FAR Part 150 Update – Duluth (DLH)

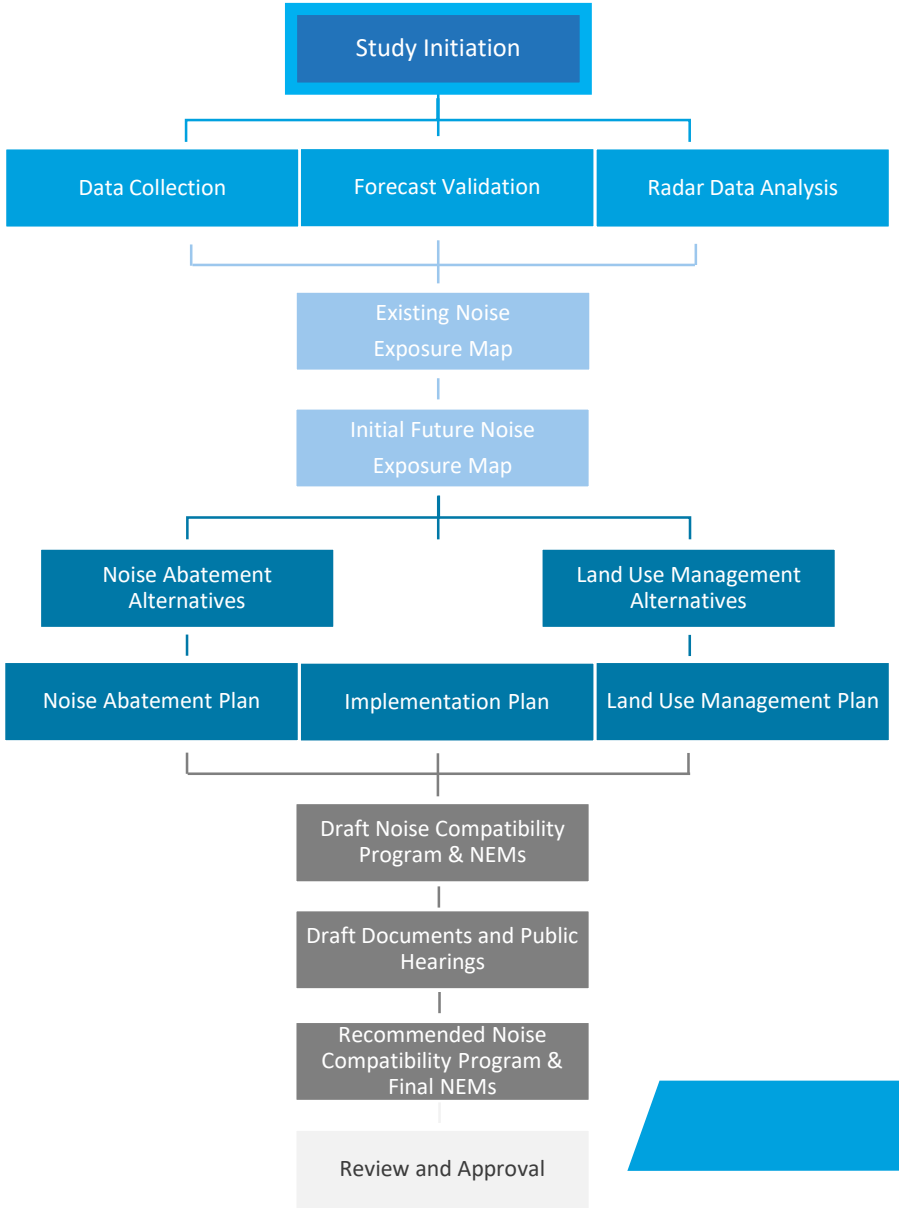
Advisory Committee Meeting | March 2020

Agenda

- Introduction
- Part 150 Study Overview
- Short-Term Noise Monitoring Results
- Noise Modeling Methodology
- Existing (2020) Noise Exposure Map (NEM) Contours
- Future (2025) Baseline Noise Exposure Contours
- Elements of a Noise Compatibility Study
- Part 150 Schedule
- Next Steps

Part 150 Study Overview

We are Here



Short-Term Noise Monitoring Results

L_{max} Noise Metric

- **Quantifies the peak or maximum noise level reached by a entire noise event**
- **Should not be confused with the Day-Night Average Sound Level (DNL) metric used for calculating Part 150 Noise Exposure Contours**

Noise Measurement Results

- **Results are analyzed and summarized in report**
- **Noise monitoring data is not used to calibrate the noise model or to make a finding of significance**

Conclusion

- **Based on captured and isolated noise events compared to single event modeled noise**
- **Recorded noise levels were within reasonable tolerance of modeled noise levels**

Short-Term Noise Monitoring Results

Noise Measurement Sites

Site	Location	City
1	5560 MN-194	Hermantown
2	4483 Martin Rd	Duluth
3	5963 Helm Rd	Duluth
4	5454 Miller Trunk Rd	Hermantown
5	Old Ugstad Rd	Duluth
6	4725 Swan Lake Rd	Hermantown
7	5006 Timber Hill Ct	Hermantown
8	4670 Lavaque Bypass Rd	Hermantown
9	5025 Silver Leaf St	Hermantown
10	3902 Norton Rd	Duluth
11	5545 Miller Trunk Hwy	Hermantown
12	2220 Norton Rd	Duluth
13	4509 Kruger Rd	Duluth
14	4926 Martin Rd	Duluth
15	Mustang Dr south of Deuce Ave	Duluth
16	4464 Ralston Dr	Duluth

