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**TAKING FLIGHT:
ANALYSIS OF
TIMOR-LESTE
CIVIL AVIATION AND
RECOMMENDATIONS**

BY TATSUO SAKAI



The Asia Foundation

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WHO WE ARE

The Asia Foundation is a nonprofit international development organization committed to improving lives across a dynamic and developing Asia. Informed by six decades of experience and deep local expertise, our work across the region addresses five overarching goals—strengthen governance, empower women, expand economic opportunity, increase environmental resilience, and promote regional cooperation.

Headquartered in San Francisco, The Asia Foundation works through a network of offices in 18 Asian countries and in Washington, DC. Working with public and private partners, the Foundation receives funding from a diverse group of bilateral and multilateral development agencies, foundations, corporations, and individuals. In 2016, we provided \$87.8 million in direct program support and distributed textbooks and other educational materials valued at \$9.5 million.

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Thanks also goes to the numerous individuals who contributed their time and knowledge to this research in the interest of strengthening the aviation industry in Timor-Leste. A list of individuals interviewed is provided in Annex A.

LIST OF ACRONYMS

AACTL: Civil Aviation Authority of Timor-Leste
ANATL: Aerial Navigation and Airports of Timor-Leste
ASA: Air Service (Transport) Agreements
ASEAN: Association of South East Asian Nations
CIQ: Custom, Immigration, and Quarantine
GATS: General Agreement on Trade in Services
FSC: Full Service Carrier
ICAO: International Civil Aviation Organization
IFR: Instrument Flight Rules
LCC: Low Cost Carrier
MAF: Mission Aviation Fellowship
MAFLAFS: Multilateral Agreement on the Full Liberalization of Air Freight Services
MPWTC: Ministry of Public Works, Transport, and Communications
MOU: Memorandum of Understanding
NGO: Non-governmental organization
DIL: Presidente Nicolau Lobato International Airport, in Dili, Timor-Leste
ROD: Record of Discussion
ROT: Runway Occupancy Time
TPP: The Trans-Pacific Partnership Agreement
UNMIT: United Nations Integrated Mission in Timor-Leste
VFR: Visual Flight Rules
WTO: World Trade Organization
ZEESM: *Zonas Especiais de Economia Social de Mercado de Timor-Leste*

FOREWORD

Timor-Leste's civil aviation industry is paramount to the development of the nation's tourism and regional connectivity. Given Timor-Leste's relative remoteness, and the current challenges in reaching its shores, all efforts ought to be made by the Government of Timor-Leste to encourage and stimulate the growth of this young industry. Unfortunately, the industry, still in its infancy, is plagued by structural and other challenges surrounding policy formation and operational limitations that do not promote investment, safety, or convenience.

At present, Timor-Leste faces numerous barriers to the growth of civil aviation, and by extension, its tourism industry. Problems range from essential regional and international connectivity and access, to the need for stronger prioritization and coordination by the government. The current operating environment for aviation stakeholders remains fragmented and silo-ed between various ministries and other actors. There is a dire need for stronger collaboration between these stakeholders, which should also include stakeholders outside the infrastructure and aviation industries, including tourism and security authorities, to ensure that the goal of increasing access to and within Timor-Leste in a sustainable, meaningful way is achieved as effectively and efficiently as possible.

Aviation policy should therefore have the explicit aim of supporting and directly linking to the tourism policy—as such, it is paramount that the aviation policy process be integrated into the ongoing tourism policy development and form part of the implementation plan moving forward. All policy decisions should be strongly grounded in visitor surveys and other market analysis to calibrate investment and services directly to the demands of the market, with the aim of growth.

When considering that this small island state is currently served by only three international routes—Denpasar (Bali), Darwin (Australia) and Singapore—analysts agree that Timor-Leste's low connectivity renders it vulnerable to market shocks and monopolies. Added to this fact, the government presently has little or no oversight or control over the services, as all flights are operated by foreign-owned and registered aircraft, and often leased under chartered agreements rendering the purchasing of seats complicated and expensive. Finally, air travel has not yet become a viable option domestically, as domestic services remain limited and irregularly scheduled, thereby rendering them infeasible for the majority of those residing or traveling within Timor-Leste.

The Asia Foundation has, since 2013, contributed research and analysis in the tourism sector through our ongoing coalitions-based program aimed at working alongside partners in government and the private sector to promote good public policy, and in particular, the use of evidence in the policy process.¹ In this work, we completed a visitor survey in 2014 in which we interviewed nearly 1,000 visitors from over 30 countries in the departure hall at the Presidente Nicolau Lobato International Airport. This survey, the first of its kind to estimate the annual value of tourism revenue to the national budget, placed the annual contribution of tourism to the country at \$14 million, making it the second largest non-oil contributor to the economy after coffee exports. According to our surveys, travelers did find travel to and from Timor-Leste to be complex and expensive, and information about traveling to, and within the country, extremely difficult to find. This research was conducted to investigate these issues further and examine some possible options for moving forward.

This paper, therefore, is intended to approach civil aviation from the perspective of an industry critical to the support of the tourism sector. The Foundation hopes that the paper will contribute to the discourse and understanding around the current state of civil aviation, and importantly, to make suggested recommendations for consideration by policy makers in the civil aviation space.

This paper takes a pragmatic, fit-for-purpose approach to the realities currently facing Timor-Leste, and makes some practical suggestions for modest investments aimed at improving civil aviation services in the short, medium, and long term. As expressed in this paper, there are a number of opportunities which should be pursued with almost immediate effect to improve the connectivity and experience of air travel to, from, and within Timor-Leste.

Susan Marx

Country Representative

Dili, Timor-Leste

January 2017

¹ The program in question is called the Support for Good Public Policy Program funded with generous support from the Australian Department of Foreign Affairs and Trade under a Strategic Country-Level Partnership with The Asia Foundation for 2013-2017.

EXECUTIVE SUMMARY

There is currently great need for evidence-based policy-making in Timor-Leste's civil aviation industry. There have been calls to construct new international airports, to begin direct flights to China, and to greatly increase existing airline and airport services, beginning with runway expansion and significant upgrades to current facilities. Timor-Leste is wholly dependent on foreign operators for aviation services, with potential risk for accessibility, both international and domestic. The Timorese government and various international organizations have drafted suggestions and recommendations for improving civil aviation in Timor-Leste. Most of these recommendations, however, are expensive and involve major infrastructure improvements, which may not be constitute an immediate priority in the context of Timor-Leste's current development needs. Underpinning this discussion is a critical lack of information surrounding aviation capacity and the accompanying evidence needed to formulate policy. This lack of data makes it difficult to analyze the validity of previous assessments, calls for expansion of the airline services industry, or assertions regarding the best use of public funds.

This paper provides insight into the current state of civil aviation in Timor-Leste, and in so doing, develops an evidence base for broader policy formulation. It analyzes key issues facing Timor-Leste's aviation industry and arrives at recommendations for the Timorese government, not based on a distant policy goal or ideal environment, but rather on what is feasible, affordable, and practical for Timor-Leste to accomplish with minimal investment.

This paper builds on research conducted in Timor-Leste. The author conducted desk research and interviewed government officials including Civil Aviation Authority of Timor-Leste (AACTL) staff, and private operators in the aviation market, including airlines and handling servicers. Research also included study of Presidente Nicolau Lobato International Airport (DIL) in Dili and local airports in Baucau, Same, and Atauro. Research was conducted from June to August 2016.

FINDINGS

This paper finds that Timorese civil aviation has great room for improvement. As with other infrastructure in Timor-Leste, aviation infrastructure is low quality and suffers from limited regulation, especially at the handful of domestic airports outside of Dili. Staff capacity in existing civil aviation authorities, both in number and in ability, is insufficient, and civil aviation regulations and other rules are not implemented. Additionally, the Timorese civil aviation authorities currently do not possess the necessary skills and experience to develop effective aviation policy. This is in part due to the lack of accurate market research, coupled with weak or non-existent

policies and plans regarding the promotion of the industry and infrastructure investment. Complicating matters further, Timor-Leste cannot address these gaps quickly, as financial resources are often obligated into sectors and projects deemed of higher political or other value.

International accessibility to Timor-Leste is fragile, as international air transport to and from the country is wholly dependent on privately owned foreign airlines, and thus on the ability of these airlines to profit. The lack of capacity is also a serious bottleneck for the domestic aviation market, as current dependence on foreign carriers and regulations limits flexibility, making existing small-scale and charter flight services in the domestic aviation market too expensive for most Timorese.

At the time of this research, market competition, did not seem to be a major bottleneck in Timor-Leste's international aviation market. Routes to and from Denpasar were, until recently, served by three airlines from two airline companies. This changed with the cessation of service on the Dili-Denpasar route by Timorese company, Air Timor, leaving only two airlines from the same company on the route. DIL-Darwin (Australia) is serviced by chartered flights by Air North. For the route from Dili-Singapore, Air Timor remains the only provider, through a charter service with Silk Air. Surprisingly, the pricing of this route is not overly distorted, given the competition between Denpasar and Singapore routes.

One of the main obstacles is a lack of adequate information and communication to both service providers and users. This creates a lower level of service satisfaction, as well as higher costs for airline companies and consumers. Stakeholders, especially potential passengers, often have to collect hard to find information on routing, ticketing, and cost through their own efforts.

This paper concludes that there seems to be low demand at present for domestic air services, and that the existing supply meets that demand. But given Timor-Leste's poor road infrastructure and mountainous terrain, it seems reasonable that more accessible domestic air travel could be of tremendous public benefit. This is presently hampered, however, by inflexible foreign regulations that do not appreciate the Timorese context, preventing increased charters and the sale of individual tickets on charter flights.

CONCLUSIONS AND RECOMMENDATIONS

This paper first and foremost found that there is not an urgent need for costly upgrades to physical civil aviation infrastructure. The author found that, while there are many desirable upgrades in safety, security, and comfort that *could* be made for a reasonably modest investment, the current infrastructure appears to serve the current demand to a reasonably satisfactory level. This is in contrast to a view within some circles in Timor-Leste, that there is a dire need for immediate and drastic upgrades to airport and other physical infrastructure. This paper will show that the current civil aviation capacity meets the current minimum demands of the country and should not be prioritized over other basic infrastructure.

