

Summary Boston Logan Noise Abatement and Elements of “Fly Quiet” Programs

Updated
August 4, 2017

DRAFT Version 2.0



Contents

- Overview of Noise Abatement Programs
 - BOS
 - Other airports
- DRAFT Fly Quiet Report

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Major elements of airport noise abatement programs

- On airport procedure/time restrictions
- Inflight noise abatement procedures
- Soundproofing for qualified residences/schools
- Noise Monitoring and Reporting System
 - Noise Monitors
 - Data collection and reporting
 - Live flight tracking
- Standard, periodic reporting
- Community Outreach
 - Established Noise Office
 - Complaint process (24/7 telephone, website capability)
 - Website interface
- Engagement with FAA, Airlines and Community Groups

Because of Logan's urban location, Massport has developed a comprehensive noise abatement program for Logan Airport

- Noise abatement departure procedures
- Late night runway preference opposite direction operations
- Decibel restriction on R4L departures and 22R arrivals
- Unidirectional/wind restriction use R14/32
- Soundproofing Program for Homes and School
- Engine run-up restrictions
 - Limited time
 - Specific locations
- Towing requirements for certain aircraft repositioning
- Encourage use of single engine taxiing and reverse thrust
- 24/7 noise complaint line 617-561-3333
- State of the art Noise Monitoring System
- Near live flight tracking on website
 - http://www.massport.com/environment/environmental_reporting/Noise%20Abatement/overview.aspx



BOS existing noise abatement restrictions...

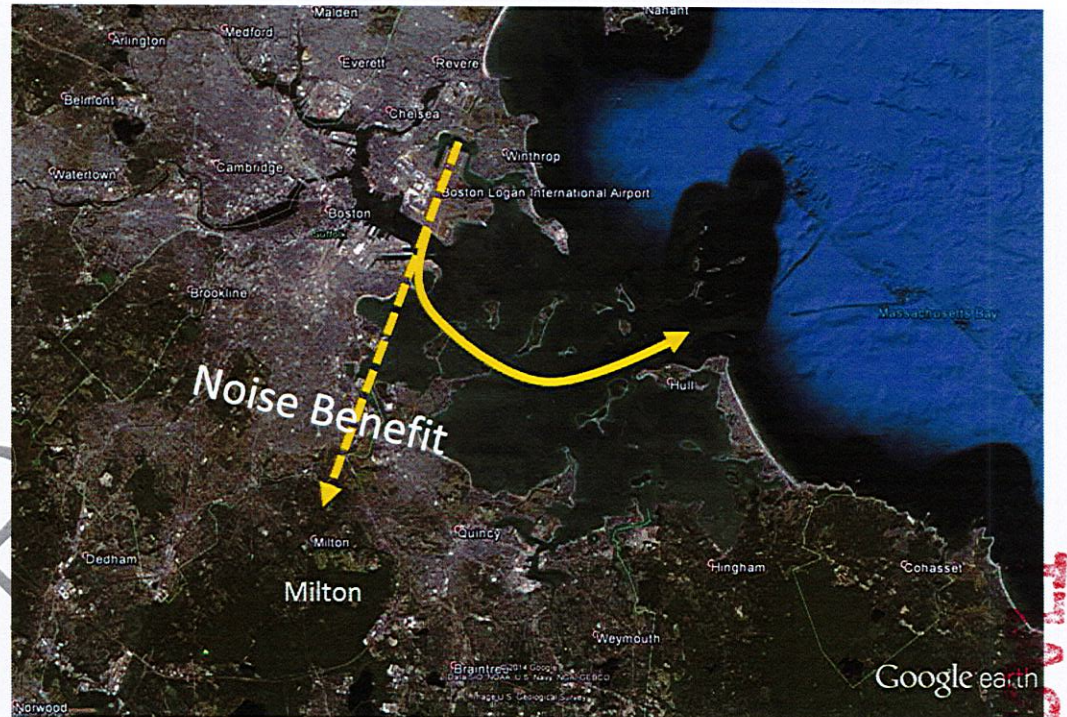


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existing noise abatement restrictions...

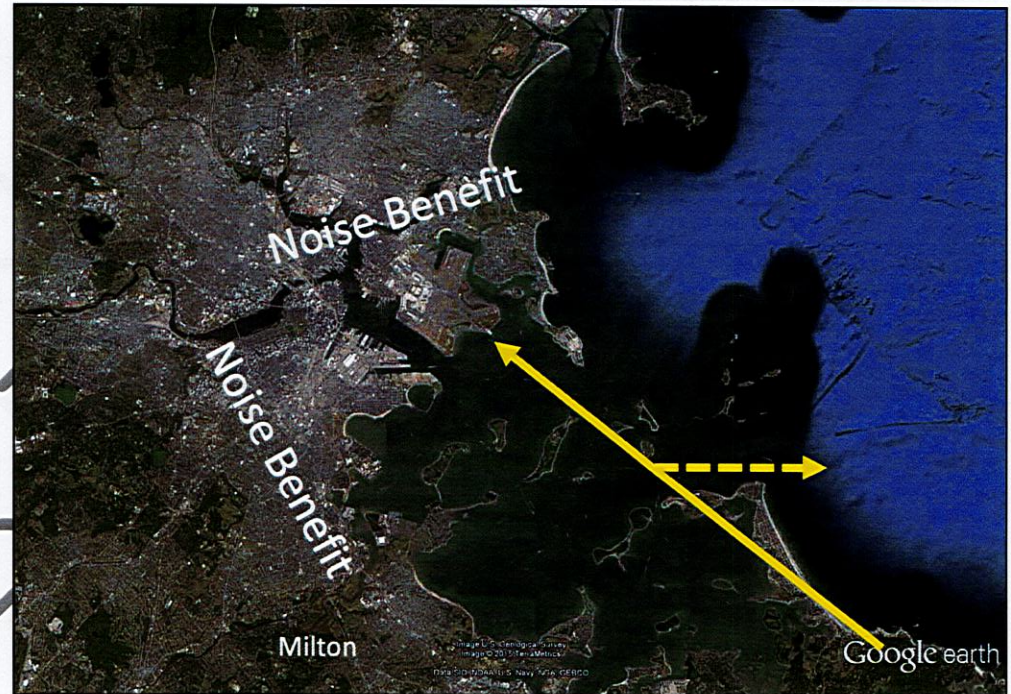
Existing noise abatement procedures benefiting communities. But these may impact other communities...

- R22R and R22L are primary SW departure runways
- Peak use is during summer periods
- Busiest departure runway flow in 2015, 34% of all departures or about 54,000 jet flights



Existing noise abatement procedures benefiting communities (cont.)

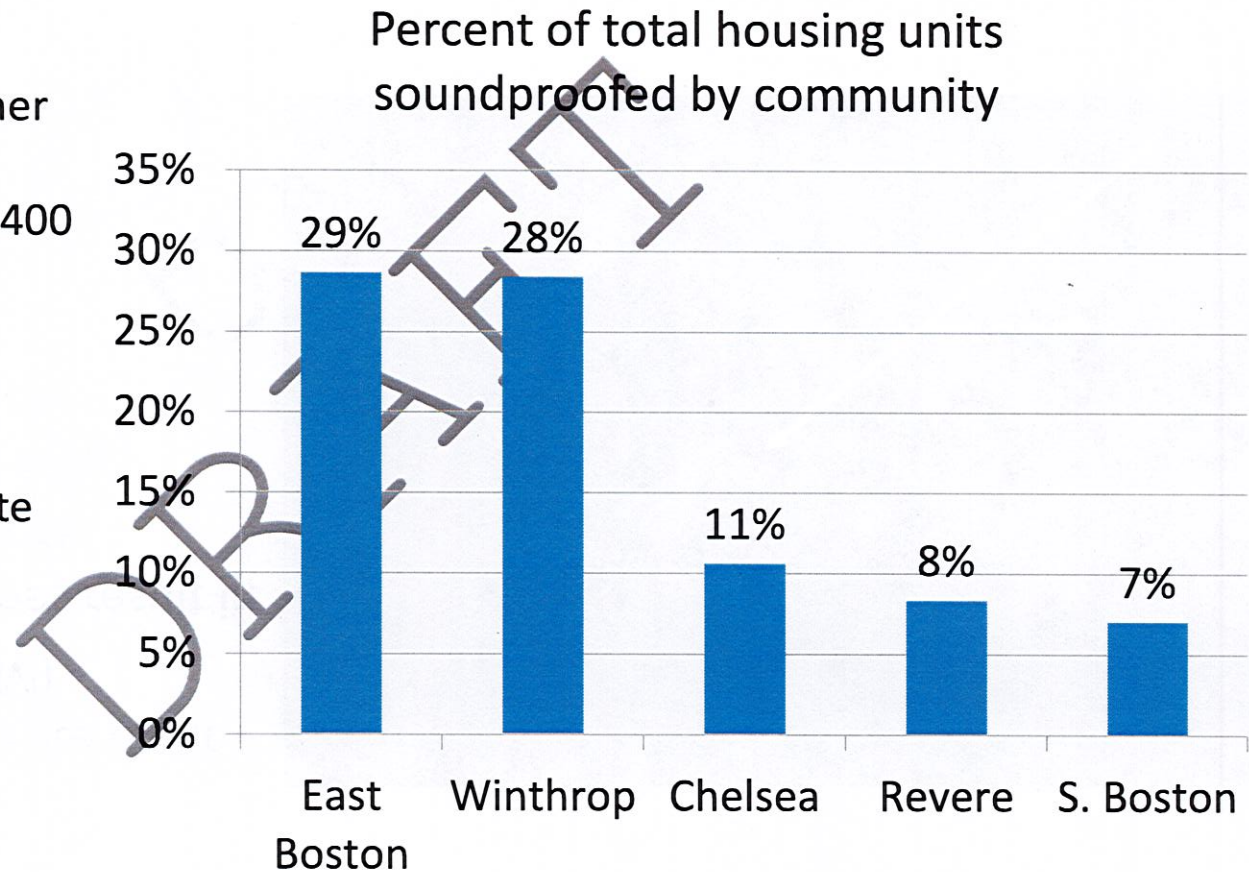
- Depart 15R, Land 33L, Late night (about midnight to 5AM)
- However, procedure does result in overflights to South Shore
- Second CAT III Runway R33L, alternative option to R4R



Begun in 1985, Massport was one of the first airports in the nation to undertake a residential and school sound proofing program

- Eligibility based on FAA criteria of 65 DNL or higher
- Over 5,400 homes or 11,400 dwelling units
- 36 schools
- Program participation rate about 90%

Community	Units Soundproofed
East Boston	4,546
Winthrop	2,364
Chelsea	1,340
Revere	1,847
S. Boston	1,241
Total	11,338