Noise monitoring was conducted at all locations requested by community members

Short-Term Noise Monitoring Results

Maximum Aircraft Noise Levels Summary

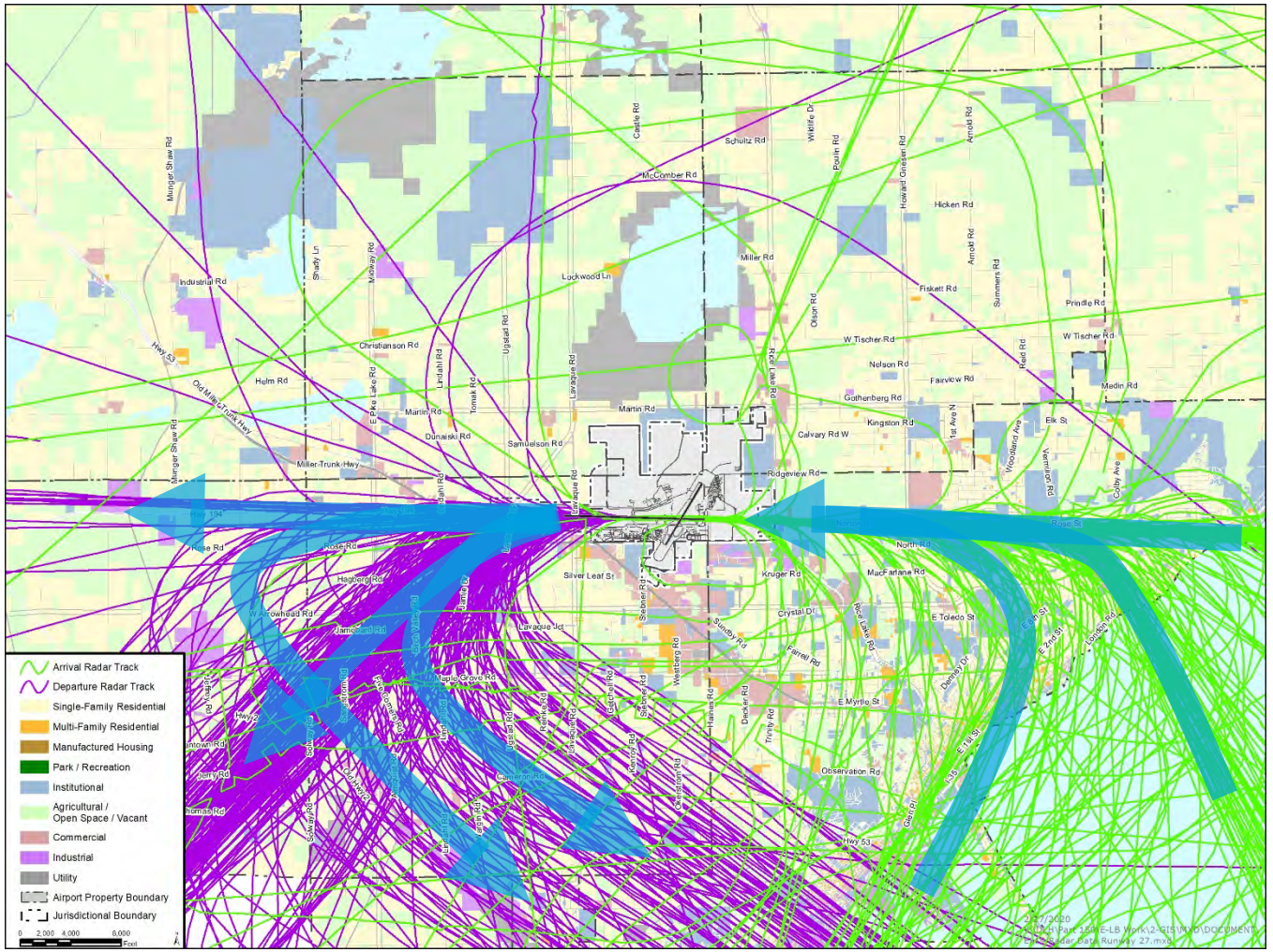
Site	Date	Time	Aircraft Type	L_{max} (dB)	Arrival/ Departure	Runway
1	11/7/2019	1:35 PM	F-16 (4)	96.1	D	27
2	11/5/2019	11:21	F-16 (2)	108.6	A	27
3	11/6/2019	1:56 PM	F-16 (5)	104.2	D	27
4	11/5/2019	1:47 PM	F-16 (4)	121.1	D	27
5	11/5/2019	9:32 AM	F-16 (2)	122.3	D	27
6	11/7/2019	11:33 AM	F-16 (1)	109.7	A	27
7	11/6/2019	3:21 PM	Helicopter (1)	79.3	O	--
8	11/5/2019	1:38 PM	F-16 (1)	110.0	D	27
9	11/7/2019	9:43 AM	F-16 (2)	105.9	D	27
10	11/5/2019	11:21 PM	F-16 (1)	104.6	A	27
11	11/7/2019	3:25 PM	F-16 (2)	114.2	D	27
12	11/5/2019	2:51 PM	E-6 Mercury (1)	95.2	A	27
13	11/6/2019	4:16 PM	Twin Propeller (1)	67.9	A	27
14	11/5/2019	10:04 AM	F-16 (1)	96.2	D	27
15	11/4/2019	3:06 PM	F-16 (1)	113.4	A	27
16	11/5/2019	3:28 PM	F-16 (2)	105.3	A	27

Noise Modeling Methodology

- **Model and Input Data**
  - **FAA's Aviation Environmental Design Tool (AEDT) Version 3b**
  - **Flight Tracks and Runway Use**
    - **FAA's National Offload Program (NOP) data (8 weeks from 2018)**
    - **MnANG 148th Fighter Wing**
  - **Aircraft Fleet Mix , Annual Operations, Stage Length and Time of Day**
    - **FAA's Traffic Flow Management System (TFMS) – Fleet Mix**
    - **FAA's Air Traffic Data System (ATADS) - Operations**
    - **MnANG 148th Fighter Wing – Reported 2458 Sorties (4,916 Operations)**
      - **AEDT ANP ID: F16PW0**
      - **AEDT AIRFRAME: Lockheed Martin F-16 Fighting Falcon**
      - **AEDT ENGINE MODEL: F110-GE-129 (w/AB)**
      - **AEDT ENGINE CODE: F1129A**

