

I. Noise Supporting Documentation

This appendix provides detailed information, tables, and figures in support of Chapter 7, *Noise*. The contents of this appendix are summarized below.

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I.1 Noise Modeling

I.1.1 AEDT Modeled Operations

The following sections of this appendix provide several tables describing the **Aviation Environmental Design Tool (AEDT)** input data for 2023 and 2024. Where possible, the data for 2022 are included for comparison.

For 2023, a total of 393,363 flight records from the **Noise and Operations Monitoring System (NOMS)** contained suitable data for modeling, which is 99.5 percent of the recorded flight records. For 2024, 410,507 NOMS flight records contained suitable data for modeling, which is 99.3 percent of the recorded flight records. These operations were scaled slightly by category and airline to match the 395,146 annual flights in Massport records for 2023, and 413,409 flights in 2024. The total number of annual flights for 2022 was 378,613.

Table I-1 (2024), **Table I-2** (2023), and **Table I-3** (2022 for comparison) provide the scaled annual operations, listed by the modeled AEDT Aircraft Noise and Performance (ANP) aircraft type. Each ANP type listed in **Table I-1** and **Table I-2** is also mapped to a runway use group based on its weight and performance characteristics described in the following Runway Use Section I.1.2. For more on AEDT Modeling, see **User's Guide Section U.7.3**.

Table I-1 2024 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
Commercial Jet Operations						
747400	Heavy Jet A	1	1	1	1	4
7478	Heavy Jet A	4	-	4	-	8
A340-211	Heavy Jet A	212	3	107	109	431
A340-642	Heavy Jet A	276	1	270	7	553
A380-841	Heavy Jet A	408	4	362	50	825
A380-861	Heavy Jet A	1	-	-	1	2
767300	Heavy Jet B	31	-	31	-	62
7673ER	Heavy Jet B	2,365	1,045	2,004	1,406	6,819
767400	Heavy Jet B	13	1	12	2	28
767CF6	Heavy Jet B	127	32	13	146	318
767JT9	Heavy Jet B	10	3	2	11	26
777200	Heavy Jet B	734	175	681	228	1,818
7773ER	Heavy Jet B	751	17	374	394	1,536
7878R	Heavy Jet B	83	136	199	20	438

Table I-1 2024 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
7879	Heavy Jet B	1,272	74	1,240	106	2,692
A300-622R	Heavy Jet B	192	128	113	207	641
A330-301	Heavy Jet B	2,266	23	1,971	318	4,577
A330-343	Heavy Jet B	2,512	216	1,943	784	5,456
A350-941	Heavy Jet B	1,486	126	795	817	3,224
MD11GE	Heavy Jet B	65	28	13	80	186
MD11PW	Heavy Jet B	44	20	6	58	128
717200	Light Jet A	7	1	4	4	16
737300	Light Jet B	1	-	1	-	2
737400	Light Jet B	6	4	5	5	20
737700	Light Jet B	12,610	3,231	13,165	2,676	31,683
737800	Light Jet B	14,474	5,222	17,085	2,611	39,392
7378MAX	Light Jet B	7,036	2,313	7,759	1,591	18,699
757300	Light Jet B	36	11	32	15	94
757PW	Light Jet B	1,073	766	1,480	359	3,678
757RR	Light Jet B	1,064	409	1,234	240	2,948
A319-131	Light Jet B	5,405	1,023	5,746	682	12,856
A320-211	Light Jet B	1,736	272	1,766	243	4,018
A320-232	Light Jet B	10,736	3,066	11,036	2,765	27,603
A320-270N	Light Jet B	2,821	760	2,949	632	7,163
A321-232	Light Jet B	24,871	9,520	28,384	6,007	68,781
EMB190	Light Jet B	15,383	2,143	15,436	2,090	35,052
CL600	RJ	12	-	12	-	23
CRJ9-ER	RJ	11	-	11	-	22
EMB14L	RJ	1,216	123	1,334	5	2,678
EMB170	RJ	1,513	96	1,494	115	3,218
EMB175	RJ	26,043	2,330	26,416	1,957	56,746
GV	RJ	1	-	1	-	2
LEAR35	RJ	1	-	1	-	2
Commercial Jets Subtotal		138,971	33,323	145,549	26,745	344,589
Commercial Non-Jet Operations						
BEC58P	Non-jet	16,655	48	16,696	6	33,405
CNA208	Non-jet	1,275	4	1,263	16	2,559

Table I-1 2024 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
CVR580	Non-jet	1	-	-	1	2
DHC830	Non-jet	2,309	50	2,331	28	4,718
Commercial Non-Jet Operations Subtotal		20,240	102	20,290	52	40,684
Commercial Aircraft Total		159,211	33,425	165,839	26,797	385,273
General Aviation Operations						
74720B	Heavy Jet A	2	0	2	0	4
747SP	Heavy Jet A	0	1	0	1	2
A340-642	Heavy Jet A	1	1	0	2	4
7673ER	Heavy Jet B	0	2	1	1	4
777300	Heavy Jet B	3	0	1	2	6
7878R	Heavy Jet B	1	1	1	1	4
A330-301	Heavy Jet B	0	2	1	1	4
A330-343	Heavy Jet B	0	1	0	1	2
A350-941	Heavy Jet B	1	0	0	1	2
C17	Heavy Jet B	3	0	3	0	6
737700	Light Jet B	4	4	4	4	17
737800	Light Jet B	4	2	4	2	11
7378MAX	Light Jet B	1	0	1	0	2
737N17	Light Jet B	1	0	1	0	2
757PW	Light Jet B	4	0	2	2	7
757RR	Light Jet B	6	1	5	2	13
A319-131	Light Jet B	111	0	104	7	222
A320-211	Light Jet B	5	0	5	0	9
A320-232	Light Jet B	46	11	41	16	114
A320-270N	Light Jet B	14	9	16	7	47
A321-232	Light Jet B	121	61	150	32	364
EMB190	Light Jet B	97	0	87	10	194
BD-700-1A10	RJ	408	43	400	52	903
BD-700-1A11	RJ	148	14	150	12	325
CIT3	RJ	11	3	11	3	28
CL600	RJ	1,686	134	1,726	95	3,641
CL601	RJ	302	24	304	23	653
CNA500	RJ	1	0	1	0	2

Table I-1 2024 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
CNA510	RJ	103	13	100	16	231
CNA525C	RJ	295	28	298	25	646
CNA55B	RJ	1,115	114	1,152	77	2,458
CNA560E	RJ	19	1	19	1	39
CNA560U	RJ	76	14	82	8	181
CNA560XL	RJ	507	24	509	22	1,062
CNA680	RJ	2,048	124	2,064	108	4,344
CNA750	RJ	675	38	667	46	1,426
ECLIPSE500	RJ	2	0	2	0	4
EMB145	RJ	34	5	33	5	77
EMB14L	RJ	4	0	4	0	7
EMB170	RJ	2	0	2	0	4
EMB175	RJ	14	0	14	0	28
FAL20	RJ	19	13	23	9	63
FAL900EX	RJ	195	9	193	11	409
G650ER	RJ	260	38	270	29	597
GIIB	RJ	1	0	1	0	2
GIV	RJ	350	44	358	36	787
GV	RJ	433	45	429	49	955
IA1125	RJ	47	14	47	14	121
LEAR35	RJ	708	158	712	154	1,732
MU3001	RJ	137	8	141	5	291
1900D	Non-jet	1	0	1	0	2
BEC58P	Non-jet	703	18	712	9	1,442
CNA172	Non-jet	10	0	10	0	21
CNA182	Non-jet	16	0	16	0	32
CNA206	Non-jet	3	0	3	0	6
CNA208	Non-jet	1,088	63	1,079	72	2,303
CNA441	Non-jet	2	0	2	0	4
COMSEP	Non-jet	87	3	79	11	181
DHC6	Non-jet	404	49	399	54	907
DHC8	Non-jet	1	0	0	1	2
DHC830	Non-jet	3	0	2	1	6

Table I-1 2024 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
GASEPF	Non-jet	11	1	11	1	24
GASEPV	Non-jet	82	3	85	0	170
PA30	Non-jet	4	0	4	0	7
A109	Non-jet	9	0	9	0	19
B206B3	Non-jet	14	0	14	0	28
B206L	Non-jet	5	0	5	0	9
B407	Non-jet	13	0	13	0	26
B429	Non-jet	23	57	25	54	159
B430	Non-jet	6	1	7	0	13
EC130	Non-jet	18	4	19	4	45
H500D	Non-jet	2	0	2	0	4
R44	Non-jet	8	1	7	2	19
S76	Non-jet	100	11	98	13	222
SA330J	Non-jet	184	8	182	10	384
SA350D	Non-jet	14	1	14	1	30
SA355F	Non-jet	7	0	7	0	13
SA365N	Non-jet	1	0	1	0	2
S70	Non-jet	3	0	3	0	6
General Aviation Total		12,846	1,222	12,944	1,124	28,136
Grand Total		172,057	34,647	178,784	27,921	413,409

Source: HMMH, 2025.

Notes: Some totals may not match due to rounding.
ANP – Aircraft Noise and Performance.

Table I-2 2023 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
Commercial Jet Operations						
747400	Heavy Jet A	2	-	2	-	4
7478	Heavy Jet A	-	1	-	1	2
A340-211	Heavy Jet A	393	-	241	152	786
A340-642	Heavy Jet A	218	1	215	4	438
A380-841	Heavy Jet A	325	1	309	17	652

Table I-2 2023 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
7673ER	Heavy Jet B	2,457	1,104	1,778	1,783	7,122
767400	Heavy Jet B	307	4	225	86	622
767CF6	Heavy Jet B	195	69	14	250	529
767JT9	Heavy Jet B	15	4	3	16	38
777200	Heavy Jet B	643	168	680	131	1,623
7773ER	Heavy Jet B	757	15	368	404	1,544
7878R	Heavy Jet B	37	142	164	15	358
7879	Heavy Jet B	1,017	76	983	110	2,187
A300-622R	Heavy Jet B	74	134	121	87	416
A330-301	Heavy Jet B	2,255	19	2,016	257	4,548
A330-343	Heavy Jet B	2,097	183	1,332	948	4,559
A350-941	Heavy Jet B	838	70	338	569	1,815
MD11GE	Heavy Jet B	100	36	32	104	272
MD11PW	Heavy Jet B	43	15	11	47	116
717200	Light Jet A	140	17	154	3	314
727EM2	Light Jet A	1	-	-	1	2
737400	Light Jet B	12	4	7	9	32
737700	Light Jet B	15,263	5,014	16,782	3,496	40,555
737800	Light Jet B	12,971	5,066	15,867	2,169	36,074
7378MAX	Light Jet B	4,894	1,918	5,521	1,291	13,625
757300	Light Jet B	67	26	77	16	186
757PW	Light Jet B	1,192	578	1,381	389	3,540
757RR	Light Jet B	1,823	721	2,179	365	5,088
A319-131	Light Jet B	4,171	877	4,182	866	10,095
A320-211	Light Jet B	1,397	76	1,400	73	2,947
A320-232	Light Jet B	7,269	1,928	7,517	1,681	18,395
A320-270N	Light Jet B	2,059	781	2,207	633	5,681
A321-232	Light Jet B	23,629	8,644	26,529	5,745	64,547
EMB190	Light Jet B	19,535	2,368	19,372	2,531	43,806
CL600	RJ	2	-	2	-	4
CRJ9-ER	RJ	29	-	25	4	58
CRJ9-LR	RJ	14	2	14	2	32
EMB14L	RJ	1,330	20	1,334	16	2,700
EMB170	RJ	751	48	677	121	1,596

Table I-2 2023 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
EMB175	RJ	25,160	1,804	25,300	1,664	53,928
GIV	RJ	1	-	1	-	2
Commercial Jets Subtotal		133,482	31,937	139,361	26,058	330,838
Commercial Non-Jet Operations						
BEC58P	Non-jet	14,460	53	14,506	7	29,026
CNA208	Non-jet	1,126	13	1,117	22	2,278
DHC6	Non-jet	13	3	16	-	32
DHC830	Non-jet	2,003	32	2,030	5	4,070
Commercial Non-Jet Operations Subtotal		17,602	101	17,669	34	35,406
Commercial Aircraft Total		151,084	32,038	157,030	26,092	366,244
General Aviation Operations						
74720B	Heavy Jet A	1	-	1	-	2
A340-642	Heavy Jet A	2	2	1	3	8
7673ER	Heavy Jet B	1	-	1	-	2
737700	Light Jet B	3	1	4	-	8
737800	Light Jet B	7	4	7	4	22
7378MAX	Light Jet B	2	-	2	-	4
A320-232	Light Jet B	1	-	1	-	2
A320-270N	Light Jet B	1	-	1	-	2
A321-232	Light Jet B	2	-	2	-	4
EMB190	Light Jet B	4	-	1	3	8
MD81	Light Jet B	2	-	2	-	4
BD-700-1A10	RJ	436	36	419	53	944
BD-700-1A11	RJ	184	21	180	24	409
CIT3	RJ	15	5	15	5	40
CL600	RJ	1,693	124	1,717	101	3,635
CL601	RJ	528	26	507	48	1,109
CNA500	RJ	1	-	1	-	2
CNA510	RJ	69	6	66	8	149
CNA525C	RJ	294	18	296	17	625
CNA55B	RJ	1,255	84	1,251	87	2,677
CNA560E	RJ	16	3	19	-	38
CNA560U	RJ	104	19	110	13	246
CNA560XL	RJ	689	36	688	38	1,450

Table I-2 2023 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
CNA680	RJ	1,756	129	1,800	85	3,770
CNA750	RJ	881	54	878	57	1,870
ECLIPSE500	RJ	102	11	99	14	226
EMB145	RJ	44	8	41	11	105
EMB14L	RJ	-	-	-	-	-
EMB175	RJ	3	-	3	-	6
FAL20	RJ	3	2	4	1	10
FAL900EX	RJ	233	12	231	14	490
G650ER	RJ	319	35	321	33	708
GIIB	RJ	3	-	3	-	6
GIV	RJ	445	46	449	42	982
GV	RJ	470	45	486	28	1,029
IA1125	RJ	67	9	68	8	151
LEAR35	RJ	841	187	861	166	2,055
MU3001	RJ	196	7	195	8	405
T-38A	RJ	2	-	2	-	4
BEC58P	Non-jet	207	6	204	9	426
CNA172	Non-jet	11	1	10	2	24
CNA182	Non-jet	17	-	17	-	34
CNA208	Non-jet	1,064	81	1,042	103	2,289
CNA441	Non-jet	6	-	6	-	12
COMSEP	Non-jet	140	5	140	5	290
DHC6	Non-jet	567	78	566	79	1,289
DHC830	Non-jet	2	-	2	-	4
GASEPF	Non-jet	21	1	21	1	44
GASEPV	Non-jet	100	1	100	1	202
PA30	Non-jet	2	-	2	-	4
PA42	Non-jet	3	-	3	-	6
A109	Helicopter	3	-	3	-	6
B206B3	Helicopter	9	-	9	-	18
B206L	Helicopter	4	-	4	-	8
B407	Helicopter	10	1	9	2	22
B427	Helicopter	1	-	1	-	2
B429	Helicopter	35	62	33	64	194

Table I-2 2023 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
B430	Helicopter	4	-	4	-	8
EC130	Helicopter	20	5	21	5	50
H500D	Helicopter	3	-	3	-	6
R44	Helicopter	3	-	3	-	6
S76	Helicopter	128	14	129	13	284
SA330J	Helicopter	198	2	193	7	399
SA350D	Helicopter	10	1	10	1	22
SA355F	Helicopter	16	-	16	-	32
SA365N	Helicopter	2	-	2	-	4
SC300C	Helicopter	1	-	1	-	2
General Aviation Total		13,261	1,190	13,288	1,163	28,902
Grand Total		164,346	33,227	170,318	27,255	395,146

Source: HMMH, 2025.

Notes: Some totals may not match due to rounding.
ANP – Aircraft Noise and Performance.

Table I-3 2022 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
Commercial Jet Operations						
747400	Heavy Jet A	205	0	203	2	410
7478	Heavy Jet A	5	1	6	0	12
A340-211	Heavy Jet A	167	0	96	71	334
A340-642	Heavy Jet A	254	2	238	18	512
A380-841	Heavy Jet A	172	0	171	1	344
A380-861	Heavy Jet A	2	0	1	1	4
767300	Heavy Jet B	178	36	6	208	429
7673ER	Heavy Jet B	3,307	984	2,290	2,000	8,581
767400	Heavy Jet B	264	3	193	74	534
767CF6	Heavy Jet B	28	11	8	31	78
767JT9	Heavy Jet B	24	5	2	27	58
777200	Heavy Jet B	503	31	413	121	1,069
7773ER	Heavy Jet B	701	141	377	465	1,685
7878R	Heavy Jet B	20	79	90	9	198

Table I-3 2022 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
7879	Heavy Jet B	866	43	633	276	1,818
A300-622R	Heavy Jet B	67	253	199	121	640
A330-301	Heavy Jet B	2,345	22	1,965	402	4,734
A330-343	Heavy Jet B	1,552	137	860	830	3,379
A350-941	Heavy Jet B	736	28	383	380	1,527
DC1030	Heavy Jet B	1	0	0	1	2
MD11GE	Heavy Jet B	61	4	36	29	130
MD11PW	Heavy Jet B	41	0	18	23	82
717200	Light Jet A	4	2	5	1	12
737400	Light Jet B	23	6	17	12	58
737700	Light Jet B	12,059	2,938	13,379	1,618	29,994
737800	Light Jet B	11,678	5,210	14,585	2,303	33,775
7378MAX	Light Jet B	3,581	1,493	4,205	869	10,148
757300	Light Jet B	54	5	54	5	118
757PW	Light Jet B	1,902	987	2,643	246	5,778
757RR	Light Jet B	460	56	499	17	1,032
A319-131	Light Jet B	6,905	918	7,304	519	15,647
A320-211	Light Jet B	1,349	35	1,285	99	2,769
A320-232	Light Jet B	8,591	2,503	9,699	1,395	22,187
A320-271N	Light Jet B	1,004	431	1,137	298	2,870
A321-232	Light Jet B	23,065	7,690	26,386	4,368	61,509
EMB190	Light Jet B	17,871	2,056	17,824	2,103	39,854
BD-700-1A10	RJ	0.43	0.00	0.43	0.00	1
CL600	RJ	13	2	13	1	29
CL601	RJ	1	0	1	0	3
CNA750	RJ	1	0	0	0	2
CRJ9-ER	RJ	2,129	183	2,071	241	4,625
CRJ9-LR	RJ	158	3	160	1	323
EMB145	RJ	1	1	1	1	4
EMB14L	RJ	1,446	31	1,367	110	2,955
EMB170	RJ	1,100	126	1,128	99	2,453
EMB175	RJ	23,199	2,056	23,362	1,892	50,508
G650ER	RJ	1.3	0.0	1.3	0.0	2.6

Table I-3 2022 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
GIV	RJ	11	2	11	2	26
GV	RJ	4	0	4	1	9
Commercial Jets Subtotal		128,111	28,514	135,332	21,293	313,250
Commercial Non-Jet Operations						
BEC58P	Non-jet	14,578	48	14,620	7	29,253
CNA208	Non-jet	859	6	858	7	1,729
DHC6	Non-jet	1	13	14	0	27
DHC830	Non-jet	1,852	72	1,913	11	3,848
Commercial Non-Jet Operations Subtotal		17,290	139	17,403	25	34,857
Commercial Aircraft Total		145,401	28,653	152,736	21,318	348,107
General Aviation Operations						
A340-211	Heavy Jet A	2	0	1	1	4
A340-642	Heavy Jet A	1	0	1	0	2
777300	Heavy Jet B	2	1	2	1	6
7878R	Heavy Jet B	2	0	2	0	4
A330-343	Heavy Jet B	1	0	1	0	2
737700	Light Jet B	14	4	11	7	36
737800	Light Jet B	2	0	2	0	4
757PW	Light Jet B	1	0	1	0	2
757RR	Light Jet B	1	0	1	0	2
A319-131	Light Jet B	7	0	7	0	14
A320-211	Light Jet B	5	3	6	2	16
A320-232	Light Jet B	4	7	12	0	24
A320-271N	Light Jet B	1	0	1	0	2
A321-232	Light Jet B	29	4	22	12	67
EMB190	Light Jet B	14	0	13	1	28
BD-700-1A10	RJ	466	52	466	52	1,037
BD-700-1A11	RJ	170	16	177	9	373
CIT3	RJ	18	1	17	2	38
CL600	RJ	1,600	147	1,650	97	3,495
CL601	RJ	511	34	510	36	1,091
CNA500	RJ	5	1	4	2	12
CNA510	RJ	17	0	15	2	34

Table I-3 2022 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
CNA525C	RJ	375	63	386	52	877
CNA55B	RJ	1,290	85	1,299	76	2,751
CNA560E	RJ	1	0	1	0	2
CNA560U	RJ	118	13	118	13	262
CNA560XL	RJ	799	52	812	38	1,702
CNA680	RJ	1,894	163	1,952	105	4,114
CNA750	RJ	972	65	971	65	2,073
CRJ9-ER	RJ	2	0	2	0	4
ECLIPSE500	RJ	67	13	67	13	161
EMB145	RJ	44	4	45	4	97
EMB175	RJ	1	0	1	0	2
FAL20	RJ	5	0	3	2	10
FAL900EX	RJ	221	14	216	19	470
G650ER	RJ	296	33	301	28	659
GII	RJ	1	0	1	0	2
GIIB	RJ	1	0	1	0	2
GIV	RJ	428	51	433	46	958
GV	RJ	447	55	461	41	1,004
IA1125	RJ	76	4	70	10	161
LEAR35	RJ	883	131	897	117	2,029
MU3001	RJ	209	17	213	12	450
1900D	Non-jet	1	0	1	0	2
BEC58P	Non-jet	318	20	319	19	676
CNA172	Non-jet	10	0	10	0	20
CNA182	Non-jet	28	0	28	0	56
CNA206	Non-jet	4	0	4	0	8
CNA208	Non-jet	1,187	76	1,186	77	2,527
CNA441	Non-jet	38	5	37	6	85
COMSEP	Non-jet	220	3	217	6	446
DHC6	Non-jet	499	50	488	60	1,097
DHC830	Non-jet	2	0	2	0	4
GASEPF	Non-jet	13	1	13	1	28
GASEPV	Non-jet	173	5	177	2	357

Table I-3 2022 Annual Modeled Operations

Aircraft Noise and Performance (ANP)	Group	Arrivals		Departures		Total
		Day	Night	Day	Night	
HS748A	Non-jet	1	0	1	0	2
PA30	Non-jet	4	0	4	0	8
PA42	Non-jet	1	0	1	0	2
A109	Helicopter	8	0	8	0	16
B206L	Helicopter	22	0	22	0	44
B407	Helicopter	9	2	9	2	22
B427	Helicopter	2	0	2	0	4
B429	Helicopter	22	57	19	60	157
EC130	Helicopter	15	10	17	8	50
R44	Helicopter	22	0	22	0	44
S76	Helicopter	143	10	144	9	305
SA330J	Helicopter	193	4	192	5	395
SA350D	Helicopter	23	1	25	0	50
SA355F	Helicopter	12	0	12	0	24
General Aviation Total		13,975	1,278	14,131	1,122	30,506
Grand Total		159,376	29,931	166,867	22,440	378,613

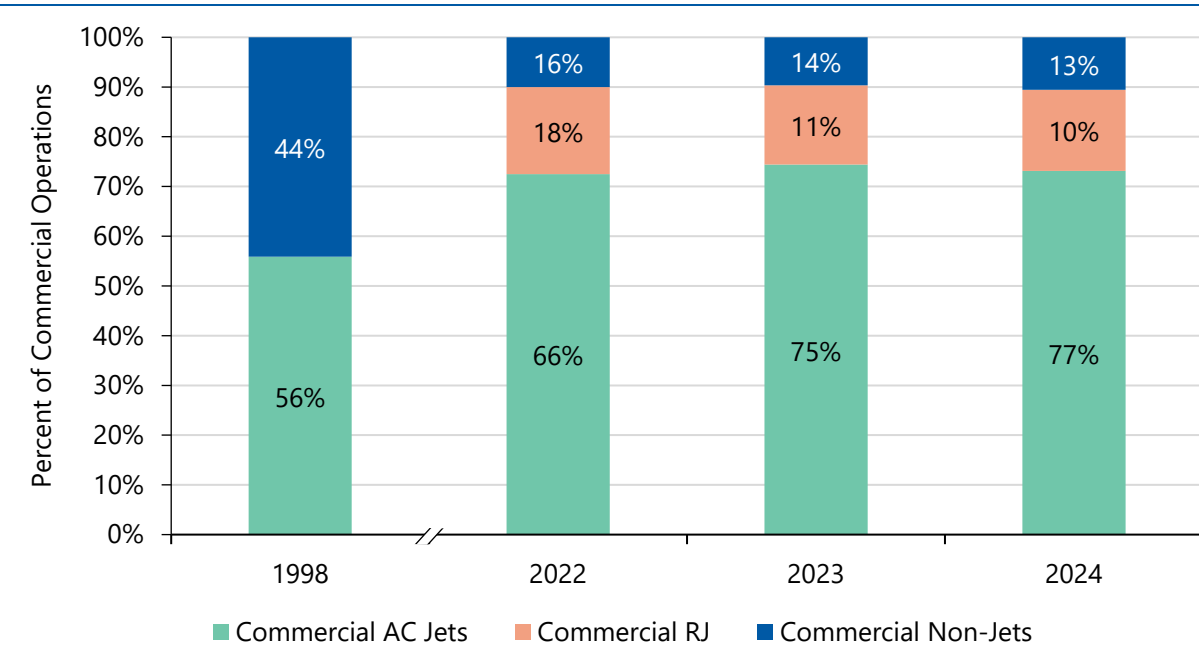
Source: HMMH, 2025.

