

Response to RS&H Memorandum  
Regarding  
A Test of the Proposed Inputs  
To the Integrated Noise Model  
For The Ohio State University Airport  
Part 150 Noise Compatibility Study

April 7, 2008

Submitted by  
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**Introduction**

At the Technical Subcommittee Meeting for The Ohio State University Airport Part 150 Noise Compatibility Study on March 26, 2008, we submitted a memorandum<sup>1</sup> (the “Test Report”) reporting on our test of the proposed noise inputs for the integrated noise model (INM).<sup>2</sup> We concluded:

On the basis of these findings, we believe that the Technical Committee should not accept the proposed night-time inputs without further Test.

RS&H asked for time to review and respond to our report. However, two days later, the Technical Subcommittee and we<sup>3</sup> were informed that the decision had been made to run the Integrated Noise Model before there had been consideration of or response to our Test Report. One week later, on April 4, 2008, we were e-mailed a memorandum analyzing and responding to the Test Report.<sup>4</sup> (the “RS&H Response Memorandum”)

We said at the March 26 meeting that if we were provided new data, we would be happy to revise and reissue the Test Report. We appreciate the additional information which RS&H has provided. We have revised the Test Report based on the new information and attach a copy of the Revised Test Report.<sup>5</sup> (the “Revised Test Report”) With the new information from RS&H we have been able to be more precise and accurate

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<sup>1</sup> A Test of the Proposed Inputs to the Integrated Noise Model for The Ohio State University Airport Part 150 Noise Compatibility Study, March 26, 2008, submitted by Scott Whitlock and Kimberly Nixon-Bell.

<sup>2</sup> The proposed inputs for the INM are set forth in the Technical Memorandum from David Full – RS&H Project Manager to Technical Subcommittee of The Ohio State University Airport March 18, 2008 subject January 17, 2008 Technical Subcommittee Meeting Follow-up. (the “Technical Memorandum”)

<sup>3</sup> We are not members of the Technical Subcommittee and attended the committee session only as members of the general public.

<sup>4</sup> Memorandum from David Full – RS&H Project Manager to Douglas E, Hammon, Airport Director, The Ohio State University Airport dated April 4, 2008, subject Whitlock/Nixon-Bell Paper dated 03/26/08.

<sup>5</sup> A Test of the Proposed Inputs to the Integrated Noise Model for The Ohio State University Airport Part 150 Noise Compatibility Study, Originally submitted March 26, 2008, Revised April 7, 2008, submitted by Scott Whitlock and Kimberly Nixon-Bell.

in our report. We have reconfirmed our conclusion that the proposed night-time inputs require further verification before being accepted for use in the INM model.

In this memorandum, we will (1) respond to the specific criticisms RS&H made of our Test Report, (2) discuss the deficiencies in the fundamental assumptions made and methodology used by RS&H in developing the proposed inputs and (3) suggest the importance of and the manner in which further verification of the proposed inputs can be done.

## Response to Criticisms

RS&H made three criticisms of our report which we will deal with in the order presented in the RS&H Response Memorandum:

- **Night-time Fleet Mix** RS&H says that we “did not understand that the time stamps on the FlightAware source data are in Greenwich Mean Time (GMT) and must be converted to local time in order to conduct a day/night analysis.”<sup>6</sup> RS&H is correct that we did not understand that the data RS&H provided from FlightAware was based on GMT. We relied on FlightAware’s statement that “By default, FlightAware displays times in the airport’s local time zone for US and Canadian airports.”<sup>7</sup> RS&H appears to have chosen to provide the FlightAware arrival and departure times in GMT but did not label those times as being GMT. Nonetheless, we have now converted the times in the data provided by RS&H to Eastern Daylight Savings Time and the Revised Test Report is based on those converted times.

RS&H claims that: “When the day/night analysis is performed with the time stamps correctly converted from Greenwich Mean time to OSU local time, The FlightAware data is very consistent with the INM Inputs set forth in the March 18, 2008 Technical Memorandum.” Review of the attached Revised Test Report will show that RS&H’s claim is not accurate.

