5 Environmental Consequences

This chapter discusses the potential environmental impacts that could result from implementing the Proposed Action and the No Action Alternative. Specifically, this EA considers effects on the environmental resource categories identified in FAA Order 1050.1F. Both the Proposed Action and the No Action Alternative were evaluated under forecasted 2018 conditions, which is the first year the Proposed Action could potentially be implemented, and under forecasted 2023 conditions. This evaluation considers the direct, indirect, and cumulative effects associated with the Proposed Action and No Action Alternative, as required under FAA Order 1050.1F.

Potential environmental impacts are identified for the environmental resource categories described in Section 4.3. Neither the Proposed Action nor the No Action Alternative would involve land acquisition; physical changes to the environment resulting from ground disturbance or construction activities; changes in patterns of population movement or growth, increases in public service demands, or business and economic activity; or generation, disturbance, transportation, or treatment of hazardous materials. Therefore, neither alternative is expected to result in impacts to certain environmental resource categories (please see Section 4.2 for a list of excluded categories). The excluded environmental resource categories are not further discussed in this chapter.

Table 5-1 identifies the environmental impact categories that the Proposed Action could potentially affect, the thresholds of significance used to determine the potential for impacts, and a side-by-side comparative summary of the potential for environmental impacts resulting from implementing the Proposed Action under 2018 and 2023 forecast conditions.

Table 5-1 Summary of Potential Environmental Impacts

Environmental Impact Category	Threshold of Significance/Factors to Consider	Impact? 2018	Impact? 2023
Noise and Noise Compatible Land Use	A significant noise impact would occur if the proposed action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65dB level due to a DNL 1.5dB or greater increase, when compared to the no action alternative for the same timeframe.	No	No

Table 5-1 Summary of Potential Environmental Impacts

Environmental Impact Category	Threshold of Significance/Factors to Consider	Impact? 2018	Impact? 2023
Department of Transportation Act, Section 4(f) Resources	A significant impact would occur if the proposed action involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource. Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.	No	No
Historic Properties and Cultural Resources	The FAA has not established a significance threshold for Historical and Cultural Resources.	No	No
Wildlife (Avian and Bat Species)	A significant impact to federally-listed threatened and endangered species would occur when the United States Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat. Lesser impacts including impacts on non-listed species could also constitute a significant impact based on consideration factors such as long-term or permanent loss of unlisted wildlife species and adverse impacts to special status species or their habitats. The FAA has not established a significance threshold for non-listed species.	No	No
Environmental Justice	The FAA has not established a significance threshold for environmental justice. However, significant factor to consider to determine potential significant impact is if the action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population due to significant impacts in other environmental impact categories, and/or causes impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population	No	No

Table 5-1 Summary of Potential Environmental Impacts

Environmental Impact Category	Threshold of Significance/Factors to Consider	Impact? 2018	Impact? 2023
Energy Supply (Aircraft Fuel)	The FAA has not established a significance threshold for Energy Supply. However, a significant factor to consider is if the action would have the potential to cause demand to exceed available or future supplies of these resources.	No	No
Air Quality	A significant impact would occur if the proposed action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.	No	No
Climate	The FAA has not established a significance threshold for Climate and has not identified specific factors to consider in making a significance determination.	No	No
Visual Effects	The FAA has not established a significance threshold for Visual Resources / Visual Character. Significant factors to consider include potential affect an action has on the nature of the visual character of the area, potential to contrast with the visual resources and/or visual character in the study area, and/or potential to block or obstruct the views of visual resources	No	No

Source: FAA Order 1050.1F, Exhibit 4-1, July 2015.
Prepared By: ATAC Corporation, October 2017.

The following sections describe the impact findings for each environmental resource category, followed by a discussion of potential cumulative impacts. In summary, no significant impacts to any environmental resource category have been identified.

5.1 Noise and Compatible Land Use

This section discusses the analysis of aircraft noise exposure under the Proposed Action and the No Action Alternative, under both 2018 and 2023 forecast conditions. This discussion includes identifying the differences in noise exposure between the Proposed Action and the No Action Alternative. This comparison is used to determine if implementing the Proposed Action would result in significant noise impacts. Additional information on noise metrics and the basics of noise can be found in **Appendix E**. Detailed information on the noise analysis prepared for the CLE-DTW Metroplex Project is included in the *Aircraft Noise Technical Report*, available at http://www.metroplexenvironmental.com.

5.1.1 Summary of Impacts

Aircraft noise exposure was modeled for both the Proposed Action and the No Action Alternative under 2018 and 2023 forecast conditions. The noise analysis demonstrates that implementing the Proposed Action would not result in a day-night average sound level (DNL) increase of 1.5 dBA or higher in noise- sensitive areas exposed to DNL 65 dB or higher. Therefore, neither the Proposed Action nor No Action Alternative would result in a significant noise impact.

5.1.2 Methodology

The noise analysis evaluated noise exposure to communities within the General Study Area from aircraft forecasted to be operating under Instrument Flight Rules (IFR) -filed flight plans, at altitudes between ground level up to 10,000 feet above ground level (AGL). IFR-filed aircraft activity was forecasted for the years 2018 and 2023 and used to model conditions under both the Proposed Action and the No Action Alternative. Noise modeling was conducted using Aviation Environmental Design Tool (AEDT) 2c, the FAA-required noise model for aviation projects, including air traffic changes over large areas and altitudes over 3,000 feet AGL.[42]

If the FAA approves the Proposed Action, the agency expects to begin implementation in 2018. Therefore, aircraft noise modeling was conducted for 2018 and five years later (2023), as required by FAA Order 1050.1F. Future year noise exposure levels modeled for the Proposed Action and the No Action Alternative were compared to determine whether there is a potential for noise impacts. Implementation of the Proposed Action would not increase the number of aircraft operations at the Study Airports. The Proposed Action does not include developing or constructing facilities, such as runways or terminal expansions, that would be necessary to accommodate an increase in aviation activity; therefore, no additional growth in operations associated with the Proposed Action is anticipated. The noise analysis reflects the change in noise exposure resulting from the proposed changes in aircraft routes (i.e., flight tracks) under the Proposed Action compared to the No Action Alternative.

Detailed information on IFR-filed aircraft operations within the General Study Area was assembled for input into AEDT, including the following data:

[42] FAA Order 1050.1F Desk Reference, *Noise and Noise-Compatible Land Use*, Sec. 11.1.3, July 2015.

Average Annual Day IFR-Filed Aircraft Flight Schedules: The IFR-filed aircraft flight schedules identify arrival and departure times, aircraft types, and origin/destination information for an average annual day (AAD) in 2018 and in 2023. The AAD represents all the aircraft operations for every day in a study year divided by 365, the number of days in a year. The AAD does not reflect a particular day, but is meant to represent a typical day over a period of a year. The forecast was based on the FAA's 2016 Terminal Area Forecast (TAF),[43] modified for 2018 and 2023 with additional details using previously identified arrival/departure times, aircraft types, and origin/destination information. More detail related to the development of the forecasts is provided in the *CLE-DTW Metroplex Average Annual Day Flight Schedules Technical Report*, available at www.metroplexenvironmental.com.

Weather: The AEDT model includes data for multiple meteorological parameters, including temperature, pressure, and humidity. Weather conditions for all Study Airports were defined and used in the noise study. Further discussion on the weather data employed in the AEDT model can be found in the *CLE-DTW Noise Technical Report* available at http://www.metroplexenvironmental.com.

Flight Tracks: The flight tracks used in noise modeling were based on radar data collected for the existing conditions (2016) noise analysis and information provided by FAA Air Traffic Control (ATC) personnel. Aircraft routings under both the No Action Alternative and Proposed Action are depicted on **Exhibits 3-7** through **3-14** in Chapter 3, *Alternatives*. For the Proposed Action, flight tracks were developed from the aircraft procedures created by the CLE-DTW Metroplex Design & Implementation (D&I) Team using the Terminal Area Route Generation, Evaluation, Traffic and Simulation (TARGETS) program. The majority of the No Action Alternative modeled flight tracks are based on the existing conditions noise analysis. The remaining No Action Alternative flight tracks for amended or new procedures were modeled based on input from the air traffic control experts who developed the procedures. Illustrations depicting Existing Conditions noise analysis radar tracks and Proposed Action procedure designs were developed and shared with the D&I Team as part of the consultation process. The consultations were conducted to seek out key model input assumptions such as frequency of Proposed Action procedure usage and air traffic control techniques, such as vectoring. The assumptions were then used for refining model track locations, altitude profiles, and utilization.

TARGETS flyability lines, or the lines indicating the actual 3D path of different categories of aircraft ideally flying the procedure for the Proposed Action procedures served as the center of the 1 nautical mile and 0.3 nautical mile containment area for RNAVs and RNPs, respectively. The containment area is generally where dispersed tracks are contained, but during the D&I consultation process, air traffic control experts could indicate the need for vectors off of the RNAV with a rejoin of the RNAV at a later point. For those identified cases NIRS model tracks were developed to account for that type of dispersion.

Runway Use: Runway use percentages were identified for all runways at the Study Airports. Forecasted aircraft operations were assigned to particular runways representing operating conditions at the Study Airports under Proposed Action and No Action Alternative conditions. Runway use patterns did not change under the Proposed Action Alternative at the Study Airports compared to the No Action Alternative.

[43] U.S. Department of Transportation, Federal Aviation Administration, Terminal Area Forecast, 2012 (https://aspm.faa.gov/main/taf.asp; accessed September 2015).

