legal challenges to the process.

To improve the decision-making and the design of support measures, local communities should financially contribute to government measures in exchange for being able to shape the policy decisions on which routes should be supported and to what extent. This could avoid lobbying from local stakeholders for connections that should not be a priority. When supporting a route, local government involvement in gathering interest from local businesses and airlines for a route, producing marketing materials jointly with airlines, encouraging business travel and tourism will also increase the likelihood of success.

The SCASDP is an example of a scheme where local communities bid for support and have to thoroughly engage stakeholders at a local level in order to receive funding from the DoT. The bids for SCASDP's funding are published online and the process of awarding funding is transparent.

Governments should develop systems that are flexible and evaluated regularly

At the outset policy-makers should commit to a periodical review of support policies, to maximise the connectivity outcomes as well as minimise expenditure and any adverse impacts on the aviation route network and on other transport modes. A recent review of PSO routes in Norway brought about closure of four PSO routes. Once a government subsidy programme is launched, it is often difficult to terminate as many stakeholders tend to perceive the programme as an entitlement. A sun-set to automatically end support automatically after a set number of years is one tool to ensure evaluation of the outcomes of support measures. This is particularly important as new developments in transport systems and communications may affect the need to support domestic air connectivity. Governments should avoid locking themselves into inflexible systems that may not be suitable for the transport networks of the future.

Notes

- 1 See <https://aci.aero/news/2018/09/20/aci-world-publishes-annual-world-airport-traffic-report/> (accessed on 25 October 2018).
- 2 See <https://www.bts.gov/newsroom/2017-traffic-data-us-airlines-and-foreign-airlines-us-flights>.
- 3 See <https://www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/challenges-of-growth-2018.pdf>.
- 4 ACI EUROPE Annual Traffic Data, see <https://aci.aero/Data-Centre/Annual-Traffic-Data>.
- 5 See <https://ec.europa.eu/transport/sites/transport/files/c20173712-guidelines-pso.pdf>, page 13.
- 6 US Department of Transportation, see <https://www.transportation.gov/policy/aviation-policy/small-community-rural-air-service/SCASDP>.
- 7 Ibid.
- 8 See <https://fas.org/sgp/crs/misc/R44176.pdf>.
- 9 For more information, see https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/.
- 10 For a DoT list of communities eligible for EAS funding in 2016 and in 1987, see <https://www.transportation.gov/office-policy/aviation-policy/essential-air-service-reports>.
- 11 See https://www.pc.gov.au/_data/assets/pdf_file/0007/231586/sub063-airports.pdf.
- 12 See <https://centreforaviation.com/analysis/reports/heathrow-airports-slot-machine-hitting-the-jackpot-again-108646>.
- 13 See <https://infrastructure.gov.au/aviation/regional/rass.aspx>.
- 14 See <https://avinor.no/en/aviation/route-development/avinor-network/>.

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Chapter 2. Policy regarding regional connectivity across all transport modes in Australia, Canada, and the United States

Governments as a rule have regional connectivity as an explicit, or at least implicit, social policy goal. Only in exceptional circumstances would a government be expected to have a policy that limits regional connectivity.

This chapter examines regional connectivity policies in three geographically large OECD countries, Australia, Canada, and the USA. These three nations were selected because of the great distances that separate many of their communities and regions. The role of aviation in facilitating regional connectivity is significant in these nations.

Australia

Australia does not have a single comprehensive legislative act dealing with transportation which covers all modes. Each mode is dealt with individually in separate legislation, so there is no overall legislative statement of transportation policy concerning connectivity and why it is important. Individual Australian states also have legislation dealing with elements of the transport system.

The Australian Federal Standing Committee on Infrastructure, Transport and Cities submitted a report to the government in late 2016 (Standing Committee on Infrastructure, Transport and Cities, 2016), following its “Inquiry into the role of transport connectivity on stimulating development and economic activity” (Northern Territory Government, 2015). The importance of connectivity (both urban and regional) was clearly recognised, but many of the key recommendations were related to high-speed rail. Indeed, while there were recommendations concerning rail, hyperloop, mass transit, bus, road, and rail, no recommendations were made directly relating to aviation or airports and their role in fostering regional connectivity. There were recommendations concerning infrastructure that were relatively generic, and could thus pertain to airport and aviation infrastructure, however, these were not specifically noted as areas of concern.

The Government tabled a response to this report in early 2018 (Standing Committee on Infrastructure, Transport and Cities, 2018). Not surprisingly, given the focus of the Standing Committee report, the Government response focused on the same areas. The words “airport” and “aviation” do not even appear in the response.

Thus while there is no formal legislative basis for supporting regional connectivity across all transport modes, the Standing Committee did note that:

“The evidence presented to the Committee highlighted the importance of improved transport connectivity to the economic and social wellbeing of Australia. Improved transport connectivity allows greater accessibility to employment and markets, and cost savings in terms of reduced transit times, less traffic congestion and reduced transport costs. The key benefit of improved transport connectivity is its transformational effects—making cities and regions more accessible, more liveable and creating opportunities for economic development that could not otherwise exist.

Carefully planned, multi-modal, transport systems promise to make cities more efficient and liveable. The creation of new transport corridors and nodes has the dual advantage of creating more efficient use

of constrained urban space while offering opportunities for wealth creation. Rapid transit public transport creates the opportunity to create value and use that value to pay for the development of public transport—value capture.

Improved transport connectivity is also critical to regional development. It provides opportunities for decentralisation and the creation of new centres—rebalancing patterns of settlement. Greater regional connectivity will promote the development of regional areas, make relocation to these areas more attractive and reduce growth pressures in major cities.”

However, as will be discussed below, the lack of a national legislative transport policy statement on connectivity has not prevented Australia from incorporating connectivity into its individual acts of legislation, transport policy and practices. Australia directly took regional connectivity into account in developing the rules to allocate a limited number of slots at Sydney Airport.

Canada

Canada does have a comprehensive national transport policy act that covers all modes of transportation. Since 1967, Canada explicitly states its national transportation policy, which is intended to ensure a “competitive, economic and efficient national transportation system” wherein all modes of transport “serve the needs of its users, advance the well-being of Canadians and enable competitiveness and economic growth in both urban and rural areas throughout Canada” (Government of Canada, 1996). Thus regional connectivity is an inherent part of Canada’s national transportation policy.

The policy is based on the proposition that this desired national system is most likely to be achieved when “competition and market forces, both within and among the various modes of transportation, are the prime agents in providing viable and effective transportation services” (Government of Canada, 1996). While there is provision for regulation and strategic public interventions, primary reliance is on competition and market forces. Indeed, a Royal Commission report recommended a full user pay system, eliminating economic regulation to the extent possible as well as subsidisation (even cross-subsidisation) of services (Royal Commission, 1992). Canada thus relies primarily on the private sector to achieve its regional connectivity goals. In aviation, privately owned air carriers have arisen to provide international service, domestic service, regional service and northern services even in the absence of government support programmes.¹ That largest airports comprising the “National Airport System” have been transferred to private but non-for-profit corporations, and air traffic control and air navigation services have been transferred to a federally created not-for-profit corporation.

A summary of regional connectivity policy in Canada:

- Canada has no programmes that promote regional connectivity by air (i.e., nothing similar to the Essential Air Service programme in the USA).
- In fact, Canada’s adoption of a user-pay system eliminated the policy lever of cross-subsidisation that existed earlier on when regional economic development had been an explicit objective of the national transportation policy. The rent paid by Canadian Airport Authorities to access the airport lands, and the generally high government charges and taxes, result in a major contribution of the aviation sector to the general treasury. This raises the cost of aviation connectivity relative to other jurisdictions, particularly the USA. The Canadian Standing Senate Committee on Transport and Communications noted “*The Government of Canada should stop treating airports as a source of public revenue and start treating them as economic spark plugs.*” (Standing Senate Committee on Transport and Communications, 2012).

- Canada used to distinguish between northern and southern services, with air services to/from and between the remote northern communities lightly regulated to promote connectivity while deregulating air services in the more densely populated south. But this ended in 1996 with the passage of the Canada Transportation Act. The recent review of this Act devoted a chapter on the North, but its recommendations were limited to infrastructure improvements, encouraging cooperation between southern and northern air carriers, granting northern carriers the opportunity to compete for government travel and considering their unique conditions when making or changing regulations (Canada Transportation Act Review, 2015). However, as noted previously, numerous carriers exist which provide connectivity between northern communities and the more populous south, even in the absence of government intervention.
- Canada does provide some funding for smaller airports, but the Federal Airport Capital Assistance Program is small and geared only to safety-related projects, not projects intended to promote connectivity. Some provinces have occasional minor airport support programmes. Canadian airports currently are not allowed access to federal infrastructure funding.
- Canada's recent focus for general infrastructure funding has been on projects that facilitate gateways for international trade. Although there is no connectivity element within a region, there is a spin-off benefit for connectivity between rural communities and foreign points.
- Canada does subsidise passenger rail services, but the national rail carrier, VIA Rail, offers limited services outside the highly populated Toronto-Montreal corridor. It is not a major player in promoting regional connectivity. The Hudson Bay Railway provides the only year-round ground transportation service between some remote Manitoba communities (mostly First Nations communities) but a flood in May 2017 closed the line north of Gillam and the line has yet to be restored, though the recent sale of the line to a consortium will have repairs underway soon.²
- The intercity bus industry is not subsidised. Entry is regulated by some provinces in order to allow incumbent carriers to earn sufficient revenue on the major routes in order to internally cross-subsidise low volume routes. It should be noted that recently Greyhound Canada announced a pending cessation of all services in Alberta, Saskatchewan, Manitoba and its services in northwest Ontario, and all but one service in British Columbia.³

Although Canada's transport policy has a connectivity objective for both rural and urban centres, the government relies on the private sector to accomplish this, limiting its contribution to matching capital for some transportation infrastructure projects. However, its high level of taxes and user charges is viewed by some as an impediment to connectivity. Moreover, Canadian policy places economic efficiency as the primary goal, with social goals as a secondary element. Thus while connectivity is supported in principle, there is relatively little the federal government does in practice to promote connectivity, preferring to rely on private commercial operators to play the lead role and supplementing this with infrastructure support.

The United States

Like Australia, the United States does not have a comprehensive transport policy act, but rather has many individual acts dealing with the various modes (aviation, highways, motor carriers, high-speed ground transport, rail, marine, urban mass transit) as well as federal funding programmes and specific regulatory restrictions (safety, security, hazardous materials, labour, etc.). There had been a statement of national transport policy in the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) (H. R. 2950).⁴ However, the 1998 Transportation Equity Act for the 21st Century (TEA-21) eliminated the

purpose statement and the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) continued with the absence of a purpose statement (The Brookings Institution 2008).

There is thus no clear statement of a national transport policy related to connectivity, although as will be discussed below, the United States has taken regional connectivity into account in its administration of slots at slot controlled airports and in the Essential Air Services (EAS) programme.

The Department of Transportation (DoT), moreover, recently published a white paper on transport connectivity (DoT 2015). It defined connectivity as follows:

“Connectivity, or accessibility, is the degree to which the transportation system provides access to essential services and other destinations. In other words, how well the transportation network connects people to the places they need to go. A number of factors affect accessibility including mobility (physical travel), land use patterns (the geographic distribution of services and activities), and mobility substitutes such as telecommunications and delivery services.”

The paper goes on to note the linkage between transportation and economic opportunity and offers proposals to advance the state of practice concerning connectivity in the USA, particularly with respect to disadvantaged populations.

Domestic air connectivity in Australia, Canada, and the USA

Issues impacting regional air connectivity

Challenges to domestic air connectivity vary not only across jurisdictions, but across airports within a given jurisdiction. Nevertheless, there are three general potential impediments to regional air connectivity: regulatory impediments, airport access, and cost of service.

- **Regulatory impediments.** Are there any regulations or legislation governing who can provide regional air services and how such services shall be provided? In the earlier days of aviation, governments determined what services could be provided by whom, what fares could be charged, frequency of service, etc. Connectivity decisions were made by government rather than the market. It is likely that some services that could have been supported might not have been allowed out of an abundance of caution by government towards a fledgling industry. Governments tended to be more concerned about preserving existing services (and the connectivity they provided) rather than creating new opportunities that could potentially threaten existing services.

In general, as the industry matured, there has been a move by governments towards deregulation of domestic air services and towards “open skies” for international air services. The industry was shown to be robust enough that even when airlines ceased services, new entrants would arise to offer new and innovative services. However, some elements of regulation still exist that could potentially affect the degree of air connectivity a community or region enjoys.

- **Airport access at slot-constrained airports.** Airports that are not congested or slot controlled have the physical capacity to accommodate regional air services, and thus connectivity is not an issue from an access perspective. Airports that are slot-controlled, however, have more demand than

capacity, and capacity must be rationed. In general, when demand exceeds supply, price is the mechanism by which the scarce good or service is allocated – those that value the good or service the most and are willing to pay the price, obtain the good or service. This poses a challenge for regional air connectivity, since carriers providing long-haul service on large aircraft tend to be both more able and willing to pay a high price to obtain scarce slots. Government intervention would be needed if scarce slots were to be made available for regional services by small aircraft.

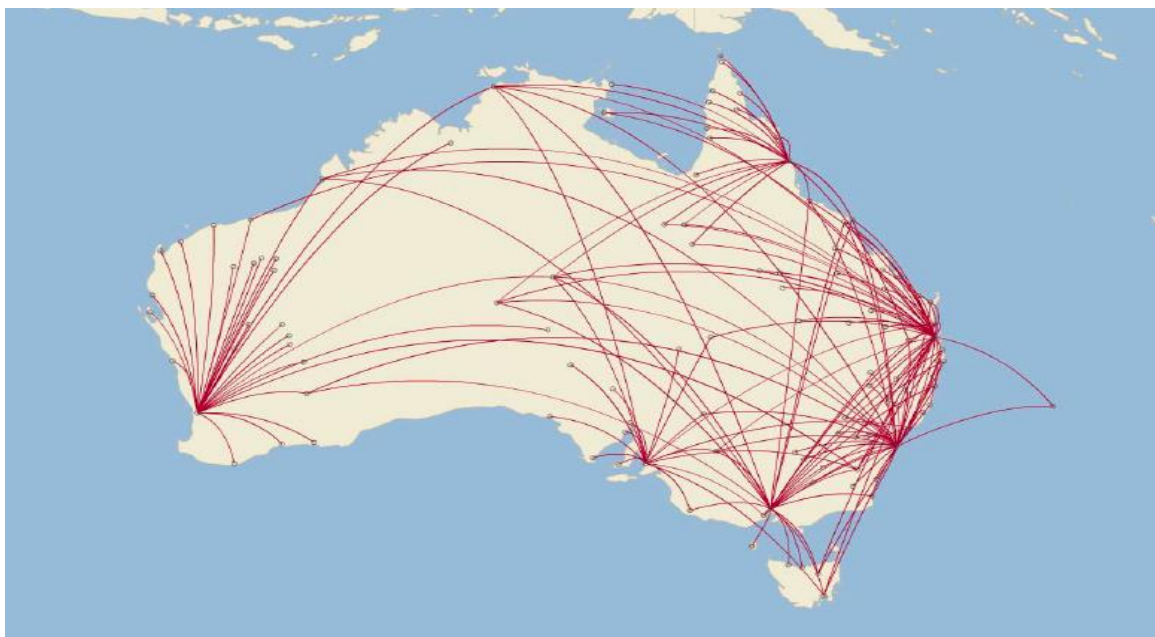
- **Cost of service.** The cost of providing regional air services tends to be higher, both for airport and airline costs. With fewer passengers to spread fixed costs across and higher per passenger operating costs of small aircraft, the financial viability of regional services can be an impediment to connectivity. Airports have tried to address part of this concern by implementing aircraft weight-based charges, which lead to proportionately lower costs for lighter (smaller) aircrafts and proportionately higher costs for larger aircrafts that have a greater ability to pay given the larger traffic base. Even so, the economics of operating small aircrafts, even with reasonable load factors, are more of a challenge. The small traffic base also poses challenges in maintaining a reasonable degree of frequency of service.

Domestic air connectivity – status and challenges

The following examines the status of the three elements of regulatory impediments, airport access and cost of service and the challenges, if any, they present in the three jurisdictions.

Australia

The following map shows existing scheduled services from non-hub airports in Australia (during the month of August 2018). There were 70 Australian domestic markets that had scheduled air service to a hub airport in this period. There were another 37 Australian domestic markets with access to two or more hubs. In total, there were 107 communities with a scheduled air service to at least one hub airport.

Figure 2.1. Existing scheduled services from non-hub airports in Australia

Notes: Hub to hub itineraries were excluded for this analysis. Here we define “hub” as being an airport with approximately 5 million or more passengers. This includes the top seven airports measured by total passengers. Traffic at the eighth largest airport in Australia drops to just over 3 million annual passengers. Domestic air service is largely deregulated. There are, however, a few regulated intrastate routes in Western Australia that provide air carriers with a monopoly. The services that are regulated tend to be very small markets that the Government of Western Australia was concerned could not support service in an open environment. Thus carriers were provided with monopoly rights to support (but not guarantee) service viability. The majority of the intrastate services, however, are not regulated and these tend to support viable air services.

Source: Innovata Schedules accessed via Diio – August 2018; domestic markets only.

Thus in Australia, there are few air service related regulatory impediments to offering regional air services. These services are unlikely to be viable without regulation, so regulation can be viewed as supporting connectivity rather than as an impediment to connectivity.⁵

As for airport access, this is problematic at only one airport: Sydney Kingsford Smith Airport. Primarily due to noise considerations, the number of aircraft movements at Sydney Airport is capped at 80 per hour (other than curfew periods, when no slots are allocated). Moreover, the Minister has the authority, subject to consultation and support from the House of Parliament, to set a lower cap. There tends to be pressure on the government from those living near the airport for reductions in noise (i.e., fewer operations), so there is a potential for an even lower cap in the future. All international, domestic and regional (within New South Wales) services must fit within this limitation and there is competition for access to slots. The cap on slots thus can represent a real limitation to regional connectivity.

It should be noted that while there is physical capacity to operate more services at Sydney Airport, the noise impacts continue to pose a challenge to increasing aircraft movements. The cap on slots is thus likely to remain an issue for the near to medium term (until the second Sydney airport is operational).

Thus the Australian federal and state (New South Wales) governments face the challenge of how to support regional air connectivity to/from a slot controlled airport. Slots allocated to regional services by small aircraft mean that fewer long-haul international services by wide-body aircraft can be accommodated. For the airport, international services tend to generate far higher aeronautical and non-

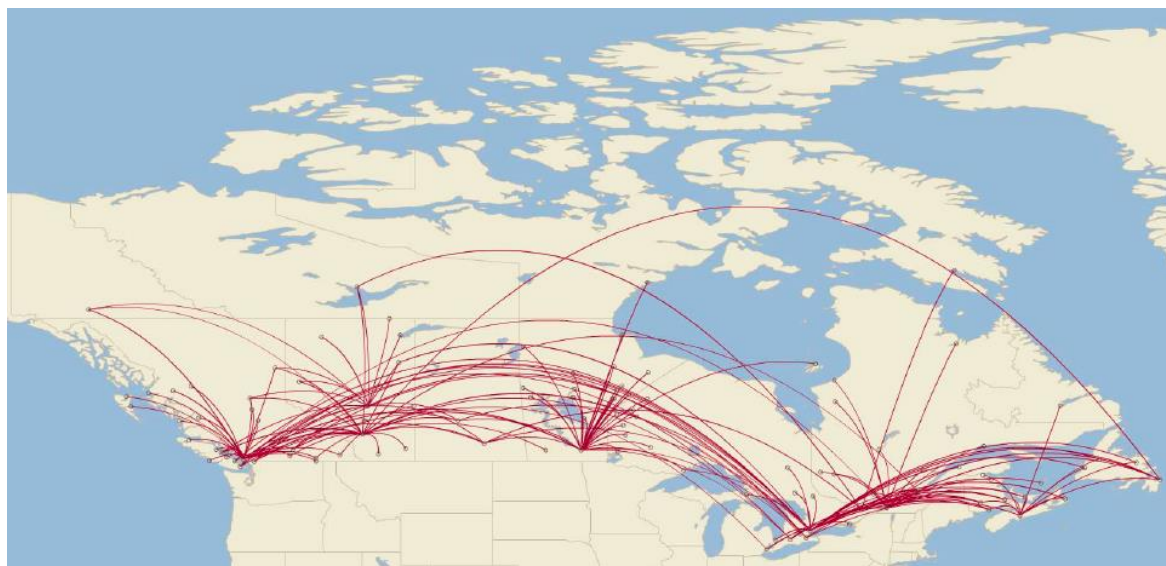
aeronautical revenues than regional services. Long-haul international services also bring in tourists and business travellers, and facilitate international trade. So from an airport and government revenue perspective, international air services can be more lucrative, and potentially have higher overall consumer welfare relative to regional services.

The final general impediment to regional air services relates to cost of service and lower traffic volumes. In Australia, as elsewhere, the provision of regional air services face the challenges of lower traffic volumes and higher per passenger costs of operation.

Canada

Similar to Figure 2.1, Figure 2.2 shows existing scheduled services from non-hub airports in Canada. There were 71 Canadian domestic markets that had scheduled air service to a hub airport in this period.⁶ There were another 31 Canadian domestic markets with access to two or more hubs. In total, there were 102 Canadian communities with a scheduled air service to at least one hub airport, numbers remarkably similar to Australia.

Figure 2.2. Existing scheduled services from non-hub airports in Canada



Notes: Hub to hub itineraries were excluded for this analysis. Here we define “hub” as being one of the top eight airports, each of which has 4 million or more passengers. Outside the top eight, Canadian airports are largely regional in nature or have traffic volumes below 2 million.

Source: Innovata Schedules accessed via Diio – August 2018; domestic markets only.

Like in Australia and the United States, domestic air service is deregulated, so there are no air service related regulatory impediments to offering regional air services.

Unlike in Australia and the USA, however, Canada has no slot controlled airports.⁷ Toronto and Vancouver are classified as Level 3 Coordinated airports by the International Air Transport Association (IATA), but both indicate that they generally can accommodate requests for new services within a couple hours of the requested slot time. Other airports in Canada are not slot constrained. Regional air connectivity thus does not face any significant airport access impediments in Canada.⁸

The main challenge to regional air services therefore relates to cost of service and lower traffic volumes rather than any regulatory impediment or access limitation.

