City of Phoenix
AVIATION DEPARTMENT

September 20, 2016

Glen A. Martin
Regional Administrator
U.S. Department of Transportation
Federal Aviation Administration
Western-Pacific Region
Office of the Regional Administrator
P.O. Box 92007
Los Angeles, CA 90009

Re: Supplement to City of Phoenix's Formal Request to Reinitiate Consultation Under the National Historic Preservation Act and Section 4(f) of the Department of Transportation Act

Dear Mr. Martin:

On behalf of the City of Phoenix (City), I am submitting this supplement to the City's July 8, 2016, formal request to the Federal Aviation Administration (FAA) to reinitiate consultation under the National Historic Preservation Act (NHPA) and Section 4(f) of the Department of Transportation Act (Section 4(f)) regarding the impacts of area navigation (RNAV) routes at Phoenix Sky Harbor International Airport (PHX). On July 29, 2016, FAA acknowledged receipt of City's formal request submitted by Michelle Dodds, the Historic Preservation Officer for the City of Phoenix. FAA stated that it would reply to the City's request within 45 days. Since that time, the City has secured additional information further demonstrating the need for FAA to reinitiate consultation under the NHPA and Section 4(f). We request that FAA consider this additional information in making its determination on the City's formal request, and the City reserves the right to submit additional information concerning the impacts of the RNAV routes.

I. The City's Monitoring Data Continues To Show That FAA Is Regularly Vectoring Aircraft Off The RNAV Routes And Over Noise Sensitive Areas Causing Impacts That FAA Has Not Evaluated And Addressed.

In the two months since the City submitted its formal request to reinitiate consultation, the City has continued to monitor the effects of FAA's RNAV route implementation on

historic properties and parks protected by the NHPA and Section 4(f). The City's monitoring shows that FAA continues to not operate the RNAV procedures pursuant to the maps published in September 2014 and the noise analysis for it. Actual radar tracks do not resemble the RNAV routes that FAA reviewed in its evaluation of environmental and historic impacts, nor are they consistent with the routes published and presented to the State Historic Preservation Officer (SHPO), the City, and others. When FAA sought the SHPO's concurrence of FAA's finding of no adverse effect in 2013, FAA represented that the RNAV routes would be flown consistent with FAA's noise modeling of the routes in its review under the NHPA, Section 4(f), and the National Environmental Policy Act (NEPA). However, the vast majority of the time on the LALUZ, FTHLS, BNYRD and KATMN routes, FAA continues to vector aircraft off the RNAV routes, causing new, significant and unexamined impacts to historic areas and parks in north-central Phoenix and the City's South Mountain Park and Preserve (SMPP). FAA never evaluated the routes actually being flown the majority of the time. In short, FAA is not using the routes it mapped and modeled, but instead is using part of the RNAV routes and then regularly vectoring aircraft off of them at points that have created new use of the airspace.

As detailed in the City's formal request, under the NHPA, "[i]f the agency official will not conduct the undertaking as proposed in the finding, the agency official shall reopen consultation . . . ." 36 C.F.R. § 800.5(d), and if "unanticipated effects on historic properties [are] found after the agency official has completed the section 106 process . . . the agency official shall make reasonable efforts to avoid, minimize or mitigate adverse effects to such properties . . . ." *Id.* § 800.13(b). FAA must reinitiate consultation with the SHPO, the City, affected Native American nations, and others to address the consistently and frequently vectored routes and the routes' negative impact on the City's historic properties and parks. Reinitiation of consultation is an essential step towards rectifying FAA's still inexplicable failure to consult with the City before implementing the RNAV routes in 2014, as required by the NHPA. *Id.* § 800.2(c)(3)

The City's recent monitoring shows that vectoring aircraft off the RNAV routes after only their first or second waypoint is now an established and ongoing practice at PHX, as opposed to an occasional deviation. FAA has very recently acknowledged in the case of the Southern California Metroplex that it will sometimes vector aircraft off of RNAV routes. However, here, a *majority* of northwest and southwest departures (on the LALUZ, FTHLS, BNYRD and KATMN RNAV routes) are consistently vectored early in corridors that are significantly different than the "precision" published RNAV routes. The vectoring of routes consistently and frequently places aircraft over historic neighborhoods and parks instead of following the published RNAV routes which were designed to follow designated corridors, such as freeways and open dessert. Yet in stark contrast to FAA's environmental assessment for the Southern California Metroplex which considered vectoring in at least 700 distinct locations, FAA's environmental analysis of RNAV routes at PHX did not address the vectoring of routes. And, because

the points of departure from the RNAV route are different from how aircraft were vectored prior to the RNAV routes, the actual flight tracks and noise impacts are fundamentally different than what had existed prior to the RNAV routes. For instance, the City's monitoring of the radar tracks for the LALUZ SID demonstrates that more than 97 percent of all flights are vectored off the published RNAV route to the FORPE waypoint. The same is true to the south, resulting in constant overflights of the SMPP. As shown by the maps included with the City's formal request, FAA's ongoing practice of vectoring flights off the RNAV routes is directing heavy air traffic over important historic sites and parks that was not been analyzed by FAA in its RNAV implementation.

FAA's vectoring off the RNAV routes has establish departing flights to the southwest that are now flying directly over most of the SMPP, an important NHPA property for which FAA did not consult with the SHPO or the City regarding potential noise impacts on the defining characteristics of SMPP—including quietude, an integral aspect of its historical significance. The United States District Court for the District of Arizona very recently acknowledged the Section 4(f) status of the SMPP and the extensive consultation and mitigation the Federal Highway Administration (FHWA) had to conduct for the South Mountain Freeway project. *Protecting Arizona's Resources and Children, et al. and Gila River Indian Community v. FAA*, Case Nos. CV-15-00893-PHX-DJH & CV-15-01219-PHX-DJH (D. Ariz. Aug. 19, 2016). FAA did none of the analysis that FHWA did under the same Section 4(f) and NHPA provisions applicable to FAA.

As an indication of the noise impacts, we have experienced a recent, unprecedented number of noise complaints from residential areas just south of the SMPP, which demonstrates that vectoring off the RNAV routes is affecting the SMPP and surrounding areas that had not previously experienced any significant noise from overflights. For instance, in two zip codes from the Ahwatukee Foothills area next to the SMPP, there has been a significant spike in complaints during January to August 2016 from the same 8-month period in 2015. In zip code 85045, complaints increased from 19 noise complaints from January to August 2015 to 2,690 complaints during the same months in 2016. Zip code 85048 experienced a similar surge of complaints in 2016, increasing from 241 noise complaints during January to August 2015 to 4,891 complaints during the same months in 2016. The impacts to SMPP and other NHPA and Section 4(f) properties require reinitiation of consultation under the NHPA and Section 4(f).

II. FAA's August 11, 2016, FOIA Response Shows That FAA's Practice Of Vectoring Off The RNAV Routes Has Not Been Subjected To Required Environmental And Safety Reviews.

FAA has failed to conduct a review of its policy of vectoring aircraft off the RNAV routes, despite that it has become an established practice and that the deviated flight tracks are causing new, significant noise impacts. As the City detailed in its formal request, the City's monitoring for the first half of 2016 indicates that use of the mapped RNAV routes as charted has been as low as 5% on certain routes, with the vast majority of flights being vectored off the RNAV route by air traffic control. Following the City's formal request, it received a response from FAA to the City's May 16, 2016, Freedom of Information Act (FOIA) request for (1) any FAA policy or procedure with respect to aircraft vectoring off of RNAV departure routes at PHX, and (2) any records relating to FAA's environmental and safety review of those deviations. *See* Attachment 1, City's FOIA Request; *see also* Attachment 2, FAA FOIA Response dated August 11, 2016. FAA confirmed that there are *no documents* reflecting a policy decision or procedure established by FAA to vector off the northwestern or southwestern RNAV routes.

Also, FAA informed the City that there are *no records* of any environmental review of the altered routes or any safety management systems (SMS) or safety risk management (SRM) review of the practice of vectoring off routes. The lack of any analysis, environmental or safety, of FAA's practice is astonishing given that some RNAV routes have been consistently modified to the extent that they are effectively a new route, flying over a new area of the City, and causing new noise impacts. It is especially concerning, because FAA has repeatedly asserted to the City, Arizona's Congressional Delegation, and the broader community that the RNAV routes are necessary and unable to be adjusted because they optimize safety in the airspace and minimize controller workload. FAA's April 2015 letter to the City and Post-Implementation Assessment Report emphasized that reducing controller workload and communications between controllers and pilots to ensure safety and efficiency was a key factor in its assessment of alternatives to the RNAV routes. *See* Attachment 3, Post-Implementation Assessment Report at 3 ("Safety and efficiency are improved with immediate course divergence due to repeatable, predictable flight paths."). In fact, the negative effects on safety and efficiency that are now caused by consistently vectoring off RNAV routes were precisely the grounds on which FAA rejected certain alternatives in the Post-Implementation Assessment Report. *Id.* at 9 (rejecting reversion to pre-RNAV routes as it "would increase controller task complexity, inhibit airport departure rates, and fail to ensure an equivalent level of safety"). Thus, FAA's excuses for non-action to the public are disingenuous to the extent that FAA itself is creating or tolerating enhanced workloads and deviation from the supposedly ideal routes for safety, all with no SRM. Either

FAA's prior representations have been false or it has created and is tolerating enhanced and unexamined safety risks.

FAA's continuing practice violates the NHPA, Section 4(f), and NEPA, and conflicts with the requirements of objectives of FAA, SMS guidelines, including Order JO 1000.37A, Air Traffic Organization Safety Management System, which "gives the responsibility for owning and executing the SMS to all employees at all levels of the ATO, from the ATO Chief Operating Officer (COO) to the individual air traffic controllers . . . ." Order JO 1000.37A at 1-1. To ensure the highest level of safety, FAA must conduct an adequate SMS review of the practice of vectoring off the RNAV routes at PHX. FAA also must reinitiate consultation to analyze its practice of vectoring off the RNAV routes and the resulting new impacts to the City's historic properties and parks.

III. FAA's Continuing Failure To Engage The Public And Reduce Impacts.

FAA must address and resolve the impacts of its RNAV routes and its policy of vectoring off the RNAV routes. To date, it has not done so.

FAA Administrator Michael Huerta told community members in Phoenix on July 22, 2016, that FAA is still willing to consider some modifications to the RNAV routes if the City were to develop a community roundtable. Administrator Huerta acknowledged that, in its development of the RNAV routes in Phoenix, FAA "did not do it right."

However, when I followed up with Administrator Huerta on July 29, he made clear to me that the FAA would only be willing to consider the changes to the RNAV routes as outlined in your letter of July 1, 2015 to Ed Zuercher. Administrator Huerta indicated that there would be no consideration of the use of the legacy western departure corridors for possible nighttime community noise relief.

Such arbitrary limitations on the scope of possible modifications are disingenuous and unreasonable, especially given that FAA's constant vectoring off of the RNAV routes places practical routes several miles from the published route without any safety or environmental review. There is no safety, environmental or other reason why FAA cannot look at more extensive changes; it simply refuses to do so. Continuing its double standard with regard to its treatment of Phoenix, FAA did make more extensive changes in response to community concerns in the Southern California Metroplex (*see* http://www.metroplexenvironmental.com/docs/socal_metroplex/final/Socal_Metroplex_FEA_Complete.pdf.pdf at 3-29 to 3-30, 3-38 to 3-40) and has committed to evaluating changes without such restrictions in Northern California.

There is no point to initiating and investing in an extensive community roundtable process when FAA predetermines the scope of possible changes to a point where there

would be no room for significant improvement. The appropriate time for community involvement was *before* FAA's implementation of the RNAV routes, where, under the NHPA, Section 4(f), and NEPA, FAA had a legal obligation to involve City and community in assessing the impacts of the RNAV routes. Spending considerable resources, months to years of time, and the public's trust on a process that is structured to fail makes no sense and the City is not prepared to do so.

The City has no interest in going down the same path of false promises as it did in early-2015, when Administrator Huerta committed to involving the City as an "important player" in the PBN Working Group, but then excluded the City from providing any meaningful input to address and minimize the noise impacts of the RNAV routes.

Further, FAA's condition that it would look at even an inadequate range of changes only if the City initiates roundtables is inconsistent with its legal obligations and poor public policy. FAA, not the City, is responsible for the RNAV route implementation and the noise effects that have been caused by it. FAA has the legal obligations to evaluate the noise and safety effects of its actions managing the airspace and air traffic, not the City. FAA's own Community Involvement Policy makes clear that FAA has the obligation to involve the public. *See* Attachment 4, FAA Order JO 7400.2K, Appendix 10 ("The Federal Aviation Administration (FAA) is committed to complete, open, and effective participation in agency action."). FAA cannot and should not condition addressing the impacts it has caused on the City's doing FAA's job and bearing the costs required for FAA to meet its legal obligations.

For the reasons discussed in this supplement and those in the City's formal request for reinitiation of consultation under the NHPA and Section 4(f), FAA must finally fulfill its expressed commitments and address the established practice of vectoring off the RNAV routes and the new noise impacts that have never been analyzed or mitigated. It must immediately (1) reinitiate consultation under the NHPA and Section 4(f); (2) analyze its policy of vectoring aircraft off of the published RNAV routes in consistent ways; and (3) conduct SRM on its vectoring practices and non-use of the RNAV routes as published. Please contact the City as soon as possible to reinitiate consultation and to address issues raised in this letter and in the City's formal request.

Sincerely,

James E. Bennett, A.A.E.
Director of Aviation Services

cc: M. Huerta, Delegation, Council, SHPO, OIG

Attachment 1

KAPLAN KIRSCH ROCKWELL

May 16, 2016

VIA CERTIFIED MAIL

National Freedom of Information Act Office
AFN-140
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, DC 20591

Re: *Freedom of Information Act Request*

To Whom It May Concern:

This Firm represents the City of Phoenix, Arizona (City), the owner and operator of Phoenix Sky Harbor International Airport (PHX or Airport), in connection with environmental, airport, and other matters. Pursuant to the Freedom of Information Act, 5 U.S.C. § 552, and on behalf of the City, we request copies of the records identified below. As used in this request, the term "record" has the meaning generally ascribed to that term under the Freedom of Information Act, including those maintained in an electronic format.

Specifically, we request copies of the following documents:

1. All records referring or relating to the FAA's practice, policy, or procedure with respect to aircraft departing on the following published RNAV Standard Instrument Departure (SID) procedures at PHX, including without limitation Tower Orders, Standard Operating Procedures, Letters of Agreement, and training materials at or between the PHX Airport Traffic Control Tower (ATCT), the Phoenix Terminal Radar Approach Control (TRACON), and/or the Albuquerque Air Route Traffic Control Center (ARTCC):
    i. FTHLS THREE,
    ii. JUDTH THREE, and
    iii. LALUZ THREE.
2. All records memorializing the practice of allowing or requiring deviations from, or issuing amended clearances to aircraft departing on, those RNAV SIDs, including without limitation Tower Orders, Standard Operating Procedures, Letters of Agreement, training materials or other documents memorializing such procedures at or between PHX, PHX TRACON, or ABQ Center.

Attorneys at Law
Denver • Washington, DC

Kaplan Kirsch & Rockwell LLP
1001 Connecticut Ave. N.W., Suite 800
Washington, DC 20036

tel: (202) 955-5600
fax: (202) 955-5616
www.kaplankirsch.com

3. All records regarding or relating to FAA environmental review of those deviations.

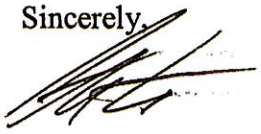
4. All records regarding or relating to FAA safety review (SRM/SMS) or other internal review of those deviations.

If this request is denied in whole or in part, we ask that you justify all withholdings and/or redactions of responsible records by reference to the specific exemptions of the Freedom of Information Act applicable thereto in a Vaughn index. *See, e.g., Vaughn v. Rosen*, 484 F.2d 820 (D.C. Cir. 1973), *cert. denied*, 415 U.S. 977 (1974).

The City is classified as an "all others" requester, as it does not request the foregoing records for a commercial, news-gathering, or academic purpose. However, the Freedom of Information Act provides for a waiver or reduction in fees where disclosure of the information is in the public interest because it is likely to contribute significantly to public understanding of the operations or activities of the government and is not primarily in the commercial interest of the requested. The City is a public entity and responsible for protecting the interests of the residents of the City, including the effects of changes to airspace and airspace procedures on local communities. The City intends to use the records sought by this request to better understand the circumstances giving rise to the adoption of the SIDs identified above, and the FAA's implementation thereof, and expects to make public any information released as a result of this request. The disclosure of the records will contribute to the understanding of the Federal government's activities and operations by informing the public as to the FAA's implementation and compliance with the SIDs identified above and the bases for FAA's actions. Accordingly, the City requests that the FAA waive all search and duplication fees.

Thank you in advance for your cooperation in this matter. I look forward to your reply within the twenty (20) business days allowed by the Freedom of Information Act. Please do not hesitate to contact me at 202.955.5600, or via email at sosit@kaplankirsch.com, if you have any questions or wish to facilitate the release of the requested records.

Sincerely,



Steven L. Osit

Attachment 2

U.S. Department
of Transportation
**Federal Aviation
Administration**

Mission Support Services
800 Independence Avenue, SW.
Washington, DC 20591

AUG 11 2016

Mr. Steven L. Osit
Kaplan Kirsch & Rockwell
1001 Connecticut Avenue West
Suite 800
Washington, DC 20056

Dear Mr. Osit:

Subject: Freedom of Information Act (FOIA) Request 2016-006404WS

This is an Air Traffic Organization (ATO), Mission Support Services, Western Service Area, partial no-records response to your FOIA request dated May 16, 2016, made under the provisions of Title 5 United States Code, Section 552. You requested a copy of records regarding the Area Navigation Standard Instrument Departure routes out of Phoenix Sky Harbor International Airport instituted in September 2014.

