

REFERENCES

- Allan, S. S., Beesley, J. A., Evans, J. E., & Gaddy, S. G. (2002). *Analysis of Delay Casualty at Newark International Airport*. U.S.A.: Lincoln Laboratory, Massachusetts Institute of Technology.
- Allen, B., & Hamilton. (2002).
- Boesel, J. (2003). *Simulating Aircraft Delay Absorption*. McLean, VA: The MITRE Corporation.
- C-549/07, C. (2008). Court cases Regulation 261/2004. *case Wallentin Hermann v Alitalia*. Luxembourg : European Court of Justice.
- Canada, A. (n.d.). *Flight Delays*. Retrieved from Delayed Flights and Cancellations : <http://www.aircanada.com/en/travelinfo/delays>
- China, S. (2012, October 23rd). *Delay or Cancellation*.
- Cornelius, J. O., & David, A. H. (2000). *Development of a wake vortex spacing system for aircraft capacity enhancement and Delay Reduction*. NASA.
- Deshpande, V. (2012, Summer). The impact of Airline Flight Schedules on Flight Delays. *Manufacturing & Services Operations Management*, 14 (3), 423 - 440.
- Hanna, J. (2011, August 31st). *Improving Fairness in Flight Delays*. Retrieved from <http://hbswk.hbs.edu>
- John, B. A., Nicholas, R. G., & Bultroni, Z. (2008). *Measuring Aggregate Flight Delays*. East Carolina : East Carolina University.
- Madhavi, M. R. (2013). *A study of Departure flight delay causes: The Case Study of BIA*. Sri Lanka: University of Moratuwa.
- Michael, B. O., & Lulli, G. (n.d.). *Ground Delay Programmes - Optimizing over the Included Flight Set Based on Distance*.
- Muller, E. R., & Chatterji, G. B. (2002). *Analysis of aircraft arrival and departure delay characteristics*. Moffett Field: NASA Ames Research Center.
- News, S. L. (2012, June 03rd). *Sri lankan Scores High on punctuality*. Retrieved from Sunday Leader Newspaper : <http://www.thesundayleader.lk/2012/06/03/srilankan-scores-high-on-punctuality>
- Nicholas, R. G. (2007). *Further Investigations in to the Causes of Flight Delays*. East Carolina : Department of Economics, East Carolina University .
- Ning, X., Kathryn, B. L., Chun, H. C., Shannon, C. W., & Lance, S. (2007). Network Analysis of Flight Delays . *TRB Annual Meeting* .
- Oliva, J. (2014, May 19). Retrieved from www.chinadaily.com.cn
- Pollock, I. (2010, August 17th). *Air delay compensation claims suspended by high Court*. Retrieved from BBC News: <http://www.bbc.co.uk/news/business>

- Sekaran, U. (2006). *Research methods for Business- A skill building Approach* (4th edition ed.). Carbondale: Southern Illinois University .
- Travel News*. (2012, June 26th). Retrieved from MSNBC :
<http://www.msnbc.msn.com/travel-news>
- Wright, C. (2012, May 31st). *Sri lankan Airlines Customer Reviews*. Retrieved from
<http://www.airlinequality.com/Forum/srilan.htm>.
- Wu, c. L. (2013). *Airline Operations and delay Managemnet*.
- Yu, R. (2011, August 8th). *New rules for airlines kick in this week to protect fliers* . Retrieved from USA Today.
- Yuan, D. (2007). *Flight Delay Cost Simulation Analysis and Airline Schedule optimization* . Victoria, Australia: RMIT University .



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APPENDICES

Appendix A : Definitions

Maximum delay - the longest delay assigned to any one flight in the GDP;

Delay variability - the standard deviation of the carrier's average delay. A small value of delay variability means average delays are quite similar for all carriers, while a large value shows a dissimilarity among the carriers' average delay;

Airborne delay - the en route delay that will be incurred if all flights depart at their planned departure times.

Block time- time which is given from one destination to another, take off from A to land B

Transit time- after landing, transit the passengers and cargo from one aircraft to another and take off

Turnaround time- time taken by the aircraft at the airport to come back, from landing to take off

Transfer passenger and baggage- Passengers and baggage making direct connections between two different flights.

Terminal - The main building or group of buildings where the processing of commercial passengers and cargo, and the boarding of aircraft occurs

Person with disabilities – Any person whose mobility is reduced due to a physical incapacity (sensory or locomotors), an intellectual deficiency, age, illness or any other cause or disability when using air transport and whose situation needs special attention and the adaption to the person's needs of the services made available to all passengers.

Passenger area - All the ground space and facilities provided for passenger processing. This includes aprons, passenger buildings, vehicle parks and roads.

Movement Area – that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).



International Airport – Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

Disruptive/Intoxicated Passenger – A passenger who fails to respect the rules of conduct at an airport or on board an aircraft or to follow the instructions of the airport staff or crew members and thereby disturbs the good order and discipline at an airport or on board an aircraft.

Airside – The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.

Aircraft maintenance area - All the ground space and facilities provided for aircraft maintenance. This includes aprons, hangars, buildings and workshops, vehicle parks and roads associated therewith. Such an area is normally designated as a security restricted area.

Aircraft in flight - An aircraft from the moment when all its external doors are closed following embarkation until the moment when such doors are opened for disembarkation.

Aerodrome – A defined area in land or water associated with buildings, installations and equipment which is either wholly or partly used for take-off, landing and surface movement of aircraft.



