

Dominican Republic Air Transport Case Study

P/15 Agenda Item 8 Secretariat
Eighth Meeting of the North American, Central American and Caribbean
Directors of Civil Aviation (NACC/DCA/08)
Ottawa, Canada, 31 July to 2 August 2018



Introduction

Policy and Regulation

Safety Audit Results

Air Connectivity and the State of Air Transport

Economic Benefits and Job Contribution

RO NACC and ATB to Conduct Case Study

New Dominican Republic aviation connectivity case study to shine spotlight on economic planning and growth benefits



As part of ICAO's continuing efforts to assist Small Island Developing States (SIDS), the Director of ICAO's North American, Central American and Caribbean (NACC) Office, Mr. Melvin Cintron (fourth from right), was joined by officers from the ICAO Air Transport Bureau and civil aviation officials and key stakeholders from the Dominican Republic yesterday to forge the parameters of a new air transport case study to quantify the economic and social benefits of aviation connectivity in the Dominican Republic.

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Objectives of the Study

- Demonstrate that a country's political will and commitment to establishing aviation as a national priority can drive economic development to the country
- Quantify the economic and social benefits from civil aviation to Dominican Republic, using data and analysis of the past two decades
- Provide a more relevant and accurate representation of the "before" and "after" effects on the economies and sustainable developments of Small Developing Island States (SIDS)

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Small Island Developing States (SIDS)

Small Island Developing States (SIDS)

consist of 38 maritime developing countries, including Dominican Republic (and 20 non-UN Members and Associate Members) facing specific social, economic and environmental vulnerabilities.



- Small domestic markets with heavy dependence on foreign markets
- High costs for energy, infrastructure, transportation and communication
- Long distances from major trading and tourist-generating markets
- Low and irregular international traffic volumes
- Little resilience to natural disasters and fragile natural environments

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Study Outline

- I. Introduction
- II. State of air transport
- III. Connectivity
- IV. Policy and regulation
- V. Navigational scenarios in the Dominican Republic
- VI. Safety audit results
- VII. Direct and indirect economic and job contributions of civil aviation to the Dominican Republic's economy
- VIII. Policies that could further enhance economic contribution of civil air transport

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Introduction
Policy and Regulation
Safety Audit Results
Air Connectivity and the State of Air Transport
Economic Benefits and Job Contribution

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Policy and Regulation

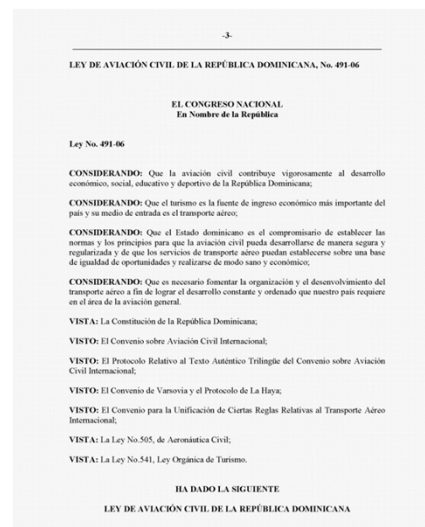
Aviation as Priority

DECISION & POLITICAL WILL

Dominican Republic chose to make aviation a priority sector in their national development planning and policies

Civil Aviation Law No.491-06
(promulgated 28 December 2006)

- Strengthen the role of the civil aviation board and its mandate for negotiations (3rd and 4th freedom rights)
- Allows for more flexibility for foreign operators



Source: JAC

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Aviation as Priority

Modifications for higher degree of liberalization

2010 – Resolution No.180-(2010)

(promulgated by JAC, currently under review)

- 6th freedom rights for passenger, cargo and combined
- 7th freedom rights for all-cargo

2013 – Law 67-13 (amending Law 491-06)

- Relaxation of ownership requirements for national operators *(company with foreign capital (up to 100%) can be considered as a national air operator, provided, that the investment is from an internationally known airline)*



Source: JAC

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Aviation as Priority

JAC Requirement Manual
(Version 6.0)

Regulatory framework for the Civil Aviation Board

- Includes regulatory framework for charter and special permits
- More flexible requirements for the issuance of Operating Permits were introduced and simplified gradually



Source: JAC

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Bilateral Agreements:

- Total number: 60**
- incl. 5th freedom: **54**
- incl. 6th freedom: **17**
- incl. 7th freedom: **19**
(all cargo)

Multilateral Agreements:

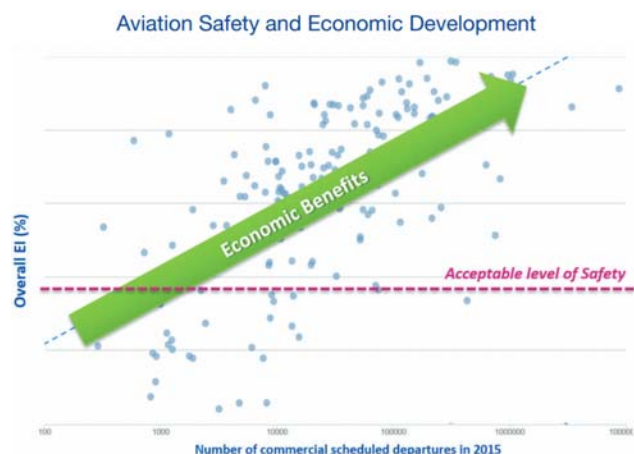
Air Transport Agreement of Association of Caribbean States (ACS)
(rubricated February 2004, final signature pending)

Multilateral Agreement of Open Skies among the Member States of the Latin American Civil Aviation Commission (LACAC)
(signed November 2011)



- Introduction
- Policy and Regulation
- Safety Audit Results**
- Air Connectivity and the State of Air Transport
- Economic Benefits and Job Contribution

How Safety Affects Air Traffic



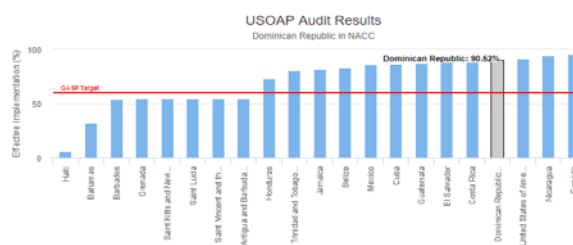
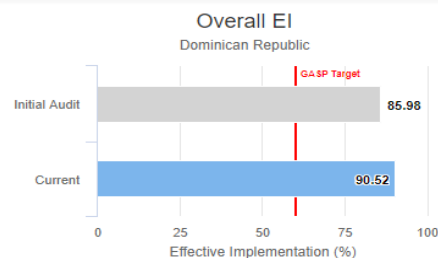
- Safety reputation might affect travelers' choice of destination and airlines
- Accidents and incidents might lead to an immediate decline of demand to travel with a particular airline
- Using an econometric model, it is estimated that **10 per cent improvement** of the effective implementation of a State's safety oversight system might generate, on average, an additional **1.8 per cent of aircraft departures** from the State concerned

Source: Aviation Benefits report, 2017, ICAO

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Safety Audit Results

- Dominican Republic improved Effective Implementation (EI) from 85.98% (2009) to **90.52%** (world average is 66.32%), ranking the country 4 of 21 in NACC region
- Dominican Republic reached the Global Aviation Safety Plan (GASP) Targets



Source: ICAO

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Dominican Republic Performance Dashboard based on ICAO Safety Audits

Indicator	Target	Value	Achieved
USOAP EI <i>USOAP overall EI (%)</i>	60%	90.52%	Yes
Significant Safety Concerns (SSCs) <i>Number of SSCs</i>	0	0	Yes
Fatal Accidents <i>Number of fatal accidents in last 5 years</i>		0	Yes
Aerodrome Certification <i>Validated status of USOAP Protocol Questions (PQ) 8.081, 8.083 and 8.086</i>	Satisfactory	Satisfactory	Yes
State Safety Programme (SSP) Foundation <i>Percentage of SSP Foundation protocol questions (PQs) validated by USOAP or submitted as completed</i>	100%	99.61%	No
State Safety Programme (SSP) <i>Level of SSP implementation</i>	Level 2	Level 3	Yes

IOSA <i>Number of IOSA certified operators</i>	>0	0	No
FAA IASA <i>IASA categorization</i>	Cat 1	Cat 1	Yes
EU Safety List <i>Number of operational restrictions</i>	Unrestricted	Unrestricted	Yes
PBN <i>Percentage of international instrument runways with PBN approaches</i>	100%	94.44%	No
Global Aviation Training Activities <i>Number of courses delivered or developed by TRAINAIR PLUS Members in the last 12 months</i>	>0	3	Yes
Corrective Action Plan Update <i>Number of updates in the last 12 months on the Online Framework (OLF)</i>	>0	1	Yes
Positive Safety Margins <i>Number of areas (Operations, Air Navigation, Support) with a positive Safety Margin</i>	3/3	3	Yes

