

The $Leq_{(day)}$ metric reports the average noise level for that period between 7:00 a.m. and 10:00 p.m. and is intended as a surrogate to represent the hours for day-use park visitors. Those visitors who participate in overnight programs are more affected by the 24-hour Leq or DNL levels, but the majority of the park visitor activity takes place in the morning, afternoon, and early evening hours. As the summary tables indicate, the proposed airport would increase the $Leq_{(day)}$ by a maximum of 0.3 dBA or less throughout the property with average changes tending toward 0.0 dBA. Again, many of the locations have cumulative $Leq_{(day)}$'s less than the natural or existing L50 ambient levels in the park. **Exhibit 7.6** illustrates the distribution of change of $Leq_{(day)}$ anticipated for the year 2020 within the park.

7.2.3.2 Cumulative Time Above Ambient (Existing and Natural)

Of potential interest to the users of Zion National Park is the change in the amount of time that locations in the park will be exposed to aircraft noise from all sources above ambient levels. Again, the details on all locations within the park are reported in **Appendix B** and the results for selected grid points are summarized in **Table 6.28** presented in **Section 6.6** of **Chapter Six**.

Table 7.8 presents summary statistics for the both the Time (in Minutes) Above the $L50_{(existing)}$ and the Time Above the $L50_{(natural)}$ ambient experienced throughout the grid points analyzed for Zion National Park for both years of analysis.

Exhibit 7.7 and **Exhibit 7.8** (revised and included in the Final EIS) present the changes in Time Above the existing and natural ambient level within the park for the year 2020. Further illustrations and tables are available in **Appendix B** that detail all other grid points within the park for each year and map 2010 conditions.

The data presented in the summary table indicates that operations at the proposed replacement airport would result in small increases in the minutes that various locations are exposed to noise above the natural and existing L50 ambient levels. The maximum increase present in the data was found for a site located approximately 1.5 miles west of Scouts Lookout, where the time above the natural ambient level is forecast to increase by slightly more than five minutes during the average day in 2020. In general, across the park in locations with low existing ambient noise levels, the replacement airport would increase the time of exposure to aircraft noise above the existing ambient by one percent or less. The same findings are true of the natural ambient condition.

7.2.3.3 Number of Events Above Selected Noise Levels

Also of potential interest to the users of Zion National Park is the change in the number of events above specific noise thresholds that are projected to occur in the future with the replacement airport. This cumulative Number of Events Above metric is reported for all grid points in **Appendix B** with the results for selected grid points presented in **Table 7.9** and **Table 7.10**. **Table 7.11** presents the maximum number of events forecast to exceed a range of noise levels at any one grid point throughout the Zion National Park for both 2010 and 2020. In addition, the maximum, minimum, and average L_{Amax} values are presented for the property.

As the table indicates, the maximum change in the number of events above various noise levels resulting from the replacement airport is generally very small as compared to the cumulative number of events at each level. This highlights the relatively small contribution that the SGU airport-only events make to the overall cumulative noise levels in the area. There would be no change in L_{Amax} values resulting from the replacement airport throughout the park for both future years, thus indicating that the loudest aircraft events are not specific to either the existing or replacement airport traffic.

Two series of six exhibits each are provided on **Exhibit 7.9 through Exhibit 7.20** which illustrate the changes anticipated to the number of events above each of the selected noise levels (20, 25, 35, 45, 55, and 60 dBA) presented in **Table 7.9 and Table 7.10**. Above the L_{Amax} of 60 dBA, the effect of change generally disappears in the park.

7.2.3.4 Discussion of Audibility Metric

Audibility (Percent Time Audible) is a key metric used by the NPS for soundscape management and analysis of impacts in units of the National Park System, together with Percent Time Above Natural Ambient (unweighted) and Maximum dBA (i.e., L_{Amax}). Audibility differs somewhat from the A-weighted Time Above Ambient (TAA) descriptor in that it makes use of frequency-based 1/3 octave band sound data. Audibility may show that an attentive listener can hear or detect an intrusive noise source at decibel levels lower than the overall natural or existing ambient (A-weighted). This is due to the fact that the human ear can discern sounds at varying decibel levels between different frequencies. This is why one sound does not necessarily mask a second even if the first is louder.

For a number of years, FAA and NPS have worked to develop a computer model that can be used to calculate aircraft audibility in national parks. After some time of making enhancements to separate models, both agencies have agreed to accept the recommendations of the Federal Interagency Committee on Aviation Noise (FICAN), made on January 27 and formally provided in writing on May 12, 2005, to use the INM Version 6.2b (INM v6.2b)³ for aircraft audibility. INM v6.2b is in the final stage of beta testing prior to public release in the near future, and FAA and NPS are refining the ambient data collection protocol that is a critical part of audibility calculations. The INM v6.2b audibility descriptor will be used in addition to other appropriate supplemental metrics, to model aircraft related impacts on NPS properties, as appropriate to project circumstances and potential severity of impacts which will be considered during project scoping and in consultation with NPS.

³ The audibility evaluation for this study was performed with the latest (beta) version of INM 6.2b, noted in this document with the suffix "b."