The United States

Finally, there is a very high degree of domestic air connectivity in the USA, as shown in Figure 2.3 below. There are 127 domestic markets with access to one hub airport. There are another 216 domestic markets with access to two or more hubs. In total 343 USA domestic markets were connected by scheduled air service to one or more hubs.

Figure 2.3. Existing scheduled services from non-hub airports in the United States



Notes: Hub to hub itineraries were excluded for this analysis. Here we define “hub” as being an airport with 25 million or more passengers. This includes the top 21 airports measured by total passengers.

Source: Innovata Schedules accessed via Diio – August 2018; domestic markets only (USA excludes Puerto Rico).

Domestic air service in the USA is largely deregulated. While there are regulations governing certain elements such as pricing disclosure, there are no regulations limiting entry into (or exit from) any domestic market by any licenced airline. So there are no air service related regulatory impediments to offering regional air services.

Again, like Australia, one impediment to regional air connectivity stems from slot restrictions at certain airports. The Federal Aviation Administration (FAA) limits operations at three airports deemed to be high density traffic airports: John F. Kennedy International Airport, LaGuardia, and Ronald Reagan Washington National airports. This is accomplished through the use of slot controls.⁹ The limitations on access to these three key airports could potentially negatively impact regional air connectivity in the USA.

The other main impediment to regional air services relates to cost of service and lower traffic volumes, as is the case in other jurisdictions.

Overview of the current support systems

Despite generally widespread recognition of the importance of transport connectivity, how governments encourage, or actively support improved regional connectivity, varies dramatically across countries.

Australia

Regulation is in place to grant monopoly protection in exchange for service to some small communities. Otherwise, market entry is open and air connectivity is promoted by commercial operation of airlines.

Special treatment for regional services (grandfathering regional service slots) is in effect at the only airport where slots are an issue: Sydney. Comparable limitations on allocation of slots do not exist at other Australian airports, which can assign a slot to any type of service. The *Sydney Airport Demand Management Act* of 1997 (Government of Australia 1997) specified the operating slot capacity of Sydney International Airport, and effectively established the power of the minister to establish regulations for slot allocation guidelines. The Minister has the authority to appoint and remove a slot management company. Further the Act clarifies that the slot management company is not an agent of the government, nor is it a public authority.

Slots grant permission for a gate movement at a specified time on a specified day. They are not transferable (other than in accordance with the rules of the Slot Management Scheme) and do not create rights or obligations that are enforceable against any person.

Australia has assigned slots at Sydney to regional air services (Government of Australia, 2013). These slots are grandfathered, and hence permanently subject to the “use it or lose it” provision. There is provision for additional permanent regional service slots to be created, as well as terminated. An operator can apply for a slot to operate a regional service outside of the permanent regional service series, but only if the slot is not in a peak period, or it is to meet a special need and is not part of a slot series (i.e., included in a group of slots allocated together). Requests for a slot for an aircraft with fewer than 18 passenger seats have to come from the permanent regional service series, or if the operator has historical precedence for those slots.

If slots exist beyond the grandfathered slots, any operator can apply for them. The Slot Manager must ensure that as close to 50% of these slots as possible go to new entrants. In addition, the Slot Manager must ensure, to the extent possible, that a permanent regional service series is offered to an operator seeking to operate a regional service. A permanent regional service series slot can only be swapped for a non-regional service slot only if that slot is within 30 minutes of the regional services slot.

One of the factors the Slot Manager needs to consider for slots with no historical precedence, is “maintaining a service to routes where regional services have ceased to operate, and of introducing a service to routes where no regional service operates” (Government of Australia, 2013).

Queensland’s Local Fare Scheme offers subsidisation of airfares for eligible residents in remote communities of up to AUD 400 for return travel between select points. The federal government subsidises the enroute air navigation charges for regional and remote services, provides targeted infrastructure investment for remote airstrips and subsidises remote air services. This latter programme, the Remote Air Services Subsidy (RASS) Scheme connects 266 communities directly, including 86 Indigenous communities, and another 106 communities receive their mail through one of the 266 directly served RASS ports (Government of Australia).

Canada

Canada imposes no limitations on air connectivity through market entry controls.

To date, Canada has not needed to implement any programme to ensure airport access for regional services as there are no slot controlled airports in Canada, other than Billy Bishop Toronto City Airport, which only has regional services by turboprop powered aircraft.

Canada has no programmes in place to address the economics of regional services. It does provide limited safety-related capital funding for regional airports that can potentially lower the costs of providing airport services. It also has occasional ad hoc infrastructure programmes that can improve the economics of smaller airports, but funding under such programmes is uncertain. There are, however, no subsidy programmes for regional and remote (or any) air services to improve regional connectivity.

The United States

There are no regulations in place that restrict entry into any domestic market by any licenced air carrier. Open entry does not place any limitations on air connectivity.

The United States currently takes into account regional air services in its administration of slot controls at JFK, LGA and DCA airports. Each of these airports has a certain number of slots allocated for regional services by turboprop aircraft seating of fewer than 75 passengers or turbojet aircraft with a certified maximum seating capacity of fewer than 56, referred to as commuter operations. These slots are explicitly stated in the Code of Federal Regulations, Title 14 (Aeronautics and Space), with 14 of 68 hourly slots at LGA allocated to commuter services and 11 of 60 hourly slots at DCA (Table 2.1). The number of slots at JFK varies by time of day. Between 10 and 15 slots are assigned to commuter operations per hour during the slot controlled time between 3pm and 5pm (Table 2.2). There was also provision in regulations for commuter slots at Newark Liberty International (EWR) and Chicago O'Hare International Airport (ORD), but slot controls were lifted at O'Hare back in 2002 and at Newark in 2016.

Table 2.1. Number of slots allocated per hour at LGA, DCA, EWR and ORD, by class of user

Class of User	LaGuardia (LGA)	Washington National (DCA)	Newark (EWR)	Chicago O'Hare (ORD)
Air Carrier	48	37	40	120
Commuter	14	11	10	25
Other	6	12	10	10

Source: US Code of Federal Regulations, Title 14 §93.123 High density traffic airports.

Table 2.2. Number of slots allocated per hour at JFK, by time of the day and class of user

Hour of day	Air Carrier	Commuter	Other
1500	69	15	2
1600	74	12	2
1700	80	13	0
1800	75	10	2
1900	63	12	2

Source: US Code of Federal Regulations, Title 14 §93.123 High density traffic airports.

Any unused air carrier slots could be used for commuter services. Any unused commuter slots could be used for other operations. Slot allocations can also be suspended if it is found that such action is necessary for the efficient use of the airspace. Slots can also be withdrawn if they are needed to fulfil international obligations or for Essential Air Services operations or simply reducing the number of slots. Withdrawal of slots will be in accordance with a priority list (separate for air carriers and commuter operations) developed by a random lottery by the FAA (FAA 2002).

The Office of the Secretary of Transportation can make slots available if needed for an EAS service to/from a high density traffic airport (FAA 2002).

In general, slots that are not used 80% of the time over a two-month period are recalled by the FAA.¹⁰

The initial allocation of slots was based on the usage of the slots on 16 December 1985. Slots (except those allocated for international services) can be transferred (bought, sold or leased) or returned. If there are available slots, they are distributed by lottery separately for air carriers and commuters. In the first round of the lottery, 25% of the available slots (or two slots, whichever is greater) are reserved for new entrants. If new entrants do not take all the available slots, they become available to incumbents.

The United States has its Essential Air Service programme that provides financial support for regional air services. It was intended to ensure that small communities with existing air services prior to deregulation would continue with at least a minimal level of service post-deregulation. In the USA the Department of Transportation “is mandated to provide eligible EAS communities with access to the National Air Transportation System.” (DoT, online). The programme subsidises eligible services from small communities to either medium or large hubs, generally for two daily trips in aircraft with 30-50 seats, or more frequencies in smaller aircraft in order to ensure their continued access to the national air transport system. The DoT currently subsidises carriers providing service to 63 communities in Alaska at a cost (annual contract subsidy rate) of almost USD 23 million per year (DoT, data for 2018) and to 111 communities outside of Alaska at a cost of over USD 293 million per year (DoT, data for 2018).

The US DoT also provides assistance via the “Small Community Air Service Development Program” which can provide revenue guarantees, marketing support, assistance with start-up costs, and studies (DoT, online).

Domestic air connectivity support going forward

Outcomes and challenges of the domestic air connectivity support system

The implementation of the various support systems across the countries led to different outcomes and challenges.

Australia

In general, there appears to be a general recognition that some regional services need to be regulated (i.e., given monopoly status in exchange for service commitments). It should be noted that the

Government of Western Australia tries to promote competition to the extent possible, and reverts to regulation only when necessary.

There are concerns about the fares on regulated (and unregulated) regional services, but these largely stem from the economics of small, unbalanced, seasonal, and inconsistent traffic volumes and high airport and aircraft costs, though the granting of monopolies may also play a role.

In Australia there appears to be a degree of conflict between stakeholders concerning the special treatment of regional service to/from Sydney Airport. Some, like the Tourism and Transportation Forum, advocate the government to consider “removing specific regulations regarding regional air services, to provide airlines with the ability to use any slot held at Sydney Airport to operate either a regional or non-regional service, as is the case at all other airports across Australia.” (DoT, online). Others, including regional air carriers, advocate allowing more slots to be set aside for regional service to spur regional economic development. From a pure economic efficiency perspective, allowing carriers to use slots for the most valued services would be best, but would likely lead to a transfer of some, if not many or all, regional services to long-haul services. However, there are valid social goals related to regional connectivity that can justify use of slots for services that do not maximise economic efficiency.

As for the high cost of regional air services, some have advocated for modest subsidisation of some services in order to promote regional connectivity. Options suggested include state incentives or guarantees to air carriers to allow fares at a fixed price for local residents.¹¹

Canada

The Government of Canada relies on the private sector for regional air connectivity, and this has largely worked despite the lack of direct government support. Although the government does provide some regional airport infrastructure funding support, the amount is limited and ad hoc in nature. In addition, as has been pointed out by numerous observers, federal policy has led to the aviation industry contributing far more to government coffers than it receives in government support, to the detriment of travellers and shippers.¹²

The United States

In general, there appears to be general support for the existing support programmes respecting regional air connectivity. The Essential Air Services programme was created as a transitional programme (initially to end after 10 years) to ensure smaller communities did not lose the air services they had prior to airline deregulation. The programme may have had its opponents, and was rumoured to be a target for the current administration’s budget cuts, but the programme continues to exist and has been in existence since 1978, through many administrations and legislative changes.

The provisions for slots being allocated for commuter services also remain in place. The FAA did issue a Notice of Proposed Rulemaking (NPRM) regarding slot management and transparency for the three major New York area airports in January 2015 (Docket FAA 2014-1073). This would have treated all three airports in the same manner, kept the slot cap, but changed the secondary market for slots. It would have kept the three categories of slots: air carriers, commuters, and others. However, given “changes in market conditions and operational performance” and the withdrawal of Newark from slot controls and reclassification as a Level 2 Schedule-facilitated airport under IATA’s Worldwide Slot Guidelines (WSG), the NPRM was withdrawn in May 2016. The FAA reserved the right to issue a Future NPRM, but did not commit to any particular action except to continue to monitor the situation and take action if necessary.

Concluding remarks

While economic efficiency is the primary goal of many nations regarding transportation, a number of nations have taken the approach of accepting a lower level of economic efficiency in exchange for reaching social policy goals regarding regional connectivity. Some may view this as a trade-off between economic efficiency and non-economic social objectives of the nation. An alternative view is that these policies seek to balance the true economic calculus by recognizing external benefits, or wider economic benefits as they are often referred.

Connectivity has real and tangible productivity enhancing benefits in the wider economy. Ignoring wider connectivity goals in transportation policy and decision making could lead to sub-optimal results from a socio-economic perspective. Improving the connectivity of smaller and remote communities is a legitimate goal of transportation and economic policy.

Notes

- 1 Much of Canada’s north is only accessible year round by air services. Numerous small and medium sized carriers provide extensive service to northern communities.
- 2 CBC News, “Railway to Churchill, Man., sold — repairs to begin ‘immediately’” accessed at <https://www.cbc.ca/news/canada/manitoba/churchill-railway-sale-omnitrix-1.4807450> .
- 3 CBC News, “Greyhound Canada to end bus service in Western provinces”, see <https://www.cbc.ca/news/business/greyhound-cancellations-alberta-manitoba-saskatchewan-british-columbia-1.4739459>.
- 4 The purpose of the act was “to develop a National Intermodal Transportation System that is economically efficient, environmentally sound, provides the foundation for the Nation to compete in the global economy and will move people and goods in an energy efficient manner.”
- 5 Some would argue that the lack of competition on these routes leads to higher fares than would be expected even based on higher airport and operating costs and that this impedes connectivity.
- 6 Here we define “hub” as being an airport with over 4 million or more passengers. This includes the top eight airports measured by total passengers, and covers the breadth of the country. Traffic at the ninth busiest airport in Canada (another Toronto area airport) drops below 3 million and traffic at the tenth busiest airport drops below 2 million.
- 7 There is one special case in Canada of a smaller airport that does have slot constraints. Billy Bishop Toronto City Airport has slot capacity limitations that are imposed by the Tripartite Agreement between PortsToronto (the operator of the airport), the City of Toronto, and Transport Canada. The airport is on an island in Lake Ontario, close to downtown Toronto, so noise is an issue. The agreement not only limits the number of slots, but also operations to turbo-prop commuter aircraft and general aviation. No commercial jet operations are allowed, so many of the services from this airport are regional in nature (including to/from USA). Airport access for regional services is therefore not an issue.
- 8 It should be noted that in Canada, following the merger of Canadian Airlines International into Air Canada in 2000, slots at Toronto Pearson Airport were allocated to domestic carriers under a consent order between Air Canada and the Competition Commissioner. The slot coordinator for Toronto Airport facilitated this transfer, which technically did not meet the IATA Worldwide Slot Guidelines (WSG) as it gave preference to slots surrendered by Air Canada to domestic carriers and excluded international carriers from access. The consent order also made terminal facilities at Hamilton International Airport available to other carriers (as a result of the merger, Air Canada had effectively procured the right to all terminal facilities) and kept Air Canada out of the market for a year to allow competing services to be established. Prior to this, in 1988, the Minister of Transport imposed a cap of 70 peak hour aircraft movements in response to concerns about congestion delays and safety. No provision was made for regional services, although 4 of the 70 slots were allocated to general aviation. Later, the cap was increased to 82 (75 for commercial operations and 7 for general aviation). The cap was removed in favour of the current IATA process in use.
- 9 Chicago O’Hare used to be slot controlled, but no longer is. O’Hare, Los Angeles, San Francisco and Newark Airports are monitored by the FAA and it has implemented a formal schedule review and approval process for the airports that generally follow the IATA Worldwide Slot Guidelines.
- 10 There are some exceptions to this. For example, new entrants are given a 90 day grace period after be allocated the slots, and air carriers forced to cease operations due to a strike are not subject to slot recall.
- 11 For example, see the 26 July 2017 submission by the Regional Chambers of Commerce and Industry of WA to the Economics and Industry Standing Committee for its Inquiry into Regional Air Fares in Western Australia, [www.parliament.wa.gov.au/parliament/commit.nsf/\(Evidence+Lookup+by+Com+ID\)/07BE16E50259CFF64825817F0011A7D2/\\$file/20170726+-+REGAIR+-+Sub+31+-+RCCIWA.pdf](http://www.parliament.wa.gov.au/parliament/commit.nsf/(Evidence+Lookup+by+Com+ID)/07BE16E50259CFF64825817F0011A7D2/$file/20170726+-+REGAIR+-+Sub+31+-+RCCIWA.pdf) (accessed on 18 August 2018).
- 12 See the aforementioned Senate report. Other notable examples are “Driven Away: Why More Canadians are Choosing Cross Border Airport” by the Conference Board of Canada (October 2012) and “One of our Airports is Missing!” by the Canadian Airports Council.

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Chapter 3. Government support measures for domestic air connectivity: The cases of Norway and Sweden

Many European countries use Public Service Obligations (PSOs) to establish air connectivity to and within remote regions. PSOs are particularly relevant for relatively large EU countries with geographies that make the use of other transport modes costly or sometimes even impossible.

This chapter describes regional air connectivity in Norway and Sweden. It focuses on how policy-makers in Norway and Sweden support domestic air connectivity with imposing PSOs. The chapter includes a discussion of various aspects of PSOs in the two countries, including the policy behind establishing PSOs as well as the process behind selecting and designing PSO routes.

Public Service Obligations to foster regional connectivity in the EU

Public Service Obligations (PSOs) in air transport are applied in many European countries to maintain essential air services to and within remote regions. Articles 16, 17 and 18 of Regulation (EEC) No 1008/2008 define how PSOs that can be imposed on carriers operating on designated routes within the European Economic Area (EEA).¹ The legislation allows any member state to impose a PSO on any route serving a peripheral or developing region (Williams, 2010). The route should be considered vital for the economic and social development of the region served by the airport. If no airline is willing to provide a service under the imposed conditions, the government may restrict access to the route to a single carrier and award financial compensation to the carrier in return for running the PSO. While a PSO can be imposed by a country on a route between its territory and that of another country within the EEA, over 90% of PSOs are currently designated for domestic connections.

In Croatia, the Czech Republic, Cyprus, Finland, Greece, Ireland, Portugal² and Sweden, the national government departments administer PSOs. In Estonia, France, Germany, Italy and Spain, administration is in the hands of regional authorities.³ In the UK, the Scottish Government (through Transport Scotland) is responsible for administering the routes operated from Glasgow and the respective regional authority for services provided in the Orkney, Shetland, and Western Isles, while in Wales it is the Welsh Government. Iceland, Norway, and Lichtenstein follow the legislation on PSOs as they are members of the European Economic Area (EEA).

To a large extent it is up to each member state to decide upon which routes are vital for the economic and social development of a given region and whether the central or the regional government should have responsibility for PSO tenders. The openness in the interpretation of PSO rules has led to a certain degree of diversity in how PSOs are awarded and applied.

Currently, Norway has the largest number of designated PSO routes (46) in the EEA, followed by France with 40. Spain and Italy have 18-20 designated routes each, whereas there are only 10-12 such routes in Croatia, Sweden, Portugal and Scotland respectively. The UK operates 22 PSOs, with the lion's share of the PSOs connecting islands to the mainland. The share of domestic seats that are offered under the PSO regime is highest in Portugal (around 40%) and Ireland (around 20%) (Lian et al., 2010, with updates). The average sector length varies between about 600 km (France) and 200 km (Norway). The average seat capacity per flight ranges from 70-110 in France and Portugal, 35-50 in Germany, Spain, and Sweden to 10-15 seats available on Scottish flights. While Norwegian PSOs have to be operated by aircraft with a minimum of 15 seats, in reality the aircraft used on these routes tends to be bigger.

The use of PSOs across the EU and how the system could potentially be improved have been extensively researched in academia. There are advantages of disadvantages of decentralised versus centralised administration and funding of PSOs, with researchers having different views on this issue.

Williams and Pagliari (2004) provide a comprehensive overview of PSOs across the EEA and outline the variation with respect to how the PSO regime is applied in different countries. The authors remark that "major inconsistencies in the approach and commitment to social air service provision across the European Union (...) may undermine broader policy initiatives designed to enhance mobility and accessibility". The study suggests that the variation of PSOs may be larger than optimal, spanning from provision of thin routes to remote areas (like in Norway and Scotland), via heavily trafficked tourist routes to islands, and routes where surface transport appears a viable alternative. They thus put forward arguments for centralising the administration and funding of PSOs at an EU-level.

Hervik et al. (1999) take a different view and recommend more decentralisation with respect to the PSO regime in Norway. Currently, PSO tenders are carried out by the Ministry of Transport and Communications (NMTC). Over the years, the competition for PSO contracts in Norway has been rather weak, with Widerøe's Flyveselskap AS (a former subsidiary of the SAS Group) as the dominant operator of domestic routes. While the counties and local communities in Norway have interest in the best possible quality of PSO services being provided, it is the Ministry that provides the funding. This creates perverse incentives for the local and regional interest groups to advocate excessive provision of PSOs. If the responsibility for tendering and funding of PSO services was transferred from the national to the local government, this would potentially lead to a better alignment between the actual local and regional needs and funding of PSO routes. In addition, a more diversified tendering regime based on local needs would also likely attract new entrants to bid for PSO routes. From 2024, the responsibility for tendering PSO contracts in Norway will indeed be transferred from the Ministry and to the regions.

All in all, while there is no common view on whether the PSO system would work better with more centralisation or decentralisation, establishing a set of clearer criteria for routes to be considered eligible for PSO support could help make decisions on which services to support and to what extent. The ways of establishing such criteria in Norway and Sweden are considered in subsequent sections of this chapter.

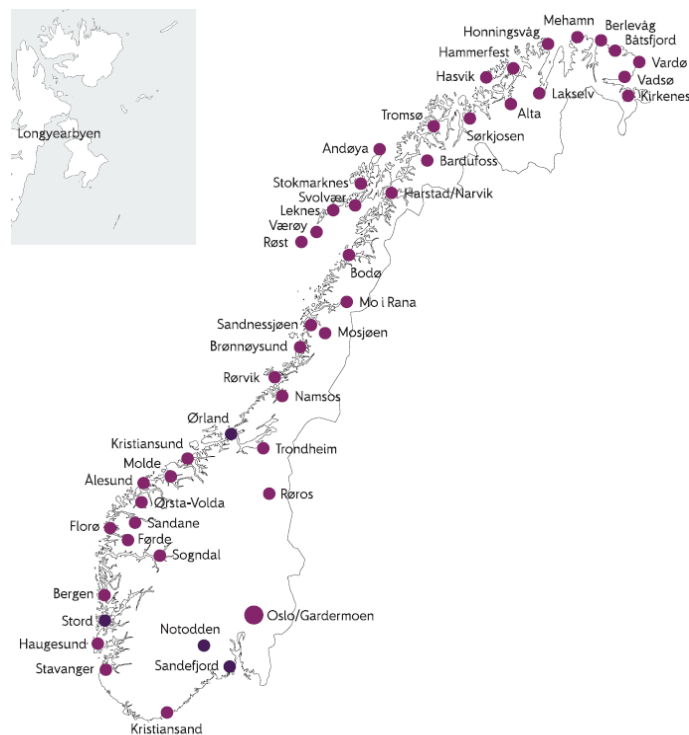
Regional connectivity in Norway

Norway has relatively many airports per capita, with 5.2 million inhabitants and 48 airports in operation. Oslo Airport (OSL) has the biggest catchment area in the country. 2.5 million people can reach the airport within 2.5 hours by road. In 2017, Oslo Airport served 11.6 million passengers on domestic routes and 15.8 million on international destinations. The share of transfer traffic has been increasing steadily and now constitutes around 25% of total traffic. The second level cities and their corresponding airports are Bergen, Trondheim and Stavanger. In 2017, these airports served 6.0, 4.4 and 4.2 million passengers respectively. A vast majority of passengers served at those airports travelled on domestic routes – over 60% in the case of Bergen and Stavanger, and almost 80% in case of the airport in Trondheim.