Notes: Some totals may not match due to rounding.

ANP – Aircraft Noise and Performance.

The 2023 and 2024 fleet mix of annual commercial **aircraft operations**, which is the aircraft takeoffs and landings for passenger and cargo operations, is shown in **Figure I-1** with 2022 and 1998 data for comparison.

Figure I-1 Fleet Mix of Commercial Operations (Passenger and Cargo) at Logan Airport, 1998, 2022-2024



Source: HMMH, 2025.

Notes: Includes both passenger and cargo operations.

Since 2010, the split between air carrier (AC) jets and regional jets (RJs) is 90 seats with RJs having fewer than 90 seats.

Prior to 2010, the split between AC jets and RJs was 100 seats with RJs having fewer than 100 seats.

The share of RJs as a percentage of the commercial fleet was not tracked prior to 2000.

In the calculation of **Day Night Average Sound Level (DNL)**, annual operations data are scaled to represent an average annual day by dividing by the total by 365 days in a year or 366 days for leap years, such as 2024. To compare operations between years, it is simpler to look at category totals. **Table I-4** summarizes the numbers of average daily operations by categories of aircraft operating at Logan Airport from 2022 through 2024 and the benchmark year, 1998. Operations are summarized by operator category commercial or **general aviation (GA)**, aircraft category, and day or night operation (night defined as 10:00 PM to 7:00 AM, consistent with the definition of DNL).

Table I-4 Modeled Daily Operations by Commercial and GA Aircraft, 1998, 2022-2024

		1998	2022	2023	2024	2022-2023 Percent Change	2023-2024 Percent Change
Commercial Aircraft							
Air Carrier Jets	Day	626.4	567.8	597.8	618.4	5.3%	3.4%
	Night	101.5	123.4	148.8	151.5	20.5%	1.8%
	Total	727.8	691.3	746.6	769.9	8.0%	3.1%
Regional Jets ^{1,2}	Day	N/A ¹	153.9	149.7	159.0	-2.8%	6.2%
	Night	N/A ¹	13.0	10.1	12.6	-22.5%	25.4%
	Total	N/A ¹	167.0	159.8	171.6	-4.3%	7.4%
Commercial Non-jets	Day	552.6	95.0	96.6	110.7	1.7%	14.6%
	Night	21.9	0.4	0.4	0.4	-17.3%	12.9%
	Total	574.4	95.5	97.0	111.2	1.6%	14.6%
Total Commercial Operations	Day	1,178.9	816.8	844.1	888.1	3.3%	5.2%
	Night	123.3	136.9	159.3	164.5	16.3%	3.3%
	Total	1,302.2	953.7	1,003.4	1,052.7	5.2%	4.9%
General Aviation (GA) Aircraft							
GA Jets	Day	35.8	60.8	61.1	55.1	0.5%	-9.8%
	Night	4.6	5.2	5.4	5.2	4.2%	-4.8%
	Total	40.4	66.0	66.5	60.3	0.8%	-9.4%
GA Non-jets	Day	37.3	16.2	11.7	15.4	-28.2%	32.0%
	Night	16.3	1.4	1.0	1.2	-25.4%	21.7%
	Total	53.6	17.6	12.7	16.6	-28.0%	31.2%
Total GA Operations	Day	73.1	77.0	72.7	70.5	-5.5%	-3.1%
	Night	20.9	6.6	6.4	6.4	-2.0%	-0.6%
	Total	94.0	83.6	79.2	76.9	-5.3%	-2.9%
Total Aircraft Operations							
Combined Commercial and GA Operations	Day	1,252.0	893.8	916.9	958.6	2.6%	4.5%
	Night	144.2	143.5	165.7	171.0	15.5%	3.2%
	Total	1,396.2	1,037.3	1,082.6	1,129.5	4.4%	4.3%

Source: Massport's Noise Monitoring System, 2025; Massport's Revenue Office, 2025; and HMMH, 2025.

Notes: Operations include scheduled and unscheduled operations.

Totals and percentages may not add exactly due to rounding.

Nighttime operations are defined as occurring between 10:00 PM and 7:00 AM

1 Regional Jets (RJs) were not tracked separately prior to 2000.

2 Prior to 2010, the split between air carrier jets and RJs is 100 seats with RJs having less than 100 seats. Since 2010, the split between air carrier jets and RJs is 90 seats with RJs having less than 90 seats.

I.1.1.2 Commercial Jet Aircraft by Part 36 Stage Category

Because of the substantial differences in noise between Stage 2, recertificated Stage 3, Stage 3, Stage 4, and Stage 5 aircraft, Massport tracks operations by these separate categories to follow their trends.

Table I-3 shows the percentage of commercial jet operations by stage category from 2022 through 2024 and the 1998 benchmark year.

Table I-5 Percentage of Commercial Jet Operations by Part 36 Stage Category, 1998, 2022-2024

Year	Stage 5 Requirements ¹	Stage 4 Requirements ²	Stage 3 ³	Recertificated Stage 3 ⁴	Stage 2 Greater than 75,000 lbs.	Total
2024	37.7%	62.0%	0.3%	0.0%	0.0%	100.0%
2023	38.4%	61.3%	0.3%	0.0%	0.0%	100.0%
2022 ⁵	33.3%	64.6%	2.0%	0.0%	0.0%	100.0%
1998	N/A	N/A	65.9%	21.7%	12.4%	100%

Source: Massport and Federal Aviation Administration (FAA) radar data, 2025; HMMH, 2025.

Notes: Values less than 0.05% appear as 0.0% due to rounding.

N/A Not applicable.

- 1 This column includes operations by aircraft that would qualify as Stage 5 if recertificated. Aircraft with maximum takeoff weight greater than 121,254 pounds that are certificated after January 1, 2018, must meet Stage 5 standards. The percentage of Logan Airport operations in aircraft meeting Stage 5 requirements was not determined prior to 2016.
- 2 This column includes aircraft that are either certificated Stage 4 or would qualify as Stage 4 if recertificated. Certification as Stage 4 was not available until 2006 and the percentage of Logan Airport operations in aircraft that meet Stage 4 requirements was not determined prior to 2009.
- 3 Certificated Stage 3 aircraft are originally manufactured meeting Stage 3 requirements under Federal Regulation Part 36. This column includes only operations by Certificated Stage 3 aircraft that do not meet higher certification standards.
- 4 Recertificated Stage 3 aircraft are aircraft that were originally manufactured and certified as Stage 1 or 2 under Federal Regulation Part 36, which have been either treated with hushkits or have been re-engineered to meet Stage 3 requirements.
- 5 2022 data in this table reflects a correction with a complete list of airlines from the 2022 *ESPR*. Values will not match.

I.1.1.3 Nighttime Operations

Massport tracks flights that operate between the hours of 10:00 PM to 7:00 AM, when each flight is weighted 10 **decibels (dB)** in calculations of DNL. **Table I-9** shows this nighttime activity by different groups of aircraft. As in years past, the majority of nighttime operations (between 10:00 PM and 7:00 AM) occurred either before midnight or after 5:00 AM.

Table I-6 Modeled Nighttime Operations at Logan Airport, 1998, 2022-2024

Year	Commercial Jets	Commercial Non-Jets	General Aviation	Total
2024	164.1	0.4	6.4	171.0
2023	158.9	0.4	6.4	165.7
2022	136.5	0.4	6.6	143.5
1998	101.5	21.9	20.9	144.2

Table I-6 Modeled Nighttime Operations at Logan Airport, 1998, 2022-2024

Year	Commercial Jets	Commercial Non-Jets	General Aviation	Total
Change from 1998 to 2024	62.7	-21.4	-14.5	26.7
1998-2024 Percent Change	61.8%	-98.1%	-69.3%	18.5%
Change from 2022 to 2024	27.7	0.0	-0.2	27.5
2022-2024 Percent Change	20.3%	-6.7%	-2.5%	19.1%

Source: Massport, 2025; HMMH, 2025.

Notes: Negative numbers represent a decrease.

I.1.2 Runway Use

Massport compares annual runway use to previous years using a variety of summary tables with different perspectives. The first summary of daytime and nighttime runway usages presented here is broken into six representative aircraft groups with similar runway requirements. Aircraft groups are defined in [User's Guide, Section U7.3.2](#). **Table I-7** and **Table I-8** show the runway use summary for the modeled 2023 and 2024 noise conditions, respectively. **Table I-9** shows the corresponding summary from the modeled 2022 noise conditions for comparison. The turbojet aircraft in the table were grouped into the different categories for reporting purposes; NOMS data are fed directly into AEDT for modeling. The modeled runway usage for a given particular aircraft type may be different from the overall group runway use presented in **Table I-7** through **Table I-9**.

Table I-7 2024 Modeled Runway Use by Aircraft Group

	Heavy Jet A		Heavy Jet B		Light Jet A		Light Jet B		Regional Jets		Non-Jets	
ARRIVALS												
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
04L	0.3%	-	0.8%	0.8%	-	-	3.4%	0.3%	6.3%	0.4%	20.9%	0.6%
04R	45.0%	27.6%	41.5%	23.2%	42.9%	-	36.7%	25.0%	33.9%	27.9%	19.4%	18.8%
09	-	-	-	-	-	-	-	-	-	-	<0.1%	-
15L	-	-	-	-	-	-	-	-	-	-	0.1%	-
15R	1.3%	-	0.6%	0.7%	-	-	0.6%	0.9%	0.4%	0.8%	2.0%	26.4%
22L	29.2%	18.4%	26.9%	30.7%	28.6%	-	25.9%	32.9%	26.5%	34.6%	25.7%	21.5%
22R	-	-	<0.1%	-	-	-	<0.1%	-	<0.1%	-	2.2%	0.9%
27	3.5%	-	15.5%	4.2%	28.6%	-	22.8%	16.4%	13.9%	16.2%	4.2%	11.5%
32	-	-	-	-	-	-	1.0%	-	6.9%	-	12.6%	-
33L	20.6%	54.0%	14.6%	40.3%	-	100.0%	9.6%	24.5%	12.1%	20.1%	8.2%	20.3%
33R	-	-	-	-	-	-	-	-	-	-	4.7%	-
DEPARTURES												
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
04L	-	-	-	-	-	-	-	-	-	-	17.9%	4.5%
04R	14.4%	4.7%	15.5%	3.4%	-	-	4.5%	3.4%	0.3%	0.6%	8.2%	0.7%
09	3.9%	6.4%	18.1%	18.1%	-	25.0%	33.5%	24.9%	40.2%	29.4%	22.0%	13.9%
15L	-	-	-	-	-	-	-	-	-	-	-	-
15R	42.1%	46.5%	11.0%	28.9%	-	25.0%	1.6%	9.5%	0.2%	8.5%	1.8%	39.9%
22L	4.6%	4.1%	4.9%	1.2%	-	-	1.2%	0.8%	<0.1%	0.2%	<0.1%	-
22R	9.4%	17.1%	22.7%	20.5%	50.0%	-	28.5%	27.1%	29.5%	30.2%	28.7%	17.5%
27	-	-	4.1%	1.6%	25.0%	25.0%	10.9%	20.8%	12.0%	21.5%	6.7%	4.1%
32	-	-	-	-	-	-	-	-	-	-	-	-
33L	25.6%	21.2%	23.8%	26.3%	25.0%	25.0%	19.8%	13.5%	17.8%	9.6%	14.7%	19.4%
33R	-	-	-	-	-	-	-	-	-	-	-	-

Source: Massport, 2025; HMMH, 2025.

Notes: Nighttime for noise modeling is defined as 10:00 PM to 7:00 AM.

Values may not add exactly to 100 percent due to rounding.

Table I-8 2023 Modeled Runway Use by Aircraft Group

	Heavy Jet A		Heavy Jet B		Light Jet A		Light Jet B		Regional Jets		Non-Jets	
ARRIVALS												
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
04L	-	-	0.9%	1.4%	5.0%	5.9%	3.9%	1.3%	7.4%	1.8%	21.3%	2.0%
04R	47.8%	19.9%	44.8%	29.3%	54.7%	64.7%	40.4%	30.2%	36.9%	32.5%	23.2%	20.6%
09	-	-	-	-	-	-	-	-	-	-	-	-
15L	-	-	-	-	-	-	-	-	-	-	0.1%	-
15R	-	-	0.2%	0.5%	-	-	0.3%	0.7%	0.3%	0.8%	2.4%	23.7%
22L	34.1%	40.1%	31.2%	30.8%	29.8%	23.5%	29.2%	37.9%	28.8%	38.3%	28.0%	25.5%
22R	-	-	-	-	-	-	<0.1%	-	<0.1%	-	3.5%	2.2%
27	4.4%	-	12.6%	9.4%	9.9%	5.9%	20.7%	14.9%	16.6%	14.7%	8.5%	9.8%
32	-	-	-	-	-	-	0.9%	-	4.9%	-	7.4%	-
33L	13.7%	40.1%	10.3%	28.7%	0.6%	-	4.5%	15.0%	5.2%	11.9%	2.6%	16.0%
33R	-	-	-	-	-	-	-	-	-	-	2.9%	0.3%
DEPARTURES												
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
04L	-	-	-	-	-	-	-	-	-	-	22.1%	5.0%
04R	24.4%	29.9%	17.7%	10.0%	1.9%	-	6.8%	6.1%	0.9%	1.4%	6.4%	3.2%
09	2.1%	3.9%	19.6%	17.9%	59.1%	51.6%	35.6%	29.1%	43.4%	35.5%	22.0%	14.1%
15L	-	-	-	-	-	-	-	-	-	-	2.2%	28.2%
15R	30.4%	26.0%	9.5%	26.5%	-	-	1.7%	10.4%	0.2%	10.5%	0.1%	18.1%
22L	14.5%	9.0%	8.5%	4.4%	-	-	2.4%	2.2%	0.1%	1.3%	0.2%	0.6%
22R	11.1%	19.8%	25.5%	20.5%	35.1%	-	32.2%	28.5%	34.0%	29.9%	33.7%	20.2%
27	-	-	2.6%	1.2%	-	-	2.7%	5.7%	4.4%	7.3%	3.5%	3.1%
32	-	-	-	-	-	-	-	-	-	-	-	-
33L	17.5%	11.3%	16.7%	19.5%	3.9%	48.4%	18.7%	18.0%	16.9%	14.2%	9.9%	7.6%
33R	-	-	-	-	-	-	-	-	-	-	-	-

Source: Massport, 2025; HMMH, 2025.

Notes: Nighttime for noise modeling is defined as 10:00 PM to 7:00 AM.

Values may not add exactly to 100 percent due to rounding.

Table I-9 2022 Modeled Runway Use by Aircraft Group

	Heavy Jet A		Heavy Jet B		Light Jet A		Light Jet B		Regional Jets		Non-Jets	
ARRIVALS												
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
04L	0.2%	-	0.2%	0.1%	-	-	2.2%	<0.1%	5.5%	0.2%	18.5%	0.4%
04R	40.0%	-	34.6%	19.0%	25.0%	-	30.8%	18.0%	28.0%	20.0%	14.0%	10.3%
09	-	-	-	-	-	-	-	-	-	-	-	-
15L	-	-	-	-	-	-	-	-	-	-	-	-
15R	0.1%	-	0.4%	1.5%	-	-	0.6%	1.0%	0.6%	1.0%	4.9%	36.5%
22L	35.2%	-	32.9%	30.2%	50.0%	-	31.0%	40.5%	31.1%	41.8%	31.0%	26.9%
22R	-	-	<0.1%	-	-	-	<0.1%	<0.1%	<0.1%	-	3.4%	1.7%
27	5.3%	-	17.4%	6.5%	25.0%	50.0%	27.2%	16.7%	21.2%	20.5%	9.5%	8.7%
32	-	-	-	-	-	-	1.2%	-	6.2%	-	11.7%	0.2%
33L	19.1%	100.0%	14.6%	42.8%	-	50.0%	7.0%	23.8%	7.4%	16.5%	4.7%	14.8%
33R	-	-	-	-	-	-	-	-	-	-	2.3%	0.4%
DEPARTURES												
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
04L	-	-	-	-	-	-	-	-	-	-	17.1%	2.8%
04R	17.4%	21.2%	10.8%	4.6%	-	-	4.4%	3.9%	0.1%	0.3%	7.1%	2.0%
09	3.8%	-	18.1%	13.0%	20.0%	-	26.9%	20.7%	33.6%	25.2%	15.7%	5.3%
15L	-	-	-	-	-	-	-	-	-	-	-	-
15R	29.9%	29.7%	7.5%	31.8%	-	-	2.1%	20.0%	0.5%	14.5%	4.6%	60.2%
22L	12.6%	8.7%	7.0%	2.1%	-	-	2.4%	1.4%	<0.1%	0.3%	<0.1%	0.8%
22R	11.9%	20.1%	28.9%	19.4%	20.0%	-	34.7%	22.0%	37.0%	30.7%	35.5%	13.0%
27	0.1%	-	3.7%	1.5%	-	100.0%	5.8%	9.2%	6.7%	7.6%	3.9%	2.2%
32	-	-	-	-	-	-	-	-	-	-	-	-
33L	24.3%	20.3%	24.0%	27.6%	60.0%	-	23.5%	22.8%	22.1%	21.3%	16.1%	13.5%
33R	-	-	-	-	-	-	-	-	-	-	-	-

Source: Massport, 2025; HMMH, 2025.

Notes: Nighttime for noise modeling is defined as 10:00 PM to 7:00 AM.

Values may not add exactly to 100 percent due to rounding.

While previous tables present runway use by aircraft groups, **Table I-10**, **Table I-11**, and **Table I-12** present the total runway use by jets and **non-jet aircraft**. The first section of each table displays the number of departures and arrivals using each runway for an average day in the given year. The second section displays the same information as annual counts, and the last section displays the percentage that each runway is used for a given operation type and time of day.

Table I-10 Summary of Jet and Non-Jet Aircraft Runway Use, 2024

	Runway												
	4L	4R	9	14 ¹	15L	15R	22L	22R	27	32 ¹	33L	33R	Total
2024 Daily Operations Counts													
Dep Day	11.3	22.8	159.0	0.0	0.0	9.6	5.0	138.6	49.6	0.0	92.5	0.0	488.5
Dep Night	0.0	2.3	18.3	0.0	0.0	10.0	0.6	20.0	13.3	0.0	11.7	0.0	76.3
Arr Day	29.1	160.6	0.0	0.0	0.1	3.4	122.6	1.4	83.4	17.8	48.8	3.0	470.1
Arr Night	0.3	23.8	0.0	0.0	0.0	1.1	31.1	0.0	14.8	0.0	23.6	0.0	94.7
Total Daily Operations	40.8	209.5	177.3	0.0	0.1	24.1	159.3	160.0	161.1	17.8	176.6	3.0	1,129.5
2024 Annual Operations Counts													
Dep Day	4,144	8,344	58,182	0	0	3,520	1,833	50,741	18,162	0	33,858	0	178,784
Dep Night	13	856	6,712	0	0	3,660	237	7,309	4,869	0	4,265	0	27,921
Arr Day	10,648	58,775	1	0	27	1,244	44,863	502	30,535	6,507	17,867	1,088	172,057
Arr Night	125	8,707	0	0	0	385	11,383	3	5,400	0	8,644	0	34,647
Total Annual Operations	14,930	76,681	64,895	0	27	8,809	58,316	58,556	58,966	6,507	64,633	1,088	413,409
2024 Percentage Operations													
Dep Day	2%	5%	33%	0%	0%	2%	1%	28%	10%	0%	19%	0%	100%
Dep Night	<1%	3%	24%	0%	0%	13%	1%	26%	17%	0%	15%	0%	100%
Arr Day	6%	34%	<1%	0%	<1%	1%	26%	<1%	18%	4%	10%	1%	99.7%
Arr Night	<1%	25%	0%	0%	0%	1%	33%	<1%	16%	0%	25%	0%	100%

Source: Massport radar data; HMMH, 2025.

Notes: These data reflect actual counts or percentages of aircraft operations on each runway end. They should not be confused with effective runway use, which weights nighttime operations by a factor of 10. Values may not add to 100 percent due to rounding.

Arr – Arrivals

Dep – Departures

1 Runway 14-32 is unidirectional: there are no arrivals to Runway 14 and no departures from Runway 32.

Table I-11 Summary of Jet and Non-Jet Aircraft Runway Use, 2023

	Runway												
	4L	4R	9	14 ¹	15L	15R	22L	22R	27	32 ¹	33L	33R	Total
2023 Daily Operations Counts													
Dep Day	12.2	28.2	162.6	0.0	0.0	8.9	9.1	151.1	14.6	0.0	79.9	0.0	466.6
Dep Night	0.0	4.8	20.5	0.0	0.0	10.3	1.9	20.2	3.7	0.0	13.3	0.0	74.7
Arr Day	29.9	170.3	0.0	0.0	0.1	2.5	131.2	2.0	79.4	11.4	21.9	1.6	450.3
Arr Night	1.2	27.5	0.0	0.0	0.0	0.9	34.0	0.0	13.2	0.0	14.2	0.0	91.0
Total Daily Operations	43.3	230.9	183.1	0.0	0.1	22.5	176.2	173.2	111.0	11.4	129.3	1.6	1082.6
2023 Annual Operations Counts													
Dep Day	4,463	10,305	59,333	11	0	3,238	3,325	55,147	5,340	0	29,156	0	170,318
Dep Night	16	1,759	7,477	0	0	3,750	683	7,367	1,365	0	4,838	0	27,255
Arr Day	10,896	62,159	5	0	30	897	47,894	713	28,982	4,168	8,009	592	164,346
Arr Night	439	10,046	0	0	0	315	12,423	8	4,811	0	5,183	1	33,227
Total Annual Operations	15,814	84,269	66,815	11	30	8,200	64,326	63,235	40,498	4,168	47,186	593	395,146
2023 Percentage Operations													
Dep Day	3%	6%	35%	<1%	0%	2%	2%	32%	3%	0%	17%	0%	100%
Dep Night	<1%	6%	27%	0%	0%	14%	3%	27%	5%	0%	18%	0%	100%
Arr Day	7%	38%	<1%	0%	<1%	1%	29%	<1%	18%	3%	5%	<1%	99.2%
Arr Night	1%	30%	0%	0%	0%	1%	37%	<1%	14%	0%	16%	<1%	100%

Source: Massport radar data; HMMH, 2025.

Notes: These data reflect actual counts or percentages of aircraft operations on each runway end. They should not be confused with effective runway use, which weights nighttime operations by a factor of 10. Values may not add to 100 percent due to rounding.

Arr – Arrivals

Dep – Departures

1 Runway 14-32 is unidirectional: there are no arrivals to Runway 14 and no departures from Runway 32.

Table I-12 Summary of Jet and Non-Jet Aircraft Runway Use, 2022

	Runway												
	4L	4R	9	14 ¹	15L	15R	22L	22R	27	32 ¹	33L	33R	Total
2022 Daily Operations Counts													
Dep Day	9.8	18.7	122.0	0.0	0.0	9.7	8.4	160.4	26.0	0.0	102.3	0.0	457.2
Dep Night	0.0	2.2	11.9	0.0	0.0	13.7	0.9	13.9	4.4	0.0	14.5	0.0	61.5
Arr Day	21.9	123.5	0.0	0.0	0.0	3.7	136.6	1.9	99.4	16.2	32.1	1.3	436.6
Arr Night	0.1	14.9	0.0	0.0	0.0	1.0	32.7	0.0	13.5	0.0	19.7	0.0	82.0
Total Daily Operations	31.7	159.4	133.9	0.0	0.0	28.1	178.6	176.2	143.2	16.2	168.6	1.3	1,037.3
2022 Annual Operations Counts													
Dep Day	3,564	6,827	44,525	0	0	3,545	3,060	58,541	9,478	0	37,327	0	166,867
Dep Night	10	813	4,342	0	0	4,996	321	5,060	1,604	0	5,292	0	22,440
Arr Day	7,977	45,083	0	0	0	1,337	49,871	710	36,283	5,912	11,729	473	159,376
Arr Night	21	5,444	0	0	0	382	11,952	9	4,920	1	7,200	2	29,931
Total Annual Operations	11,573	58,166	48,867	0	0	10,261	65,204	64,321	52,285	5,913	61,548	475	378,613
2022 Percentage Operations													
Dep Day	2%	4%	27%	0%	0%	2%	2%	35%	6%	0%	22%	0%	100%
Dep Night	<1%	4%	19%	0%	0%	22%	1%	23%	7%	0%	24%	0%	100%
Arr Day	5%	28%	0%	0%	0%	1%	31%	<1%	23%	4%	7%	<1%	99.3%
Arr Night	<1%	18%	0%	0%	0%	1%	40%	<1%	16%	<1%	24%	<1%	100%

Source: Massport radar data; HMMH, 2023.

