

CENTENNIAL AIRPORT COMMUNITY NOISE ROUNDTABLE

May 5, 2021

6:30 p.m. – 8:30 p.m.

Chair: Brad Pierce **Vice Chair:** Melissa Coudeyras **Treasurer:** Tom Dougherty **Secretary:** Alison Biggs
CACNR Mission: Utilizing Partnerships to Reduce Airport Noise for the Benefit of Neighboring Communities

HYBRID IN PERSON AND VIRTUAL MEETING VIA ZOOM

PARTICIPANTS ARE INVITED TO ATTEND IN PERSON OR VIRTUALLY, USING THE INFORMATION PROVIDED:

In Person for CACNR Member Representatives and Alternate Representatives

(In Person attendance limited to the above due to space available for social distancing)

Centennial Airport, 7565 S. Peoria Street, Unit D9, Englewood, CO 80112

Virtual for CACNR Member Representatives and Alternates if desired, and Members of the Public

Rachel Keller is inviting you to a scheduled Zoom meeting:.

Join Zoom Meeting: <https://us02web.zoom.us/j/7174170957?pwd=RndnaEY5SUIGNmdHSEkrSU1GZXIHQT09>

Meeting ID: 717 417 0957

Passcode: 5wBabR

One tap mobile

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+1 301 715 8592 US (Washington DC)

+1 312 626 6799 US (Chicago)

+1 646 558 8656 US (New York)

Meeting ID: 717 417 0957

Passcode: 996717

Find your local number: <https://us02web.zoom.us/j/kd5eRYAXow>

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AGENDA

1. CALL TO ORDER AND DETERMINATION OF QUORUM:

Arapahoe County: Carrie Warren-Gully/Bill Skinner
Paul Krier/Vacant

Douglas County: Abe Laydon/Dan Avery
Alison Biggs/Mark Adams

Aurora: Brad Pierce/Karen Hancock

Castle Pines: Melissa Coudeyras/Kevin Rants

Castle Rock: Laura Cavey/Vacant

Centennial: Candace Moon/Don Sheehan

Cherry Hills Village: Al Blum/Afshin Safavi

Foxfield: Pam Thompson/Frank Lawrence

Greenwood Village: Tom Dougherty/Karen Blilie

Lone Tree: Mike Anderson/Jennifer Drybread

Parker: Amy Holland/Todd Hendreks

ACPAA: Robert Olislagers/Michael Fronapfel

AOPA: Robert Doubek/John Hirshman

CABA: Don Kuskie/Mike Straka

CDOT Aeronautics Div: Todd Green/Vacant

FAA APA Control Tower: Melissa Booth/Ron Curry

FAA District Office: John Bauer/John Sweeney

FAA TRACON: Steve Martin/Bill Dunn

Wings Over the Rockies: Bill Wasmund/Keith Palmer

2. PUBLIC COMMENT: (non-Agenda items – 3 minutes per person time limit; correspondence from the public)

3. CONSENT AGENDA: (note – items here may be moved to Agenda Item #4 for discussion, on the request of any CACNR Representative)

A. DRAFT MINUTES, April 7, 2021 – Alison Biggs, Secretary

B. TREASURER'S REPORT, April 2021 – Tom Dougherty, Treasurer

C. NOISE REPORT – Rachel Keller

D. ACPAA, April 8, 2021 – Bob Doubek, ACPAA Treasurer; Melissa Coudeyras CACNR Representative to April meeting

E. NEXTGEN – Brad Pierce

F. N.O.I.S.E. – Brad Pierce

4. ITEMS REMOVED FROM CONSENT AGENDA

5. COMMITTEE REPORTS:

- A. EXECUTIVE/WORK PLAN COMMITTEE – Brad Pierce, Chair
 - 1. CACNR Phase II
- B. COMMUNITY OUTREACH – Melissa Coudeyras, Chair
- C. FLY QUIET – Bill Wasmund, Chair
- D. NOISE MONITORS – Candace Moon, Chair
- E. WORK PROGRAM – Alison Biggs, Chair

6. FAA REPORTS:

- A. CENTENNIAL AIRPORT AIR TRAFFIC CONTROL TOWER – Melissa Booth/Ron Curry

7. OTHER REGULAR REPORTS:

- A. AIRPORT DIRECTOR'S REPORT – Robert Olislagers
 - 1. Airport Activity
 - 2. Legislative
 - 3. Litigation/Metroplex
 - 4. Other

8. OLD BUSINESS:

- A. 2021 MEETING SCHEDULE FOR CACNR AND ACPAA with CACNR REPRESENTATIVES TO ACPAA
 - 1. Need CACNR Representative for ACPAA May 13 meeting and August 12 through the rest of the year
- B. CONGRESSIONAL QUIET SKIES CAUCUS
- C. ITEMS FROM PRIOR CACNR MEETINGS

9. NEW BUSINESS:

- A. INFORMATION SHARING
 - 1. "US Department of Transportation, Office of Inspector General - NextGen Benefits Have Not Kept Pace..."
- B. CACNR Membership Application from Highlands Ranch Metropolitan District

10. PUBLIC COMMENT: (3 minutes per person time limit):

11. NEXT MEETINGS:

- A. **CACNR** –

June 2, 2021	6:30 p.m. assumed hybrid in-person/virtual meeting
July 7, 2021	6:30 p.m. assumed hybrid in-person/virtual meeting
August 4, 2021	6:30 p.m. assumed hybrid in-person/virtual meeting
- B. **ACPAA** –

May 13, 2021	3:30 p.m. probable virtual meeting
June 10, 2021	3:00 p.m. probable virtual meeting
July 2021	no meeting
August 12, 2021	3:00 p.m. probable virtual meeting

12. ADJOURN

CENTENNIAL AIRPORT COMMUNITY NOISE ROUNDTABLE

MINUTES

April 7, 2021

DRAFT

VISION – QUIETER SKIES FOR OUR COMMUNITIES

MISSION – UTILIZING PARTNERSHIPS TO REDUCE AIRPORT NOISE FOR THE BENEFIT OF NEIGHBORING COMMUNITIES

Chair: Brad Pierce **Vice Chair:** Melissa Coudeyras **Treasurer:** Tom Dougherty **Secretary:** Alison Biggs

1. **CALL TO ORDER, ROLL CALL, and QUORUM:** The virtual meeting via Zoom was called to order at 6:38 p.m. by Chair Brad Pierce. The following were in attendance and a quorum was present:

Arapahoe County	Carrie Warren-Gully	Greenwood Village:	Tom Dougherty
Arapahoe County:	Paul Krier	Lone Tree:	Mike Anderson
Douglas County:	Dan Avery	Parker:	Todd Hendreks
Douglas County:	Alison Biggs	ACPAA:	Robert Olislagers
Aurora:	Brad Pierce	AOPA:	Robert Doubek
Castle Pines:	Melissa Coudeyras	CABA:	Don Kuskie
Centennial:	Candace Moon	Wings Over the Rockies:	Bill Wasmund
Foxfield:	Pam Thompson		

Others in attendance were Aurora Alternate Representative Karen Hancock; ACPAA Alternate Representative Mike Fronapfel; and ACPAA staff Gina Conley, Deborah Grigsby, Rachel Keller, and Kristen Pollien.

Those absent were:

Castle Rock:	Jason Gray/Vacant	FAA APA Control Tower:	Melissa Booth/Ron Curry
Cherry Hills Village:	Al Blum/Afshin Safavi	FAA District Office:	John Bauer/John Sweeney
CDOT Aeronautics Div:	Todd Green/Vacant	FAA TRACON:	Steve Martin/Bill Dunn

2. **APPROVAL OF AGENDA:** On the motion of Tom Dougherty, duly seconded, the agenda was approved.

3. **PUBLIC COMMENT:** Public members present included: Andrea Suhaka, past Centennial Alternate Representative; Dave Adams, Inspiration area in Southeast Aurora; Renee Anderson and Andy Jones, Highlands Ranch Metropolitan District; Kim Hellweg, Elizabeth; John Kocon, Estates of Buffalo Ridge in Castle Pines; Jim Slaggert, Orchard Hills 1 in Greenwood Village, and Sue Santos, Sterling Ranch.

David Adams from the Inspiration area in southeast Aurora indicated there had been as many as 37 recent nighttime disturbances in his area. Of these, there had been at least 18 props, and most were southbound departures which turned almost immediately over his house. He questioned why they could not fly further south where there were no people and turn there instead of over populated areas such as his. Robert Olislagers indicated he would need more specific information, but would work with Mr. Adams after the meeting, and Adams agreed to call him.

Inquiries had come to the CACNR email address from a resident of the area at I-25 and University, about a small plane making loops between 7:00 p.m. and 9:00 p.m. The plane had also been seen during the day. At the request of Brad Pierce, Rachel Keller had been communicating with the resident. She reported on her efforts and communications with the resident, who lives outside the Centennial Airport airspace, and indicated she had also received a similar complaint from someone else in the resident's general area. The plane did not show up on any of the tracking sites, so it may be filtered out by the FAA for some reason, or the plane did not have the equipment to transmit its location by radar. The Centennial Air Traffic Control Tower had also been unable to identify anything useful about the aircraft. The resident had been asked to see if the aircraft's tail number could be obtained, which could then be submitted with an inquiry to the Flight Standards District Office.

John Kocon from the northwest area of Castle Pines, east of Daniels Park, commented he had lived in the area for about 15 years, and the increase in noise from small jets and props in the last one-to-two years had been remarkable. There seemed to be a dramatic change in flight paths affecting the area. Brad Pierce suggested at least some of that might be attributed to the changes brought about by Metroplex. It was agreed Mr. Kocon would provide more information to airport staff for further exploration of the situation.

Jim Slaggert from Orchard Hills in Greenwood Village indicated he had been in the area for about nine years and had lodged complaints during that time, including speaking with airport staff. There is a noise monitor about 150 yards from his house. He expressed frustration that there were always excuses for the noise, but nothing ever seemed to be done about it. The area gets many training flights, and the pattern is expanded far too often. He felt there was no excuse for flights to get precedence over people. People have stopped complaining because nothing is done, and they have been told lodging too many complaints will lower their property values if they try to sell their homes.

He further inquired why the airport is not more proactive with its fly quiet program and why certain measures were not made mandatory as at some other airports in the country. With all the noise monitor data, residents should not have to complain. He suggested if a pilot violated the fly quiet program, the plane should be met upon landing, and the pilot disciplined. He also requested more public accountability for the flight schools. The lack of FAA participation with CACNR was noted as an indication that the FAA does not care about the public and the effect aircraft noise has on people.

Brad Pierce explained some of the current and ongoing efforts with the flight schools, as well as some of the FAA constraints on making a fly quiet program mandatory.

Kim Hellweg agreed with the previous speaker, but noted the flight schools may set limits for their students, but that the pilots need to police their behavior as well. However, with no repercussions for offending behavior, she questioned what the general public could do.

Ron Jones introduced Sue Santos from the Sterling Ranch area. This is a large development near Highlands Ranch, and it has been working with Highland Ranch on areas of mutual interest.

4. **CONSENT AGENDA:** The Consent Agenda included the March 3, 2021 draft minutes, and a Treasurer's Report dated April 1, 2021 which showed a balance of \$7,803.94.

On the motion of Melissa Coudeyras, duly seconded, the Consent Agenda was approved.

5. **ITEM(S) REMOVED FROM CONSENT AGENDA:** None

6. **COMMITTEE REPORTS:**

A. **EXECUTIVE /WORK PLAN COMMITTEES –**

1. A draft response to the FAA re its Neighborhood Environmental Survey (NES) had been provided. Following discussion, motion was made by Alison Biggs, duly seconded, to fix any typographical errors and approve the draft for submission to the FAA via the Federal Register, signed by Chair Brad Pierce. Motion carried. All were encouraged to get their jurisdictions to submit comments on the NES, as well as to provide comments personally. It would be important for the FAA to know the public cares about the issues raised in this Survey. The link for providing comments was provided in one of the N.O.I.S.E. reports provided later in the agenda.

2. Jason Schwartz had provided an initial Phase 2 Initial Work Plan related to CACNR's 's Work Program. There was general agreement Task 1 and Task 2 should receive the first attention, and Schwartz would be asked to provide a cost estimate for those two portions of Phase 2. It was understood the committees could and should proceed with giving the other tasks in their portions of the Work Program attention as well, if they were able to do so.

3. A sample agenda for May had been provided. It showed what the agenda might look like with the Approval of the Agenda category was removed, and those reports which were usually received in writing were all placed on the Consent Agenda. Members would be responsible for reading the reports before the meeting, and if anyone wished to discuss anything contained in a report, it could be moved to the next Agenda item. Reasons for trying this approach were discussed, including a more productive use of CACNR discussion time, and the ability to focus more on the progress being made on the CACNR Work Program or other matters requiring CACNR attention or action.

