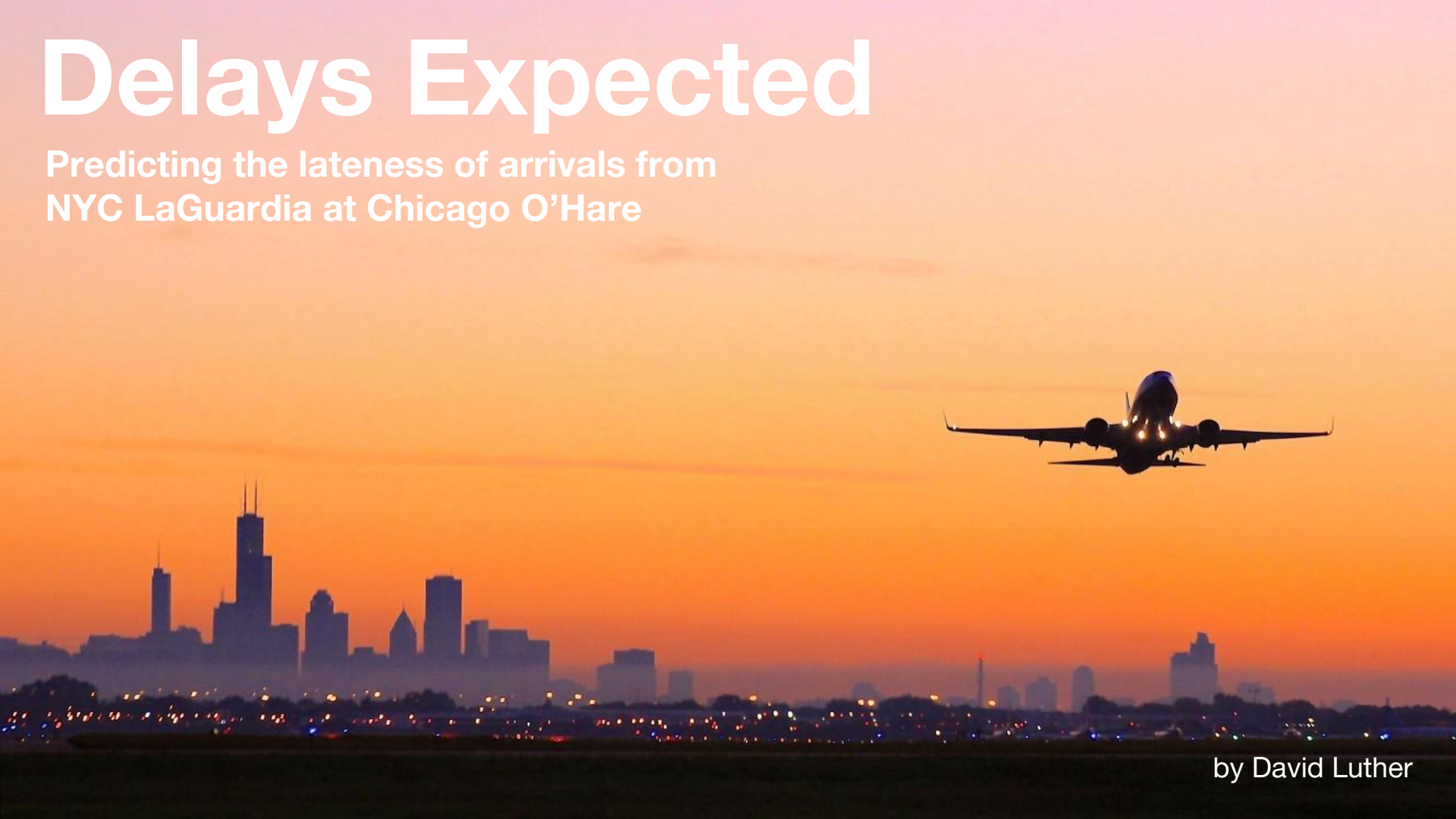
