# Airline Schedules in Action;
# The Schedule Makes an Airline an Airline

# Overview

- The Art and Science of Airline Schedule Design;
- Business Models and Schedule Design;
- Anatomy of a Network Hub, United at Denver;
- Anatomy of a Southwest Airlines Focus City, Nashville;
- Anatomy of a ULCC Destination City, Allegiant & PGD.
- Summary

# The Art and Science of Airline Scheduling

- **Time is not free, especially for airplanes and terminal gates.**
- **Every hour has a cost of ownership, lease or use.**
- **Passenger traffic and revenue demand is uneven, by time of day and day of week and season of the year.**
- **5pm departures are popular, 3am departures not so much.**
- **Aircraft schedules must be;**
  - **Crewable, make efficient use of flight and cabin crews**
  - **Maintainable, schedules that permit effective maintenance support**
  - **Realistic, permitting high on-time performance**
  - **Connective, creating online connections (for carriers that hub)**
  - **Gateable, schedules that do not overload hub/focus city facilities**

# The Schedule Product

- **Some carriers publish schedules out 11 months, rolling over monthly.**
- **Typically the next 4-6 months are detailed, past that is placeholder.**

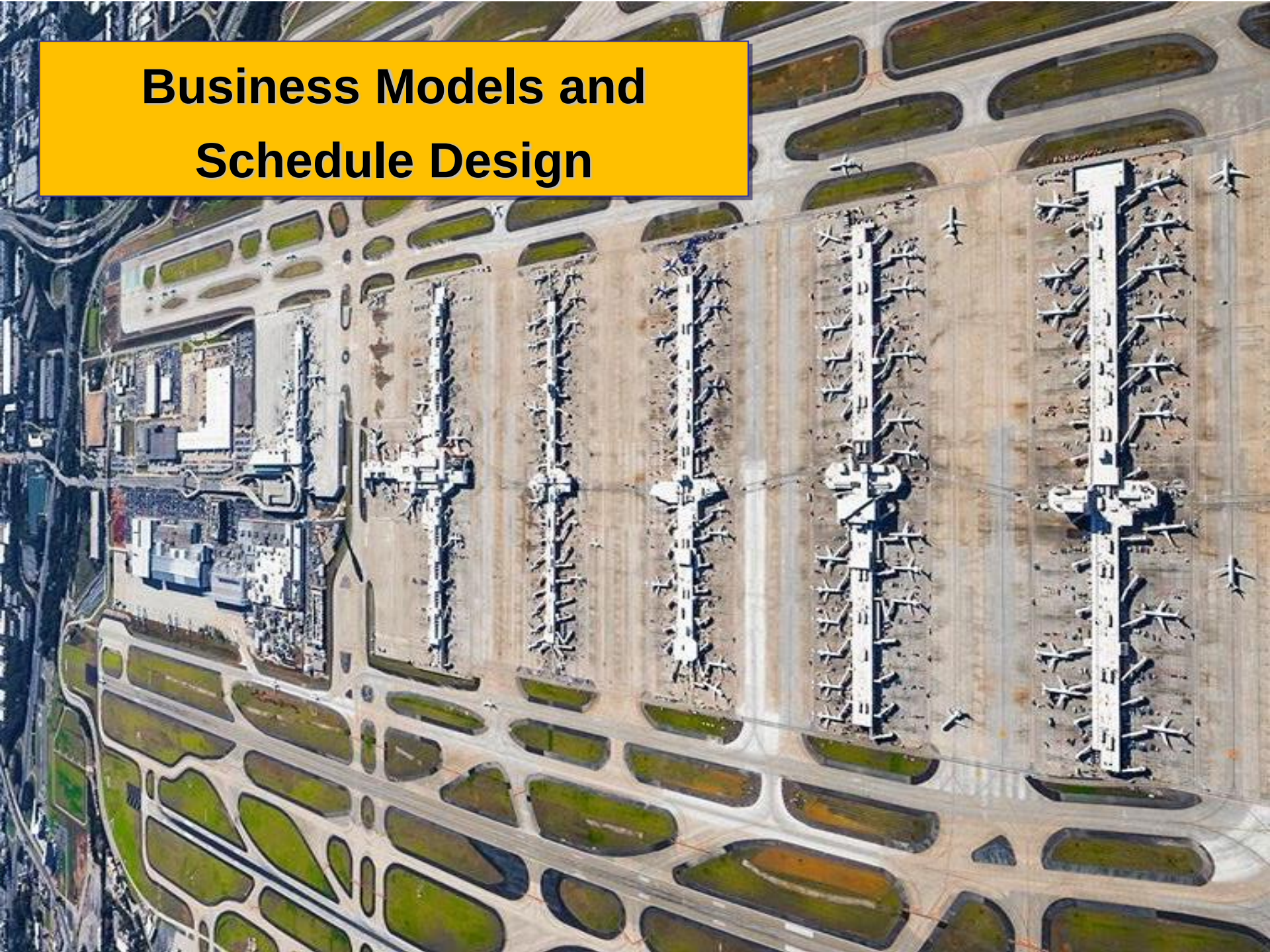
| DOMESTIC AIRLINE SCHEDULE PUBLICATION STRATEGIES | | |
|---|---|---|
| **Carrier Group** | **Schedule for Sale Term** | **Schedule Adjustments** |
| Alaska<br>American<br>Delta<br>Hawiian<br>United | Schedules published outward on a rolling 11 month basis | Constant adjustment of schedules up to 60 days prior to day of operation |
| Allegiant<br>Frontier<br>jetBlue<br>Southwest<br>Spirit | Schedules published for a season or defined period, typically up to 7 months outward | Adjustments within a published schedule period are rare |