Notes: These data reflect actual counts or percentages of aircraft operations on each runway end. They should not be confused with effective runway use, which weights nighttime operations by a factor of 10. Values may not add to 100 percent due to rounding.

Arr – Arrivals

Dep – Departures

1 Runway 14-32 is unidirectional: there are no arrivals to Runway 14 and no departures from Runway 32.

Runway use can also be presented in terms of percent of total operations. **Table I-13** presents the 2022, 2023 and 2024 runway use for all operations which use Logan Airport. For 2022, Runways 22L and 22R were the most active, with 22R handling the most departures and 22L handling the most arrivals. In 2023 and 2024, the most active departure runway was Runway 9 and the most active arrival runway was Runway 4R.

Table I-13 Total Modeled Runway Use by All Operations, 2022-2024

Runway	Jet Arrivals		Non-Jet Arrivals		Jet Departures		Non-Jet Departures		All Operations
	Day	Night	Day	Night	Day	Night	Day	Night	
2024 Operations									
4L	1.4%	<0.1%	1.2%	<0.1%	0.0%	0.0%	1.0%	<0.1%	3.6%
4R	13.1%	2.1%	1.1%	<0.1%	1.6%	0.2%	0.5%	<0.1%	18.5%
9	0.0%	0.0%	<0.1%	0.0%	12.8%	1.6%	1.2%	<0.1%	15.7%
14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15L	0.0%	0.0%	<0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	<0.1%
15R	0.2%	0.1%	0.1%	<0.1%	0.8%	0.9%	0.1%	<0.1%	2.1%
22L	9.4%	2.7%	1.4%	<0.1%	0.4%	0.1%	<0.1%	0.0%	14.1%
22R	<0.1%	0.0%	0.1%	<0.1%	10.7%	1.8%	1.6%	<0.1%	14.2%
27	7.2%	1.3%	0.2%	<0.1%	4.0%	1.2%	0.4%	<0.1%	14.3%
32	0.9%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%
33L	3.9%	2.1%	0.5%	<0.1%	7.4%	1.0%	0.8%	<0.1%	15.6%
33R	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Total	36.0%	8.3%	5.6%	0.1%	37.7%	6.7%	5.6%	0.1%	100.0%
2023 Operations									
4L	1.7%	0.1%	1.1%	<0.1%	0.0%	0.0%	1.1%	<0.1%	4.0%
4R	14.5%	2.5%	1.2%	<0.1%	2.3%	0.4%	0.3%	<0.1%	21.3%
9	0.0%	0.0%	<0.1%	0.0%	13.9%	1.9%	1.1%	<0.1%	16.9%
14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	<0.1%	0.0%	<0.1%
15L	0.0%	0.0%	<0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	<0.1%
15R	0.1%	0.1%	0.1%	<0.1%	0.7%	0.9%	0.1%	<0.1%	2.1%
22L	10.7%	3.1%	1.4%	<0.1%	0.8%	0.2%	<0.1%	<0.1%	16.3%
22R	<0.1%	0.0%	0.2%	<0.1%	12.2%	1.8%	1.7%	<0.1%	16.0%
27	6.9%	1.2%	0.4%	<0.1%	1.2%	0.3%	0.2%	<0.1%	10.2%
32	0.7%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
33L	1.9%	1.3%	0.1%	<0.1%	6.9%	1.2%	0.5%	<0.1%	11.9%
33R	0.0%	0.0%	0.1%	<0.1%	0.0%	0.0%	0.0%	0.0%	0.2%
Total	36.5%	8.3%	5.1%	0.1%	38.0%	6.8%	5.1%	0.1%	100.0%
2022 Operations									
4L	1.1%	<0.1%	1.0%	<0.1%	0.0%	0.0%	0.9%	<0.1%	3.0%
4R	11.1%	1.4%	0.8%	<0.1%	1.4%	0.2%	0.4%	<0.1%	15.4%

Table I-13 Total Modeled Runway Use by All Operations, 2022-2024

Runway	Jet Arrivals		Non-Jet Arrivals		Jet Departures		Non-Jet Departures		All Operations
	Day	Night	Day	Night	Day	Night	Day	Night	
9	0.0%	0.0%	0.0%	0.0%	10.9%	1.1%	0.9%	<0.1%	12.9%
14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15L	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15R	0.2%	0.1%	0.1%	<0.1%	0.8%	1.3%	0.1%	<0.1%	2.7%
22L	11.5%	3.1%	1.7%	<0.1%	0.8%	0.1%	<0.1%	<0.1%	17.2%
22R	<0.1%	<0.1%	0.2%	<0.1%	13.5%	1.3%	2.0%	<0.1%	17.0%
27	9.1%	1.3%	0.5%	<0.1%	2.3%	0.4%	0.2%	<0.1%	13.8%
32	0.9%	0.0%	0.6%	<0.1%	0.0%	0.0%	0.0%	0.0%	1.6%
33L	2.8%	1.9%	0.3%	<0.1%	9.0%	1.4%	0.9%	<0.1%	16.3%
33R	0.0%	0.0%	0.1%	<0.1%	0.0%	0.0%	0.0%	0.0%	0.1%
Total	36.7%	7.8%	5.4%	0.1%	38.7%	5.9%	5.4%	0.1%	100.0%

Source: Massport radar data; HMMH, 2025.

Notes: Night for noise modeling is defined as 10:00 PM to 7:00 AM.

Nighttime runway restrictions are in effect from 11:00 PM to 6:00 AM.

Values may not add to exactly 100 percent due to rounding.

Table I-14 presents a historical summary of runway use by jets. Note that Logan Airport Noise Rules prevent arrivals to Runway 22R and departures from Runway 4L by jet aircraft except under certain circumstances.

Table I-14 Summary of Jet Aircraft Runway Use, 1998, 2022-2024

Runway	4L	4R	9	14 ¹	15R	22L	22R	27	32 ¹	33L
2024										
Departures	0%	4%	33%	0%	4%	1%	28%	12%	0%	19%
Arrivals	3%	34%	0%	0%	1%	27%	<1%	19%	2%	13%
2023										
Departures	0%	6%	35%	0%	4%	2%	31%	3%	0%	18%
Arrivals	4%	38%	0%	0%	<1%	31%	<1%	18%	2%	7%
2022										
Departures	0%	4%	27%	0%	5%	2%	33%	6%	0%	23%
Arrivals	2%	28%	0%	0%	1%	33%	<1%	23%	2%	11%

Table I-14 Summary of Jet Aircraft Runway Use, 1998, 2022-2024

Runway	4L	4R	9	14 ¹	15R	22L	22R	27	32 ¹	33L
1998										
Departures	0%	8%	35%	-	6%	5%	28%	14%	N/A	5%
Arrivals	2%	41%	0%	-	2%	7%	0%	28%	N/A	19%

Source: Massport radar data; HMMH, 2025.

Notes: These data reflect actual percentages of jet aircraft operations on each runway end. They should not be confused with effective runway use, which weights nighttime operations by a factor of 10 so that use of a runway at night more closely reflects its effect on total noise exposure.

Jet aircraft cannot use Runway 15L or 33R due to its length of only 2,557 feet.

Values may not add to exactly 100 percent due to rounding.

1 Runway 14-32 opened in late November 2006. Runway 14-32 is unidirectional with no arrivals to Runway 14 and no departures from Runway 32.

Since runway use plays a key role in determining the aircraft noise distribution in the Airport's environment, Massport also tracks the level of traffic off each runway end by combining counts of operations that overfly the same general area. The total operations and percentages shown for 2022, 2023, and 2024 in **Table I-15** represent the amount of activity experienced off each runway end for a given year. **Table I-16** presents the effective usage of each runway.

Table I-15 Runway Usage by Runway End, 2022-2024

Runway End	Operation(s) ¹	2022		2023		2024	
		Total Flights	Percent of Total ²	Total Flights	Percent of Total ²	Total Flights	Percent of Total ²
04L	R4L A + R22R D	71,600	18.9%	73,850	18.7%	68,824	16.6%
04R	R4R A + R22L D	53,908	14.2%	76,213	19.3%	69,551	16.8%
9	R9 A + R27 D	11,082	2.9%	6,709	1.7%	23,031	5.6%
14	N/A	0	0.0%	0	0.0%	0	0.0%
15L	R15L A + R33R D	0	0.0%	30	0.0%	27	0.0%
15R	R15R A + R33L D	44,338	11.7%	35,206	8.9%	39,752	9.6%
22L	R22L A + R4R D	69,463	18.3%	72,382	18.3%	65,446	15.8%
22R	R22R A + R4L D	4,293	1.1%	5,200	1.3%	4,662	1.1%
27	R27 A + R9 D	90,070	23.8%	100,604	25.5%	100,829	24.4%
32	R32 A + R14 D	5,913	1.6%	4,179	1.1%	6,507	1.6%
33L	R33L A + R15R D	27,471	7.3%	20,180	5.1%	33,691	8.1%
33R	R33R A + R15L D	475	0.1%	593	0.2%	1,088	0.3%
All		378,613	100.0%	395,146	100.0%	413,409	100.0%

Source: Massport radar data; HMMH, 2025.

Notes: N/A – not applicable.

Runway 14-32 is unidirectional: there are no arrivals to Runway 14 and no departures from Runway 32.

1 A: Arrivals; D: Departures.

2 Percentages are rounded to the nearest tenth.

Table I-16 Effective Jet Aircraft Runway Usage, 2022-2024

Runway End	2022 Effective Usage		2023 Effective Usage		2024 Effective Usage	
	ARR	DEP	ARR	DEP	ARR	DEP
4R/4L	23.1%	3.6%	35.6%	6.3%	30.0%	3.5%
9	0.0%	22.9%	0.0%	30.8%	0.0%	27.7%
15R	0.9%	14.0%	0.6%	9.2%	0.8%	8.9%
22L/22R	37.2%	29.2%	35.0%	31.3%	30.9%	28.0%
27	19.1%	6.7%	15.9%	4.3%	16.9%	15.1%
33L	18.9%	23.5%	12.4%	17.9%	20.7%	16.8%
14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32	0.8%	0.0%	0.6%	0.0%	0.7%	0.0%

Source: Massport NOMS data; HMMH, 2025.

I.1.3 Flight Tracks

The AEDT pre-processor converts each radar track to an AEDT model track and then models the scaled aircraft operation on that track. **Table I-17** lists the number of flight tracks used in the noise modeling process for 2022, 2023 and 2024. A statistical analysis of the flight tracks for each year is presented in **Section I.1.3**.

Table I-17 Total Count of Flight Tracks Modeled with AEDT, 2022-2024

	Runway											
	4L	4R	9	14	15L	15R	22L	22R	27	32	33L	33R
2024												
Departures	3,934	9,016	64,550	0	0	7,149	2,051	57,524	22,908	0	37,809	0
Arrivals	10,696	67,160	1	0	27	1,621	55,864	496	35,777	6,488	26,371	1,065
2023												
Departures	4,393	11,982	66,534	11	0	6,923	4,004	62,212	6,686	0	33,827	0
Arrivals	11,304	71,905	5	0	30	1,186	60,096	725	33,643	4,158	13,140	599
2022												
Departures	3,579	7,614	48,628	0	0	8,469	3,366	63,308	11,028	0	42,404	0
Arrivals	7,975	50,215	0	0	0	1,696	61,458	715	40,937	5,892	18,817	474

Source: Massport's Noise and Operational Monitoring System (NOMS) data and HMMH, 2025

I.2 Annual Noise Model Results

I.2.1 Noise Exposed Population

Table I-18 presents the noise-exposed population by community. See **User's Guide, Section U7.4.1** for further on this analysis.

Table I-18 Noise-Exposed Population by Community, 1998, 2022-2024

Year	Census Data	75+ dB DNL	70-75 dB DNL	65-70 dB DNL ¹	Total (65+)	60-65 dB DNL
BOSTON²						
1998	1990	58	580	10,877	11,515	52,201
2022	2020	0	0	3,862	3,862	17,804
2023	2020	0	7	3,215	3,222	19,224
2024	2020	0	0	3,373	3,373	20,112
CHELSEA						
1998	1990	0	0	0	0	9,222
2022	2020	0	0	0	0	13,683
2023	2020	0	0	0	0	12,684
2024	2020	0	0	0	0	12,759
REVERE						
1998	1990	0	0	3,168	3,168	2,132
2022	2020	0	0	3,416	3,416	3,904
2023	2020	0	0	4,000	4,000	4,134
2024	2020	0	0	3,371	3,371	3,900
WINTHROP						
1998	1990	519	1,522	6,572	8,613	6,507
2022	2020	0	27	880	907	4,848
2023	2020	0	205	1,370	1,575	6,427
2024	2020	0	192	1,044	1,236	5,677
All Communities						
1998	1990	577	2,102	20,617	23,296	70,062
2022	2020	0	27	8,158	8,185	40,239
2023	2020	0	212	8,585	8,797	42,469
2024	2020	0	192	7,788	7,980	42,448

Source: HMMH, 2025.

Notes: The communities of Everett, Medford, and Quincy had no noise exposure population at or above 60 dB DNL for the years shown.

dB decibel;

DNL Day-Night Average Sound Level;

1 65 dB DNL is the federally defined noise criterion for residential incompatibility with aircraft noise (if not sound-insulated).

2 Boston includes portions of Dorchester, East Boston, Roxbury, South Boston, and the South End.

I.2.2 Cumulative Noise Index (CNI)

The Logan Airport Noise Rules define **Cumulative Noise Index (CNI)** in terms of **Effective Perceived Noise Level (EPNL)** and established a CNI limit of 156.5 Effective Perceived Noise Decibels (EPNdB). In addition, Massport calculates and reports partial CNI values for various subsets of the Logan Airport fleet as shown in **Table I-19**. For more on CNI, the **User's Guide, Section U7.4.2**.

Table I-19 Cumulative Noise Index (CNI) Effective Perceived Noise Level (EPNL), 1998, 2022-2024 (limit 156.5)

	1998	2022	2023	2024
Full CNI (Entire Commercial Jet Fleet)	154.7	152.8	153.4	153.6
Total Passenger Jets	153.7	152.5	153.0	153.3
Total Cargo Jets	147.9	142.2	142.9	142.7
Total Daytime	150.4	147.6	147.9	148.1
Total Nighttime	152.7	151.3	152.0	152.2
Daytime Passenger	150.1	147.4	147.8	148.0
Nighttime Passenger	151.2	150.8	151.5	151.7
Daytime Cargo	138.0	134.3	133.1	132.9
Nighttime Cargo	147.5	141.4	142.5	142.2

Source: HMMH, 2025.

Table I-20 shows the relative contribution of each airline to total CNI. The table provides the number of flight operations, the contribution to CNI by airline, and the partial CNI per operation for 2022, 2023 and 2024, sorted by the partial CNI per operation for 2024. The data reflect the contributions of individual aircraft noise levels and the frequency with which they occur. For example, JetBlue Airways, with the largest number of operations, typically has a higher total CNI per airline, but its partial CNI per operation is often below the other major airlines, partly due to its use of newer, quieter aircraft.

Regional carriers generally contribute the least to the partial CNI per operation whereas international and cargo carriers, which typically operate larger aircraft and generally have more operations at night, are usually at the top of the list. The relative positions for the domestic carriers are due mainly to their fleet characteristics and number of night operations. For more information on CNI, see **User's Guide, Section U7.4.2**.

Table I-20 Annual Operations and Partial CNI by Airline and per Operation, 2022-2024

Airlines	Airline Group	Operations			Total Airline CNI (EPNdB)			Partial CNI (EPNdB) per Operation		
		2022	2023	2024	2022	2023	2024	2022	2023	2024
El Al Israel Airlines Ltd.	International	164	284	338	129	131	131	107	106	106
Federal Express	Cargo	4,722	3,479	3,147	140	140	140	103	105	105
United Parcel Service	Cargo	2,114	2,089	2,338	138	139	139	105	106	105
ABX Air, Inc.	Cargo	147	214	500	127	128	131	105	105	104
Hawaiian Airlines	Domestic	422	444	446	128	130	130	102	103	104
British Airways	International	1,703	2,002	1,981	135	135	135	102	102	102
Emirates Airlines	International	702	732	736	130	130	130	102	102	102
Avianca	International	-	439	521	-	125	128	-	98	101
Cathay Pacific	International	-	313	622	-	126	129	-	101	101
Iberia Airlines Of Spain	International	696	940	1,089	128	129	130	100	99	100
Alaska Airlines	Domestic	4,404	5,019	5,119	135	136	136	98	99	99
American Airlines	Domestic	41,255	32,623	34,938	144	144	145	98	99	99
Delta Air Lines	Domestic	46,893	58,538	58,176	146	147	147	99	99	99
Frontier Airlines	Domestic	1,489	1,039	2,914	130	125	134	98	95	99
Lufthansa	International	1,446	1,686	1,611	131	131	131	100	99	99
Air Canada	International	625	2,244	2,458	122	132	132	94	99	98
Austrian Airlines	International	-	-	242	-	-	122	-	-	98
JetBlue Airways	Domestic	91,803	97,486	93,703	147	148	147	97	98	98
Southwest Airlines	Domestic	10,535	12,218	13,186	139	139	139	99	99	98
Spirit Airlines	Domestic	6,717	9,537	13,664	136	139	140	98	99	98
Swiss Air	International	804	1,044	1,054	127	128	128	98	98	98
Turkish Airlines	International	742	658	690	127	127	126	99	99	98
United Airlines	Domestic	22,123	24,764	24,716	142	142	142	98	98	98
Aer Lingus	International	1,910	2,034	2,049	130	130	130	97	97	97

Table I-20 Annual Operations and Partial CNI by Airline and per Operation, 2022-2024

Airlines	Airline Group	Operations			Total Airline CNI (EPNdB)			Partial CNI (EPNdB) per Operation		
		2022	2023	2024	2022	2023	2024	2022	2023	2024
ITA Airlines	International	484	506	478	124	124	124	97	97	97
Korean Air Lines Co., Ltd.	International	366	618	732	122	125	126	96	97	97
SATA International Airlines	International	648	750	962	126	126	127	98	98	97
LATAM Airlines	International	-	316	312	-	121	121	-	96	97
TAP - Air Portugal	International	965	1,250	1,302	127	128	128	97	97	97
Virgin Atlantic	International	670	727	1,108	127	128	128	99	99	97
Air France	International	961	972	1,137	125	126	127	95	96	96
KLM Royal Dutch Airlines	International	364	348	364	125	123	122	99	98	96
Qatar Airways	International	728	726	872	126	125	126	97	97	96
Sun Country Airlines	Domestic	416	472	557	120	121	123	94	94	96
Condor Flugdienst	International	104	-	236	119	-	119	98	-	95
Envoy Airlines	Domestic	2,039	3,475	3,828	126	130	131	93	95	95
Fly Play Corp	International	453	696	648	121	124	123	95	95	95
Icelandair	International	1,450	1,390	1,496	128	127	127	96	96	95
Republic Airlines	Domestic	46,247	45,002	52,705	141	141	142	95	94	95
TACA International Airlines, S.A.	International	-	186	459	-	117	122	-	94	95
Allegiant Air	Domestic	1,154	1,018	1,016	124	124	124	93	94	94
Jazz Air Inc.	International	4,166	2,906	2,929	132	130	129	96	95	94
Scandinavian Airlines	International	389	544	664	121	122	123	95	95	94
Aeromexico	International	-	-	569	-	-	121	-	-	93
COPA Airlines	International	228	646	939	122	126	123	99	98	93

Table I-20 Annual Operations and Partial CNI by Airline and per Operation, 2022-2024

Airlines	Airline Group	Operations			Total Airline CNI (EPNdB)			Partial CNI (EPNdB) per Operation		
		2022	2023	2024	2022	2023	2024	2022	2023	2024
Etihad Airways	International	-	-	374	-	-	119	-	-	93
WestJet Airlines	International	144	164	200	115	116	116	94	94	93
Bermudair Limited	International	-	192	622	-	116	120	-	93	92
Hainan Airlines	International			312			117			92
Japan Airlines	International	730	730	732	121	121	121	92	92	92
Piedmont Airlines	Domestic	2,955	2,700	2,678	125	125	127	91	90	92
Amerijet International	Cargo	-	293	-	-	129	-	-	105	-
Endeavor Air	Domestic	4,621	-	-	130	-	-	93	-	-
Kalitta Air	Cargo	349	-	-	127	-	-	102	-	-
SkyWest Airlines	Domestic	782	3,920	-	123	130	-	94	95	-

Source: Massport; HMMH, 2025.

Notes: This table only includes airlines with more than 100 flights in 2023 or 2024..Airlines with no operations or less than 100 operations at Logan Airport in a given year are indicated by “-”

Operations for some carriers differ from those in Chapter 3, *Activity Levels and Forecasting*, and Chapter 8, *Air Quality and Greenhouse Gas Emissions*, because this table only includes jet aircraft and not turboprops, and because it includes both scheduled and unscheduled air carriers.

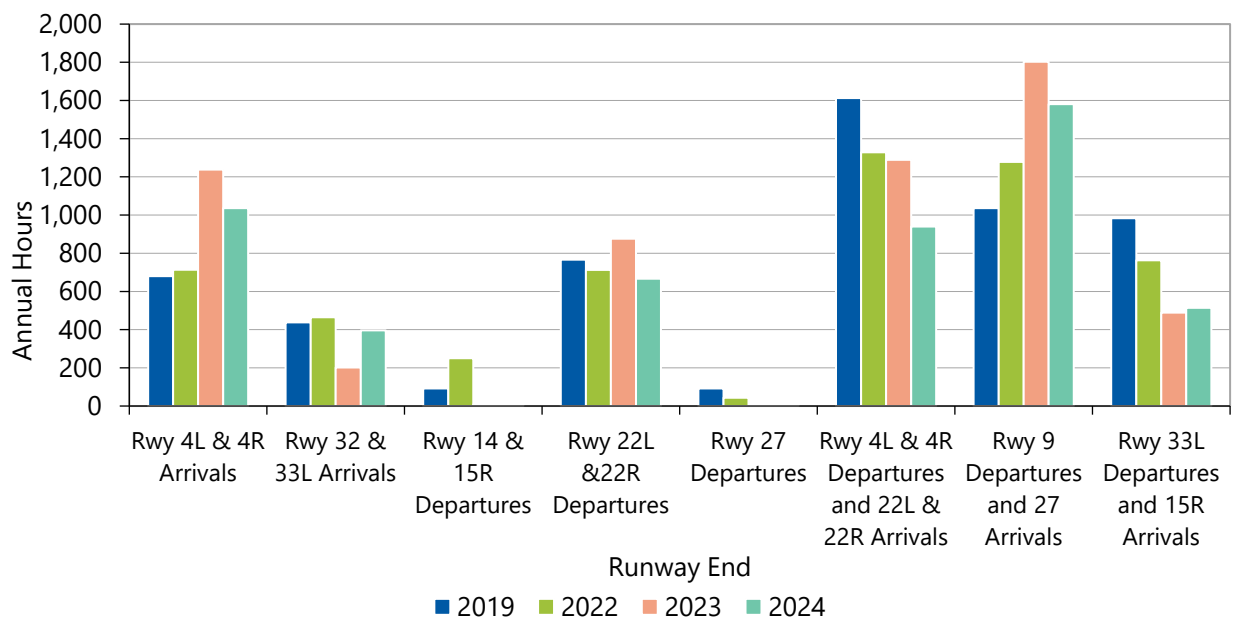
CNI: Cumulative Noise Index

EPNdB: Effective Perceived Noise Decibels

I.2.3 Dwell and Persistence Reporting

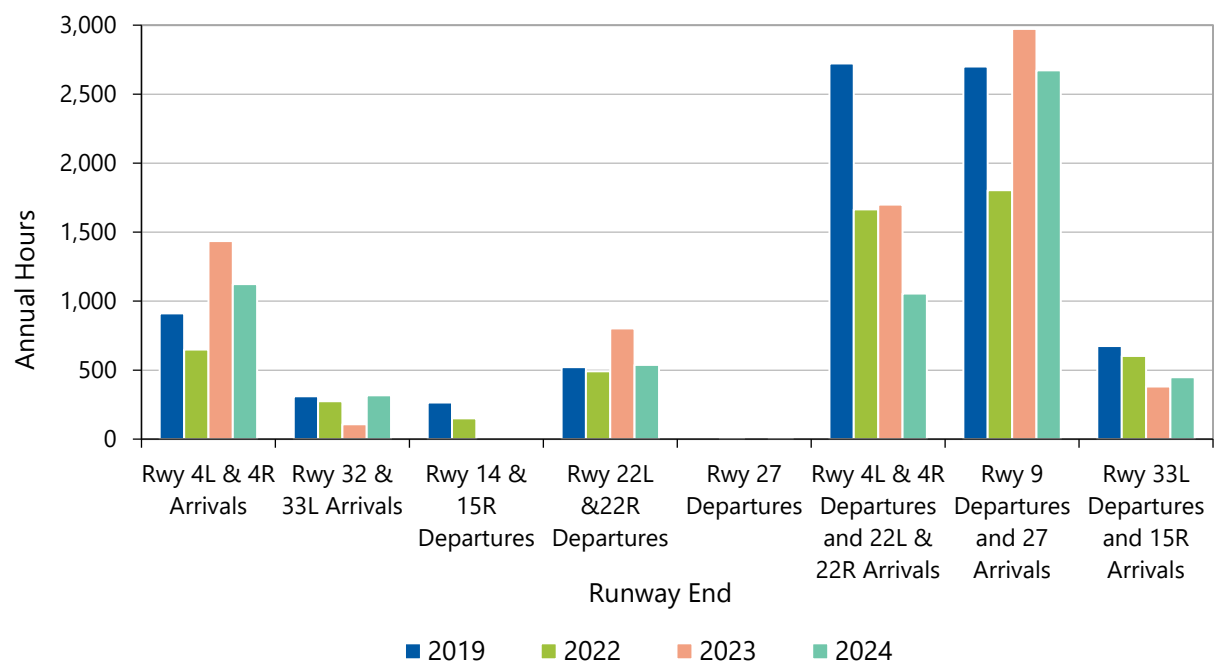
Dwell and Persistence are measured by the number of hours that a given location or area is subject to jet aircraft overflights. **Figure I-2** and **Figure I-3** illustrate the annual hours of dwell and persistence by runway end for 2022 through 2024. The data accounts for the time the runway configuration was in use and does not necessarily represent operations on those runways. For more on dwell and persistence reporting see [User’s Guide Section U7.4.2](#).

