

NYC Airports: Comparative Review

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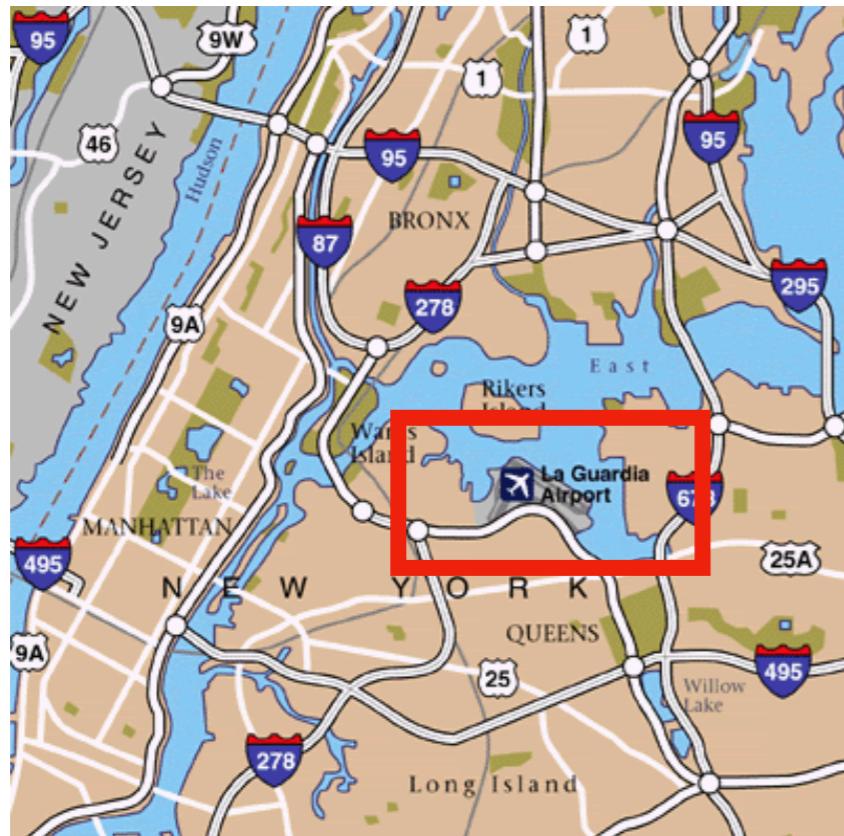


1. Objective

- High level overview of the NYC airports
- Identification of KPIs for the Airports
- Preliminary analysis of the available data
- Discussion & Next Steps Planning

2. Overview

La Guardia Airport (LGA)



Source: worldairportguides.com

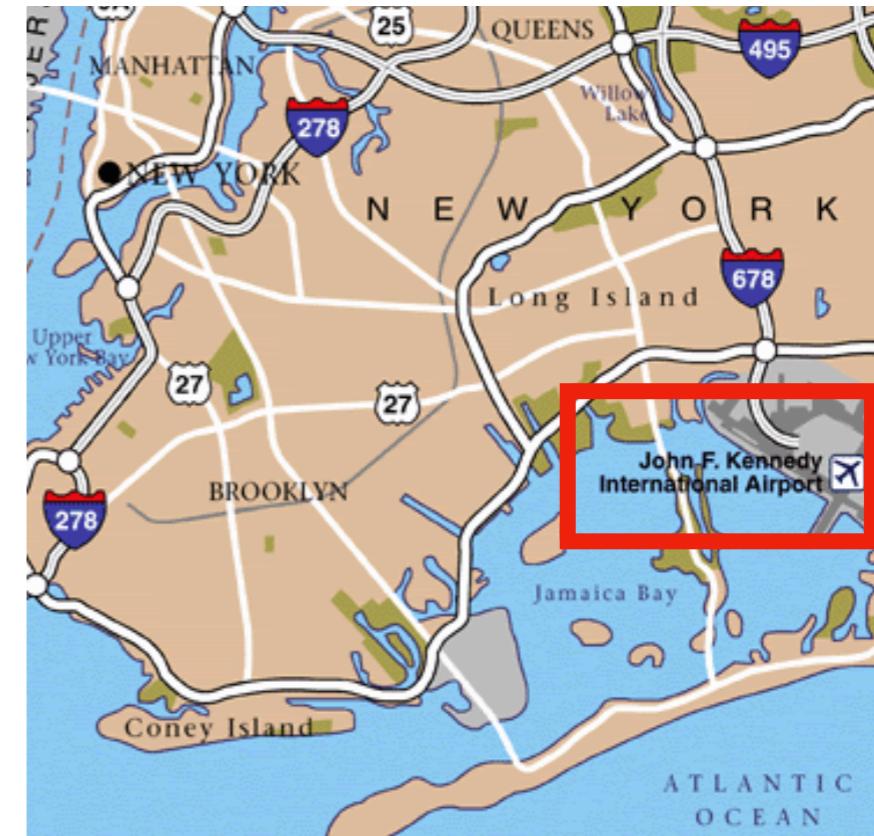
Location: Queens, NYC

Focus: Domestic Flights

Start of Operation: 1953

Annual # of passengers: 30M

John F Kennedy Airport (JFK)