- **Other carriers publish schedules out by season or period, typically seven months. Few schedule changes occur after loading for sale.**

# The Machinery of Schedule Production

- **Multi-step process to design, produce, publish & manage schedules.**
- **Long range (beyond 12 months out) planning includes;**
  - **Capacity Planning; number and gauge of aircraft in future years;**
  - **Future Schedules; where will those planes be deployed?**
- **For the current and near future (next 12 months) schedule plan;**
  - **The Planning Department allocates resources for the next 12 months;**
  - **Current Schedules details out the schedules for the near future;**
  - **From that process comes monthly crew schedules and station schedules**
- **Schedule production processes are ongoing and continuous, there is always next year or next season to plan out and publish for sale.**

# Business Models and Schedule Design



# Schedule Design by Business Model

- **Hub and spoke carriers American, Delta, United;**
  - **Most domestic service is hub – spoke;**
  - **Hubs have 100s of flights per day, timed to interconnect at the hub;**
  - **Each network carrier has about 7 domestic hubs;**
  - **About 36% of network domestic traffic is connecting.**

- **Value Carriers Southwest, jetBlue, Alaska, Hawaiian;**
  - **Route systems a mix of "hubs", focus cities and point to point city pairs;**
  - **Less than 20% of domestic traffic is connecting.**

- **Ultra Low-Cost Carriers (ULCC) Spirit, Frontier, Allegiant;**
  - **Focus on point to point city pairs, connecting traffic an afterthought;**
  - **Connecting traffic 4% of group total with Allegiant at 0%.**

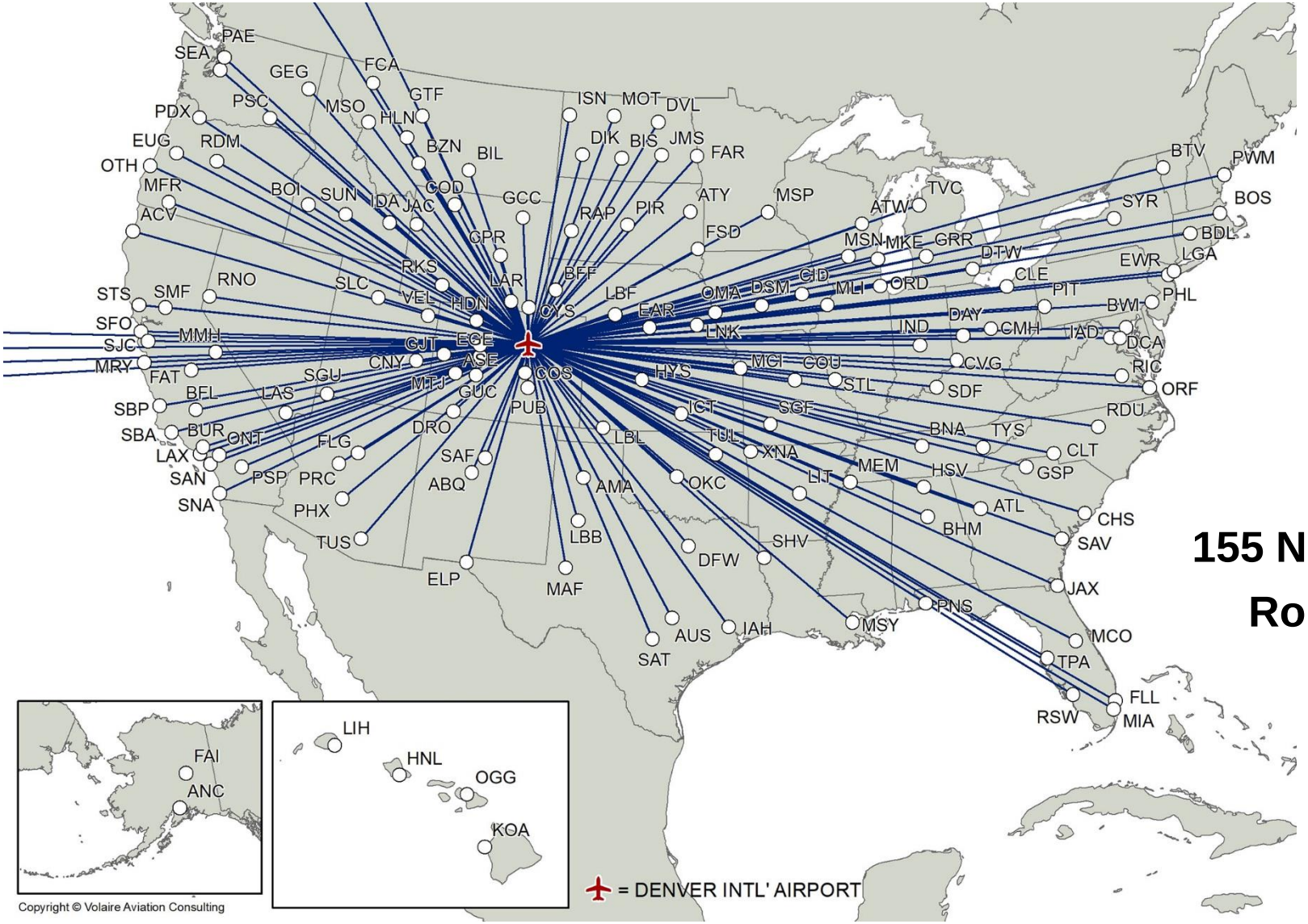
# Schedule Design by Business Model

- **Connecting passengers are essential to network hub spoke carriers.**
- **Connecting passengers are less important to WN, AS and HA.**
- **Connecting passengers are almost accidental for ULCCs.**

