



MICHAEL D. DENNEHY
Town Administrator

TOWN OF MILTON

MASSACHUSETTS

July 10, 2019

Ms. Colleen D'Alessandro
Acting Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Ms. Lisa Wieland
Chief Executive Officer and Executive Director
Massport Executive Offices
1 Harborside Drive
East Boston, MA 02128

Mr. David Carlon, Chair
Mr. Matthew Romero, Executive Director
Massport Community Advisory Committee
P.O. Box 470614
Brookline, MA 02447

Re: RNAV Study/Block 2

Dear Ms. D'Alessandro, Ms. Wieland, and Messrs. Carlon and Romero:

This letter transmits a document and appendix entitled Requests and Recommendations For Study Block 2 Dispersed Runway 4L and 4R Arrival Path Tests. These Requests and Recommendations are being conveyed following the April 2019 Block 2 update presented to MCAC members and the public. The purpose of this submission is to focus on needed 4L/4R test elements in order to try to assure that the 4L/4R communities are fully included in Block 2 testing as the RNAV Study progresses over the coming year. The Request and Recommendations present our test needs, and the appendix contains background and foreground discussion and data.

We request that the FAA, the MIT consultants and Massport work with us and our MCAC representative to include such tests in MIT's work, and we also seek the assistance of the MCAC in this effort. The Requests and Recommendations, presented by the Select Board of the Town of Milton, are accompanied by letters of support by State Representatives William Driscoll, Jr. (7th

Norfolk) and Daniel R. Cullinane (12th Suffolk) as well as State Senator Walter F. Timilty (Norfolk, Bristol, Plymouth).

Sincerely,


Richard G. Wells, Jr.

Michael F. Zullas


Melinda A. Collins

Kathleen M. Conlon

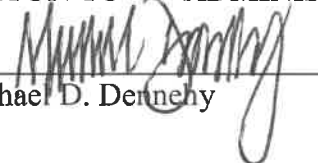

Kathleen M. Conlon

Anthony J. Farrington

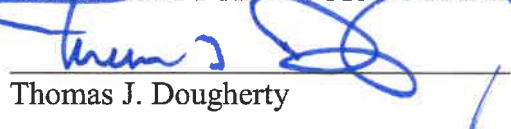

Anthony J. Farrington

SELECT BOARD


MILTON TOWN ADMINISTRATOR


Michael D. Dennehy

MILTON REPRESENTATIVE TO MASSPORT
COMMUNITY ADVISORY COMMITTEE


Thomas J. Dougherty

MILTON AIRPLANE NOISE
ADVISORY COMMITTEE


Andrew Schmidt, Chair

cc: U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren

Congressman Stephen F. Lynch
Congresswoman Ayanna Pressley
Attorney General Maura Healey
State Senator Walter F. Timilty
State Representative William Driscoll, Jr.
State Representative Daniel R. Cullinane
Milton Airplane Noise Advisory Committee
Milton Board of Health
Milton School Committee
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq.

REQUESTS AND RECOMMENDATIONS FOR BLOCK 2

DISPERSED RUNWAY 4L AND 4R ARRIVAL PATH TESTS

CONTENTS

1.0 PREFACE

2.0 KEY CONSIDERATIONS

3.0 PRIOR REQUESTS AND FAA RESPONSES

4.0 DISPERSION REQUEST AND TEST ELEMENTS

4.1 AUTOMATE DISPERSION

4.2 USE MULTIPLE FLIGHT PATHS

4.3 USE CHARTED VISUAL FLIGHT PROCEDURES

4.4 RECOGNIZE WESTWARD SHIFT OF CSPR SKYRAILS

4.5 CHMNY VERSUS MILTT REALITIES

4.6 DISPERSION CHART SHOWING ONE TEST AREA

4.7 4R RNP APPROACH—MIN POPULATION FROM SOUTH

4.8 4R RNP APPROACH — OFFSET INITIAL

4.9 4R LOW-NOISE OVERWATER RNAV APPROACH + RNP

5.0 22L-TYPE LOW-NOISE OFFSET RNAV APPROACH +RNP

6.0 27 DEPARTURES WAYPOINT RELOCATION

7.0 FIELDWORK TO CONFIRM REALITIES/POSSIBILITIES

8.0 DWELL AND PERSISTENCE REQUIRE SIMILAR ACTION

1.0 Preface

RNAV involuntarily shifted flights away from Braintree and Quincy and concentrated them on narrow 4L/4R paths.

The resultant noise and pollution burden suffered by residents overflowed by 4L and 4R arrivals is painful and unbearable.

As this paragraph was being written, even under clear blue skies on an afternoon in the second week of June 2019, large jets were descending toward Logan Airport on 2-meter-wide PBN RNAV skyrails headed for both 4R and 4L runways, overflying Milton, Mattapan, Dorchester, Hyde Park and South Boston in close parallel fashion. Those jets approaching 4R fly in an-every-50-second sequence, and the jets approaching 4L in parallel are ahead, or behind, one or more of those parallel track 4R approach path planes. Consequently, there were that day, as so often, only about 7 to 12 seconds out of each minute without loud noise. Seven to twelve seconds out of a minute. Less undisturbed time than it takes to place and connect a phone call. The rest of each minute is accompanied by oncoming, overhead and leaving loud jet noise. Yet, the wind was from the south at Logan as this paragraph was written. In fact, the 4L/4R arrivals were flying with a tailwind above 10 knots in clear weather. You may wonder at the technology but find it impossible to converse under it. The closely spaced 4L/4R parallel runways (CSPR) double noise crush is intolerable.

At times, one large 4L jet flies overhead exactly parallel with a large 4R jet also overhead. Their respective cockpits are within sufficiently close distance that cabin crews and passengers could look across and see their CSPR companion. Four loud engines, six wheel sets lowered many miles earlier than MIT models indicate, both loud overhead, then loud as they move on, and that crescendo slowly wanes, while in seconds the noise increase begins again because a 4R following jet that was 50 seconds behind just 40 seconds ago has been oncoming, closing in, or overhead... and there is no respite in sight. Day after day..and night after night. Sleep deprivation follows daily lifestyle deprivation. Again and again.

For the year 2018, the CSPR (4L/4R) received (4R) 57,899 jet arrivals and (4L) 7,274 jet arrivals which totaled 35% of yearly 2018 jet arrivals at Logan despite 4L/4R having only 18% of Logan runways' windward facing position across the year.

For more than half a decade now, the 4L/4R communities have been asking Massport and the FAA to do three things:

- 1) Restore the dispersion of 4L/4R overflights using RNAV to resemble the degree of flight paths dispersion that existed before the introduction of PBN;
- 2) Require that planes arriving on 4L/4R adhere to FAA's 3 degree glide slope standard so that altitude over residents is maintained by that required decline angle of descent.
- 3) Conduct field work under the 4L/4R paths which will show that the RNAV paths are shifted more westward than FAA reports, that the CSPR 4L/4R are much closer together than reported, that noise monitor location and technology are no longer providing reliable data, and that dispersion and glide slope alternatives can be informed by actual conditions better than lab assumptions.

This submission addresses each of those requests with very specific reference to the exact present status of the MIT Block 2 Study elements and the 4L/4R communities' specific asks regarding those same requested test items 1, 2, and 3.

2.0 Key Considerations

2.1 There has been drastic and unacceptable increase in the frequency, density and concentration of aircraft and noise over limited geography. A 2018 MIT Thesis summary acknowledges this. <https://pdfs.semanticscholar.org/6322/03aec9d9a55136e8bc9e105b1e4bbc8ca93.pdf> see page 21.

2.2 Appropriate dispersion test alternatives will recognize that the increase in air traffic volume and size of jets is a contributing factor to noise experience but is no substitute for testing restoration of relative overflight dispersion to place residents in the same relative position as they were in pre-PBN with those increases similarly shared.

2.3 The 4L/4R communities request that the Block 2 4R RNP Approach — Min Population Exposure from South test (MPES) and the 4R RNP Offset-Initial test be included elements of dispersion testing. [MIT April 2019 Slide 25] See Section 4.6 and Sections 4.7 and 4.8.

2.4 Quite apart from the MPES test and others like it, the 4L/4R communities have repeatedly sought, and strongly reiterate the need now, for the Block 2 tests to include tests of overflight paths that disperse flights within the 4L/4R communities as referenced in Section 4.6. Such paths do not shift flights onto other municipalities, although a full restoration of pre-RNAV dispersion would do so and be most fair to all. There is no excuse for failing to also test such dispersed paths given that test limitation. That is a sine qua non for these communities.

2.5 The 4L/4R communities request that the Low Noise Overwater Offset RNAV Approach with RNP Overlay described in Section 4.9 and a test like that in Section 5

for 22L arrivals [MIT April 2019 Slides 13-18 covering 72% of the aircraft fleet] be modeled and tested for 4L and 4R arrivals. Such techniques should be included as part of the test of dispersed paths as referenced in Section 4.6.

2.6 The 4L/4R communities support the Block 2 test of Runway 27 Departures RNAV waypoint Relocation [MIT April 2019 Slide 69] which would relieve some overflight burden experienced by communities under 4L arrivals. Section 6.

2.7 The highly problematical burdens due to dwell and persistence experienced by 4L/4R overflowed residents are not addressed anywhere in the MIT Study. These two longstanding and inequitable noise and pollution crisis creators need to be addressed in this Study or in parallel fashion as soon as possible. An air traffic control (ATC) governance protocol should be tested to rotate runway use when prevailing wind subsides rather than continue as now.

3.0 Prior Requests and FAA Responses

The Appendix to this submission contains a set of requests made since 2015 on behalf of the 4L/4R overflowed communities by their municipal, state and Federal representatives to FAA through Massport.

Those submissions include repeated specific requests, with supporting information, asking that FAA test restoration of dispersed arrival 4L/4R arrival flight paths, require adherence to 3 degree glide slope altitude requirements, and conduct related field work. For example:

3.1 The November 9, 2015 letter and supporting materials provided by the Milton Board of Selectmen to the FAA Regional Administrator, Massport CEO and Logan CAC President

following the Boston Logan Airport Noise Study. This letter reviewed prior requests and continuing need for reintroduction of dispersed runway 4L and 4R flight paths with specific requests/ recommendations and documented the extreme noise burden of RNAV path concentration and use: taking a 40 day period, 466 of the total night and day 960 hours had runway 4L/4R landings, namely 48.5% of all hours, including 26.6% of all nocturnal hours. Use of 4L/4R in periods of tailwind, crosswind and little ambient wind was excessive: the Volpe Center noise assessment estimated that 4L/4R would be used 40% of the time despite northeast wind flow (ie. 4L/4R headwind) being present 18% of the time. The letter requested FAA engagement regarding dispersion, altitude and on the ground field study.

3.2 The "4L/4R/RNAV/RNP/RUP Test Plan Proposal"

submitted to the MCAC Aviation Subcommittee (and subsequently to its Executive Committee) in April 2017 with signed endorsements of U.S Senators Markey and Warren, Congressmen Lynch and Capuano, State Representatives Driscoll (7th Norfolk) and Cullinane (12th Suffolk, including Mattapan, Dorchester, South Boston and Milton), the MCAC representative of Randolph, MCAC representative of Canton and the MCAC representative of Milton. This called for the FAA-Massport MOU Study by MIT to test (1) "return to pre-RNAV dispersion of flight paths while using RNAV and RPN to do so" (2) "revise altitude, angle and separation" and (3) field study of the actual overflight paths.

3.3 The September 23, 2017 follow-up to John Hansman and Flavio Leo detailing the continuing need for these three test elements and updating the continued burdens on 4L/4R communities such as the fact that in a then current four-day period the number and concentration of planes continued to

be oppressive; specifically: in those 4 days 1,124 planes overflow the 4L/4R residents under the concentrated paths.

3.4 The January 29, 2018 letter to the FAA Regional Administrator and Massport CEO by the Milton Board of Selectmen urging that Block 2 of the RNAV study: (1) test dispersion of several 4L and 4R arrival paths in a manner such that overflight noise impacts that are comparable to pre-RNAV distribution; (2) test higher altitudes and glide slope for arrivals to 4L and 4R; and (3) conduct field work so that Professor Hansman and others who are performing the RNAV study may observe the westward shift of 4R arrivals from the reported centerline flight path, witness the approaches to the unique-to-Logan CSPR 4L/4R and observe geography and terrain relevant to test paths.

3.5 MIT April 2018 Presentation and Milton Response/Requests

On April 18, 2018, MIT presented a preliminary methodology (see MIT's slide 47 in the Appendix to this submission) at the MCAC Aviation Subcommittee meeting.

A response on behalf of Milton was presented at that same meeting (See slide 11 of Milton's presentation in the Appendix to this submission).

The MIT slide (1) did not take any account of 4L as a CSPR or how 4R could disperse westward given 4L's presence; (2) referred to arrivals from the south without addressing how arrivals from the north into those paths would be affected; and (3) sketched a theoretical bulge across municipalities to the east, west and south of Milton rather than at least starting with restoration of 4L/4R dispersed paths over a lesser test field.

The Milton representative presented a "**Dispersion Recommendation**" contained in the Appendix to this submission to the Subcommittee and to MIT at that same meeting. It sought development and testing by the MIT experts of dispersed paths as

indicated on its page 11. It included a test question on the need for a protocol for dispersed paths rotation.

In addition, beginning at pages 14, 26, and 38 it presented each of the other Block 2 Test elements that Milton had requested (altitude and field work---and justification for asking for each). The minutes of the meeting expressly record and attach Milton's requests. This is a quote from the minutes:

"Presentation by Cindy Christiansen of Milton: (see presentation attached)

Arrivals on 4L/R changed with implementation of RNAV in 2011. Radar tracks inaccurate. Recommended "strings of a harp" arrival approaches with hourly rotation among same. Asked for field work in Milton, Quincy and Dorchester. She also presented material to show the prior rejection of increased approach altitude be revisited because of the material presented. The complete list of requests is contained in the provided document "Supplement to Presentation.pdf."

4.0 Dispersion Request and Test Elements

According to the FAA, NextGen is "a satellite-enabled navigation system that is more precise than traditional ground-based navigation aids. Satellites enable the FAA to create optimum routes anywhere in the NAS for departure, cruising altitude, approach and arrival operations." Source: https://www.faa.gov/nextgen/how_nextgen_works/

We request that MIT test dispersion of 4L and 4R arrival overflights using all three available means:

4.1 Automate dispersion:

Modify the NextGen system to automatically disperse flights.

When residents purchased their homes, they made decisions based on historical flight paths. With PBN, those flight paths have been shifted into narrow skyrails over residents without their prior consent. There have been some expert suggestions that deserve testing.

Dr T. Reynolds of MIT Draper Labs observed in 2016 that RNAV technology could be used to create a family of dispersed overflight paths to address the noise impacts of the present RNAV concentrated paths.

Such tests would recreate safe dispersion by replicating pre-RNAV path dispersion which was at the previous, proven safe dispersion method that allowed for proper spacing and safety buffers between aircraft using ATC vectoring.

Automated dispersion replication testing addresses safety, efficiency, and noise. Dispersion would address the RNAV skyrails' disproportional noise and pollution impacts on residents under the narrow flight PBN paths. We request that the full expanse of 4L/4R overflow area shown in Sections 4.4, 4.6, 4.7, 4.8 and 4.9 be considered for dispersed test path development utilizing maximum guidance degree angles for convergence of dispersed paths, adherence to cross-track tolerance criteria, and other means to achieve dispersion. We ask that MIT engage with representatives of the 4L/4R communities to iterate suitable test elements. **And:**

4.2 Use multiple flight paths:

Define multiple flight paths across the historic approach quadrangle and rotate flight path use. See Sections 4.6 and 4.7, 4.8, 4.9 and 5.0. ATC could test use of such flight paths in coordination and rotation in order not to burden any one path's overflowed neighborhoods with continuous flights. Each rotation period would be a defined number of test hours. **And:**

4.3 Use charted visual flight procedures as weather permits:

This will take advantage of the fact that pilots have more discretion when flying a visual approach than when flying RNAV approaches.

This also aligns with historical flight patterns where RNAV visual approach permits a sharper turn than RNP does. Adherence to gear deployment mileage-from-touchdown norms also should be addressed on visual and RNAV paths.

4.4 Recognize the westward shift of the CSPR skyrails:

The first of the following slides illustrates the significant westward shift of the 4L/4R flight path center lines.

The CSPR center flight lines, as flown, are to the west of the pre-RNAV dispersed 4R flight path, increasing the noise for residents under the CSPR lines dramatically.

The Cunningham Park-Fullers End noise monitor is noted on the slide. It is far from the noise center. Field work would confirm this.



4R PRE - RNAV

4L 2019

CSPR

4.5 CHMNY and MILTT apart and in relation to Logan

The next two slides show CHMNY (blue) and MILTT (red) in relation to each other and then in relation to Logan.

CHMNY is not an FAA waypoint. We use it to mark the actual GPS location of the 4R track which is west of the MILTT FAA waypoint.

Planes approaching 4R fly over the point labeled CHMNY on the next two slides which is to the west of the waypoint MILTT. When 4R is in use, hundreds of flights a day fly over CHMNY. In fact, if those planes were to head from CHMNY to MILTT and beyond, on that heading they would head out to sea. From CHMNY they fly toward 4R over areas closer to 4L overflights than recorded by FAA. See Section 4.4 above. Field work would confirm this.

5/28/2019

42°16'25.1"N 71°02'57.1"W - Google Maps

Google Maps 42°16'25.1"N 71°02'57.1"W

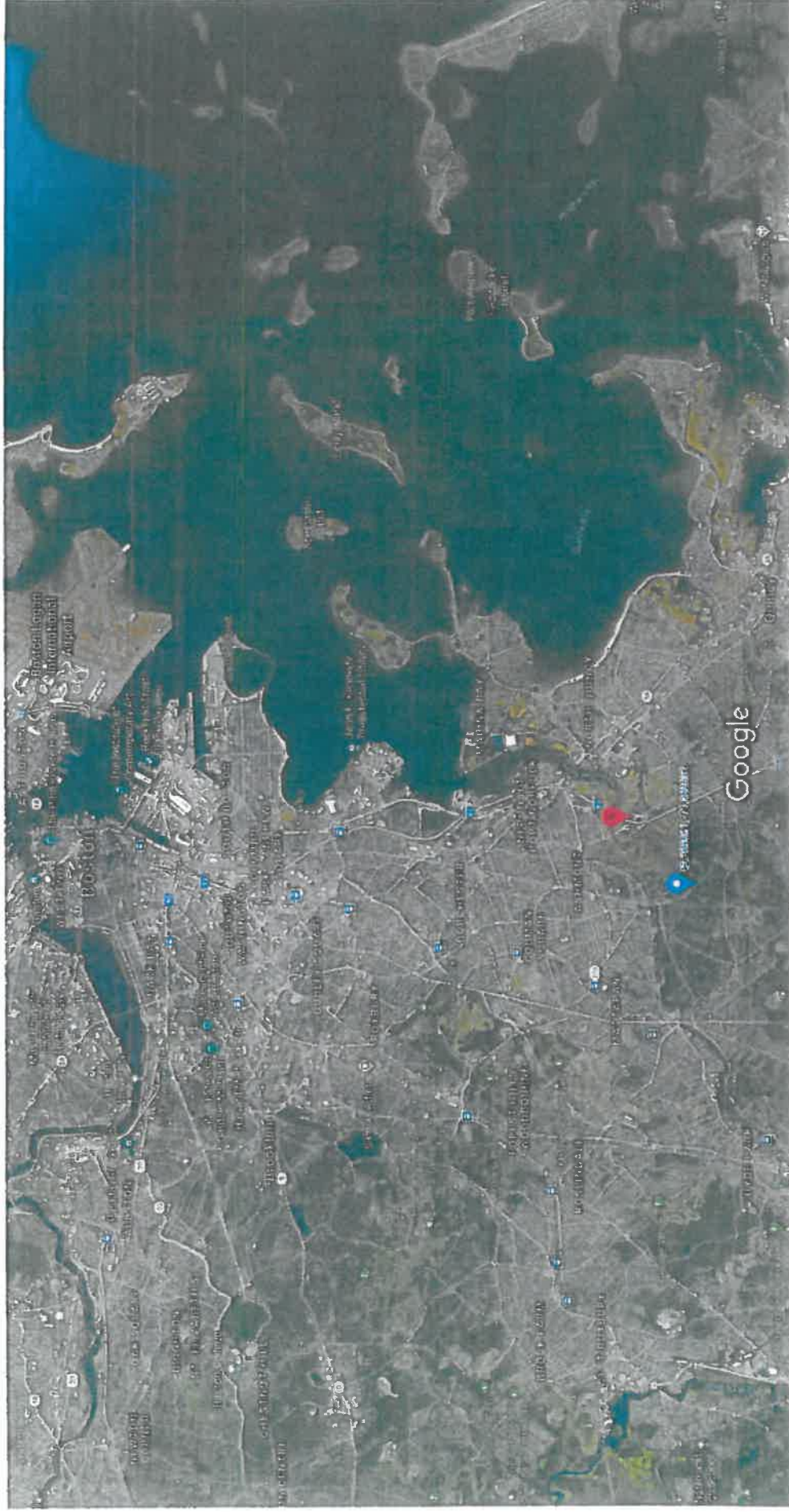
↑ MILIT 42.273650 -71.049162



Imagery ©2019 Google, Map data ©2019 Google 1000 ft

↑
CHMNY
42.263146
-71.062565

Google Maps 42°16'25.1"N 71°02'57.1"W



Imagery ©2019 Google, TerraMetrics, Data SIO, NOAA, U.S. Navy, NGA, GEBCO, U.S. Geological Survey, Map data ©2019 1 mi

4.6 The Dispersion chart shows a potential 4L/4R test area

The next slide shows the angle of approach (left side) of the 4L visual approach path as a means of sketching a corresponding 4R angle of approach (right side). Within those lines is a potential area for testing dispersed 4L/4R paths that would attempt to restore dispersion of overflight patterns to pre-RNAV-like form.

Air traffic volume and jet size has increased but such impacts would be shared ratably as before PBN by this and the other dispersion test elements shown on the other slides in this document. (Note that this slide uses the reported 4L GPS and 4R GPS path lines. The actual CSPR paths are shifted to the west and closer together as mentioned previously. Canton, Dorchester, Mattapan, Milton, Hyde Park and South Boston are all affected.) Sections 4.7, 4.8 and 4.9 show additional dispersion test areas and methods.

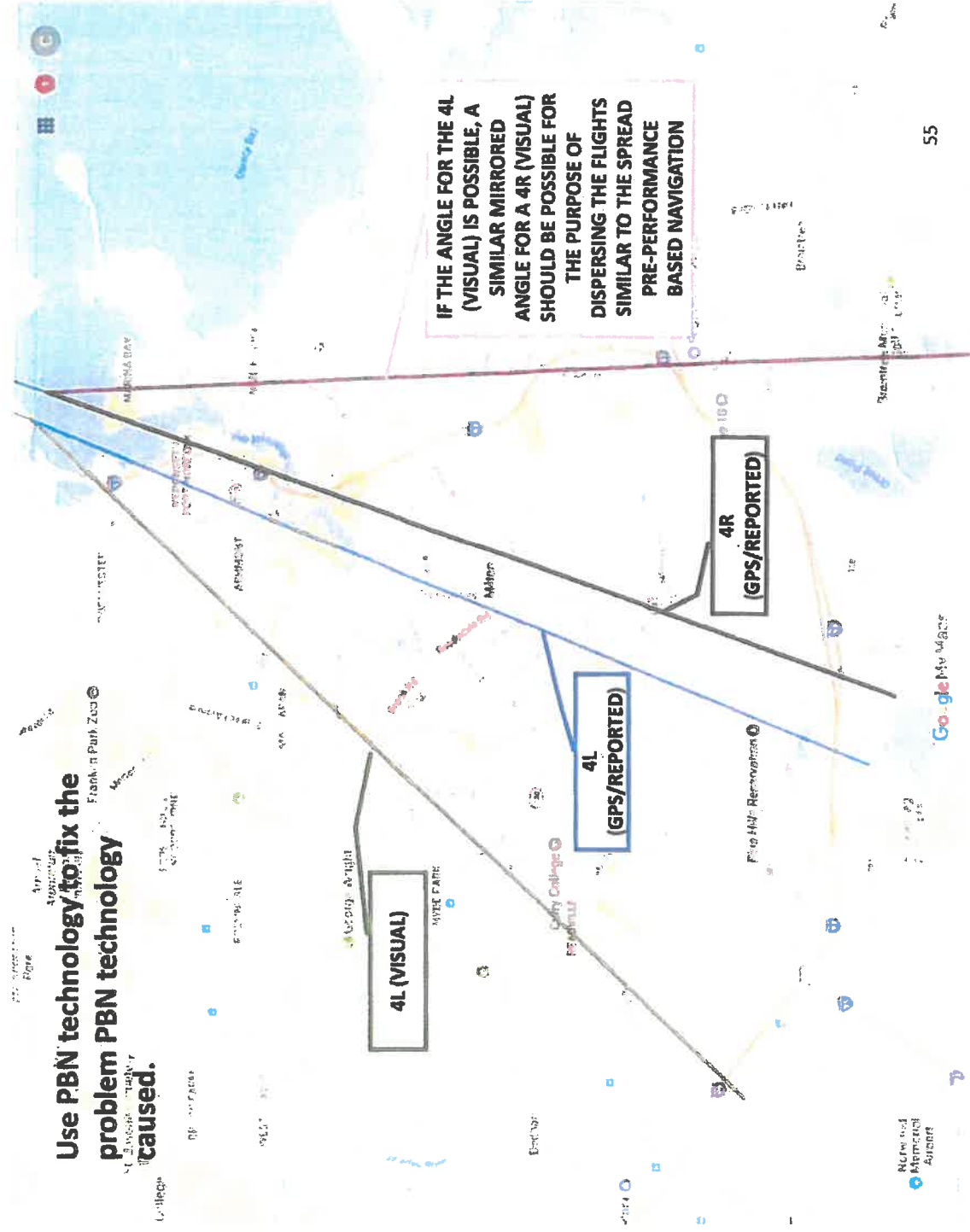
DISPERSION

Why not “strings of the harp”, i.e., a “family of RNAV paths” within this triangle? We know that the FAA thinks it can have the two 4L RNAV paths shown. If these two are possible, then so are others to the east of 4R. 4L(Visual) meets up with 4R(GPS) at about 3.0 nm from the runway end.

Are greater angles at the intersection possible?

How many paths are possible?

How can multiple paths to the same runway ends be rotated? Hourly? Daily?