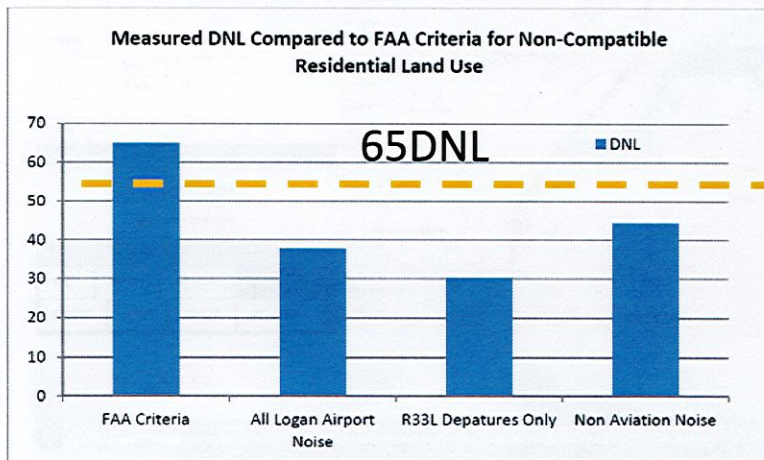
Source: 2010 Census and Massport

Noise Surveys ... (Examples)

Belmont February 22, 2014 – March 20, 2014

- All Logan Airport Noise 44.5 DNL
- R33L Departures Only 44.1 DNL
- Non Aviation Noise 45.0 DNL

Noise Survey Measurements
Brush Hill Rd, Milton

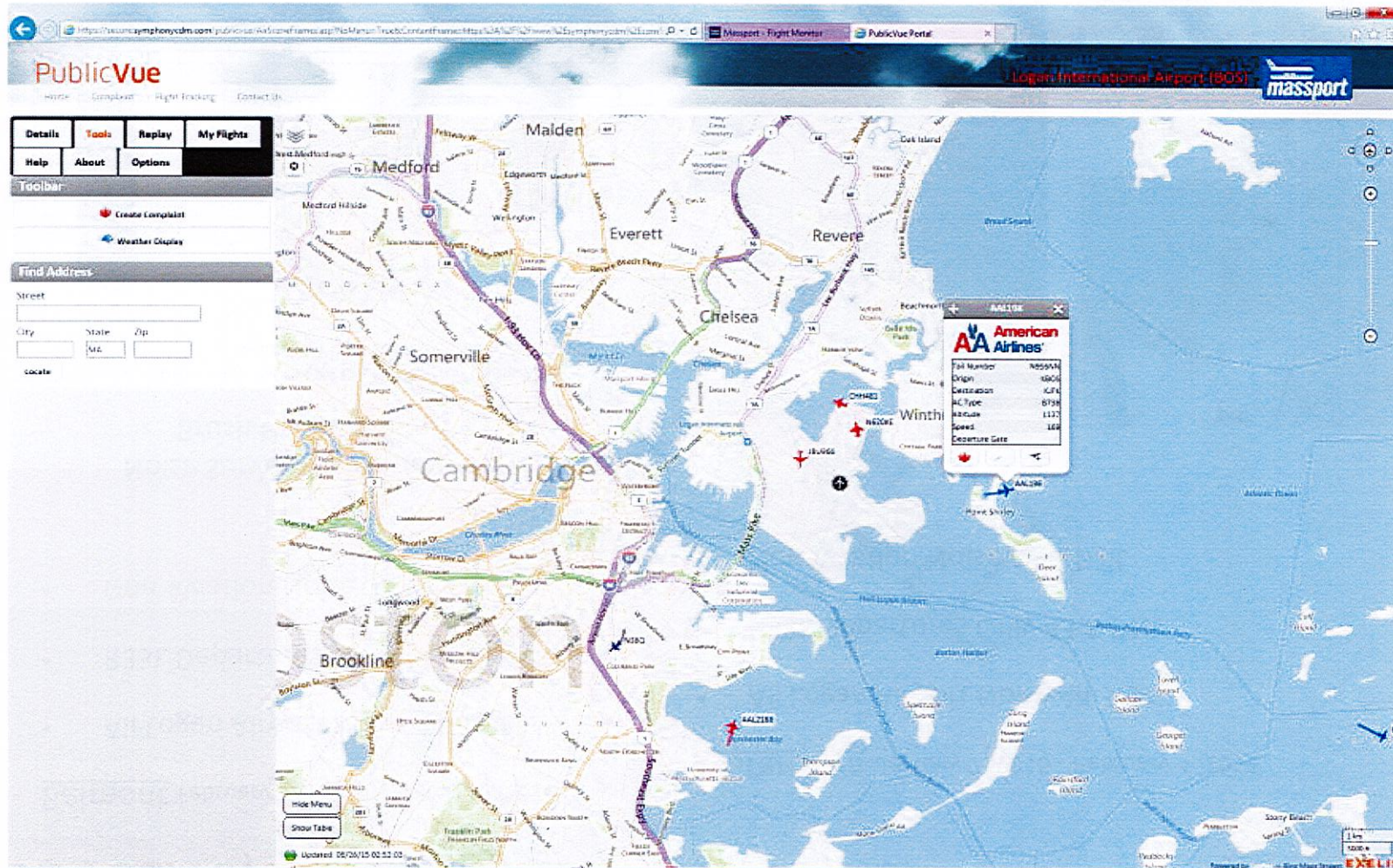


Watertown January 7, 2015 - February 4, 2015

- All Logan Airport Noise 44.3 DNL
- R33L Departures Only 43.8 DNL
- Non Aviation Noise 49.8 DNL



Live flight tracking, weather information and opportunity to file a complaint electronically



Legislated Massachusetts Port Authority CAC is composed of 35 communities with six (6) appointments allocated to Boston.

Massport is engaging with the Massport CAC on current noise issues including RNAV pilot

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- Arlington
- Bedford
- Belmont
- Beverly
- Boston (6)
- Braintree
- Brookline
- Cambridge
- Canton
- Chelsea
- Cohasset
- Concord
- Everett
- Hingham
- Hull
- Lexington
- Lynn
- Lincoln
- Marblehead
- Malden
- Medford
- Melrose
- Milton
- Nahant
- Quincy
- Randolph
- Revere
- Salem
- Scituate
- Somerville
- Swampscott
- Watertown
- Weymouth
- Winthrop
- Worcester

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Extensive data reporting to the public on Logan overflights

Massport Aviation Noise Abatement\Overflight Data Reports Regularly Produced As-of April 2015

Report	Published	Content	Frequency
Summary Runway Use	Website, EDR	Runway use by arrival/departures by runway end, jet only	Monthly on website, summarized yearly in EDR
Summary Noise Complaints by Town	Website, EDR	Number of complaints and complainants to MPA website\noise abatement line by town	Monthly on website, Yearly summary in EDR
Noise Complaint Reports	To Individual Complainants, written response is on a first come first served	Background information on how Logan works specific information on complaint.	Mailings are daily to complainants, first come first served.
Misc reports to community	Mailed directly to requestor	Flight tracks, altitude, frequency, runway use, complaint data, weather data, etc.	On request
R22R Blast Fence Report	MPA to City of Boston	Accounting of Jet Landings on R22R	Semi-Annual
Annual Operations by Aircraft Type	EDR	Aircraft Type details by arrivals, departures, day and night	Annual
Runway Use by All Operations	EDR	Runway Use by jets, non-jets, day night totaling 100% of all operations	Annual
Flight Track Monitoring Report	EDR	Summary of flight track departures, by major departure corridors, shore line crossing altitudes, compatible land use	Annually
Runway 27 Report	Emailed to Community & EDR	% and number of tracks inside corridor by gates relative to FAA requirements	Annually
Noise Contours	EDR	FAA designated 65 and 60 DNL contours	Annually
Noise Measurements	EDR	Microphone readings in communities, aircraft noise metric in decibels	Annually, Available on Request
Noise Exposed Population by community	EDR	Based on FAA designated annual noise contours, population by community	Annually
Supplemental Metrics	EDR	Time Above, Dwell/Persistence Exceedance Percentage of Operations by Airlines by Engine Category	Annually
Number of Homes/Units/Schools Soundproofed	EDR,	Updated information on annual and cumulative residences/schools soundproofed by community	Annually Available on Request
Cumulative Noise Index	EDR	Index by aircraft type, airlines, daytime and nighttime	Annually
Runway Use Test Report to CAC	CAC	Tracking current Runway Use Test, Phase Three of Noise Study	Periodically
Noise Surveys	Periodically	Noise measurements at local sites with event and flight track analysis	Periodically

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Logan Vs Seattle-Tacoma Noise Abatement Program Comparison

Logan Vs Seattle-Tacoma Noise Abatement Program Comparison

Measures (2014 Part 150)	Sea-Tac	Logan
Explore Limited Rescheduling of Nighttime Flights (voluntary)	Yes	Yes- Opposite Direction Operations (ODO) overnight
Use VOR Radials to Curb Aircraft Drifting from Noise Abatement Track (voluntary)	Yes	Yes- Now RNAVs
Maintenance Run-up Regulations	Disapproved	Yes- location and time restrictions
Preferential Runway Use (night time preferred runway configuration)	Yes	Yes (ODO, late night)
Fly Quiet Program/Fly Quiet Award	Yes	Airline Specific Noise Data Published in annual EDR
Use of FMS Procedures	Yes	Yes- RNAVs
Use of Ground Equipment	No (withdrawn)	Yes
Ground Run-Up enclosure (GRE)/ procedures to minimize run-up noise	Under Review	No GRE but run-up time and locations restrictions
Expand the Fly Quiet Program	Underway	BLANS and future with MPA CAC
Sound Insulation of Homes and Schools	Implemented	Implemented
Property Acquisition/Easement /Compatibility Planning (65DNL)	Implemented	Boston area fully developed
Initiate a formal study to evaluate the noise levels at churches/places of worship located within the modified Noise Remedy Boundary for eligibility for sound insulation.	Approved	Residential and School Soundproofing, special noise studies for overwater and hill effects completed
Evaluate and Upgrade Noise Monitoring and Flight Tracking Systems	Approved	Implemented
Periodically review and, if necessary update the Noise Exposure Maps (NEMs) and the Noise Compatibility Program (NCP)	Approved (Every 5 years or as needed)	Implemented- Annual EDR
Continue to Operate the Noise Office	Yes	Yes- est. 1975

Other Comparisons (cont.)	Sea-Tac	Logan
Operations Review and NEM Updates	Yes	Yes
Monthly Reports	No	Yes- RW Use/Complaints by Town
CAC Meetings	Yes	Yes/MPA CAC, (Logan CAC through BLANS)
Yearly Environmental Report (EDR)	No	Yes
Off Hours Complaint (E-mail, voicemail)	Yes	Yes
Airport Flight Tracker	Yes	Yes

