



SFO GBAS System, Strategic Vision Community Outreach

SFO Roundtable Briefing
April 5, 2023

SFO

Ground Based Augmentation System (GBAS)

GBAS receives information from Global Positioning System (GPS), and Wide Area Augmentation System (WAAS), to enhance existing approaches or create new precision approach paths

GBAS By the Numbers

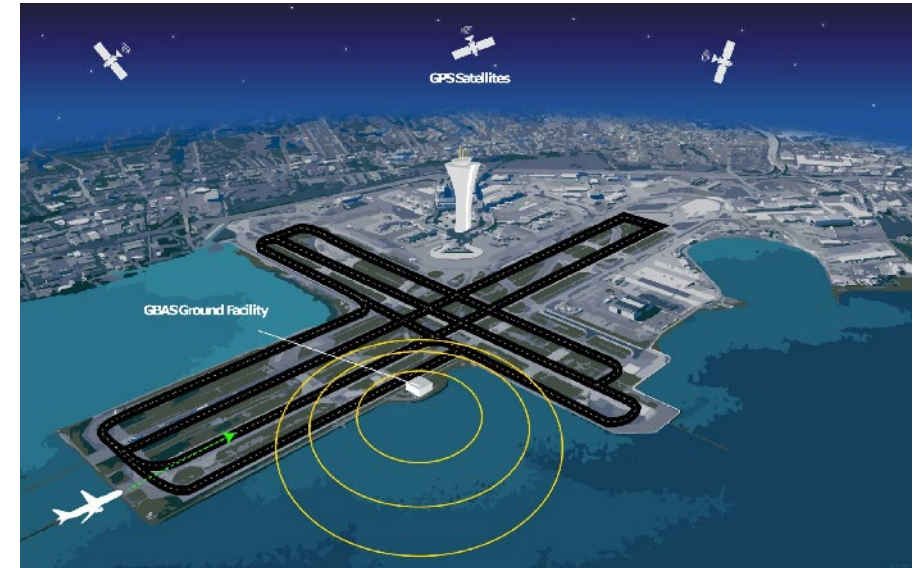
48 Unique GBAS Landing System (GLS) approach procedures per site

4 GPS receiving antennas installed on the airport

23 Nmi is the maximum range of GBAS navigation enhancement

10 Nmi is the US extent of GBAS precision approach augmentation

30% Percentage of daily flights capable of GLS at SFO in 2023 and rising



<https://www.flysfo.com/community/noise/making-sfo-quieter/sfos-initiatives-tackle-noise>



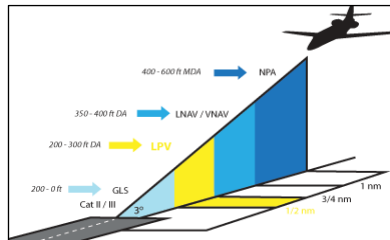
1. Reduce Noise Impact to the Community

- GLS, and RNP to GLS, allows innovative procedure design resulting in unique flight tracks and increased operational altitudes.



2. Create Redundant ILS Capabilities

- Allows continued ILS like operations during airport construction and equipment outages



3. Enhance Efficiency

- Single GBAS can support multiple runway ends steeper approaches and reduced track miles via RNP to GLS leading to reduced fuel burn and GHG



4. Reduce Delays

- Closely Spaced Parallel Runway Operations (CSPR) and CAT I/II/III Capabilities to runways that do not currently have ILS.

SFIA GBAS Strategic Vision

SFO GBAS Project Team Estimated Implementation Date for Procedure Group

2022	2023/24	2025/26*	2026-28**	2030+**
<p>Gain Experience (Overlays)</p> <p>Overlay Approaches</p> <p>Stakeholder Training and Operations</p> <p>Maintain Non-Federal NAVAID</p>	<p>Expand Capabilities (Group 1)</p> <p>Down the Bay Approach</p> <p>Higher GPA Approaches</p> <p>GLS in CSPR</p> <p>Autopilot to Touchdown</p>	<p>Increase Utilization</p> <p>Nighttime GLS Ops</p> <p>Implement A-RNP with GLS</p>	<p>Innovate & Improve (Group 2B)</p> <p>Utilize SFO A-RNP and GLS in Multiple Airport Route Separation (MARS) for Bay Area Airports</p> <p>Enhanced Dispersion with TBFM for SFO</p> <p>Enhanced Dispersion with TBFM for Bay Area</p>	<p>Innovate & Improve (Group 3)</p> <p>Virtual Displaced Threshold</p> <p>Terminal Area Path (GLS Precision for Aircraft Separation)</p> <p>Automated Dispersion (with TAP)</p> <p>GLS CAT III</p>

FAA ATCT Staffing/Technology

Measure Utilization, System Availability, Noise, ATCT Feedback and Pilot Feedback