A search for records was conducted at the Phoenix Airport Traffic Control Tower, the Phoenix Terminal Radar Approach Control, and the ATO, Western Service Center, Operations Support Group. The search revealed no records, documents, or files pertaining to your specific requests in items 3 and 4. The search revealed 21 documents responsive to items 1 and 2 of your request, which are contained on the enclosed compact disc.

Your request qualifies for the "All Other" fee category, whereby you are not charged for the first 2 hours of search time, any review time, and the first 100 pages of documents. You are being charged **$331.00** for the processing of this request, which represents the cost of search time beyond the first two hours. An invoice is enclosed for your reference.

The undersigned and Clark Desing, Director, ATO, Western Service Center, are responsible for this partial no-records response. You may request reconsideration of this determination through electronic mail at FOIA-Appeals@faa.gov or by writing to the address below:

Assistant Administrator for Finance and Management, AFN-1
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Your request for reconsideration must be made in writing within 90 days from the date that the initial determination was made, and must include all information and arguments relied upon. Your appeal must also state that it is an "appeal" from the above described

denial of a request made under the FOIA and include your assigned FOIA control number. The envelope containing the appeal should be marked "FOIA."

If you have questions, please contact Mark T. Collins, FOIA Officer, ATO, Western Service Area, at (425) 203-4116.

Sincerely,

for Johan C. Foss

Elizabeth L. Ray
Vice President
Mission Support Services, AJV-0

Enclosures

Federal Aviation Administration
Air Traffic Org - Western Service Area
FAA ATO-WSA Mailcode: AJO2-W52
1601 Lind Avenue SW
Renton, WA 98057-4056

FOIA Number:	2016-006404WS (WSJA001)
Pay.Gov Web Payment ID:	467308

Invoice

Steven L Otis
1001 Connecticut Avenue NW, Suite 905
Washington, DC 20036
sosit@kaplankirsch.com,

Date	Item Category	Description	Other	Charges Incurred	Charges Deducted	Charges Applied	Payment
08/10/2016	Search	Manual Search	PHX Search	$255.00	$120.00	$135.00	$0.00
08/10/2016		Manual Search	PHX Supervisor Search	$166.00	$0.00	$166.00	$0.00
08/10/2016	Review	Review Time	PHX Supervisor Review	$332.00	$332.00	$0.00	$0.00
08/10/2016	Other	Other Incurred Costs	PHX Supervisor	$83.00	$83.00	$0.00	$0.00
08/10/2016	Search	Manual Search	OSG Search	$30.00	$0.00	$30.00	$0.00
08/10/2016	Review	Review Time	FOIA Officer Review	$95.00	$95.00	$0.00	$0.00
						$331.00	**$0.00**

A balance equal to or less than $20.00 is not collected.

Amount Due **$331.00**

To pay by check: Please clip the payment coupon below and mail it, along with your check payable to DOT/FAA, to the address indicated.

To pay thru Pay.Gov: Please use the link from our FOIA web page (www.faa.gov/foia) to access the proper Pay.Gov Account. Pay.Gov is a secure website where you can pay by eCheck or Credit Card. When you access the Pay.Gov website, you will be asked for the following information:

Web Payment ID Number: **467308**
FOIA Request Number: **2016-006404**
Name of FOIA Requester: **Steven L Otis**
Amount Due: **$331.00**

Steven L Otis
1001 Connecticut Avenue NW, Suite 905
Washington, DC 20036
sosit@kaplankirsch.com,

Balance due upon receipt.

Balance Due:	$331.00
Payment Amount:	

Please write the FOIA Number in the memo field on your check.

FOIA Number: 2016-006404WS (WSJA001)

Remit to: Federal Aviation Administration
Air Traffic Org - Western Service Area, WS-JA1
FAA ATO-WSA Mailcode: AJO2-W52
1601 Lind Avenue SW
Renton, WA 98057-4056

KAPLAN KIRSCH ROCKWELL

FOIA REQUEST
TO: WSA CONTROL NO. 2016-006404

May 16, 2016

Received by ATO WSA
Date Received: 06/03/2016
FOIA #: 2016-006404WS
Requester: Osit, Steven
ID/Event Date: N/A
Location: Phoenix, AZ
Fac/Pkg: N/A

VIA CERTIFIED MAIL

National Freedom of Information Act Office
AFN-140
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, DC 20591

Re: *Freedom of Information Act Request*

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   i. FTHLS THREE

   ii. JUDTH THREE, and

   iii. LALUZ THREE.

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If this request is denied in whole or in part, we ask that you justify all withholdings and/or redactions of responsible records by reference to the specific exemptions of the Freedom of Information Act applicable thereto in a Vaughn index. *See, e.g., Vaughn v. Rosen,* 484 F.2d 820 (D.C. Cir. 1973), *cert. denied,* 415 U.S. 977 (1974).

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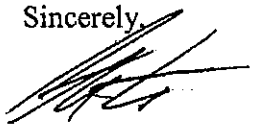
Thank you in advance for your cooperation in this matter. I look forward to your reply within the twenty (20) business days allowed by the Freedom of Information Act. Please do not hesitate to contact me at 202.955.5600, or via email at sosit@kaplankirsch.com , if you have any questions or wish to facilitate the release of the requested records.

Sincerely,



Steven L. Osit

Attachment 3

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of the Regional Administrator

P.O. Box 92007
Los Angeles, CA 90009

APR 14 2015

Mr. Ed Zuercher
City Manager, City of Phoenix
200 West Washington Street
12th Floor
Phoenix, AZ 85003

Dear Mr. Zuercher:

On April 13, the FAA met with city representatives to discuss possible route adjustments and other strategies that could potentially address community concerns about noise caused by the west departure flight paths from Phoenix Sky Harbor International Airport. In that meeting, City representatives said they intended to present the FAA's suggestions to the City Council on Wednesday, April 15. To assist in that, I am providing you a recap of our recommendations.

In September 2014, the FAA transitioned from radar-based departure procedures to Performance Based Navigation (PBN) departure procedures in Phoenix. The new procedures make a safe system even safer by automatically keeping arrival routes and departure routes separated from one another. Airlines program the procedures into their flight computers, and planes fly the routes automatically. This decreases communications between controllers and pilots, which reduces the chances for miscommunications. The radar-based procedures, by contrast, were inefficient given today's technology, requiring aircraft to fly further than necessary. Additionally, the procedures were interdependent, meaning air traffic controllers had to issue instructions to keep aircraft safely separated.

The FAA continues to support a collaborative approach towards addressing the community's concerns with the new procedures and is hopeful for more involvement from the City to work through the suggestions for alternatives we have put forward. During the week of April 6, the FAA provided data and a total of 14 alternatives to the City's representatives on the Phoenix Performance Based Navigation Working Group, and understood the City would offer its own ideas or suggestions for the FAA to consider. However, that did not happen. For this approach to work, it's critical that the city partner with the FAA and provide input about specific measures you would like us to consider and analyze. We strongly believe the City needs to consider alternatives other than just returning to or overlaying the procedures that were in place before Sept. 18, 2014.

The FAA presented possible adjustments for the departure procedures to the northwest and southwest. Our preferred alternatives – Alternatives NW2 and SW2 in the attached report –

reduce aircraft speeds and increase aircraft rates of climb, so altitudes would generally be higher than they are under the current procedures. The higher altitudes potentially decrease noise levels. Additionally, these alternatives maintain efficiency while enhancing safety by increasing vertical separation between Phoenix turbojet and turboprop departures, and between Phoenix turboprop departures and aircraft flying at low altitudes to and from satellite airports.

The alternatives for the northwest departures procedures (LALUZ, YOTES, SNOBL and MAYSA) –included (*Please note NW 1-7 correspond with alternatives in the attached report)*:

- No Action (Alternative NW1)
- Add RNAV Waypoint (New WP1) and Speed and Altitude Restrictions to LALUZ, YOTES, SNOBL, and MAYSA – Preferred Alternative (Alternative NW2)
- Revert to Pre-September 18, 2014 Non-RNAV Routings (Alternative NW3)
- Revert to Pre-September 18, 2014 Using PBN RNAV Routings (Alternative NW4)
- Immediate Turn Direct TWNSD Waypoint (Alternative NW5)
- Add RNAV Waypoint to Extend Upwind Leg (Alternative NW6)
- Add Radius to Fix (RF) Leg (Alternative NW7)

The alternatives for the southwest departure procedures (BNYRD, FTHLS, JUDTH, KATMN) included (*Please note SW 1-5 correspond with alternatives in the attached report)*:

- No action (Alternative SW1)
- Add Speed and Altitude Restriction toBNYRD, FTHLS, JUDTH, and KATMN – Preferred Alternative (Alternative SW2)
- Revert to Pre-September 18, 2014 Non-RNAV Routings (Alternative SW3)
- Move DAVZZ Waypoint (Alternative SW4)
- Runway Heading to Intercept Course to DAVZZ Waypoint (Alternative SW5)

In addition to requesting your feedback on the potential adjustments to existing routes, the FAA has suggested a number of other strategies the City could explore that, when combined, could help reduce noise. The ideas that the working group laid out are based on finding ways to adjust routes, altitudes, and volume while maintaining safety and efficiency without shifting noise over other noise-sensitive areas.

These include:

- Voluntary noise abatement flight and runway use. We discussed identifying the geographic areas the City feels may benefit from these procedures, as well as possible night-time measures. A number of large airports use such measures to address noise issues.
- Community involvement in understanding, identifying and recommending possible solutions to airport issues. Other large airports provide excellent examples of how community roundtables are used to accommodate the diverse interests in and around a metropolitan airport. These organizations provide a forum in which the FAA, airlines and communities can share information and ideas.
- Accept the FAA's offer to assist the airport noise office. We are aware the office is receiving an unprecedented number of noise complaints, and are requesting again to meet with airport representatives to analyze its procedures to ensure complaints are logged, analyzed and processed as efficiently as possible.
- Presenting other recommendations the City has for route adjustments, beyond the FAA's preferred alternatives.

The FAA believes the best approach going forward is a multi-pronged strategy that combines possible adjustments to the routes with some of the additional kinds of noise abatement measures identified above. Several of these strategies need to be initiated by the City. Per the DOT/FAA's Aviation Noise Abatement Policy, airport proprietors are primarily responsible for planning and implementing actions designed to reduce the effect of noise on residents of the surrounding area.

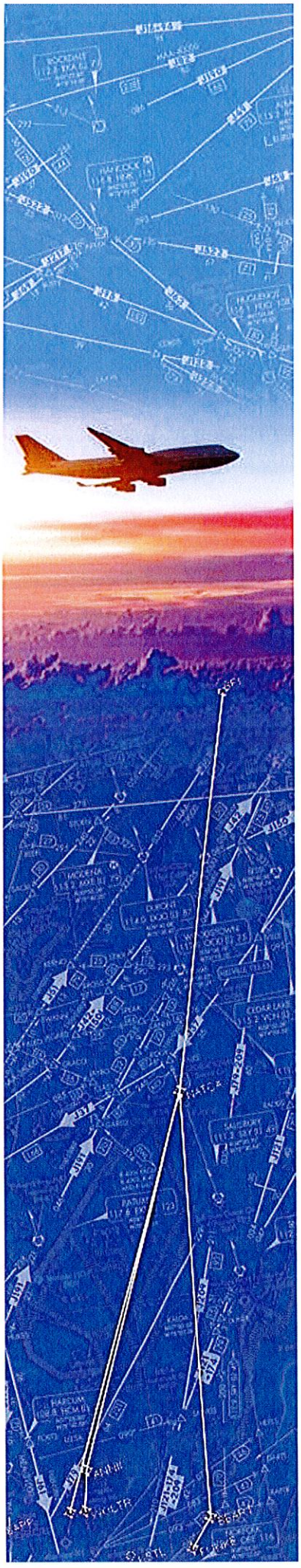
This approach would establish a comprehensive set of measures for consideration that might be helpful in the near and long term. We believe it is important for the FAA and the City to work together to complete a comprehensive plan within two months. This plan needs to lay out any FAA route changes as well as any strategies the City intends to undertake and timelines for their implementation. The FAA is willing to work with the City to identify voluntary measures to reduce noise beyond what is legally required, consistent with the FAA's statutory mission and its policy against merely shifting noise from one community to another.

Additionally, the FAA would like to work more effectively with the City of Phoenix and Sky Harbor International Airport to anticipate and address issues that could arise during the development of the Phoenix Metroplex project. We are requesting a meeting with the appropriate representatives to ensure key officials in the airport and City understand the Metroplex process. Furthermore, the City Council has identified communications with the FAA as an issue of concern. We believe the City should establish a formal process in which the City can provide information for the FAA to consider, and in which the FAA, the City, the airlines and the community can collaboratively share information and ideas.

We look forward to working collaboratively with the City to address issues related to the current Phoenix procedures, as well as any future issues that may arise.

Regards,

Glen Martin
Regional Administrator



Federal Aviation Administration

Phoenix West Flow RNAV SID Post-Implementation Assessment Report

BY

FEDERAL AVIATION ADMINISTRATION

April 2015

Table of Contents

List of Figures

1 Background and Overview

On September 18, 2014, the Federal Aviation Administration (FAA) implemented nine new Area Navigation (RNAV) Standard Instrument Departures (SIDs) at Phoenix Sky Harbor International Airport (KPHX) which have flow-dependent transitions designed to ensure repeatable, predictable flight paths. The purpose and need of the project was to improve the predictability of flight routes in the greater Phoenix airspace. The safety and efficiency of the National Airspace System (NAS) are enhanced by decreasing communication requirements between controllers and pilots and providing more direct routings that are not dependent on ground base navigational aids. The departure procedures attempt to maintain unrestricted climbs as much as possible, while providing procedural de-confliction where practical from other SID and Standard Terminal Arrival Routes (STAR).

Prior to January 2015, to implement RNAV procedures, the FAA utilized the 18-step process described in FAA Order 7100.9, *Standard Terminal Arrival Program and Procedures*. The development of these SIDs began March 2012, in accordance with the requirements of that order. On April 3, 2014, FAA Order 7100.41, *Performance Based Navigation Implementation (PBN) Process*, superseded FAA Order 7100.9. The post-implementation monitoring and evaluation guidance contained in FAA Order 7100.41 was applied during this post-implementation assessment. During this final phase, the operation of the procedures and/or routes is assessed to ensure they perform as expected and meet the goals finalized during the development phase. Post-implementation activities also involve collecting and analyzing data to ensure that safe and efficient procedures were developed.

On December 19, 2014, the FAA completed a post-implementation assessment which included an analysis of all RNAV SID procedures. The assessment determined the procedures performed as expected and met the goals identified in the development phase.

In response to concerns conveyed by the Phoenix City Manager, FAA Administrator Michael P. Huerta stated, "We are committed to partnering with the airport and airlines to explore other potential adjustments to the procedures to better manage noise issues." The FAA convened a PBN Working Group (Workgroup) to explore potential adjustments to the new air traffic procedures implemented at KPHX (See Attachment A, Huerta letter to Phoenix City Manager Ed Zuercher). Any potential adjustment would be subject to a subsequent environmental review of the final procedure design prior to implementation.

2 Scoping

NATCA and FAA (The Parties) recognize that having a consistent and collaborative approach to information sharing, consensus building, and formulation of agreements would allow the overall process to move forward more effectively and efficiently while addressing the interests of all concerned (See Attachment B: Post-Implementation Scoping Letter).

The Parties agreed to form a Workgroup comprised of:

1) One National Air Traffic Controllers Association (NATCA) Co-Lead, identified by NATCA National Airspace Representative
2) One FAA Management Co-Lead, identified by Director for Airspace Services
3) Two NATCA Points of Contacts (POC), one each from Phoenix TRACON (P50) and Phoenix Tower (PHX)
4) Two FAA Management POCs, one each from P50 and PHX
5) Western Service Center (WSC) PBN Operations Support Group Representatives, one each from FAA Management and NATCA
6) One FAA AeroNav Products (AJV-3) Representative
7) One FAA Environmental Specialist
8) One Lead Operator designated by Airlines For America (A4A)

Additional support will be provided as requested by the Co-Leads:

1) One MITRE Analyst
2) One ATAC Analyst
3) One CSSI Documentation Specialist

The Workgroup shall:

1) Assess and examine the Phoenix PBN SIDs with initial turns to the northwest, specifically the LALUZ, MAYSA, SNOBL, and YOTES RNAV SIDs, focusing on the initial segments to the TWSND waypoint, when KPHX is departing in a west configuration.
2) Assess and examine the IZZZO RNAV SID, focusing on the initial segment to the KEENS waypoint, when KPHX is departing in a west configuration.
3) Assess and examine the Phoenix PBN SIDs with initial turns to the southwest, specifically the BNYRD, FTHLS, JUDTH and KATMN RNAV SIDs, focusing on the initial segments to the DAVZZ waypoint, when KPHX is departing in a west configuration.
4) Consider comments from the City of Phoenix Aviation Department, the Phoenix Mayor's Office, and the Phoenix City Council.
5) Propose modifications that would maintain and/or enhance safety, improve operational efficiency, and ensure procedural conformance with the intended flight paths.

Figure 2-1 depicts the overview of the project area.