RS&H also goes to great lengths to try to show that the FlightAware data and the Columbus Regional Airport Authority (CRAA) Noise Office data are in complete support of each other when compared using the correct time stamps. RS&H claims that

In almost all cases, the two sources yield nearly identical results for all aircraft types. The significant exceptions are four aircraft types that have significantly more operations in the CRAA Noise Office data than the FlightAware data. The difference between the two data sources results from the fact that operators of these four aircraft types have requested that certain information about their operations be “blocked” and not included in the FlightAware records.”

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<sup>6</sup> RS&H Response Memorandum, p. 1

<sup>7</sup> <http://flightaware.com/about/faq/rvt>

On that basis RS&H has chosen to use the CRAA Noise Office data, which is not available to the public,<sup>8</sup> rather than FlightAware data, which is available to the public. However, RS&H appears not to understand fully the extent of the records in the FlightAware database which RS&H has provided. The operations of the four aircraft types which RS&H claim are not included are, in fact, included in the FlightAware data RS&H furnished to us, although in a coded form which permits the identification of the aircraft type but not the aircraft i.d. The aircraft operations of the four aircraft types which RS&H believes are missing from the FlightAware data are actually included in the data and were included in our test week analysis. As a result of RS&H's misunderstanding of the data from FlightAware, Chart 2 which included in the RS&H Response Memorandum is incorrect. ***The result is that there is no justifiable reason for RS&H to have chosen to use a restricted data base for developing their proposed inputs rather than a publicly available data base.***

RS&H appears to us to have ignored, without giving any reason, the database which The Ohio State University Airport makes available to the public – WebScene. In our Revised Test Report we were able to identify aircraft types for 74 of 182 operations. Fifty of those aircraft types were identified using WebScene and 45 were identified using FlightAware.<sup>9</sup> In most cases both WebScene and FlightAware confirmed the data contained in the other database. Clearly, it would have been better if RS&H had combined the data in the two publicly available data bases which is the methodology we used. In our approach, with combined data bases, we identified the aircraft type involved in more than 40% of the operations and made no assumptions about the aircraft type in the remaining operations. By contrast, RS&H actually identified the aircraft type involved in less than 26% of the total airport operations and assumed the identity of the aircraft involved in the remaining operations based on undocumented anecdotal evidence and assumptions that do not seem to stand a test of reasonableness.

- **Local Operations** For the first time of which we are aware, RS&H has provided a written definition of Local Operations and suggests that we may have “a misunderstanding of what constitutes a ‘local operation’ for purposes of INM inputs.” How RS&H could make such a claim without reviewing our methodology for identifying Local Operations is not understandable. We offered at the March 26, 2008, meeting to sit down with RS&H personnel and review our methodology and supporting documents. RS&H has chosen to make its criticisms without availing themselves of our offer.

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<sup>8</sup> In the Technical Memorandum RS&H notes that the database they chose to use “is restricted by the FAA and The Ohio State University Airport is only permitted to release information from this database in summary form.” (Technical Memorandum, p. 10) A week ago we requested that the FAA authorize release of part of this database to us on a confidential basis so that we could use it to test the RS&H proposed inputs. We have not yet received a response from the FAA.

<sup>9</sup> We did use the coded information in FlightAware to identify aircraft which RS&H incorrectly claims are not included.

In the Revised Test Memorandum we strictly applied the RS&H definition of Local Operations, tracking the local operation on WebScene from departure to arrival. We report that we identified 18 Local Operations during the test week. That is more than five times the Local Operations used in the revised RS&H proposed input.

RS&H also claims that: “Touch-and-go and practice operations are prohibited at OSUA between 11 p.m. and 7 a.m.” That statement is simply not true. The Noise Abatement Guidelines say that touch & goes and low practice approaches are “prohibited” between 11 p.m. and 7 a.m. but the Guidelines make clear that they are not mandatory. The Guidelines state that “the Airport **requests** that you follow these **recommended** noise abatement guidelines....”<sup>10</sup> [emphasis added] Not all pilots accede to the request; during the test week we found six instances of “prohibited” operations occurring after midnight.