Other Comparisons	Sea-Tac	Logan
Runways	3 (parallel)	6 (multiple intersections)
Aircraft Operations (2015)	381,408	372,928
Most Utilized dep/arr RW (2016)	65%-70% South Flow	RW4R arrivals: 33.9% RW22R Departures: 31.8%
Restrict Taxiing of Aircraft to/from Maintenance Areas during Nighttime Hours	Not Implemented	Yes- towing requirement

Comparison Between Boston Logan and London Heathrow		
	London Heathrow	Boston Logan
Passengers (2014)	73,400,000	31,634,445
Flights (2014)	470,695	363,797
Pax per flights	156	87
Pop in 65Dnl	42,000	4,300
Soundproofing/Schools	Yes	Yes/35
Soundproofing/Homes	Yes	Yes/11,000
Soundproofed Windows	50% covered	Free
Curfew	No	No
Night Time Restrictions (23:00 to 07:00)	Yes	Yes
Run Up Restrictions	Yes	Yes
Towing Requirements	Yes	Yes
Decibel Restrictions on Runways		Yes
Electric Power at Gates	Yes	Yes
Noise Abatement Office	Yes (Community Relations)	Yes
Noise Monitors	12	30
24/7 Complaint Line	Yes	Yes
On-line Flight Tracking	Yes (1 day delay)	Yes (10 minute delay)
Noise Based Fees	Yes	Yes (late night Stage 2 only)
Noise Abatement Turns	Yes	Yes
3 Degree Glide Slope	Yes	Yes
Predominant RWS used (2014)	27L/R (70%)	4R/9 (30%)
Number of Runays	2	6
Short Haul Jets	64%	96% (includes non-jets)
Wide-body Twin Jets	25%	3%
Wide-body 3-4 Engine Jets	11%	1%
% of fleet that meets Stage 4 Requirements (2012)	97.6%	95.8%
% of fleet that meets Stage 4 Requirements (2013)	98.1% (+0.5%)	97.4% (+1.6%)

Stage 2 only, no longer needed.
Late night Rnwy pref.

Stage 2 only, no longer needed.
Late night Rnwy pref.

Source: Massport, heathrowairport.com/noise

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Fly Quiet Programs: SEA

ENV HOME | AIR QUALITY & ENERGY | AIRPORT NOISE | ENV DOCS | MATERIALS MGMT | SITE CLEAN-UP

WATER, WETLANDS, WILDLIFE

Noise Abatement

- Flight Patterns
- Procedures
- Aircraft Monitoring System
- Aircraft Engine Maintenance Run-ups
- Fly Quiet
- Noise Comment Form

Fly Quiet Awards

The Port of Seattle recognized three airlines with its annual Fly Quiet Awards. The awards honor airlines for their efforts in noise reduction and abatement programs at Seattle-Tacoma International Airport for the year 2016.

Congratulations to....

2016 Fly Quiet Awards

Sea-Tac Airport honors three airlines for using noise abatement procedures and quieter aircraft to reduce noise.

Southwest

Jazz

Virgin America

CONGRATULATIONS!

SEATTLE-TACOMA INTERNATIONAL AIRPORT
Port of Seattle

Fly Quiet Bravo Award – Southwest Airlines

Awarded to the quietest airline among the top five carriers at Sea-Tac.

Southwest operates a modern fleet of Boeing 737 aircraft. This is their 1st Fly Quiet Award. Southwest maintains a busy daily schedule while operating with noise levels consistently lower than competing airlines and doing a remarkable job at flying the noise abatement procedures correctly.

Fly Quiet Award – Virgin America

Awarded to the quietest airline with at least 1,000 annual jet operations at Sea-Tac.

Virgin America operates a modern fleet of quiet Airbus A320 aircraft. This is 6th time Virgin has received a Fly Quiet Award.

Virgin continues to be recognized due to their combination of quiet operations and strong adherence to flight procedures and abatement measures.

Fly Quiet Regional Airline Award – Jazz Aviation

Awarded to the quietest regional airline with at least 360 annual jet operations at Sea-Tac.

Jazz Aviation operates the quiet Canadair Regional Jet (CRJ). This is their 7th award overall, which is the most of any airline since the Fly Quiet Awards began in 2005.

Jazz Aviation's successful track record is due in part to operating a fleet of quiet and modern regional jets that adhere to strict noise abatement efforts and near flawless flight procedures.

PRESS RELEASE
Read more about the program.
[MORE INFO](#)

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Fly Quiet Programs: ORD

Chicago O'Hare International Airport



On June 17, 1997, the City of Chicago announced that airlines operating at O'Hare International Airport had agreed to use designated noise abatement flight procedures in accordance with the Fly Quiet Program. The Fly Quiet Program was implemented in an effort to further reduce the impacts of aircraft noise on the surrounding neighborhoods.

The Fly Quiet Program is a voluntary program that encourages pilots and air traffic controllers to use designated nighttime preferential runways and flight tracks developed by the Chicago Department of Aviation (CDA) in cooperation with the O'Hare Noise Compatibility Commission, the airlines, and the air traffic controllers. These preferred routes are intended to direct aircraft over less-populated areas, such as forest preserves, highways, as well as commercial and industrial areas.

As part of the Fly Quiet Program, the CDA prepares a Quarterly Fly Quiet Report. This report is shared with the O'Hare Noise Compatibility Commission, the airlines, the Federal Aviation Administration and the general public. The Fly Quiet Report contains detailed information regarding nighttime runway use, flight operations, flight tracks, and noise complaints and 24-hour tracking of ground run-ups. The data presented in the Fly Quiet Report are compiled from the Airport Noise Management System (ANMS) and airport operation logs.

This document was prepared in consultation with the O'Hare Noise Compatibility Commission.

- Preferential Runway Use Configurations
- Arrival and Departure Procedures
- Ground Run-Up Locations
- Airport Layout Diagram
- Land Use
- Outreach

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This page was updated in November 2015

Visit the O'Hare Noise webpage at www.flychicago.com/ORDNoise

Boston Logan International Airport **DRAFT** Operational Overview and Fly Quiet Report, Q1 2017



WORKING DRAFT V1.0
As of July 31, 2017



Operational Update

Overview of Noise Complaints

Flight Tracks Information

Aircraft Type Report

Noise Abatement Program Overview

Informational Update

INSERT

Information Update to Communities, including construction update, unusual weather events during period...

Highlights for the 1st Quarter 2017

Arrivals	Departures
Total: 38,881	Total: 38,819
% Change from 4Qtr '16: +03%	% Change from 4Qtr '16: +03%
% Change from 1stQ '16:	% Change from 1stQ '16:
Most used Arrival Runway: 27 – 11,326 / 29.1%	Most used Departure runway: 33L – 10,889 / 28.1%
Most Common Wind Direction: W/NW (37%)	

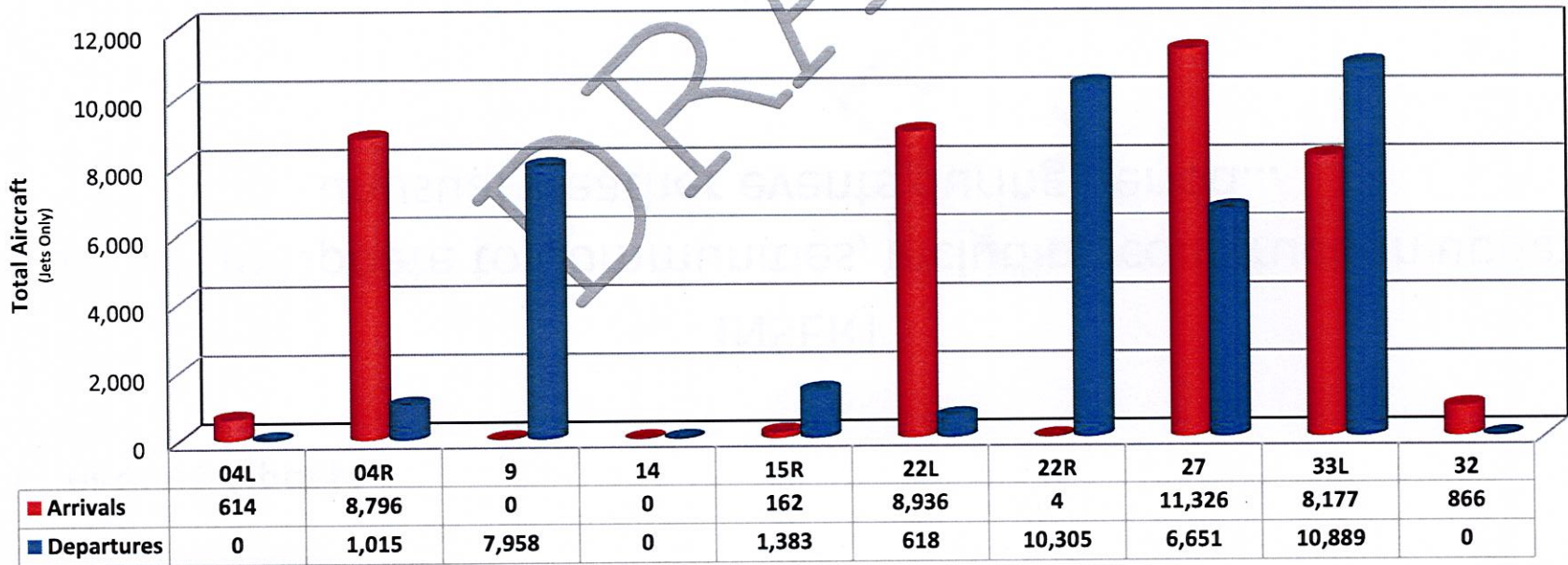
Operational Update

Boston Logan International Airport

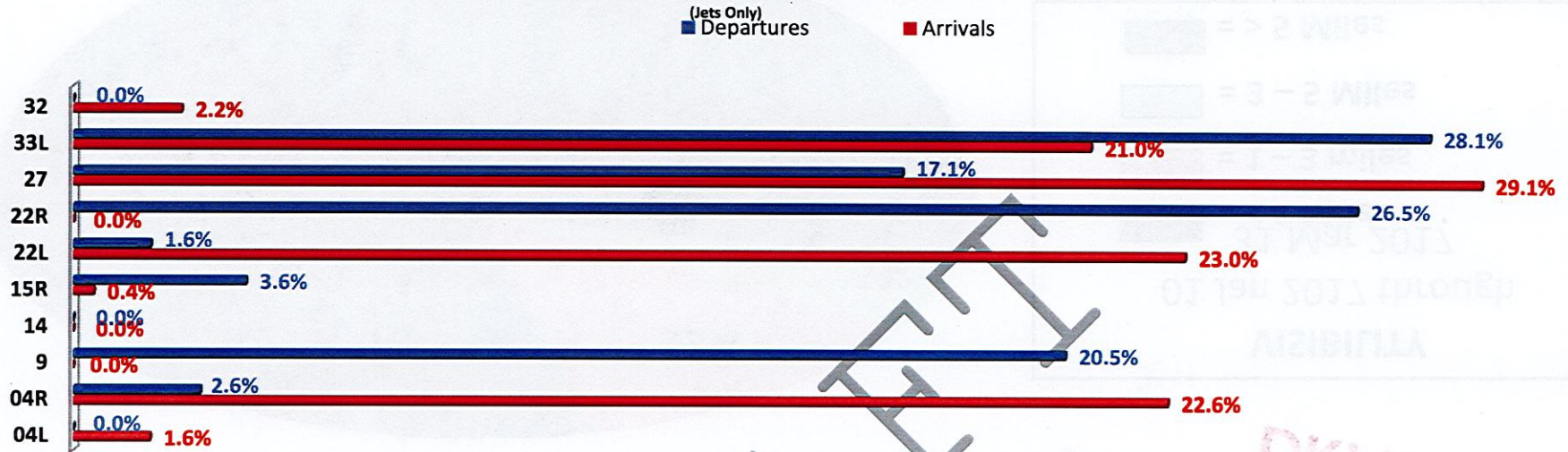
Runway Use (Jets Only)