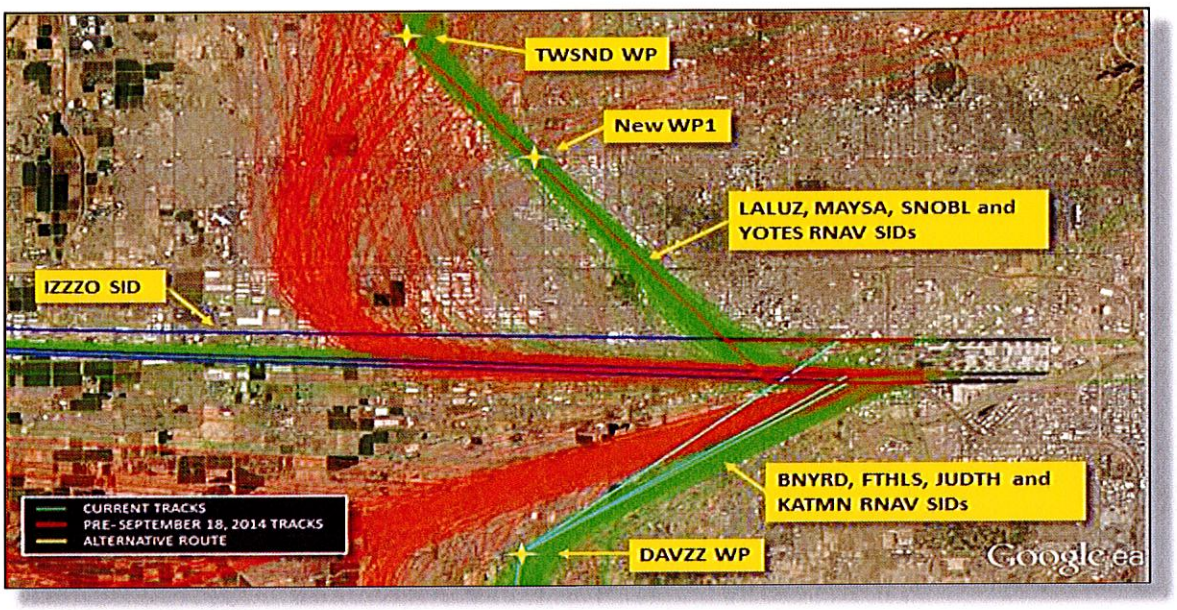


Figure 2-1 Overall View of Project Area 1

3 Post Implementation Findings

3.1 Air Traffic Control (ATC) Findings

ATC reported the following benefits for the September 18, 2014 departure procedure implementation:

- Safety and efficiency are improved with immediate course divergence due to repeatable, predictable flight paths
- Provides lateral separation between successive west configuration departures
- Maintains increased departure throughput during peak traffic periods with a third departure course
- Reduces ground controller task complexity by simplifying departure gate balancing
- PBN procedures enhance safety by reducing frequency congestion
- Reduces potential conflicts

3.2 Industry Findings

Industry reported the following benefits and data for the September 18, 2014 departure procedure implementation:

- Reduced an average 3.5 nautical miles (NM) per flight for all configurations
- KPHX averages 588 departures per day of these daily departures, approximately 500 flights utilize the new procedures in all configurations
- Approximately 1,750 flight miles have been eliminated per day

- Over 15,000 metric ton reduction in CO_2 emissions are realized annually
- Approximately $3.6 million in fuel savings[1] are realized annually
- Reverting to pre-September 18, 2014 routings, industry reported the following data for west configurations:
    - LALUZ, YOTES, SNOBL, and MAYSA RNAV SIDs
        - Adds approximately 410 NM per day based on 117 flights
        - Equates to over 374,000 gallons of fuel and over 3,515 metric tons of CO_2 per year
    - IZZZO RNAV SID
        - Adds approximately 38 NM per day based on 54 flights
        - Equates to over 34,600 gallons of fuel and 325 metric tons of CO_2 per year
    - FTHLS, BNYRD, JUD TH, and KATMN RNAV SIDs
        - Adds approximately 59 NM per day based on 66 flights
        - Equates to over 53,000 gallons of fuel and 498 metric tons of CO_2 per year
        - Reversion to the previous procedures would reintroduce in excess of 4,300 metric tons of CO_2 emissions annually into the Phoenix metropolitan area's environment

4 Implementation Assessment of KPHX Northwest, West, and Southwest SIDs

4.1 Assessment of the Northwest RNAV SIDs: LALUZ, YOTES, SNOBL, and MAYSA

As directed by the scoping document, the Workgroup assessed the LALUZ, MAYSA, SNOBL, and YOTES RNAV SIDs. The Workgroup's task was to create and assess potential adjustments which maintain and/or enhance safety, improve operational efficiency, and ensure procedural conformance with the intended flight paths. Focusing on the initial segments to the TWSND waypoint on the SIDs when KPHX is departing in a west configuration, the following potential adjustments were considered:

[1] Source fuel cost : HTTP://www.transtats.bts.gov/fuel.asp, based on fuel costs of $2.30 per gallon

4.1.1 Alternative NW1: No Action

Description:

- No change to September 18, 2014 west flow departure procedures

Considerations:

- Other alternatives identified by the Workgroup enhanced safety and efficiency, which met the goals of the original project

Decision:

The Workgroup identified other alternatives which were aligned with the purpose and need of the project and were able to produce gains in efficiency and safety.

4.1.2 Alternative NW2: Add RNAV Waypoint (New WP1) and Speed and Altitude Restrictions to Northwest SIDs: LALUZ, YOTES, SNOBL, and MAYSA

Description:

- Add RNAV waypoint on the LALUZ, YOTES, SNOBL, and MAYSA SIDs, in the vicinity of Grand Avenue and Indian School Road, which would keep flight tracks within the Grand Avenue Corridor (industrial corridor as defined by the City of Phoenix)
- Add altitude restriction (at-or-above 4,000 feet Mean Sea Level [MSL]) at New WP1
- Add altitude restriction (at-or-above 5,000 feet MSL) at TWSND waypoint (WP)
- Add speed restriction (at-or-below 230 knots) at New WP1 and TWSND WP
- No change in the lateral path to ensure alignment with the purpose and need of the project

Considerations:

- Speed and altitude restrictions at New WP1 and TWSND WPs would increase aircraft rates of climb resulting in aircraft being higher at any given point along the procedure than experienced today. Consistent departure speed assignments would ensure predictable and repeatable flight paths eliminating over takes and conflictions. Currently northwest departures are climbed to 8,000 feet MSL these new restrictions would allow SIDs to have an unrestricted climb to FL210.
- Speed and altitude restrictions also de-conflict KPHX departures from KPHX northwest arrivals. Airspace constraints and mountainous terrain limit the TRACON's ability to utilize lateral separation making vertical separation essential.
- Due to military airspace constraints and mountainous terrain, turboprop and turbojet departure courses must be merged within five to seven NM from departure end of the runway. With a steeper climb profile, safety is enhanced due to the expeditious application of vertical separation between Phoenix turbojet departures initially assigned 8,000 feet MSL and turboprop departures initially assigned 5,000 feet MSL.

- The speed and altitude restrictions in this alternative help eliminate interactions between KPHX turboprop departures and low attitude satellite and military operations. Satellite and military operations are conducted outside Class B airspace and concentrated at-or- below 6,000 feet MSL. The higher altitude for KPHX turboprop departures would retain the aircraft within Class B airspace providing an enhanced level of safety.
- Maintains equivalent level of airport throughput by retaining current immediate departure course divergence. Without the initial departure separation provided by immediate course divergence, departures from parallel runways would become dependent. Other forms of separation would have to be employed, in this case lateral separation. This would increase controller task complexity, inhibit airport departure rates, and fail to ensure an equivalent level of safety.
- During the two week traffic sampling (September 19, 2014 to October 3, 2014) approximately seven percent of northwest departures were below the proposed 4,000 foot MSL altitude restriction placed at New WP1. The Phoenix Subject Matter Experts (SME) noted the percentage increases dramatically during hot summer months. The climb restrictions would eliminate this summer month increase and increase aircraft conformance.

Decision:

The Workgroup decided to recommend this potential adjustment as the preferred alternative for the northwest SIDs, subject to further review including environmental analysis.

This alternative does not increase miles flown as there is no change in the lateral path. Therefore, there is no loss of efficiency, no increase in fuel burn and no increase CO_2 emissions. Not modifying the lateral path of the procedures, the current level of safety is maintained.

Crossing altitudes and speed restrictions at New WP1 and TWSND waypoints would increase departure rates of climb, resulting in steeper climb profiles. Today, without restrictions approximately seven percent[2] of departures operate at shallow climb rates as illustrated by the red tracks in Figure 4.1.2-1. The Phoenix Subject Matter Experts (SME) noted the percentage increases dramatically during hot summer months. The steeper profiles created by the proposed restrictions would eliminate aircraft flight paths below 4,000 feet MSL in the vicinity of New WP1 as illustrated in Figure 4.1.2-2. Additional benefits would be realized in that all departures would be at higher altitudes at any given point on the procedure. Figure 4.1.2-3 illustrates an overhead view of the restrictions associated with New WP1 and TWSND waypoints.

Turboprop departures are typically assigned radar vectors and routed east of the subject RNAV departure course. Vertical separation between turbojet and turboprop departures must be attained prior to merging them onto a common departure routes. The differing performance characteristics of these aircraft increases controller task complexity. Higher climb rates

[2] Percentage from a PDARS sampling of departure track data from 09/19/2014 through 10/03/2014

achieved by adding altitude and speed restrictions at New WP1 and TWSND waypoints would provide vertical separation sooner. This would reduce controller task complexity, reduce miles flown and reduce fuel burn and CO_2 emissions while increasing the level of safety Satellite and military operations are conducted outside Class B airspace and concentrated at-or-below 6,000 feet. The higher altitude for KPHX turboprop departures would retain them within Class B airspace providing an enhanced level of safety.

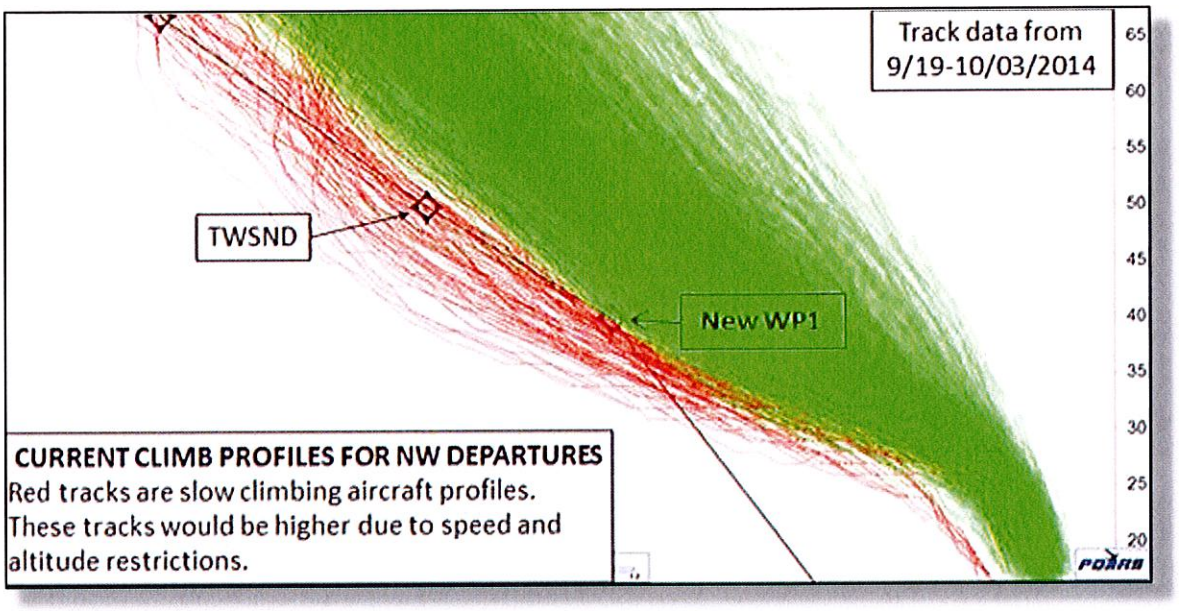


Figure 4.1.2-1. Historical Climb Profiles of PHX Northwest SIDs (Elevation View)

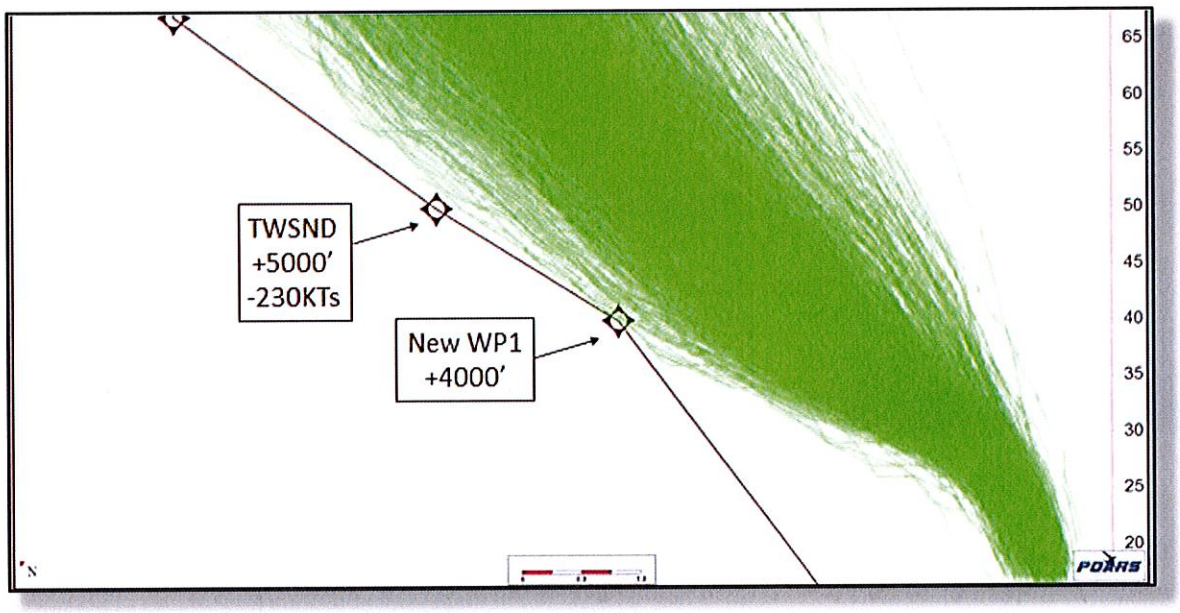


Figure 4.1.2-2. Northwest SIDs Amended Flight Tracks with Altitude Restrictions

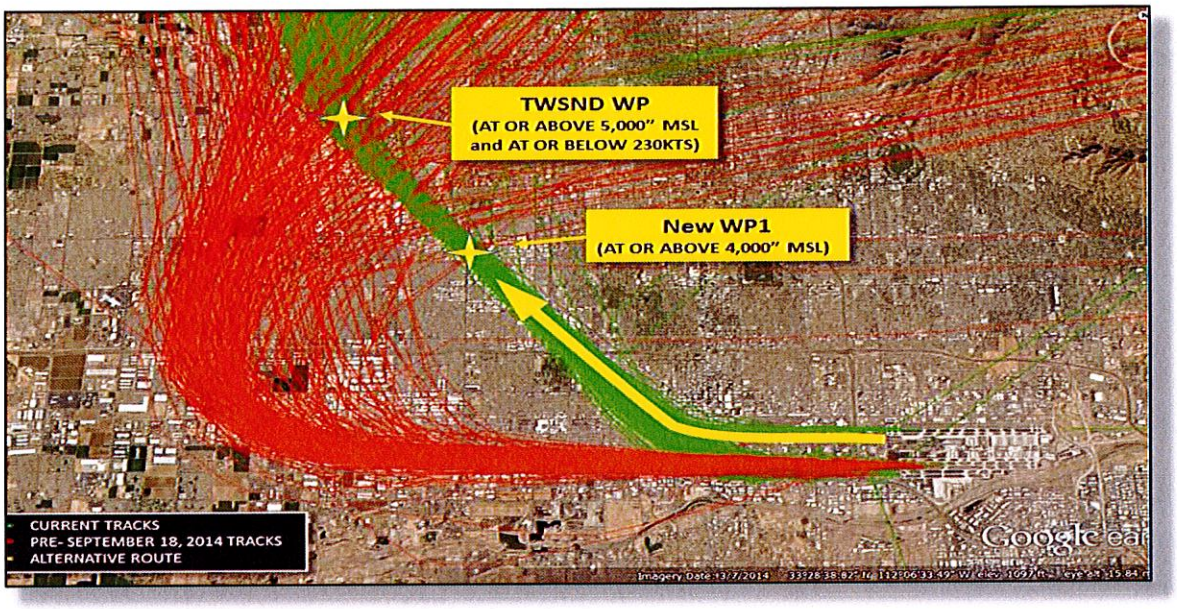


Figure 4.1.2-3. Northwest SIDs Proposed Amended Procedure(s)

4.1.3 Alternative NW3: Revert to Pre-September 18, 2014 Non-RNAV Routings

Description:

- Revert to Pre-September 18, 2014 published Non-RNAV departure procedures

Considerations:

- FAA Administrator Huerta letter to Phoenix City Manager Ed Zuercher, dated January 22, 2015
- Reroutes flight tracks away from the industrial corridor
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures
- With repeatable and predictable flight paths modifications would eliminate overtakes and conflicting departure paths
- Reverting to the September 18, 2014 northwest departures would not maintain an equivalent level of airport throughput. Eliminating the current immediate departure course divergence would create a dependency with the IZZZO RNAV SID. The pre-September 18,2014 northwest SIDs and the IZZZO SID both have initial runway heading legs, creating the dependency. This dependency would require other forms of separation, in this case lateral separation. This would increase controller task complexity, inhibit airport departure rates, and fail to ensure an equivalent level of safety.

Decision:

Reverting to the pre-September 18, 2014 flight tracks would reduce efficiency and safety, and would not align with the purpose and need of the project. Approximately 3.29 nautical flying miles are added with this alternative. On a west departure configuration, approximately 351,000 additional gallons of fuel would be burned annually. This would also result in an additional 3,300 metric tons of CO_2 introduced annually into the environment. This alternative would also route flights away from a designated industrial corridor. (See Figure 4.1.3-1. Northwest SIDs with No Performance Based Navigation [Radar Vectoring])

The lack of PBN procedures is contrary to the Congressional mandate to implement Next Generation Air Transportation System (NextGen) procedures. Reversion to radar vectoring would: increase controller task complexity, create the potential for airport throughput reductions, and fail to maintain an equivalent level of safety.

