SFO GLS Demonstration
An Airline’s Perspective

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373 Destinations

60 countries
United Airlines Approach Toolbox

RNAV  ILS  GPS
RNAV RNP  GLS  VOR
United’s US Hub Strategy

- KSFO
- KIAH
- KEWR
- KIAD
- KDEN
- KORD
SFO’s ROAD BLOCKS TO EFFICIENCY

1. San Francisco International Airport
2. Newark Liberty International Airport
3. Chicago O’Hare International Airport
4. New York La Guardia Airport
5. Denver International Airport
6. Houston – George Bush Intercontinental Airport
8. Boston Logan International Airport
9. Dallas/Ft. Worth International Airport
10. Philadelphia International Airport

Source: The Weather Channel
GLS is a non-government supported program in the United States
KSFO/SFO
SAN FRANCISCO, CALIF
GLS P Rwy 10L

MISSED APCH: Climb to 4000', direct DUMBA, and hold.

1. GPS Required.
2. VOR/DME and GLS glidepath not coincident.

CONCEPT CHART TEST PURPOSES ONLY

END OF AUTO

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Current SFO Closely Spaced Parallel Runways
Adjustable GBAS Glide Slope Mitigates Wake Turbulence Issues

28R
3.25 degrees

28L
3 degrees
Team assembled and began creating approaches.

Flew conceptual approaches in Boeing Cab Seattle. Made adjustments.

Engaged SFO Airport in participating in Demo.

Completed Risk Assessment and obtained funding for demonstration flight.

Met with ATC to discuss demo flight plan.

Obtained approval to operate GBAS at SFO Airport.

Flew approaches in full motion simulator.

Demonstration Day August 27, 2016.
Flight time: 3 hours 30 minutes

Total miles flown: 761 nautical miles

Courtesy: Flightaware.com
Post Demonstration
United Airlines is committed to GLS

Largest US carrier equipped with GLS

Over 177 Boeing 737’s and 787’s equipped with GLS

On a given day over 50% of arrivals to hub airports could be GLS equipped
**Fleet Update**

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- United has 7 GLS capable Level D full motion simulators.
- 24% of United’s worldwide fleet equipped with GLS.
- With current order book will have 210 GLS equipped aircraft by 2020.
- GLS installed on 737Max10 (2018) and Airbus 350 (2022).
What is next for GLS?

Both United and Delta are:

Obtaining permission to fly to Category II minima

Auto land capability

Identifying other hub airports where GLS would increase efficiency
Thank You!