| LARGE CARRIER DOMESTIC LOCAL O&D VS CONNECT O&D; 12 MO JUNE 2019 | | | | |
|---|---|---|---|---|
| Carrier | O&D | % Connecting | Local O&D | Connecting O&D |
| American | 114,837,668 | 38% | 71,199,354 | 43,638,314 |
| Delta | 113,726,808 | 37% | 71,647,889 | 42,078,919 |
| United | 87,979,894 | 31% | 60,706,127 | 27,273,767 |
| | | | | |
| Southwest | 130,168,865 | 21% | 102,833,403 | 27,335,462 |
| Alaska | 35,401,770 | 16% | 29,737,487 | 5,664,283 |
| Hawaiian | 8,657,867 | 13% | 7,532,344 | 1,125,523 |
| | | | | |
| Spirit | 25,881,387 | 6% | 24,328,504 | 1,552,883 |
| Frontier | 18,705,286 | 5% | 17,770,022 | 935,264 |
| jetBlue | 30,396,219 | 4% | 29,180,370 | 1,215,849 |
| Allegiant | 14,286,099 | 0% | 14,286,099 | 0 |
| Group | 580,041,863 | 26% | 429,230,979 | 150,810,884 |

# Anatomy of a Network Hub; United Airlines at Denver

# United Airlines at Denver; Route Map



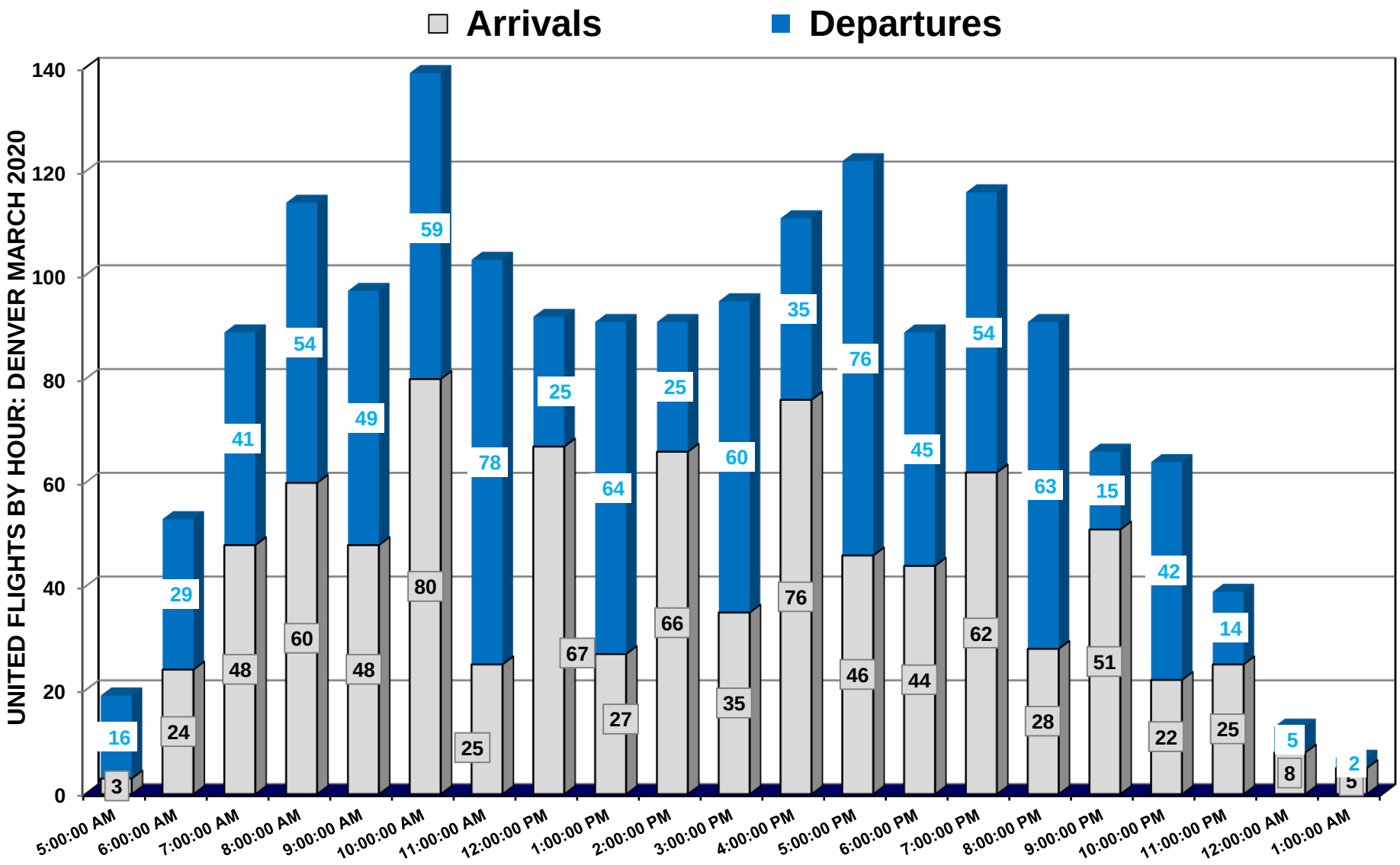

**155 Nonstop Routes**

# United Airlines at Denver; By The Numbers

- Classic mid-continent hub.
- 56% of flights regional partners.
- 87% annual load factor.
- Avg aircraft gauge 107 seats.
- Five regional partners used.