More detail related to the development of the NIRS model input files is provided in the *Aircraft Noise Technical Report*.[44]

As discussed in Section 4.3.1.1, the AEDT model was used to compute DNL values for 2018 and 2023 Proposed Action and No Action Alternative conditions at multiple sets of data points throughout the General Study Area:[45]

- 197,409 2010 Census block centroids;
- 168,291 uniform grid points at 0.5-nautical mile (nm) intervals on a uniform grid covering the General Study Area, which were also used to calculate DNL values at potential Department of Transportation Act (DOT), Section 4(f) resources and historic sites; and,
- 14,093 unique points representing Section 4(f) resources, including 2,495 National Register listed historic sites. Other unique points evaluated include 6 noise sensitive uses in areas around the Study Airports exposed to noise levels of DNL 65 dB and higher.

As discussed in Section 4.3.1.1, DNL is the FAA's primary noise metric. **Table 5-2** provides the criteria used to assess the changes in aircraft noise exposure attributable to the Proposed Action compared with the No Action Alternative. FAA Order 1050.1F defines a significant impact as an increase of DNL 1.5 dB at noise-sensitive land use locations (e.g., residences, schools, etc.) exposed to aircraft noise of DNL 65 dB or higher under the Proposed Action. For example, an increase from 63.5 dB to 65 dB is considered a significant impact.

FAA Order 1050.1F also recommends that when there are DNL increases of 1.5 dB or more at noise-sensitive locations in areas exposed to aircraft noise of DNL 65 dB and higher, DNL increases of 3 dB or more in areas exposed to aircraft noise between DNL 60 dB and 65 dB should also be evaluated and disclosed. It is important to note that DNL increases of 3 dB in areas exposed to aircraft noise below DNL 65 dB are not considered "significant impacts" but are to be considered in the environmental evaluation of a proposed project.

FAA Order 1050.1F also stipulates that changes in exposure of DNL 5 dB or greater in areas exposed to aircraft noise between DNL 45 dB and 60 dB should be considered for airspace actions, such as changes to air traffic routes. This threshold was established in 1990, following issuance of an FAA noise screening procedure to evaluate whether certain airspace actions above 3,000 feet AGL might increase DNL levels by 5 dB or more. The FAA prepared this noise-screening procedure because experience indicated that DNL increases 5 dB or more at cumulative levels well below DNL 65 dB could be disturbing to people and become a source of public concern. As shown in **Table 5-2**, a 3 dB increase in areas exposed to DNL 60 to 65 dB and a 5 dB increase in areas exposed to DNL 45 to 60 dB are considered reportable noise increases.

[44] Found at http://www.metroplexenvironmental.com

[45] Between the issuance of the Draft EA and the Final EA, the census block centroid count was updated to reflect an omitted but modeled centroid, and additional West Virginia unique points were modeled and added to the total.

Table 5-2 Criteria for Determining Impact of Changes in Aircraft Noise

DNL Noise Exposure Level	Increase in DNL with Proposed Action	Aircraft Noise Exposure Change Consideration
DNL 65 and higher	DNL 1.5 dB or more 1/	Exceeds Threshold of Significance
DNL 60 to 65	DNL 3.0 dB or more 2/	Reportable Noise Increase (Considered When Evaluating Air Traffic Actions)
DNL 45 to 60	DNL 5.0 dB or more 3/	Reportable Noise Increase (Information Disclosed When Evaluating Air Traffic Actions)

Notes:
1/ Source FAA Order 1050.1F Desk Reference, Pg. 11-9; Title 14 C.F.R. Part 150.21 (2) (d); and Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.
2/ Source FAA Order 1050.1F Desk Reference, Pg. 11-9; and Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.
3/ Source FAA, Order 1050.1F Desk Reference, Pg. 11-9.

Source: FAA Order 1050.1F Desk Reference, Ch. 11, *Noise and Noise-Compatible Land Use*, July 2015.
Prepared by: ATAC Corporation, August 2017

5.1.3 Potential Impacts – 2018

Table 5-3 summarizes the results of the noise analysis for 2018 conditions. The results indicate that the Proposed Action when compared to the No Action Alternative would not result in a DNL 1.5 dB or higher increase in noise in sensitive areas exposed to DNL 65 dB or higher. Furthermore, no population would experience a reportable noise increase in areas exposed to DNL between 60 dB and 65 dB. However, a total of 335 people, associated with six population centroids located in Sumter Township southwest of DTW would experience a DNL 5 dB increase in areas exposed to DNL between 45 dB and 60 dB. This reportable noise increase is attributable to aircraft operating on the proposed KAYLN1 and CCOBB1 SIDs.

Table 5-3 Change in Potential Population Exposed to Aircraft Noise – 2018

DNL Noise Exposure Level Under the Proposed Action	Increase in DNL with the Proposed Action	Population Exposed to Noise that Exceeds the Threshold	
		No Action Alternative	Proposed Action
DNL 65 and higher	DNL 1.5 dB or greater	0	0
DNL 60 to 65	DNL 3.0 dB or greater	0	0
DNL 45 to 60	DNL 5.0 dB or greater	0	335

Sources: U.S. Census Bureau, 2010 Census (population centroid data), accessed March 2015; ATAC Corporation, October 2017 (AEDT modeling results).
Prepared by: ATAC Corporation, October 2017.

Exhibit 5-1 shows the location of the population centroids that would experience the reportable noise increase under 2018 conditions. Although there is a reportable noise increase in 2018, these results indicate that the Proposed Action would not result in a significant noise exposure impact on population exposed to DNL 65 dB or higher levels under the Proposed Action. Detailed information on the population centroids can be found in the *CLE-DTW Noise Technical Report* available at http://www.metroplexenvironmental.com.

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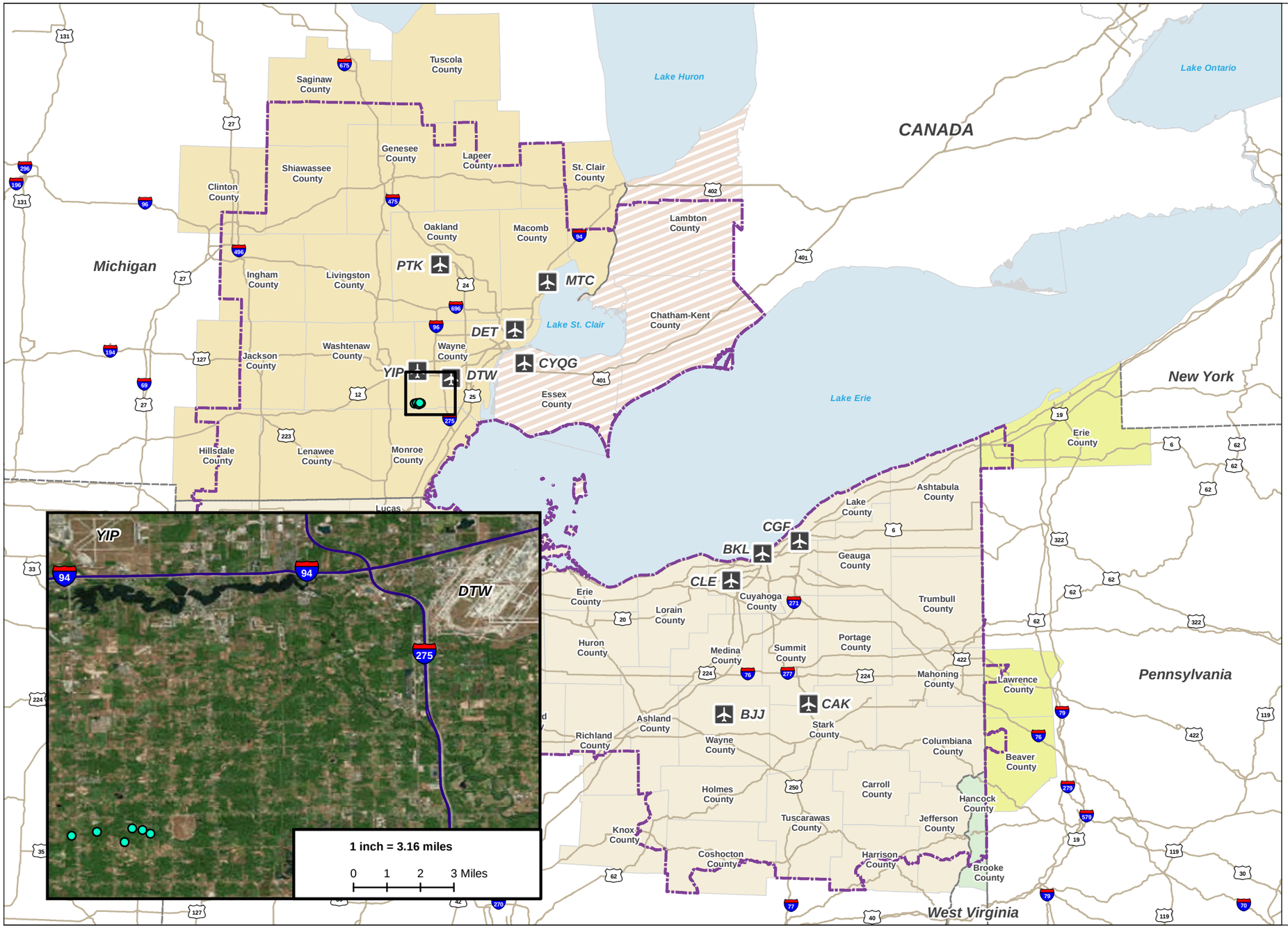