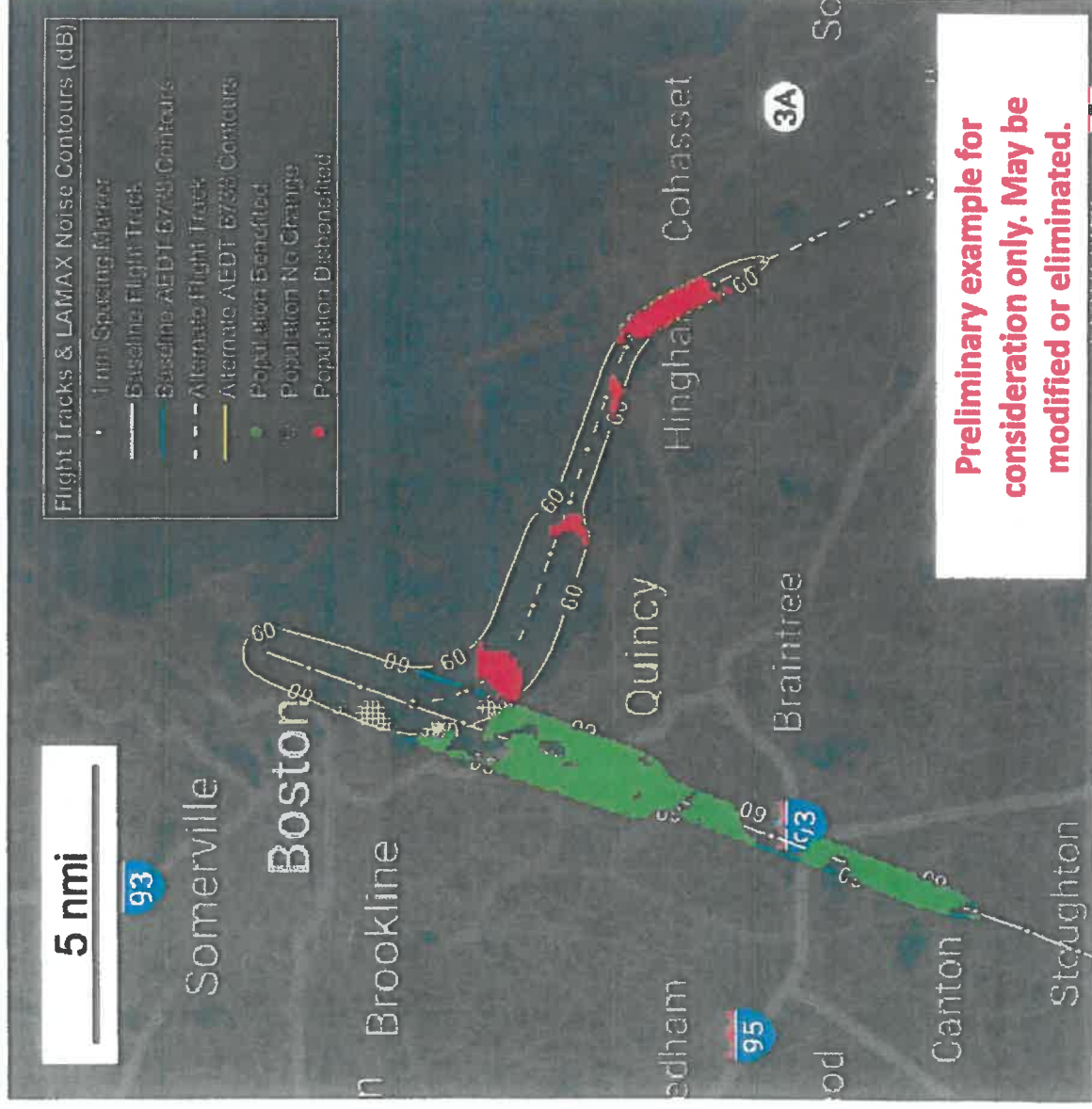


4.7 The 4R RPN Approach—Min Population Exposure from the South

The next slide shows a potential test presented by MIT at the April 2019 MCAC meeting (MIT Slide 25). It has the potential to reduce burden on residents now under the 4R PBN path, and should be considered as an element of dispersion testing. It is not a substitute for the dispersed paths testing addressed above, but in addition to, and as a part of, that testing as we view it.

4R RNP Approach – Min Population Exposure from South

B737-800 60dB $L_{A,max}$ Noise Exposure



B737-800	
Population Exposure ($L_{A,max}$)	
Straight In	60dB
RNP	32,232
Difference (Straight In – RNP)	11,682
	20,550

1.5nmi final segment
 90° 2nmi radius-to-fix turn
 5nmi straight segment
 45° 2nmi radius-to-fix turn

- Procedure within RNP criteria.
- Community support unclear.
- Possible flyability issues need to be tested.
- Air traffic merging concern with straight-in traffic.

4.8 4R RNP Approach Offset Initial

The next slide shows a potential test presented by MIT at the April 2019 MCAC meeting (MIT Slide 18). It also has the potential to reduce burden on residents now under the 4R PBN path, and should be considered as an element of dispersion testing. It is not a substitute for the dispersed paths testing addressed above, but in addition to, and as a part of, that testing as we view it.

4R RNP Approach – Offset Initial

B737-800 60dB $L_{A,max}$ Noise Exposure



1.5nmi final segment
90° 2nmi radius-to-fix turn
90° 2nmi radius-to-fix turn

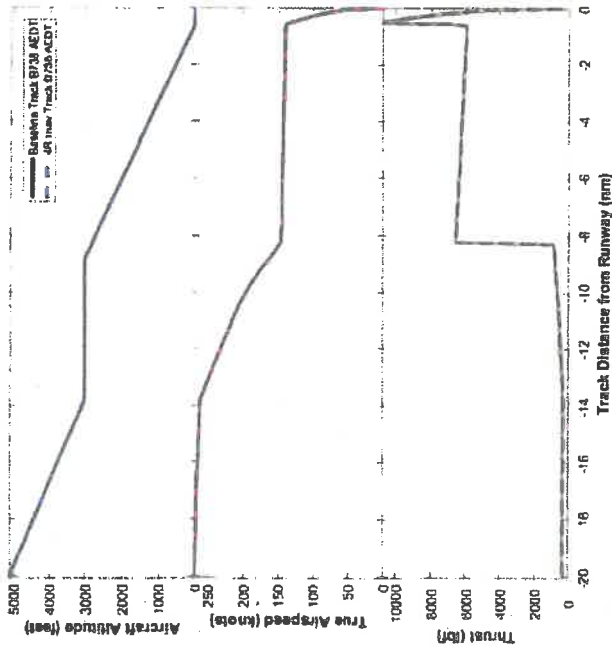
- Procedure within RNP criteria.
- Community support unclear.

Preliminary example to evaluate methodology only. Should not be considered representative case.

4.9 4R Low-Noise Overwater RNAV Approach with RNP Overlay: Noise Exposure

The next slide is MIT's graphic presentation of a runway 4R low-noise overwater RNAV approach with RNP Overlay. The slide shows the potential noise exposure reduction. This was presented preliminarily by the MIT consultants. Such a path should be tested in a manner that does not affect Hull residents as an element of dispersed 4R paths testing. It has significant potential if that can be achieved.

4R Low-Noise Overwater RNAV Approach with RNP Overlay: Noise Exposure



Population Exposure (L_{MAX})

	60dB	65dB	70dB
Straight In	30,239	7,468	530
Modified Procedure	18,283	5,792	529
Reduction	11,956	1,676	1



Aircraft	B737-800
Metric	$L_{A,MAX}$
Noise Model	AEDT
Notes	Standard AEDT arrival profile

5.0 22L Low-Noise Offset RNAV Approach with RNP Overlay

The next slides show a test presented by MIT at the April 2019 MCAC meeting (MIT Slides 13, 15-18) and could be an example of a type of approach to be tested as part of 4L/ 4R dispersion testing advocated in Section 4 above.

Notes:

- **Intended to comply with design criteria for vertical-guidance RNAV**
- **Overflies midpoint of Nahant causeway at same location as 4R SID departure crossings**



22L Arrival RNAV with RNP Overlay vs Straight In B738 Profile Generator 60dB $L_{A,max}$ Noise Exposure

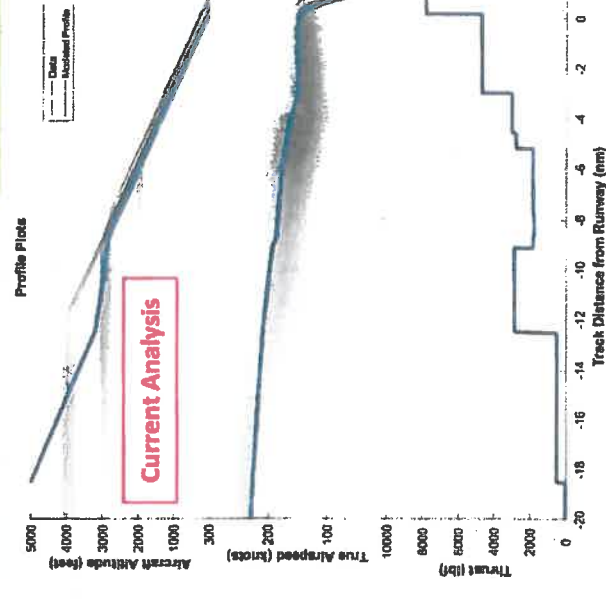
Current Analysis

B737-800 60dB $L_{A,max}$ Noise Exposure

B737-800 Population Exposure ($L_{A,max}$)
15% of aircraft fleet



Straight In	60dB
RNP	77,418
Difference (Straight In - RNP)	24,272
	53,146

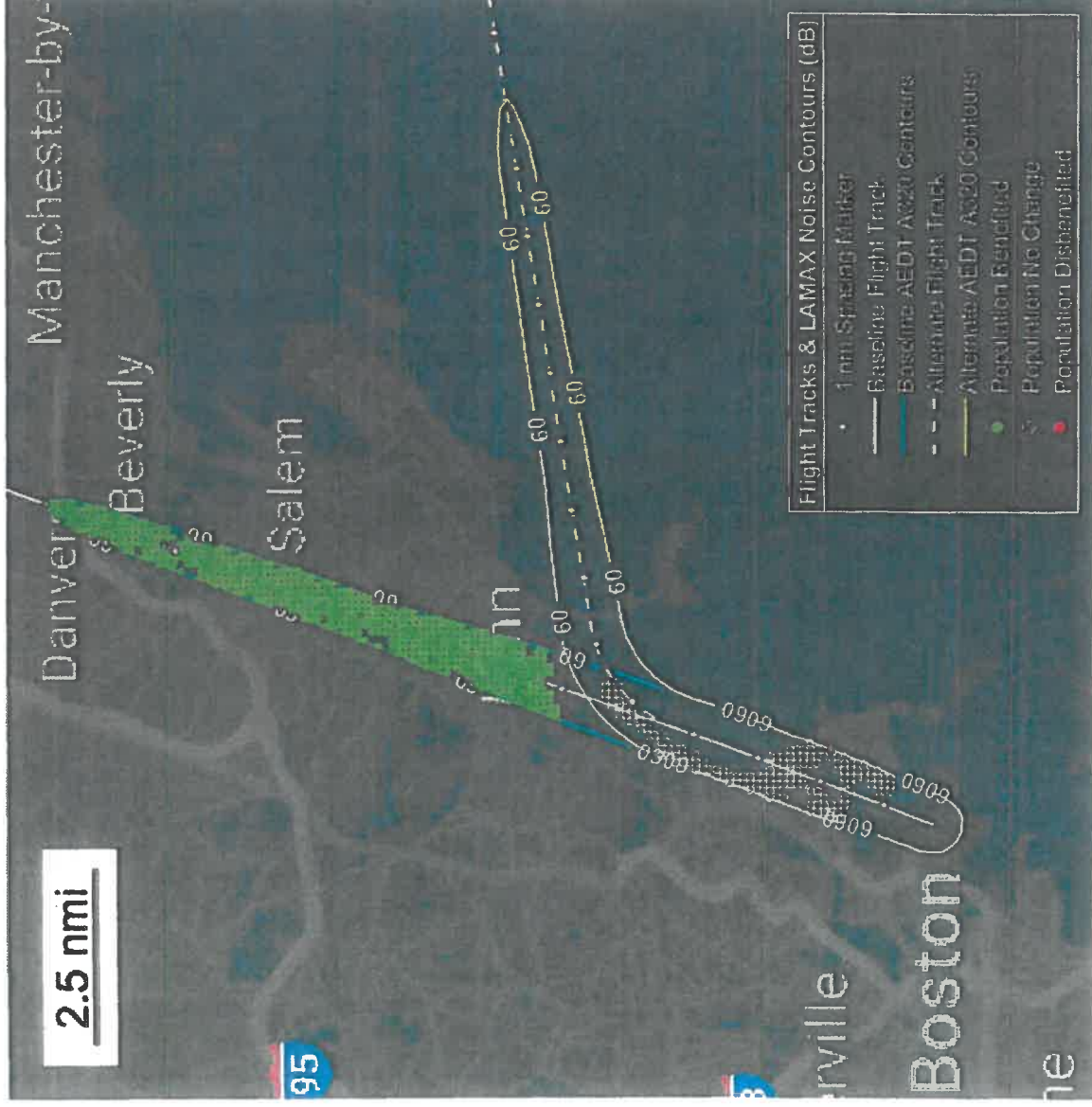


Altitude, speed, and thrust profiles are based on flight profile data from Boston. Slightly adjusted inbound heading

- Procedure within RNAV criteria. Initial .41 review found no major obstacles

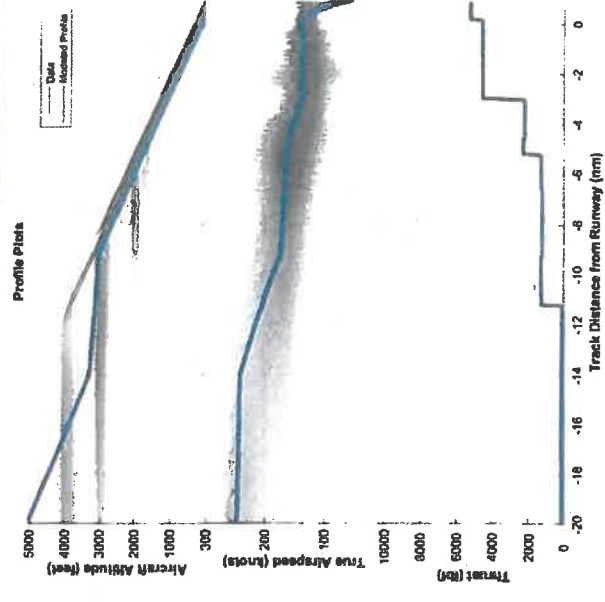
22L Arrival RNAV with RNP Overlay vs Straight In A320 Profile Generator 60dB $L_{A,max}$ Noise Exposure

A320 60dB $L_{A,max}$ Noise Exposure



A320 Population Exposure ($L_{A,max}$) 27% of aircraft fleet

	60dB
Straight In	73,173
RNP	22,003
Difference (Straight In - RNP)	51,170

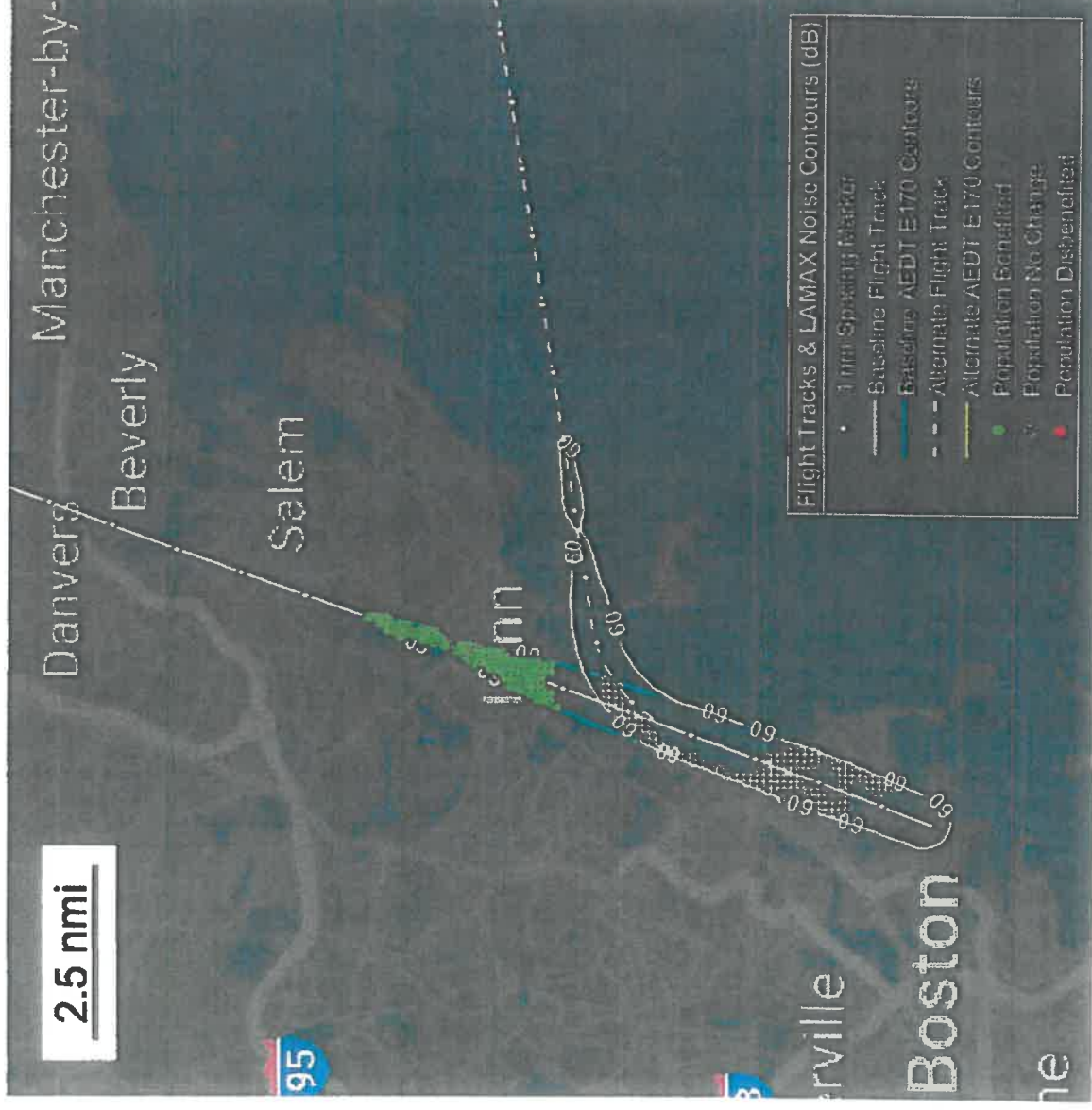


Altitude, speed, and thrust profiles are based on flight profile data from Boston. Slightly adjusted inbound heading

- Procedure within RNAV criteria. Initial .41 review found no major obstacles

22L Arrival RNAV with RNP Overlay vs Straight In E190 Profile Generator 60dB $L_{A,max}$ Noise Exposure

E190 60dB $L_{A,max}$ Noise Exposure



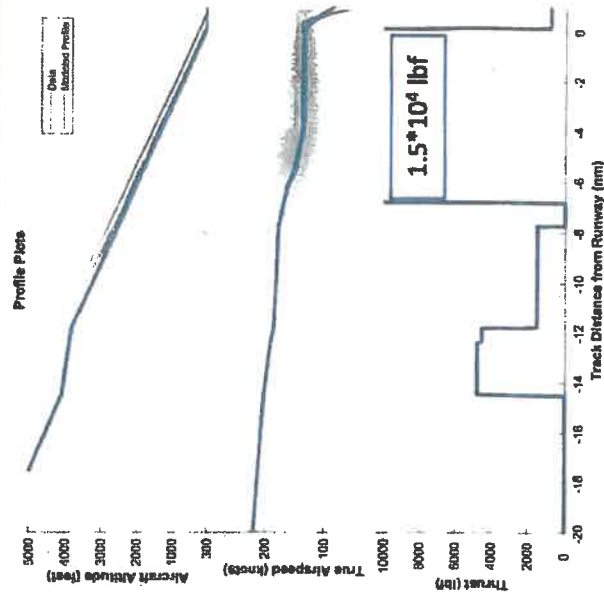
22L Arrival RNAV with RNP Overlay vs Straight In B773 Profile Generator 60dB $L_{A,max}$ Noise Exposure

B777-300 60dB $L_{A,max}$ Noise Exposure



B777-300 Population Exposure ($L_{A,max}$)
6% of aircraft fleet

Straight In	60dB
RNP	119,392
Difference (Straight In – RNP)	33,145
	86,247



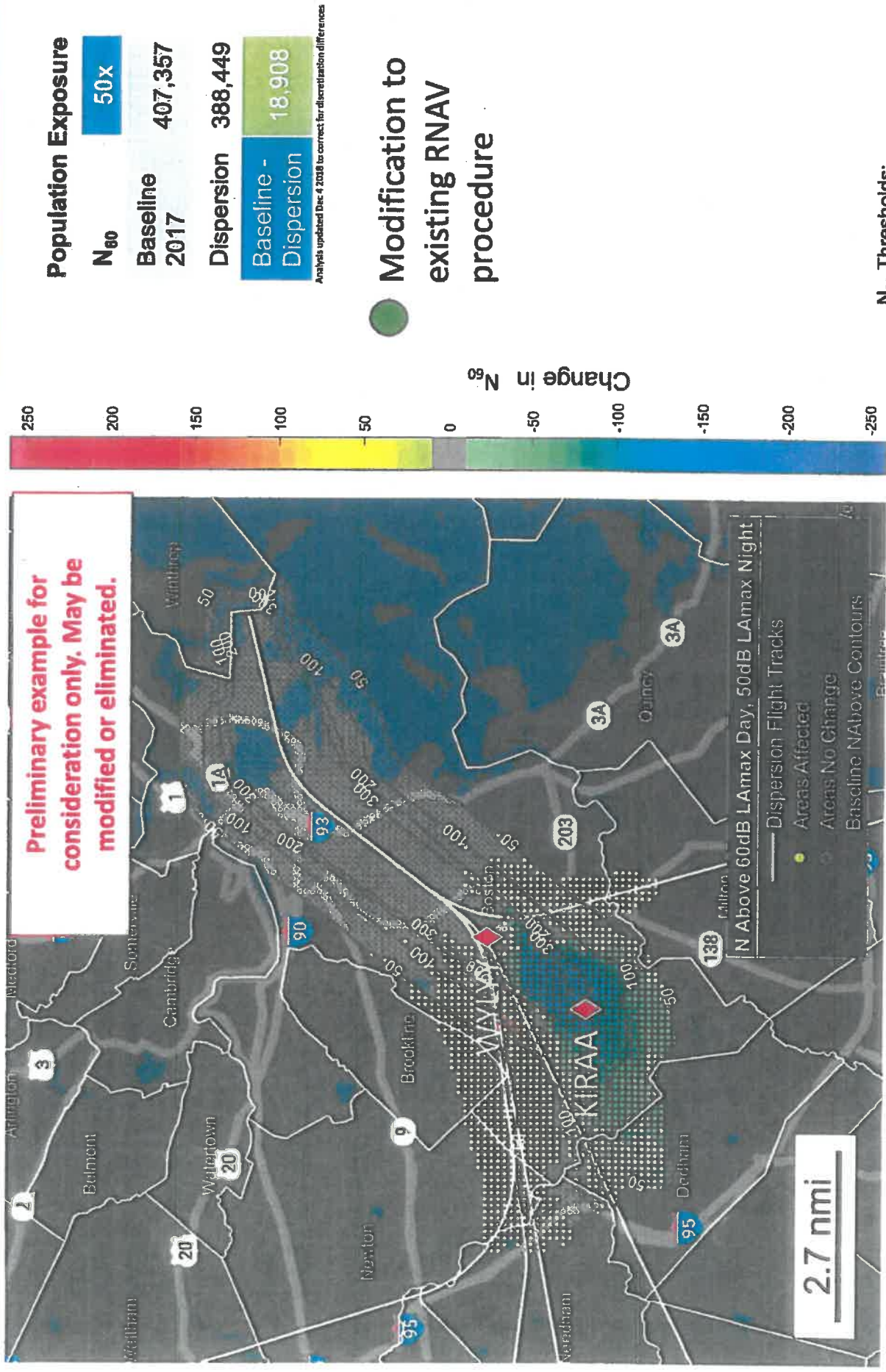
Altitude, speed, and thrust profiles are based on flight profile data from Boston. Slightly adjusted inbound heading

- Procedure within RNAV criteria. Initial .41 review found no major obstacles

6.0 27 Departures RNAV Waypoint Relocation

The next slide was presented by MIT at the April 2019 MCAC meeting (MIT Slide 69) and could lessen the burden on some residents under 4L arrivals. We note that Block 2 tests of increased 33L departure altitudes could lessen noise burden on some residents who are also under 4L as well.

27 Departures RNAV Waypoint Relocation Change in N_{60} Compared to 2017



7.0 Field Work Will Confirm Center Lines and Glide Slope Realities

We reiterate our request that field work occur to confirm the westward shift and close proximity of 4L/4R centerlines, to assess dispersion path possibilities and to assess the reality of flights not adhering to the 3 degree glide slope FAA norms. Such field work also will provide opportunities for community engagement and feedback consistent with the FAA's Community Involvement Policy.

MIT's various slides use A-weighted maximum level (LAmax) **single** event (**single** overflight) noise measurement and "9-or-more" flights-a-day histograms. However, neither of those tools is designed to capture the cumulative noise burdens of more than 200 or 250 overflights a day of the **same** residential areas.

Field work would not only confirm those burdens but also allow exploration of **an over-woods, quarries, woods-again, then marsh path alternative** to the over Route 3/ Expressway path that MIT preliminarily sketched. We reiterate here that such a path be considered as one part of dispersed paths analysis given its potential low population impact. Field work can establish it. Comparison with present noise burdens can then be made.

The proper comparator for the present 4L/4R paths and the dispersion that these Requests and Recommendations address is the **pre-RNAV 2010 4L/4R actual arrival overflight paths configuration**—not the already narrowed RNAV paths of 2017 MIT has at times used as comparator. As noted, burdens cannot be measured merely by single event noise tools, or noise

tools that consider 9-or-more overflights (such as 10 or 11 overflights a day) equal to 250 or more overflights a day.

We submit that measurement of the pre-RNAV overflight noise burden reflecting both its dispersion and aircraft frequency, adjusted pro rata across that configuration for total flight volume increase, is a relevant comparator against which to measure alternatives. We request that MIT include such a comparator in its Study and use field work to help compare that replica with the actual present concentrated CSPR and with the dispersed path alternatives referenced in these Requests and Recommendations.

8.0 Dwell and Persistence MUST Be Addressed

The FAA needs to address the intolerable impacts of dwell and persistence on residents under the PBN paths. Noise and jet soot (on house clapboards and in lungs) caused by a failure to use ATC runway rotation governance compounds skyrail concentration injuries. Restoration of dispersed overflight paths will address PBN's shift of burden onto un-consenting overflowed residents. But even then, once prevailing winds subside to 10 knots or less, Logan flights remain on the same paths hours and days after headwind speed has subsided below need for continued use. There is no ATC protocol for shifting runways and sharing burdens when this occurs, as exists at some other major world airports. The ongoing MOU testing should be accompanied by test of such a governance protocol. Alternatively, Massport, the MCAC and FAA should develop one promptly.

APPENDIX
TO
REQUESTS AND RECOMMENDATIONS FOR BLOCK 2
DISPERSED RUNWAY 4L AND 4R ARRIVAL PATH TESTS
INDEX

1. Letter dated April 2, 2014 from Milton Select Board (“SB”) to FAA and Massport
2. Letter dated June 29, 2015 from SB to FAA (comment letter on proposed 4L RNAV)
3. Memorandum dated June 29, 2015 from Milton Board of Health to FAA (comment letter on proposed 4L RNAV)
4. Letter dated October 13, 2015 from Senator Brian A. Joyce to FAA and Massport
5. Letter dated November 9, 2015 from SB to FAA, Massport and Logan CAC President
6. Letter dated March 22, 2016 letter from SB to FAA and Massport
7. Letter dated July 19, 2016 from SB to FAA
8. Letter dated September 8, 2016 from SB to FAA and Massport
9. Email from Cindy L. Christiansen, PhD, former Milton MCAC Representative, to Ralph Dormitzer, Chair of MCAC’s Aviation Subcommittee, dated April 7, 2017
10. Letter dated August 18, 2017 letter from SB to FAA and Massport
11. Email from Cindy L. Christiansen, PhD, former Milton MCAC Representative, to MIT Professor John Hansman and Massport dated September 23, 2017
12. Letter dated January 29, 2018 from SB to FAA and Massport
13. Block 2 Requests presented by Cindy L. Christiansen, PhD, former Milton MCAC Representative, to MCAC Aviation Subcommittee on April 18, 2018



ANNEMARIE FAGAN
TOWN ADMINISTRATOR

COMMONWEALTH OF MASSACHUSETTS
TOWN OF MILTON

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KATHLEEN M. CONLON
MEMBER

April 2, 2014

Ms. Amy L. Corbett
Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Mr. Thomas P. Glynn
Chief Executive Officer
Massport Executive Offices
1 Harborside Drive
East Boston, MA 02128

Dear Ms. Corbett and Mr. Glynn:

The Town of Milton has experienced a marked increase in air traffic and, as a result, the Board of Selectmen has received complaints from residents about airplane noise, pollution and related health risks. As you know, there is growing medical evidence that airplane noise is associated with a variety of health issues such as an increased risk of cardiovascular disease, coronary heart disease and stroke.^{1,2 & 3} Some residents of Milton have reported to us that they are suffering from negative health impacts caused by noise and air pollution generated by the increased air traffic. Interrupted sleep, anxiety, annoyance and reduced quality of life are problems that have been commonly cited to us. Additionally, many residents are concerned about the impact that the increased amount of air traffic over Milton has on the value of their property. We seek your assistance in alleviating these health risks and concerns and we propose certain actions below that the FAA and/or Massport can take to accomplish this result.

