

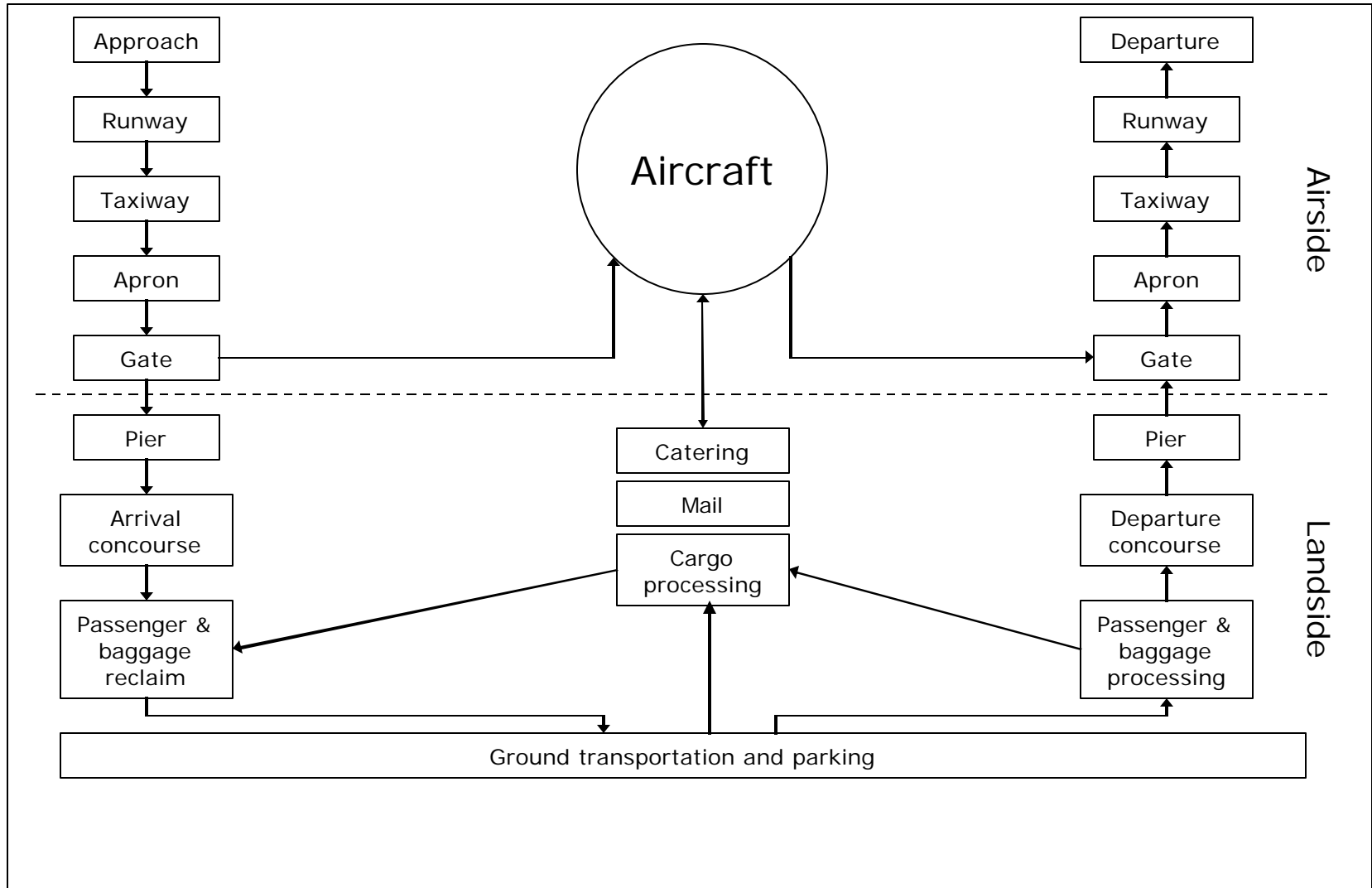


Airport Performance Measurement

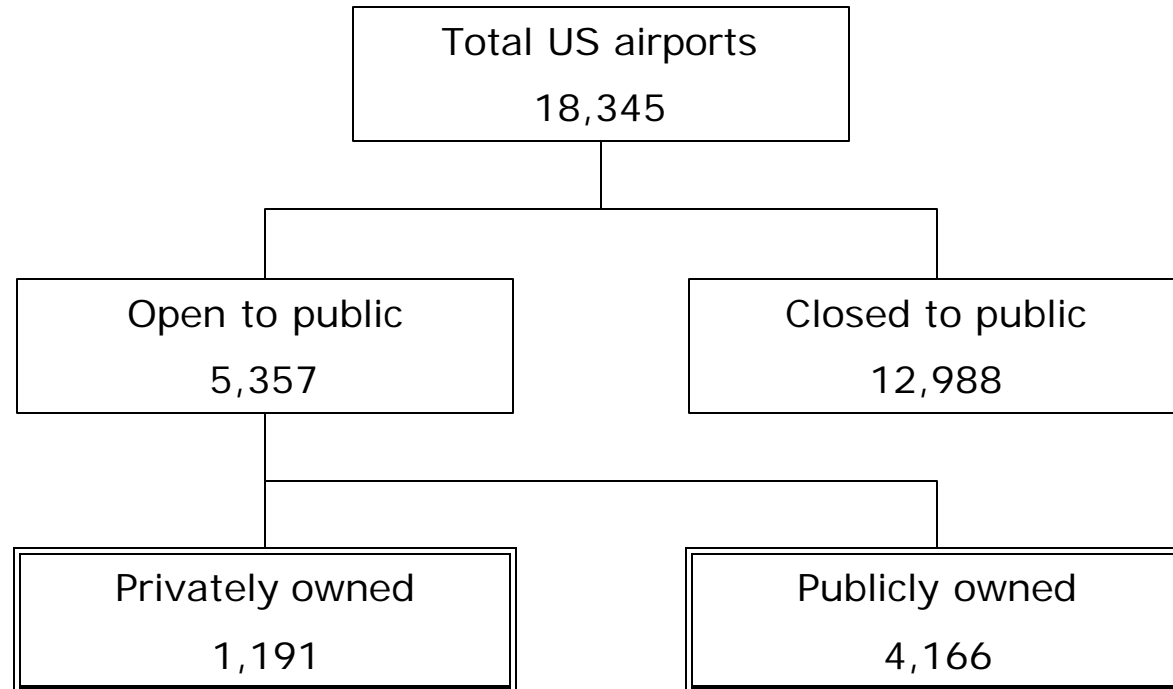
Agenda

- **Airport Characteristics**
- **Airport Key Performance Indicators**

The Airport System



US Airport Ownership



Airport Stakeholders

Airport Users	Administrative	Outside entities
Passengers	Management	Individuals living nearby
Airlines	Owners (public and private)	
Cargo operators	Regulators	
Other business partners (e.g. concessionaries)		

Agenda

- **Airport Characteristics**

- **Airport Key Performance Indicators**

Characteristics of Profiled Airports

- Profile of six airports:

- San Francisco area:

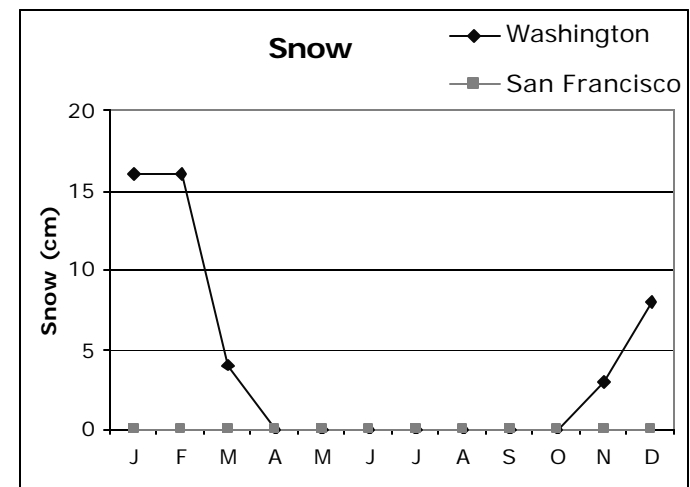
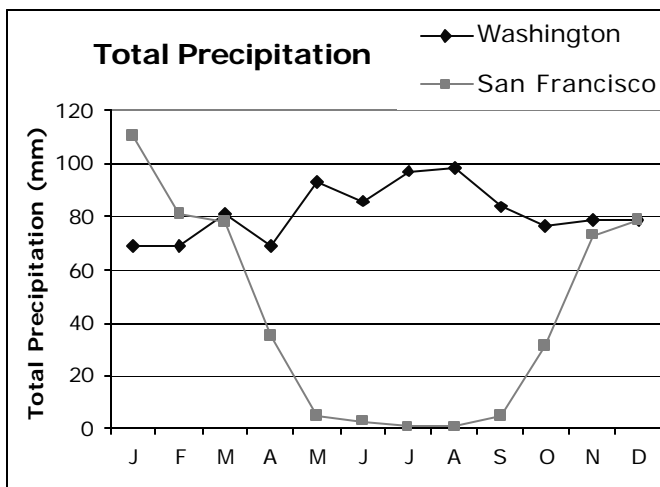
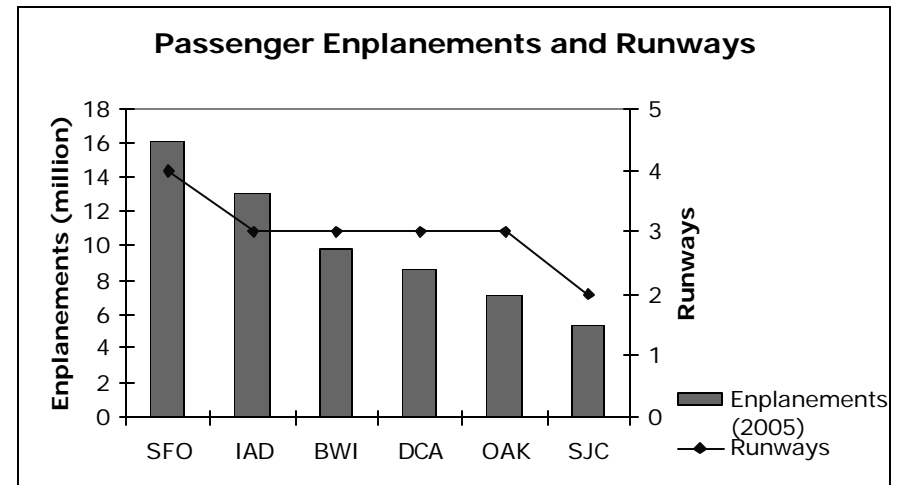
- OAK-SJC-SFO

- Located within 34 mile drive of each other

- Metro DC area:

- BWI-DCA-IAD

- Located within 57 mile drive of each other

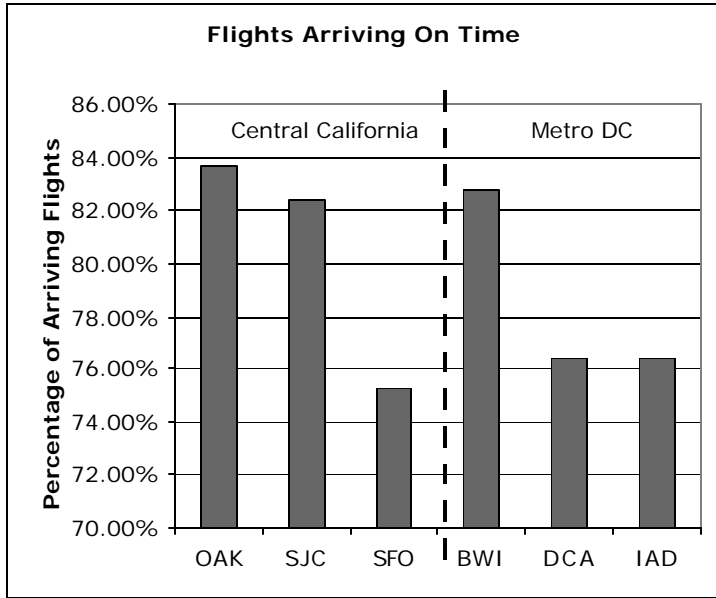


Passenger-Oriented Airport Key Performance Indicators

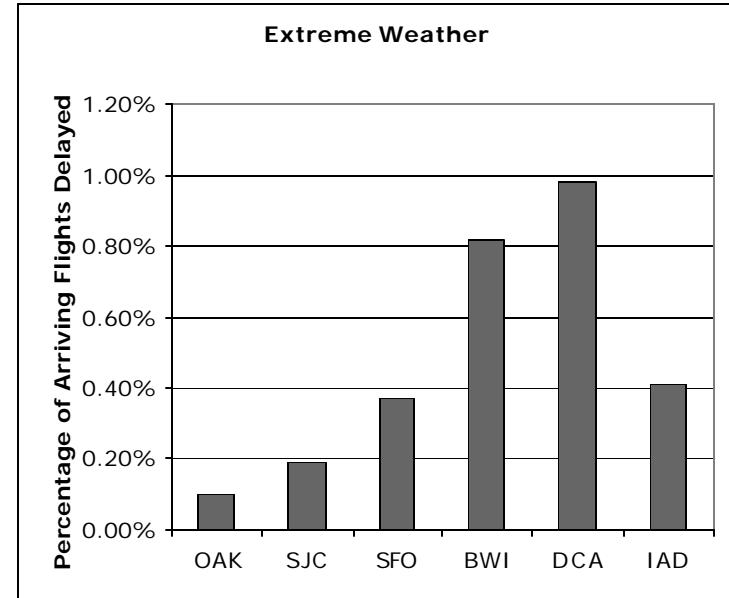
- Percentage flights delayed
 - Uncontrollable: Weather, traffic volume
 - Controllable: Efficiency of airport operations (e.g. ramp service)
- Connecting times
 - Uncontrollable: Airline schedules
 - Controllable: Physical organization of airport, efficiency of handling operations (e.g. baggage transfer times, security screening efficiency, etc.)
- Wait times at check-in, security, immigration
 - Uncontrollable: "Peakness" of airline schedules
 - Controllable: Efficiency of airport operations
- Baggage delivery (timeliness, lost bags)
 - Uncontrollable: Airline schedules
 - Controllable: Efficiency of baggage handling operations

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Flight Arrival Status (Sept '06)