At the present time all airlines with routes to and from Timor-Leste are low-capacity airplanes with shorter routes, and fewer requirements of airport facilities. Current facilities are adequate for the domestic aviation market, as the flying population in Timor-Leste is small and demand for flights remains minimal.

Additionally, while the argument to tap the lucrative Chinese tourism market is often made, the demand for these services is not established. It is unlikely that Chinese or other foreign airlines would sacrifice precious air traffic rights to and from congested airports for routes to DIL where passenger demand is not assured. Also, while DIL cannot support large long-haul jets, the aircraft it currently accommodates have sufficient range to reach all major Asian hub airports.

Despite the reliance on imports for nearly all consumer goods in Timor-Leste's economy, air transport is not the most effective way to link Timor-Leste and the global economy for the purpose of trade. This is in part because Timor-Leste does not yet have high-value products and industries that require fast cargo transport or frequent passenger traffic. It seems that the government's investment into maritime cargo transport is wiser to support current import and export industries. Similarly, to contribute more effectively to the domestic economy, improved road infrastructure would be a far better investment and is urgently needed.

The conclusion is that Timor-Leste would be better served in more fully utilizing its current aviation capacity and in developing basic capacity for future development, as these are the more relevant challenges currently facing the aviation sector. Regarding connectivity, the solutions are mainly related to policy and attracting foreign investment, both of which are heavily dependent on increased governmental capacity.

In order to address the need to bolster tourism through support for the aviation industry, and to address the issues raised in this paper, there are four primary recommendations for consideration:

- 1. The Government of Timor-Leste should reorganize its aviation management authorities, and establish a dedicated policy-making unit:** The Timorese aviation industry would benefit from a dedicated, unified policy-formulation unit. Currently policy is divided and not coordinated between the AACTL and ANATL. It is therefore recommended that the policy-making units be combined into one coherent policy-making body with oversight over setting effective targets and corresponding policies for everything ranging from tourism strategy to a policy on attracting more foreign investment;
- 2. Formulate much needed aviation policies:** The Timorese civil aviation authorities would benefit from introducing, or rehabilitating a Timorese cabotage policy requiring that every operator providing domestic air services in Timor-Leste register as a Timorese aviation service.² This policy would provide much needed flexibility to the air services market and create the conditions for greater private engagement. Promotion policies would increase private investment, creating added public benefit through increased public services.
- 3. Improve existing aviation capacity and services through cost-effective investments:** There are many inexpensive fixes to existing infrastructure and services that would increase efficiency and allow Timor-Leste to meet demand until 2030 and into the future.
- 4. Secure international and domestic connectivity:** Timor-Leste's accessibility is at risk, both internationally for travelers coming to and from Timor-Leste, and domestically for Timorese seeking to travel within the country. There are many policy options that might help to alleviate this risk, each with different tradeoffs.

² Cabotage refers to the right to operate sea, air, or other transport services within a particular territory.

1. Background and Recent Trends in Civil Aviation

In this paper, civil aviation is defined as activities using civil aircraft (including helicopters and not including military, custom, police, and other state aircraft) covered by the Convention on International Civil Aviation.³ This paper examines other services using aircraft that do not transport passengers or cargo and also non-scheduled flights. Thus, in this paper “air transport” means scheduled and non-scheduled flight services to transport passengers, mail, or cargo between two different points, including air transport and other aviation services such as sightseeing, spraying, surveying, mapping, photography, and parachute jumping.

Civil aviation is unique when compared with land and maritime transport. As the newest form of transportation, it involves advanced technology and therefore large up front, and ongoing investment in infrastructure, equipment, and operations. These barriers to entry restrict aviation to fewer actors than other transportation markets, and the majority of countries have only one or two airlines as national flag carriers. Additionally, the aircraft manufacturing industry is profitable only with economies of scale, and thus the market is occupied by a small number of outsized players, predominantly Boeing and Airbus.

State authorities strongly control civil aviation markets. Originally, this was due to the technologies involved in civil aviation being of concern for national security. While this has diminished, the scale of the aviation industry and the growing global market economy have maintained civil aviation as an area of national importance.⁴

1.1 LEGAL FRAMEWORKS IN CIVIL AVIATION

1.1.1 The Chicago Convention and Trade Laws

In order to coordinate growing the international civil aviation

market, 52 countries signed the Convention on International Civil Aviation in Chicago, Illinois, U.S.A, in 1944. Known as the “Chicago Convention,” this convention became effective in 1947 and still provides the fundamental framework for international civil aviation through the governance of the Civil Aviation Organization (ICAO), designated to coordinate and regulate international civil aviation.

The Chicago Convention confirmed state sovereignty over airspace while also providing air traffic rights to fly over a foreign country without landing and to land at a point in a foreign country without loading and unloading any passengers and cargo (technical landing). Under the Chicago Convention, international air services between two different countries must be permitted by state authorities of the countries. For this reason, governments need bilateral agreements to exchange air traffic rights for international air transport services provided by national airlines. These agreements are known as Air Service (Transport) Agreements (ASAs). These bilateral frameworks provide traffic rights—the routes and the capacity (frequency/size) of international flights—to each country.⁵ Traffic rights are distributed to airlines designated in the ASAs,⁶ classified as air freedoms. For a detailed list of air freedoms and for additional information about the Chicago Convention, please see Annex B.

This international framework for international flights and regulative practices for domestic air services is well established and recognized in numerous international trade laws. One of the treaties of the World Trade Organization (WTO), the General Agreement on Trade in Services (GATS), provides an exceptional provision for civil aviation.⁷ Regionally, the Trans-Pacific Partnership Agreement (TPP) also provided an exceptional article for civil aviation, though ratification is not possible since the withdrawal of the U.S. in 23 January 2017.⁸

3 Article 3 of the Convention on International Civil Aviation (the Chicago Convention) <http://www.icao.int/publications/pages/doc7300.aspx>. By this convention, “air service” refers to “any scheduled air service performed by aircraft for the public transport of passengers, mail or cargo.”

4 The range and speed of aircraft have greatly contributed to globalization, and as a competitive global market aviation is sensitive to global trends. The Oil Embargo, 9/11, and other trends and crises have huge impact on the market. As fuel is a large percentage of aviation operational costs, the price of oil has an enormous effect

5 Scheduled flights confirmed by ASAs are stable. Confirmed flights are permitted even while governmental authorities confirm international flights every six months. Furthermore, if an airline does not use its traffic rights, the relationship with the governmental authority deteriorates. Such distrust might be disadvantageous for the airline in future ASA negotiations. Additionally, scheduled flights, especially for full service carriers (FSCs), requires a lot of costs. For these reasons, full service carriers, especially national flag carriers, which have to care about their Governmental authorities, tend to be sensitive to the feasibility of setting a new route. For example, in the case of a congested airport of a country (A), if another country (B), which has small or unclear aviation demands, wants to enter the airport of A, B's airline might have to begin charter flights (charter flights can be set by the temporary permissions of Governmental authorities without ASAs) to prove the demand before negotiating the ASA with A. This is because A wants to negotiate the ASA only after showing the clear demands for the ASA.

6 To secure the flexibility of changing routes and capacity, the detailed contents are normally provided by a memorandum of understanding (MOU) or a record of discussion (ROD).

7 The Agreement provides the obligations shall not apply to measures affecting (a) traffic rights, however granted or (b) services directly related to the exercise of traffic rights. GATS intended to impose the obligations to other air services other than air transport services. GATS prepared the voluntary provisions to open such non-transport air services. However, most party States do not accept the obligations in the schedule to protect their cabotage policies.

8 Air services are covered by Chapter 10 (Cross-Border Trade in Services). However, Article 10.2 of the Chapter provides that “This Chapter shall not apply to air services, including domestic and international air transportation services, whether scheduled or non-scheduled, or to related services in support of air services.” The exceptional provision excludes air services other than air transport services, as WTO intended. However, most of the party States also made reservations in order to circumvent this obligation and keep their cabotage policies.

1.1.2 Cabotage Policy

While ASAs govern the rules and procedures of international flights, cabotage policy establishes government control of national or domestic flights, and serves as an important governmental control of the domestic civil aviation market. Cabotage policy originated from maritime industrial policy requiring that only nationally-flagged (registered), nationally-owned, and nationally-crewed ships could be in operation for domestic maritime transport (some countries such as the United States also require the ships to be nationally-built). Therefore, in most instances, cabotage policies for civil aviation require that only nationally-registered, nationally-owned, nationally-based operators and nationally-registered aircraft run domestic air services. These policies are generally supported by concerns for national security and the need to protect local servicers from international market competition.

Cabotage policies are often criticized as distorting the domestic transport market; however, an important purpose of cabotage policy is to mobilize transport operators in cases of emergency or economic crisis. For example, in the Great East Japan Earthquake in 2011, Japanese cabotage policy aided in maritime transport and rescue operations. In this particular case, the majority of foreign shipping servicers refused to transport goods to the suffering areas on the coast near Fukushima because of concerns about radioactive pollution from the Fukushima Daiichi Nuclear Accident. The Japanese Ministry of Land, Infrastructure, Transport, and Tourism mobilized domestic servicers for emergency transportation.

1.2 RECENT TRENDS IN THE INTERNATIONAL AIR TRANSPORT MARKET

The international air transport market is growing dramatically in step with globalization, with several emerging trends leading the market. First, the growth of Low Cost Carriers (LCC) is having a disruptive impact on the aviation market. Traditionally, the air transport market has been operated by a few airlines, in particular national flag carriers supported by each government. These airlines have provided higher-grade services at higher prices. LCCs are disruptive in that they enter the market with simpler services and cheaper prices, exploring new demand and markets for air transport. After the emergence of LCCs, traditional carriers providing normal services came to be called Full Service Carriers (FSCs).

On the positive side, LCCs are able to offer lower-priced services and therefore reach a wider clientele through competitive pricing, more destinations, and simpler cost structures. LCCs employ these common strategies to enable

cheaper pricing and reduce costs, including the “single aircraft fleet.” Under this strategy, LCCs have only one or two types of aircraft. Each type requires specific licenses of operation and maintenance. This strategy enables LCCs to reduce the cost of training pilots and maintenance staff, and can also simplify facilities for handling and maintenance. Employing this strategy, most LCCs use small/mid-size, narrow body, and regional jets like A320s or B737s.