4. Input was solicited to determine the interest in/willingness to resume in-person CACNR meetings. Discussion included where the meetings might be held. Carrie Warren Gully indicated Arapahoe County might be ready to resume letting CACNR use its previously used meeting room by mid-summer; she would inquire and let us know when. Robert Olislagers indicated what ACPAA was doing with regards to safety and disinfecting procedures at its new headquarters building, and noted good audiovisual mechanisms were also available. The meeting room could handle 29 individuals, with temperature checks, masks, and social distancing. By consensus, it was agreed to hold a hybrid meeting in May, with those who wished to attend in person going to the ACPAA building, and those wishing to attend virtually using the Zoom system that had been in place since 2020. Committees should continue meeting as they have been before the CACNR meeting, or as otherwise desired. Brad Pierce will coordinate the virtual arrangements with airport personnel, and on request, Robert Olislagers agreed to provide a map to the new location of the airport headquarters building.

B. **COMMUNITY OUTREACH** – Melissa Coudeyras noted the committee had met prior to this meeting. She thanked Mike Renshaw from the Highlands Ranch Metropolitan District for his assistance in getting the CACNR's website link to WebTrak fixed. The committee continues to work on its priority tasks, and is currently updating the generally asked questions section of the website, and the answers to those questions. She noted Andy Jones had indicated the Highlands Ranch Metropolitan District, had supported becoming a CACNR Member, with formal action to be taken by it at the end of April.

C. **FLY QUIET** – Bill Wasmund reported for this committee which had also met before this meeting. A written report was provided and shown on the zoom screen. The committee is proceeding with possibly updating the Noise Abatement Guidelines, and implementation of the meeting previously suggested by Douglas County Commissioner Abe Laydon, with Dan Avery. An agenda for that meeting will be forwarded to Mike Fronapfel and Rachel Keller.

It was noted the link previously mentioned for submission of NES comments did not work. The information would be sent to all by Rachel Keller.

D. **NOISE MONITORS** – The committee had met before this meeting, and requested CACNR be provided with a regular redacted or summarized report from airport staff, which would contain information about the numbers and types of complaints or requests for information related to airport noise issues that the airport had received, and the information provided to the complainers. It was noted there are reportedly systems available which can provide extensive information without utilizing considerable staff time, such as correlating noisy flights with numbers of complaints about them, and more. Such systems could be expensive, so CACNR would need to identify what kind of additional information it would like to receive, and its use, see if the

system the airport currently has can provide that information, and if not, then explore the capabilities and costs of other systems. Knowledge of what the public is asking for would help address this topic.

The February Noise Report was reviewed. It showed there had been **19,343 Total Operations in February**, down from **23,799** in January, **25,427** in December 2020 and **24,677** in November 2020. There had been **8,624 Local Operations in February**, down from **10,701** in January, **12,187** in December 2020, and **11,752** in November 2020.

During February, there were **23,166 noise events** at the 12 noise monitors. Noise events at each monitor were:

9,115 events at the **Golf Course** monitor on airport property (4,372 in the 60-69 decibel range)
4,724 events at the **Meridian** monitor (3,731 in the 60-69 decibel range)
2,181 events at the **Airport East** monitor on airport property (1,182 in the 60-69 decibel range)
1,661 events at the **State Park** monitor (1,233 in the 60-69 decibel range)
1,388 events at the **Parker** monitor (1,140 in the 60-69 decibel range)
1,059 events at the **Castle Rock** monitor (1,011 in the 60-69 decibel range)

965 events at the **Grandview Estates** monitor (855 in the 60-69 decibel range)
879 events at the **Greenwood Village** monitor (759 in the 60-69 decibel range)
491 events at the **Lone Tree** monitor (441 in the 60-69 decibel range)
464 events at the **Hunter's Hill** monitor (405 in the 60 – 69 decibel range)
154 events at the **Castle Pines** monitor (147 in the 60-69 decibel range)
88 events at the **Sagebrush Park** monitor (76 in the 60-69 decibel range)

Including the two monitors on airport property, locations with noise events in the **70-79 decibel** range were:

Golf Course –	3,567	Parker –	241	Castle Rock –	47
Meridian –	949	Greenwood Village –	115	Lone Tree –	47
Airport East –	561	Grandview Estates –	106	Sagebrush Park –	11
State Park –	412	Hunters Hill –	56	Castle Pines –	6

Including the two monitors on airport property, locations with noise events in the **80-89 decibel** range were:

Golf Course –	1,001	Parker –	7	Greenwood Village –	2
Airport East –	393	Grandview Estates –	4	Sagebrush Park –	1
Meridian –	43	Hunters Hill –	3	Castle Rock –	1
State Park –	15	Lone Tree –	3	Castle Pines –	1

Including the two monitors on airport property, locations with noise events in the **90+ decibel** range were:

Golf Course –	175	Airport East –	45	Meridian –	1	State Park –	1
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In February, there had been **802 complaints from 45 households**:

Unincorporated Arapahoe County – 425 (53%) complaints.....from 13 households (29%)
Unincorporated Douglas County ----114 complaints (14%)from 8 households (18%)
Centennial – -----85 complaints (11%).....from 5 households (11%)
Castle Rock – -----53 complaints (07%).....from 2 households (4%)
Highlands Ranch -----48 complaints (06%)from 5 households (11%)
Aurora -----26 complaints (03%).....from 4 households (9%)
Greenwood Village -----24 complaints (03%).....from 4 households (9%)
Parker -----23 complaints (03%).....from 1 household (2%)
Other -----03 complaints (0.4%)from 2 households (4%)
Lone Tree -----01 complaint (0.1%).....from 1 household (2%)

Year to Date, there had been **1,681 complaints from 62 households**:

Unincorporated Arapahoe County – 810 (48%) complaints.....from 17 households (27%)
Unincorporated Douglas County ----193 complaints (11%)from 11 households (18%)
Centennial – -----180 complaints (10%).....from 5 households (8%)
Castle Rock – -----165 complaints (09%).....from 2 households (3%)
Greenwood Village -----151 complaints (08%).....from 7 households (11%)
Aurora -----65 complaints (03%).....from 4 households (6%)
Parker -----52 complaints (03%).....from 2 households (3%)
Highlands Ranch -----50 complaints (02%)from 5 households (8%)
Other -----07 complaints (0.4%)from 4 households (6%)
Lone Tree -----04 complaints (0.2%)... from 2 households (3%)
Denver-----03 complaints (0.17%)... from 2 households (3%)
Cherry Hills Village-----01 complaint (0.05%).....from 1 household (1.6%)

In February, 112 complainers had **requested responses** from the airport, with 82 requests made by email, and 30 by telephone. Year to date, there had been 193 **responses requested**, with 139 made by email and 54 made by telephone.

Of the 802 February **complaints**, 734 (92%) were about **daytime flights** and 68 (8%) were about **nighttime flights**.

Comparatively, in **February 2021** there were 802 complaint resulting from 19,343 operations and in **February 2020**, there had been 747 complaints resulting from 22,708 operations.

Year to date, the **top five complaining households** were:

Unincorporated Arapahoe County 368 (22%)

Unincorporated Arapahoe County 318 (19%)

Centennial 174 (10%)

Unincorporated Douglas County 166 (10%)

Castle Rock 160 (10%)

Remaining (29%)

With the top complaining household removed, **props accounted for 80% of the complaints by aircraft type** in February 2021, while **jets accounted for 18% of the complaints**, and **1% were about helicopters**.

Departures were responsible for 41% of the complaints by operation type, training was responsible for 33%, and arrivals were 25%.

A graph showing the 13-month relationships between airport operations and the numbers of complaints with and without the top complaining household removed were provided. There were no higher numbers than those which occurred in September 2020.

The February complaint map showed the household locations of the complaints, with 1 being outside the map boundaries, in Sedalia. The **largest cluster of complaints** was again located north and slightly west of the airport's north-south runway.

The Year-to-Date complaint map was also provided, with 5 households located outside the map area, in Littleton, Northglenn, Littleton, Sedalia and two from Franktown.

The January 2021 radar track density map was again provided.

Question was asked if the complaint numbers from Highlands Ranch bleed over into Unincorporated Douglas County? Response was no. Question was asked why the February operations number had decreased by over 4,000 flights? Response was probably a combination of the pandemic, colder weather, and a decrease in corporate flights.

E. **WORK PLAN** – Combined with the Executive Committee, report above.

7. **FAA REPORTS:**

A. **DISTRICT OFFICE** – None

B. **CENTENNIAL (APA) AIR TRAFFIC CONTROL TOWER** – None

C. **TRACON** – None

8. **OTHER REGULAR MONTHLY REPORTS:**

A. **ARAPAHOE COUNTY PUBLIC AIRPORT AUTHORITY** – Robert Doubek had provided his report from the March ACPAA meeting, and the CACNR report to that meeting was also available. Data comparing the airport's operations and fuel sales from 2019 and 2020 had been provided; overall, airport revenue declined 10.5% in 2020, but expenses had been reduced by 16.34%, resulting in a net airport income of \$2,648,78.

Brad Pierce reported there had been a good discussion with ACPAA about the flight school noise situation.

B. **AIRPORT DIRECTOR'S REPORT** – Robert Olislagers noted he was doing more study on what could be done with the FAA in relation to the request from Abe Laydon regarding the flight schools. He stated such requests should come to CACNR before ACPAA. In the past there had been interest in addressing noise at the source, and there is a position that noise should not just be moved from one location to another.

Olislagers indicated oral arguments regarding ACPAA's legal action against the Denver Metroplex Project had been scheduled for May 6, 2021.

At the last meeting, a map showing the practice areas southeast and southwest of Centennial Airport had been provided, which referenced training boxes. Question had been asked when those areas and boxes had been established and by whom. Olislagers indicated he had learned there were also seven boxes established by the Air Force Academy right up against the Chatfield ones. Those in the both the Southwest and Southeast practice areas had been set up by the flight schools, not the FAA or the airport. There will be more attention given to their purpose.

All were again encouraged to provide comments regarding the FAA's NES as had been discussed earlier in the meeting.

Comment was made that In addition to working with the flight schools and attention to the training boxes, the impacts of flight noise in the immediate proximity to the airport should not be lost, and perhaps should be included in the discussions. It was also noted the FAA's APA control tower should be asked to participate in any such meeting as well.

C. **CDOT AERONAUTICS DIVISION** – None

D. **NEXTGEN ADVISORY COMMITTEE (NAC)** – Brad Pierce had provided the agenda from the March 18th NAC meeting. There had been discussion, which had included N.O.I.S.E., about the current noise metric, and the FAA's efforts with community engagement. It was hoped such discussions and inclusions would continue.

E. **N.O.I.S.E.** – N.O.I.S.E. had linked its professional staffing services with Primacy Strategy Group, with its Executive Director Emily Tranter now on that staff. N.O.I.S.E. membership invoices would now be received from that group. A N.O.I.S.E. mailing had been shared which included the news that the FAA had extended its NES public comment period until April 14. As noted earlier, the link for submission of a comment was not accurate and Rachel Keller would send that information.

F. **1ST QUARTER LAND USE REVIEW** – This review contained eight referrals, with one approved and the other seven subject to comment. None had been not recommended. It had been heard there was something in the works right next to the airport, but any referral about it had not yet been received.

9. **OLD BUSINESS:**

A. **2021 MEETING SCHEDULE FOR CACNR & ACPAA, INCLUDING CACNR REPRESENTATIVES TO ACPAA** – The 2021 meeting schedule was provided. Melissa Coudeyras would cover the April meeting. Opportunities exist for the ACPAA meetings from May through the rest of the year.

B. **CONGRESSIONAL QUIET SKIES CAUCUS** – None

C. **ACTION ITEMS FROM PRIOR CACNR MEETINGS** – A list of Items for Follow-Up from previous meetings had been provided. Suggestions were solicited for future content type and format. Including the names of those responsible for the various items was suggested.

10. **NEW BUSINESS:**

A. **INFORMATION SHARING** – News articles provided with this meeting's materials were noted. They included: D.C. Attorney General Urges FAA to Change Airport Noise Policy, from *Washington Top News*; Quieter Planes Creating Far More Noise Complaints, from *AvWeb*; and Sky Harbor Group to Build Private Hanger Campus at Centennial Airport, from *Aviation Pros*.

11. **PUBLIC COMMENT**: Andy Jones commented the public needs to know why the demand for flight training has increased, and would likely increase even more by the end of Summer or early Fall. Robert Olislagers noted that United Airlines had announced it would need 5,000 new pilots by 2030, and the needs of other airlines would likely be going up in a similar fashion.

