

INTRODUCTION

Airline schedules data is the backbone of all other data sets.

All of us in this room are here because of airline schedules that were pitched, discussed, negotiated, and implemented, and changed - through Air Service Development meetings year(s) prior to today.

OAG has been receiving and distributing airline schedules since 1929, and still maintains a digital library of schedules data going back 40 years.

The process of taking in airline schedules from over 900 airlines around the world is a constantly moving and complex process.

The objective is to help explain, understand, and simplify the fundamentals of airline schedules data and air service development.



THE EVOLUTION OF SCHEDULES DATA



Government regulated air services, bi-laterals, schedules filed by post or SITA messages

Some deregulation.

Magnetic tapes accepted
for schedules filing
Schedules change still limited

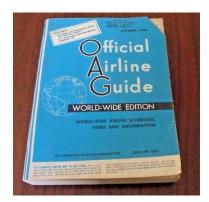
Electronic filing introduced GDS's update more frequently Schedule changes still quite Seasonal in most markets Dynamic scheduling launched
Daily schedule changes
GDS's capable of dynamic changes
And we still get some paper!

1950's

1970's

1990's

2010's



1960's

Bi-laterals expanded. schedules adjusted twice yearly. Telex messages increasingly used 1980's

Airline competition develops Schedules seen as major tool In GDS/Marketing systems Still using tapes/telex and paper! 2000's

LCC's grow rapidly! Schedules change frequently Many GDS's update daily We still get paper schedules! 2020's

Constant schedule changes Immediate updates Rapidly changing market And we expect some paper!

HOW MUCH INFO IS IN AIRLINE SCHEDULES DATA?

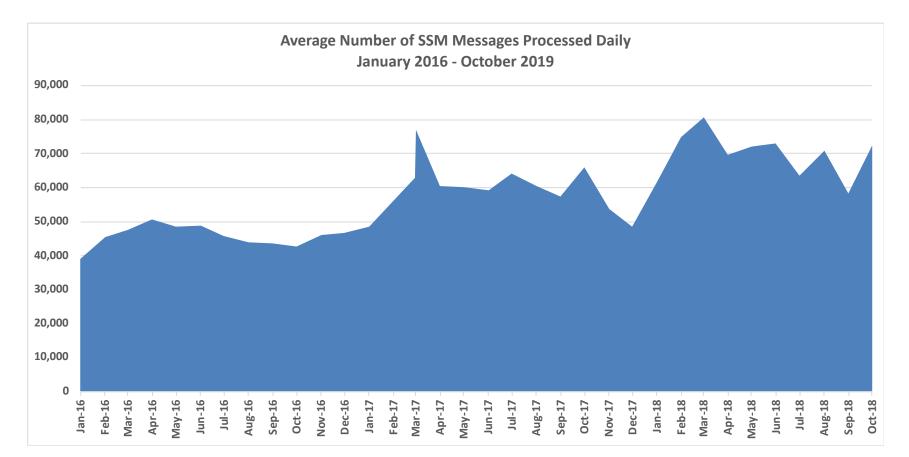
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| Field | Field Name | Type | VI-20-10 | | |
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| 2. | Carrier Code ICAO | Text | 27. | Service Type | Text |
| 3. | Service Number | Text | 28. | Passenger Classes | Text |
| 4 | Operational Suffix | Text | 29. | Available Total Seats | Numeric |
| 5. | Departure Port Code | Text | 30. | Available First Class Seats | Numeric |
| 6. | Departure Port Code ICAO | Text | 31. | Available Business Class Seats | Numeric |
| 7 | Departure Terminal | Text | 32. | Available Premium Economy Class Seats | Numeric |
| 0 | Departure City Code | Text | 33. | Available Economy Class Seats | Numeric |
| 8. | | | 34. | Meals | Text |
| 9. | Departure Country Code | Text | 35. | Freight Classes | Text |
| 10. | Arrival Port Code | Text | 36. | Freight Tons | Numeric |
| 11. | Arrival Port Code ICAO | Text | 37. | Comment 010/050 | Text |
| 12. | Arrival Terminal | Text | 38. | Operating/Non-Operating Marker | Text |
| 13. | Arrival City Code | Text | 39. | Ghost Flight | Text |
| 14. | Arrival Country Code | Text | 40. | Duplicate Services | Text |
| 15. | Departure Time | Text | 41. | Shared Airline Designator Code | Text |
| 16. | Arrival Time | Text | 42. | Shared Airline Designator Name | Text |
| 17. | Arrival Day | Text | 43. | Equipment Owner | Text |
| 18. | Elapsed Journey Time | Text | 44. | Restriction | Text |
| | | | 45. | Domestic/International MCT Marker | Text |
| 19. | Days Of Operation | Text | 46. | Full Routing | Text |
| 20. | Effective From Date | Text | 47. | Longest Sector | Text |
| 21. | Effective To Date | Text | 48. | Intermediate Ports | Text |
| 22. | Stops | Numeric | 49. | Distance | Numeric |
| 23. | General Equipment Type | Text | 50. | Government Approval | Text |
| 24. | Specific Equipment Type | Text | 51. | Inflight Service | Text |
| 25. | Specific Equipment Type ICAO | Text | 52. | Secure Flight | Text |

DAILY SCHEDULE CHANGES PROCESSED



- On average we process some 58,000 schedule changes a day.
- That's the equivalent to a schedule change every 1.5 seconds!
- Those changes can be a change of capacity, schedule, aircraft type, airport terminal, new and discontinued routes etc...



