APPENDIX G  REQUESTS TO FAA REGARDING NON-STANDARD AIRCRAFT TYPE MODELING SUBSTITUTIONS

The INM database does not include data for every aircraft type. The database includes a lookup table that identifies approved “substitutes” for many types. However, that lookup table does not include some aircraft types modeled at VNY. For those aircraft types, recommendations for INM substitute aircraft were forwarded to the FAA for approval or identification of an alternate approved substitution. The following pages present copies of the LAWA request to FAA for guidance.

Appendix H presents the FAA response. The noise contours presented in this document followed the FAA guidance.
This page intentionally left blank.
Van Nuys Airport
December 2011
Updated 14 C.F.R. Part 150 Noise Exposure Maps

Los Angeles World Airports

October 19, 2010

Victor Globa
Environmental Protection Specialist
Federal Aviation Administration
Western-Pacific Region
Los Angeles Airports District Office
P.O. 92007
Los Angeles, CA 90009-2007

Subject: Request for Approval of Integrated Noise Model Non-Standard Aircraft Substitutions in Support of the Noise Exposure Map Update at Van Nuys Airport

Dear Mr. Globa:

Los Angeles World Airports (LAWA) requests the Federal Aviation Administration’s (FAA) approval of non-standard aircraft substitutions in the FAA Integrated Noise Model (INM) for updating the Noise Exposure Maps (NEMs) for Van Nuys Airport (VNY).

Based on aircraft fleet data derived from the Van Nuys Data System and Airport Noise and Operations Monitoring System (ANOMS), LAWNA has identified a list of aircraft types that operate at VNY but are not included in the INM Version 7.0b database. For each of these aircraft types a recommended INM substitution has been identified to use in the NEMs Update modeling process. Consistent with FAA policies and procedures, we are submitting this listing and recommended aircraft types for review and approval by FAA/AAE.

LAWA requests that the FAA approve the use of these “non-standard” aircraft substitutions in INM 7.0b for the VNY NEM Update. If you have any specific comments or questions related to this request, please feel free to contact Robert Behr of Harris Miller Miller & Hanson (HMMH) at (316) 368-0707, ext 2228 or me at (424) 646-8499.

Thank you for your assistance on this matter.

Sincerely yours,

Scott Tatro
Environmental Affairs Officer

Attachment: INM Aircraft Substitution Requests and Suggestions

T:\ENVMTG2010\01102385M\PCDOCS\#274905v1
Appendix A

INM Aircraft Substitution Requests and Suggestions

We have identified the following 32 aircraft types included in the VNY Part 150 Noise Exposure Map fleet mix on which FAA-approved substitutions are required. In each case, we have proposed a substitute from the INM 7.0b database. The bases for our proposals are discussed following the table. The bases for some recommendations refer to recent guidance FAA provided HMMI for the VNY Part 161 study, and for recent noise studies at Naples Municipal Airport (APF), Jackson-Evers International Airport (JAN), Louisville International Airport (SDF), Martin County Airport/Witham Field (SUA).