AIRLINE FLEETS (USING DIL)⁹

Airlines	A320	A319	B737	E170/175	Others
Citilink (discontinued January 2017)	39		4		
Sriwijaya Air			35		
Nam Air			10		
Silk Air	11	4			
Air North				4	

AIRLINE FLEETS (OTHER ASIAN LCCS)

Airlines	A320	A319	B737	E170/175	Others
Air Asia	81				
Cebu Pacific	36	7			14
Tigerair	21	2			
Spring Airlines	60				

Due to the growth of LCCs and the single aircraft fleet, the aircraft manufacturing industry also estimates that the market for narrow body aircraft is the fastest growing market. The average size of aircraft will decrease for the next two decades while the demand for civil aviation will increase.¹⁰ This is important for Timor-Leste as smaller aircraft require less runway space.

“Point-to-point” is another strategy of LCCs. International hub airports are congested by existing airlines. Most airlines using these airports are FSCs granted traffic rights by ASAs.¹¹ Furthermore, these airports tend to impose higher fees for landing and using facilities. Thus LCCs avoid using these hub airports and connect to local airports directly. FSCs tend to take the traditional strategy of “hub and spoke,” using larger aircraft for the main routes between congested hub airports, and smaller aircraft for the local branch routes. Therefore, FSCs require various types of aircrafts in their fleets. Due to the different types of planes and agreements and connections with governmental authorities, FSCs cannot change routes and capacities frequently. On the other hand, LCCs’ point-

9 Based on <https://www.planespotters.net/airlines> accessed 30 July 2016. Note: Air North has some small aircraft such as E120. However, the data from the website does not include these small-sized aircraft.

10 [http://www.boeing.co.uk/news-media-room/news-releases/2015/june/boeing-forecasts-demand-for-38050-new-airplanes-valued-at-\\$5.6-trillion](http://www.boeing.co.uk/news-media-room/news-releases/2015/june/boeing-forecasts-demand-for-38050-new-airplanes-valued-at-$5.6-trillion).

11 Additionally, IATA’s slot allocation rule provides the priority of existing airlines as a “historic rule” <http://www.iata.org/policy/infrastructure/slots/Pages/slot-guidelines.aspx>

to-point strategy allows them to use few types of aircraft because all of their routes are local routes. LCCs can thus change routes frequently along with changing demand. This is important for Timor-Leste in that it is not necessary to build a hub airport to attract LCCs.

Another trend in the international air transport market is growing global and regional competition between airports. Along with the progress of globalization, the pressure to reduce the cost for transportation is also growing, and airports are trying to reduce costs through economies of scale. Therefore, current and future competition to be a global or regional hub airport is intense. Competing airports need to invest large amounts in order to finance large investments. To meet these demands, privatization of airports is also progressing, at odds with traditional public financing of airport infrastructure as public transportation infrastructure.

Open sky policies (or “open skies”) are a growing issue in civil aviation. As discussed earlier, setting international air transport routes to meet market demand flexibly is very complicated. Under an open sky agreement between two States, these countries’ airlines can set their flights freely through direct negotiations and management with airport authorities within the two territories. Open skies can promote flexible flight setting and new entry to the market. Thus many countries seek open skies to promote the air transport industry and improve airport accessibility. At the same time, slot allocation at certain congested airports is of great interest to governments, as these can be used as strategic tools to advance their interests. Therefore, some countries exclude their major airports from open sky policies. For example, Japan has many open sky agreements but these agreements do not cover airports in the Tokyo metropolitan area.

Importantly for Timor-Leste, the Association of South East Asian Nations (ASEAN) also promotes the civil aviation market through its open sky policy known as the “ASEAN Single Aviation Market.” In 2015, ASEAN countries ratified the Multilateral Agreement on the Full Liberalization of Air Freight Services (MAFLAFS). At the time of writing, August 2016, MAFLAFS is almost ratified by nearly all countries in ASEAN.¹²

2. Current Overview of Civil Aviation in Timor-Leste

2.1 INTERNATIONAL CIVIL AVIATION

At the time of the drafting of this report, Presidente Nicolau

Lobato International Airport (DIL) in Dili is currently the only airport to provide international air transport services in Timor-Leste, thus for the purpose of this discussion, reference to DIL is synonymous with international services. It is anticipated that regional airports in Oecusse and Suai will have international capacity in the near future.

2.1.1 Timor-Leste Connected to the World: Air Service Agreements

Timor-Leste has signed two ASAs with Indonesia and Singapore, with agreed details documented in MOUs. An ASA between Timor-Leste and Australia has already been signed but has not entered into force yet at the time of this writing.¹³

Civil aviation authorities normally negotiate ASAs in communication with their countries’ airlines and publish summaries of the contents of the agreed MOUs, and not the MOUs themselves. Regarding Indonesia and Singapore, interestingly, the Timorese civil aviation authorities have never disclosed the contents of the MOUs or even the ASAs, so the details of these agreements are not entirely clear. According to interviews and research in Timor-Leste and Indonesia, the ASA between Timor-Leste and Indonesia may provide 21 or 28 international flights per week (three or four daily flights). The ASA between Timor-Leste and Singapore likely specifies seven flights per week (one flight daily). It is not clear that these ASAs include the rules for ground handling, code sharing, charter, and other regulations. According to the text of the ASA with Indonesia sourced from an Indonesian government website, the ASAs do not include these additional rules.

2.1.2 International Air Services in Timor-Leste

Timor-Leste lacks its own traffic rights and operators. A Timorese company, Air Timor, currently manages the ticketing for Silk Air flights between Dili and Singapore. Until January 2017, Air Timor also contracted Indonesian airline Citilink to provide daily service between Dili and Denpasar. Prior to January 2017, Air Timor had cited plans to begin its own air services and to train pilots, however, this would require Timor-Leste to have its own air traffic rights.

All airlines currently or recently serving DIL—Citilink, Sriwijaya Air, Nam Air, Silk Air, and Air North—are LCCs or regional airlines that take the same strategy as LCCs with efficient and flexible point-to-point route/schedule setting, and with single aircraft fleets (hereafter the term “LCCs” includes these regional airlines taking LCC-like strategies). These airlines pay landing fees but do not pay parking fees,

¹² Under this framework, airlines of ASEAN countries can enjoy Third, Fourth, and Fifth Freedoms in all airports in this region without further ASAs. <http://asean.org/asean-open-skies-reality/>

¹³ Based on interviews with AACTL, ASAs do not designate airlines or airports, and grant air traffic rights to only Indonesian and Singaporean airlines (the ASA with Singapore includes the Fifth Freedom while the ASA with Indonesia provides only Third and Fourth Freedoms). It is not clear whether the ASAs and MOUs of the ASAs confirmed the air traffic rights of only Indonesian and Singaporean airlines, or only Indonesian and Singaporean airlines exercise the rights while Timor-Leste also has the rights.

as they park at the airport for very short periods of time. No airlines park aircraft overnight at DIL.

Other than these scheduled flights and periodic charter flights, some of the small operators who provide domestic charter flight services in Timor-Leste also provide international charter flights, mainly for medical purposes. Due to the lack of flight information from DIL, the volume and frequency of these intermittent international charter services remains unclear.

2.2. DOMESTIC CIVIL AVIATION

All service providers for domestic air services in Timor-Leste are foreign registered operators. Mission Aviation Fellowship (MAF) is an Australian registered operator and non-governmental organization that provides charter flight services between DIL and domestic airports using two Cessna 208 aircrafts (eight passengers in the normal seat layout). Approximately half of their services are medical emergency flights offered by the Ministry of Health. Another charter flight operator, MHS Aviation, is registered by Malaysian law and provides charter flights specifically for the oil company Timor Gap between Dili and oil rigs off the coast of Suai, using three Super Puma helicopters (approximately 20 passengers each).

Kenn Borik, a Canadian registered operator, provides periodic charter flights between Dili and Oecusse, and more recently Dili and Suai, using a 19-passenger capacity DHC-6 plane (twin otter). The aircraft is owned and leased by *Zonas Especiais de Economia Social de Mercado de Timor-Leste* (ZEESM), or the Special Economic Zone for Social Market Economy of Timor-Leste. The details of the contract for the lease are not clear, but the initial indication is that AACTL plans to expand use of the aircraft for increased scheduled service between Dili and Oecusse, Suai, Same, and Atauro island.

All operators are registered under foreign law and their services are accordingly inspected and regulated by foreign civil aviation authorities. Therefore, all of the operators need to acquire foreign permissions for each flight.

In most countries charter flight services are strictly regulated in order to protect the interests of companies operating scheduled air transport, and national security interests. Likewise, in the case of Timorese domestic flights, multiple charter companies and the selling of individual tickets are prohibited by foreign charter regulations. These services are

mainly for passenger transport, while some operators provide aerial services such as mapping.

3. Current Capacity and Infrastructure of Timorese Civil Aviation

3.1 INTERNATIONAL CAPACITY AND INFRASTRUCTURE

3.1.1 Airport Facilities

As DIL is currently the only international airport in Timor-Leste, the volume of Timorese international flights depends entirely on its capacity. DIL has a single 1850 meter (m) x 30m paved asphalt runway. The airport has basic facilities including terminal buildings, a control tower, an air navigation system, a tarmac apron (paved parking area for aircraft), a standby generator, and a fire and rescue team.¹⁴ DIL handled nearly 200,000 passengers in 2014.

DIL does not currently house separate cargo handling facilities.¹⁵ According to the local ground handling services, STAT, the majority of current air cargo demand is personal delivery. In 2014 the airport handled less than 200 tons (t) of cargo, down from 500t in 2012. This decrease is due to the drawdown of the United Nations Integrated Mission in Timor-Leste (UNMIT) at the end of 2012.¹⁶

While airline representatives welcome expanding the runway and terminal buildings of DIL, current airport facilities satisfy minimum standards for operating international flights.¹⁷ However, some concerns were noted as a result of current capacity, namely around safety and nighttime use.¹⁸ The width of the runway is more important than the length because the wind from the sea or mountains hits aircraft when they are landing. As Timor-Leste is very windy, this is an issue. Also, at present time DIL cannot operate at night, as the airport and obstruction lighting system is inoperative. In addition, due to the basic nature of the air traffic control system including Non-Directional Beacon and Doppler VHF Omnidirectional Range and Distance Measuring Equipment systems, DIL operates only under Visual Flight Rules (VFR). In other words, this airport cannot rely on Instrument Flight Rules (IFR) and therefore may not be operated in certain poor weather conditions, per VFR.