The Board of Selectmen requests your assistance in reducing airplane noise over Milton from flights arriving at and departing from Logan International Airport ("Logan"). Specifically, we request that action be taken to equitably distribute air traffic by reducing (i) the number of aircraft arrivals from the southwest on the 4/22 parallel runways (the "4s") and (ii) the number of aircraft departures from the west on runway 27 and the northwest on runway 33L that fly over

¹ Residential exposure to aircraft noise and hospital admissions for cardiovascular diseases: multi-airport retrospective study *BMJ* 2013;347:f5561 doi: 10.1136/bmj.f5561 (Published 8 October 2013)

² Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study *BMJ* 2013;347:f5432 doi: 10.1136/bmj.f5432 (Published 8 October 2013)

³ Airport noise and cardiovascular disease *BMJ* 2013;347:f5752 doi: 10.1136/bmj.f5752 (Published 8 October 2013)
AM 29844330.4

Ms. Amy L. Corbett
Mr. Thomas P. Glynn
April 1, 2014

Milton. Many residents are impacted by the noise from these departures after they have endured days of noise from runway 4 arrivals.

Runway use statistics show that the 4s are the most heavily used arrival runways at Logan. Meteorological conditions (e.g., weather and wind) are not the only factors that contribute to heavy use of the 4s. Sections 1.3.3 and 1.3.6 of the enclosed Boston ARTCC (Air Route Traffic Control Center) Standard Operating Procedure for Logan ("SOP") designate the 4s as the default arrival runways even in calm wind conditions. We request that these sections of the SOP be revised to designate over water arrivals and departures as the calm-wind configuration.

As you know, the Logan Airport Community Advisory Committee ("CAC") is developing a new runway use plan. We support the adoption of a new runway use plan that will distribute air traffic more equitably over the communities surrounding Logan.

In addition to establishing a new runway use plan, the Milton Board of Selectmen requests that the FAA and/or Massport take the following actions:

1. Implement Controlled Descents – this will require aircraft to remain at a higher altitude over a large portion of densely populated areas; may also result in reduced fuel burn.
2. Implement Steeper Glide Paths – this will require aircraft to remain at a higher altitude over a large portion of densely populated areas; may also result in reduced fuel burn.
3. Localizer Offset – offsetting the 4R localizer to the east will route arrivals over the water and reduce noise and pollution impacts on densely populated areas.
4. Implement and Monitor Runway Use Plan – in addition to developing a new runway use plan, the implementation of a more robust air traffic monitoring system will create accountability to ensure plan adherence.
5. Establish Nighttime Noise Abatement Policy – requiring over water arrivals and departures at night, as weather permits, will reduce noise and pollution impacts on densely populated areas.

We look forward to receiving your response and working with you to find an equitable solution to the ongoing impacts from increased air traffic over Milton.

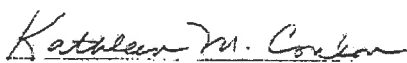
Sincerely,



Denis F. Keohane, Chairman



Thomas Hurley, Secretary



Kathleen M. Conlon, Member

Enclosure

AM 29844330.4

Ms. Amy L. Corbett
Mr. Thomas P. Glynn
April 1, 2014

cc: U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren
Congressman Steven F. Lynch
Congressman Michael E. Capuano
State Senator Brian A. Joyce
State Representative Walter F. Timilty
State Representative Daniel R. Cullinane
Mr. Christopher Zambuto, Milton CAC representative
Mr. David Godine, Milton CAC representative (alternate)
Ms. Sheryl Fleitman and Mr. Philip Jochenning, Co-Chairs, Milton Citizens Against
Aviation Impact



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J. THOMAS HURLEY
CHAIRMAN

DAVID T. BURNES
SECRETARY

KATHLEEN M. CONLON
MEMBER

June 29, 2015

VIA EMAIL (9-ANE-BOS-NAV-4L@faa.gov) & U.S. MAIL

Department of Transportation/Federal Aviation Administration

New England Region

12 New England Executive Park

Burlington, MA 01803

ATTN: Allan Goldsher

RE: Comments on the Town of Milton on the Proposed Runway 4L RNAVs

To Whom It May Concern:

The Town of Milton ("Milton") submits the following comments on the FAA's proposed implementation of the Runway 4L RNAVs ("4L RNAVs").

Milton strongly opposes the establishment of yet two (2) more RNAVs – in addition to the three (3) RNAVs that already exist – over its airspace, because of the already high number of overflights in Milton, because of the increased cumulative noise impacts to Milton which the FAA does not appear to be measuring appropriately, and because of the increased risks to human health from airplane emissions, which the FAA appears to have discounted. In addition, the FAA is ignoring new information about both the volume and level of community impacts and adverse effects to Milton residents and to all citizens in the overflight areas. Most troubling, it appears the FAA intends to establish and implement these new RNAVs without providing opportunities for the required community involvement, and without performing the required environmental analysis and consultation, avoiding its responsibilities under the National Environmental Policy Act ("NEPA").

Ultimately, Milton seeks fairness and equity in the distribution of airplane operations and the impacts of those operations. We believe, based on data discussed in more detail below, that Milton receives a disproportionate impact of airplane operations in the Boston-Logan area. Milton is a predominantly residential community with a population of 27,000. Comprised of only 13.3 square miles, Milton bears the brunt of heavy air traffic and three (3) RNAVs (4R, 27 and 31L), which is far more than any surrounding community except for the much larger City of Boston, in which the airport is located. The skies over Milton are already saturated with too many airplanes, often from very early morning until very late at night. Implementation of two

new RNAVs over Milton will increase the existing inequity, and we request that the FAA utilize the RNAV process to remedy, rather than to perpetuate this problem.

1. Community Involvement and Notification. The FAA's Order 7400.2K, Air Traffic Organization Policy, "Procedures for Handling Airspace Matters" (July 24, 2014) includes as Appendix 10 the FAA's "Community Involvement Policy." That Policy states:

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

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

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

We applaud this Policy, and the rationale behind it, which states "The first step in meeting the needs of the public is to understand the public's needs. Community involvement lets the agency know what the citizens think about our activities. *Though community involvement, we will broaden our information base and improve our decisions.*" Order 7400.2k, Appendix 10 (emphasis added). We agree that broadening the FAA's information base about the impacts its actions have on surrounding communities will, ultimately, improve the decisions coming out of the FAA for the agency, its constituents, and the public who are impacted by FAA actions.

We urge the FAA to comply with the Policy, and all of the tasks identified in the Policy, including the following:

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

It is our experience to date, and has been the experience of other communities, including, for example, the City of Phoenix, Arizona that the FAA does not and has not complied with the Policy and the tasks for the agency set forth above. The FAA has failed to provide meaningful opportunity for public input into the RNAV implementation process, and has ignored or delayed responding to requests for information sharing and direct communication with impacted communities. Specifically, the FAA has consistently refused to meet with Milton residents and officials to discuss the specific impacts from the ongoing RNAVs implementation in Milton, and to discuss ways to work around those impacts. We have been asking for a meeting with the FAA and Massport to discuss the inequitable distribution of flights over Milton, and the failure to properly utilize the PRAS system for over a year, since April 2, 2014. We have never received a response to that request.

In addition, in January 2015, Congressman Stephen Lynch requested Administrator Huerta direct the FAA New England Regional Office to set up a meeting with Milton officials and residents. In April 2015, that request was refused, citing a concern about showing "deference" to one community. Such a response is wholly insufficient. A meeting with one of the impacted communities would not "defer" to that community, but would demonstrate that the FAA takes its own Policy, and requirement of community involvement, seriously.

The May 18, 2015 meeting held by the FAA was useful only in a limited way. First, the number of permitted attendees was extremely limited. For example, Milton was not allowed to bring Town Counsel to the meeting, even after it made a specific request to do so. While phone and internet participation were provided for, it is simply a different experience from being "in the room." The meeting was not sufficiently noticed, or planned, and there was not enough notice to allow participants to fully prepare for the meeting. The venue was too small to hold all of the interested parties, and requests to change to a larger venue were ignored. There was very limited opportunity to ask questions, the promised follow-up to questions submitted in writing after the meeting was delayed, and the responses have, in many instances either been vague or referred back to documents previously introduced at the May 18, 2015 meeting and thus were entirely unhelpful. The FAA certainly knows the issue of RNAV implementation is important to multiple communities and officials, and should have prepared better by providing more notice, a larger room, and providing time for questions and answers at the meeting, as well as providing the promised follow-up on questions submitted at and after the meeting in a timely and substantive manner.

2. NEPA Requirements. Under the National Environmental Policy Act ("NEPA"), the FAA is required to evaluate the potential environmental effects of projects before "undertaking a major federal action which could significantly affect the quality of the human environment." 42 US § 4332(2)(C). In addition to NEPA and the regulations implementing NEPA, the FAA has established its own regulations which set forth the process by which an Environmental Impact Statement ("EIS") or an Environmental Assessment ("EA") must be conducted and the results evaluated. FAA Order 1050.1E CHG 1 ("Order 1050.1") updates "agency-wide policies and procedures for compliance" with NEPA and its regulations. The Order applies to actions directly undertaken by the FAA and those where the FAA has sufficient control or responsibility to condition the license or project of a non-FAA entity.

Under Order 1050.1, section 311, certain actions that establish, modify, or apply air traffic and air space procedures are “categorically excluded” from environmental review under NEPA. We understand that the JetBlue testing of the proposed 4L RNAV was conducted under categorical exclusion 311n, which applies to:

tests of air traffic departure or arrival procedures conducted under 3,000 feet above ground level, provided that: (1) the duration of the test does not exceed six months; (2) the test is requested by an airport or launch operator in response to mitigating noise concerns, or initiated by the FAA for safety or efficiency of proposed procedures; and (3) test data collected will be used to assess operational and noise impacts of the test.

In choosing to conduct the JetBlue testing under categorical exclusion 311n, the FAA failed to review, properly evaluate, and comply with its responsibilities under section 304 of Order 1050.1, Extraordinary Circumstances.¹ Where extraordinary circumstances are present, it is not appropriate to rely on a categorical exclusion, and an EA or EIS must be completed.²

Specific to Milton, it is clear that there are extraordinary circumstances present. First, the ongoing RNAVs implementation is disruptive to and within Milton. As the data set forth below indicates, there has been a 25-fold increase in noise complaints recorded from Milton since 2012. That disruption (and the number of complaints recorded) will only be exacerbated by the implementation of two more RNAVs over Milton. Also, Milton has several schools, which are highly sensitive communities, and which are under the concentrated RNAV flight paths and impacted by the ongoing RNAV implementations.

The impacts of airplanes on communities are “highly controversial.” As well as the impacts already discussed, more data has been provided which indicates airplane noise in overflown communities disrupts sleep patterns which results in adverse human health impacts. The noise from airplane overflights also negatively impacts property values. Fewer buyers are willing to purchase a home in an area with known noise impacts, and prices can be suppressed.

Anecdotal data from Milton residents indicate that the noise from airplanes in Milton is clearly heard above background noise in both commercial and residential areas. Additionally, these noise events disrupt conversations both indoors and outside, and disrupt sleep. As elected officials, we hear frequently from Milton residents who suffer from interrupted sleep, anxiety

¹ 2010 Final Guidance from the Council on Environmental Quality concerning the use of categorical exclusions requires that agencies applying established categorical exclusions to agency actions must document that there were no extraordinary circumstances precluding the proposed action. 75 Fed. Reg. 75628, 75636 (December 6, 2010).; see also Section 213(c) of the FAA Modernization and Reform Act of 2012. That was not done in the instance of the proposed 4L RNAV.

² Extraordinary circumstances can include effects on the quality of the human environment that are subject to a substantial dispute as to the size, nature, or effect of a proposed Federal action. The effects of an action are considered “highly controversial” when reasonable disagreement exists over the project’s risk of causing environmental harm. Opposition by a local government, or a substantial number of persons affected by the action, should be considered in determining whether or not a reasonable disagreement exists. See Order 1050.1 at paragraph 304i.

and a reduced quality of life because of the noise pollution caused by very frequent – and some days continuous – flights over Milton at low altitudes. The seriousness of the health problems that three (3), let alone five (5), RNAVs pose for Milton cannot be overstated. Finally, there is also anecdotal data that housing prices and housing sales are being impacted by airplane noise. Given the extensive community complaints, the media coverage, and attention generated by this issue (including attention given by our state and congressional representatives), it is impossible to conclude that the further implementation of RNAVs over Milton (or within the Boston-Logan airspace generally) is not “highly controversial.”³

Accordingly, extraordinary circumstances do exist, and NEPA requires that the FAA conduct a full assessment of the environmental impacts of the implementation of the proposed 4L RNAVs and any other RNAVs which overfly Milton, up to and including the preparation of a full Environmental Impact Statement. We request that you cease and desist from implementing any RNAVs that overfly Milton unless and until the cumulative impacts of these RNAVs and the extraordinary circumstances are appropriately addressed under NEPA.

3. Community Impacts and Failure to take into Account Cumulative Impacts. The FAA’s process to date has failed to take into account the cumulative impacts of the ongoing RNAVs implementation. Instead, the FAA is evaluating each new RNAV in isolation. Perhaps that method makes sense in a community that either is not already burdened with air traffic or does not already have an RNAV over it. But, in the case of Milton, the FAA’s method is wholly inappropriate. No community in the Greater Boston area (except for the City of Boston, in which the airport is located) is subjected to the number of RNAVs that fly over Milton. Given Milton’s unique circumstances, the FAA should and must analyze the cumulative impact of all five (5) RNAVs that either already fly over or are proposed to fly over Milton, and not only the impact of the proposed 4L RNAV.

Milton is currently impacted by the ongoing overuse of Runways 4R (which already has an RNAV) and 4L and the RNAVs for Runways 27 and 33L, which were implemented in 2013. Currently proposed are two new RNAVs for Runway 4L, which would bring the total number of RNAVs for Milton to five (5) (which, again, is unprecedented in the suburban communities surrounding Boston). Complaints on the Massport complaint line have increased for Milton from an average of 9 per month in 2012, to an average of 160 per month in 2013, to an average of 222 per month in 2014. That represents a *25-fold increase in noise complaints*.⁴ Even more troubling, the noise complaints are not just limited to the summer months, but continue growing in volume in every month of the year as the Boston Logan Airport throughput increases because of routing efficiencies due to the implementation of RNAV procedures. Of the 29 months of

³ The FAA recognized this point when it conducted an EA for the implementation of the Runway 33L RNAV at Boston Logan, stating “increases in noise . . . has the potential to be highly controversial on environmental grounds and may be the subject of extraordinary circumstances precluding the use of a categorical exclusion.” Experience in Phoenix, Chicago, Charlotte, and Atlanta confirms this conclusion.

⁴ Noise complaints for 2015 have only been tabulated through May, and average 132 monthly. However, the months of greatest number of complaints are June, July, August, and September. So far, the number of complaints recorded in 2015 has been similar to the number of complaints in January-May of 2014 and have greatly exceeded the number of complaints recorded in January-May of 2013 and 2012.

complaint data recorded since 2012, the number of complaints recorded in each month except for five (mostly winter) months, has exceeded the total number of complaints recorded in 2012.

The FAA continues to ignore the increased complaint data, and continues to repeat to Milton and other affected communities that there is no increased noise impact from the RNAV implementations. That simply is not true, given the increased frequency of complaints recorded, and data provided by Milton residents. As discussed above, data from Milton residents demonstrates that the noise from airplanes in Milton is heard above background noise in residential areas, disrupts conversations both indoors and outside, disrupts sleep, and impacts property values.

In the documents supporting the proposed implementation of the 4L RNAV, JetBlue claims that the existing land use patterns which will be overflowed are “mixed residential, commercial, and open space.” However, the vast majority of the land use in Milton under the 4L RNAV is residential. In addition to many single family and multi-family homes, the area under the 4L RNAV in Milton includes a large housing development for senior citizens, a nursing home, Curry College and three elementary schools. Combining increased throughput and residential neighborhoods increases the impact of aviation on those neighborhoods. The FAA has not sufficiently evaluated these impacts. Moreover, the Fowl Meadow and Ponkapoag Bog, which is an “area of critical environmental concern,” would also lie under the 4L RNAV.⁵

This problem is exacerbated by the FAA’s use of outdated data and methodology, specifically, the reliance on the DNL measure in assessing community impacts and the need for noise mitigation. This measure is outdated and inadequate. It does not address the acute highs in airport noise impacts actually experienced by residents, but lumps all noise together in 24-hour averages. Milton is not alone in this contention. That this measure is inadequate to measure impacts particularly in metro areas surrounding airports is a significant issue being raised by communities around the country, including New York City, Chicago, Los Angeles, and Phoenix.

We request that no further RNAVs be implemented which overfly Milton, unless and until the DNL data is updated and the actual community impacts and cumulative impacts to Milton are appropriately analyzed, that data shared with the impacted community, and a further opportunity for comment provided.

4. Fairness in the Distribution of Airplane Overflights. We understand that the Boston Logan Airport Noise Study Phase III (“BLANS III”) is evaluating runway use measures to be included in a new runway use program that will eventually replace the Preferential Runway Advisory System (“PRAS”). PRAS was developed to help ensure an equitable distribution of the noise impacts of runway use on surrounding communities. Despite the PRAS system, the data demonstrates that Milton receives a grossly disproportionate share of airplane traffic, and accompanying noise.

⁵ The Massachusetts Secretary of Environmental Affairs determined that the Fowl Meadow and Ponkapoag Bog is an area of critical environmental concern in 1992.

Under the PRAS system, Runways 4L and 4R should be used approximately 21.1% of the time (PRAS Equivalent Operations). Based on prevailing winds (from the NE), Runways 4L and 4R should be used approximately 18% of the time (How Logan Operates, Figure 6). However, based on the Volpe data presented at the May 18, 2015 meeting, Runways 4L and 4R receive 39.8% of the usage (Volpe, Airport Configurations for Noise Analysis, based on 2010 Massport data analysis of 2009 runway operating configuration logs). Runways 4L and 4R are already being substantially overused, in a manner that increases the noise and other impacts on Milton and other communities under 4L and 4R.

We request that no new RNAVs be implemented for either 4L or 4R until such time as the BLANS III evaluation is complete, and new testing has been done which incorporates those recommendations, so that the impacts of airplane noise are more equitably distributed through the surrounding communities. This request is consistent with the FAA's responsibilities under Order 1050.1 where noise impacts and the cumulative impacts from airplane operations, are to be evaluated when implementing any new RNAV. This request is also consistent with the goals of the BLANS Phase III, and why the BLANS process was convened.

In addition to strongly opposing two new RNAVs, we also hereby request the FAA's immediate assistance in alleviating the substantial burdens that the FAA's implementation and overuse of the 4R RNAV and the implementation of the 27 and 33L RNAVs have already placed on Milton residents. As elected officials who represent residents who are suffering from severe noise pollution and health risks caused by three RNAVs over Milton, we call upon the FAA to cease and desist the overuse of the 4R RNAV and to distribute air traffic in a much more equitable manner. Moving air traffic from the 4R RNAV on the eastern side of Milton to a new 4L RNAV on the western side of Milton is not an acceptable solution to a very serious problem. Compared to most of our surrounding communities, Milton is unduly burdened with air traffic. The number of RNAVs flying over Milton is inequitable and unjust. Consistent with our April 2014 request, and Congressman Lynch's January 2015 request, we ask that a senior regional representative of the FAA meet within the next thirty (30) days with the Chair of our Board and our Town Administrator to discuss remedial measures that can be taken to lessen the cumulative impacts that the RNAVs are having on Milton's residents.

5. Public Health Impacts from Airplane Engine Emissions. It has recently come to our attention that the United States Environmental Protection Agency ("EPA") is going to be implementing a new rulemaking process to set forth standards for emissions from airplane engines. The EPA administrator intends to make a finding that emissions of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride from engines used in commercial aircraft endanger the public health and the environment.

Further, there is data available which demonstrates that aircraft emissions, particularly of fine particulates impacts public health directly, by depositing particulates into the lungs and indirectly, by contributing to ozone and smog. FAA's own analysis of aviation emissions cites to research that indicates "fine particulate matter is responsible for the majority of the health risks from aviation emissions."⁶ These particulates contribute to increased heart and lung disease,

⁶ Aviation Emissions, Impacts & Mitigation: A Primer (FAA, Office of Environment and Energy), January 2015.

including increased hospital admissions, emergency room visits, and work absences. Children and the elderly are especially vulnerable to exposure to fine particulates. This fine particulate exposure is increasing in Milton, from an increased number of arriving aircraft, flying at less than 3000 feet over our town, on the 4L and 4R RNAVs.

We request that no RNAVs be implemented which overfly Milton, unless and until the human health impacts, particularly related to fine particulate emissions are appropriately evaluated, that data shared with the impacted community, and a further opportunity for comment provided.

6. Sharing Information. The May 18, 2015 public meeting indicated that not only is the FAA considering implementing the Visual 4L RNAV tested by JetBlue in 2014, but it is considering the implementation of a GPS based (or IFR) RNAV for 4L. The May 18 meeting was the first time anyone in Milton was made aware of this second proposal for 4L. Milton has not been properly notified about the second RNAV, and it has not been tested, as the JetBlue RNAV was. Not even the Logan CAC was notified about the GPS procedure until shortly before the May 18 meeting.

We understand that the approach plate for IFR 4L RNAV has not yet been finalized for publication and public release. This additional proposed RNAV for Runway 4L, still mostly undefined, with absolutely no notice to impacted communities, is yet another failure of the FAA to comply with its requirements under Order 700.2k and under NEPA. All of our comments set forth above for the 4L RNAV tested by JetBlue apply to the IFR RNAV for 4L as well.

We request that any implementation of the second 4L RNAV be halted, until the route itself is finalized, and until the FAA complies with its Community Outreach and environmental analysis obligations, which includes allowing for additional comment by impacted community members.

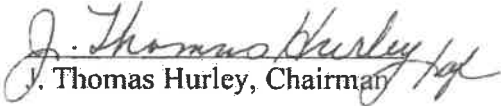
Finally, we request that we be provided written notification by the FAA of any final decisions or final agency action to implement either of the 4L RNAVs, and that you share this information with the public at large.⁷ Please direct this correspondence to our counsel, Attorney Karis L. North, Murphy, Hesse, Toomey & Lehan, 300 Crown Colony Drive, Suite 400, Quincy MA, 02169, 617-479-5000. Attorney North may be reached on email at knorth@mhtl.com.

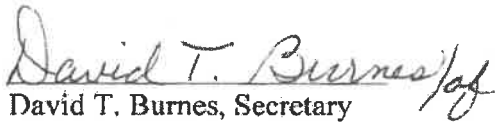
⁷ CEQ recommends that agencies publish information about their claim of categorical exemption and NEPA compliance "particularly when there is a high level of public interest in a proposed action," as there is here. 75 Fed. Reg. at 75636.

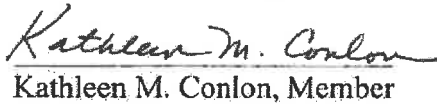
We appreciate the opportunity to comment on the proposed 4L RNAV, and we look forward to your responses to our comments, and to finally scheduling a meeting within Milton to discuss and address these issues.

Sincerely,

Board of Selectmen of the Town of Milton


J. Thomas Hurley, Chairman


David T. Burnes, Secretary


Kathleen M. Conlon, Member

cc: Congressman Stephen F. Lynch
 Congressman Michael E. Capuano
 U.S. Senator Elizabeth A. Warren
 U.S. Senator Edward J. Markey
 State Senator Brian A. Joyce
 State Representative Walter F. Timilty
 State Representative Daniel R. Cullinane
 Milton Board of Health
 Milton Airplane Noise Advisory Committee
 Milton CAC Representative Cindy L. Christiansen
 Milton CAC Representative (Alternate) David Godine
 Milton CAC Representative Caroline A. Kinsella
 Karis L. North, Esq.



TOWN OF MILTON BOARD OF HEALTH

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TO: Department of Transportation/Federal Aviation Administration
New England Region
12 New England Executive Park
Burlington, MA. 01803
ATTN: Allan Goldsher

FROM: Milton Board of Health

DATE: June 29, 2015

RE: Detrimental Health Effects of RNAV Plane Flights over the Town of Milton

The Milton Board of Health along with the Milton Board of Selectman and the Milton Airplane Noise Advisory Committee strongly oppose the proposed 4L RNAV and 4L visual approach RNAV. We strongly urge the FAA to halt any further implementation of these RNAV's.

The Town of Milton is 13.3 square miles in area, and is already experiencing an unfair distribution of flights compared to other surrounding communities. Milton residents have the highest number of complaints compared to all other communities.

The Town has experienced an exponential increase in RNAV's. As you know these RNAV's are highways in the sky: they are narrow concentrated paths for the airplanes to fly along. We are very concerned about the potential health risks associated with repeat exposure. Already residents have told us about their worries, including soot falling on their cars, homes, lawns and gardens from the airplanes fine particulate matter. These airplanes are lower also, many are flying less than 3000 feet.

According to the recent LAX study, fine particulate matter can cause blocked coronary arteries as well as worsen respiratory diseases like asthma. The study authors also stated that their findings could apply to any other large airport. Other studies have demonstrated increases in blood pressure for those bothered by noise from aircraft while they were sleeping.

The residents in Milton will be put at a higher risk for illnesses if these proposed changes occur. Additionally, the location of these RNAV's would affect some of the most vulnerable populations including : elderly residents of Fuller Village, Milton Health Care nursing home facility, college students-Curry College, young children- Thatcher Montessori school, Delphi academy, Tucker Elementary School, just to name a few.

In the past, routes have gone out over the water, and not over populated communities and residential areas. These proposed changes will be going over residential areas and effecting homeowners and residents that never previously had routes over their homes.

We urge the FAA to consider the above factors and stop the implementation of these proposed RNAV's.

Respectfully,

Caroline A Kinsella B.S.N. R.N.

Director,
The Milton Board of Health

Anne Fidler, ScD. - Chairman
Laura Richards, Esq. - Secretary
Roxanne Musto, RN-C, MS, ANP- Member
Dr. Anthony Compagnone, M.D. Medical Director



The Commonwealth of Massachusetts
MASSACHUSETTS SENATE

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Norfolk, Bristol and Plymouth District

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Terry English
Federal Aviation Administration
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CEO Thomas P. Glynn
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Chairman
SPECIAL COMMITTEE TO
IMPROVE GOVERNMENT

Vice Chair
COMMITTEE ON REDISTRICTING
JOINT COMMITTEE ON
HEALTH CARE FINANCING

October 13, 2015

Dear Ms. English and Mr. Glynn,

I write again to express my concerns and frustration about air traffic, and to request important information.