Location: Queens, NYC

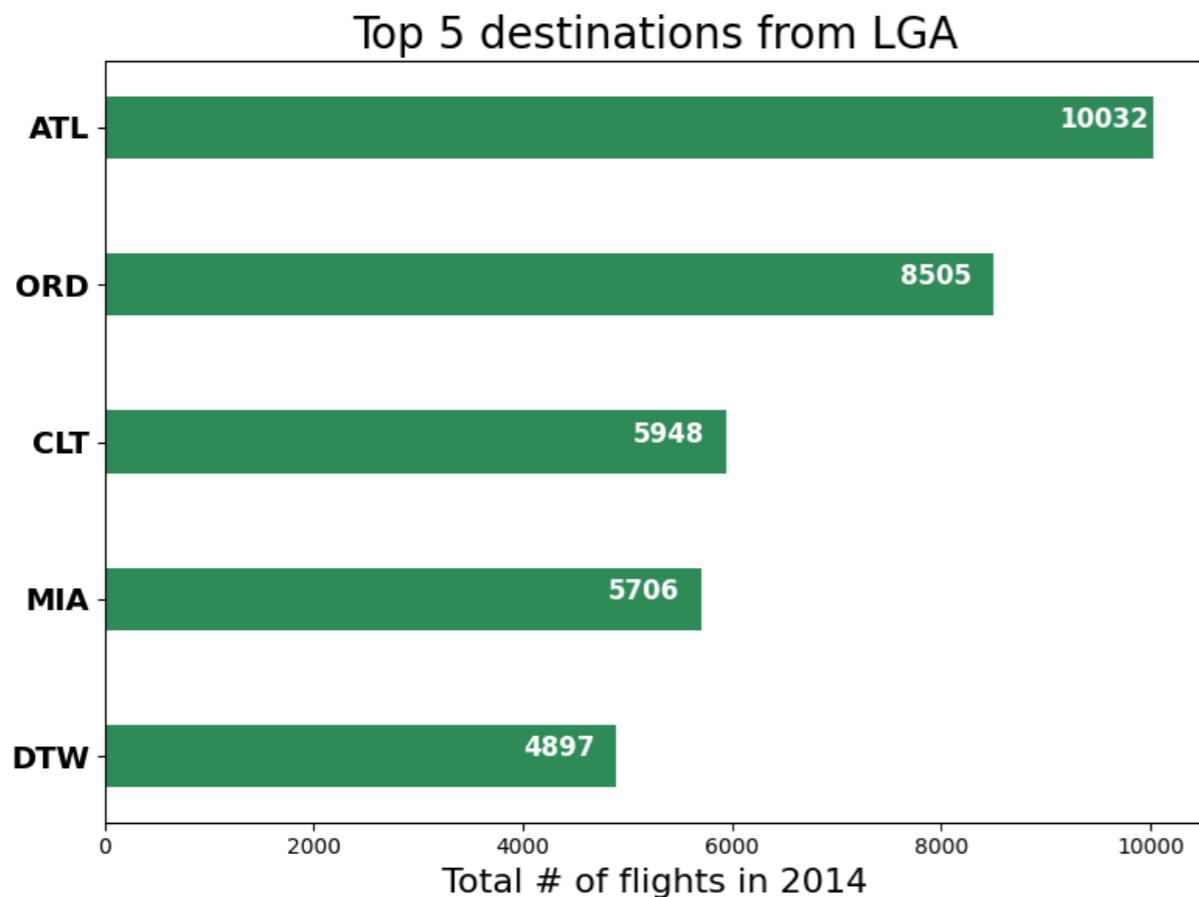
Focus: Domestic & International Flights

Start of Operation: 1948

Annual # of passengers: 62,5M

3. Destinations

LaGuardia Airport (LGA)