- **Total Night-time Jet Operations** The RS&H Response Memorandum states that we “incorrectly referenced 279 jet operations in a year in their paper and made subsequent calculations based on that number.”<sup>11</sup> RS&H is correct that 279 is wrong and that the correct number should be 479.<sup>12</sup> However, the following statement that we “made subsequent calculations based on that number” is wrong.<sup>13</sup> There was only one calculation in the text which followed that number: “In one week of test data we observed 70 jet operations or about 15% of the total proposed input of night-time jet operations.”<sup>14</sup> The number 70 is in fact 14.6% of 479 or “about 15%.”<sup>15</sup> Even though we made a typographical error in reporting the divisor, we used the correct divisor (479) in the calculation and reported the result correctly.<sup>16</sup>

The RS&H Response Memorandum also makes the claim that our “analysis of WebScene data identified 177 night operations during the test week. The analysis also noted that 10-15 of those operations were actually conducted at Port Columbus International Airport....”<sup>17</sup> That statement is simply false; there is no reference in either our Test Report or our Revised Test Report to Port Columbus International Airport.

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<sup>10</sup> The Ohio State University Airport Noise Abatement Guidelines.

<sup>11</sup> RS&H Response Memorandum p. 1 with the same claim repeated on page 4.

<sup>12</sup> Their statement as to how the typographical error happened is pure fantasy which they could have corrected with a simple telephone call or e-mail or by accepting our offer to review all of our underlying data with them.

<sup>13</sup> This is not the first time we have questioned RS&H methodology with respect to simple mathematics. The first thing we pointed out at the first Technical Subcommittee meeting on January 17, 2008, was a mathematical problem with RS&H’s proposed inputs at that time. See Test Report and Revised Test Report. P. 1

<sup>14</sup> Test Report, p. 5

<sup>15</sup> If we had used 279 as the denominator, we would have said that 70 jet operations was about 25% of the total, a statement which we did not make. Test Report p. 5.

<sup>16</sup> There was a calculation in footnote 27 of the Test Report which used the wrong divisor and which reported an incorrect result. That calculation has been corrected and appears in footnote 22 of the Revised Test Report.

<sup>17</sup> RS&H Response Memorandum, p. 4

## RS&H Fundamental Assumptions and Methodology

We challenge the fundamental assumptions and methodology used by RS&H in two areas.

- **Assumption #1: The CRAA Noise Office data contains all of the jet flights.** At the Technical Subcommittee meeting on March 26, 2008, Mr. Don Andrews of RS&H stated that: “It is a reasonable assumption to say that FlightAware and CRAA are capturing all jet flights.” Later, in response to a direct question from Mr. E. J. Thomas, Mr. Andrews said that he had “100% confidence” in the jet inputs.<sup>18</sup> There are two problems.

First, if the CRAA Noise Office data were capturing all jet flights, RS&H would not have had to adjust it upward by 62 flights in order to equalize arrivals and departures.<sup>19</sup> That very adjustment indicates that the CRAA jet data is incomplete.

Second, our more precise analysis combining WebScene and FlightAware data during the test week demonstrates that the CRAA Noise Office data did not capture all jet flights. Although we have some reservations about the accuracy of the WebScene data in a few instances,<sup>20</sup> it is conclusive that CRAA Noise Office data did not capture all jet flights. The question is: How many jet flights are left out of the proposed inputs? There seems to be little question that it is a substantial number.<sup>21</sup>

After adjusting to equalize arrivals and departures, RS&H had only 24,000 operations out of 87,186 operations in which the aircraft type was believed to be known. In order to account for the remaining 51,186 operations in which the aircraft type was unknown, RS&H had to increase the number of aircraft types in each category. Apparently based upon Mr. Andrew’s assertions of confidence that the CRAA Noise Office data accounted for all jet operations, an assumption which our one week test of night-time operations has demonstrated is clearly untrue, RS&H made the decision to increase the number of jet operations by zero. However RS&H increased operations by propeller driven multi-engine aircraft by 149%, operations by propeller driven single-engine aircraft by 568%, operations by helicopters by 746% and operations by military aircraft by 842%.<sup>22</sup> Compared to the total lack of adjustment to jet operations, those adjustments seem unreasonable. Our empirical data, although developed under extreme time pressure and limited in scope, suggests that the RS&H methodology is very materially wrong.