LEGEND

- Centroid Exposed to a DNL 45 to 60 dB with a DNL 5 dB Increase
- General Study Area Boundary
- Study Airports
- Water
- State and Provincial Boundaries
- Highways

Counties in the General Study Area

- Michigan Counties
- Ohio Counties
- Pennsylvania Counties
- West Virginia Counties
- Canadian Counties and Municipalities

Notes:

BJJ	Wayne County Airport
BKL	Burke Lakefront Airport;
CAK	Akron-Canton Regional Airport
CGF	Cuyahoga County Airport
CLE	Cleveland-Hopkins International Airport
CYQG	Windsor Airport
DET	Coleman A. Young Municipal Airport
DTW	Detroit Metropolitan Wayne County Airport
MTC	Selfridge Air National Guard Base
PTK	Oakland County International Airport
TOL	Toledo Express Airport
YIP	Willow Run Airport

Coordinate System: NAD 1983 Albers
Projection: Albers
Datum: North American 1983
Scale: 1:1,839,538

0 5 10 20 Miles

Sources: Statistics Canada Catalogue no. 92-160-X, 2011 (Provincial, Canadian counties and municipalities, water boundary Files); Road Network File, 2016 Census. Statistics Canada Catalogue no. 92-500-X (Highways); U.S. Census Bureau, 2016 (2016 TIGER/Line Shapefiles (machine-readable data files); ESRI, Inc., 2016 (U.S. states, counties, tribal properties, roads, airports); ATAC Corporation, 2017, (2016 General Study Area boundary).
Prepared by: ATAC Corporation, April 2018.

Exhibit 5-1

Change in Population Exposed to Aircraft Noise - 2018

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Under the No Action Alternative, no changes to air traffic routes in the Cleveland-Detroit Metroplex would occur in 2018 and no effects related to changes in aircraft noise exposure would be anticipated.

5.1.4 Potential Impacts – 2023

Potential impacts were also evaluated under 2023 conditions for both the Proposed Action and No Action Alternative using the same methodology and criteria employed to analyze impacts under 2018 conditions. **Table 5-4** summarizes the results of the noise change analysis prepared for 2018.

The noise analysis results indicate that the Proposed Action when compared to the No Action Alternative would not result in a DNL 1.5 dBA or higher increase in sensitive areas exposed to DNL 65 dB or higher. In addition, no population would be exposed to reportable noise increases between DNL 60 dB and 65 dB. However, a total of 438 people associated with nine population centroids would experience a DNL 5 dB increase in areas exposed to DNL between 45 dB and 60 dB. All the population centroids are located to the southwest of DTW. Similar to noise analysis results for 2018, this reportable noise increase is attributable to aircraft operating on the proposed KAYLN1 and CCOBB1 SIDs.

Table 5-4 Change in Potential Population Exposed to Aircraft Noise – 2023

DNL Noise Exposure Level Under the Proposed Action	Increase in DNL with the Proposed Action	Population Exposed to Noise that Exceeds the Threshold	
		No Action Alternative	Proposed Action
DNL 65 and higher	DNL 1.5 dB or greater	0	0
DNL 60 to 65	DNL 3.0 dB or greater	0	0
DNL 45 to 60	DNL 5.0 dB or greater	0	438

Sources: U.S. Census Bureau, 2010 Census (population centroid data), accessed March 2015; ATAC Corporation, October 2017 (AEDT modeling results).
Prepared by: ATAC Corporation, October 2017.

Exhibit 5-2 shows the location of the population centroids that would experience the reportable noise increase. Although there is a reportable noise increase in 2023, these results indicate that the Proposed Action would not result in a significant noise exposure impact on population exposed to DNL 65 dB or higher levels under the Proposed Action. Detailed information on the population centroids can be found in the *CLE-DTW Noise Technical Report* available at http://www.metroplexenvironmental.com.

Under the No Action Alternative, no changes to air traffic routes in the Cleveland-Detroit Metroplex would occur in 2023 and no effects related to changes in aircraft noise exposure would be anticipated.

5.1.5 Noise Sensitive Uses and Areas

In addition to disclosing potential noise impacts to residential population, FAA Order 1050.1F requires the FAA to identify and describe noise sensitive uses and areas in the General Study Area. As defined in Paragraph 11-5b(8) of Order 1050.1F, a noise sensitive area is "[a]n area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks,

recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites." Potential impacts to residential population are discussed in Sections 5.1.3 and 5.1.4. Potential impacts to recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites are discussed in Sections 5.2 and 5.3. Excluding these resources, **Table 4-3** in Chapter 4 lists the locations identified as noise sensitive uses in the General Study Area. The noise analysis results indicate that the Proposed Action when compared to the No Action Alternative would not result in a DNL 1.5 dBA or higher increase to noise sensitive uses or noise sensitive areas in locations exposed to DNL 65 dB or higher. In addition, these resources would not experience reportable noise increases between DNL 60 dB and 65 dB and DNL 45 and 60 dB.

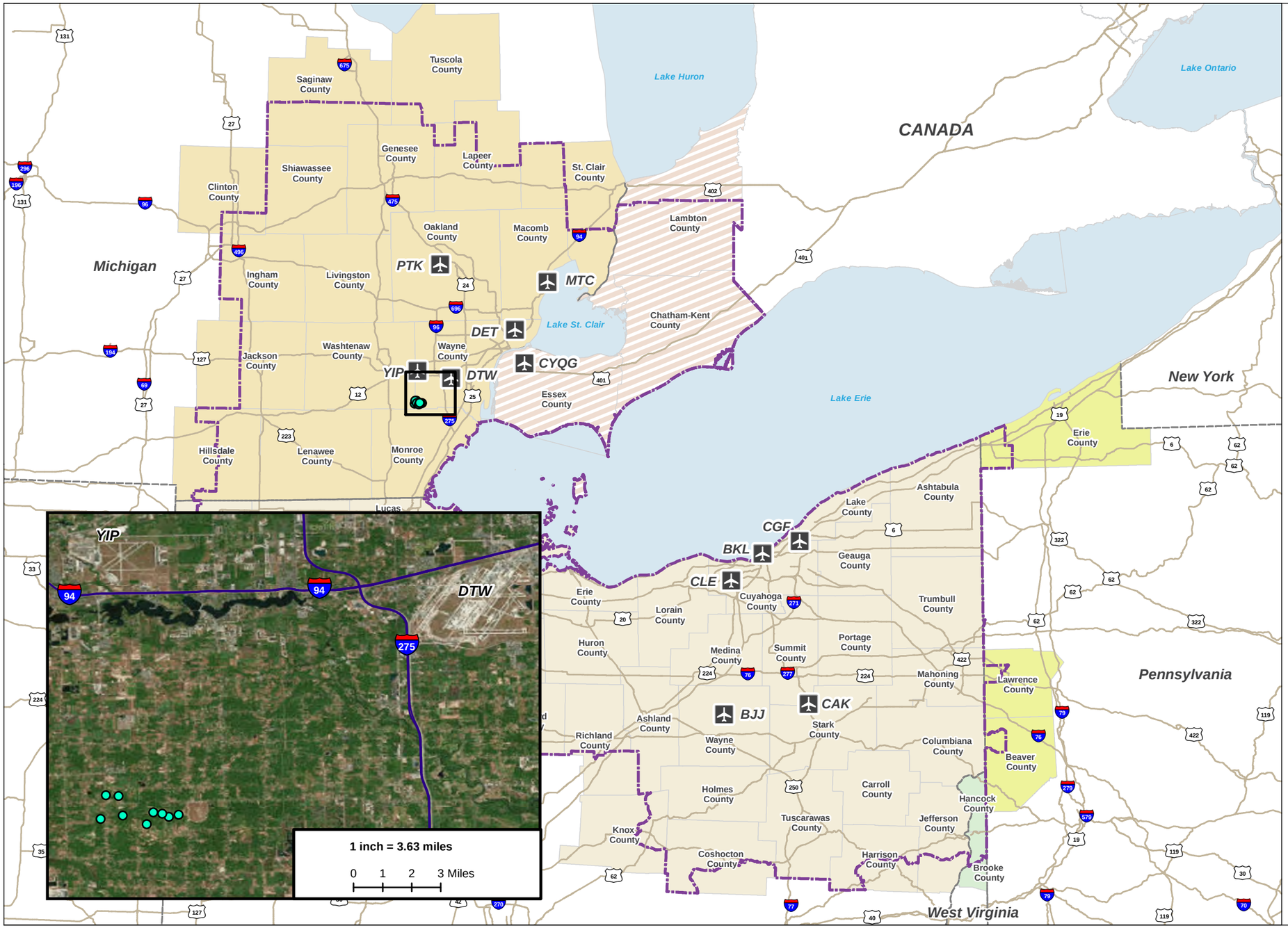
5.1.6 Noise Compatible Land Use

FAA Order 1050.1F requires that EA documents discuss possible conflicts between the proposed action and the objectives of federal, regional, state, local and tribal land use plans, policies and controls for the area concerned. Potential impacts to noise compatible land use were focused on changes in aircraft noise exposure resulting from implementing the Proposed Action. FAA Order 1050.1F states, "The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impact. If the noise analysis concludes that there is no significant impact, a similar conclusion usually may be drawn with respect to compatible land use." Air traffic actions like the CLE-DTW Metroplex Project do not result in direct impacts to land such as ground disturbance. Accordingly, the compatible land use analysis relies on changes in aircraft noise exposure between the Proposed Action and the No Action Alternative (discussed in Section 5.1) as the basis for determining compatible land use impacts within the General Study Area.