First, I would like to again register my opposition to the proposed change to the Runway 4L flight procedure, which would impose additional burdens on Milton, Massachusetts. Milton is uniquely burdened by flight traffic in the Greater Boston area. It is the only community that receives traffic from four flight paths – Runway 4R arrivals, Runway 4L arrivals, Runway 27 departures, and Runway 33L departures. Boston as a whole may receive traffic from multiple flight paths, but no single neighborhood is impacted by as many flight paths as Milton. Adding additional traffic from Runway 4L only increases the already unfair burden.

Furthermore, the implementation of RNAV flight procedures has been particularly troubling. Although the overall number of homes impacted may be reduced, the homes underneath the resulting "superhighway in the sky" are subject to nearly constant noise when those runways are in use. These airplanes produce emissions and noise that adversely affect health and the environment, disrupt sleep, and interrupt learning in our schools.

I am increasingly hearing from my constituents that planes arriving on Runway 4R seem to be flying lower, and spaced very closely together. I respectfully request that the FAA and MassPort provide me with data from the last 18 months detailing the percentage of the time that Runway 4R has been in use, both cumulatively and monthly, the elevation of those flights, and the number of planes that have overflowed Milton on Runway 4R. I also request information

about the wind direction during the times that Runway 4R is in use. I would also like this information for Runways 27, 33L, and 4L.

I am concerned about the safety of both my constituents underneath Runway 4R and the safety of passengers on the planes. It is clear that safety is compromised when planes are flying lower than what the flight procedure directs, and when planes are spaced only a few seconds apart. It also severely impacts the quality of life of residents on the ground. Additionally, I understand that it is safest for airplanes to both take off and land into the wind.

I am troubled that safety is being sacrificed for the sake of efficiency, and that residents on the ground are being disregarded for the sake of profit. I request that the FAA reconsider the existing flight procedures and distribute the flight paths more equitably.

Sincerely,

A handwritten signature in dark ink, appearing to read 'B. A. Joyce', with a stylized flourish at the end.

BRIAN A. JOYCE

State Senator

BAJ:rsa

cc: Senator Elizabeth A. Warren
Senator Edward J. Markey
Congressman Stephen F. Lynch
Congressman Michael E. Capuano
Milton Board of Selectmen
Milton CAC Representative Cindy L. Christiansen



ANNEMARIE FAGAN
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DAVID T. BURNES
SECRETARY

KATHLEEN M. CONLON
MEMBER

November 9, 2015

VIA EMAIL AND U.S. MAIL

Ms. Amy Lind Corbett
Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Mr. Thomas P. Glynn
Chief Executive Officer
Massport Executive Offices
1 Harborside Drive
East Boston, MA 02128

Mr. Darryl Pomicter
President
Logan Airport Community Advisory Committee, Inc.
136 Myrtle Street
Boston, MA 02114-4447

Re: Boston Logan Airport Noise Study

Dear Ms. Corbett, Mr. Glynn and Mr. Pomicter:

Last year, we wrote to the FAA and Massport to advise you of the negative effects that increased air traffic over the Town of Milton, and the noise and air pollution associated with it, has had upon the people we represent. We asked the FAA to distribute air traffic equitably by redistributing arrivals on runways 4R and 4L and departures on runways 27 and 33L. We also requested that the new runway use plan to be developed by the Logan Airport Community Advisory Committee ("CAC") take five specific actions, including the implementation of steeper glide paths and controlled descents and the redirection of arriving flights and all nighttime flights over the ocean. A copy of our April 2, 2014 letter is attached hereto as Exhibit A. By letter

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomieter
November 9, 2015
Page 2

dated April 11, 2014, Massport referred our letter to the CAC and "ask[ed] [the CAC] to take up these issues at their next meeting." A copy of Massport's letter is attached hereto as Exhibit B.

During the past year, the situation has worsened considerably. Residents of Milton continue to complain to us, their elected representatives, about interrupted sleep, anxiety, and a reduced quality of life because of the marked increase in air traffic. Too often, it is difficult for many of our residents to have a conversation outdoors because airplanes are flying at very low altitudes and with great frequency. The number of complaints we receive has only continued to grow.¹ As you know, there is medical evidence that airplane noise is associated with health issues such as an increased risk of cardiovascular disease, coronary heart disease and stroke.² Additionally, many Milton residents are concerned about the impact that the increased volume of airplane noise and pollution has on property values. Copies of a few representative samples of the many letters and emails that we have received from Milton residents in recent times are attached hereto as Exhibit C.

Four runways (arrivals on 4R and 4L and southbound departures on 27 and 33L) place air traffic over Milton. Currently, three (3) RNAVs (for runways 4R, 27 and 33L) fly over Milton. Earlier this year, the FAA proposed to add two (2) more RNAVs, each for runway 4L, to the sky over Milton. If implemented, the FAA's proposal would result in five (5) RNAVs over Milton.³ The existing situation, let alone the proposed two additional RNAVs, is inequitable.

It appears that neither Massport nor the FAA has taken any action to address the concerns we raised last year. Our representative to the CAC, Cindy L. Christiansen, Ph.D., a professional researcher and statistician, recently brought to our attention several issues that she believes are flaws in the Boston Logan Airport Noise Study ("BLANS") that are outlined below, after first

¹ Milton had the highest number of total calls from any town by far in 2014, with 2,669 recorded complaints, and has had the highest number of noise complaints for each of the last three calendar years. Complaints on the Massport complaint line have increased for Milton from an average of 9 per month in 2012, to an average of 160 per month in 2013, to an average of 222 per month in 2014. That represents a *25-fold increase in noise complaints*. Noise complaints for 2015 have only been tabulated through September, and average 220 monthly.

² Residential exposure to aircraft noise and hospital admissions for cardiovascular diseases: multi-airport retrospective study *BMJ* 2013;347:f5561 doi: 10.1136/bmj.f5561 (Published 8 October 2013); Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study *BMJ* 2013;347:f5432 doi: 10.1136/bmj.f5432 (Published 8 October 2013); Airport noise and cardiovascular disease *BMJ* 2013;347:f5752 doi: 10.1136/bmj.f5752 (Published 8 October 2013).

³ On June 29, 2015, we submitted comments to the FAA objecting to the implementation of the two proposed 4L RNAVs and seeking relief from the overuse of runway 4R. We understand that the 4L RNAV proposals and the many written comments submitted to the FAA are still under review.

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 3

trying to discuss and resolve these problems through the CAC and its consultant. Because of the timing of the current work on Phase III of the BLANS study, we believe it is important that Massport and the FAA work with Milton and the CAC to address these concerns now, before it becomes too late.

In addition, Dr. Christiansen also reports that the CAC has not received important information that it requested from the FAA and Massport on January 15, 2015. The purpose of this letter is to request that (A) Massport and the FAA take the necessary steps to work with the CAC to correct the BLANS flaws, (B) Massport and the FAA provide the requested information to the CAC and (C) the FAA address Milton's concerns about the significant overuse of the 4R/L runways and the virtually constant noise created by the three (3) RNAVs (particularly the 4R RNAV) when they are in use. Specifically, the Town of Milton respectfully requests that the BLANS III testing, as presently designed, be stopped and redesigned so that a new runway usage plan that will distribute air traffic across the Greater Boston metropolitan area in an equitable manner can be achieved.⁴

BLANS III Design and Analyses Flaws

Dr. Christiansen has reported to us that despite being two (2) years into the BLANS III study, with the Test #1 period completed and the Test #2 period ending soon, the CAC does not have all of the data it needs to achieve its goals. Despite promising statements made by the Project Management Team near the start of the BLANS III process about the goals to be achieved,⁵ to date the CAC has been unable to make a determination of a valid metric that constitutes a "more equitable distribution of noise" or any determination as to what the annual runway goals are. Moreover, we understand that the CAC (1) has not been able to correlate complaints and noise with testing and configuration changes; (2) does not have flight path maps; (3) does not have flight track maps; (4) does not know which runway use affects which communities; (5) does not

⁴ See "Overview of Boston Logan Operations and Noise from Overflights" presentation to Massport's Board of Directors dated March 19, 2015: "Phase III, Runway Use: Goal is to balance use of runways when possible (e.g., wind and weather permitting)."

⁵ The minutes of the Project Management Team's November 14, 2013 meeting record the following statements:

"...She [Terry English, FAA, BLANS Program Manager] also referenced the BLANS Phase 3 scope of work that includes a dual CAC goal of 'reducing noise' and providing a more equitable distribution of noise."

"(Brian Brunelle FAA, Boston Logan Airport Traffic Control Tower) ... It is also critical that the CAC state what their annual runway use goals are. Otherwise there is nothing to achieve."

See Minutes from Phase 3 Boston Logan Airport Noise Study (BLANS) Management Meeting Date: November 14, 2013 Time: 10:00 a.m. – 1:00 p.m.

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomier
November 9, 2015
Page 4

have the noise exposure and impacts by runway end and by community from runway end; (6) does not have the information about all aircraft (i.e., not only jets); and (7) does not have complete information on runway use restrictions.

Dr. Christiansen has reported to us that her review of the BLANS III testing design, which has focused so far only on problems of "dwell and persistence", shows that it is flawed because it (a) omits some configurations, (b) includes some configurations that are seldom used, (c) fails to include other configurations as choices, (d) fails to account for the fact that some communities are affected by multiple configurations, (e) does not focus on the communities with the biggest problems, and (f) fails to reflect seasonal effects on configuration changes, given that the testing period is only 6 months and the weather patterns at Logan Airport change significantly from winter to summer.

Specifically, Dr. Christiansen has reported to us the following problems:

1. The most frequently used 4/9 configuration (configuration #1; runways 4R/L were used for 35% of all jet arrivals in 2014 and runway 9 was used for 30.7% of departures) is given as a first choice for a switch in 4 of the 5 remaining configurations in Test #1. The only place that 4/9 shows up as third choice is in configuration #6 (15/9), which is used only about 1% of the time. This does not result in a fair distribution.
2. In 50% of the configurations for Test #1, the 22R/L runways, which are seldom used alone during high demand periods, are the alternate first choice. This means that to be compliant with the Test #1 decision matrix when demand is high, the FAA will always use the other first choice, which is 4/9. This is a serious flaw in the BLANS design.
3. Runway 27 departures also include runway 33L departures as documented in the description of the configurations for Test #1 and Test #2. Because of the south turn for 27 departures that was designed to avoid flying over parts of Jamaica Plain, Brookline and beyond, the same communities to the south (Milton, Roslindale, Hyde Park and others) that receive the 27 southbound departures also receive the 33L southbound departures. This does not result in a fair distribution.
4. Configuration #2, Test #1 (33/27) has a first choice switch to the 4/9 configuration. This makes no sense if the goal of the design is not to burden the same people with both the sound of departing aircraft when they try to fall asleep at night and the sound of arriving aircraft waking them up the next morning. The design ignores the fact that some communities, like Milton, receive both the Runway 27 departures and the 4R/L arrivals.

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 5

Configuration #2, with its first choice in the decision matrix to be an acceptable switch to the 4/9 configuration, leads to this inequitable result, and it must be revisited and revised.

5. The number of configurations has changed from Test #1 to Test #2. One technical committee document proposed five runway configurations. Test #1 has six. Test #2 has seven, but only six are used as "prior" runway configurations. It is not clear who chose the runway configurations in the decision matrices for the two tests.⁶ These inconsistencies are unexplained and result in decision matrices that would never be approved by a scientific peer-review process.
6. Test #1 allowed two runway configurations as first choices, one as a second choice and another as a third choice. Test #2 now gives several first choice configurations with 4/9 included in each. This design gives the FAA approval for switching from one configuration to the 4/9 and offers no guidance toward the BLANS goal to balance runway use.
7. The decision matrix for configuration changes is designed to allow a change in the departure runway to trump a change in the arrival runway, protecting communities under departure paths over communities under arrival paths if a change cannot be made to protect both. However, a runway 9 departure is considered an "over the water" procedure according to Massport's Noise Abatement Office; the design does not account for the fact that there is no departure-overflowed community to protect when runway 9 departures persist. When runway 9 has been used for departures, paired for about 35% of the arrivals to 4R/L, the first priority should be to relieve those communities under the arrival path. A well-thought out design should take this into account if the intent is to fairly distribute the burden of Logan Airport's air traffic.
8. The denominator for rates of configuration change should not be the total number of days but, rather, the number of days when a change is possible because of wind direction and speed. To do otherwise presents an inaccurate picture of an increased rate of success and produces a statistic that is meaningless for assessing good-faith efforts by the FAA and Massport to distribute planes fairly across the metroplex. Timing, concentration and

⁶ At the July 6, 2015 CAC meeting, Dr. Christiansen asked the FAA's consultant, Mr. Adams, who chose the runway configurations in the decision matrix. Mr. Adams advised Dr. Christiansen that the FAA chose the configurations. However, at the September 10, 2015 meeting, CAC President Darryl Pomicter told Dr. Christiansen that the prior CAC President, Sandra Kunz, had determined the configurations. A third alternative is offered in the FAA's press release about Test #1, in which the FAA stated that Massport determined the configurations for Test #1.

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 6

number of operations from runway use when weather conditions force configuration choice should be considered in the decision matrix for times when configuration choice is not affected by nature, but not in the denominator of the proportion representing successful decisions with respect to fairness.

9. During the Test # 2 period, the FAA is being encouraged to switch configurations in the morning and afternoon. However, Mr. Gene Brown, a former Milton CAC Representative, gathered the following statistics for the 40-day period from September 1, 2015 through October 10, 2015, which show that the FAA did not switch configurations on many days even when wind speed and direction allowed it. These statistics are of particular concern to us. During this period of time, we heard from many residents who complained about constant and brutally loud noise:
 - Of the 960 available hours (40 days x 24 hours per day) for landing aircraft from September 1, 2015 through October 10, 2015, 466 hours had landings on runway 4R/L. This means that runways 4R/L were used 48.5% of the time during this 40-day period.
 - East/Northeast wind use of 4R/L occurred for 296 hours; Southeast to South wind use of 4R/L occurred for 94 hours; Northwest wind use of 4R/L was 57 hours; West, southwest and calm or variable use of 4R/L was 19 hours. If runways 4R/L were only used for east and northeast wind conditions during this time period, usage would have been 30.1%, not 48.5%.
 - Runways 4R/L were used for landings on 33 days, or 82.5%, of these 40 days.
 - Nocturnal hours use of runway 4R/L (10 PM - 6 AM) was 85 hours or 26.6% of the 320 nocturnal hours in the time period.
 - Even though the goal for Test #2 of BLANS III is to switch runway configurations twice per day when weather conditions allow, of the 144 hours during the October 1 through October 6 time frame, 4R/L was used for 129 hours, leaving only 15 hours without arrivals being flown over Milton during these six days. On some of these days, the choice to use 4R/L for arrivals was weather-related. However, on the sixth day (October 6, 2015), after five consecutive days of 19 to 24 hour use of 4R/L, Massport closed runways 33L and 15R for maintenance, resulting in yet another 19 hours of 4R/L use when the winds were northwest and calm and when another configuration could have been used.

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 7

- Data on runway use for many of these 40 days shows a gross overuse of 4R/L for arrivals. Here are just a few examples:
 - On September 1, Milton had 10 hours of arrivals even though the winds were 120-10 to 200-5 (SE to SW) during this time period.
 - On September 3, Milton had 15 hours of arrivals with winds 110-4, 120-6 and 140-7 (SE).
 - On each of September 10 and September 11, Milton had 24 hours of arrivals even though the wind was northwest or at 6 knots for hours of these days.
 - After these two days of 24 hours of arrivals, on September 12, the FAA sent more arrivals over Milton between 5:00 a.m. and 8:00 a.m. when winds were 220-4 (SW), and again between 10:00 a.m. to 10:00 p.m. when winds were 090-7 to 160-7 (E and SE), for a total of 15 hours.
 - As if September 10 through September 12 were not enough to demonstrate the unfair distribution of arrivals, on September 13, Milton had 19 hours of arrivals, from 5:00 a.m. until midnight, when winds were out of the southeast and east, 110-10, 100-5 and 070-4.
10. The Project Management Team's statement in its July 17, 2015 meeting minutes that "at least one of CAC's preferences was achieved over 70 percent of the time"⁷ is misleading. Using the identical time period and the identical assessment algorithm, the FAA reported, in Table 2 of the draft report, that at least one of the configuration changes was made on 63% (not over 70%) of the 178 days in the test period. Furthermore, the inconsistencies in Tables 1 and 2, where Massport and the FAA, respectively, report their results of Test #1 are very significant. Here are two of many examples of such inconsistencies in the reported statistics:

⁷ The Project Management Team's notes of its July 17, 2015 meeting (dated August 7, 2015) states that:

"T English (TE) asked if R Adams (RA) had attended the CAC meeting on July 6, 2015 and whether he had everything needed to assess Runway Use Test #1. ... RA said that overall he believes that Test #1 was successful noting that at least one of CAC's preferences was achieved over 70 percent of the time. He also said that there was no major disagreement from CAC members about Test #1 and that most CAC representatives were encouraged that FAA is undertaking the tests."

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 8

- Change from both the previous night's arrival and departure runways; 178 day period
 - Massport 51%; FAA 31%
- Change from the previous night's arrival runway but not departure; 178 day period
 - Massport 8%; FAA 26%

The foregoing statistics demonstrate that runways 4R/L have been, and continue to be, greatly overused and that the goals of the BLANS III study are not being met.

Milton has not been alone in finding flaws in the BLANS testing. See email from John Stewart, CAC representative from Boston's South End, to CAC President Darryl Pomicter and CAC representatives dated September 9, 2015 ("Test 1 was an unmitigated disaster for the RW 27 communities. ... This Test was a failure and the South End would vehemently oppose its implementation."), attached hereto as Exhibit D.

**To Date, the CAC's Development of a Runway Use Plan Has Not Resulted
in an Equitable Distribution of Air Traffic**

According to its Articles of Organization, the CAC's purpose is to:

1. "... represent the communities in the Greater Boston area which are impacted by the operations and expansion of Logan International Airport in the evaluation of present and proposed ... aircraft operations related to the airport and ways to reduce noise and mitigate the adverse impacts of the airport and its operations. ...
2. In furtherance of these purposes, the corporation will seek to protect the communities from adverse effects, including noise and air pollution and ground traffic impacts, which would be caused by Logan International Airport, including, but not limited to, expansion of Logan International Airport runways, taxiways, terminal gates, parking facilities, flightpath procedures and other airside, landside and operational capacity improvements.
3. In furtherance of these purposes, the corporation may engage in litigation before any local, state or Federal court or agency."

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 9

See Articles of Organization of Logan Airport Community Advisory Committee, Inc. filed with the Massachusetts Secretary of State on January 21, 2003.⁸

We believe the CAC is being hampered in fulfilling its purpose by the lack of responsiveness to its requests for data and information from Massport and the FAA. Without this important information, and without well-designed studies, the CAC is not able to protect the communities that have been impacted the most by air traffic arriving at and departing from Logan Airport, including Milton.

The Volpe presentation at the FAA's May 18, 2015 hearing on the proposed 4L RNAV indicates that the FAA estimated DNL assuming that Logan will be in a northeast wind flow approximately 40% of the time, which are times when the 4R and 4L runways will be used. Note that 40% is in contrast to the reported annual northeast wind 18% of the time (reference: <https://www.massport.com/environment/environmental-reporting/noise-abatement/how-logan-operates/>). We are concerned that, if Volpe made this determination last May while the Phase III process was still in the early stages, then what influence will the CAC have in ultimately redistributing air traffic to eliminate the unfair and unsafe practice of using the 4R/L runways for 40% of the Logan arrivals? Volpe's determination as to the use and distribution of arrivals on the 4R/L runways seriously undercuts the CAC's purpose and authority and makes the CAC process illusory. Full and fair evaluation of an appropriate and equitable runway distribution by the CAC in accordance with its purpose and intent is not possible where the end result is pre-determined.

There is still time during the BLANS III process for Massport and the FAA to support the CAC so that it may live up to its mission of adequately representing and protecting affected communities from the adverse impacts of noise and pollution. We believe Massport, the FAA and the CAC must act, and act soon.

⁸ According to a letter dated October 23, 2015 from Thomas P. Glynn, Chief Executive Officer of Massport, to Senator Brian A. Joyce, "Massport believes that noise from aircraft is a regional issue that must be addressed through regional dialogue with all communities at the table, with the FAA which determines flight paths and Massport participating. Such regional community dialogue is the mission of the statutory Community Advisory Committee."

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 10

The FAA Has Not Provided Information that the CAC Needs to Perform its Function

At the January 15, 2015 CAC meeting, the CAC voted to request updated radar flight track analyses and various noise abatement information.⁹ Ten months later, the CAC is still waiting for this information from the FAA.

⁹ An email from CAC President Darryl Pomicter to Mr. Jose Masso of Massport dated August 24, 2015, which was copied to all CAC member and is attached hereto as Exhibit E, states the following:

"In addition to completing the Boston Logan Airport Noise Study, Phase 3 for a new Runway Use Program, please consider the four Logan CAC Motions agreed to January 15, 2015 and emailed to Massport and FAA January 22 to be highest priorities for the Logan CAC:

MOTION: Moved and seconded that the FAA (with technical assistance from Massport) update the radar flight track analysis of the runway 27 departures for 2014 with respect to RNAV way points and gates. Include analysis of standard deviation of the radar tracks and compliance with the Runway 27 ROD.

MOTION AGREED TO UNANIMOUSLY.

MOTION: Moved and seconded that:

The Logan CAC requests Massport provide basic Logan Airport noise abatement information:

1. Runway Use (Arrivals and Departures Operations) by Runway End.
2. Noise (Exposure and Impacts) by Runway End.
3. Noise (Exposure and Impacts) by Community from Runway End.
4. All aircraft (not just jets).

MOTION AGREED TO UNANIMOUSLY.

MOTION: Moved and seconded that Massport and FAA representatives attend the next CAC meeting to discuss availability of real time data, queryable data, graphical data and/or reporting standards regarding aircraft arrivals and departures that includes multiple variables including runway use, wind direction, altitudes, flight track locations, numbers of planes etc.

MOTION AGREED TO UNANIMOUSLY.

MOTION: Moved and seconded that the communities of Arlington, Belmont and Watertown request through the CAC that the FAA re-examine Runway 33L RNAV SID, implemented in June of 2013, in light of the significant increase in noise complaints and negative feedback from communities since implementation and that alternatives or modifications be considered.

MOTION AGREED TO, ONE VOTE IN THE NEGATIVE."

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomicter
November 9, 2015
Page 11

We understand that, during the Project Management Team's November 2, 2015 conference call, CAC President Pomicter, referring to Test #1 and Test #2, stated "[t]hese two ended up with nothing." We also understand that there was a discussion about a lack of funding to do all of the work that the CAC wants to do, pay for the data and information requested by the CAC, analyze data from Test #1 and Test #2, and conduct Test #3 and possibly a new Test #4.

Conclusion

Based on all of the foregoing, we believe that BLANS III, as currently designed and being tested, may encourage the overuse of runways 4L and 4R and may fail to incorporate protection when switching runway configurations for communities like Milton that are affected by more than one configuration. Such overuse has already had a severe adverse impact upon the Town of Milton from which we seek permanent relief.

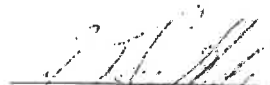
We respectfully request a fair and objective determination of runway usage configurations and a fair and equitable distribution of air traffic over the Greater Boston metropolitan area. Preferably, more arrivals would be routed over the ocean to minimize the impact on all communities surrounding Logan Airport. It is inequitable for the FAA to concentrate flight paths and overburden any community.¹⁰ As noted above, we respectfully request that the BLANS III testing, as presently designed, be stopped and redesigned so that a new runway usage plan that will distribute air traffic across the Greater Boston metropolitan area in an equitable manner can be achieved. We also request that the FAA, Massport and the President of the CAC meet with us to discuss BLANS III. Milton's Town Administrator, Annemarie Fagan, will contact each of you to arrange such a meeting.

¹⁰ As you know, communities in other parts of the country are experiencing the same problem that Milton is as a result of the FAA's implementation of the Next Gen RNAV system. The City of Phoenix, Arizona and residents of the Georgetown neighborhood of Washington, D.C. have filed suits against the FAA because of the extreme toll that noise from increased air traffic has taken on their residents.

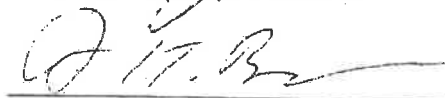
Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
Mr. Darryl Pomictor
November 9, 2015
Page 12

Thank you for your consideration of this letter and the relief we request. We look forward to your response and to achieving a permanent solution to the current inequitable conditions.

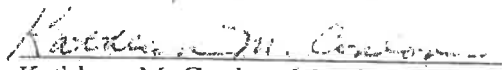
Sincerely,



J. Thomas Hurley, Chairman



David T. Burnes, Secretary



Kathleen M. Conlon, Member

cc: U.S. Senator Edward J. Markey (without exhibits)
U.S. Senator Elizabeth Warren (without exhibits)
Congressman Stephen F. Lynch (without exhibits)
Congressman Michael E. Capuano (without exhibits)
State Senator Brian A. Joyce (without exhibits)
State Representative Walter F. Timilty (without exhibits)
State Representative Daniel R. Cullinane (without exhibits)
Cindy L. Christiansen, Ph.D., Logan CAC Representative
Mr. David Godine, Logan CAC Representative (Alternate) (without exhibits)
Ms. Caroline Kinsella, Massport CAC Representative
Milton Airplane Noise Advisory Committee (without exhibits)
Milton Board of Health (without exhibits)
Milton Board of Park Commissioners (without exhibits)
Milton Council on Aging (without exhibits)
Milton Planning Board (without exhibits)
Milton School Committee (without exhibits)
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq., Milton Town Counsel



ANNEMARIE FAGAN
TOWN ADMINISTRATOR

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MEMBER

March 22, 2016

VIA EMAIL AND U.S. MAIL

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1 Harborside Drive
East Boston, MA 02128

Re: Overuse of Logan Airport Runways 4L and 4R from 3/13/16 to 3/17/16

Dear Ms. Corbett and Mr. Glynn:

We write to inform you that from approximately 5:00 a.m. on Sunday, March 13, 2016, until midnight on Wednesday, March 16, 2016, the Town of Milton experienced virtually constant noise as a result of aircraft departing from Runway 27 (7 hours) and then arriving on Runways 4R and 4L (84 hours) at Logan Airport. Many Milton residents complained to us about interrupted sleep, anxiety and other health impacts during this 91-hour period that brought far too many low-flying airplanes over our Town. At 5:15 a.m. on Thursday, March 17, after only five (5) hours of rest from landings on Runways 4R and 4L, the FAA again used Runway 4R for three more hours, this time in calm and southeast winds. The constant noise that was inflicted upon our Town by the FAA's overuse of these runways last week is unacceptable. We are seeking immediate relief to ensure that it is never repeated.

On March 17, Milton's Town Administrator, Annemarie Fagan, telephoned Ms. Corbett to discuss the situation and left a message. Ms. Fagan has not yet received the courtesy of a reply. On March 18, Ms. Fagan spoke with Frank Iacovino of Massport's Noise Abatement Office and received a routine response that was completely inadequate in light of the circumstances.

On many occasions, we have notified the FAA and Massport about the adverse effects that the RNAV system, which places an increased number of aircraft over Milton in concentrated flight paths, has had upon the people we represent. Noise is only one problem, albeit a very serious


Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
March 22, 2016
Page 2

one. The public health risk from pollution that is associated with concentrated superhighways in the sky is also a very serious concern for the Milton Board of Selectmen. We have repeatedly asked the FAA to distribute air traffic equitably by redistributing some arrivals on runways 4R and 4L and departures on runways 27 and 33L. To date, we have received no assistance from the FAA or Massport to remediate the situation.