The third tier of airports in Norway, Tromsø, Bodø, Ålesund and Kristiansand, each served around 1-2 million passengers in 2017, with Ålesund and Kristiansand having served around 250-300 000 international passengers.

Norway has an extensive PSO system of regional air routes that connect airports with short runways into the airport network. All PSO routes in Norway are currently provided by Widerøe's Flyveselskap AS. Inhabitants in the south of Norway are connected to the hub in Oslo with PSOs available from five regional airports. In the north, PSO routes connect passengers to the nearest regional hubs; around half of the traffic on those routes connects at these regional hubs to get to Oslo.

Figure 3.1. Map of Norwegian airports



Note: Notodden, Sandefjord and Ørland are not owned and operated by Avinor. Rygge Airport (east of the Oslo Fjord) is currently only operating military as well as search and rescue aircraft and hence it is not included in the map. Source: Avinor.

Although PSO routes help travelers from the regions to access the route networks at the regional hubs as well as the national hub in Oslo, unlike the Essential Air Service programme in the USA, this is not an explicit objective of PSOs.

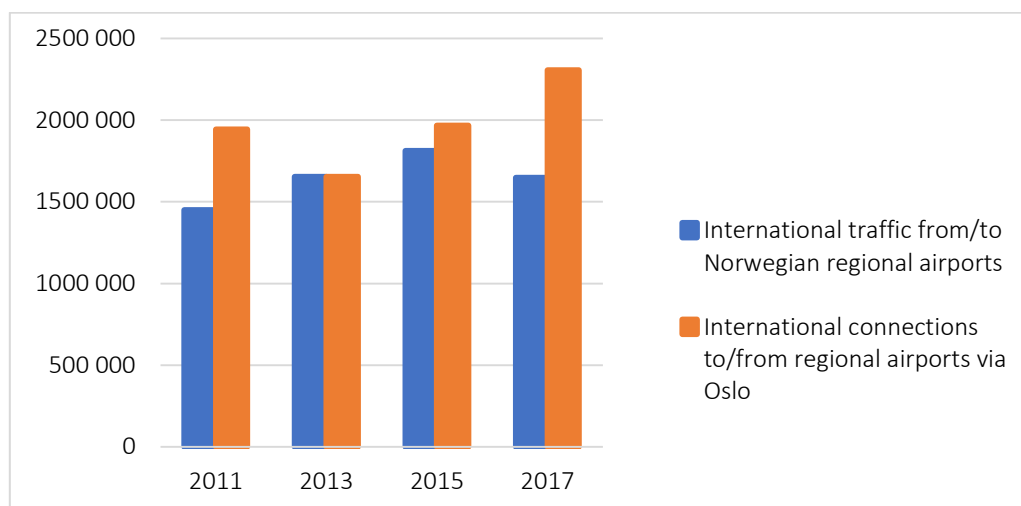
The hub at Oslo is not dominated by one national network carrier, like it is the case at most European hubs. SAS and Norwegian Air Shuttle AS, the two biggest carriers operating from the airport, have 35-40% market share each. SAS, which has its main hub in Copenhagen, has developed a number of direct routes from Oslo as a response to the competition from Norwegian. Norwegian is now the largest airline in Norway, both with respect to domestic and international traffic. Since 2013, Norwegian has developed a few long-haul routes from Oslo, but the number of offered destinations is low in comparison to the European network carriers, e.g. KLM at Amsterdam Schiphol.

Oslo Airport is fully slot coordinated, but most of the requests for slots have been met. Peak hour capacity is now in excess of 70 air traffic movements (ATMs), and it is intended to be increased up to 90 ATMs in 2030. To meet the projected demand for slots at Oslo Airport, Avinor has plans to build a new third runway at the airport to increase capacity.

Two thirds of over 23 million international trips to and from Norway go via the hub at Oslo, with the majority of trips either starting or ending within the Oslo region. The Sandefjord Torp airport located 110 km south of Oslo serves around 1.6 million passengers on international destinations per year. Other airports in Norway serve the remaining 6 million international trips.

In terms of connecting passengers from regional airports onto international flights, connections are available both through the hub in Oslo, as well as other foreign hubs. Over the past few years the hub in Oslo increased its importance in this regard – the number of international trips from the regions via Oslo airport has been increasing since 2013. In 2017, 2.3 million of such trips were made. The rise of the importance of Oslo as a connecting airport has been coupled with decreasing importance of other foreign hubs in this respect (Figure 3.2).

Figure 3.2. International traffic to and from regional airports in Norway via the hub at Oslo versus other foreign hubs (2011-2017)

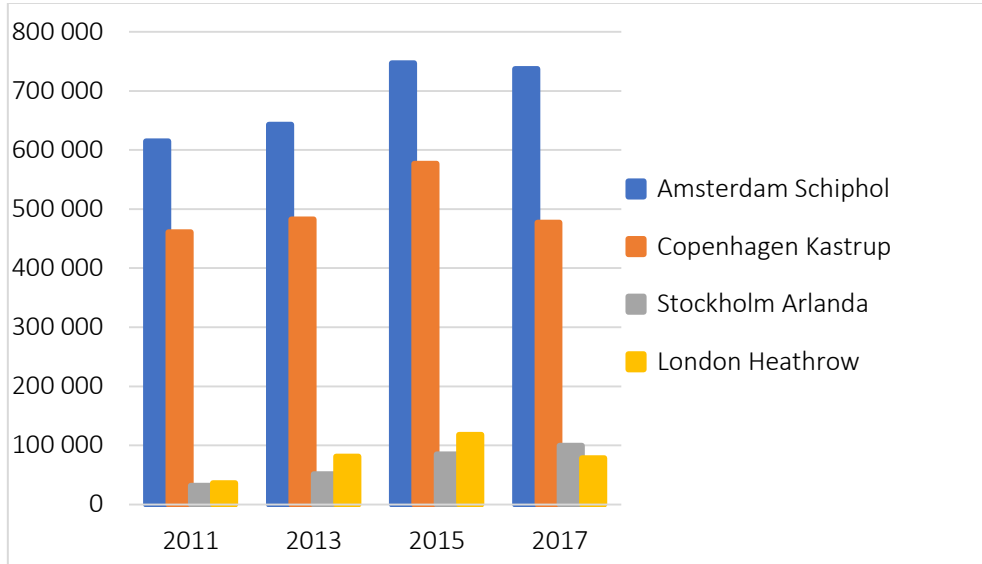


Source: National Air Travel Surveys, Avinor.

The main competitors of Oslo Airport for connecting traffic are hubs in Copenhagen and Amsterdam (Figure 3.3). While the SAS hub at Copenhagen mostly competes for passengers travelling to and from

the Oslo region, the KLM hub at Amsterdam Schiphol mostly competes with the hub at Oslo for transfer passengers to and from regional airports in Norway (Table 3.1 and Figure 3.4).

Figure 3.3. Transfer traffic from regional airports in Norway by connecting airport (2011-2017)



Source: National Air Travel Surveys, Avinor.

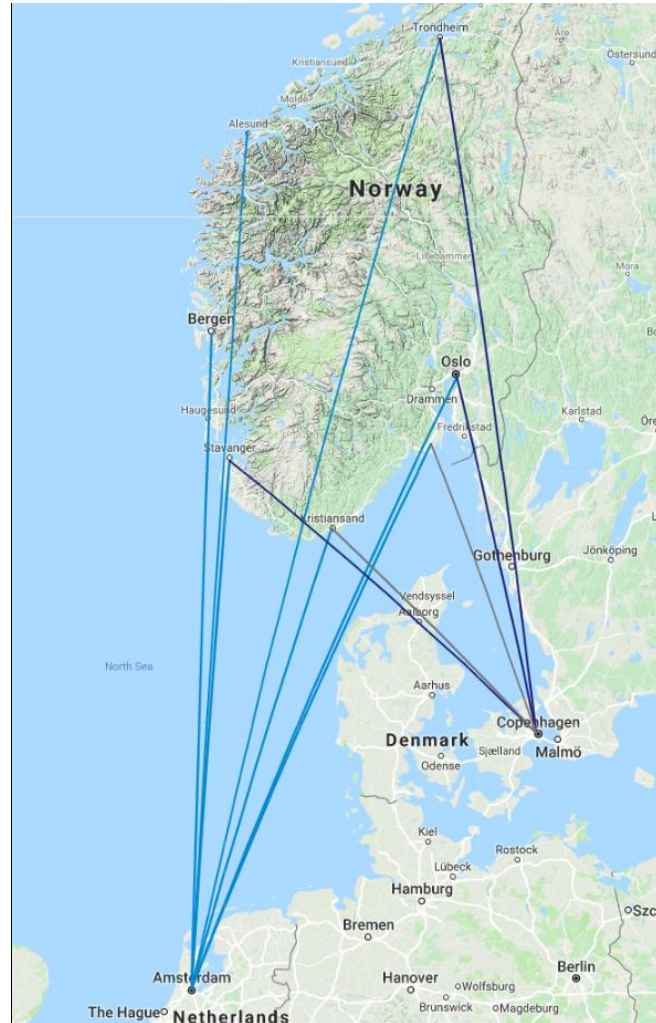
Table 3.1. Daily flights offered to and from destinations in Norway by SAS to Copenhagen and KLM to Amsterdam (2018)

Airport	SAS CPH	KLM AMS
Oslo	13	5
Sandefjord	(2)	2
Kristiansand	(3)	2
Stavanger	6	5
Bergen	6	4
Ålesund	-	2
Trondheim	3	3

Note: Flights to and from Sandefjord and Kristiansand to Copenhagen are operated by Widerøe's Flyveselskap AS. Winter routes to Stockholm, Copenhagen, and London Gatwick are offered from Tromsø 4 times a week.

Source: Airport websites.

Figure 3.4. SAS and KLM route network to Norway to/from their main hub



Source: Google Maps.

If Oslo Airport manages to successfully compete for connecting passengers with the hubs in Amsterdam and Copenhagen, it could increase its traffic base and extend its relatively underdeveloped international route network.

To help grow connectivity of an airport, the operator of most of the airports in Norway, Avinor, applies the following support measures:

- Reduced airport charges for start-up routes (30% reduction for routes to northern Norway on a permanent basis),
- Reduced passenger fees for start-up routes,
- Reduced transfer fees (30 % reduction for routes to Northern Norway on a permanent basis),
- Reduced transfer times,
- Business agreements with the airport regarding day-to-day operations.

The most recent measure implemented by Avinor, Connecting Norway, enables travellers to connect to domestic flights without having to check in their luggage at Oslo airport and to check in for their domestic connection upon passing the toll barrier, hence significantly reducing the transfer time.

As the national operator, Avinor needs to consider a tradeoff between stimulating new international routes at regional airports and so diverting traffic demand from the hub at Oslo. In a similar context, there is also a question about whether connections to foreign hubs should be encouraged. New hub routes may be convenient for local passengers, but such routes may divert traffic from the existing routes. In such cases, connections from the regions to Oslo have been treated as more important in the past.

Characteristics of the PSO network in Norway

Figure 3.5 depicts PSO routes that are currently in operation in Norway.

In 2017, around 1 million passengers were served by PSO-designated routes in Norway, a substantial decrease from about 1.2 million passengers served each year in the period 2013-2016. The drop in passengers served by PSOs mostly occurred due to four routes changing their status from PSO-designated to fully commercial operations. The reduction in the number of PSO routes is at least partly responsible for lower government expenditure on PSOs – it fell from NOK 824 million in 2016 to 765 NOK million in 2017.

Figure 3.5. PSO routes in Norway

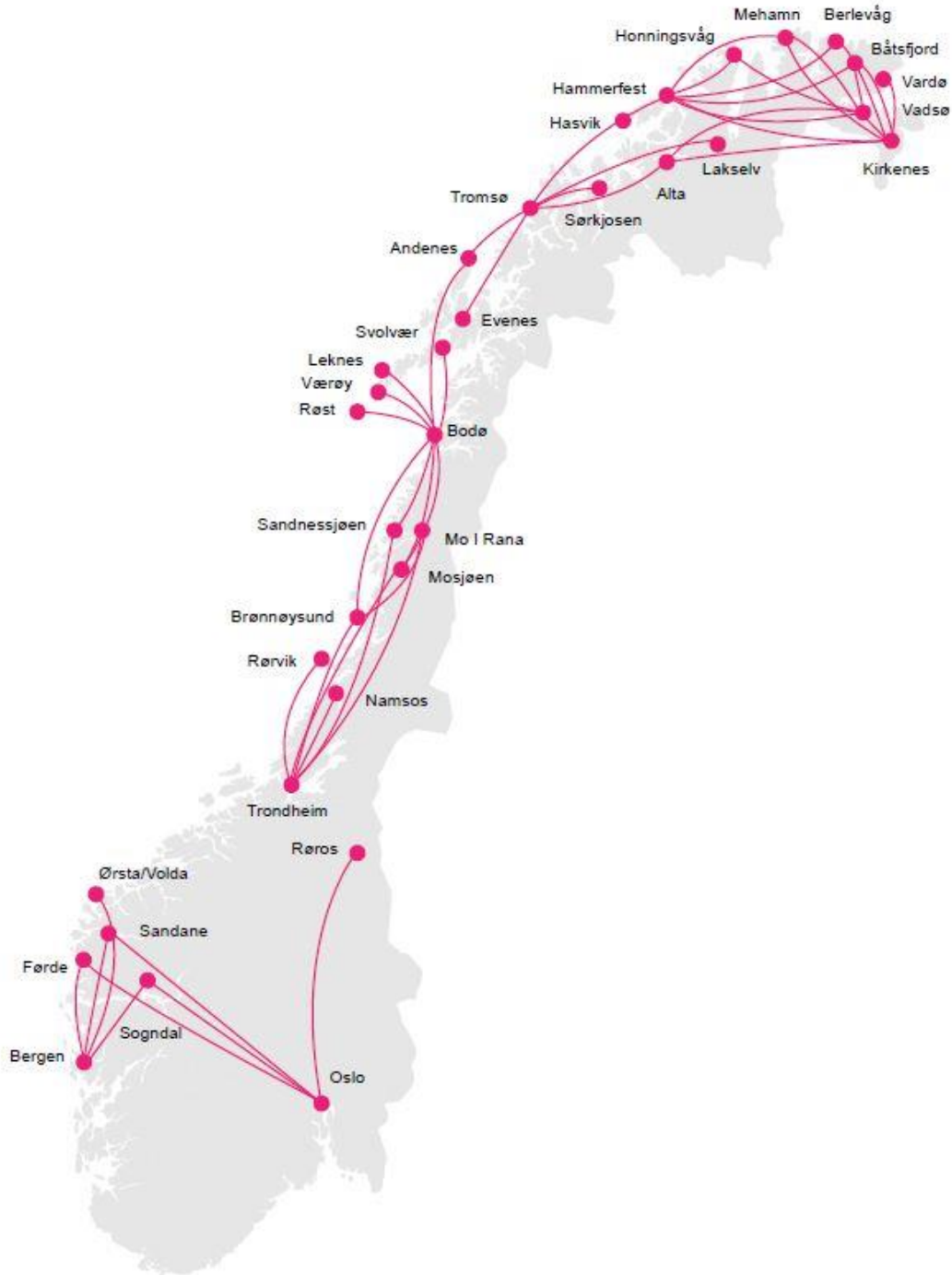


Table 3.2. Basic passenger statistics for a selection of airports that operate PSO routes in Norway (2017)

IATA	Airport	Scheduled Traffic			Offshore Arr./dep.	Passengers Total
		Arrived / Departed				
		Domestic	Change from 2016	Transfers		
Northern Norway						
ANX	ANDØYA	44 822	-4.4%	338	0	45 270
BVG	BERLEVAG	5 720	-1.9%	46	0	5 766
BNN	BRØNNØYSUND	90 951	-2.0%	682	13 117	104 750
BJF	BÅTSFJORD	14 415	1.8%	360	0	14 832
HFT	HAMMERFEST	125 499	12.5%	10 862	26 913	163 433
HAA	HASVIK	9 629	14.5%	34	0	9 663
HVG	HONNINGSVAG	13 133	-2.8%	240	0	13 385
LKL	LAKSELV	56 523	0.1%	96	15	57 780
LKN	LEKNES	122 199	12.7%	1 140	0	123 339
MEH	MEHAMN	14 837	0.9%	78	0	14 915
MQN	MO I RANA	109 839	3.0%	1 784	0	114 154
MJF	MOSJØEN	62 287	7.7%	574	0	64 057
OSY	NAMSOS	23 716	-14.2%	162	0	23 908
NVK	NARVIK	6 884	-73.2%	12	0	6 957
RVK	RØRVIK	35 251	1.1%	42	0	35 433
RET	RØST	9 197	-0.9%	12	0	9 209
SSJ	SANDNESSJØEN	72 928	-2.1%	508	0	73 494
SKN	STOKMARKNES	101 311	10.1%	1 580	0	102 891
SVJ	SVOLVÆR	94 076	16.3%	1 598	0	95 798
SOJ	SØRKJOSEN	13 253	-3.8%	138	0	13 391
VDS	VADSØ	62 485	-0.4%	14 364	0	76 849
VAW	VARDØ	10 848	-9.2%	566	523	11 937
VRY	VÆRØY	8 655	-2.0%	0	0	8 793
Sum N Norway		1 108 458		35 216	40 568	1 190 004
Southern Norway						
FDE	FØRDE	81 963	2.4%	578	0	82 541
FRO	FLØRØ	97 439	-5.4%	1 810	30 530	129 865
RRS	RØROS	24 393	17.5%	0	0	24 473
SDN	SANDANE	35 236	-1.3%	184	0	35 692
SOG	SOGNDAL	56 867	-1.0%	11 738	0	68 946
HOV	ØRSTA VOLDA	107 755	6.1%	776	0	108 553
SUM S Norway		403 653		15 086		450 070
TOTAL		1 512 111		50 302	40 568	1 640 074
Commercial services or potentially so Economic deficit/adequate or nearly adequate accessibility						

Source: Avinor.

Note: Larger airports, like Oslo, Bergen, Trondheim, Bodø and Tromsø, are excluded because it would be difficult to infer any conclusions from passenger numbers as to the commercial viability of PSO-designated routes. Transfer passengers are counted twice in the statistics collected by Avinor, the table follows this convention so transfer passengers above are double-counted.

According to Thune-Larsen et al. (2014) and Bråthen et al. (2015), some of the PSO-designated routes to the airport highlighted in blue in Table 3.2 either already operate commercial domestic air services (Hammerfest, Stokmarknes, Florø, ørsta/Volda) or could potentially be in the position to do so (Leknes, Svolvær). Moreover, some PSOs on high-volume services (from Lakselv and potentially from Svolvær to Bodø) could also be commercially viable, although they would most likely necessitate high fare levels. Some other airports, highlighted in yellow, are either very unlikely to host commercially viable connections or do not provide a substantial connectivity improvement – as the minimum standards of connectivity are met by the availability of other transport modes or the other airport nearby. Without government subsidies, other connections with very low demand would most likely stop, which could in turn lead to airport closure. Vardø and Namsos airports would most likely close, if the routes from Vardø to Kirkenes and Namsos to Trondheim were no longer subsidised by the government.

Regional connectivity in Sweden

Sweden's population, estimated to be 10 million, is served by 40 airports with scheduled routes (Figure 3.7). The Stockholm region has 2.3 million inhabitants and is served by the biggest airport in the country, Stockholm Arlanda, which served 26.6 million passengers in 2017. The second largest airport, Gothenburg Landvetter, is significantly smaller than Arlanda – in 2017 it served 6.7 million travellers. These two airports account for about 95 % of all international traffic served from Swedish airports. 10 airports owned and operated by the state-owned company Swedavia are highlighted in Figure 3.6. Ronneby Airport (RNB) and Luleå Airport (LLA) are partly owned by the Swedish Air Forces, but Swedavia is responsible for commercial air traffic at these airports. In total, the Swedish airport network served 14 million domestic and 28 million international passengers in 2017.