5.1.6.1 Potential Impacts – 2018 and 2023

As stated in Section 5.1, the Proposed Action, when compared with the No Action Alternative, would not result in changes in aircraft noise exposure in 2018 or 2023 that would exceed the FAA's significance threshold. Likewise, there are no conflicts with federal, regional, state, local land use plans, policies and controls. Therefore, the Proposed Action would not result in significant compatible land use impacts.

Under the No Action Alternative, there would be no changes to air traffic routing in the General Study Area and no changes in aircraft noise exposure expected to occur in either 2018 or 2023. Therefore, the No Action Alternative would not result in significant compatible land use impacts.



LEGEND

- Centroid Exposed to a DNL 45 to 60 dB with a DNL 5 dB Increase
- General Study Area Boundary
- Study Airports
- Water
- State and Provincial Boundaries
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Counties in the General Study Area

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- West Virginia Counties
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Notes:

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CYQG	Windsor Airport
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TOL	Toledo Express Airport
YIP	Willow Run Airport

Coordinate System: NAD 1983 Albers
Projection: Albers
Datum: North American 1983
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Sources: Statistics Canada Catalogue no. 92-160-X, 2011 (Provincial, Canadian counties and municipalities, water boundary Files); Road Network File, 2016 Census. Statistics Canada Catalogue no. 92-500-X (Highways); U.S. Census Bureau, 2016 (2016 TIGER/Line Shapefiles (machine-readable data files); ESRI, Inc., 2016 (U.S. states, counties, tribal properties, roads, airports); ATAC Corporation, 2017, (2016 General Study Area boundary).
Prepared by: ATAC Corporation, April, 2018.

Exhibit 5-2

Change in Population Exposed to Aircraft Noise - 2023

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5.2 Department of Transportation Act, Section 4(f) Resources

This section discusses potential impacts to Department of Transportation (DOT) Act, Section 4(f) Resources. **Exhibit 4-4** depicts Section 4(f) resources within the General Study Area as described in Section 4.3.3.

5.2.1 Summary of Impacts

Evaluating potential impacts to Section 4(f) resources focuses on changes in aircraft noise exposure resulting from implementing the Proposed Action. The FAA's aircraft noise exposure analysis indicates that the Proposed Action would not substantially change the noise environment at any Section 4(f) resource identified within the General Study Area when compared with the No Action Alternative. Furthermore, any changes in aircraft traffic patterns would occur at altitudes and distances from viewers that would not substantially impair the view or setting of Section 4(f) resources. Therefore, no constructive use of a Section 4(f) resource associated with the Proposed Action would occur and no impacts would be anticipated.

Under the No Action Alternative, no changes in air traffic routes in the General Study Area would occur. Therefore, no changes to aircraft noise exposure or aircraft overflight patterns would occur over Section 4(f) resources and no impacts would be anticipated.

5.2.2 Methodology

The FAA evaluates potential effects on Section 4(f) resources in terms of both direct impacts (i.e., physical use) and indirect impacts (i.e., constructive use). A direct impact would occur as a result of land acquisition, construction, or other ground disturbance activities that would result in physical use of all or a portion of a Section 4(f) property. As land acquisition, construction, or other ground disturbance activities would not occur under either the Proposed Action or the No Action Alternative, neither alternative would have the potential to cause a direct impact to a Section 4(f) resource. Therefore, analysis of potential impacts to Section 4(f) resources is limited to identifying indirect impacts resulting from constructive use. A constructive use of a Section 4(f) resource would occur if there were a substantial impairment of the resource to the degree that the activities, features, or attributes of the site that contribute to its significance or enjoyment are substantially diminished. This could occur as a result of both visual and noise impacts. Concerning aircraft noise, a constructive use would occur if noise levels substantially impair the resource. Refer to Section 5.9, Visual Impacts, regarding potential visual impacts within the General Study Area.

Noise exposure levels were calculated for grid points placed at Section 4(f) properties. A list of the resources evaluated is provided in the *Aircraft Noise Technical Report* available at http://www.metroplexenvironmental.com. Section 5.1.2 includes further discussion on the grid points used in the Section 4(f) analysis. The analysis of potential impacts to Section 4(f) resources considered whether these properties would experience a significant noise increase, when comparing the Proposed Action with the No Action Alternative, using the applicable thresholds shown in **Table 5-2**.

FAA Order 1050.1F identifies additional factors in deciding whether to apply the thresholds listed above to determine the significance of noise impacts on Section 4(f) resources. If a reportable noise increase were to occur, the Section 4(f) properties would be evaluated further to determine if the project-related effects would constitute a constructive use. Further

evaluation can include confirming that the property is in fact a Section 4(f) resource and identifying the specific attributes for which the property is managed (e.g., for traditional recreational uses or where other noise is very low and a quiet setting is a generally recognized purpose and attribute).

In cases where Land and Water Conservation Fund Act (LWCF)[46] resources are "used" by a transportation project, FAA Order 1050.1F stipulates that replacement satisfactory to the Secretary of the Interior is required for recreation lands aided by the Department of Interior's LWCF. Therefore, these resources are considered as part of the Section 4(f) impact analysis process.

5.2.3 Potential Impacts – 2018 and 2023

As stated in Section 5.1, the Proposed Action, when compared with the No Action Alternative, would not result in changes in aircraft noise exposure in 2018 or 2023 that would exceed the FAA's significance threshold or result in reportable noise increases to Section 4(f) resources. Noise analysis results for Section 4(f) properties located within the General Study Area can be found in Appendix 2 in the *Aircraft Noise Technical Report* available at http://www.metroplexenvironmental.com. As stated in Section 5.9, the Proposed Action, when compared with the No Action Alternative, would not cause a significant visual impact in 2018 or 2023. Any changes in aircraft traffic patterns would occur at altitudes and distances from viewers that would not substantially impair the view or setting of the Section 4(f) resources. Therefore, the Proposed Action would not result in potential impacts to Section 4(f) resources.

Under the No Action Alternative, no changes to air traffic routes in the Cleveland-Detroit Metroplex would occur in either 2018 or 2023 and no effects related to changes in aircraft noise exposure or impairment to the view or setting of Section 4(f) resources would be anticipated. Therefore, the No Action Alternative would not result in potential impacts to Section 4(f) resources.

5.3 Historic and Cultural Resources

This section discusses the analysis of impacts to historic properties under the Proposed Action and the No Action Alternative. Section 4.3.4 provides information on historic properties within the General Study Area. The FAA initiated consultation with the State Historic Preservation Officer (SHPOs) for the States of Michigan, Ohio, Pennsylvania, and West Virginia on June 13, 2017, in accordance with Section 106 of the *National Historic Preservation Act of 1966* (16 U.S.C. § 470 *et seq*.) and the implementing regulations at 36 C.F.R. Part 800. Additional consultation was undertaken with both the Michigan SHPO office beginning October 26, 2017 and concluding January 9, 2018; and the Sumpter Township Clerk's Office beginning October 27, 2017 and concluding November 1, 2017 regarding above ground properties that may be potentially eligible for NRHP listing. As there are no on-tribal or off-tribal[47] lands located within the General Study Area based on readily available data and there are no historically recognized lands within the General Study Area, no Tribal Historic Preservation Officers (THPOs) were contacted as part of the Section 106 process.

[46] 16 U.S.C. §§ 460l-4, et seq.

[47] "Off-Tribal" lands may include Protected Tribal Resources or Native American sacred sites.

5.3.1 Summary of Impacts

The aircraft noise exposure analysis indicates that there would be no significant impact to the noise environment at any historic properties under the Proposed Action compared with the No Action Alternative. The aircraft noise exposure analysis indicates there would be reportable noise increases (see **Table 5-2**) in the Sumpter Township area (In the Southwest corner of Wayne County, southwest of DTW) of the General Study Area. Changes in historic and current aircraft traffic patterns would occur at altitudes and distances from viewers that would not substantially impair the view or setting of historic properties or those properties potentially eligible for NHRP listing. The Proposed Action would not directly or indirectly change the characteristics qualifying or potentially qualifying a historic resource for inclusion in or its eligibility for the NRHP. Therefore, no adverse effects to historic properties under the Proposed Action would be anticipated for 2018 or 2023.

Under the No Action Alternative, no changes to air traffic routes in the Cleveland-Detroit Metroplex would occur in either 2018 or 2023 and no changes to aircraft noise exposure or changes in aircraft overflight patterns over historic properties would be anticipated. Therefore, no historic properties would be affected by aircraft noise, nor would there be any visual impacts at historic properties under the No Action Alternative.

5.3.2 Methodology

The *National Historic Preservation Act of 1966* requires the FAA to consider the effects of its undertakings on properties listed or eligible for listing in the National Register of Historic Places (i.e., National Register). In assessing whether an undertaking, such as the Proposed Action, affects a property listed or eligible for listing on the National Register, FAA must consider both direct and indirect effects. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Federal regulations define an area of potential effect (APE) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.[48] Direct effects generally occur at the time and place of the proposed action. An APE has been defined for the CLE-DTW Metroplex Project to assess the potential direct and indirect effects of the Proposed Action on historic properties.