2017 Jet	YTD		January		February		March	
	Arv	Dep	Arv	Dep	Arv	Dep	Arv	Dep
04L	614	0	104	0	114	0	396	0
04R	8,796	1,015	3,420	382	1,300	186	4,076	447
9	0	7,958	0	2,858	0	1,308	0	3,792
14	0	0	0	0	0	0	0	0
15R	162	1,383	0	502	129	457	33	424
22L	8,936	618	3,386	268	3,500	219	2,050	131
22R	4	10,305	0	3,768	4	4,193	0	2,344
27	11,326	6,651	3,491	2,255	3,817	1,883	4,018	2,513
33L	8,177	10,889	2,326	2,884	2,571	3,415	3,280	4,590
32	866	0	211	0	252	0	403	0
Total	38,881	38,819	12,938	12,917	11,687	11,661	14,256	14,241

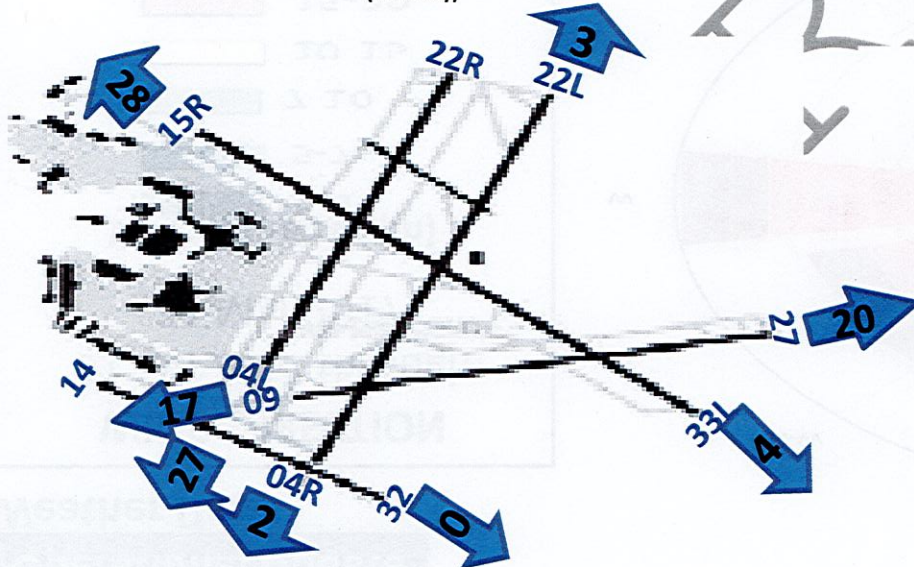
1st Quarter 2017 Runway Use



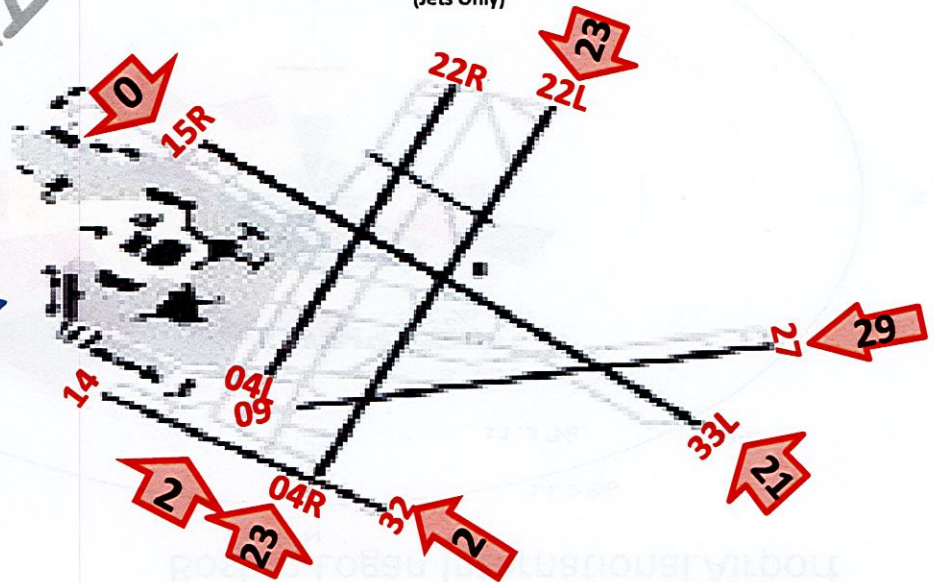
1st Quarter 2017 Runway Use



Percentage Departures
1st Quarter 2017
(Jets Only)

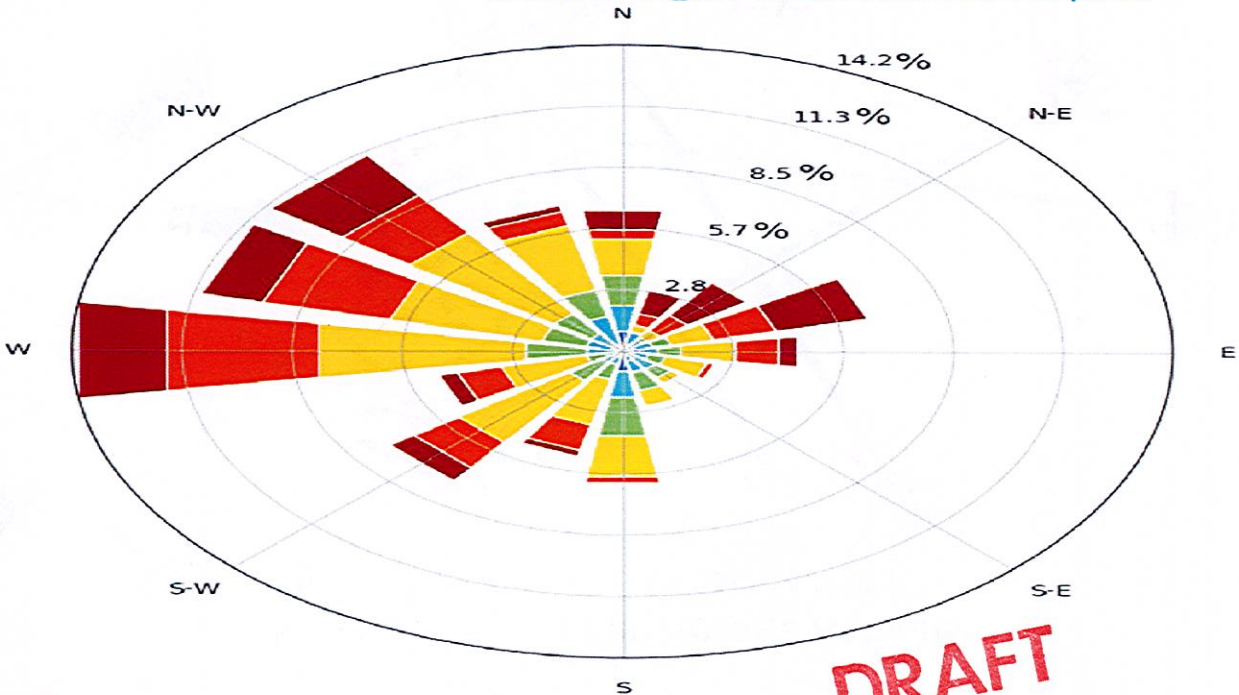
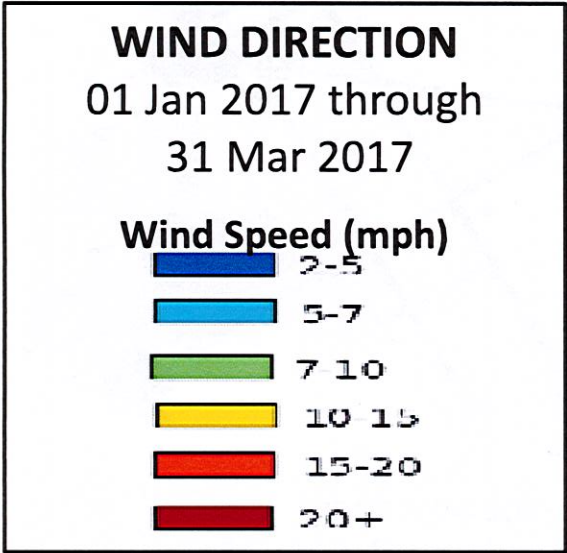


Percentage Arrivals
1st Quarter 2017
(Jets Only)