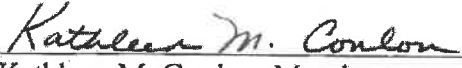
The implementation of the RNAV system has unduly burdened the Town of Milton. As you know, four (4) runways (arrivals on 4R and 4L and southbound departures on 27 and 33L) place air traffic over Milton. Currently, three (3) RNAVs (for runways 4R, 27 and 33L) fly over Milton. Last year, the FAA proposed to add two (2) more RNAVs, each for runway 4L, to the sky over Milton. If implemented, the FAA's proposal would result in five (5) RNAVs over Milton, a scenario that is wholly unacceptable to us. Our Town receives a disproportionate share of air traffic while some communities near Logan Airport receive little air traffic. That is inequitable and unsustainable over the long term.

We are once again respectfully requesting a meeting in person with senior level representatives of the FAA and Massport to discuss the problems that Milton has experienced since the RNAV system was implemented. Town Administrator Fagan will contact you to arrange a meeting. We look forward to your response and to achieving a permanent solution to the current inequitable conditions. Thank you for your anticipated cooperation.

Sincerely,


J. Thomas Hurley, Chairman


David T. Burnes, Secretary


Kathleen M. Conlon, Member

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
March 22, 2016
Page 3

cc: Governor Charlie Baker
U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren
Congressman Stephen F. Lynch
Congressman Michael E. Capuano
State Senator Brian A. Joyce
State Representative Walter F. Timilty
State Representative Daniel R. Cullinane
Cindy L. Christiansen, Ph.D., Massport and Logan CAC Representative
Milton Airplane Noise Advisory Committee
Milton Board of Health
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq.



ANNEMARIE FAGAN
TOWN ADMINISTRATOR

COMMONWEALTH OF MASSACHUSETTS
TOWN OF MILTON
OFFICE OF SELECTMEN

525 CANTON AVENUE, MILTON, MA 02186

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SELECTMEN

KATHLEEN M. CONLON
CHAIRMAN

DAVID T. BURNES
SECRETARY

J. THOMAS HURLEY
MEMBER

July 19, 2016

VIA EMAIL AND U.S. MAIL

Ms. Amy Lind Corbett
Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Mr. Todd Friedenbergl
Deputy Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Dear Ms. Corbett and Mr. Friedenbergl

Thank you for meeting with Town Administrator Annemarie Fagan, Logan Community Advisory Committee ("CAC") Representative Cindy Christiansen, Airplane Noise Advisory Committee Chair Andy Schmidt, and me on Friday, June 17, 2016, to discuss the ongoing burdens that the FAA's NextGen program have placed upon the Town of Milton. We appreciate your time and your willingness to listen to our concerns about the volume, frequency and altitude of aircraft flying over the Town of Milton.

Milton seeks real solutions and permanent relief from the RNAVs that have overburdened our community and saturated our skies with aircraft in concentrated flight paths, often for more than 19 hours a day and for multiple consecutive days. To sum up the problem succinctly, there are too many airplanes flying over Milton. I write to summarize the issues we discussed as well as some measures that Milton representatives proposed during our meeting for your consideration.

(1) **Reduce Volume of Arrivals to Runways 4R and 4L**

During the month of May 2016, 6,596 airplanes flew over Milton to land on Runway 4R. This number represents 44.4% of all arrivals to Logan. During the past twelve (12) months, 33% of arriving jets flew over Milton to land on Runway 4R and an additional 5% landed on Runway 4L. The current situation is unacceptable to Milton, as is the projection used in the May 18, 2015 presentation and analysis prepared by Volpe showing that the baseline (current) percentage

Ms. Amy Lind Corbett
Mr. Todd Friedenberg
July 19, 2016
Page 2

of arrivals flying over Milton to land on Runways 4R and 4L is 40%. Over the last seven years 36% of jet arrivals have landed on Runways 4R and 4L (31% and 5%, respectively). The PRAS goal is 21.1% effective runway use. Forty percent (40%) of arrivals flying over Milton cannot be part of the FAA's plan for managing and equitably distributing the burden of flight operations at Logan Airport. Forty percent (40%) of arrivals is not acceptable to the Town of Milton.

The FAA must reduce the volume of air traffic over Milton substantially, to at least the PRAS goal of 21.1% effective runway use. It is unjust and inequitable that some communities that are as close to Logan Airport as Milton is have virtually no arrival or departure flight paths over them while Milton bears the burden of a high percentage of arrivals. Moving arriving aircraft from the Runway 4R RNAV to the proposed Runway 4L RNAV, which would also fly over Milton, will not solve the problem that our Town is experiencing as a result of the FAA's NextGen system. Air traffic must be dispersed equitably among all of the communities in Greater Boston, all of which benefit from Logan Airport's proximity to them. That is the only sustainable solution to the problem that the FAA's NextGen program has created for Milton.

While the FAA's NextGen program may have achieved efficiencies for airlines, it has failed to protect the health and safety of people on the ground below the RNAV flight paths. As the Board of Selectmen has informed the FAA and Massport previously, the NextGen system has adversely impacted the quality of life and health of many Milton residents.

Reducing the percentage of arrivals over Milton is Milton's primary request and one that we believe can be accomplished quickly by making runway use choices that spread flights across all runway configurations more equitably. Such a reduction would occur, for example, by removing the designation of the Runway 4/9 configuration as the calm wind arrival/departure runways; by using Runway 15R for arrivals when demand is low and the winds are from the southeast; and by ending the increasing practice of using Runway 4R for arrivals in northwest winds. Additionally, we recommend that, each day, the Logan tower be provided with information about the previous day's and week's runway use to inform the tower's decision-making for runway configuration choices. We look forward to hearing additional, concrete ideas that the FAA may have for reducing the use of Runways 4R and 4L that will promote fairness and a more equitable shared burden across communities.

(2) Other Relief

As we discussed, we believe there are several other measures that the FAA can implement quickly if not immediately to provide some relief to Milton, to neighboring communities and, in the case of (d) and (e) below, to the nation. We summarize them here for your convenience, in no particular order of priority:

Ms. Amy Lind Corbett
Mr. Todd Friedenberg
July 19, 2016
Page 3

(a) **NABBO Waypoint**

During our meeting, we asked the FAA to assess potential noise reduction by requiring arrivals to Runway 4R to turn south of the NABBO waypoint at an altitude of 3,000 feet or higher and then follow a continuous descent approach to the airport. Similarly, arrivals to Runway 4L should turn south of a waypoint that is equivalent to NABBO (i.e., at or above 3,100 feet) and follow a continuous descent approach to the airport. If your assessment of the noise impact of these requirements is consistent with our expectations (i.e., that it would reduce the noise burden), we would ask the FAA to implement such turning requirements immediately. Currently, the NABBO waypoint is not being observed uniformly by pilots. Approximately one-third of aircraft arriving on Runway 4R is turning north of the NABBO waypoint, which inflicts additional and unnecessary noise on Milton residents.

(b) **Departures from Runway 27**

Departures from Runway 27 are required to make a quick southbound turn to fly over the Roxbury neighborhood of Boston and avoid flying over the more affluent communities to the west of Boston. These southbound departures then fly over Milton and other communities southwest of the airport before looping toward their final destination. Residents of the avoided communities west of Boston benefit greatly from having an airport approximately six miles from their homes and yet do not share the burden of noise and pollution associated with the airport. This is an inequitable result that must be re-examined by the FAA.

(c) **Departures from Runway 33L**

Many flights departing Logan Airport from Runway 33L do not follow the prescribed RNAV flight path and instead turn southeast around the KIRAA waypoint (a waypoint for the departure flight path from Runway 27). Their failure to follow the 33L RNAV flight path puts more planes over Milton at a low altitude. We ask the FAA to ensure that departures from Runway 33L follow the RNAV flight path and not turn before the RNAV procedures dictate that they should.

(d) **Vortex Generators**

The FAA should require all airline operators to install vortex generators on the wings of the A320 series aircraft in order to reduce noise. At our meeting, Mr. Schmidt gave you 3-D copies of a vortex generator. They are lightweight and inexpensive and are already

Ms. Amy Lind Corbett
Mr. Todd Friedenberg
July 19, 2016
Page 4

in use in Europe. Vortex generators are standard equipment on all new A320 series aircraft. The FAA should mandate their use on all A320 aircraft flying in U.S. air space.

(e) **Continuous Descent**

Since the implementation of the NextGen system, airplanes arriving on Runways 4R and 4L at Logan Airport have been flying over Milton at altitudes (under 2,000 feet) that are too low. Historically, airplanes flying over Milton were at higher altitudes. The noise created by low-flying, frequent (i.e., often at 30-second intervals and sometimes at the same time on parallel paths) aircraft over our Town is intolerable. We understand that a continuous descent reduces the noise from arriving aircraft while also saving fuel. We ask the FAA to require a continuous descent approach for arrivals to Logan in order to keep the planes higher in the sky for a longer period of time and reduce the significant noise burden that has been placed on Milton.

(f) **Runway Restrictions**

At our meeting, we discussed the possibility, first suggested by FAA Tower personnel during a recent CAC conference call, of removing the wind restriction on Runway 14/32. This would open up Runway 14/32 for more arrivals, allow for another 2-runway arrival configuration using Runways 32 and 27 in northwest winds, and help to avoid the overuse of Runways 4R and 4L for arrivals. Because Mr. Friedenberg indicated that it will take time and work to remove the wind restriction, we ask the FAA to coordinate with Massport and to commence the process of reviewing the restriction and implementing a change as soon as possible.

We look forward to a continued dialogue with you and the implementation of the foregoing measures in an expeditious manner. We welcome your ideas for additional solutions that will achieve a reduction in the amount of air traffic over Milton.

Thank you again for taking the time to come to Milton to meet with us.

Sincerely,



Kathleen M. Conlon
Chair, Milton Board of Selectmen

Ms. Amy Lind Corbett
Mr. Todd Friedenberg
July 19, 2016
Page 5

cc: Governor Charlie Baker
U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren
Congressman Stephen F. Lynch
Congressman Michael E. Capuano
State Senator Brian A. Joyce
State Representative Walter F. Timilty
State Representative Daniel R. Cullinane
Town Administrator Annemarie Fagan
Cindy L. Christiansen, Ph.D., Massport and Logan CAC Representative
Mr. Andrew Schmidt
Milton Airplane Noise Advisory Committee
Milton Board of Health
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq.



ANNEMARIE FAGAN
TOWN ADMINISTRATOR

September 8, 2016

COMMONWEALTH OF MASSACHUSETTS

TOWN OF MILTON

OFFICE OF SELECTMEN

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CHAIRMAN

DAVID T. BURNES
SECRETARY

J. THOMAS HURLEY
MEMBER

VIA EMAIL AND U.S. MAIL

Ms. Amy Lind Corbett
Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Mr. Thomas P. Glynn
Chief Executive Officer
Massport Executive Offices
1 Harborside Drive
East Boston, MA 02128

Dear Ms. Corbett and Mr. Glynn:

On several occasions during the past couple of years, we have written to you to bring to your attention the very serious problem of increased airplane traffic, and the noise and pollution associated with it, over the Town of Milton. Various town officials, including members of this Board, have met with you and/or your colleagues to address this issue and request that changes be made. Last December, FAA and Massport representatives attended a meeting in Milton hosted by Congressman Stephen F. Lynch for communities affected by increased levels of airplane noise. At Congressman Lynch's meeting, FAA and Massport representatives heard from Milton residents who described extended periods of loud, constant noise over consecutive days as well as their concerns about health risks relating to noise and pollution from excessive air traffic.

Despite our numerous requests, your attendance at meetings, and the very substantial increase in the number of noise complaints that Milton residents have filed with Massport's Noise Abatement Office, the Town of Milton has yet to receive any relief from the FAA's gross overuse of Runways 4R/4L for arriving flights.¹ If anything, the situation seems only to have

¹ As you know, although arrivals to Runways 4R and 4L (particularly 4R) are not the sole cause of Milton's aircraft noise complaints, they are by far the major cause. Our letter dated July 19, 2016 to Ms. Corbett and Mr. Todd Friedenbergh of the FAA outlined measures that can and should be taken by the FAA to alleviate the problems that Milton experiences because of the RNAV paths for departures from Runways 27 and 33L. In that letter, and when we met in person with Ms. Corbett and Mr. Friedenbergh on June 17, 2016, we pointed out that Milton would have little to no air traffic associated with Runway 33L if departing planes would follow the prescribed RNAV path rather than turn southeast around the KIRAA waypoint (which is for Runway 27 departures). Departures from Runway 27

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
September 8, 2016
Page 2

gotten worse. Neither the FAA nor Massport has implemented any changes that would provide Milton with even short-term relief² from, let alone permanent solutions to, the problems created by the FAA's NextGen program.

On March 22, 2016, we wrote to inform you of a 91-hour period during the month of March during which the Town of Milton experienced virtually constant noise as a result of departures from Runway 27 (7 hours) and arrivals to Runways 4R and 4L (84 hours). Our letter reiterated that Milton receives a disproportionate share of air traffic while some communities that are as close to Logan Airport as Milton receive very little air traffic. We asked for an equitable distribution of air traffic across the Greater Boston area³ and immediate relief to ensure that such a situation would not be repeated. Despite meetings that we and other Milton officials had with Mr. Glynn on May 12 and Ms. Corbett on June 17, nothing has changed.

Today we write to inform you that airplane noise over Milton this summer has been atrocious and has unduly burdened many residents of our Town. Noise is more than a nuisance. Noise is a public health concern, as is pollution from ultrafine particles emitted from airplanes, especially the low-flying arrivals that go over Milton. We wish to share with you a few of the most egregious examples of consecutive days of long hours of constant noise that the people we represent have experienced, often on otherwise beautiful summer weekends when people expect to be enjoying outdoor activities. Instead, they are closing windows and moving outdoor events indoors.

Equally troubling is the fact that, at times, the FAA directed arriving aircraft to Runways 4R and 4L when wind conditions did not support using these runways. Our understanding is that Runways 4R/L are to be used when the wind is from the northeast. However, too many times

place traffic over Milton for the sole purpose of avoiding suburban communities west of Boston, which is a very unjust result and should have been revisited long ago by the FAA. Residents of the western suburbs utilize Logan Airport as do those who live in Milton and other NextGen-affected communities. The western suburbs should share not only the convenience to an international airport but also the burdens associated with it. It is grossly unjust and against public policy for the FAA to overburden a handful of communities with loud airplane noise from low-flying planes.

² Please see our July 19, 2016 letter to Ms. Corbett and Mr. Friedenbergl, which reiterated some short-term measures that we had discussed on June 17, 2016, such as ensuring that the Logan Tower has rolling 7-day runway use data, implementing continuous descent requirements for arriving flights, and ensuring that arrivals to Runway 4R turn south of the NABBO waypoint at an altitude of at least 3,000 feet.

³ Though imperfect, prior to the FAA's implementation of NextGen at Logan Airport, air traffic was distributed across many communities. The concentration of flight paths as a result of NextGen has dramatically increased air traffic over Milton. Moreover, airplanes are flying over Milton at lower altitudes than they previously did and are not adhering to altitude requirements at key waypoints like NABBO.

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
September 8, 2016
Page 3

this summer. Milton has experienced hours of loud, constant airplane noise when winds were out of the northwest, southeast or southwest or when conditions were calm.

Below are representative samples, certainly not an exhaustive list, of unacceptable periods of overuse of Runways 4R/L:

(a) From Tuesday, July 5, through Sunday, July 10, Runways 4R/L were used for 99.5 hours as follows:

- 15.5 hours on July 5
- 5 hours on July 6
- 19 hours on July 7
- 20 hours on July 8
- 20.5 hours on July 9
- 19.5 hours on July 10

During some of this time, winds were not from the northeast and, therefore, the FAA did not have to use Runways 4R/L. For example, on the evening of July 10 (day 6), conditions were calm and another runway could have been used a few hours before the FAA finally switched from the 4s to 27/33 at approximately 11:00 p.m. During this time period, it was unconscionable for the FAA not to have changed to another runway configuration, especially when wind direction permitted or required it, to afford even a minimal degree of relief to people who lost sleep and suffered health effects from four (4) days of constant airplane noise from as early as 5:00 a.m. until after midnight. At 8:30 a.m. on Monday, July 11, despite using Runways 4R/L for the preceding 6 days, the FAA again began directing arrivals to Runway 4R even though wind conditions did not require its use.

(b) For the four (4) day period from Friday, July 29, through Monday, August 1, Milton experienced approximately 19 hours of airplane noise from arrivals to Runway 4R each day, ruining a summer weekend for many residents. The noise continued into Tuesday, August 2. Please see the email correspondence between the Chair of the Milton Board of Selectmen and Mr. Friedenberg attached to this letter as Exhibit A.

(c) During the five (5) day period from Friday, August 19 through Tuesday, August 23, Milton had nearly sixty (60) hours of air traffic. Despite the fact that the winds were from the southeast for most of this time, the FAA directed arrivals to land on Runway 4R instead of Runway 15R. Please see the attached Exhibit B, which is a summary of runway usage from

Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
September 8, 2016
Page 4

August 19 through August 23 prepared by the Chair of Milton's Airplane Noise Advisory Committee.

(d) During the 83-hour period from 5:00 a.m. on Saturday, August 27, through 3:00 p.m. on Tuesday, August 30, arrivals to runway 4R flew over Milton for a total of 44 hours. If wind direction truly were the FAA's primary factor in determining which runway to use, the Logan Tower would have used Runway 4R for only 15 of those 44 hours as winds were from the northeast and east for only 15 hours during this period. For 16 of the 44 hours in question, winds were from northwest (270-350), for 12 hours, winds were from the southeast (120-170), and for the remaining 1 hour, conditions were calm.

(e) Labor Day weekend was another summer weekend ruined by constant airplane noise for many Milton residents. From Friday, September 2, through today, Thursday, September 8, Runways 4R/L were used for 135 hours⁴ (through 5:00 p.m. today and still counting) as follows:

- 19 hours on September 2
- 17 hours on September 3
- 19 hours on September 4
- 19 hours on September 5
- 24 hours on September 6
- 19 hours on September 7
- 18 hours (and still counting) on September 8

Residents of Milton have described the constant airplane noise over consecutive summer days as "horrific", "inhumane", "outrageous", "awful" and "unbearable", among many other adjectives. The increased volume of air traffic and the loud noise over protracted periods of time that Milton has experienced since the FAA began implementing NextGen at Logan Airport are unconscionable and contrary to good public policy. NextGen may have created efficiencies for airlines but it has been an abject failure for people who live under highly concentrated flight paths near airports across the country. The FAA must consider, and both the FAA and Massport should protect, the public health, safety and interests of people on the ground who have a right to the quiet enjoyment of their property. Communities such as Milton existed long before Logan Airport was constructed, let alone NextGen's concentrated flight paths were implemented. It is

⁴ If propeller plane traffic from Runway 22 is factored in, the number only increases.


Ms. Amy Lind Corbett
Mr. Thomas P. Glynn
September 8, 2016
Page 5

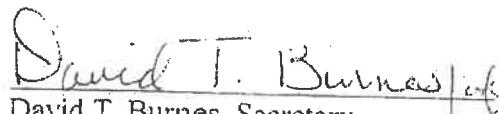
well past the time for both the FAA and Massport to provide relief to communities like Milton that are affected by ear-piercing, whining aircraft noise for hours on end.

We demand both short-term and long-term relief from the burdens that NextGen has caused for residents of Milton. We look forward to hearing from you.

Sincerely,

Milton Board of Selectmen


Kathleen M. Conlon, Chair


David T. Burnes, Secretary

J. Thomas Hurley, Member

cc: President Barack Obama
U.S. Secretary of Transportation Anthony Foxx
FAA Administrator Michael Huerta
Governor Charlie Baker
U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren
Congressman Stephen F. Lynch
Congressman Michael E. Capuano
State Senator Brian A. Joyce
State Representative Walter F. Timilty
State Representative Daniel R. Cullinane
Cindy L. Christiansen, Ph.D., Massport and Logan CAC Representative
Milton Airplane Noise Advisory Committee
Milton Board of Health
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq.

From: tdprojects@aol.com <tdprojects@aol.com>

To: tdprojects <tdprojects@aol.com>

Subject: Fwd: RNAV study proposal with another letter of support

Date: Mon, Jun 3, 2019 10:04 pm

Attachments: 4R Test Plan Study Proposal.pdf (1612K)

-----Original Message-----

From: Cindy L. Christiansen <clcmilton@gmail.com>

To: Ralph Dormitzer <rdormitzer@gmail.com>

Cc: Tom Dougherty <tdprojects@aol.com>

Sent: Fri, Apr 7, 2017 9:34 am

Subject: RNAV study proposal with another letter of support

Hi Ralph:

I know that you have been out of commission and I hope things have changed for the better or that they will very soon. Last time I wrote to you about my proposed study (3/28) I said I would send an update when I received another letter of support.

Yesterday I received a letter of support from Warren, Markey, Capuano, and Lynch. This completes my outreach to elected officials and the 2 non-subcommittee MCAC members representing communities under 4R arrivals. Attached is a file that includes the updated cover page, the original proposal and technical appendix, and the updated set of the letters of support. The attached file, '4R Test Plan Study Proposal.pdf', is a final version of the file that I sent to you on 3/28/17.

The proposed test is a prototype for a regional solution:

- Return to pre-RNAV dispersion of flight paths while using RNAV and RPN to do so,
- Relate that to a Runway Use Plan that balances <10mph community overflight exposure,
- Revise altitude, angle and separation to reduce overflight persistence and dwell.

I think this is a meaningful test that can be applied regionally.

Would you please add this proposed study to the agenda for discussion and vote at the next Aviation Subcommittee meeting?

Also, when you are available and feel up to it, Tom and I would like to set up a time to meet with you to go over the details of the proposal in advance of the Aviation Subcommittee meeting. Is there a good time & day to do that - same Dunkin Donuts as where we met before?

If I can help to set up the meeting location or if I can be helpful in some other way, please let me know. Thank you for all of your work on this Ralph.

- Cindy

+++++

Cindy L. Christiansen, Ph.D.

59 Collamore Street

(617) 322-9323

4L/4R/RNAV/RNP/RUP-Test Plan Proposal

Submitted to the MCAC Aviation Subcommittee by Cindy L. Christiansen, Ph.D.

Supported by:

Senator Elizabeth Warren, United States Senator, Massachusetts

Senator Edward J. Markey, United States Senator, Massachusetts

Congressman Stephen F. Lynch, 8th District, Massachusetts

Congressman Michael E. Capuano, 7th District, Massachusetts

State Senator Walter F. Timilty, Norfolk, Bristol, and Plymouth

State Representative William J. Driscoll, Jr., 7th Norfolk

State Representative Daniel Cullinane, 12th Suffolk

MCAC Representative John McVeigh, MBA, CHO, R.S., Commissioner of Public Health, Randolph, MA

MCAC Representative Laura Smead, Town Planner, Canton, MA

4L/4R/RNAV/RNP/RUP-Test Plan Proposal

Summary

The overarching goal of this MOU RNAV study is to determine alternatives to the current 4R arrival RNAV path and use that will spread the noise and pollution exposure from 4R and 4L arrivals fairly and across as wide of an area as possible. This goal is best met by replicating, as closely as possible, pre-RNAV aircraft arrival dispersion and altitude and by establishing runway path and runway use recommendations along with tower reports that encourage rotation and equality of use-hours when prevailing head winds are less than 10 knots.

To achieve the goal of fair, wide-spread, but limited noise and pollution exposure we propose

- a) the use of RNAV's GPS technology to replicate pre-RNAV dispersion by determining and testing multiple paths to the 4R and 4L runway ends, both linear and curved,
- b) thoughtful placement of the multiple paths using simulated geographic-population-sensitive location analyses,
- c) optimizing equitable exposure by establishing use recommendations for times when prevailing head winds are less than 10 knots for the multiple paths and alternative runway choices, and
- d) creating metrics that define pre-RNAV baseline arrival characteristics that can be used to describe pre-RNAV conditions, compare to current conditions, analyze and refine goals, and monitor success.

In addition, to increase regional benefits from these MOU RNAV studies, the proposal includes an assessment of how current non-compliance with RNAV procedures and flightpaths contributes to excessive noise and pollution across the region.

Background

Massport documented that the MOU RNAV studies will be undertaken with the following principles:

- Safety for passengers and people on the ground
- Weather as a factor
- Data driven
- Regional fairness across metropolitan region
- Massport CAC as regional voice

Past and present community input points to concentrated flight paths, low altitude, early morning and late night overflights, dwell, persistence, runway overuse, aircraft deviating from the designed paths and glideslopes, growth in the number of operations and Stage 3 aircraft, and inadequate noise abatement requirements for aviation operations at Logan as causes of the excessive noise and pollution burdens experienced by those on the ground.

The number of jet arrivals to runway 4R, the most-used arrival runway at Logan, increased by 14% in 2016 over the number in 2015 while the overall increase at Logan was only 5%. Logan's pursuit to expand both the national and international operations along with the shift in fleet mix to larger planes guarantees that Massport will look to the parallel 4R and 4L runways to accommodate much of the predicted growth. At risk is further cost shifting from these expansions onto the communities underneath paths to and from high capacity runways. Any benefits from an RNAV study that merely shifts some of the increasing number of runway 4R arrivals will quickly fade as total operations increase. The same is true for studies of other flight paths where the number of operations show substantial increase, e.g., 33L departures.

Specific Aims of the Proposed Arrival RNAV Study

Aim 1. Determine and test

- the optimum number of arrival paths, both linear and curved, and the widest spread possible for arrivals to runways 4R and 4L that will most closely replicate pre-RNAV dispersion,
- whether these paths can be used simultaneously, sequentially, or by alternating their use across time periods,
- placement and noise impacts of the paths using geographic-population-sensitive location analyses and obtaining an independent expert's input and cross-check

with a goal to restore burden sharing and to reduce noise and pollution concentration.

Any path to Runway 4R or 4L will fly over homes and schools. Therefore, this Aim is meant to reduce the number of hours of use and the number of planes that burden any single home or school using the very RNAV technology that helped create the problem we now need to fix.

The results from work on this Aim are expected to benefit other arrivals paths used at Logan, especially 22L where increasing the number of paths, dispersion across the paths, and curved approaches could be of great benefit.

Aim 2. Develop and test a Runway Use Plan (RUP) that not only varies the use of these additional paths during prevailing headwinds in order to fairly spread noise and pollution exposure, but also tests an overall RUP for all runways applicable when winds < 10mph.

This study Aim will help establish capacity limits for arrival runways 4R and 4L, and others, based on human exposure to aircraft noise and pollution, as compared to the FAA capacity limits that are based on Logan's current runway infrastructure. Every aspect of this RNAV arrival study requires knowing the past, current, and future number of arrivals to runways 4R and 4L. With Logan's growth, and because of the accelerated increase in the use of runway 4R for arrivals, a study designed for current use will be irrelevant soon after the study's completion.

Simulation studies that vary parameters of path number and locations, hours of runway use, multiple path hours, and number of operations can be used to determine the "breaking points" for explicitly-defined individual and community exposure upper-limits and will provide much needed information for a regionally-determined fair RUP. One example is to test how total arrivals per-hour (TA/H) could vary across the day, by spreading TA/H across the optimal number of paths per runway on a sequential east to west cycle, each inbound plane approaches on the next adjacent path to the west of the prior plane. The RUP overlay and resulting daily tower reports would specify that future use of what runway endures inversely with TA/H, such that runway use in wind<10 mph is equal on a weekly basis.

Aim 3. Assess pre/post arrival conditions including dispersion, concentration, and altitude

The success of this RNAV-MOU study relies heavily on a detailed and accurate description of the pre-RNAV dispersion, aircraft type, and altitudes in order to design alternative paths that closely replicate those conditions and that account for current attributes of fleet mix. The attached Technical Appendix proposes several metrics to characterize the pre-RNAV baseline period and some simplified analytic methods that can be used to assess aviation exposure and the expected improvements in burden for those on the ground if the studied changes to flight paths and runway use were made. Also included is a supplement method for designing and creating spatial data that better reflects individuals' aviation noise and pollution burdens.