For purposes of this analysis, the APE is the same geographic area and boundary as the General Study Area. **Exhibit 4-5** in Section 4.3.3 shows the historic properties listed on the National Register that are found within the General Study Area. **Table 5-5** shows those properties identified by Sumpter Township as over 100 years age and potentially eligible for NHRP listing.

All historic properties identified within the APE require further evaluation by the FAA to determine if the property may experience a potential adverse effect. Therefore, noise exposure levels at points representing historic properties listed on the National Register were calculated for purposes of determining potential adverse effects. A list of the resources

[48] 36 CFR 800.16(d)

evaluated is provided in the *Aircraft Noise Technical Report* available at http://www.metroplexenvironmental.com. In addition, noise exposure results for the uniform grid points (located at 0.5 nm intervals throughout the General Study Area) were evaluated to identify potential adverse effects to historic properties that are eligible but may not be listed on the National Register. If a significant or reportable noise increase were identified at one of these grid points, the surrounding area would be examined for the presence of eligible-to-be-listed historic properties.

On June 13, 2017, the FAA sought concurrence from the Michigan, Ohio, Pennsylvania, and West Virginia SHPOs on the proposed methodology for determining impacts to historic properties and the proposed APE. Letters of concurrence were received from the West Virginia SHPO on July 17, 2017, Pennsylvania SHPO on July 18, 2017, Ohio SHPO on July 21, 2017, and the Michigan SHPO on October 11, 2017. Further discussions with the Michigan SHPO regarding above ground potentially eligible properties in the Sumpter Township concluded on January 9, 2018. Written and telephone discussions regarding above ground potentially eligible properties were conducted with Sumpter Township on October 27, 2017 and concluded November 1, 2017, with 12 properties noted by Sumpter Township as being over 100 years age and thus potentially eligible. Further address and georeferencing of the properties over 100 years age resulted in two properties identified as being within .5 nm of the reportable noise exposure grid points.

Table 5-5 Sumpter Township Properties Exceeding 100 Years Age

Address	City	State	Zipcode	Year Built	Reportable Noise Increase in Immediate Vicinity?
45633 Willis Rd.	Belleville	MI	48111	1915	No
46075 Willis Rd.	Belleville	MI	48111	1915	No
40200 Judd Rd.	Belleville	MI	48111	1917	No
23260 Karr Rd.	Belleville	MI	48111	1900	No
25200 Sumpter Rd.	Belleville	MI	48111	1915	No
23775 Martinsville Rd.	Belleville	MI	48111	1900	No
39505 Willow Rd.	Belleville	MI	48111	1900	No
27320 Sumpter Rd.	Belleville	MI	48111	1910	No
49875 Willow Rd.	Belleville	MI	48111	1910	Yes
49317 Arkona Rd.	Belleville	MI	48111	1900	Yes
29209 Karr Rd.	Belleville	MI	48111	1900	No
22160 Elwell	Belleville	MI	48112	1889	No

Source: Sumpter Township Clerk's Office File Research, November 1, 2017.
Prepared by: ATAC Corporation, November 2017.

The analysis of potential impacts to historic properties considers whether these properties would experience a significant noise increase, when comparing the Proposed Action with the No Action Alternative, using the applicable thresholds shown in **Table 5-2**. Properties exposed to DNL 65 dB or higher under the Proposed Action and an increase of DNL 1.5 dB or higher may be considered to be potentially adversely effected by the project. Reportable increases in noise were detected for properties potentially eligible for NHRP listing and exposed to DNL between DNL 45 dB and lower than 65 dB, thus the FAA considered further whether the increase would result in an adverse effect on historic properties. The noise analysis indicated a reportable change for two properties potentially eligible for NHRP listing. Aircraft overflight and visual presence have been documented in the Detroit area since

approximately 1910.[49] DTW airport was officially opened on February 22, 1930 and by 1958 had full radar, air traffic control, multiple arrival and departure runways similar to the current layout, and was certified for international jet aircraft.[50] Historic jet traffic has served the region and exposed properties to jet aircraft overflight including the Sumpter Township since the mid-1950s.[51] Concluding the further research on the subject properties determined the reportable increase would not diminish the integrity of the applicable property's setting for which the setting contributes to historical or cultural significance. One of the public workshops was held in Sumpter Township at the Sumpter Township Community Center on November 30, 2017 to respond in person to any questions about reportable noise increases. 12 people attended the workshop in Sumpter Township and there were no submitted comments regarding potential adverse effects on historic properties. Additional public workshop details are found in Appendix A.

5.3.3 Potential Impacts – 2018 and 2023

As stated in Section 5.1, when compared with the No Action Alternative, the Proposed Action would not result in changes in aircraft noise exposure in 2018 or 2023 that would exceed FAA's significance threshold for noise. While reportable noise increases to residential population were identified, none of these increases occur at NHRP listed historic properties. The two properties in the immediate vicinity of the reportable noise increases would experience no effect in their continuing potential eligibility for NHRP listing from implementation of the Proposed Action due to the historic and continuing overflight presence since the mid-1950s. Therefore, the Proposed Action would not result in an adverse effect to historic properties. Noise analysis results for historic properties located within the General Study Area can be found in Appendix 2 in the *Aircraft Noise Technical Report* available at http://www.metroplexenvironmental.com.

Under the No Action Alternative no changes to air traffic routes in the Cleveland-Detroit Metroplex would occur in either 2018 or 2023 and no adverse effects related to changes in aircraft noise exposure would be anticipated. Therefore, the No Action Alternative would not result in impacts to historic or cultural resources.

5.4 Wildlife (Avian and Bat Species) and Migratory Birds

This section discusses the analysis of potential impacts to avian and bat species under the Proposed Action and the No Action Alternative.

5.4.1 Summary of Impacts

The greatest potential for impacts to wildlife species would result from wildlife strikes on avian and bat species at altitudes below 3,000 feet AGL. Changes to flight paths under the Proposed Action would primarily occur at or above 3,000 feet AGL. Therefore, the Proposed Action would not result in significant impacts to avian and bat species when compared with the No Action Alternative.

[49] Detroit News, http://www.detroitnews.com/picture-gallery/news/local/michigan-history/2014/09/08/detroits-early-history-in-aviation/14402765/ accessed October 27, 2017.

[50] Detroit Metropolitan Wayne County Airport, http://www.metroairport.com/TravelerInfo/GeneralInfo/AboutDTW/AirportHistory.aspx accessed November 1, 2017.

[51] Id.

The No Action Alternative would not involve changes to air traffic flows, land acquisition, construction, or other ground disturbance activities. Therefore, the No Action Alternative would not result in significant impacts to fish, wildlife, or plants.

5.4.2 Methodology

The FAA's *Wildlife Strike Database* is the best information available for assessing potential impacts of aircraft on wildlife. Strike reports over the past 25 years aggregated nationally as well as for individual airports are available from the database to understand existing conditions. Strike reports are comparable to known information on the presence of specific species of concern to corroborate the reports.

This analysis involved a review of wildlife strike reports[52] for the Study Airports under both the Proposed Action and the No Action Alternative, and an evaluation of the potential for the presence of federal- and state-listed threatened and endangered species (i.e., special-status species) within the General Study Area. The FAA compared modifications in flight procedures to the occurrence of special-status species to qualitatively assess the likelihood of whether wildlife strikes might change under the Proposed Action.

5.4.3 Potential Impacts – 2018 and 2023

A significant impact would be likely to occur if the Proposed Action were to jeopardize the existence of special-status species or result in destroying or adversely modifying critical habitat in the General Study Area. Changes to flight paths under the Proposed Action would primarily occur at or above 3,000 feet AGL, so there is no potential for these effects in the General Study Area. Accordingly, the analysis is focused on the potential for significant impacts to species resulting from increased wildlife strikes with aircraft.

Since 1990, the FAA has compiled reports of wildlife strikes with aircraft. The information is available to the public through the FAA's *Wildlife Strike Database* and the "Annual Report: Wildlife Strikes to Civil Aircraft in the United States." Between 1990 and 2015, the Wildlife Strike Database reported 166,276 wildlife strikes nationally.[53] Of the records that identify the type of animal involved in the strike incident, birds represent 96 percent of all strikes.[54] Of those records, for commercial and GA aircraft, 73 percent of the strikes occurred at or below 500 feet AGL and declined by 34 percent for every 1,000-foot gain in height for commercial aircraft and 44 percent for GA aircraft. The Wildlife Strike Database reports that of identified species, waterfowl, gulls, and raptors are the species groups of birds with the most damaging strikes.[55]

Table 5-6 provides a summary of wildlife strikes reported for the Study Airport between January 1,1990 and December 31, 2016. In total, 2,329 reported strikes (96 percent of all strike records) occurred at altitudes below 3,000 feet AGL. A total of 1,472 strikes reported at the Study Airports included species identification.

The *Migratory Bird Treaty Act (MBTA) of 1918* (16 U.S.C. §§ 703–712) protects all the bird species identified in these reports. Furthermore, federal and state laws protect listed

[52] U.S. Department of Transportation, Federal Aviation Administration, *Wildlife Strike Database* (http://www.faa.gov/airports/airport_safety/wildlife/database/; Accessed August 2017).

[53] Id.

[54] Id.

[55] Id.

endangered and threatened species. In Chapter 4, **Table 4-3** identifies the four federally-listed bird species found in counties in the General Study Area. None of the bird strike reports at the Study Airports included the species listed in **Table 4-3**.