Some local airports have been discussed as potential secondary international airports, however, Timor-Leste's basic law for civil aviation, the Decree-Law 2003/01, provides that only DIL and Baucau airport can provide international flights.¹⁹ Baucau airport has the longest runway

14 <http://asiafoundation.org/publication/a-political-economy-of-public-transportation-in-timor-leste/>

15 However, the airport did process a small amount of cargo through basic handling services.

16 JICA, The Project for Study on Dili Urban Master Plan in the Democratic Republic of Timor-Leste, Final Report (Draft)

17 Interviews with airline staff.

18 Interviews with manager of Air Timor and other staff.

19 Section 8 (2) of Decree-Law 2003/01

in Timor-Leste, at 2500m, and hosted international flights, including from Australia, prior to Indonesian occupation. During occupation, it was used exclusively by the Indonesian military. The runway pavement has not been properly maintained and currently it cannot support jet flights. In Covalima municipality, the Tasi Mane oil industry project includes plans to develop Suai airport. However, the project itself is now on hold because the Korean global company, Hyundai, withdrew. The Oecusse airport is being developed, with plans to add international flights.

3.1.2 Airport Management

Aerial Navigation and Airports of Timor-Leste (ANATL) is an authority under the Ministry of Public Works, Transport, and Communications (MPWTC) responsible for providing basic services for airports and air traffic control. ANATL has collected 1.3-2.1 million USD revenue annually from 2011 to 2014 from landing fees, airport taxes, and rental fees. This revenue covered nearly one third of its operational and maintenance costs. ANATL currently employs 121 staff including 20 air traffic control officers.²⁰

DIL collects landing and parking fees from operators and rent from offices and parking lots. However, the Ministry of Finance currently manages these revenues directly. ANATL is seeking to establish its own funding to support management. In July 2016, an Airport Board was established and will seek an autonomous body to manage the airport through its own revenues.²¹ This autonomous body may plan to only manage DIL airport. The airport security manager has said that ANATL would seek to impose other kinds of fees including security fees on users. According to the security manager of ANATL, there have not yet been security problems such as terrorism or smuggling, but they would like to increase resources for passenger screening. Efforts to improve the security standards at DIL seem targeted specifically at meeting ICAO standards, as in Timor-Leste human smuggling and trafficking are more cheaply and easily accomplished through land and sea borders.

3.1.3 Airport Servicers

Three primary companies provide services at DIL. SDV East Timor, a subsidiary of French global logistics company Bolloré Logistics, provided ground handling services including passenger check in, calculation of weight and balance of aircraft, and preparation of trim sheet for Air Timor ticketed flights between Dili and Denpasar, Bali.²² The second company, STAT, provides ground handling services

similar to those of SDV. STAT is a Timorese-owned private company providing services to Indonesian airlines Sriwijaya Air and Nam Air, and to Silk Air (Singapore). The third company, 'STARS (Timor-Leste)' provides fueling, refueling, and maintenance and operation of fuel storage facilities. It is a wholly owned subsidiary of Singapore logistics company ST-Airport Services (STARS).

DIL currently lacks maintenance and catering services. Thus airlines have to board their own engineers on aircraft from the destination to Dili, and also need to "double-cater," or bring food, drinks, and other supplies from the destination for both flights to and from Dili.

3.1.4 Airport Operations

DIL had 66 flights to/from three destinations per week during the period of research. These flights utilized small jets including the A320/319, B737, and E170/175. Citilink, Sriwijaya Air, and Nam Air, and Silk Air operated international scheduled services to/from Denpasar and Singapore. Australian airline Air North ran periodic charter flights to/from Darwin. Additionally, other small charter flight operators ran charter flights for international and domestic air services; however, these small operators do not have jet aircraft or a set schedule. There is no official website for the airport. Please see Annex C for time slots in use as of June to August 2016.

3.1.5 Available Capacity of DIL

At time of this research (August 2016), there was no official data for runway and terminal capacity of DIL. This paper accordingly examines capacity briefly and more generally.

The capacity of an airport is typically calculated using three factors. The first is the slot capacity, which is the number of times aircraft can land and take off at the airport in a day.²³ The second is the terminal handling capacity, or the speed at which the airport manages passengers and cargo through Customs, Immigration, and Quarantine (CIQ) processes, and boarding and baggage procedures, including baggage claim and security checks.²⁴ The third factor is runway capacity, which includes the length, width, and pavement condition of the runway. This determines the size and range of aircraft utilized.

As a result of primary research monitoring DIL's slot capacity, terminal handling capacity, and runway capacity, it was determined that DIL has a maximum passenger capacity of approximately 766,500 passengers per year (see Annex E for a description of how this was calculated). Even if DIL has other

20 Asian Development Bank, Draft Timor-Leste Transport Sector Master Plan, June 2015

21 <http://timor-leste.gov.tl/?p=15869&lang=tp>

22 <http://www.bolloré-logistics.com/en/Pages/NEWS/SDV-East-Timor-Appointed-Ground-Handling-Provider-for-Garuda-Indonesia.aspx>

23 Slot capacity sets the physical limit of the airport. The number of available slots of the airport can be determined by dividing the operating hours by the Runway Occupancy Time, the duration an aircraft occupies the runway, from entering to exiting, including taxi and taking off. The operating hours of the airport are affected by night operation and location (in case of noise pollution issues, etc).

24 This is not a critical factor in airport capacity, as many major airports exceed terminal capacity. However, lack of terminal capacity affects security, CIQ checks, and passenger comfort.

bottlenecks and the current number of flights reach capacity limits, current flights could accommodate approximately 390,000 passengers per year.²⁵

Calculating further, DIL can support nearly 800,000 passengers per year with its current facilities and operational capacity, and there is little reason to upgrade facilities. The Asian Development Bank estimates that the future demand of passengers in DIL might be 400,000 by 2030.²⁶ Thus the current capacity of the facilities at DIL can definitely support current passenger load and demand for at least the next two decades. In the event of increased demand, there are a number of cost-effective alterations available to increase passenger capacity in the future. For example, extending DIL operating hours would be an easy way to expand capacity with relatively minor cost, compared to say, a costlier runway expansion. Improving efficiency of CIQ processes is another low-cost way to increase the capacity of the airport. Given that the most time consuming aspect to processing passengers is the customs checkpoint, reducing the number of passengers screened and sampled could also increase capacity. A further burden on the airport is the long Runway Occupancy Time (ROT) delays that are largely caused by the lack of a parallel taxiway. The lack of a taxiway means that aircraft currently use the turning pad to move between the terminal building and the runway, limiting the number of aircraft that can take off and land. Adding a taxiway would increase airport capacity inexpensively as compared to adding another full runway.

In addition, measuring airport capacity by the number of passengers, the size and range of aircraft can also affect capacity. Large aircraft such as B747-400 (for international long-range flights) require a 3150m-length asphalt or concrete paved runway. The 1800m-length runway of DIL cannot support such a big jet. However, the need for planes of this size should be carefully considered. While DIL cannot support a jet of this size, it can support the A320 and B737-500 aircraft. These aircraft are within range of all major Asian hub airports, with a capacity of over 100 passengers each.²⁷

3.2 DOMESTIC CAPACITY AND INFRASTRUCTURE

3.2.1 Capacity of Infrastructure of Timorese domestic civil aviation

DIL rents office and parking space to charter flight servicers who mainly provide domestic air services. But the airport provides only basic air traffic services to these operators, without maintenance, ground handling, or refuel services.

Timor-Leste has regional airports on Atauro Island and in Baucau, Covalima, Oecusse, Manufahi, Bobonaro, Viqueque, and Lautem municipalities. However, these airports are in very poor condition, lacking air traffic control, maintenance capacity, and other facilities. Given these constraints, flight operators must check the conditions and guide flights by themselves.

3.2.2 Decree-Law No. 1/2003

Decree-Law No. 1/2003 limits the use of foreign operators to the two international airports, Dili and Baucau.²⁸ The Decree-Law also provides that only Timorese registered operators can run domestic air transport services.²⁹ Thus Timor-Leste uses a cabotage policy, the right to operate transport services within a particular territory, for domestic air transport services. But due to the lack of detailed procedures, including a registry system and airworthiness certification, the policy has not yet been implemented. In the absence of these procedures, there are no Timorese operators, aircraft, pilots, or maintenance staff, even for domestic services.

In 2016, AACTL drafted a policy to establish its own registry and procedures. Based on interviews with the director, AACTL also plans to create a new company to operate domestic scheduled air transport services between Dili and Oecusse. AACTL expects that this new company will register as a Timorese operator and the staff and aircraft will be certified by AACTL.

25 Currently, the airport supports 66 international flights per week. There are 20 flights on A320s with 128 seats each, 28 flights on B737-500s with 130 seats, and 18 flights on EMB 170/175 with 72 seats (in case of E170). The sum of these seats is equal to 7496. Thus utilizing the present number of international flights, the airport could provide nearly 390,000 seats in a year.

26 Asian Development Bank, Draft Timor-Leste Transport Sector Master Plan, June 2015

27 The range of this aircraft depends on the runway length, pavement condition, weather, altitude, and loading weight, especially seat layout. Operating skills such as increasing flap angle and advanced technologies such as introducing winglets can expand the range. At minimum, a A320 with over 100 passengers can fly 5000km from a 1800m-length asphalt runway. The max range of A320 aircraft can cover all Asian major hub airports. Even for other small and mid-size aircraft like B737, the average range is normally 3000km. Such aircraft could reach Kuala Lumpur and Manila from DIL. <http://www.sunshinecoastairport.com.au/documents/runways.pdf>
<http://internetlooks.com/a320200.html>
http://www.anahd.co.jp/investors/data/annual/pdf/13f/13f_07.pdf

28 Section 8 of Decree-Law No. 1 /2003

29 Section 34 and 36 of Decree-Law No. 1 /2003

4. Timor-Leste's Current Efforts to Improve the Aviation Industry

Timorese authorities are working to better the aviation industry, though the scope of this effort is unclear given the lack of available information. There are currently three major efforts related to Timorese civil aviation development.

