

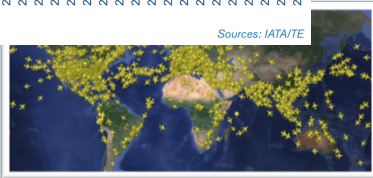
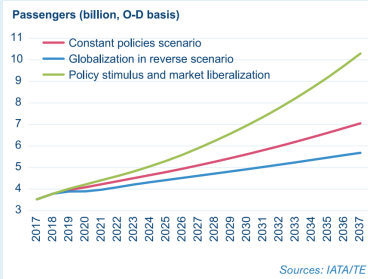
WORKSHOP ITA-MIT ON BIG DATA ANALYTICS FOR AIR TRANSPORTATION

AUGUST 20-21, 2019

**AERONAUTICS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING – IEI**

Some Current Air Transportation System Challenges

Capacity constraints & congestion

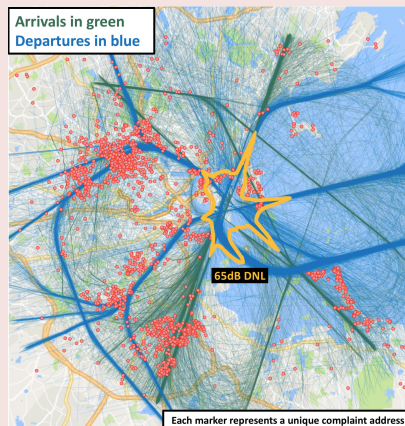


More stringent performance targets

- ✧ Safety
- ✧ Efficiency
- ✧ Predictability
- ✧ Cost-effectiveness
- ✧ Service quality
- ✧ ...



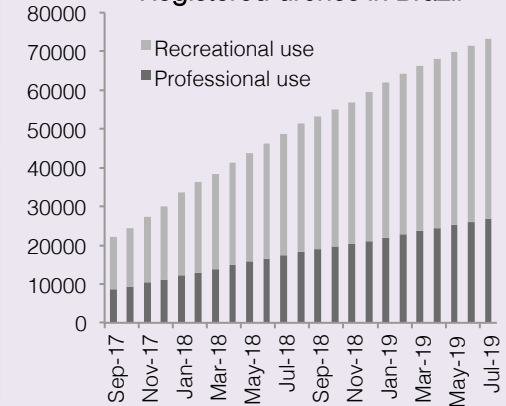
Growing environmental concerns



Rise of new vehicles & concepts



Registered drones in Brazil



Need for Innovative Solutions

The FAA Eyes Big Data Possibilities

By David Hughes, Federal Aviation Administration



How big data is helping meet Europe's capacity challenge

EUROCONTROL controllers are using innovative machine-learning techniques to track and predict real-time flight routes and better manage demand and capacity

Press Release No.: 23

Date: 9 May 2019



Thriving in the Age of Data and Digital Transformation



Geneva – The International Air Transport Association (IATA) announced that supporting airlines' ability to thrive in the coming age of data and digital transformation will be the focus of the 2019 [Aviation Data Symposium](#).

Big Data Analytics Opportunity



NATS

About Discover Services

Asia Pacific

Case studies

July eNewsletter

September eNewsletter

November eNewsletter

March eNewsletter

June eNewsletter

June eNewsletter

Seaside Case Study: Future-Proofing Budapest Airport

Harnessing Big Data for Flight Operations

Moulding the Future of Asia's Aviation Industry

Home / Asia Pacific / June eNewsletter

Harnessing Big Data for Flight Operations



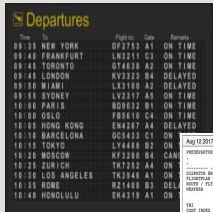
Big data analytics used to reduce airport delays

A new system to predict whether passengers will catch their connecting flights has been developed to reduce delays at the world's most congested airports, by the UCL School of Management...