Figure I-2 Comparison of Annual Hours of Dwell Exceedance by Runway End



Source: HMMH, 2025.

Figure I-3 Comparison of Annual Hours of Persistence Exceedance by Runway End



Source: HMMH, 2025.

I.2.4 Time Above (TA) and Time Above Night (TAN)

Table I-21 and **Table I-22** present a summary of the AEDT-calculated **Time Above (TA)** values for 2022, 2023, and 2024 at each of the monitor locations. For more on Time Above, see the **User's Guide, Section U7.4.4**.

Table I-21 Time Above (TA) dBA Thresholds in a 24-Hour Period for Average Day, 2022–2024

Site ¹	Distance (mi) ²	Minutes above Threshold									Modeled DNL (dB) ³		
		2022			2023			2024			2022	2023	2024
		85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA			
1	3.7	0.0	0.0	6.8	0.0	0.0	5.2	0.0	0.0	16.4	52.4	51.7	55.2
2	2.9	0.0	0.9	11.3	0.0	0.7	6.8	0.0	2.6	20.9	56.2	54.8	59.5
3	2.5	0.0	1.8	71.8	0.0	3.0	93.9	0.0	2.4	84.9	60.5	62.4	61.8
4	1.6	8.1	41.0	97.0	8.8	46.1	106.2	9.5	46.0	106.0	71.2	72.2	72.2
5	1.9	0.0	16.4	81.2	0.1	25.3	91.6	0.1	24.6	90.9	64.6	66.2	66.0
6	0.8	0.0	0.9	53.8	0.0	2.0	82.4	0.0	1.3	76.4	61.7	62.4	61.9
7	1.0	0.6	8.7	98.4	1.2	11.1	103.8	0.8	7.1	90.2	65.4	67.0	65.2
8	1.6	0.0	3.2	42.5	0.0	5.9	45.6	0.0	3.9	38.2	61.2	62.9	61.4
9	1.3	0.9	24.9	81.9	1.7	26.9	102.4	1.2	23.1	91.4	67.9	68.9	67.9
10	1.3	0.0	4.6	50.0	0.1	7.6	57.7	0.0	5.3	49.7	61.8	63.1	61.7
11	1.8	0.0	0.8	12.1	0.0	1.5	17.3	0.0	1.3	13.5	56.7	57.8	56.7
12	1.2	0.0	9.3	90.9	0.0	9.3	104.2	0.0	10.5	99.7	64.7	64.7	64.5
13	1.9	0.0	12.8	50.2	0.1	12.3	36.2	0.1	13.6	40.0	64.2	63.7	63.9
14	1.2	0.0	0.2	47.0	0.0	0.2	60.9	0.0	0.1	71.9	60.2	60.1	60.8
15	2.8	0.0	4.5	39.4	0.0	4.8	31.1	0.0	5.6	33.4	61.1	60.6	61.0
16	2.4	0.9	25.4	57.1	0.9	26.6	58.7	0.8	23.5	52.0	68.7	69.2	68.6
17	5.3	0.0	1.0	52.7	0.0	1.0	55.8	0.0	0.9	49.9	61.0	61.5	60.9
18	5.9	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0	0.3	45.0	46.8	45.0
19	8.7	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0	0.5	44.7	46.4	44.4
20	8.4	0.0	0.0	12.8	0.0	0.0	15.9	0.0	0.0	14.5	55.5	55.9	55.5
21	4.5	0.0	0.0	14.1	0.0	0.0	14.6	0.0	0.0	15.3	54.8	54.1	54.0

Table I-21 Time Above (TA) dBA Thresholds in a 24-Hour Period for Average Day, 2022–2024

Site ¹	Distance (mi) ²	Minutes above Threshold									Modeled DNL (dB) ³		
		2022			2023			2024			2022	2023	2024
		85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA			
22	6	0.0	0.1	10.1	0.0	0.1	9.9	0.0	0.1	11.8	53.8	53.1	53.1
23	6.3	0.0	0.0	18.4	0.0	0.0	29.4	0.0	0.0	27.7	54.7	57.0	56.4
24	8.1	0.0	0.0	6.3	0.0	0.0	10.8	0.0	0.0	10.0	52.9	55.0	54.5
25	4.2	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.2	48.9	50.1	49.4
26	6	0.0	0.0	22.7	0.0	0.0	21.2	0.0	0.0	24.0	58.3	57.3	58.0
27	5.3	0.0	0.0	5.8	0.0	0.0	3.6	0.0	0.0	13.0	50.9	49.2	54.2
28	7.7	0.0	0.0	1.5	0.0	0.0	1.1	0.0	0.0	4.2	47.9	46.2	51.3
29	7.3	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.4	45.4	44.5	49.0
30	1.5	0.0	0.1	10.4	0.0	0.1	11.3	0.0	0.1	19.1	57.3	57.0	57.8
Average TA Value ⁴		0.4	5.2	34.9	0.4	6.2	39.3	0.4	5.7	38.9	57.6	58.0	58.4

Source: HMMH, 2025.

Notes:

dBA A-weighted decibel;

DNL Day-Night Average Sound Level.

1 Site numbers correlate with the **Figure 7-13** map and the addresses listed in **Table 7-2** in **Section 7.3.3** in Chapter 7 of the EDR.

2 Distance from Logan Airport calculated from the Airport Reference Point.

3 2022 DNL is modeled with AEDT version 3e and 2023 and 2024 data is modeled with version 3g.

4 Arithmetic average includes all 30 noise monitoring sites.

Table I-22 Time Above (TA) dBA Thresholds in a Nine Hour Night Period for Average Day, 2022-2024³

Site ¹	Distance (mi) ²	Minutes above Threshold									Modeled DNL (dB) ³		
		2022			2023			2024			2022	2023	2024
		85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA			
1	3.7	0.0	0.0	0.7	0.0	0.0	1.2	0.0	0.0	3.7	52.4	51.7	55.2
2	2.9	0.0	0.1	1.2	0.0	0.2	1.4	0.0	0.6	4.6	56.2	54.8	59.5
3	2.5	0.0	0.2	9.9	0.0	0.2	12.6	0.0	0.1	10.9	60.5	62.4	61.8
4	1.6	1.2	5.7	13.2	1.3	6.0	14.8	1.4	5.8	14.1	71.2	72.2	72.2
5	1.9	0.0	2.0	11.0	0.0	3.2	11.9	0.0	2.9	11.4	64.6	66.2	66.0
6	0.8	0.0	0.1	6.7	0.0	0.3	13.0	0.0	0.2	11.3	61.7	62.4	61.9
7	1	0.1	1.1	13.1	0.2	1.8	17.5	0.1	0.9	14.6	65.4	67.0	65.2
8	1.6	0.0	0.4	5.9	0.0	1.0	9.1	0.0	0.5	7.2	61.2	62.9	61.4
9	1.3	0.1	3.5	11.3	0.3	5.5	18.0	0.1	4.5	15.3	67.9	68.9	67.9
10	1.3	0.0	0.6	6.8	0.0	1.0	10.8	0.0	0.5	8.2	61.8	63.1	61.7
11	1.8	0.0	0.1	1.5	0.0	0.1	2.2	0.0	0.1	1.2	56.7	57.8	56.7
12	1.2	0.0	1.1	11.3	0.0	1.8	16.8	0.0	1.7	14.7	64.7	64.7	64.5
13	1.9	0.0	1.5	6.0	0.0	2.1	5.6	0.0	1.9	5.1	64.2	63.7	63.9
14	1.2	0.0	0.0	5.8	0.0	0.0	9.9	0.0	0.0	12.6	60.2	60.1	60.8
15	2.8	0.0	0.5	4.8	0.0	0.9	4.8	0.0	1.0	4.2	61.1	60.6	61.0
16	2.4	0.1	3.7	8.3	0.2	5.6	11.9	0.1	4.8	10.1	68.7	69.2	68.6
17	5.3	0.0	0.1	7.7	0.0	0.2	11.9	0.0	0.2	10.3	61.0	61.5	60.9
18	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	46.8	45.0
19	8.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	44.7	46.4	44.4
20	8.4	0.0	0.0	1.9	0.0	0.0	4.2	0.0	0.0	3.8	55.5	55.9	55.5
21	4.5	0.0	0.0	1.7	0.0	0.0	2.5	0.0	0.0	2.2	54.8	54.1	54.0
22	6	0.0	0.0	1.2	0.0	0.0	1.7	0.0	0.0	1.6	53.8	53.1	53.1
23	6.3	0.0	0.0	2.7	0.0	0.0	4.9	0.0	0.0	4.0	54.7	57.0	56.4
24	8.1	0.0	0.0	0.9	0.0	0.0	1.7	0.0	0.0	1.4	52.9	55.0	54.5

25	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.9	50.1	49.4
26	6	0.0	0.0	3.2	0.0	0.0	5.1	0.0	0.0	6.2	58.3	57.3	58.0
27	5.3	0.0	0.0	0.6	0.0	0.0	0.8	0.0	0.0	3.0	50.9	49.2	54.2
28	7.7	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0	1.1	47.9	46.2	51.3
29	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	45.4	44.5	49.0
30	1.5	0.0	0.0	1.3	0.0	0.0	2.4	0.0	0.0	4.0	57.3	57.0	57.8
Average TA Value ⁵		0.1	0.7	4.6	0.1	1.0	6.6	0.1	0.9	6.2	57.6	58.0	58.4

Source: HMMH, 2025

Notes: dBA: A-weighted decibel;

DNL: Day-Night Average Sound Level.

1 Site numbers correlate with the **Figure 7-13** map and the addresses listed in **Table 7-2** in **Section 7.3.3** in Chapter 7 of the EDR.

2 Distance from Logan Airport calculated from the Airport Reference Point.

3 Nine-hour nighttime period from 10:00 PM – 7:00 AM.

4 2022 DNL is modeled with AEDT version 3e and 2023 and 2024 data is modeled with version 3g.

5 Arithmetic average includes all 30 noise monitoring sites.

I.3 Status of Mitigation Programs

I.3.1 Residential Sound Insulation Program

As discussed in **Chapter 7, Noise, Section 7.4.2** Massport has been working to restart its **residential sound insulation program (RSIP)**. In 2023 and 2024, no new dwelling units received sound insulation from Massport. The total for residential buildings remains at 5,467 and 11,515 for dwelling units. Future EDR's will provide updates to the number of units added.

I.3.2 Noise Complaints

Table I-23 presents a detailed list by community of the total noise complaints made in 2022, 2023 and 2024, which can be filed either on Massport's Noise Complaint Line, through a form on Massport's website, or through the PublicVue flight track portal. **Figure I-4** shows the complaints and complainants data graphically.

Table I-23 Noise Complaint Line Summary, 2022-2024

Town Name	2022		2023		2024		2022-2023 Change in number of complaints	2023-2024 Change in number of complaints
	Complaints	Complainants	Complaints	Complainants	Complaints	Complainants		
Allston	6	2	0	0	0	0	-6	0
Arlington	11,276	58	7,695	31	7,521	27	-3,581	174
Belmont	920	47	855	37	2,379	22	-65	-1,524

Table I-23 Noise Complaint Line Summary, 2022-2024

Town Name	2022		2023		2024		2022-2023 Change in number of complaints	2023-2024 Change in number of complaints
	Complaints	Complainants	Complaints	Complainants	Complaints	Complainants		
Beverly	36	5	9	4	12	5	-27	-3
Billerica	0	0	0	0	1	1	0	-1
Boston	430	29	401	21	990	9	-29	-589
Boxford	1	1	0	0	0	0	-1	0
Braintree	1,010	5	374	7	15	5	-636	359
Brighton	1	1	0	0	2	2	-1	-2
Brookline	2	2	5	4	4	2	3	1
Burlington	0	0	0	0	1	1	0	-1
Cambridge	1,214	68	2,149	33	2,220	42	935	-71
Canton	4	3	5	5	3	3	1	2
Charlestown	51	19	16	12	8	4	-35	8
Chelmsford	1,093	1	1,982	1	3,521	1	889	-1,539
Chelsea	103	35	38	16	36	19	-65	2
Cohasset	571	4	326	3	548	2	-245	-222
Danvers	39	2	36	4	12	3	-3	24
Dedham	0	0	0	0	1	1	0	-1
Dorchester	19	11	25	16	101	25	6	-76
Dover	2	2	2	2	1	1	0	1
Duxbury	23	1	0	0	0	0	-23	0
East Boston	191	56	81	32	103	50	-110	-22
Easton	12	1	9	1	0	0	-3	9
Essex	1	1	2	2	1	1	1	1
Everett	18	12	37	11	303	9	19	-266
Framingham	28	2	15	1	15	1	-13	0
Gloucester	30	1	4	1	5	5	-26	-1
Grafton	1	1	0	0	0	0	-1	0
Hamilton	3	3	8	6	0	0	5	8
Hanover	0	0	0	0	5	1	0	-5
Hanson	0	0	4	1	21	1	4	-17
Hingham	6	4	2	2	3	3	-4	-1
Holbrook	1	1	30	4	8	2	29	22
Hopkinton	1	1	0	0	0	0	-1	0
Hull	650	33	259	25	172	30	-391	87
Hyde Park	7	2	6	4	16	5	-1	-10
Ipswich	16	2	2	2	0	0	-14	2
Jamaica Plain	224	30	130	22	355	72	-94	-225

Table I-23 Noise Complaint Line Summary, 2022-2024

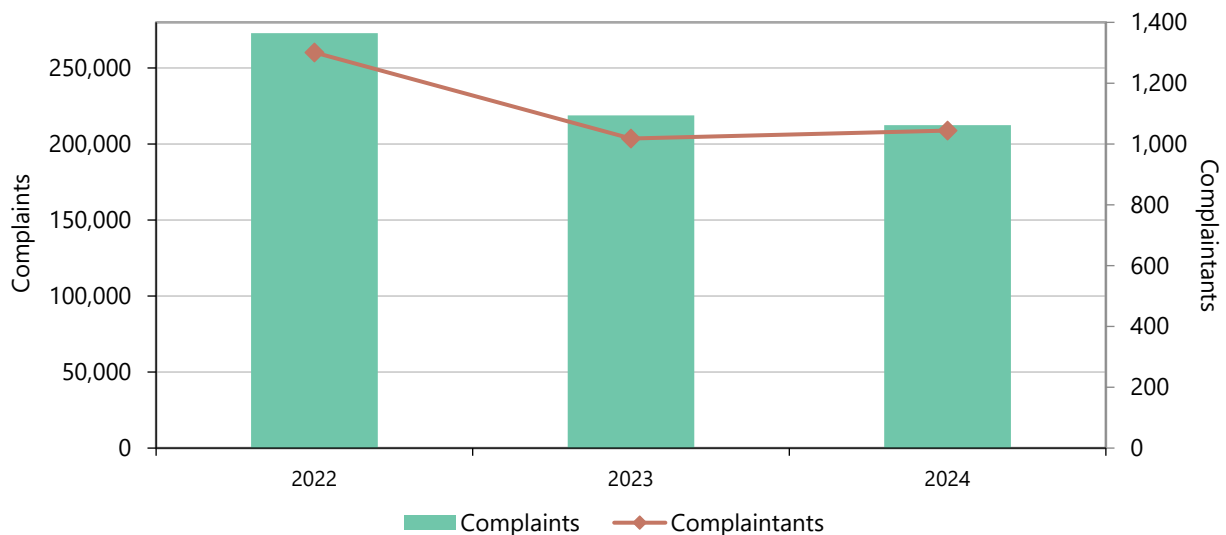
Town Name	2022		2023		2024		2022-2023 Change in number of complaints	2023-2024 Change in number of complaints
	Complaints	Complainants	Complaints	Complainants	Complaints	Complainants		
Kingston	0	0	3	1	3	1	3	0
Lawrence	332	1	6	1	0	0	-326	6
Lexington	0	0	2	2	0	0	2	2
Littleton	1	1	0	0	0	0	-1	0
Lynn	72	18	54	14	33	6	-18	21
Lynnfield	0	0	3	1	1	1	3	2
Malden	3,265	9	2,660	11	1,525	11	-605	1,135
Manchester	0	0	2	2	6	2	2	-4
Marblehead	2,807	6	1,764	9	336	5	-1,043	1,428
Marlborough	3	1	0	0	0	0	-3	0
Marshfield	20	6	2	2	2	2	-18	0
Medford	73,912	211	28,371	143	22,663	139	-45,541	5,708
Melrose	1,008	2	408	1	123	1	-600	285
Middleton	7	2	0	0	0	0	-7	0
Millis	1	1	0	0	0	0	-1	0
Milton	17,420	110	19,750	91	17,565	71	2,330	-2,185
Nahant	134	26	71	22	30	15	-63	41
Needham	1	1	0	0	0	0	-1	0
Newington	153	2	61	1	154	1	-92	-93
Newton	38	11	22	7	16	7	-16	6
North Easton	19	1	276	1	0	0	257	276
Norton	3	2	1	1	0	0	-2	1
Norwell	7	2	2	1	0	0	-5	2
Peabody	11	8	11	6	6	6	0	5
Pembroke	0	0	0	0	1	1	0	-1
Quincy	21	8	31	8	10	4	10	21
Randolph	6	1	0	0	4	3	-6	-4
Reading	2	2	2	2	0	0	0	2
Revere	10,200	27	115	36	56	17	-10,085	59
Roslindale	350	16	148	12	461	58	-202	-313
Roxbury	1,586	6	354	5	684	17	-1,232	-330
Salem	326	12	173	9	51	5	-153	122
Scituate	4	3	6	5	3	3	2	3
Sharon	0	0	4	2	39	10	4	-35
Somerville	40,372	155	37,293	113	43,370	99	-3,079	-6,077
South Boston	25	18	128	36	397	81	103	-269

Table I-23 Noise Complaint Line Summary, 2022-2024

Town Name	2022		2023		2024		2022-2023 Change in number of complaints	2023-2024 Change in number of complaints
	Complaints	Complainants	Complaints	Complainants	Complaints	Complainants		
South End	3,347	7	11,067	7	24,944	6	7,720	-13,877
Stoneham	2	1	1	1	0	0	-1	1
Stoughton	0	0	3	1	7	2	3	-4
Swampscott	16	7	8	4	2	2	-8	6
Upton	1	1	0	0	0	0	-1	0
Vineyard Haven	0	0	0	0	2	1	0	-2
Wakefield	30	1	1	1	0	0	-29	1
Waltham	2	2	0	0	1	1	-2	-1
Watertown	3,661	28	2,314	23	1,963	8	-1,347	351
Wellesley	0	0	46	2	223	2	46	-177
Wenham	479	5	121	4	88	2	-358	33
West Roxbury	50	8	174	5	218	22	124	-44
Weston	1	1	0	0	0	0	-1	0
Westwood	1	1	0	0	5	1	-1	-5
Weymouth	696	6	147	8	48	2	-549	99
Whitman	1	1	0	0	0	0	-1	0
Winchester	8,466	9	7,058	7	4,868	15	-1,408	2,190
Winthrop	84,748	103	90,458	94	72,115	55	5,710	18,343
Woburn	1,346	5	1,202	6	2,017	4	-144	-815
Grand Total	272,943	1,301	218,830	1,018	212,423	1,044	-54,113	6,407

Source: Massport and HMMH, 2025.

Figure I-4 Noise Complaint Line Complaints and Complainants by Year, 2022-2024



Source: Massport and HMMH, 2025.

I.4 Statistical Analyses of Flight Tracks

The following sections present the data and analysis of jet aircraft departures from Runways 4R, 9, 15R, 22L, 22R, 27, and 33L through gates defined to capture the aircraft flight paths. The gates, shown in **Figure I-5** through **Figure I-10**, are virtual vertical planes bounded by geographic coordinates on each end and floor and ceiling altitudes. The statistical analyses include summaries of the volume and composition of departing flights crossing through each gate, or gate segment, and volume of flights above or below a specified altitude in feet above mean sea level. Some analyses also evaluate flight procedures by categorizing flight tracks that turn at a certain distance from the Distance Measuring Equipment (DME), a navigational aid located on the eastern shoreline at BOS. These analyses are used to evaluate the performance of flight procedures off each runway end. For more information on flight track monitoring, jet departure gates, and Air Traffic Control (ATC) procedures, see [User's Guide Section U7.6.1](#).

I.4.1 Statistical Analyses of Flight Tracks: Runway 4R

Jet aircraft departures from Runway 4R remain on runway heading until 4 DME and then turn right, crossing the Nahant causeway. The Nahant Gate monitors aircraft after the first turn at 4 DME. The Swampscott and Marblehead Gates monitor northbound shoreline crossings, while the Hull 2, Hull 3, and Cohasset Gates monitor southbound shoreline crossings.

Table I-24 shows Runway 4R departures for 2022 through 2024, with more than 99 percent “over the causeway”. **Table I-25** shows how many of the shoreline crossings from Runway 4R were above 6,000 feet.

Figure I-5 illustrates the gates analyzed for Runway 4R.

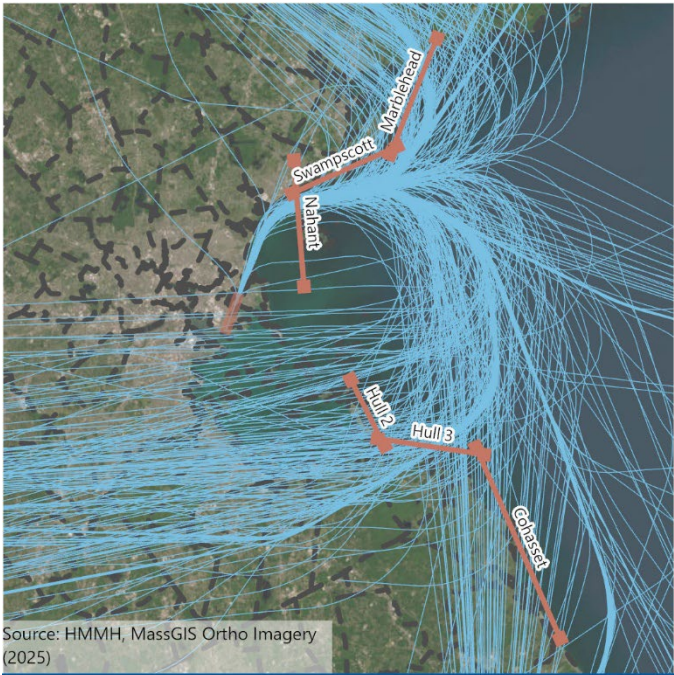


Figure I-5 Statistical Analyses of Flight Tracks - Runway 4R

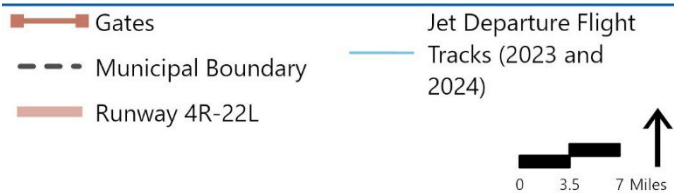


Table I-24 Runway 4R Nahant Gate Summary, 2022-2024

Gate	2022		2023		2024	
	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment
North End of Gate	21	0.3%	52	0.5%	32	0.4%
Over Causeway	6,081	99.4%	10,569	99.2%	7,150	99.3%
South End of Gate	13	0.2%	37	0.3%	15	0.2%
Total	6,115	100.0%	10,658	100.0%	7,197	100.0%

Source: Massport; HMMH 2025
Note: Some totals may not match due to rounding.