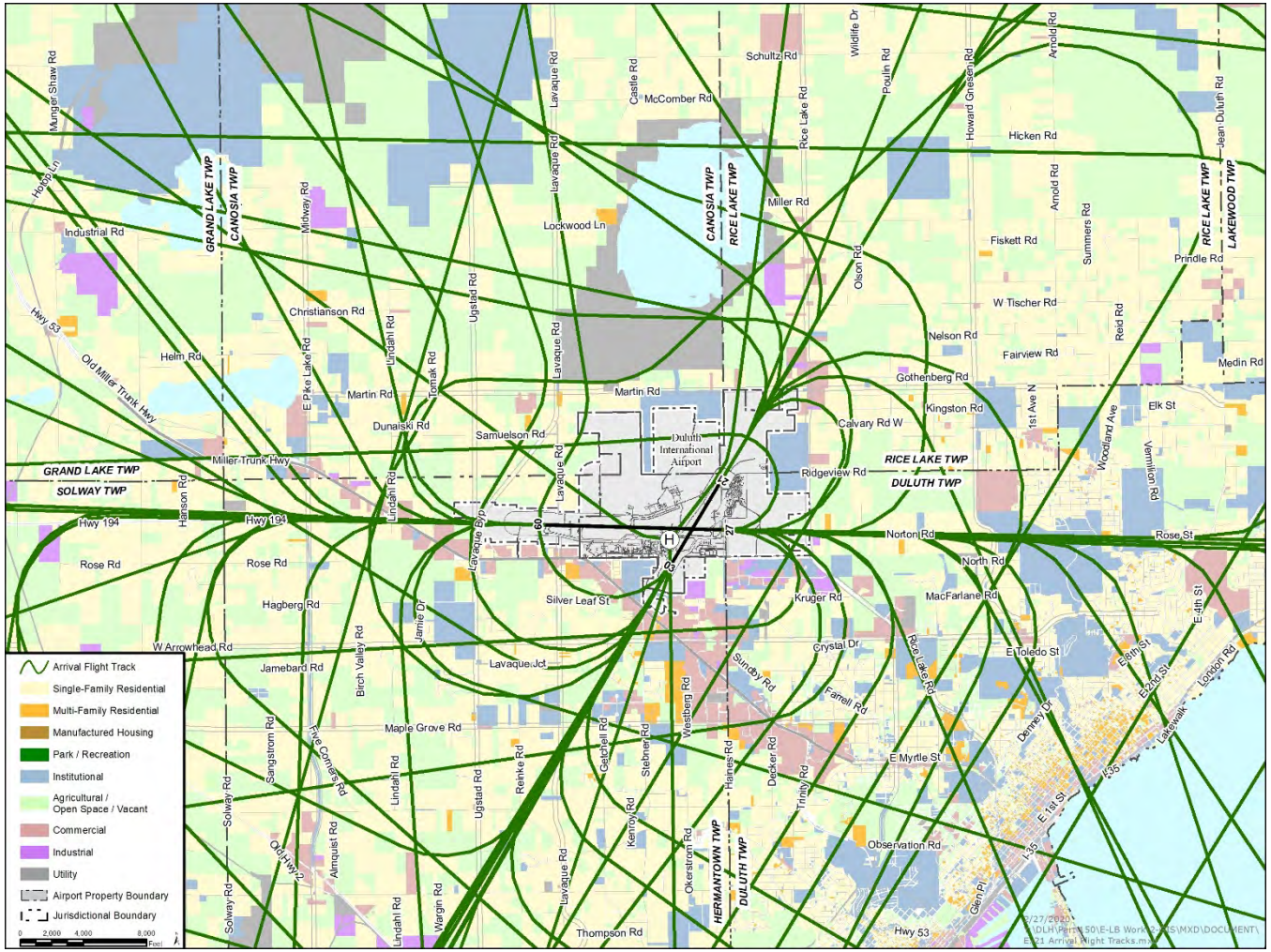
Noise Modeling Methodology

Flight Track Development



Noise Modeling Methodology

Civilian Arrival Flight Tracks

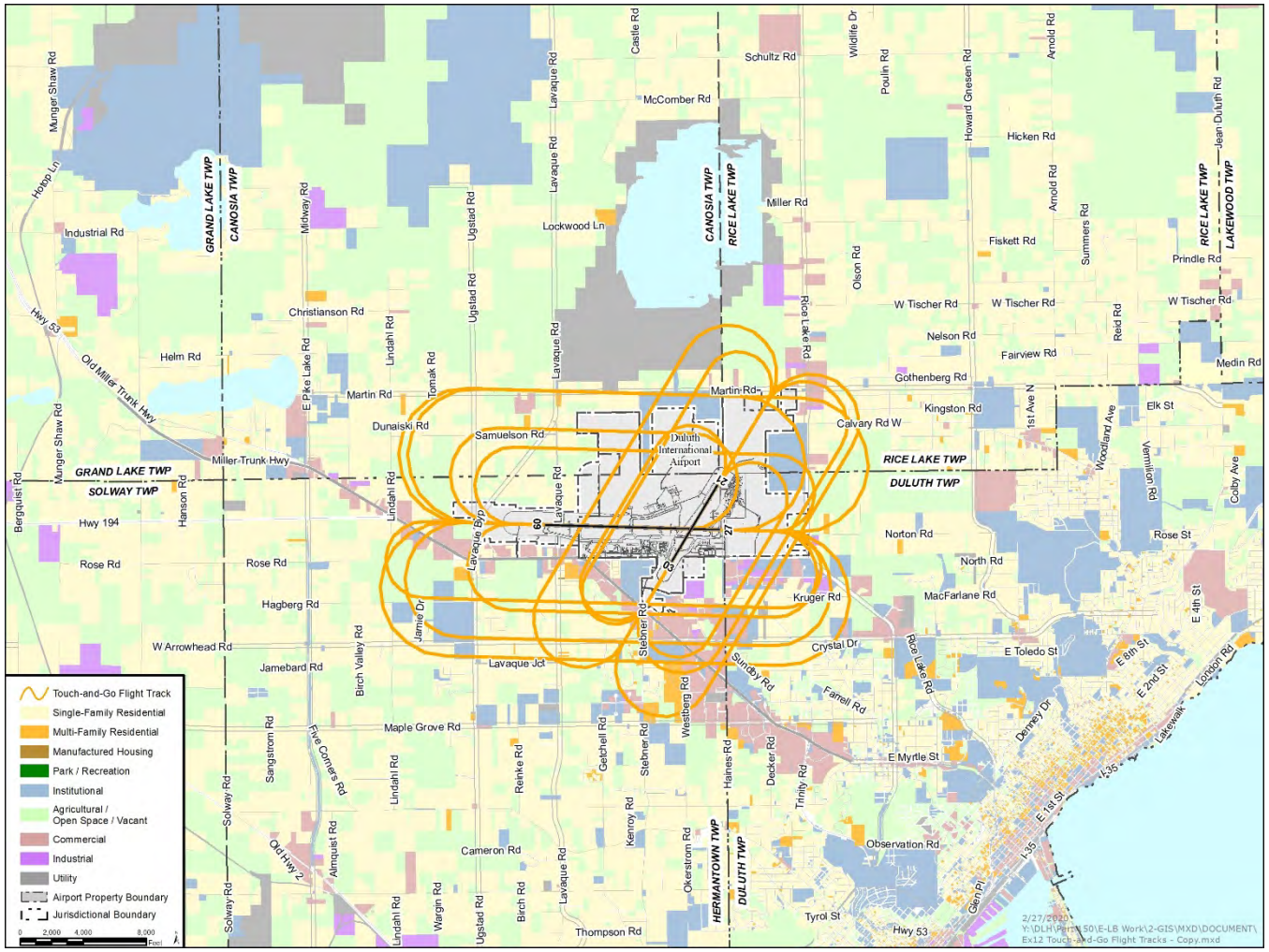


Noise Modeling Methodology

Civilian Departure Flight Tracks

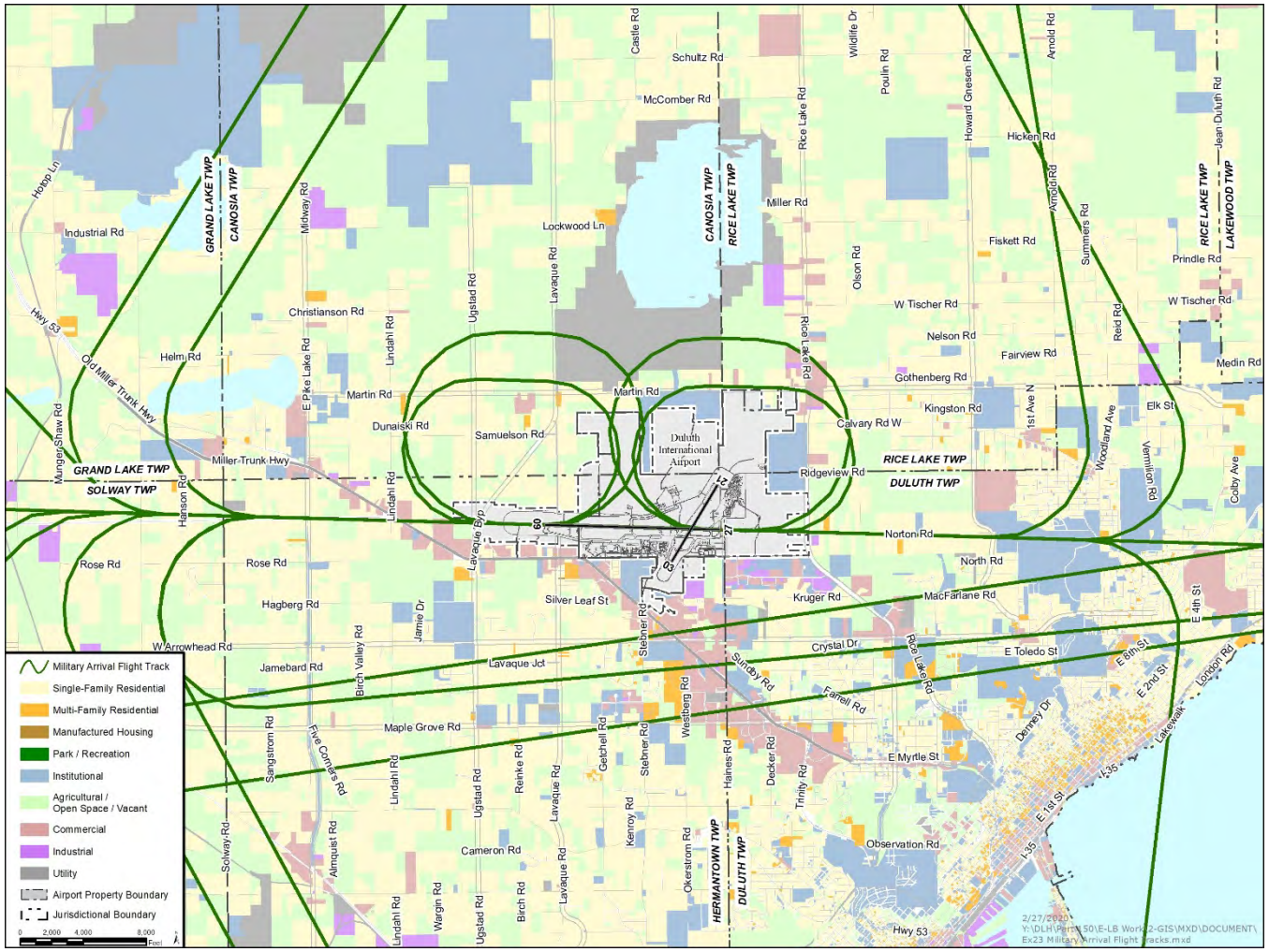
Noise Modeling Methodology

Civilian Touch-and-Go Flight Tracks



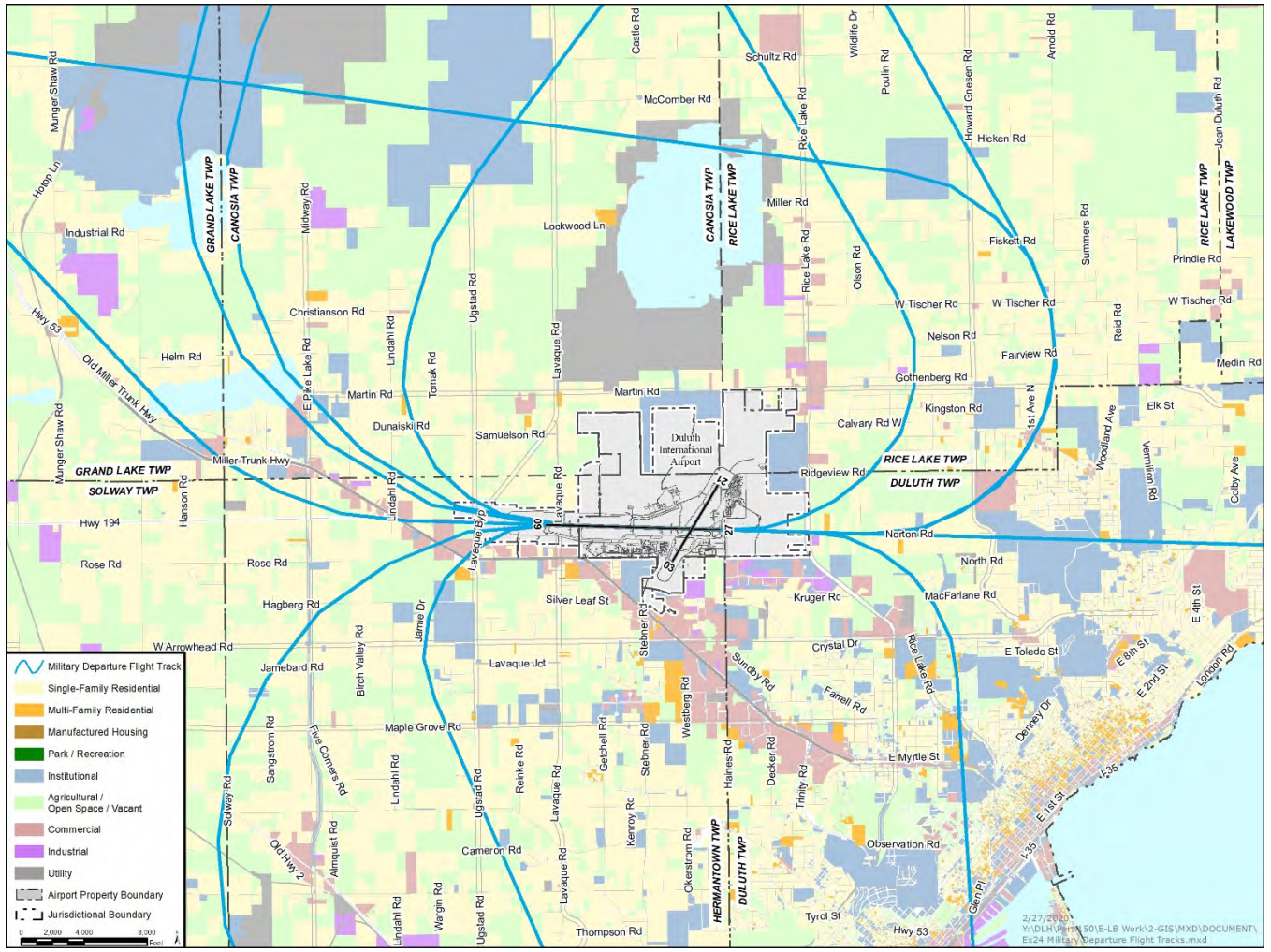
Noise Modeling Methodology

Military Arrival Flight Tracks



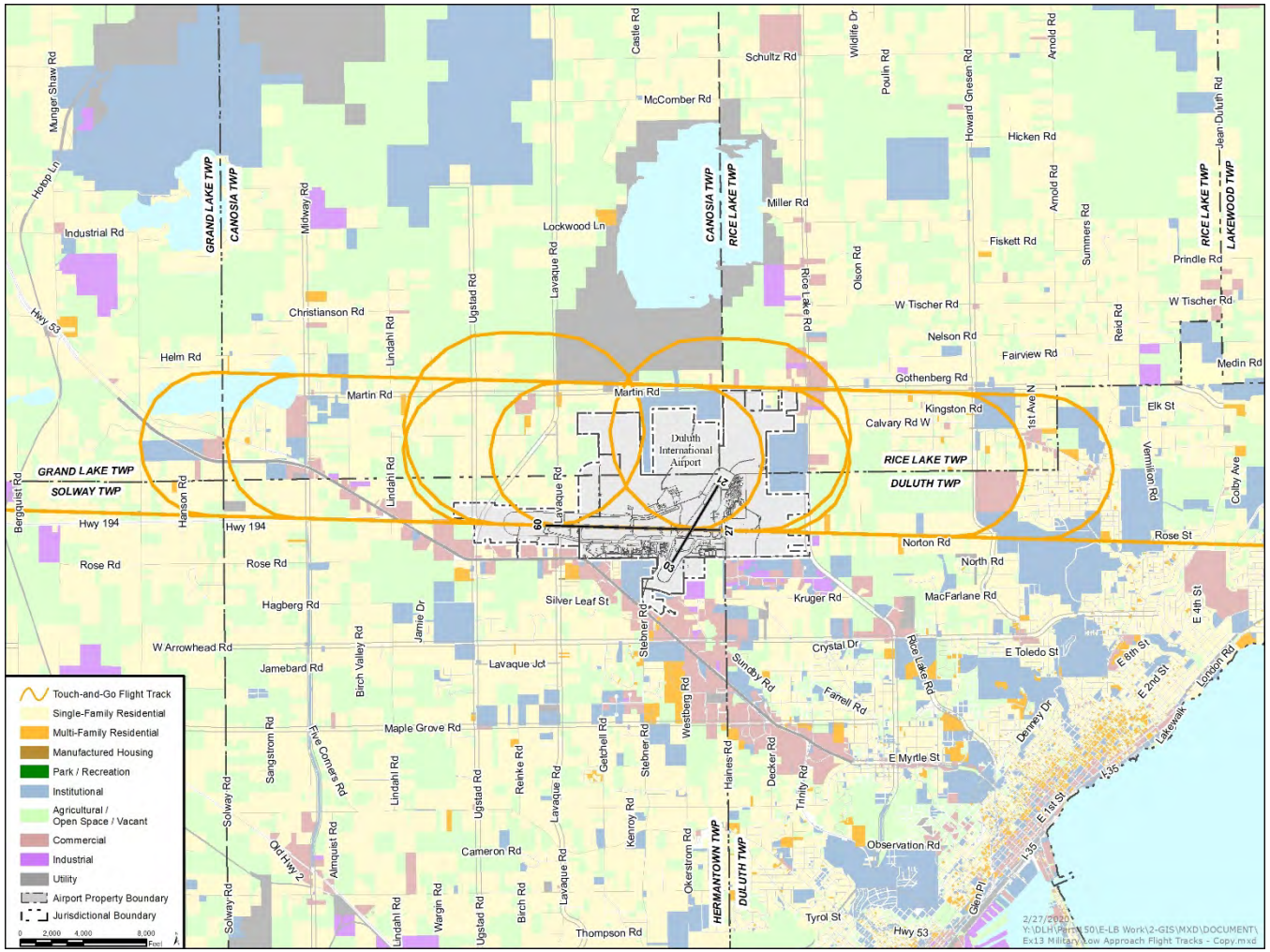
Noise Modeling Methodology

Military Departure Flight Tracks



Noise Modeling Methodology

Military Low Approach Flight Tracks



Noise Modeling Methodology

Existing (2020) NEM - Operating Levels and Fleet Mix

Aircraft Type	2020 Annual Operations	2020 Average Annual Day			Percent of Total
		Day	Night	Total	
Large Jets	1,792	2.6	2.3	4.9	2.8%
Regional/Air Taxi Jets	5,767	11.6	4.2	15.8	8.9%
Commuter/Air Taxi Props	2,013	3.1	2.4	5.5	3.1%
General Aviation Jets	16,290	37.3	7.3	44.6	25.2%
General Aviation Props	28,925	61.4	17.8	79.3	44.8%
General Aviation Helicopter	468	0.6	0.7	1.3	0.7%
Civil Aircraft Subtotal	*55,254*	*116.8*	*34.7*	*151.4*	--
Military Aircraft	5,087	25.0	0.4	25.4	14.4%
Grand Total	*60,341*	*141.8*	*35.1*	*176.8*	*100.0%*

Note: Military operations are based on flying days in a year and not 365 days, MnANG 148th Fighter Wing reported 199 flying days, while the C130 used 250 flying days (federal holidays and weekends deemed as non-flying days). Totals may not equal sum total due to rounding.