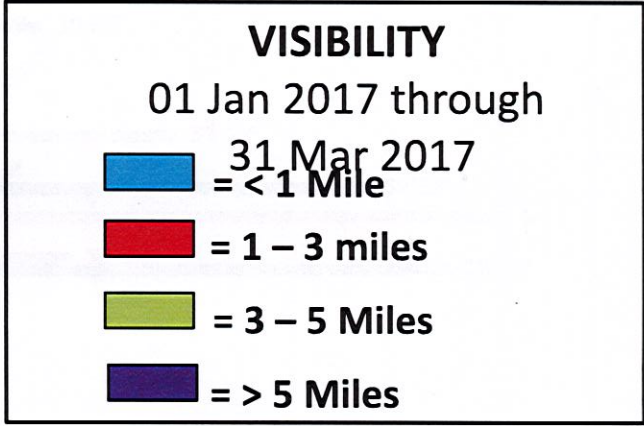
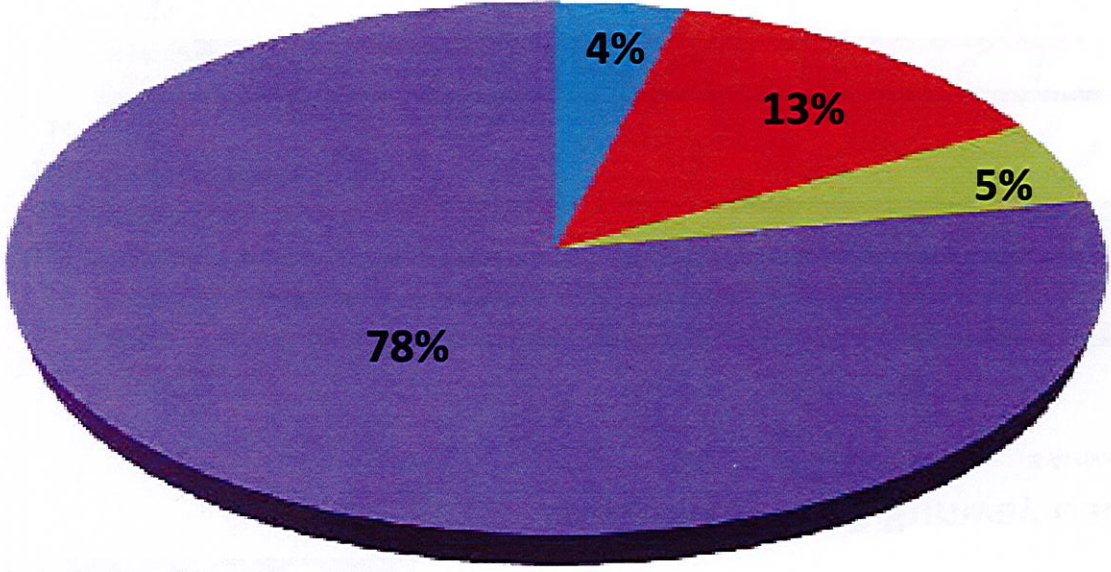


Operational Update
Weather Data

Boston Logan International Airport



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Operational Update

Flight Tracks

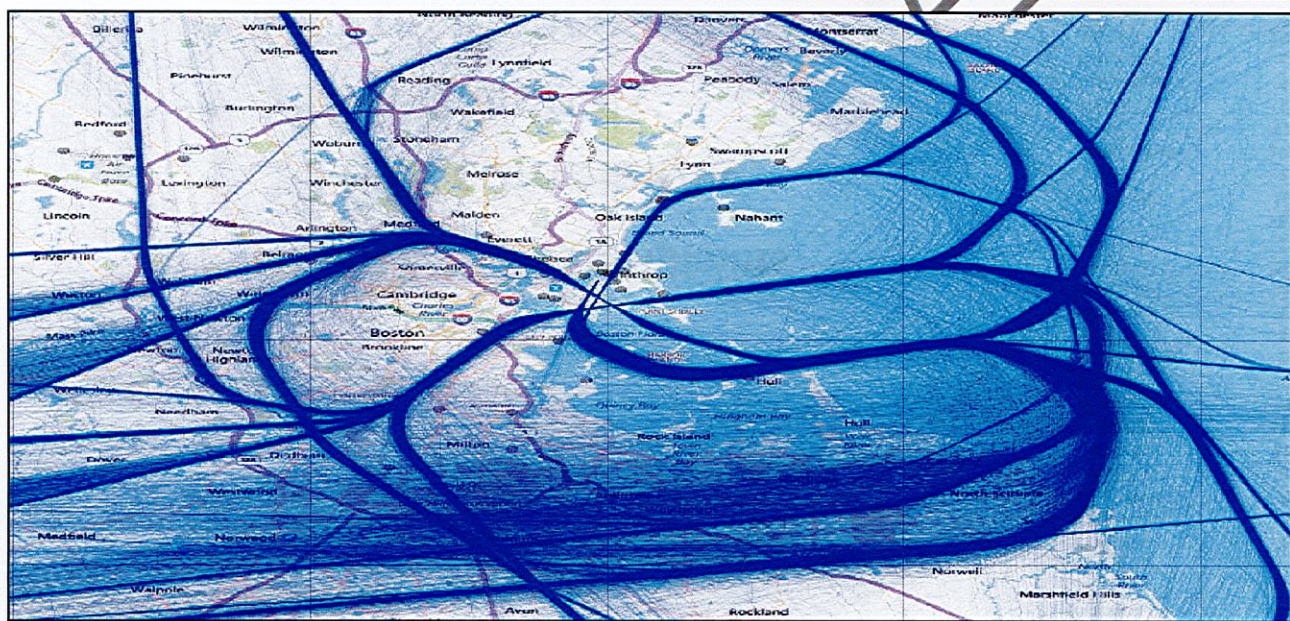
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Arrival Flight Tracks

01 Jan 2017 through
31 Mar 2017

(38,392 Tracks)

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Departure Flight Tracks

01 Jan 2017 through
31 Mar 2017

(38,905 Tracks)

Noise Complaints

Q1 2017, Noise Complaints

- 10,873 complaints
- 758 individuals
- 680 residences
- 59 communities.

DBALL

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Community	Calls	Residences
Arlington	707	42
Belmont	135	15
Beverly	1	1
Boston	36	25
Braintree	2	1
Cambridge	331	26
Charlestown	2	2
Chelsea	9	7
Cohasset	32	2
Dorchester	189	8
East Boston	33	13
Everett	13	2
Framingham	2	1
Groton	3	1
Groveland	1	1
Hamilton	31	16
Hingham	26	9
Holbrook	1	1
Hull	205	52
Hyde Park	16	6
Ipswich	2	2
Jamaica Plain	193	32
Lynn	47	3
Malden	1	1
Marblehead	4	1
Marshfield	1	1
Medford	249	37
Melrose	3	1
Millis	73	1
Milton	6,644	158
Nahant	26	4
Needham	8	1
Newton	26	2
Norwell	4	3
Peabody	8	1
Quincy	5	4
Randolph	1	1
Revere	21	13
Roslindale	171	20
Roxbury	165	15
Salem	2	2
Shirley	1	1
Somerville	381	32
South Boston	638	15
South End	196	46
Stoneham	1	1
Stoughton	2	1
Sudbury	25	1
Watertown	36	9
Wenham	48	7
West Groton	1	1
West Roxbury	3	1
Westwood	29	2
Weymouth	18	5
Whitman	1	1
Winchester	24	3
Winthrop	33	18
Woburn	5	1
Totals:	10,871	680
Communities:		59

Noise Complaints

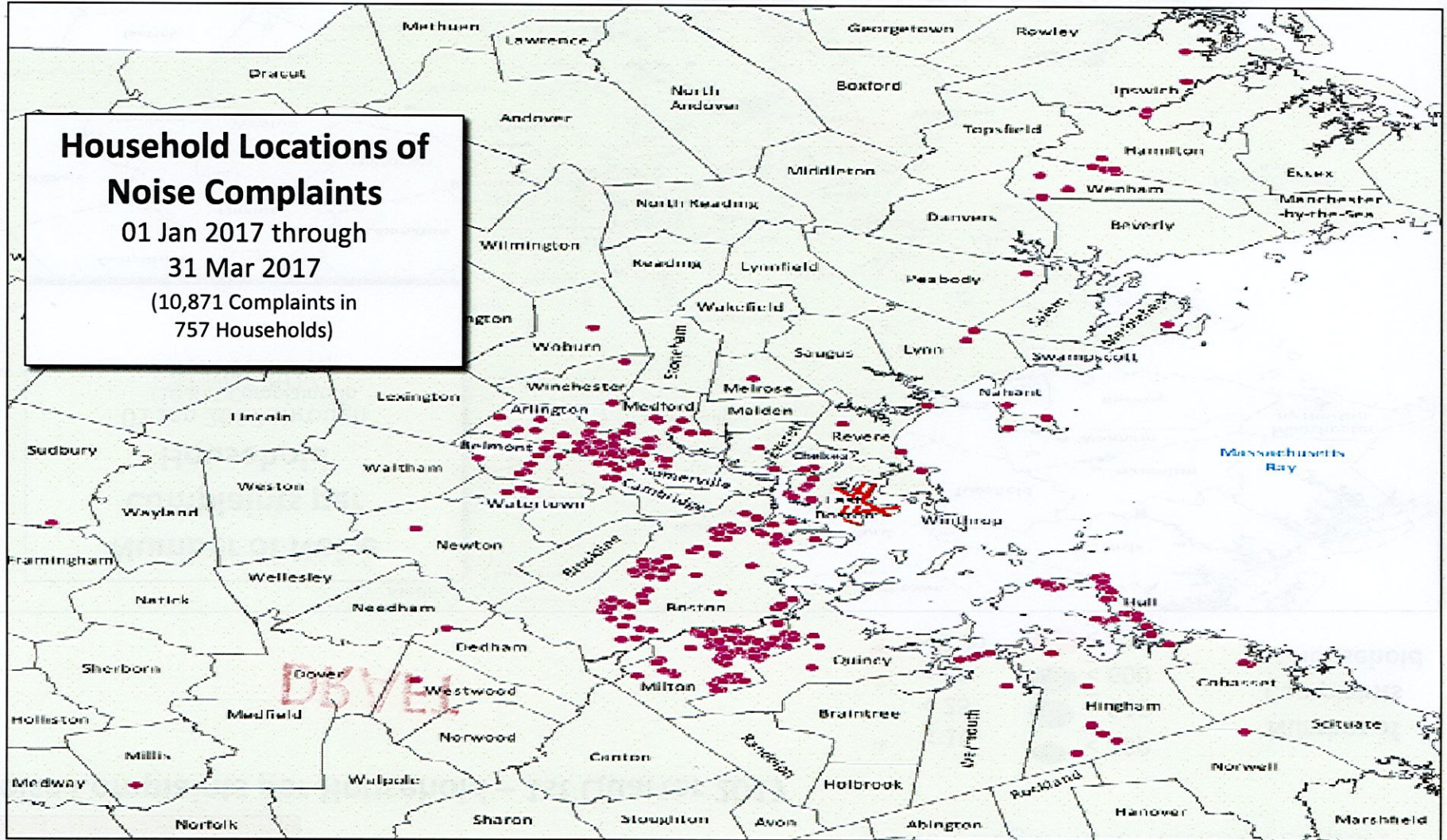
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Noise Complaint Locations – 1st Quarter 2017

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Household Location of Complaints