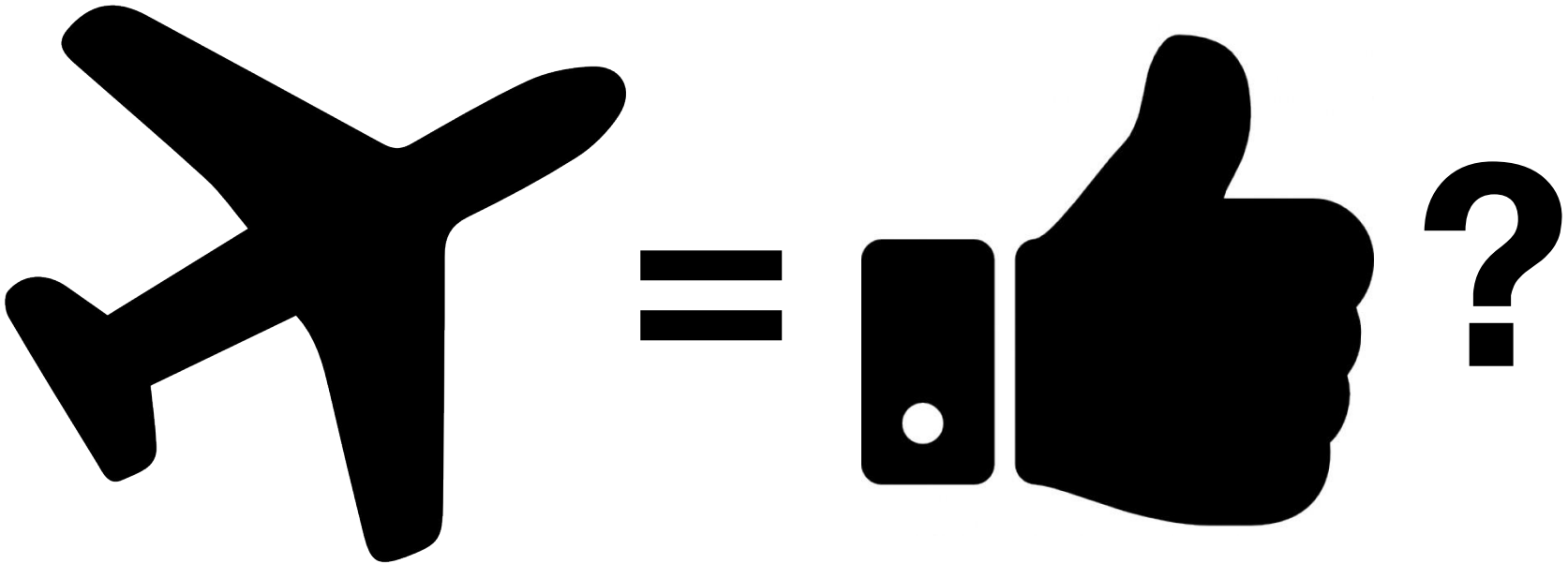
Delays Expected

