

2016-2040 RTP/SCS Urban Airport Capacity Constraints Analysis

Presentation to ATAC

March 13, 2015



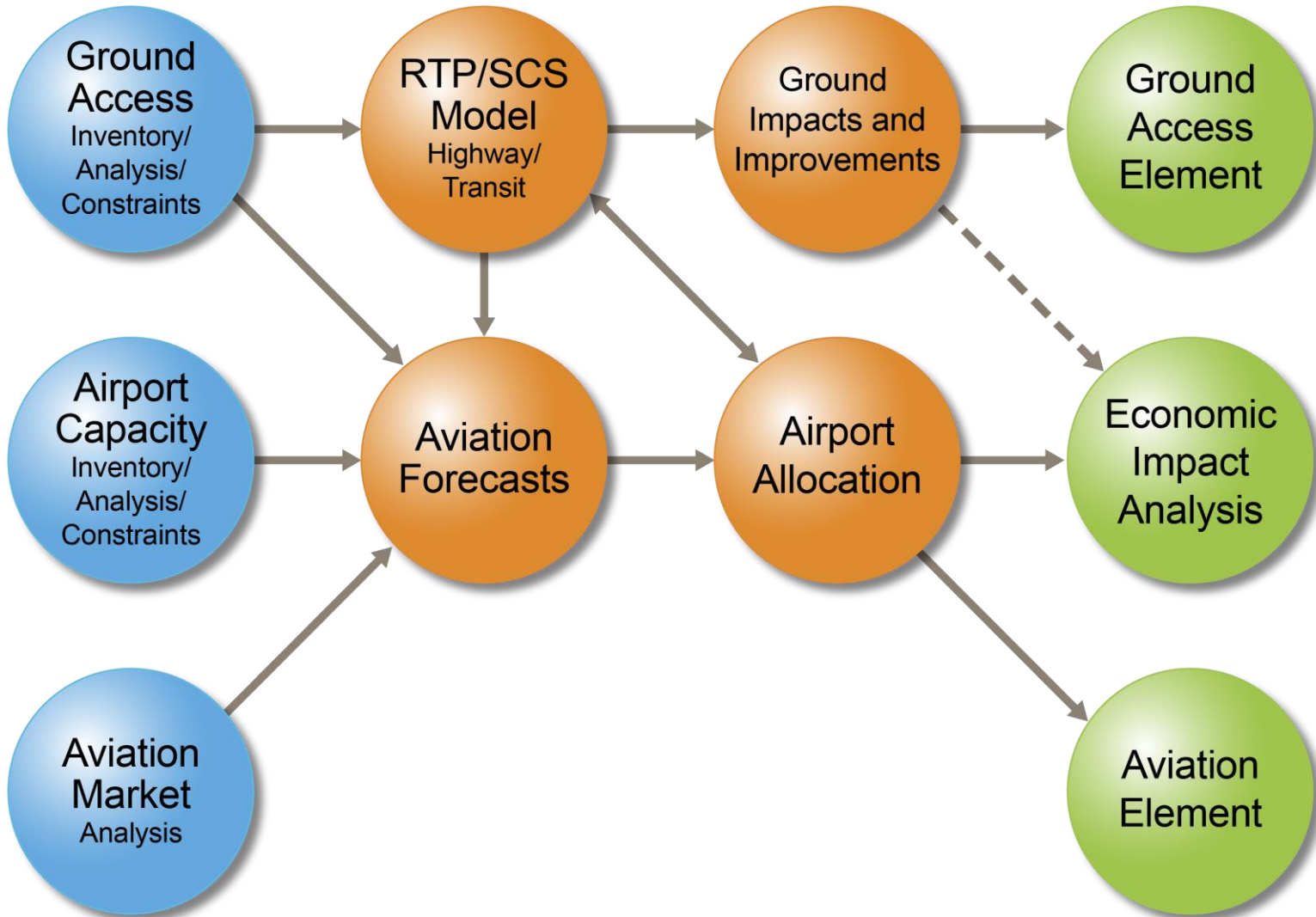
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Work Flow



Capacity Constrained Airports

Four of the commercial airports in the region are considered to be “capacity constrained urban airports” by SCAG. This effort is to identify the physical airside capacity of these airports:

- Bob Hope Airport (BUR)
- Los Angeles International Airport (LAX)
- Long Beach Airport (LGB)
- John Wayne Airport (SNA)

Capacity review does not seek to determine potential demand to fill the capacity.

Capacity Constraints Methodology

Identify an upper limit on the capacity of the **airfield** and the **terminal** at each airport based on each airport's adopted master plan (or similar study indicating potential runway and terminal configurations).

A MAP (Million Annual Passengers) range was developed independently for the airfield and the terminal at each airport. The lower of the airfield and terminal capacity at each airport is taken to be the physical capacity of the airport.