Figure 3.6. Airports in Sweden



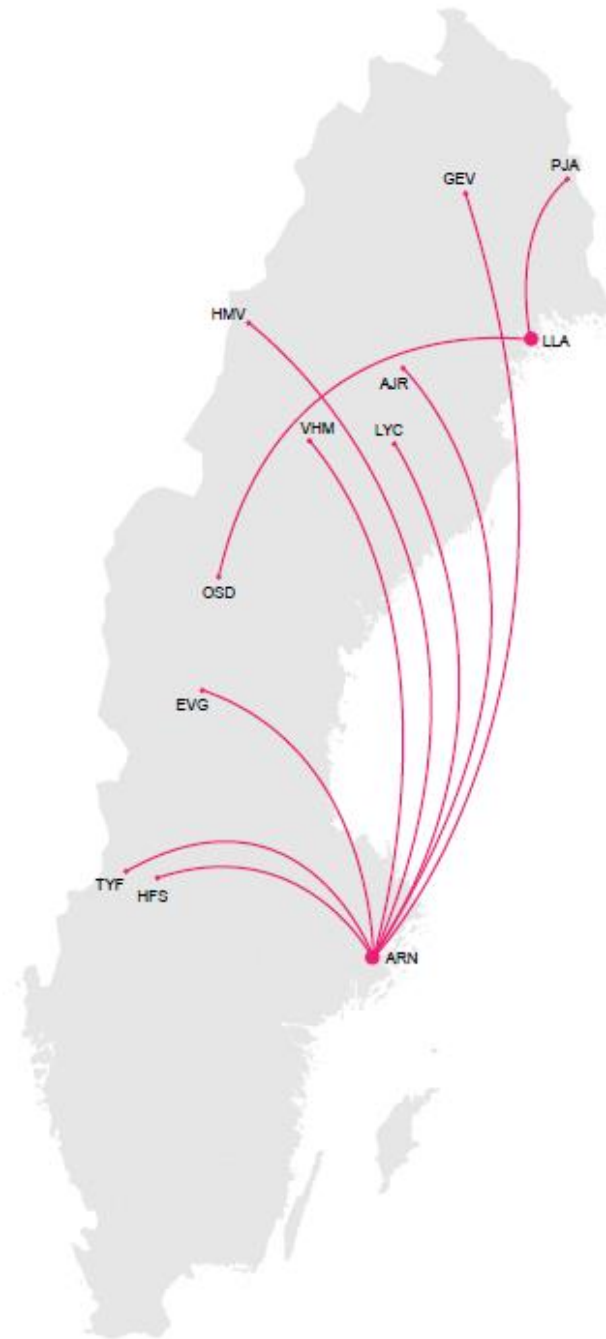
Note: Airports owned and operated by Swedavia are surrounded by red circles.

Source: www.flygplatser.se, amended by the authors.

Characteristics of the PSO network in Sweden

Figure 3.8 depicts the PSO network in Sweden. The network is significantly smaller than that of Norway. This is partly due to the fact that for decades successive Swedish governments have supported industrial policy that resulted in concentrating the vast majority of Swedish population in the south of the country.

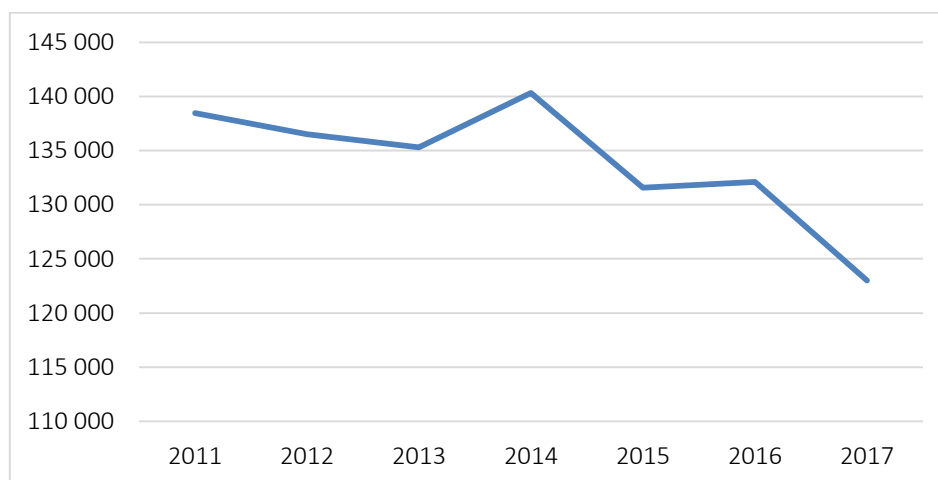
Figure 3.7. PSO routes in Sweden



Like in Norway, PSOs in Sweden are awarded based on the minimum connectivity criteria (see sections below). Although the criteria applied in Sweden are more detailed than the ones that are currently applied to decision-making on PSOs in Norway, the Swedish criteria do not yet explicitly include an economic impact assessment (EIA) of all relevant surface transport modes. Such approaches are currently being developed.

In 2017, fewer than 125 000 passengers travelled on PSO-designated routes in Sweden (Figure 3.8), significantly fewer than in Norway. The level of government subsidies provided for PSO routes per passenger in Sweden is very similar to that of Norway, and amounted to over SEK 700 (about EUR 70) per passenger in 2017.

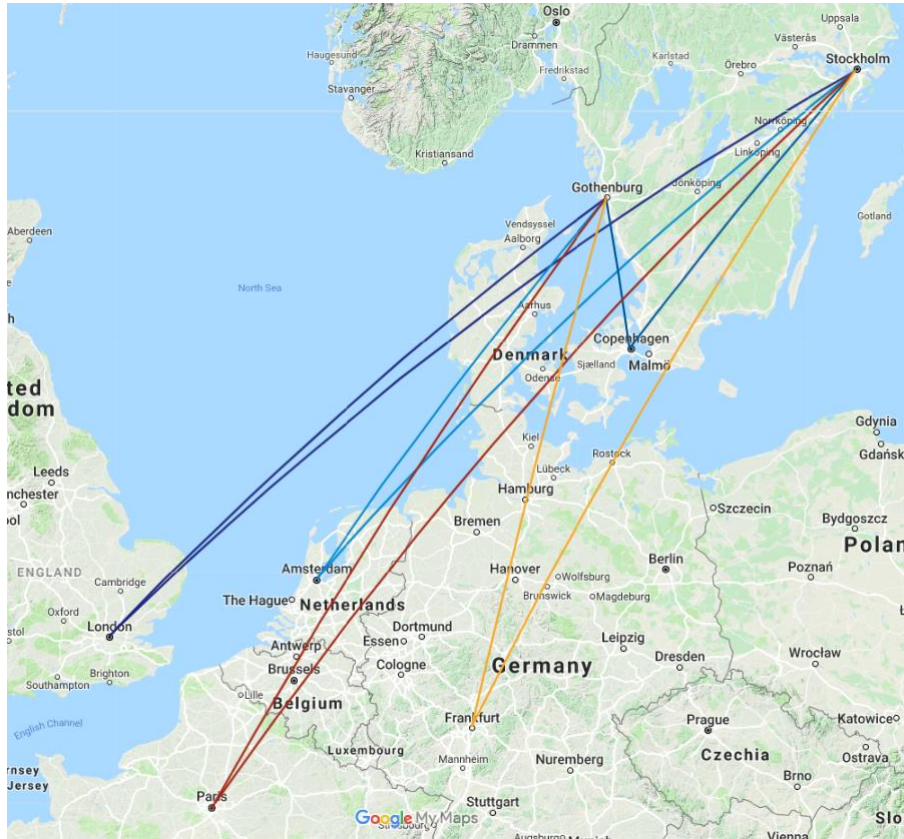
Figure 3.8 Passengers on PSO-designated routes in Sweden (2011-2017)



Source: Trafikverket.

As depicted in Figure 3.9, PSO routes in Sweden connect different regional destinations to Stockholm Arlanda, one of the three main aviation hubs in Scandinavia. Stockholm Arlanda and Gothenburg Landvetter both provide connectivity to the main European hubs (Figure 3.9 and Table 3.3). Around half of the connections to the main hubs are provided by hub carriers. The structure of the PSO network is different in Norway, where PSOs do not connect passengers only between regional destinations and Oslo, but also between regional destinations and larger regional hubs in Tromsø, Bodø, Trondheim, and Bergen.

Figure 3.9. Connections to main European hub airports from Stockholm Arlanda and Gothenburg Landvetter



Source: Google Maps.

The two main international scheduled connections go via Stockholm Arlanda (ARN) and Gothenburg Landvetter (GOT). Table 3.3 describes the structure.

Table 3.3. Daily route frequencies to main European hubs from Stockholm Arlanda and Gothenburg Landvetter

Destination airport	Stockholm (ARN)	Gothenburg (GOT)
Amsterdam (AMS)	10 (6)	6 (6)
Copenhagen (CPH)	24 (16)	8 (8)
London (LHR)	12 (6)	3 (3)
Frankfurt (FRA)	8 (5)	5 (5)
Paris (CDG)	6 (3)	3 (3)

Note: Frequencies provided by hub carriers are denoted in brackets.

Source: Airport websites.

Objectives and decision-making process regarding PSO routes in Norway and Sweden

Transport policy objectives

Government support for domestic air transport services is based on the transport policy objectives set out in the national transport plans of Norway and Sweden and guided by the European Regulation (EEC) No 1008/2008 on common rules for the operation of air services in the Community.

In Norway, the three main objectives set out by the National Transport Plan are to (NMTC, 2017):

- Improve accessibility for passenger and freight transport throughout the country, where reduced travel time is an objective.
- Reduce the number of traffic accidents.
- Reduce GHG emissions in line with low-emission objectives and reduce other negative impacts on the environment.

The Swedish transport objectives set out in the National Transport Plan 2018-2029 (Trafikverket, 2017a) are divided into objectives relating directly to ensuring sufficient levels of connectivity and objectives relating to achieving a sustainable, energy-efficient transport system that adheres to the principles of security and improved health and environmental outcomes.

The objectives above are reflected in project assessment and selection by policy-makers.

Criteria for determining the level of domestic air connectivity

Determining the level of domestic air connectivity, in terms of frequencies and destinations served, as well as the level of subsidy that should be provided for the routes is not a straightforward task. The literature on this issue is scarce and no approaches are currently considered best practice.

One possible way of deciding on the level of connectivity and support provided is through defining a minimum level of accessibility (or connectivity – this chapter uses these terms interchangeably) that policy-makers should strive to ensure for everyone in a country. Defining such a minimum could be based on a set of constraints, for example, maximum travel time that is needed to reach bigger cities or the level of access to hospitals and airports with international connections. Since the cost of providing the minimum level of service can be very high for remote, smaller communities, attaining such policy goals should be defined in light of socio-economic costs and wider benefits of providing the minimum level of access.

A possible framework for analysing economic viability of domestic air connections and the socio-economic impacts of supporting domestic air connectivity is set out by Bråthen and Eriksen (2018). The framework includes consideration of other transport modes. It relies on estimating generalised travel costs for relevant travel alternatives. The required level of subsidies to support a PSO route is determined by examining air fare data and using an airline cost model. The monetised values of CO₂-emissions and accident levels are not included in the estimates, as Svenden & Bråthen (2015) demonstrated that these costs do not have significant impact on the total estimates and the resulting conclusions.

Thune-Larsen et al. (2014) and Bråthen et al. (2015) discuss how such criteria are defined and could be improved in order to help decision-making on PSO air services in Norway. The discussion is partly based on guidelines produced in policy papers by Trafikverket (2013 and 2017b) that stipulate criteria to apply when deciding on support measures for regional air transport in Sweden.

The criteria should be adapted to different needs among the regions, and pragmatism is needed when they are applied. For example, criteria stating that it should be possible to travel to Oslo and back for a work trip within a day may be reasonable when examining connectivity in southern, but not in northern, Norway.

This is a challenge for many countries. For example, one of the criteria applied to decision-making on support for routes within the Essential Air Service programme (EAS) in the USA is the requirement for communities to be located at least 70 miles away from the nearest larger city (Metrass-Mendes et al., 2011). Applying this criterion will inevitably result in varying levels of connectivity from the regions to Washington D.C. and other metropolitan areas. It may also lead to the establishment of services beyond what is really necessary, often due to local political pressures. One way of circumventing this challenge, to ensure a coordinated prioritisation of regional public spending, would be to hand over decision-making to the regions.

Although applying the same set of criteria may pose the challenge outlined above, applying consistent criteria across the entire network can help avoid *ad hoc* decision-making that may result in large variability of available services across regions.

The main criteria that are used to estimate the level of connectivity available in different regions of Norway are the following:

- Access to the capital,
- Access to an airport with international services,
- Access to “advanced health care” (a regional hospital),
- Access to local administration.

A weighted estimate of travel time for inhabitants in a given area is then calculated for different transport mode alternatives and for the four criteria set out above.

The assessment results for each of the criteria are then considered on balance (they are not weighted to achieve a single score) and against two different standards: the higher standard of connectivity (“green standard”) and the minimum standard of connectivity (“yellow standard”). The details on these two standards are outlined in Table 4. If the level of service provided to a region or a community falls short of the yellow standard set out in Table 4, it is deemed insufficient (“red standard”).

Table 3.4 .Details behind the green and yellow connectivity standards set out to assess the level of domestic connectivity for different counties in Norway

Criteria	Green standard	Yellow standard
Access from a local airport to the capital (1)	<p>Outbound flight:</p> <ul style="list-style-type: none"> Monday to Friday: Latest arrival to the capital's airport at 8.30am Total travel time of max. 3 hours from home <p>Return flight:</p> <ul style="list-style-type: none"> Earliest return from the capital at 5pm Max. 4 hours travel time to home 	<p>Outbound flight:</p> <ul style="list-style-type: none"> Monday to Friday: Latest arrival to the Capital's airport at 10am Total travel time of max. 4 hours from home <p>Return flight:</p> <ul style="list-style-type: none"> Earliest return from the capital at 3pm Max. 5 hours travel time to home
Access from a local airport to an international airport (2)	<p>Outbound flight:</p> <ul style="list-style-type: none"> Monday to Friday: Latest arrival to an airport with international services at 8.30am Total travel time of max. 3 hours from home. <p>Return flight:</p> <ul style="list-style-type: none"> Earliest return from the international airport at 5 pm Max. 4 hours travel time to home 	<p>Outbound flight:</p> <ul style="list-style-type: none"> Monday to Friday: Latest arrival to an airport with international services at 10am Total travel time of max. 4 hours from home <p>Return flight:</p> <ul style="list-style-type: none"> Earliest return from the international airport at 5 pm Max. 5 hours travel time to home
Access to advanced health care (3)	<p>Outbound flight:</p> <ul style="list-style-type: none"> All week: Latest arrival to the hospital at 10am Earliest departure from home at 3am Max. 3 hours travel time <p>Return flight:</p> <ul style="list-style-type: none"> Earliest return from the hospital's closest airport to the local airport at 4 pm Max. 4 hours travel time to home 	<p>Outbound flight:</p> <ul style="list-style-type: none"> Monday to Friday: Latest arrival to the hospital at 10am Earliest departure from home at 3 am Max. 4 hours travel time <p>Return flight:</p> <ul style="list-style-type: none"> Earliest return from the hospital's closest airport at 4 pm Max. 4 hours travel time to home
Access to the County administration (4)	Monday to Friday: As for Criterion 3.	As for Criterion 2.

Source: Bråthen & Eriksen (2018).

The criteria set out above provided the decision-making basis for the PSO tender that ran from April 2016 until March 2020 for routes from regional airports in southern Norway⁴ to Oslo and Bergen. Slightly different criteria are applied to tenders for routes in the north. In addition to the criteria stipulated above, there is consideration of how well connected northern communities are to commercial trunk routes from Tromsø, Bodø and Trondheim to Oslo.

In Sweden, the criteria used to determine the level of support for domestic air connectivity are very similar to those established in Norway and follow the same logic (Trafikverket, 2017). They are, however, more detailed. Additional criteria include separate assessments of the level of access to and from Stockholm, to opportunities for international travel, to the main Swedish cities, to regional hospitals, universities, and regional tourist attractions. Sweden also explicitly assesses the socio-economic impacts of how PSO services may affect local populations.

In both countries, assessments are conducted for different transport modes. In Norway, a potential PSO route is compared to the baseline and to the best possible surface transport alternative in terms of their generalised travel costs. In Sweden, a potential PSO route is also compared to the baseline and to both the best possible surface transport alternative and the public transport options.

Table 3.5 provides a hypothetical example of such an assessment of different transport alternatives for a region in Norway. The assessment demonstrates that, for the minimum standard of connectivity to be met, subsidisation of PSO connections is required.

Table 3.5. An example of how different travel alternatives are compared in PSO assessments in Norway

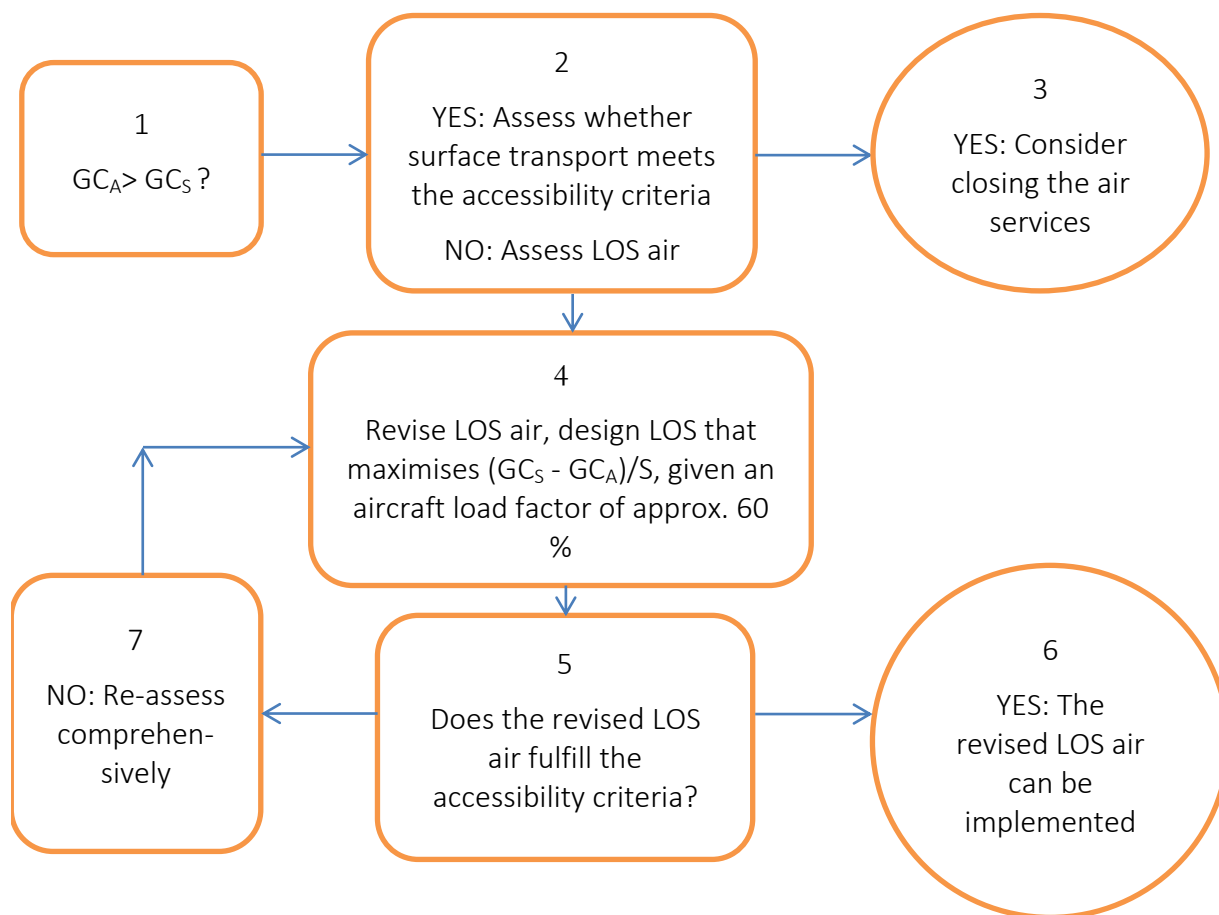
Transport alternatives	Criteria			
	1	2	3	4
	Access to the capital	Access to an international airport	Access to advanced health care	Access to the County administration
Existing transport option (could be a PSO air service)	Green	Green	Green	Red
Surface transport (in some cases equal to today's transport)	Red	Red	Yellow	Red
PSO alternative(s) (further alternatives can be added for comparison)	Green	Green	Green	Yellow

Source: Bråthen & Eriksen (2018).

To provide insights into the level of domestic air connectivity required, the assessment above is then complemented with an analysis of socio-economic impacts of connectivity. This requires estimating the generalised travel costs for different transport alternatives – including PSOs (GC_A) versus the best possible surface transport alternative (GC_S). Generalised travel costs consist of payable costs (fares, tolls), travel time costs, and vehicle operating costs (for road transport).

If $GC_A > GC_S$, then the level of PSO services should be reduced, or the PSO should be discontinued. If $GC_A < GC_S$, then an assessment is needed of whether the costs of using surface transport justify the PSO subsidy level (S). If $(GC_S - GC_A)/S > 1$ i.e. the added costs of using the surface transport alternative exceed the air transport subsidy level, then there are strong reasons to provide the subsidy on the basis of travel time savings. If, however, $(GC_S - GC_A)/S < 1$, then the PSO service cannot be justified on the basis of travel cost savings. These steps can be repeated for different levels of service until arriving at the optimal level of service. Figure 3.10 summarises this approach.

Figure 3.10. Steps required to determine the desired level of service based on generalised travel cost estimates



Note: LOS stands for “level of service”.

Source: Bråthen & Eriksen (2018).

This method of analysis provides an indication of whether subsidising a specific PSO route would potentially achieve the intended outcomes. The decision on establishing a PSO and the level of service it should provide, however, should not be made solely based on the results of such an analysis. A wider perspective is needed to consider all the benefits and costs of possible interventions. For example, network modelling can be used to capture the potential impacts of any intervention on the entire route network. For small regional airports, whose existence may be dependent upon PSO services, operating costs and possible future infrastructure investment should be included in the impact assessment.

The presented method could be amended to serve as a useful tool in different contexts and for decision-makers in other countries. In particular, this approach does not consider capacity constraints within the national airport system. This is because in the Norwegian and Swedish contexts capacity constraints at major airports do not currently pose challenges to domestic air connectivity, in contrast to other countries, e.g. the UK (Merkert and O’Fee, 2013). Considerations of capacity constraints, however, are becoming more pertinent, as constraints on availability of slots coincide with demand peaks. The constraints are likely to affect domestic air connectivity in Norway and Sweden in the future, both to

larger cities and to major airports that offer international flights. Assessing the socio-economic impacts with and without constraints on access to slots could offer valuable insights into the benefits of potential infrastructure expansion to regional communities.

Table 3.6 outlines the estimates that were most recently produced for decision-making on PSO routes in southern Norway: Førde-Bergen, Sogndal-Bergen and Fagernes-Oslo. More details of how these estimates were calculated are provided in Thune-Larsen et al. (2014) and Bråthen et al. (2015).

