

1. Definitions (for the purposes of these tests)

- a. Configuration – Any combination of two or more runways with a defined primary arrival runway end and primary departure runway end. There may be secondary arrival runway ends and secondary departure runway ends utilized as traffic and operational conditions require.
- b. Runway End – Acknowledges that each runway has two operating ends (one for arrivals and one for departures) based on direction of flow.
- c. Seasonal Runway Use – Acknowledges that runway use is seasonal due to changing wind and weather conditions during the various seasons.

2. Test 4B Definition

Goals:

- 1. More equitable distribution of Noise Impacts and decreased Noise Impacts overall.** Develop and agree on metrics and reporting format to evaluate actual and changes. Develop and agree on a Monitoring Program for implementation and effectiveness. With timely and relevant reporting of actual and changes.
- 2. Balance Runway Use shorter term for Respite: Dwell, hours and consecutive hours daily, and Persistence, days and consecutive days monthly. Between all Runway Ends. Avoid excessive use of any Runway.** Need is increased by RNAV, less-than-annual noise exposure concentrations.
- 3. [Test 4A: Balance Runway Use longer term, between Runway Ends used (nominally) in the same wind conditions. (Without increasing previous total use; within previous range for each Runway End.) RW 33L/R Dep-15R/L Arr and RW 27 Dep-9 Arr. Runway use balance shifted since 2007, new RW 14-32. Need is accentuated by seasonal winds significantly increasing seasonal use of some runways (and with RNAV).]**
- 4. Test 4B: Balance Runway Use longer term, overall, between all Runway Ends. Decrease use of historically most-used Runway End. RW 4L/R Arr-22R/L Dep.** Need is accentuated by seasonal winds significantly increasing seasonal use of some runways (and with RNAV).
- 5. Balance considering all airplanes (in Noise Model), Arrivals and Departures Operations,** all runways at each of the 6 Logan Runway Ends. Balance considering Operations Events, Noise Exposure weighted with Population for Noise Impacts, and Intruding Events.

2.

- i. When operating in a configuration with arrivals on Runways 4R and/or 4L, attempt to achieve an overall balancing of runway use:
 - 1. Attempt to decrease maximum consecutive days of a runway use, Persistence.
 - 2. Attempt to decrease maximum hours daily of a runway use, Dwell.
 - 3. Attempt to decrease daily maximum consecutive periods (Overnight, 00:00 -05:59; Morning, 06:00-11:59; Afternoon, 12:00-17:59; and Evening, 18:00-23:59) of a runway use.
 - 4. Attempt to decrease maximum consecutive days of a runway use with use in the same period as the prior day.
 - 5. Attempt to decrease jet arrivals on Runway 4R and Runway 4L by up to 5% from past levels.
- ii. It is intended for the overall use of Runways 4R and 4L to be less during the test period than it has been during the same months in recent years, which has been approximately 40% for the period from June through September, 2013-2015. (Ranging 31-36% + 6-7%, total 38-42%) This is seasonally higher than the 2011-2015 annual average. (Ranging, all aircraft 8-10% + 26-34%, total 35-44%, combined average 37%).
- iii. The above up to 5% decrease goal for jet arrivals does not consider departures (2011-2015 annual average, all aircraft ~35% Runway 22L Departures and ~2% Runway 22R Departures, total 37%) or non-jets. Or, Noise Exposure, Day-Night Average Sound Level (DNL) by Runway End. Or, Noise Impacts, Level-Weighted Population (LWP) by Runway End. Or, Noise Impacts, shorter term, Intruding Events (N Lmax 70 dBA Day + Lmax 60 dBA Night). Massport is late providing the (finally) agreed annual Noise Exposure (DNL) and Noise Impacts (LWP) by Runway End to refine balance considering Population. Massport has not agreed to provide Intruding Events, to allow refining balance considering shorter term Noise Impacts and Population. When Massport provides the additional metrics, Test results changes can be better evaluated. (Test 4—with FAA ATCT efforts; Massport reporting; and monthly FAA ATCT, Massport, and LCAC review—is valid and important ongoing, even without the goals refinement currently awaiting Massport.)