MAP includes both arriving and departing passengers.

Capacity Constraints Methodology – Airfield

Annual Service Volume (ASV) represents the number of aircraft operations that an airport's runway system can accommodate. It is calculated based on the FAA Advisory Circular 150/5060-5 *Airport Capacity and Delay*, including such factors as:

- Number of runways
- Runway configuration
- Runway exits
- Touch and go operations
- Aircraft fleet mix

Capacity Constraints Methodology – Airfield

MAP was calculated by multiplying ASV times the average passengers per operation. Average passengers per operation varies with each airport's fleet/flight mix.

Capacity Constraints Methodology – Terminal

Terminal methodology is based on:

- Number of gates for each aircraft design group (ADG)
- Average seats per ADG
- Turns per gate (1 turn = 1 arrival + 1 departure)
- Load factors by ADG

An important trend at many airports is that airlines are shifting to newer ADG III aircraft (e.g., 737-900, A321) that accommodate more passengers.

Capacity Constraints Methodology – Other Considerations

Some other factors were considered where relevant to specific airports:

- Operational mix (commercial vs. GA and other uses)
- Time-of-day variation (e.g., short-haul flights tend to cluster in the morning and evening, while long-haul flights have more varied departure/arrival times)

Capacity review does not seek to determine potential demand to fill the capacity.

Bob Hope Airport (BUR)



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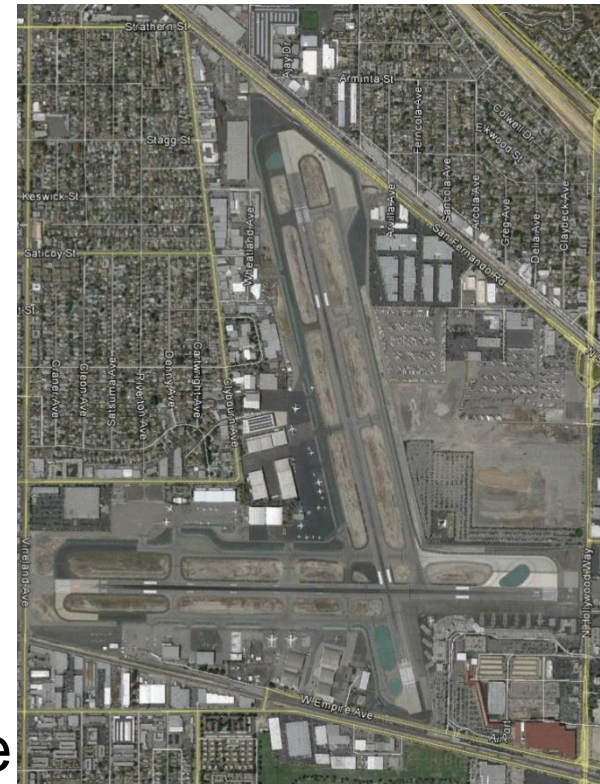
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Bob Hope Airport (BUR)

- Two intersecting runways
 - Runway 8/26 – 5,802 feet long and 150 feet wide
 - Runway 15/33 – 6,886 feet long and 150 feet wide
 - Predominate flow is landings on Runway 8 and departures on Runway 15
- Terminal with 14 gates, proposed replacement terminal with 14 gates
- Runways and replacement terminal will accommodate ADG III
- Constrained airspace
- Short trips result in light mid-day schedule



Bob Hope Airport (BUR) – Airfield

- Intersecting runways are typically an inefficient airfield configuration
- Configuration of BUR's taxiway system (close to runway) further restricts flow of aircraft on the field
- Airspace conflict with VNY
- FAA study concluded airfield capacity of 50-55 operations per hour
- **Airfield** capacity is 7.3 MAP

Bob Hope Airport (BUR) – Terminal

- 14 ADG III gates, all ground loaded (front and back)
- Seats: up to 200 seats
- 15 turns per day
- Load factor: 85%
- **Terminal** capacity is 12.2 MAP
- Therefore, overall capacity for BUR is **7.3 MAP** (based on airfield)



Los Angeles International Airport (LAX)



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Los Angeles International Airport (LAX)