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<sup>18</sup> Contemporaneous notes of Scott Whitlock.

<sup>19</sup> Table B-4 “Equalize Arrival/Departure Count. Technical Memorandum, p. 39. Note that this adjustment was done only at the “Model Combination” level. If the adjustment had been done at the aircraft type level or, even more properly, at the individual aircraft level, the number might have been greater. See discussion in the Revised Test Report, p. 2.

<sup>20</sup> See footnotes beginning at footnote 14 in the Revised Test Report. We have asked (see footnote 13 to the Test Report), and the Worthington City Council has asked more than a year ago, that the Airport Administration take steps to be able to provide accurate numbers for night-time operations. To our knowledge, no steps have been taken by the Airport Administration.

<sup>21</sup> See pp. 4-5 of the Revised Test Report.

<sup>22</sup> Compare Technical Memorandum Table B-4, p. 39, to Table B-5, pp. 44-45.

- **Assumption #2 The newly discovered tower log establishes that there are only .05 Local Operations on average per night.** In the Technical Memorandum RS&H proposed to base the model on the assumption that there were no Local Operations during the night-time hours. In response to our Test Report, RS&H now proposes to increase night-time Local Operations to an average of ½ of one operation per night.<sup>23</sup> That is equivalent to one touch-and-go every four nights. Although our Test Report discussing this suggested that the RS&H original input was “contradicted by the fact that the Airport has received many complaints about local operations at night from Worthington residents”, the RS&H team still apparently ignores the data contained in the complaint records.

The RS&H team dismisses the problem of understating night-time touch-and-go operations on the basis that “the noise contours developed with or without the 0.5 touch-and-go per night would be identical.”<sup>24</sup> Leaving aside for the moment the question of whether an accurate number of night-time local operations would affect the contours,<sup>25</sup> the RS&H team apparently has no concern about whether the supplemental single event noise data is accurate.<sup>26</sup>

Our Revised Test Report, utilizing RS&H’s newly provided definition of Local Operations, suggests that the RS&H assumption and resulting proposed input for Local Operations at night is materially wrong.<sup>27</sup>

### **Further Verification of Proposed Inputs**

It is important that the affected communities and their citizens have confidence in the results of this Part 150 Study. Unfortunately, we do not have confidence that INM will be either accurate or useful. In every case in which we have been able to test the RS&H assumptions, data and proposed inputs we have found errors, all of which go in the direction of understating the noise impacts on the surrounding communities. In addition, in every case in which the RS&H team has had the choice of using public data against which their work could be checked or restricted data not available to the public, the RS&H team has chosen to use restricted data.

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<sup>23</sup> The tower records are claimed by RS&H to show that “there were 185 annual touch-and-go training operations recorded during INM nighttime hours.” It is unclear to us whether those records count a touch (arrival) and a go (departure) as one training operation or two training operations. We have asked the RS&H to make available to us a copy of the tower records for night-time operations so that we may establish what the number 185 means and compare the records to the records we have developed independently using WebScene.

<sup>24</sup> RS&H Response Memorandum, p. 3

<sup>25</sup> Our test week number for night-time Local Operations is more than five times the RS&H proposed input. Revised Test Report, p. 5

<sup>26</sup> It should be noted that the Worthington City Council has emphasized the importance of single event noise data for planning purposes. City of Worthington, Ohio, Comprehensive Plan Update and 2005 Strategic Plan for Worthington, October, 2005, p. 107.

<sup>27</sup> Revised Test Report, p. 5.