12. **NEXT MEETINGS:**

A. CACNR – May 5, 2021	6:30 p.m. combination in-person and virtual meeting
June 2, 2021	6:30 p.m. meeting location to be determined.
July 7, 2021	6:30 p.m. meeting location to be determined.
August 4, 2021	6:30 p.m. meeting location to be determined

B. ACPAA – April 8, 2021	3:00 p.m. probable virtual meeting
May 13, 2021	3:00 p.m. probable virtual meeting
June 17, 2021	3:00 p.m. probable virtual meeting
July 2021	Not Meeting
August 12, 2021	3:00 p.m. probable virtual meeting

13. **ADJOURNMENT:** The meeting was adjourned at 8:34 p.m.

Alison Biggs, Secretary

CENTENNIAL AIRPORT COMMUNITY NOISE ROUNDTABLE		2021 BUDGET AS OF APRIL 29, 2021		
(Considered a place holder year until the pandemic circumstances have evolved)				
		CACNR 2021 BUDGET	ACTUAL TO DATE	NOTES
INCOME:				
CARRY OVER FROM 2020		\$ 10,277.48	\$ 10,277.48	carry over from 2020
ACPAA		\$ -		
CACNR REGULAR MEMBERS		\$ -		
TOTAL INCOME:		\$ 10,277.48	\$ 10,277.48	
EXPENDITURES:				
WORK PROGRAM:				
COMMUNITY OUTREACH				
Website		\$ 700.00		Website updating and maintenance
		\$ 500.00		Place holder for projects tbd
FLY QUIET		\$ 500.00		Place holder for projects tbd
NOISE MONITOR		\$ 500.00		Place holder for projects tbd
WORK PLAN		\$ 500.00		Place holder for projects tbd
EDUCATION				
2 Reps to UC Davis Symposium**		\$ 500.00	\$ 175.00	Conference registration fees for seven CACNR members to attend Virtual February 23rd-26th UC Davis Symposium at \$25 per person
2 Reps to 2 N.O.I.S.E. Conferences**		\$ -		**2021 conferences will be virtual; no registration fee
CONSULTATION/ TASK SUPPORT		\$ 3,000.00	\$ 2,250.00	Pilot project with Jason Schwartz-invoice received 2/3/21 and submitted for payment 2/4/2, due 3/5/21
MEMBERSHIP DUES		\$ 1,000.00		N.O.I.S.E.
ADMINISTRATIVE		\$ 200.00	\$ 48.54	Zoom Pro Account expenses for December 2020 and January and February 2021
TOTAL EXPENDITURES AS OF 04-29-21:		\$ 7,400.00	\$ 2,473.54	Actual to be determined at the end of 2021
CARRY OVER TO 2022 AS OF 04-29-21		\$ 2,877.48	\$ 7,803.94	Actual to be determined at the end of 2021
** Usually includes registration, travel, ground transportation, lodging, meals. 2021 meetings will be held virtually				
FRAME OF REFERENCE: MOU Funding Structure adopted 12/13/2018 calls for initial funding to generate \$22,250, with \$10,000 from ACPAA and \$12,250 to come from CANR's Regular Members.				
"This funding would be in place for the next two years, subject to annual appropriations. Thereafter, CACNR will provide ACPAA and each Regular Member with a report on the previous year's expenditures, and an annual invoice accompanied by a proposed budget indicating how the requested funds would be utilized, so that funds could be appropriated for the coming year."				
PLEASE NOTE FUNDING FROM ACPAA AND REGULAR MEMBERS WAS NOT REQUESTED FOR 2020 and 2021 DUE TO THE ECONOMIC IMPACTS OF THE CORONAVIRUS PANDEMIC.				
IT IS ANTICIPATED THE SECOND YEAR OF THE FUNDING STRUCTURE OUTLINED ABOVE WILL BE RESUMED FOR 2022				

Centennial Airport Community Noise Roundtable

Melissa Coudeyras

April 7, 2021

For April 8, 2021 ACPAA Meeting

Public Comment:

- Four citizens from the areas of Aurora, Greenwood Village, Castle Pines, and Elizabeth. Complaints were related to night flights, flight school training, and increase in aircraft noise in the past year.

Executive Committee:

- Drafted a response from the Roundtable to the FAA environmental survey. Members and their municipalities were encouraged to send a response. Motion to send the response was approved.
- Presented CACNR Workplan Phase II from consultant Jason Schwartz. Priority was given to Industry Engagement. A cost estimate will be submitted soon.
- Revamp of agenda to make it more streamlined and concise.
- Discussion about future in person meetings. May will be a hybrid meeting.
- Highlands Ranch Metro District is interested in joining the Roundtable. They will vote on the membership at their April board meeting.

Outreach Committee:

- Addressing the website link to report noise that isn't working.
- Working on updating FAQ's on the website.

Fly Quiet Committee:

- Looking at industry engagement with the flight schools.

Noise Monitor Committee:

- Discussed new reporting system that is expensive, but would provide more information to the airport, roundtable, and public.

NextGen Advisory Committee:

- Met virtually March 18. Beth White, FAA, spoke about FAA engagement efforts.

Next CACNR meeting will be in person on May 6.

Respectfully submitted,

Melissa Coudeyras

CACNR Vice Chair

BOARD MEETING NOTES – APRIL 8, 2021

Bob Doubek, ACPAA Treasurer

The Consent Agenda included five non-controversial items which were approved. The Business Agenda included updates on Metroplex and the Hotel.

Metroplex: The US District Court of Appeals has scheduled oral arguments for May 6, 2021. Most likely to be conducted remotely. Ms. Bruetsch will provide additional information at the Board meeting.

Hotel: A letter has been sent to the court appointed receiver inviting all three proposals to proceed with due diligence and be prepared to make a formal presentation to the Board on June 17th at the next scheduled Board Meeting.

Rjd/4/28/2021

ACPAA Meeting April 8, 2021

Melissa Coudeyras, CACNR Representative

Metroplex Oral Arguments update-Robert and Kimberly Bruetsch, counsel

Hotel Proposals due at the end of the month with presentations and a decision to grant a new lease scheduled for June 17, 2021. Three interested parties to make a presentation.

Fuel and Operations Report-March

All airport users are up from last year.



Fly Quiet Committee April, 2021 Monthly Report

- In order to address a request from Douglas County Chief Planner Dan Avery regarding the review and possible update of the CACNR/KAPA voluntary Noise Abatement Guidelines, Brad, Robert, Rachel & Mike F. met with the KAPA Flight Schools. 3 flight schools attended, 2 virtually & 1 in person. A large part of the discussion centered on the practice areas and the maps that define them. It was also brought up that CACNR is receiving a great deal of public comments from Roxborough Park, Louviers, Highlands Ranch, Elizabeth, etc. regarding the noise generated by the aircraft using the practice areas.
- Communication is ongoing with Jason Schwartz of ABCx2 to assist us in developing Industry Engagement topics.
- We have re-established talks with Whispertrack regarding adding the KAPA Noise Abatement Guidelines to their electronic tablet application.
- Carrie Warren-Gully received a tour of the KAPA facilities and airfield from the airport operations staff.
- Following up with operations on modifications to the C1 hotspot area.

CACNR/ACPAA 2021 MEETING SCHEDULES

CACNR REPRESENTATIVES TO 2021 MEETINGS OF THE ARAPAHOE COUNTY PUBLIC AIRPORT AUTHORITY

ACPAA meets at 3:00 p.m., 7565 South Peoria Street, Englewood, CO 80112

Or virtually, depending on circumstances prior to each meeting

<u>CACNR MEETING</u>	<u>ACPAA MEETING</u>	<u>CACNR REPRESENTATIVE</u>	<u>REPORT DUE DATE</u> (To rkeller@centennialairport.com)
January 06	Not Meeting		combine with February report.
February 03	February 11	Candace Moon	February 05 (see above)
March 03	March 11	Brad Pierce	March 5
April 07	April 08	Melissa Coudeyras	limited time to write.
May 05	May 13		May 07
June 02	June 17		June 10
July 07	Not Meeting		combine with August report.
August 04	August 12		August 06 (see above)
September 01	September 09		September 03
October 06	October 14		October 08
November 03	November 12 (2 nd Friday)		November 05
December 01	December 09		December 03

ITEMS FOR FOLLOW-UP

For Review on May 5, 2021

- Will monthly, bimonthly or quarterly lists be most useful? **ALL**
- Consider what amount of detail is needed; can it be assumed some things will be done without being listed here. **ALL**
- At all meetings, various ideas seem to be discussed/suggested regarding work of the committees, and on other topics as well. Do such discussions need to be listed, or will each committee make note of the ideas, determine follow-up and report back to the larger group?) **ALL**
- When items are completed, is it adequate to just delete them from this list, or is anything further desired? **ALL**

04/07/2021

1. Robert Olislagers to work with Dave Adams from Inspiration area about the turning route of southbound flights. **RO**
2. Had resident from I-25 and University been able to obtain the tail number of the offending small plane which could not be otherwise identified, so it could be reported as noted in the minutes? **Rachel Keller**
3. Had John Kocon from northwest of Castle Pines provided more information to airport staff for further exploration of dramatic change in flight paths affecting his area? **Rachel Keller**
4. Jason Schwartz to be asked to provide a cost estimate for two portions of Phase Two. **EC**
5. Coordinate arrangements for hybrid virtual/in-person May CACNR meeting. **Brad Pierce**
6. Provide map to the new ACPAA location for in-person part of the May meeting. **Robert Olislagers**
7. Reiteration of #2 & #3 from 02/03/21 **Fly Quiet Committee and Brad Pierce**
8. Forward agenda for meeting noted in #7 to Mike Fronapfel and Rachel Keller. **Bill Wasmund.**
9. Send CACNR information about numbers and types of complaints or requests for information received from the public, and the information provided accordingly. **Airport Staff**
10. CACNR to determine what, if any, additional information about noise and its effect on the public it and the public would like to regularly receive, and how that would be used; explore capabilities of current noise monitor system to generate that information; explore capabilities and costs of other systems if appropriate. **No champion identified – could become a major project for a future Work Program?**
11. More attention to be given to the training boxes in the practice areas southeast and southwest of the airport. **Robert Olislagers & airport staff**
12. Ask control tower to attend the meeting under development and referenced in #7 above. Also include the impacts of flight noise in immediate proximity to the airport. **Brad Pierce and Fly Quiet Committee.**
13. As always, need CACNR Representative to attend ACPAA meetings for every remaining month of 2021. **ALL**
14. Provide information to the public about the anticipated demand for more flight training as the need for new pilots is increasing./**No champion identified – do we pursue at this time or in the future?**

03/03/2021

1. Executive Committee authorized to proceed with Phase II of the Work Program project. **EC**
2. As always, need CACNR Representative to attend ACPAA meetings for every month of 2021 except April. **ALL**
3. Follow up to be done with Jason Crow re Congressional Quiet Skies Caucus. **EC or ?**

02/03/21

1. Information about the Flight Standards District Office to be placed on CACNR's website.
Community Outreach Committee
2. Explore holding some type of meeting between CACNR and flight school operators; see if Noise Abatement Guidelines (NAG) should be updated; could NAG be formally incorporated into flight school best practices **Brad Pierce and Fly Quiet Committee**
3. Consider rolling #2 into the Work Program; possibly link with good neighbor incentives; Brad Pierce would coordinate such efforts, perhaps starting with consideration of updating the NAG. **Brad Pierce**
4. Rachel Keller to follow on getting the report from the portable noise monitor that had been placed in Castle Pines Village. **Rachel Keller**

01/06/21

1. Rachel Keller would see if Web Track was working properly, as a member of the public had noticed planes dropping off when he was trying to track flights. **Rachel Keller**
2. Request was made for CACNR to receive a summary or informational report about results from portable noise monitors when they were utilized. **Rachel Keller or airport staff**
3. Email of congratulations to be sent to the Rocky Mountain Metropolitan Airport Community Noise Roundtable. **EC**



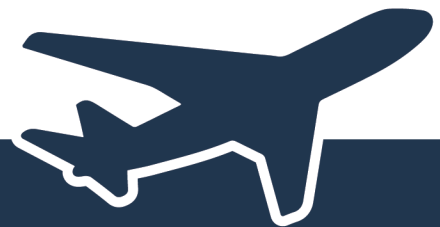
U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

**NextGen Benefits Have Not Kept Pace
With Initial Projections, but Opportunities
Remain To Improve Future Modernization
Efforts**

FAA

Report No. AV2021023

March 30, 2021





NextGen Benefits Have Not Kept Pace With Initial Projections, but Opportunities Remain To Improve Future Modernization Efforts

Mandated by the FAA Reauthorization Act of 2018

Federal Aviation Administration | AV2021023 | March 30, 2021

What We Looked At

The Federal Aviation Administration's (FAA) Next Generation Air Transportation System (NextGen) is a multibillion dollar infrastructure project aimed at modernizing our Nation's aging air traffic system to provide safer and more efficient air traffic management. Since 2006, our office and others have identified a number of challenges to implementing NextGen programs and capabilities, which have led to program delays and lower usage of new capabilities. Given these concerns, the FAA Reauthorization Act of 2018 mandated that the Office of Inspector General (OIG) study the potential impacts of a significantly delayed, diminished, or completely failed delivery of NextGen. Our audit objectives were to (1) compare the current expected benefits of NextGen with the initial projections and identify the reasons for revising those projections and (2) identify lessons learned from developing and implementing significant air traffic modernization programs.