Table A1 Aircraft Types and Recommended INM Substitutions

<table>
<thead>
<tr>
<th>#</th>
<th>Group</th>
<th>Aircraft Code</th>
<th>Represented Aircraft Models</th>
<th>Recommended INM Substitution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jet</td>
<td>C90X</td>
<td>Cessna 340, Citation Excel</td>
<td>CNA30B</td>
</tr>
<tr>
<td>2</td>
<td>Jet</td>
<td>G32X</td>
<td>1128 Galaxy, Gulfstream 90X</td>
<td>C32X</td>
</tr>
<tr>
<td>3</td>
<td>Jet</td>
<td>GLLX</td>
<td>Bombardier Global Express BD-700</td>
<td>GV</td>
</tr>
<tr>
<td>4</td>
<td>Jet</td>
<td>HS250</td>
<td>Raytheon Hawker 800 HS75-1600</td>
<td>LEG250S</td>
</tr>
<tr>
<td>5</td>
<td>Jet</td>
<td>L35</td>
<td>Aton L-50 Abalone</td>
<td>T-35A</td>
</tr>
<tr>
<td>6</td>
<td>Jet</td>
<td>PPRM1</td>
<td>Premier 1, 380</td>
<td>CAN500</td>
</tr>
<tr>
<td>7</td>
<td>Piston</td>
<td>C200/400</td>
<td>Aeron Commander 680</td>
<td>BEC200P</td>
</tr>
<tr>
<td>8</td>
<td>Piston</td>
<td>B22</td>
<td>North American B-25 Mitchell</td>
<td>D3A</td>
</tr>
<tr>
<td>9</td>
<td>Piston</td>
<td>B20</td>
<td>Boeing (Douglas) B-26 Marauder Invader</td>
<td>D3C</td>
</tr>
<tr>
<td>10</td>
<td>Piston</td>
<td>C42</td>
<td>Cessna C-42 Commando</td>
<td>D3C</td>
</tr>
<tr>
<td>11</td>
<td>Piston</td>
<td>C42</td>
<td>Cessna C-42 Commando</td>
<td>D3C</td>
</tr>
<tr>
<td>12</td>
<td>Piston</td>
<td>C18</td>
<td>Grumman HU-16 Albatross</td>
<td>D3C</td>
</tr>
<tr>
<td>13</td>
<td>Piston</td>
<td>C611</td>
<td>Cessna 411</td>
<td>BEC611P</td>
</tr>
<tr>
<td>14</td>
<td>Piston</td>
<td>C625</td>
<td>Hydronav T-625</td>
<td>BEC625P</td>
</tr>
<tr>
<td>15</td>
<td>Piston</td>
<td>P58</td>
<td>Paletto P-58</td>
<td>BEC58P</td>
</tr>
<tr>
<td>16</td>
<td>Piston</td>
<td>T66U</td>
<td>Helio H-560 Twin Commander</td>
<td>BEC63P</td>
</tr>
<tr>
<td>17</td>
<td>Twin</td>
<td>B350</td>
<td>Beechcraft King Air 350</td>
<td>DHC3</td>
</tr>
<tr>
<td>18</td>
<td>Twin</td>
<td>C10T</td>
<td>Cessna P210 (turbine)</td>
<td>CAN208</td>
</tr>
<tr>
<td>19</td>
<td>Twin</td>
<td>C92</td>
<td>Grumman Greyhound</td>
<td>H5748A</td>
</tr>
<tr>
<td>20</td>
<td>Twin</td>
<td>CV11</td>
<td>Cessna C-401</td>
<td>CV110</td>
</tr>
<tr>
<td>21</td>
<td>Twin</td>
<td>P40T</td>
<td>Piper Malibu Meridan</td>
<td>SDC30</td>
</tr>
<tr>
<td>22</td>
<td>Twin</td>
<td>P60T</td>
<td>Pivatov P-60 (turbine)</td>
<td>CAN441</td>
</tr>
<tr>
<td>23</td>
<td>Twin</td>
<td>P180</td>
<td>Piaggio P-180 Avanti</td>
<td>DHC6</td>
</tr>
<tr>
<td>24</td>
<td>Twin</td>
<td>R12</td>
<td>Pilatus PC-12, Eagle</td>
<td>1900D</td>
</tr>
<tr>
<td>25</td>
<td>Twin</td>
<td>T900</td>
<td>Socata T900</td>
<td>1900D</td>
</tr>
<tr>
<td>26</td>
<td>Rotor</td>
<td>B117C</td>
<td>Eurocopter BLX120, EC145</td>
<td>E232</td>
</tr>
<tr>
<td>27</td>
<td>Rotor</td>
<td>B123</td>
<td>Bell 430/410/EP</td>
<td>EC130</td>
</tr>
<tr>
<td>28</td>
<td>Rotor</td>
<td>B250</td>
<td>Eurocopter B250/300 Colibri</td>
<td>B250</td>
</tr>
<tr>
<td>29</td>
<td>Rotor</td>
<td>B335</td>
<td>MD-900 Explorer</td>
<td>EC330</td>
</tr>
<tr>
<td>30</td>
<td>Rotor</td>
<td>B410H</td>
<td>Bell 410/415/EP</td>
<td>R44</td>
</tr>
<tr>
<td>31</td>
<td>Rotor</td>
<td>B410H</td>
<td>Bell 510/416/EP</td>
<td>R68</td>
</tr>
<tr>
<td>32</td>
<td>Rotor</td>
<td>B525</td>
<td>Bell 120/150</td>
<td>R78</td>
</tr>
<tr>
<td>33</td>
<td>Rotor</td>
<td>B525</td>
<td>Sikorsky S-55</td>
<td>R78</td>
</tr>
</tbody>
</table>