Table I-25 Runway 4R Shoreline Crossings Above 6,000 Feet for 2022 through 2024

Gate	2022			2023			2024		
	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft
Swampscott Gate	155	20	12.9%	306	43	14.1%	155	22	14.2%
Marblehead Gate	2,333	2,291	98.2%	3,565	3,488	97.8%	2,593	2,535	97.8%
Hull 2 Gate	333	333	100.0%	629	629	100.0%	379	379	100.0%
Hull 3 Gate	814	814	100.0%	1,450	1,449	99.9%	873	872	99.9%
Cohasset Gate	307	307	100.0%	491	490	99.8%	297	296	99.7%
Total	3,942	3,765	95.5%	6,441	6,099	94.7%	4,297	4,104	95.5%

Source: Massport, HMMH 2025

Note: Some totals may not match due to rounding.

I.4.2 Statistical Analyses of Flight Tracks - Runway 9

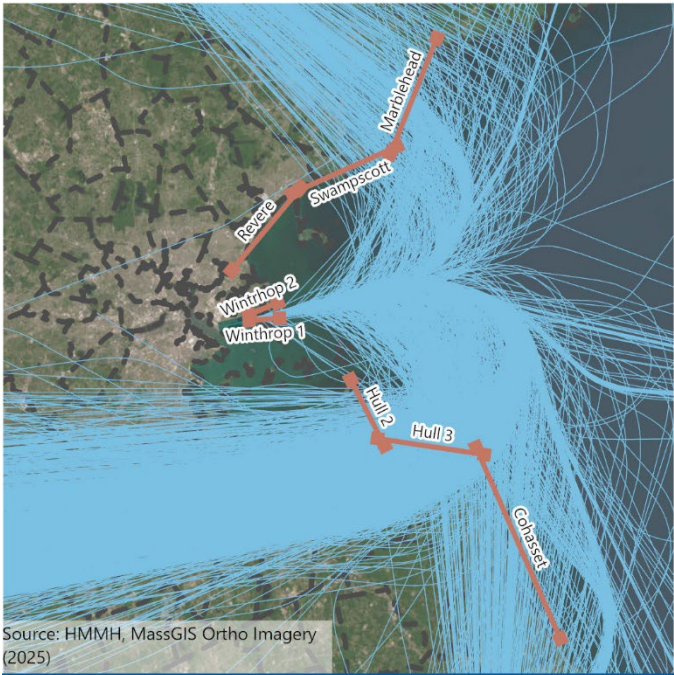


Figure I-6 Statistical Analyses of Flight Tracks - Runway 9



Jets departing from Runway 9 maintain runway heading and gain altitude before turning back to cross the shoreline and proceed to their destinations. The Winthrop 1 and Winthrop 2 gates monitor early turns for departures off Runway 9. The Revere, Swampscott, or Marblehead gates monitor northbound shoreline crossings, while the Hull 2, Hull 3, or Cohasset gates monitor southbound shoreline crossings.

Table I-26 shows how many tracks turned prior to the BOS 2 DME, a point located two nautical miles from the DME. Northbound turns before BOS 2 DME pass through the Winthrop 1 Gate. Southbound traffic would pass through the Winthrop 2 Gate. **Table I-27** shows the number and percentages of Runway 9 departures above 6,000 feet when crossing the shoreline in 2022, 2023 and 2024. **Figure I-6** illustrates the gates analyzed for Runway 9.

Table I-26 Runway 9 Gate Summary — Winthrop Gates 1 and 2, 2022-2024

Gate	2022		2023		2024	
	Tracks Through Gate	Percent Turning Before BOS 2 DME	Tracks Through Gate	Percent Turning Before BOS 2 DME	Tracks Through Gate	Percent Turning Before BOS 2 DME
Winthrop	13	<0.1%	26	0.0%	31	0.0%
Winthrop	12	<0.1%	46	0.1%	35	0.1%
Neither	45,310	99.9%	61,989	99.9%	61,995	99.9%
Total	45,335	100.0%	62,061	100.0%	62,061	100.0%

Source: Massport, HMMH 2025
Note: Some totals may not match due to rounding.

Table I-27 Runway 9 Shoreline Crossings Above 6,000 Feet for 2022 through 2024

Gate	2022			2023			2024		
	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft
Revere Gate	24	11	45.8%	40	19	47.5%	74	32	43.2%
Swampscott Gate	773	715	92.5%	1,404	1,284	91.5%	990	900	90.9%
Marblehead Gate	9,451	9,413	99.6%	13,605	13,561	99.7%	12,936	12,892	99.7%
Hull 2 Gate	2,921	2,918	99.9%	3,826	3,819	99.8%	3,103	3,097	99.8%
Hull 3 Gate	5,220	5,121	98.1%	7,380	7,241	98.1%	5,934	5,844	98.5%
Cohasset Gate	14,971	14,959	99.9%	18,769	18,754	99.9%	18,510	18,497	99.9%
Total	33,360	33,137	99.3%	45,024	44,678	99.2%	41,547	41,262	99.3%

Source: Massport, HMMH 2025

Note: Some totals may not match due to rounding.

I.4.3 Statistical Analyses of Flight Tracks - Runway 15R

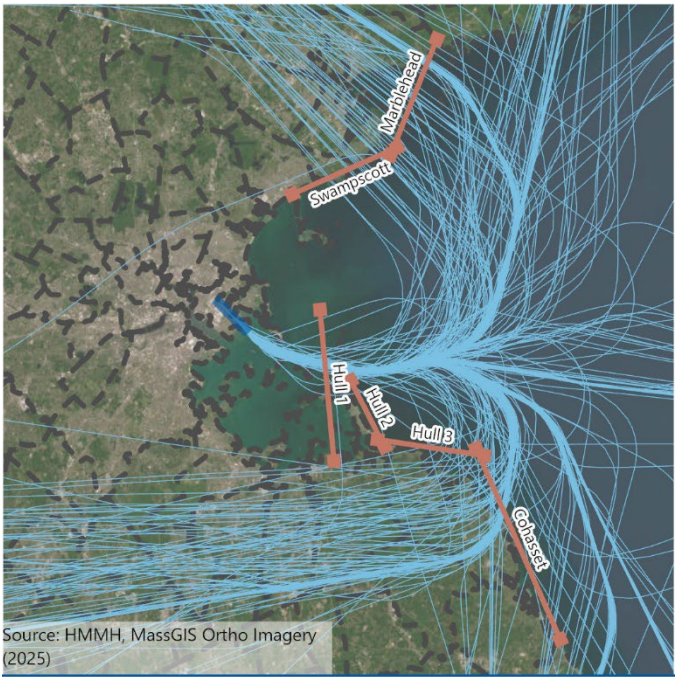


Figure I-7 Statistical Analyses of Flight Tracks - Runway 15R

After takeoff, Runway 15R departures turn left approximately 30 degrees to avoid Hull, head out over Boston Harbor, and return over the shore through the Swampscott and Marblehead Gates to the north, or through the Hull 2, Hull 3, and Cohasset Gates to the south. Massport uses the Hull 1 Gate to monitor departures from Runway 15R as they make their initial turn over Boston Harbor.

The initial turn and success rate in avoidance of Hull overflights is shown in **Table I-28**. **Table I-29** shows the number and percentages of Runway 15R departures above 6,000 feet when crossing the shoreline in 2022, 2023, and 2024. **Figure I-7** illustrates the gates analyzed for Runway 15R.

Table I-28 Runways 15R Hull 1 Gate Summary, 2022-2024

Gate	2022		2023		2024	
	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment
North of Hull Peninsula	7,782	99.7%	6,310	99.8%	6,547	99.8%
Over Hull	22	0.3%	11	0.2%	14	0.2%
Total	7,804	100.0%	6,321	100.0%	6,561	100.0%

Source: Massport; HMMH, 2025.
Note: Some totals may not match due to rounding.

Table I-29 Runway 15R Shoreline Crossings Above 6,000 Feet, 2022-2024

Gate	2022			2023			2024		
	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft
Swampscott Gate	213	211	99.1%	246	245	99.6%	197	195	99.0%
Marblehead Gate	1,737	1,734	99.8%	1,302	1,302	100.0%	1,210	1,209	99.9%
Hull 2 Gate	15	14	93.3%	9	6	66.7%	13	12	92.3%
Hull 3 Gate	230	207	90.0%	196	167	85.2%	116	95	81.9%
Cohasset Gate	2,224	2,219	99.8%	1,268	1,267	99.9%	1,262	1,260	99.8%
Total	4,419	4,385	99.2%	3,021	2,987	98.9%	2,798	2,771	99.0%

Source: Massport; HMMH, 2025.

Note: Some totals may not match due to rounding.

I.4.4 Statistical Analyses of Flight Tracks: Runways 22R and 22L

Jet aircraft departures from Runways 22R and 22L make a left turn, gain altitude over water, and then turn to cross the shoreline before proceeding. The Quantum 2 and Hull 1 Gates monitor the turn to 140 degrees over Boston Harbor and the passage north of Hull. The shoreline gates monitor shoreline crossings, as described for Runways 4R, 9, and 15R.

Figure I-8 illustrates the gates analyzed for Runway 22R and Runway 22L.

Table I-30 shows the jet departures dispersion from Runways 22R and 22L as they pass through the Quantum 2 Gate. The Block 2 Runway 22L/22R Standard Instrument Departure (SID) changes were published in November 2023, resulting in an earlier turn and the slight shift of tracks to the north above Hull. The higher percentage of tracks within the first segment of Quantum 2 Gate in 2024, shown in **Table I-30**, and increase in the

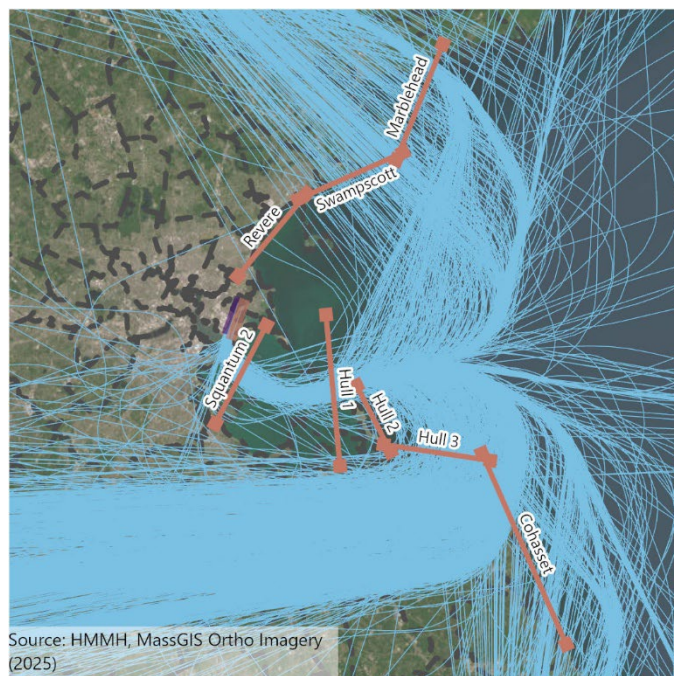
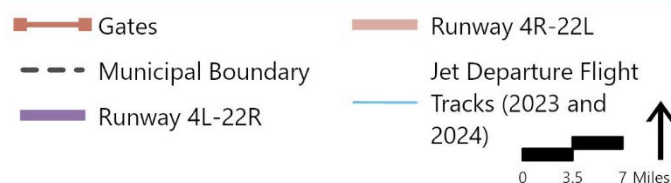


Figure I-8 Statistical Analyses of Flight Tracks - Runway 22R and Runway 22L



percentage of flight tracks North of Hull Peninsula in 2024, shown in **Table I-31** shows the procedure is working as intended. **Table I-31** shows flights that avoided Hull, and **Table I-32** shows Runway 22R and 22L departures above 6,000 feet when crossing the shoreline.

Table I-30 Runways 22R and 22L Squantum 2 Gate¹ Summary, 2022-2024

Gate Segment	2022		2023		2024	
	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment
0 - 12,000 ft (Northernmost Segment)	3,854	6.6%	2,827	4.8%	11,134	21.2%
12,000 - 14,000 ft	52,589	89.5%	53,321	90.4%	40,384	76.8%
14,000 - 21,000 ft	2,296	3.9%	2,782	4.7%	1,032	2.0%
21,000 - 27,000 ft (Southernmost Segment)	31	0.1%	32	0.1%	21	0.0%
Total	58,770	100.0%	58,962	100.0%	52,571	100.0%

Source: Massport; HMMH, 2025.

Notes: Some totals may not match due to rounding.

1 The 27,000-foot-wide Squantum 2 Gate is divided into four segments, identified in this table by distance from the northernmost point. The first segment of the 27,000-foot wide gate is the northernmost segment and is primarily over Boston Harbor. The subsequent segments extend southward toward Quincy.

Table I-31 Runways 22R and 22L Hull 1 Gate Summary, 2022-2024

Gate Segment	2022		2023		2024	
	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment	Tracks Through Gate Segment	Percentage of Tracks Through Gate Segment
North of Hull Peninsula	58,188	99.1%	58,300	99.1%	52,261	99.6%
Over Hull	507	0.9%	554	0.9%	235	0.4%
Total	58,695	100.0%	58,854	100.0%	52,496	100.0%

Source: Massport; HMMH, 2025.

Notes: Some totals may not match due to rounding.

Table I-32 Runways 22R and 22L Shoreline Crossings Above 6,000 Feet, 2022-2024

Gate	2022			2023			2024		
	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft	Tracks Through Gate	Tracks Above 6,000 ft	Percentage Above 6,000 ft
Revere Gate	91	90	98.9%	126	124	98.4%	78	76	97.4%
Swampscott Gate	1,429	1,425	99.7%	1,909	1,908	99.9%	1,293	1,290	99.8%
Marblehead Gate	13,290	13,285	100.0%	13,484	13,482	100.0%	11,812	11,803	99.9%
Hull 2 Gate	34	31	91.2%	63	47	74.6%	55	45	81.8%
Hull 3 Gate	3,705	3,623	97.8%	4,257	4,173	98.0%	3,237	3,163	97.7%
Cohasset Gate	21,732	21,720	99.9%	19,989	19,977	99.9%	18,152	18,146	100.0%
Total	40,281	40,174	99.7%	39,828	39,711	99.7%	34,627	34,523	99.7%

Source: Massport; HMMH, 2025.

Notes: Some totals may not match due to rounding.

I.4.5 Statistical Analyses of Flight Tracks: Runway 27

On September 15, 1996, the **Federal Aviation Administration (FAA)** implemented a departure procedure for Runway 27 called the “WYLYY RNAV” procedure. Massport has been providing on-going radar flight track data and analysis to FAA with respect to the procedure.

Figure I-9 illustrates the gates analyzed for Runway 27. Gate A is closest to the airport, with each subsequently labeled gate further from the runway. The gates increase in width as the distance is increased along the flight path, together forming a noise abatement corridor. A consistent percentage of traffic through each gate means that flights are not entering the corridor late or exiting the corridor too early.

Table I-33 through **Table I-35** presents the conformance results for the Runway 27 corridor for 2022 through 2024. As a result of implementing the Block 1 and Block 2 procedures for departures from Runways 15R, 22L and 22R, the FAA made a change to the **Area Navigation (RNAV)** SIDs in late 2023, modifying the heading of the first left turn for aircraft departing Runway 27, which has resulted in flight paths largely missing the first two gates in 2024. The original goal for the corridor was for at least 68 percent of aircraft to pass through all five gates; that goal was achieved from 2012 to 2021. The recent heading modifications for Runway 27 departures have resulted in the percent through the defined Runway 27 corridor dropping below 68 percent in 2022 and 2023. Because most aircraft now miss Gate A, the percent within the defined corridor for 2024 was about 2 percent, as demonstrated in **Table I-33**. The FAA has been reviewing this change and has provided updates to the **Massport Community Advisory Committee (Massport CAC)**.

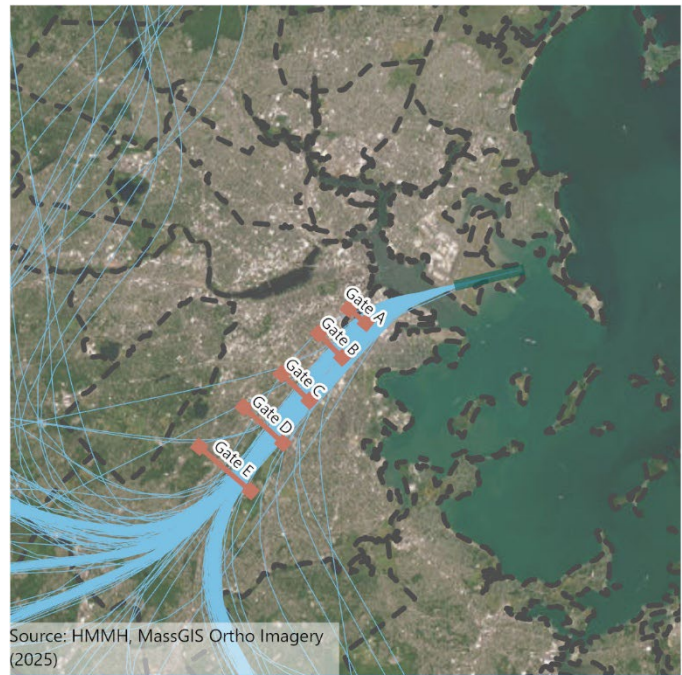


Figure I-9 Statistical Analyses of Flight Tracks - Runway 27

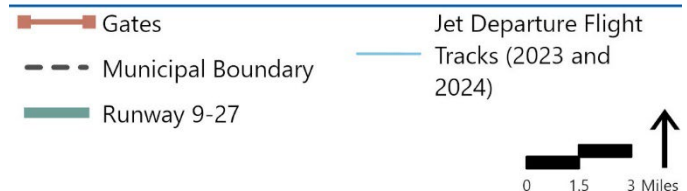


Table I-33 Runway 27 Corridor Percent of Tracks Through Each Gate, 2024

Month	Total # of Tracks	Total # of Tracks Through All Gates	Percent of Tracks Through All Gates	Runway 27 Corridor Gates					Average Percent Through Each Gate
				Gate A	Gate B	Gate C	Gate D	Gate E	
				1,400 ft	2,200 ft	2,900 ft	4,700 ft	6,300 ft	
January	1,882	19	1.0%	23	234	1,694	1,858	1,840	60.0%
February	2,088	29	1.4%	31	299	1,839	2,058	2,037	60.0%
March	2,004	51	2.5%	61	350	1,930	2,152	2,133	66.1%
April	1,322	41	3.1%	44	231	1,201	1,313	1,307	62.0%
May	631	-	0.0%	15	91	550	620	-	40.4%
June	911	23	2.5%	25	144	818	901	893	61.1%
July	1,278	38	3.0%	44	195	1,147	1,270	1,257	61.2%
August	1,578	42	2.7%	46	246	1,417	1,561	1,545	61.0%
September	1,254	40	3.2%	42	196	1,135	1,244	1,234	61.4%
October	2,651	69	2.6%	77	437	2,397	2,620	2,603	61.4%
November	3,755	65	1.7%	80	667	3,363	3,728	3,678	61.3%
December	2,075	25	1.2%	28	291	1,859	2,050	2,027	60.3%
Total	21,429	442	2.1%	516	3,381	19,350	21,375	20,554	60.8%

Source: Massport; HMMH, 2025.

Notes: Some totals may not match due to rounding.

Table I-34 Runway 27 Corridor Percent of Tracks Through Each Gate, 2023

Month	Total # of Tracks	Total # of Tracks Through All Gates	Percent of Tracks Through All Gates	Runway 27 Corridor Gates					Average Percent Through Each Gate
				Gate A	Gate B	Gate C	Gate D	Gate E	
				1,400 ft	2,200 ft	2,900 ft	4,700 ft	6,300 ft	
January	351	234	66.7%	246	271	339	346	337	87.7%
February	883	586	66.4%	613	699	833	863	844	87.2%
March	1,379	884	64.1%	902	1,033	1,301	1,350	1,329	85.8%
April	549	344	62.7%	353	404	510	532	526	84.7%
May	837	551	65.8%	568	616	798	827	810	86.5%
June	427	280	65.6%	287	321	409	419	412	86.6%
July	150	104	69.3%	108	117	146	146	142	87.9%
August	28	20	71.4%	20	23	28	28	27	90.0%

Table I-34 Runway 27 Corridor Percent of Tracks Through Each Gate, 2023

Month	Total # of Tracks	Total # of Tracks Through All Gates	Percent of Tracks Through All Gates	Runway 27 Corridor Gates					Average Percent Through Each Gate
				Gate A	Gate B	Gate C	Gate D	Gate E	
				1,400 ft	2,200 ft	2,900 ft	4,700 ft	6,300 ft	
September	15	5	33.3%	5	11	13	14	14	76.0%
October	9	7	77.8%	7	7	7	7	7	77.8%
November	9	3	33.3%	4	7	9	9	8	82.2%
December	1,336	17	1.3%	22	166	1,174	1,320	1,312	59.8%
Total	5,973	3,035	50.8%	3,135	3,675	5,567	5,861	5,768	80.4%

Source: Massport; HMMH, 2025.

Notes: Some totals may not match due to rounding.

Table I-35 Runway 27 Corridor Percent of Tracks Through Each Gate, 2022

Month	Total # of Tracks	Total # of Tracks Through All Gates	Percent of Tracks Through All Gates	Runway 27 Corridor Gates					Average Percent Through Each Gate
				Gate A	Gate B	Gate C	Gate D	Gate E	
				1,400 ft	2,200 ft	2,900 ft	4,700 ft	6,300 ft	
January	2,797	1,656	59.2%	1,685	1,929	2,467	2,587	2,577	80.4%
February	1,316	726	55.2%	731	851	1,078	1,139	1,137	75.0%
March	1,939	1,220	62.9%	1,231	1,421	1,827	1,926	1,921	85.9%
April	1,568	887	56.6%	899	1,078	1,418	1,481	1,471	81.0%
May	879	565	64.3%	578	651	827	867	857	86.0%
June	630	384	61.0%	394	438	560	580	576	80.9%
July	362	252	69.6%	258	276	344	354	351	87.5%
August	4	4	100.0%	4	4	4	4	4	100.0%
September	288	195	67.7%	199	221	278	287	283	88.1%
October	132	77	58.3%	79	97	119	127	128	83.3%
November	302	186	61.6%	189	224	289	300	298	86.1%
December	-	-	-	-	-	-	-	-	-
Total	10,217	6,152	60.2%	6,247	7,190	9,211	9,652	9,603	82.0%

Source: Massport; HMMH, 2023.

Notes: Some totals may not match due to rounding.

I.4.6 Statistical Analyses of Flight Tracks: Runway 33L



Jets departing from Runway 33L fly in a corridor along the north side of the Mystic River until 5 DME or reaching an altitude of 3,000 feet and then turn on course to their destinations. The Somerville and Everett Gates extend from BOS 2 DME to BOS 5 DME and are used to monitor the departure procedure for Runway 33L. Early turns to the left would pass through the Somerville Gate below 3,000 feet. Early turns to the right would pass through the Everett Gate below 3,000 feet. **Table I-36** shows tracks below 3,000 feet which turn before BOS 5 DME. **Figure I-10** illustrates the gates analyzed for Runway 33L.

Figure I-10 Statistical Analyses of Flight Tracks - Runway 33L

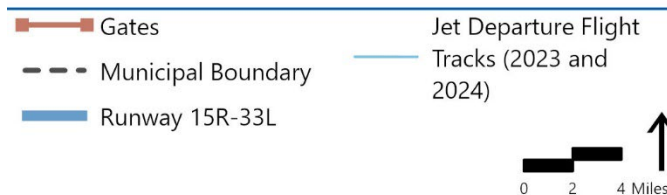


Table I-36 Runway 33L Gates — Passages Below 3,000 Feet, 2022-2024

Gate	2022				2023				2024			
	Tracks Through Gate	Tracks Above 3,000 ft	Tracks Below 3,000 ft	% Below 3,000 ft	Tracks Through Gate	Tracks Above 3,000 ft	Tracks Below 3,000 ft	% Below 3,000 ft	Tracks Through Gate	Tracks Above 3,000 ft	Tracks Below 3,000 ft	% Below 3,000 ft
Everett Gate	149	50	99	0.3%	103	24	79	0.2%	212	72	140	0.4%
Somerville Gate	819	158	661	1.7%	713	115	598	1.9%	691	122	569	1.8%
Neither gate	38,055	-	-	-	31,014	-	-	-	30,927	-	-	-
Total	39,023	208	760	1.9%	31,830	139	677	2.1%	31,830	194	709	2.2%

Source: Massport; HMMH, 2025.

Notes: Some totals may not match due to rounding.

