2017 Aircraft LTO Data Processing for the National Emission Inventory

Purpose

To assist state, local, and tribal agencies in their submittal of aircraft-related activity data, EPA has compiled the aircraft landing and takeoff (LTO) data from several Federal Aviation Administration's (FAA) data sources including the 2017 T-100 dataset, which provides activity for large commercial aircraft and represents a majority of the emissions. To ensure completeness, the FAA's 2014 Terminal Area Forecast (TAF) data, 2014 Air Traffic Activity Data Systems (ATADS) data, and 2014 Airport Master Record (form 5010) data are also used to capture the smaller general aviation (GA), air taxis (AT) and military operations. These aircraft activity data are compiled and provided for review and revision by agencies in order to accurately estimate activity data for all aircraft types. These compiled data, including local revisions, will be used to calculate the 2017 National Emission Inventory (NEI) aviation emissions using the FAA's new Aviation Environmental Design Tool (AEDT).

Please note that by reviewing and correcting the LTO data in this dataset you will NOT need to submit an airport emissions file to EIS. If you send the LTO and facility revisions back to EPA now, EPA will perform the processing tasks required, such as applying the activity data to AEDT to estimate emissions, matching EIS facility, unit, and process IDs for the airports, as well submitting the emissions inventory to the EIS Gateway. This will be the easiest way for agencies to submit local aviation data into EIS. Those who choose not to participate in this data gathering process, but still want local emissions data included in EIS, will be required to prepare their data to meet all EIS input requirements and submit it themselves.

Background

The T-100 data is derived from commercial aviation operations, reported directly by the airlines and specifically includes detailed information about large commercial air carriers and air taxis. Because the T-100 aircraft data are provided for individual aircraft, specifying manufacturer and aircraft model, they can be matched to specific aircraft in the FAA's new AEDT, which is a SQL based software tool used to estimate emissions. Please note the previous FAA's Emission Dispersion and Modeling Systems (EDMS) emissions will not be accepted by the EPA for current and future versions of the NEI. Because of the details provided in T-100, it is possible to identify which aircraft are typically used for air taxi services based on typical passenger capacity. All non-air taxi data in the T-100 data are assumed to be large commercial aircraft.

The FAA's TAF and ATADS datasets do not provide operations data at the aircraft manufacturer and model level of detail that the T-100 data does; instead, operations are provided for general aircraft types (i.e., air carriers, air taxis, general aviation and military). ATADS includes actual operations at FAA controlled facilities, while TAF includes the ATADS data and also modeled operations for other non-FAA control facilities. Note that the TAF and ATADS data are provided as operations (separate operation

counts for each landing and takeoff leg), such that the TAF and ATADS operations need to be divided by 2 to get LTOs.

Previously the TAF/ATADS data were adjusted because both the T-100 data and the TAF/ATADS data are reported by the airports include commercial air carriers and air taxis, the data needs to be adjusted to avoid issues of double counting when the two datasets are combined. However due to limited resources, the EPA is using the 2014 TAF/ATADS data as used for 2014 NEI (after reconciliation with T100 and without any growth adjustment from 2014 to 2017) for the 2017 NEI with the assumption the overlap is not significant and cannot be quantified between the differing years.

The 5010 forms are used for airport infrastructure planning include a variety of information about airport operations and characteristics. Such information is particularly important for smaller facilities where data sources are sparse. The EPA reviewed the data reported in the 5010 submittals to estimate LTO activity for general aviation and air taxis. Again, EPA used the 5010 as adjusted for 2014 NEI with no growth for 2017. These carryover generic LTOs from the 2014NEI are identified as such.

Reviewing/Revising Data

EPA's compiled LTO data are available for state/local/tribal (SLT) agency review. The data are presented as a Microsoft Access database. Please do not review/revise the Access data. The database includes two drop-down menus: one for selecting data by state and one for selecting data by tribal code. Once the state/tribe has been selected, users have the option of viewing the data in Access (this is Read Only and for review ONLY) and exporting the data to a Microsoft Excel spreadsheet for further actual review and revisions. Agencies will need to review both the LTO data as well as facility information. The LTO data will include the Airport identification information, aircraft information, and LTO data. The facility data will include airport identification information, address, coordinates, description, and operating status.

Please note that to export the data to Excel, the user will first need to create a folder on the C drive of their computer called "2017 NEI LTO Review" (C:\2017 NEI LTO Review). The exported Excel file(s) will be generated in this folder. Revisions should be made in the Excel files as described below to facilitate EPA processing and avoid errors:

- Revising Data: Existing LTO data can be corrected by adding the new data value to the "Revised LTO" column and marking it as a "Revision" in the "Revisions Comment" field.
- Removing Data: Please DO NOT DELETE ANY ROWS in the Excel spreadsheet. If you want to remove LTO data, simply change the "Revised LTO" column to 0 and mark it as a "Revision" in the "Revisions Comment" field.
- Adding Data: Rows can be added to account for new aircraft or engine type combination. Please make sure that the airport, aircraft, and engine combination does not already exist in the dataset before adding new rows, as adding an existing combination may cause double counting. When adding a row, fill in all other fields when possible, including the EISFacilitySiteIdentifier

where possible. Also, leave the "PrimaryKey" and the "EPA LTO" fields blank, as these fields are for internal record keeping.