What We Found

NextGen's actual and projected benefits have not kept pace with initial projections due to implementation challenges, optimistic assumptions, and other factors. FAA's most recent business case projects total NextGen benefits to be over \$100 billion less than the Joint Planning and Development Office's original estimate, and benefits actually achieved to date have been minimal and difficult to measure. FAA's projections were optimistic about traffic growth and did not account for risk factors. We also found that significant declines in air traffic due to COVID-19 have further extended the timeframe for realizing expected NextGen benefits. In addition, prior OIG NextGen-related work has identified lessons that FAA could use to improve NextGen delivery. For example, while FAA has collaborated with industry to prioritize, implement, and measure benefits of NextGen programs, there are still opportunities for improving transparency, which will be critical to secure industry's long-term investment. Further advancing NextGen will depend on resolving complex implementation challenges, including effectively prioritizing programs, integrating interdependent capabilities, and harnessing controller automation tools to achieve benefits.

Our Recommendations

FAA concurred with our three recommendations to improve NextGen delivery and other future National Airspace System modernization efforts, and provided appropriate actions and completion dates. Accordingly, we consider all recommendations resolved but open pending completion of the planned actions.

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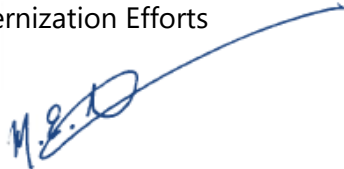
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Memorandum

Date: March 30, 2021

Subject: ACTION: NextGen Benefits Have Not Kept Pace With Initial Projections, but Opportunities Remain To Improve Future Modernization Efforts
Report No. AV2021023

From: Matthew E. Hampton
Assistant Inspector General for Aviation Audits 

To: Federal Aviation Administrator

The Federal Aviation Administration's (FAA) Next Generation Air Transportation System (NextGen)¹ is a multibillion dollar infrastructure project aimed at modernizing our Nation's aging air traffic system to provide safer and more efficient air traffic management. NextGen's goal is to provide new capabilities such as precision satellite navigation, digital data link communications for air traffic controllers and pilots, and an integrated weather system.

Since 2006, our office and others have identified a number of challenges to implementing NextGen programs and capabilities, which have led to program delays and lower usage of new capabilities. As a result, FAA has revised its projected benefits for NextGen multiple times. While NextGen is expected to significantly enhance aircraft operations and foster industry growth, these benefits depend on the successful delivery of the new programs and capabilities.

Given these concerns, the FAA Reauthorization Act of 2018 mandated the Office of Inspector General (OIG) study the potential impacts of a significantly delayed, diminished, or completely failed delivery of NextGen. Accordingly, we initiated an audit to (1) compare the current expected benefits of NextGen with the initial projections and identify the reasons for revising those projections and (2) identify lessons learned from developing and implementing significant air traffic modernization programs.

We conducted this audit in accordance with generally accepted Government auditing standards. Exhibit A details our scope and methodology. Exhibit B lists

¹ NextGen is a collection of new programs and capabilities, including new air traffic management technologies and procedures; airport infrastructure improvements; and environmental, safety, and security-related enhancements.

the organizations we visited or contacted, and exhibit C lists the acronyms used in this report.

We appreciate the courtesies and cooperation of Department of Transportation (DOT) representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-0500 or Jay Borwankar, Program Director, at (202) 493-0970.

cc: The Secretary
 DOT Audit Liaison, M-1
 FAA Audit Liaison, AAE-100

Results in Brief

NextGen benefits are lower than expected due to implementation challenges, optimistic assumptions, and other factors.

Over the past decade, FAA has updated its projections for NextGen benefits multiple times. In its most recent estimate from 2017, FAA's overall benefits projection is \$113 billion lower than the Joint Planning and Development Office's (JPDO) initial projection.² Moreover, benefits actually achieved to date are limited. According to FAA, NextGen generated \$6 billion in total benefits from 2010 to 2018 split between the Agency, airlines, and the traveling public. NextGen's benefits have not kept pace with expectations for a number of reasons, including implementation challenges—such as the 2-year delay in implementing Time-Based Flow Management (TBFM)³ capabilities for air traffic—that contributed to the Agency reducing its most recent benefit projection by nearly \$66 billion. Furthermore, FAA and aviation stakeholders⁴ told us that accrued NextGen benefits are difficult to measure, making it challenging to assess NextGen's impact on the National Airspace System's (NAS) performance. For example, analyses of NextGen benefits related to reduced flight delays must also consider other factors, such as the impact of weather and airline business decisions. Moreover, FAA based its NextGen benefit projections on optimistic assumptions about air traffic growth, and the Agency did not adjust its projections or produce multiple scenarios to account for risk. For example, the initial benefit projections did not factor in the impact of potential economic downturns on the aviation industry or the effect of delays on one program impacting benefits from other programs. Finally, FAA has acknowledged that significant declines in air traffic and passengers due to the unprecedented Coronavirus Disease 2019 (COVID-19) pandemic will further delay the expected timeline for achieving NextGen benefits.

Prior OIG work has identified lessons for improving FAA's delivery of NextGen and other future modernization efforts.

FAA's experience and our prior work has shown that successful NextGen implementation requires support and coordination both between FAA and industry stakeholders and within multiple FAA lines of business. For example, key NextGen technologies depend on airlines' willingness to install costly avionics on their aircraft. Demonstrating NextGen's tangible benefits and prioritizing its most beneficial capabilities is key to securing industry's investment. Beginning in 2013,

² In 2007, JPDO projected that NextGen benefits would total more than \$213 billion. JPDO was established by Congress in 2003 as a multi-agency organization managed by FAA to develop a plan for implementing NextGen.

³ TBFM is an automation decision support tool to help controllers sequence and space aircraft and enable the use of more efficient approach procedures to airport runways.

⁴ Aviation stakeholders include Airlines for America and MITRE Corp.

FAA successfully worked with industry through the NextGen Advisory Committee (NAC)⁵ to set top implementation priorities based on benefits and implementation readiness. However, industry representatives have expressed concerns about the continued effectiveness of the NAC following its transition from the Radio Technical Commission for Aeronautics (RTCA) to FAA in 2018.⁶ Industry has also requested enhanced transparency about the current state of NextGen benefits; however, FAA last published its NextGen business case in 2016 and does not currently plan to publish additional updates. Along with the need for industry commitment, there are lessons learned related to FAA's ongoing challenges with implementing and integrating NextGen. For example, our work has shown that FAA has struggled to integrate key NextGen technologies and capabilities⁷ due to extended program delays that caused ripple effect delays with other programs. In addition, the Agency has not fully made use of its own internal NextGen benefits analyses to help prioritize future implementation decisions. Finally, critical controller automation tools are not yet in use, which hinders FAA's ability to test and evaluate the full impact of new technologies. Leveraging these lessons learned will be critical for deploying NextGen's advanced capabilities, achieving benefits, and modernizing the NAS in a timely manner.

We are making recommendations to improve FAA's analysis and reporting of NextGen benefits, along with the Agency's delivery of NextGen and other future modernization efforts.

Background

In 2003, Congress mandated that FAA establish JPDO to develop a plan for implementing NextGen by 2025 and coordinate research efforts with other Federal agencies.⁸ NextGen encompasses multiple programs, procedures, and systems at different levels of maturity. Implementing NextGen is a complex undertaking and requires joint investments from FAA (new ground systems for controllers) and airspace users (new avionics and displays for pilots) to realize expected benefits. As part of its efforts, in 2007, JPDO developed a business case for NextGen that presented an overview of the projected benefits and costs of implementing NextGen for FAA and the airlines. JPDO predicted NextGen would

⁵ The NAC was established in 2010 to develop recommendations for NextGen and includes operators, manufacturers, air traffic management, aviation safety, airports, and environmental experts.

⁶ The NAC's original charter expired in 2018 and subsequently moved from the RTCA to FAA.

⁷ NextGen technologies and capabilities include Data Communications (DataComm), En Route Automation Modernization (ERAM), and TBFM.

⁸ FAA's partner agencies for NextGen are the National Aeronautics and Space Administration, Department of Defense, Department of Homeland Security, and the Department of Commerce/National Weather Service.

require significant investments from airlines—an estimated \$14 to \$20 billion by 2025—to equip their fleets with new avionics to enable NextGen capabilities while promising incredible returns on that investment. It also predicted the need for a complete transformation of our Nation’s air transportation system to facilitate the expected doubling or even tripling of demand for air travel by 2025. The legacy air traffic control systems, while safe, were built on technology platforms from the 1940s and 1950s that have largely exceeded their original life expectancy and have since reached the limits of their ability to handle increases in traffic. In 2007, JPDO reported that congestion was costing \$9.4 billion per year in passenger delays and predicted it could grow to \$20 billion per year by 2025 without substantial increases in the NAS’ capacity.

JPDO was disbanded in 2014, but FAA continued to produce business cases for NextGen. To estimate the benefits of planned NextGen improvements, FAA primarily uses its simulation model—the System Wide Analysis Capability (SWAC).⁹ JPDO used a similar model and approach in its 2007 business case, but FAA has continued to improve the modeling process and has incorporated updated plans and performance of NextGen and the NAS into its modeling. In addition, for programs that the NAS Systems Engineering and Integration Office¹⁰ does not model, such as airborne rerouting, FAA relies on supplemental benefit estimates from FAA program offices.

FAA’s business case also attempts to quantify benefits of improvements that the Agency has already implemented. FAA does this by updating the benefits data using mostly post implementation operational assessments. FAA works with MITRE¹¹ and the Joint Analysis Team (JAT)¹² to conduct these analyses. FAA then projects future benefits for these improvements and adds them to the overall benefits projection.

FAA published its most recent and last planned business case in July 2016.¹³ However, FAA updated its benefits estimates internally in 2017 in response to our letter reviewing the 2016 business case. Our work identified several issues that led to the estimates being optimistic, including using outdated program

⁹ The SWAC is a fast-time simulation model that estimates expected operational benefits of NextGen improvements for the NAS.

¹⁰ FAA’s NAS Systems Engineering and Integration Office helps to design, analyze, plan, and protect the NAS by managing the NAS Enterprise Architecture, defining NAS requirements, performing enterprise safety analyses, maintaining systems engineering guidance and information, defining security standards, and analyzing NAS performance using computational models and data analytics.

¹¹ MITRE Corporation functions as FAA’s federally funded research and development center.

¹² JAT is a joint FAA and industry group of experts that work to develop mutually agreed upon measurements of NextGen programs at key sites. JAT is a subgroup under the NAC.

¹³ According to FAA officials, FAA does not plan to develop another full business case; instead, the Agency is focused on working with industry on joint program benefit analyses.

schedules, aggressive assumptions about future implementations and traffic growth, and a lack of risk adjustment or alternative scenarios.¹⁴

NextGen Projected and Actual Benefits Are Lower Than Expected Due to Implementation Challenges, Optimistic Assumptions, and Other Factors

NextGen's benefits have not kept pace with initial expectations. FAA's most recent business case projects total NextGen benefits to be over \$100 billion less than JPDO's original estimate, and benefits actually achieved to date have been minimal. Moreover, these benefits are difficult to measure, and FAA has faced key implementation challenges that have limited its success. Additionally, NextGen's benefit projections were optimistic and did not account for risk factors. Finally, significant declines in air traffic and passengers due to COVID-19 have extended the timeframe for realizing expected NextGen benefits.