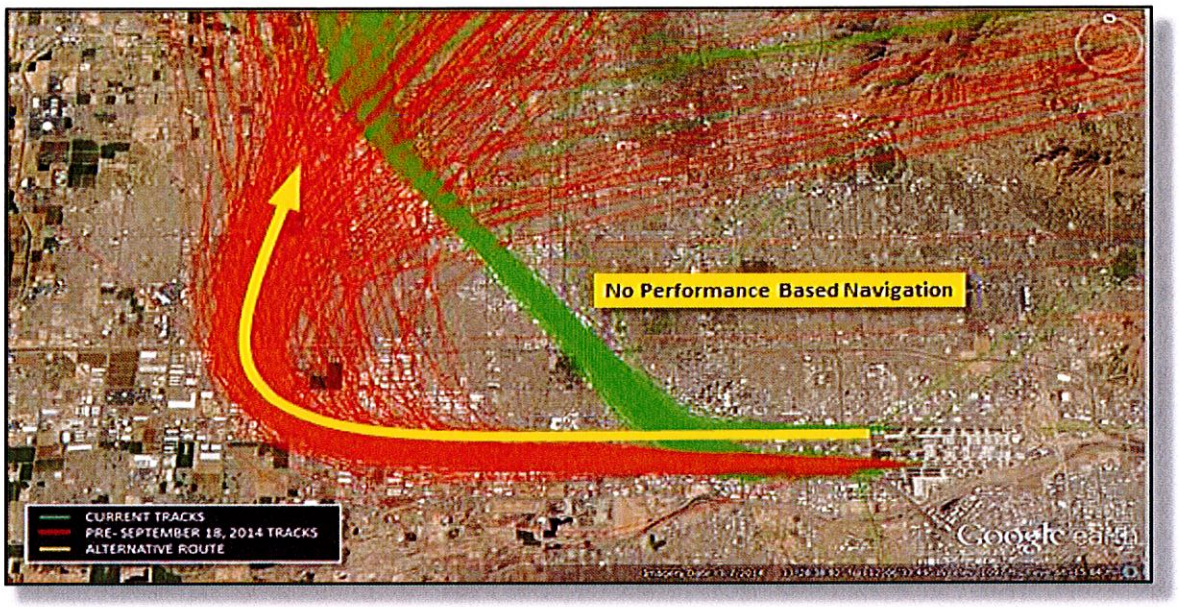


Figure 4.1.3-1. Northwest SIDs with No Performance Based Navigation (Radar Vectoring)

4.1.4 Alternative NW4: Revert to Pre-September 18, 2014 Using PBN RNAV Routings

Description:

- Revert to Pre-September 18, 2014 flight paths incorporating RNAV procedures

Considerations:

- Reroutes flight tracks away from the industrial corridor
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures

Decision:

Reverting to the pre-September 18, 2014 flight tracks would reduce efficiency and safety and would not align with the purpose and need of the project. Approximately 1.85 nautical flying miles are added with this alternative. On a west departure configuration, approximately 197,500 additional gallons of fuel would be burned annually. This would also result in an additional 1,850 metric tons of CO_2 introduced annually into the environment. This alternative would also route flights away from a designated industrial corridor. (See Figure 4.1.4-1. Northwest SIDs Using Performance Based Navigation)

This alternative also introduces the potential for reducing airport throughput and failing to maintain an equivalent level of safety. The extended initial departure tracks following the runway heading(s) create an undesirable and inefficient dependency between parallel runway departures. Simultaneous departures from the parallel runways would be adversely impacted as lateral separation would not be attained immediately after departure as is provided by the Workgroups recommended alternative. Any reduction in efficiency does not align with the purpose and need of this project.

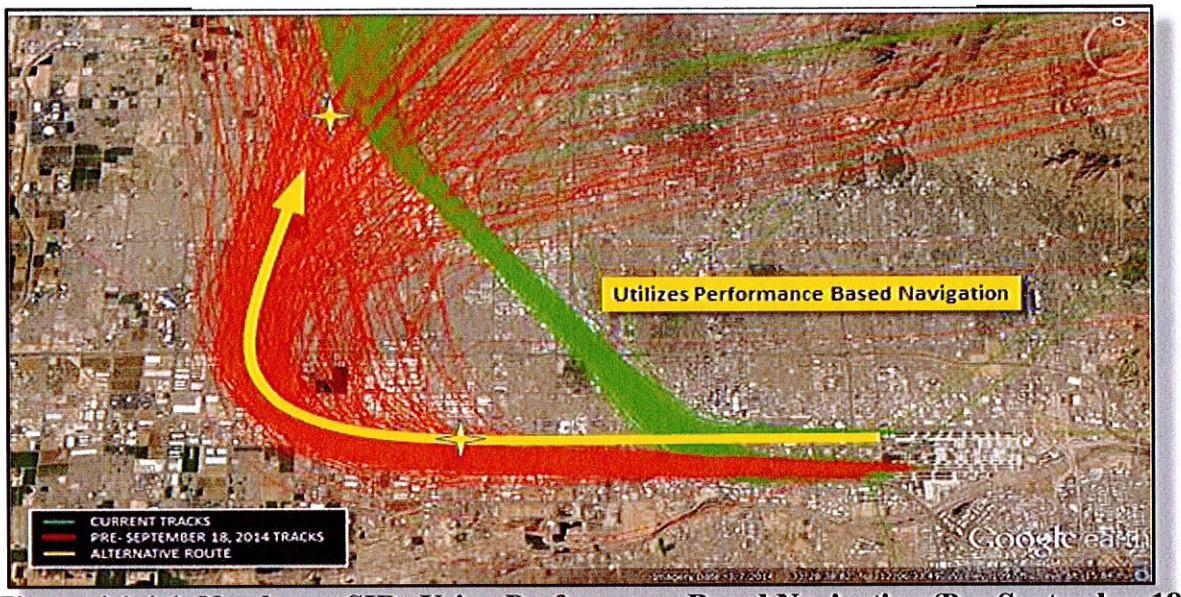


Figure 4.1.4-1. Northwest SIDs Using Performance Based Navigation (Pre-September 18, 2014 Flight Tracks)

4.1.5 Alternative NW5: Immediate Turn Direct TWNSD Waypoint

Description:

- Immediate right turn from runway direct TWNSD WP on the LALUZ, YOTES, SNOBL, and MAYSA SIDs

Considerations:

- Increases efficiency and reduces controller task complexity
- Dispersal of flight tracks over residential areas

Decision:

This alternative would realize an increase in efficiency by reducing miles flown on the route by 1.40 NM. The reduction correlates to an annual miles flown savings of approximately 17,000 NM. It reduces annual fuel burn by approximately 42,500 gallons and reducing annual carbon emissions by 399 metric tons. This alternative maintains an equivalent level of safety.

However, this alternative would route flights away from the Grand Avenue industrial corridor and move flight paths to the east, closer to, or directly over sensitive residential areas. The expected noise impact does not align with the purpose and need of this project. (See Figure 4.1.5-1. Northwest SIDs with Immediate Turn Direct to TWSND waypoint)

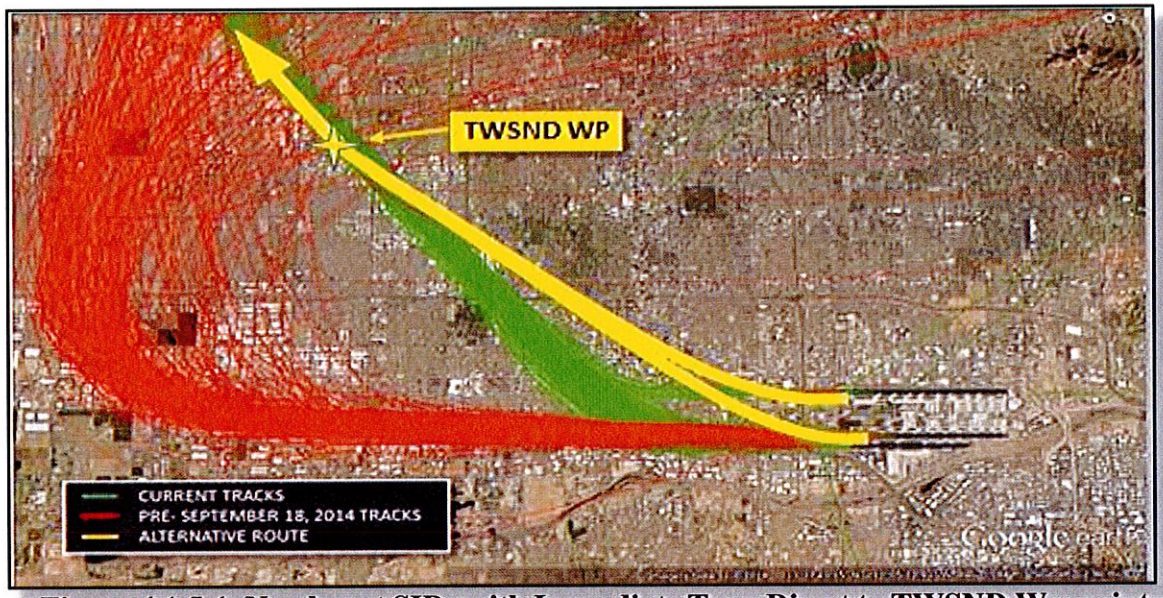


Figure 4.1.5-1. Northwest SIDs with Immediate Turn Direct to TWSND Waypoint

4.1.6 Alternative NW6: Add RNAV Waypoint to Extend Upwind Leg

Description:

- Add RNAV WP 1.3 NM west of the current tracks on the LALUZ, YOTES, SNOBL, and MAYSA SIDs to relocate turn point to the west

Considerations:

- Aircraft would fly runway heading for 1.3 NM further than the current procedure, prior to starting northwest turn to TWSND WP, routing flights away from the industrial corridor and over residential areas
- KPHX SMEs relayed that elimination of course divergence creates loss of efficiency due to reduced departure throughput

Decision:

Reverting to the pre-September 18, 2014 flight tracks using PBN procedures would also reduce efficiency and safety and would not align with the purpose and need of the project. Approximately 0.66 nautical flying miles are added to each departure with this alternative. Approximately 70,400 additional gallons of fuel would be burned and an additional 660 metric tons of CO_2 would be introduced annually into the environment. This alternative would also route flights away from a designated industrial corridor.

This alternative also introduces the likely potential for reducing airport throughput and failing to maintain an equivalent level of safety. The extended initial departure tracks following the runway heading(s) create an undesirable and inefficient dependency between parallel runway departures. Simultaneous departures from the parallel runways would be adversely impacted as lateral separation would not be attained immediately after departure as is provided by the Workgroups recommended alternative. (See Figure 4.1.6-1. Northwest SIDs with Extended Upwind Leg)

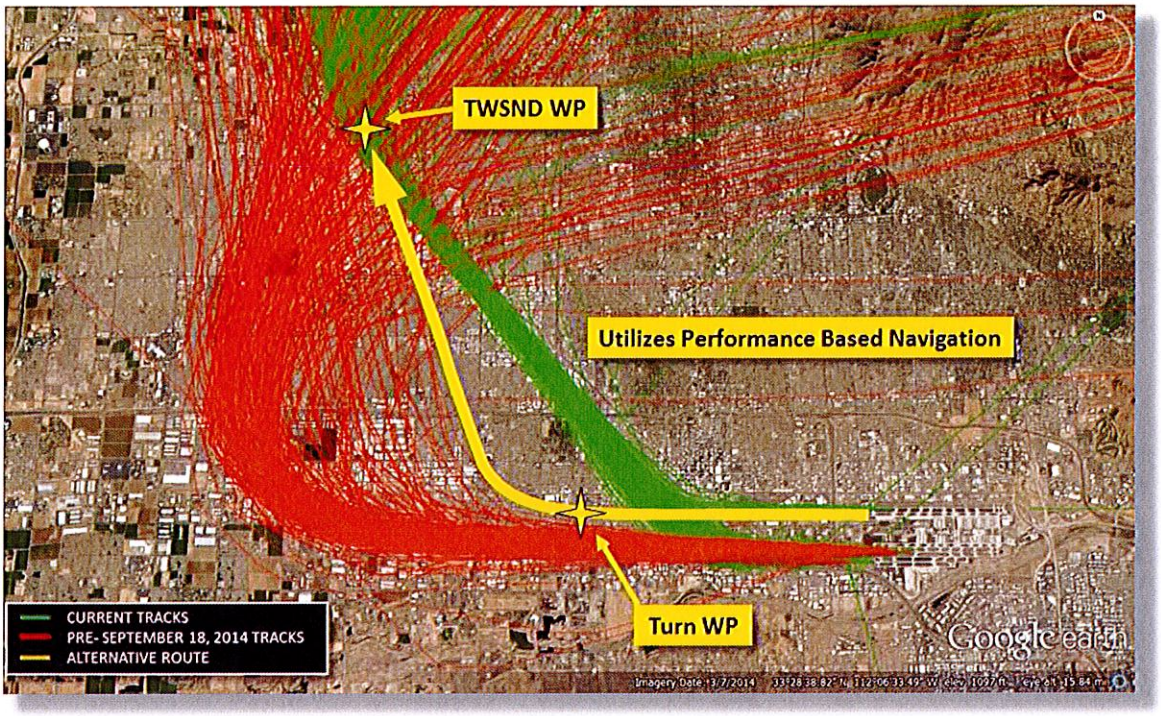


Figure 4.1.6-1. Northwest SIDs with Extended Upwind Leg

4.1.7 Alternative NW7: Add Radius to Fix (RF) Leg

Description:

- An RF leg departure procedure as proposed by Industry

Considerations:

- Increased flight path precision
- Fleet equipage limitations
- Criteria not supported for public procedures

Decision:

Although there are benefits to RF segments as they increase flight path repeatability and predictability, there is currently no criterion for their implementation in public instrument departure procedures. (See Figure 4.1.7-1. Northwest SIDs with RF Leg [RF Leg Would Tighten Turn Track Width]). Several aircraft types are unable to fly RF legs for departures; therefore aircraft would be on multiple SIDs and would increase ATC task complexity.

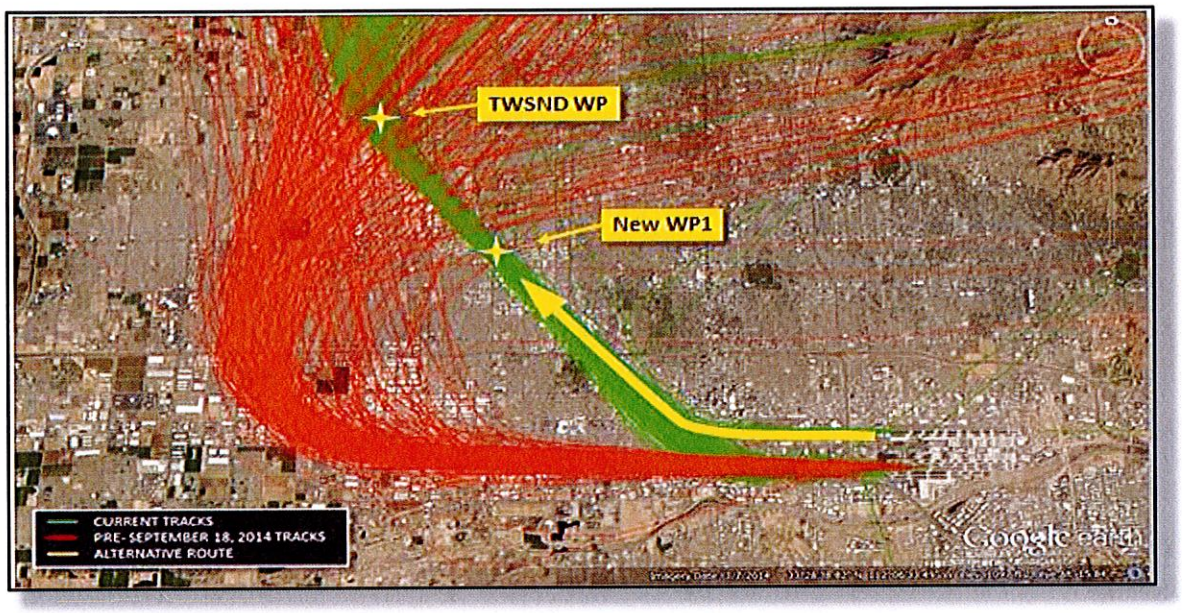


Figure 4.1.7-1. Northwest SIDs with RF Leg (RF Leg Would Tighten Turn Track Width)

4.2 Assessment of the West RNAV SID: IZZZO

As directed by the scoping document, the Workgroup assessed the IZZZO RNAV SID. The Workgroup's task was to create and assess potential adjustments which would maintain and/or enhance safety, improve operational efficiency, and ensure procedural conformance with the intended flight paths. Focusing on the SID when KPHX is departing in a west configuration, the following modifications were considered:

4.2.1 Alternative W1: No Action

Description:

- No change to September 18, 2014 west flow departure procedures

Considerations:

- No change to September 18, 2014 west flow departure procedures
- No Turboprop departures on this procedure
- Without turboprop traffic, turbojets would climb without restrictions

Decision:

The Workgroup decided to recommend this potential adjustment alternative for the west SID, subject to further review including environmental analysis.

There were no impacting issues requiring modifications identified on this route. This alternative does not increase miles flown as there is no change in the lateral path. Therefore, there is no loss of efficiency, no increase in fuel burn and no increase CO_2 emissions. Not modifying the lateral path of the procedures, the current level of safety is maintained.