I.5 2022 through 2024 DNL Levels for Census Block Group Locations

Table I-37 reports the DNL value for each Census **Block Group** down to DNL 50 dB, computed with AEDT for 2023 and 2024. A Census Block Group represents several US Census Blocks. The Average Block DNL is the arithmetic average of the DNL calculated for the centroid of each US Census Block in that group, while the DNL at centroid represents the DNL calculated at the geographic center of the Block Group.

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173561002	Arlington	1,482	691	50.0	50.1	49.5	49.6	49.6	49.7
250173507023	Arlington/ Somerville	866	421	50.2	49.8	49.6	49.2	49.6	49.2
250250203021	Boston	407	273	N/A	N/A	48.5	48.4	49.8	49.7
250250203041	Boston	323	229	50.2	50.2	49.6	49.7	50.3	50.4
250250203042	Boston	562	319	49.7	49.6	49.2	49.0	50.1	49.9
250250301001	Boston	205	123	51.3	51.2	50.7	50.7	51.1	51.2
250250301002	Boston	126	84	50.8	50.8	50.1	50.2	50.6	50.8
250250302001	Boston	270	176	50.9	50.9	50.3	50.3	51.1	51.1
250250302002	Boston	287	172	50.6	50.6	50.1	50.0	50.9	50.8
250250303021	Boston	747	278	51.0	50.6	50.2	49.9	51.7	51.4
250250304001	Boston	191	116	51.8	51.8	51.3	51.1	52.3	52.1
250250304002	Boston	616	402	51.3	51.4	50.7	50.8	51.4	51.5
250250304004	Boston	551	325	51.9	51.8	51.2	51.1	52.6	52.4
250250305001	Boston	379	243	52.5	52.2	51.9	51.7	52.6	52.2
250250305002	Boston	671	434	52.0	51.9	51.3	51.3	52.1	52.2
250250305003	Boston	216	144	51.8	51.8	51.1	51.3	51.7	51.9
250250401001	Boston	361	170	50.9	50.8	50.4	50.3	50.5	50.4
250250401002	Boston	619	346	50.3	50.4	49.9	49.9	49.9	49.9
250250402001	Boston	69	44	53.1	53.1	52.4	52.6	52.3	52.6

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250402002	Boston	262	79	51.8	51.8	51.3	51.3	51.3	51.3
250250403001	Boston	238	108	52.1	52.0	51.5	51.5	51.4	51.4
250250403002	Boston	774	349	51.1	50.9	50.6	50.4	50.5	50.3
250250403003	Boston	529	260	51.2	51.2	50.5	50.7	50.4	50.6
250250403004	Boston	394	193	51.6	51.7	51.0	51.2	50.8	51.0
250250403005	Boston	244	104	50.6	50.6	50.2	50.1	50.0	49.9
250250406001	Boston	383	218	50.9	51.2	50.3	50.7	50.1	50.5
250250406002	Boston	1,019	499	51.0	51.1	50.5	50.6	50.3	50.4
250250408011	Boston	681	338	52.4	52.5	51.9	52.0	51.8	51.9
250250408013	Boston	1,517	967	52.8	53.4	52.1	52.9	52.1	52.9
250250501011	Boston	280	83	62.7	62.8	63.7	62.4	63.8	62.5
250250501012	Boston	1,259	596	59.9	59.7	59.6	59.3	59.7	59.3
250250501013	Boston	1,036	380	61.6	61.8	60.6	61.3	60.6	61.3
250250502001	Boston	915	349	60.1	60.2	59.5	59.6	59.4	59.6
250250502002	Boston	905	414	59.1	59.2	58.0	58.6	58.0	58.6
250250503001	Boston	885	555	56.7	56.1	56.2	55.6	56.3	55.6
250250503002	Boston	413	137	55.6	55.5	55.1	55.0	55.2	55.2
250250503003	Boston	841	654	55.1	55.1	54.7	54.5	55.1	54.9
250250504001	Boston	81	21	56.3	56.3	56.0	55.8	56.3	56.0
250250504002	Boston	115	64	56.8	56.9	55.9	56.3	56.5	56.8
250250505001	Boston	1,648	774	58.9	59.0	58.4	58.4	58.5	58.5
250250506001	Boston	92	30	58.2	58.2	57.5	57.6	57.5	57.6
250250506002	Boston	516	224	57.1	57.5	56.5	56.9	56.6	57.1
250250507001	Boston	1,403	517	59.3	59.5	58.8	58.9	58.8	58.9
250250507002	Boston	994	350	61.5	61.4	60.7	60.7	60.7	60.7
250250507003	Boston	659	244	62.9	62.6	61.4	61.9	61.4	61.9

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250509011	Boston	906	316	66.7	67.5	66.2	67.0	66.5	67.3
250250509012	Boston	1,003	364	65.2	65.4	64.0	64.9	64.2	65.1
250250509013	Boston	396	111	65.3	66.5	65.5	66.0	65.8	66.3
250250510001	Boston	1,464	622	63.8	63.6	63.3	62.9	63.2	62.8
250250510002	Boston	1,039	482	58.5	57.4	58.2	57.1	57.9	56.8
250250510003	Boston	695	283	63.1	62.7	62.1	62.0	62.1	62.0
250250511011	Boston	988	381	58.8	58.0	59.6	58.9	58.7	57.8
250250511012	Boston	726	300	56.6	56.5	57.0	56.6	56.3	55.8
250250511013	Boston	957	337	62.3	62.9	63.6	64.2	62.4	62.8
250250511014	Boston	379	108	60.3	57.4	63.5	58.6	62.3	57.3
250250512002	Boston	882	386	59.1	58.8	58.8	58.4	59.3	58.8
250250512003	Boston	48	26	57.8	57.9	57.1	57.5	57.7	58.1
250250601011	Boston	461	216	60.3	60.3	60.7	61.7	60.6	61.4
250250601012	Boston	304	174	59.3	59.2	62.1	61.0	61.5	60.5
250250601013	Boston	677	333	59.6	59.6	60.2	61.3	60.0	60.8
250250601014	Boston	485	296	58.8	58.5	59.4	60.3	59.1	59.9
250250602001	Boston	464	222	56.7	56.8	57.6	57.9	58.0	58.2
250250602002	Boston	851	434	55.8	55.6	56.6	56.8	56.9	57.0
250250603011	Boston	548	286	54.6	54.5	55.3	55.1	56.4	56.4
250250603012	Boston	429	187	54.2	54.2	55.1	55.1	55.8	55.9
250250603013	Boston	365	198	54.8	54.6	55.7	55.1	57.0	56.8
250250604001	Boston	763	395	53.2	53.3	53.2	53.4	56.3	56.6
250250604002	Boston	315	186	53.3	53.5	53.5	53.9	55.7	55.8
250250604003	Boston	311	156	53.0	53.0	53.3	53.5	55.5	55.3
250250604004	Boston	355	172	52.5	52.4	52.5	52.4	56.2	55.8
250250604005	Boston	212	108	53.3	53.2	53.1	53.0	57.2	57.0

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250605011	Boston	358	199	55.8	55.8	56.2	56.2	57.5	57.8
250250605013	Boston	346	207	54.6	54.6	54.3	54.5	58.0	57.9
250250605014	Boston	400	183	57.7	57.4	58.2	58.2	59.0	58.8
250250605015	Boston	272	130	54.6	54.6	54.1	54.2	58.7	58.7
250250606011	Boston	743	453	55.5	55.6	54.7	54.7	59.8	59.9
250250606031	Boston	942	786	59.5	60.0	58.0	58.3	62.8	63.3
250250606041	Boston	127	102	57.5	60.8	55.9	59.1	59.4	63.7
250250606042	Boston	432	532	56.5	56.4	54.7	54.7	58.1	58.1
250250607001	Boston	388	137	55.4	55.4	54.2	54.2	59.1	59.1
250250607002	Boston	129	46	55.0	55.0	53.9	53.8	59.0	58.7
250250608001	Boston	235	98	53.9	53.9	53.3	53.4	58.1	58.1
250250608002	Boston	517	265	53.9	53.9	53.2	53.3	58.1	58.2
250250608003	Boston	224	100	54.8	54.8	53.9	54.0	59.0	59.2
250250608004	Boston	596	355	54.2	54.3	53.1	53.3	58.1	58.4
250250610001	Boston	327	166	53.0	53.0	52.5	52.6	57.0	57.1
250250610002	Boston	13	4	52.7	52.6	52.3	52.2	56.8	56.7
250250610003	Boston	474	233	52.5	52.5	52.0	52.0	56.7	56.7
250250611011	Boston	137	57	51.9	51.9	51.2	51.4	55.7	56.1
250250611012	Boston	556	261	51.2	51.1	50.8	50.7	55.3	55.1
250250612011	Boston	1,186	625	53.1	53.8	52.1	52.7	57.1	57.8
250250612031	Boston	561	314	55.5	55.4	54.0	53.9	58.3	58.0
250250612041	Boston	343	256	56.4	56.0	54.9	54.4	58.8	58.3
250250701021	Boston	362	183	50.3	50.2	49.4	49.3	51.2	51.1
250250701031	Boston	751	379	53.3	53.2	51.7	51.7	54.5	54.6
250250701041	Boston	303	164	53.6	54.1	52.0	52.5	54.8	55.5
250250701042	Boston	255	126	52.5	52.4	51.3	51.3	53.6	53.6

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250701043	Boston	522	346	51.0	51.0	49.8	49.9	52.0	52.0
250250702011	Boston	438	159	51.1	51.1	50.0	49.7	52.6	52.3
250250702012	Boston	1,815	272	50.4	50.5	49.1	49.3	51.4	51.6
250250702021	Boston	2,416	1,374	51.7	51.7	50.4	50.3	52.9	52.8
250250702022	Boston	630	257	52.1	52.2	50.8	50.7	53.5	53.4
250250703011	Boston	202	135	N/A	N/A	48.0	48.1	50.4	50.5
250250703012	Boston	561	294	50.1	50.1	48.4	48.7	50.9	51.3
250250703021	Boston	155	91	50.1	50.0	48.9	48.8	51.3	51.2
250250703022	Boston	3	1	N/A	N/A	48.4	48.2	50.6	50.3
250250704021	Boston	838	577	52.9	52.8	51.4	51.3	54.3	54.2
250250704022	Boston	565	363	51.3	51.3	49.9	49.8	52.5	52.5
250250705011	Boston	270	162	51.1	51.1	49.5	49.6	52.3	52.3
250250705012	Boston	495	266	51.6	51.7	50.1	50.1	53.0	53.0
250250705021	Boston	289	167	50.6	50.6	49.1	49.2	51.9	52.0
250250705022	Boston	813	352	50.4	50.4	48.9	48.9	51.8	51.8
250250706001	Boston	57	34	49.8	49.6	48.8	48.3	51.5	50.9
250250706002	Boston	801	450	N/A	N/A	47.8	47.7	50.5	50.4
250250707001	Boston	38	20	N/A	N/A	47.4	47.4	49.6	49.6
250250707002	Boston	356	180	N/A	N/A	47.3	47.3	49.7	49.7
250250708021	Boston	302	221	N/A	N/A	47.1	47.3	49.7	50.0
250250709011	Boston	76	35	49.6	49.5	48.0	47.9	51.0	51.0
250250709021	Boston	569	329	50.0	49.8	48.7	48.3	51.9	51.3
250250709022	Boston	430	216	50.2	49.9	48.9	48.4	52.0	51.4
250250711011	Boston	563	229	51.5	52.0	50.0	50.4	53.5	54.0
250250711012	Boston	107	47	51.3	51.4	49.4	49.7	52.8	53.3
250250711014	Boston	547	292	52.4	52.3	50.8	50.6	54.4	54.2

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250712011	Boston	123	60	52.3	52.3	50.6	50.7	53.7	53.7
250250712012	Boston	687	367	53.1	53.3	51.6	51.7	55.0	55.2
250250712013	Boston	13	255	52.7	52.7	50.6	51.1	53.9	54.5
250250712014	Boston	396	181	51.6	51.7	50.3	50.1	53.4	53.2
250250801001	Boston	375	106	52.6	52.9	51.1	51.3	55.7	56.0
250250801002	Boston	171	65	52.0	52.0	50.4	50.3	55.1	55.1
250250803001	Boston	424	180	51.9	51.8	50.0	50.1	54.2	54.4
250250803002	Boston	740	292	51.3	51.4	49.6	49.6	53.8	53.9
250250804011	Boston	475	237	50.8	50.9	49.0	49.1	52.6	52.8
250250804012	Boston	920	519	N/A	N/A	47.6	47.6	50.9	51.0
250250805001	Boston	202	84	N/A	N/A	47.6	47.1	50.8	50.1
250250805002	Boston	832	405	N/A	N/A	48.2	47.9	51.4	51.0
250250806012	Boston	65	20	N/A	N/A	47.0	46.5	50.3	49.6
250250806013	Boston	215	131	N/A	N/A	47.3	47.5	50.8	51.0
250250813011	Boston	149	62	N/A	N/A	47.5	47.5	52.0	52.0
250250813012	Boston	458	157	N/A	N/A	46.4	46.0	50.4	49.8
250250813021	Boston	353	137	N/A	N/A	47.6	47.6	52.2	52.1
250250813022	Boston	947	420	N/A	N/A	46.5	46.5	50.5	50.3
250250814003	Boston	645	356	N/A	N/A	47.0	47.1	50.6	50.7
250250815001	Boston	549	218	N/A	N/A	47.1	47.2	50.8	51.0
250250815002	Boston	1,281	555	49.6	49.6	47.8	47.8	52.1	52.1
250250817002	Boston	445	223	51.1	51.1	49.3	49.4	54.0	54.1
250250817003	Boston	458	162	50.2	50.2	48.6	48.5	53.1	52.8
250250817004	Boston	514	196	50.2	50.3	48.6	48.5	52.9	52.7
250250817005	Boston	169	74	50.3	50.2	48.7	48.5	52.8	52.3
250250818001	Boston	211	84	51.5	51.5	49.8	49.8	54.4	54.4

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250818002	Boston	226	92	51.7	51.7	49.9	50.0	54.9	55.0
250250818003	Boston	87	21	51.3	51.3	49.8	49.7	55.0	54.9
250250819001	Boston	260	98	50.7	50.8	48.9	49.1	53.7	53.9
250250819002	Boston	166	66	50.3	50.5	48.4	48.7	53.1	53.5
250250819003	Boston	265	80	50.3	50.3	48.6	48.5	53.4	53.3
250250819004	Boston	781	309	50.2	50.2	48.3	48.5	53.2	53.4
250250820001	Boston	520	219	50.7	50.8	49.2	49.2	54.5	54.5
250250820002	Boston	421	194	50.7	50.7	49.0	49.1	54.2	54.2
250250820003	Boston	427	171	50.9	50.9	49.1	49.2	54.2	54.3
250250821001	Boston	612	225	50.3	50.4	48.8	48.8	54.1	54.1
250250821002	Boston	1,234	485	50.0	50.1	48.5	48.5	53.8	53.9
250250821003	Boston	1,356	638	50.5	50.5	48.8	48.8	54.0	54.0
250250901001	Boston	365	147	49.5	49.4	48.2	48.0	53.5	53.3
250250901002	Boston	267	119	N/A	N/A	47.5	47.4	52.6	52.5
250250901003	Boston	550	198	N/A	N/A	47.4	47.4	52.6	52.6
250250901004	Boston	340	117	N/A	N/A	46.9	46.8	51.9	51.7
250250901005	Boston	392	131	N/A	N/A	46.3	46.4	51.0	51.2
250250902001	Boston	325	128	N/A	N/A	47.6	47.5	52.7	52.6
250250902002	Boston	553	225	N/A	N/A	48.0	48.0	53.2	53.3
250250903001	Boston	627	213	49.6	49.6	48.4	48.5	53.6	53.7
250250903002	Boston	1,329	456	49.7	49.8	48.7	48.5	54.0	53.8
250250903003	Boston	1,081	391	50.4	50.4	49.0	49.1	54.3	54.4
250250904001	Boston	486	162	51.0	51.1	49.7	49.7	55.0	55.0
250250904002	Boston	407	177	50.9	50.8	49.7	49.4	54.9	54.7
250250904003	Boston	464	135	51.4	51.5	50.0	50.1	55.2	55.4
250250904004	Boston	397	157	51.7	51.7	50.2	50.2	55.3	55.4

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250906001	Boston	345	120	52.0	52.0	50.4	50.4	55.5	55.4
250250906002	Boston	721	255	52.2	52.2	50.7	50.8	55.8	55.9
250250907001	Boston	436	201	49.9	50.0	49.7	49.7	53.8	53.8
250250907002	Boston	482	222	50.9	50.8	50.3	50.2	55.2	55.1
250250907003	Boston	577	295	49.9	50.0	49.4	49.5	53.9	54.1
250250907004	Boston	190	90	52.0	52.2	51.5	51.2	56.6	56.4
250250909011	Boston	443	234	50.9	50.3	51.9	51.0	53.1	52.8
250250909012	Boston	534	244	52.5	53.9	54.9	56.3	54.9	55.8
250250910011	Boston	295	145	N/A	N/A	48.0	47.9	51.0	50.8
250250910012	Boston	490	260	N/A	N/A	48.9	48.8	50.7	50.3
250250910013	Boston	354	197	49.9	51.0	51.6	53.3	52.0	53.0
250250910014	Boston	717	383	N/A	N/A	50.6	49.8	51.8	51.9
250250911001	Boston	1,225	538	N/A	N/A	49.1	49.1	52.3	52.3
250250911002	Boston	486	201	N/A	N/A	48.9	49.0	51.5	51.3
250250911003	Boston	98	38	N/A	N/A	48.4	48.6	51.4	51.7
250250911004	Boston	381	169	N/A	N/A	48.4	48.3	52.0	51.9
250250911005	Boston	399	164	N/A	N/A	48.7	48.7	52.6	52.7
250250912001	Boston	455	220	49.5	49.7	48.9	49.1	53.4	53.8
250250912002	Boston	154	71	N/A	N/A	48.4	48.3	52.6	52.5
250250912003	Boston	540	229	49.5	49.5	48.7	48.8	53.5	53.7
250250913001	Boston	541	184	50.5	50.5	49.7	49.6	54.9	54.8
250250913002	Boston	519	184	51.3	51.4	50.2	50.2	55.5	55.5
250250914001	Boston	1,104	408	49.7	49.8	48.9	48.9	54.0	54.1
250250914002	Boston	354	135	50.5	50.4	49.3	49.3	54.7	54.6
250250915001	Boston	360	113	N/A	N/A	48.0	47.9	52.1	52.1
250250915002	Boston	733	245	N/A	N/A	47.7	47.7	52.0	52.2

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250250915003	Boston	371	169	N/A	N/A	47.3	47.4	51.3	51.1
250250916001	Boston	364	201	N/A	N/A	47.0	47.0	50.4	50.3
250250916002	Boston	748	275	N/A	N/A	47.5	47.4	50.2	50.1
250250916003	Boston	211	73	N/A	N/A	48.3	48.0	49.7	49.7
250250917001	Boston	1,170	421	N/A	N/A	46.7	46.8	49.6	49.6
250250917002	Boston	379	109	N/A	N/A	46.7	46.7	50.3	50.3
250250917003	Boston	143	54	N/A	N/A	46.6	46.5	50.5	50.2
250250918001	Boston	653	260	N/A	N/A	47.6	47.4	52.3	51.9
250250918002	Boston	799	308	N/A	N/A	47.0	47.2	51.2	51.6
250250918003	Boston	659	253	N/A	N/A	46.9	47.1	51.3	51.7
250250919001	Boston	500	155	N/A	N/A	46.8	46.8	51.5	51.4
250250919002	Boston	101	40	N/A	N/A	46.3	46.3	50.3	50.6
250250919003	Boston	837	303	N/A	N/A	46.1	46.2	50.5	50.7
250250919004	Boston	370	126	N/A	N/A	45.8	45.8	49.6	49.6
250250920004	Boston	735	238	N/A	N/A	46.3	46.3	50.0	49.9
250250921011	Boston	894	382	51.0	51.0	52.5	53.4	52.2	53.0
250250921012	Boston	482	166	N/A	N/A	48.6	48.7	49.7	49.7
250250921013	Boston	57	16	51.2	51.8	55.1	54.3	54.6	53.8
250250921014	Boston	739	320	N/A	N/A	49.3	50.0	49.8	50.3
250250921015	Boston	457	160	N/A	N/A	49.2	49.4	49.6	49.7
250250924001	Boston	333	92	N/A	N/A	45.5	45.5	49.7	49.6
250250924002	Boston	380	123	N/A	N/A	45.9	45.8	50.5	50.4
250250924003	Boston	517	212	N/A	N/A	46.7	46.6	51.7	51.5
250250924004	Boston	318	86	N/A	N/A	46.4	46.6	51.5	51.7
250250924005	Boston	779	265	N/A	N/A	46.6	46.6	51.6	51.6
250251001004	Boston	362	121	N/A	N/A	45.6	45.5	50.4	50.3

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250251001005	Boston	129	60	N/A	N/A	45.0	45.0	49.6	49.7
250251001006	Boston	629	179	N/A	N/A	45.3	45.5	49.7	50.0
250251006011	Boston	204	87	52.2	52.1	56.4	54.7	55.8	54.1
250251006012	Boston	295	105	50.5	50.3	52.7	52.8	52.3	52.3
250251006013	Boston	413	167	N/A	N/A	50.7	50.8	50.6	50.7
250251006031	Boston	491	175	56.1	56.4	58.9	58.6	58.4	58.1
250251006032	Boston	272	120	57.7	58.7	60.4	60.9	59.9	60.3
250251007001	Boston	396	179	54.5	54.4	55.5	56.7	54.9	56.2
250251007002	Boston	579	345	56.9	57.5	58.8	59.5	58.3	59.1
250251007003	Boston	146	52	56.0	56.3	59.4	58.4	58.9	57.9
250251007004	Boston	258	116	52.9	53.0	55.2	55.3	54.6	54.8
250251007005	Boston	198	82	52.2	52.2	54.2	54.5	53.7	54.0
250251008001	Boston	307	111	N/A	N/A	50.2	50.0	50.2	50.0
250251008002	Boston	548	250	50.2	50.0	52.6	52.4	52.2	52.0
250251008003	Boston	142	41	50.3	50.3	52.9	52.6	52.4	52.2
250251008004	Boston	144	75	50.4	52.4	52.4	54.7	51.9	54.1
250251008005	Boston	336	138	N/A	N/A	51.3	50.8	50.9	50.5
250251008006	Boston	672	319	N/A	N/A	50.6	49.9	50.4	49.8
250251011013	Boston	157	65	N/A	N/A	45.1	45.8	49.9	50.8
250251101041	Boston	222	96	N/A	N/A	45.6	45.5	50.4	50.3
250251101042	Boston	1,075	392	N/A	N/A	45.9	45.9	50.7	50.7
250251101051	Boston	797	405	N/A	N/A	46.7	46.6	51.6	51.5
250251101061	Boston	262	146	N/A	N/A	46.1	46.1	51.1	51.1
250251101062	Boston	203	84	N/A	N/A	46.3	46.3	51.3	51.3
250251102011	Boston	1,211	527	N/A	N/A	45.1	45.2	50.3	50.5
250251103011	Boston	700	282	N/A	N/A	45.9	45.8	51.1	51.1

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250251103012	Boston	498	195	N/A	N/A	46.1	46.2	51.3	51.4
250251104011	Boston	1,262	517	N/A	N/A	45.8	45.7	50.8	50.7
250251104012	Boston	501	194	N/A	N/A	45.5	45.6	50.7	50.7
250251104031	Boston	160	58	N/A	N/A	45.0	45.0	50.2	50.2
250251104032	Boston	236	99	N/A	N/A	45.1	45.1	50.2	50.3
250251104033	Boston	206	59	N/A	N/A	44.4	44.4	49.6	49.6
250251104034	Boston	218	65	N/A	N/A	44.8	44.9	49.9	50.0
250251105021	Boston	511	216	N/A	N/A	44.9	44.9	49.8	49.8
250251105022	Boston	630	284	N/A	N/A	45.0	45.0	50.0	50.1
250251105023	Boston	367	144	N/A	N/A	44.6	44.6	49.5	49.6
250251201042	Boston	475	201	N/A	N/A	45.5	45.4	49.9	49.8
250251202011	Boston	871	402	N/A	N/A	45.9	45.8	50.3	50.3
250251202012	Boston	1,390	676	N/A	N/A	46.7	46.7	51.4	51.4
250251202013	Boston	200	102	N/A	N/A	46.5	46.6	51.3	51.4
250251203011	Boston	503	186	N/A	N/A	46.4	46.3	50.4	50.3
250251203012	Boston	308	124	N/A	N/A	47.2	47.3	51.6	51.9
250251203013	Boston	574	192	N/A	N/A	47.3	47.3	52.0	52.0
250251203014	Boston	419	205	N/A	N/A	46.2	46.3	50.4	50.5
250251204002	Boston	423	233	N/A	N/A	45.6	45.6	49.8	49.8
250259811002	Boston	6	1	N/A	N/A	46.9	46.9	52.1	52.1
250259816001	Boston	2	1	67.3	70.0	70.6	70.6	69.9	69.9
250235001011	Boston/Hull	1,501	859	54.2	51.6	54.1	51.7	53.7	52.0
250259813001	Boston/ Winthrop	55	33	64.8	78.4	63.9	79.9	64.1	78.8
250173546011	Cambridge	5	-	49.9	50.0	49.5	49.6	49.8	49.9
250173548001	Cambridge	1,082	522	50.9	50.9	50.5	50.5	50.6	50.6