NextGen Benefits Are Significantly Lower Than Initially Projected

In 2007, JPDO's initial business case projected that NextGen would generate \$213 billion¹⁵ in benefits by 2025 from capacity increases. Subsequently, in 2012, FAA published its own benefit projections for NextGen totaling \$118 billion through 2030¹⁶ split between FAA, airlines, and the traveling public. FAA has since updated its benefit projections multiple times, with a high of \$199 billion in 2013, down to \$100 billion in 2017 (see figure 1). FAA's 2017 estimate was \$113 billion less than what JPDO originally projected and extended over a longer time horizon—2030 vs. 2025. Although the more recent estimates for NextGen benefits are much lower than JPDO's initial 2007 estimate, NextGen was projected to generate \$100 billion in benefits, which is still significantly higher

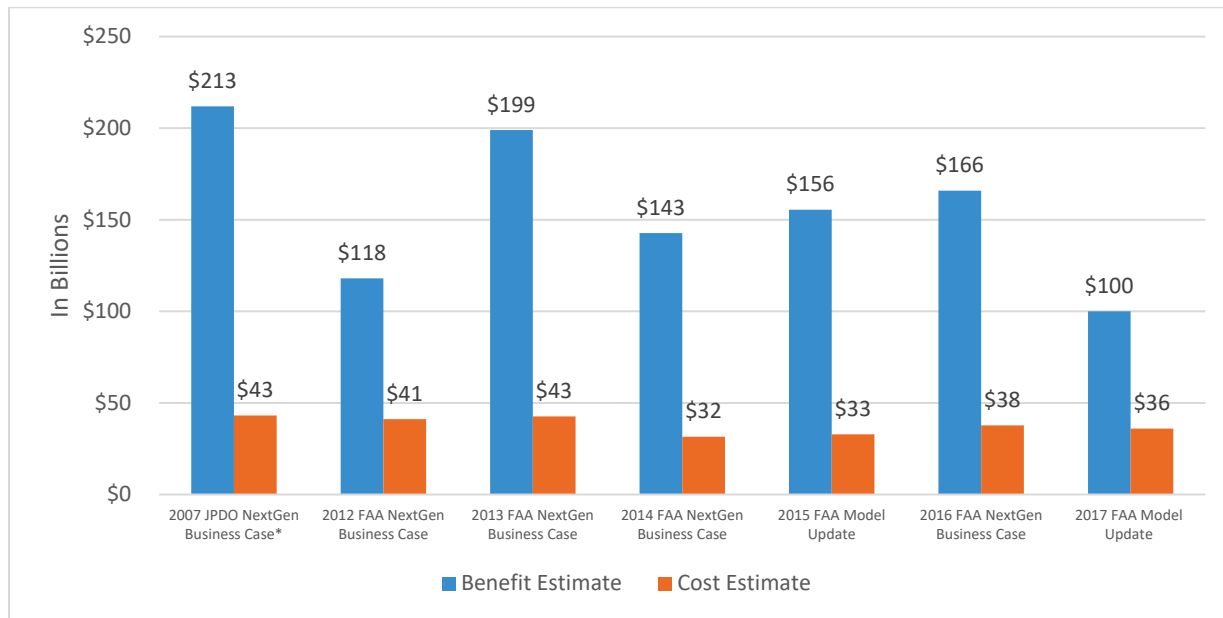
¹⁴ *Letter to Chairman Bill Shuster and Chairman Frank L. LoBiondo Regarding FAA's July 2016 NextGen Business Case*, (OIG Correspondence No. CC2017015), August 15, 2017. OIG products are available on our website at <http://www.oig.dot.gov/>.

¹⁵ The \$213 billion is based on forecasted capacity increases. The analysis of other sources of benefits, including environmental, safety, and weather, were not mature enough to project a total for 2025. All business case benefit and cost estimates are provided in fiscal year 2018 dollars.

¹⁶ FAA's benefit estimates are more mature and include additional sources of benefits, such as safety, and reduced operating costs to FAA. However, reduced delays are the majority source of benefits from each of FAA's business cases.

than its projected total cost of \$36 billion, giving it a positive return on investment.

Figure 1. NextGen's Projected Benefits and Costs (in Billions)



*The 2007 JPDO NextGen Business Case includes benefits through 2025. All FAA estimates are through 2030. Additionally, JPDO's benefit estimate is from capacity improvements only, whereas FAA's business cases include additional sources of benefits, such as those arising from improvement in safety and reduced operating costs.

Source: OIG analysis of JPDO and FAA data, converted into fiscal year 2018 dollars for comparison.

FAA has objected to using the JPDO benefit estimates as a baseline for comparison because those estimates were not produced solely by FAA, and officials claim they were never supported by the Agency. However, FAA was a partner agency to JPDO, and the Agency had engaged the contractor that developed JPDO's estimate. Even disregarding the JPDO estimate, FAA's 2017 update is the lowest estimate the Agency has produced by billions of dollars.

FAA's Systems Analysis & Modeling Division asserted that NextGen benefits have not been lost, but simply delayed. The 2030 end date for calculating benefits does not provide a full 20-year lifecycle for many individual NextGen programs due to delays in implementation. The Systems Analysis & Modeling Division contended that if the 2017 estimate was extended through 2035, the total benefits would exceed \$160 billion.

Thus far, FAA claims NextGen has generated \$6 billion in total benefits from 2010 to 2018 split between FAA, airlines, and the traveling public. These benefits represent a small percentage of FAA's overall \$100 billion total projected benefits and are lower than the \$9 billion that FAA has already invested in implementing

NextGen.¹⁷ Airlines have also made investments to upgrade their aircraft avionics for NextGen. However, the \$6 billion in benefits is in keeping with FAA's 2017 model update that predicted benefits would equal costs in 2024.

Impacts of NextGen Programs Are Not Easily Measured

NextGen benefits are difficult to measure according to FAA officials, MITRE, and industry experts. MITRE, JAT, and FAA use sophisticated models and carefully designed pre/post implementation analyses to determine the benefits achieved from NextGen capabilities at specific sites. However, factors outside FAA's control—such as weather and airline business decisions, including changes to their schedules and aircraft fleet composition—can offset any improvements in operations. As such, these factors can impact the projected improvements in flight delay numbers and fuel burn efficiency. Furthermore, site- and technology-specific studies are limited in their ability to fully capture NextGen-related benefits due to the cost and difficulty of conducting them. As a result, FAA is forced to extrapolate the results from some sites to others when incorporating these results into the Agency NextGen benefits model, which could lead to unreliable benefit projections.

In a separate effort, FAA is developing a set of NextGen performance metrics that the Agency plans to report on a daily basis using actual operations while accounting for factors outside FAA's control, such as weather. Specifically, these metrics would measure the impact of Initial-Trajectory Based Operations (iTBO).¹⁸ iTBO is a step towards shifting air traffic controllers to separate traffic using time-based metering, which relies on new controller tools and onboard avionics to improve efficiency. iTBO integrates the key NextGen technologies and capabilities that FAA's model predicts will generate future NextGen benefits, including Performance-Based Navigation (PBN),¹⁹ controller metering automation tools, and Data Communications (DataComm).²⁰ However, FAA could not provide a

¹⁷ The \$9 billion includes NextGen funding from 2003 to 2018.

¹⁸ iTBO is the first phase in moving towards full Trajectory Based Operations (TBO), an air traffic management method for strategically planning, managing, and optimizing flights by using time-based management (TBM), information exchange between air and ground systems, and the aircraft's ability to fly precise paths. TBO is a shift in the way controllers separate air traffic from using set distance, miles-in-trail, to using time.

¹⁹ PBN delivers new flight routes that primarily use satellite-based navigation aids and on-board aircraft equipment to navigate with greater precision and accuracy. As such, PBN can provide significant benefits, such as more direct flight paths, improved on-time airport arrival rates, greater fuel savings, and reduced emissions and noise.

²⁰ DataComm enables air to ground digital communications services between FAA facilities, controllers, aircraft, and flight crews that result in reduced delays, increased throughput and efficiency, enhanced safety, and a reduction in environmental impacts.

date for when these metrics would be available and used to assess NextGen's performance.

Due to FAA's lack of system-wide measures for NextGen performance, we analyzed several performance metrics from the Department of Transportation's Bureau of Transportation Statistics (BTS). Specifically, we looked at taxi times and delays from 2008 to 2019 across the NAS for the 24 largest domestic airlines, including American Airlines, Delta Air Lines, and United Airlines. We were not able to identify any clear improvement to NAS operations overall. Instead, overall operations appeared to become less efficient, with average taxi time, departure delays, and arrival delays all increasing over this period. Airlines for America (A4A) also conducted analysis showing increased block times.²¹ However, the impact of a variety of airline business decisions, weather, and other non-NextGen related factors can outweigh the impact of NextGen programs. As such, this analysis is not sufficient to evaluate NextGen's impact on operations. Specifically, FAA's analysis shows that the increases in delays can be attributed to increases in traffic at some large airports. The concentration of additional traffic at these airports has led to significant increases in delays throughout the system.

Implementation Challenges Have Delayed and Diminished Programs, Lowering Expected Benefits

Our office, the Government Accountability Office, and others²² have identified challenges to implementing NextGen programs and capabilities dating back to 2006. These challenges include delays and reduction of the number of planned sites for new controller tools to manage air traffic and new advanced flight procedures that are key drivers for NextGen benefits.

While FAA has deployed much of the infrastructure for NextGen, new capabilities that are expected to generate benefits are not widely used or have yet to be implemented, including advanced PBN procedures and reduced separation standards from Automatic Dependent Surveillance-Broadcast (ADS-B).²³ Additionally, key controller tools such as Terminal Sequencing and Spacing (TSAS),²⁴ which should facilitate increased use of PBN procedures when demand

²¹ Block time is time from departure gate to arrival gate.

²² As part of our audit, we reviewed documents from the National Research Council, NAC, and Airlines for America.

²³ ADS-B uses the satellite-based Global Positioning System and is intended to allow FAA to transition from ground-based radar to a satellite-based system for improving surveillance and management of air traffic.

²⁴ TSAS is a new tool to help air traffic controllers merge and sequence aircraft using time-based metering in the airspace closest to airports.

is high at airports, and Terminal Flight Data Manager (TFDM),²⁵ which aims to improve efficiency of surface operations, have not yet been deployed.

Some programs—even after they have been deemed fully operational—are not producing their expected benefits, and their new capabilities are not being deployed as widely as originally planned. For example, the first seven completed Metroplex²⁶ sites—a program that primarily implements new PBN procedures at the largest airports—are producing about half of the benefits originally expected. Additionally, in August 2017 we highlighted several concerns about FAA’s 2016 NextGen Business Case model, including the concern that the Agency was using out-of-date program schedules to calculate projected NextGen benefits that did not reflect delays to key programs. For example, each Metroplex site has taken longer to implement than originally expected—4 to 5 years instead of 2 to 3 years—due to a range of factors including technical issues with the En Route Automation Modernization (ERAM)²⁷ system’s installation, increased community outreach due to environmental concerns, and issues with procedure design. In addition to the delays, FAA’s 2016 model assumed that a full Metroplex implementation would occur at 31 major airports by 2022, rather than FAA’s subsequently scaled-down plan to implement these improvements at only 19 airports.

In response to our 2017 letter, FAA’s Systems Analysis & Modeling Division staff addressed many of our concerns while updating the NextGen benefits model. Their update resulted in reducing the benefit projection by 40 percent—from \$166 billion to \$100 billion. FAA estimates that approximately \$18 billion (27 percent) of the \$66 billion decrease is attributable to delays and reductions in deployment sites of key NextGen programs and capabilities. Specifically, FAA updated its benefits model to reflect 2-year delays to new TBFM capabilities and the TSAS tool for terminal controllers; a delay and reduction in the number of Metroplex sites; and an up to 8-year delay in relative spacing using Interval Management, another key component of time-based metering.

Of the \$100 billion in benefits projected in 2017, only 18 percent is projected to be generated by programs that have been implemented, with the rest coming from future planned programs and capabilities, such as new controller automation tools and reduced separation standards. However, based on FAA’s

²⁵ TFDM is a new decision support tool for airport surface management, including creating virtual departure queues, data sharing with flight operators, and electronic flight strips to help enable time-based metering.

²⁶ Metroplex is an initiative intended to improve the efficiency of airspace that affects multiple airports near large metropolitan areas by implementing high value PBN procedures and airspace changes.

²⁷ ERAM is a multibillion-dollar system for processing flight data at facilities that manage high-altitude traffic typically above 10,000 feet, where aircraft reach their cruising altitudes.

past performance, as documented in our prior audit work, these programs could experience delays or may not fully deliver their expected benefits.

NextGen Benefit Projections Were Based on Optimistic Air Traffic Growth and Lacked Risk Adjustments

The original JPDO model as well as FAA's later models for NextGen benefits were based on optimistic assumptions about projected air traffic levels. The models relied on the Terminal Area Forecast (TAF),²⁸ which has consistently predicted significant traffic growth. However, traffic has remained largely flat since NextGen began, and recently traffic has decreased significantly due to the COVID-19 pandemic.

The majority of FAA's projected NextGen benefits are from the flying public experiencing less delay per flight than they would have experienced without NextGen. These benefits, known as Passenger Value of Time (PVT), make up 64 percent of the total benefits in FAA's 2017 projection. The heavy reliance on PVT makes NextGen benefits very sensitive to changes in air traffic and number of passengers. In 2013, FAA updated the dollar value for PVT in its business case model in accordance with DOT guidance²⁹ from \$28.60 per hour to \$43.50 per hour (a 52 percent increase), with a 1.6 percent annual increase. This contributed to a dramatic increase in the projected benefits for NextGen overall, from \$118 billion to \$199 billion, with PVT accounting for well over half of the total benefits. However, given that FAA's models have consistently overestimated traffic growth, the resulting projected benefits derived from PVT could be greatly inflated.