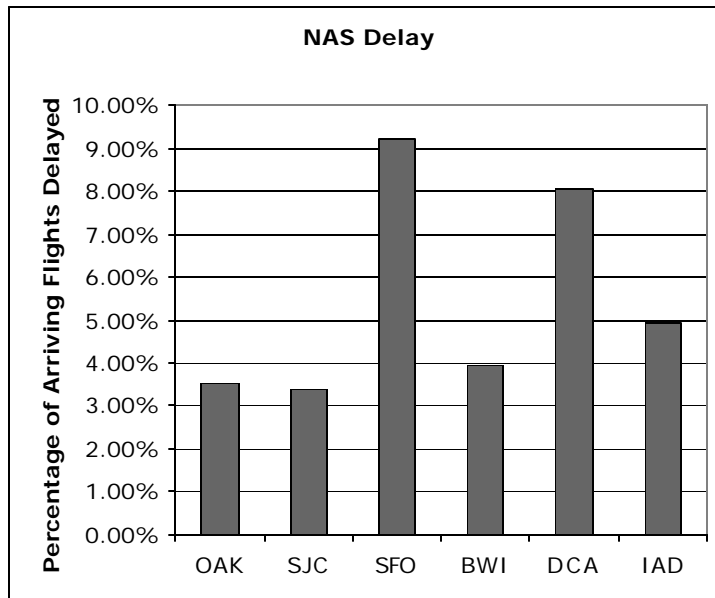


- On-time: Arrival within 15 minutes of schedule

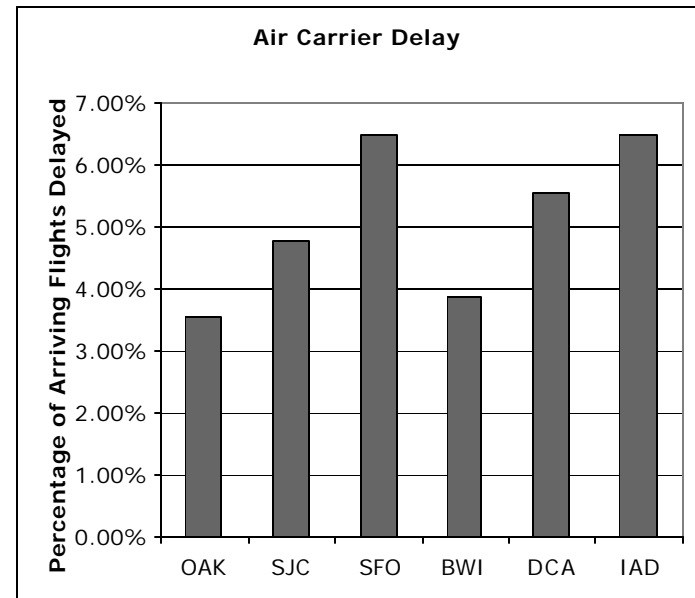


- Extreme weather delay: Significant meteorological conditions (actual or forecast) that, in the judgment of the carrier, delays or prevents the operation of a flight (e.g. tornado, blizzard, hurricane, etc.)

Flight Arrival Status (Sept '06)