Green indicates that the State exceeds the target set by ICAO

Source: ICAO

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Introduction

Policy and Regulation

Safety Audit Results

Air Connectivity and the State of Air Transport

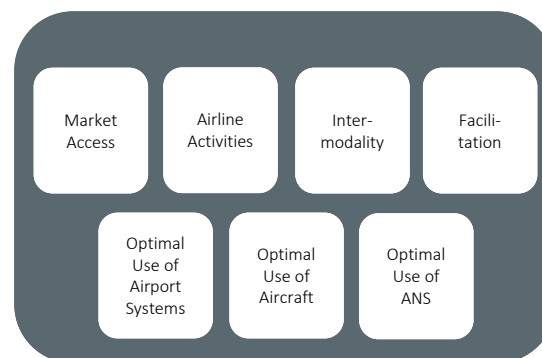
Economic Benefits and Job Contribution

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Definition of Air Connectivity

Movement of passengers, mail and cargo involving the **minimum of transit points**

- which makes trip as **short** as possible
- with **optimal** user satisfaction
- at the **minimum** price possible



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Measurement of Air Connectivity

Global Air Connectivity Index

Departure	Share of 2016 Pax	0 stop (Direct)	1 Stop 2016	2 Stops 2016	Weighted average Stops 2016
United States	7.87%	47.0%	46.3%	6.8%	0.60
United Kingdom	7.06%	84.3%	14.6%	1.1%	0.17
Germany	5.12%	75.5%	22.7%	1.8%	0.26
Spain	4.94%	83.9%	14.5%	1.6%	0.18
China	4.49%	73.7%	24.6%	1.7%	0.28
Italy	3.76%	75.2%	22.6%	2.2%	0.27
France	3.65%	77.7%	20.7%	1.6%	0.24
Japan	2.91%	75.1%	22.3%	2.5%	0.27
Republic of Korea	2.33%	86.2%	12.7%	1.1%	0.15
Thailand	2.17%	75.3%	22.4%	2.3%	0.27
United Arab Emirates	2.16%	86.2%	13.1%	0.7%	0.14
Canada	2.05%	54.5%	38.8%	6.6%	0.52
India	2.00%	51.1%	43.8%	5.2%	0.54
Hong Kong, SAR, China	1.77%	87.6%	11.9%	0.5%	0.13
Taiwan Province of China	1.68%	89.5%	9.5%	1.0%	0.12

(ranks 47th by share of 2016 pax)

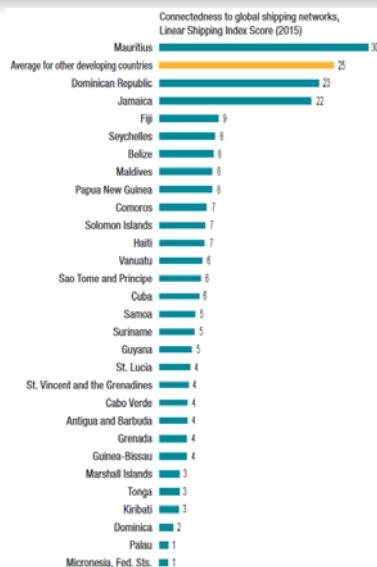
Dominican Republic	0.43%	61.1%	36.6%	2.4%	0.41
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Source: MIDT Big data

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Measurement of Shipping Network Connectivity

The score of Dominican Republic (23) is close to the average for other developing countries (25)

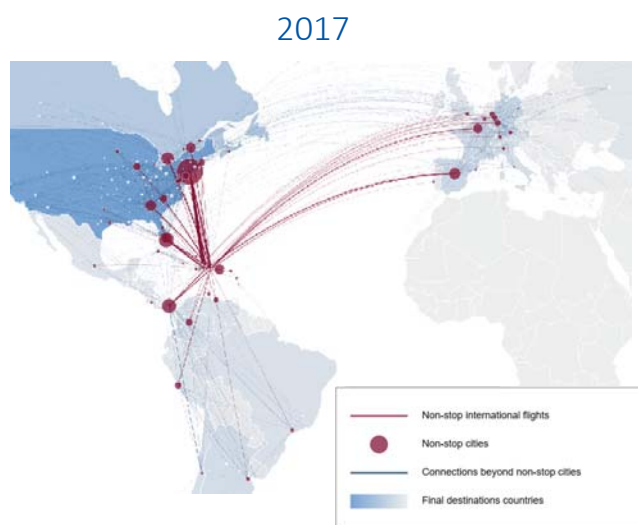


Source: Making Development Co-operation work for Small Island Developing States, OECD

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The State of Air Transport Dominican Republic

- Over 99.9% of traffic is international
- More than 90% of tourists arrive by air
- 80% of passengers originating in Dominican Republic depart from Punta Cana and Santo Domingo airports
- Half of passengers departing from Dominican Republic fly to United States
- Eight out of the top 10 outbound routes are to United States
- More than 20% of passengers departing from Dominican Republic travel to New York/Newark



Source: ICAO-ICM

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Airlines of Dominican Republic

1995: Dominicana de Aviación ceased all operations

2001-2004: Massive drop of domestic capacity partly due to the increased road connectivity within the State

2003: PAWA Dominicana was founded

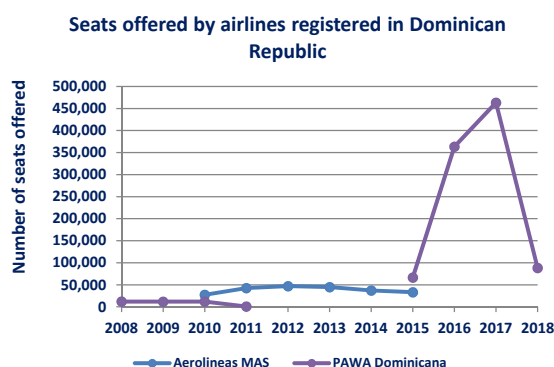
2005: Aerolíneas Mas was founded

2012: End of scheduled domestic services

2012-2014: PAWA Dominicana temporarily ceased scheduled flights, only offering non-scheduled flights

2015: Aerolíneas Mas ceased all operations

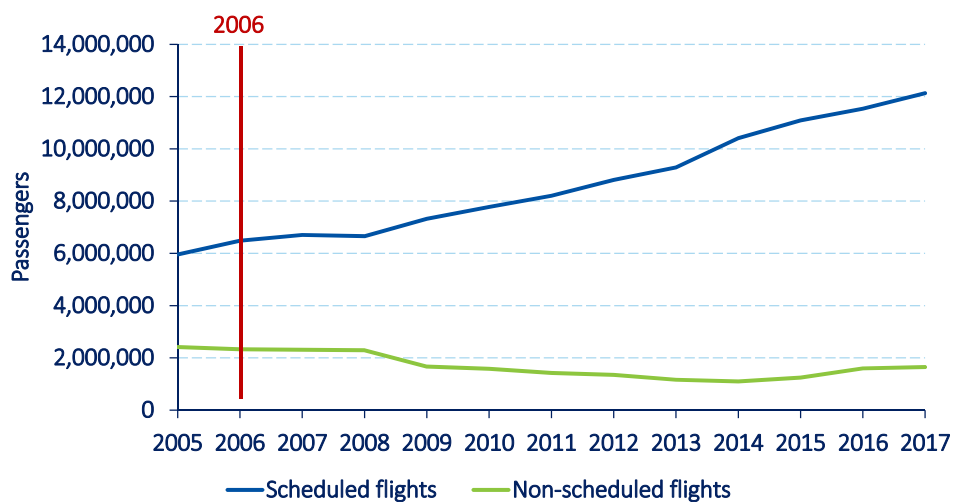
2018: PAWA Dominicana ceased all operations