- **Large Jets - Bombardier CRJ-900/700 (53%) and the Airbus 319-131 (30%)**
- **Regional/Air Taxi Jets - Bombardier Challenger 600/CRJ-200 (67%)**
- **Military Aircraft - Lockheed F-16 Fighting Falcon (97%)**

Noise Modeling Methodology

Existing (2020) NEM - Arrival Runway Use

Aircraft Category	Runway End					Total
	03	09	21	27	H1	
Daytime Arrivals						
Large Jets	--	66.7%	--	33.3%	--	100.0%
Regional/Air Taxi Jets	17.2%	28.1%	13.3%	41.4%	--	100.0%
Commuter/Air Taxi Props	27.5%	26.3%	9.7%	36.5%	--	100.0%
General Aviation Jets	17.2%	25.9%	14.1%	42.8%	--	100.0%
General Aviation Props	20.4%	30.3%	15.3%	34.0%	--	100.0%
General Aviation Helicopter	--	--	--	--	100.0%	100.0%
Military Aircraft	--	20.0%	--	80.0%	--	100.0%
Nighttime Arrivals						
Large Jets	11.3%	40.6%	1.9%	46.2%	--	100.0%
Regional/Air Taxi Jets	12.0%	32.0%	--	56.0%	--	100.0%
Commuter/Air Taxi Props	23.4%	30.8%	11.5%	34.3%	--	100.0%
General Aviation Jets	12.0%	32.0%	--	56.0%	--	100.0%
General Aviation Props	20.3%	29.8%	9.6%	40.4%	--	100.0%
General Aviation Helicopter	--	--	--	--	100.0%	100.0%
Military Aircraft	--	20.0%	--	80.0%	--	100.0%

Note: Totals may not equal sum total due to rounding.

- **Runway 09/27 is utilized for 69% of all arrivals**
- **75% of Jet aircraft arrive to Runway 09/27**
- **Military operations only use Runway 09/27**

Noise Modeling Methodology

Existing (2020) NEM - Departure Runway Use

Aircraft Category	Runway End					Total
	03	09	21	27	H1	
Daytime Departures						
Large Jets	9.2%	24.0%	3.3%	63.5%	--	100.0%
Regional/Air Taxi Jets	14.2%	35.2%	10.5%	40.1%	--	100.0%
Commuter/Air Taxi Props	17.6%	28.8%	11.4%	42.2%	--	100.0%
General Aviation Jets	14.9%	36.9%	11.0%	37.2%	--	100.0%
General Aviation Props	14.7%	36.5%	11.1%	37.7%	--	100.0%
General Aviation Helicopter	--	--	--	--	100.0%	100.0%
Military Aircraft	--	20.0%	--	80.0%	--	100.0%
Nighttime Departures						
Large Jets	--	40.0%	--	60.0%	--	100.0%
Regional/Air Taxi Jets	20.0%	33.3%	3.3%	43.3%	--	100.0%
Commuter/Air Taxi Props	28.0%	19.0%	6.9%	46.1%	--	100.0%
General Aviation Jets	20.0%	33.3%	3.3%	43.3%	--	100.0%
General Aviation Props	19.1%	25.4%	10.0%	45.6%	--	100.0%
General Aviation Helicopter	--	--	--	--	100.0%	100.0%
Military Aircraft	--	--	--	--	--	--

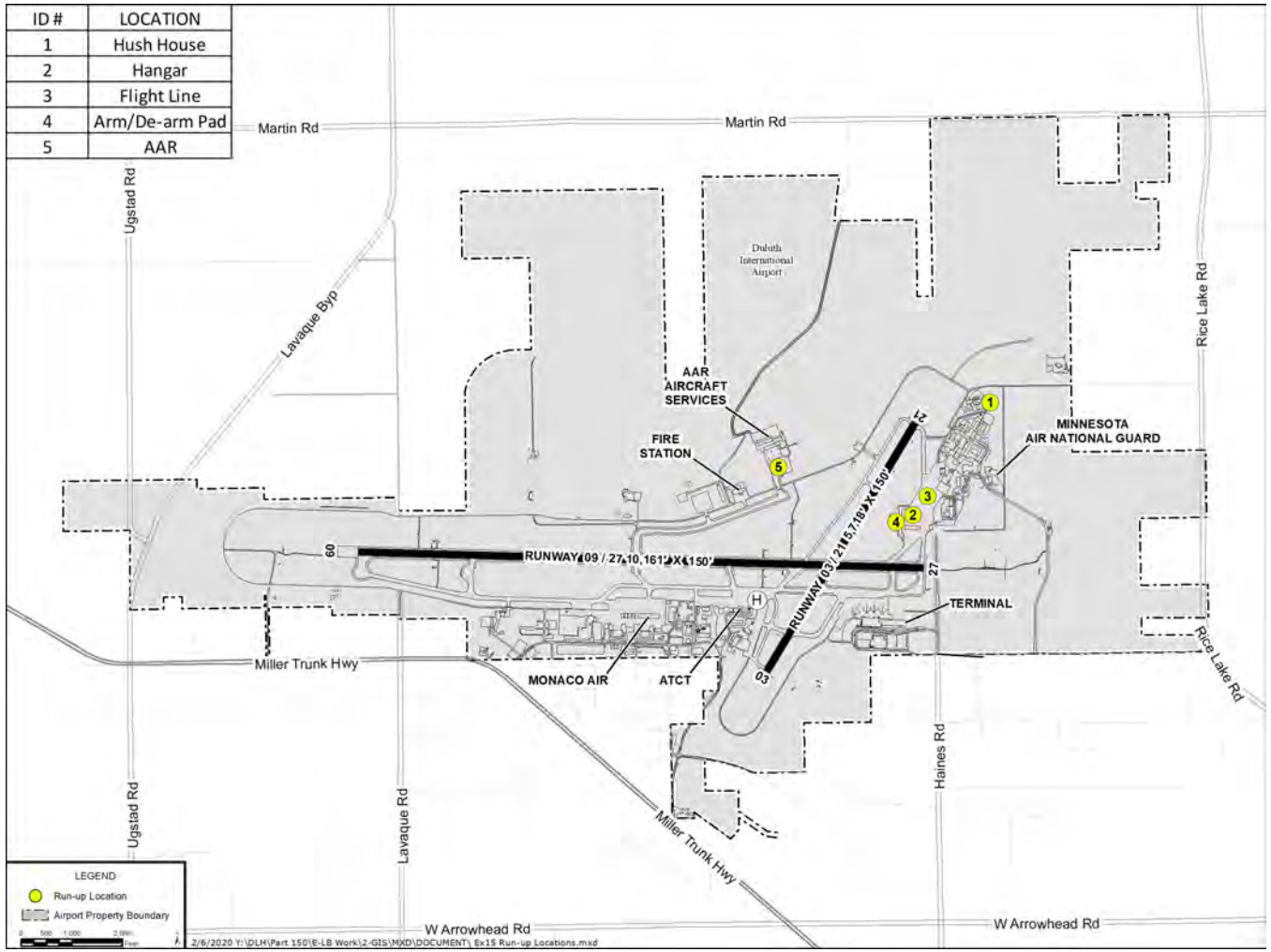
Note: Totals may not equal sum total due to rounding.