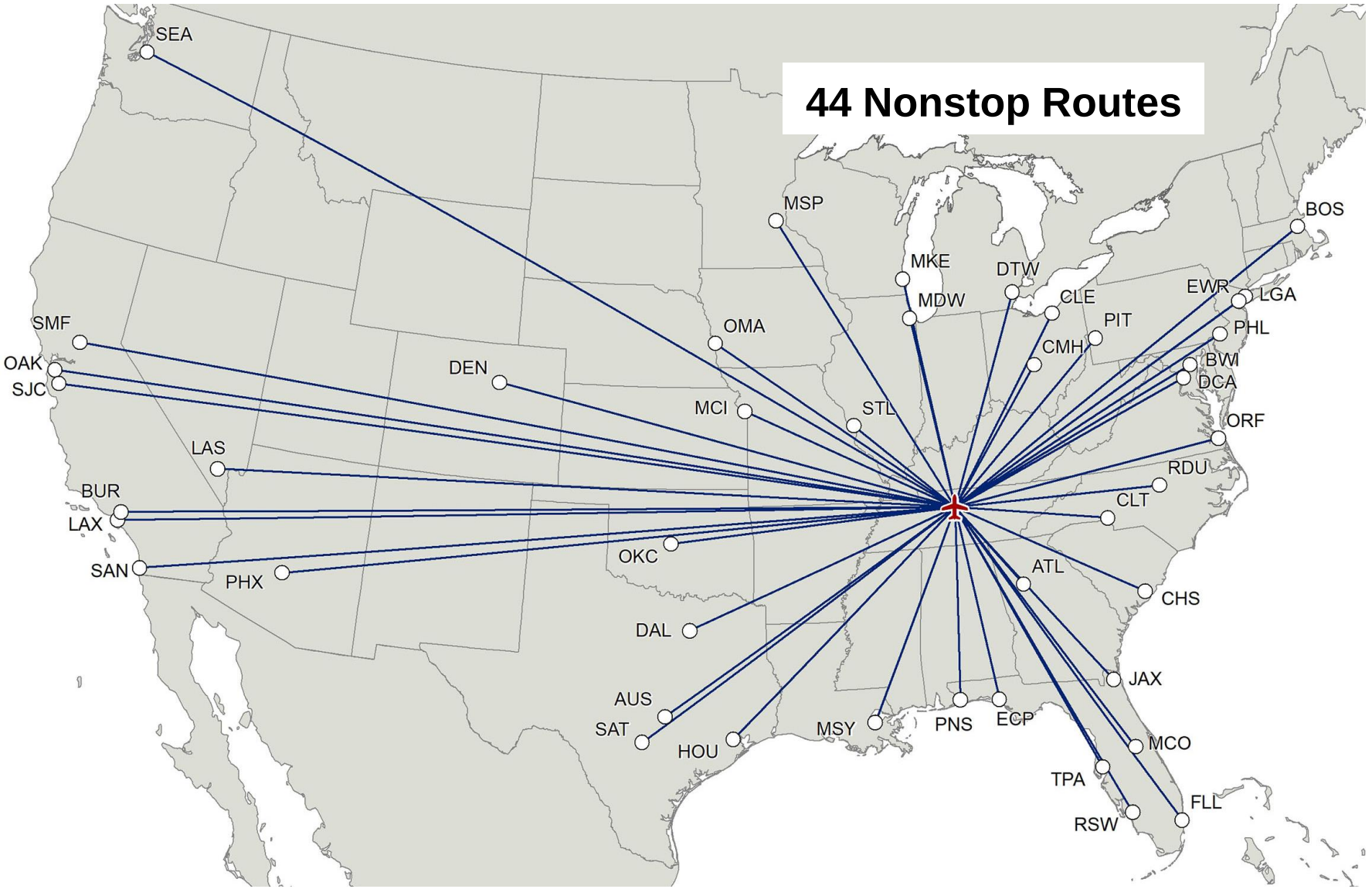
| UNITED AIRLINES DENVER HUB | |
|---|---|
| Data for 12 months ended June 2019 | |
| Peak Departures Per Day | 501 |
| Gate Positions | 94 |
| Peak Day Flights Per Gate | 5.3 |
| | |
| Local O&D Passengers | 11,691,918 |
| Domestic Connect | 15,504,631 |
| Total Domestic O&D | 27,196,549 |
| | |
| Annual Flights | 297,092 |
| Seats | 31,882,876 |
| Average Aircraft Gauge | 107 |
| Load Factor | 87.3% |
| | |
| Equipment Types Used | |
| Wide Body | 3% |
| Narrow Body Mainline | 41% |
| Dual Class RJ | 20% |
| 50-Seat | 36% |
| Regional Partners Used | 5 |