Source: ICAO

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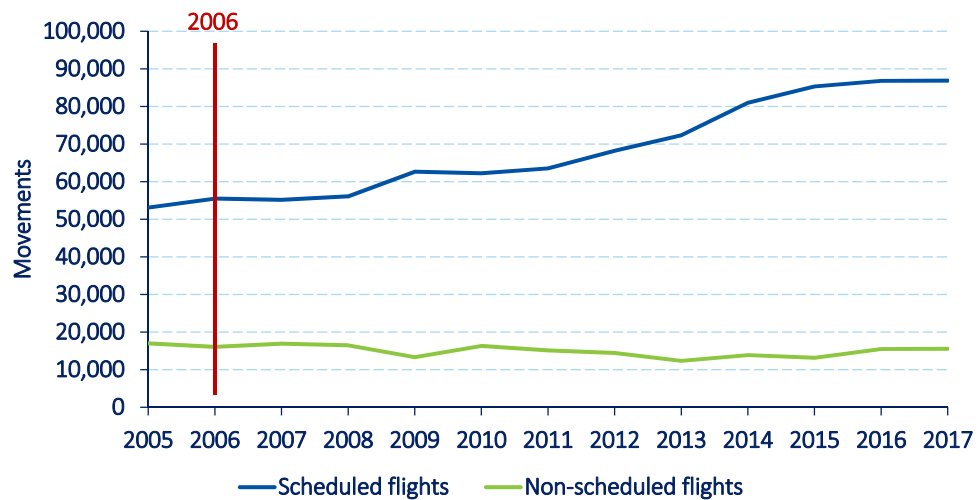
Passenger Arrivals



Source: JAC, Dominican Republic

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Number of Flights



Source: JAC, Dominican Republic

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- Economic Benefits and Job Contribution**

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Economy of Dominican Republic Some Key Facts

Dominican Republic has enjoyed strong economic growth in recent years and a significant reduction in poverty, although the country remains vulnerable to natural disasters such as hurricanes (World Bank Group)

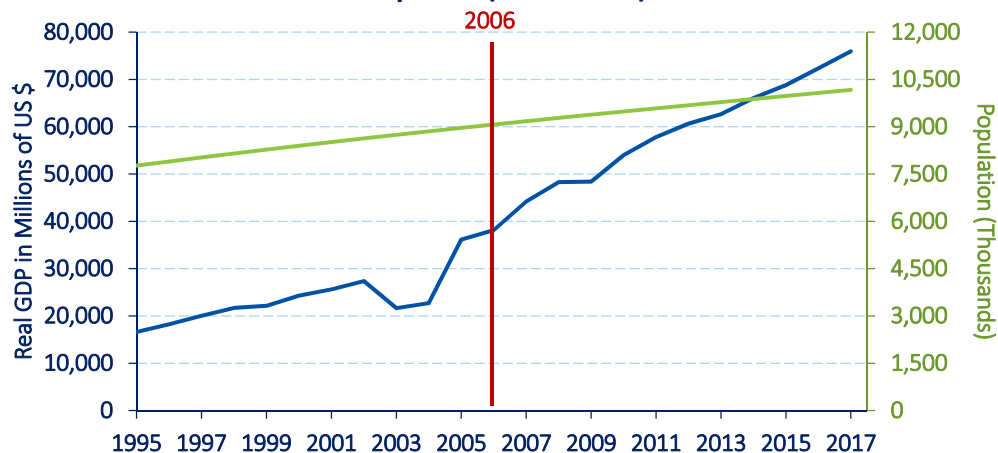
- Small Island Developing State (SIDS)
- Upper middle-income developing country (by World Bank Group)
- 99th in Ease of Doing Business Ranking 2018 (by World Bank Group)
- 104th in Global Competitiveness Index 2017-2018 (by World Economic Forum)
- 76th in Travel & Tourism Competitive Index 2017 (by World Economic Forum)

Source: ICAO

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Real GDP and Population of Dominican Republic

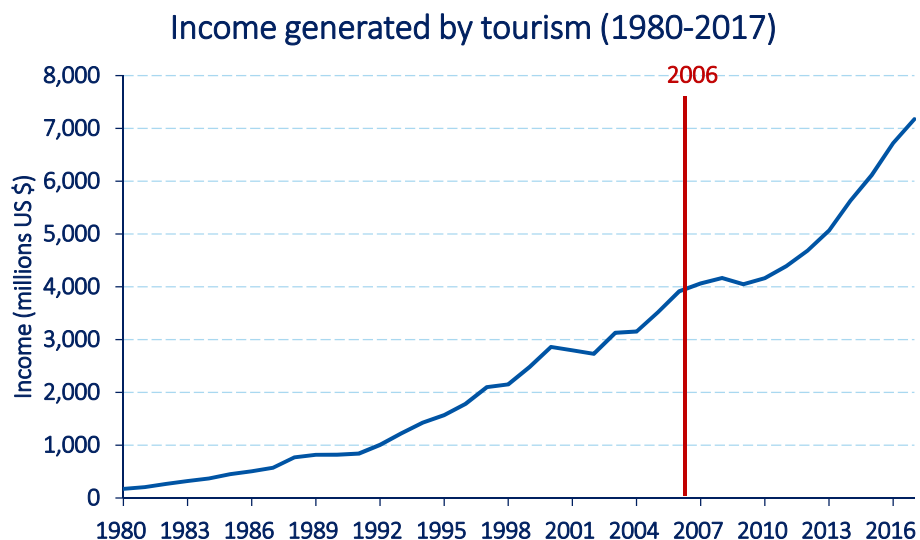
Real Gross Domestic Product and Population of Dominican Republic (1995-2017)



Source: World Bank national accounts data, and OECD National Accounts data files

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Income Generated by Tourism in Dominican Republic



Source: Hotels & Tourism Association of the Dominican Republic and Central Bank of the Dominican Republic

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Quantification of Policy Change Impact Preliminary Analysis

Time-series regression analysis

Income generated by tourism
 $= f(\text{Expenditure, Tourists, GDP, Jobs, Hotels})$

- **Dependent variable:**
 - Income generated by tourism
- **Independent variables:**
 - Total jobs, expense per trip, number of tourists (Dominican non-residents and non-resident foreigners), hotel rooms available and GDP
 - Some independent variables may be multiplied together, logged and/or first differenced

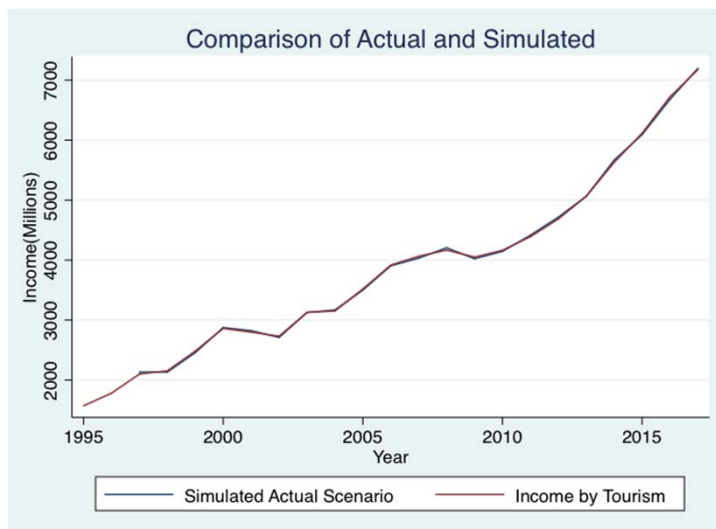
Independent Variable	Coefficient (α_i)	t-value
Foreign Non-Resident Expenditure per Year (FNRE)	0.950965	41.13
Lagged Difference of Dominican Non-Resident Expenditure per Year (L.D.DNRE)	-0.552799	-3.17
Lagged Difference of GDP (L.D.GDP)	0.0103679	4.24
Number of Jobs Created per Dollar of GDP (JGDP)	-2359.008	-4.91
Number of Jobs Created per Tourist (JPT)	4845.298	2.08
Number of Rooms Booked (NRB)	35261.2	7.97
Constant (β)	-747.3531	-3.45

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Quantification of Policy Change Impact Preliminary Analysis

Simulated Actual Scenario

- Use the estimated coefficients and the actual values of each independent variables for simulation
- Can be a good approximation to the actual results (income generated by tourism), which endogenously reflect the policy change to make aviation a priority in 2006

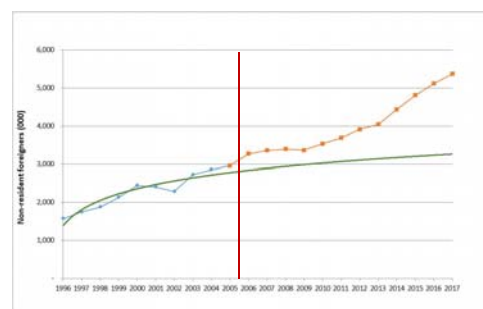


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Quantification of Policy Change Impact Preliminary Analysis