At this point the The OSU Airport and the RS&H team have a decision as to whether it would be better from the standpoint of public confidence and efficiency to engage in further verification or to proceed with the development of a new fleet mix for use in the INM. We are prepared to undertake further verification and have asked the FAA to give us access to the records which RS&H has used to develop the currently proposed fleet mix.

Thus far, RS&H has apparently had no method for verifying its fleet mix once it is developed. We do not suggest that the tests that we have done are the ideal verification methodology but they are certainly better than nothing. We note that with one exception every issue we have raised has resulted in RS&H making changes in the fleet mix – increasing fraction operations to whole numbers, adding Stage 2 jet operations which took place, increasing the number of night-time operations by the LabCorp planes from 160 to 1,521, and adding Local Operations at night.<sup>28</sup> Only in the case of jet operations during the night-time hours has RS&H refused to make any change in the fleet mix. Unfortunately, as is demonstrated in the attached Revised Test Report, the current RS&H proposal clearly omits jet operations which actually occurred during the base period. What we don't know at this point is the full scope of the problem, but further verification will help to refine the scope of the problem. There are clearly a number of additional issues, some of them quite specific, which should be addressed by further verification.<sup>29</sup>

If the decision is made now to redevelop the fleet mix, we suggest that the inputs should be based upon empirical data to the greatest extent possible. We have used a combination of WebScene and FlightAware data in our analysis. We would suggest that both data sources should be used. It should be noted that the RS&H team used WebScene extensively (and apparently exclusively) to develop the flight tracks to be used in the INM,<sup>30</sup> but did not use WebScene to develop the flight mix. If data were available from the Columbus Regional Airport Authority webtrak system,<sup>31</sup> we would suggest that data be used as in our experience it is more complete and possibly the most accurate data available. Unfortunately it may not be available for the base period. If the FAA would consent to making CAA Noise Office data so that its use could be independently verified, then we would suggest that it be used together with the WebScene and FlightAware data. Finally, if Tower logs are available, those logs should be used to confirm all inputs for hours during which the The OSU Airport Tower is open.<sup>32</sup> Only after empirical sources have been exhausted should the inputs be based on anecdotal evidence and assumptions and the anecdotal evidence and assumptions should be fully documented.

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<sup>28</sup> In the last example, however, we believe that the night-time Local Operations may still be materially understated.

<sup>29</sup> See footnote 20 in the Revised Test Report.

<sup>30</sup> We have not questioned the flight track inputs although there were some questions raised at the March 26, 2008, Technical Subcommittee meeting about the altitude of the Citation 560 jet during the first three nautical miles after the start of roll.

<sup>31</sup> See [www.columbusairports.com/noise/webtrak.asp](http://www.columbusairports.com/noise/webtrak.asp).

<sup>32</sup> We expect that those logs are public records under Ohio law and can be made available to the public for review.

We suggest that the consultants should review the data available from official actions of city governments, such as Worthington, data available from the City of Worthington, WOOSE and The OSU Airport<sup>33</sup> noise complaint systems (which provide a guide to the perceived noise impacts on surrounding communities), and the work done by the Airport Advisory Board, the Airport Noise Committee and their subcommittees.

Finally, we suggest that an empirical and independently verifiable data base be developed for the base period fleet mix. We have developed one methodology for doing that and although we do not suggest that ours is the only methodology,<sup>34</sup> it appears that RS&H does not have any methodology which is based on empirical and independently verifiable data.

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<sup>33</sup> We caution that there are many documented and uncorrected problems with The OSU Airport noise complaint system and that the data from that system cannot be used without correcting for the problems. As one example, it has come to our attention that Worthington residents being affected by Local Operations are having their complaints about multiple single events combined and treated as a single complaint. That may hold down the numbers in the statistics about noise complaints which The OSU Airport publishes to the communities, but the end result is to grossly understate the daily impact of Local Operations on Worthington residents who live under the flight patterns.

<sup>34</sup> We continue to stand ready to share all of our worksheets and methodology with RS&H provided only that RS&H shares its worksheets with us.