4.1 NEW TIMORESE REGISTRY AND CERTIFICATION FRAMEWORK

AACTL drafted a framework for its own registry and certification for operators and aircraft air-worthiness based on ICAO standards. Through this framework it is possible for a Timorese air operator and aircraft registry to exist. AACTL is waiting for approval by the government, and thus did not disclose the details of the framework. However, the framework does not include cabotage policy and the director of AACTL said that he did not expect current operators to use the framework. AACTL expects that only a new air operator would use the registry in scheduling flights between Dili and Oecusse. AACTL has four safety inspectors, two experts, and two trainees available to implement this policy.

4.2 ESTABLISHING AN AUTONOMOUS BODY TO MANAGE DILI INTERNATIONAL AIRPORT

The Timorese government has decided to establish an autonomous body to manage DIL.³⁰ According to the airport's security manager, the Board of Directors for the autonomous body has not yet been established. The future autonomous body will seek to be financially independent by collecting fees from airport users and spending this revenue to manage the airport. In order to increase revenues, fees for security and safety will be imposed (likely on travelers).

4.3 CREATING A NATIONAL SERVICER FOR DOMESTIC AIR TRAVEL

AACTL plans to establish a new company to schedule flights between Dili and Oecusse. According to the manager of STAT, the Timorese company plans to purchase DHC-6 aircraft from ZEESM and prepare pilots for service. ZEESM may support the service as well. STAT would like to expand these scheduled services to other cities. The current ongoing registry and certification framework drafted by AACTL is intended to cover this new service.

5. Key Findings and Conclusions

5.1 INTERNATIONAL AIR SERVICES

5.1.1 Infrastructure Capacity

Current international civil aviation in Timor-Leste satisfies existing and near future demand until at least 2030, when any number of inexpensive options might match capacity to demand. Likewise, the current infrastructure of DIL is old and poorly maintained but does achieve minimum operational standard. While safety has been cited as a concern, specifically the lack of lighting systems, IFR, and the narrow runway vulnerable to crosswinds, these issues pose more of a limit to capacity than a specific safety problem.

Some stakeholders in Timor-Leste noted that they would like to see routes directly between Chinese cities and Dili, leading some to suggest larger aircraft and runway capacity might be needed³¹. However, there is no clear need to introduce larger aircraft or longer international routes, and it isn't economically feasible for Chinese FSCs to do so. The current capacity of the runway can support mid-sized (around 100 passengers or less) flights by regional jets to China. Furthermore, FSCs fly routes to and from hub airports with large passenger demands. Almost all Chinese hub airports, such as Shanghai, Beijing, and Hong Kong, are congested and the air traffic rights to and from these airports are precious for airlines. It is unlikely that Chinese FSCs would spend air traffic rights in these hub airports for routes to Dili when passenger demand is not assured.

Focusing on attracting Chinese LCCs and regional airlines using smaller aircraft is a reasonable and feasible solution to this problem, and would also contribute to increased international accessibility to Timor-Leste, a concern mentioned elsewhere in this paper.

5.1.2. Market Competition

The lack of market competition was mentioned earlier in this paper as a potential issue, and it does seem to pose a bottleneck in Timor-Leste's international aviation market. At time of research for this report, the route to and from Denpasar was served by three airlines from two companies.³² Since January 2017, however, one airline no longer serves that route, leaving two airlines belonging to the same parent company to supply the same route. For the Singapore route, there is only one service through a chartered Silk Air flight. Surprisingly, the pricing of this route does not seem to be too distorted, given the competition in routes between Denpasar and Singapore. Both Denpasar and Singapore

30 <http://timor-leste.gov.tl/?p=15869&lang=tp>

31 Recent research by The Asia Foundation into the trends of visitors to Timor-Leste indicates, however, that China is not the main market for tourism to Timor-Leste, rather that the vast majority of people visiting from abroad are from Australia. Source: The Asia Foundation 2014 Survey of Travelers to Timor-Leste (<https://asiafoundation.org/resources/pdfs/VisitorSurvey2014English.pdf>)

32 Citilink ceased operations on this route in January 2017, leaving Sriwijaya with a monopoly on the Dili to Denpasar route.

airports are congested hub airports with many transit routes, and there are many connecting flights between Denpasar and Singapore. In fact, the cost of a one-way flight between Dili and Singapore (around 300USD) is similar to that of a flight from Singapore to Mandalay, approximately the same distance at (2500km).³³

5.1.3. Extra Costs for Airline Companies

There is a lack of information and communication to service providers and users. This creates extra costs for airline companies and consumers. Stakeholders, especially customers, have to collect information through their own efforts.

5.1.4 The Risk of Inaccessibility

The importance of connectivity cannot be overstated. The risk of international inaccessibility affects both the ability of Timorese people to travel and for citizens of other countries to travel to Timor. As mentioned earlier, Timor-Leste's current accessibility depends on foreign servicers. All airlines operating jet flights are foreign LCCs, and international air transport to and from Timor-Leste largely relies on Indonesian servicers. While the current relationship between Indonesia and Timor-Leste is better than in previous decades, good relations between the two should not be taken for granted.

Foreign-owned and operated LCCs servicing DIL are sensitive to costs, and this has ramifications for Timor-Leste aviation services and broader global accessibility to the country. Timorese authorities cannot order, pressure, or influence by any other means foreign-owned LCCs' decisions to set or remove routes. If the costs to operate to and from Dili increase, or occupancy on flights reduce resulting in airlines not being able to meet these costs, air service to DIL will cease entirely. This possibility was reinforced by the recent cessation of the Citilink flight between Dili and Denpasar. It is likely that a further reduction in the number of airlines and routes would distort market competition.

The underlying factor remains that Timor-Leste has no current capacity for operating its own international flights, lacking skills, aircraft, staff, and traffic rights. Due to the lack of a national carrier, Timor-Leste is not able to create international routes by itself.

As a result, Timor-Leste is entirely reliant on its ability to attract foreign airlines to maintain international routes, which given the competition for air space in busy airports, is not easy and requires much better sharing of information and communication between Timorese public authorities and private actors than is the current norm. Coupled with the

often confusing regulations and controls by the government and the need for large upfront investment in the airline industry, few actors have been willing to take the risk. This was demonstrated in January 2017, when Air Timor announced that it would discontinue Citilink-operated flights between DIL and Denpasar. In addition, the company reduced Silk Air-operated flights between Dili and Singapore to twice a week. In a Facebook post and emails to customers, Air Timor cited government policy as the cause for this business move.³⁴ Namely, the company claimed the decision to allow Sriwijaya subsidiary Nam Air to operate on the route increased capacity far above demand. Air Timor also blamed cheaper fares to Bali for drawing passengers away from the Singapore option. The monopoly by a single Indonesian airline of the route between DIL and Denpasar and fewer scheduled flights to Singapore will certainly increase the vulnerability of the Timorese civil aviation sector.

All of these aspects collectively creates a problematic environment for the Timorese aviation market. Operations depend completely on foreign regional airlines and fail to develop Timorese capacity.

5.1.5 Weak Policy-Making Capacity of Timorese Government

Civil aviation authorities generally have three duties: 1) to provide public services including air traffic control; 2) to regulate operators for safety and security; and 3) to conduct policy planning for industry development. The Japanese Civil Aviation Bureau, for example, has three departments: the Air Navigation Services Department for public services, the Aviation Safety and Security Department for regulation, and the Aviation Network Department for policy-making.³⁵ At present, the scope and mandate of Timorese civil aviation authorities are not clearly defined. Two of the three necessary units exist with ANATL providing public services and airport policy, while AACTL is responsible for regulation and policy-making. There is a need to separate these three bureaucracies and to clearly delineate roles and responsibility to allow for effective management of three separate but interrelated duties.

Of particular concern is the lack of a specialized policy-making department. Timorese authorities sometimes publish incoherent policies or regulations that do not match market realities and demand. According to interviews with some operators, for example, the Timorese government published a price control policy in 2016 in an attempt to set minimum and maximum pricing for flights to and from Denpasar. The government repealed this policy soon after. In another example still in practice, the Timorese government plans to

33 <https://www.skyscanner.com> Based on data from August 3, 2016.

34 <https://www.facebook.com/AirTimor.ItsYourAirline/photos/a.1404211242945954.1073741880.147073715326386/1406195716080840/?type=3&theater>

35 These three departments are officially equal, however, the status and power of the Aviation Network Department is greater, evidenced by all Director Generals of the Japanese Civil Aviation Bureau holding previously titles as directors within the Aviation Network Department.

prohibit the use of aircraft older than 20 years. This policy is unrealistic in light of current trends in the global and regional aviation markets, which include the growth of a market for second-hand aircraft. These policies might be due to a lack of communication between public authorities and private players in the Timorese civil aviation market.³⁶

5.2 DOMESTIC AIR SERVICES

5.2.1 Infrastructure Capacity

All domestic operators have only small aircraft with fewer than 20 seats. According to interviews, there is little demand for domestic air services, and in order to meet current demand, it is not necessary to expand the domestic air transport infrastructure.

5.2.2 Lack of National Legal Controls

The lack of feasible legal institutions for civil aviation is critical, especially for domestic air services in Timor-Leste. Air servicers in the Timorese domestic aviation market are able to use only foreign regulations. Due to this dependence, domestic air services lack flexibility. Normally regulations for domestic air services exist to protect scheduled domestic flights to secure stable accessibility in a country. However, in Timor-Leste, there are no scheduled domestic flight services. Therefore, there is no reason to regulate charter flight services. Due to the lack of a Timorese institution for civil aviation, the Timorese government cannot implement its own civil aviation policies. Multiple charterers and the selling of individual tickets can reduce the cost of charter flights and improve flexibility dramatically. However, under the strict foreign regulations that ignore the Timorese context, these business practices are prohibited.