Aim 4. Establish noise abatement requirements and means for their enforcement for operations tested in the MOU RNAV studies

To improve the robustness of the MOU RNAV studies and to increase their chance of success, as defined by long-term, consistent community input, the studies should address the following causes of excessive and unnecessary noise and pollution, some of which are features of the RNAVs that are being studied or are assumptions used to assess RNAV noise burden:

- Aircraft deviating from the designed glideslope
- Aircraft deviating from the designed paths
- Lack of airspeed and altitude minimums and their enforcement
- No established noise abatement requirements, e.g., delaying configuration until necessary to meet landing requirements, night time and early-morning curfews

These analyses will provide important information pertinent to all communities affected by RNAV overflights.

Technical Appendix for 4L/4R/RNAV/RNP/RUP-Test Plan Proposal

As Congress, state and local governments, individuals, the FAA, and airports become appropriately aware of the substantial negative health and quality of life effects from aviation traffic, policy change, supplemental metrics, and new analytic methods are needed. The FAA/Massport MOU RNAV studies, including the one described here, provide an excellent opportunity to expand the knowledge base and improve metrics and methods for quantifying aviation exposure burden.

As is true for all good collaborate research, we encourage dialog and the exchange of ideas for ways to improve this proposed analytic plan and hope to participate fully in this process by offering expertise with study design, statistical modeling, and metric and method development for specific applications.

The recommendations in this Technical Appendix incorporates community input that asks us not to ignore individual burden while considering best choices for populations. Current noise impact policy fails because it implicitly encourages an unjust concentration of the aviation burdens on a limited group of individuals. To achieve the current policy goal for reduced noise impact implicitly requires the FAA to design flight paths with no deviations, much like we have now. The policy, if stated explicitly, is unquestionably unjust because it says to fly as many operations as possible over the same individuals, albeit, the smallest population possible.

The current policy on noise impact that requires the FAA to use DNL, fails to protect selected individuals and communities by encouraging a false baseline and by allowing good intentions to go bad by not explicitly stating and explaining the certain, mathematically known consequences brought about by the use of the DNL metric.

Although policy that requires measuring noise impact using DNL and population counts might work for new airport design and site selection, it fails miserably when used for policy decisions and flight path designs for an airport built adjacent to an already existing urban and suburban area with homes, schools, and places of worship in all directions including along the shorelines.

Spatial Blocks. Currently census block centroids and the populations that they contain are assigned an estimated DNL value using FAA approved software and local airport operations input data. Census blocks vary substantial in size, shape, and in other attributes, perhaps most importantly by land use within a census block. With the exponential improvements to computing hardware and software abilities and the multiple spatial databases available across government agencies, we encourage these MOU-RNAV studies to improve the ability to define representative characteristics of aviation burden for pre/post comparisons (for Aim 3 and 4) and the assessment of the impacts of new paths and runway use (for Aims 1 and 2) by creating equal size spatial blocks that use current RNAV path lines as the centering spatial constant.

Starting with the line that defines the 4R RNAV path from the NABBO waypoint to the runway end, create 0.25 nm wide by 0.50 nm long rectangular spatial blocks in both NW and SE directions from the flight path. For this study, the spatial block should cover all of Milton and all or parts of surrounding adjacent communities. At about 10 nm from Logan, the included area should spread NW toward Dedham from the proposed 4L Visual RNAV at HOCY and follow a

line perpendicular to the 4R RNAV path about 12 nm to areas that include Braintree and parts of South Weymouth. The trapezoid-shaped area can narrow closer to the airport.

Pre/Post Statistics and Graphics (Aims 3 and 4). For comparison of pre/post RNAV dispersion and altitude create pre and post monthly RNAV heat maps and tabled statistics separately for jets and non jets arrivals to Runways 4R and 4L, for 4R alone, 4L alone, and 4R and 4L combined for these statistics:

- Counts of the number of arrival operations
- Minimum altitude
- Altitude at the 1st quartile
- Median altitude

Additional statistics are needed to study whether other RNAV-related factors, along with concentration and altitude, contribute to the substantial increase in complaints from those under RNAV arrival paths, for example, lack of adherence to flight path procedure, nighttime use of concentrated paths, and runway use during sensitive times.

Separately for jet and non jets, for pre and post RNAV by month and for 4R, 4L and 4R+4L

- Summary statistics of
 - Counts of the number of spatial blocks crossed for each arrival operation
 - Proportion of operations that followed a 3 degree glideslope
 - Number of hours, out of 24, that there were overflights
 - Number of hours between 10pm to 6am that there were overflights
 - Number of weekend hours that there were overflights
 - Number of national and state holiday hours that there were overflights
 - Number of 360's and go-arounds

We also suggest a more traditional method to study dispersion and altitudes of aviation traffic that also will add insight about pre/post differences. Draw lines perpendicular to the current 4R GPS path at 0.5 (preferred) or 1 nm increments starting at the runway way end out to the NABBO waypoint. For each perpendicular line capture the distance from the center line and the altitude of all arrivals that cross the perpendicular lines. With these 2 numbers/flight/line compare quantiles, e.g., deciles on either side of the center line, pre/post or do some formal statistical tests or graphics (e.g. q-q plots) to show whether the pre/post distributions are the same.

Simulation Studies Statistics and Graphics (Aims 1 and 2). Designing multiple flight paths and their subsequent simulation studies of path and runway will require an iterative process of changing input parameters followed by checks for movement toward the study's goal to spread the pollution and noise exposure from 4R and 4L arrivals fairly and across as wide of an area as possible. We recommend that this process use the spatial blocks defined above and the simplified statistics listed.

Other Metrics. Aim 2 suggests using total arrivals per hour (TA/H) to describe and assess goals for variations of use over time periods. To find the baseline TA/H for 4R consider the seasonal

average for 4R pre-RNAV and expand it by the ratio of total arrivals today per day compared to total arrivals per day in the months just before RNAV was initiated on 4R.

Daily counts of the number of hours of runway use, the number of nighttime hours, and the number of operations over affected areas by spatial blocks, along with the minimum, maximum and quartiles of the altitudes of those flights, are simple, easy to understand metrics of noise burden that should be reported in the RNAV studies as supplemental metrics. This information also will be helpful for the development and implementation of a RUP. Metrics that combine noise from multiple events, e.g., DNL, should also include interval or quantile values, not just a single point estimates, and should be derived with equal consideration for granularity and parsimony. For example, percentiles of minute or hourly DNL by day could be reported. It is also important to study single-event measures such as SEL and to measure and consider background noise levels when assessing impact based on these standard noise metrics.

Congress of the United States

Washington, DC 20515

April 4, 2017


Ralph Dormitzer
Chair, MCAC Aviation Subcommittee
rdormitzer@gmail.com

Dear Mr. Dormitzer,

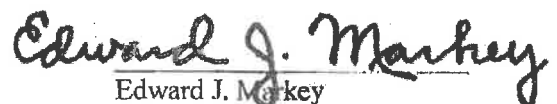
We are writing to respectfully request that members of the Massport Community Advisory Committee (MCAC) Aviation Subcommittee continue to assist the ongoing efforts of the town of Milton and other local communities affected by the new area navigation (RNAV) flight patterns. We have heard from certain communities that the implementation of the RNAV MOU has caused increased noise. We appreciate your continued assistance in working with MCAC Aviation Subcommittee members in providing as much support and advocacy for these affected communities as possible.

We understand that noise is an inevitable product of air travel - and by extension an unavoidable challenge for those communities living within the vicinity of Logan Airport - but it's also critical that we work to help these communities address this difficult situation as much as possible. To that end, we request that the MCAC fully review and carefully consider the 4L/4R/RNAV/RNP/RUP - Test Plan Proposal as part of the Massport/FAA MOU RNAV Tests Implementation. Thank you for your time and consideration.


Sincerely,



Elizabeth Warren
United States Senator



Edward J. Markey
United States Senator



Michael E. Capuano
Member of Congress



Stephen F. Lynch
Member of Congress



COMMONWEALTH OF MASSACHUSETTS
THE GENERAL COURT

STATE HOUSE, BOSTON 02133 1053

March 20, 2017

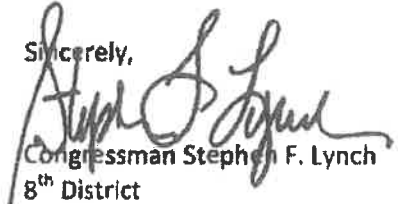
Ralph Dormitzer
Chair, MCAC Aviation Subcommittee
rdormitzer@gmail.com


Dear Mr. Dormitzer,

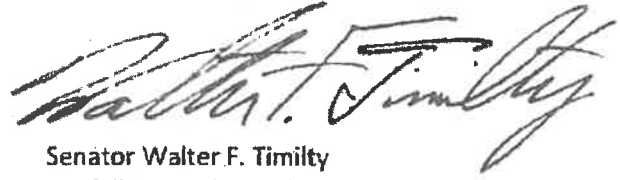
We write to express our concerns regarding the barrage of airplane noise the Town of Milton is subjected to on a daily basis. Since the implementation of the RNAV MOU, Milton has endured more than its fair-share of over flights. For that reason, we are seeking your assistance in working with your fellow members on the Massport Community Advisory Committee (MCAC) Aviation Subcommittee to bring some relief to our community and to the other communities that are most heavily impacted by the RNAV flight patterns.

We understand that living in the vicinity of Logan Airport will always create some level of impact on our town. However, we feel a more equitable dispersion of arriving and departing flights, similar to the patterns that existed prior to the RNAV NextGen implementation, should be utilized. Consequently, we urge you and your fellow subcommittee members to work with the whole of the MCAC to identify solutions that will allow for the dispersion of the noise burden over all the neighboring communities. Moreover, we fully support MCAC recommending and Massport/FAA implementing this 4L/4R/RNAV/RNP/RUP - Test Plan Proposal as part of the Massport/FAA MOU RNAV Tests Implementation.

Sincerely,


Congressman Stephen F. Lynch
8th District
Massachusetts


Representative William J. Driscoll Jr.
7th Norfolk


Senator Walter F. Timilty
Norfolk, Bristol and Plymouth


Representative Daniel Cullinane
12th Suffolk

cc: MCAC Aviation Subcommittee Members



Town of Randolph, Massachusetts

Board of Health

41 SOUTH MAIN
RANDOLPH, MASSACHUSETTS 02368

TEL. (781) 961-0924

FAX (781) 961-0927

Members:

Merk Kittredge, Chair
Thomas Fisher, V. Chair
Dr. David Kaplan, CHO, RS, Member

Nelly Brown Janga
Esther Muhammad, RN
John McVeigh, Commissioner

Date: 3/21/17

Re: RNAV Study

To Whom it May Concern:

I support the MCAC recommending and Massport/FAA considering this Test Plan Proposal as part of the Massport/FAA MOU RNAV Tests.

FOR THE BOARD OF HEALTH

John McVeigh, MBA, CHO, R.S.
Commissioner of Public Health

Cc. Board



TOWN OF CANTON, MASSACHUSETTS
PLANNING OFFICE

PLANNING DIVISION STAFF:

LAURA SMEAD, *Town Planner*

KAREN LAWLER, *Administrative Assistant*

March 7, 2017

To Whom It May Concern:

I fully support the MCAC recommending and Massport/FAA implementing this Test Plan Proposal as part of the Massport/FAA MOU RNAV Tests implementation.

Sincerely,

A handwritten signature in dark ink, appearing to read "Laura Smead", is written over a faint, larger signature.

Laura Smead,
Town Planner



MICHAEL D. DENNEHY
TOWN ADMINISTRATOR

COMMONWEALTH OF MASSACHUSETTS
TOWN OF MILTON
OFFICE OF SELECTMEN

525 CANTON AVENUE, MILTON, MA 02186

TEL. 617-898-4843

FAX 617-698-6741

SELECTMEN

DAVID T. BURNES
CHAIRMAN

KATHLEEN M. CONLON
SECRETARY

RICHARD G. WELLS JR.
MEMBER

August 18, 2017

Ms. Amy Lind Corbett
Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Mr. Thomas P. Glynn
Chief Executive Officer
Massport Executive Offices
1 Harborside Drive
East Boston, MA 02128

Dear Ms. Corbett and Mr. Glynn:

We are writing to document some recent examples of incessant, loud noise from airplane traffic over the Town of Milton and to reiterate our past requests for interim and permanent relief. We continue to be very concerned about the noise and pollution created by the FAA's implementation of NextGen that have placed an unfair and undue burden on the health and welfare of people who live below or near these concentrated flight paths. We hope that your ongoing RNAV study will yield positive results for not only the residents of Milton whom we represent, but also the region as a whole. While the RNAV study is proceeding, we seek interim relief.

Examples of Recent Conditions

As you know, the most significant problem for Milton stems from arrivals to the parallel Runways 4R and 4L.¹ During the Spring of 2017, Milton residents bore the burden of multiple

¹ Departures from Runway 27 also place a great deal of traffic over Milton as well as Mattapan, Hyde Park, Roslindale, Roxbury and Jamaica Plain. Our understanding is that Runway 27 departures fly over these communities in order to avoid flying over suburban communities west of Boston, possibly due to litigation that preceded the implementation of NextGen by decades. If so, that is unconscionable and against public policy. The FAA and Massport should undertake a review of the Runway 27 departure path in light of the changed circumstances that NextGen has caused. NextGen is overburdening some communities and benefitting others, creating gross inequities in quality of life as well as public health risks.

days of consecutive hours of constant airplane noise. By way of example, for 61 hours of a 66-hour period from Tuesday, April 25, to Thursday, April 27, 2017, Milton experienced an arrival to Runway 4R or 4L every 2.1 minutes on average. During this time, there was only one five-hour break from the noise (from midnight until 5:00 a.m. on April 27). Even during two extended periods of at least 10 hours each, when winds were less than 10 knots and, thus, a switch to another runway could have been made to provide relief to the overburdened, the FAA continued to direct arriving flights to Runways 4R or 4L.

Another example is May 11, 2017, when 541 airplanes arrived on Runways 4R and 4L during a 16-hour period from 6:36 a.m. until 10:41 p.m., averaging one airplane every 1.8 minutes. Starting at 6:00 p.m., the winds were less than 10 knots, and a runway change could have been made but was not made until 10:41 p.m., nearly five hours later. It is simply not sustainable for any community to bear the burden of near-constant noise and pollution from 541 airplanes in a 16-hour period on a single day.

The constant airplane noise was so bad at times during the Spring that we heard from some Milton parents who had checked their families into hotels outside Milton so that their school-age children taking MCAS tests could get adequate sleep during the testing period. This is an unacceptable consequence of both the FAA's implementation of NextGen and the overscheduling of flights at Logan Airport.

As you know, Runway 4R was closed for renovations from May 15, 2017 until June 24, 2017. This temporary closure afforded some short-term relief to some of the Milton residents who have suffered from more than three years of the FAA's gross overuse of the Runway 4R "superhighway in the sky" for arriving flights often at altitudes that are below those called for in the published arrival procedures. However, other residents (including some who are impacted by Runway 4R arrivals) were burdened by arrivals to Runway 4L during the temporary closure.

Runway 4R partially re-opened in late June. Ongoing construction of a safety approach lighting pier and the presence of tall cranes at the end of the runway has required Massport to keep Runway 4R closed between the hours of 10:00 p.m. and 2:00 p.m. We understand that the construction project is expected to end by September 1, 2017, at which time Runway 4R will again be fully operational with no use restrictions.

Since Runway 4R partially re-opened, we have noticed an increase in arrivals to Runway 4L and an increased use of Runways 4R and 4L simultaneously. Simultaneous arrivals to the parallel Runways 4R and 4L only expands the number of Milton residents (as well as Dorchester and South Boston residents) who are impacted by loud noise and pollution and increases the scope of the overall problem. Noise and air pollution are bad enough when several hundred airplanes arrive on Runway 4R on a given day. Conditions are substantially worse when airplanes arrive simultaneously on parallel runways that are separated by only 1,500 feet. Thousands of Milton residents are "sandwiched" between the closely-spaced parallel runways for arrivals to Runway 4R and Runway 4L and are severely impacted by noise and pollution. The noise that is heard by residents who live in the "sandwich" area is horrendous. Simply put, this situation is unhealthy and unsustainable.

The following are examples of recent overuse of Runways 4R and 4L:

- During the nearly 17 hour period from 5:08 a.m. until 9:44 p.m. on Sunday, July 23, 473 airplanes arrived on Runways 4R and 4L, averaging one airplane every 2.1 minutes. All 473 flew over Dorchester and South Boston; 94% of them flew over Milton.
- Two days later, during the 13-hour period from 12:18 p.m. on July 25 until 1:28 a.m. on July 26, 445 airplanes arrived on Runways 4R and 4L, averaging one airplane every 1.8 minutes.
 - On July 25, arriving Delta flight 2643 dipped approximately 100 feet below the altitude called for on the Runway 4R glide path. Delta 2643, which had already deployed its landing gear nearly 7 miles from the runway end, subsequently increased thrust and speed to climb 100 feet in under one mile, increasing noise and air pollution over Milton during a high usage period while failing to follow the published arrivals procedures for Runway 4R. This is not the first time this type of event has occurred.
- From 2:15 p.m. on Friday, July 28, until 12:08 a.m. on Saturday, July 29, 346 airplanes arrived on Runways 4R and 4L. From 4:57 a.m. on Saturday, July 29, until 12:42 a.m. on Sunday, July 30, 508 airplanes arrived on Runways 4R and 4L. Air traffic over Milton started up again at 6:47 a.m. on Sunday, July 30,² and continued for the next 14 hours, during which time 470 airplanes arrived on 4R and 4L. This is a total of 1,324 airplanes flying at low altitude in concentrated paths over Milton, Dorchester and South Boston during a three-day period during the summer, when people expect to be able to enjoy the outdoors. 978 of these 1,324 overflights occurred over a summer weekend.
- On Monday, July 31, from 2:24 p.m. until 7:21 p.m., 209 airplanes arrived on Runways 4R and 4L, averaging one every 1.4 minutes during a six-hour period.
- On Tuesday, August 1, between 3:02 p.m. and 7:01 p.m., 171 airplanes arrived on Runways 4R and 4L, averaging one every 1.4 minutes during a four-hour period.
- On Tuesday, August 8, between 2:24 p.m. and 8:29 p.m., 266 airplanes arrived on Runways 4R and 4L, averaging one every 1.4 minutes during a six-hour period.

The problem is getting worse and becoming a public health crisis. The FAA and Massport must take immediate action to protect the public health, safety and interests of people on the ground who have a right to the quiet enjoyment of their property. While the RNAV study is on-going (and, we hope, will eventually achieve permanent relief for all affected communities), the FAA and Massport must provide short-term relief by dispersing some of the traffic, preferably over communities that now receive little to no air traffic.³ Residents of such communities benefit

² Meanwhile, departures from Runway 27, which are not included in the data described in this letter, began flying over Milton at 5:12 a.m. on Sunday, July 30, only exacerbating an already awful situation.

³ Prior to the implementation of NextGen, arrivals were fanned out over a broad area, not flown in concentrated paths. The map attached to this letter as Exhibit A is from the National Transportation Noise Map, which reports road and aviation noise nationally. It illustrates the allocation of this noise burden that makes some parts of Milton as noisy as – if not noisier than – much of the City of Boston.

from the convenience of Logan International Airport just as much as residents of the severely impacted communities do, and must share in the burden of Logan's operations.

Runway Use Restrictions

The implementation of NextGen at Logan International Airport created a material change in flight operations and, therefore, warrants a re-examination of all runway use restrictions and past records of decisions and court decisions to ensure that communities surrounding the airport are treated equitably.

Night-time (11:00 p.m. to 6:00 a.m.) arrivals to Runway 22R are prohibited, yet there is no such prohibition for arrivals to Runway 4L, which is the same runway coming from the opposite direction, and the parallel Runway 4R. In 2016, only 9 airplanes arrived on Runway 22R (although approximately 44,000 planes departed parallel Runway 22L). Approximately 58,000 airplanes arrived on Runways 4R and 4L last year, many of them well after midnight or before 6:00 a.m. It is well past time for the FAA and Massport to provide the same night-time restrictions for arrivals to Runways 4R and 4L that it provides for arrivals to Runway 22R. We hereby request that the FAA and Massport take immediate action to begin the process of implementing the same night-time use prohibitions for Runway 4R and 4L arrivals that are in effect for Runway 22R arrivals.

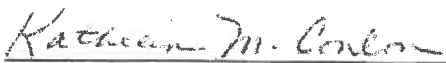
Currently, the unidirectional Runway 14/32 is used only when winds are 10 knots from the northwest or southeast or greater. The wind restriction was implemented long before NextGen, which has caused material changes to air traffic operations and material adverse impacts to some communities. The rationale for the 10-knot wind restriction on the unidirectional Runway 14/32 must be revisited.

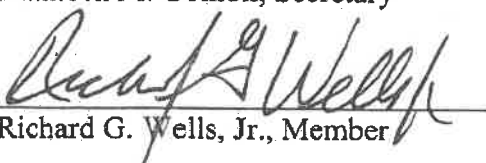
Thank you for your attention to our concerns and the matters and requests we have raised in this letter. We look forward to your response, and we stand ready to work with you to address these very serious public health issues.

Sincerely,

Milton Board of Selectmen


David T. Burnes, Chair


Kathleen M. Conlon, Secretary


Richard G. Wells, Jr., Member

cc: President Donald J. Trump
U.S. Secretary of Transportation Elaine L. Chao
FAA Administrator Michael P. Huerta
U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren
Congressman Stephen F. Lynch
Congressman Michael E. Capuano
Governor Charlie Baker
Attorney General Maura Healey
State Senator Walter F. Timilty
State Representative William Driscoll, Jr.
State Representative Daniel R. Cullinane
Cindy L. Christiansen, Ph.D., Massport and Logan CAC Representative
Milton Airplane Noise Advisory Committee
Milton Board of Health
Milton School Committee
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq.

EXHIBIT A

See attached.



National Transportation Noise Map

Find and Analyze Noise by View/Map Source

1000' (0.62) Street View



To: John Hansman, Flavio Leo
CC: Ralph Dormitzer, Chair of Aviation Subcommittee
From: Cindy L. Christiansen
Date: September 23, 2017
Re: Changes in PBN and other procedures and characteristics that affect approaches

Hundreds of residents in Dorchester and Milton have reported that approaches to 4R are lower and more concentrated than in the recent past. Since the implementation of new technology for Precision-Based Navigation (PBN) similar complaints have been made about approaches at BWI, SEA, SFO and other airports across the country.

The following paragraph is from the Massport/FAA MOU signed in September of 2016. The highlight is mine.

This MOU outlines the actions the Authority and the FAA intend to undertake in seeking reductions to overflight noise impacts of aircraft operations at Boston Logan International Airport (BOS) that result from the FAA's implementation of NexGen *{sic}* precision-based navigation (PBN) procedures including RNAV.

This statement says that the study's focus is not just on pre/post RNAV but on changes due to PBN implementations. I have found many changes to Runway 4R approaches related to PBN implementation, changes in ILS approaches, and other changes that negatively affect those underneath concentrated flight paths. I ask that the study team consider these changes when seeking solutions to the problems PBN causes the residents underneath the approach flight paths.

Technical and Flight Path Changes

1. The Current FAA 4R RNAV and ILS Plates/Charts have changed substantially compare to ones used in 2009

I refer to the plates using these abbreviations. The reported differences require interpretation to assess their impacts on aiming points, glideslope, altitude, dispersion, etc.

- ILS09 = ILS or LOC Rwy 4R July 30, 2009
 - RNAV09 = RNAV (GPS) RWY 4R July 30, 2009
 - ILS16 = ILS or LOC Rwy 4R March 31, 2016
 - RNAV17 = RNAV (GPS) RWY 4R April 27, 2017
1. RNAV09 does not include the MILTT waypoint but instead has waypoint IRSEW that is shown on the plate to be 5 nm from the 4R runway end with a glideslope ground-vertex far from the runway end, likely at the aiming point. MILTT is reported to be 5.1 nm from the runway end in other plates. IRSEW was at 42.2748 -71.04863 (lat/long) in 2009 and now is 42.32266 -71.02556.
 2. ILS09 and RNAV09 show the 3-degree glideslope ground-vertex at the aiming point, 0.2 nm from the runway end; ILS16 and RNAV17 show the 3-degree glideslope vertex at the runway end.
 3. ILS09 shows the altitude at MILTT to be 1723 ft. compared to ILS16 where the altitude is 1700 ft.
 4. The Final Approach Fix (FAF) for the ILS09 is 1800 ft.; the other 3 plates give the FAF as 1700 ft.
 5. The approach minima for Category A&B planes for the category circling are much lower in ILS09 than in ILS16.
 6. The compass Locator Outer Marker (LOM) MILTT appears in the ILS09 but not in the ILS16; the same is true for the LOM STOGE.
 7. The RNAV17 plate, top left box, indicates WAAS but the RNAV09 does not.

11/2/2017

8. Comparing RNAV09 with RNAV17, the approach minima have decreased substantially in all categories.
9. The RNAV17 plate contains information for the concurrent use of Runway 4L for the 4R RNAV approach and also has side-step information; neither appears on the RNAV09 plates.

2. LPV(WAAS) RNAV GPS Approaches were available for Logan Runways 12/15/2011

LPV(WAAS) was implemented for all major approach runways with RNAVs at Logan on 12/15/2011. LPV(WAAS) is reported to have lateral and vertical accuracies of 2 meter or less. Much of the change in the 2015 and 2009 plates, topic #1 above, is related to the new WAAS technology that only recently has been available for final approaches here and across the country. LPV(WAAS) also allows less separation in final approaches and less separation in simultaneous approaches to closely spaced parallel runways (see # 5). Even though LPV(WAAS) GPS arrivals were available for 4R approaches on 12/15/2011, the procedure requires a certified receiver that was not, and is still not standard equipment on many planes. The FAA reports that the entire Cape Air fleet was equipped with LPV(WAAS) certified receivers in 2013. LPV(WAAS) was implemented at Logan at the same time the STARS RNAVs went into effect. I do not know if this is coincidental. Further evidence points to connections between increased burdens to residents underneath flight paths and WAAS availability. In 2013 RTCA, a public not-for-profit aviation association that serves as the 'private' in a public-private relationship with FAA, identified WAAS as an in-progress PBN enabler for approaches. In 2013 RTCA also identifies, as a barrier, insufficient knowledge about the different types of PBN (GPS, LPV, RNAV, Advanced RNAV, RNP, and RNP AR).

3. Arrivals per hour for those under 4R&L paths and those sandwiched between the two has increased substantially (CSPR and ReCat)

The 4R&L approaches to Closely Spaced Parallel Runways (CSPRs) are unique at Logan. They are unlike other approach configurations where the arrivals are either split between runways with different directions (e.g., 22L and 27) or are not CSPRs (e.g. 32 and 33L). The use of CSPRs approaches to 4R&L runways means that planes overfly the same residents in Randolph, Milton, Dorchester, and South Boston with non-stop noise and pollution, sometimes for 20 consecutive hours. Without appropriate analyses that includes identification and study of exact locations over time, one cannot scientifically claim that nothing has changed for individuals on the ground. It is not appropriate to do a population-level analysis when the effects are purposely concentrated over sacrificial individuals. Below are examples of what some residents experience because PBN enables the FAA to reduce separation on CSPRs. These examples, and others, should be compared with similar days of arrivals to 4R&L in 2009, or before, at specific locations or addresses in Milton and Dorchester that are under the flight paths or in the sandwich to better understand how PBN, including LPV(WAAS) (item #3), has changed the frequency, spacing, and where planes now fly on their approaches to CSPRs. The new CSPR standards for Logan are connected to PBN Wake Turbulence Recategorization (ReCat) studies, with Phase 1 being finalized in 2011. In October 2015 RTCA reported "It was noted that the industry is realizing benefits at Boston Logan;" from ReCat. Also related to this PBN implementation timetable, FAA Order 7110.308A was amended in 2017 to add 4R/L GPS navigation to the order.