Hypothetical Scenario that assumes no aviation policy change in 2006

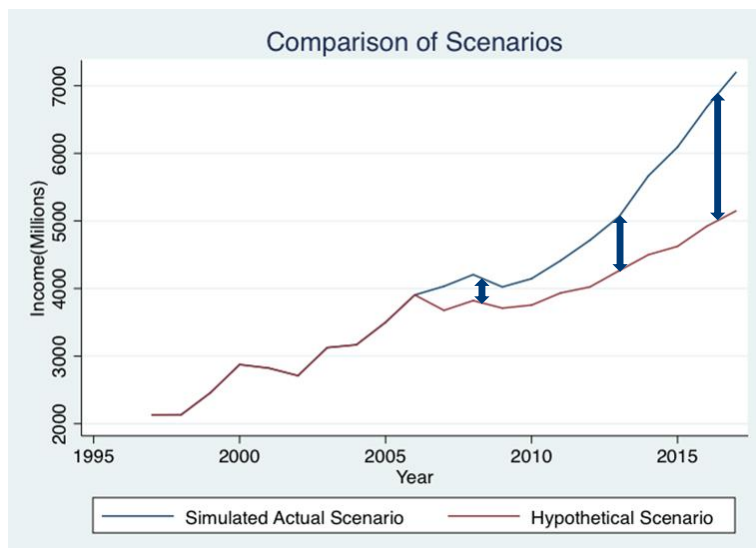
- Use the coefficients estimated in the regression analysis
- Use the **adjusted number of tourists** from 2006 to 2017 (Dominican non-residents and non-resident foreigners) for 3 independent variables
 - Forecast “after 2006 period” by extending the trend line of “prior to 2006 period”
 - Add 0.9% difference in air traffic compound annual growth rate observed at the global level between the two periods
- Can yield the “hypothetical” income generated by tourism after 2006 if the tourist volume increased at the same rate as prior to 2006



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Quantification of Policy Change Impact Preliminary Analysis

The simulated actual scenario and the hypothetical scenario are compared to estimate an overall effect of aviation policy change on income generated by tourism over time



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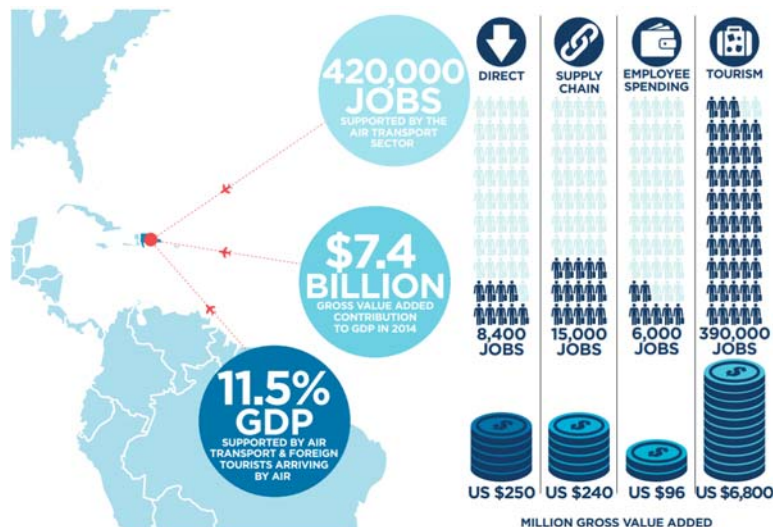
Quantification of Policy Change Impact Preliminary Analysis

This preliminary analysis indicates that aviation policy change in 2006 contributed to approximately **USD 10 billion (i.e. 17.5% more)** cumulative income from tourism from 2007 to 2017

Year	Simulated Actual Scenario (\$, million)	Hypothetical Scenario (\$, million)	Difference of Scenarios (\$, million)	Estimated policy change impact (%)
2007	4,033	3,677	356	8.83
2008	4,205	3,821	384	9.13
2009	4,023	3,710	313	7.79
2010	4,146	3,755	391	9.44
2011	4,415	3,935	480	10.86
2012	4,715	4,024	691	14.66
2013	5,064	4,264	800	15.80
2014	5,667	4,499	1,168	20.61
2015	6,093	4,624	1,469	24.11
2016	6,683	4,920	1,762	26.37
2017	7,198	5,148	2,051	28.49

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Quantification of Policy Change Impact Preliminary Analysis



In 2014,

- **15.8%** of total gross value added by aviation (i.e. USD 1.2 billion out of USD 7.4 billion)
- **1.8%** of Dominican Republic's GDP

can be attributed to aviation policy change made in 2006

Source: IATA and ICAO estimates

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UN 2030 Agenda for Sustainable Development

Sustainable Development Goals (SDGs)

Attainment of the SDGs relies on advances in sustainable air transport, which is a driver of sustainable development.



- Many of the SDGs are directly and indirectly connected to sustainable air transport (especially SDG 9, 8, 11 and 13)
- Progress towards the goals needs to be monitored and evaluated by adequate and quality data
- **SDG Target 9.1** – Develop quality, reliable, sustainable and resilient infrastructure with a focus on affordable and equitable access for all
 - ICAO is a **custodial agency** responsible for collecting traffic data and sharing the information with the UN system to support the agreed global indicator (*passenger and freight volumes by mode of transport*)

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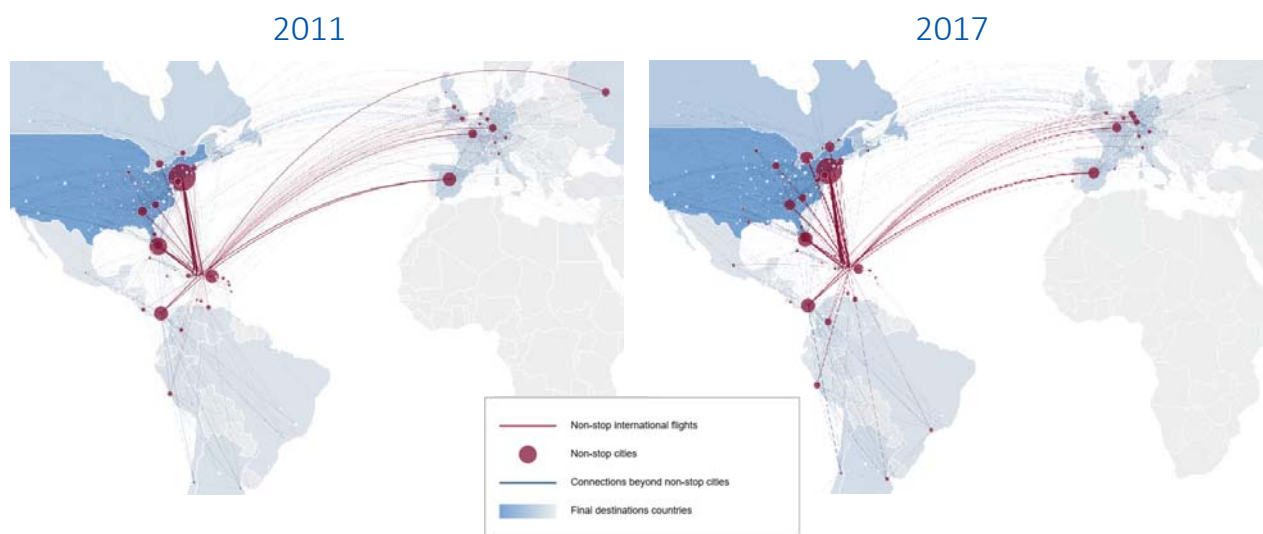
This study will serve as a template for other SIDS to consider in order to optimize their own air transport benefits



Source: United Nations

Appendix

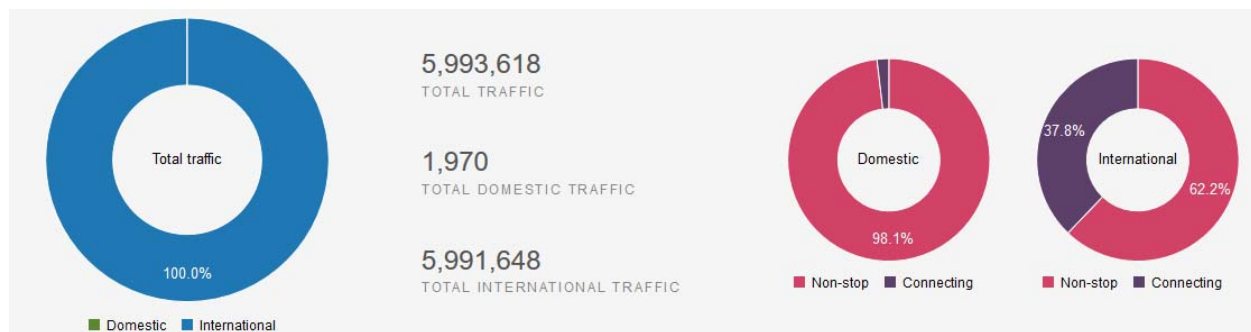
Air Connectivity of Dominican Republic



Source: ICAO-ICM

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Passenger Traffic Composition of Dominican Republic in 2017