5.2.3 Domestic Accessibility

Given Timor-Leste's poor road infrastructure and mountainous terrain, more accessible domestic air travel could be of tremendous benefit. While civil aviation services can connect Dili to remote areas, the high cost of these flights is prohibitive for the majority of the population. The high cost of services may be one of the reasons demand is small compared with other modes of transport. For example, Mission Aviation Fellowship (MAF), in addition to their domestic medical air ambulance services, provides charter flights between Dili and many of the regional air strips including Oecusse, Suai, Same, and Atauro for prices ranging

from about USD 450-900 one-way in a 7-seater single propeller aircraft. In comparison, MHS Aviation's helicopter service costs nearly three times that of MAF. It is therefore difficult to determine the actual social and economic need for domestic aviation services.

Given the high barrier to entry in the aviation market, it is therefore not uncommon to seek public sector support to catalyze local accessibility. This appears to be happening to some extent with the development of regional airports in Timor-Leste, though the benefit to domestic consumers is not yet clear. Domestic scheduled air transport services are costly, yet the public, especially in rural areas, needs scheduled air services for transportation. Many governments thus subsidize domestic air transport, especially at the municipal level.

Subsidies often take the form of public-private partnerships and other types of privatization. This is somewhat controversial as it is not specifically public infrastructure, particularly in democracies. Another common solution is for local municipalities to create public-owned or public-supported local operators to maintain domestic scheduled flights. These public policies are often combined with specialized ticket pricing policies for local people.

In another common policy approach, government directs national flag carriers to use revenues from profitable routes to fund unprofitable routes. One reason for the bankruptcy of Japan Airlines in 2010 was the deficit caused by the local unprofitable routes maintained as its responsibility as national flag carrier.

6. Recommendations

6.1 BUILD CAPACITY OF GOVERNMENT TO PROMOTE INDUSTRY AND MAKE POLICY THROUGH REORGANIZATION OF AVIATION MANAGEMENT AUTHORITIES

As noted earlier in this paper, duties of ANATL and AACTL are not clearly defined and there is no specific unit responsible for policy-making. Additionally, Timor-Leste currently lacks staff for communicating with and promoting the airline industry. This paper recommends that the Timorese government consolidate policy-making functions from the two existing bureaucracies into a new policy-making unit

36 In another example, contradictory information on Timor-Leste's ASAs and related MOUs was encountered in the course of researching this paper. According to the foreign advisor of the Director General of Transport and Communication in the MPWTC, Timor-Leste's ASAs grant it air traffic rights equal to those of Indonesia and Singapore. The flights by Citilink and Silk Air were just operated by these airlines' aircraft and staff as wet lease (leasing including aircrafts, operating and maintenance staffs, insurances and others). The rights and responsibilities for these flights belong to Air Timor as a Timorese airline under the ASAs. However, these flights had Citilink's and Silk Air's flight codes, QE (Citilink) and MI (Silk Air). Air Timor does not have any Air Operator Certificate (AOC). Additionally, the director of AACTL and the managing staff of Air Timor made statements contrary to what the advisor said. The managing staff of Air Timor completely denied that Timor-Leste has air traffic rights in Singapore and Indonesia. Additionally, the Director General for Transport and Communication said that 14 flights per week to and from Denpasar are currently granted per air traffic rights in the ASA with Indonesia. Nam Air's seven flights per week are not granted under the ASA, just permitted as periodic charter flights. This information implies that the MOU designates the routes (and airlines).

charged with developing policy and setting targets, and that the AACTL be strengthened and tasked with developing systems for interaction between public and private actors.

Pending further suggestions from the newly formed policy unit, the AACTL and ANATL should undergo further strategic revision. Their current focus on developing capacity to manage and regulate the aviation market and infrastructure seems limited to safety and security concerns, and not to broader issues. ANATL wants to impose security fees on the airport users and airlines, and AACTL seeks to regulate the age of aircraft. These regulations do not meet the current needs of Timorese civil aviation.³⁷

The capacity of Timorese civil aviation authorities is a major impediment to further developing Timorese air services.³⁸

6.1.1 Develop Dedicated Policy-Making Unit

This unit would be tasked with developing civil aviation policies and targets for Timor-Leste related to regulation and development. It would also be responsible for collecting data, currently a critical need.

The lack of a clear strategy for business and especially tourism development is the biggest bottleneck to setting targets for aviation policies. The lack of understanding of recent trends in the global and regional aviation markets is another bottleneck, as the Timor-Leste Strategic Development Plan does not address current trends in civil aviation, including growing LCCs and the decreasing size of aircraft.

It is also critical for this unit to observe the needs of other agencies in the Timorese government. Civil aviation infrastructure, especially in an isolated island country like Timor-Leste, has an outsized impact on the economy and society as a whole. Therefore, policy targets should be set with the goals and strategies of other economic and social policies in mind, including tourism, export industries, and higher education policies.

Infrastructure development must be tied to specific needs in the aviation sector, and varied uses of aviation infrastructure require different types of policies and investments. For example, if Timor-Leste opts for a national flag carrier for international flights, it would be necessary to invest heavily in aircraft and labor. If Timor-Leste wants to introduce foreign FSCs to and from Dili, large investment in airport facilities, including the runway and the terminal, is needed. If attracting LCCs is the target, no large investment is necessary, but some policies to reduce their costs are needed. If air cargo transport is introduced, different and specialized infrastructure must be developed. The ability to comprehensively set policy is currently lacking.

The types of airlines provided are also a policy decision and depends on the users targeted. Business users want speed and connectivity from hub airports. High-end tourists want comfortable services via direct flights from their home countries. Low-end tourists want cheaper tickets with simple services. The range of aircraft (which largely affects the runway capacity) depends on the target destinations.

As the civil aviation industry requires large investment by private sector players for market entry and sustaining business, government policies strongly affect the incentives for the private sector to invest. Policies enticing private investment and engagement would be of huge benefit to the Timorese aviation sector.

6.1.2 Develop Systems for Interaction Between Public and Private Actors

Private actors in the Timorese civil aviation market have no incentive to interact with Timorese authorities, as they are registered in foreign countries and they trust these countries' authorities, not Timorese authorities. This lack of incentive to interact between public and private actors creates a bottleneck in further developing the civil aviation industry.

Unlike smaller and more porous industries, there are unique qualities to civil aviation that would allow for effective

37 LCCs reduce costs in many ways. One common way is by purchasing old and frequently second-hand aircraft. They also have the incentive to reduce maintenance costs. Therefore, some authorities are afraid to rely on LCCs and want to regulate them. However, the safety risks of civil aviation depend on many various factors including age of aircraft, maintenance, but also pilot skills, airport facilities, and working culture. The South East Asia region has a lot of LCCs. Many of these LCCs are criticized for the poor quality for safety. However, South East Asian FSCs and regional airlines also have a lot of safety concerns. For example, Malaysia Airlines, one of the national flag carriers in this region, is infamous for two recent tragic accidents. Therefore, many government authorities judge the safety quality of incoming foreign aircraft not by the types of airline, but by the quality of the safety regulations of the countries that each airline belongs to. From this perspective, the biggest safety risk for Timor-Leste is not its dependence on LCCs, but may be the dependence on Indonesian airlines that are globally notorious for poor safety institutions. Some countries also introduce regulations for the age of aircraft due to safety concerns. It is true that the age of aircraft largely affects the quality of safety. However, whether the old aircraft is dangerous depends on a lot of factors, including maintenance conditions and the type of aircraft. In particular, the type of aircraft is a big factor. Normally, jet engines need frequent maintenance and the structure is more complex. Thus, the average retirement age of jets is gradually decreasing. On the other hand, small turboprop engines do not need such frequent maintenance. The structure is relatively simple. Additionally, due to an emerging second-hand aircraft market and aircraft leasing market, the average age for retiring turboprop aircraft is increasing. Therefore, simple regulations for the age of aircraft without careful consideration can be harmful for the civil aviation market and not effective in improving safety. Under the current situation, Timorese authorities should improve the safety facilities in the airport first. Fixing the lighting facilities might be the least costly measure. Additionally, introducing IFR can be a great advantage to attract safer airlines, as most Indonesian airports rely on VFR.

38 There are positive changes, however, as foreign assistance from Australia and Japan is gradually building capacity to manage basic operations including air traffic control and security and safety inspection.

government intervention. First, the civil aviation market is relatively small compared with other industries, in particular the number of actors is very limited. Due to the need for large and fixed investments, unofficial or illegal small actors cannot enter the market easily. Therefore, it is easier for the public authority to communicate with and regulate private actors as compared to other industries. Second, the field of civil aviation needs highly expertized skills. This is not only a barrier against unofficial or illegal actors' entry, but also an opportunity to establish an efficient skill- and knowledge-based bureaucracy.

At this stage in Timor-Leste's development, it is most important to support local actors and attract foreign operators and investors in the country. Timor-Leste is currently seeking to establish an autonomous body to manage airport infrastructure, which would collect fees and then use those fees exclusively for the industry, reducing the public burden. This would incentivize the government and is a good first step, but must be considered in context. Increasing fees and taxes would increase the cost of entry and operations for new actors, dissuading foreign operators from investing in Timor-Leste. Establishing an autonomous body, while politically helpful as it reduces public financing of the aviation industry, would also squeeze LCCs with often thin margins, and might not be ideal at the present time.

The AACTL currently lacks staff for communicating with and promoting the airline industry. Developing a unit to strengthen this capacity should be prioritized. This new staff would be the first generation of a bureaucracy responsible for the development of the industry, thus it is important for AACTL to recruit carefully and invest with a long-term vision. The skillset required, particularly around policy formation and global awareness, takes time to build and it would be wise for the AACTL to hire staff and train, as opposed to hiring foreign experts and more senior staff. A small number of foreign experts, however, would be needed to lead and teach Timorese staff. Please see Annex D for a suggested human resource development plan.³⁹

Specialized staff for civil aviation promotion would develop trust with the private sector, leading to increased private investment. For productive interactions between public and private actors, the incentive for private players to provide information and discuss needs is critically important. Such private business information can be confidential or guarded. Thus only when players in the industry can trust that an agency or unit can protect the industry from other agencies can the necessary exchange of information and opinions take place. This is aided by continuous long term staffing.

The civil aviation policy and planning initiative could be a pilot for developing policy and planning capacity across the Timorese government.⁴⁰ The civil aviation market lends itself well to this model, as there are fewer players than in other markets and officers could identify and communicate with these players easily. Furthermore, the regulatory powers of civil aviation authorities are broadly recognized in the international community.