Table 3.6. A comparison of costs for different transport alternatives for Førde-Bergen, Sogndal-Bergen and Fagernes-Oslo, per passenger (EUR 2014 prices)

Transport alternative	Førde-Bergen		Sogndal-Bergen		Fagernes-Oslo	
	Air	Surface	Air	Surface	Air	Surface
Travel time centre to centre (hours), including airport shuttle and ferries	1.45	3.33	1.55	4.28	1.33	3.10
Value of travel time	57	128	60	164	51	119
Payable costs excl. airport shuttle:						
• Air fare	60	-	74	-	56	-
• Road tolls, ferries	-	14	-	18	-	4
• Vehicle driving costs	-	30	-	41	-	32
Costs to/from the airports	44	-	44	-	44	-
SUM GC_A and GC_S	161	172	178	223	151	155
Aircraft costs and PSO subsidies, per passenger, one way:						
Aircraft costs	127		97		467	
PSO subsidies (S)	67		23		411	
Generalised Cost Savings/Subsidy ratio:						
$(GC_A - GC_S)/S$, per passenger	0.16		1.95		0.01	

Note: Wherever an estimate is missing it is because the cost element was not relevant for the assessed transport alternative. The level of PSO subsidies (S) is calculated as the difference between the estimated costs per passenger and based on a model by Janic (2000).

Source: Bråthen & Eriksen (2018).

The Fagernes-Oslo route has the lowest $(GC_S - GC_A)/S$ ratio, which makes it difficult to justify the PSO by the potential generalised travel cost savings. Moreover, the surface transport for this connection meets the minimum standards set out by the assessment (Table 3.7). This leads to the conclusion that this particular PSO route should be closed.

Table 3.7 Assessment of different travel alternatives for Førde-Bergen, Sogndal-Bergen and Fagernes-Oslo

	Criteria			
	1	2	3	4
	Access to the Capital	Access to an international airport	Access to advanced health care	Access to the County administration
Førde-Bergen				
Surface				
Surface and air via Florø				
PSO Førde-Bergen				N/A
Fagernes-Oslo				
Surface				
PSO Fagernes-Oslo				N/A
Sogndal-Bergen				
Surface				
Surface and air via Florø				
PSO Sogndal-Bergen				N/A

Source: Bråthen & Eriksen (2018).

For Førde-Bergen, the alternative travel option of surface transport to Florø and air connectivity available from Florø to Bergen would meet the minimum connectivity standards. Moreover, the proposed PSO on this route would have a very low $(GC_S - GC_A)/S$ ratio. This leads to the conclusion that this PSO route should be closed.

One of the alternatives for reaching Bergen from Sogndal (surface transport and air connections via Florø) would meet the minimum connectivity standards. However, the relatively high $(GC_S - GC_A)/S$ ratio is more than sufficient to justify a direct PSO service to Bergen on the basis of travel time savings.

One way of achieving higher travel time savings is through better integration of different transport modes. There are concerns that PSO routes are not well integrated into the transport networks due to the fact that responsibility for their procurement lies with the central government, while the governance of other transport modes (e.g. buses and passenger ferries) is in the hands of regional authorities. This may lead to principal-agent issues that may be better handled if the responsibility for PSOs lies with regional authorities. Such a change to the governance of PSOs in Norway is suggested by Hervik et al. (1999). In fact, the Norwegian government is planning to hand over the responsibility for PSOs to the regions from 2024.

Devolution of responsibilities for PSO tendering may also have the benefit of allowing local communities to create integrated socio-economic development plans in which PSOs can possibly play an important role. Halpern and Bråthen (2010 and 2011) analyse population and business surveys in Ålesund and Brønnøysund, two remote regions of Norway, to establish that connections offered by their respective local airports play an important socio-economic role. Among other positive effects, air connectivity helps retain local populations in those regions by providing greater access to important services (e.g. health care) as well as holiday options. It also fosters investment in those regions.

Determining the level of support for domestic air connectivity: theory and practice

The policy debate on the level of support that should be provided focuses on the trade-off between the level of government expenditure and ensuring adequate level of service to remote regions. In theory, second best pricing (see Baumol & Bradford, 1970) can help to set prices that would maximise the welfare benefits to the users of air transport. With a binding fiscal constraint, prices should be set higher than the marginal cost. The lower the price sensitivity of a passenger segment, the higher the price set. While this would maximise welfare in each passenger segment, the distributive impacts of such a solution may not always work from the public policy perspective, as the most price inelastic passengers are often those who rely on air services to the greatest extent. In countries like Norway, where travel for health care reasons is reimbursed, this issue does not constitute a significant policy concern.

In practice, decision-making on the level of required domestic air connectivity and the subsidies that should be provided is challenging for a number of reasons. First, connectivity assessments often need to be based on simplifications and a host of assumptions due to often limited or missing information about different market segments and the actual decision-making and pricing by air carriers. Moreover, the required level of service may also be based on other considerations than value-for-money and economic efficiency, as well as equity or economic rebalancing across regions. In those cases, cost-benefit analysis can still be applied to help assess the required level of air transport services. CBA can also take into account various constraints, such as limited financial resources available for any prospective programmes.

In Norway, support for domestic air connections needs to be considered in the context of cross-subsidisation of unprofitable airports by the profitable ones within one network run by the owner of (almost all) airports in Norway, Avinor. In 2002, the Norwegian Competition Authority (NCA) made a formal inquiry into the charging structure applied to Norwegian airports, which was implemented by Avinor's predecessor, Norwegian Air Transport and Airport Management. NCA stated that the charges should to a larger extent reflect the marginal costs of airport services to improve the use of airports and the route network. NCA argued that a pricing system based on optimal pricing under financial constraints should be applied. NCA also argued that the Norwegian Ministry of Transport and Communications should consider increasing subsidies provided to airports that serve thin routes to avoid deterring aircraft operators with excessive airport charges. At the time of writing of this report, the discussion on these issues was still ongoing.

There is also an ongoing debate on how to determine the level of subsidy per passenger. In Norway, since 2016 the level of air fares on PSO routes has been based on estimating maximum air fares for full-flex tickets, including all fees and taxes. The model applied to the calculations is linear, based on (fixed) costs and flight distance as inputs. The model is calibrated by comparing the results to air fares on commercially provided comparable routes. Discounts are provided to children, students, the elderly, disabled persons, and accompanying persons. The operator can set fares below the established maximum full-flex fare as long as the subsidy level is not exceeded. There is a discussion on whether the maximum air fare restriction fosters economic efficiency, particularly during periods when demand exceeds available capacity. There may also be challenges connected to providing the right incentives for efficient price discrimination.⁵ A study by Jansson (2007) indicated that a 20 % reduction in maximum air fares stipulated for PSOs in Norway would improve economic efficiency due to higher benefits to passengers and positive system effects on the transport network in general.

In Sweden, the level of air fares on PSO routes is based on the maximum average level for each route separately. It is unclear, however, how exactly the fares are determined.

The PSO procurement process

Before deregulation of the aviation sector, air services were regulated by annual block grant contracts with the air carriers. The NMTC would then cover any losses incurred due to running the specified services. Nowadays, domestic connections are supported through procurement of PSO contracts with air carriers. The initiative to establish PSOs usually comes from regional authorities.

The standards relating to the required routes in PSO procurement generally include:

- Number of round trips per day,
- Seat capacity during a given period of time,
- Route schedule (including number and time of stopovers at different airports),
- Number of days per year without a service,
- Aircraft seat capacity,
- Emissions of specified substances,
- Comfort factors, like pressurised cabin,
- Air fare levels, including social discounts.

Currently, the minimum number of seats per route per year is stipulated, together with demands for departure and arrival times in line with the connectivity criteria (see Table 4).

For example, for the Sogndal-Oslo and Sogndal-Bergen routes, the service requirements are as follows (Bråthen et al. (2018)):

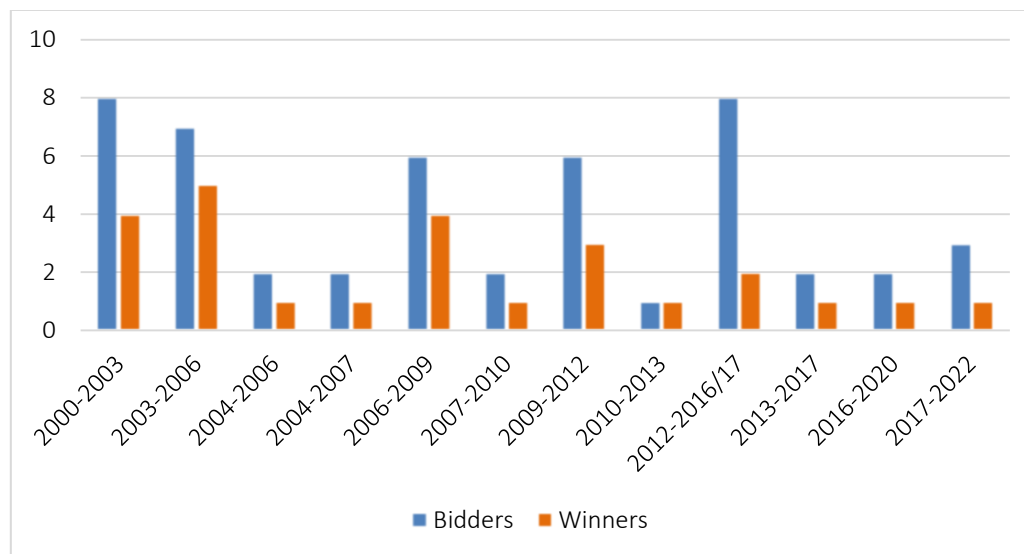
- 77 000 seats to be provided to/from Oslo and 25 000 to/from Bergen,
- No specific demands as to frequency, aircraft seat capacity or routing patterns,
- One departure landing at Oslo at 08.00am at the latest,
- One return flight from Oslo departing at 04.30pm at the earliest,
- One departure landing at Bergen at 09.30am at the latest,
- One return flight from Bergen departing 04.30pm at the earliest.

The winner of the bid will be the bidder who proposes the lowest subsidy for operating a specific route area for a period of 4 to 5 years. It is possible to include more factors in the decision-making and either specify the weights to be applied to each factor or consider all factors on balance (with the amount of the requested subsidy being the most important factor). A minimum (or maximum) limit may also be set for the most important factors. This is however not applied to the current procurement process. PSO tenders may also ask for or encourage bids that do not entail requests for subsidies. In such cases, the winner would benefit from monopoly rights on the PSO route.

One of the challenges of the PSO tendering process in Norway is weak competition for bids. The reason for it is that remote connections often have to be operated by small aircraft, which many companies do not have as part of their fleets. Since 2013, the tenders have been won by only one bidder, Widerøe's

Flyveselskap AS (see Figure 3.11). Widerøe has a fleet of De Havilland Dash 8-100/200 aircraft, with 39 seat capacity.

Figure 3.11. Number of bidders and winner of PSO tenders in Norway for the period 2000-2022



Source: NMTC.

There is also a concern that some domestic routes that are currently subsidised could be provided by the market. In a thin market without competitors, increasing air fares coupled with reduction in the provided frequency of service is usually an indication of the route being commercially viable. In 2016, PSOs for three routes in Norway (Oslo-Florø, Florø-Bergen and Ørsta/Volda-Oslo) were discontinued. Indeed, this resulted in a 10 % drop in passenger numbers due to air fare increases of 10 to 30% depending on the route and reduced departure frequencies. Bråthen et al. (2018) point out that while this had a negative impact on the passengers, significant savings have been made due to discontinuation of the subsidy payments.

Procurement of PSOs in Sweden is very similar to the one conducted in Norway. The decision-making also rests with the central government and a very similar decision-making process is followed to award bids. Sweden, however, conducts a thorough assessment of regional connectivity needs before it decides on supporting domestic air services. Moreover, the requirements stipulated in tenders are much more detailed than those in Norway.

In order to assess the need for a PSO service, the following main steps are taken by the policy-maker (Trafikverket, 2017b):

1. Assessment of market needs:
 - a. Connectivity analysis,
 - b. Assessment of network deficiencies.
2. Assessment of whether the route can be operated without a PSO.
3. Assessment of cooperation possibilities.
4. Assessment of alternatives: PSO versus other possible support measures.

5. Assessment against Trafikverket's PSO criteria:
 - a. The need for interregional travel.
 - b. The extent to which regional connections cannot be served by public transport alternatives.
 - c. The extent to which demand is not related to frequent commuting.
 - d. The extent to which passengers will cover the cost of travel.
 - e. The extent to which the costs and the subsidy level are within the scope of the Swedish PSO framework.
6. Coherence check against national transport policy objectives.
7. Coherence check against regional policy objectives.
8. Design of PSO specifications.
9. PSO tendering process.

Like in Norway, the number of bidders for PSO tenders is limited. In spring 2018, the PSO operator NextJet went bankrupt and had to cease all of its operations overnight. Amapola and NyxAir are now two new operators of PSO routes.

In terms of allocating slots for PSO routes, Trafikverket reserves slots that can be used by the operators running PSO services. This means that the slots in the event of the service being stopped are in the hands of Trafikverket. In Norway, slots are not reserved for PSO routes and PSO operators may in theory use the slots they currently use to operate PSO routes for other services.

Concluding remarks

The methodology behind determining the level of domestic air connectivity that should be provided to remote communities in Norway and Sweden as well as the process behind awarding PSO services in the two countries set out important lessons for other countries across the OECD.

The assessment of need for air connectivity provision should take into account other viable travel alternatives, to avoid creating unnecessary connections and unintended consequences on other transport modes. Cost-benefit analysis of different viable support alternatives by estimating generalised costs of travel, including setting the appropriate level of air fares, can help determine the optimal level of service required to improve welfare of remote communities.

Weak competition for tenders in countries like Norway and Sweden may potentially yield less economically efficient outcomes. Flexibility as to the process and conditions stipulated in tenders should be considered in light of trying to encourage many bidders to participate.

Finally, when PSO tenders are awarded and funded by the central government, like in Norway and Sweden, this creates incentives for local authorities to ask for more subsidies for air services than may be necessary. Leaving the responsibility for decision-making and funding in the hands of local authorities may help solve that problem.

Notes

- 1 For the updated list of PSOs across the EEA, see:
https://ec.europa.eu/transport/sites/transport/files/modes/air/internal_market/doc/pso_inventory_table.pdf.
- 2 In Portugal, some routes are awarded by regional authorities.
- 3 Some routes in France and Spain are awarded at the central government level.
- 4 The tender included connections south of Trondheim.
- 5 For further details, see NMTC (2016), sections 3.2, 3.3 and 6.

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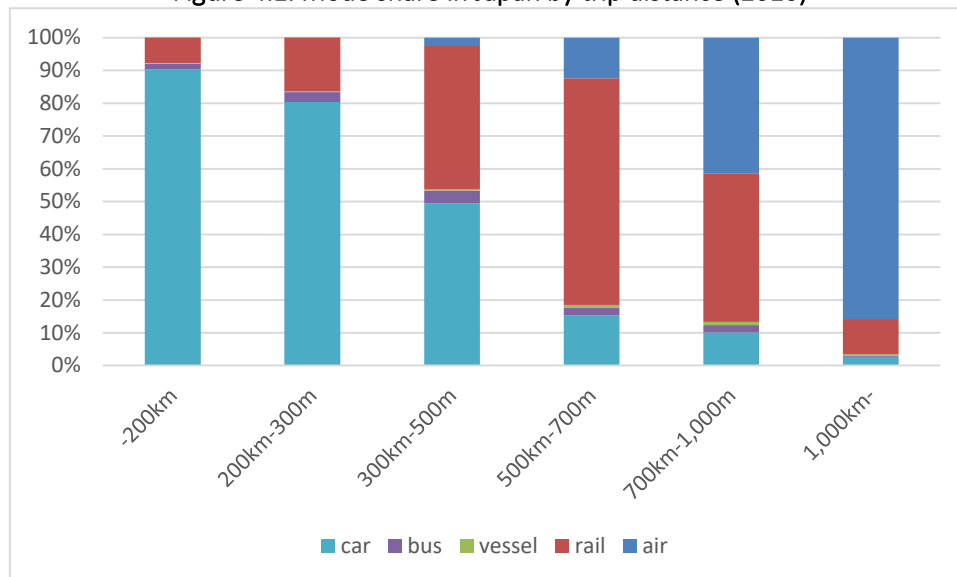
Chapter 4. Government support for domestic air connectivity in Japan: history, outcomes and a possible way forward

Sections below outline the characteristics of Japan’s connectivity across regions (“domestic connectivity”). It sets out the roles played by the domestic aviation sector, the highways network, and the high-speed rail.

The role of air transport in providing domestic connectivity

Aircraft can carry passengers and freight quickly over mid to long distances, hence providing potential for significant time savings to passenger travel and shipment of goods relative to other transport modes. At the same time, air travel is usually more costly than other transport alternatives. Due to these characteristics, the attractiveness of aviation relative to other transport modes increases with distance. This is reflected in Figure 4.1, which demonstrates that in Japan the air transport mode share dramatically increases for trips over 700 km.

Figure 4.1. Mode share in Japan by trip distance (2010)



Note: Inter-regional Travel Survey is a nation-wide survey conducted by MLIT every five years for non-commuting trips that cross prefectural or regional block boundaries on a weekday and on a weekend for five transport modes: air, rail, sea, bus, and private car.

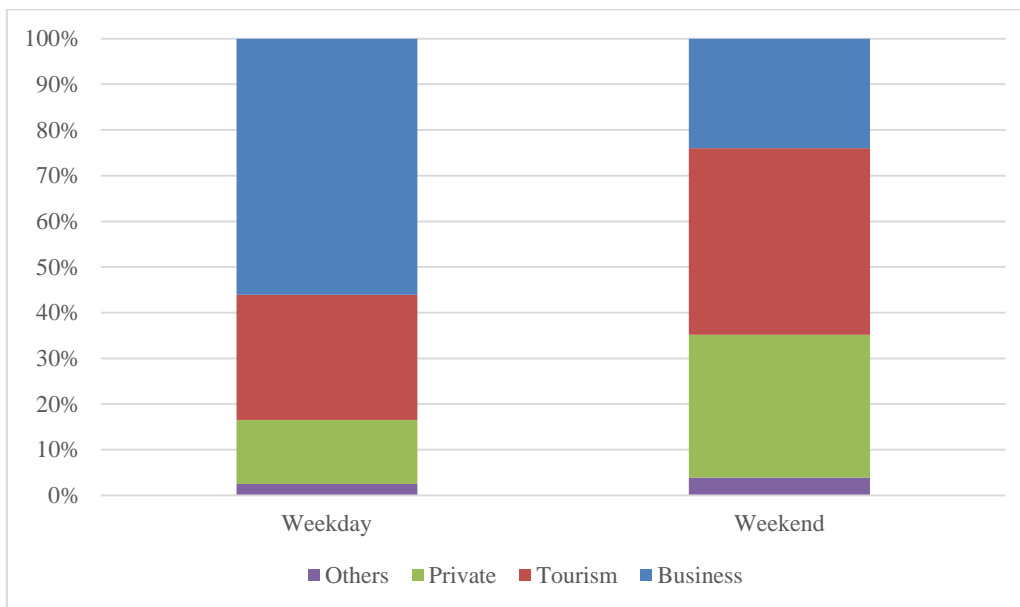
Source: MLIT’s Inter-regional Travel Survey – 2010 (MLIT, 2013).

For trips between locations separated by water, maritime transport plays a very important role. The use of relatively slow ships is most common, as high-speed vessels such as jetfoils and hovercrafts are expensive options. Domestic air travel provides the only realistic high-speed alternative. Out of the 86 airports with scheduled air services, 26 are located on remote islands¹. Among the 234 domestic air

routes² operated in 2017, 56 had remote islands either as an origin or as a destination (or both).³ 42 were between remote islands and regional hub cities⁴ or between two remote islands. 14 were long-distance routes, such as Ishigaki – Tokyo, on which majority of the passengers are tourists. The average sector length between remote islands and regional hub cities is 293 km, while the average sector length for domestic routes is 815 km (MLIT, 1962-2017).

The Inter-Regional Travel Survey in 2010 (MLIT, 2013) revealed that the majority of weekday air travel on domestic routes is for the purpose of business. The costs of such trips are usually borne by the firm. Last minute reservations are common and price elasticity is low. On weekends, most trips are taken by tourists and individuals visiting friends and relatives (VFR). VFR travellers and particularly tourists exhibit a higher price elasticity of demand than business travellers (Figure 4.2).

Figure 4.1. Passenger numbers on domestic routes by purpose of travel (2010)



Source: MLIT's Inter-regional Travel Survey – 2010 (MLIT, 2013).