MAKE SMARTER MOVES

OUR DATA AND AIR SERVICE DEVELOPMENT





WHY DO YOU NEED SCHEDULES DATA? WHY IS IT IMPORTANT IN ASD?



Frequencies change very quickly – an example:

- ▶ In twelve months there were 5 frequency changes and one new carrier on LAX SFO
- ▶ Airlines drop and add frequencies in response to competitive activity
- ▶ Alternate services are always available for poorly performing services

When frequencies change scheduled departure times can change as well:

| Airline | 07-Jan | 04-Feb | 04-Mar | 01-Apr | 06-May | 06-Jun | 01-Jul | 05-Aug | 02-Sep | 07-Oct | 04-Nov | 02-Dec |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Alaska Airlines | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 10 |
| American Airlines | 12 | 12 | 12 | 12 | 12 | 12 | 8 | 8 | 8 | 8 | 9 | 8 |
| Delta Air Lines | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Southwest Airlines | | | | | | 7 | 7 | 7 | 6 | 6 | 6 | 6 |
| United Airlines | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 12 |

RAPIDLY CHANGING SCHEDULES

- We tracked scheduled departure times between LAX – SFO for Monday 2nd December 2019.
- Between the 1st April & 2nd September,
 12 flights had schedule changes applied.
- Nearly 30% of flights saw a change of timing.
- And each change will have had ripple effect on connecting opportunities at each airport – directly affecting many other scheduled routes.

| American Airlines 630 Alaska Airlines 630 United Airlines 630 United Airlines 630 Delta Air Lines 700 Delta Air Lines 700 American Airlines 800 United Airlines 800 Anaska Airlines 830 American Airlines 822 Alaska Airlines 830 Alaska Airlines 833 Alaska Airlines 930 Delta Air Lines 834 Maritines 930 United Airlines 930 United Airlines 930 United Airlines 930 United Airlines 1000 American Airlines 1000 United Airlines 1005 Delta Air Lines 1000 Mareican Airlines 1100 Southwest Airlines 1030 Alaska Airlines 1130 United Airlines 1034 United Airlines 1130 United Airlines 1133 Alaska Airlines 1130 United Airlines 1215 Alaska Airlines 1230 United Airlines 1225 | 1st April For 2nd December Travel | | 2nd September For 2nd December Travel | |
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| Alaska Airlines | American Airlines | 800 | United Airlines | 800 |
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OAG

MAKE SMARTER MOVES

SOME INTERESTING INSIGHTS

OAG

Airlines file schedule changes in different ways

One major US carrier makes all their changes on a Saturday.....any guesses?

A major European airline makes numerous changes almost daily.....know who?

Chinese airlines tend to file domestic schedules with less than 90 days notice

Low Cost Carriers tend to make more destination changes than schedule change Legacy and particularly network carriers adjust schedules by minutes

US schedules work to the minute e.g. Depart 09:33 European schedules work to the "five or ten" e.g. Depart 09:33

CONSTANTLY CHANGING SCHEDULES MEANS..... OAG CONSTANTLY CHANGING CONNECTIONS

Airline Schedules are the data are how connections are built.

Many airports rely on connections to provide global access to their communities.

Most major hubs rely on connecting traffic to support their network

Local markets alone are frequently too small for the frequency offered.

A quick connection can make a service successful while a lengthy layover can kill a market flow

It is very important that both airports and airlines understand the impact that changes to connectivity can have on their business.



CONNECTING SCHEDULES ALL HAVE MINIMUM CONNECTING TIMES



Most major airports file their Minimum Connecting Times (MCT)

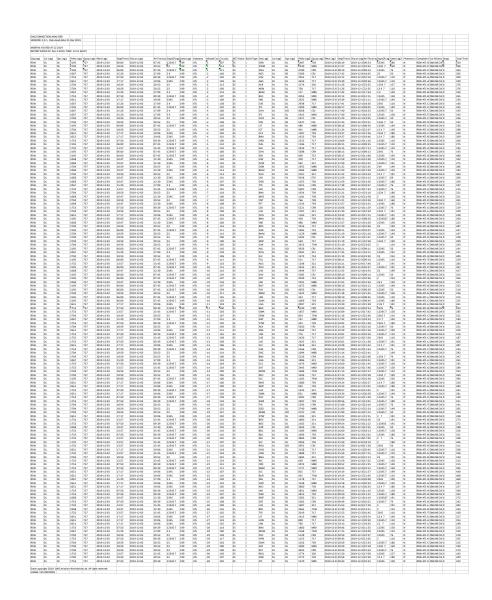
- Domestic to Domestic
- International to Domestic
- London Heathrow T3 to T5 etc.