- The EPA will assume a default taxi in time of 7 minutes and a default taxi out time of 19 minutes. If states want to revise the taxi in or out time for specific airports please add the correct times in revised taxi in time and revised taxi out time columns.
- Please note there are some airports in the dataset with limited information pertaining to the airport name, county FIPs, and addresses. Please add additional information if possible.
- There may also be issues with geographic data for airports. For many of the new airports the latitude and longitude are inconsistent with the FIP, city, state, and zipcode. Please review and correct these issues if possible.

See Tables 1, 2, 3, and 4 for examples on how to correctly submit LTO revisions. See Tables 5, 6, and 7 for examples on how to correctly submit airport revisions. Please note that some EIS-required fields (i.e., EISEmissionsUnitIdentifier and EISEmissionsProcessIdentifier) are not included in the database. These fields were removed to simplify the data revision process and will be added by EPA. The EISFacilitySiteIdentifier, which is unique, is included, however, to avoid errors resulting from duplication of the more common three-digit alphanumeric airport code, FacilitySiteIdentifier. (Note that the FacilitySiteIdentifier indicated may be one of many alternate ones for a given airport). Some airports in the database currently do not have an EISFacilitySiteIdentifier; EPA will add these during processing. If your airport is not included in this database (either with or without an EISFacilitySiteIdentifier) please add the airport and be prepared to provide the airport's street address, city, state, zip, and latitude/longitude coordinates in the airport revisions.

For additional information on whether or not LTOs should be updated/replaced or left untouched as is, especially in regard to the generic data from ATADS/TAF and/or 5010 please refer to Appendix A for more information and examples.

The AircraftEngineTypeCodes are available under the Reporting Code Tables link in the EIS gateway. It should be noted that are some records that look like duplicates in the reporting code table. These are not actually duplicates. There are additional details about the version of the aircraft engine used on the FAA's AEDT software. This additional information relates to engine modifications that have occurred over the time. However, as engine modification data for individual aircraft are difficult to find, it is recommended that the lowest numeric ID in any set of "duplicates" be used if the engine modification is not known. These additional details can be found in the Excel file called AETC_Engine_Mode.xlsx, which is an abbreviated AircraftEngineTypeCode Reporting Code table with engine modification data added.

Submitting Data to EPA

States must submit their changes by **September 14, 2018** to this email address managed by EPA's contractor Eastern Research Group (ERG). If no changes are required, you may indicate that you accept EPA's data via an EIS support request (as you would for any category of data for which you accept EPA estimates), or by sending an email indicating acceptance to the above address. Note this email account

has a 10 MB limit. If a state submittal is larger than 10 MB, a message can be left at this e-mail address requesting data transfer using a secure FTP site. A representative from ERG will respond to this request with instructions how to access the FTP site.

The EPA will review the state-submitted data to ensure that it is appropriate and reasonable. Once the LTO data have been finalized, then the aircraft specific LTO data will be run using the latest version of AEDT to estimate criteria and HAP emissions for aircraft engine exhaust, auxiliary power units, and ground support equipment. The remaining aircraft type data will be applied to generic emission factors.

If you need assistance, contact Laurel Driver at 919.541.2859.

Note EPA strongly encourages agencies to review and, if necessary, submit their LTO data to the EPA via this review process. In doing so, then states need not submit EIS staging tables for the 2017 NEI and they are ensured that the latest FAA model will be used consistently to estimate their emissions.

Table 1. Exported LTO Data from Access Database for Review (no changes)

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA_ LTO	Revised_ LTO	Revised_TGO	Revised_ Taxi_In_ (default_7_min)	Revised_ Taxi_Out_ (default_19_min)	Revision Comment
1	37001		Example Airport	NC	AAA	10000000	2275050011	Aircraft / General Aviation /Pistor	999903	100					
2	37001		Example Airport	NC	AAA	10000000	2275020000	Aircraft/Commercial	1412	150					

***NOTE: Do not change the Primary Key, these are for internal tracking purposes.**

Table 2. Example of a LTO revision to an existing record

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA_ LTO	Revised_ LTO	Revised_TGO	Revised_ Taxi_In_ (default_7_min)	Revised_ Taxi_Out_ (default_19_min)	Revision Comment
1	37001		Example Airport	NC	AAA	10000000	2275050011	aft /General Aviation /	999903	100	82			12	Revision

***NOTE: Do not change the Primary Key, these are for internal tracking purposes.**

Table 3. Example of a LTO deletion of an existing record

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA_ LTO	Revised_ LTO	Revised_TGO	Revised_ Taxi_In_ (default_7_min)	Revised_ Taxi_Out_ (default_19_min)	Revision Comment
2	37001		Example Airport	NC	AAA	10000000	2275020000	Aircraft/Commerci	1412	150	0				Revision

