Metroplex

An Update on Southern California Airspace Modernization November 10, 2016 Chart Publication Date Long Beach Daugherty, John Wayne Orange County, Los Alamitos, Fullerton Municipal and Zamperini Field Airports

October 17, 2016



We Must Modernize











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SoCal Metroplex Study Area

- Scope: Six major airports and 15 satellite airports:
 - Bob Hope Airport (BUR)
 - Los Angeles International Airport (LAX)
 - Long Beach Airport (LGB)
 - Ontario International Airport (ONT)
 - San Diego International Airport (SAN)
 - John Wayne-Orange County Airport (SNA)
- Other airports include but not limited to:
 - McClellan-Palomar Airport (CRQ)
 - Palm Springs International Airport (PSP)
 - Santa Monica Municipal Airport (SMO)
 - Van Nuys Airport (VNY)



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SoCal Metroplex Overview

- Goals include improving flexibility and predictability of air traffic routes through increased use of performance based navigation (PBN)
- Improvements will be achieved by utilizing satellite technology and publishing and implementing advanced procedures
 - Area Navigation (RNAV)
 - Standard Terminal Arrivals (STARs)
 - Standard Instrument Departures (SIDs)
 - Required Navigation Performance (RNP) Approach procedures
 - Optimized Profile Descent (OPD)

SoCal Metroplex Terms

- Area Navigation (RNAV) A method of navigation that mitigates the limitations of an aircraft navigating from one ground based navigational aid to a satellite system providing point to point operational capabilities
- Standard Terminal Arrival Route (STAR) A specific repeatable path with lateral and often vertical descent guidance for arrivals to an airport
- Standard Instrument Departure (SID) A specific repeatable path with lateral and often vertical climb guidance for departures from an airport
- Required Navigation Performance (RNP Approach) Approach providing a higher level of precision than an approach using ground based navigation
- Optimized Profile Descent (OPD) A procedure that keeps arrival aircraft at cruise altitude as long as possible before beginning a uninterrupted descent. Once begun, the procedure departs from the usual pattern of stair step descent all the way down to landing

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SoCal Metroplex Phases

- Study Team Phase (Complete December 2011)
 - Potential opportunities and operational issues are identified to determine if a benefit can be developed through the application of Performance Based Navigation (PBN) procedures and airspace changes
 - · These designs are highly conceptual
- Design Team Phase (Complete March 2014)
 - This phase is used to refine the Study Team recommendations and conceptual designs
 into final, implementable PBN procedure and airspace designs
- Evaluation Phase (Complete August 2016)
 - The proposed procedures are evaluated to determine if they meet operational, environmental and safety requirements
- Implementation Phase (Began August 31, 2016)
 - After issuance of a FONSI/ROD, activities in this phase are to complete and execute the implementation of the procedures developed during the previous phase(s)

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DESIGN PRINCIPLES

Departure and Landing Direction Runway Use

- Wind direction and velocity are key factors used to determine departure and landing direction
- Wind speed below five knots is negligible
- Runways are typically identified by their runway magnetic direction
 - Example: The west flow runway at San Diego International Airport (SAN) is 275 degrees magnetic
 - The last digit is dropped and it becomes SAN Runway 27
- The rationale for a headwind is more wind flowing over the wings provides more lift at a lower ground speed
 - A tailwind makes an aircraft faster across the ground requiring more runway length
- Southern California airports typical experience westerly winds which favors west operations



Optimized Profile Descent Example (Arrival)



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Vectoring Example

- Current arrival procedures utilize ground based navigation and radar vectors
 - High workload for air traffic controllers and flight crew
 - Inconsistent flight paths create wide dispersion for arriving traffic
 - Inconsistent vertical profiles
 - Altitudes assigned by air traffic control
 - Arrival procedure not connected to approach



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RNAV RNP Example

- RNAV STAR connects an arrival route to an RNAV RNP approach procedure
- STAR/Approach connectivity provides repeatable and predicable flight paths
 - Simplifies operations for flight crews and ATC
 - Allows use of flight-deck automation
 - Stabilized and efficient approach operations



Optimized Climb Profile Example (Departure)



Summary of Qualitative Benefits

- Reduced ATC task complexity
- Reduced communications (flight deck and controller)
 - Reduced phraseology
 - Reduced frequency congestion
- Reduced pilot workload
- Repeatable, predictable flight paths
- Accurate fuel planning
- Laterally or vertically segregated flows



NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

SoCal Environmental Assessment (EA)

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- The Environmental process began with Study Team participation in November of 2011
- Draft EA released June 10, 2015
 - Public comment period was open for 120 days
- Finding of No Significant Impact/Record of Decision (FONSI/ROD) signed August 31, 2016
- Final EA is available on the SoCal Metroplex website

SoCal Decision Document

- FONSI/ROD enables the agency to move forward with replacing dozens of existing conventional air traffic control procedures with new satellite-based procedures
- FAA is working to phase in use of the procedures, starting in November 2016 and continuing through April 2017
- The agency will conduct additional informational briefings to inform the public of the project at each phase

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SoCal Environmental Information

- When the Southern California Metroplex procedures are implemented, some people might see aircraft where they did not previously fly. This is because some air route changes will occur, and because satellite-based procedures create more concentrated flight paths than conventional procedures
- Some people will experience noise decreases or increases and some will experience no changes at all
- Some flight track dispersion will continue to occur after the new procedures are implemented because the Metroplex project includes a number of existing procedures
- Also, air traffic controllers will need to occasionally vector aircraft for safety or efficiency reasons or to reroute them around weather systems

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SoCal Metroplex Noise Maps

- The following noise maps are created to enhance the understanding of all potential noise changes in the study area
- Please note that many of these changes occur at noise levels at or below the noise level experienced in everyday living situations in the area
- Noise maps represent noise changes of DNL* +/-1 dB
 For many people, this small change is difficult to distinguish
- FAA did not use these maps for decision purposes
- Noise maps are provided for disclosure purposes only

*Day-Night Average Sound Level (DNL) is the 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m., and midnight, local time.



Increase/Decrease in DNL At or Above DNL 45 dBA



Earl HERE, DeLorme, Mapmyindia, @ OyenStreetMap contributors, and the SIS user of

results for grid points representing Section 4(f) resources and National Register listed historic resources are available in Appendix B to the SoCal Metroplex Noi Technical Report released on September 2, 2016. All noise analysis results released on September 2, 2016 are available in Google Earth format available for download at http://www.metroplexenvironmental.com. Based on requirements depicted in FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures", the noise impact analysis evaluates significant and

Based on requirements depicted in FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures", the noise impact analysis evaluates significant and reportable changes in DNL at levels equal to or higher than DNL 45 dB. Noise analysis results for the SoCal Metroplex Project EA indicate that the Proposed Action, when compared to the No Action Alternative, would not result in any significant impacts (i.e., a day-night average sound level [DNL] 1.5 dB increase in areas exposed to DNL 65 dB or higher) or reportable noise increases (i.e., DNL increases of 3 dB or more in areas exposed to aircraft noise between DNL 60 dB and 65 dB or DNL increases of 5 dB or greater in areas exposed to aircraft noise between DNL 45 dB and 60 dB).

Increase/Decrease in DNL At or Below DNL 45 dBA



Earl HERE, DeLarme, Magnyridta, & OperGreetMap contribution, and the GEL use

Based on requirements depicted in FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures", the noise impact analysis evaluates significant and reportable changes in DNL at levels equal to or higher than DNL 45 dB. Noise analysis results for the SoCal Metroplex Project EA indicate that the Proposed Action, when compared to the No Action Alternative, would not result in any significant impacts (i.e., a day-night average sound level [DNL] 1.5 dB increase in areas exposed to DNL 65 dB or higher) or reportable noise increases (i.e., DNL increases of 3 dB or more in areas exposed to aircraft noise between DNL 60 dB and 65 dB or DNL increases of 5 dB or greater in areas exposed to aircraft noise between DNL 45 dB and 60 dB).



COMMUNITY ENGAGEMENT

SoCal Community Engagement

- Early Notification of EA January 21, 2014
- FAA conducted 11 public workshops: June 16 through July 1, 2015
 - Santa Ana, Santa Monica, Los Angeles, San Diego, Palm Springs, Torrance, Long Beach, Ontario, Ventura, Santa Barbara, and Burbank
- FAA extended public comment period for total of 120 days (October 8, 2015)
- Approximately 4,000 individual substantive comments received
 - Approximately 2,700 unique comment/form letters received
 - Approximately 380 comments received after public comment closed
 - Approximately 570 comments were received from three online community groups
 - Responses to comments are included in the environmental assessment

Community Engagement

- Based on community comments the FAA reviewed all procedures
- Analysis consisted of reviewing the following:
 - Safety
 - Will the change have an adverse impact on safe operations?
 - Team considered Aviation Safety Information Analysis and Sharing data with potential relevance to airspace, procedures and enhancement of safety:
 - Traffic Collision Avoidance System hotspots
 - Terrain Avoidance Warning System alerts
 - High energy descent/approach events
 - Efficiency
 - Will the change create substantial inefficiencies?
 - Complexity
 - Will the change increase workload beyond a reasonable level for controllers or flight crews?