- **Runway 09/27 is utilized for 74% of all departures**
- **77% of Jet aircraft depart from Runway 09/27**
- **Military operations only use Runway 09/27**

Noise Modeling Methodology

Aircraft Run-up Locations

ID #	LOCATION
1	Hush House
2	Hangar
3	Flight Line
4	Arm/De-arm Pad
5	AAR



Noise Modeling Methodology

Existing (2020) NEM - Run-up Activity

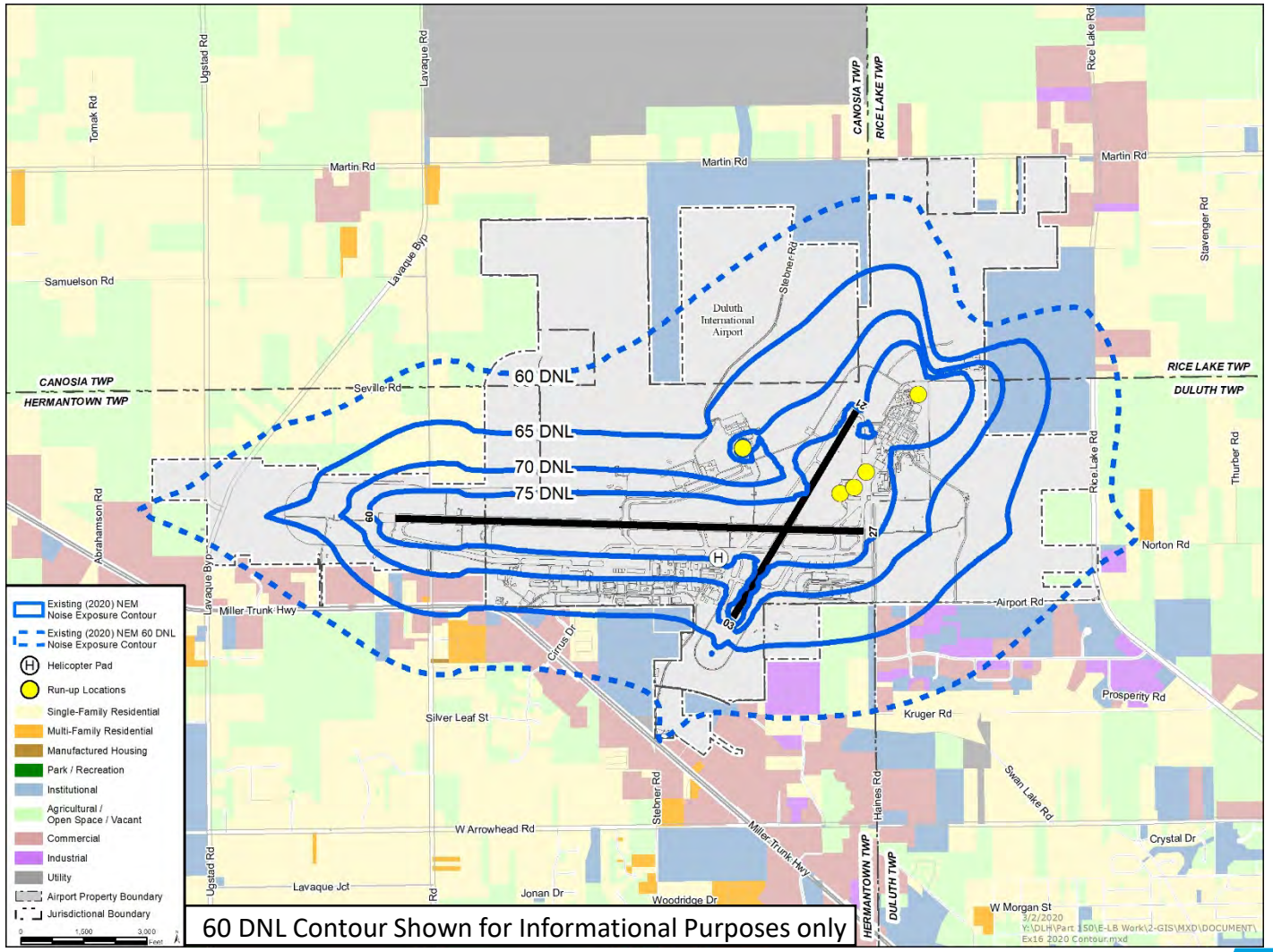
Run-Up Location	Aircraft AEDT ANP ID	Annual Runups			Daily Total	Duration (minutes)	Heading (degrees)	Thrust / Setting
		Daytime	Nighttime	Annual Total				
Hush House	F16PW0	87.4	--	87.4	0.44	50.0	211	65%
Hush House	F16PW0	87.4	--	87.4	0.44	7.6	211	78%
Hush House	F16PW0	87.4	--	87.4	0.44	7.6	211	82%
Hush House	F16PW0	87.4	--	87.4	0.44	7.6	211	89%
Hush House	F16PW0	87.4	--	87.4	0.44	2.1	211	AB
Hangar	F16PW0	4.6	--	4.6	0.02	30.0	180	70%
Flight Line	F16PW0	182.0	--	182.0	0.91	10.0	270	70%
Departure Arm Pad	F16PW0	2,458.0	--	2,458.0	12.35	30.0	90	67%
Arrival De-Arm Pad	F16PW0	2,379.3	78.7	2,458.0	12.35	10.0	90	67%
AAR	A319-131	38.3	--	38.3	0.10	30.0	270	80%
AAR	A320-232	13.7	--	13.7	0.04	30.0	270	80%

Note: Daily military run-up operations are based on flying days in a year and not 365 days, MnANG 148th Fighter Wing reported 199 flying days.

- **Run-ups conducted at five (5) locations**
- **Run-up activity at hush house non-attenuated in the model**
- **AAR maintenance facility - Airbus 319/320**

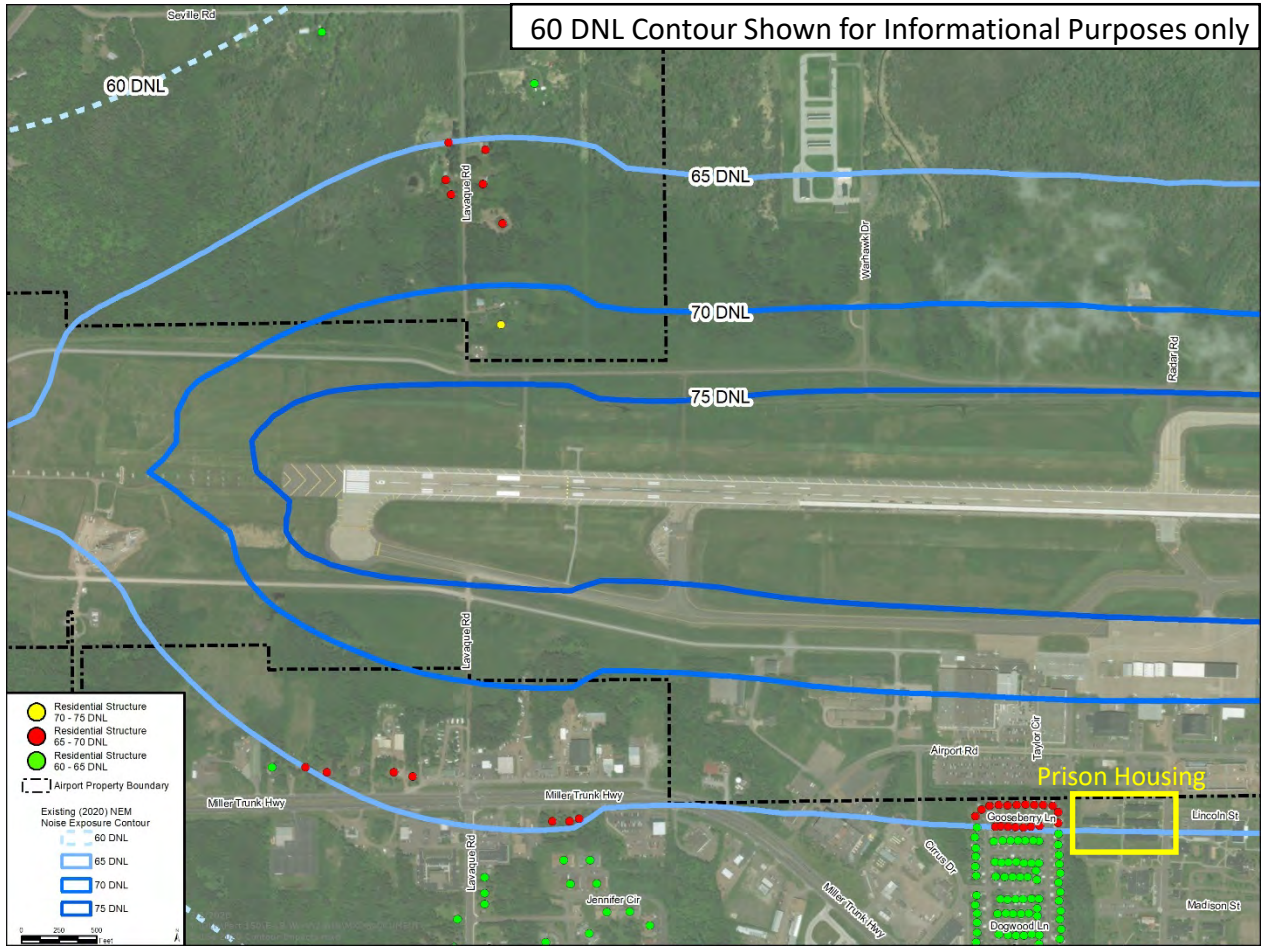
Existing (2020) Noise Exposure Map (NEM) Contours