Predicting the lateness of arrivals from NYC LaGuardia at Chicago O'Hare



by David Luther



Didn’t
think so...

Objective

Predict how late (or early) a flight might be.

Based on:

- Day of week
- Time of day
- Other available schedule information

Focus of Study

Decided to look at:

- American Airlines flights
- From New York Laguardia (LGA)
- Arriving at Chicago O’Hare (ORD)
- Largest timeframe possible

American Airlines 321 AAL321 / AA321

ARRIVED OVER A WEEK AGO
Gate H6

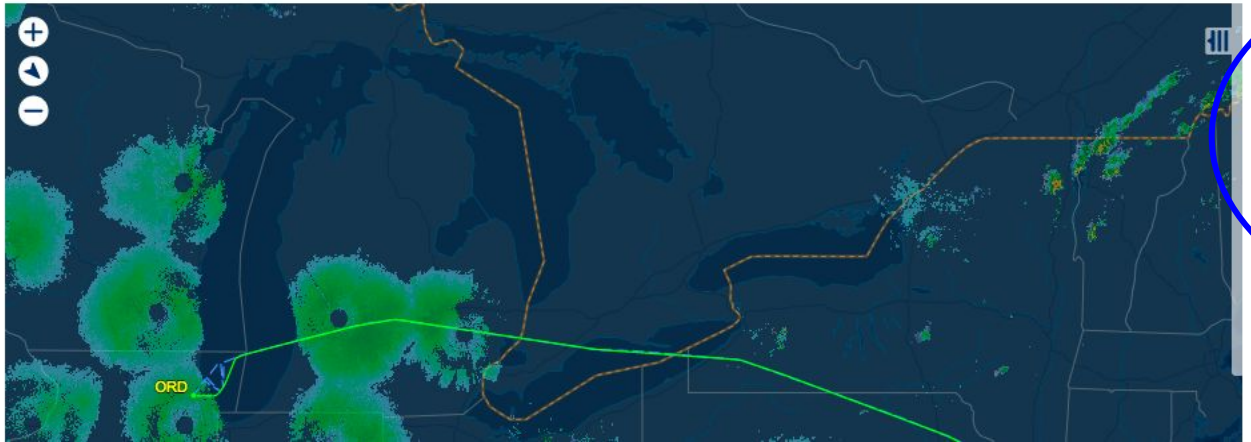
Get Notifications

LGA
NEW YORK, NY
left **GATE D8**
LaGuardia - **LGA**
WEDNESDAY 27-SEP-2017
09:21PM EDT (9 minutes early)

ORD
CHICAGO, IL
arrived at **GATE H6**
Chicago O'Hare Intl - **ORD**
WEDNESDAY 27-SEP-2017
(25 minutes early) **10:44PM CDT**

2h 23m total flight time

NOT YOUR FLIGHT? AAL321 flight schedule



Flight Details

View track log | Track inbound plane
All flights between LGA and ORD | Add AAL321 to My FA

DEPARTURE TIMES

	Gate Departure	Taxiing	Takeoff
Actual	09:21PM EDT	21 minutes	09:42PM EDT
Scheduled	09:30PM EDT		09:30PM EDT
Average Delay	Less than 10 minutes		

ARRIVAL TIMES

	Landing	Taxiing	Gate Arrival
Actual	10:36PM CDT	8 minutes	10:44PM CDT
Scheduled	10:59PM CDT		11:09PM CDT
Average Delay			Less than 10 minutes

AIRCRAFT INFORMATION

Aircraft Type: **Boeing 737-800 (twin-jet) (B738)** Photos

AIRLINE INFORMATION

Airline: American Airlines "American" all flights
Average Fare: **$169.06** (airline insight)