4.2.2 Alternative W2: Add Speed and Altitude Restriction Waypoint

Description:

- Add speed and altitude restriction to IZZZO RNAV SID

Considerations:

- No benefits to safety or efficiency identified
- No Turboprop departures on this procedure
- Without turboprop traffic, turbojets climb unrestricted

Decision:

Without turboprop departures on the route, turbojet aircraft are able to climb unrestricted. This eliminates the need for a waypoint crossing restriction. There were no additional issues requiring design modification. Without a change to the lateral path there is no increase to miles flown. Therefore, there is no loss of efficiency, no increase in fuel burn and no increase CO_2 emissions. Not modifying the lateral path of the procedure, the current level of safety is maintained. This alternative did not increase current level of efficiency or safety. Figure 4.2.2-1 depicts the current west RNAV SID with a proposed altitude and speed restriction waypoint.

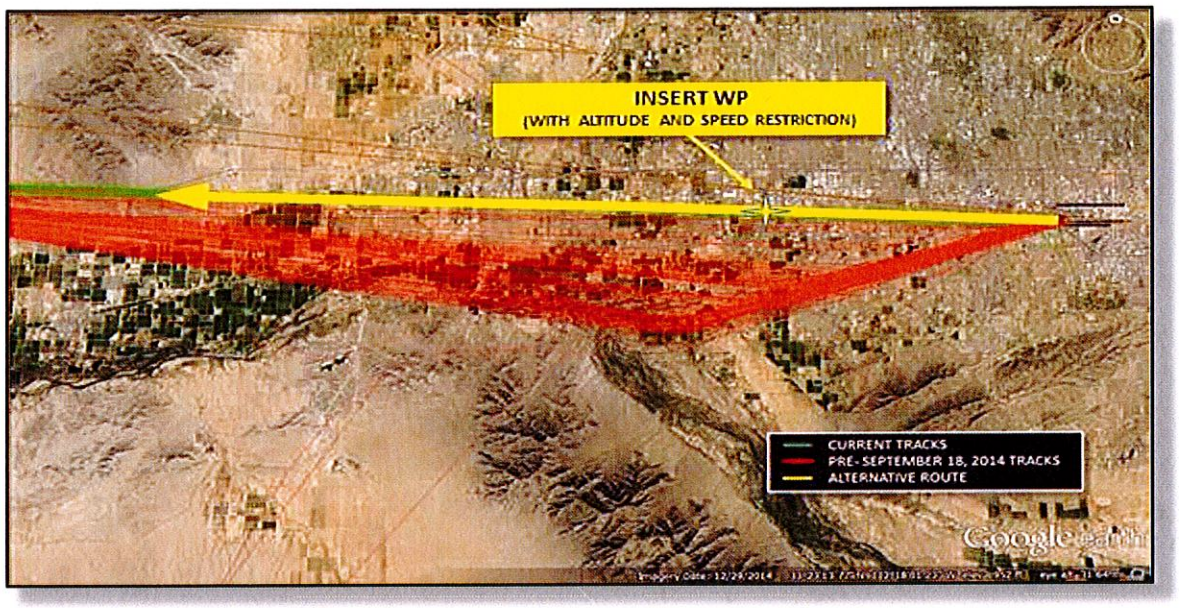


Figure 4.2.2-1. Current West RNAV SID with Proposed Altitude/Speed Restriction Waypoint

4.3 Assessment of Southwest RNAV SIDs: BNYRD, FTHLS, JUDTH, and KATMN

As directed by the scoping document, the Workgroup assessed the BNYRD, FTHLS, JUDTH, and KATMN RNAV SIDs. The Workgroup's task was to create and assess potential adjustments which would maintain and/or enhance safety, improve operational efficiency, and ensure procedural conformance with the intended flight paths. Focusing on the initial segments to the DAVZZ waypoint on the SIDs when KPHX is departing in a west configuration, the following modifications were considered:

4.3.1 Alternative SW1: No Action

Description

- No change to September 18, 2014 west flow departure procedures

Considerations:

- Other alternatives identified by the Workgroup enhanced safety and efficiency, which met the goals of the original project

Decision:

The Workgroup identified other alternatives which were aligned with the purpose and need of the project and were able to produce gains in efficiency and safety.

4.3.2 Alternative SW2: Add Speed and Altitude Restriction to Southwest SIDs: BNYRD, FTHLS, JUDTH, and KATMN

Description:

- Add altitude restriction (at-or-above 4,000 feet MSL) at DAVZZ WP
- Add speed restriction (at-or-below 230 knots) at DAVZZ WP
- No change in the lateral path to ensure alignment with the purpose and need of the project

Considerations:

- Speed and altitude restrictions at DAVZZ WP would increase aircraft rates of climb resulting in aircraft being higher at any given point along the procedure than experienced today. Consistent departure speed assignments would ensure predictable and repeatable flight paths eliminating over takes and conflictions.
- Speed and altitude restrictions also de-conflict KPHX departures from KPHX southwest arrivals. Airspace constraints and mountainous terrain limit the TRACON's ability to utilize lateral separation making vertical separation essential.
- With a steeper climb profile, safety is enhanced due to the expeditious application of vertical separation between Phoenix turbojet departures initially assigned 8,000 feet MSL and turboprop departures initially assigned 5,000 feet MSL.

- The speed and altitude restrictions in this alternative help eliminate interactions between KPHX turboprop departures and low attitude satellite and military operations. Satellite and military operations are conducted outside Class B airspace and concentrated at-or- below 6,000 feet MSL. The higher altitude for KPHX turboprop departures would retain them within Class B airspace providing an enhanced level of safety.
- During the two week traffic sampling (September 19, 2014 to October 3, 2014) approximately 15 percent[3] of southwest departures were below the proposed 4,000 foot MSL altitude restriction placed at DAVZZ. The Phoenix Subject Matter Experts (SME) noted the percentage increases dramatically during hot summer months. The climb restrictions would eliminate this summer month increase and increase aircraft conformance.

Decision:

The Workgroup decided to recommend this potential adjustment as the preferred alternative for the southwest SIDs, subject to further review including environmental analysis.

This alternative does not increase miles flown as there is no change in the lateral path. Therefore, there is no loss of efficiency, no increase in fuel burn and no increase in CO_2 emissions. By not modifying the lateral path of the procedures, the current level of safety is maintained.

Speed and altitude restrictions also de-conflict KPHX departures from KPHX southwest arrivals on the HYDRR RNAV STAR. By reducing the length of departure level offs and the vertical interactions with the HYDRR RNAV STAR, the Phoenix SMEs noted that the current procedures has reduced annual Traffic Collision Avoidance System (TCAS) events. Reverting to the Pre-September 2014 procedures with extended track mile interaction between arrival and departure routes could increase TCAS events.

Crossing altitude and speed restriction at DAVZZ WP would increase departure rates of climb, resulting in steeper climb profiles. Today, without restrictions approximately 15 percent of departures operate at shallow climb rates as illustrated by the red tracks in Figure 4.3.2-1. The Phoenix SMEs noted the percentage increases dramatically during hot summer months. The steeper profiles created by the proposed restrictions would eliminate aircraft flight paths below 4,000 feet MSL in the vicinity of DAVZZ WP as illustrated in Figure 4.3.2-2. Additional benefits would be realized in that all departures would be at higher altitudes at any given point on the procedure and interaction with increased Minimum Vectoring Altitudes (MVA) would be reduced. Figure 4.3.2-3 illustrates an overhead view of the restrictions associated with DAVZZ WP.

Turboprop departures are typically assigned 5,000 feet MSL with turbojet aircraft assigned 8,000 feet MSL with additional miles in trail. Vertical separation between turbojet and turboprop departures must be attained prior to merging them onto a common departure routes. The differing performance characteristics of these aircraft increases controller task complexity. Higher climb rates achieved by adding altitude and speed restrictions at DAVZZ WP would

[3] Percentage from a PDARS sampling of departure track data from 09/19/2014 through 10/03/2014

provide vertical separation sooner. This would allow departures to be turned on course sooner than is experienced today. This would reduce controller task complexity, reduce miles flown and related fuel burn and CO_2 emissions, and increase the level of safety.

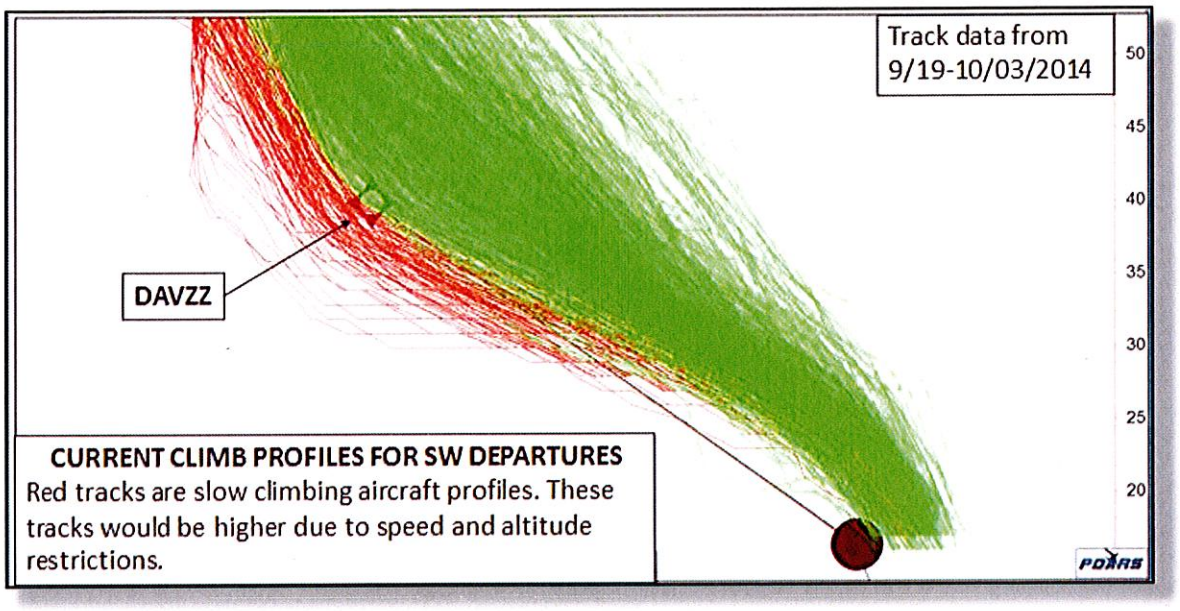


Figure 4.3.2-1. Historical Climb Profiles of PHX Southwest SIDs

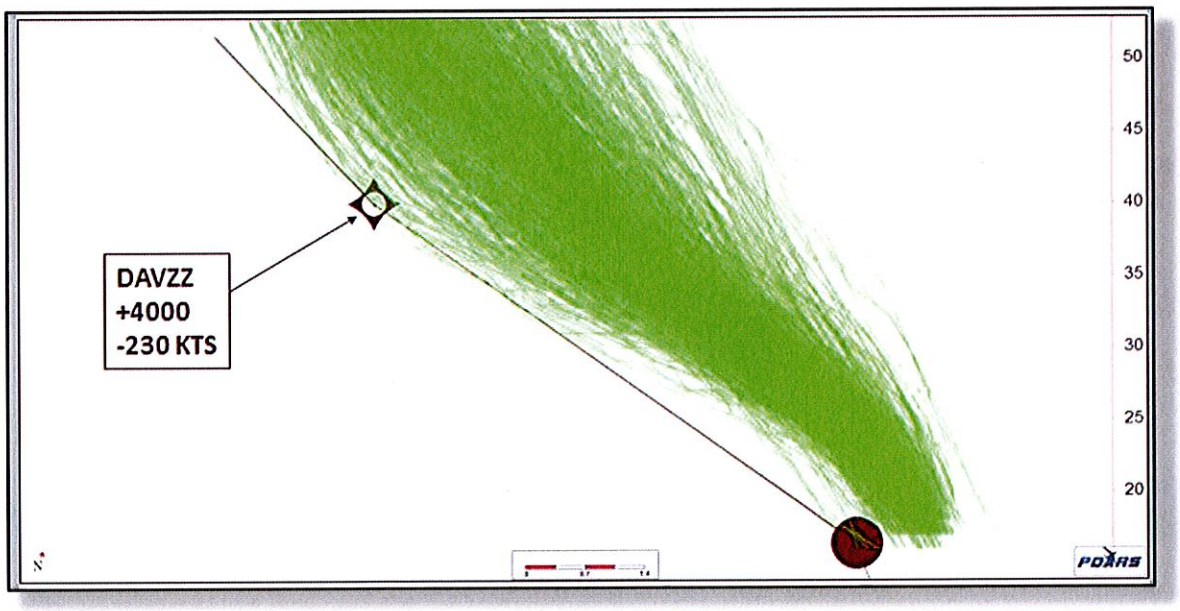


Figure 4.3.2-2. Southwest SIDs Amended Flight Tracks with Altitude Restrictions (Elevation View)

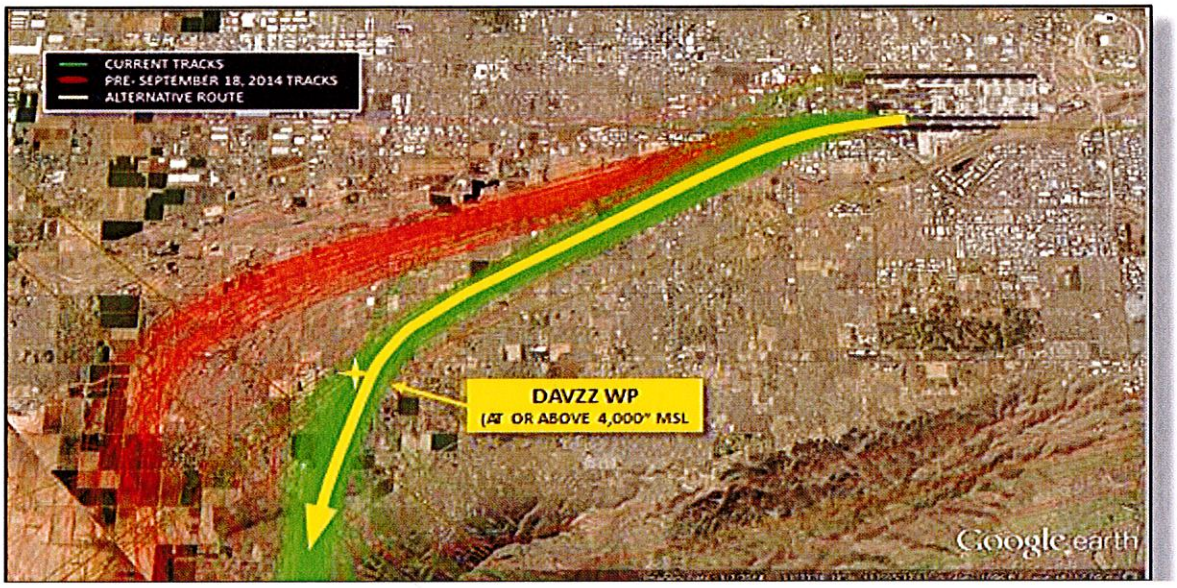


Figure 4.3.2-3. Southwest SIDs Proposed Amended Procedure(s)

4.3.3 Alternative SW3: Revert to Pre-September 18, 2014 Non-RNAV Routings

Description

- Revert to Pre-September 18, 2014 published non-RNAV departure procedures

Considerations:

- Letter to Manager, City of Phoenix, from Administrator Huerta dated January 22, 2015
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures

Decision:

Reverting to the pre-September 18, 2014 flight tracks would reduce efficiency, safety and not align with the purpose and need of the project. An average of 2.2 NM is added to each departure's route by this alternative. Approximately 132,000 additional gallons of fuel would be burned annually. This would also result in an additional 1,200 metric tons of CO_2 introduced annually into the environment.

The lack of PBN procedures and reverting to radar vectoring would increase controller task complexity, and create the potential for reducing airport throughput and failing to maintain an equivalent level of safety. Figure 4.3.3-1 depicts Pre-September 2014 traffic in red.

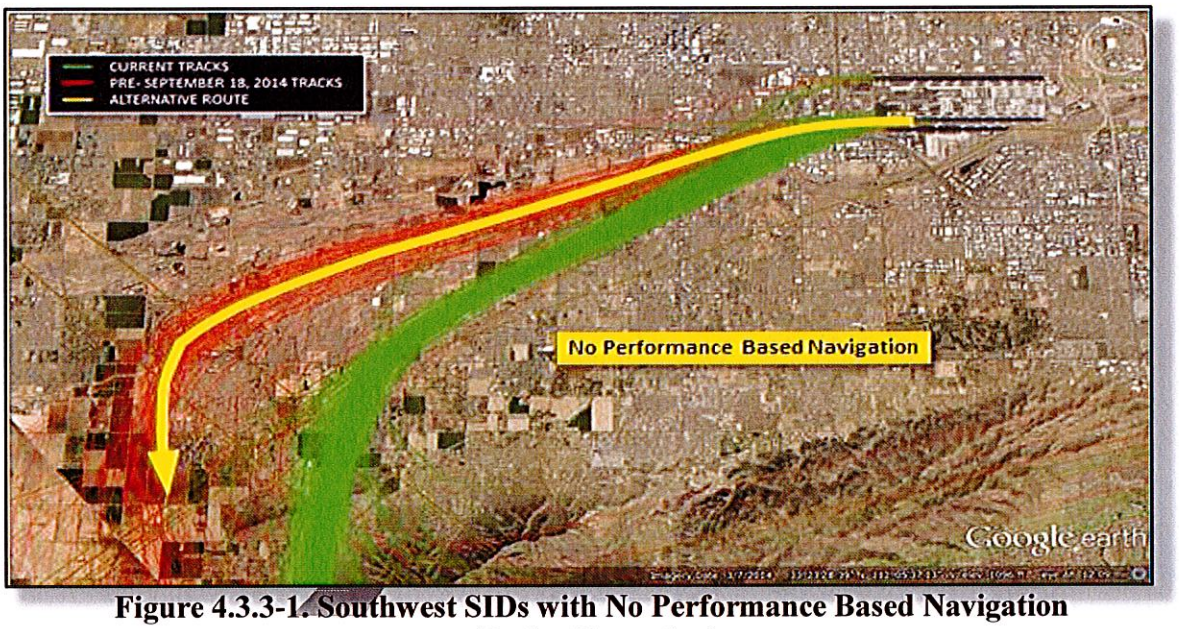


Figure 4.3.3-1. Southwest SIDs with No Performance Based Navigation (Radar Vectoring)

4.3.4 Alternative SW4: Relocate DAVZZ Waypoint

Description

- Explore lateral adjustments to DAVZZ WP to enhance the safety and efficiency of the procedures

Considerations:

- Letter to Manager, City of Phoenix, from Administrator Huerta dated January 22, 2015
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures

Decision:

Moving DAVZZ WP to the west, as depicted in Figure 4.3.4-1, extends the point at which departures continue their turns to the south and east and would reduce efficiency and safety and would not align with the purpose and need of the project. The efficiency reduction is due to the addition of 0.36 nautical flying miles to each departure's route. Approximately 8,650 miles would be added to annual departure flights, resulting in approximately 21,600 additional gallons of fuel to be burned and an additional 203 metric tons of CO_2 to be introduced annually into the environment. This alternative would also route flights away from a designated industrial corridor.