# United Airlines at Denver; Hub Operation by Hour



# Anatomy of a Southwest Airlines Focus City; Nashville

# Southwest Airlines at Nashville; Route Map



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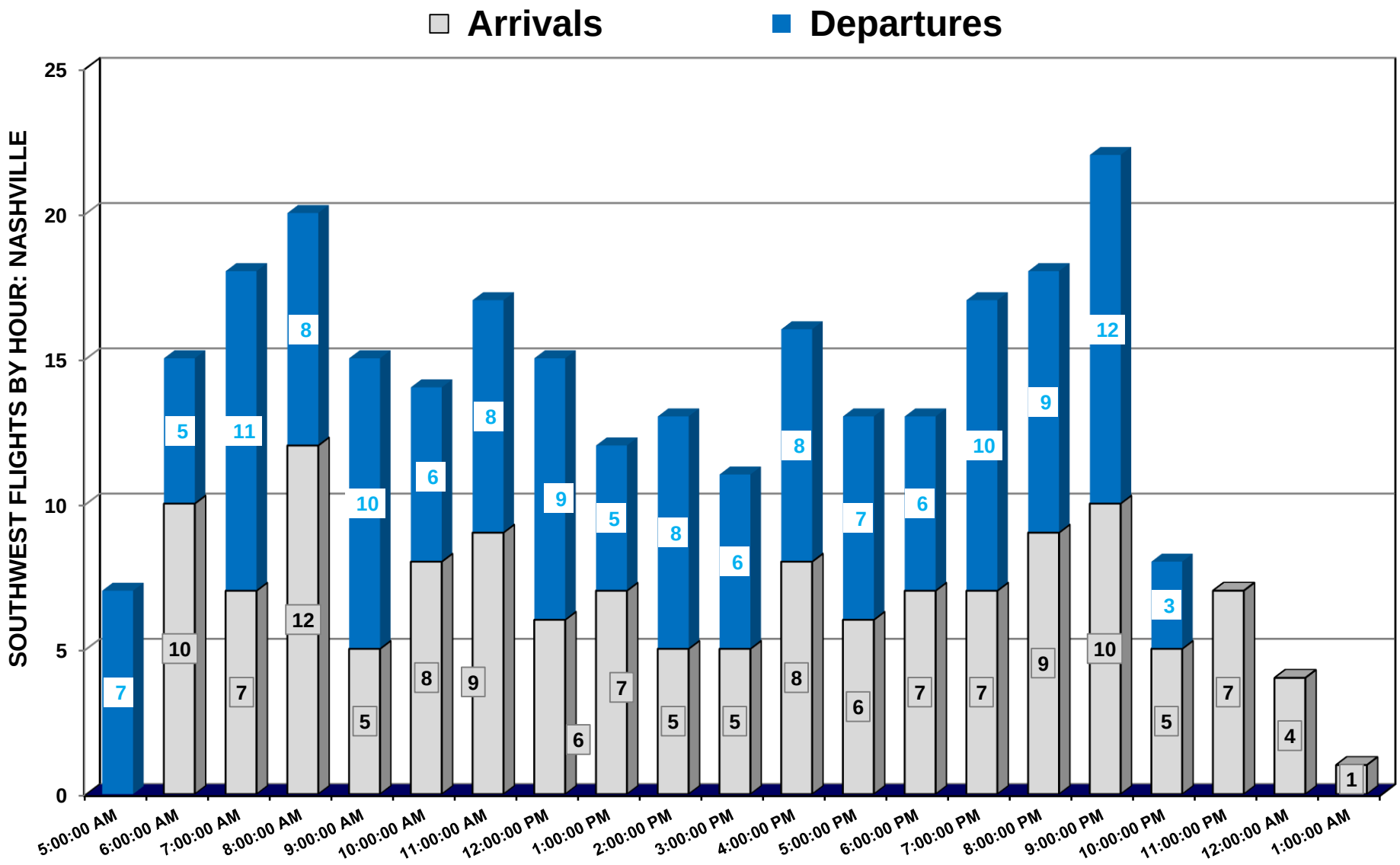
# Southwest Airlines at Nashville; By The Numbers

- Classic Southwest focus city.
- Each gate used 10 times daily.
- 84% annual load factor.
- Avg aircraft gauge 150 seats.
- Connect or through flow passengers are 26% of total.