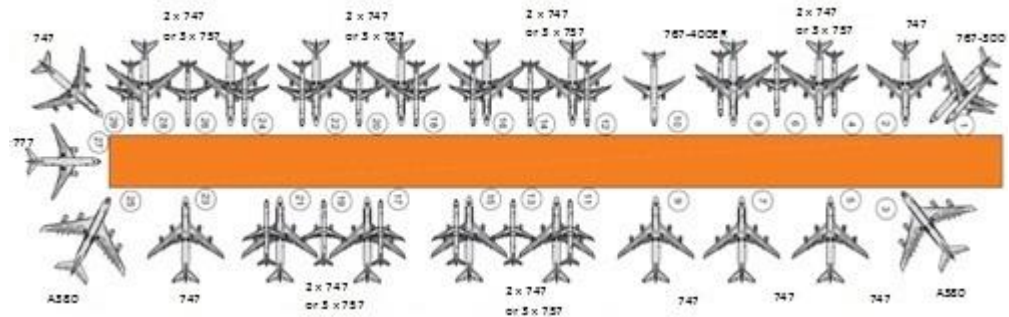
– Four parallel runways

- 6L/24R, 6R/24L, 7L/25R, 7R/25L
- All runways > 10,000 feet in LAX Master Plan (2004)
- Predominant flow is west with landings on Runways 24R and 25L and departures on Runways 24L and 25R



Los Angeles International Airport (LAX)

- Terminals will have a total of 153 gates
- Gate conflicts and future Multiple Aircraft Ramp Systems (MARS) result in a range for the possible total number and mix of aircraft at the gates



- Turns per day are dependent upon size of aircraft and range from 16 for ADG I/II aircraft to 10 for ADG V/VI aircrafts

Los Angeles International Airport (LAX) – Airfield

- Airfield is typically operated so as to maximize airfield capacity
- Runway spacing enables simultaneous arrivals in all weather conditions
- **Airfield** capacity is 82.9 MAP (based on Specific Plan Amendment Study assumptions)

Los Angeles International Airport (LAX) – Terminal

Item	ADG I/II	ADG III	ADG IV	ADG V	ADG VI
Gates*	14	27	63	41	8
Turns per Day	16	16	12	10	10

* Based on LAX Specific Plan Amendment Study Report, July 2012, Appendix F-1, Figure B, for Alternatives 1 and 2.

- Average load factor is 81.3%
- **Terminal** capacity is 103.6 MAP
- Therefore, overall capacity for LAX is **82.9 MAP** (based on airfield)

Long Beach Airport (LGB)



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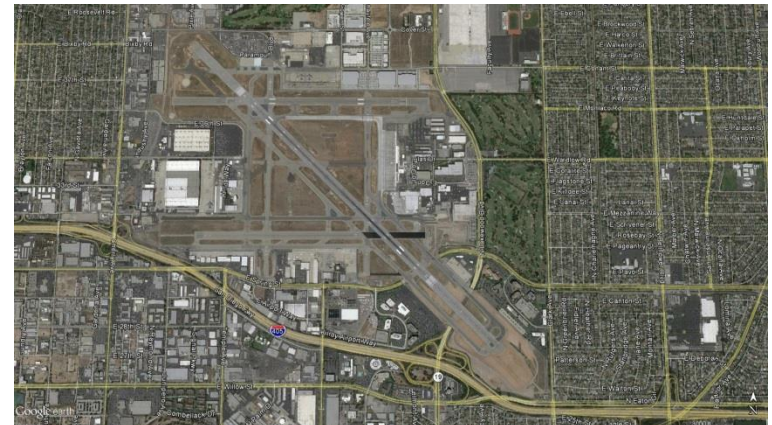
Long Beach Airport (LGB)

– Runway configuration

- Two sets of parallel runways forming a square and a diagonal runway, for a total of 5 runways
 - Runway 7L/25R – 6,191 feet long by 150 feet wide
 - Runway 7R/25L – 5,421 feet long by 150 feet wide
 - Runway 12/30 – 10,003 feet long by 200 feet wide
 - Runway 16L/34R – 3,330 feet long by 75 feet wide
 - Runway 16R/34L – 4,470 feet long by 75 feet wide
- Only one runway (12/30) is used for commercial operations

– Terminal (11 gates)

- All ground loaded (front and back)