- NAS delays: Delays and cancellations attributable to the national airspace system that refer to a broad set of conditions — non-extreme weather conditions, airport operations, heavy traffic volume, air traffic control, etc.



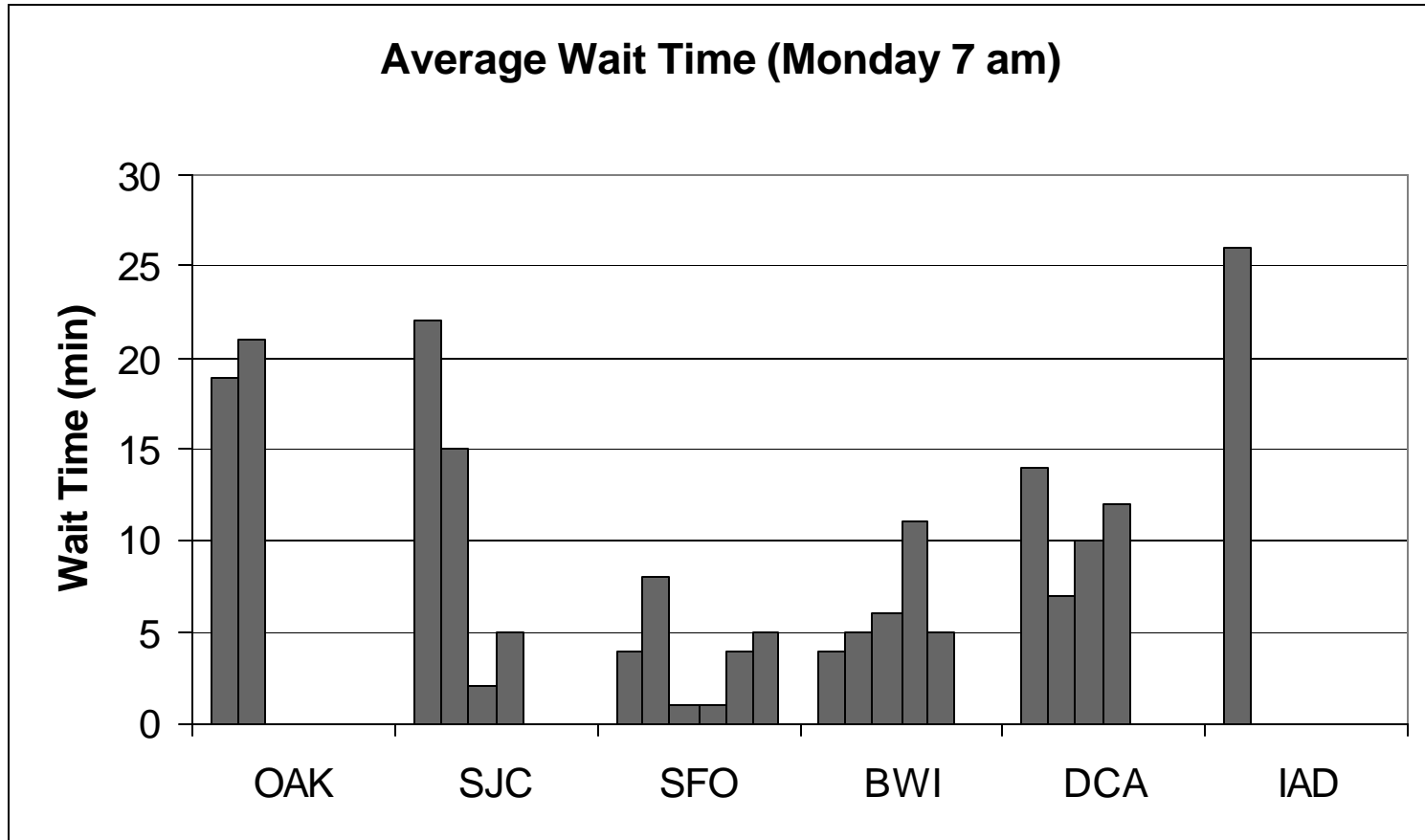
- Air carrier delay: The delay was due to circumstances within the airline's control (e.g. maintenance or crew problems, aircraft cleaning, baggage loading, fueling, etc.)