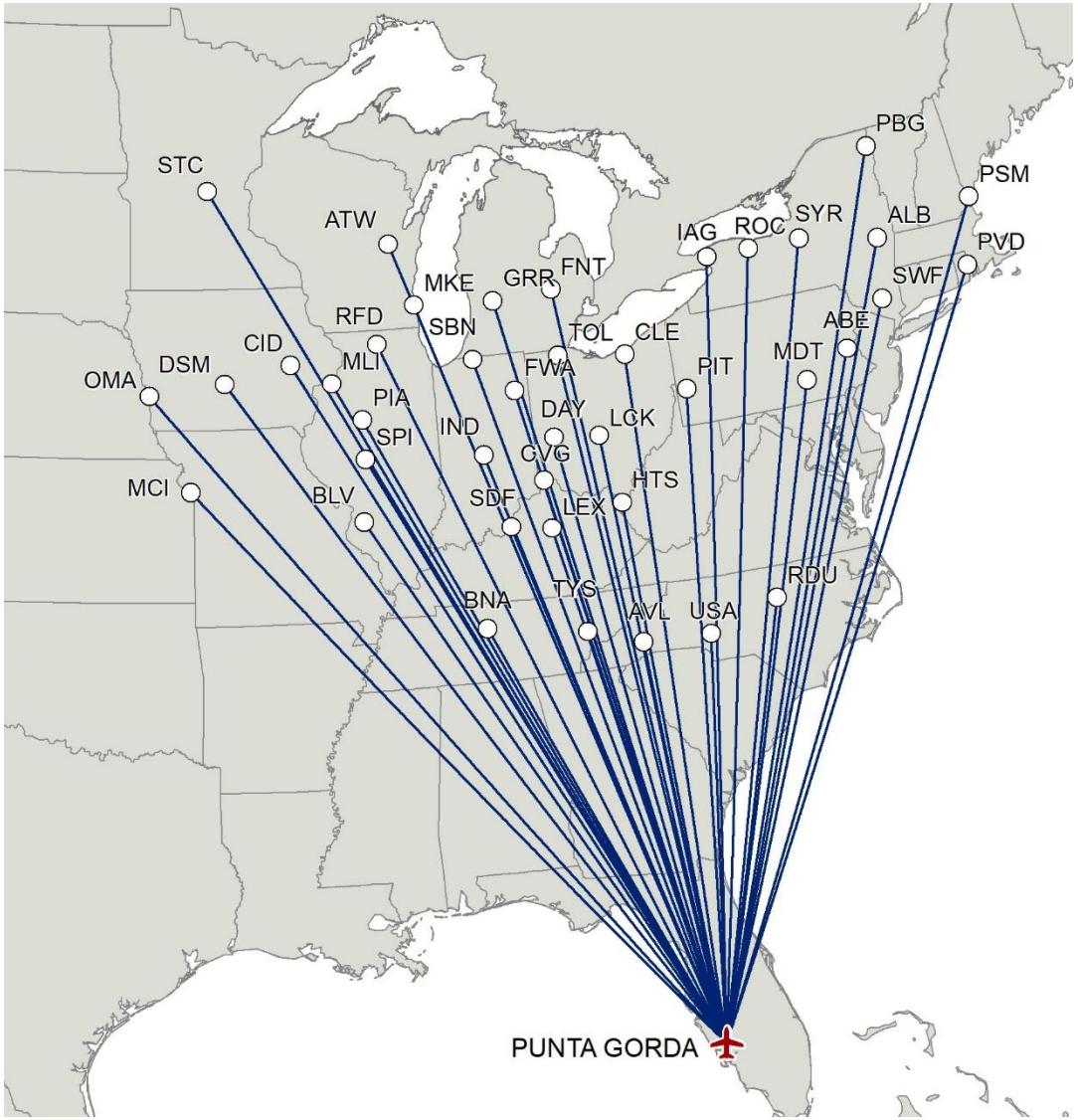
| SOUTHWEST AIRLINES NASHVILLE | |
|---|---|
| Data for 12 months ended June 2019 | |
| Peak Departures Per Day | 138 |
| Gate Positions | 14 |
| Peak Day Flights Per Gate | 9.9 |
| | |
| Local O&D Passengers | 6,580,668 |
| Domestic Connect or Thru | 2,380,290 |
| Total Domestic O&D | 8,960,958 |
| | |
| Annual Flights | 76,130 |
| Seats | 11,404,190 |
| Average Aircraft Gauge | 150 |
| Load Factor | 83.7% |
| | |
| Equipment Types Used | |
| 737 | 100% |
| Regional Partners Used | 0 |

# Southwest Airlines at Nashville; Operations by Hour



# Anatomy of a ULCC Focus City; Allegiant at Punta Gorda

# Allegiant Air at Punta Gorda Route Map




**41 Nonstop Routes**

**10 Based Airbus**

**Very Seasonal Market**

**$1 Billion + local EI**

# Allegiant Air at Punta Gorda; By The Numbers

- **Classic ULCC destination & base.**
- **10 based aircraft plus crew base.**
- **84% annual load factor.**
- **Avg aircraft gauge 182 seats.**
- **No regional partners, no connecting traffic.**

| ALLEGIANT AIR AT PUNTA GORDA | |
|---|---|
| Data for 12 months ended June 2019 | |
| Peak Departures Per Day | 28 |
| Ground Board "Z" Gates | 7 gates, 10 ramp spots |
| Peak Day Flights Per Gate | 4 |
| | |
| Local O&D Passengers | 1,648,449 |
| Domestic Connect or Thru | 0 |
| Total Domestic O&D | 1,648,449 |
| | |
| Annual Flights | 10,767 |
| Seats | 1,963,796 |
| Average Aircraft Gauge | 182 |
| Load Factor | 84.1% |
| | |
| Equipment Types Used | |
| Airbus 319/320 | 100% |
| Regional Partners Used | 0 |

# Allegiant Air at Punta Gorda; Peak Day Schedule

- **Snapshot of a peak day at PGD for Allegiant. (Sunday 3/22/2020)**
- **10 based aircraft leave early am.**
- **18 turns during the day.**
- **10 based aircraft return late pm.**
- **A few turns done by aircraft from other domiciles.**