There is also no consensus on how to calculate PVT. According to DOT guidance, FAA counts every minute equally to add to the total reduction in delays to passengers. As a result, DOT's guidance for calculating PVT leads FAA to higher benefit calculations as compared to some other countries we reviewed. For example, Canada does not include increments of less than 5 minutes, and Germany discounts smaller increments of time compared to larger ones when calculating PVT. Meanwhile, the European Union recommends counting all time

²⁸ The TAF is an annual report that projects air traffic at all U.S. airports. FAA has recognized actual traffic has consistently been lower than the last several TAF projections and the shortfall is apparent even in the first projected year, but FAA continues to use it in NextGen benefits forecasts.

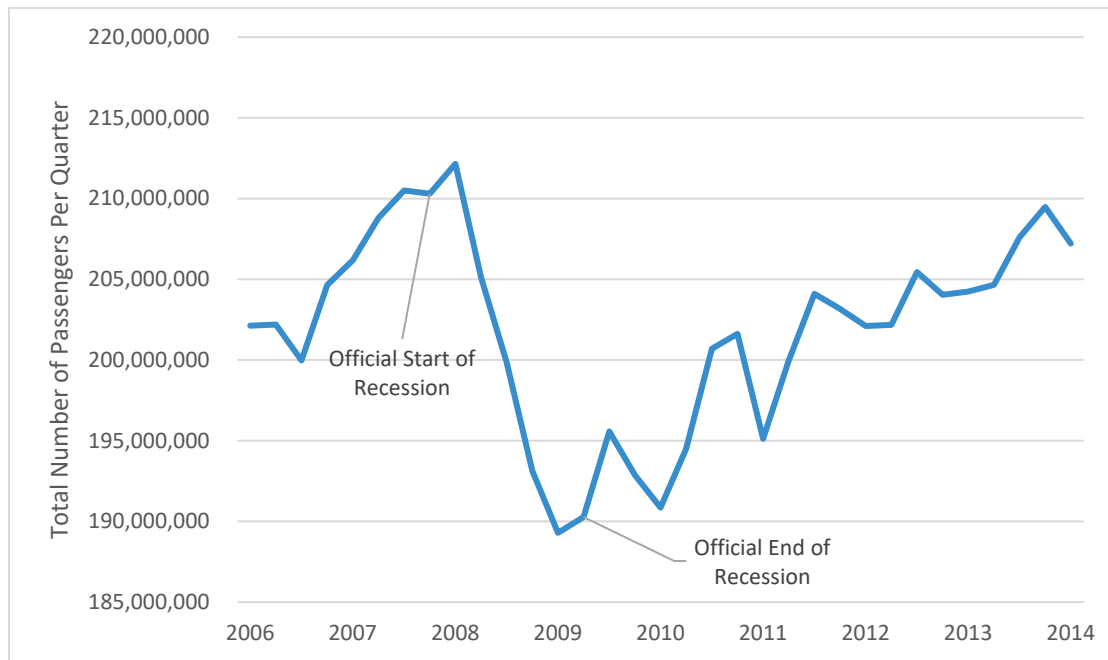
²⁹ *Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis* (9/28/2011), <https://www.transportation.gov/resources/2011-revised-value-of-travel-time-guidance>.

equally but reporting small increments separately, providing greater transparency.

Furthermore, traffic has not grown as expected since NextGen began. In 2007, JPDO predicted NextGen would need to triple capacity to accommodate traffic growth. This contributed significantly to JPDO's initial benefit estimate being much higher than later FAA projections. When traffic levels return and potentially grow as FAA's models predict, delays are expected to continue to increase even with NextGen programs and capabilities fully deployed. For example, FAA's 2016 NextGen business case predicted that without NextGen, flights would be delayed on average by over 20 minutes. However, with NextGen improvements, delays are still expected to increase by almost 15 minutes per flight.

Finally, FAA's NextGen benefit projections did not factor in risks—such as the risk that air traffic growth would not increase as expected. While FAA does provide a risk adjustment when estimating the benefits of individual programs as part of the Acquisition Management System process, it did not perform a risk adjustment in its business cases when projecting the overall benefits of NextGen. Staff from FAA's Systems Analysis & Modeling Division explained that until recently, they have lacked official ranges for the TAF to incorporate in their model to generate different forecasts or risk adjustments. However, there are additional factors that may impact the overall risk of implementing NextGen, such as program interdependencies that are not fully captured by assessing risks for the individual programs. Furthermore, the projections did not factor in other significant events, such as economic fluctuations that occur cyclically, which can also have a measurable impact on traffic levels. For example, the economic recession of 2007–2009 reduced air traffic significantly (see figure 2).

Figure 2. Passenger Throughput Before and After 2007–2009 Economic Recession



Source: OIG analysis of BTS passenger throughput data. Data have been adjusted for seasonal variation.

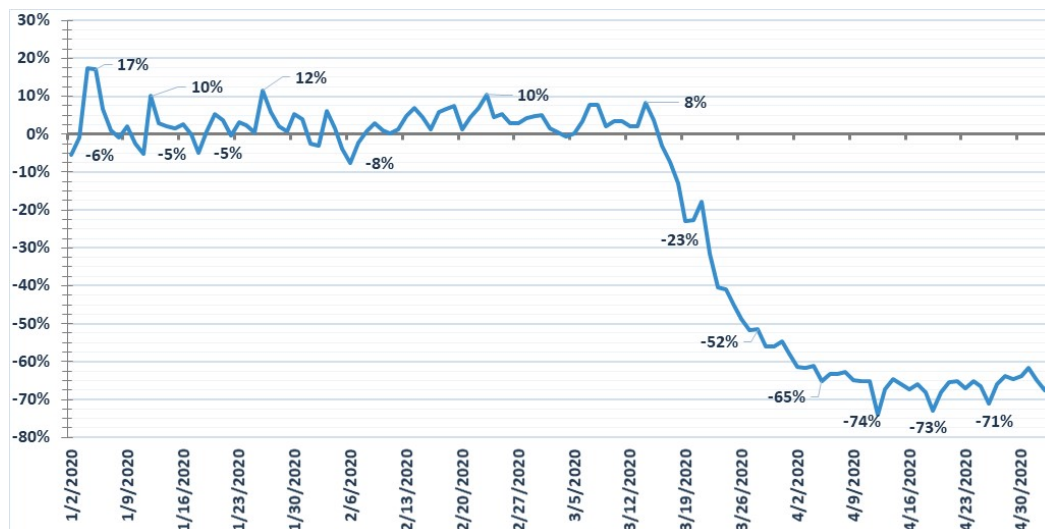
Factoring in the risk of such cyclical events could improve the accuracy of FAA's benefit estimates. This is especially the case given that FAA's benefits model is sensitive to the growth of air traffic, and FAA uses air traffic projections that have historically overestimated growth. Additionally, Office of Management and Budget (OMB) guidance recommends that multiple scenarios and probability distributions be provided when possible in benefit-cost estimates, especially when past experience shows initial estimates were optimistic.³⁰ FAA's lack of risk adjustments and its decision to provide only a single scenario for NextGen benefits led to overly optimistic expectations about NextGen's benefits. As a result, FAA provides no level of assurance to decision makers or stakeholders on whether potential billion-dollar NextGen investments are low, medium, or high risk.

³⁰ Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs (OMB Circular A-94).

COVID-19 Will Further Extend the Timeframe for Capturing NextGen Benefits

FAA acknowledges that NextGen's benefits will be further delayed by the unprecedented COVID-19 pandemic. Specifically, the COVID-19 pandemic has resulted in a tremendous drop in air traffic and passengers, both of which are major drivers for NextGen benefits. Since early 2020, when the pandemic began in the United States, there have been days in which air traffic decreased over 70 percent and passengers over 90 percent (see figures 3 and 4). Additionally, FAA stated that COVID-19 has led to delays in key NextGen programs, including TFDM and DataComm, which will further affect NextGen's benefit recovery timeframe.

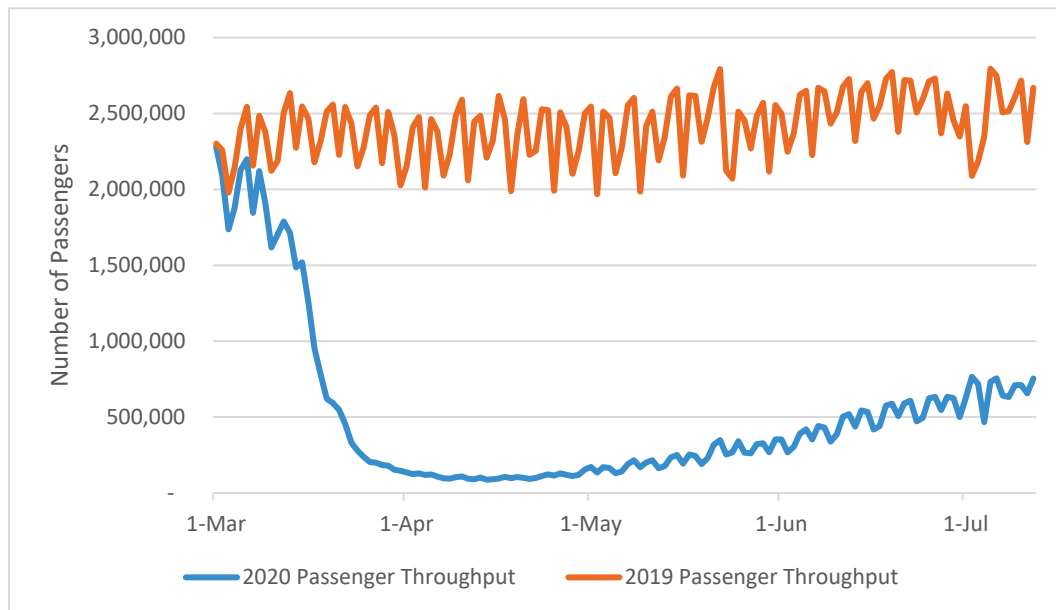
Figure 3. Percentage Change in Daily Flights³¹ Compared to Prior 3-Year Average



Source: FAA data.

³¹ Chart depicts daily number of Instrument Flight Rules (IFR) flights, which is a set of rules governing flights relying on the aircraft's instruments and navigation aids. IFR permit aircraft to fly in certain limited visibility and cloud conditions. Virtually any commercial operation—including airlines and business jets—are IFR flights.

Figure 4. Passenger Throughput Data, 2019 and 2020



Source: OIG analysis of Transportation Security Administration data.

It is unknown how long the impacts of the pandemic will last and the extent of the decrease in air traffic. However, according to FAA officials, there will be very little benefit from NextGen during this time, and many systems, such as TBFM and TSAS, could go completely unused until traffic levels return. In addition, capabilities such as PBN will provide much lower benefit because of the reduced traffic.

There will still be some benefits from NextGen, such as consolidating systems and modernizing infrastructure, but these cost savings only made up 2 percent of the 2017 benefit estimate. Furthermore, as previously mentioned, the majority of the already accumulated \$6 billion in benefits are derived from reduced expected delay to passengers (\$3.4 billion), or PVT. Given the impact of COVID-19 on passenger travel, PVT is unlikely to continue to be a source of significant benefits in the near-term.

Prior OIG Work Has Identified Lessons for Potentially Improving FAA's Delivery of NextGen and Other Future Modernization Efforts

Our longstanding body of work related to NextGen has identified lessons that FAA could use to improve NextGen delivery. For example, while FAA has collaborated with industry to prioritize, implement, and measure benefits of NextGen programs, there are still opportunities for improving transparency, which will be critical to secure industry's long-term investment. In addition, further advancing NextGen will depend on resolving complex implementation challenges, including effectively prioritizing programs, integrating interdependent capabilities, and harnessing controller automation tools to achieve benefits.

FAA Has Collaborated With Industry To Advance NextGen but Can Improve Transparency and Internal Coordination

While FAA and industry have partnered to prioritize and plan programs, securing industry investment remains key to NextGen's long-term success. Central to this effort is FAA being transparent with stakeholders about NextGen benefits. Overall, successful NextGen implementation also requires support and coordination both between FAA and industry stakeholders and within multiple FAA lines of business.

FAA Has Partnered With Industry To Prioritize and Plan Programs but Will Require Additional Industry Investment

NextGen is a large joint investment between FAA (\$21 billion) and industry (\$15 billion). As such, both FAA and industry play a role in advancing and measuring NextGen's success. For example, airline business decisions can have a significant impact on the operational efficiency of the NAS, such as scheduling of flights and fleet types.