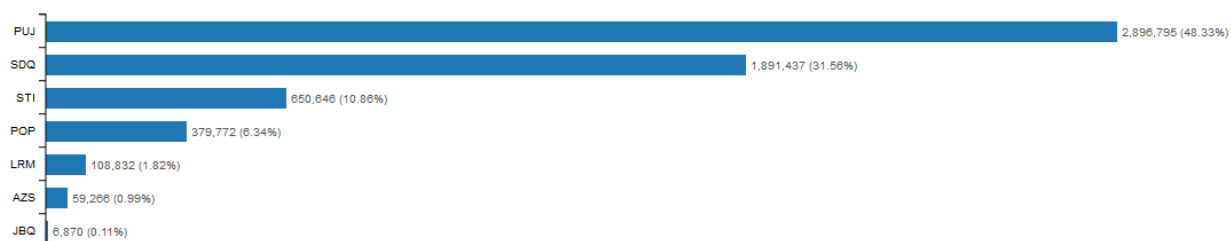
ICAO-ICM Global Air Transport Diagnosis using Marketing Information Data Transfer (MITD) Data

Source: ICAO-ICM

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80% of passengers originating in Dominican Republic departed from Punta Cana (PUJ) and Santo Domingo (SDQ) airports in 2017

Origin airports for the traffic from Dominican Republic (DO).



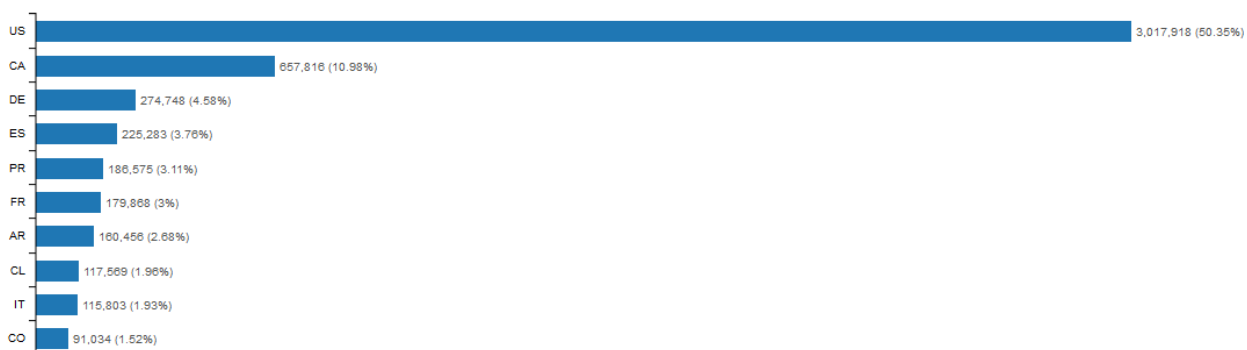
Source: ICAO-ICM

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Half of passengers departing from Dominican Republic flew to United States

Destination traffic

Country destinations for traffic that originated from Dominican Republic (DO).



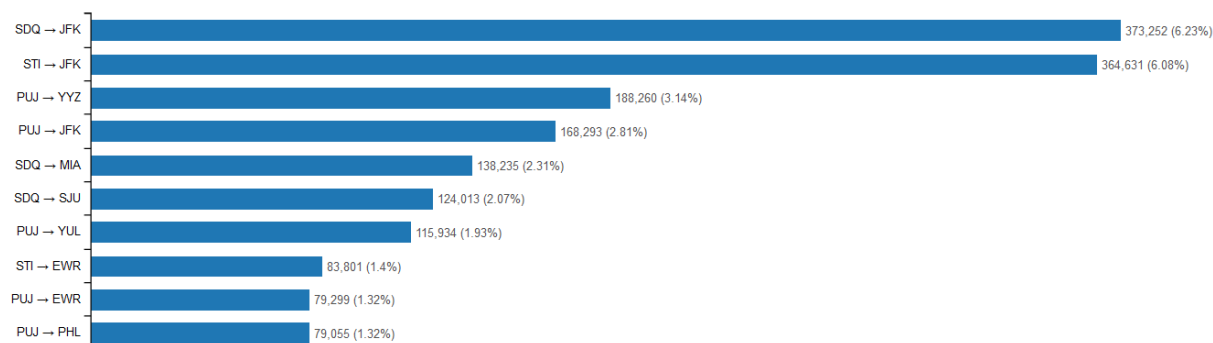
Source: ICAO-ICM

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Top 10 Outbound Routes

Eight out of the top 10 outbound routes from Dominican Republic are to United States in 2017

Outbound routes from Dominican Republic (DO).



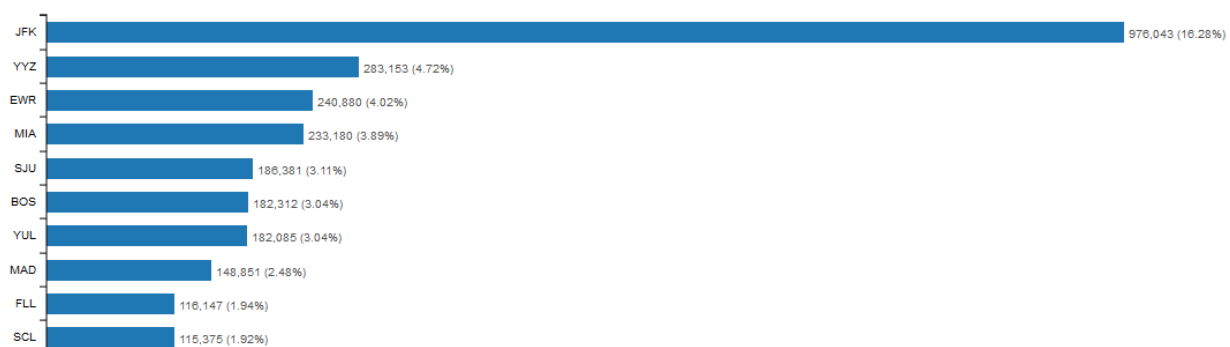
Source: ICAO-ICM

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Top 10 Destination Airports

More than 20% of passengers departing from Dominican Republic travel to New York (JFK or EWR) in 2017

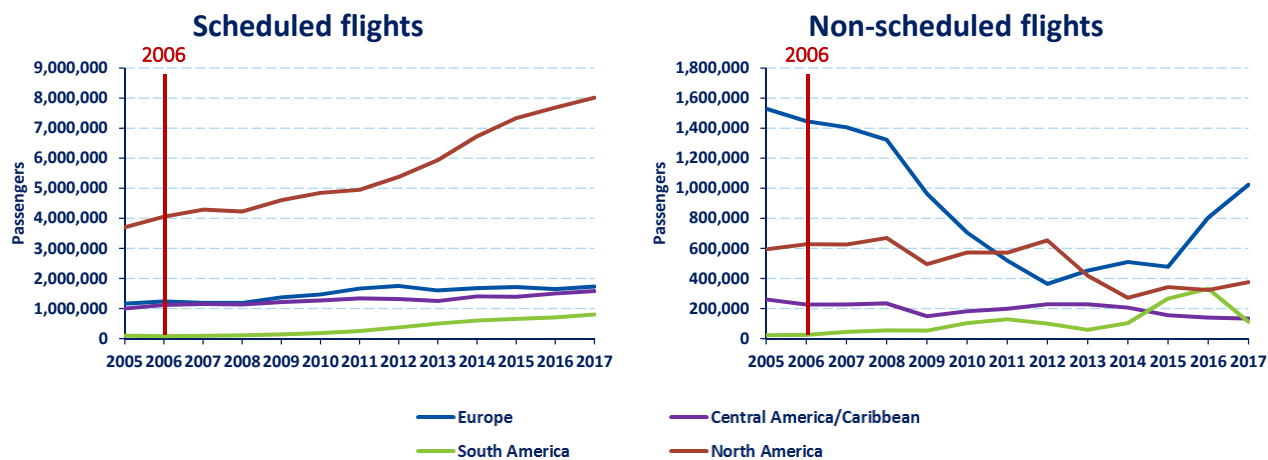
Airport destinations for traffic that originated from Dominican Republic (DO).