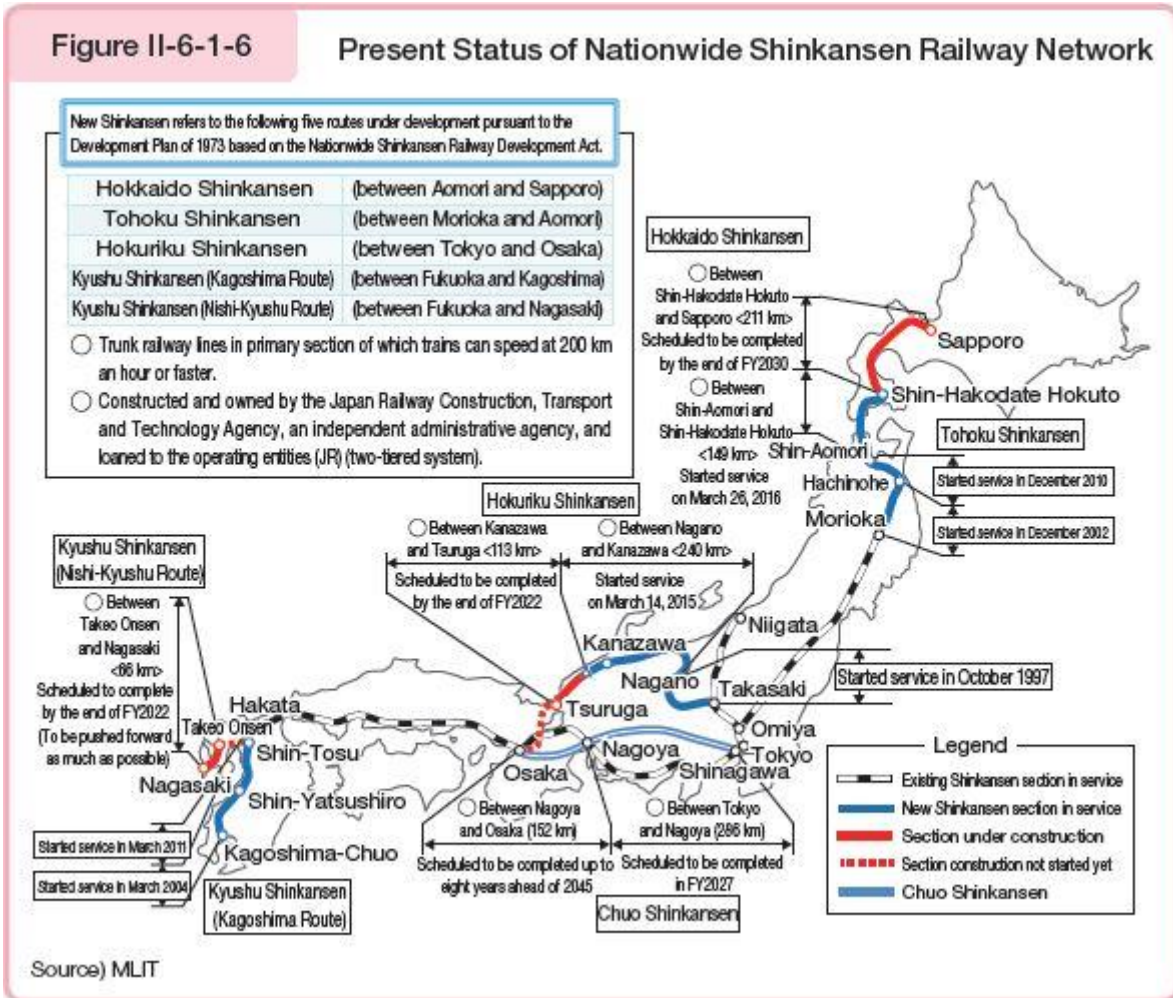
The majority of the residents of remote islands, however, travel for different reasons than business, leisure or family visits. According to a multiple-choice survey conducted in Kuchinoerabu, Kagoshima Prefecture (Yakushima-cho Sea Route Improvement Council, 2016), shopping accounted for half and medical care accounted for a third of the respondents' trip purposes. Residents of remote islands have high dependence on cities to provide essential services. This leads to low price elasticity of demand. Remote island residents also frequently take trips to use services in cities. Approximately 40% of the respondents in the Kuchinoerabu survey travel to the nearest city at least once a month. Air transport provides residents of remote islands with connectivity to services on which they depend.

Connecting regions of Japan: Shinkansen, highways network and domestic air transport

Shinkansen, the high-speed inter-city rail service, is the backbone of public transport in Japan. Tokaido Shinkansen, the first HSR to be developed between Tokyo and Osaka, started its operation in 1964. The

network was then extended to the west in the 1970s, linking Tokyo, Osaka, and Hakata (Fukuoka). Following this, Shinkansen was developed from Tokyo to the north. By the turn of the century, the Shinkansen network was more or less completed in the north of Honshu. Today, with a total of 2 765 km, Hakodate in Hokkaido is connected to Kagoshima in Kyushu (Figure 4.3).

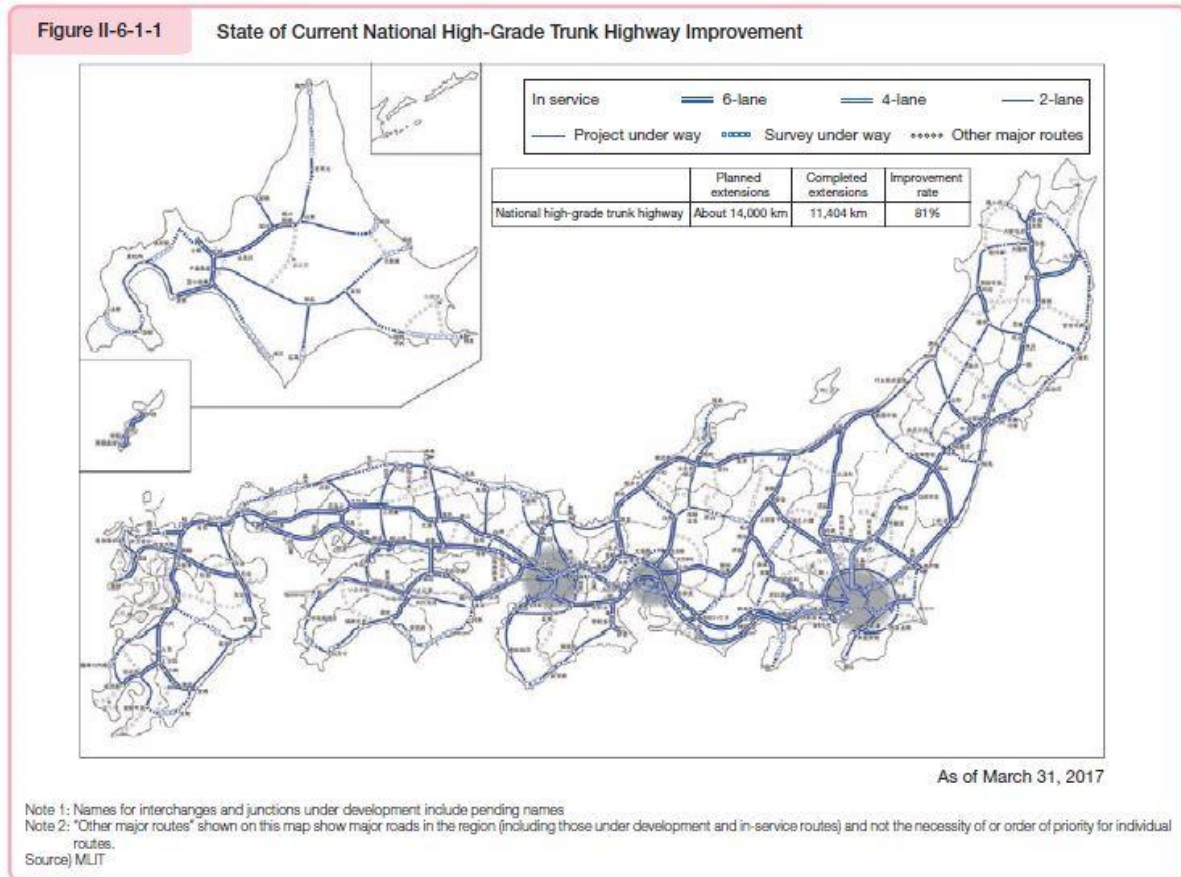
Figure 4.3. Shinkansen Network



Source: White Paper - FY2016, MLIT (2017).

The National High-Grade Trunk Highway Network has been developed not only to facilitate passenger transport but also to provide efficient network for the shipment of goods (Figure 4.4). As of the end of fiscal year (FY) 2016, total length of the network amounted to 11 404 km.

Figure 4.4. National High-Grade Trunk Highway Network



Source: White Paper - FY2016, MLIT (2017).

In Japan, there are 97 aerodromes for public use. Tokyo International Airport, commonly known as Haneda Airport, is one of the 20 airports owned and operated by the Japan Civil Aviation Bureau (JCAB). Of the remaining airports, 4 international airports are corporatised, 65 airports are run by local governments, and 8 military airports are partially used for civil aviation. Currently, Haneda Airport, Narita Airport, Kansai Airport, Osaka Airport (Itami), and Fukuoka Airport are designated by MLIT as congested airports under Civil Aeronautics Law 107-3. Domestic connectivity statistics of the 10 busiest airports in Japan are summarised in Table 4.1.

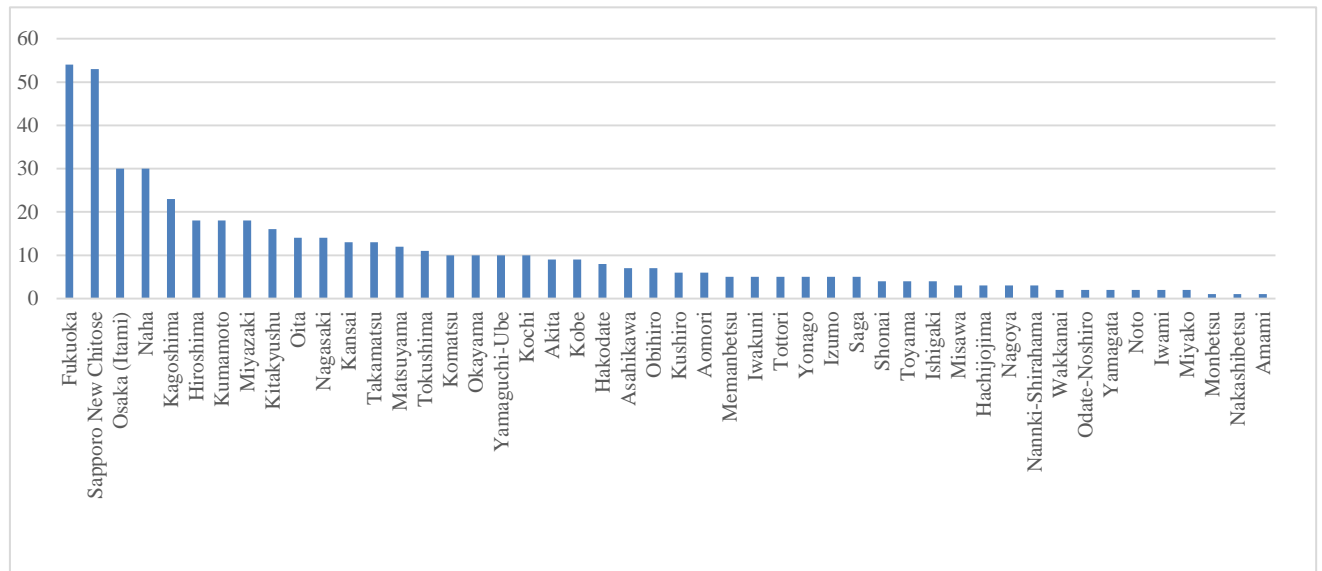
Table 4.1. Domestic connectivity statistics for the 10 busiest airports in Japan (2017)

	Number of destinations	Frequencies per day	Average seat capacity	Average load factor (%)	Average sector length (km)
Tokyo Haneda (HND)	48	496	236	72	931
Okinawa Naha (OKA)	29	152	197	75	1,114
Fukuoka (FUK)	27	174	173	75	863
Sapporo New Chitose (CTS)	26	130	211	75	880
Osaka (ITM)	25	183	152	71	655
Tokyo Narita (NRT)	19	72	171	81	969
Chubu (NGO)	18	81	137	70	906
Kagoshima (KOJ)	17	77	133	68	732
Kansai (KIX)	14	65	175	79	972
Sendai (SDJ)	9	51	115	70	828

Source: MLIT's Annual Report of Air Transport Statistics (2017), MLIT (1962-2017), compiled by the author.

Haneda Airport is by far the largest and most congested airport in Japan. In June 2018 the airport served 498 flights to 48 destinations (Figure 4.5). In FY2017, the average sector length was 931 km and the average seat capacity was 236⁵. In 2017, Haneda handled over 68 million passengers on domestic and around 17 million passengers on international routes (Annals of Airport Administration – 2017, MLIT, 2008-2017). When Narita Airport opened to handle the international flights in 1978, Haneda Airport had become a domestic airport. With the turn of the century, however, the government decided to reintroduce international flights at Haneda, starting off with charter flights. When the fourth runway was opened in 2010, some of the additional slots were carved out for international flights. Currently 81 slots are used for international services.

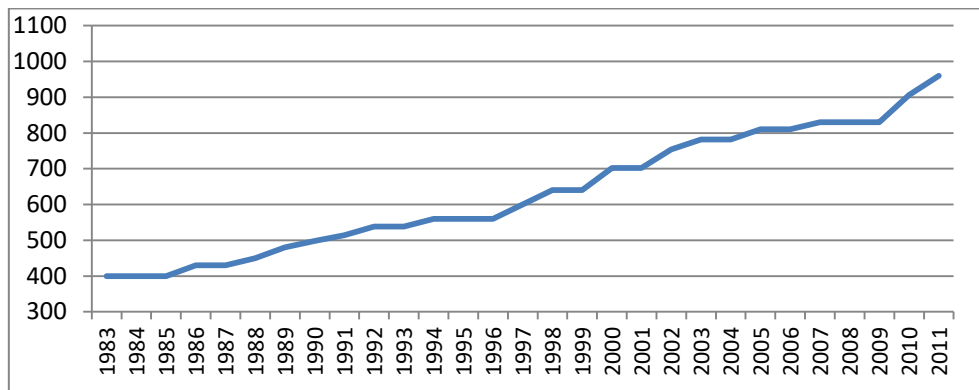
Figure 4.5. Frequencies available at Haneda in June 2018, by destination



Source: Tokyo International Airport Terminal Home Page (2018), compiled by the author.

At Haneda Airport, the number of available slots has gradually been increasing over the years, as depicted in Figure 4.6. Since the early 1980s, the total number of landing slots available per day more than doubled.

Figure 4.6. Number of available slots per day at Haneda Airport (1983-2011)

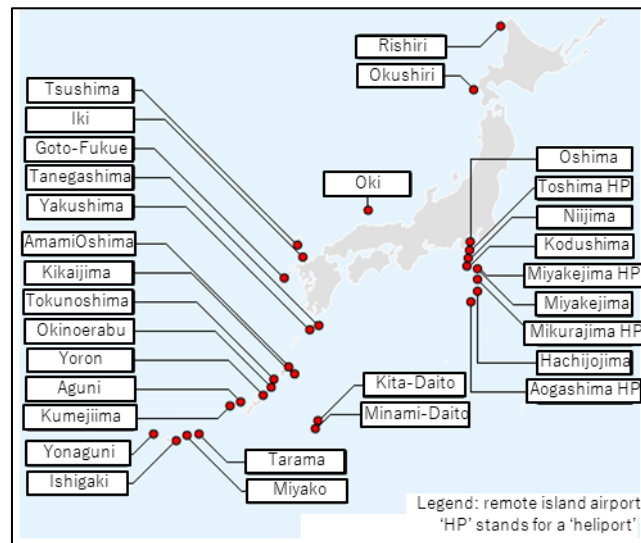


Source: MLIT (2012a), data compiled by the author.

Japan is composed of the relatively large islands of Honshu, Hokkaido, Shikoku, Kyushu and Okinawa, as well as 6 847 remote islands. 416 of these remote islands are inhabited. As residents of the remote islands depend on connectivity to the nearby major hub cities for the provision of many essential services, securing connectivity for residents is high on both local and national political agendas. The predominant mode of transport for remote islands is maritime transport, followed by air transport. According to MLIT, in April 2018 there were 295 remote island sea routes operated by 228 enterprises⁶. In FY2016, the total number of passengers served by the maritime sector was 43 million.

There are 26 airports and 4 heliports with scheduled services in Japan. These are depicted in Figure 4.7. In FY2017, a total of 4 million passengers travelled on air routes between remote islands and regional hub cities, the average distance of one such trip was 293 km. In comparison to remote island sea transport, the total volume of remote island air transport is 10 times smaller and the average distance is more than 10 times longer.

Figure 4.7. Remote island airports serving scheduled traffic



Note: HP stands for heliport.

Source: Ekitan, edited by the author.

Government support for domestic air connectivity

Government transport policy in the 1960s and 70s focused on how to facilitate sustainable growth of the transport industry. Policy decisions were made mostly on a mode-by-mode basis. A “demand-supply test”, which required the scheme promoter to justify that there was sufficient demand for the service they intended to provide, was commonly used to prevent oversupply.

As the transport industry matured in the 1980s and 90s, transport policy orientation turned towards deregulation and started to be considered across modes. The facilitation of competition in the market for transport was meant to replace the ex-ante market control. The decision to lift the demand-supply test across the entire transport sector in 1996 was the first integrated policy decision across all transport modes. Subsequently, in 2011, domestic land, sea and air transport support measures were consolidated into a uniform subsidy scheme.

As a consequence of deregulation, cross-subsidisation of less profitable routes by airlines was no longer incentivised. In order to provide connectivity to remote islands, the government decided to support

airlines with a subsidy for their operations of remote island routes and to safeguard slots for domestic connectivity at congested airports.

The Air Transport Committee’s Report: Market deregulation, maintaining essential connectivity of remote regions, and slot allocation at congested airports

Foundation of current air transport policy is stipulated in the Report of Transport Policy Council, Air Transport Committee entitled “Measures needed to facilitate deregulation in the air transport market” published in 1998 (MoT, 1998).

In 1996, in light of the need to promote administrative reform and economic restructuring, the then Ministry of Transport (MoT) made the decision to abolish the “demand-supply test” across all transport modes. Following the Report regarding deregulation of the transport sector from the MoT’s Transport Policy Council in 1997, the Air Transport Committee of the Transport Policy Council was commissioned to recommend on how to further deregulate the air transport sector. The Committee also was tasked with recommending how government could maintain air connectivity of remote regions and how to allocate slots at congested airports. Revision of the Civil Aeronautics Law based on the recommendations was passed by the National Diet and enacted in 2000. The details of the recommendations produced by the Committee are outlined below.

Deregulation of the air transport sector

The key policy principle stipulated by Air Transport Committee of Transport Policy Council in its 1998 report (MoT, 1998) is that of deregulating the air transport sector through enhancing market-based outcomes. Until then air carriers had to obtain a permit for each service based on the demand-supply test. The scheme promoters had to provide evidence of sufficient demand as well as absence of excessive competition for the service. They were also required to obtain approval of the air fare levels. Though the changes were implemented already in 1985, it was not only until the late 1990s when the three incumbents – Japan Airlines (JAL), All Nippon Airways (ANA), and Toa Airways (TDA) – were challenged by the rise of new entrants to the market.

Since aviation liberalisation is expected to further enhance competition among air carriers, the resulting product diversification and lower air fares are expected to produce greater benefits to the users of aviation, passengers and shippers.

Removing the demand-supply test and the requirement for the air fare approval changed government’s role in the market. Rather than pursuing ex-ante control of the market, the government was now to stipulate rules for airlines to follow and undertake ex-post surveillance of the market outcomes. Government intervention in the market for aviation would only be justified when there is market failure. Infrastructure development was also deemed an important policy objective, in order to provide an environment in which airlines would compete.

Maintaining essential connectivity of remote regions

Deregulation of the air transport sector provided carriers with significant incentives to rationalise their route networks in order to increase profitability. Intensified competition reduced airlines’ ability to cross-subsidize less profitable services in the network. As many routes connecting remote islands are marginal, this development threatened the existence of air services providing essential mobility for the residents in

remote regions, despite the support measures for such routes in place at the time. The measures included subsidies and tax breaks for airlines to acquire small aircraft to operate routes to remote regions and discounts for landing charges at airports based on remote islands.

The Air Transport Committee's report argued that additional support on top of the current measures was required to provide sufficient levels of connectivity to remote regions. In particular, the report stated that it was necessary to provide airlines serving remote connections with an operational subsidy for such routes. It also called on the government to establish a framework under which local governments could select and maintain the routes. The scope of the subsidy should be limited to the routes that meet certain criteria, such as sufficient geographical and meteorological constraints, or no availability of alternatives, also across other transport modes.

Slot allocation at congested airports

Since there was no expectation that aviation capacity needs at airports in major metropolitan areas, such as Tokyo, would be met in the foreseeable future, the report called for a reallocation of the existing slots to further promote competition among airlines and improve user benefits. The Air Transport Committee's report set out three different alternatives: administrative slot allocation, auctioning of slots, and allocation of slots based on a lottery.

The report considered all three approaches and concluded that if the objectives are appropriately developed and the transparency of procedures is ensured, administrative slot allocation is to be the preferred option. If this approach was implemented, objectives should include maximising both the efficiency of airline operations and benefits to the users of aviation. The report also called for the decision-making criteria to be transparent. It was also clear about the need to foster operations by new entrants at congested airport sites.

Support for remote island air connectivity under an integrated framework for sustaining regional public transport

Support for public transport in the regions

Financial support for regional public transport has a long history. In the 1960s, motorisation developed rapidly and started to erode the viability of public transport in local regions. This adversely affected the financial standing of the JNR, which started to operate a deficit in 1964. By 1980, the deficit reached JPY one trillion per year. As a solution to this, the JNR was split into six passenger firms and one freight firm in 1987 for privatisation. Four of the passenger firms were subsequently listed in the stock market and fully privatised. This put an end to the government's funding of national railway operations. Following this, operational subsidies to regional private railways were abolished in the 1990s.

During this same period, as railway lost its status as the backbone of the regional transport network, bus services became the "last resort" for regional mobility. In 1969, operational subsidies for bus service in underpopulated areas were introduced. The central government and local prefectures each provided half the funds to cover the net loss incurred by the operators of bus routes that were designated as essential.

In 2007, the Act on Regional Public Transport Revitalisation and Recovery was enacted. Under the new act local committees composed of various stakeholders were encouraged to review and make plans for renewal of regional public transport that had deteriorated during decades of motorization and deregulation. MLIT introduced a new multi-modal subsidy in association with the new act, which was

reviewed in 2009–2010, together with the existing subsidies for each mode. In 2011, the central government's subsidies for regional public transport were integrated into one Programme for Securing, Sustaining and Improving Regional Public Transport (the 2011 Programme) (MLIT (2011)).

Support for air routes to and within remote islands

Access to a regional hub city is an indispensable life-line for remote island residents. In 1952, the Act on Remote Island Sea Route Improvement was enacted. As per the terms of the act, the central and local governments each provided half of the net loss incurred from the operation of remote island sea routes that met specific criteria as well as capital cost of relevant vessels.

Subsidies for air routes to remote islands began as a subsidy for aircraft procurement in 1972. The rationale of this scheme was to reduce the airlines' capital costs of acquiring small aircraft, which tend to have higher unit costs. This was perceived by the government as an alternative to having to make investments in airport capacity in remote regions to enable bigger aircraft operations. For that reason, the support scheme for aircraft acquisition was established under the Special Account for Airport Development. In 1999, at the time when new air transport policy was developed, subsidies were expanded to cover part of other non-personnel expenses incurred by airlines operating on remote island air routes.