6.2 INTRODUCE POLICIES TO NURTURE AND BUILD CAPACITY OF TIMORESE CIVIL AVIATION INDUSTRY

6.2.1 Introduce a Cabotage Policy

Timorese civil aviation authorities would benefit from introducing, or rehabilitating, a Timorese cabotage policy requiring that every operator providing domestic air services in Timor-Leste register as a Timorese aviation servicer. This policy stipulates that private air servicers must use a Timorese legal framework and Timorese authorities should be responsible for the industry, and would accomplish the following: 1) provide policy for the Timorese authorities to meet the unique and flexible needs of the aviation industry; and 2) create strong incentive for authorities to be responsible for the market and for private actors to interact with Timorese authorities, and not exclusively with foreign authorities.

The details of the regulations and permissions would initially be less important as they would gradually develop through interaction between Timorese authorities and private actors.

Introducing the cabotage policy has another advantage in addition to creating the incentive to interact. Almost all countries in the world implement their cabotage policies not only to protect their markets but also for national security and other national interests. This might make cabotage an easier political sell.

A cabotage policy would be most effective if introduced in an early phase of the industry's aviation industry development; in other words, the time is now. If the government were to impose such a strong regulation with a mature and well-developed industry, including foreign actors, there would be strong resistance from abroad.

Many countries regulate foreign ownership and capital under their cabotage policies; however, such regulations for foreign ownership and capital should not be included in Timor-Leste's cabotage policy. The majority of Timorese air services are financed by foreign investment and the Timorese economy cannot yet support the civil aviation industry on its own.

³⁹ New staff would need a clear Terms of Reference so as to not be assigned to other government projects. They would need foreign language skills and to be internationally educated, and to be incentivized to stay with the AACTL for the period of time necessary to build political and technical relationships necessary for success. These staff would not need existing knowledge or expertise in civil aviation and could learn from experts in AACTL or ANATL and private operators as needed.

⁴⁰ The MPWTC is currently making efforts to develop policy-making capacity and create a policy coordinating division under the Minister.

One possible criticism of a cabotage policy is that Timorese authorities would be unable to enforce regulations, especially safety regulations. However, the Timorese domestic aviation market is very small. Private operators are thus incentivized to maintain safety quality even in the absence of effective regulation, in order to avoid loss of their own assets (e.g. aircraft) or business in the event of an accident.

The primary negative tradeoff of a cabotage policy is the lower utility of Timorese operator and aircraft certifications. Even under the current framework, some lessors of aircraft, and insurance companies, impose extra fees on leasing or operating aircraft in Timor-Leste because of concerns related to poor and dangerous conditions for civil aviation. Additionally, foreign registration and certification by developed countries such as Australia and Canada can be valid for multiple countries and regions. Lessors and insurance companies may not trust Timorese regulations and may require that the certification is valid only in Timor-Leste, and possibly Indonesia. Therefore, introducing a cabotage policy increases the risk of higher costs and reduced flexibility in current air services.

One possible solution to this problem is to include exceptional provisions for a country such as Australia in the cabotage policy. Validating the certifications of a certain developed country may seem to make the cabotage policy meaningless, however, by limiting the number of foreign regulations valid in the Timorese aviation market, the Timorese authority can focus on the negotiations with a certain country to relax the regulations for the Timorese aviation market.

Implementing the cabotage policy while accepting this disadvantage is another possible option. Cabotage policy could hamper the domestic air services industry and private players would criticize the Timorese framework. However, the Timorese authority must have the incentive to face the market, including the global leasing and insurance markets. The authority would have to care about foreign and global evaluations in order to sustain and develop the domestic civil aviation market. It would be difficult, but such experiences could develop a true capacity for policy making in this country.

6.2.2 Introduce Promotion Policies for Timorese Civil Aviation Industry

The dedicated policy-making unit should consider various promotion policies related to the civil aviation industry including subsidies and other forms of public-sector support for domestic travel, broad capacity building strategies, and others to be determined and based on data and evidence collected by the policy unit.

6.3 Improve Existing Aviation Capacity and Services through Cost-effective Investments

Aviation infrastructure is costly and such investment should not be the first priority in Timor-Leste. Increasing the capacity of current infrastructure and capacity is therefore the best way to support the civil aviation industry. Improvements should be based on recommendations from the newly formed policy unit.

As mentioned earlier, there are many ways to improve the capacity of the airport through smaller investments, for example by fixing the lighting facilities, expanding the taxiway, or improving CIQ processes, efforts that would increase the number of available slots for the airport. As an example, it was observed at DIL that the customs checking process is inefficient. Reducing the number of samplings could easily increase the terminal handling capacity and is an inexpensive fix. In the case of domestic civil aviation, simply cutting the grass at regular intervals or other routine maintenance issues could increase efficiency.

In order to properly assess the need for improvement, more exact data for the current available capacity of the airports, including ROT and terminal handling capacity, is needed. This lack of this data is a critical weakness in drafting new policy for civil aviation development. Subject to a review of the newly developed policy unit, aviation/airport policy might also address the lack of services for flight maintenance and catering.

6.4 SECURE INTERNATIONAL AND DOMESTIC ACCESSIBILITY

As mentioned previously in this paper, Timor-Leste's accessibility is at risk, both internationally for travelers coming to and from Timor and domestically for Timorese seeking to travel within the country.

6.4.1. International Accessibility

There are many policies that could help to secure international accessibility. One such option is for Timor-Leste to increase the number of routes and airlines using Timorese airports. To encourage this increase, Timor-Leste would need more ASAs and to distribute air traffic rights. The Philippines, Malaysia, and Brunei are currently the best opportunities to negotiate with and secure ASAs.⁴¹

One of the most difficult negotiations within an ASA is the issue of air traffic rights, namely traffic rights to Timor-Leste are not attractive enough to offer these countries incentives for ASAs. Therefore, Timor-Leste would benefit from becoming a member of ASEAN and entering the Single Aviation Market. If this is not currently feasible, Timor-

⁴¹ Malaysia's Kuala Lumpur airport is a global hub airport. The Philippines has also multiple popular international airports, including Manila and Cebu. Additionally, these countries are home to the largest LCCs, such as Air Asia and Cebu Pacific. Brunei has a large, non-congested airport. These three countries are in the range of aircraft supported by the current capacity of DIL.

Leste should accept ASAs with unfavorable or unilateral conditions, as they would still be an improvement upon the current situation.

To negotiate these ASAs, Timor-Leste would first need a specialized policy unit, previously recommended. This unit would have many tools at its disposal in negotiations, including the ability to pressure private industry, legal procedures, and infrastructure management and access. After securing ASAs, Timor-Leste would need to attract foreign airlines other than Indonesian airlines.⁴² Mentioned elsewhere in this paper, this would ensure Timor-Leste's ongoing accessibility and strengthen domestic aviation.

Becoming a hub airport and attracting FSCs could be another policy option to secure international aviation accessibility. However, this is too costly and therefore unrealistic at the present time (see Annex E for further explanation).

6.4.2 Domestic Accessibility

For domestic aviation accessibility, a cabotage policy with an open charter flight policy could be sufficient.

Under a policy allowing private servicers to provide flexible charter services, second-hand ticketing would also be a good idea. For example, when one party books a chartered flight but cannot use all of the seats, they can sell the available seats to others under the open charter policy. A second-hand ticketing agency can also purchase the seats and sell them to other users through flexible pricing as based on demand. Thus, demand for domestic air services could increase and local Timorese could access the services.

To further contribute to efforts to secure domestic accessibility, policies supporting operators and improving local airport infrastructure would be useful. Timorese authorities should draft these policies with the following considerations in mind.

First, local municipalities should be responsible for local airport policies. As this paper mentioned elsewhere, the domestic needs of civil aviation are at the present time unclear. If local municipalities have the ability to manage local airports and investment in further improvements, they would more relevantly assess needs. For example, cutting grass on the runway and monitoring the area to exclude the entry of local people or animals are some actual needs of private air operators in Timor-Leste, and not for example a new terminal.

Second, if the public authority supports a certain service, the service should seek new and different demand to avoid distorting the current domestic aviation market. For example, special ticket prices for rural and low-income Timorese can create new and different demand that would not compete with existing operators used by foreigners and wealthy Timorese. This servicer should also focus on scheduled services and not charter services as existing private operators can flexibly operate these charter services with intermittent demand.

Third, ZEESM and other regional actors should be treated carefully. For example, ZEESM is able to support flight services between Dili and Oecusse. It would be very difficult, however, for ZEESM to withdraw support for flight services when existing private players are well-developed. This is because ZEESM is responsible for regional development, not for the development of the civil aviation market as a whole. Therefore, national civil aviation authorities would be responsible for these public support policies.

Finally, if possible, government policy should reflect that military and other public authorities provide essential minimum aviation services such as emergency medical transport. These policy recommendations are based on current realities and should be reexamined in light of changes to the global, Asian, and Timorese domestic market.

42 For attracting safer airlines, the Timorese authority also has to exchange information for the safety regulative capacities of the surrounding countries in the international community, such as ICAO, with foreign counterparts.

Annex A: List of Interviews

NAME	TITLE / POSITION	DATE OF INTERVIEW
Jonathan Lowe	Program Manager/Pilot – Timor-Leste, Mission Aviation Fellowship	July 1, 2016
Sabino Henriques	Director, AACTL (Civil Aviation Authority of Timor-Leste)	July 5, 2016
Syed Abdul Rahman	Manager, Dili & Denpasar Air Timor	July 8, 2016
James Gan	Manager in Dili, Nam Air	July 9-11, 2016 (via email)
Mario Gomez	Manager of Airport Security, ANATL (Aerial Navigation and Airports of Timor-Leste)	July 27, 2016
Joao Bosco A. Guterres	Director, STAT	August 5, 2016
Mario Spencer	Advisor of Director General (Transport and Communications), Ministry of Public Works, Transport, and Communications	August 10, 2016
Tol Mofflin	Head of Training, Air Timor	August 11, 2016
Joanico Goncalves	Director General (Transport and Communications), Ministry of Public Works, Transport, and Communications	August 12, 2016
Inacio Freitas Moreira	Vice Minister of Public Works, Transport, and Communications	August 12, 2016

Annex B: Air Freedoms and Information Related to Chicago Convention

1. Air traffic rights under the Chicago Convention and ASAs are classified into nine freedoms of the air. Basically, ASAs exchange third and fourth freedoms. Some ASAs grant fifth freedoms.