Source: ICAO-ICM

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Passenger Arrivals

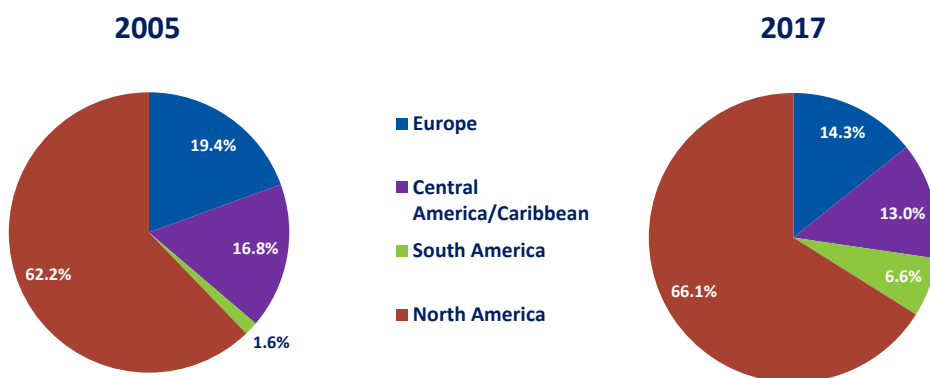


Source: JAC, Dominican Republic

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Passenger Arrivals

Passengers by Region of Origin: Scheduled Flights to Dominican Republic

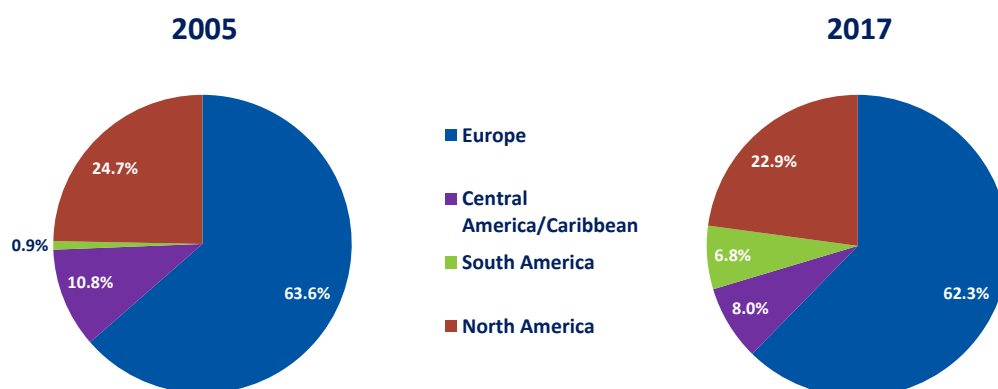


Source: JAC, Dominican Republic

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Passenger Arrivals

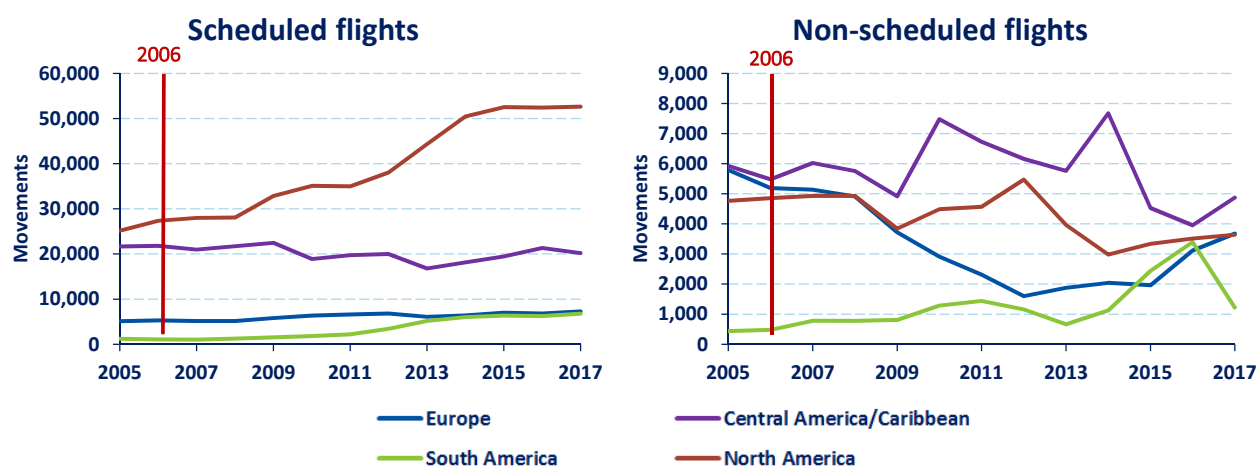
Passengers by Region of Origin: Non-scheduled Flights to Dominican Republic



Source: JAC, Dominican Republic

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Number of Flights

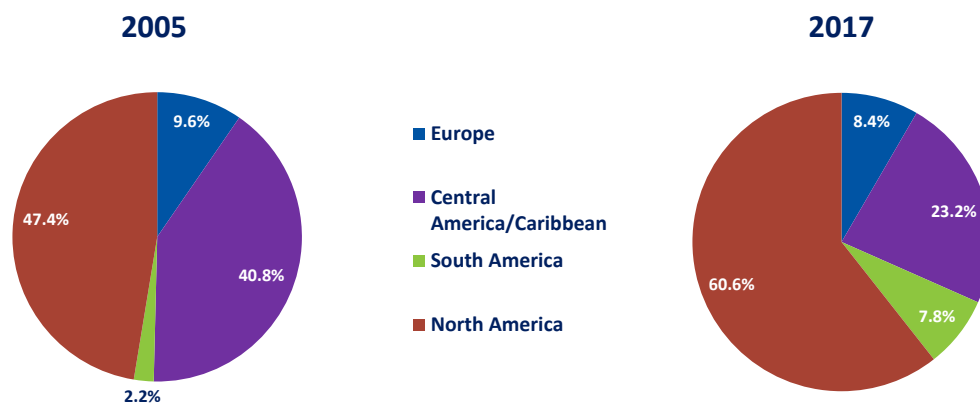


Source: JAC, Dominican Republic

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Number of Flights

Flights by Region of Origin: Scheduled Flights to Dominican Republic

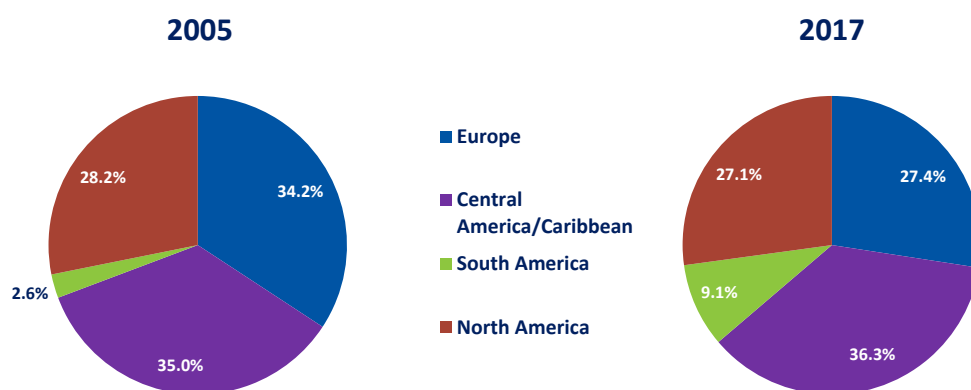


Source: JAC, Dominican Republic

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Number of Flights

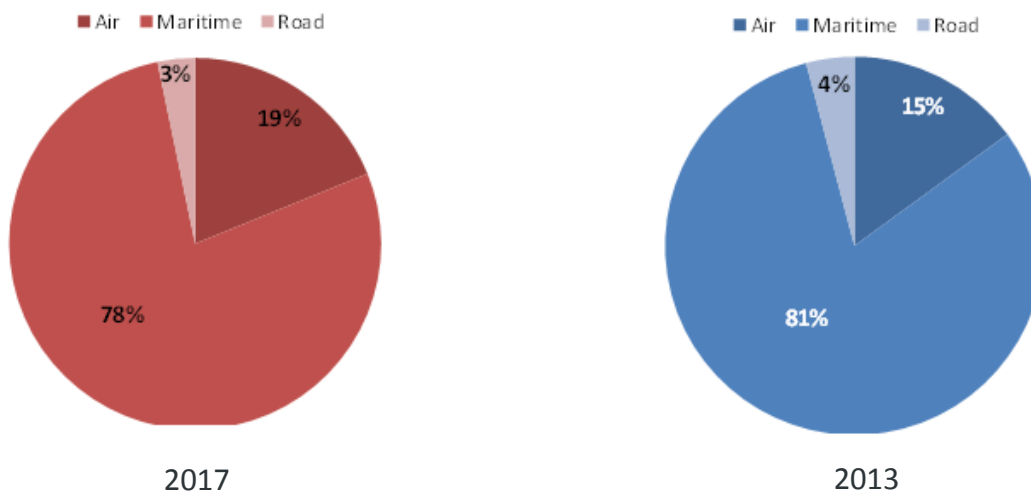
Flights by Region of Origin: Non-scheduled Flights to Dominican Republic