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Airport Security Wait Times

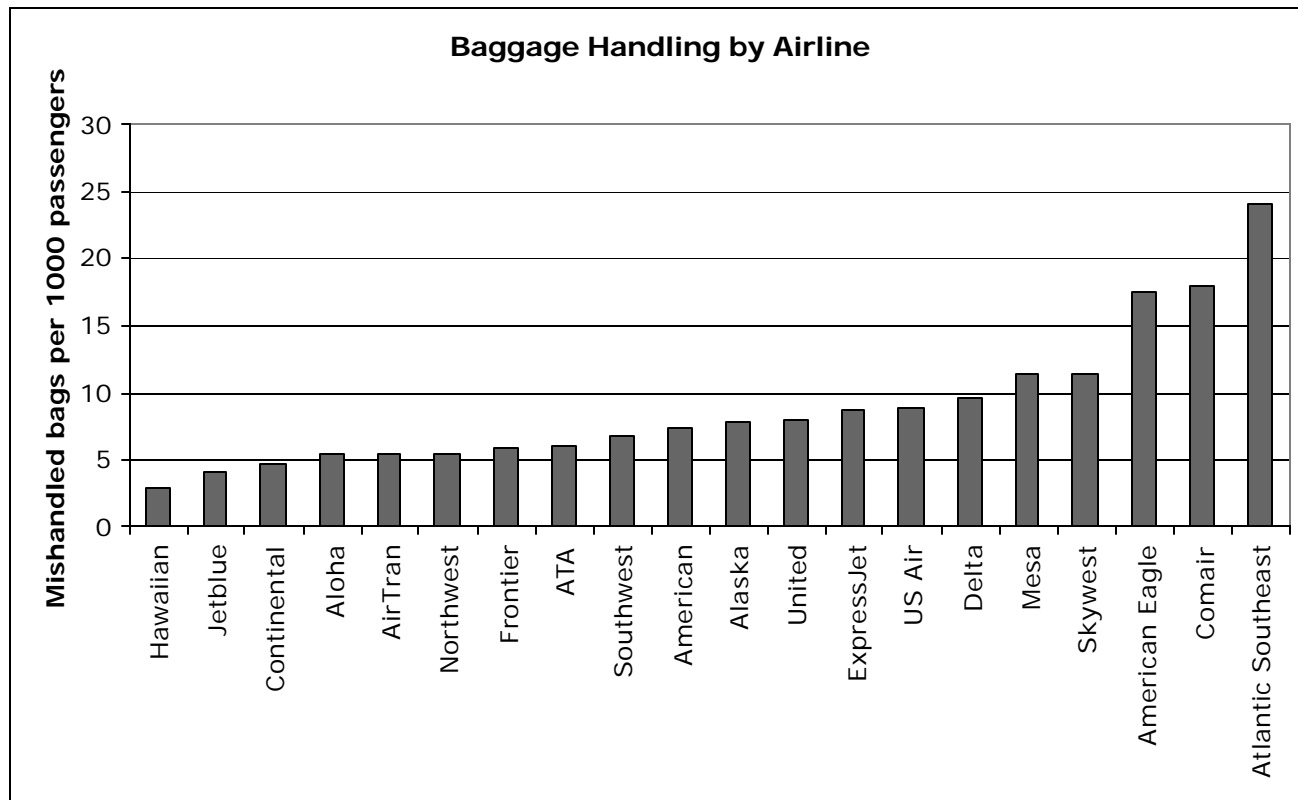


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Baggage Handling Effectiveness