The number of aircraft operations under the Proposed Action and No Action Alternative would be the same. Therefore, the assessment of the potential impacts focuses on changes to flight paths and the potential for impact due to wildlife strikes. As shown in **Table 5-6**, only three percent of bird/bat strikes (81of 2,329 total records) occurred at altitudes above 3,000 feet AGL. The decline in the number of strikes reported above 3,000 feet AGL indicates that there is less likelihood of bird/bat strikes at these altitudes. Under the Proposed Action, changes to proposed flight paths would primarily occur at or above 3,000 feet AGL and no significant changes to arrival and departure corridors below 3,000 feet AGL would be expected. Therefore, no significant impacts to bird or bat species would be anticipated.

The No Action Alternative would not involve changes to air traffic flows, land acquisition, construction, or other ground disturbance activities. Therefore, no impacts to avian and bat species would occur.

Table 5-6 FAA Wildlife Strike Database Records for Study Airports by Altitude (1990 – 2016)

Type of Strike	Airport (Ground Level)	3,000 ft. AGL or less	>3,000 ft. AGL to ≤ 10,000 ft. AGL	Greater than 10,000 ft. AGL	Total
Identified Bird and Bat Species	0	0	0	0	0
	193	0	0	193	193
	29	0	0	29	29
	27	1	0	28	27
	620	7	0	627	620
	59	1	0	60	59
	430	2	0	432	430
	14	1	0	15	14
	0	0	0	0	0
	35	0	0	35	35
	53	0	0	53	53
Total	1,460	12	0	1,472	1,460
Unknown Bird and Bat Species	1	0	0	1	1
	31	0	0	31	31
	49	7	0	56	49
	10	0	0	10	10
	249	26	1	276	249
	49	4	1	54	49
	415	29	3	447	415
	11	1	0	12	11
	0	0	0	0	0
	26	1	0	27	26
	28	1	0	29	28
Total	869	69	5	943	869
Grand Total	2,329	81	5	2,415	2,329
Percentage	96%	3%	0%	100%	96%

Source: U.S. Department of Transportation, Federal Aviation Administration, *FAA Wildlife Strike Database* (http://wildlife-mitigation.tc.faa.gov/wildlife/default.aspx) accessed August 16, 2017.
Prepared by: ATAC Corporation, August 2017.

5.5 Environmental Justice

This section presents a summary of the analysis of environmental justice impacts under the Proposed Action and the No Action Alternative.

5.5.1 Summary of Impacts

Neither the Proposed Action nor the No Action Alternative would displace people or businesses; therefore, implementing the Proposed Action or No Action Alternative would not result in direct impacts in this category. No areas within the General Study Area would experience significant impacts to air quality or noise. While some areas would be exposed to reportable noise increases of DNL 5 dB within areas exposed to DNL 45 to 60 dB, these would not constitute a significant impact related to a change in DNL exposure to people, including members of minority and/or low-income populations (see Section 5.1). Therefore, no disproportionately high and adverse effects to minority populations or low-income populations would occur under either the Proposed Action or the No Action Alternative.

5.5.2 Methodology

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies include environmental justice as part of their mission by identifying and addressing as appropriate, the potential for disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. Environmental justice applies to all environmental resources. Therefore, a disproportionately high and adverse human health or environmental effect on minority and low-income populations may represent a significant impact.

5.5.3 Potential Impacts – 2018 and 2023

Under the Proposed Action, neither people nor businesses would be displaced. As discussed in Section 5.1, under the Proposed Action, no census block centroids in the General Study Area would experience a significant noise impact in either 2018 or 2023. However, under 2018 conditions, six population centroids representing 249 people located in areas identified as environmental justice communities experience reportable noise increases of DNL 5 dB in areas exposed to DNL 45 to 60 dB. These centroids are depicted in **Exhibit 5-3**. Similarly, under 2023 conditions, eight population centroids representing 332 people located in areas identified as environmental justice communities experience reportable noise increases of DNL 5 dB in areas exposed to DNL 45 to 60 dB. These centroids are depicted in **Exhibit 5-4**. As noted in **Table 4-2**, 1,024,929 persons are exposed to noise levels above 45dB in the General Study Area and of this total, .00025% of the total noise exposed population are exposed to a reportable noise increase. While disclosure of reportable noise increases in the communities is warranted, they are not significant noise impacts, nor do they reflect disproportionately high or adverse impacts to minority or low-income communities relative to the General Study Area as whole. Therefore, no adverse direct or indirect effects would occur to any environmental justice populations within the General Study Area under the Proposed Action for 2018 and 2023.

Under the No Action Alternative, neither people nor businesses would be displaced. Furthermore, air traffic routes would not change and there would be no change in aircraft noise exposure in 2018 or 2023 that could result in an indirect impact. Therefore, the No

Action Alternative would not result in disproportionately high and adverse human health or environmental effects on minority and low-income populations.

5.6 Energy Supply (Aircraft Fuel)

This section discusses whether changes in the movement of aircraft would result in measurable effects on local energy supplies under the Proposed Action and the No Action Alternative.

5.6.1 Summary of Impacts

In comparison to the No Action Alternative, the Proposed Action would result in a relatively small increase in aircraft fuel burned: 1.47 percent increase in 2018 and 2.06 percent increase in 2023. These increases would not be expected to affect local aircraft fuel supplies. Therefore, no significant impacts to energy supply would be anticipated.

The No Action Alternative would not involve changes to air traffic flows, construction, or other ground disturbance activities. Therefore, the No Action Alternative would not result in the depletion of local energy supply.

5.6.2 Methodology

The Proposed Action would not change the number of aircraft operations relative to the No Action Alternative, but it would involve changes to air traffic flows during the departure, descent, and approach phases of flight. These changes affect both the route an aircraft may follow as well as its climb-out and descent profiles. This in turn may directly affect aircraft fuel burn (or fuel expended). Aircraft fuel burn is considered a proxy for determining whether the Proposed Action would have a measurable effect on local energy supplies when compared with the No Action Alternative.

In addition to calculating aircraft noise exposure, the FAA's AEDT model calculates aircraft-related fuel burn (e.g., AAD flight schedules, flight tracks, and runway use). See Section 5.1.2 for further discussion on AEDT input data. Determining the difference in fuel burn between alternatives can be used as an indicator of changes in fuel consumption resulting from implementation of the Proposed Action when compared with the No Action Alternative.

5.6.3 Potential Impacts – 2018 and 2023

Table 5-7 presents the results of the fuel burn analysis for the Proposed Action and No Action Alternative. In comparison to the No Action Alternative, the Proposed Action would result in approximately 15 metric tons (MT) more fuel burned in 2018 (1.47 percent increase) and approximately 23 MT more fuel burned in 2023 (2.06 percent increase). Given these relatively small increases, the FAA expects that when compared with the No Action Alternative, the Proposed Action would not adversely affect local fuel supplies. Therefore, no significant impacts to energy supply would be anticipated.

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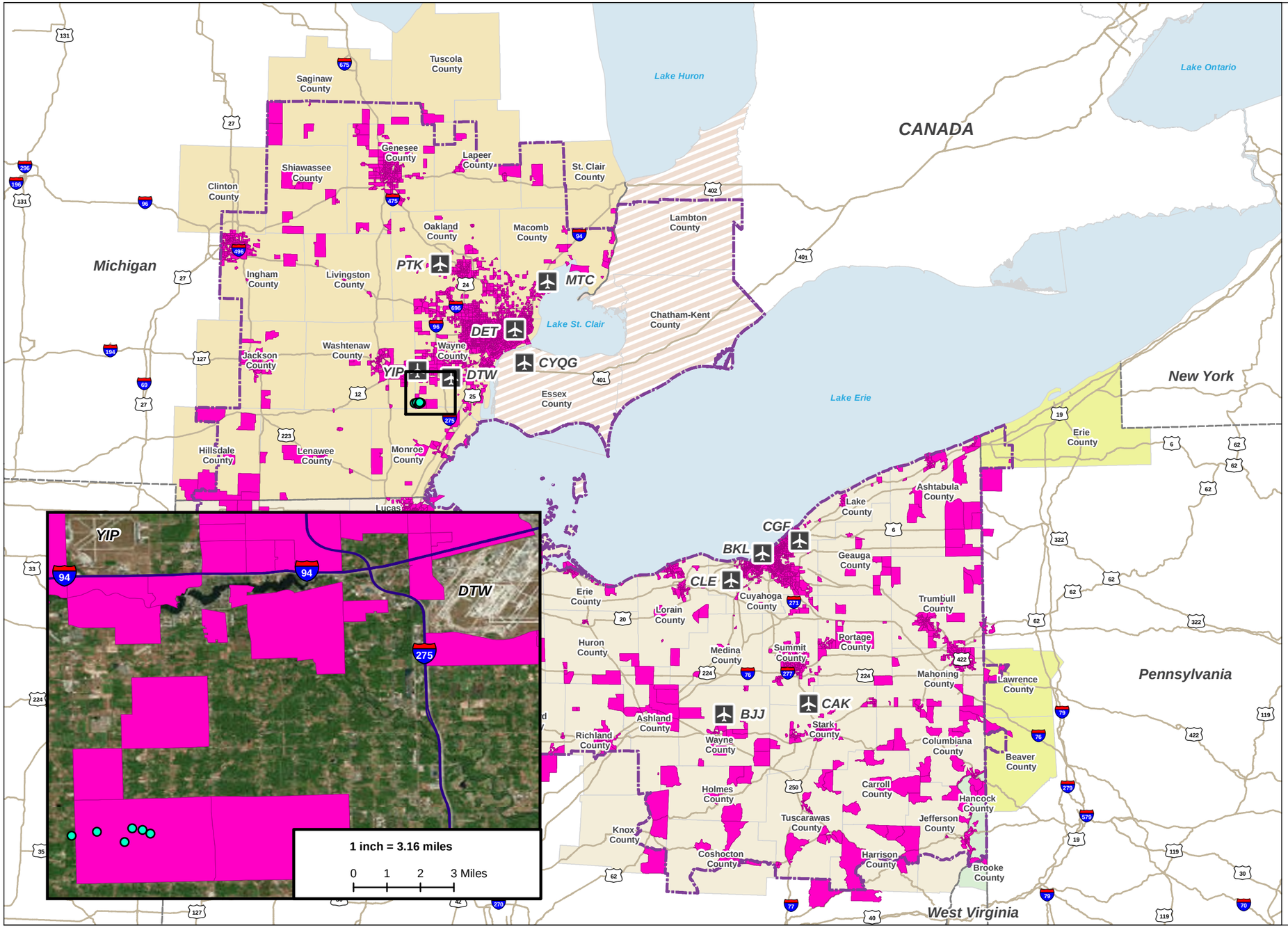