FREEDOMS OF THE AIR	THE CONTENTS	APPLICATION
First Freedom	The freedom to fly over another country's territory without landing.	The Chicago Convention provides it to every party State.
Second Freedom	The freedom to make a technical landing for fuel or maintenance without loading any passengers.	The Chicago Convention provides it to every party State.
Third Freedom	The freedom to unload the passengers or freight from one's own country in another country.	This needs to be agreed in ASAs.
Fourth Freedom	The freedom to unload the passengers or freight from a partner country in one's own country.	This needs to be agreed in ASAs.
Fifth Freedom (Beyond right)	The freedom to fly passengers or freight between a partner country and another country (located at an intermediate point to the partner country or beyond) when the flight originates or ends in one's own country.	This needs to be agreed in ASAs. Few ASAs allow it.
Sixth Freedom	The freedom to fly passengers or freight between a partner country and another country, making a stop in your own country.	This needs to be agreed in ASAs. Few ASAs allow it.
Seventh Freedom	The freedom to fly passengers or freight between a partner country and another country without making any stops in one's own country (does not apply to operations in Third and Fourth Freedoms).	This needs to be agreed in ASAs. In practice, it is not allowed.
Eighth Freedom	The freedom to practice true cabotage ¹ in connection with the operations allowed in Third and Fourth Freedoms.	This needs to be agreed in ASAs. In practice, it is not allowed.

2. The International Air Transport Association (IATA) is another important organization of international civil aviation created at the Chicago Convention. IATA is an industrial association consisting of airlines, air servicers, and related actors such as travel agencies. IATA provides some voluntary but important guidelines for civil aviation, including guidelines for slot allocation in congested airports. Some service providers, especially LCCs, do not join IATA.

Under the framework of the Chicago Convention and ASAs, international scheduled flights have distinguished status compared with charter flights, including periodic charter flights. International flights, on the regular basis that the traffic rights are granted by ASAs, are stable because the rights are negotiated and confirmed by international agreements. State governmental authorities tend to institute protective policies for scheduled flights set by ASAs, and IATA (most of its members are national carriers granted air traffic rights by ASAs) also gives these flights first priority in the rules for allocating airport slots.⁴³ On the other hand, charter flights without the rights of ASAs must have weaker conditions than scheduled flights. These flights can only run in the vacant spots that scheduled flights do not use. Charter flights require the State authority's permission for each flight, while scheduled flights can operate based on collective permissions once in a season (normally in half a year). In many countries, charter flights are also subject to other regulations, including prohibition of individual ticket selling or multiple charterers. Therefore, the granting of air traffic rights to run international scheduled flights to and from certain congested and popular airports is in the diplomatic and strategic interests of State governments.

43 <http://www.iata.org/policy/infrastructure/slots/Pages/slot-guidelines.aspx>

Annex C: Used Slots in June to August 2016 DIL Schedule

TIME	MON	TUES	WED	THU	FRI	SAT	SUN
6:35	From Darwin		From Darwin	From Darwin			
7:20			To Darwin		From Darwin	From Darwin	
8:05					To Darwin	To Darwin	
10:00		*From Darwin (varies by day)					
10:40			From Darwin				
10:45		*To Darwin (varies by day)					
11:15	To Darwin		To Darwin	To Darwin			
11:35	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar
12:10	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar
12:20	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar
12:50	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar	From Denpasar
13:20	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar
13:30	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar	To Denpasar
14:20		From Singapore		From Singapore		From Singapore	
15:25		To Singapore		To Singapore		To Singapore	
16:20	From Darwin						From Darwin
17:05	To Darwin						To Darwin

Annex D: Human Resource Development Plan for
AACTL

The following table shows an example of a human resource development plan. The Air Talks & Industry Coordinating Officer is the key position to communicate with private actors in the industry and to ensure public policies reflect these interactions, including “air talks” (ASA negotiations). The One-Stop Website Manager is the officer responsible for disclosing information. In civil aviation, the governmental authority has a lot of critical information for the industry. Therefore, publishing the information is key to promoting the industry. The Assistant Director of AACTL is the position to coordinate both the regulative policies that AACTL currently focuses on, and the industry promotion policies that the new staff would support. In order to avoid over-dependence on foreign experts, their terms should be limited in advance. Periodic promotions based on a seniority system will help develop new Timorese staff’s commitment to the field of civil aviation and the industry.

POSITION	FIRST PHASE	NEXT PHASE	LAST PHASE
Air Talks & Industry Coordinating Officer	Chief: Foreign expert (Recruited) Deputy: Senior Timorese (Recruited) Assistant: Young Timorese (Recruited)	Chief: Senior Timorese (Promoted) Deputy: Foreign expert Assistant: Young Timorese	Chief: Senior Timorese Deputy: Young Timorese (Promoted) Assistant: Young Timorese (Recruited)
One-Stop Website Manager	Chief: Foreign expert (Recruited) Deputy: Young Timorese (Recruited)	Chief: Young Timorese (Promoted) Assistant: Young Timorese (Recruited)	Chief: Young Timorese Deputy: Young Timorese (Promoted)
Director of AACTL	Assistant: Young Timorese (Recruited)	Assistant: Young Timorese	Deputy: Young Timorese (Promoted) Assistant: Young Timorese (Recruited)

Annex E: Further Notes on DIL Airport Capacity

On the method for calculating current maximum passenger capacity for DIL: The earliest flight arrives to DIL at 6:35AM, and the latest flight leaves at 17:05PM. Therefore, the operating hours of the airport are 10.5 hours (630 minutes). According to primary research, the average Runway Occupancy Times (ROT) of jet aircraft at DIL is nearly four minutes. The runway of DIL can support over 150 landings or take-offs in a day: $630 / 4 = 157.5$ (minutes).

This number, however, ignores the specific ability of ground handling and air traffic control. The most congested time (12:20PM to 13:30PM) has four flights (two departure flights and two arrival flights). If four flights within 70 minutes is the maximum for ground handling and air traffic control for the airport, the maximum number of available slots is 27 flights per a day: $((4 - 1) / 70 \text{ minutes} * 640 \text{ minutes}) + 1 = 28$.

It is harder to calculate terminal handling capacity than runway capacity because the current number of passengers does not reach the limit of the terminal capacity of DIL.

This paper assumes that the terminal reaches the limits of the capacity during the most congested time from 12:20PM to 13:30PM. On July 27, 2016, two jets (Citilink A320 and Nam Air B737) arrived at the airport during the congested time. Additionally, another small charter aircraft arrived and the passengers went through the terminal. The A320 has 128 seats and the B737 has 130 seats. According to the interviews, the load factor of Citilink is roughly 50%, and that of Nam Air is 80%. Thus, the total number of passengers of the two jets might be nearly 170. The small aircraft had nearly 20 passengers. Thus the rough estimate for total number of passengers was 200. These 200 passengers took an hour and five minutes to go through the terminal building. In another case, Sriwijaya Air's jet arrived at 14:10PM on the same day. The 100 passengers took 35 minutes to go through the terminal. Therefore, the terminal can handle 100 passengers in a little over 30 minutes. Based on the assumption, the terminal capacity of Dili international airport may be nearly 800,000: $630 \text{ minutes} / 30 \text{ minutes} * 100 \text{ passengers} * 365 = 766,500$.

At the time of research, the airport supported 66 international flights per week. There are 20 flights on A320s with 128 seats each, 28 flights on B737-500s with 130 seats, and 18 flights on EMB 170/175 with 72 seats (in case of E170). The sum of these seats is equal to 7496. Thus utilizing the present number of international flights, the airport could provide nearly 390,000 seats in a year.

On requirements for becoming a hub airport: Being a hub airport requires significant investment for airport facilities including the runway, terminal building, ground handling facilities, and safety facilities.

Becoming a hub airport also entails other costs. Hub airports need various connecting flights, which requires demand for destinations such as Tokyo, Beijing, or San Francisco. For establishing such flights, the countries that wanted to have hub airports would need to create national carriers. For example, Dubai has Emirates. Abu Dhabi has Etihad Airways. Even for smaller countries the situation is the same. Brunei created Royal Brunei Airlines to set the international routes from Brunei international airport.

This is problematic as a first step. First, if a foreign Full Service Carrier (FSC) wants to set the routes from another country's airport, the FSC (and the country where the FSC is registered) has to have air traffic rights for Fifth, Sixth, and Seventh Freedoms. Fifth Freedom is allowed in some (but not so many) ASAs. Sixth and Seventh freedoms are not allowed in any ASAs.

Additionally, almost all FSCs have strong connections with their civil aviation authorities. Their route setting policies are also related to their countries' airport development policies. Thus, no FSCs will prioritize another country's airport over their home country's airport.

Furthermore, the route setting of FSCs is not flexible because most of them employ "hub and spoke" strategies with various types of aircraft. Each type of aircraft matches each type of route. Therefore, setting a new route is relatively costly for FSCs, unlike Low Cost Carriers (LCCs). For this reason, FSCs are reluctant to set a route where the demands are not clear.

In many cases, in order to attract foreign FSCs to an airport where the demand is unclear, the home country of the airport should set a chartered flight to prove the demand. If the chartered flight can prove certain demand for the route, the foreign FSC's home country authority could begin negotiation of the ASA and the FSC would begin to think about the scheduled flight. Therefore, a policy to be a hub airport is related to both policies to create a national carrier, and then set international flights and policies to attract FSCs. These policies require heavy investment. Therefore, securing accessibility to the world by attracting FSCs is not realistic for Timor-Leste, at least in the short term.

ABOUT THE AUTHOR

As an Administrative Officer in the Ministry of Land, Infrastructure, Transport and Tourism of Japan, Tatsuo Sakai managed infrastructure and transport policy planning and coordination across the Ministry, such as urban and regional planning, civil aviation network development, and road infrastructure regulation. From 2012 to 2014, he was the chief officer of the Aviation Network Division in the Japanese Civil Aviation Bureau. His responsibilities included the development of Japanese regional airports and related industries, and international negotiations with member countries of the European Union, Association of South East Asian Nations, and the Trans-Pacific Partnership.

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