Existing (2020) NEM Contours



Existing (2020) Noise Exposure Map (NEM) Contours

Existing (2020) NEM Contours – Impacted Homes



Category	Type	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB
Housing	Single-Family Residential	13	1	0
	Multi-Family Residential	0	0	0
	Manufactured Housing	19	0	0
	Total Housing Units	**32**	**1**	**0**
Population	Single-Family Residential	25	2	0
	Multi-Family Residential	0	0	0
	Manufactured Housing	36	0	0
	Total Population	**60**	**2**	**0**

Note: Population estimates are based on the United States Census Bureau 2017 American Community Survey (ACS) average household size per number of housing units per census block group. Prison Housing statistics are not included in impacted housing or population counts.

Future (2025) Baseline Noise Exposure Contours

- **No airfield changes**
- **No airspace changes**
- **Future (2025) Baseline modeling methodology;**
  - **Master Plan Aviation Forecast**
  - **63,560 forecasted operations at DLH by 2025**
  - **Boeing 717-200 added for new Delta Airlines service**
  - **Military arm and de-arm run up activity increase (+190.0 Annually/0.95 Daily)**
  - **No change to runway utilization, track utilization, stage length distribution and time of day utilization**
- **Lockheed Martin F-35 Lightning II**
  - **Part 150 stipulates the Future (2025) fleet mix is designed from an FAA approved aviation forecast**
  - **Potential deployment after Future (2025) Baseline**
  - **If deployed to DLH the Air National Guard would conduct an Environmental Analysis**

Future (2025) Baseline Noise Exposure Contours

Future (2025) Baseline Operating Levels and Fleet Mix

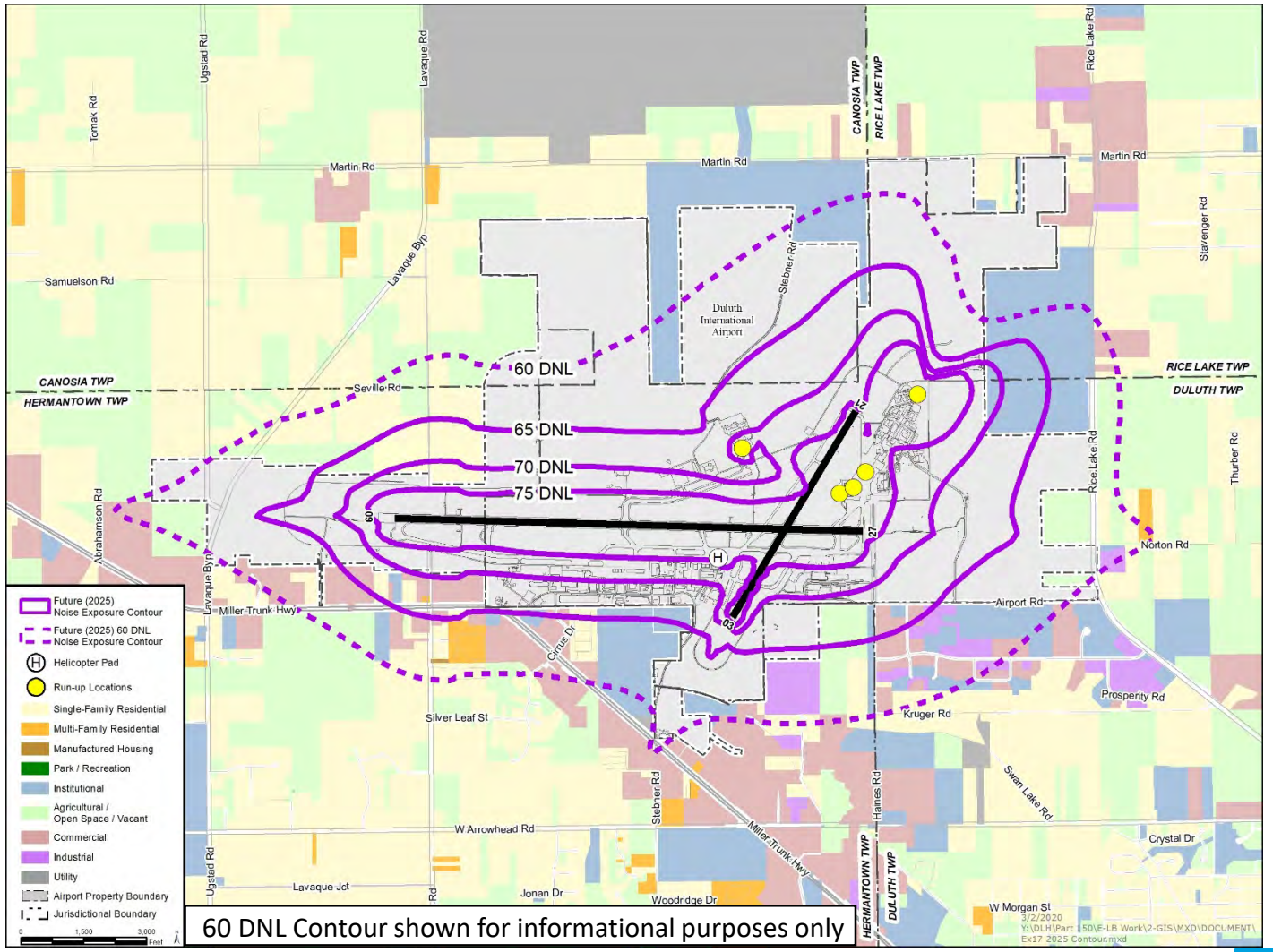
Aircraft Type	2025 Annual Operations	2025 Average Annual Day			Percent of Total
		Day	Night	Total	
Large Jets	3,092	3.6	4.9	8.5	4.2%
Regional/Air Taxi Jets	5,746	11.6	4.2	15.7	7.8%
Commuter/Air Taxi Props	2,006	3.1	2.4	5.5	2.7%
General Aviation Jets	18,893	43.2	8.5	51.8	25.5%
General Aviation Props	33,548	71.2	20.7	91.9	45.3%
General Aviation Helicopter	575	0.7	0.8	1.6	0.8%
Civil Aircraft Subtotal	*63,859*	*133.5*	*41.4*	*175.0*	--
Military Aircraft	5,650	27.6	0.4	28.0	13.8%
Grand Total	*69,509*	*161.1*	*41.8*	*203.0*	*100.0%*

Note: Military operations are based on flying days in a year and not 365 days, MnANG 148th Fighter Wing reported 199 flying days, while the C130 used 250 flying days available (federal holidays and weekends deemed as non-flying days). Totals may nut equal sum total due to rounding.