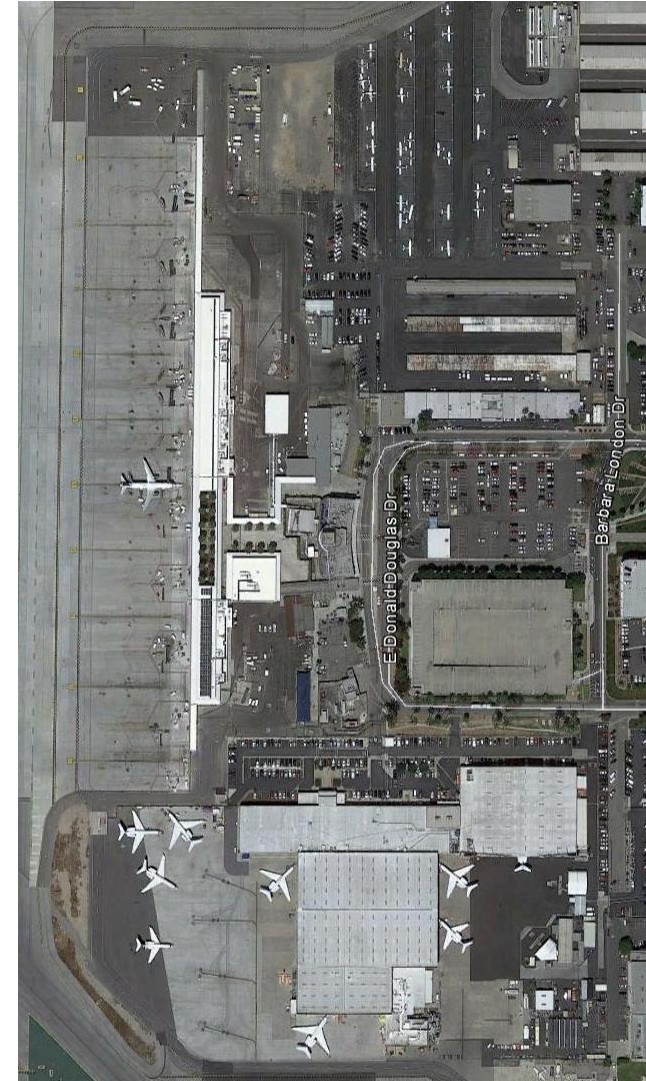


Long Beach Airport (LGB) – Airfield

- The high number of GA operations including training and helicopter operations reduce airfield capacity
- Only one runway is typically used for commercial air traffic, and it crosses all the other runways
- **Airfield** capacity is 9.5 MAP

Long Beach Airport (LGB) – Terminal

- 11 Gates
- 10 turns per day (Ground loading requires more time to turn the gate)
- Load factor: 88%
- **Terminal** capacity is 6.6 MAP
- Therefore, overall capacity for LGB is **6.6 MAP**



John Wayne Airport (SNA)



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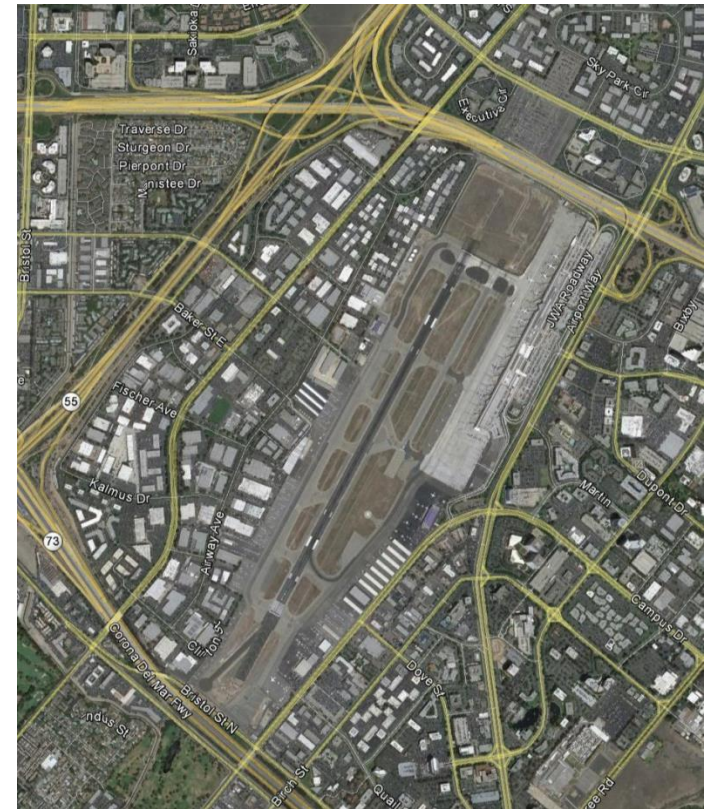
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John Wayne Airport (SNA)


- Two closely spaced parallel runways
 - Runway 2L/20R – 5,701 feet long by 150 feet wide (commercial runway)
 - Runway 2R/20L – 2,887 feet long by 75 feet wide (GA runway)
- Terminal (20 gates with passenger boarding bridges and 6 commuter gates with ground loading)
- Short commercial runway length limits size of aircraft that can operate at the airport



John Wayne Airport (SNA) – Airfield

- Airfield operates as a single runway configuration for commercial operations. (GA aircraft must be staggered.)
- **Airfield** capacity is 9.6 MAP

John Wayne Airport (SNA) – Terminal

- 26 Gates
 - 16 turns per day for ADG I, II, and III; 10 turns per day for ADG IV
 - Load factor: 85%
 - **Terminal capacity is 15.4 MAP**
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- Therefore, overall capacity for SNA is **9.6 MAP** (based on airfield)

Discussion



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