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173548002	Cambridge	1,241	609	50.2	50.3	49.8	49.9	49.9	49.9
250173549012	Cambridge	964	567	50.2	50.2	49.7	49.7	49.9	49.9
250173549021	Cambridge	1,311	567	50.7	50.8	50.3	50.4	50.4	50.5
250173549022	Cambridge	1,318	623	50.5	50.5	50.1	50.0	50.2	50.3
250173549023	Cambridge	2,070	808	50.3	50.3	49.8	49.9	50.1	50.1
250173549024	Cambridge	917	445	50.4	50.4	50.0	50.0	50.2	50.2
250173550001	Cambridge	883	423	50.5	50.6	50.0	50.1	50.2	50.3
250173550002	Cambridge	1,309	677	51.0	51.0	50.5	50.5	50.6	50.6
250173550003	Cambridge	937	445	50.9	51.1	50.5	50.7	50.6	50.8
250173509002	Cambridge/ Somerville	1,312	581	50.2	50.3	49.8	49.9	49.6	49.7
250251601022	Chelsea	1,431	378	58.8	59.0	58.6	58.6	58.5	58.4
250251601024	Chelsea	40	9	59.6	59.7	59.1	59.2	59.0	59.1
250251601032	Chelsea	881	234	64.1	64.2	63.6	63.7	63.9	63.9
250251601033	Chelsea	303	164	60.7	60.8	59.6	60.4	59.5	60.3
250251601034	Chelsea	664	166	63.6	64.0	62.1	63.5	62.2	63.7
250251602001	Chelsea	717	185	61.3	61.4	61.1	61.0	61.2	61.0
250251602002	Chelsea	379	104	62.8	62.9	62.5	62.4	62.8	62.6
250251602003	Chelsea	458	125	64.1	64.2	63.3	63.7	63.6	64.0
250251602004	Chelsea	182	59	63.3	63.5	62.5	63.0	62.9	63.4
250251603001	Chelsea	389	207	62.9	60.9	62.6	60.5	63.0	60.9
250251603002	Chelsea	1,013	652	60.6	60.1	60.2	59.6	60.6	59.9
250251604001	Chelsea	258	94	62.4	62.7	62.1	62.2	62.4	62.6
250251604002	Chelsea	164	52	60.1	59.8	59.8	59.3	59.9	59.3
250251604003	Chelsea	489	255	56.4	56.4	55.6	55.9	55.3	55.6
250251604004	Chelsea	157	98	59.8	59.4	59.1	59.0	59.0	58.9

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250251605011	Chelsea	1,076	328	55.1	55.0	54.7	54.6	54.3	54.2
250251605012	Chelsea	960	279	55.5	55.7	55.3	55.3	55.0	55.0
250251605013	Chelsea	283	90	57.0	57.0	57.0	56.5	56.8	56.3
250251605014	Chelsea	582	333	55.9	55.8	55.3	55.4	55.0	55.1
250251605015	Chelsea	878	322	54.6	54.7	54.2	54.3	53.9	54.0
250251605021	Chelsea	429	132	55.1	55.0	55.8	54.6	55.6	54.3
250251605023	Chelsea	609	190	53.7	52.8	52.4	52.6	51.9	52.2
250251605024	Chelsea	194	54	52.6	52.6	52.5	52.4	52.1	51.9
250251605025	Chelsea	456	199	55.6	56.2	54.3	55.8	54.0	55.6
250251606011	Chelsea	222	10	53.0	53.1	52.8	52.7	52.4	52.3
250251606012	Chelsea	778	460	51.8	51.5	51.2	51.2	50.8	50.8
250251606013	Chelsea	579	196	52.6	52.0	51.8	51.7	51.4	51.3
250251606014	Chelsea	540	195	52.7	52.9	52.5	52.5	52.0	52.0
250251606021	Chelsea	850	297	52.5	52.2	52.0	51.8	51.5	51.3
250251606022	Chelsea	519	195	50.3	50.0	50.0	49.7	49.4	49.1
250251606024	Chelsea	632	220	50.3	50.1	49.7	49.8	49.3	49.3
250251606025	Chelsea	646	264	51.1	50.9	50.4	50.6	49.9	50.1
250251706012	Chelsea/ Revere	351	113	50.7	50.9	50.6	51.2	50.0	50.5
250173421012	Everett	1,227	402	50.2	50.3	49.8	49.9	49.2	49.3
250173421014	Everett	1,052	377	49.9	49.8	49.6	49.5	49.0	48.9
250173422012	Everett	1,351	488	50.8	50.8	50.3	50.3	49.7	49.7
250173423011	Everett	1,460	513	51.8	51.5	51.2	50.9	50.8	50.5
250173423012	Everett	1,782	625	52.5	52.5	51.9	51.9	51.5	51.5
250173423021	Everett	2,003	710	53.2	53.3	52.5	52.6	52.2	52.3
250173423022	Everett	805	287	54.9	54.8	54.2	54.1	54.0	53.9

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173423023	Everett	1,740	620	53.1	53.1	52.4	52.5	52.1	52.1
250173424011	Everett	2,148	897	56.1	56.1	55.5	55.5	55.3	55.3
250173424012	Everett	1,398	537	57.1	57.1	56.4	56.4	56.4	56.4
250173424013	Everett	1,058	407	53.5	53.3	52.9	52.7	52.4	52.3
250173424021	Everett	1,387	674	57.9	58.0	57.3	57.4	57.3	57.4
250173424022	Everett	1,413	630	56.9	56.0	56.2	55.3	56.2	55.2
250173424023	Everett	842	402	57.2	57.3	56.6	56.7	56.4	56.5
250173424024	Everett	22	9	58.8	58.5	58.2	57.9	58.3	58.0
250173425011	Everett	2,291	843	53.3	53.3	52.8	52.7	52.3	52.2
250173425012	Everett	2,449	991	55.9	55.7	55.2	55.1	54.9	54.7
250173425021	Everett	1,607	575	51.4	51.5	50.9	51.0	50.3	50.4
250173426001	Everett	1,368	428	52.4	52.3	51.9	51.9	51.4	51.4
250173426002	Everett	1,076	363	54.2	54.4	53.7	53.9	53.3	53.4
250173426003	Everett	2,525	960	53.2	53.3	52.7	52.8	52.2	52.2
250235001012	Hull	775	463	51.3	50.4	51.3	50.4	50.4	49.5
250235001013	Hull	1,341	738	50.0	49.9	49.6	49.4	49.2	49.1
250092051001	Lynn	1,434	538	51.7	52.5	52.1	52.9	51.7	52.5
250092051002	Lynn	1,275	424	52.4	52.6	52.8	52.9	52.3	52.5
250092051003	Lynn	1,074	364	54.3	54.5	54.7	54.9	54.3	54.5
250092051004	Lynn	1,653	576	54.1	54.5	54.5	54.9	54.1	54.6
250092051005	Lynn	692	261	54.9	55.2	55.3	55.6	55.0	55.3
250092052001	Lynn	869	424	52.8	52.8	53.1	53.2	52.7	52.8
250092052002	Lynn	805	285	55.3	55.2	55.7	55.5	55.3	55.2
250092052003	Lynn	1,607	577	55.1	55.2	55.5	55.6	55.1	55.2
250092052004	Lynn	1,603	496	56.0	56.1	56.3	56.5	56.0	56.1
250092052005	Lynn	1,041	390	52.6	55.0	52.9	55.4	52.5	55.0

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250092053002	Lynn	1,054	356	N/A	N/A	49.5	49.6	49.1	49.1
250092055001	Lynn	2,391	762	52.5	51.2	52.8	51.5	52.4	51.1
250092055002	Lynn	3,109	1,034	56.7	56.6	57.1	57.0	56.7	56.6
250092058001	Lynn	1,124	364	52.1	52.3	52.4	52.6	52.0	52.2
250092058002	Lynn	1,220	342	52.3	52.6	52.6	52.9	52.2	52.5
250092058003	Lynn	1,381	508	50.8	50.5	51.2	50.8	50.7	50.3
250092059001	Lynn	1,952	581	52.2	52.3	52.5	52.6	52.1	52.2
250092059002	Lynn	1,398	453	51.2	51.3	51.5	51.6	51.1	51.2
250092059003	Lynn	1,448	501	N/A	N/A	49.8	49.5	49.3	49.1
250092060001	Lynn	1,630	478	56.3	56.5	56.6	56.8	56.2	56.4
250092060002	Lynn	2,074	685	54.9	55.2	55.3	55.5	54.9	55.1
250092061001	Lynn	1,998	795	56.4	56.9	56.7	57.3	56.3	56.9
250092061002	Lynn	2,201	684	57.2	57.4	57.5	57.7	57.2	57.4
250092062001	Lynn	1,352	361	54.8	54.9	55.1	55.2	54.7	54.8
250092062002	Lynn	2,507	811	56.5	56.9	56.8	57.3	56.4	56.9
250092062003	Lynn	2,020	578	55.5	55.0	55.9	55.3	55.4	54.9
250092063001	Lynn	1,220	388	51.7	51.6	52.0	51.9	51.5	51.4
250092063002	Lynn	1,137	376	53.6	53.9	54.0	54.2	53.5	53.8
250092063003	Lynn	1,018	325	50.7	50.2	51.0	50.5	50.4	50.0
250092063004	Lynn	839	258	52.4	52.8	52.8	53.2	52.3	52.7
250092064004	Lynn	1,578	499	50.6	50.4	50.9	50.7	50.4	50.2
250092068001	Lynn	1,982	719	51.3	51.2	51.6	51.5	51.0	50.9
250092068002	Lynn	2,443	1,062	53.3	53.2	53.7	53.5	53.1	53.0
250092069001	Lynn	1,006	672	50.9	50.8	51.3	51.2	50.6	50.5
250092069002	Lynn	1,380	677	N/A	N/A	49.8	49.7	48.5	48.4
250092069003	Lynn	1,809	967	50.6	50.6	51.1	51.1	50.2	50.2

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250092069004	Lynn	800	345	N/A	N/A	49.9	49.9	48.9	48.9
250092070001	Lynn	966	614	55.2	54.3	55.6	54.6	55.0	54.1
250092070002	Lynn	1,323	440	57.8	57.9	58.1	58.2	57.7	57.8
250092071001	Lynn	1,581	455	55.9	56.1	56.2	56.4	55.8	56.0
250092071002	Lynn	1,176	326	57.1	57.3	57.5	57.7	57.0	57.3
250092071003	Lynn	1,050	338	54.5	54.6	54.8	54.9	54.4	54.5
250092072001	Lynn	1,443	409	57.3	59.1	57.6	59.4	57.2	59.0
250092072002	Lynn	1,560	713	57.9	58.0	58.2	58.4	57.8	58.0
250173412002	Malden	1,022	472	53.2	53.4	52.3	52.5	52.3	52.5
250173412003	Malden	937	369	53.0	53.1	52.1	52.2	52.0	52.1
250173412004	Malden	1,737	736	51.7	51.8	50.8	50.8	50.7	50.7
250173412005	Malden	1,076	392	51.0	50.9	50.1	49.9	49.9	49.8
250173414004	Malden	1,827	634	50.3	50.2	49.6	49.5	49.3	49.2
250173414005	Malden	781	392	52.1	52.0	51.4	51.3	51.1	51.1
250173391011	Medford	1,286	696	52.1	52.2	51.3	51.4	51.2	51.3
250173391012	Medford	872	323	50.9	51.0	50.1	50.1	50.0	50.0
250173391013	Medford	1,109	806	52.2	52.0	51.4	51.3	51.4	51.3
250173391022	Medford	1,314	600	51.6	51.6	50.7	50.7	50.6	50.6
250173394001	Medford	1,098	541	50.3	50.0	49.5	49.3	49.5	49.2
250173394002	Medford	666	266	50.9	50.8	50.3	50.2	50.3	50.2
250173394003	Medford	772	382	50.5	50.6	49.9	49.9	49.8	49.9
250173394004	Medford	943	418	50.2	50.1	49.5	49.5	49.5	49.4
250173395001	Medford	2,982	600	51.9	52.0	51.3	51.4	51.4	51.5
250173395002	Medford	1,214	555	52.6	52.6	51.9	52.0	52.0	52.1
250173395003	Medford	677	297	51.4	51.2	50.7	50.5	50.6	50.5
250173395004	Medford	789	309	51.5	51.6	50.8	50.9	50.9	50.9

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173396001	Medford	844	388	52.9	52.8	52.4	52.3	52.6	52.5
250173396002	Medford	892	377	53.2	53.2	52.7	52.6	52.8	52.8
250173396003	Medford	1,000	450	52.9	53.0	52.5	52.5	52.6	52.6
250173396004	Medford	843	370	52.9	53.1	52.4	52.6	52.4	52.6
250173396005	Medford	897	373	52.6	52.6	52.1	52.2	51.9	52.0
250173396006	Medford	978	435	52.2	52.3	51.8	51.9	51.4	51.5
250173397001	Medford	654	296	54.0	54.4	53.4	53.8	53.5	54.0
250173397002	Medford	1,622	686	53.6	53.8	53.1	53.3	53.0	53.2
250173397003	Medford	753	354	53.8	53.8	53.3	53.3	53.4	53.4
250173397004	Medford	887	375	53.1	53.1	52.6	52.7	52.5	52.5
250173398021	Medford	1,490	703	55.6	55.7	55.0	55.0	55.0	55.2
250173398022	Medford	680	253	53.6	53.7	52.9	53.0	53.0	53.0
250173398023	Medford	761	275	54.4	54.4	53.7	53.7	53.8	53.8
250173398024	Medford	2,554	1,420	54.8	55.5	54.2	54.9	54.3	54.9
250173398031	Medford	1,043	620	56.6	56.9	56.0	56.3	56.0	56.3
250173398032	Medford	2,340	1,431	56.3	56.3	55.7	55.6	55.7	55.6
250173398041	Medford	695	265	56.1	56.2	55.5	55.5	55.5	55.6
250173398042	Medford	535	240	55.7	55.8	55.1	55.1	55.0	55.1
250173398043	Medford	1,030	429	55.2	54.9	54.5	54.2	54.4	54.1
250173399001	Medford	1,577	671	53.8	53.9	53.0	53.1	52.9	53.0
250173399002	Medford	943	382	53.7	53.7	53.0	52.9	52.9	52.8
250173399003	Medford	1,073	459	52.6	52.6	51.7	51.7	51.6	51.5
250173399004	Medford	812	347	53.1	53.2	52.4	52.4	52.3	52.4
250173399005	Medford	922	382	52.9	52.9	52.1	52.1	51.9	51.9
250173400001	Medford	1,108	461	52.1	52.1	51.2	51.2	50.9	51.0
250173400002	Medford	778	379	52.1	52.2	51.3	51.3	51.1	51.1

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173400003	Medford	704	304	52.7	52.7	51.8	51.9	51.7	51.8
250173401003	Medford	1,535	639	51.6	51.7	50.6	50.7	50.4	50.5
250173401005	Medford	857	327	50.7	50.8	49.7	49.7	49.5	49.5
250214161011	Milton	2,162	737	53.2	54.0	55.2	56.1	54.8	55.6
250214161012	Milton	1,965	608	N/A	N/A	50.8	51.9	50.6	51.4
250214161013	Milton	827	282	52.3	52.1	54.3	54.3	54.0	53.9
250214164001	Milton	887	283	N/A	N/A	50.2	51.6	49.9	51.2
250214164002	Milton	1,071	346	53.9	54.1	55.7	56.2	55.3	55.7
250214164003	Milton	1,007	359	51.9	54.4	54.1	56.5	53.7	56.0
250214164005	Milton	815	311	54.1	55.3	55.5	57.4	55.1	56.9
250214164006	Milton	1,122	395	53.1	56.0	55.0	58.1	54.5	57.6
250214164007	Milton	662	258	N/A	N/A	49.8	51.3	49.5	50.9
250214172024	Milton/ Quincy	1,155	472	N/A	N/A	50.1	49.4	49.8	49.1
250092106001	Peabody	1,809	744	50.1	51.1	50.7	51.7	50.4	51.4
250092106002	Peabody	2,615	1,033	50.2	50.2	50.6	50.6	50.2	50.3
250092107001	Peabody	1,326	535	N/A	N/A	49.9	49.9	49.6	49.6
250092107002	Peabody	1,062	509	49.7	49.7	50.3	50.4	50.0	50.1
250092107003	Peabody	1,271	545	50.2	50.5	50.8	51.1	50.5	50.9
250092107004	Peabody	787	286	50.0	50.0	50.6	50.6	50.3	50.3
250092108002	Peabody	1,327	627	N/A	N/A	49.7	49.8	49.4	49.6
250092108003	Peabody	1,026	475	N/A	N/A	49.6	49.6	49.4	49.3
250214172013	Quincy	1,991	867	49.6	50.4	51.5	52.4	51.2	52.0
250214172014	Quincy	808	428	52.0	53.2	54.1	55.1	53.7	54.7
250214173001	Quincy	3,660	2,357	52.4	53.9	54.1	55.9	53.6	55.4
250214175023	Quincy	917	347	50.2	49.8	51.6	51.7	51.2	51.3

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250251704001	Revere	874	313	50.1	48.7	50.9	49.4	50.0	48.6
250251704002	Revere	243	96	49.9	50.1	50.3	51.0	49.4	50.1
250251705021	Revere	241	91	59.4	59.9	60.0	60.4	59.4	59.8
250251705022	Revere	954	643	56.3	58.4	56.6	59.0	55.8	58.3
250251705023	Revere	524	266	60.8	60.9	61.4	61.3	60.8	60.8
250251705031	Revere	1,065	601	55.4	56.8	55.8	57.5	55.0	56.7
250251705041	Revere	115	39	56.4	56.8	57.2	57.6	56.3	56.7
250251705042	Revere	335	106	53.3	52.7	54.4	53.6	53.4	52.6
250251706014	Revere	30	12	50.3	50.2	51.3	50.9	50.4	50.0
250251707011	Revere	735	334	56.0	54.7	58.4	55.8	57.4	54.7
250251707012	Revere	829	345	60.8	62.3	61.1	63.0	60.2	62.2
250251707021	Revere	52	21	53.6	53.2	54.5	54.3	53.5	53.2
250251707022	Revere	1,180	375	55.0	54.9	56.6	56.1	55.5	55.0
250251707023	Revere	650	217	52.0	52.0	52.7	53.0	51.7	52.0
250251707024	Revere	562	183	53.1	53.3	54.4	54.3	53.4	53.3
250251707025	Revere	371	194	55.7	55.4	55.5	56.4	54.4	55.3
250251708001	Revere	1,054	391	64.8	63.9	65.9	64.7	65.1	63.9
250251708002	Revere	652	218	64.4	65.8	66.5	66.6	65.7	65.8
250251708003	Revere	643	259	62.4	64.4	63.6	65.3	62.5	64.4
250251708004	Revere	445	177	63.3	61.1	66.7	62.4	65.9	61.1
250092047011	Salem	1,014	402	51.8	53.6	52.3	54.1	51.9	53.8
250173501051	Somerville	1,181	530	54.1	54.3	53.5	53.8	53.3	53.6
250173501061	Somerville	1,660	1,006	53.7	53.8	53.2	53.2	52.9	53.0
250173501071	Somerville	1,355	553	51.0	51.2	50.5	50.7	50.2	50.3
250173501081	Somerville	2,655	1,049	53.0	52.9	52.5	52.4	52.2	52.0
250173501082	Somerville	1,519	725	51.6	51.7	51.1	51.2	50.7	50.8

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173501091	Somerville	2,176	882	52.0	51.7	51.5	51.2	51.2	50.8
250173502013	Somerville	769	319	50.3	50.3	49.8	49.8	49.4	49.4
250173502021	Somerville	1,361	586	50.7	50.8	50.2	50.3	49.8	49.9
250173502023	Somerville	1,120	564	50.8	50.8	50.3	50.3	49.9	49.9
250173503001	Somerville	900	429	51.1	50.7	50.6	50.3	50.2	49.9
250173503002	Somerville	1,118	528	50.6	50.7	50.2	50.3	49.9	49.9
250173503003	Somerville	966	407	51.7	51.6	51.2	51.2	50.9	50.9
250173504001	Somerville	1,054	397	52.5	52.6	52.0	52.1	52.1	52.3
250173504002	Somerville	1,380	601	51.8	51.8	51.4	51.4	51.2	51.2
250173504003	Somerville	1,077	468	51.2	51.2	50.8	50.8	50.6	50.6
250173504004	Somerville	1,491	732	51.6	51.6	51.2	51.2	51.1	51.2
250173504005	Somerville	899	392	52.2	52.2	51.7	51.8	51.7	51.8
250173505001	Somerville	874	391	51.9	51.9	51.4	51.5	51.5	51.6
250173505002	Somerville	869	395	51.7	51.8	51.3	51.3	51.4	51.5
250173506001	Somerville	1,779	9	52.2	52.2	51.7	51.7	51.8	51.9
250173506002	Somerville	984	391	51.7	51.7	51.2	51.1	51.3	51.3
250173506003	Somerville	743	241	51.4	51.4	50.8	50.8	51.0	51.0
250173506004	Somerville	1,282	507	52.0	52.0	51.5	51.6	51.7	51.7
250173507011	Somerville	1,109	466	51.2	51.2	50.6	50.7	50.8	50.8
250173507012	Somerville	1,048	476	50.8	51.0	50.3	50.4	50.3	50.5
250173507013	Somerville	843	468	51.0	51.1	50.5	50.6	50.6	50.7
250173507022	Somerville	1,298	678	50.6	50.6	50.0	50.0	50.1	50.1
250173508001	Somerville	1,045	507	51.4	51.4	50.9	50.9	51.1	51.1
250173508002	Somerville	1,031	461	51.5	51.5	51.0	51.0	51.2	51.2
250173509001	Somerville	875	408	50.8	50.9	50.4	50.5	50.3	50.3
250173509003	Somerville	1,344	718	51.0	51.1	50.6	50.7	50.7	50.8

Table I-37 DNL Values at U.S. Census 2020 Block Groups, 2022-2024

Census Block Group ID	Name	Population	Housing Units	2022		2023		2024	
				Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid	Average Block DNL	DNL at centroid
250173510022	Somerville	1,174	511	50.2	50.2	49.8	49.8	49.5	49.6
250173514031	Somerville	674	286	50.4	50.4	49.9	49.8	49.6	49.5
250251801011	Winthrop	335	143	53.3	53.4	54.6	54.5	54.0	53.8
250251801012	Winthrop	600	366	51.7	51.1	52.7	52.2	51.9	51.5
250251801013	Winthrop	208	90	54.5	54.7	55.4	56.0	54.2	54.8
250251801014	Winthrop	2,020	879	55.0	55.1	56.3	56.3	55.4	55.3
250251802001	Winthrop	641	234	58.8	59.1	60.5	60.5	59.3	59.1
250251802002	Winthrop	362	143	56.8	56.7	57.9	57.7	57.2	57.1
250251802003	Winthrop	545	264	58.4	58.3	59.2	59.3	58.6	58.6
250251802004	Winthrop	1,028	499	60.7	61.2	62.7	62.5	61.3	61.1
250251803011	Winthrop	522	212	60.0	59.9	61.0	60.9	60.1	60.0
250251803012	Winthrop	754	331	61.0	60.8	61.9	61.7	61.7	61.5
250251803013	Winthrop	419	157	63.1	62.9	64.1	64.2	62.7	62.7
250251803014	Winthrop	651	265	61.5	61.5	61.9	62.2	61.3	61.5
250251804001	Winthrop	721	376	57.9	56.0	59.1	57.0	58.8	56.6
250251804002	Winthrop	299	118	58.6	58.2	59.7	59.1	59.4	58.9
250251805001	Winthrop	384	180	55.5	56.6	56.3	57.8	56.0	57.5
250251805002	Winthrop	344	145	64.8	64.3	66.4	65.8	66.3	65.6
250251805003	Winthrop	239	118	59.8	58.5	60.9	59.9	60.6	59.6
250251805004	Winthrop	389	185	66.3	67.3	67.5	68.9	67.4	68.7

Source: HMMH, 2025.

Notes: N/A: Not applicable

Census Block group was not in 2023 or 2024 50 dB or greater noise contours.

I.6 Airline Fleet Improvements

Commercial air carrier and cargo operators are deploying the newest engine technology at Logan Airport.

Table I-38 reports the percentage of an airline's fleet that is Stage 3, Stage 4 equivalent, or Stage 5 equivalent for 2022, 2023, and 2024.