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NOVEMBER 10, 2016 PROCEDURE IMPLEMENTATION

Procedures for November 10, 2016

Group One Publication November 10, 2016

LGB RNAV RNP RWY 12	LGB, SNA, SLI, FUL and TOA KAYOH6 STAR (conventional amendment)	
LGB RNAV RNP RWY 25R	SNA RNAV RNP Z RWY 20R	
LGB RNAV RNP RWY 30	SNA RNAV RNP RWY 02L	
LGB GPS RWY 30		
Future Chart Dates		
January 5, 2017		
	January 5, 2017	
	January 5, 2017 March 2, 2017	

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Map of November 10, 2016 Procedures





LONG BEACH DAUGHERTY AIRPORT (LGB)

LGB RNAV RNP RWY 12



Long Beach Daugherty Airport (LGB) Instrument Approach Publication: RNAV (RNP) Nov 10, 2016

- A Required Navigation Performance (RNP) approach provides a higher level of precision, providing a more repeatable and predictable path for LGB arrivals
- The BAUBB, PCIFC and DSNEE STARs are designed to join the RNP approach increasing efficiency
 - + The LGB ROOBY STAR will require a radar vector to the approach
- The approach is assigned by ATC to properly equipped jet and high performance turboprop aircraft with qualified aircrews



LGB RNAV RNP RWY 25R



Long Beach Daugherty Airport (LGB) Instrument Approach RNAV (RNP) RWY 25R Publication: Nov 10, 2016

- A Required Navigation Performance (RNP) approach provides a higher level of precision, providing a more repeatable and predictable path for LGB arrivals
- The BAUBB, PCIFC and DSNEE STARs are designed to join the RNP approach increasing efficiency
 - The LGB ROOBY STAR will require a radar vector to the approach

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• The approach is assigned by ATC to properly equipped jet and high performance turboprop aircraft with qualified aircrews

LGB RNAV RNP RWY 30



Long Beach Daugherty Airport (LGB) Instrument Approach RNAV (RNP) RWY 30 Publication: Nov 10, 2016

- A Required Navigation Performance (RNP) approach provides a higher level of precision, providing a more repeatable and predictable path for LGB arrivals
- The BAUBB, PCIFC and DSNEE STARs are designed to join the RNP approach increasing efficiency
 - The LGB ROOBY STAR will require a radar vector to the approach

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 The approach is assigned by ATC to properly equipped jet and high performance turboprop aircraft with qualified aircrews

LGB GPS RWY 30



Long Beach Daugherty Airport (LGB) Instrument Approach GPS RWY 30 Publication: Nov 10, 2016

• This approach was modified to incorporate Metroplex waypoints in order to provide continuity



LGB KAYOH 6 Conventional STAR Amendment



Long Beach Airport (LGB)	
STAR (Arrival)	
КАҮОН 6	
Publication:	
KAYOH 6, November 10, 2016	

 This conventional STAR was modified to incorporate Metroplex waypoints in order to provide continuity



JOHN WAYNE ORANGE COUNTY AIRPORT (SNA)



SNA RNAV RNP Z RWY 20R



SNA John Wayne- Orange County Airport (SNA) Instrument Approach RNAV (RNP) Z RWY 20R Publication: RNAV (RNP) Nov 10, 2016 TILLT OHSEA APR 27, 2017

- RNAV RNP approaches provide a repeatable and predictable path with precise vertical and lateral guidance
- RNP approaches are assigned by ATC to properly equipped jet and high performance turboprop aircraft with qualified aircrews
- Inbound aircraft from the east would be vectored to join the approach by ATC

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SNA RNAV RNP RWY 02L



John Wayne- Orange County Airport (SNA) Instrument Approach RNAV (RNP) RWY 02L Publication: RNAV(RNP) Nov 10, 2016 ROOBY MAR 2, 2017 TILLT, OHSEA APR 27, 2017