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Appendix B : Questionnaire

Identification of Possible Reasons that affect departure flight punctuality

I, Nilanka Sarojanie, a student of M.Sc. in Transportation at University of Moratuwa am expecting your valuable ideas regarding Aircrafts delay in Sri Lanka. Aircrafts Delay is a crucial problem in today's aviation industry. Therefore the information collected will be used to identify the policy and Regulations for Mitigating Aircrafts departure delays in Sri Lanka.

Please complete this questionnaire by selecting the appropriate boxes and select the relevant fields. It will only take few minutes to complete and any information you provide will be completely anonymous and will be treated in the strictest confidence and used for study purpose only.

Questionnaire Instructions

Please complete the questionnaire according to your view as a representative of regulating authority / an airline / training school / airport or authority or an industry expert. Please send the form after filling. If you need any additional information concerning the questionnaire or assistance in filling the questionnaire, please do not hesitate to contact: Sarojanie : 0715471264



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e mail : sansarojanie@yahoo.com or sansarojanie@gmail.com

Please select the relevant fields/ Responsible area.

Profession

- Engineer
- Pilot
- Inspector
- Instructor
- Consultant
- Industry personnel
- Educational Institute
- Other

Responsible Area

- Flight Operations

- Cabin Safety
- ATC
- Aerodrome
- Air Navigation
- Security
- Legal
- Airport Facility
- Airworthiness
- Other

The main four delay categories are mentioned below. Rank 1 to 4 (1 as the highest and the 4 is the lowest). Delay Categories are "ATC", "Unavoidable", "A/P facilities" and "Technical".

(a) What is your order of ranking on "number of delays per day" ? Please list down. (Eg: 1 - ATC , 2 - Technical, ... etc)

1.
2.
3.
4.

(b) What is your order of ranking on "Delay time per flight" ? . Please list down. (Eg: 1 - ATC , 2 - Technical, ... etc)

1.
2.
3.
4.

1. ATC Category

The areas of reasons for the ATC category as follows. Please select the areas that can be controlled the departure delays with introducing new policies and regulations?

- A/C Rotation
- Ground Movement Congestion
- Last minute Bay Change
- Late Reporting of Crew
- T/R Passenger & Baggage

Please tick the following statements from 1.1 to 1.4 based on your views.

1 2 3 4 5
Totally Agree Totally Disagree

1.1. Introduction/Changes in Policy on awaiting push back clearance can be controlled the ground movement congestion

1 2 3 4 5

1.2. Arrival/ departure taxi time should be maintained at a constant

1 2 3 4 5

1.3. Internal organizational policy and regulations can mitigate the problems on late reporting of operating crew and the technical crew

1 2 3 4 5

1.4. "Transfer passenger and baggage handling takes more time due to long taxi in time and long taxi out time and also multiple taxies". Introducing new policy and regulations can reduce these type of delays.

1 2 3 4 5

2. Unavoidable Category

The areas of reasons for the Unavoidable category as follows. Please select the areas that can be controlled the departure delays with introducing new policies and regulations?

- A/C Rotation
- Late engine start up
- Bird Strikes and Foreign Objects
- Late completion of boarding
- Late departure clearance
- Offloading Passenger and Baggage
- Late Reporting
- Technical rectifications
- Transfer Passenger and Baggage

Route changes

Please tick the following statements from 2.1 to 2.6 based on your views.

1 2 3 4 5
Totally Agree Totally Disagree

2.1. Emergency situations can't be controlled introducing new policies. But providing infrastructure and facilities and training programmes will help to reduce delay due to emergencies

1 2 3 4 5

2.2. Additional maintenance and availability of resources reduce the time consumption on engine start up

1 2 3 4 5

2.3. Increasing maintenance can avoid the equipment failure FMC breakdown and etc.

1 2 3 4 5
 
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2.4. Providing training programmes and professional qualifications will help to maintain the availability of usable equipment without failure or breakdown

1 2 3 4 5

2.5. Introducing new policy can prohibit the policy on intoxicated passengers, on time arrival by passenger for boarding.

1 2 3 4 5

2.6. New policy can avoid the offloading passenger and baggage due to no show

1 2 3 4 5

3. Airport Facility Category

The areas of reasons for the A/P Facility category as follows. Please select the areas that can be controlled the departure delays with introducing new policies and regulations?

- Security checks and searches
- A/C rotation due to congestion in some areas
- Closure of check in counters
- Late completion of boarding
- Late departure clearance
- T/R passenger and baggage

4. Technical Category

The areas of reasons for the Technical category as follows. Please select the areas that can be controlled the departure delays with introducing new policies and regulations?

- A/C change due to technical problems
- A/C rotation due to insufficient resources
- Avionics faults
- Awaiting for passengers, crew, ops Capt.
- Cabin defects
- Full G/S provision due APU failure
- Insufficient Ground time

Please tick the following statements 4.1 to 4.5 based on your views.

1 2 3 4 5

Totally Agree Totally Disagree

4.1. Regular maintenance and periodic maintenances can reduce the technical errors and failures

1 2 3 4 5

4.2. Scheduled maintenance will help to manage the time for operation of an aircraft

1 2 3 4 5

4.3. **Unscheduled maintenance will increase the delay in operations of an aircraft**

1 2 3 4 5

4.4. **Internal Quality Control and Quality Assurances on safety and security before departure is a must.**

1 2 3 4 5

4.5. **Policy on recruit professionals regarding technical maintenances will help availability of human resource for emergencies or rectifications**

1 2 3 4 5

Please submit the form after fill.



Submit