This alternative also introduces the likely potential for reducing airport throughput and failing to maintain an equivalent level of safety. The extended initial departure track caused by the western relocation of DAVZZ may eliminate lateral separation needed to simultaneously depart southwest and west departure SID flights.

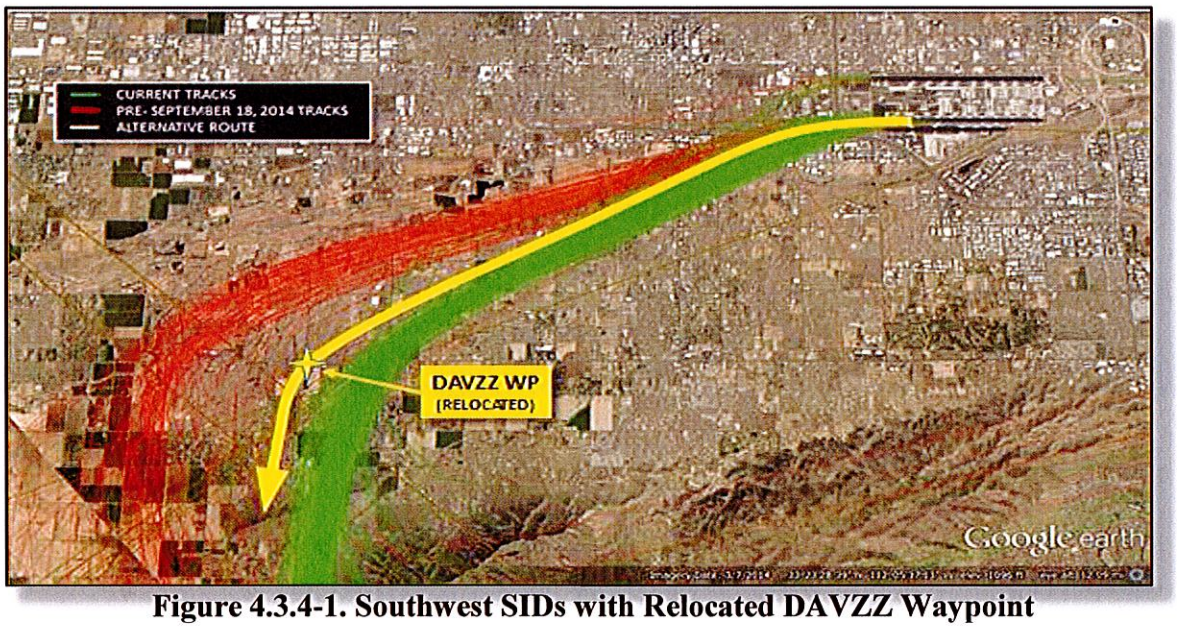


Figure 4.3.4-1. Southwest SIDs with Relocated DAVZZ Waypoint

4.3.5 Alternative SW5: Runway Heading to Intercept Course to DAVZZ Waypoint

Description

- Explore alternate RNAV criteria for heading to intercept course to DAVZZ WP

Considerations:

- Letter to Manager, City of Phoenix, from Administrator Huerta dated January 22, 2015
- Elimination of immediate course divergence creates loss of efficiency due to reduced departure throughput
- Higher altitude potentially decreases noise levels

Decision:

Requiring departures to extend their initial segment on runway heading to join an RNAV course to DAVZZ WP would create a dependency with departures utilizing the IZZZO SID. A loss of efficiency would also be realized, as 0.20 nautical flying miles are added to each departure's route. Approximately 4,800 miles would be added to annual departure flights. Due to the additional miles flown, approximately 12,000 additional gallons of fuel would be burned and an additional 112 metric tons of CO_2 would be introduced annually into the environment.

This alternative also introduces the likely potential for reducing airport throughput and failing to maintain an equivalent level of safety. The extended runway heading departure track, required by design criteria to intercept and fly a course to DAVZZ WP, would eliminate the immediate lateral separation between departures from parallel runways needed to simultaneously depart Runways 26, 25R and 25L. Figure 4.3.5-1 depicts the "Course-To-Fix" routing in yellow.

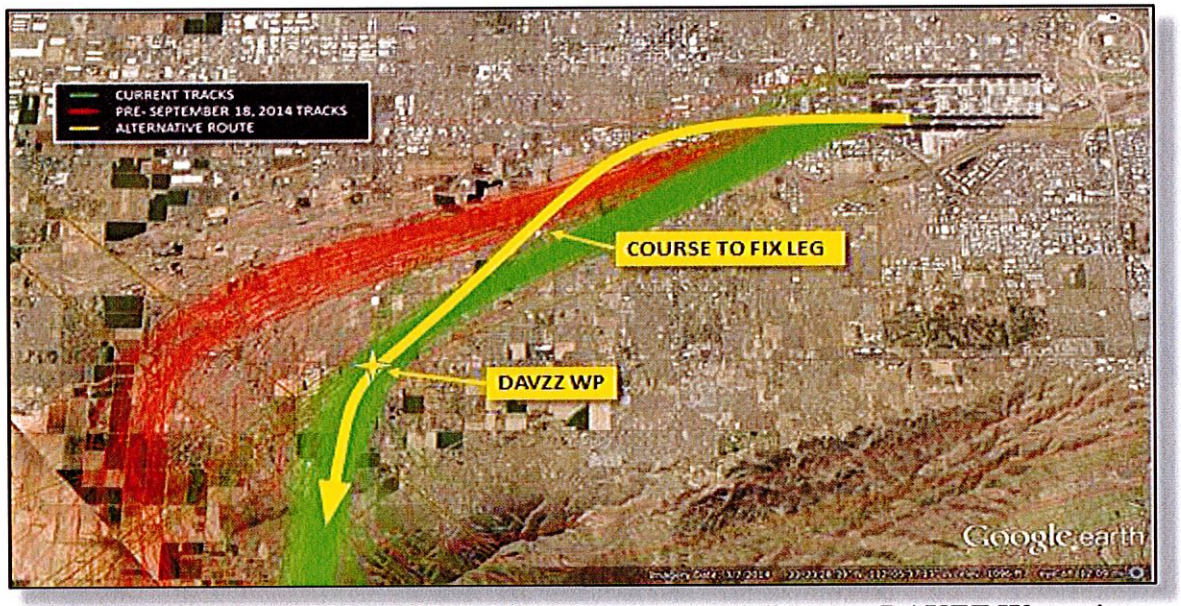


Figure 4.3.5-1. Southwest SIDs with "Course-To-Fix" Leg to DAVZZ Waypoint

5 Post-Implementation Workgroup Recommendations

The Workgroup created and evaluated multiple potential adjustment alternatives for possible procedure amendments, subject to additional environmental review, that aligned with the purpose and need of the post September 18, 2014 project. Subsections 5.1 and 5.3 delineates the selection methodology for the Northwest and Southwest SIDs procedure amendments.

The No Action alternative was selected for the West SID. Subsection 5.2 delineates the selection methodology for the West SID.

5.1 Northwest RNAV SIDs Procedure Amendments

The Workgroup created and evaluated seven alternative procedure amendments to the current KPHX northwest SIDs. After examining all potential adjustment alternatives, the Workgroup selected Alternative NW2 as the preferred procedure amendment, subject to further review including environmental analysis. Alternative NW2 adds an RNAV waypoint (New WP1) to the LALUZ, YOTES, SNOBL, and MAYSA SIDs in the vicinity of the intersection of Grand Avenue and Indian School Road, with altitude and speed restrictions. New WP1 would be restricted at-or-above 4,000 feet MSL and TWNSD WP would be restricted at-or-above 5,000 feet MSL and 230 knots. Using these restrictions, aircraft rates of climb would increase and aircraft altitudes would generally be higher than current procedures. The higher altitudes potentially decrease noise levels. Alternative NW2 also enhances the level of safety by increasing vertical separation between Phoenix turbojet and turboprop departures, as well as satellite airport operations, while maintaining an equivalent level of efficiency. Additionally Industry partners simulated the procedures and identified the best climb rates for all aircraft. The lateral path of Alternative NW2 remains unchanged.

5.2 West RNAV SID Proposed Procedure Amendments

The Workgroup considered two alternative procedure amendments for the West RNAV SID. After examining all alternatives, the Workgroup selected Alternative W1 (No Action) as the preferred solution. This No Action alternative does not increase miles flown as there is no change in the lateral path. Therefore, there is no loss of efficiency, no increase in fuel burn and no increase CO_2 emissions. Not modifying the lateral path of the procedures, the current level of safety is maintained.

5.3 Southwest RNAV SIDs Proposed Procedure Amendment

The Workgroup created and evaluated five alternative procedure amendments to the current KPHX southwest SIDs. After examining the alternatives the Workgroup selected Alternative SW2 as the proposed procedure amendment, subject to further review including environmental analysis. Alternative SW2 incorporates an altitude restriction, at-or-above 4,000 feet MSL and speed restriction, 230 knots at DAVZZ WP. Using these restrictions, aircraft rates of climb would increase and aircraft altitudes would be higher than current procedures. The higher altitude potentially decreases noise levels. Alternative SW2 also enhances the level of safety by increasing vertical separation between Phoenix turbojet and turboprop departures, as well as satellite airport operations, while maintaining an equivalent level of efficiency. Additionally,

Industry partners simulated the procedures and identified the best climb rates for all aircraft. The lateral path of Alternative SW2 remains unchanged.

6 Environmental Overview

6.1 Background

As documented in the Categorical Exclusion (CATEX) Declaration dated September 12, 2013, the FAA determined that the nine RNAV SID procedures, and the five RNAV STARS for KPHX were categorically excluded from further environmental review as per the FAA Order 1050.1E, *Environmental Impacts: Policies and Procedure*, the FAA Modernization and Reform Act of 2012, Section 213 (c)(l) and Memo FAA Order 1050.1E, Change 1, Guidance Memo #5 dated December 6, 2012, *Guidance for Implementation of the Categorical Exclusion in Section 213(c)(l) of the FAA Modernization and Reform Act of 2012.*

Subsequent to implementation of the procedures, the FAA was made aware that communities around the airport had concerns about the noise generated by some of the new procedures. The FAA committed to exploring potential adjustments to the September 18, 2014, procedures to help manage noise issues associated with the new procedures.

The departure procedures being assessed are:

- Northwest SIDs (LALUZ, YOTES, SNOBL, MAYSA)
- West SID (IZZZO)
- Southwest SIDs (FTHLS, BNYRD, JUDTH, KATMN)

The assessment process includes analyzing post implementation data and identifying possible procedure adjustments to ensure that aircraft are flying newly published procedures as intended. Adjustments would be subject to environmental review.

6.2 Investigation

The post implementation assessment identified alternatives for amendments to the west flow RNAV departure procedures. The proposed procedural amendments take into account the following operational assumptions:

- No change in the number of operations utilizing the west flow SIDs
- No change in fleet mix
- No change in runway use
- No change to night time operations

This post-implementation assessment is intended to make modifications and adjustments that align with the purpose and need of the original project.

FAA also conducted an initial environmental screening of the potential adjustment alternatives. The alternatives were evaluated by analyzing and comparing the results from the original environmental analysis to the potential environmental effects for each of the proposed procedural amendments. The comparison analysis indicated there were likely no extraordinary circumstances for two of the proposed procedural amendments, and that these

alternatives would likely not result in a significant environmental effect in accordance with FAA Order 1050.1E. Additionally, the comparison analysis was completed for the resource impact categories as defined in FAA Order 1050.1E. However, implementation of any proposed adjustment alternatives would require further review, including the appropriate environmental review under NEPA.

The proposed alternatives that align with the purpose and need of the original project are identified as:

- Alternative NW2: An addition of an RNAV waypoint and speed and altitude restrictions on the northwest SIDs (LALUZ, YOTES, SNOBL, MAYSA)
- Alternative SW2: An addition of a speed and altitude restriction on the southwest SIDs (FTHLS, BNYRD, JUDTH, KATMN)

In order to determine the extent of the potential noise impact, the *Guidance for Screening Air Traffic Actions* (Screening Guidance) was applied to help determine the need for a detailed noise analysis of the proposed procedural amendments. The Screening Guidance provides a solid and repeatable approach to noise screening within the regulatory framework of FAA Order 1050.1E.

6.3 Alternative NW2 Environmental Review

Alternative NW2 is an addition of an RNAV waypoint on the northwest departure SIDs with an altitude and speed restriction (LALUZ, YOTES, SNOBL, MAYSA). Changes in the location of a fix could potentially result in a change in noise impacts.

The Screening Guidance Lateral Movement Test was used to determine the potential for noise impacts related to the proposed procedural amendment. The Lateral Movement Test is applied to determine if the lateral movement of a route resulting from adding, removing, or changing the location of a fix is enough to cause a change in Day/Night Average Sound Level (DNL) exceeding the noise screening thresholds. The test can be used for both jet and/or propeller traffic, and also in cases where the location change is accompanied by an increase in altitude or a decrease in the number of operations.

The following data for the existing and proposed procedural amendments were evaluated for application of the Lateral Movement Test:

- Geographic coordinates of the fixes that define the route or procedure. This information is used to determine the greatest lateral displacement of the proposed route from the existing route in thousands of feet MSL.
- Lowest altitude specified in Above Ground Level (AGL) flown along the changed portion of the route or procedure
- Presence of noise sensitive receptors near the changed portion of the route

The Lateral Movement Test noise screening results indicated that the proposed amendments would not change the noise impact determination associated with the current published northwest RNAV departure procedures. However, implementation of the proposed amendments would require further review, including the appropriate environmental review under NEPA.

6.4 Alternative SW2 Environmental Review

Alternative SW2 is the addition of a speed and altitude restriction to southwest SIDs (FTHLS, BNYRD, JUDTH, KATMN).

The Screening Guidance Altitude/Operations Test was used to determine the potential for noise impacts related to the proposed procedural amendment. The Altitude/ Operations Test is used to screen for potential noise impacts resulting from a single change in altitude on a route or procedure, or simultaneous change in number of operations and altitude. This test applies to both jet and/or propeller traffic. The Altitude/Operations Test was applied to determine if changes in the number of operations or altitudes or both are enough to cause a change in DNL exceeding the noise screening thresholds. There is no expected change in the number of operations for Alternative SW2. Therefore, only the change in altitude was evaluated as per the Screening Guidance.

The following data for the existing and proposed altitude change were evaluated for application of the Altitude/Operations Test:

- Lowest existing altitude specified in AGL typically flown at the location of the largest altitude decrease
- Lowest proposed altitude in AGL expected to be flown along the route or procedure
- Presence of noise sensitive receptors near the changed portion of the route

The Altitude/Operations Test noise screening results indicated that the proposed amendments would not change the noise impact determination associated with the current published southwest RNAV departure procedures. However, implementation of the proposed amendments would require further review, including the appropriate environmental review under NEPA.

6.5 Findings

The noise screening results indicated that the proposed amendments would not change the noise impact determination associated with the current published northwest and southwest RNAV departure procedures. The noise screening results indicate a potential for decreasing noise due to higher altitudes associated with the proposed amendments. Additionally, there is no change to the impact determination for any of the other resource impact categories per FAA Order 1050.1E as analyzed in the CATEX determination dated September 12, 2013. However, implementation of the proposed amendments would require further review, including the appropriate environmental review under NEPA.

7 Summary

The Workgroup was tasked to perform a post-implementation assessment of procedures published September 18, 2014. The Workgroup created and evaluated 14 potential adjustment alternative designs and developed procedural amendments for the northwest and southwest KPHX SIDs. These amendments meet the purpose and need of the original project by enhancing safety and efficiency. The Workgroup performed a noise screening evaluation which indicated a potential for decreasing noise and did not identify additional environmental impacts. The Workgroup recommends FAA initiate activities to implement these procedural amendments subject to the appropriate environmental review of the final procedure design.

Attachment A: Huerta Letter to Phoenix City Manager Ed Zuercher

U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

January 22, 2015

Mr. Ed Zuercher
City Manager, City of Phoenix
200 West Washington Street
Phoenix, AZ 85003

Dear Mr. Zuercher:

Thank you for your December 23, 2014, letter about the new air traffic procedures that the Federal Aviation Administration (FAA) implemented for Phoenix Sky Harbor International Airport last September.

We are working with airports, airlines, and communities all over the country to modernize the National Airspace System by taking full advantage of emerging technologies and aircraft navigation capabilities to improve safety and efficiency. The recently implemented Performance Based Navigation (PBN) procedures in Phoenix make a safe system even safer by automatically keeping arrival routes and departure routes separated from one another. Airlines program the procedures into their flight computers, and planes fly the routes automatically. This decreases communications between controllers and pilots, which reduces the chances for miscommunications. It also creates more predictable flight paths and provides more direct routings. An ancillary benefit is a reduction in fuel burned and associated CO_2 emissions.