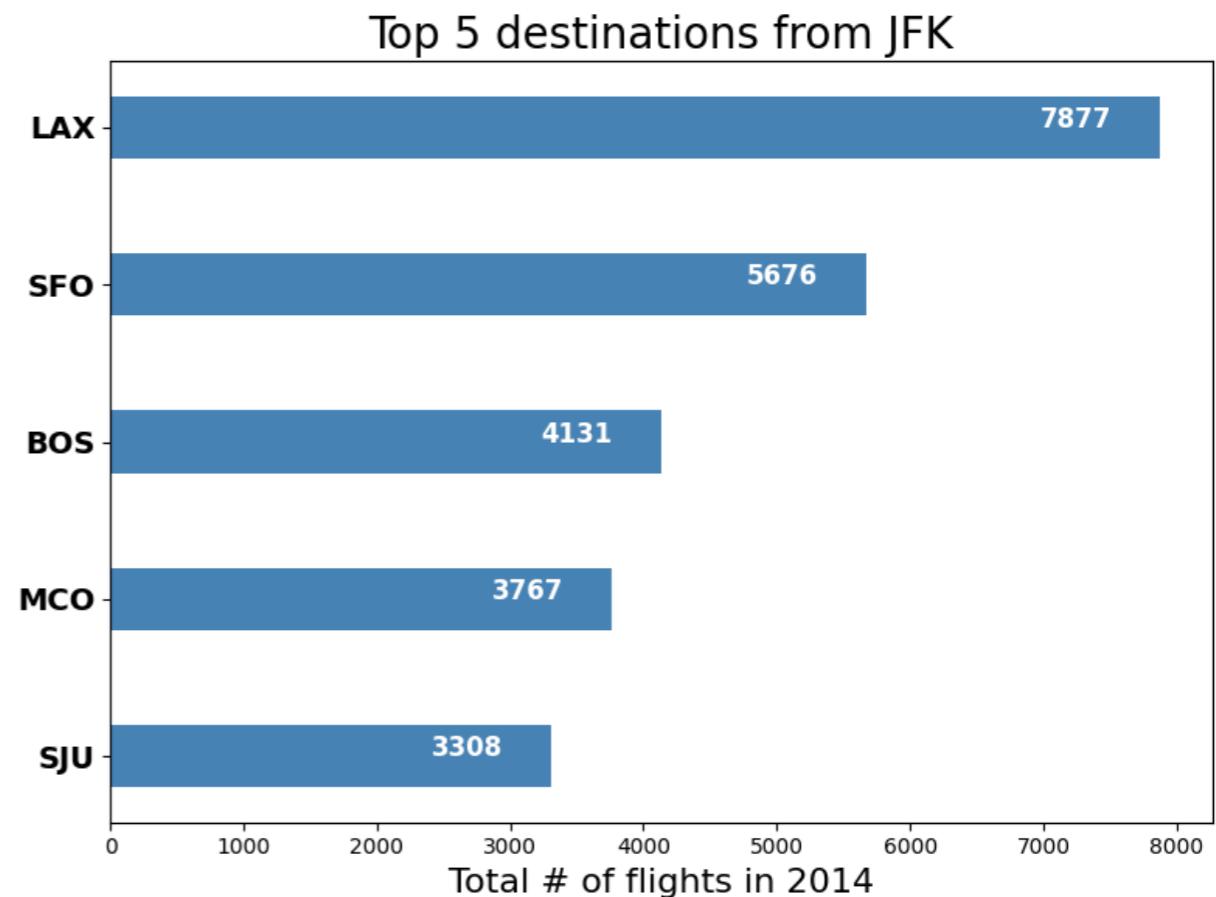


ATL: Atlanta , ORD: Chicago , CLT: Charlotte, MIA: Miami , DTW: Detroit

Total flights: 101,334
Destinations: 64

Domestic Flights: 100%

John F Kennedy Airport (JFK)