LEGEND

- Centroid Exposed to a DNL 45 to 60 dB with a DNL 5 dB Increase
- Area of Environmental Justice Concern
- General Study Area Boundary
- Study Airports
- Water
- State and Provincial Boundaries
- Highways

Counties in the General Study

- Michigan Counties
- Ohio Counties
- Pennsylvania Counties
- West Virginia Counties
- Canadian Counties and Municipalities

Notes:

BJJ	Wayne County Airport
BKL	Burke Lakefront Airport;
CAK	Akron-Canton Regional Airport
CGF	Cuyahoga County Airport
CLE	Cleveland-Hopkins International Airport
CYQG	Windsor Airport
DET	Coleman A. Young Municipal Airport
DTW	Detroit Metropolitan Wayne County Airport
MTC	Selfridge Air National Guard Base
PTK	Oakland County International Airport
TOL	Toledo Express Airport
YIP	Willow Run Airport

Coordinate System: NAD 1983 Albers
Projection: Albers
Datum: North American 1983
Scale: 1:1,839,538

0 5 10 20 Miles

Sources: Statistics Canada Catalogue no. 92-160-X, 2011 (Provincial, Canadian counties and municipalities, water boundary Files); Road Network File, 2016 Census. Statistics Canada Catalogue no. 92-500-X (Highways); U.S. Census Bureau, 2016 (2016 TIGER/Line Shapefiles (machine-readable data files); ESRI, Inc., 2016 (U.S. states, counties, tribal properties, roads, airports); ATAC Corporation, 2017, (2016 General Study Area boundary).

Prepared by: ATAC Corporation, April 2018.

Exhibit 5-3

Change in Population Exposed to Aircraft Noise in Environmental Justice Areas - 2018

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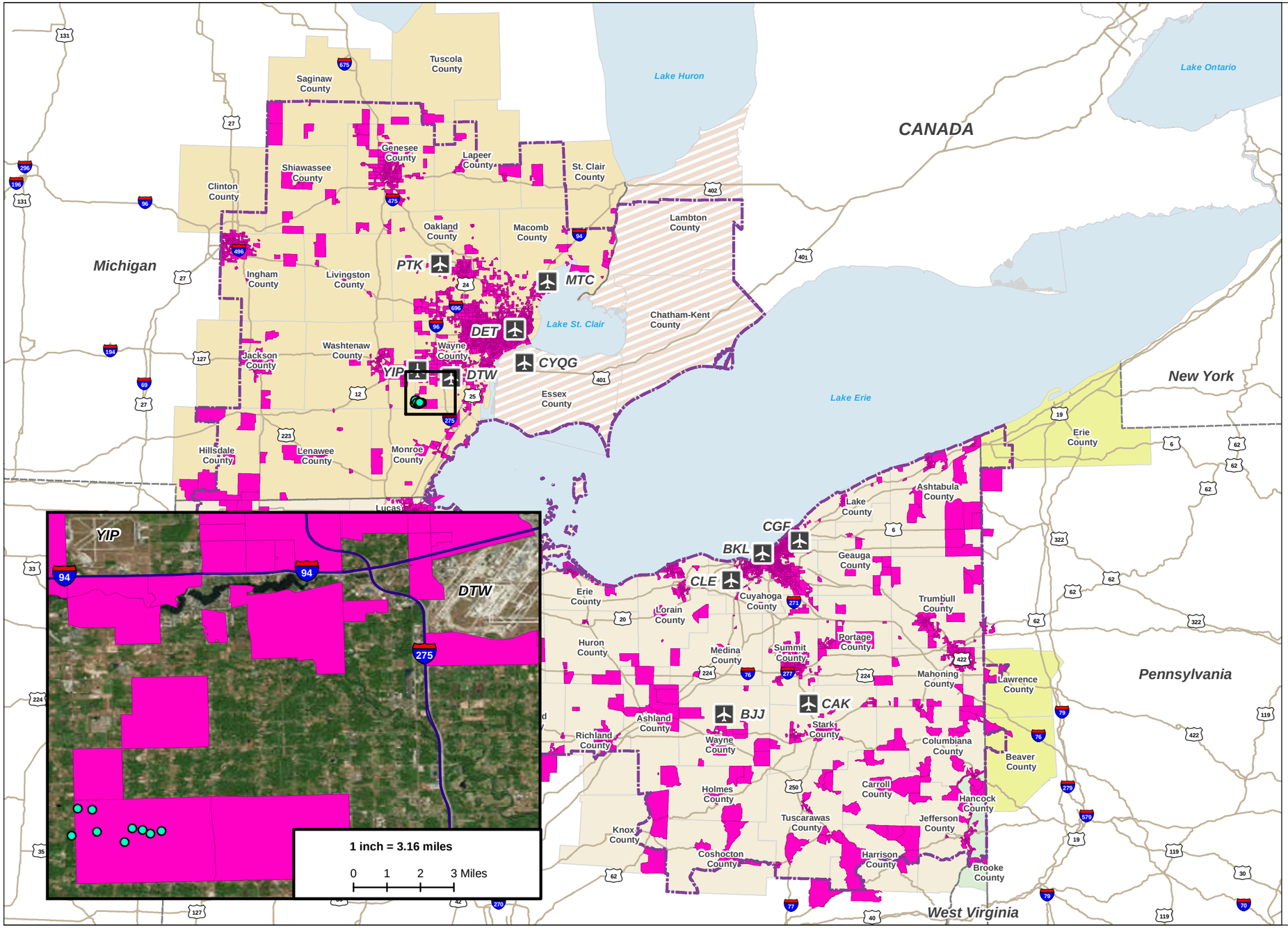

LEGEND

- Centroid Exposed to a DNL 45 to 60 dB with a DNL 5 dB Increase
- Area of Environmental Justice Concern
- General Study Area Boundary
- Study Airports
- Water
- State and Provincial Boundaries
- Highways

Counties in the General Study Area

- Michigan Counties
- Ohio Counties
- Pennsylvania Counties
- West Virginia Counties
- Canadian Counties and Municipalities

Notes:

BJJ	Wayne County Airport
BKL	Burke Lakefront Airport;
CAK	Akron-Canton Regional Airport
CGF	Cuyahoga County Airport
CLE	Cleveland-Hopkins International Airport
CYQG	Windsor Airport
DET	Coleman A. Young Municipal Airport
DTW	Detroit Metropolitan Wayne County Airport
MTC	Selfridge Air National Guard Base
PTK	Oakland County International Airport
TOL	Toledo Express Airport
YIP	Willow Run Airport

Coordinate System: NAD 1983 Albers
Projection: Albers
Datum: North American 1983
Scale: 1:1,839,538

0 5 10 20 Miles

Sources: Statistics Canada Catalogue no. 92-160-X, 2011 (Provincial, Canadian counties and municipalities, water boundary Files); Road Network File, 2016 Census. Statistics Canada Catalogue no. 92-500-X (Highways); U.S. Census Bureau, 2016 (2016 TIGER/Line Shapefiles (machine-readable data files); ESRI, Inc., 2016 (U.S. states, counties, tribal properties, roads, airports); ATAC Corporation, 2017, (2016 General Study Area boundary).

Prepared by: ATAC Corporation, April 2018.

Exhibit 5-4

Change in Population Exposed to Aircraft Noise in Environmental Justice Areas - 2023

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Table 5-7 Energy Consumption Comparison

	2018		2023	
	No Action Alternative	**Proposed Action**	**No Action Alternative**	**Proposed Action**
Fuel Burn (MT)	1012.68	1027.62	1105.77	1,128.56
Volume Change (MT) (Proposed Action – No Action Alternative)		14.93		22.8
Percent Change from No Action Alternative		1.47		2.06

Note: MT = Metric Ton

Source: ATAC Corporation, October 2017 (AEDT modeling results).
Prepared by: ATAC Corporation, October 2017.

5.7 Air Quality

This section discusses the analysis of air quality impacts under the Proposed Action and the No Action Alternative.