We recognize communities around the airport have concerns about the noise generated by some of the new procedures. After becoming aware of this issue, the FAA quickly took steps to ensure aircraft remained for a greater distance on the charted departure routes, which are designed to fly over an industrial area instead of residential communities to the east. We're continuing to work with aircraft operators to ensure the procedures are being flown as intended. FAA representatives also attended two public meetings to receive input from residents and elected officials.

We are committed to partnering with the airport and airlines to explore other potential adjustments to the procedures to better manage noise issues. We will reconvene our Performance Based Navigation Working Group in February. As I told Mayor Stanton and Congressman Gallego when I met with them on Wednesday, January 21, the City of Phoenix is an important player in this process and we want city representatives to be part of this process.

Although we are committed to exploring possible adjustments to the new procedures, we cannot revert to the procedures that were in use before September 18, 2014. Making changes is not as

simple as turning one procedure off and turning another one on, and designing and developing possible adjustments will not be a simple or quick process.

The new arrival procedures are interdependent with the new departure procedures. Making changes to one would have a domino effect, requiring changes to others. Adjustments to the new procedures must be designed, subjected to a rigorous safety analysis, flight-checked, and charted. Air traffic control and aircraft automation systems must be updated, and air traffic control personnel must be retrained on any changes. We also must conduct the environmental reviews that further changes may require.

As we pursue improvements in safety and efficiency of the National Airspace System for the flying public, we remain committed to working with communities to manage noise issues associated with these changes. We will work closely with the Phoenix Department of Aviation and airlines to explore potential adjustments to the new procedures, and we will keep the community and Congress informed about our efforts.

If we can be of further assistance, please contact me or Molly Harris, Acting Assistant Administrator for Government and Industry Affairs.

Sincerely,

Michael P. Huerta
Administrator

Attachment B: Scoping Document

Scoping Document
for
Post-Implementation Assessment

PURPOSE: Post-implementation analysis is a standard part of Performance Based Navigation (PBN) implementation activities, and includes a review of post-implementation data and any necessary design adjustments to ensure that aircraft are flying newly published procedures as intended.

PROCESS: The Parties recognize that having a consistent and collaborative approach to information sharing, consensus building, and formulation of agreements will allow the overall process to move forward more effectively and efficiently while addressing the interests of all concerned.

1. The Parties agree to form a Workgroup comprising of:

   1 NATCA Co-Lead, identified by NATCA National Airspace Representative
   1 Management Co-Lead, identified by Director for Airspace Services
   2 NATCA POCs (1 each from P50 and PHX)
   2 Management POCs (1 each from P50 and PHX)
   2 WSC PBN Co-Leads (1 each from Management and NATCA)
   1 AJV-3 Representative
   1 FAA Environmental Specialist
   1 Lead Operator (designated by A4A)

   The following subject matter experts will support the team as requested by the Co-Leads:

   1 MITRE analyst
   1 ATAC analyst
   1 CSSI documentation specialist

2. The Workgroup may establish sub-groups to address specific issues as identified by the Workgroup. If a sub-group(s) is unable to reach an agreement by consensus on any portion of the project, that matter will be elevated to the Workgroup for resolution by consensus.

3. The Workgroup and any established sub-groups shall make every effort to reach an agreement through consensus. For the purpose of this document, consensus is defined as the voluntary agreement of all representatives of the Workgroup. If the Workgroup members are unable to reach an agreement on any portion of the project, that matter will be elevated to the Workgroup Co-Leads. Should the Co-Leads fail to reach agreement, the matter will be elevated to the signatories of this document for a collaborative resolution. If the signatories are unable to reach agreement, either Party may pursue whatever course of action is available to them under the CBA, Federal Service Labor/Management Relations Statute and all applicable laws, rules, and regulations.

4. NATCA representatives on the Workgroup and sub-groups shall be in a duty status for all Workgroup and sub-group activities. Additionally, they shall be afforded a reasonable amount of duty time in order to travel for Workgroup-related duties and to communicate with NATCA regarding the status of any Workgroup initiatives.

Scoping Document
for
Post-Implementation Assessment

5. NATCA designated Workgroup and sub-group members will be provided access to the same information as any other Workgroup member.
6. All agreements reached by the Workgroup shall be reduced to writing.

SCOPE: The Workgroup shall:

1. Assess and examine the Phoenix PBN Standard Instrument Departures (SID) with initial turns to the northwest, specifically the LALUZ, MAYSA, SNOBL, and YOTES RNAV SIDs, focusing on the initial segments to the TWSND waypoint, when Phoenix is departing in a west configuration.
2. Assess and examine the Phoenix PBN SIDs with initial turns to the southwest, specifically the BNYRD, FTHLS, JUDTH and KATMN RNAV SIDs, focusing on the initial segments to the DAVSS waypoint, when Phoenix is departing in a west configuration.
3. Assess and examine the Phoenix PBN SID with an initial runway heading, specifically the IZZZO RNAV SID, focusing on the initial segments to the KEENS waypoint, when Phoenix is departing in a west configuration.
4. Analyze feedback from the City of Phoenix Aviation Department, the Phoenix Mayor's Office, and the Phoenix City Council.
5. Propose modifications that will maintain and/or enhance safety, improve operational efficiency, and ensure procedural conformance with the intended flight paths.
6. Produce and deliver the following to Jim Davis and Elizabeth Ray:
   a. Within two weeks of execution of this Scoping Document, a summary of meeting minutes reflecting initial findings.
   b. Within three weeks of execution of this Scoping Document, a summary of meeting minutes reflecting the work completed during Week 2.
   c. Within four weeks of execution of this Scoping Document, a summary of meeting minutes reflecting the work completed during Week 3 and a final design package, if applicable.
7. The Workgroup shall conclude its work no later than March 11, 2015.

Date: 2/9/2015

James D. Davis
Jim Davis
NATCA National Airspace Representative

Eddie Parish
Eddie Parish
Director, Mission Support Services, AJV-1

Attachment C: Cost/Benefit Calculations

Procedure	Workgroup Alternative Identifier	Departure Runway	Mileage to TWSND WP	Delta from Workgroup Recommended Proposal	Annual Cost/(Benefit)	
					Gallons	Metric Tons (CO_2)
LALUZ, YOTES, SNOBL, MAYSA (117 Flights per Day)	NW1	26	9.6	0.0	0	0
		25R	10.0	0.0	0	0
		25L	10.1	0.0	0	0
	NW2 (Recommended)	26	9.6	0.0	0.0	0
		25R	10.0	0.0	0.0	0
		25L	10.1	0.0	0.0	0
	NW3	26	12.9	3.2	341,640	3,263
		25R	13.6	3.3	351,249	3,354
		25L	13.7	3.3	352,316	3,365
	NW4	26	12.9	1.8	194,308	1,856
		25R	13.6	1.9	197,511	1,886
		25L	13.7	1.9	198,578	1,896
	NW5	26	9.2	(0.4)	(40,570)	(387)
		25R	9.7	(0.4)	(42,705)	(408)
		25L	9.8	(0.4)	(43,773)	(418)
	NW6	26	10.2	0.7	69,396	663
		25R	10.6	0.7	70,463	673
		25L	10.7	0.7	71,531	683
	NW7	26	9.6	N/A	N/A	N/A
		25R	10.0	N/A	N/A	N/A
		25L	10.1	N/A	N/A	N/A

Procedure	Workgroup Alternative Identifier	Departure Runway	Mileage to KEENS WP	Delta from Workgroup Recommended Proposal	Annual Cost/(Benefit)	
					Gallons	Metric Tons (CO_2)
IZZZO (54 Flights per Day)	W1 (Recommended)	26	28.7	0.0	0	0
		25R	28.8	0.0	0	0
		25L	28.8	0.0	0	0
	W2	26	28.7	0.0	0	0
		25R	28.8	0.0	0	0
		25L	28.8	0.0	0	0

Procedure	Workgroup Alternative Identifier	Departure Runway	Mileage to VANZZ WP	Delta from Workgroup Recommended Proposal	Annual Cost/(Benefit)	
					Gallons	Metric Tons (CO_2)
BNYRD, FTHLS, JUDTH, KATMN (66 Flights per Day)	SW1	26	10.1	0.0	0	0
		25R	9.8	0.0	0	0
		25L	10.0	0.0	0	0
	SW2 (Recommended)	26	10.1	0.0	0	0
		25R	9.8	0.0	0	0
		25L	10.0	0.0	0	0
	SW3	26	11.6	2.2	134,904	1,288
		25R	11.4	2.2	132,495	1,265
		25L	11.6	2.2	131,291	1,254
	SW4	26	10.4	0.4	22,283	213
		25R	10.1	0.4	21,681	207
		25L	10.3	0.4	21,079	201
	SW5	26	10.2	0.2	12,647	121
		25R	10.2	0.2	12,045	115
		25L	10.4	0.2	11,443	109

All figures are approximate

= Indicates Workgroup Recommended Alternative (Baseline for Comparisons)

Appendix A: Data, Tools and Guidance

The following tools were employed by the Phoenix RNAV SID Post-Implementation Workgroup in the process of studying the Phoenix Procedures:

- Performance Data Analysis and Reporting System (PDARS)
    - Historical traffic flow analysis using merged datasets to analyze multi-facility operations
    - Customized reports to measure performance and air traffic operations (i.e., fix loading, hourly breakdowns, origin-destination counts, etc.)
    - Graphical replays to understand and visualize air traffic operations
- Terminal Area Route Generation Evaluation and Traffic Simulation (TARGETS)
    - Comparison of pre and post track data of actual flown routes to proposed routes
    - Procedure design work
- Air Traffic Airspace Lab (ATALAB) National Offload Program (NOP) data queries
    - Quantification of traffic demand over time for specific segments of airspace
- Guidance for Screening Air Traffic Actions (December 2012)

Appendix B: Post Analysis Environmental Review Details

4.1.1 Alternative NW1: No Action

Description:

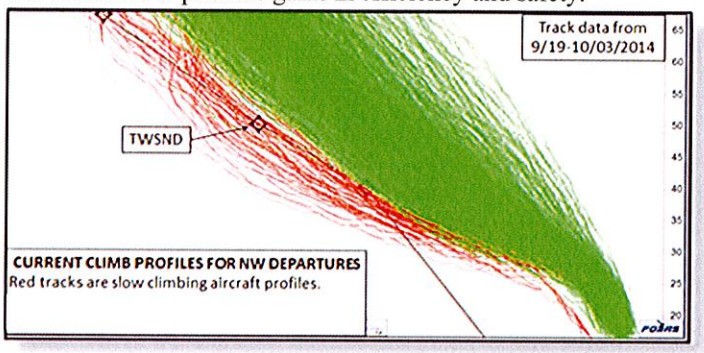
- No change to September 18, 2014 west flow departure procedures.

Considerations:

- Other alternatives identified enhanced safety and efficiency, which align with the goals of the original project.

Decision:

- The Workgroup identified other alternatives which were aligned with the purpose and need of the original project and were able to produce gains in efficiency and safety.



4.1.1 Environmental Review

Noise Analysis:

- No change in noise exposure.

4.1.2 Alternative NW2: Add Waypoint and Speed and Altitude Restrictions to Northwest SIDs: LALUZ, YOTES, SNOBL, and MAYSA

Description:

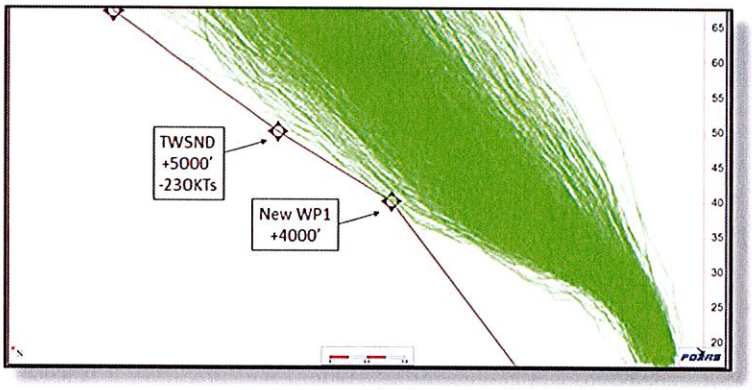
- Add RNAV waypoint on the LALUZ, YOTES, SNOBL, and MAYSA SIDs in the vicinity of Grand Avenue and Indian School Road, as well as altitude and speed restrictions. No change in the lateral path.

Considerations:

- Using this restriction, aircraft rates of climb will increase
- Aircraft will be higher than current procedure.
- Proposed waypoint (New WP1) assigns an at or above 4,000 feet MSL altitude restriction.
- Add similar speed and altitude restrictions at TWNSD waypoint (230 knot speed restriction and at or above 5,000 feet MSL altitude restriction).
- Potential decrease noise levels due to higher altitude.

Decision:

- Workgroup selected this alternative for the northwest SIDs.



4.1.2 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Above 3,000 feet AGL" was applied to evaluate the proposed New WP1 location and altitude, as well as the altitude restriction for the existing TWNSD waypoint location.
- The LAT noise screening tool data indicated that the proposed altitude for NEW WP1 would support up to a 3,000 feet lateral displacement from the existing route at the proposed geographical location for New WP1.
- Evaluation of land use within a radius of 3,000 feet from the geographic location of New WP1 indicated the presence of noise sensitive receptors to the northeast.
- The Workgroup determined that a lateral displacement of 3,000 feet on either side of the existing route would not substantially improve efficiency and/or safety of the existing procedure.

Findings:

- The LAT noise screening tool data indicated that Alternative NW2 would not likely cause a change in the Day Night Average Sound Level (DNL) exceeding the noise screening thresholds.
- Given that the route is not expected to be laterally displaced, the LAT noise screening data indicated that the proposed 4,000 feet AGL altitude for New WP1 would not result in extraordinary circumstances.

4.1.3 Alternative NW3: Revert to Pre-September 18, 2014 Non-RNAV Routings

Description:

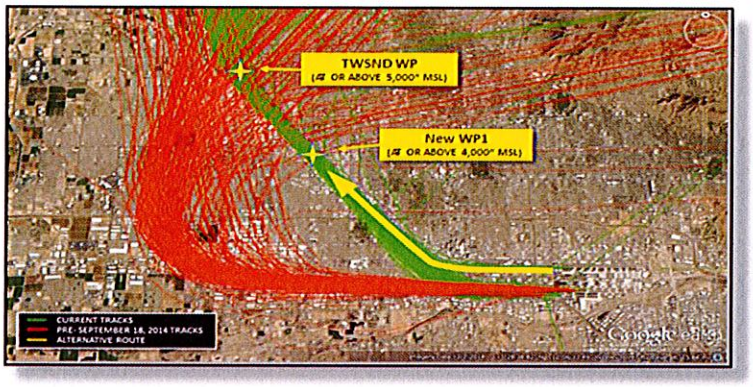
- Revert to Pre-September 18, 2014 published Non-RNAV departure procedures.

Considerations:

- Reroutes flight tracks away from the industrial corridor.
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures.

Decision:

Reverting to the pre-September 18, 2014 flight tracks would reduce efficiency and safety, and would not align with the purpose and need of the original project.



4.1.3 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Under 3,000 feet AGL" was applied to evaluate the propose route lateral displacement of approximately six nautical miles from the existing procedure initial turn to the northwest.
- Evaluation of land use in the vicinity of the proposed initial turn to the northwest indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative NW3 would potentially cause a change in the DNL exceeding the noise screening thresholds.
- The presence of noise sensitive receptors in the vicinity of the proposed initial turn to the northwest indicated the potential for extraordinary circumstances.
- The LAT noise screening tool data indicated that Alternative NW3 failed the LAT; as the potential exists for extraordinary circumstances according to FAA Order 1050.1E.
-

4.1.4 Alternative NW4: Revert to Pre-September 18, 2014 Using RNAV Routings

Description:

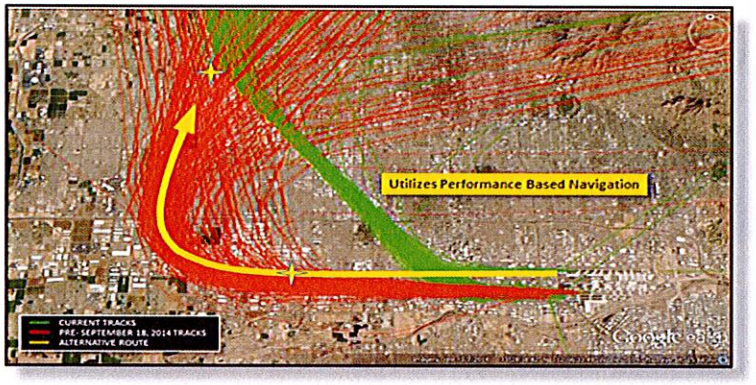
- Revert to Pre-September 18, 2014 flight paths incorporating RNAV procedures.

Considerations:

- Reroutes flight tracks away from the industrial corridor.
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures.

Decision:

- Alternative would reduce efficiency and safety and will not align with the purpose and need of the original project.



4.1.4 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Under 3,000 feet AGL" was applied to evaluate the propose route lateral displacement of approximately six nautical miles from the existing procedure initial turn to the northwest.
- Evaluation of land use in the vicinity of the proposed initial turn to the northwest indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative NW4 would potentially cause a change in the DNL exceeding the noise screening thresholds.
- The presence of noise sensitive receptors in the vicinity of the proposed initial turn to the northwest indicated the potential for extraordinary circumstances.
- Alternative NW4 would be considered a distinct federal action due to the displacement of the proposed lateral track exceeding the parameters of the LAT associated with the changes in altitude.