In 2011, sea and air route subsidies, except for the aircraft acquisition subsidy for remote island routes, were integrated under the Programme for Securing, Sustaining and Improving Regional Public Transport in the government's General Account.

Measures supporting air transport to and within remote islands in the 2011 Programme

The Programme stipulates the criteria, amount of subsidy to be provided, procedure, as well as other details, as follows:

- Criteria that need to be fulfilled:
 - The route links a remote island and its most relevant destination that facilitates daily life.⁷
 - All sea routes to that destination take more than 2 hours.
 - The route should not be a route in which more than two operators compete with each other.
 - The operating plan needs to be appropriate and feasible.
- Amount of subsidy to be provided:
 - Operational subsidy: half of either the expected loss on the route or the calibrated loss vis-à-vis yardstick operating cost, whichever of these two has the lower value. Yardstick is applied to hedge from irrational losses.
 - Air fare discount subsidy: half of difference between air fare discount envisaged by the local council on the route and the average air fare level of other non-subsidised routes in the region.

- Procedure
 - Local council comprising local governments, local offices of central government, airlines and other aviation stakeholders needs to consolidate a three-year life-line regional public transport plan.
 - Once granted, the subsidy is provided for a period of one fiscal year.

Table 4.2 lists the 14 remote island air routes⁸ to which operational subsidy was provided in FY2017.

Table 4.2. List of routes subsidised in the remote regions

Prefecture	Remote island	Regional hub
Hokkaido	Rishiri	Sapporo Okadama
	Okushiri	Hakodate
Tokyo	Oshima	Chofu (Tokyo)
	Nijijima	Chofu (Tokyo)
	Miyakejima	Chofu (Tokyo)
	Hachijojima	Tokyo (Haneda)
Nagasaki	Tsushima	Nagasaki
	Fukue	Nagasaki
	Iki	Nagasaki
Kagoshima	Kikai	Amami
	Tokunoshima	Amami
	Okierabu	Yoron
	Okierabu	Kagoshima
Okinawa	Yonaguni	Naha

Source: Information from relevant prefectures (Hokkaido Prefecture (2018), Tokyo (2018), Nagasaki (2018), Kagoshima Prefecture (2016), Okinawa Prefecture Prefecture (2018), compiled by the author.

Specific national border remote island grant

In April 2017, in conjunction with the new Act on National Border Remote Islands, the central government introduced a grant to local governments that would cover from 50 to 60% of the local government's expenditures relating to the provision of reduced sea and air fares, transport cost relief for agricultural products as well as job creation and tourism promotion.

The objective of the fare reductions is to match the level of sea fares with the JR Group's railway fare levels and match the level of air fares with the Shinkansen fare levels. According to the cabinet office, air fares will on average have to be reduced by 38% to match the Shinkansen fare levels.

Other government support for domestic air connectivity

Apart from government subsidy and slot allocation, there is a package of support measures for domestic air connectivity, some introduced prior to the deregulation of the air transport sector. These are set out in the sections below.

Reductions in the level of airport landing charges for remote routes

The government incentivises domestic air connectivity through providing reductions in the level of airport landing charges for domestic connections at those airports that are in government ownership.

Landing charges depend on the maximum take-off weight (MTW) of aircraft, their effective perceived noise in decibels (EPNdB), and revenue per passenger carried. The higher the MTW, the steeper the landing charge is. The charge varies from JPY 750 per ton for aircraft of up to 25 tons and JPY 1 610 per ton for aircraft of over 201 tons.

The amount of reduction depends mainly on how many frequencies are available for a given remote destination (the higher the frequency, the lower the discount). Table 4.3 details the discounts for landing charges available at different airports. For example, at Haneda such reductions belong to five distinct categories. For historical reasons, there is a special law that facilitates regional promotion of the Okinawa Prefecture. For these routes, the landing charges amount to as little as between 1/6 and 1/16 of the base price, depending on the size of the aircraft used on such services. The same discounts apply to all routes to/from remote islands.

Table 4.3. Reductions in the level of landing charges by airport

		Landing charge reduction by airport			
		Tokyo Haneda	Fukuoka, Sapporo New Chitose	Naha	Other national airports ²
Departure Airport	Tokyo Haneda, Osaka (Itami), Fukuoka, Sapporo New Chitose	base price	base price		
	Kansai, Hiroshima, Takamatsu, Matsuyama, Kitakyushu, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima	2/3 of base price		1/6 of base price	1/2 of base price
	Kushiro, Hakodate, Kochi, Yonago (Miho), Iwakuni, Tokushima, Komatsu	2/5 of base price	1/2 of base price	(1/8 for props, 1/16 for aircraft with MTW of 6 tons or less)	(exception: 1/3 of base price for flights from Kansai, Narita and Chubu)
	Asahikawa, Obihiro, Memanbetsu, Akita, Yamaguchi-Ube, Aomori, Shonai, Toyama, Kobe, Tottori, Izumo, Okayama, Saga	1/5 of base price	(exception: 1/3 of base price for flights from Kansai, Narita and Chubu)		
	Wakkanai, Monbetsu, Nakashibetsu, Sapporo Okadama, Misawa, Odate-Noshiro, Yamagata, Noto, Nanki-Shirahama, Iwami, etc.	1/6 of base price			
	Naha, all the remote island airports	1/6 of base price (1/8 for props, 1/16 for aircraft with MTW of 6 tons or less)			

Notes: "Base price" is based on MTW, noise level of the aircraft and number of passengers.

"Other national airports": Wakkanai, Kushiro, Sapporo Okadama, Hakodate, Misawa, Ibaraki, Niigata, Komatsu, Yonago (Miho), Hiroshima, Iwakuni, Tokushima, Takamatsu, Matsuyama, Kochi, Kitakyushu, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima.

Additional 10% discount is applied to aircraft with MTW of 50 tons or less.

Landing charge of Haneda and Sapporo New Chitose for particular midnight flight is 1/2 of base price.

Landing charge of international airports (Narita, Kansai, Osaka (Itami), Chubu), privatized concession airport (Sendai) and local government airports is set independently by the operator and is different from above.

Source: MLIT (2012a), information compiled by the author.

Considering that IATA estimates that landing charges can constitute as much as 7% of the total cost of airline operations (IATA, 2009), the reduction in the level of landing charges for remote routes does not appear to be insignificant.

Reductions in the domestic aviation fuel tax rates

Aviation fuel tax is levied on aircraft fuel consumed on domestic routes. Proceeds from the tax are used to fund airport development.

In 2011, the tax was reduced from JPY 26 000/kl to JPY 18 000/kl. Initially having been implemented for a period of three years, the reduction has since been extended twice to facilitate maintaining and recovering regional air networks.

Also, just as with the discounts on landing charges, there is special treatment for Okinawa routes (JPY 9 000/kl) and for routes to/from remote islands (JPY 13 500/kl), introduced in 1997 and 1999 respectively.

Reductions in the fixed asset tax rates

Fixed asset tax rates are levied by local governments on various fixed assets such as real estate and depreciable assets such as aircrafts. The base rate amounts to 1.4% of the asset value. To promote domestic air connectivity, reduced tax rates are applied. Such reductions range from 2/3 to 1/4 of the base rate depending on the size of the aircraft and its level of utilisation on local routes. Original reduction was introduced in 1954.

Investment in regional airlines

A number of local governments in Hokkaido, Nagasaki, Kumamoto, Kagoshima, and Okinawa have made investments in regional airlines that mainly operate turbo-prop aircrafts. Capital injections by these local governments usually form part of the overall support that they provide to airlines operating on remote island routes in their respective jurisdictions.

The evolution of the slot allocation policy at Haneda Airport

The Ancien Régime

Until the amendment of June 1999 (effective as of February 2000) permits for aircraft operations were stipulated in Paragraph (1) of Article 100 Clause (ii) of Civil Aeronautics Law (Law No. 231 of 15 July 1952). It indicated that “Any person that wishes to manage scheduled air transport service shall obtain a permit for each route from the Minister of Transport” (see Yamaguchi (2018c) for the provisions). The operating permit had to be obtained route-wise. In Paragraph (1) of Article 101, it is mentioned that “At the time of the start of the operation, the new route shall not be providing excessive capacity vis-à-vis the air transport demand for that route.” Therefore, the applicant was required to provide the evidence

of the demand – supply test being satisfied for the route. When the route was meant to serve Haneda Airport, the minister would also consider whether to grant the applicant a slot at Haneda Airport to operate the route. Paragraph (1) of Article 101 was applied once the necessary changes have been made to changes in the operation plan. Therefore, if an airline wanted to switch a Haneda slot for another route, the Minister would have to authorise such a change.

Under this “Ancien Régime” three major airlines were designated to operate as follows: JAL on international and domestic trunk routes⁹, ANA on domestic trunk and local routes, and JAS (ex-TDA) on domestic local routes. This so-called 45/47¹⁰ Framework was revised in 1985. The revised framework introduced more competition into the air transport sector; for instance, by dropping the designation of different types of routes to the three incumbent airlines as well as gradual reductions in the limits on passenger volumes to allow for more routes to be operated by two or three airlines. The limits on passenger volumes were eventually fully removed in 1997. In the domestic market ANA had half of the share, and JAL and JAS each had a quarter. Since JAS operated local routes that were less lucrative, JAS’ requests for additional slots at Haneda were given priority.

The new legal framework

The licencing clause for air transport operation in the Civil Aeronautics Law was revised in 2000. The licence is now given to the enterprise as a whole and not for separate routes. In addition to this, the demand–supply test was dropped.

A new article on Special Exceptions pertaining to Congested Aerodromes was added to the licencing clause. To fly into a congested airport, airlines are required to obtain a five-year licence. Licencing criteria stipulated in Clause (ii) of Paragraph (2) in Article 107-3 state that “The relevant congested aerodrome shall be used for proper and reasonable purposes, including offering of transport services that are convenient for the users through promotion of competition and formulation of diversified transport networks, etc.” Thus, there are two major objectives of slot allocation at congested airports: (i) promotion of competition and (ii) formulation of diversified transport networks. The new policy contained in the revised licencing clause freed the airlines from having to apply for each route separately (see Yamaguchi (2018c) for the provisions).

Although the slot allocation at Haneda Airport conducted in 1997 was implemented under the old law, it enabled new entrants to operate from the airport for the first time in 35 years. Out of the 40 additional slots made available with the construction of the new runway C (R/W-C), 6 were allocated to the new entrants, 3 to SKY and ADO Airlines each. 6 slots were ring-fenced for local routes with only one frequency available at the time, such as Wakkanai Airport, and connections to newly opened airports, such as Saga Airport and Odate-Noshiro Airport. The rest were allocated to the incumbent airlines based on a set of key performance indicators (KPIs) regarding user benefits (such as air fare reductions, safety outcomes, contribution to the national route network formation), management efficiency, and performance ratings. This KPI-based allocation was subsequently incorporated in the rating system of the allocation rule under the revised law.

Setting up the new slot allocation policy in 1998

The Report of the Committee¹¹ on the Slot Allocation Scheme (1998) in November 1998 addressed a number of basic issues related to slot allocation under the new law.

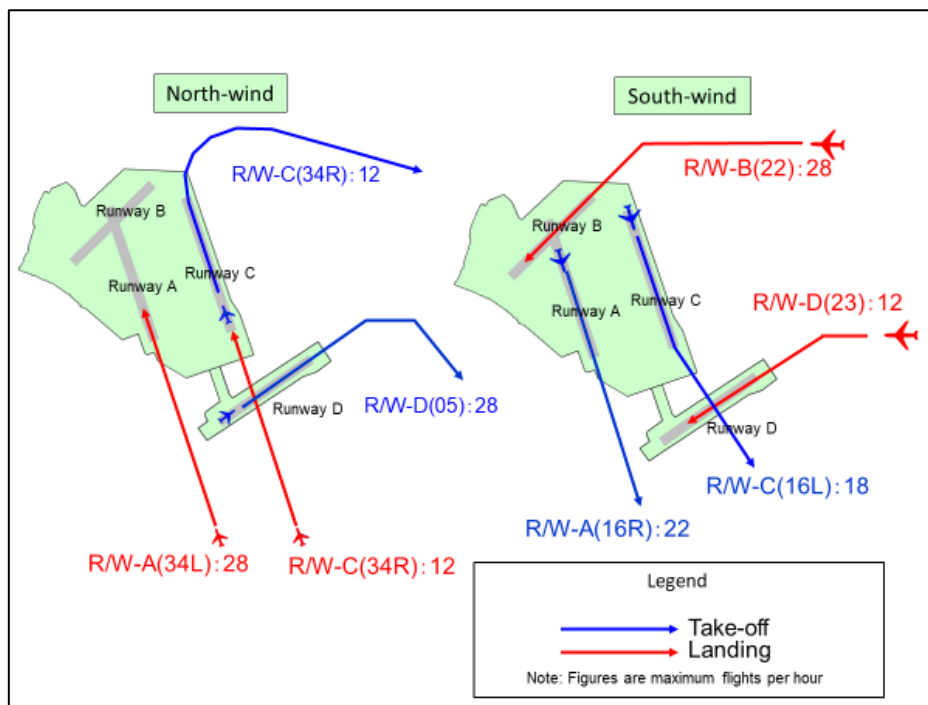
First, it recommended that additional slots made available should not be the only object of slot allocation and a certain number of slots recollected from existing air carriers should also be periodically put

forward for reallocation. Second, slot allocation to new entrants and slots intended to maintain and foster the minimum air transport network¹² should be appropriated before rendered to air carrier evaluation or competitive bidding. Third, except for a number of earmarked slots for local routes, airlines are now basically allowed to use Haneda slots for at their discretion. Fourth, as for actual allocation of slots at specific airports, another roundtable Committee should be set up to discuss this issue.

Haneda’s expansion in 2000

In July 2000, runway B (RW-B) was relocated towards the bay-side at Haneda Airport (see Figure 4.8 for the configuration of runways at the airport), which allowed for operation of 57 additional daily slots¹³. The Committee on Slot Allocation Scheme at Congested Airports, which was established to serve as a forum to discuss actual allocation scheme, delivered a report in February of 2000. The report recommended that 15 slots be ring-fenced for new airlines; 3 for SKY and 3 for ADO. 9 slots would be secured for future new airlines¹⁴. Two slots were safeguarded for operations to the newly-opened local airports of Odate-Noshiro and Monbetsu. The remaining 40 slots were to be allocated to the incumbent airlines based on their KPI scores in terms of providing user benefits (such as air fare reductions, safety outcomes, contribution to the national route network formation), management efficiency and their performance ratings. In the end, 14 slots were allocated to JAS, and 13 to JAL and 15 to ANA including two safeguarded slots for new airports.

Figure 4.8. Runway configuration at Haneda Airport



Source: MLIT (2012a), compiled by the author.

The One Frequency Rule

In July of 2000, the One Frequency Rule was introduced into the slot allocation system. The rule stipulated that if the last frequency of a local route is to be lost, MLIT would recollect the relevant slot

and conduct bidding for this slot among the airlines. This rule per se does not necessarily ensure the operation of a local route. It does, however, increase the chances of the route being preserved. When a route is on the verge of being discontinued, other airlines in conjunction with local stakeholders are offered an opportunity to take initiative of sustaining the service by taking over the slot. For example, in 2002, ANA announced its closing of the Haneda - Yamagata route. MLIT proceeded with the tendering for the operation of this route and JAS (later merged with JAL) stood up to exercise the operation by utilising the ANA slot for that service. In 2015, ANA dropped the Haneda – Oshima route. Since Oshima is a remote island in the Tokyo Prefecture relatively close to the city of Tokyo, sea transport is a feasible alternative¹⁵. For that reason, the operational subsidy was not applicable to this route. Since there was no airline willing to take up the service, the Haneda – Oshima service was brought to an end.

Rise of new entrants at Haneda

In early 2000s, there were three instances of slot allocation in which all available slots (4 April 2002, 12 October 2002, and 10 July 2003) were ring-fenced and provided to new entrants. This increased the share of slots in the hands of new entrants to 12% of the overall number of available slots.

In February 2004, the Committee on Desirable Use of Haneda Airport was established and, after extensive period of discussions, delivered a report in September 2004. 40 slots¹⁶ were taken away from JAL and ANA¹⁷, 20 of which were to be reallocated to the new entrants. As a result, the share of slots allocated to new airlines increased to 17% of the total. There was an intense discussion on whether the new entrants would operate the more lucrative trunk routes using the newly acquired slots. New airlines were at the time only beginning to develop routes to local cities and it would have been very challenging for them to effectively compete on remote destinations with the incumbents. For this reason, the report by the Committee concluded that it was unnecessary at that stage to compel new airlines to establishing particular services.

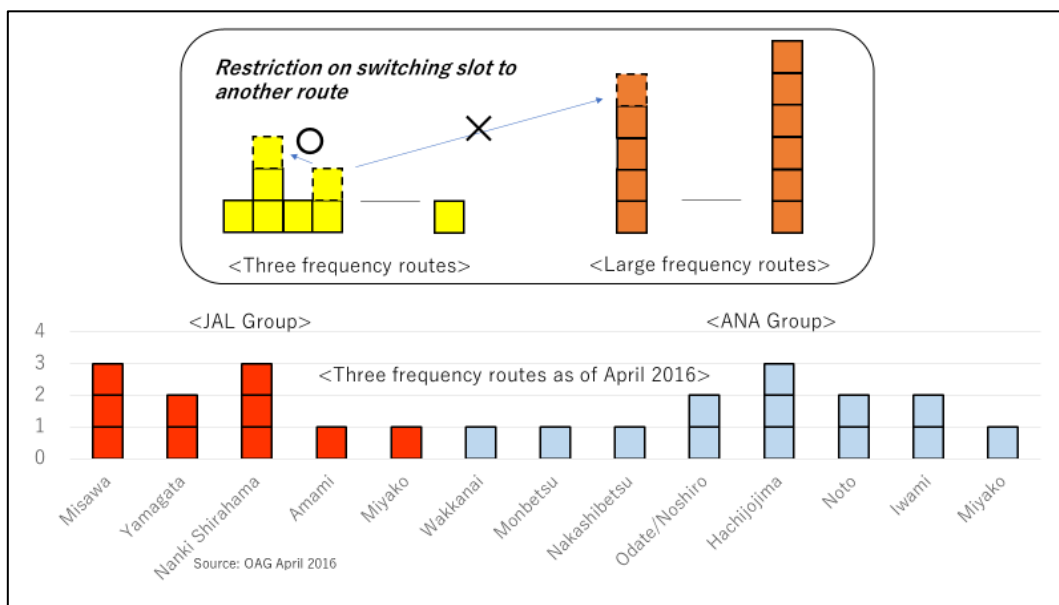
The allocation of slots to new entrants has, however, been controversial. For example, SKY obtained slots at Haneda to operate routes to Tokushima and Kagoshima, only to start operating trunk routes shortly after seizing the slots. In response to such moves by the airlines, MLIT imposed a new slot allocation from December 2005. A number of slots allocated to new entrants at that time were to be ring-fenced for non-trunk routes.

There was also the need to revise the definition of a new entrant. The 2004 Report contended that a new entrant is a carrier that has fewer than 12 aircrafts in total based on minimum scale necessary to compete with larger incumbent carriers (MLIT, 2004).

The Three Frequency Rule

In 2005, a new rule called the Three Frequency Rule was imposed on the incumbent airlines. The rule was intended to maintain and foster a wide network of domestic connections. Routes with frequencies of three or fewer served by each incumbent airline were grouped together. To keep the slots that would be allocated to this category, each carrier would have to either continue to operate the same route, or change the route to another route from the same category. As depicted in Figure 4.9, this rule was aimed at preventing the switch to higher frequency routes and preserving connectivity for less frequent services.

Figure 4.9. The Three Frequency Rule



Source: MLIT (2012a), material edited by the author.

In 2007, 6 additional slots were made available by installing high-speed break-off taxiways so that landing aircrafts could clear the runway as soon as possible in peak hours. These slots were utilised provisionally: 4 slots were ring-fenced for flights between Haneda Airport and Kansai Airport. These were intended to enhance international access to/from Haneda Airport via Kansai Airport, which has the largest network in Japan to East Asian cities. 2 slots were blocked for local routes.

Haneda’s expansion in 2010

In 2010, Haneda Airport opened its fourth runway – D (RW-D). The total number of daily slots increased from 415 to 480 in 2010 and then to 546 in 2013. The slots were allocated in two phases, in 2010 and 2013 (Table 4.4).

Table 4.4. Slot allocation at Haneda Airport in 2010 and 2013

	2009	2010	2013
Domestic	403	440 (+37)	465 (+25)
International	12	40 (+28)	81 (+41)
Total	415	480 (+65)	546 (+66)

Source: MLIT (2010, 2012a, 2012b), data compiled by the author.

The consultation on how to allocate the 37 slots in 2010 was conducted by the Committee on Allocation Criteria for Haneda Airport. Based on the consultation, MLIT allocated the slots as follows:

- Each new entrant (SKY, ADO, SNJ, SFJ) was allocated 4 slots each (total of 16 slots):
 - 3 slots to be used at its discretion,

- 1 slot to be used on a non-trunk route.
- 1 slot was allocated for a pilot project to be conducted by MLIT with new routes that could be operated by small aircraft.
- The remaining 20 slots were allocated to the incumbent airlines (JAL, ANA):
 - 4 departure slots were provisionally allocated to ANA as a reward for maintaining low density routes of under 400 000 passengers per year after the 2005 reallocation¹⁸,
 - 16 slots were allocated to JAL (7) and ANA (9) based on appraisal (see Annex 2 for a summary of appraisal criteria).

In July 2012, the Sub-committee on Criteria of Haneda Airport Slot Allocation under the Air Transport Committee of MLIT's Transport Policy Council was set up to deliver a report on the second phase of domestic slot allocation at Haneda. The Sub-committee examined the effectiveness of the previous slot allocations at Haneda and recommended the following changes to the slot allocation rules:

- All new entrants that have with total of 12 or more aircraft in operation should be treated in the same way as incumbent carriers for the purpose of slot allocation.
- The One Frequency Rule and the Three Frequency Rule should be maintained in order to help foster low-density routes from Haneda. At the same time, a revision of criteria for slot allocation is needed in order to incentivise traffic growth for a wide range of destinations.
- Safety considerations should continue to be at the heart of slot allocation decision-making. The carriers that make efforts to improve their safety should be rewarded.
- Although JCAB has not engaged in auctioning of slots, airlines should be encouraged to compete for slots with proposals on how to utilise them. It is suggested to introduce "Policy Contest" for local routes in which slots would go to those airlines that submitted the best proposals through partnership with local entities.
- Due to JAL's filing for bankruptcy in 2010 and its subsequent government-backed bail out, the Sub-committee recommended that evaluation points, relevant to the period in which JAL had operated under the bailout process, be mapped out.

