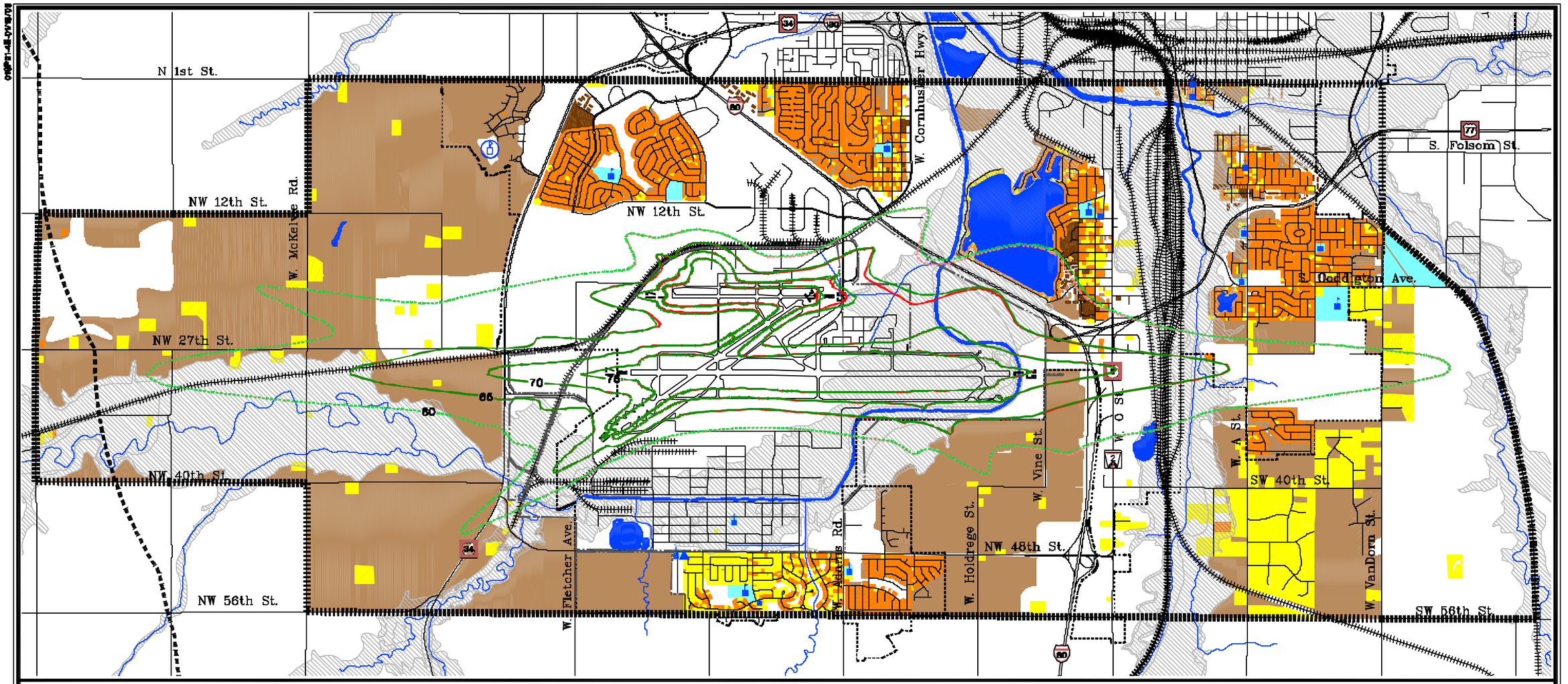

LEGEND

- Airport Property
- Municipal Boundaries
- Extra-territorial Jurisdiction
- Railroad Tracks
- Study Area
- 2007 Noise Exposure Contour, Marginal Effect
- 2007 Noise Exposure Contour, Significant Effect
- Alternative 1 Noise Exposure Contour, Marginal Effect
- Alternative 1 Noise Exposure Contour, Significant Effect
- Low Density Residential (0-3 du/ac)
- Medium Density Residential (3.1-10 du/ac)
- High Density Residential (10.1+ du/ac)
- Floodplains
- Noise Sensitive
- School
- Library
- Historic Structures
- Places of Worship
- Potential Growth Risk

Source: Base Information and Map: City of Lincoln Geographic Information System, May 2002. Coffman Associates Analysis.