Big Aviation Data Analytics Opportunity

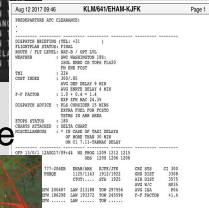
“Raw” System Data

Flight schedule



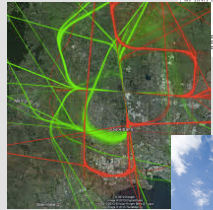
Flight	Destination	Status	Time
09:55 NEW YORK	DT2150 A1	ON TIME	
09:55 FRANKFURT	LN3211 C3	ON TIME	
09:55 TORONTO	DT4830 A2	ON TIME	
09:55 LONDON	WY3322 B4	DELAYED	
09:55 MIAMI	LX3100 A2	DELAYED	
09:55 PHOENIX	LX3277 A1	ON TIME	
09:55 PARIS	RH3032 B1	ON TIME	
10:00 GDL	PR3610 C4	ON TIME	
10:00 HONG KONG	EN4207 A4	DELAYED	
10:00 BARCELONA	GG4223 C1	ON	
10:00 TOKYO	LY4480 B3	ON	
10:00 MOSCOW	RP3305 B4	CAN	
10:00 ZURICH	TK7532 A4	ON	
10:00 LOS ANGELES	TR3400 A1	ON	
10:00 Doha	RZ1400 B3	DEL	
10:00 HONOLULU	EA4310 A1	ON	

Flight plan



Flight	Destination	Status	Time
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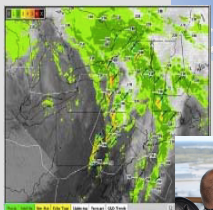
Surveillance



Flight ops



Weather



Behavioral



Size of data...

Machine Learning

Statistics

Optimization

Visual Analytics

Size of insight...

Evaluate performance, diagnose

Identify and understand patterns of system behavior

Create insights

Predict future states and decisions

Optimize actions

Objectives of the Workshop

Gather academia, industry & government to discuss emerging opportunities on big data analytics for air transportation



Agenda

August 20, 2019

- 13:30 Welcome and opening remarks**
Cláudio Jorge Pinto Alves - Rector, Professor of the Civil Engineering Department, ITA
- 13:45 Examples of using data analytics for improving the safety and efficiency of air transportation**
R. John Hansman - Professor of the Aeronautics and Astronautics Department, Director of the International Center for Air Transportation, MIT
- 14:45 Predicting airport acceptance rates for improved traffic flow management decision support**
Mayara Murça - Cap Eng, Professor of the Civil Engineering Department, ITA
- 15:15 Flight trajectory data analytics for characterization of air traffic performance**
McWilliam de Oliveira - Maj Esp CTA, Ph.D. student, ITA
- 15:45 Break**
- 16:15 Airline sciences at Airbus**
José Fregnani - Senior Researcher, Airbus
- 16:45 Causal analysis of vertical flight inefficiency during descents**
João Basílio Szenczuk - M.Sc. student, ITA
- 17:15 Does one model fit them all? A network design analysis of airline business model adaptation in face of competition**
Renan Oliveira - Ph.D. student, ITA
- 17:45 Intelligent systems for management of airport commercial facilities considering passenger satisfaction: a neuro-fuzzy approach**
Lenice Silva - Ph.D. student, ITA
- 18:15 Closing**

August 21, 2019

- 13:30 Welcome**
- 13:40 The challenges and opportunities of big data analytics in Air Traffic Management**
Marcos Resende - ATM Business Director, Atech
- 14:10 Data-driven decision in DECEA**
Hygino Rolim - Ten Cel Av R/1, Department of Airspace Control
- 14:40 Constructing an origin/destination matrix of Brazilian interurban transport with mobile phone big data**
Leandro Rodrigues e Silva - Civil Aviation Planning Coordinator, Civil Aviation Secretary
Fabiana Todesco - Director of the Department of Airport Management, Civil Aviation Secretary
- 15:10 Break**
- 15:40 Lessons learnt with the use of SWIM data for predictive analytics**
Ítalo Romani - Senior Researcher, Boeing
- 16:10 Data analytics applications and challenges in airline operations**
Marcelo Leão - Flight Operations Engineer, Azul Brazilian Airlines
- 16:40 Machine learning applied on airline reliability data**
Mayara Castilho - Fleet Performance & Reliability Specialist, Embraer
- 17:15 Closing**