The criteria guiding allocation of slots are summarised in Annex 3. After summing up the points gained in the four categories of KPIs by each airline, a coefficient of 0.54 was applied to JAL's appraisal points (excluding safety, etc.) to deduct the points relevant to the period required for the bailout process. Each airline was allocated with its prorated number of slots by applying the KPI point ratio that each airline obtained to the 25 total slots. For example, ANA obtained 15.4 points out of the 49.5 available, which implied it would obtain 8 slots i.e. 31% of slots available for allocation.

The current status of allocated slots at Haneda Airport is depicted in Table 4.5. Excluding the tentative allocated slots (for HND-KIX and the Policy Contest), incumbents and new airlines hold 77% and 22% of slots respectively. Around 11% of allocated slots were ring-fenced for non-trunk routes.

Table 4.5. Slots allocated at Haneda Airport

	Unrestricted slots	Local destination slots	HND-KIX	Policy Contest	Total
JAL	176	7.5	-	1	184.5
ANA	160	11.5	-	2	173.5
SKY	28	8	-	-	36
ADO	19	4	-	-	23
SNJ	18	7	-	-	25
SFJ	14	5	4	-	23
Total ¹⁹	415	43	4	3	465

Source: MLIT (2012b), data compiled by the author.

Outcomes of the Haneda slot allocation process

There is an inherent trade-off between reaching the objective of fostering competition and maintaining a wide route network at congested airport sites. This is mostly due to the fact that new entrants tend to concentrate their operations on high-volume, more profitable routes. To maintain regional connectivity, the government has developed a programme supporting connections to and within remote areas of Japan.

The total number of destinations available at Haneda increased from 42 to 48 between 1997 and 2018 (Table 4.6). The number of available flights increased by 68%, from 297 to 498.

Table 4.6. Number of flights to/from Haneda Airport in 1997 and 2018

	1997 (42 destinations)			2018 (48 destinations)		
	Trunk	Local	Total	Trunk	Local	Total
Incumbents	100	197	297	131	256	387
	34%	66%	100%	34%	66%	100%
New airlines	-	-	-	49	62	111
	-	-	-	44%	56%	100%
Total	100	197	297	180	318	498
	34%	66%	100%	36%	64%	100%

Source: Data from "Sujidemiru Koku – 1999" (Japan Civil Aviation Promotion Foundation, 1999) and Tokyo International Airport Terminal Home Page (June 2018), compiled by the author.

While by the end of 2012 all the new entrants to the market reached the threshold of 12 aircraft and they were hence treated as the incumbent carriers, new airlines have appeared on the horizon as well.

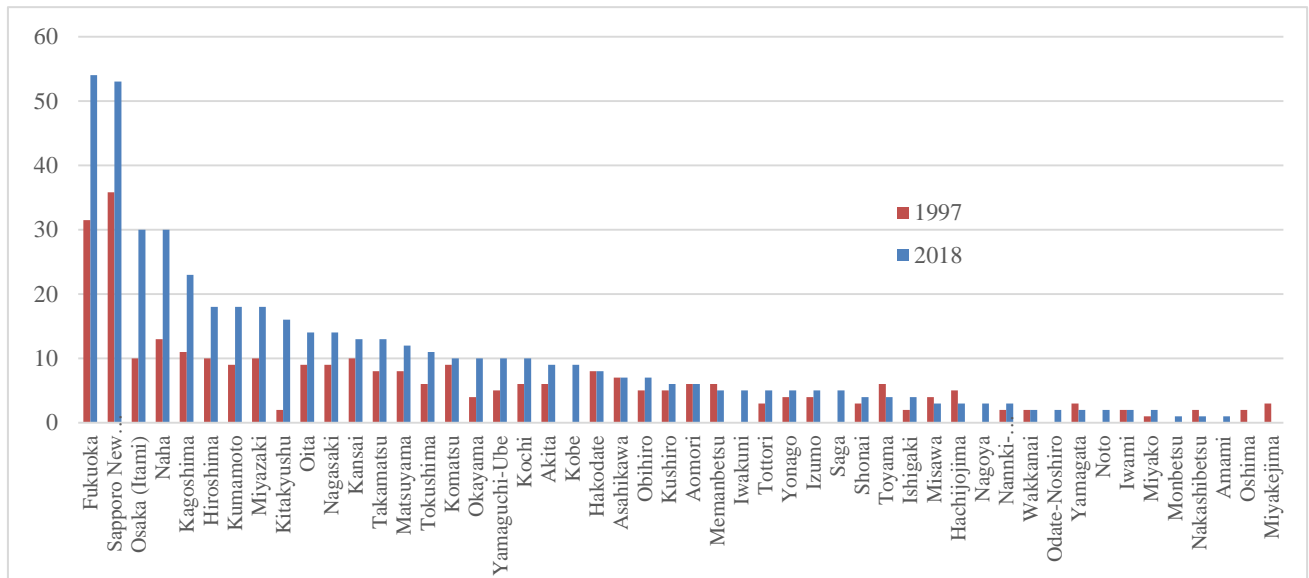
Fuji Dream Airlines, a regional jet air carrier based in Shizuoka and Nagoya Komaki, has been in operation since 2009. Spring Airlines Japan and AirAsia Japan started operations in 2014 and 2017 respectively. These and other airlines may be interested in entering the market at Haneda in the near future.

There is a concern that code-sharing agreements between new entrants and the incumbent airlines may lead to slots being ultimately used by the customers of the incumbent carriers. Indeed, a significant portion of slots allocated to new entrants are routes with code-sharing agreements with incumbent airlines. MLIT limits such code-sharing agreements to account for fewer than 50% of available seat capacity. MLIT also give constraint on the control of new entrants by incumbent airlines – by limiting equity ownership to 20% and board membership to 1/4.

Domestic air connectivity support: challenges and possible policy responses

The total number of flights increased from 297 to 498 between 1997 and 2018, a significant portion of which can be attributed to increased frequency of trunk routes (Figure 4.10). Out of the 201 additional flights, 80 were trunk routes between Osaka (Itami and Kansai), Sapporo New Chitose, Fukuoka, and Naha. The Oshima and Miyakejima routes from Haneda were discontinued, commuter air services²⁰ to these destinations from Chofu, however, have continued to operate. Gini index in terms of frequency has increased from 0.4 in 1997 to 0.5 in 2018 (calculated by the author). Distribution of frequency at Haneda Airport has become more skewed to the trunk and other major routes.

Figure 4.10. Number of flights to and from Haneda Airport (daily) in 1997 and 2018

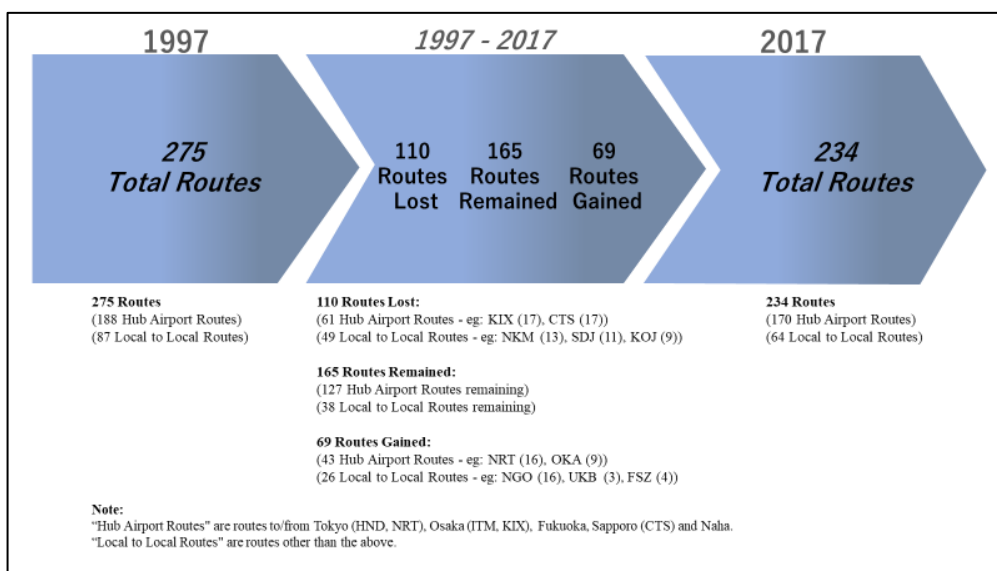


Source: Data from “Sujidemiru Koku (1999)” (Japan Civil Aviation Promotion Foundation, 1999) and Tokyo International Airport Terminal Home Page (June 2018), compiled by the author.

The central government decided to reintroduce international flights at Haneda Airport in 2010. Currently, 81 slots are used for international flights. The plan is to increase capacity at Haneda Airport by revising the air paths before the 2020 Tokyo Olympic and Paralympic Games and utilise the expected capacity increase of 39 000 slots per year (equivalent to 53 flights per day) for international flights.

Over the past 20 years, the national air route network has gone through a period of consolidation. Figure 4.11 illustrates the change in number of routes between 1997 and 2017: the total number of routes has decreased from 275 to 234.

Figure 4.11. Change in number of routes 1997/2017



Note: Seasonal routes operated under 6 months are excluded.

Source: Data from Annual Report of Air Transport Statistics - 1997 and 2017 (MLIT, 1962-2017), compiled by the author.

Significant connectivity increases at Narita and Okinawa over the past decade were delivered by low-cost carriers. New airports such as Kobe and Shizuoka have also succeeded in securing multiple new destinations, whereas new sub-regional airports, such as Odate-Noshiro and Noto, have scheduled services only to Haneda.

Domestic air connectivity outcomes depend both on the characteristics of the market for aviation and the direction of government policy regarding air transport as well as other transport modes, or even other sectors of the economy. In terms of the scale of the support offered by the government for domestic transport, the level of support for the transport networks overall has significantly decreased throughout the decades. The highest levels of support are provided for air connectivity among and within remote islands. Even for these policies, however, the rules for obtaining support are stringent.

Concluding remarks

Over the past twenty years, government support measures for domestic air connectivity have been in the constant state of development. Maintaining and improving air connectivity is an art that requires

periodic review and adjustment to the constantly changing socio-economic circumstances. Policy-makers needs to consider how to trade off fostering competition in the aviation sector versus support for creation of wider and more comprehensive route networks.

In 2020, slot allocation at Haneda will be up for another periodic review. This could be a convenient time for JCAB to look into issuing a stakeholder consultation to begin the process of thinking about any policy changes needed to improve the support for domestic routes in Japan.

One way of increasing the resilience of remote routes would be to consider consolidation of regional aviation. For the past two years, JCAB has been running a series of consultations with airlines and regional governments as well as other stakeholders to discuss potential consolidation of small regional airlines that mainly operate turbo-jet aircrafts on remote island routes. JCAB has been advised to continue examining the policy options, through stakeholder dialogue and evidence gathering with the view to reaching a conclusion by the end of FY 2018.

JCAB should also keep an eye on competition between new and incumbent airlines, including consequence of SKY's restructuring plan targeted to be accomplished by 2020, since it would indirectly reshape domestic air connectivity in the future.

Another factor that could be taken into account is the inter-city railway service. For air transport, Shinkansen is a competitive mode in mid-range travel. As is observed in papers such as Yamaguchi (2018a, 2018b), competitive railway service gives a natural impetus to the airlines. Air connectivity between regions that lack good Shinkansen connectivity, therefore, may deserve preferential treatment.

Notes

- 1 MLIT defines remote islands as islands other than Honshu, Hokkaido, Shikoku, Kyushu and Okinawa. Apart from 86 airports, there are 4 remote island heliports with scheduled helicopter services: Miyakejima, Toshima, Mikurajima, and Aogashima, all in the Tokyo Prefecture.
- 2 One route constitutes two flights – from the origin to the destination and back, for example, from Tokyo to Fukuoka and from Fukuoka back to Tokyo. See Glossary of terms.
- 3 See Annex 2 for the full list of such routes operated in Japan in 2017.
- 4 Centres of economic activity, i.e. “hub cities” for remote islands, depend on the economic geography of the region: e.g., Rishiri – Sapporo, Okushiri – Hakodate, Hachijojima – Tokyo, Amami – Kagoshima, Kumejima – Naha. Annex 2 lists all routes between remote islands and their respective hub cities that were available in 2017.
- 5 Calculated by the author from Annual Report of Air Transport Statistics – 2017, MLIT, 1962-2017.
- 6 Of which 148 are private firms, 31 are joint ventures between local governments and the private sector, and 49 are public-sector enterprises.
- 7 This chapter calls such destinations “hub cities”.
- 8 By comparison, there were 120 remote island sea routes that were subsidised in FY2017.
- 9 See Glossary of terms.
- 10 45/47 stands for 1970 and 1972 in Japan’s Showa era.
- 11 The Committee is an informal advisory group comprising representatives from academia, of the prefectural governor, labour union and consumer protection organisation to advise the Director General of Civil Aviation Bureau, MLIT.
- 12 The Report does not give a definition of a “minimum air transport network”. Subsequent Report of 2004 stipulates that routes such as Odate-Noshiro and Monbetsu that were commenced after the opening of the new airport have survived based on the “minimum network” consideration, by earmarking of slots and implementing the “One Frequency Rule”.
- 13 The numbers quoted here and in subsequent paragraphs pertain to pairs of slots available daily, with one slot available for take-off and one for landing per day.
- 14 Definition of “new airline” was determined as an airline with less than 6 total slots at Haneda Airport. This implied that Skymark Airlines and Hokkaido International Airlines would not be considered as a “new airline” in the future allocation procedures.
- 15 There are several alternative ways to access Oshima: Turbo-prop from Chofu Airfield (25 mins), Jetfoil (105 mins) and Ferry (6 hours) from the Tokyo Takeshiba Pier.
- 16 Slots used for 16 local routes, such as Wakknai, Nakashibetsu and Monbetsu, were excluded from this pool.
- 17 JAL and JAS had merged in 2004. One of the conditions on which the Fair Trade Commission of Japan agreed to the merger was the commitment made by JAL and JAS to return 12 slots back into the pool.
- 18 When in 2005 ANA had 18 of their slots recollected, out of which 9 were allocated back, ANA maintained low density routes by utilising off-peak unsecured slots. The new flight pattern after 2010 at Haneda Airport would deprive ANA of these unsecured slots leading to reduction of services. Unless departure slots are provided, these services would be lost. MLIT hence provisionally allocated these 4 departure slots to ANA. The corresponding 4 arrival slots were allocated as follows: JAL - 1, ANA - 1, SFJ - 2.

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- 19 There are total of 498 flights as of June 2018. Discrepancy between the total allocated slots (465) and the actual number of flights is due to airlines' utilisation of early morning and late evening slots that are treated separately from the general slot allocation regime.
- 20 Commuter air services use aircraft of seat capacity no larger than 19 seats.

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Annex 2. Remote island routes in Japan

Routes between remote islands and regional hub cities or between two remote islands (2017)

Remote island	Regional hub city
<u>Rishiri</u>	<u>Sapporo (Okadama)</u>
<u>Okushiri</u>	<u>Hakodate</u>
<u>Oshima</u>	<u>Tokyo (Chofu)</u>
Toshima	Oshima
<u>Hachijojima</u>	<u>Tokyo (Haneda)</u>
<u>Miyakejima</u>	<u>Tokyo (Chofu)</u> , Oshima
Mikurajima	Miyakejima, Hachijojima
Aogashima	Hachijojima
Kodusima	Tokyo (Chofu)
<u>Niijima</u>	<u>Tokyo (Chofu)</u>
Oki	Izumo
<u>Fukue</u>	Fukuoka, <u>Nagasaki</u>
<u>Tsushima</u>	Fukuoka, <u>Nagasaki</u>
<u>Iki</u>	<u>Nagasaki</u>
Tanegashima	Kagoshima
Yakushima	Kagoshima
Amami	Kagoshima, Naha
<u>Okinoerabu</u>	<u>Kagoshima</u> , Amami, <u>Yoron</u>
<u>Kikai</u>	Kagoshima, <u>Amami</u>
Yoron	Kagoshima, Amami, Naha
<u>Tokunoshima</u>	Kagoshima, <u>Amami</u>
Kita-Daito	Naha, Minami-Daito
Minami-Daito	Naha
Kumejima	Naha
Miyako	Naha, Ishigaki
Ishigaki	Naha
<u>Yonaguni</u>	<u>Naha</u> , Ishigaki
Tarama	Miyako

Routes between remote islands and metropolitan areas (2017)

Remote island	Metropolitan area
Amami	Tokyo (Haneda, Narita), Osaka (Itami, Kansai), Fukuoka
Miyako	Tokyo (Haneda), Osaka (Kansai)
Ishigaki	Tokyo (Haneda), Chubu, Osaka (Kansai), Fukuoka
Oki	Osaka (Itami)
Yakushima	Osaka (Itami), Fukuoka

Note: Remote island routes that were subsidised in 2017 are depicted in red and underscored.

Source: Annual Report of Air Transport Statistics – 2017 (MLIT 1962-2017).

Annex 3. Criteria guiding allocation of slots at Haneda in 2010

Category of appraisal	Performance of each airline	
	JAL	ANA
1. Appraisal from enhancement of user benefit (1) Effort of reducing air fare level Has the average reduction of revenue per passenger-kilometer in the past 5 years out-performed industry average?	0	0
(2) Safety The airline has not caused a fatal accident in the past 5 years	2	2
(3) Contribution to establishing and improving national air transport network ① Contribution to establishing and improving nation-wide air transport network Frequency in low density routes has increased in the past 5 years Airports with over-night aircraft stay have increased ② Contribution to establishing and improving regional air transport network to/from Haneda Airport Ratio of frequency in non-trunk route* to/from Haneda Airport has exceeded 50% Majority of the slots allocated in the last round have been utilized on non-trunk routes	2 0 2 –	2 2 2 –
2. Appraisal from promotion of efficient management of airlines Operating cost per passenger-kilometer has decreased in the past 5 years Operating revenue per personnel has increased in the past 5 years	0 1	0 0
3. Appraisal from utilization of landing slots Average number of passengers per flight at Haneda Airport has increase in the past 5 years	0	0
4. Others The airline has not faced administrative disposition during the past five years	0	0
Total (Appraisal regarding “1.” is double weighted)	7	8
Number of slot allocation (total of 16 additional slots prorated by points achieved and rounded to the nearest integer)	7	9

Annex 4. Criteria guiding allocation of slots at Haneda in 2013

Category of appraisal	Performance of each airline						Weight
	JAL	ANA	SKY	ADO	SNJ	SFJ	
1. Appraisal from enhancement user benefit							
(1) Effort of reducing air fare level							
Has the average reduction of revenue per passenger-kilometer in the past 5 years out-performed industry average?	0	0	3	0	3	0	6
(2) Safety							
Cumulative points of ranking among airlines for the following indices: - Average rate of cancellation or delay (over 15 mins) due to aircraft problem in the past 5 years - Rate of planning measures to prevent recurrence within 90 days after reporting safety incidences in the past 5 years	1.1	1.2	1	1.2	0.2	1.3	6
(3) Contribution to establishing and improving national air transport network							
① Contribution to establishing and improving nation-wide air transport network							
Ratio of the airline to the total figure of the industry for the following index: - Number of regional routes including remote island routes (routes other than the trunk route* and Haneda routes)	2.8	2.3	0.5	0.2	0.2	0	6
Ratio of the airline to the total figure of the industry for the following index: - Number of passenger-kilometers in regional routes including remote island routes (routes other than the trunk route* and Haneda routes)	1.8	3.2	0.8	0.2	0.1	0	6
② Contribution to establishing and improving regional air transport network to/from Haneda Airport							
Has the ratio of number of non-trunk route* to/from Haneda Airport in the past 5 years exceeded industry average?	2	2	0	0	2	0	6
Ratio of the airline to the total figure of the industry for the following index: - Total number of frequencies operated in the "Three-frequency Rule" category	1.8	4.2	0	0	0	0	6

(4) Promotion of competition by facilitating entry of new airlines							
Has the airline reached total fleet size of 12 aircrafts when the current slot allocation is conducted?	0	0	0	0	0	6	6
2. Appraisal from promotion of efficient management of airlines							
Has the average reduction of operating cost per passenger-kilometer in the past 5 years out-performed industry average?	1	1	1	0	0	0	3
Has the average increase of operating revenue per personnel in the past 5 years out-performed industry average?	1	0	0	1	0	1	3
3. Appraisal from utilization of landing slots							
Has the average number of passengers per flight in the past 5 years exceeded industry average at Haneda Airport?	0	1.5	1.5	0	0	0	3
4. Others							
Has the airline faced administrative disposition during the past five years?	0	0	0.75	0.75	0.75	0.75	3
Total	11.4	15.4	8.5	3.3	6.2	9.1	54
Exclusion factor of points retained during the corporate bail-out process	0.56						
Grand total (JAL's point is calculated by summing product of the bail-out factor and each appraisal point except item 1(2) and 4)	6.9	15.4	8.5	3.3	6.2	9.1	49.5
Number of slot allocated (total of 25 additional slots prorated by points achieved and rounded to the nearest integer)	3.4 ⇒3	7.7 ⇒8	4.3 ⇒4	1.6 ⇒2	3.1 ⇒3	4.5 ⇒5	25

Notes: The totals have been rounded to one decimal place. "Past five years" in this case refers to FY2007~FY2011. Reference period is June 2012 for 1.(3)①(number of routes) and ② and FY2011 for 1,(3)①(passenger-kilometer)

Government Support Measures for Domestic Air Connectivity

This report reviews government support measures for domestic air connectivity in Australia, Canada, Japan, Norway, Sweden and the United States. It analyses different approaches to providing regional connectivity in terms of their effectiveness in reaching government policy goals as well as value-for-money considerations. The study was commissioned by the United Kingdom's Department for Transport.

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