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SCALE IN FEET

Lincoln Airport

Exhibit 4E
ALTERNATIVE 1-TEST THE EFFECTIVENESS OF UTILIZING RUNWAY 17R-35L FOR NIGHTTIME OPERATIONS

TABLE 4B
Population Impacted by Noise
Alternative 1 - Test the Effectiveness of Utilizing Runway 17R-35L for Nighttime Operations

DNL Range	2007 Baseline	Alternative 1	Net Change
Existing Population			
60-65	517	464	-53
65-70	10	11	+1
70-75	0	0	0
75+	0	0	0
Subtotal	527	475	-52
Potential Population[1]			
60-65	1,830	1,854	+24
65-70	9	9	0
70-75	1	1	0
75+	0	0	0
Subtotal	1,840	1,864	+24
Total	2,367	2,339	-28
LWP	1,154	1,141	0
Noise-Sensitive Institutions			
Places of Worship	0	0	0
Schools	0	0	0
Other (Libraries, Museums, Community Centers, Hospitals, Nursing Homes)	0	0	0
Total Noise-Sensitive Institutions	0	0	0
Total Historic Resources	0	0	0

Notes:
1. Based on additional potential new dwelling units in 2007 reflecting current land use plans and zoning.
2. Due to the process of rounding, some numbers may not add exactly.

* LWP – level-weighted population – is an estimate of the number of people actually annoyed by aircraft noise. It is computed by multiplying the population in each DNL range by the appropriate LWP response factor: 60-65 DNL = .205; 65-70 DNL = 0.376; 70-75DNL = 0.644; 75+ DNL = 1.000. See the **Technical Information Paper, *Measuring the Impact of Noise on People***, at the back of the *Noise Exposure Maps* document.

A breakdown of the increase or decrease in population from the 2007 baseline and Alternative 1 noise contours is presented in **Table 4C**. This reveals that with the use of this alternative, one additional person would be impacted by noise levels above 65 DNL assuming the existing land use

conditions. The alternative contours would affect 24 more individuals if vacant land is developed as planned/ zoned. There is a net decrease in population of 28 if this alternative is implemented.

TABLE 4C
Population Increase or Decrease with Alternative 1

2007 vs. Alt. 1	60-65	65-70	70+	Net Impact
Existing Land Use	-53	+1	0	-52
Future Potential Land Use	+24	0	0	+24
Totals	-29	+1	0	-28

Operational Issues

Pilots have the ultimate decision of which runway to use when departing an airport. At times, pilots may choose Runway 17L-35R due to its close proximity to general aviation aircraft services and parking areas. The decision to use Runway 17R-35L for nighttime departures may cause additional taxi times for general aviation aircraft. Pilots may also incur some delays while waiting to cross both Runways 17L-35R and 14-32. In addition, the potential for runway incursions increases because general aviation aircraft will have to cross both Runways 17L-35R and 14-32 while the airport traffic control tower is closed.

Air Service Factors

Some delays are anticipated due to increased taxi distances and the potential for runway incursions increases.

Costs

Aircraft operators would likely experience an increase in taxi time. In addition, this procedure would expose existing population to increased noise within the 65 to 70 DNL range south of the airport. Therefore, an environmental review will have to be prepared.

Environmental Issues

Since this alternative exposes existing residential areas to new and/or increased levels of aircraft noise between 55 to 60 DNL, a preliminary environmental review will be required prior to implementation. Based on the results of the preliminary environmental review, the FAA will determine the level of environmental analysis needed pursuant to the National Environmental Policy Act of 1969 and its implementing regulations.

Implementation

This procedure would primarily be implemented by the airport proprietor. This could be accomplished through informational brochures, use of the Airport Facility Directory, and/or a Notice to Airmen (NOTAM).

Implementation of noise abatement measures are subject to additional operational, feasibility, and environmental review by the FAA.

Conclusion

While this alternative reduces the overall number of residents within the 60 DNL noise exposure contour, noise will be increased over some individuals within the 65 DNL contour. In addition, the potential for increasing runway incursions and longer taxi distances eliminates this procedure from being considered further.