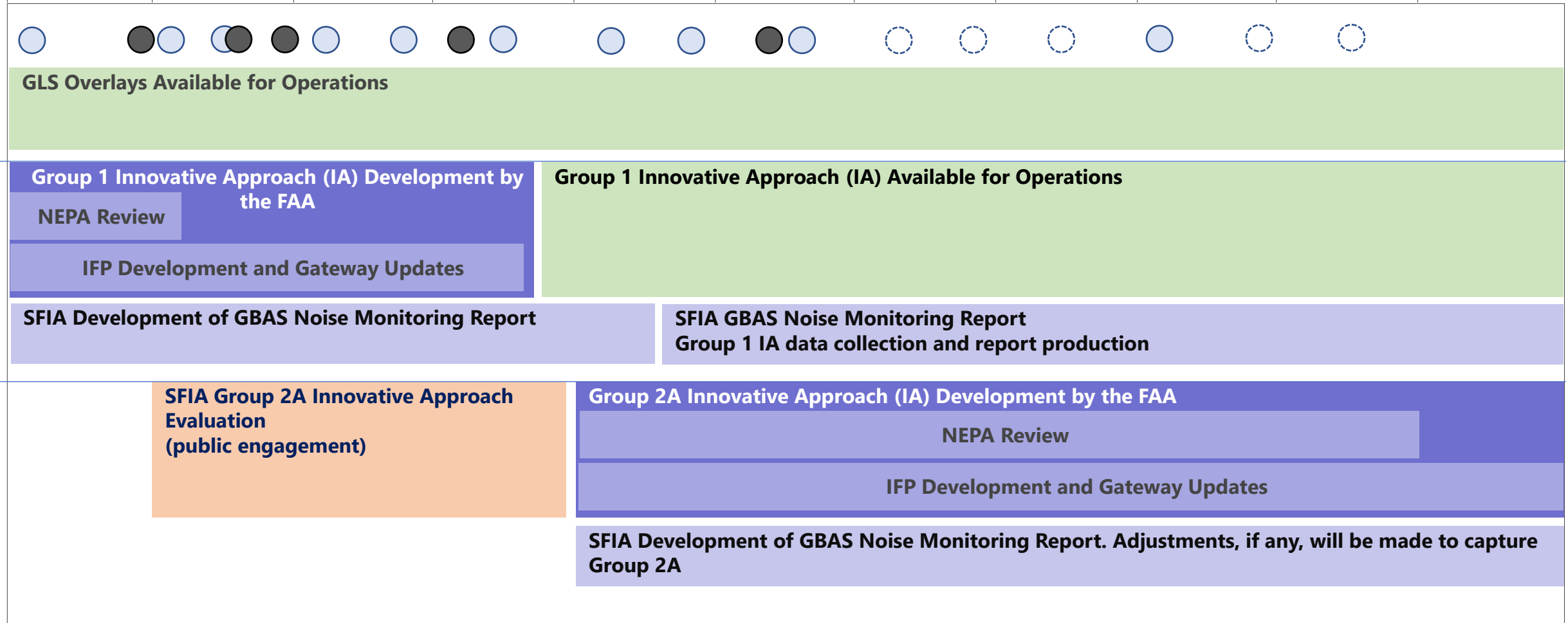
Collaborate Research, Technology, Criteria, Infrastructure and Experience through interactions with FAA, Global Aviation Community, Academia and Residents of the Bay Area

* Timelines are estimated and may change due to FAA resource availability

**GLS CAT II in 2025/26 and CAT III in 2030+ is a reflection of SFO desired timeline and may be delayed

SFIA GLS Procedure Development Schedule and Planned Outreach

Q1 2023 | Q2 2023 | Q3 2023 | Q4 2023 | Q1 2024 | Q2 2024 | Q3 2024 | Q4 2024 | Q1 2025 | Q2 2025 |2025/26



● SFO Roundtable TWG presentation
 ● SFO Roundtable TWG update
 ● Other Public Presentation (LATO/IGWG, and others)

Timeline for Group 2A Procedure Information

21MAR23	First version of Group 2A CFPPs uploaded to noise.flysfo.com website
07APR23	Detailed effected population information (by Procedure, by City) uploaded to noise.flysfo.com
07APR23	Interactive noise contour information (map based SEL and LMAX) uploaded to noise.flysfo.com
28APR23	Interactive population information (map based) uploaded to noise.flysfo.com
APR23 – DEC23	Obtain feedback, receive additional Group 2A/2B/3 procedure suggestions/modifications



THANK YOU

SFO

Questions?



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Expand Capabilities: Group 1 Innovative GLS Procedures Rwys 28L/28R

GLS Updates in the IFP Gateway

GLS T RWY 28R, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS U RWY 28R, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS W RWY 28R, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS X RWY 28R, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS Y RWY 28L, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS Y RWY 28R, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS Z RWY 28L, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA
GLS Z RWY 28R, ORIG	SAN FRANCISCO INTL	SFO (KSFO)	SAN FRANCISCO, CA	11/30/2023	Pending		Email FAA

FAA IFP Gateway SFO IFP Production Plan 15MAR23

← GLS-BVE Rwy 28R

← GLS-R Rwy 28R

← GLS-DB Rwy 28R

← GLS-BV Rwy 28R

← GLS-TT Rwy 28L

← GLS-TT Rwy 28R

← GLS Rwy 28L

← GLS Rwy 28R

24 Concepts were identified, 12 were converted to CFPP, 8 are currently under FAA development

SFIA will be required to monitor the utilization, performance and noise of the procedures for at least 1 year following implementation

SFIA GBAS Project Team has updated CFPP Flight Inspection Graphics to reflect FAA approach ident

Updates to CVFP permitting increased GLS usage when cleared to a "named" visual approach will occur after this publication cycle ([see backup materials for more information](#))

SFIA GBAS Flight Procedures Subcommittee has developed the following Group 2A GLS concept approaches for public evaluation

1. GLS CAT II Rwy 28R* – Addition of CAT II minimums to current GLS overlay approach on Rwy 28R
2. GLS CAT II Rwy 19L – Addition of CAT II minimums to current GLS overlay approach on Rwy 19L
3. GLS SB Rwy 19L - New approach to Rwy 19L which overlays vector path used heavily by NCT during Southeast Flow
4. GLS DB1 Rwy 28R – Roundtable suggested procedure
5. GLS OW1 Rwy 28R – Roundtable suggested procedure
6. GLS OW2 Rwy 28R – Roundtable suggested procedure

*GLS CAT II Rwy 28R CFPPs divided into ARCHI and EDDYY transition