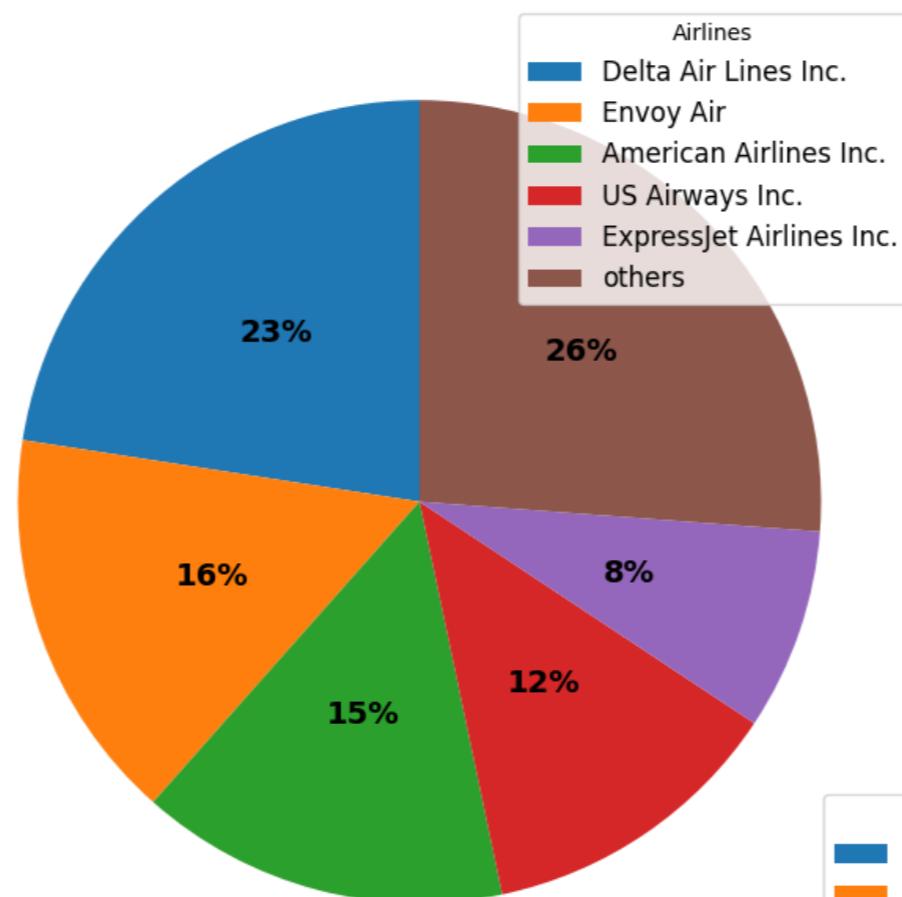
LAX: Los Angeles , SFO: San Francisco, BOS: Boston , MCO: Orlando , SJU: San Juan

Total flights: 76,910
Destinations: 67

Domestic Flights: 94.6%

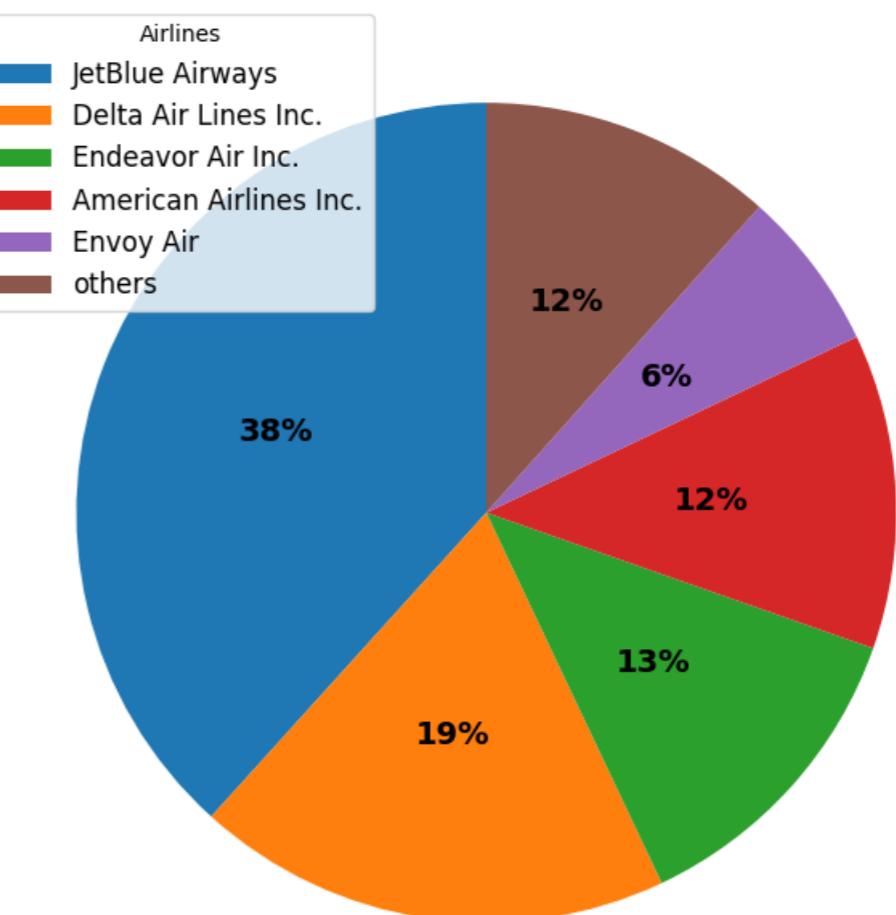
4. Airlines

Flights by Airline : LGA



Airline	LGA	JFK
Endeavor Air Inc.	✓	✓
American Airlines Inc.	✓	✓
JetBlue Airways	✓	✓
Delta Air Lines Inc.	✓	✓
ExpressJet Airlines Inc.	✓	✓
Frontier Airlines Inc.	✓	
AirTran Airways Corporation	✓	
Envoy Air	✓	✓
SkyWest Airlines Inc.	✓	
United Air Lines Inc.	✓	✓
US Airways Inc.	✓	✓
Southwest Airlines Co.	✓	
Mesa Airlines Inc.	✓	
Hawaiian Airlines Inc.		✓
Virgin America		✓