1. **Between 4pm and 7pm** on August 8, 2017, **154** planes flew over the same homes and schools on approach to 4R&L. This is **one plane every 70 seconds**, on average.
2. On July 23, 2017, **473** planes flew to 4R&L runways over a **16.6-hour period**, about **one every 126 seconds**.
3. On July 28, 2017, **346** planes flew over the same homes and schools in a **10-hour period**, about **one every 103 seconds**.

4. On July 29, 2017, **508** planes flew over the same homes and schools as they approached runways 4R&L over a **19.8-hour period**. On average, this is a **plane every 140 seconds for almost 20 hours**.
5. On July 31, 2017 **470** planes flew over the same homes and schools over a **14.3-hour period**. This is **one plane every 109 seconds**, on average
6. Over the **4-day period (7/28 -7/31)**, residents under the 4R&L approach paths, especially those in the sandwich, had **1,124 low-altitude planes** fly over their homes.

When compared to areas of similar distance from the airport, the dwell, persistence, and number of direct fly-overs is unprecedented. A thorough resident-level, not a population-level, analysis is needed to demonstrate the impact of PBN technology and CSPRs on affected residents underneath these paths.

4. The Massport Flight Monitor shows a westward shift in the 4R arrival paths from earlier times – this is a related observation but different from the 5/31 request about the current use of 4R(Actual) and not 4R(GPS/reported)

It is imperative that users of the flight track radar data quantify and provide information on the data's reliability and precision. This is especially important given there are differences in what is shown on the monitor, on Massport flight tracks, and in the consultant's analyses. Also, accurate statements of uncertainty are necessary when the analytic conclusions differ from the experience of those underneath these PBN approach paths, as is the case here. Differences between reported and analytic conclusions often mean there are problems with the data, their use, or the model. The slight westward shift in the path on the flight monitor is a hint that there could be other data problems affecting the accuracy of flight track analyses. This finding also is consistent with reports from Dorchester that the 4R approach path used to be over the river but now are over homes and the reports from Milton residents that the 4R(GPS) path is shifted westward (something the Aviation Subcommittee asked Massport and the study team to investigate as Block 1 work). If the noise analyses and graphics do not account for errors-in-variables, the validity and precision of the results are overstated and possibly misleading. We need a comprehensive understanding about the quality of the flight track data before it is used to assess problems and progress.

Massport Data and Statement Related to Changes

5. Analysis of DNL data from 2009 and 2015 shows increased noise for areas close to the paths and decreases elsewhere

Comparison of EDR DNL by census blocks in 2009 and 2015 shows increased noise levels close to the approach paths and decreases elsewhere. This is exactly what is expected with a concentration of flights and the use of PBN. A similar pattern of increased DNL can be found along the 33L departure RNAV, indicating that like departures, approach paths are now severely concentrated.

1. Dorchester
 - a. All census blocks had DNL>45 in 2009 and 2015
 - b. Fewer than 2% of the 677 census blocks had a DNL decrease in 2015 compared to 2009
 - c. 35% of the census blocks had an increase of 1 dB or greater, all within proximity to the 4R&L approach paths
2. Milton
 - a. 60% of the 405 census blocks had increases of 1 dB or greater in 2015 compared with 2009, 10% greater than 2 dB, 5% greater than 2.5 dB, and, as in Dorchester, the greatest increases occur along the 4R&L approach paths
 - b. Only 0.5% of Milton's census blocks had decreases in 2015 compared to 2009, with the greatest decrease being only 0.12 dB

3. Quincy
 - a. 78% of the 1,078 census blocks had decreases in 2015 compared with 2009; 40% had decreases of 1 dB or greater
 - b. 5% of the census blocks had an increase of 1 dB or greater; these blocks are on the west side of Quincy and, like in Dorchester and Milton, are the blocks closest to the 4R approach path
4. Braintree and Weymouth
 - a. All the 33 census blocks in Braintree and all the 130 census blocks in Weymouth that are included in the EDR had DNL < 45 in 2009 and remained less than 45 in 2015
 - b. No census block in either community had an increase in DNL in 2015 when compared to 2009
 - c. Although all census blocks started with DNLs < 45, each decreased further in 2015 with 38% of the blocks in Braintree and 46% of the blocks in Weymouth dropping by 1.5 dB or greater

6. The 2012/2013 EDR states it is obvious that arrival paths have been concentrated

Some believe the Runways 4R&L graphics and study assessments to-date imply that nothing has changed. However, the 2012/2013 combined year EDR, page 186, agrees with residents and communities that complain that the new PBN technology has concentrated arrivals. The EDR says the following; the highlight is mine.

Figure 6-4 displays air carrier jet arrivals. This graphic displays the east downwind configuration that the air carrier arrivals utilize to line up on final approach to the runways thus avoiding populated areas to the west of the Airport. The RNAV arrival procedures are very evident in the 2013-modeled data with a narrowing of the flight tracks into concentrated areas.

General Changes

7. "Load Factors are at an all time high"

This quote is from visual material for a recent Massport Board meeting that says load factors are now, on average, 85%. An average of 85% means many load factors are close to or are 100%. It is unclear if noise analysis input values are changed to reflect this recent trend. Accurate load factors are required for reliable noise assessments for those under departure PBN procedures as well as arrivals, especially when assessing what has changed and why so many more people now complain about aviation noise and pollution.

8. The fleet mix has changed substantially

The FAA reports a substantial change in the fleet mix at Logan between 2011 and 2012 with a decrease of about 70,000 Air Taxi operations and an increase of about 60,000 operations by Air Carrier. The change is so extreme that it could imply a reclassification of aircraft. However, a shift of the numbers in these categories does not occur at several other airports that I checked. At Logan, the timing of the shift in fleet mix overlaps with the implementation of the Logan STARS and the LPV(WAAS) GPS. The FAA also has pointed to a change in fleet mix as one reason for changes in runway use, with larger jets often dictating runway selection.

I provided a technical appendix in my 4L/4R/RNAV/RNP/RUP-Test Plan Proposal presented at the May 5, 2017 Aviation Subcommittee meeting that offers improved ways of looking at and analyzing the problems for PBN approach paths. Please review the statistics and methods described in the technical appendix, along with the information provided here when developing and assessing changes to approaches caused by the implementation of NextGen PBN procedures. There are supportive

documents and references for the eight topics, but all are easily found and accessible to aviation researchers, airport operators, and the FAA.

I encourage the use of good scientific and creative thinking to find solutions to reverse the extremely negative consequences that PBN has forced upon those underneath approach and departure paths. I look forward to learning more from you on how these, and other, changes to approach paths can be remedied, perhaps by using the very technologies that have created the problems.



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January 29, 2018

Ms. Amy Lind Corbett
Regional Administrator
New England Region
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803-5299

Mr. Thomas P. Glynn
Chief Executive Officer
Massport Executive Offices
1 Harborside Drive
East Boston, MA 02128

Re: RNAV Study/Block 2

Dear Ms. Corbett and Mr. Glynn:

At the November 15, 2017 public meeting concerning Block 1 of the FAA's and Massport's ongoing RNAV study, MIT Professor John Hansman invited input into Block 2 of the study. We are writing to reiterate our request, voiced by one of the undersigned during the public comment period on November 15, that Block 2 include study and testing of measures that would provide meaningful relief from airplane noise and pollution for the communities that are adversely affected by arrivals to Runways 4R and 4L.

Our representative to the Massport Community Advisory Committee, Cindy Christiansen, Ph.D., had previously requested that the three topics listed below be considered for Block 1. As you know, they were not included in Block 1, which instead focused on departures from runways 33L, 27, 15R, 22L and 22R and nighttime overwater arrivals to runway 33L. Block 1 did not address arrivals to runways 4L or 4R or other runways (other than 33L as noted). We request that the following be studied and tested during Block 2:

- (1) Test dispersion of several 4R and 4L arrival paths in a manner that provides overflight noise impacts that are comparable to pre-RNAV distribution.
- (2) Test higher altitudes and steeper glideslope for arrivals to 4R and 4L.

(3) Conduct field work so that Professor Hansman and others who are performing the RNAV study may observe the westward shift of the 4R arrivals from the centerline flight path, witness the approaches to closely spaced parallel runways that are unique to Logan Airport, and observe Milton's geography and terrain.


Because the arrival paths for the parallel Runways 4R and 4L are closely spaced, they impose a significant amount of jet noise upon people who live and work in the "sandwich area" between them. Therefore, it is impossible to test relief for the 4R arrival path alone without taking into account the impact of arrivals to Runway 4L. We believe both must be studied as part of Block 2 if the RNAV study is to have any meaningful effect upon the communities that suffer from the most used arrival paths.


Currently, Block 2 contemplates only a testing of the so-called "Canarsie approach" for Runway 4R arrivals and no testing or study for Runway 4L arrivals. We understand that the Canarsie approach for 4R could be of very limited application because it would require aircraft to be fitted with certain instrumentation and pilots to have additional training and, further, that it may adversely impact other communities that are also overburdened by airplane noise, including the Town of Hull. Thus, the Canarsie approach may not produce meaningful relief for residents of Milton and our neighbors in Dorchester and South Boston from the significant airplane noise and pollution impacts that we and others have brought to your attention over the past few years. We believe that the studies requested above will produce meaningful relief for Milton and the other communities that are affected by arrivals to 4L and 4R, and that they should be incorporated into Block 2 and given high priority.


Thank you for considering our request with respect to Block 2 of the RNAV study.

Sincerely,

Milton Board of Selectmen



David T. Burnes, Chair

Kathleen M. Conlon, Secretary

Richard G. Wells, Jr., Member

cc: U.S. Senator Edward J. Markey
U.S. Senator Elizabeth Warren
Congressman Stephen F. Lynch
Congressman Michael E. Capuano
Attorney General Maura Healey
State Senator Walter F. Timilty

State Representative William Driscoll, Jr.
State Representative Daniel R. Cullinane
Cindy L. Christiansen, Ph.D., Massport and Logan CAC Representative
Milton Airplane Noise Advisory Committee
Milton Board of Health
Milton School Committee
John P. Flynn, Esq., Milton Town Counsel
Karis L. North, Esq.

Block 2 Requests

Cindy L. Christiansen
Massport Community Advisory Committee (MCAC)
Milton Representative
Aviation Subcommittee Meeting April 18, 2018
Braintree Town Hall

Requests are followed by Justifications. Justifications are followed by slides with **Yellow** backgrounds that contain Requests and Questions we would like to have answered.

1

Requests for Block 2 Study

- 1. Dispersion studies that could benefit all approach paths at Logan and across the nation**
 - 1. RNAV Families as suggested by Dr. Tom Reynolds**
 - 2. 30-degree Angled approaches, or greater, that meet up with the straight-in at 3 nm from displaced threshold, similar to what the FAA shows it can do by the 4L RNAV Visual angled approach**
2. Increased altitudes that could benefit all approach paths at Logan and across the nation
3. Conduct field work to witness
 1. Location of approach flight paths 4R and 4L
 2. Consequences of the unique configuration at Logan that uses Closely Spaced Parallel Runways (CSPR) for approaches
4. Operational and Conformance Factors

2

Dispersion – Justifications for Request

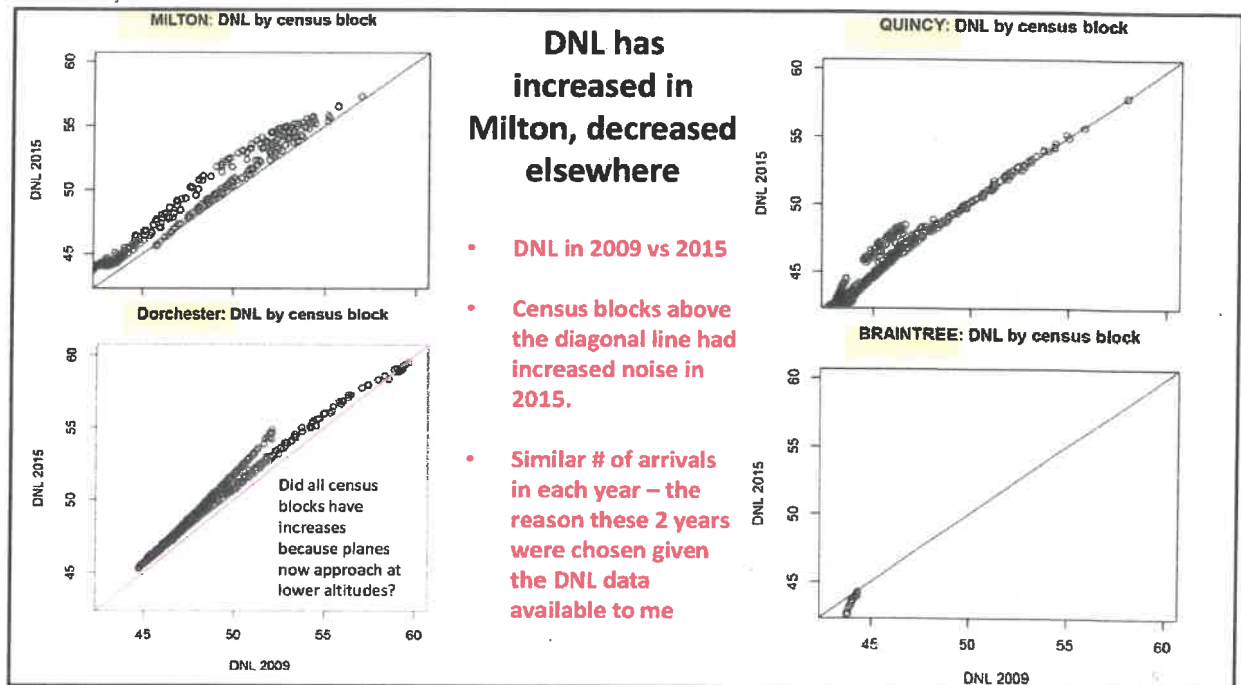
- Approach flight path concentration has been gradual, not the off/on switch like for departure paths
- FAA updated Approach Procedures to Runways 4R, 15R, 22L, 33L on 12/15/2011 that enabled RNAV/WAAS/LPV instrument approaches
- Not all aircraft were equipped to use the RNAV/WAAS/LPV instrument approaches on 12/15/2011
- **In 2013 RTCA**, a not-for-profit aviation association that serves as the 'private' in a public-private relationship with FAA, **identified WAAS as an in-progress enabler for APPROACHES.**
- **Block 1 Test Criteria were equally met by 4R/4L but residents, elected officials and I were told to wait.**
- **Although new paths and waypoints were considered "low hanging fruit" for flight paths over some communities in Block 1 work, those under 4R and 4L were told to wait for this more complex study need until Block 2. We have waited.**

3

Dispersion – Justifications for Request, continued

- Approach path concentration has occurred and complained about across the country, not just in the Boston area, e.g., BWI, DCA, SFO, SDA
- Similar to what is being studied for departures
- 2012/2013 Massport Environmental Data Report (EDR) states it is obvious that arrival paths have been concentrated (p 186)
- Approaches have been moved away from some and concentrated onto others without their consent
 - I think that changes in DNL by city/town affected by the 4's help to defend this statement – see the next 3 slides

4



DNL has increased in Milton and Dorchester, Parts of Quincy, decreased elsewhere

- **Dorchester**
 - All census blocks had DNL > 45 in 2009 and 2015
 - Fewer than 2% of the 677 census blocks had a DNL decrease in 2015 compared to 2009
 - 35% of the census blocks had an increase of 1 dB or greater, all within proximity to the 4R&L approach paths
- **Quincy**
 - 78% of the 1,078 census blocks had decreases in 2015 compared with 2009; 40% had decreases of 1 dB or greater
 - 5% of the census blocks had an increase of 1 dB or greater; these blocks are on the west side of Quincy and, like in Dorchester and Milton, are the blocks closest to the 4R approach path

6

DNL has increased in Milton and Dorchester, Parts of Quincy, decreased elsewhere

- **Milton**
 - 60% of the 405 census blocks had increases of 1 dB or greater in 2015 compared with 2009, **10% greater than 2 dB, 5% greater than 2.5 dB**, and, as in Dorchester, the greatest increases occur along the 4R&L approach paths
 - Only 0.5% of Milton's census blocks had decreases in 2015 compared to 2009, with the greatest decrease being only 0.12 dB
- **Braintree and Weymouth**
 - All the 33 census blocks in Braintree and all the 130 census blocks in Weymouth that are included in the EDR had DNL < 45 in 2009 and remained less than 45 in 2015
 - No census block in either community had an increase in DNL in 2015 when compared to 2009
 - Although all census blocks started with DNLs < 45, each decreased further in 2015 with 38% of the blocks in Braintree and 46% of the blocks in Weymouth **dropping by 1.5 dB or greater**

7

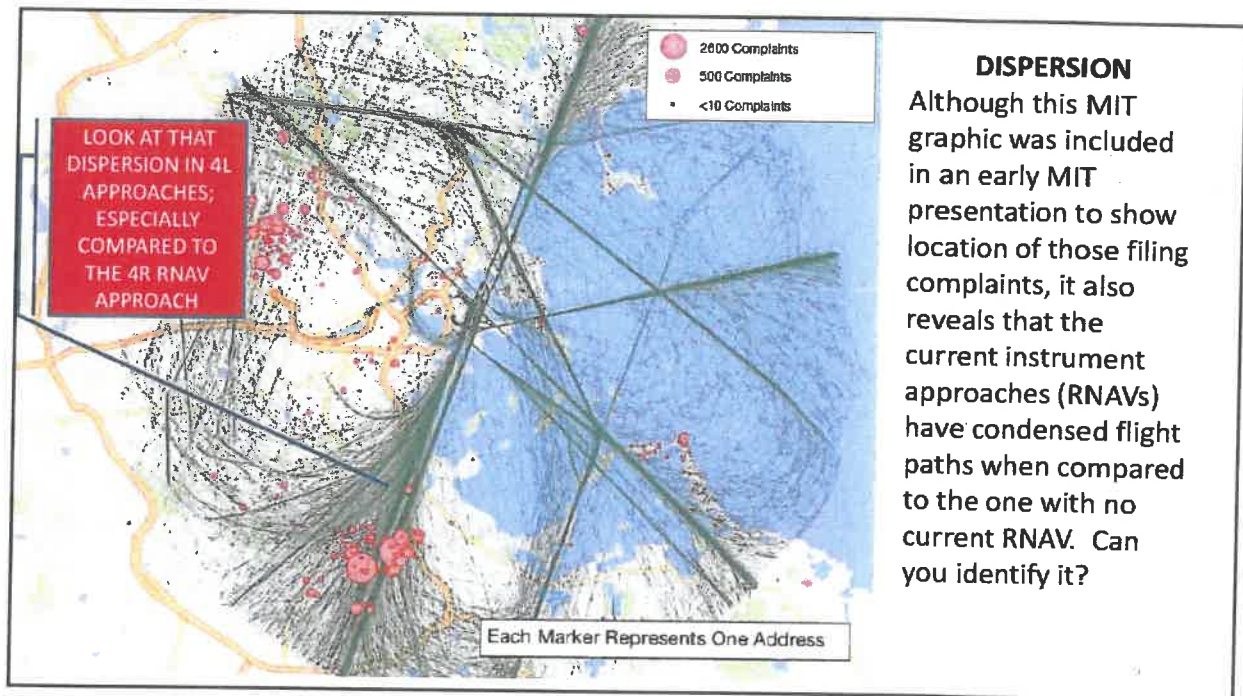
Dispersion – Justifications for Request, continued

- **Another MIT Expert has suggested a “hybrid “multi-RNAV procedure” solution**

“There has long been the idea of a **hybrid “multi-RNAV procedure”** solution where the current RNAV procedure defines the center-line track of a **family of RNAVs**, with other family members offset by 1 and 2 nmi left and right of the center-line which ultimately all converge at about a 5 nmi final for arrivals, or diverge to these families a few miles after departure. When the airport is operating in a given configuration for long periods, each individual track could be **used for an hour at a time** to spread the noise within a swath similar to what would naturally result from vectored arrivals, but still enabling benefits of optimized RNAV procedures to be achieved.”

January 13, 2016 email from Dr. T Reynolds, MIT Lincoln Labs to FAA and Dr. R.J.Hansman

8



Don't be fooled by the MIT density plots

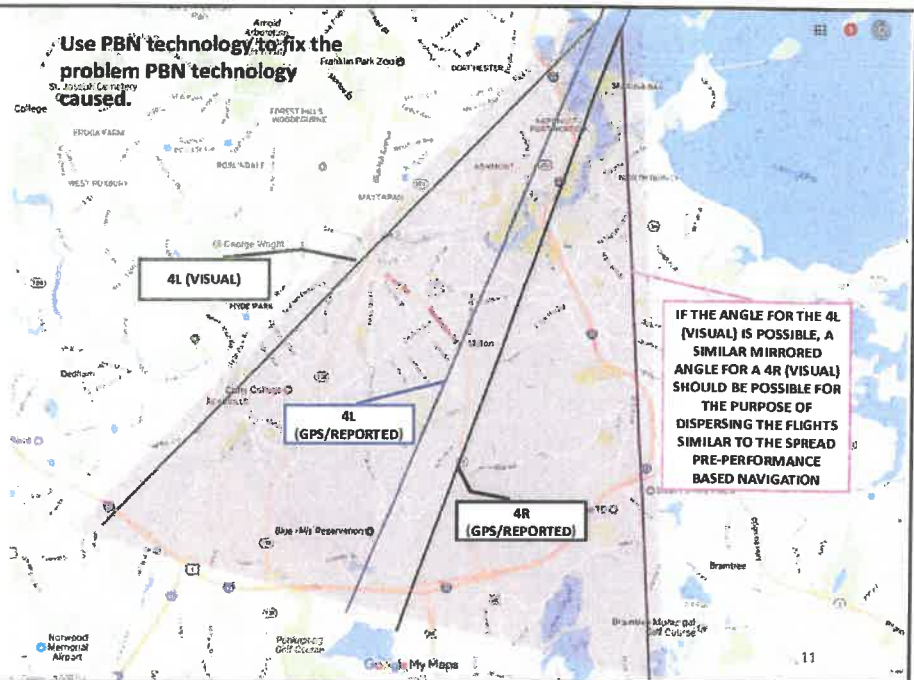
- “Red” = 9 or more fly overs/day, on average, in a year
 - 9/day is 3,300 /year
 - 139/day, like in parts of Milton, is 50,700/year
 - 3,300/year is tolerable; 50,700/year is not tolerable
- The “zoom” is so high that it masks the concentration of flights at 2000 feet and lower, like they are over Milton and Dorchester
 - Departures are higher sooner and this is less of a problem in their density plots
- Other serious, obvious mistakes put into question the quality of the work
 - For example, no information on how high a plane has to be to be counted

10

DISPERSION

Why not "strings of the harp", i.e., a "family of RNAV paths" within this triangle? We know that the FAA thinks it can have the two 4L RNAV paths shown. If these two are possible, then so are others to the east of 4R. 4L(Visual) meets up with 4R(GPS) at about 3.0 nm from the runway end.

Are greater angles at the intersection possible?
How many paths are possible?
How can multiple paths to the same runway ends be rotated?
Hourly? Daily?



Block 2 Study Requests for Approaches (not just the 4's)

Dispersion studies that could benefit all approach paths at Logan and across the nation

- RNAV Families as suggested by Dr. Tom Reynolds
 - How many RNAV approaches, along with the straight-in, are possible if one is focused on helping those on the ground?
 - How can these be rotated?
- 30-degree Angled approaches, or greater, that meet up with the straight-in at 3 nm from displace threshold, similar to what the FAA shows it can do by the 4L RNAV Visual angled approach
 - Can these be used in Instrument conditions? If not, why not?
 - Are greater angles possible if one is focused on helping those on the ground?
 - This could be helpful to approaches to 22R especially if angled approaches to the east of the approach centerline could be used (mostly over the water)

12

Block 2 Study Requests for Approaches (not just the 4's)

- **ALL WORK DONE WITH 4R APPROACHES MUST INCLUDE 4L PROCEDURES TOO**
- **Please do a better job on the density plots for approaches and provide a more appropriate version.**
 - Use a zoom level that is appropriate for the altitude of the procedure
 - When dividing the area into 1-square acre blocks, the blocks need to align with the angle of the flight path, otherwise the graphic could show more dispersion than is actually there.
 - It is inappropriate to use the categorization of 9+ as the highest grouping when some areas have fly overs in the 100+, making the graphs misleading. Please re-do.
 - When counting, one must define what counts – please do that on the requested re-done density plots

13

Requests for Block 2 Study

1. Dispersion studies that could benefit all approach paths at Logan and across the nation
 1. RNAV Families as suggested by Dr. Tom Reynolds
 2. 30-degree Angled approaches, or greater, that meet up with the straight-in at 3 nm from displace threshold, similar to what the FAA shows it can do by the 4L RNAV Visual angled approach
- 2. Increased altitudes that could benefit all approach paths at Logan and across the nation**
3. Conduct field work to witness
 1. Location of approach flight paths 4R and 4L
 2. Consequences of the unique configuration at Logan that uses Closely Spaced Parallel Runways (CSPR) for approaches
4. Operational and Conformance Factors

14

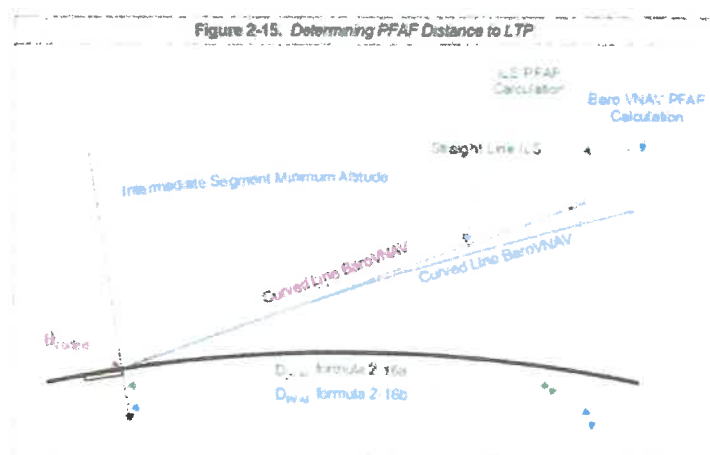
Increase Approach Altitudes – Justifications for Request

- Several changes from 2009 4R Procedure Chart compared to current Chart
 - Sidestep to 4L
 - **Final Approach Fix altitude was 1800 ft for the instrument approach and now is 1700**
- Radar based-navigation altitudes were higher
 - A change to 4r approached procedure produced, August 2011, effective 12/15/2011, same day as WAAS
 - notes a change to the FAF (MILTT) based on new use of formula 2-16b.
- Increased altitude helps all communities under approach paths, even those under the potential new dispersed RNAV family paths

15

Increase Approach Altitudes – Justifications for Request

2.13 Determining Precise Final Approach Fix/Final Approach Fix (PFAF/FAF) Coordinates (see figure 2-15).



2-46

16

Increase Approach Altitudes – Justifications for Request

- This formula is in [8260.54A - The United States Standard for Area Navigation](#) and caused the 8/11/2011 (corrected from 2001) write up of the updated 4R procedure, with effective date 12/15/2011.
- That order was cancelled 9/28/2012 and replaced with [8260.58](#)
 - **8260.58 - United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design**
- We need help from the consultants to better understand the effects caused by changes to the mathematic formulae required when FAA began its gradual switch from radar (2-dimensional) to GPS PBN (3-dimensional) navigation
- References in this slide also used [here](#) in the presentation