3 Jackson-Evers International Airport Part 150 Study, HMMI Project No. 304140, FAA approval issued May 13, 2010.  
4 Louisville International Airport Part 150 Noise Exposure Map Update, HMMI Project No. 304600.000, FAA approval issued July 13, 2010.  
5 Martin County Airport/Witham Field Part 150 Noise Exposure Map Update, HMMI Project No. 303880.003, FAA approval issued June 11, 2010.
HARRIS MILLER MILLER & HANSON INC.

Request for INM 7.0b Aircraft Type Substitutions for Van Nuys Part 150 NEM Update
October 16, 2010
Page A2

1. Cessna 560XL Citation Excel C56X

We propose to model the C56X operations with INM type CNA55B as recommended for JAN.

In the JAN Part 150 the FAA approved the Cessna Citation Bravo (CNA55B) as the substitution aircraft for the Cessna Citation Excel (Cessna model 560XL). Both aircraft have the PW500 series power plants with similar certification noise levels shown in Table A2.

Table A2 Noise Certification Data from Cessna 560XL and Cessna 550 Bravo

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>TYPE DESIGNATION</th>
<th>MTOW (lb)</th>
<th>MLW (lb)</th>
<th>ENGINE MANUFACTURE/TYPE DESIGNATOR</th>
<th>NOISE LEVEL (EPNDB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessna</td>
<td>Cessna 560XL</td>
<td>20,000</td>
<td>18,700</td>
<td>PW545A</td>
<td>72.4</td>
</tr>
<tr>
<td></td>
<td>Cessna 550 Bravo</td>
<td>14,000</td>
<td>12,500</td>
<td>PW520A</td>
<td>73.7</td>
</tr>
</tbody>
</table>

Source: FAA AC 36-1H, as posted on http://www.faa.gov/about/office_org/headquarters_offices/AEP/noise_levels/media/ucert_appendix_01_030210.xls

2. 1126 Galaxy Gulfstream 200 – GALX

We propose to model GALX operations with INM type CL601 as recommended for JAN.

The Israel Aircraft Industries (IAI) 1126 Galaxy was renamed the Gulfstream G200 shortly after Gulfstream’s parent company, General Dynamics, purchased Galaxy Aerospace in 2001. The aircraft has a MTOW of 34,850 lb, MLW of 28,000 lb, and powered by two Pratt & Whitney Canada PW506A turbofan engines rated at 6,040 lb each. This is comparable to the INM type CL600 (MTOW 36,000 lb, MLW 33,000 lb, and max. static thrust 7,500 lb, according to INM 7.0b).

Table A3 compares certification data for these three aircraft types. The CL601 matches slightly better than the CL600, especially on the lateral measurement.