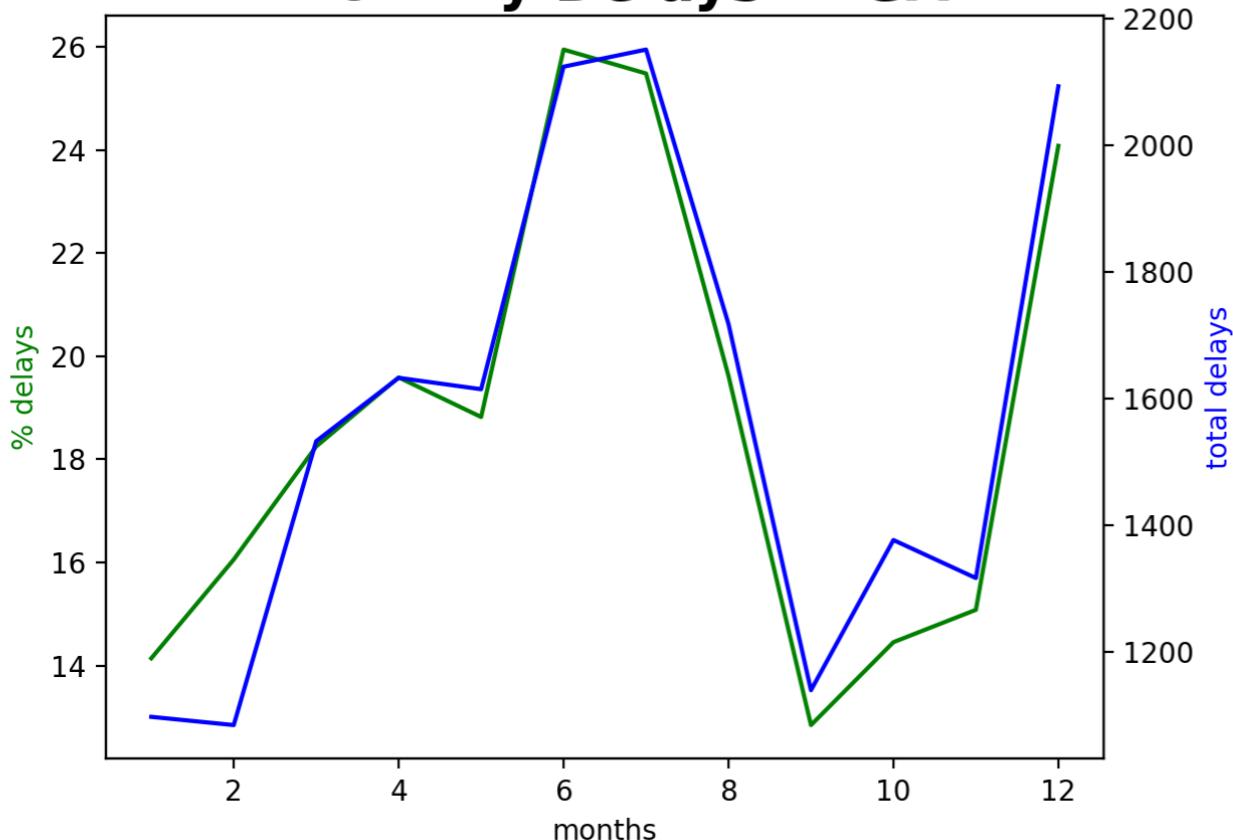
Flights by Airline : JFK



3. Delays

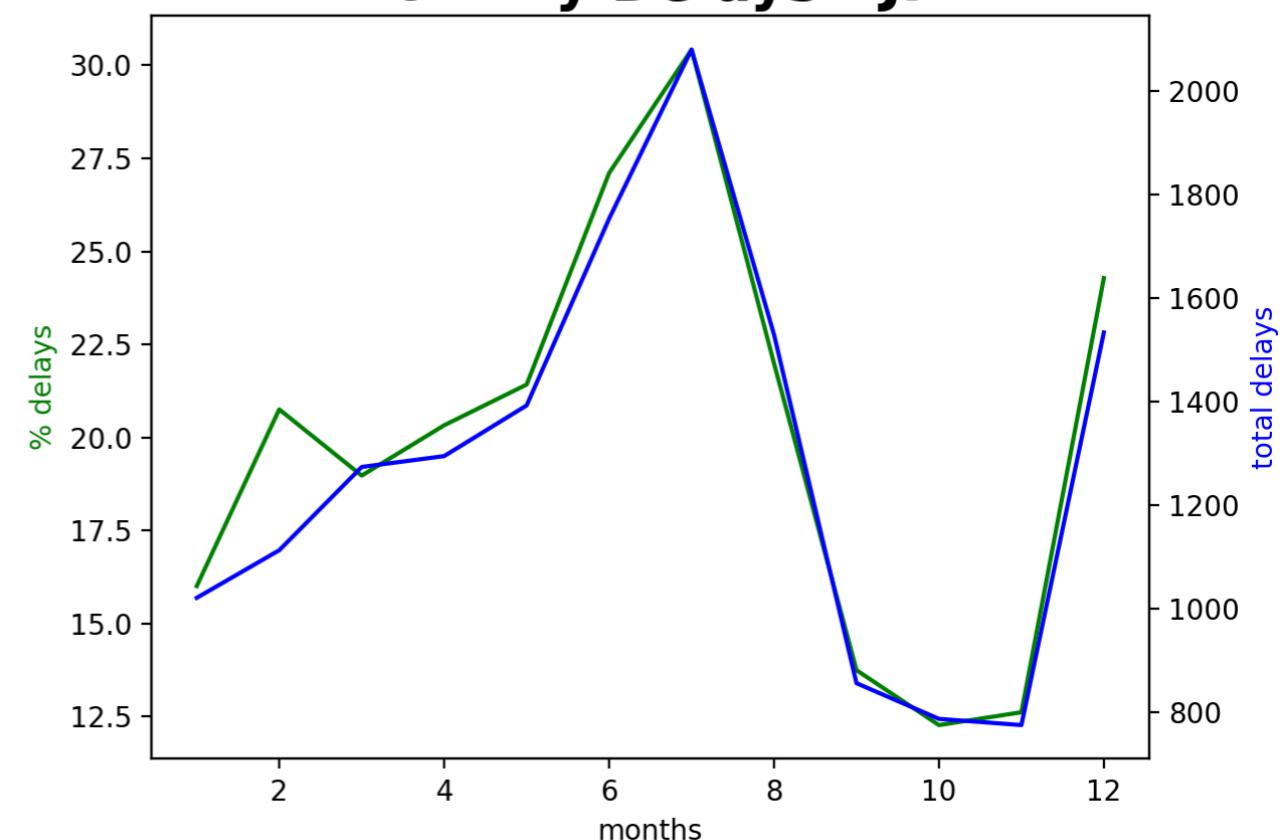
La Guardia Airport (LGA)

Monthly Delays : LGA



John F Kennedy Airport (JFK)

Monthly Delays : JFK



4. Understanding delays: Logit model

Variables:

‘carrier’: airline

‘origin’: airport (LAX / JFK)

‘month’: month of the year

‘country’ : country of destination

Logit Model:

- Widely used for modelling binary outcomes: delay / no delay

4. Logit model: Odd Ratio results

Interpretation :

Variable	Odd Ratio	P-value
Intercept	0.296929	0.000
American Airlines Inc.	0.577462	0.000
JetBlue Airways	0.791695	0.000
Delta Air Lines Inc.	0.554797	0.000
ExpressJet Airlines Inc.	1.369358	0.000
Frontier Airlines Inc.	1.108770	0.260
AirTran Airways Corporation	1.236115	0.000
Envoy Air	0.893467	0.457
SkyWest Airlines Inc.	0.799715	0.000
United Air Lines Inc.	1.002841	0.996
US Airways Inc.	0.657804	0.000
Southwest Airlines Co.	0.411657	0.000
Mesa Airlines Inc.	0.757657	0.000
Hawaiian Airlines Inc.	1.243385	0.000
Virgin America	1.094805	0.375
LGA	0.932689	0.000
Feb	1.005019	0.877
March	1.036736	0.237
April	1.134279	0.000
May	1.131162	0.000
June	1.592464	0.000
July	1.659512	0.000
August	1.171910	0.000
September	0.627316	0.000
October	0.662093	0.000
November	0.690232	0.000
December	1.384174	0.000
United States	1.072740	0.101
Virgin Islands	0.915648	0.647

The odds of delay at LGA are **7%** lower than at JFK

The **busiest months** such as June, July and December **increase** the odds of delays significantly (38% -66% w.r.t. January)

There is significant variation in the odds for delay depending on the airline.