5.7.1 Summary of Impacts

The Proposed Action would result in a slight increase in emissions when compared to the No Action Alternative. However, changes to flight paths under the Proposed Action would occur at or above 3,000 feet AGL and are presumed to conform with the applicable state implementation plans (SIPs). Furthermore, changes to flight paths below the mixing height are also presumed to conform when modifications to procedures are designed to enhance operational efficiency. The slight increase in emissions is expected to have little if any effect on emissions or ground concentrations. Therefore, no significant impacts to air quality would be anticipated.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to air quality would be anticipated.

5.7.2 Methodology

Typically, significant air quality impacts would be identified if an action would result in the exceedance of one or more of the NAAQS for any time period analyzed.[56] Section 176(c) of the *Clean Air Act* requires that federal actions conform to the appropriate SIP in order to attain the air quality goals identified in the CAA. However, a conformity determination is not required if the emissions caused by a federal action would be less than the *de minimis* levels established in regulations issued by EPA.[57] FAA Order 1050.1F provides that further analysis for NEPA purposes is normally not required where emissions do not exceed the EPA's *de minimis* thresholds.[58] The EPA regulations identify certain actions that would not exceed these thresholds, including ATC activities and adoption of approach, departure, and enroute procedures for aircraft operations above the mixing height specified in the applicable SIP (or 3,000 feet AGL in places without an established mixing height). In addition, the EPA regulations allow federal agencies to identify specific actions as "presumed to conform" (PTC)

[56] FAA Order 1050.1F Desk Reference, Section 1, July 2015.
[57] 40 C.F.R. § 93.153(b).
[58] FAA Order 1050.1F Desk Reference, Section 1, July 2015.

to the applicable SIP.[59] In a notice published in the Federal Register, the FAA has identified several actions that "will not exceed the applicable *de minimis* emissions levels" and, therefore, are presumed to conform, including ATC activities and adoption of approach, departure, and enroute procedures for air operations.[60] The FAA's PTC notice explains that aircraft emissions above the mixing height do not have an effect on pollution concentrations at ground level. The notice also specifically notes that changes in air traffic procedures above 1,500 feet AGL and below the mixing height "would have little if any effect on emissions and ground concentrations."[61] Furthermore, "air traffic actions below the mixing height are also presumed to conform when modifications to routes and procedures are designed to enhance operational efficiency (i.e., to reduce delay)."[62]

5.7.3 Potential Impacts – 2018 and 2023

Under the Proposed Action there would be a slight increase in fuel burn (1.46 percent in 2018 and 2.03 percent in 2023) when compared to the No Action Alternative. While increased fuel burn corresponds with an increase in emissions, operational changes that could result in an increase in fuel burn would occur at 3,000 feet AGL or above and would not result in an increase in emissions and ground concentrations. Any operational changes that could result in an increase in fuel burn would occur at or above 3,000 feet AGL. Procedures above 3,000 feet AGL are considered a *de minimis* action, would have little if any effect on emissions and ground concentrations, and are presumed to conform to all SIPs for criteria pollutants. Therefore, no further air quality analysis is necessary, a conformity determination is not required, and the Proposed Action would not result in a significant impact to air quality. The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to air quality would be anticipated.

5.8 Climate

This section discusses greenhouse gas (GHG) emissions and effects to the climate as they relate to the Proposed Action and the No Action Alternative.

5.8.1 Summary of Impacts

Although fuel burn would increase slightly under the Proposed Action as compared to the No Action Alternative, no significant impacts to the climate would be anticipated.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to climate would be anticipated.

5.8.2 Methodology

In accordance with FAA guidance, estimated CO_2 emissions were calculated from the amount of fuel burned under the No Action Alternative and the Proposed Action in 2018 and 2023 (see Section 5.8). The resulting CO_2 emissions were then reported as CO_2e.

[59] Id at 93.153(f).
[60] Federal Presumed to Conform Actions under General Conformity, 72 Fed. Reg. 41565 (July 30, 2007).
[61] Id.
[62] Id.

5.8.3 Potential Impacts – 2018 and 2023

Table 5-8 shows project-related CO_2e emissions. In 2018, the Proposed Action would produce approximately 3,242 MT of CO_2e and the No Action Alternative would produce approximately 3,195 MT of CO_2e. This represents a slight increase of approximately 47 MT of CO_2e or 1.47 percent under the Proposed Action when compared to the No Action Alternative. This would compromise less than 0.000062 percent of U.S.-based greenhouse gas emissions as reported for 2014[63] and less than 0.000009 percent of global greenhouse gas emissions as reported for 2014.[64] Similarly, in 2023, the No Action Alternative would produce approximately 3,489 MT of CO_2e and the Proposed Action would produce approximately 3,561 MT of CO_2e. This represents a slight increase of approximately 72 MT of CO_2e or 2.06 percent under the Proposed Action when compared to the No Action Alternative. This would compromise less than 0.000066 percent of U.S.-based greenhouse gas emissions as reported for 2014 and less than 0.000010 percent of global greenhouse gas emissions as reported for 2014.

Table 5-8 CO_2e Emissions – 2018 and 2023

	2018		2023	
	No Action Alternative	**Proposed Action**	**No Action Alternative**	**Proposed Action**
CO_2e Emissions (MT)	3,195.01	3,242.13	3,488.70	3,560.62
Volume Change (MT)		47.11		71.92
(Proposed Action – No Action Alternative)		1.47		2.06

Note: CO_2e = Carbon Dioxide Equivalent

Source: ATAC Corporation, October 2017 (AEDT modeling results).
Prepared by: ATAC Corporation, October 2017.

5.9 Visual Impacts

This section discusses the analysis of visual impacts under the Proposed Action and the No Action Alternative.

5.9.1 Summary of Impacts

As stated in Section 5.1, implementation of the Proposed Action would not increase the number of aircraft operations at the Study Airports compared with the No Action Alternative. Changes in aircraft traffic patterns under the Proposed Action are expected to be at altitudes and distances sufficiently removed from viewers that visual impacts would not be anticipated.

Under the No Action Alternative, no changes in air traffic routes would occur and no changes in aircraft overflight patterns would be expected. Therefore, the No Action Alternative would not result in visual impacts.

[63] Boden, T.A., Marland, G., and Andres, R.J. (2017). National CO2 Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-2014, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, 10.3334/CDIAC/00001_V2017. Information Analysis Center (http://cdiac.ornl.gov/trends/emis/tre_coun.html#), accessed September 2017.

[64] Id.

5.9.2 Methodology

As discussed in FAA Order 1050.1F, visual, or aesthetic, impacts are difficult to define and evaluate because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the project contrasts with the existing environment and whether the difference is considered objectionable by the agency responsible for the location in which the project is set. Visual impacts are normally related to the disturbance of the aesthetic integrity of an area caused by development, construction, or demolition, and thus, do not typically apply to airspace changes.

To evaluate the potential for indirect impacts resulting from changes in aircraft routings and visual intrusion, the general altitudes at which aircraft route changes occur beyond the immediate airport environs, which experience overflights on a routine basis, are considered to evaluate the potential for visual impacts.

5.9.3 Potential Impacts – 2018 and 2023

According to FAA Order 1050.1F, the visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact. Changes in aircraft routes associated with the Proposed Action would generally occur at altitudes above 3,000 feet AGL; therefore, the visual sight of aircraft and aircraft lights would not be considered intrusive. Consequently, the Proposed Action would not result in significant visual impacts. Accordingly, significant visual impacts resulting from the Proposed Action or the No Action Alternative would not be anticipated.

5.10 Cumulative Impacts

Consideration of cumulative impacts applies to the impacts resulting from the implementation of the Proposed Action with other actions. CEQ regulations define a cumulative impact as "an impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."[65] The regulations also state that cumulative impacts can result from individually minor, but collectively significant actions that take place over a period of time.

5.10.1 Summary of Impacts

The implementation of the Proposed Action when considered with other past, present, and reasonably foreseeable future actions would not be expected to result in significant cumulative impacts.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no cumulative impacts would be anticipated.

5.10.2 Methodology

Research was conducted to identify planned airport improvement projects at all Study Airports that in combination with the Proposed Action might result in cumulative environmental impacts. Due to the nature of the resources affected by the Proposed Action, only past, present, and reasonably foreseeable future actions that would have direct or indirect effects

[65] 40 C.F.R § 1508.7

on aircraft flight patterns within the General Study Area were to be considered. Therefore, the type of projects that would be considered under the cumulative impact analysis were primarily limited to airfield projects, specifically projects that directly affect or involve runways and modifications to parallel taxiways. Reasonably foreseeable future actions refers to projects that would likely be completed before 2023.

The same significance thresholds used to determine impacts associated with the Proposed Action are applied to determine significant cumulative impacts. Because there is no potential for impact, those environmental resource categories that are not affected by the Proposed Action (listed in Section 4.2) are not further evaluated for cumulative impacts. Similarly, if no impacts to an environmental resource category were identified under the Proposed Action when compared to the No Action Alternative, then no further analysis for cumulative impacts was required.

5.10.3 Potential Impacts – 2018 and 2023

As stated in Section 5.10.2, extensive research was conducted to identify relevant airport improvement projects related to runway changes. Sources reviewed included FAA, state, and local Capital Improvement Project lists and websites for all airports and associated state, county, and local planning, public works, and transportation agencies. No documents identified included information on past, present, and reasonably foreseeable future actions with the potential for direct or indirect effects on aircraft flight patterns within the General Study Area. Accordingly, no cumulative impacts would be anticipated for the Proposed Action when compared to the No Action Alternative for either 2018 or 2023.

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