***NOTE: Do not change the Primary Key, these are for internal tracking purposes.**

Table 4. Example of a LTO additions to the existing dataset

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA_ LTO	Revised_ LTO	Revised_T GO	Revised_ Taxi_In_ (default_7_min)	Revised_ Taxi_Out_ (default_19_min)	Revision Comment
	37001		Example Airport	NC	AAA	10000000	2275050011	Aircraft /General Aviation /Piston	1415		25			12	Addition
	37001		Example Airport	NC	AAB	10000001	2275020000	Aircraft/Commercial	1418		30		5		Addition

***NOTE: Primary Keys are null for additions.**

Table 5. Example of Airport Data to review

AirportKey	StateAnd County FIPSCode	Tribal Code	Airport	City	State	ZIP	Latitude	Longitude	Facility SiteIdentifier	EISFacility SiteIdentifier	OpStatus	RevisionNotes
293	37001		Example Airport	City	NC	27703	54.14472	-165.60416	AAA		Open	

***NOTE: Do not change the Airport Key, these are for internal tracking purposes.**

Table 6. Example of Airport Data revised

AirportKey	StateAnd County FIPSCode	Tribal Code	Airport	City	State	ZIP	Latitude	Longitude	Facility SiteIdentifier	EISFacility SiteIdentifier	OpStatus	RevisionNotes
293	37001		Example Airport	Town	NC	27703	99.999	9999.999	AAA		Open	Revised City, Lat, and Long

***NOTE: Do not change the Airport Key, these are for internal tracking purposes.**

Table 7. Example of Airport Data additional

AirportKey	StateAnd County FIPSCode	Tribal Code	Airport	City	State	ZIP	Latitude	Longitude	Facility SiteIdentifier	EISFacility SiteIdentifier	OpStatus	RevisionNotes
	37001		New Airport	Place	NC	27703	55.5555	777.7777	ZZZ		New, since 2014 Inventory	New Airport

***NOTE: AirportKeys are null for additions.**

Appendix A

Because of the potential overlap between data sources, some double counting of LTOs can occur between the specific data (T-100) and the generic (ATADS/TAF and 5010). The T-100 data is preferred. It should also be noted that FAA is continually updating their ATADS/TAF data as more data become available therefore it is not unusual to see changes between ATADS/TAF data downloads.

When reviewing the generic data, if large differences seem to appear between what is in the NEI LTO database for review and the data downloaded, you may want to consider updating the data, but note it is important to first subtract the corresponding specific data (T100) at the SCC level first to ensure that the LTO comparison is compatible. It is up to the states discretion, but if the differences between your data and NEI's data are close, it's is EPA's recommendation that LTO data no need to be revised. Examples of when to update 2017 generic LTOs are provided below.

FacilitySite Identifier	Source ClassificationCode	ProcessDescription	2017 ATADS/TAF	2017 T100	2017 Generic For Review	Percent Change	Suggested Action
DAB	2275060011	Air Taxi, Piston	12,239		943	1198%	Update 2017 generic LTO
DAB	2275060012	Air Taxi, Turbine	43,905	44	3,382	1198%	Update 2017 generic LTO
DAB	2275050011	General Aviation, Piston	68,038		100,104	-32%	Update 2017 generic LTO
DAB	2275050012	General Aviation, Turbine	26,328	6	38,737	-32%	Update 2017 generic LTO
DAB	2275001000	Military Aircraft, Total	562		554	1%	Do not update/add 2017 generic LTO, close
DAB	2275020000	Commercial Aircraft, Total: All Types	3,235	3,199		1%	Do not update/add 2017 generic LTO, T100 present
DAB		Total	154,307	3,249	143,719		
MDW	2275060011	Air Taxi, Piston	3,064		2,803	9%	Do not update/add 2017 generic LTO, close
MDW	2275060012	Air Taxi, Turbine	10,991	581	7,889	39%	Update 2017 generic LTO
MDW	2275050011	General Aviation, Piston	12,879		13,002	-1%	Do not update/add 2017 generic LTO, close
MDW	2275050012	General Aviation, Turbine	4,983	693	4,992	0%	Do not update/add 2017 generic LTO, close
MDW	2275001000	Military Aircraft, Total	553	1	914	-40%	Update 2017 generic LTO
MDW	2275020000	Commercial Aircraft, Total: All Types	93,201	92,625		1%	Do not update/add 2017 generic LTO, T100 present
MDW		Total	125,671	93,900	29,600		
ORD	2275060011	Air Taxi, Piston	24,891		35,589	-30%	Update 2017 generic LTO
ORD	2275060012	Air Taxi, Turbine	89,287	106,798	125,586	-16%	Update to 0 LTOs, T100 present and higher
ORD	2275050011	General Aviation, Piston	2,158		2,514	-14%	Do not update/add 2017 generic LTO
ORD	2275050012	General Aviation, Turbine	835	3,083	972	-73%	Do not update/add 2017 generic LTO, T100 present
ORD	2275001000	Military Aircraft, Total	52		98	-47%	Do not update/add 2017 generic LTO
ORD	2275020000	Commercial Aircraft, Total: All Types	316,302	314,987		0%	Do not update/add 2017 generic LTO, T100 present
ORD		Total	433,525	424,868	164,759		