~~The intent of the test is to reduce the percentage of arrivals landing on Runways 4R and 4L by 5 percentage points compared with the same months in recent years.~~

- ~~i. During periods when operating in a configuration when arrivals would typically occur on Runways 4L and 4R, attempt to reduce the overall use of~~

~~Runways 4L and 4R for arrivals by 5 percentage points from the average historic baseline since the opening of Runway 14-32 in 2007~~

~~ii. It is noted that for the test period, the comparisons of runway use should be made with historic data from the same months to remove seasonal runway use variations; the use of Runways 4L and 4R for arrivals has been approximately 36% during the same months in recent years.~~

3. Approach to Implementation

Test Periods – Tests 4A (described separately) and 4B are to be conducted simultaneously. Suggest employing a 3-month test period of the runway use program instructions after the environmental documentation has been completed for an operational test per FAA Order 1050.1F: “Environmental Impacts: Policies and Procedures,” dated July 16, 2015.

- i. Develop ATCT language
- ii. Provide instruction/training of ATCT staff
- iii. Implement runway use program test
- iv. Monitor ability to implement
- v. Monitor effectiveness of changes in runway end use
- vi. Identify problems/opportunities
- vii. Make adjustments during test period

~~Metrics~~ Monitoring and Reporting

Massport shall be responsible for reporting, with the assistance of FAA ATCT, when necessary. The spreadsheet report shall include Test 4A and Test 4B results, covering all Arrivals and Departures Operations at all Runway Ends.

1. Respite

A. Persistence.

a. Monthly days with use. Total days with any use.

b. Consecutive days with use. $1^{st} + 2^{nd} + 3^{rd} + 4^{th} = 3$

c. Weighted consecutive days with use. $1^{st} + 2^{nd} + 3^{rd} + 4^{th} = 1 + 2 + 3 + 4 = 10$

B. Dwell.

a. Daily hours with use. Total hours with any use.

b. Daily periods with use: Overnight, 00:00-05:59; Morning, 06:00-11:59; Afternoon, 12:00-17:59; and Evening, 18:00-23:59.

c. Daily consecutive periods with use. Overnight and Morning + Morning and Afternoon + Afternoon and Evening = 3

d. Weighted daily consecutive periods with use. Total: 2 consecutive periods = 4; 3 consecutive periods = 8; 4 consecutive periods = 16.

C. Persistence-Dwell.

- a. Consecutive days same periods with use. Total periods with any use same period the prior day. Overnight to Overnight + Morning to Morning + Afternoon to Afternoon + Evening to Evening.
- b. Weighted consecutive days same periods with use. Total for all periods: 2 consecutive days same period = 4; 3 consecutive days same period = 8; 4 consecutive days same period = 16.

2. Runway Use

- D. Arrivals and Departures Operations, Events (N) by Runway End and Total. All airplanes in Noise Model. (# and %)
- E. Noise Exposure, annual, Day-Night Average Sound Level (DNL) by Runway End and Total. Map contours by DNL level, and Population between contour DNL levels. (>=45 dBA)
- F. Noise Impacts, annual, Level-Weighted Population (LWP) by Runway End and Total.
- G. Noise Impacts, shorter term, Intruding Events (N Lmax 70 dBA Day + Lmax 60 dBA Night). Map Contours by N level, and Population between contour N levels.
- H. (Also, Noise Exposure and Noise Impacts (and Intruding Events) by Community from Runway End.)

III. Report Format-Operational Performance

1. Persistence and Dwell Hours spreadsheet:

- A. Daily Hours horizontally, 00-24. Delineating periods: 00-06, 06-12, 12-18, 18-24.
- B. Monthly Days vertically, 1-31. Delineating week beginning and end: Monday-Sunday.
- C. Each Hour/Day allowing coloring (ROYGBIV) for use of all (6) Runway Ends. Arrivals 4LR, 9, 15LR, 22LR, 27, 33LR over Departures: 22RL, 27, 33RL, 4RL, 27, 15RL.
- D. Persistence, monthly days and consecutive days totals vertically.
- E. Dwell, daily hours, periods, and consecutive periods totals horizontally.
- F. Persistence-Dwell, consecutive days periods of use totals vertically.
- G. Monthly Average Day. Hour colored (by Runway End Arrivals and Departures) if used >50% days, average Persistence, average Dwell, average Persistence-Dwell.

2. Arrivals and Departures Events spreadsheet—same worksheet layout and format overall as Persistence and Dwell Hours worksheet:

- A. Daily Hours horizontally, 00-24. Delineating periods: 00-06, 06-12, 12-18, 18-24.
- B. Monthly Days vertically, 1-31. Delineating week beginning and end: Monday-Sunday.
- C. Each Hour/Day with Events of any runway by all (6) Runway Ends. Arrivals 4LR, 9, 15LR, 22LR, 27, 33LR over Departures: 22RL, 27, 33RL, 4RL, 27, 15RL.
- D. Events, Arrivals and Departures, monthly totals vertically (by hour, period).
- E. Events, Arrivals and Departures, daily totals horizontally
- F. Monthly Average Day. Average hourly Events of any Runway by all (6) Runway Ends. Average daily Events of any runway by all Runway Ends, Arrivals and Departures.