4.1.5 Alternative NW5: Immediate Turn Direct TWNSD Waypoint

Description:

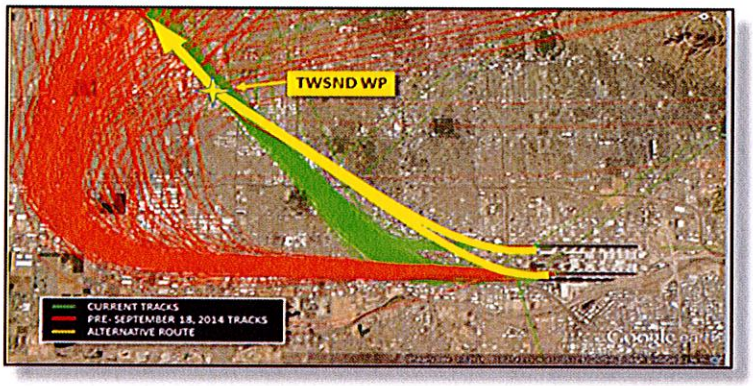
- Immediate right turn from departure end of runway direct TWNSD waypoint on the LALUZ, YOTES, SNOBL, and MAYSA SIDs.

Considerations:

- Increases efficiency and reduces controller task complexity.
- Dispersal of flight tracks over residential areas.

Decision:

- Alternative has potential environmental concerns.



4.1.5 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Under 3,000 feet AGL" was applied to evaluate the propose route lateral displacement of approximately one nautical mile from the immediate turn from the runway end to the existing procedure initial turn to the northwest.
- Evaluation of land use in the vicinity of the proposed initial turn to the northwest indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative NW5 would potentially cause a change in the DNL exceeding the noise screening thresholds.
- The presence of noise sensitive receptors in the vicinity of the proposed immediate turn to the northwest indicated the potential for extraordinary circumstances.
- Alternative NW5 would be considered a distinct federal action due to the displacement of the proposed lateral track exceeding the parameters of the LAT associated with the changes in altitude.

4.1.6 Alternative NW6: Add RNAV Waypoint to Extend Upwind Leg

Description:

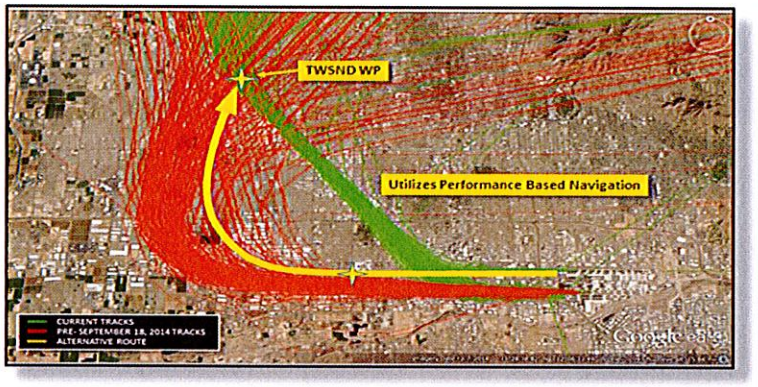
- Add RNAV waypoint two miles west of the current tracks on the LALUZ, YOTES, SNOBL, and MAYSA SIDs to relocate turn point to the west.

Considerations:

- Aircraft will fly runway heading for 1.3NM prior to starting northwest turn to TWSND waypoint, routing flights away from the industrial corridor and over residential areas.
- Elimination of course divergence creates loss of efficiency due to reduced departure throughput.t

Decision:

- Alternative would reduce efficiency and safety.



4.1.6 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Under 3,000 feet AGL" was applied to evaluate the proposed route lateral displacement of approximately two nautical miles from the existing procedure initial turn to the northwest.
- Evaluation of land use in the vicinity of the proposed initial turn to the northwest indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative NW6 would potentially cause a change in the DNL exceeding the noise screening thresholds.
- The presence of noise sensitive receptors in the vicinity of the proposed waypoint and subsequent turn to the northwest indicated the potential for extraordinary circumstances.
- Alternative NW6 would be considered a distinct federal action due to the displacement of the proposed lateral track exceeding the parameters of the LAT associated with the changes in altitude.

4.1.7 Alternative NW7: Add Radius to Fix (RF) Leg

Description:

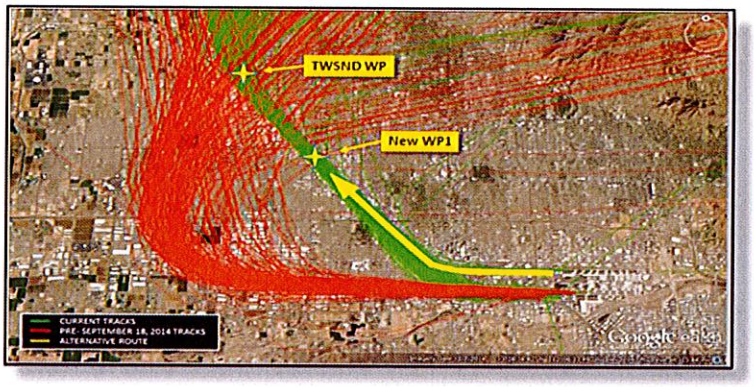
- Add an RF leg departure procedure.

Considerations:

- Increased flight path precision.
- Fleet equipage limitations.
- Criteria not supported for public procedures.

Decision:

- Alternative does not meet criteria for public instrument departure procedures.



4.1.7 Environmental Review

Noise Analysis:

- The noise screening tools and techniques to evaluate potential changes in noise impacts associated with the change in a route or procedure were not applied to Alternative NW7 as the alternative does not meet criteria for a public procedure per FAA Order 8260.46E, "*Departure Procedure Program*" and FAA order 8260.58, "*United States Standard for Performance Based Navigation Instrument Procedure Design*".

4.2.1 Alternative W1: No Action

Description:

- No change to September 18, 2014 west flow departure procedures.

Considerations:

- No change to September 18, 2014 west flow departure procedures.

Decision:

- No Action Alternative was selected.

4.2.1 Environmental Review

Noise Analysis:

- No change in noise exposure.

4.2.2 Alternative W2: Add Speed and Altitude Restriction

Description:

- Add speed and altitude restriction to IZZZO RNAV SID.

Considerations:

- No benefits to safety or efficiency identified.

Decision:

- Turbojet aircraft are able to climb unrestricted and eliminates the need for a waypoint crossing restriction.

4.2.2 Environmental Review

Noise Analysis:

- The Altitude/Operations Test (A/O) was used to screen for potential noise impacts resulting from a single change in altitude on a route or procedure.
- The Alternative W2 would result in an increase in aircraft altitude at the location of the speed and altitude restriction.
- The number of departure operation is not expected to increase as a result of the Alternative W2.

Findings:

- The A/O noise screening tool data indicated that Alternative W2 would not cause a change in the DNL exceeding the noise screening thresholds.
- Given that there is no expected lateral displacement of the west flow RNAV SIDs, evaluation of land use along the ground track of the Alternative W2 indicated the speed and altitude restriction would not result in extraordinary circumstances above 3,000 feet AGL.
- The Workgroup determined that Alternative W2 would not substantially improve efficiency and/or safety of the existing procedure; therefore Alternative W2 is not recommended.

4.3.1 Alternative SW1: No Action

Description:

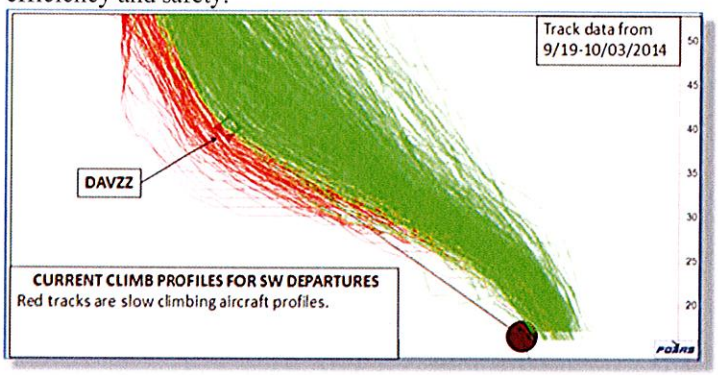
- No change to September 18, 2014 west flow departure procedures.

Considerations:

- Other alternatives identified by the Workgroup enhanced safety and efficiency, which met the goals of the original project.

Decision:

The Workgroup identified other alternatives which were aligned with the purpose and need of the project and were able to produce gains in efficiency and safety.



4.3.1 Environmental Review

Noise Analysis:

- No change in noise exposure.

4.3.2 Alternative SW2: Add Speed and Altitude Restriction to Southwest SIDs: BNYRD, FTHLS, JUDTH, and KATMN

Description:

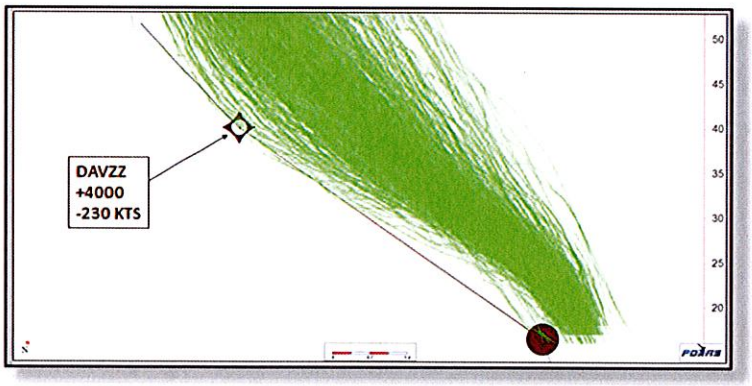
- Add speed and altitude restriction to southwest SIDs. No change in the lateral path.

Considerations:

- Retains direct-to-fix legs required for immediate divergence off runway.
- Waypoint assigns at-or-above 4,000 feet MSL altitude restriction.
- Waypoint assigns at-or-below 230 knots speed restriction.
- Aircraft rates of climb will increase. Aircraft will be higher than current procedure.
- Enhances level of safety by increasing vertical separation from Phoenix turboprop departures and satellite airport operations.
- Potential decrease noise levels due to higher altitude.

Decision:

- Workgroup selected this alternative for the southwest SIDs.



4.3.2 Environmental Review

Noise Analysis:

- The Altitude/Operations Test (A/O) was used to screen for potential noise impacts resulting from a single change in altitude on a route or procedure.
- Given that the number of operations associated with the southwest SIDs is not expected to increase, the A/O noise screening tool data indicated that the Alternative SW2 would support a speed and altitude restriction.

Findings:

- The A/O noise screening tool data indicated that Alternative SW2 would not cause a change in the DNL exceeding the noise screening thresholds.
- Given that there is no expected lateral displacement of the southwest RNAV SIDs, evaluation of land use along the ground track of the Alternative SW2 indicated the speed and altitude restriction would not result in extraordinary circumstances above 3,000 feet AGL.

4.3.3 Alternative SW3: Revert to Pre-September 18, 2014 Non-RNAV Routings

Description:

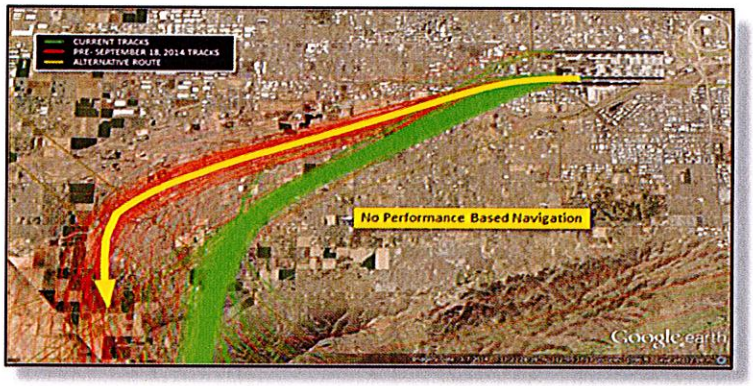
- Revert to Pre-September 18, 2014 published non-RNAV departure procedures.

Considerations:

- Letter to Manager, City of Phoenix, from Administrator Huerta dated January 22, 2015.
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures.

Decision:

- Alternative would reduce efficiency and safety and will not align with the purpose and need of the project.



4.3.3 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Under 3,000 feet AGL" was applied to evaluate the propose route lateral displacement of approximately 1.3 nautical miles from the existing procedure.
- Evaluation of land use along the ground track of the proposed procedure indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative SW3 would potentially cause a change in the DNL exceeding the noise screening thresholds.
- Alternative SW3 would be considered a distinct federal action due to the displacement of the proposed lateral track exceeding the parameters of the LAT associated with the changes in altitude.

4.3.4 Alternative SW4: Move DAVZZ Waypoint

Description:

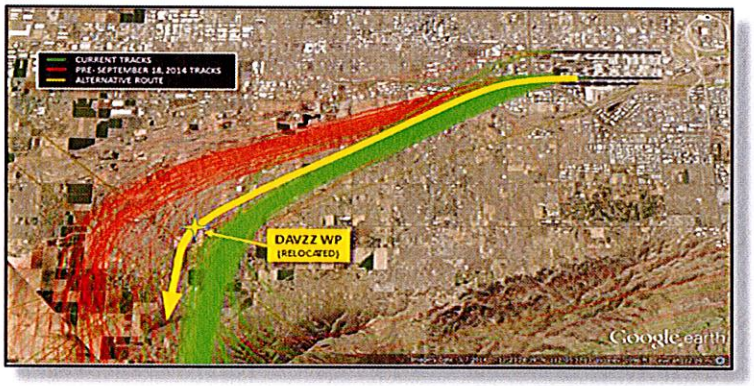
- Explore lateral adjustments to DAVZZ waypoint to enhance the safety and efficiency of the procedures.

Considerations:

- Letter to Manager, City of Phoenix, from Administrator Huerta dated January 22, 2015.
- Eliminates efficiency and safety enhancements realized by the September 18, 2014 published procedures.

Decision:

- Alternative would reduce efficiency and safety and will not align with the purpose and need of the project.



4.3.4 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Above 3,000 feet AGL" was applied to evaluate the propose route lateral displacement of approximately 0.3 nautical miles from the existing procedure.
- Evaluation of land use along the ground track of the proposed procedure indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative SW4 would potentially cause a change in the DNL exceeding the noise screening thresholds.
- The presence of noise sensitive receptors in the vicinity of the proposed waypoint indicated the potential for extraordinary circumstances.
- The LAT noise screening tool data indicated that Alternative SW4 failed the LAT; as the potential exists for extraordinary circumstances according to FAA Order 1050.1E.

4.3.5 Alternative SW5: Runway Heading to Intercept Course to DAVZZ Waypoint

Description:

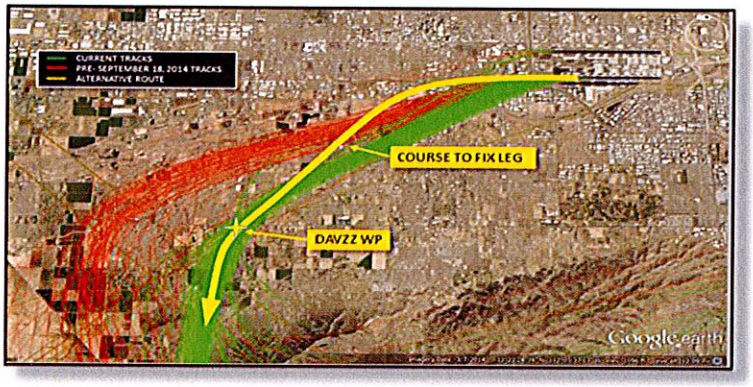
- Explore alternate RNAV criteria for heading to intercept course to DAVZZ waypoint.

Considerations:

- Letter to Manager, City of Phoenix, from Administrator Huerta dated January 22, 2015.
- Elimination of immediate course divergence creates loss of efficiency due to reduced departure throughput.
- Higher altitude potentially decreases noise levels.

Decision:

- Alternative would reduce efficiency and safety and will not align with the purpose and need of the project.



4.3.5 Environmental Review

Noise Analysis:

- The Lateral Movement Test (LAT) for actions "Under 3,000 feet AGL" was applied to evaluate the propose route lateral displacement of approximately 1.3 nautical miles from the existing procedure.
- Evaluation of land use along the ground track of the proposed procedure indicated the presence of noise sensitive receptors.

Findings:

- The LAT noise screening tool data indicated that Alternative SW5 would potentially cause a change DNL exceeding the noise screening thresholds.
- The presence of noise sensitive receptors in the vicinity of the proposed waypoint indicated the potential for extraordinary circumstances.
- The LAT noise screening tool data indicated that Alternative SW5 failed the LAT; as the potential exists for extraordinary circumstances according to FAA Order 1050.1E.

Appendix 10. Community Involvement Policy

Community Involvement Policy Statement

The first step in meeting the needs of the public is to understand the public's needs. Community involvement lets the agency know what the citizens think about our activities. Though community involvement, we will broaden our information base and improve our decisions.

The Federal Aviation Administration (FAA) is committed to complete, open, and effective participation in agency action. The agency regards community involvement as an essential element in the development of programs and decisions that affect the public.

The public has a right to know about our projects and to participate in our decision making process. To ensure that FAA actions serve the collective public interests, all stakeholders will have an opportunity to be heard. Our goals are:

- To provides active, early, and continuous public involvement;
- To provide reasonable public access to information;
- To provide the public an opportunity to comment prior to key decisions; and
- To solicit and consider public input on plans, proposals, alternatives, impacts, mitigation and final decision.

This task will require agency management and staff:

- To identify and involve the public and to consider specific concerns;
- To use public involvement techniques designed to meet the diverse needs of the broad public, including not only interested groups and the general public, but individuals as well;
- To ensure FAA planning and project managers commit appropriate financial and human resources to community involvement;
- To sponsor outreach, information, and educational assistance to help the public participate in FAA planning, programming, and project development activities;
- To ensure key personnel are trained properly in community involvement techniques and methods; and
- To development and evaluate public involvement processes and procedures to assess their success at meeting our goals.

The goals of community involvement are:

- To promote a shared obligation of the public and FAA decision makers in identifying aviation-related concern and developing and evaluating alternatives to address them; and
- To promote an active public role to minimize potential adverse community reaction to agency plans that are necessary for safe, effective, and environmentally responsible management of our airspace.

Signed by

David R. Hinson

Administrator

Dated: April 17, 1995