- RNAV RNP approaches provide a repeatable and predictable path with precise vertical and lateral guidance
- RNP approaches are assigned by ATC to properly equipped jet and high performance turboprop aircraft with qualified aircrews
- The SNA TILLT, OHSEA and ROOBY RNAV STARS connect to the RNP approach
- Arrivals from the east on the LGB/SNA DSNEE will not utilize RWY 02L



SNA KAYOH 6 Conventional STAR Amendment



John Wayne- Orange County Airport (SNA) STAR (Arrival) KAYOH 6 Publication: KAYOH 6, November 10, 2016

• This conventional STAR was modified to incorporate Metroplex waypoints in order to provide continuity

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LOS ALAMITOS AIRPORT (SLI) FULLERTON MUNICIPAL AIRPORT (FUL) ZAMPERINI FIELD (TOA)

SLI, FUL and TOA KAYOH 6 Conventional STAR Amendment



Fullerton Municipal Airport (FUL) Zamperini Field Airport (TOA) Los Alamitos Army Airfield (SLI) STAR (Arrival) KAYOH 6 Publication: KAYOH 6

• This conventional STAR was modified to incorporate Metroplex waypoints in order to provide continuity.





ENVIRONMENTAL AND PROJECT INFORMATION

Environmental and Project Information

- This briefing is for informational purposes and does not reopen the SoCal Metroplex Environmental
- No changes have or will take effect before November 10, 2016
- Noise issues should be directed to the appropriate airport noise office
- Information about the SoCal Metroplex Project is available on the Metroplex site
- This presentation will be available on-line
- Education information will be available in coming weeks



Additional Public Information

- Before publishing the procedures, the agency will conduct additional public information meetings and webinars to further inform people about the changes
- The FAA will announce the upcoming public outreach to select officials, in press releases and on Facebook, Twitter, Instagram, the Metroplex website and possibly other platforms too

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Community Engagement

Meeting	Date and Location
Community Pre-implementation (Webinar)	October 17, 2016, 6:00 PM (SBA, BUR, PSP, ONT and VNY)
Community Pre-implementation (Webinar)	October 17, 2016, 8:00 PM (SAN, CRQ, SDM and NZY)
Community Pre-implementation (Webinar)	October 18, 2016, 6:00 PM (LGB, SNA, SLI, FUL and TOA)
Community Pre-implementation (Webinar)	October 18, 2016, 8:00 PM (SAN, CRQ, SDM and NZY)
Community Pre-implementation (Webinar)	October 20, 2016, 6:00 PM (LAX and SMO)
Community Pre-implementation (Webinar)	October 20, 2016, 8:00 PM (SBA, BUR, PSP, ONT and VNY)
Community Informational Briefing	October 25, 2016 D.W. Griffith Middle School (LAX)
Community Informational Briefing	October 26, 2016 Palms Middle School (SMO/Culver City)
Community Informational Briefing	October 27, 2016 Liberty Station-Corky McMillin Event Center (SAN)
Community Informational Briefing	November 1, 2016 6:00 – 9:00 PM (La Presa Middle School, 1001 Leland Street, Spring Valley, CA 91977)
Community Informational Briefing	November 2, 2016 6:00 – 9:00 PM (El Modena High School at 3920 E. Spring Street Orange, CA 92869)



SOCAL METROPLEX WEBSITE INFORMATION

Website Links (1 of 2)

SoCal Environmental Assessment Website

<u>http://www.metroplexenvironmental.com/socal_metroplex/socal_introduction.html</u>

SoCal Metroplex Frequently Asked Questions

<u>http://www.metroplexenvironmental.com/socal_metroplex/socal_questions.html</u>

SoCal Metroplex Documents (EA and Google Earth)

<u>http://metroplexenvironmental.com/socal_metroplex/socal_docs.html</u>



Website Links (2 of 2)

Final Environmental Assessment Appendix F:

Volume 1 (Responses to public comments)

 <u>http://metroplexenvironmental.com/docs/socal_metroplex/final/SoCal_Metroplex_FEA_A</u> ppendix_F-Vol_I.pdf.pdf

Volume 2 (Responses to public comments)

 <u>http://metroplexenvironmental.com/docs/socal_metroplex/final/SoCal_Metroplex_FEA_A</u> ppendix_F-Vol_II.pdf

Volume 3 (Responses to public comments)

 <u>http://metroplexenvironmental.com/docs/socal_metroplex/final/SoCal_Metroplex_FEA_A</u> ppendix_F-Vol_III.pdf



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Questions ?