3. Wind and Maintenance/Repair Conditions spreadsheet—same hours horizontally and days vertically layout and format overall as Hours and Events spreadsheets:

- A. Wind Direction and Speed when changed, by hour of change.
- B. Color hours each day a Runway is not available for operation due to Maintenance/Repair, and note reason.
- C. Runway Configuration when changed, by hour of change, noting reason for change: Wind, Maintenance/Repair, Schedule Load, or Noise Abatement.
- D. Note Runway Configuration selection is based upon Schedule Load, Maintenance/Repair availability, Wind Direction and Speed (acceptable wind, NOT optimal wind), and Noise Abatement.

IV. Report Timing

1. Prior year period, 2015 June-July-August, in intended Test Report Format by Massport to FAA ATCT and LCAC by three weeks after LCAC Test acceptance—to allow edit before start of Test.
2. Daily through previous day by Massport for FAA ATCT. Following day AM.
3. Weekly through previous week ending Sunday by Massport to FAA ATCT and LCAC. By Wednesday after the last day of the previous week.
4. Monthly for Review Meeting with Massport, FAA ATCT, and LCAC. By the 2nd Wednesday after the last day of the previous month (8-14 days).

V. Evaluation Comparison

1. Prior year (same months) period (June-September) 2015.
2. Seasonal (same months) period (June-September) average—2015-2013.
3. Post and Pre RW 14-32, 2007 multi-year averages.
4. Phase 3 Baseline 2015 year.

~~4.~~

- a. ~~ATCT Performance—These metrics are designed to specifically measure ATCT’s ability to implement the test program and would be produced weekly, as appropriate:~~
 - i. ~~Arrival Runway Split—FAA to report the hourly numbers of arrivals on Runways 4L and 4R and on other runways over the test period.~~
 - ~~Massport to calculate the percentage use of Runways 4L and 4R for arrivals over the test period.~~
 - ~~Massport to compare percentage use of Runways 4L and 4R for arrivals with baseline historic usage during the same time periods to determine what reductions on Runways 4L and 4R were achieved.~~
 - ii. ~~Documentation—Provide detailed operational conditions (wind, weather, airfield closures, etc.) for the test period.~~
- b. ~~Operational Performance—These metrics are designed to measure the operational results of implementing the program:~~
 - i. ~~Runway End Use Percentages—Massport to provide daily reports of runway end use percentages to include:~~
 - ~~Runway End Use by Day (24 hours)~~
 - ~~Detailed Runway End Use for 6:00 am to 8:30 pm~~
 - ii. ~~Hourly Operational Data—At the end of each week, Massport/FAA to provide hourly reports (taken from available sources) of wind, weather, traffic volumes, airfield closures~~
- c. a. Noise Performance – These metrics are designed to measure the noise results of implementing the overall runway use program:

- i. *Baseline Preparation* – Massport to update the 2015 baseline noise data for comparison purposes to include:

DNL noise contours for 65, 60, 55, ~~and 50~~, and 45 dB increments

Number of people residing within each 5 dB DNL increment

DNL for the evaluation points identified in previous phases of BLANS

Noise-level weighted population data for the evaluation points (*CAC will calculate this from noise data prepared by Massport*)

- ii. *Noise Analysis of Recommended Runway Use Program* – At the end of the Test Period #4 and upon development of a recommended runway use program by CAC, Massport to provide a noise analysis to include:

DNL noise contours for 65, 60, 55, ~~and 50~~, and 45 dB increments

Number of people residing within each 5 dB DNL increment

DNL for the evaluation points identified in previous phases of BLANS

Noise-level weighted population data for the evaluation points (*CAC will calculate this from noise data prepared by Massport*)

- d-b. Percentage-Based Goals – Except for those listed above, there would not be percentage-based goals for runway end utilization or configuration utilization. After the end of the test periods, the feasibility of percentage-based goals would be determined and if determined to be valuable those goals established. The most likely goals for runway end utilization are improvement from current towards more equitable Noise Impacts—based on metrics and monitoring reporting to be agreed, including all aircraft and population-noise-weighting—not simply Events or Noise Exposure.