Additionally, in order for airlines to fully benefit from NextGen, they need to equip their aircraft with new avionics and other technologies. While airlines have made significant investments in new equipment, they were reluctant to make such investments until they were convinced that NextGen's benefits would outweigh their initial investment and that they could trust FAA would implement them as planned. In the past, FAA worked successfully with industry to implement the first segments of DataComm, a program requiring new onboard avionics

investments by airlines and ground infrastructure by FAA. The collaboration was successful because airlines saw clear and immediate benefits to the investment.

FAA and industry have also already successfully worked together to establish NextGen's top priorities. Under the RTCA—a chartered Federal Advisory Committee—FAA and industry formed the NAC, which provided a forum and structure to work together. In 2013, FAA asked the NAC to prioritize the NextGen programs based on benefits, technological maturity, and implementation readiness. As FAA has implemented these programs, the Agency has used JAT analysis to influence the scope and identify additional sites for several of these NextGen initiatives. For example, JAT found benefits from both Wake Recategorization (Wake Recat)³² and DataComm Tower Services, which brought greater industry support and helped increase the number of sites for implementation. Alternatively, the JAT analysis of the North Texas Metroplex found that while there were benefits, they were lower than originally expected. This helped limit the implementation of Metroplex elsewhere.

While the NAC was able to prioritize NextGen programs and develop an implementation plan, its charter expired on May 29, 2018, and transitioned from the RTCA to FAA. Industry officials we spoke with are concerned about the continued effectiveness of the NAC, which could influence their continued willingness to invest in NextGen related technologies. Given that a significant amount of industry investment will still be required to advance NextGen, gaining industry partnership and support to continually identify priorities and assess benefits will remain critical.

Stakeholders Would Like More Transparency on NextGen Benefits

A key aspect of securing industry investment in NextGen is communicating NextGen's benefits. Airline officials stated that they would like more transparency from FAA on actual benefits of NextGen programs. For example, JAT's group of experts work to analyze and develop mutually agreed upon results of NextGen programs, such as the impact of Metroplex on fuel burn, at key sites. While airlines support this effort, its scope is limited by the difficulty and cost of conducting such analyses.

According to the airline representatives we spoke with, industry would like to see regular reporting on the benefits of NextGen with clear explanations of where the data are coming from. However, FAA has not published a new business case for NextGen since 2016, and the Agency has no plans to publish an updated business case. According to FAA officials, the Agency does not plan to develop another full business case; instead, it is focused on working with industry on joint program benefit analyses. Yet, given the recent changes to the airline industry in

³² Wake Recat safely reduces the separation between aircraft on arrivals and departures.

the wake of COVID-19, further transparency is critical to report on the effective status and benefits of NextGen and inform airlines' planning and investments in new avionics.

Prior and Current OIG Work Has Raised Issues About Effective Coordination Across FAA Lines of Business

NextGen programs require FAA to work effectively across diverse agency lines of business. However, OIG has found that FAA has had issues coordinating NextGen programs across offices and air traffic facilities. For example, implementing Metroplex requires multiple offices to work together to make policy changes, develop new flight procedures, ensure adequate training for controllers on new procedures, and develop new automation tools to allow controllers to manage traffic effectively. Additionally, FAA, industry, and our own work found that TBFM requires air traffic control facilities to work together to facilitate time-based metering. However, lack of a national vision, standardized operating policies and procedures, and intra-facility agreements led to fragmented usage of the tool. While FAA has worked to address these issues, NextGen will continue to present challenges in coordinating across multiple lines of business and air traffic facilities.

Other Lessons Provide Additional Insights Into Complex Implementation Challenges That May Impact NextGen Delivery

Significant work and challenges remain to implement and integrate NextGen's advanced capabilities. While FAA has formulated its own analysis of NextGen benefits and impact, the Agency does not make use of these analyses to help prioritize future implementation decisions. In addition, critical automation tools are not yet in use, which hinders FAA's ability to evaluate and test new technologies and advance NextGen benefits.

FAA Does Not Fully Leverage Its Own Analysis of NextGen Benefits To Help Prioritize Implementation

Until recently, FAA did not leverage the benefits work of its own Systems Analysis & Modeling Division to help prioritize NextGen funding or deployments. FAA approves and plans implementations of new technologies and capabilities based on cost-benefit analyses performed as part of its Acquisition Management System, which relies on engineering estimates and results of demonstration projects. However, FAA usually does not use the updated projections and post-implementation analysis it already conducts to help reprioritize NextGen

programs and deployment locations to maximize benefits to users and the traveling public. Instead, according to FAA officials, the Agency prioritizes programs based on the Enterprise Architecture and funding. FAA was able to provide one example of leveraging such analyses to help prioritize site selections for iTBO; however, other NextGen programs have not leveraged the Systems Analysis & Modeling Division's work.

FAA has relied on similar work from JAT to reduce the number of Metroplex locations where benefits were lower than expected and to expand the number of locations using Wake Recat due to the program's high benefits. However, other than the recent iTBO work, FAA could not provide examples where the Agency had leveraged its own work to make more efficient implementation decisions. According to the FAA officials we spoke with, the Agency considers a large number of logistical and planning considerations to make deployment decisions, making it difficult to adjust based on actual benefits data. However, some officials we spoke with also agreed that using benefits data would help the Agency make better decisions regarding how and where to invest in future NextGen capabilities.

Integrating NextGen Technologies To Enable Advanced Capabilities Remains a Challenge

NextGen requires FAA to implement multiple new and highly interdependent technologies. Our recent and longstanding body of work has shown that new systems, such as DataComm, ERAM, and TBFM, faced delays and budget overruns. Due to the interdependencies between these systems, delays in one system caused a ripple effect and therefore delayed other systems. While FAA has largely deployed the new infrastructure as described above, FAA continues to face challenges in implementing additional segments of these systems or capabilities. FAA also has yet to implement other key systems that drive NextGen benefits, including TSAS and TFDM.

The Agency has struggled with the shift from planning to actually using the new capabilities to generate benefits for all stakeholders. For example, new PBN procedures have not been as widely implemented as planned due to mixed levels of avionics on aircraft operating in the NAS, lack of controller tools, delays to ERAM, and community legal challenges due to noise concerns. FAA's continued focus on addressing these barriers is needed to achieve the benefits from NextGen.

Controllers Are Not Yet Consistently Using Critical Automation Tools, Limiting Potential Benefits

FAA's experience with NextGen so far has shown that controller automation tools, such as TSAS and TBFM, are critical to increasing the efficiency of operations in the NAS. These new tools can reduce separation of aircraft and facilitate the use

of more advanced flight procedures with shorter and more fuel efficient flight paths. However, in previous audits we found that FAA lacked a national program vision, clear guidance, standard operating procedures, training, and metrics to measure success for TBFM. This resulted in fragmented and inconsistent use by controllers, limiting benefits. MITRE is currently working with FAA to help implement these new technologies, flight procedures, and operating paradigms at several airports. While these changes will provide little to no benefit while air traffic remains low due to the COVID-19 pandemic, according to MITRE, they will provide an environment to more easily test TBO and transition controllers and pilots to using the new systems and capabilities.

Conclusion

Over the last decade, FAA and industry have invested significantly in NextGen and achieved a relatively small percentage of the expected benefits from new capabilities. Overall NextGen benefits will fall short of the predictions from JPDO and FAA due to delays to key programs, optimistic assumptions about traffic and passenger growth, and factors outside of FAA's control, including business decisions by airlines and declines in air traffic caused by the COVID-19 pandemic. There are a number of key lessons learned from over a decade of NextGen planning, development, and implementation that FAA can leverage further to benefit future modernization efforts. Leveraging these lessons can help FAA set stakeholder expectations, secure additional industry investment, and continue to make progress in improving the efficiency of the NAS.

Recommendations

To improve the delivery of NextGen and other future NAS modernization efforts, we recommend that the Federal Aviation Administrator:

1. Publish metrics that measure performance of NextGen improvements across the NAS.
2. Develop and implement a process that incorporates interim adjusted benefit projections and interim implementation analyses to support prioritization of NextGen programs and deployment locations.
3. Update and provide stakeholders a risk adjusted NextGen benefit projection.

Agency Comments and OIG Response

We provided FAA with our draft report on February 5, 2021, and received its response on March 9, 2021, which is included as an appendix to this report. FAA concurred with all three of our recommendations and proposed appropriate actions and completion dates. Accordingly, we consider all recommendations as resolved but open pending completion of the planned actions.

Actions Required

We consider all three recommendations to be resolved but open pending completion of FAA's planned actions.

Exhibit A. Scope and Methodology

We conducted this audit between October 2019 and February 2021 in accordance with generally accepted Government auditing standards as prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Our audit objectives were to (1) compare the current expected benefits of NextGen with the original projections and identify the reasons for revising those projections, and (2) identify lessons learned from developing and implementing significant air traffic modernization programs.

To determine and compare the current expected benefits of NextGen with the original benefit projections, we compiled prior NextGen business cases and documents produced by FAA and JPDO. In order to compare early benefits from 2007 to the most recent benefit estimates of 2017, we consulted with an OIG economist and converted the benefit estimates into fiscal year 2018 dollars using the fiscal year average consumer price index. We also compared the original and current estimated costs using the same process.

To identify the causes for revising projections, we compiled and examined program documents produced by FAA, JPDO, and prior OIG reports. We compared business cases produced by FAA and JPDO to identify changes in capabilities and how benefits were modeled. We reviewed prior OIG work to identify previous findings that contributed to revising projections. We also interviewed program officials and other stakeholders, including FAA's Systems Analysis & Modeling Division and other NextGen officials, MITRE, Airlines for America, former JPDO members, and National Aeronautics and Space Administration officials.

We worked with OIG statisticians to obtain and analyze performance metrics data. The statisticians downloaded, unzipped, and imported 144 Airline Service Quality Performance data files from DOT's BTS TranStats website for the years 2008 to 2019. Some of the data elements included are departure, arrival, and elapsed flight times as shown by the Official Airline Guide. The statistician standardized the variables length in those 144 files and then merged them into one file which had over 76 million flight records reported by 24 U.S. certificated air carriers for 8,925 city pairs. Carriers within 1 percent or more of the total domestic scheduled service passenger revenues are required to report data for flights involving any airport in the 48 contiguous states accounting for 1 percent or more of the domestic scheduled service passenger enplanements. The regulation also provides for the voluntary reporting of a carrier's entire domestic

system and voluntary reporting by other carriers. In addition, the statistician summarized some of these data by year and month and computed metrics that focused on data pertaining to this audit such as arrival delays, departures delays, and taxi times.

The statisticians also downloaded from the TranStats website and imported files titled "T-100 Domestic Market Data – U.S. Carriers Traffic and Capacity" for the years 2008 to November 2019. The data fields contain information on passengers and seats. The variable lengths were standardized and merged into one T-100D file that had over 4 million flight records for over 108 million flights, reported by 191 air carriers for 76,288 city pairs. These flights had over 8 billion passengers or 80 percent of the over 10 billion available seats. The statisticians summarized these data by year and month and computed metrics that focused on capacity growth.

We also downloaded passenger throughput data from the BTS and Transportation Security Administration website and imported data into Excel files for the following years: 2000–2003, 2006–2013, and 2019–2020. The data fields contain information on the total amount of travelers that passed through our air traffic system. To adjust for seasonal trends within passenger travel, we consulted with an OIG economist to eliminate the seasonal component. The data were adjusted using the Pindyck and Rubinfeld seasonal adjustment method, which utilizes a 12-month centered moving average. These data were used to determine the impact of external events on the air traffic system.

To identify lessons learned from developing and implementing significant air traffic modernization programs, we reviewed prior OIG reports to determine key challenges and lessons learned during the development and implementation of NextGen. We interviewed program officials as well as external stakeholders such as FAA's Office of the Chief Scientist, NAC, JAT, and MITRE to gain their perspective and discuss the lessons learned they identified during the development and implementation of NextGen.