Extrapolations

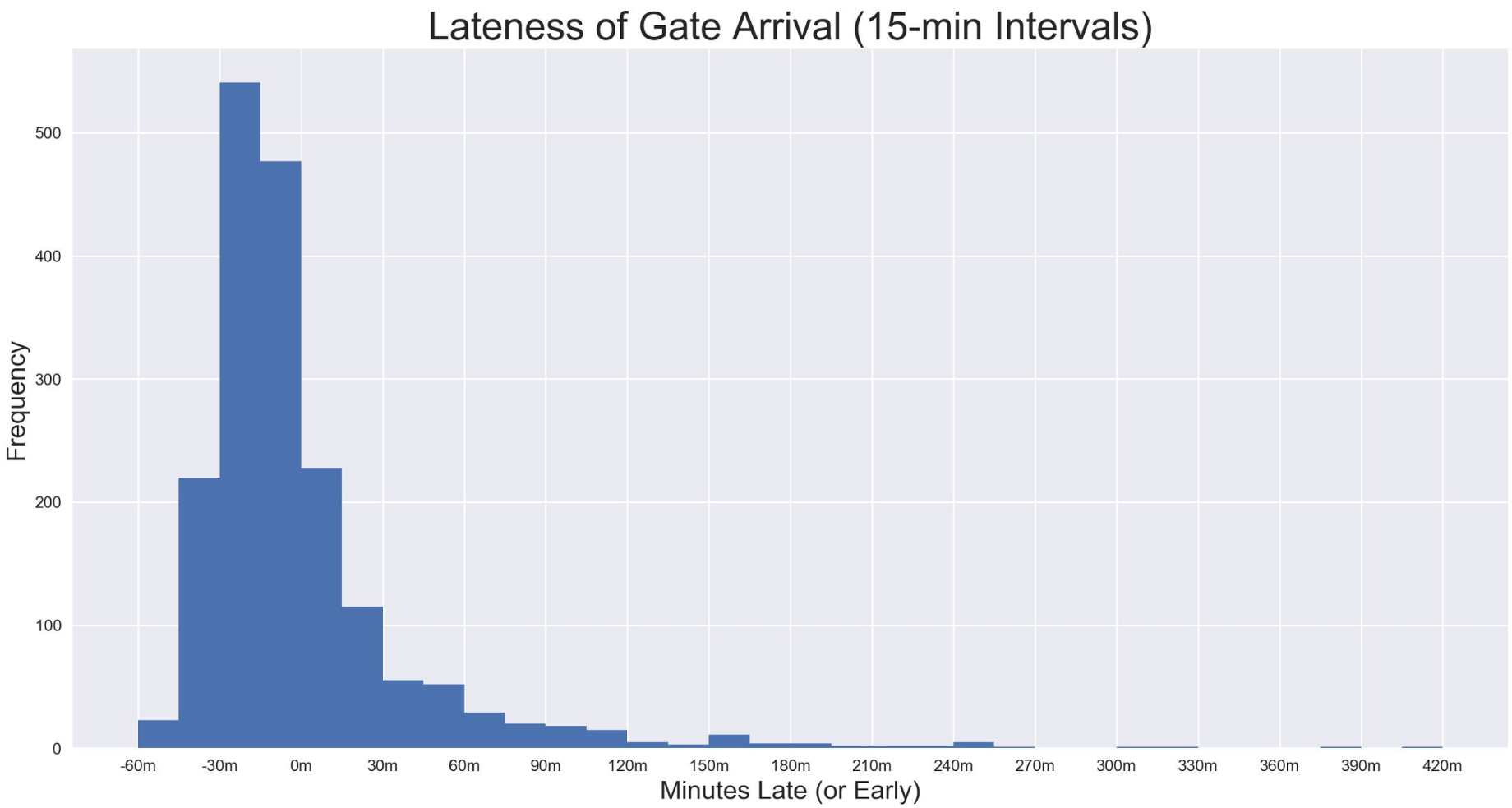
Date —> Day of Week

Scheduled Gate Arrival —> Time of Day (Quarter of Day)