Runways

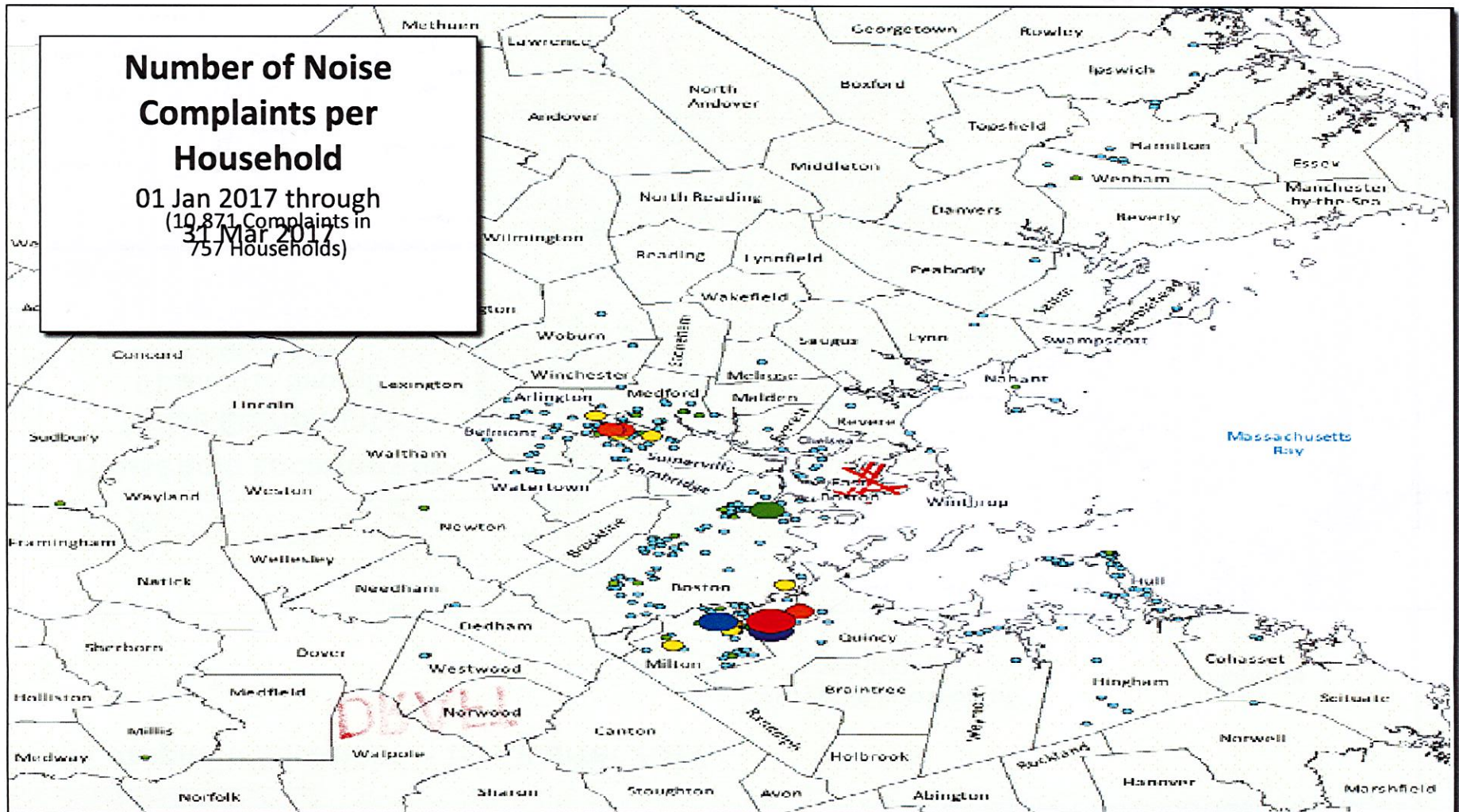
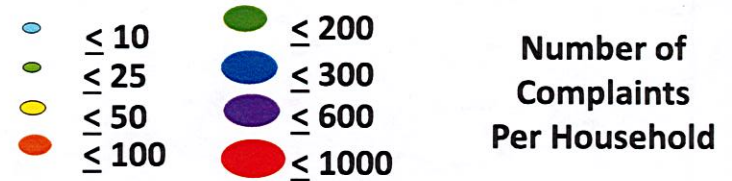


Noise Complaints

Boston Logan International Airport

Noise Complaints per Household – 1st Quarter 2017

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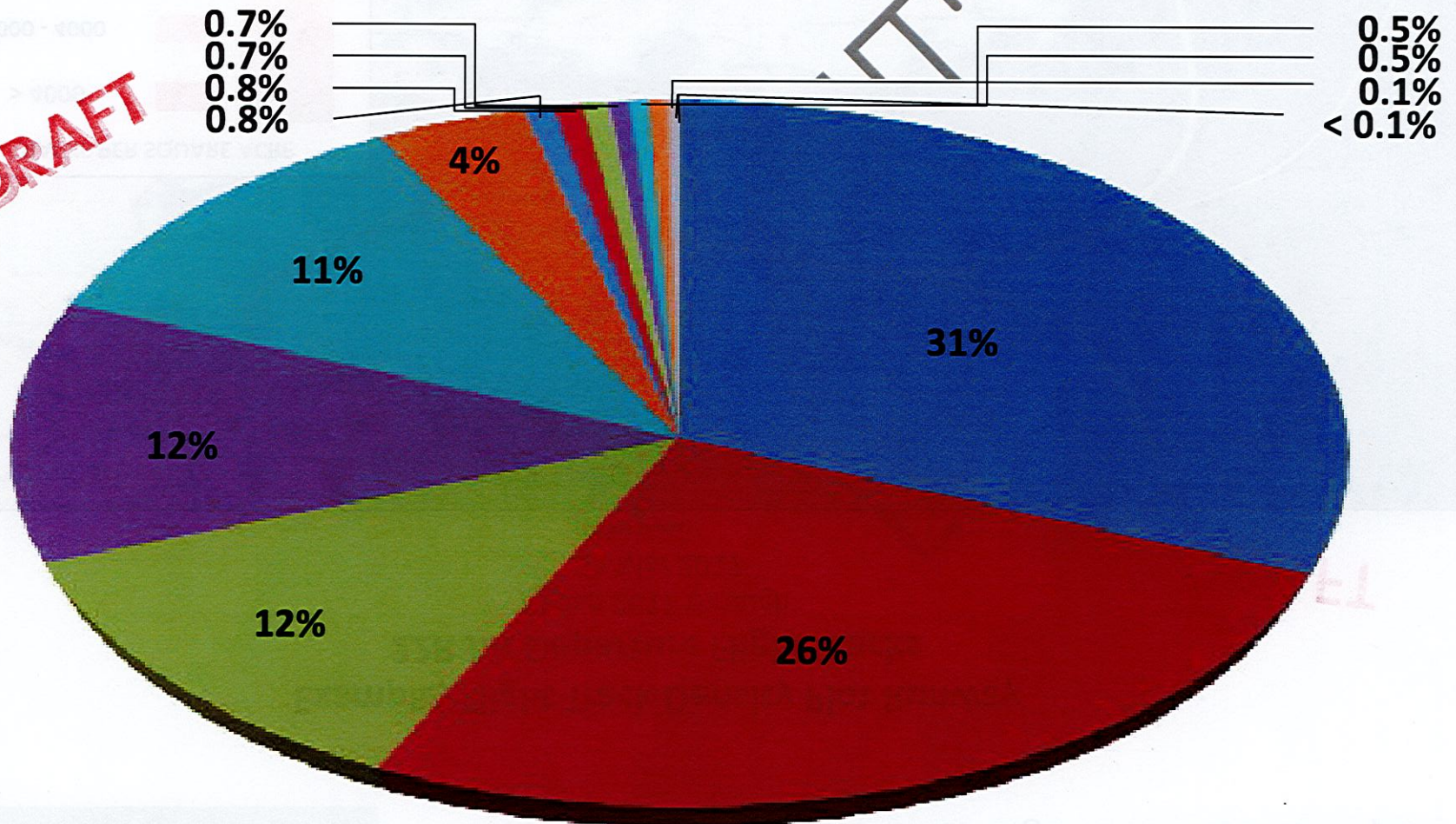


Noise Complaints

Noise Complaints Types – 1st Quarter 2017

- TOO MUCH NOISE
- CONSTANT NOISE
- SLEEP INTERUPTION
- AIRCRAFT TOO LOW
- OVER USE OF RUNWAY
- NOISE AT WRONG TIME
- AIR POLLUTION
- AIRCRAFT OFF COURSE
- HELICOPTER
- VIBRATIONS
- SAFETY CONCERNS
- TV INTERRUPTION
- OTHER
- UNKNOWN
- CONSTRUCTION

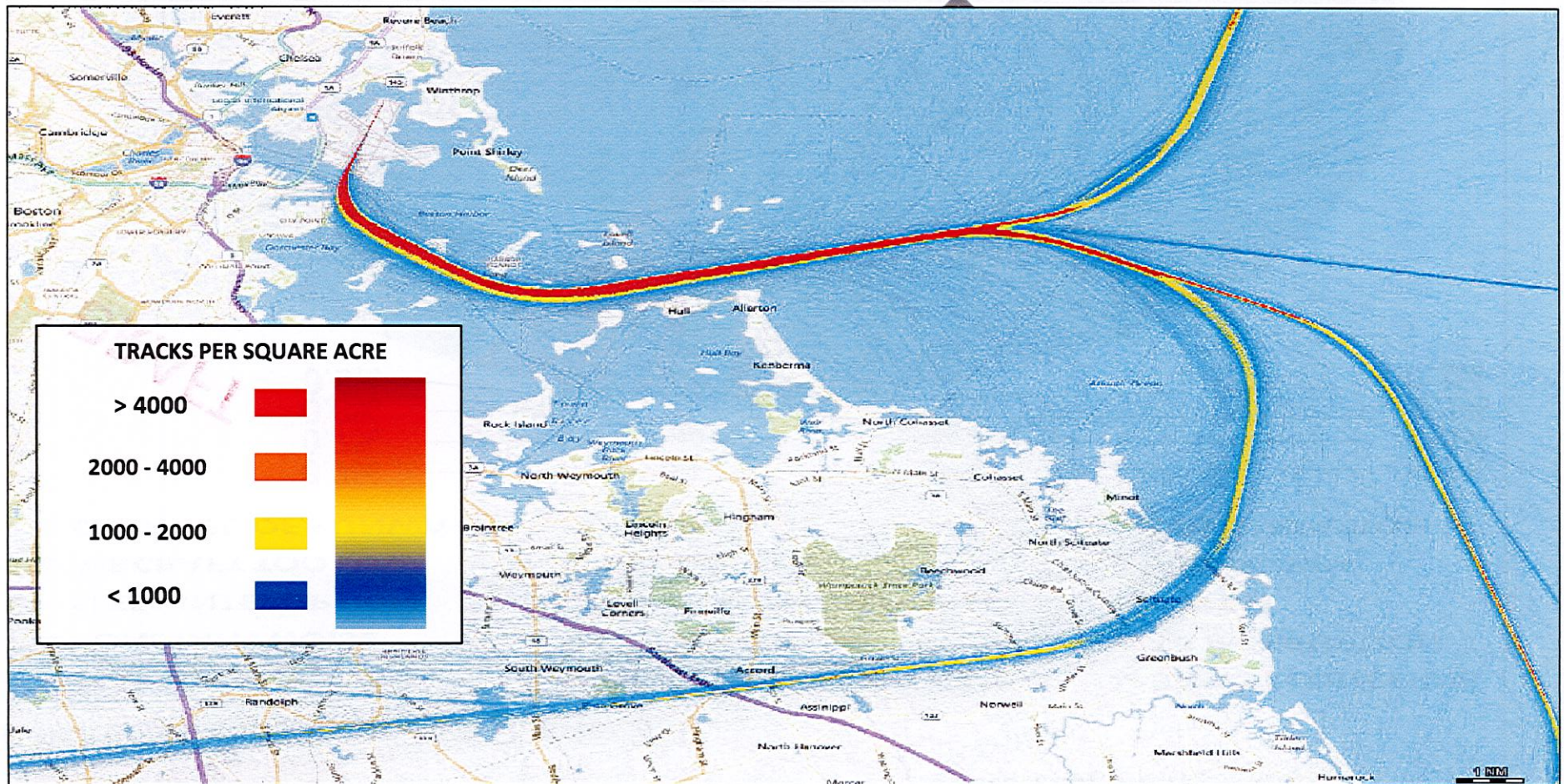
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Example, Flight Track Density Plot Runway 22R Jet Departure Flight Tracks