Exhibit B. Organizations Visited or Contacted

FAA Offices

Air Traffic Organization

Office of Performance Analysis

Systems Operations Services

Office of NextGen

NAS Systems Engineering and Integration Office

Office of the Chief Scientist

Portfolio Management & Technology Development

Systems Analysis & Modeling

Other Organizations

Airlines For America

DOT Bureau of Transportation Statistics

Joint Analysis Team

The MITRE Corporation

NextGen Advisory Committee

National Aeronautics and Space Administration

Exhibit C. List of Acronyms

ADS-B	Automatic Dependent Surveillance-Broadcast
BTS	Bureau of Transportation Statistics
DataComm	Data Communications
DOT	Department of Transportation
ERAM	En Route Automation Modernization
FAA	Federal Aviation Administration
iTBO	Initial-Trajectory Based Operations
JAT	Joint Analysis Team
JPDO	Joint Planning and Advisory Committee
NAC	NextGen Advisory Committee
NAS	National Airspace System
OIG	Office of Inspector General
OMB	Office of Management and Budget
PBN	Performance-Based Navigation
PVT	Passenger Value of Time
RTCA	Radio Technical Commission Aeronautics
SWAC	System Wide Analysis Capability
TAF	Terminal Area Forecast
TBFM	Time-Based Flow Management
TBM	Time-based management
TFDM	Terminal Flight Data Manager
TSAS	Terminal Sequencing and Spacing

Exhibit D. Major Contributors to This Report

NATHAN CUSTER	PROGRAM DIRECTOR
JAYDEEP BORWANKAR	PROGRAM DIRECTOR
JAMES OVELMEN	PROJECT MANAGER
MELISSA PYRON	SENIOR AUDITOR
TAMARIA KELLY	SENIOR ANALYST
ANDREW WEAKLEY	AUDITOR
GENESIS TURMAN	ANALYST
AUDRE AZUOLAS	SENIOR TECHNICAL WRITER
ALLISON DUKAVAS	WRITER-EDITOR
AMY BERKS	DEPUTY CHIEF COUNSEL
PETRA SWARTZLANDER	SENIOR STATISTICIAN
MAKESI ORMOND	STATISTICIAN
JERROD SHARPE	SENIOR ECONOMIST
EVAN ROGERS	ECONOMIST

Appendix. Agency Comments

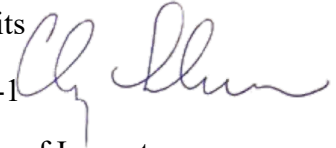


Federal Aviation Administration

Memorandum

Date: March 9, 2021

To: Matthew E. Hampton, Assistant Inspector General for Aviation Audits

From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-1 

Subject: Response of the Federal Aviation Administration (FAA) to the Office of Inspector General (OIG) Draft Report: NextGen Benefits Have Not Kept Pace With Initial Projections, but Opportunities Remain to Improve Future Modernization Efforts

The FAA-led modernization of our nation's air transportation system is one of the most ambitious infrastructure projects in U.S. history. Working with industry and various aviation stakeholders, we have developed long-term National Airspace System (NAS) plans and continue to develop and assess potential new entrants to the NAS.

FAA has reviewed the OIG draft report and has the following comments regarding our approach to benefits. The \$100 billion benefit estimate for NextGen through 2030 represented a detailed modeling analysis conducted in 2017. The result bounds the overall timeframe for realizing the \$100 billion between 2030 and 2035 (pre-COVID-19 pandemic). The FAA estimates of NextGen benefits are segmented into the following three parts:

- **Realized Benefits from Implemented NextGen Capabilities**

Since December 2015, FAA and industry have collaborated, through the Joint Analysis Team (JAT), to achieve consensus on benefits estimates for key NextGen programs¹. Leveraging JAT methodologies, FAA has completed post-operational analyses of more than 20 capabilities at nearly 200 sites. FAA estimates that NextGen implementations from 2010 through 2019 have accrued \$7.3 billion in benefits to industry and society as follows²:

- \$1.3 billion in fuel savings
- \$1.5 billion in other aircraft operating cost savings

¹ Key NextGen programs include Optimized Profile Descents (OPDs), Wake Re-categorization, Metroplex, Established on RNP (EOR), and Tower Controller Pilot Data Link Communications (CPDLC).

² Parts may not sum to total due to rounding.

- \$4.2 billion in passenger travel time savings³
- \$0.4 billion in safety.

- **Future Benefits from Implemented NextGen Capabilities**

Implemented NextGen capabilities will continue to contribute to NextGen benefits in future years. To estimate these future benefits in 2017, we extrapolated the detailed post-implementation analyses using standard economic and traffic growth factors. This resulted in a (pre-COVID-19 pandemic) \$21 billion of total benefits from implemented capabilities expected by 2030.

- **Future NextGen Benefits from New Sites and Capabilities**

FAA conducted its first enterprise-level cost-benefit assessment of NextGen in 2012 to confirm that the program provided value to taxpayers and operators and to justify the investment to stakeholders. The analysis, which aimed to capture all expected NextGen costs and benefits, was updated in 2013, 2014, 2016, and finally 2017. By analyzing all NextGen capabilities simultaneously, it ensured proper accounting for program synergies and overlaps⁴.

In early 2020, FAA updated the Future NextGen Benefits estimates by applying a risk factor for slower traffic growth and implementations delays resulting in realization of an expected \$100 billion in the early 2030s. FAA continues to work with industry to build consensus on data, methodologies, and the value of NextGen improvements. The achieved benefits estimated thus far represent a small portion of expected future benefits. As programs continue to capitalize on the deployed NextGen infrastructure, benefits are expected to grow.

Upon review of OIG's draft report, FAA concurs with the recommendations to improve the delivery of NextGen and other future NAS modernization efforts, as written. For recommendations 1 and 3, we plan to complete actions by April 30, 2021. We will implement recommendation 2 by October 31, 2021.

We appreciate this opportunity to offer additional perspective on the OIG draft report. Please contact H. Clayton Foushee at Clay.Foushee@faa.gov if you have any questions or require additional information about these comments.

³ Per Department of Transportation (DOT) guidance, FAA values passenger travel time savings when conducting cost-benefit analyses for investment, regulatory, and grant-making purposes.

⁴ The latest NextGen business case includes improvements described in The Future of the NAS and in the 2017 NAS Segment Implementation Plan. No new implementations were considered after 2026.

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April 28, 2021

Mr. Brad Pierce, Chairman
Centennial Airport Community Noise Roundtable
c/o Centennial Airport
Arapahoe County Public Airport Authority
7565 S. Peoria St. Unit D9
Englewood, CO 80112

RE: Highlands Ranch Metro District Request for Full Membership in CACNR

Dear Chairman Pierce,

Please accept this letter as a formal written request by the Board of Directors of the Highlands Ranch Metropolitan District to become full voting members of the Centennial Airport Community Noise Roundtable (CACNR).

Over the course of the past year the Board of Directors have received an increasing number of noise complaints from residents of the Metro District concerning flight operations at Centennial Airport, and are very concerned about the negative impact of aircraft noise on the quality of life of the residents of Highlands Ranch. The Board of Directors strongly believes that through active participation on the CACNR and dialogue with other local representatives, significant improvement is possible with regard to mitigating the impact of aircraft noise within the community.

Please accept this letter as a formal request for consideration to admit the Highlands Ranch Metro District as a full voting member of the CACNR. Attached please find the executed Memorandum of Understanding signature page. Thank you for your consideration of this request.

Very Respectfully,

A handwritten signature in blue ink, appearing to read "Mark Dickerson", is written over a large, stylized blue circular flourish.

Mark Dickerson, Chairman, Highlands Ranch Metro District Board of Directors

Cc: HRMD Board of Directors

Mike Renshaw, HRMD General Manager

A Memorandum of Understanding
For the Formal Creation of the
Centennial Airport Community Noise Roundtable

IN WITNESS WHEREOF, the CACNR Regular Members have acknowledged the Memorandum of Understanding in counterparts as of the date set forth below.

Dated this 27TH day of APRIL, 2021.

ON BEHALF OF HIGHLANDS RANCH METROPOLITAN DISTRICT

NAME:



TITLE:

CHAIRMAN, BOARD OF DIRECTORS



Centennial Airport Community Noise Roundtable
c/o Centennial Airport
7565 S. Peoria St. Unit D9
Englewood, CO 80112
www.centennialairportnoise.com

April 13, 2021

On behalf of the Centennial Airport Community Noise Roundtable (CACNR) we thank the FAA for the opportunity to provide comment on the historic, long awaited Neighborhood Environmental Study (NES), released in January 2021.

The Centennial Airport Community Noise Roundtable (CACNR) was created in 2009 as a result of recommendations from the Centennial Airport Part 150 Study to create an advisory committee to address aircraft noise issues impacting the communities surrounding Centennial Airport, and to monitor programs implemented as a result of the adoption of the ACPAA Noise Compatibility Program. Our Mission is to utilize partnerships to reduce airport noise for the benefit of neighboring communities.

Centennial Airport is one of more than 70 public-use, general aviation airports in the state of Colorado, and we know many General Aviation airports operate throughout the country.

Unfortunately, we note that not one General Aviation airport was included in the 20 airports selected for the Neighborhood Environmental Study. We believe this was an unfortunate oversight, and a depth of useful information has been lost.

Centennial Airport was opened in 1967 and has been owned and operated by the Arapahoe County Public Airport Authority (ACPAA) since 1975. The Airport's location along Interstate 25 next to the Denver Tech Center and a few miles south of downtown Denver makes it a key element of the economic vitality of the Denver metropolitan area.

Centennial Airport is home to more than 800 fixed-base aircraft. This ever-increasing number includes a mix of single-engine, multi-engine, turboprops, jets, and helicopters. Fixed-base operators (FBOs) provide a full spectrum of services for both the locally based and transient

pilot communities. With approximately 320,000 annual take-offs and landings on three runways, Centennial Airport ranks among the busiest general aviation airports in the United States. The Airport's mission is safety, security, and service for the general aviation community.

CACNR's 11 member cities, towns, and counties are diverse in size and geography, but are all dedicated to working with their residents, the neighboring airports, and the FAA to find reasonable solutions to the impacts of aviation noise. We believe the release of this study and its finding, that an increased percentage of people are highly annoyed by aviation noise, is a vital first step in that important task.

We understand the need to improve the efficiency and capacity of the national airspace while decreasing emissions and the impact on our environment. However, with increased air traffic volume over the last decade, as well as the enhanced navigational capabilities of many aircraft, the resulting concentrated traffic corridors have more noticeable effects on the ground that must be considered thoroughly, and as a priority concern.

There are number of Flight Schools based at Centennial Airport. Numerous individuals from surrounding communities are experiencing increased noise from Flight Schools and express their concerns and frustrations in many ways, including at CANCR monthly meetings. Noise from Flight Schools is not only loud but constant.

Aviation noise impacts are a health and an economic issue. In order to adequately understand and address the impacts of aviation noise on residents, the FAA must first establish adequate metrics to measure those impacts. We maintain that DNL does not represent and account for the additional factors resulting from today's aircraft operations that add to annoyance. It may appear that residents today are more sensitive to average noise (as measured by DNL) when in reality they are also reacting to new annoying factors. The recently released NES supports this assertion in the strongest terms.

DNL is an average and humans do not perceive noise in averages but rather as individual events. Factors which are involved with the public's perception of noise include:

- The psychological impact of concentrated, extended noise
- The physiological /cardiovascular impact of infrequent, significant noise spikes during nighttime hours
- The impact of less audible low frequency noise whose vibration induces audible noise
- The length of each period of frequent, regular noise spike "rush hours" due to over-flights
- The number of rush hours per day
- The average dB of a rush hour's noise—not day-night average
- The intensity of spikes above the ambient dB during rush hour noise
- The intensity and number of spikes above the ambient noise level, for non-rush hours from 10 PM to 7 AM

A more appropriate metric to measure aviation noise impacts is crucial for relations between the FAA, airports, and the public. We believe the FAA has taken measures to improve community engagement when implementing NexGen and other NAS changes, and this culture should extend to each regional office and control tower in the most robust manner. There can no longer be a 'one size fits all' approach to dealing with the effects of aircraft noise on the public.

In relation to the next steps of this study, this public comment period should represent the first step in a public engagement process. We know that the FAA sees value in communicating with airport noise roundtables, like CACNR. We believe the FAA should invest resources and transparent communication practices with roundtables, and empower creation of frameworks that represent the real needs of their unique local dynamics and experiences. This sets up the FAA-Community engagement efforts to become successful.

We know our National Airspace System is very large and complex and understand that the study, testing, and implementation of new metrics to measure noise impact is a large-scale, expensive undertaking. We do not ask lightly that this be a main focus of the FAA over the next decade and beyond. There is concern the additional time which may be directed to conducting more studies will further delay any policy changes which would positively affect the public, which has already waited many years for the NES to be released. Studies can become endless, as each will raise more ideas which could be pursued before anything is actually done.

We would ask that the FAA consider the use now of existing information to develop policy changes appropriate to that information. The use of pilot programs to test the efficacy of policy change might even be considered. We believe that now is time to shape the next 50 years of federal policy that includes noise mitigation and abatement as a strong pillar. The FAA in collaboration with the stakeholder public should not miss this opportunity to address this very serious need.

We wish to be an ally and partner to the FAA in this endeavor. We believe that communication and transparency will only aid this effort, not slow it down.

Respectfully submitted,

A handwritten signature in black ink that reads "Brad Pierce". The signature is written in a cursive, slightly stylized font. The first name "Brad" is written in a more standard cursive, while "Pierce" has a more elaborate, flowing script with a large, sweeping 'P' and 'C'.

Brad Pierce
Chair, Centennial Airport Community Roundtable