Source: JAC, Dominican Republic

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Trade by Mode of Transport

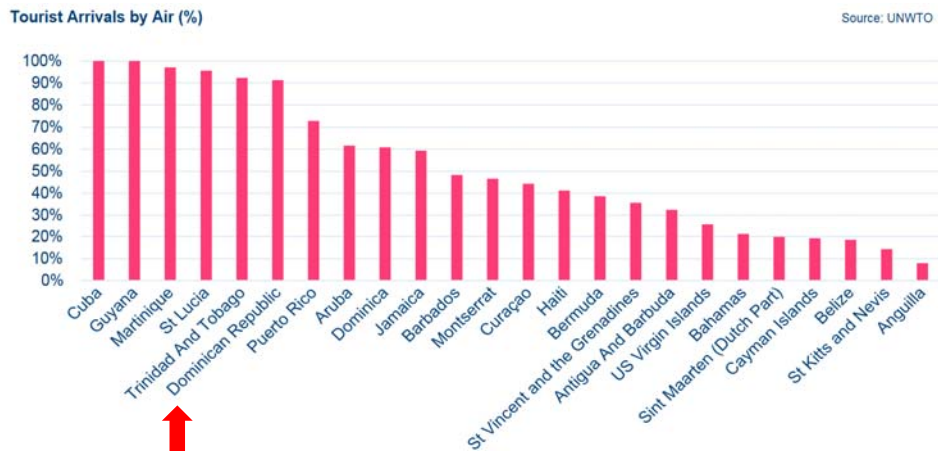


Source: Dirección General de Aduanas (DGA). Departamento de Estadísticas.

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Tourist Arrivals by Air

In Dominican Republic, more than 90% of tourists arrive by air



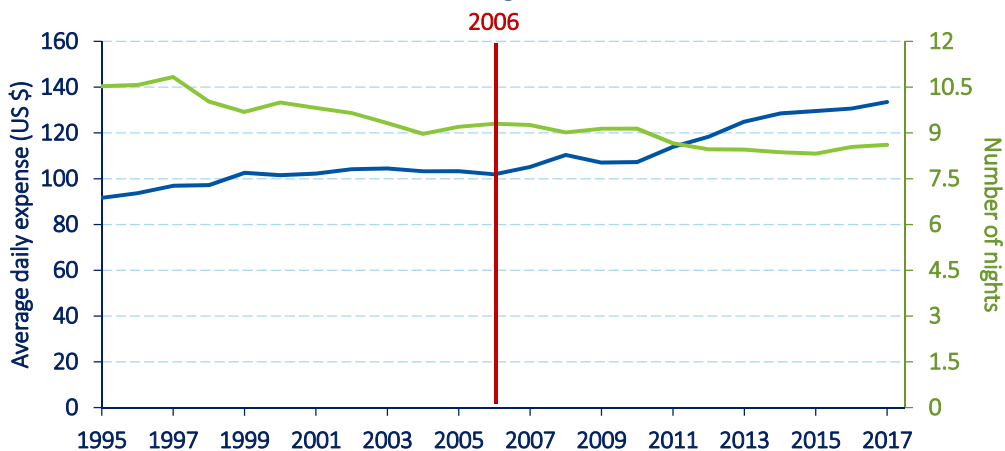
Source: UNWTO

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Expenditure and Duration of Stay

Daily expenditure and average duration stay of non-resident foreigners



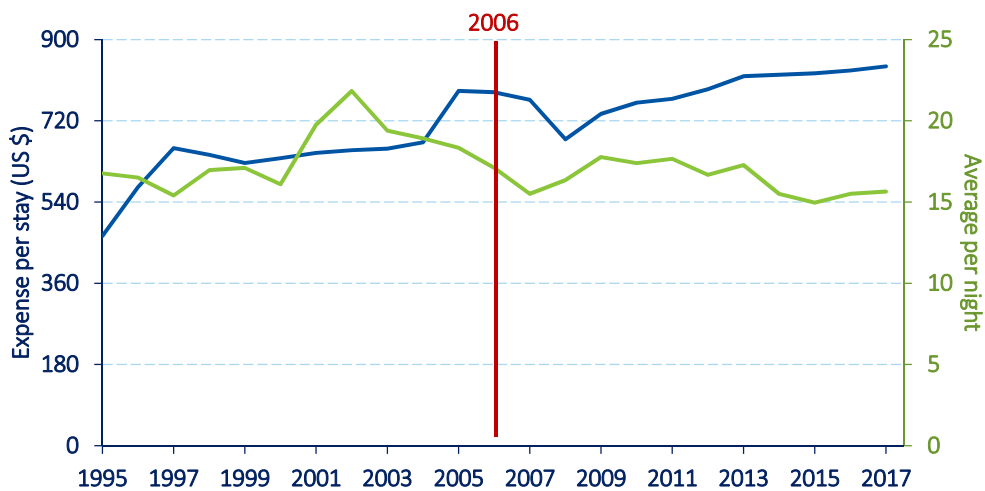
Source: Dominican Republic

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Expenditure and Average per Night

Expenditure and average per night of Dominican non-residents

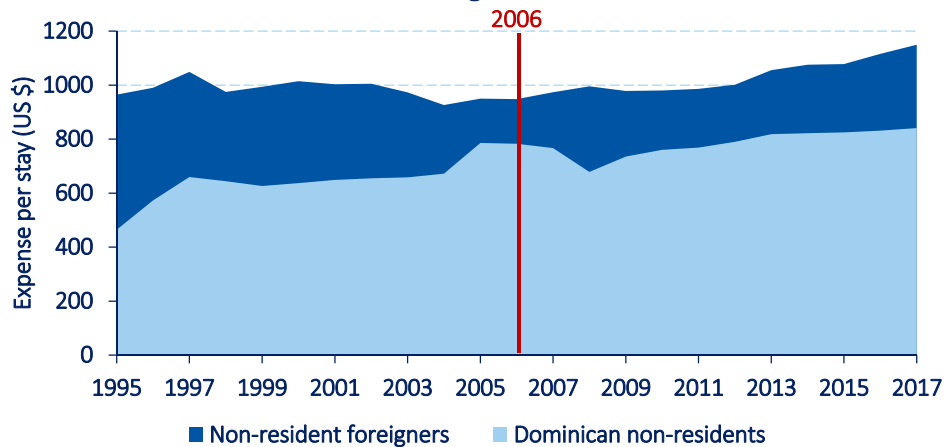


Source: Dominican Republic

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Expenditure per Stay

Expenditure of Dominican non-residents and non-resident foreigners

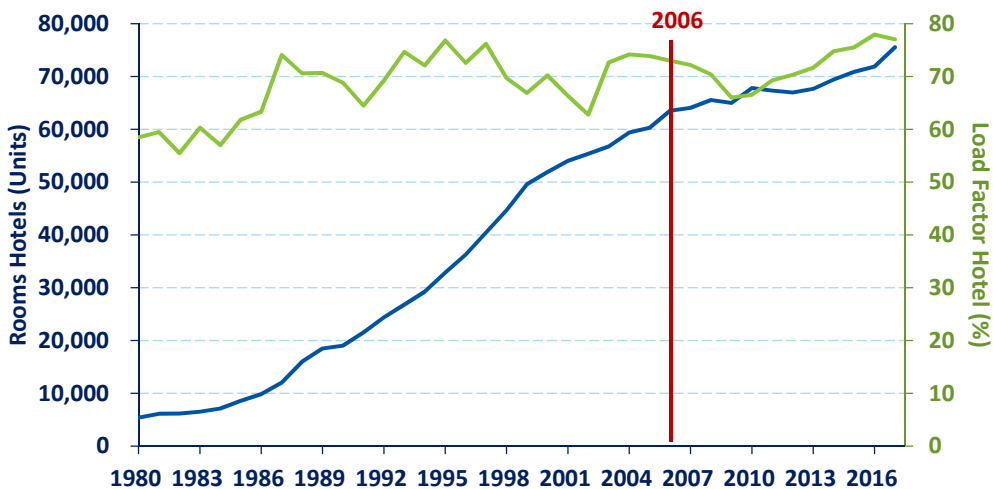


Source: Dominican Republic

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Hotel Room Units and Load Factor

Hotel room units and load factor (1980-2017)