Table I-38 Percentage of Airline Operations in Stage 3, 4 or 5 Aircraft, 2022-2024

Airlines ¹	2022	2023	2024	2022			2023			2024		
				Stage 3 ²	Stage 4	Stage 5	Stage 3 ²	Stage 4	Stage 5	Stage 3 ²	Stage 4	Stage 5
JetBlue Airways	91,803	97,486	93,703	0%	44%	56%	0%	46%	54%	0%	41%	59%
Delta Air Lines	46,893	58,538	58,176	0%	72%	28%	0%	61%	39%	0%	73%	27%
Republic Airlines	46,247	45,002	52,705	0%	100%	0%	0%	100%	0%	1%	99%	0%
American Airlines	41,255	32,623	34,938	0%	58%	42%	0%	62%	38%	0%	65%	35%
United Airlines	22,123	24,764	24,716	0%	83%	17%	0%	59%	41%	0%	68%	32%
Spirit Airlines	6,717	9,537	13,664	0%	26%	74%	0%	5%	95%	0%	11%	89%
Southwest Airlines	10,535	12,218	13,186	0%	91%	9%	0%	72%	28%	0%	64%	36%
Alaska Airlines	4,404	5,019	5,119	0%	98%	1%	0%	99%	1%	0%	98%	2%
Envoy Airlines	2,039	3,475	3,828	6%	94%	0%	3%	97%	0%	2%	98%	0%
Federal Express	4,722	3,479	3,147	4%	96%	0%	10%	84%	6%	7%	85%	8%
Jazz Air Inc.	4,557	2,906	2,929	9%	91%	0%	0%	100%	0%	0%	100%	0%
Frontier Airlines	1,489	1,039	2,914	0%	33%	67%	0%	41%	59%	0%	31%	69%
Piedmont Airlines	2,955	2,700	2,678	0%	2%	98%	0%	6%	94%	0%	5%	95%
Air Canada	625	2,244	2,458	0%	5%	95%	0%	2%	98%	0%	3%	97%
United Parcel Service	2,114	2,089	2,338	0%	99%	1%	0%	98%	2%	0%	98%	2%
Aer Lingus	1,910	2,034	2,049	0%	68%	32%	0%	66%	34%	0%	64%	36%
British Airways	1,703	2,002	1,981	0%	90%	10%	0%	100%	0%	0%	95%	5%
Lufthansa	1,446	1,686	1,611	0%	28%	72%	0%	17%	83%	0%	27%	73%
Icelandair	1,450	1,390	1,496	0%	49%	51%	0%	54%	46%	0%	48%	52%
TAP - Air Portugal	965	1,250	1,302	0%	98%	2%	0%	100%	0%	0%	93%	7%
Air France	961	972	1,137	0%	3%	97%	0%	16%	84%	0%	15%	85%
Virgin Atlantic	670	727	1,108	0%	0%	100%	0%	0%	100%	0%	0%	100%
Iberia Air Lines Of Spain	696	940	1,089	0%	99%	1%	0%	87%	13%	0%	84%	16%
Swiss Air	804	1,044	1,054	2%	0%	98%	1%	0%	99%	1%	0%	99%
Allegiant Air	1,154	1,018	1,016	0%	100%	0%	0%	100%	0%	0%	100%	0%

Table I-38 Percentage of Airline Operations in Stage 3, 4 or 5 Aircraft, 2022-2024

Airlines ¹	2022	2023	2024	2022			2023			2024		
				Stage 3 ²	Stage 4	Stage 5	Stage 3 ²	Stage 4	Stage 5	Stage 3 ²	Stage 4	Stage 5
SATA International Airlines	648	750	962	0%	0%	100%	0%	0%	100%	1%	10%	89%
COPA Airlines	228	646	939	0%	100%	0%	0%	100%	0%	0%	58%	42%
Qatar Airways	728	726	872	0%	2%	98%	0%	1%	99%	0%	0%	100%
Emirates Airlines	702	732	736	0%	99%	1%	0%	100%	0%	0%	100%	0%
Japan Airlines	730	730	732	0%	0%	100%	0%	0%	100%	0%	0%	100%
Korean Air Lines Co., Ltd.	366	618	732	0%	51%	49%	0%	66%	34%	0%	75%	25%
Turkish Airlines	742	658	690	0%	0%	100%	0%	0%	100%	0%	0%	100%
Scandinavian Airlines	389	544	664	0%	0%	100%	0%	0%	100%	0%	0%	100%
Fly Play Corp	453	696	648	0%	0%	100%	0%	0%	100%	0%	0%	100%
Cathay Pacific	83	313	622	0%	0%	100%	0%	0%	100%	0%	0%	100%
BermudAir Limited	0	192	622	N/A	N/A	N/A	2%	98%	0%	0%	100%	0%
Sun Country Airlines	416	472	557	0%	100%	0%	0%	100%	0%	0%	100%	0%
Avianca	0	439	521	N/A	N/A	N/A	0%	36%	64%	0%	17%	83%
ABX Air, Inc.	147	214	500	95%	5%	0%	88%	12%	0%	63%	37%	0%
ITA Airlines	484	506	478	0%	100%	0%	0%	92%	8%	0%	96%	4%
TACA International Airlines, S.A.	0	186	459	N/A	N/A	N/A	0%	26%	74%	0%	5%	95%
Hawaiian Airlines	422	444	446	0%	0%	100%	0%	0%	100%	0%	0%	100%
Etihad Airways PJSC Corporation	0	0	374	N/A	N/A	N/A	N/A	N/A	N/A	0%	1%	99%
KLM Royal Dutch Airlines	364	348	364	0%	98%	2%	0%	68%	32%	0%	24%	76%
El Al Israel Airlines Ltd.	164	284	338	0%	99%	1%	0%	95%	5%	0%	99%	1%
LATAM Airlines	54	316	312	0%	100%	0%	0%	100%	0%	0%	100%	0%
Hainan Airlines	0	32	312	N/A	N/A	N/A	0%	0%	100%	0%	0%	100%
Austrian Airlines	0	0	242	N/A	N/A	N/A	N/A	N/A	N/A	0%	100%	0%

Table I-38 Percentage of Airline Operations in Stage 3, 4 or 5 Aircraft, 2022-2024

Airlines ¹	2022	2023	2024	2022			2023			2024		
				Stage 3 ²	Stage 4	Stage 5	Stage 3 ²	Stage 4	Stage 5	Stage 3 ²	Stage 4	Stage 5
Condor Flugdienst	104	79	236	0%	52%	48%	0%	0%	100%	0%	0%	100%
WestJet Airlines	144	164	200	0%	100%	0%	0%	81%	19%	0%	73%	27%
SkyWest Airlines	782	3,920	10	0%	100%	0%	0%	100%	0%	0%	60%	40%
Amerijet International	8	293	16	100%	0%	0%	100%	0%	0%	100%	0%	0%

Source: Massport and HMMH, 2025.

Notes: N/A: Not available.

Operations for some carriers differ with those in Chapter 3, *Activity Levels and Forecasting*, and Chapter 8, *Air Quality and Greenhouse Gas Emissions*, because this table only includes jet aircraft, not turboprops, and it includes both scheduled and unscheduled air carriers.

1 This table only includes airlines with more than 100 flights in 2023 or 2024.

2 Stage 3 means originally manufactured as a certificated Stage 3 aircraft under FAR Part 36 and not meeting Stage 4 or Stage 5 noise standards.. Stage 4 or Stage 5 listings means the aircraft meets Stage 4 or Stage 5 requirements, even if not certificated as such

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I.7 Massport CAC Executive Committee Brief Slide Deck on Runway 27 Departure Procedure

8/13/2024

MCAC Executive Committee Brief

BOSTON LOGAN INTERNATIONAL AIRPORT RWY 27



Federal Aviation
Administration

AGENDA

- Block 1 & Block 2 Publication Timeline
- Background
- Runway 27 Departure History
- Standard Instrument Departure (SID) Updates
- Runway 27 Departure Corridor (Old vs New)
- Flight Track Comparison
- NEPA Review
- Questions
- Future Steps – TBD

8/13/2024

2



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Block 1 & Block 2 Publication Timeline

Block 1

- Task: RNAV (RNP) RWY 33L procedure/ Move Runway 15R Departure Flight Path North of Hull Peninsula
- Block 1 procedures published on December 2, 2021

Block 2

- Task: Modify the RNAV Departures with a speed restriction to enable an earlier turn to the east, shifting aircraft tracks north away from Hull. Implement a new overwater RNAV approach for Runway 22L that crosses the Nahant Causeway from the east to join a 4-mile final approach.
- Block 2 Departure Procedures Published on November 30, 2023
- ***When the FAA opens up a procedure it has to be brought up to current criteria.***
 - ✓ 28 Day interim and 56 day publication cycle

8/13/2024

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Background

- The FAA and Massport signed a Memorandum of Understanding (MOU) in 2016 establishing a framework to explore and evaluate possible changes to satellite-based air traffic procedures at Boston Logan International Airport to reduce the impact from aircraft overflight noise.
- Over a number of years, FAA, Massport, MCAC and MIT worked collaboratively within the MOU framework to successfully design and implement procedures as requested by MCAC.
- The Runway 27 Standard Instrument Departure (SID) update is a result of implementing Block 1 and 2 community requested procedures.
 - All runways that are part of the SIDs procedure design must be updated to current safety criteria. Therefore, the R27 heading to KIRAA changed from 234 to 237 as part of optimized Terminal Instrument Procedures (TERPS) Departure criteria.

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Runway 27 Departure History

- Implemented in 1996 as a standard (Non-Area Navigation (RNAV) noise abatement procedure after an Environmental Impact Statement (EIS)/Record of Decision (ROD)
- Goal was to get 68% of flight tracks within a defined noise abatement corridor of more compatible land use
- RNAV technology is used to improve the precision of flight tracks within the corridor
- After 15+ years and multiple FAA modifications to the RNAV procedure, the goal of 68% within the corridor was achieved

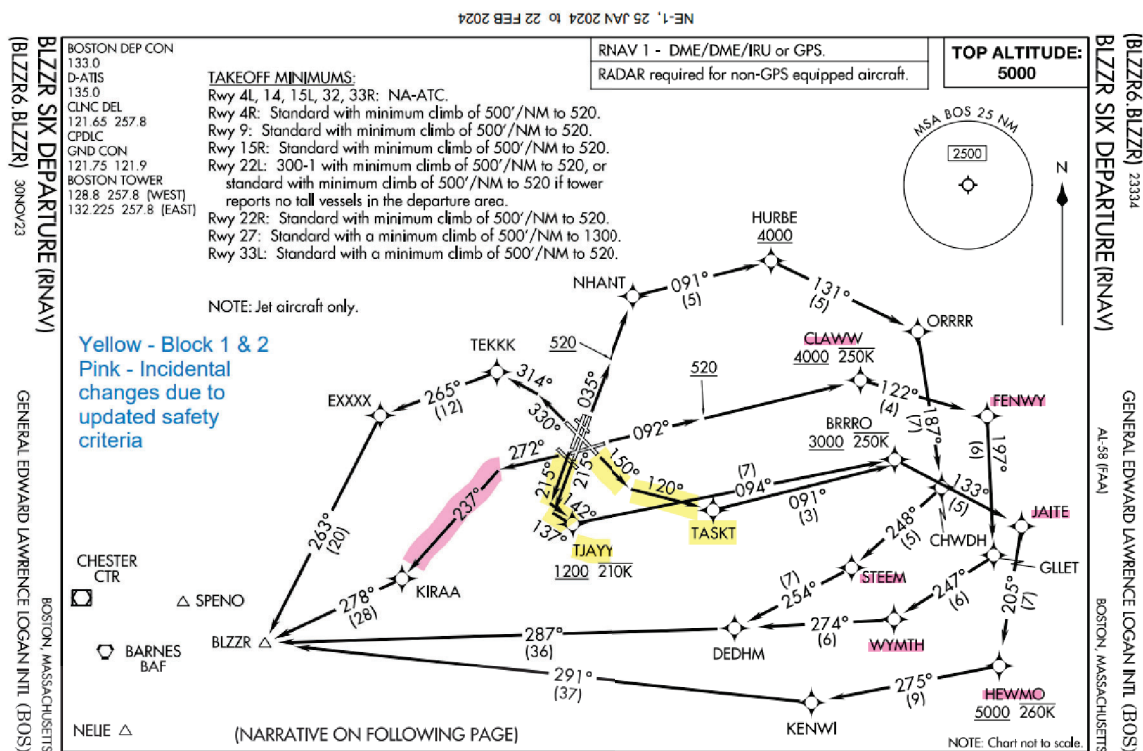
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Example SID:
BLZZR6



8/13/2024

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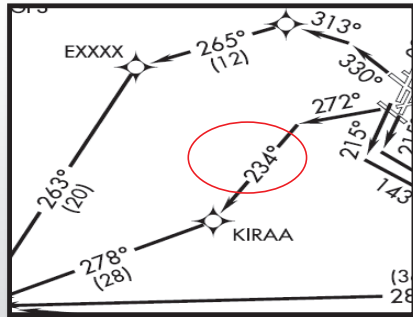


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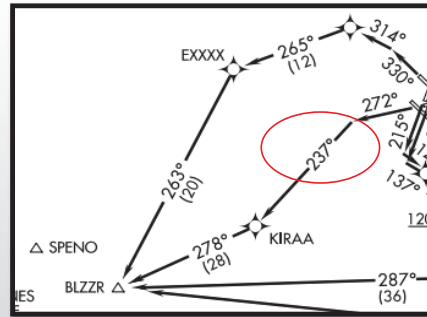
Standard Instrument Departure (SID) Changes

- Current track shows that aircraft depart Runway 27 on a compass heading of 272. When able, aircraft intercept the fixed path of 237 to KIRAA. This is referred to as a “course to fix” path. There have been no changes to flight paths after KIRAA.
- The heading to KIRAA changed by 3 degrees to meet current safety criteria within TARGETS.
 - ✓ KIRAA was 234° and is now published as 237°
 - ✓ TARGETS = procedure development software
- KIRAA Waypoint originated JAN 2000, and has moved twice but not since JAN 2017.

Previous



Current



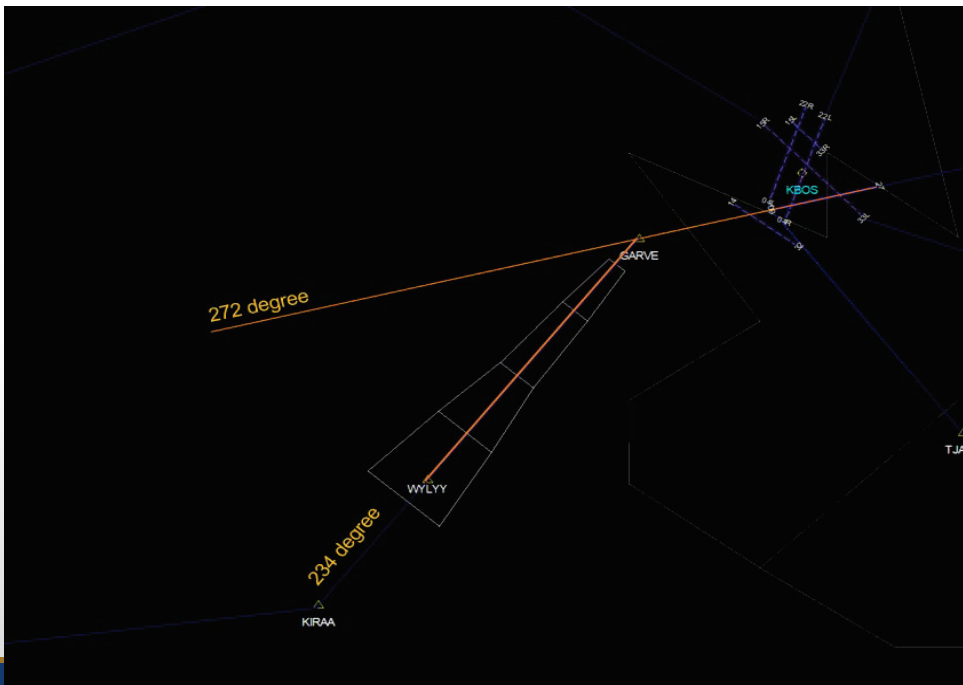
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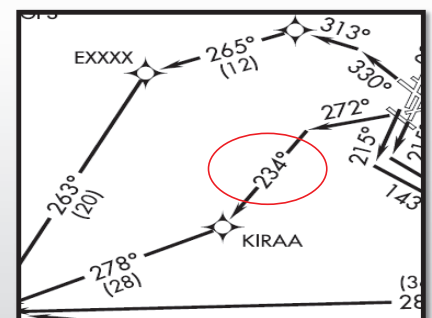


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Runway 27 Departure Corridor



Old BLZZR
departure showing
234 degree
heading to KIRAA



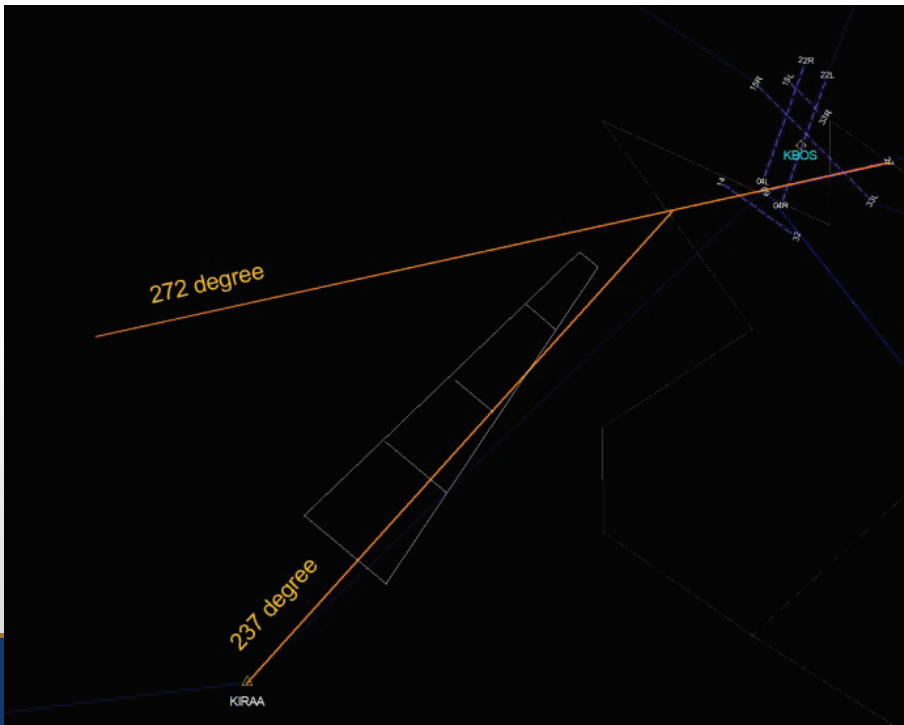
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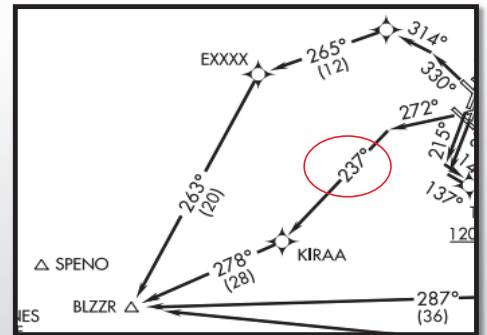


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Currently Published Procedure



Current BLZZR departure showing 237 degree heading to KIRAA



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RWY 27 Departure Corridor Flight Tracks



Nov 2019
2680 TRACKS
RWY 27 Departures only



Dec 2023
1445 TRACKS
RWY 27 Departures only



Federal Aviation Administration

NEPA Review

- On May 16, 2024, the FAA completed a Noise Screening Analysis Report for the proposed KBOS RNAV SID. Using the Terminal Area Route Generation, Evaluation, and Traffic Simulation (TARGETS) Environmental Plug-in tool and the Aviation Environmental Design Tool (AEDT), the analysis resulted in no reportable or significant impacts resulting from the proposed action.
- The noise screening showed DNL increases from 1.4 to 1.7, and DNL decreases from 1.7 to 2.7.
- Baseline and alternate DNL levels are below 65 db
- The FAA's criteria for reportable and significant changes are:
 - Significant: ± 1.5 dB at DNL 65 dB or higher
 - Reportable: ± 3 dB at DNL 60 dB to less than 65 dB
 - Reportable: ± 5 dB at DNL 45 dB to less than 60 dB

7/12/2024

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QUESTIONS



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I.8 Responses to Massport CAC on Changes to Runway 27 Departure Procedures



October 16, 2024

Dear Aaron Toffler & Massport Community Advisory Executive Committee:

The information below has been prepared for the MCAC in response to your questions regarding the changes to the BOS Rwy 27 departure procedure. Thank you for your continued cooperation in ensuring aviation safety and efficiency. Please do not hesitate to reach out for clarification of the information below, should you require it.

The FAA indicated that the NAV database is updated every 28 days. Is this database publicly available?

Answer: The FAA 28-day NASR Subscription, which is used to develop and update Instrument Approach Procedures, digital products, aeronautical charts, and related publications, is available to the public at

https://www.faa.gov/air_traffic/flight_info/aeronav/aero_data/NASR_Subscription/

MCAC would like to be able to see all approach and departure procedures at Logan on a map that has enough granularity for us to be able to identify which communities (neighborhoods) are impacted by which procedures.

Answer: The attached two Google Earth topographic map images show the 237 vs. 234 departure track headings. By zooming in on these maps, one can depict which communities would be most impacted.

The MCAC requests that the FAA and Massport work together to produce maps that show all departure and arrival tracks for each runway configuration showing populations impacted on the ground

Answer: This request can be coordinated with Massport

Which of the four published changes implemented from Block 1 and/or Block 2 precipitated the change in the Runway 27 departure procedure for safety reasons?

Answer: MCAC's Block 1 request was to move the Runway 15R departure flight path north of the Hull peninsula. The FAA honored that request, and the procedures were published December 2, 2021. MCAC's Block 2 request was to modify the RNAV departures with a speed restriction to enable an earlier turn to the east, shifting aircraft tracks north away from Hull. Once we open up a procedure, no matter how minor the request is, the FAA has to look at the procedure as an entirety. When we opened up the procedure for Block 2, we honored the requested change; however, during the design process, our TARGETS software automatically amended the RWY27 transitions on the SSOXS and LBSTA departures to the minimum distance requirement for a VI-CF segment (which led to the 237 heading). The change was inadvertent, as the RWY 27 transition had not been discussed as part of the Block 2 discussions with MCAC.

How was the target of 68% determined?

Answer: For the departure gate corridor off Runway 27, the 68% desired result for compliance was agreed upon by the Logan CAC (currently MCAC) Massport and the FAA. During the fall of 1996, the LOGAN SID was amended to begin the process.

What is the FAA's definition of a "noise abatement corridor"?

Answer: The FAA does not define verbiage; however, the interpretation of a noise abatement corridor includes strategies and techniques aimed at reducing noise thru a passage.

How is it assigned?

Answer: Noise abatement is normally coordinated through an airport. In this case, the "noise abatement corridor" was a decision coordinated between Logan CAC (currently MCAC), Massport, and the FAA.

What are the benefits?

Answer: The benefits are the reduction of aircraft noise impacts on communities.

What could cause it to be amended or removed?

Answer: There are multiple reasons noise abatement could be amended or removed, such as safety concerns, the airport conducting a new Part 150 (a voluntary FAA program that sets guidelines for airport operators to document aircraft noise exposure, and to establish noise abatement and compatible land use programs), or as a result of a community making a request. Please remember noise abatement decisions are always second to safety and efficiency.

How was that track determined to be a "noise abatement corridor"?

Answer: The track was constructed utilizing the LOGAN departure based on a point where aircraft would turn first when established at the BOS 2.2 DME and then fly a 235 track. Changes in wind direction and speed were also determining factors.

The FAA indicated that there have been multiple (minor) modifications of the RNAV over 15+ years. Were these modifications publicly noticed?

Answer: Although a public notice did not go out, there were numerous meetings with updates that took place with MCAC, Massport, MIT, and the FAA in the past. Multiple iterations of proposed RNAV designs were modified within a 15+ year time period to meet the needs of the community.

Was the MCAC notified?

Answer: The MCAC was notified on the proposed requests; however, there was an inadvertent oversight on the Runway 27 transition in Block 2.

What precipitated these modifications?

Answer: It is the FAA's understanding that MCAC has its internal processes when dealing with community driven requests for proposed changes at BOS Logan. The history of these proposed changes can be found on the MCAC's meeting website.

Was it a result of the standard review of procedures?

Answer: No

The NEPA analysis that determined that this was not a significant change – is this an internal FAA review that the FAA certifies is compliant with NEPA? Can we be notified when this is happening? Can we participate? Is there any documentation of the analysis other than the result?

Answer: The internal NEPA analysis using the TARGETS tool and the Airport Environmental Design Tool found no reportable or significant noise impacts, ensuring NEPA compliance. The FAA collaborates with MCAC and Massport under an MOU to engage with affected communities for MIT's Block 1 and 2 recommendations.

Sincerely,

Lindsey White
Community Engagement Officer
New England Regional Administrator's Office

2 Enclosures