Cambridge City Council
Health & Environment Committee
Hearing on RNAV Airplane Study

October 15, 2019
RNAV Airplane Study Update

Presentation Contents:
• Flight Noise Background
• City Expectations for RNAV Study Results
• Current Study Process
• Next Steps
• Tentative Schedule
Airplane Noise Background

• Long history of airplane noise in Cambridge
• City initially worked with Logan Citizen Advisory Committee to address noise complaints
• City is now represented on the state created Massport Advisory Committee
• Engages with Massport, FAA, elected officials and neighboring communities who share similar runway impacts
• Use of runway 33L, which directly affects Cambridge, has increased over the years
• Air traffic at Logan is increasing, resulting in more overflights
Logan Flight Growth

- Marketing of Logan and strong economy mean increased number of flights
- More flights occurring later at night and earlier in the morning than in prior years
- Trends mean more disturbance for those near the flight paths
Flight Tracks Before RNAV

Flights spread over most of Cambridge
How did we get here? Runway 33L RNAV Process

• Logan Citizens Advisory Committee, Noise Study Phase II

• Starting in 2008 several alternative RNAV (Area Navigation) options for runway 33L were evaluated.

• Intention was to reduce noise for everyone by bringing planes out over less dense areas and reaching higher altitudes before turning

• Proposed RNAV options were rejected by FAA for operational reasons

• FAA suggested their own RNAV since runway 33L was the only runway without one – implemented in 2013

• Location and frequency of the noise changed in 2013 with new RNAV procedure
RNAV Track Concentration

2010

2015

Flight Track Density Plot
January 1, 2010 to December 31, 2010
Runway 33L Jet Departures
(24,698 Flight Tracks)

Flight Track Density
Low  Medium  High

Airport Runway
Roads
River or Stream
Municipal Boundary
Water

City of Cambridge - Community Development Department
Month, Year
7
Regional Noise Complaints
RNAV Study Process

• Memorandum of Understanding (MOU) entered into in October 2016 between FAA & Massport to cooperate in analyzing opportunities for noise reduction through changes or amendments to procedures.

• MIT Lab for Aviation and the Environment engaged to manage the RNAV Study.

• The study has two parts: Block 1 (short-term) & Block 2 (longer-term)
What the Study Doesn’t Look At

• Early morning and night-time flights – no curfew allowed under current federal law
• Overall number of flights - longer term issue of capacity for CAC to bring up to Massport
• Aircraft type – being reviewed and monitored by upcoming Massport Fly Quiet report
• Health affects of plane noise – emerging field of study and not yet covered by federal law regulating plane traffic
Block 1

- Short-term measures to decrease noise on 33L – no shifting of population impacts or environmental review
  - Thrust and speed management
  - Fleet specific performance analysis and noise modeling

- Not Apparent that anything can be implemented in Block 1 due to concerns about plane speeds
Dispersion Concepts (Block 2)

1. Altitude-based: Flights are free to vector to next waypoint @ 3k or 4k ft. Different planes reach 3k or 4k ft. at different times (aircraft type, weight, weather)

2. Controller-based (ATC vectoring)

3. Divergent-headings (create a new fork in trunk)

4. Waypoint relocation (4 variants, -.5, -1, +.5, +1nm)

Modeling of Concepts

33L Departures Altitude-Based Dispersion at 3000ft Change in N₆₀ Compared to 2017

2017 Baseline

Preliminary example for consideration only. May be modified or eliminated.

Population Exposure

<table>
<thead>
<tr>
<th>N₆₀</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>336,643</td>
</tr>
<tr>
<td>Dispersion</td>
<td>342,387</td>
</tr>
<tr>
<td>Baseline - Dispersion</td>
<td>-5,744</td>
</tr>
</tbody>
</table>

Controller concerns about variability in flight path length

Analysis based on peak day operations; only includes 33L departures

Source: Runway 33L Impacted Communities Focus Briefing 6.24.19, Dr. J. Hansman
Expected Outcomes for Cambridge from RNAV study

• Reduce concentrations of noise by introducing vectors to spread out overflights
• Could mean “new” noise to additional Cambridge households but less concentration of noise impacts
• Identify option(s) that best share noise impacts both in Cambridge and in surrounding communities
Questions to Consider

• Does a dispersion concept provide relief for those most impacted by RNAV?
• What is the nature of the relief? Lower volume of flights directly overhead or possibly fewer days with flights?
• For those who benefited most from RNAV – how do the dispersion concepts impact them?
• Will there be metrics or tracking of the performance of an implemented modification to 33L departures against established criteria?
Process Moving Forward

• Expecting data soon on a data request from study team on options

• City in process of hiring a consultant to review data and look at spread of noise before, now and in each option – one month

• Process to review one or more options that best meet Cambridge’s desired outcomes

• Discussions with other 33L communities to discuss options and try to reach consensus

• Massport CAC vote in early 2020 to make recommendation

• FAA review of recommendation and possible modifications – about six months
Thank You