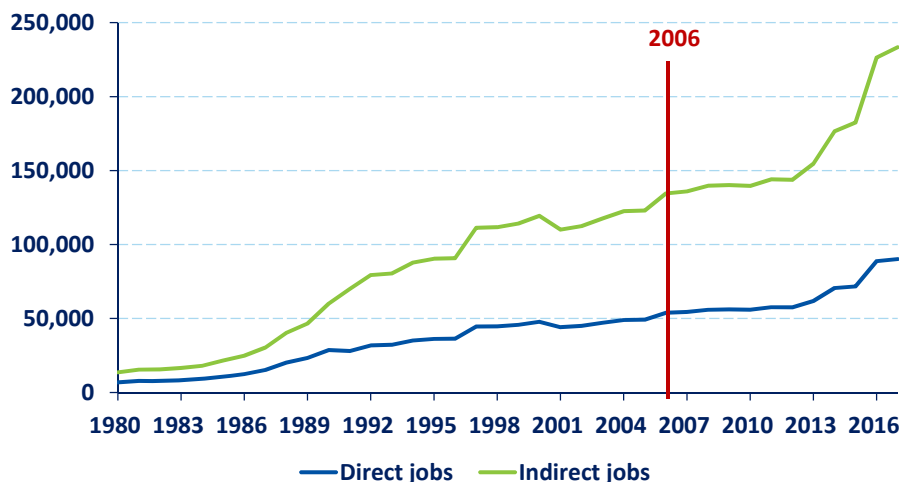


Source: Hotels & Tourism Association of the Dominican Republic and Central Bank of the Dominican Republic

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Jobs Generated by Hotels in Dominican Republic

Jobs generated by hotels (1980-2017)

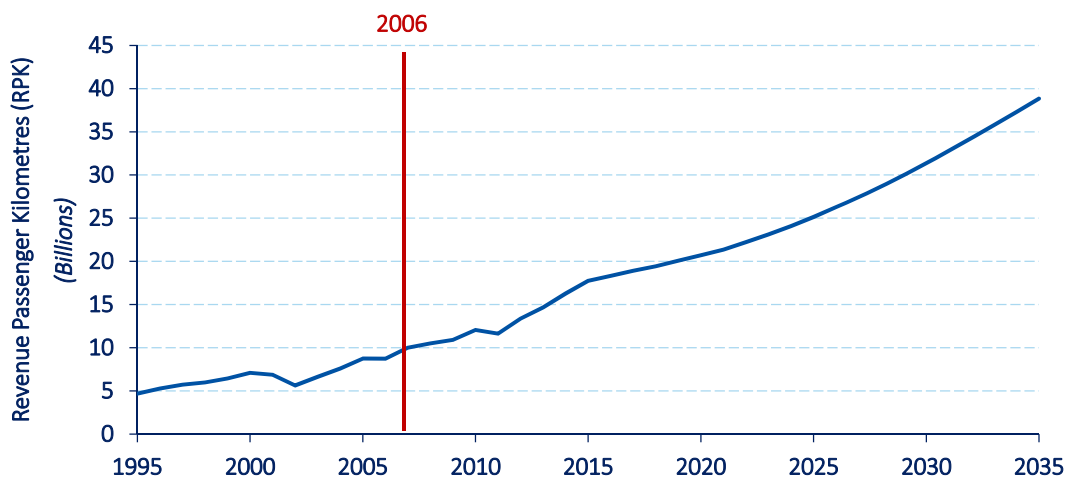


Source: Hotels & Tourism Association of the Dominican Republic and Central Bank of the Dominican Republic

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Long-term Traffic Forecasts

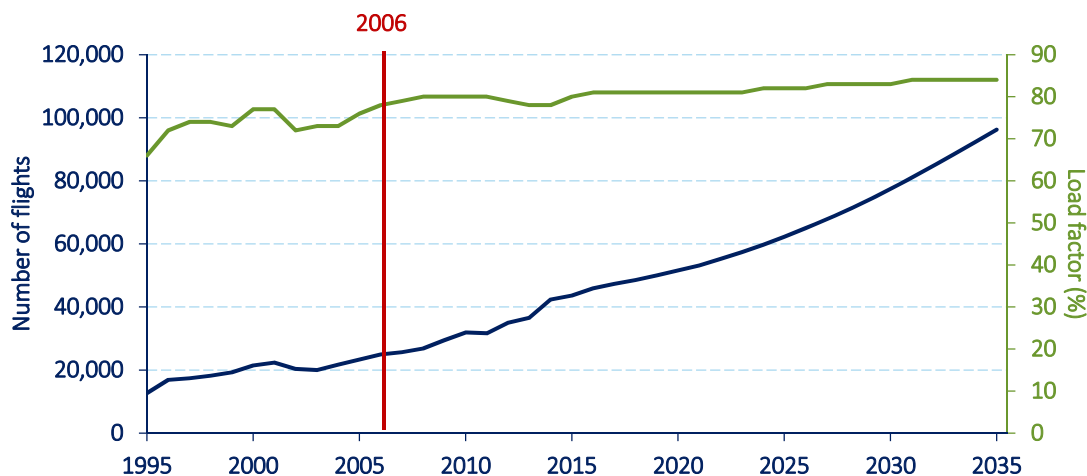
Revenue Passenger Kilometres (RPK) departing from Dominican Republic



Source: ICAO

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Number of flights and load factor departing from Dominican Republic



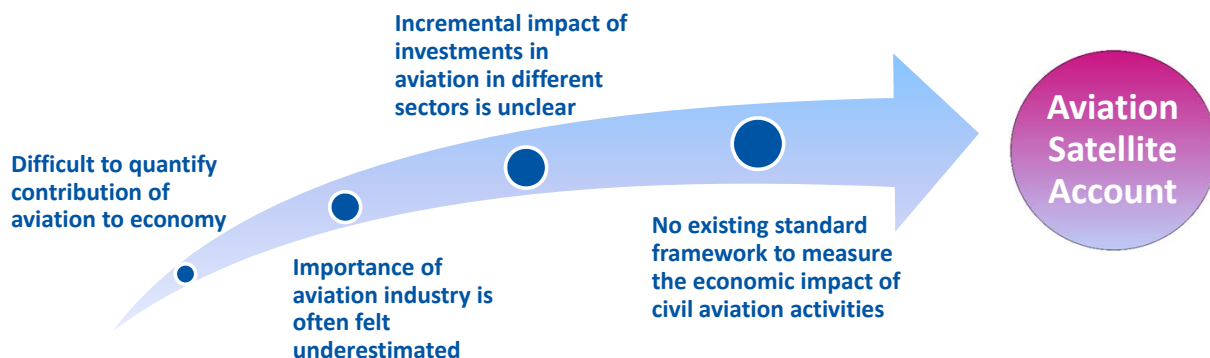
Source: ICAO

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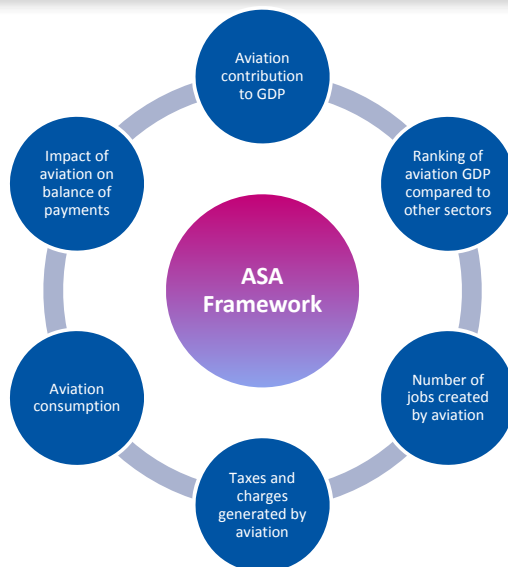
- The System of National Accounts (SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity in accordance with strict accounting conventions based on economic principles
- A Satellite Account is to provide more depth on measuring economic activities and social behavior of certain economic sectors that are not defined as industries in national accounts
- Examples of existing Satellite Accounts:
 - Tourism Satellite Account
 - Health Satellite Account
 - Unpaid household activity

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Need of Aviation Satellite Account (ASA)



The ASA will provide State an articulated framework measuring all aviation related economic activities

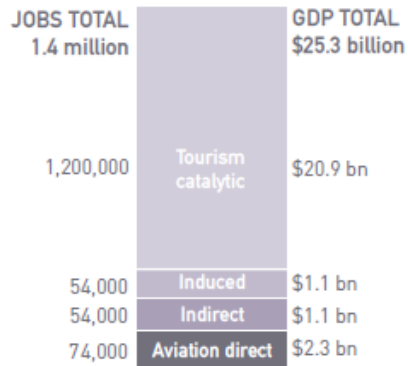


Aviation's Economic Contribution

Latin America and the Caribbean (2014)



SIDS (2014)



Source: Aviation Benefits Beyond Borders 2016, ATAG