But airlines file their <u>exceptions</u> to the airport defaults and sometimes do not advise the airports concerned.

Regional airports in North America rely on connecting traffic and tight MCT's. If every route in the US saw subtle changes in connectivity like the LAX – SFO example the impact can be huge.

EXAMPLE: TODAY'S "MISSED" SCHEDULED CONNECTIONS AT RSW VIA ATL





- 1. We extracted the "missed connections" from RSW for today via Atlanta to US Domestic Markets.
- 2. We applied a specific filter to Delta Air Lines
- 3. Added a maximum circuitry of 150%

Result:

135 missed connections in one day.

That's 135 missed opportunities to build traffic at RSW.

MISSING A CONNECTION DUE TO SCHEDULING



Today this is scheduled to happen:

DL1068 will depart RSW at 10:47 arriving at gate at ATL at 12:30

Delta Air Lines publish a 35 minute connection for domestic to domestic flights in Atlanta

DL 1355 will depart ATL for DEN at 12:59, which is only 29 minutes after the RSW service arrived....6 minutes INSIDE the MCT...thus not a valid scheduled connection.

93,515 passengers travel from RSW to DEN each year but they all miss this possible connection

Other connections exist but are they a missed opportunity? How many more are there in the room?

| | | FitNo | DeptTime | | | Missed Connection | | мст | | | FltNo | DeptTime | ArrTime | |
|----------|----------|-------|----------|--------------|---------|-------------------|----------|-------|----------|----------|-------|----------|---------|-----------------|
| Org Leg1 | Car Leg1 | Leg1 | Leg1 | ArrTime Leg1 | Gateway | Time | Circuity | Value | Des Leg2 | Car Leg2 | Leg2 | Leg2 | Leg2 | O&D Market Size |
| RSW | DL | 1068 | 10:47 | 12:30 | ATL | -6 | 107 | 35 | DEN | DL | 1355 | 12:59 | 14:26 | 93,515 |

HOW SCHEDULES IS ESSENTIAL TO TRAFFIC DATA....AND VICE VERSA

It's important to understand the traffic at your airport

But it's more important to understand the traffic at your competitors!

Traffic data, combined with Schedules data provides killer insights about your market.

The mix of traffic, seasonality, average yields, point of sale variances, direct and indirect volumes are all valuable insights.

You can't build a successful business case without schedules, traffic, and connections data.

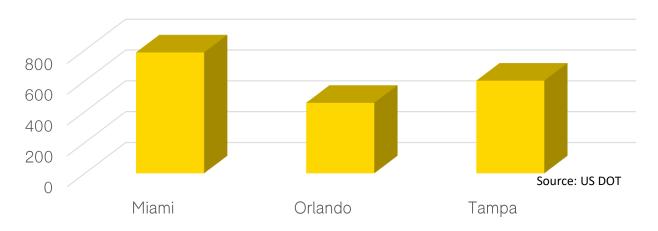


SO WHAT HAPPENED ON THOSE SCHEDULED FLIGHTS?



FLORIDA - LONDON YIELDS

Florida – London July 2018 – Jun 2019



Orlando has the volume
Orlando may have the volume but Miami has the yield advantage
While Tampa offers a US\$100 premium over Orlando

Schedules, Connections, and Traffic data used effectively can create a case for each market!

WHERE ARE THE FUTURE SCHEDULES GOING TO BE?



UNSERVED & INDIRECT OPPORTUNITIES

Traffic data quickly identifies unserved and indirect flows...

This should be the list of new route targets, increased frequencies/capacity for any airport.

| From: Washington IAD | |
|----------------------|-------------------|
| Destination city | Indirect Est. Pax |
| Saigon | 29,466 |
| Manila | 26,232 |
| Bangkok | 24,104 |
| Lagos | 20,676 |
| Mumbai | 19,532 |
| Chennai | 16,462 |
| Singapore | 15,765 |
| Kuwait | 15,690 |
| Taipei | 15,450 |
| Shanghai | 14,824 |

| From: Los Angeles LAX | |
|-----------------------|-------------------|
| Destination city | Indirect Est. Pax |
| Saigon | 123,464 |
| Bangkok | 122,182 |
| Delhi | 60,465 |
| Yerevan | 43,894 |
| Mumbai | 36,303 |
| Tehran | 36,125 |
| Jakarta | 35,005 |
| Denpasar | 34,774 |
| Cairo | 30,114 |
| Phnom Penh | 23,911 |

TO SUMMARIZE

OAG

- Every commercial airport should have access to data
- Without data its impossible to create effective business cases
- But most importantly grab the data and grab those routes

It is my pleasure to introduce Mike Mooney from Volaire Consulting that will now show you how to apply this powerful data