Scheduled Taxi Time = Scheduled Gate Arrival Time – Scheduled Landing Time

Lateness = Actual Arrival Time – Scheduled Arrival Time

- Positive number? **LATE**
- Negative number? **EARLY**
- Zero? **ON TIME**

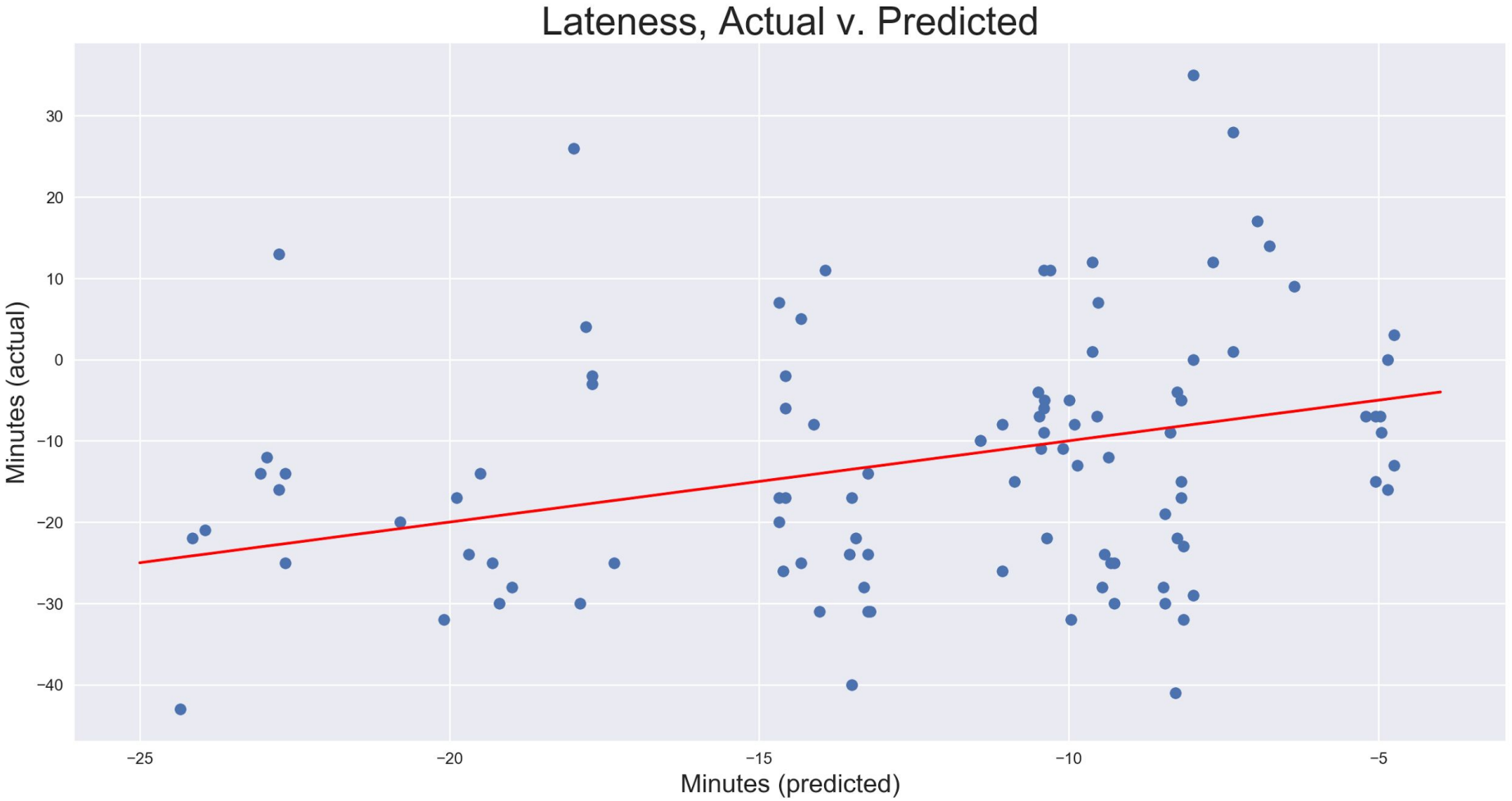

Lateness of Gate Arrival (15-min Intervals)
Frequency
0
100
200
300
400
500
-60m
-30m
0m
30m
60m
90m
120m
150m
180m
210m
240m
270m
300m
330m
360m
390m
420m
Minutes Late (or Early)

Building the Linear Regression Model

Possible Features:

- Day of Week
- Time of Day – Quarters

- Scheduled Taxi Time


Lateness, Actual v. Predicted
Minutes (actual)
30
20
10
0
−10
−20
−30
−40
−25
−20
−15
−10
−5
Minutes (predicted)

¯\(°_o)/¯

Test Results

Model Error (RMSE):

- 14.8 minutes

Dummy Error (RMSE), guessing the average (-10.9 minutes):

- 15.3 minutes

Model beats dummy by 0.5 minutes!!

(Not so good....)

Conclusion

Some trend, but other stronger factors at play.

Further data needed:

- Route length
- Origin
- Traffic at time of arrival
- Average ticket cost per flight