ALTERNATIVE 2 - ENGINE RUN-UP LOCATION NOISE ASSESSMENT

As previously discussed, several operators located on the airfield perform business jet, turbine, and piston aircraft maintenance. Following maintenance, engine run-ups are done as a safety precaution to test the aircraft. Lincoln Airport currently requests that aircraft maintenance run-ups be performed on the run-up pad on the west side of the airport along Taxiway E (the Existing Site is depicted on **Exhibit 4B**) from 7:00 p.m. to 7:00 a.m. and on the north end of the east ramp (Site A is depicted on **Exhibit 4B**) from 7:00 a.m. to 7:00 p.m.

Noise Effects

The Integrated Noise Model (INM), Version 6.0c, was used for the noise analysis of engine maintenance run-ups for each of the run-up locations studied in the HWS report (see **Exhibit 4B)**. Single event noise patterns (L_{max} noise contours) were prepared for the loudest business jet aircraft used by these operators, the Lear 25 (INM designation LEAR25). L_{max} represents the peak noise level of the event – the noise level that would actually be heard by the human ear. The INM does not account for noise attenuation provided by structures when calculating noise exposure. In addition, aircraft must face into the wind. To account for this variability, the longest distance from the aircraft to the run-up contour was measured. This measurement is the radius of the L_{max} depicted on **Exhibits 4F** and **4G**. Therefore, the L_{max} noise exposure contours represent a worst case scenario of the run-up noise in all directions.

An analysis was conducted for each of the current run-up locations used on the airfield. The results of this analysis are depicted on **Exhibits 4F and 4G**. The contours on these exhibits are the 65 decibel (dBA) and 80 dBA L_{max}. The 65 dBA L_{max} is used to assess the nighttime impacts of each run-up site. This is based upon exterior-to-interior sound attenuation of a typical home of 20 to 25 dBA with windows closed. Therefore, the 65 dBA L_{max} translates into interior levels of about 40 to 45 dBA. These

levels generally represent the lower end of the sleep disturbance spectrum. (See the sleep disturbance section in the TIP, "Effects of Noise Exposure".)

A similar rationale is used to access the daytime impacts. Assuming the same attenuation level of a typical home, the 80 dBA L_{max} translates into an interior level of 60 dBA. The 60 dBA L_{max} is the normal conversation level between two individuals approximately three feet apart.

The existing run-up site, depicted on **Exhibit 4F**, is the only site that does not impact existing residential or noise-sensitive land uses off airport property within the 65 or 80 dBA L_{max} contours (a rental home and place of worship that are both owned by the Airport Authority fall on the outer edge of the 65 dBA L_{max}). Sites A through D all shift noise above 65 dBA L_{max} over nearby residential areas and, therefore, are not appropriate for nighttime run-ups.

Site B, depicted on **Exhibit 4G**, is the only site that would not be appropriate for daytime run-ups. The 80 dBA L_{max} touches the residential area located to the east of the airport. The existing, A, C, and D run-up sites are all acceptable for daytime run-up activity based on noise.

Operational Issues

Sites A and B are the only sites where aircraft do not have to cross an active runway to gain access from the east ramp. However, pavement load bearing capacity of the ramp in these two sites is limited to 49,000 pounds. Aircraft circulation around Site A has also been a concern. An alternative ramp layout to reduce aircraft congestion for Site A is provided on **Exhibit 4H**. Site B would also limit future hangar development.

Site C is limited by the pavement load carrying capacity of Taxiway E and Runway 17L-35R would still need to be crossed to gain access to the site. Site D is located in the runway visibility zone (RVZ) preventing the ability to build a structure on the site if it is needed and Runway 17L-35R would still need to be crossed to gain access to the site.

Air Service Factors

There are no air service factors associated with these alternative run-up sites.

Costs

Sites B, C, and D all require construction of ramp and access taxiways. The cost of constructing the ramp and associated taxiway is approximately $1,250,000 (without any run-up attenuation structure).

There would be no additional cost to continue to use Site A. However, aircraft over 60,000 pounds are too heavy for the ramp at Site A and must be taken to the existing run-up pad located on the west side of the airport along Taxiway E.

Conclusion

Based on this analysis, construction of a new run-up pad does not appear to be necessary at this time. The