For instance, a flight with ExpressJet has 37% higher chance of delay compare to the flight with Endeavor Air

Reference category :

Carrier: Endeavor Air Inc.

Month : January

Origin : JFK

Country: Puerto Rico

4. Logit model: conclusions

The key factors impacting the performance of the airports can be external such as airlines performance

Funding for the airport needs to address the areas \ times in which airports are underperforming

The performance of the airports needs to evaluated in detail using more current data

4. Further work

Further analysis needs to take into account:

Wait Time:

- Check In
- Baggage Claim
- Immigration

Mishandled Baggage

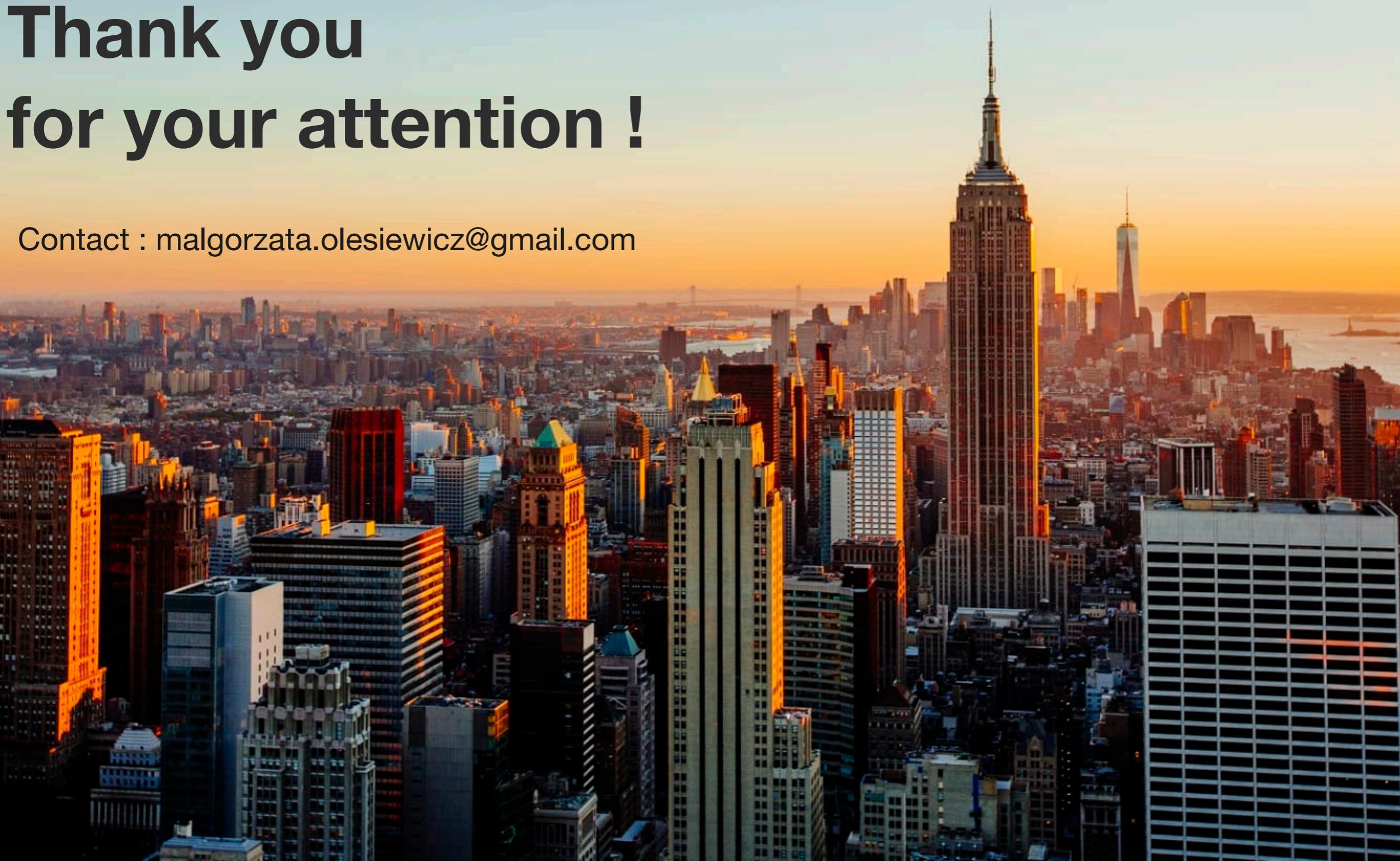
Passangers Satisfaction

Delay trends over the years vs growth rate of the airports

Improvement in performance and growth after the last round of funding received

Thank you for your attention !