**ALLEIGANT PGD SCHEDULE SUNDAY MARCH 22, 2020**

| Origin | Arrival | Aircraft | Departure | Destination | Routing | Aircraft |
|---|---|---|---|---|---|---|
| | | | 06:00 | FWA | FWA ORF CLE | 1 |
| | | | 06:10 | SDF | SDF BLV IND | 2 |
| | | | 06:20 | FNT | FNT MDT CHS | 3 |
| | | | 06:40 | ALB | ALB FNT | 4 |
| | | 10 ORIGINATING AIRCRAFT | 06:50 | ATW | ATW DSM | 5 |
| | | | 07:00 | PVD | PVD RFD | 6 |
| | | | 07:21 | SYR | SYR OMA | 7 |
| | | | 07:31 | MLI | MLI IAG | 8 |
| | | | 07:41 | PBG | PBG SBN | 9 |
| | | | 08:00 | CID | CID PIA | 10 |
| CVG | 08:09 | CVG Dom | 08:59 | CVG | | |
| GRR | 08:40 | GRR Dom | 09:30 | GRR | | |
| SDF | 11:14 | 2 | 12:04 | BLV | | |
| FWA | 11:33 | 1 | 12:18 | ORF | | |
| FNT | 12:33 | 3 | 13:23 | MDT | | |
| ALB | 13:22 | 4 | 14:12 | FNT | | |
| ATW | 13:44 | 5 | 14:34 | DSM | | |
| PVD | 13:45 | 6 | 14:44 | RFD | | |
| MLI | 13:51 | 8 | 14:54 | IAG | | |
| SYR | 13:57 | 7 | 15:04 | OMA | | |
| CID | 14:33 | 10 | 15:23 | PIA | | |
| PBG | 14:52 | 9 | 15:42 | SBN | | |
| PIT | 16:19 | Inside Out | 17:09 | PIT | | |
| ORF | 17:10 | 1 | 17:55 | CLE | | |
| LEX | 17:12 | Inside Out | 18:02 | LEX | | |
| BLV | 17:27 | 2 | 18:17 | IND | | |
| MDT | 19:12 | 3 | 20:02 | CHS | | |
| CVG | 20:19 | CVG Dom | 21:09 | CVG | | |
| FNT | 20:25 | | | | | |
| RFD | 21:06 | | | | | |
| DSM | 21:08 | | | | | |
| IAG | 21:18 | | | | | |
| PIA | 21:21 | 10 TERMINATING AIRCRAFT | | | | |
| SBN | 21:43 | | | | | |
| OMA | 21:58 | | | | | |
| CHS | 23:32 | | | | | |
| IND | 23:39 | | | | | |
| CLE | 23:44 | | | | | |