September 2006

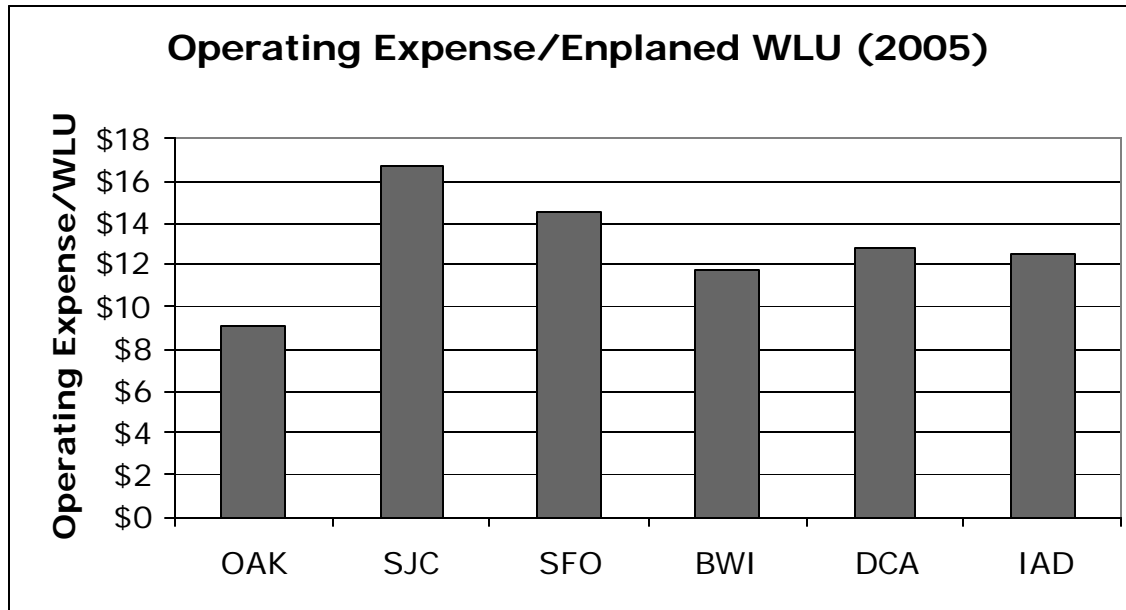
Source: US DOT

Airport Management-Oriented Key Performance Indicators

- Cost/passenger -- Cost/ton of cargo -- Cost/WLU
 - Uncontrollable: Fixed asset depreciation costs
 - Controllable: Labor rates, labor efficiency, number of passengers/amount of cargo
- Labor cost/aircraft movement
 - Controllable: Labor rates, labor efficiency, number of aircraft movements
- Aircraft movements per runway
 - Uncontrollable: Number of runways, weather
 - Controllable: Overall number of aircraft movements
- Minimum connecting times
 - Uncontrollable: Airline schedules
 - Controllable: Physical organization of airport, efficiency of handling operations (e.g. baggage transfer times, security screening efficiency, etc.)

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Operating Expense Per WLU



- **1 Work Load Unit = 1 passenger or 100 kg of cargo**
- **Operating expense** = Cost for staff, communications and utilities, supplies and materials, repairs and maintenance, contractual services etc. *Excludes* depreciation.