Table A3 Noise Certification Data from IAI 1126 Galaxy/Gulfstream G200, Bombardier CL-601, and Bombardier CL-600

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type Designation</th>
<th>MTOW (lb)</th>
<th>MLW (lb)</th>
<th>Engine Manufacturer / Type Designator</th>
<th>Noise Level (EPNDB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulfstream</td>
<td>G200</td>
<td>34,850</td>
<td>28,000</td>
<td>PW506A</td>
<td>81.40* 85.80</td>
</tr>
<tr>
<td>IAI</td>
<td>1126 Galaxy</td>
<td>34,850</td>
<td>28,000</td>
<td>PW506A</td>
<td>81.40* 85.80</td>
</tr>
<tr>
<td>Gulfstream</td>
<td>G200</td>
<td>34,850</td>
<td>28,000</td>
<td>PW506A</td>
<td>81.40* 85.80</td>
</tr>
<tr>
<td>Bombardier</td>
<td>CL-601-3R</td>
<td>43,100</td>
<td>36,000</td>
<td>CF34-4A1</td>
<td>79.80* 85.70</td>
</tr>
<tr>
<td>Bombardier</td>
<td>CL-600</td>
<td>36,000</td>
<td>33,000</td>
<td>ALF502</td>
<td>71.60* 89.30</td>
</tr>
</tbody>
</table>

Source: FAA AC 36-1H, Appendix 1, 030210
http://www.faa.gov/about/office_org/headquarters_offices/AEP/noise_levels/media/ucert_appendix_01_030210.xls

3. Bombardier BD-700 Global Express/Global 5000 – GLEX

We propose to model GLEX operations with INM type GV as recommended for SDF.

The GLEX, Bombardier BD-700 Global Express, is similar to the Gulfstream V. Both aircraft use variants of the Rolls-Royce BR710 engine and both have similar maximum take-off weights, landing weights and noise levels. Table A4 provides a comparison of the noise certification data for these aircraft.

\* Data for this aircraft is from AC36-1H, Appendix 1 (March 2, 2010).
Table A4 Noise Certification Data from Bombardier Global Express and Gulfstream GV

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type Designation</th>
<th>MTOW (lb)</th>
<th>MLW (lb)</th>
<th>Engine Manufacturer / Type Designator</th>
<th>Noise Level (EPN dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bombardier</td>
<td>BD-700-1A10 (Global Express)</td>
<td>96,000</td>
<td>78,500</td>
<td>BR700-710-A2-20</td>
<td>82.7 88.6 89.8</td>
</tr>
<tr>
<td>Bombardier</td>
<td>BD-700-1A10 (Global Express)</td>
<td>93,500</td>
<td>78,500</td>
<td>BR700-710-A2-20</td>
<td>82.1 88.7 89.8</td>
</tr>
<tr>
<td>Bombardier</td>
<td>BD-700-1A10 (Global Express)</td>
<td>75,000</td>
<td>75,000</td>
<td>Rolls Royce/BR700-710-A2-20</td>
<td>75.6 89.3 89.7</td>
</tr>
<tr>
<td>Gulfstream</td>
<td>G-V</td>
<td>90,500</td>
<td>75,300</td>
<td>BR700-710-A1-10</td>
<td>80.3 98.1 90.8</td>
</tr>
</tbody>
</table>


4. Raytheon Hawker-125-1000 – H25C

We propose to model H25C operations with INM type LEAR35 as recommended for SDF.

We compared the Hawker 125-1000 with the Hawker 800 and LEAR35 aircraft shown in Table A5. Based on the comparison, the LEAR35 appears to be a good match.

Table A5 Noise Certification Data from BAe-125-1000 and -800 and LEAR35

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type Designation</th>
<th>MTOW (lb)</th>
<th>MLW (lb)</th>
<th>Engine Manufacturer / Type Designator</th>
<th>Noise Level (EPN dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raytheon</td>
<td>Hawker 125-1000</td>
<td>31,000</td>
<td>25,000</td>
<td>PW305</td>
<td>81.8 85.9 91.6</td>
</tr>
<tr>
<td>Raytheon</td>
<td>Hawker 125-800</td>
<td>27,400</td>
<td>23,350</td>
<td>TFE731-5-1H</td>
<td>80.9 87.2 96.5</td>
</tr>
<tr>
<td>Learjet</td>
<td>LEAR 35 A</td>
<td>18,000</td>
<td>14,300</td>
<td>TFE731-2-2D</td>
<td>83.6 87.4 91.3</td>
</tr>
</tbody>
</table>


5. Aero L-39 Albatros – L-39

We propose to model L39 operations with INM type T-38A as recommended for VNY Part 161.