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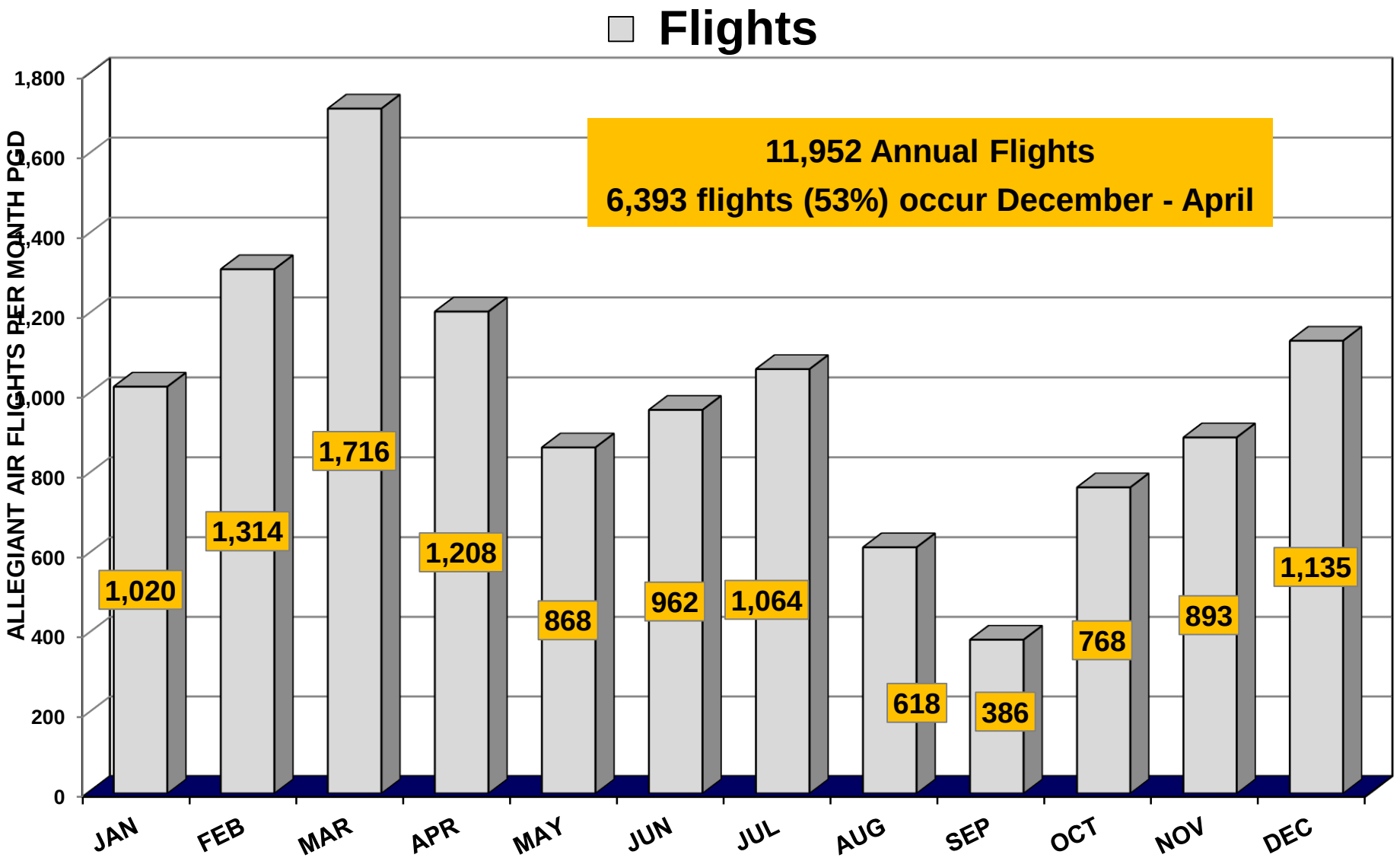
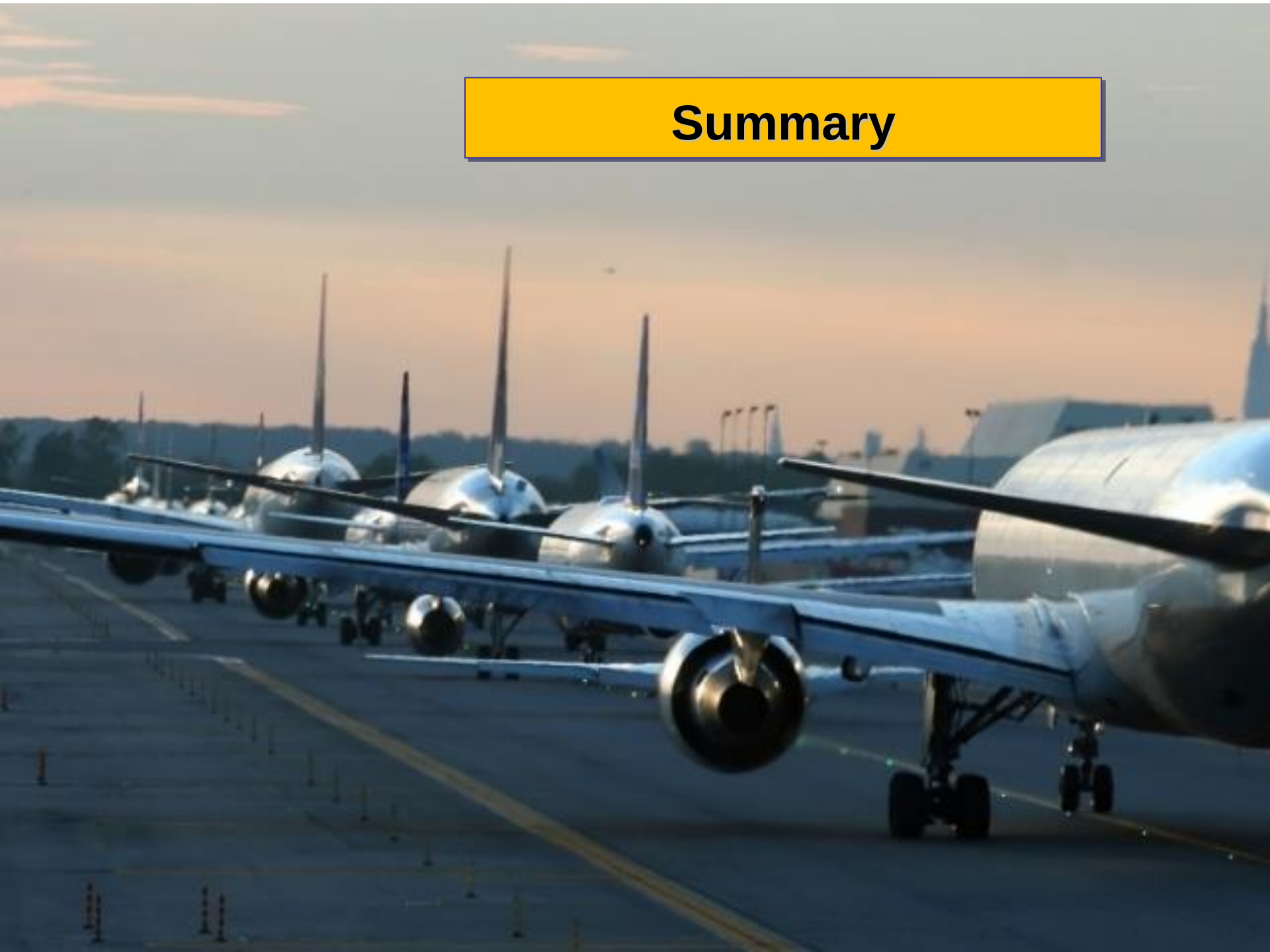
# Allegiant Air PGD; Flights per Month Year 2019 Sept.



# Summary



# Summary

- **Its not an airline unless it has a schedule.**
- **Schedule design, implementation and management is a complex task.**
- **Scheduling strategy & tactics vary greatly, based on business model.**
- **This is just domestic, international scheduling is even more complex.**
- **Think about it when you fly home from this conference.**