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Logit: Results Odds Ratios

Intercept	0.296929
C(carrier)[T.AA]	0.577462
C(carrier)[T.B6]	0.791695
C(carrier)[T.DL]	0.554797
C(carrier)[T.EV]	1.369358
C(carrier)[T.F9]	1.108770
C(carrier)[T.FL]	1.236115
C(carrier)[T.HA]	0.893467
C(carrier)[T.MQ]	0.799715
C(carrier)[T.OO]	1.002841
C(carrier)[T.UA]	0.657804
C(carrier)[T.US]	0.411657
C(carrier)[T.VX]	0.757657
C(carrier)[T.WN]	1.243385
C(carrier)[T.YV]	1.094805
C(origin)[T.LGA]	0.932689
C(month)[T.2.0]	1.005019
C(month)[T.3.0]	1.036736
C(month)[T.4.0]	1.134279
C(month)[T.5.0]	1.131162
C(month)[T.6.0]	1.592464
C(month)[T.7.0]	1.659512
C(month)[T.8.0]	1.171910
C(month)[T.9.0]	0.627316
C(month)[T.10.0]	0.662093
C(month)[T.11.0]	0.690232
C(month)[T.12.0]	1.384174
C(country)[T.United States]	1.072740
C(country)[T.Virgin Islands]	0.915648

Reference category :

Carrier: Endeavor Air Inc.
Month : January
Origin : JFK
Country: Puerto Rico

Logit Regression Results

Dep. Variable: delay No. Observations: 177734
 Model: Logit Df Residuals: 177705
 Method: MLE Df Model: 28
 Date: Sun, 15 Mar 2020 Pseudo R-squ.: 0.02656
 Time: 20:50:26 Log-Likelihood: -84862.
 converged: False LL-Null: -87178.
 Covariance Type: nonrobust LLR p-value: 0.000

Variable	coef	std err	z	P> z	[0.025	0.975]
Intercept	-1.2143	0.052	-23.382	0.000	-1.316	-1.112
C(carrier) T.AA	-0.5491	0.029	-19.264	0.000	-0.605	-0.493
C(carrier) T.B6	-0.2336	0.025	-9.268	0.000	-0.283	-0.184
C(carrier) T.DL	-0.5892	0.027	-22.127	0.000	-0.641	-0.537
C(carrier) T.EV	0.3143	0.033	9.402	0.000	0.249	0.380
C(carrier) T.F9	0.1033	0.092	1.126	0.260	-0.076	0.283
C(carrier) T.FL	0.2120	0.047	4.519	0.000	0.120	0.304
C(carrier) T.HA	-0.1126	0.151	-0.744	0.457	-0.409	0.184
C(carrier) T.MQ	-0.2235	0.029	-7.745	0.000	-0.280	-0.167
C(carrier) T.OO	0.0028	0.548	0.005	0.996	-1.071	1.077
C(carrier) T.UA	-0.4188	0.034	-12.308	0.000	-0.486	-0.352
C(carrier) T.US	-0.8876	0.035	-25.255	0.000	-0.956	-0.819
C(carrier) T.VX	-0.2775	0.054	-5.095	0.000	-0.384	-0.171
C(carrier) T.WN	0.2178	0.038	5.711	0.000	0.143	0.293
C(carrier) T.YV	0.0906	0.102	0.887	0.375	-0.109	0.291
C(origin) T.LGA	-0.0697	0.015	-4.549	0.000	-0.100	-0.040
C(month) T.2.0	0.0050	0.032	0.154	0.877	-0.059	0.069
C(month) T.3.0	0.0361	0.030	1.183	0.237	-0.024	0.096
C(month) T.4.0	0.1260	0.030	4.157	0.000	0.067	0.185
C(month) T.5.0	0.1232	0.030	4.090	0.000	0.064	0.182
C(month) T.6.0	0.4653	0.029	15.965	0.000	0.408	0.522
C(month) T.7.0	0.5065	0.029	17.611	0.000	0.450	0.563
C(month) T.8.0	0.1586	0.030	5.340	0.000	0.100	0.217
C(month) T.9.0	-0.4663	0.033	-14.057	0.000	-0.531	-0.401
C(month) T.10.0	-0.4123	0.032	-12.744	0.000	-0.476	-0.349
C(month) T.11.0	-0.3707	0.033	-11.333	0.000	-0.435	-0.307
C(month) T.12.0	0.3251	0.029	11.069	0.000	0.268	0.383
C(country) T.United States	0.0702	0.043	1.642	0.101	-0.014	0.154
C(country) T.Virgin Islands	-0.0881	0.193	-0.457	0.647	-0.466	0.289

Logit: Results Coefficients