The L-39 Albatros is somewhat unique with no parallel aircraft having the same engine type. For the VNY Part 161, the T-38A was recommended.

6. Premier 1 390 - PRM1

We propose to model the Beechcraft 390 Premier I (PRM1) with INM type CNA500 as recommended for JAN and SDF.

The PRM1 is a relatively new light twin-engine corporate jet. The maximum take-off weight is 12,500 lb. and maximum landing weight is 11,600 lb. The aircraft is powered by two William FJ44-2A turbofans, each rated at 2,300 lb. The PRM1 is similar in weight and engines as the Cessna 525A (max take-off weight of 12,575 lb., max landing weight of 11,500 lb., powered by William FJ44-2C).

\[\text{Data presented here regarding the Beech 390 Premier I is from ""Jane's All the World's Aircraft 2005-2006"" pp 578-579.}\]
HARRIS MILLER MILLER & HANSON INC.

Request for INM 7.0b Aircraft Type Substitutions for Van Nuys Part 150 NEM Update
October 16, 2010
Page A4

Turbofans with max thrust of 2,400 lb.,\(^a\), which has an INM standard substitution of CNA525 and is mapped to the CNA500. In addition, the Cessna 525A and the PRM1 have similar noise certification data as summarized in Table A6.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Max. Takeoff Weight (lbs)</th>
<th>Max. Landing Weight (lbs)</th>
<th>Powerplant</th>
<th>Noise Level (EPNdB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessna</td>
<td>525A Citation Jet II (C52J)</td>
<td>12,370</td>
<td>11,500</td>
<td>JF44-20C</td>
<td>74.5</td>
</tr>
<tr>
<td>Raytheon</td>
<td>360 Premier</td>
<td>12,500</td>
<td>11,600</td>
<td>JF44-2A</td>
<td>76.8</td>
</tr>
</tbody>
</table>

Source: FAA AO-98-1H, as posted on http://www.faa.gov/about/office_ops/headquarters_offices/apd/noise_levels/media/cert_appendix_01_030210.xls

7. Aero Commander 680 – AC68, AC61L
   We propose to model these aircraft types as INM type BEC58P.
   The AC68/AC61L, Aero Commander is a twin-engine propeller aircraft that also has a turboprop variant. It is assumed that the piston propeller aircraft variant is more prevalent and thus the twin-engine Baron was selected as the substitute.

9. Boeing (Douglas B-26 Marauder/Invader – B26
10. Curtiss C-46 Commando – C46
11. Fairchild C-82 Jet Packet – C82
12. Grumman HU-16 Albatross – U16
   We propose to model these aircraft types as INM type DC3 as recommended for the VNY Part 161.
These aircraft all have twin-piston radial engines of variable sizes. The DC3 is the only INM aircraft type with twin radial engines and therefore determined to be the best aircraft to represent all of these aircraft types.

13. Cessna 411 – C411
    We propose to model the Cessna 411 as INM type BEC58P.
    The C411 is a twin-engine aircraft powered by two Continental TSIO-520 piston engines. Two derivatives of this aircraft type are the C401 and C402 which have the Beech Baron, BEC58P INM aircraft, identified as the appropriate substitute aircraft. A pressurized version, C421, is also linked to the BEC58P. Therefore, the BEC58P appears to be the appropriate aircraft type for the C411.

14. Hydroplane Che-25 – CE25
    We propose to model the CE25 as INM type BEC58P.
    The CE25 is a twin-piston engine aircraft developed in Russia. Not much other information is readily available; therefore, the INM twin-piston engine aircraft, BEC58P, was selected as a viable substitute.

15. Partenavia P.68 – P68
    We propose to model the P68 as INM type BEC58P as recommended for APF.

\(^a\) Data presented here regarding the Cessna 525A are from "Jane's All the World's Aircraft 2005-2006" pp 646-647.
HARRIS MILLER MILLER & HANSON INC.