01 Jan 2017 through
31 Mar 2017
(10,305 Tracks)

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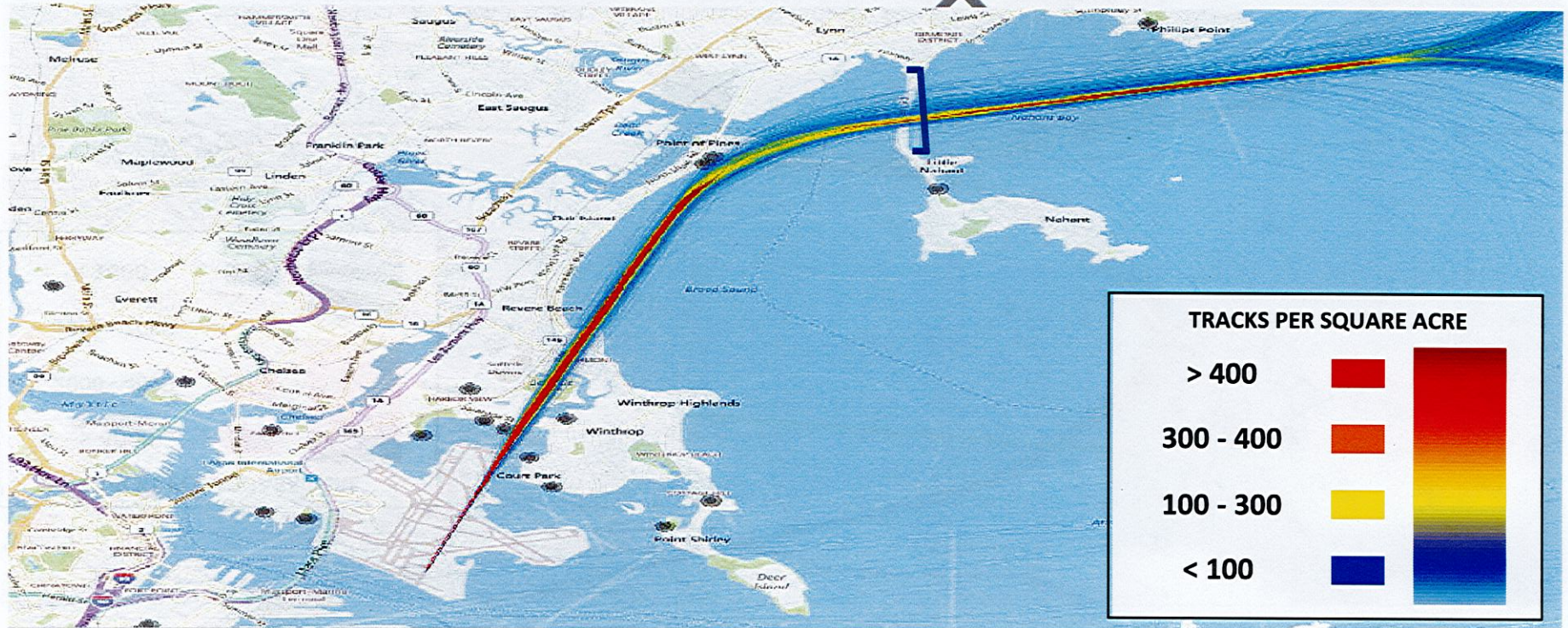
Flight Tracks, Information

Boston Logan International Airport

Note: How is flight track information collected?

The following figures present flight tracks and “gates” which are virtual vertical planes used to capture the aircraft flight paths. The gates are defined using geographic coordinates to capture basic informational statistics.

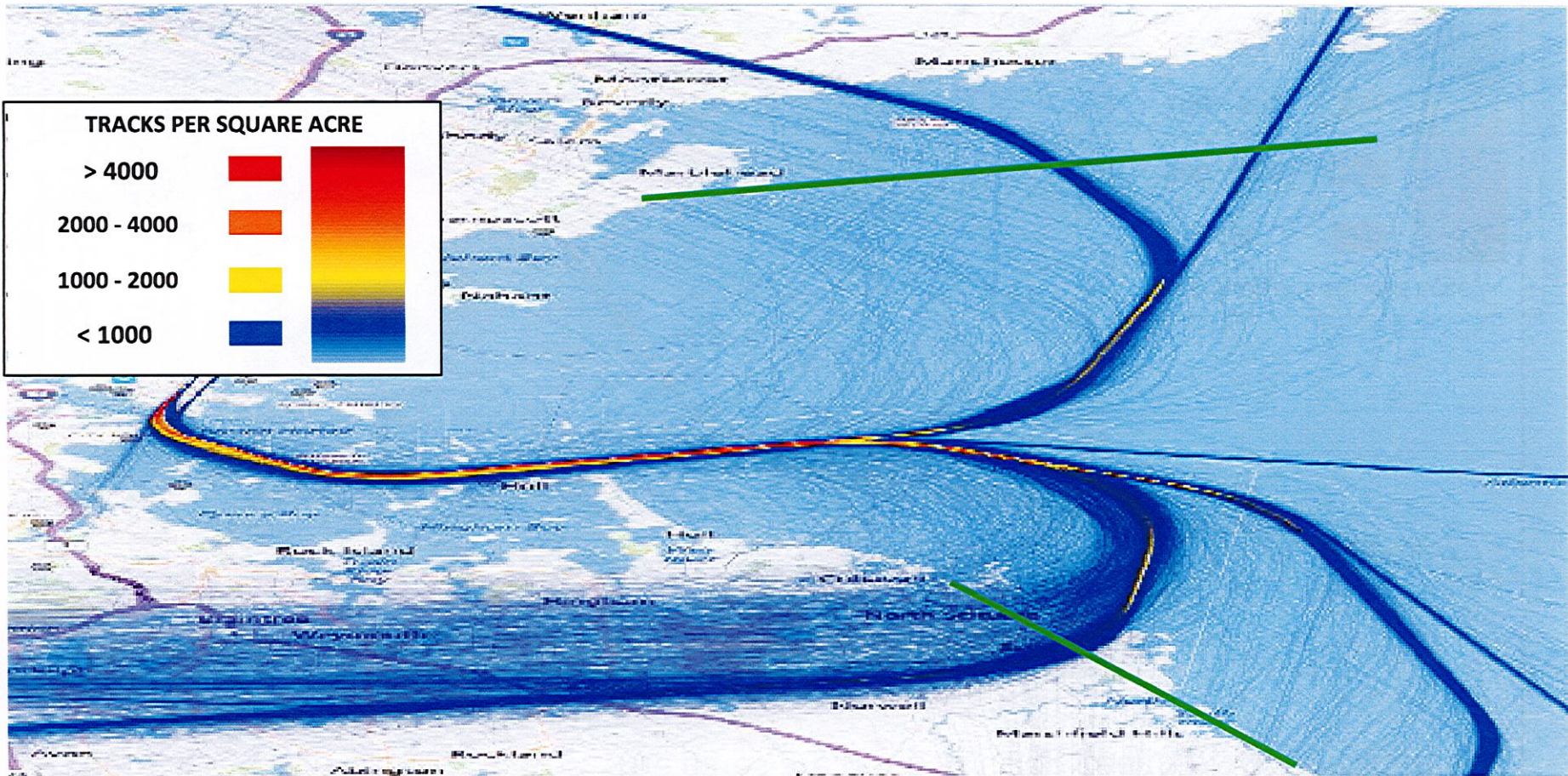
Example, aircraft flying over the Nahant Causeway R4R departures



	Number of Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment
North of the Causeway	18	0.8%
Over Causeway	2233	99.0%
South of the Causeway	11	0.2%
Total	2,262	100.00%

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Example, flight tracks across the South and North Shore