17

Increase Approach Altitudes – Justifications for Request

Although community input here and across the country is consistent: planes on approach are lower now and we want them higher, like they used to be. Studying steeper approach paths were rejected on “safety grounds” in Prof Hansman’s 9/28/2017 (p59) briefing:

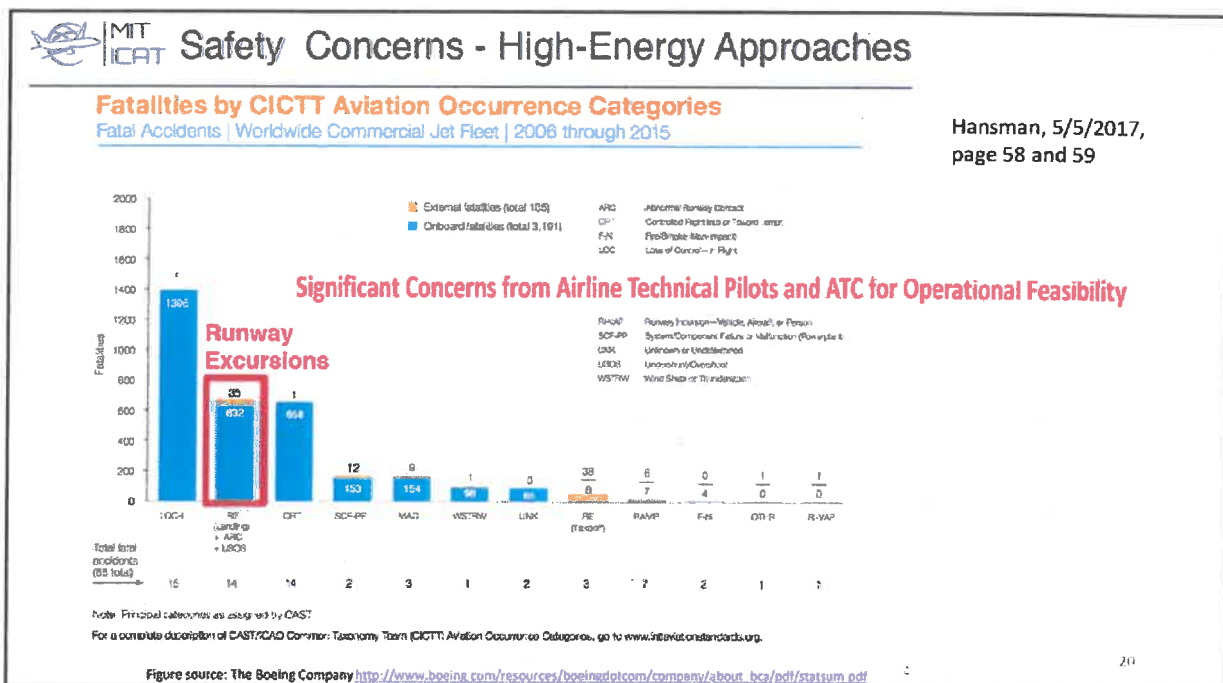
- Note: Team also reviewed and **rejected** based on environmental or **safety grounds**
 - **Steeper approaches on arrivals**
 - R4R Arrivals Expressway alignment

18

Increase Approach Altitudes – Justifications for Request

- Consultant simulated noise impact improvements from two types of steeper approaches
- Reported that higher altitudes and steeper approaches are a safety concern because of “landing excursions”
 - Landing excursions are accidents where aircraft veer off or overrun the runway due to difficulties with speed management
- Cited 14 fatal accidents over a 10-year period between 2006 and 2015 that were classified as landing excursions.
- **No other work was reported.**

19



Increase Approach Altitudes – Justifications for Request

- **Upon my review there is no documentation indicating that these 14 accidents were caused by a steep approach.**
 - **None** of the 14 accidents occurred in the **United States**. One accident occurred in each of these locations: Russia, Norway, Indonesia, Angola, Brazil, Thailand, Honduras, Sudan, Netherlands, Japan, India, Columbia, Ghana, and the Republic of Congo
 - The last 2 accidents, in Ghana in 2012 and in the Republic of Congo in 2015, involved 30-year old cargo aircraft.
 - Four of the fourteen were associated with wet runways and weather.
- **No relevant data or reference given to indicate that a steep approach is associated with runway excursions.**

21

Increase Approach Altitudes – Justifications for Request

- **No runway excursion accidents in the United States or Canada in the last 10 years even though there are many approach paths with greater than 3.0-degree glideslopes here.**
 - **San Diego's** Runway 27 is a 3.5-degree glideslope
 - **Las Vegas** Runway 1 has a 3.4-degree glideslope
 - **Van Nuys** has a 3.5-degree glideslope
 - **Toronto** has 2 runways with 3.2-degree and greater glideslopes
 - **Many others**
- **Heathrow Airport Study, 2016, *3.2° Slightly Steeper Approach Trial Report*, found**
 - No increase in missed approaches
 - No unintended consequences
 - Fewer noise complaints
 - Substantial noise reduction
 - **Contrary to pre-study pilot opinions, speed management was not a problem and was slightly improved for the higher 3.2-degree approach glideslope.**

22

Increase Approach Altitudes – Justifications for Request

“At the call two weeks ago when MIT summarized approach operations, we had a discussion about **approach angles steeper than the standard 3 degrees to mitigate noise by getting aircraft at higher altitudes at a given distance from the airport. London City Airport (LCY) is one of the airports that uses a 5.5 degree approach angle for both noise and high-rise building reasons. I could not find any specific noise analysis of steeper approaches, but I am attaching a document I wrote some years ago when working on the “Silent Aircraft Initiative” which includes background info on steeper approaches in pages 5-9. “**

December 17, 2014 email from Dr. T Reynolds, MIT Lincoln Labs to FAA and Dr. R.J.Hansman

23

Increase Approach Altitudes – Justifications for Request

• UPS Study of increased Glideslope shared by FAA

“The B767 and MD-11 were found capable of flying dual-segment steep approaches up to and including 4.00° angles with adequate margins for error. ... **Based on the study results, 4.00° is the maximum recommended angle.**”

STEEP SEGMENTED APPROACHES UPS AIRLINES – EUROPE CHIEF PILOT GROUP

FEASIBILITY STUDY, prepared by Captain Dash Roberts. Shared on March 8, 2016 in email from Christopher Dorian (FAA) to Dr. R. J. Hansman and others

24

Block 2 Study Requests for Approach Altitude (not just for the 4's)

- **Please conduct increased-altitude studies; these could benefit all those under approach paths at Logan and across the nation**
- **Please answer these questions:**
 - **If there are legitimate safety concerns, what are they and how do those concerns trump the feasible in the referenced studies if one's purpose is to reduce the burden to those on the ground?**
 - **What are the noise benefits for increase altitudes?**
 - **What are the changes to altitude caused by FAA's mathematical formula changes used for satellite navigation paths compared to radar navigation?**
 - **Did these satellite-based formula changes also affect departure altitudes?**

25

Requests for Block 2 Study

1. Dispersion studies that could benefit all approach paths at Logan and across the nation
 1. RNAV Families as suggested by Dr. Tom Reynolds
 2. 30-degree Angled approaches, or greater, that meet up with the straight-in at 3 nm from displace threshold, similar to what the FAA shows it can do by the 4L RNAV Visual angled approach
2. Increased altitudes that could benefit all approach paths at Logan and across the nation
3. **Conduct field work to witness**
 1. **Location of approach flight paths 4R and 4L**
 2. **Consequences of the unique configuration at Logan that uses Closely Spaced Parallel Runways (CSPR) for approaches**
4. Operational and Conformance Factors

26

Conduct Field Work – Justifications for Request

- Communities in Dorchester, Milton, and Quincy continue to ask that the MIT Study consultants visit the areas being flown over by the 4R and 4L approaches
- From information provided during MCAC meetings, Professor Hansman, and the CEOs of Massport and study consultant HMMH live under or in areas under 33L departures, making them familiar with that path
- Professor Hansman has expressed willingness to visit Dorchester, Milton and Quincy to several Milton residents and me

27

Conduct Field Work – Justifications for Request

- Reduced separation on a single path is disturbing; reduced separation on Closely Spaced Parallel Runways is inhumane exposure inflicted on those under and within the sandwich. Anyone recommending or allowing this should experience it first
- Data provided by Massport, one day in 2009 and one day in 2017, shows a shift in the flight path.
 - Map projection
- Even this shift does not fully explain the discrepancies reported by those directly under the flight paths.

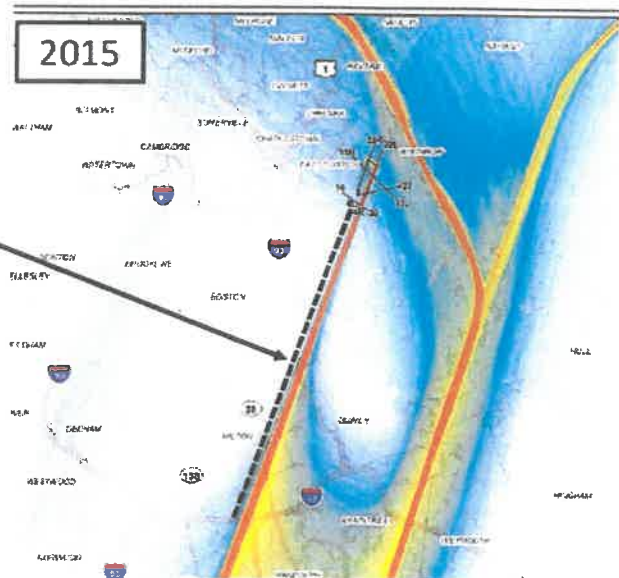
28

Why field work?

- See the shift in the actual flight paths compared with what is shown on the Massport flight monitor
 - Many in Milton report this
 - Residents in Dorchester too
- Witness the sandwich created by simultaneous approaches to 4R and 4L
 - Only configuration like this because the 22R/22L (opposite direction) have restrictions
- Observe the terrain, home/school locations
- Field work request by Milton on 5/5/2017; current request made through the Aviation Subcommittee Chair has gone unanswered

MIT
ICAT

Runway 4R Arrivals:

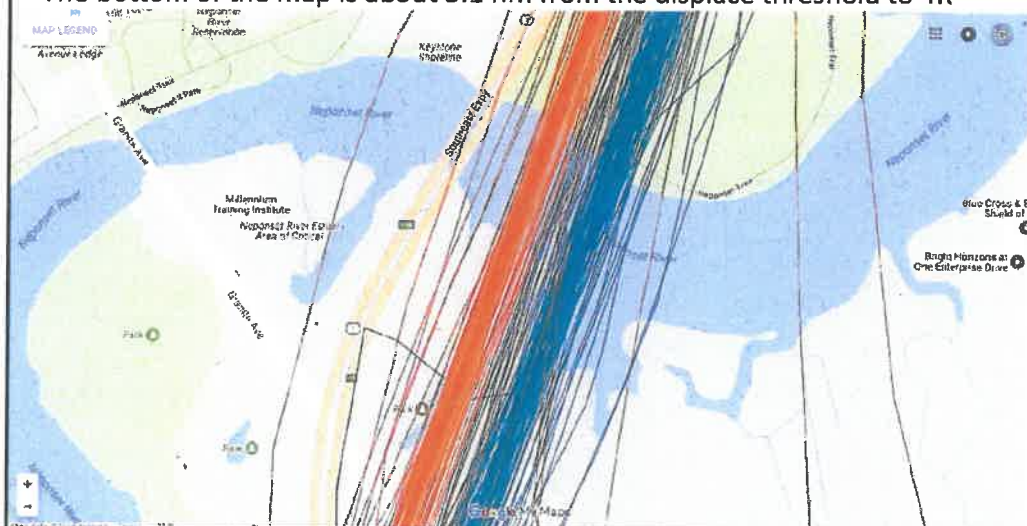


Jet Flight tracks to 4R between 3pm and 7pm

2009: 114 tracks (blue)

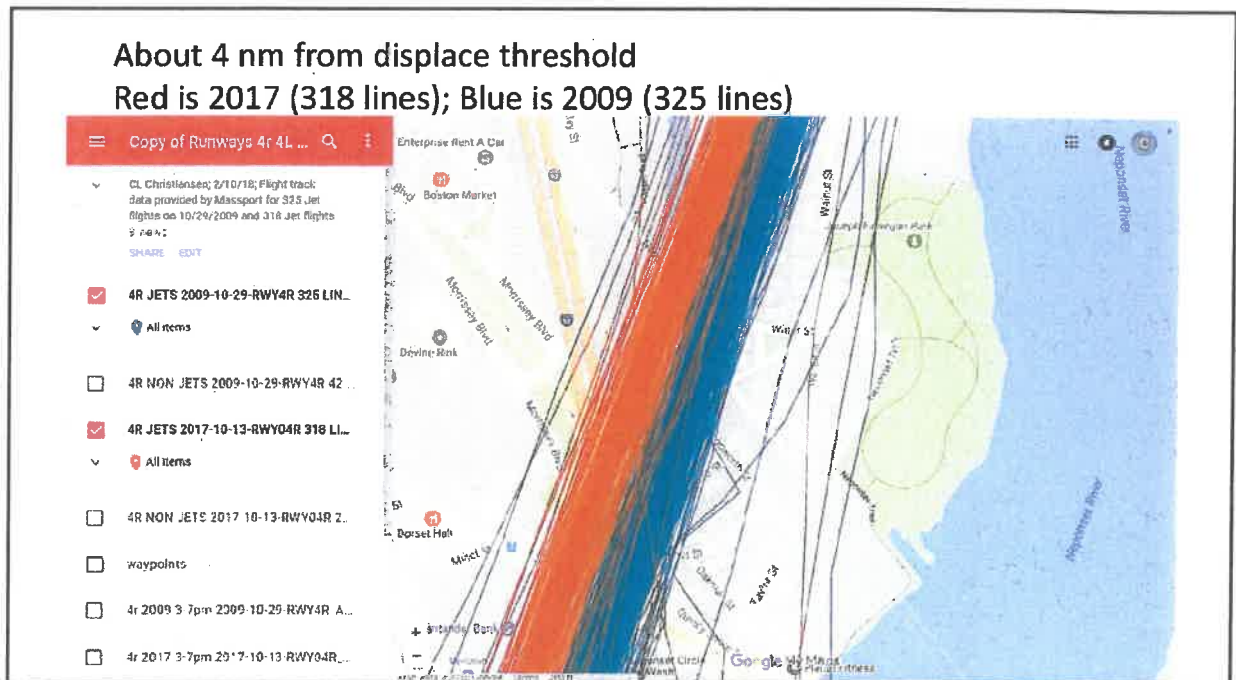
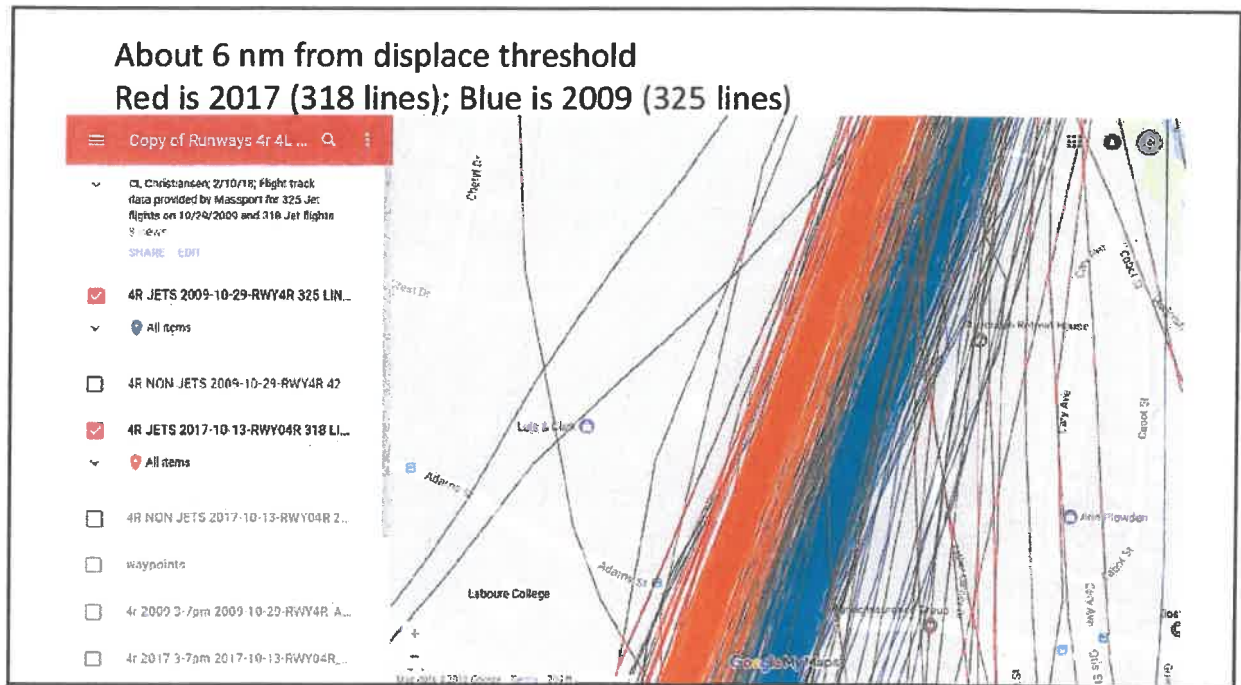
2017: 110 tracks (red)

The bottom of the map is about 5.1 nm from the displace threshold to 4R



Two Whys?

1. Why the shift?
2. Why insist that approaches have had no change when the concentration is evident when one uses an appropriate zoom level for the altitude of the planes?



Are all flight path maps off? Are exposure estimates off because of it?

My research

- Bing, Google (Massport online monitor uses Bing) Maps use Mercator Projections. Mercator
 - Distorts Latitude and longitude
 - Distorts Size and shape
- In the FAA June 2017 Charting Notice the FAA writes:
*In all volumes of the digital-Terminal Procedures Publication (d-TPP) the FAA maintained **Instrument Approach Procedure charts**, published in PDF format, now carry georeferenced encoding for geographic positioning. Coordinate readings are based on a Lambert Conformal Conic projection, NAD83 Datum, and GRS 1980 Ellipsoid.*
 - Lambert Maintains correct area
 - Unique to Approaches

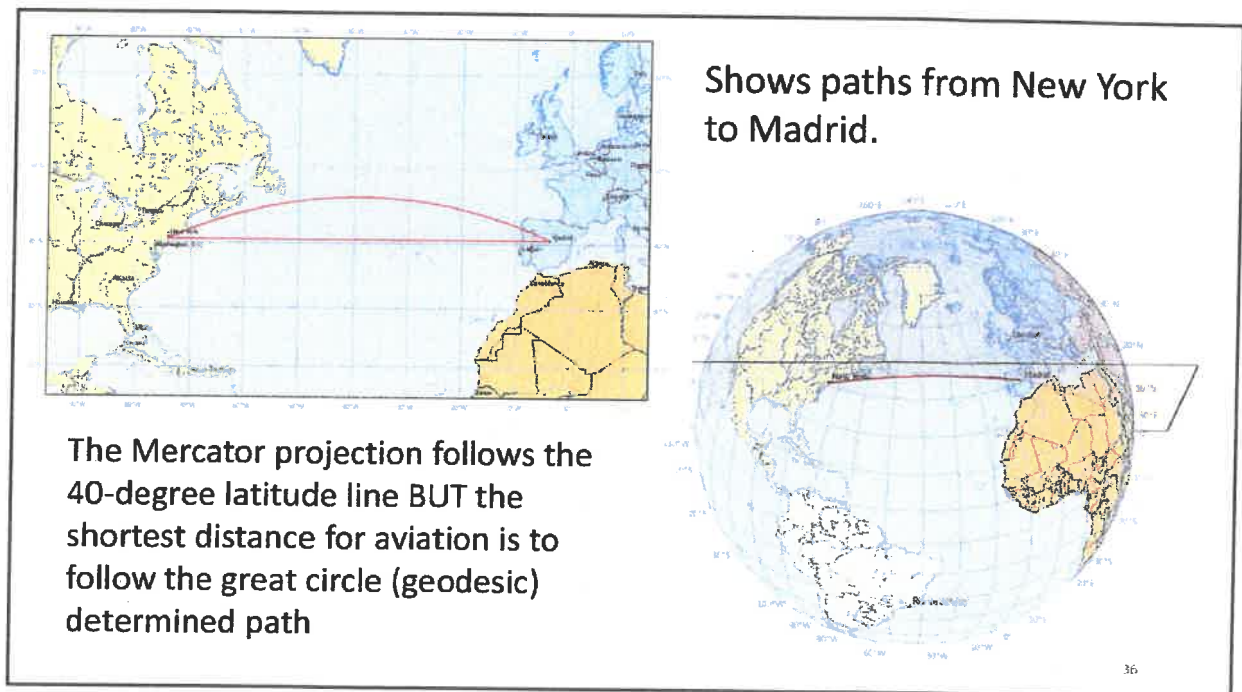
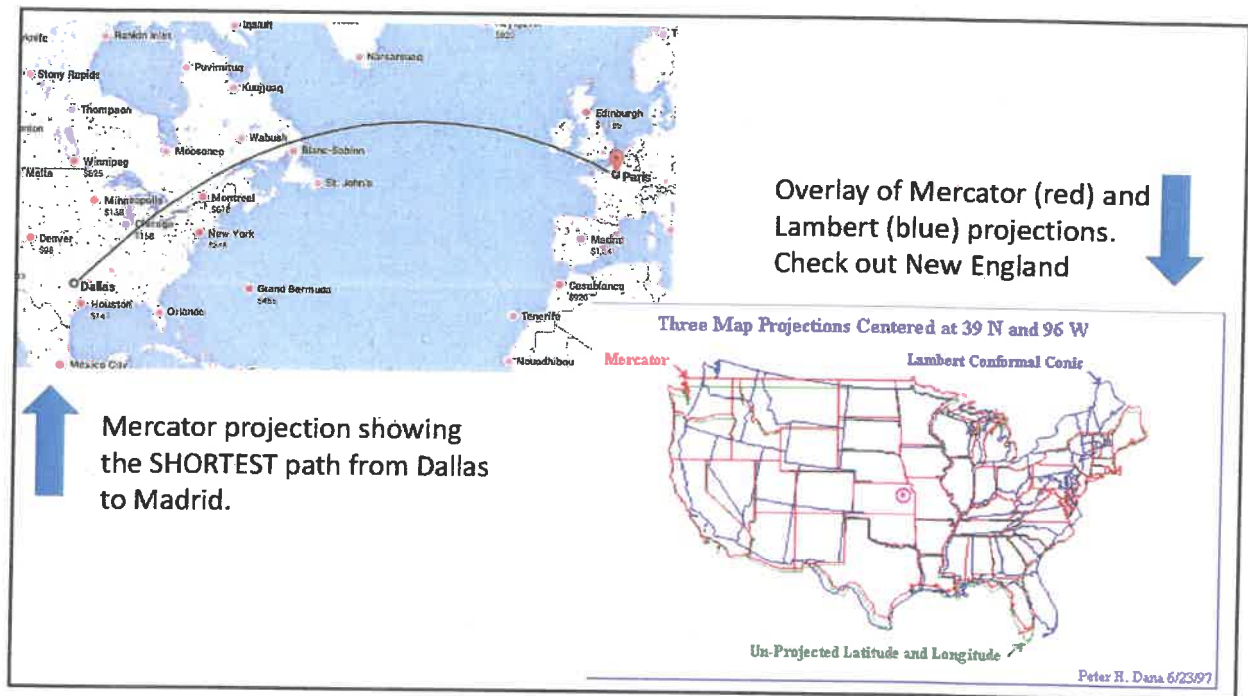
16

Are all flight path maps off? Are exposure estimates off because of it?

My research

- This relates to the change in formula for altitudes at the FAF ([see Request #2](#))
- Differences in distortion between Mercator and Lambert is more pronounced in NE/SW directions, not NW/SW so much in the New England area
- Aviation uses great circles (geodesic) as the shortest-distance flight
- Ship/boat navigation at sea often required non-distortion of compass directions
- Radar is 2-dimensional; does not include vertical needs of aviation
- GPS is 3-dimensional; includes vertical needs of aviation (as does WAAS)
- GPS navigation changed mathematical formulae for paths, altitude

34



Are all flight path maps off? Are exposure estimates off because of it?

My research; [See references in previous slide](#)

From 8260.58 - United States Standard for **Performance Based Navigation (PBN)** Instrument Procedure Design

3.1.74 Precise Final Approach Fix (PFAF). The PFAF is a calculated WGS-84 geographic position located on the final approach course where the designed vertical path (NPA procedures) or glidepath (APV and PA procedures) intercepts the intermediate segment altitude (glidepath intercept altitude). The PFAF marks the beginning of the FAS. The calculation of the distance from LTP to PFAF includes the earth curvature.

In 3.1.74, and throughout 8260.58; the person commenting had many comments that said

These references must be interpreted to mean that the applicable procedural design elements must be relative to WGS-84 or FAA-approved equivalent geographic position

Block 2 Study Requests for Field Work and Questions

- **ALL WORK DONE WITH 4R APPROACHES MUST INCLUDE 4L PROCEDURES TOO**
- **Please Schedule a time to visit and experience the 4R/L approaches in Dorchester, Milton, and Quincy**
- **Please explain the differences in flight paths shown using Massport data from 2009 and 2017**
- **Please explain changes with respect to mathematical formulae changes for altitude and flight paths caused by the switch from radar to satellite navigation**
- **Please explain the effects of these changes to people on the ground who consistently report that flights are lower (departures too) and are not following the paths shown on the monitors or maps**

38

Block 2 Study Requests for Field Work and Questions

- **What map projection and mathematical formulae (pre/post Order 8260.58) is used in:**
 - **AEDT software**
 - **HMMH density plot**
 - **ANOPP**
 - **IMN**
 - **Massport provided flight paths and profile graphs to the LCAC**
- **And what differences should we expect in paths and altitude if these map projections are different?**

39

Requests for Block 2 Study

1. Dispersion studies that could benefit all approach paths at Logan and across the nation
 1. RNAV Families as suggested by Dr. Tom Reynolds
 2. 30-degree Angled approaches, or greater, that meet up with the straight-in at 3 nm from displaced threshold, similar to what the FAA shows it can do by the 4L RNAV Visual angled approach
2. Increased altitudes that could benefit all approach paths at Logan and across the nation
3. Conduct field work to witness
 1. Location of approach flight paths 4R and 4L
 2. Consequences of the unique configuration at Logan that uses Closely Spaced Parallel Runways (CSPR) for approaches
- 4. Operational and Conformance Factors**

40

Conformance and Operational Factors – Justifications for Request

- Operational factors were studied as part of Block 1 work for departures but not for arrivals even though operational factors such as speed, flying clean, meet the stated requirements for Block 1 work. A way to correct this imbalance is to include operational factors for APPROACHES as part of Block 2 work
- Airframe noise was considered in Block 1 for departures but not for approaches
- It is well known that “flying dirty” increases noise for those on the ground.
- Since the first A/S Subcommittee meeting with the consultants on 5/5/17, the MCAC and residents have asked for simulation studies on several “what if” questions about conformance; there has been no work on this in the current study
- Hard to find any reason how studies of conformance and operational factors for APPROACHES would shift noise

41

Block 2 Study Requests Conformance and Operational Factors for APPROACHES

- **Conduct simulation studies of the effect of noise reduction when requiring approaches to 4R/L to follow the fly-over, altitude, and speed requirements in the attached supplement**
- **Conduct simulation studies of the effect of noise reduction when requiring pilots to follow “clean” approaches to the runway ends**

42

Block 2 Study Requests Conformance and Operational Factors for APPROACHES

- **Conduct simulation studies of the effect of conformance to path and altitude in the current approach procedures**
- **Report on all approach procedures known to reduce noise that are studied and reported here**
 - Civil Aviation Authority CAP1554: Review of Arrival Noise Controls

43