Request for INM 7 0b Aircraft Type Substitutions for Van Nuys Part 150 NEM Update
October 15, 2010
Page A5

The P68 is a twin-engine piston aircraft most similar in size and engine type to the Beech Baron INM standard aircraft type (BEC58P).

   We propose to model the TCOU as INM type BEC58P.
   The TCOU is a twin-engine piston aircraft most similar in size and engine type to the Beech Baron INM standard aircraft type (BEC58P).

17. Beechcraft King Air 350 – B350
   We propose to model the B350 as INM type DHC6.
   The B350 is another variant of the King Air aircraft with two P&W PT6A turboprop engines. There are several King Air models that are modeled with the DHC6 INM aircraft type; thus, it is appropriate to also use the DHC6 for this model.

18. Cessna P210 (turbine) – C10T
   We propose to model the C10T as INM type CNA208 as recommended for SUA.
   The C10T is a single-engine aircraft with a turboprop.

19. Grumman Greyhound – C2
   We propose to model the C2 as INM type HS748A.
   The C2 is a twin-engine turboprop aircraft powered by two Allison T56-A turboprops. The HS748A appears to be the closest match as the INM substitute aircraft.

20. Convair 580 – CVLT
   We propose to model the CVLT as INM type CVR580.
   The CVLT designation represents the various Convair models 580, 600, and 640. The Convair 580 type was selected as it is an INM standard aircraft type, CVR580.

21. Piper Malibu Meridian – P46T
   We propose to model the P46T as INM type SD330 as recommended for APF.
   The SD330 INM type was recommended by the FAA for the Piper Malibu Meridian for the Van Nuys Airport Part 161 study and approved for the APF Part 150 study.

22. Partenavia P.68 (turbine) – P68T
   We propose to model the P68T as INM type CNA441.
   The P68T is a twin-engine turboprop aircraft most similar in size and engine type to the Cessna Conquest INM standard aircraft type (CNA441).

23. Piaggio P-180 Avanti – P180
   We propose to model the P180 as INM type DHC6 as recommended for APF.
   The Piaggio P-180 Avanti has two PT6A-66 turboprops which appear to be similar to the DHC6 turboprops, PT6A-27.
24. Pilatus PC-12 – PC12
25. Socata TBM-700 – TBM7
   We propose to model these aircraft types as INM type 1900D as recommended for APF.
   The FAA approved the INM aircraft type 1900D for these single-engine turboprop aircraft in the APF
   study.
26. Eurocopter BK 117C.1C – BK117
   We propose to model the BK117 as INM type B222.
   The BK117 has a similar Lycoming LTS101 turboshaft comparable to the INM standard aircraft, Bell
   222.
27. Bell 412/412EP – B412
   We propose to model the B412 as INM type BO105.
28. Eurocopter EC120 Colibri – E20
   We propose to model the EC120 as INM type SA341G.
   The E20 has a similar Turbomeca turboshaft comparable to the INM standard aircraft, SA341G,
   Gazelle.
29. MD900 Explorer – EXPL
   We propose to model the EXPL as INM type EC130.
   The EXPL has one or two turboshafts along with NOTAR technology to reduce the noise signature.
   The EC130 has the fenestron tail rotor which has also been shown to reduce noise generation.
   Therefore, the EC130 is the appropriate substitute aircraft for the EXPL.
30. Bell 47-G/H – B47G (S0)
   We propose to model the B47G as INM type R44.
   The B47G has a similar piston or reciprocating engine as the INM standard aircraft, R44, Robinson
   44.
31. Bell 430 – B430
   We propose to model the B430 as INM type S76 as recommended for APF.
   The B430 is a twin-engine light to medium helicopter comparable to the INM standard aircraft, S76,
   Sikorsky S-76 Spirit.
32. Sikorsky S-58 – S58T
   We propose to model the S58T as INM type S76.
   The S58T is similar in size, weight, and power plant to the INM standard aircraft, S76, Sikorsky S-76
   Spirit.
This page intentionally left blank.