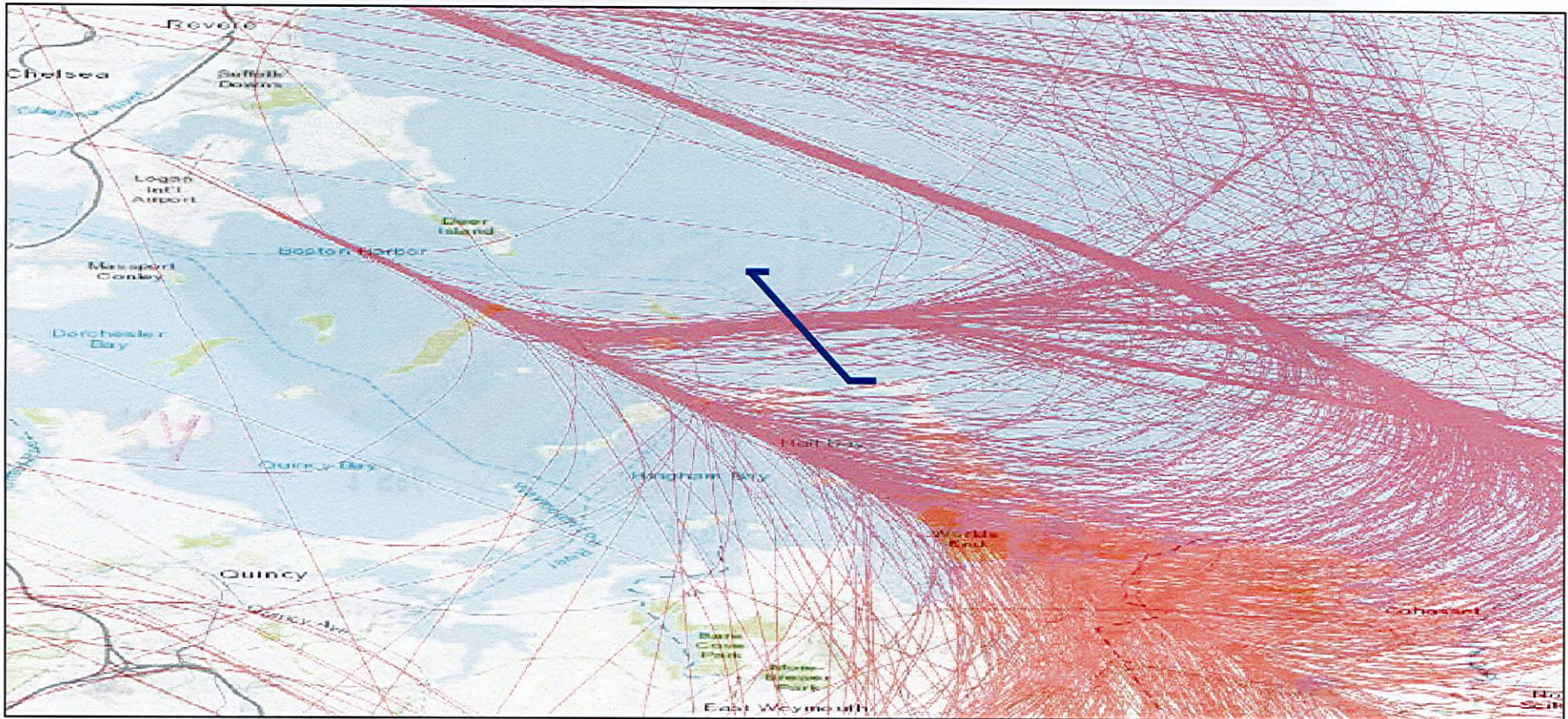


Runway 22R/22L North and South Shore Jet Departures for 1st Quarter 2017				
	South Shore	North Shore	Total	
Operations	4,485	2,913	7,398 of 10,923	
Percentage of Flights	41%	27%	67%	
Average Altitude	13,655 ft	13,026 ft		
Under 10,000 ft	134 (3%)	29 (1%)	163 (2%)	

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Example, use of “Lighthouse” RNAV Visual approach to R33L

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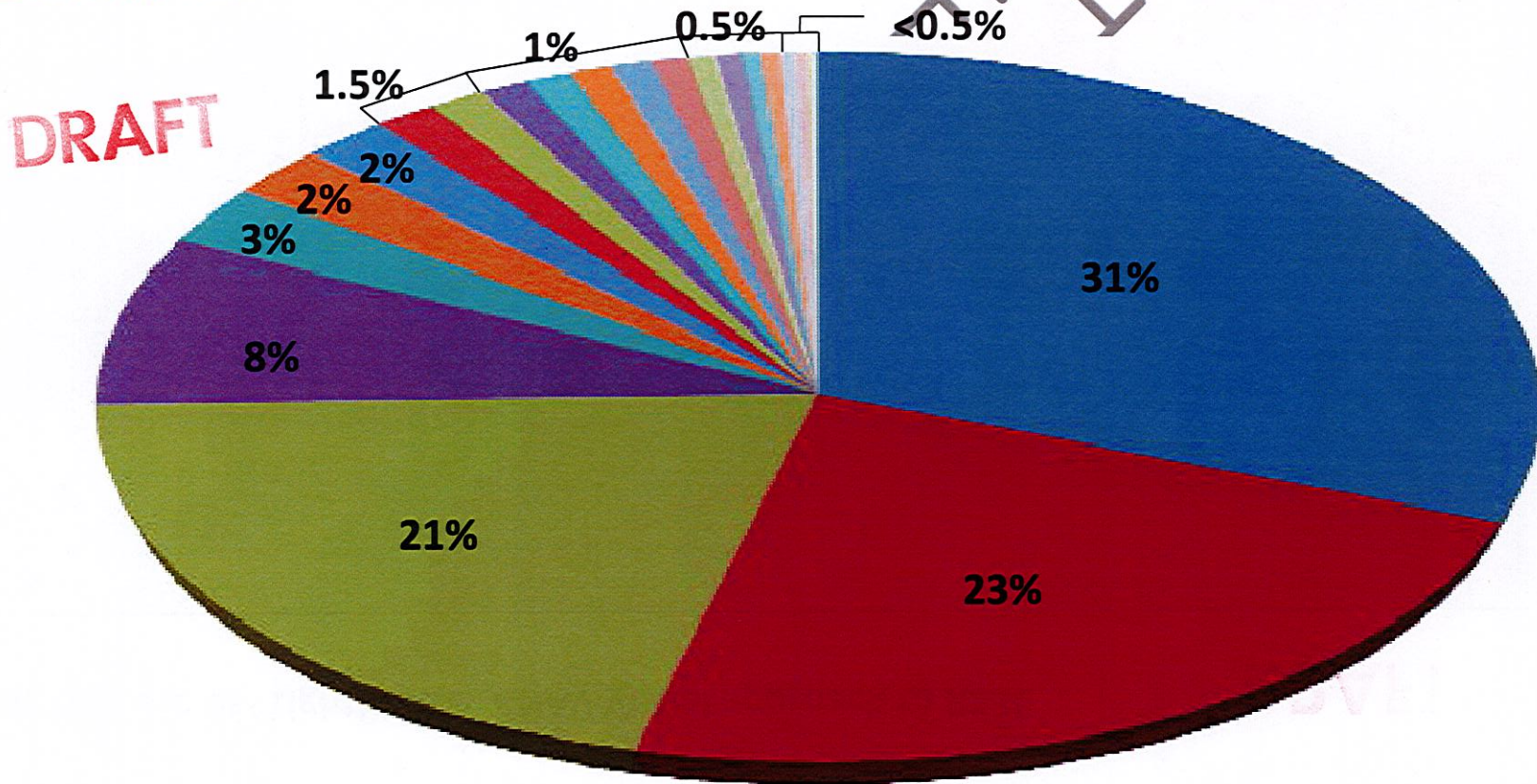
Runway 33L Lighthouse Gate Summary for 1st Quarter 2017			
	4th Quarter 2016	1st Quarter 2017	Percentage Use Change
Runway 33L Arrivals Midnight to 5AM	2,152	1,633	-32%
Flights Utilizing RNAV Visual to R33L	408	424	+04%
Percent of 33L Arrival Utilizing RNAV Visual to 33L	19%	26%	+07%

Aircraft Type Report

Boston Logan International Airport

Aircraft Landing at Logan International Airport – 1st Quarter 2017

- A319/A320/321
- E170/E175/E190
- B733/B737/B738/B739/73E
- CRJ2/CRJ7/CRJ9
- B752/B753
- B712
- DH8A/DH8C/DH8D
- A332/A333
- B762/B763/B764
- B772/B773
- B788/B789
- MD90
- SF34
- MD83/MD88
- E145/E45X
- B744/B748
- DC10
- A306
- A310
- A359
- A343/A346
- A388
- MD11



Aircraft Type Report

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Boston Logan International Airport

Stage 3 vs Stage 4

The following table shows the number of Stage 3 and Stage 4 Aircraft Flights flown by the Airlines that serve Boston Logan International Airport for the 1st Quarter of 2017.

Airline	Stage 3 Flights	Stage 3%	Stage 4 Flights	Stage 4%	Total Flights
Aer Lingus	0	0%	184	100%	184
Air Canada	0	0%	417	100%	417
Air Canada Jazz	0	0%	740	100%	740
Air France	0	0%	85	100%	85
Aero Mexico	0	0%	67	100%	67
Alaska	0	0%	314	100%	314
American	0	0%	6240	100%	6240
British Airways	0	0%	293	100%	293
Cathay Pacific	0	0%	54	100%	54
Copa Airlines	0	0%	90	100%	90
Delta	1249	20%	5088	80%	6337
El Al Air	0	0%	37	100%	37
Emirates	0	0%	179	100%	179
FedEx	240	52%	221	48%	461
GoJet	0	0%	124	100%	124
Hainan	0	0%	124	100%	124
Icelandair	0	0%	116	100%	116
Japan Airline	0	0%	90	100%	90
JetBlue	0	0%	11767	100%	11767
Lufthansa	0	0%	167	100%	167
Sun Country	0	0%	58	100%	58
Norwegian Airlines	0	0%	102	100%	102
Piedmont Airlines	0	0%	574	100%	574
Qatar Airways	0	0%	89	100%	89
SATA Internacional	57	50%	57	50%	114
Scandinavian Airlines	0	0%	72	100%	72
Sky Regional	0	0%	212	100%	212
Southwest	0	0%	2486	100%	2486
Spirit Airlines	0	0%	977	100%	977
Swiss	0	0%	89	100%	89
TAP Portugal	0	0%	63	100%	63
Turkish Airlines	0	0%	50	100%	50
United	0	0%	2818	100%	2818
UPS	0	0%	243	100%	243
Virgin America	0	0%	389	100%	389
Virgin Atlantic	0	0%	79	100%	79
WestJet Encore	0	0%	338	100%	338
Wow Air	0	0%	90	100%	90

Noise Abatement Program Overview

Boston Logan International Airport

Boston Logan Noise Abatement Program

Massport formally established a Noise Abatement Office in August of 1977. The office helps the FAA and Logan air carriers analyze how airport noise affected local communities so that steps can be taken to further reduce the airport's impact on surrounding residents.

Major elements of the Boston Logan Noise Abatement Program:

1. On airport procedure/time restrictions
2. Inflight noise abatement procedures
3. Soundproofing for qualified residences
4. Noise Monitoring and Reporting System
5. Data collection and reporting
6. Live flight tracking
7. Standard, periodic reporting
8. Community engagement
9. Complaint process
10. Engagement with FAA, Airlines and Community Groups

The Massport Noise Abatement Office maintains a 24-hour noise report line that allows Boston Logan's neighbors to report excessive airport noise in their community. The noise report line number is **617-561-3333**. There is also an online form for noise questions or concerns which can be found at www.massport.com. Residents who file a noise report will receive a custom response from the Noise Abatement Office.

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