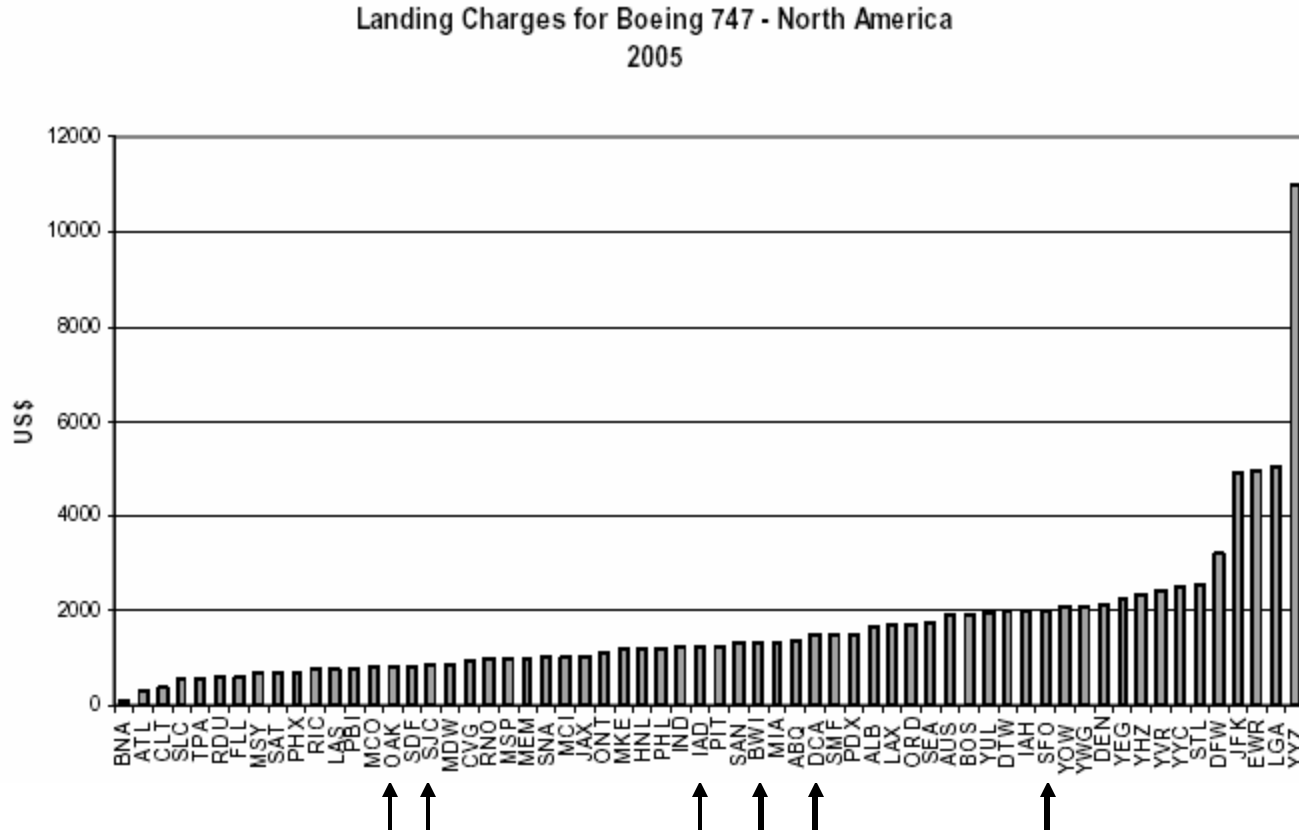
Airport Owner

Key Performance Indicators

- Cost/passenger -- Cost/ton of cargo -- Cost/WLU
 - Uncontrollable: Fixed asset depreciation costs
 - Controllable: Labor rates, labor efficiency, number of passengers and amount of cargo
- Landing fee revenue/aircraft movement
- Emissions/aircraft movement

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Aircraft Landing Fees



E.g. at IAD

- Landing fee: \$3.32 / 1000 lb
- B747 landing weight: Approx. 400,000 lb
- Total fee: \$1,328

Affected Individual

Airport Key Performance Indicators

- Number of noise level infringements
- Emissions/aircraft movement
- Proportion of passengers using public transport

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Summary

- A variety of KPIs can be tracked, but which KPIs are important and which direction is desirable varies by which perspective one takes
- Some KPIs can be optimized “locally”, but such an optimization can lead to a sub-optimal point at the global (organizational) level
- KPIs are impacted both by controllable and uncontrollable factors. In a comparison, one needs to adjust for the uncontrollable factors in order to determine how to optimize the controllable factors