- **Large Jets - Bombardier CRJ-900/700 (63%), Airbus 319-131 (23%)**
- **Regional/Air Taxi Jets - Bombardier Challenger 600/CRJ-200 (67%)**
- **Military Aircraft - Lockheed F-16 Fighting Falcon (94%)**
- **Increase of 9,168 annual operations (26.2 daily operations)**

Future (2025) Baseline Noise Exposure Contours

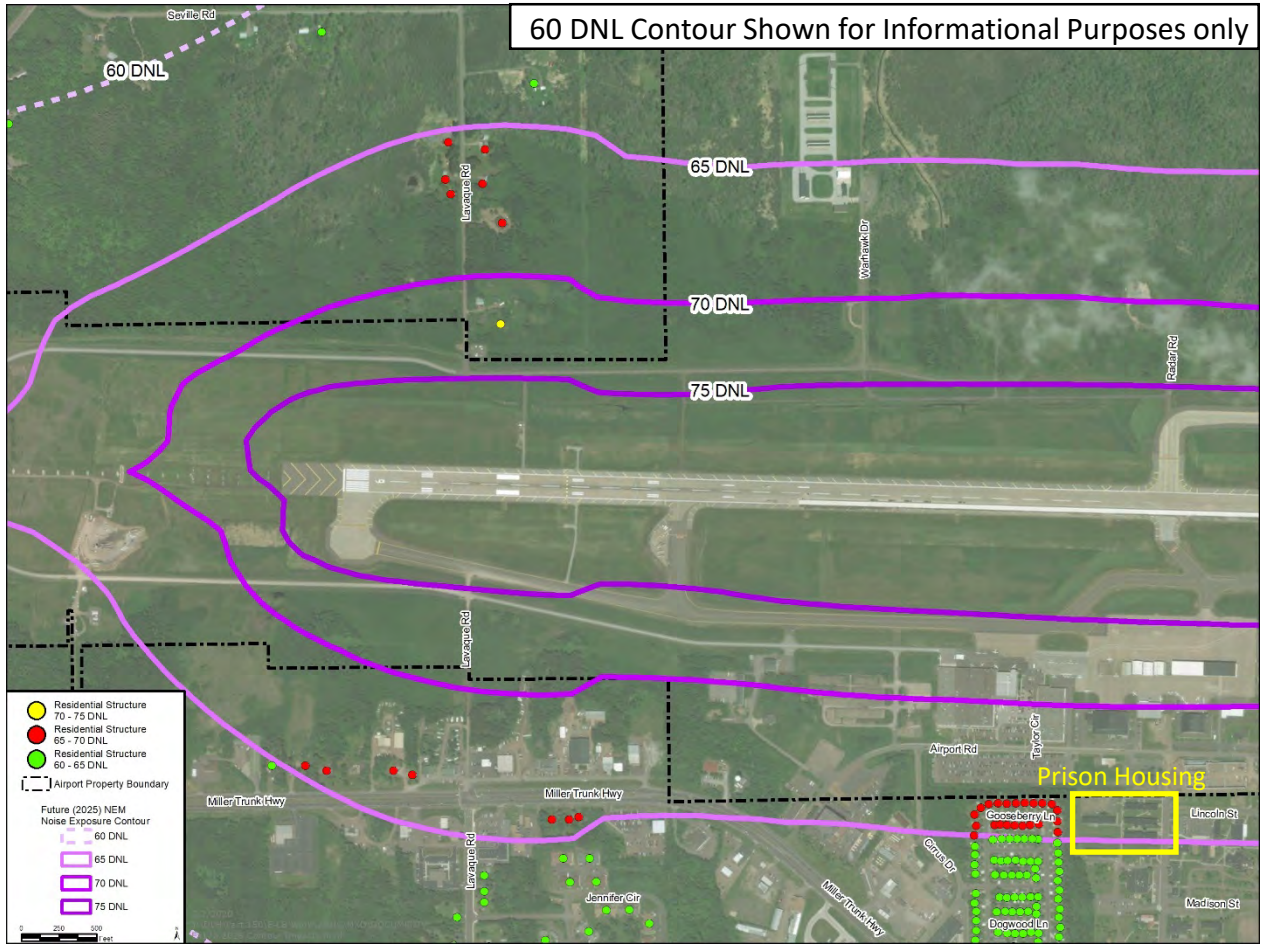
Future (2025) Baseline Noise Contours



60 DNL Contour shown for informational purposes only

Future (2025) Baseline Noise Exposure Contours

Future (2025) Baseline Contours – Impacted Homes

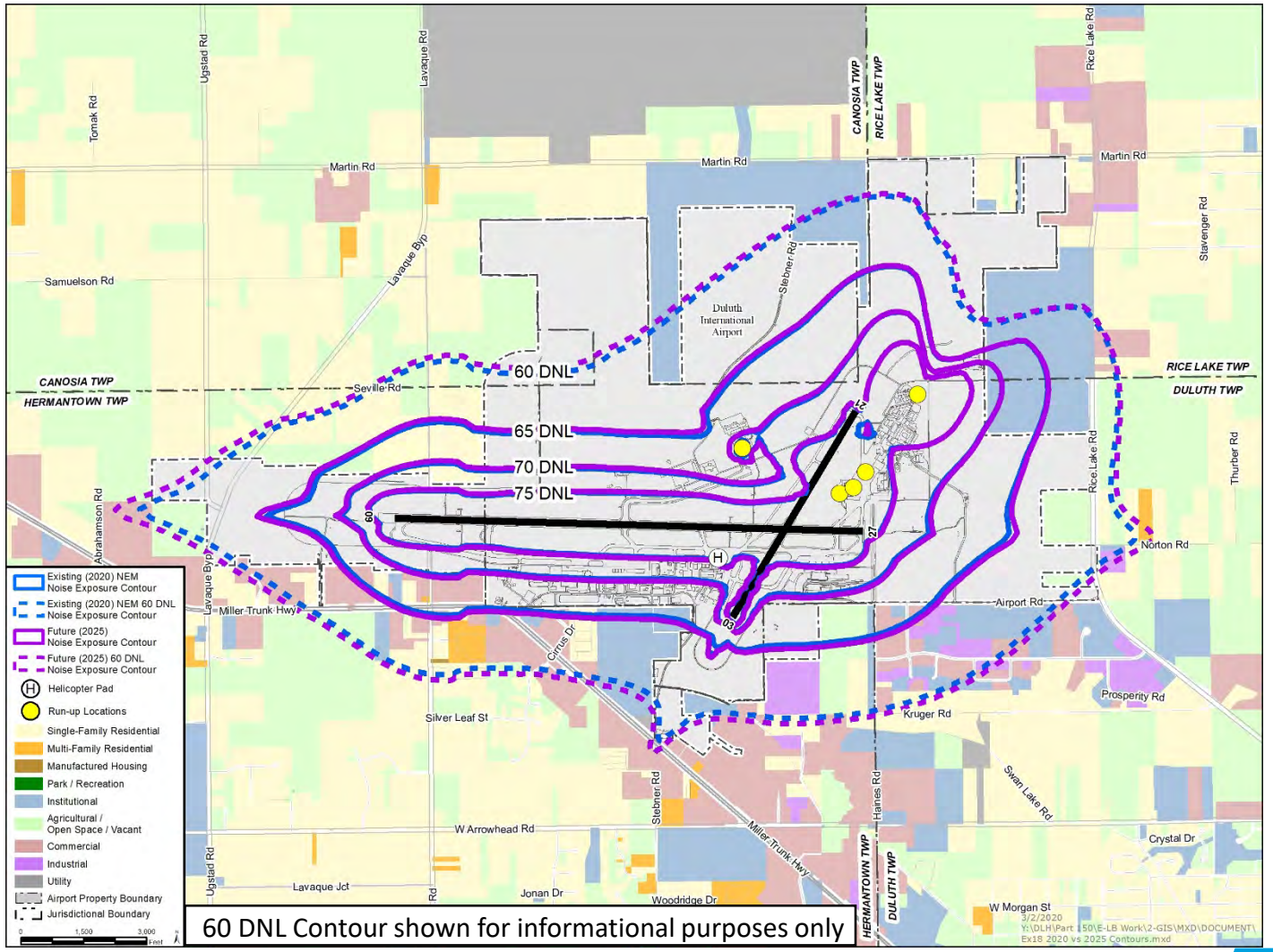


Category	Type	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB
Housing	Single-Family Residential	13	1	0
	Multi-Family Residential	0	0	0
	Manufactured Housing	22	0	0
	Total Housing Units	**35**	**1**	**0**
Population	Single-Family Residential	25	2	0
	Multi-Family Residential	0	0	0
	Manufactured Housing	41	0	0
	Total Population	**66**	**2**	**0**

Note: Population estimates are based on the United States Census Bureau 2017 American Community Survey (ACS) average household size per number of housing units per census block group. Prison Housing statistics are not included in impacted housing or population counts.

Future (2025) Baseline Noise Exposure Contours

Existing (2020) NEM vs. Future (2025) Baseline Noise Contours

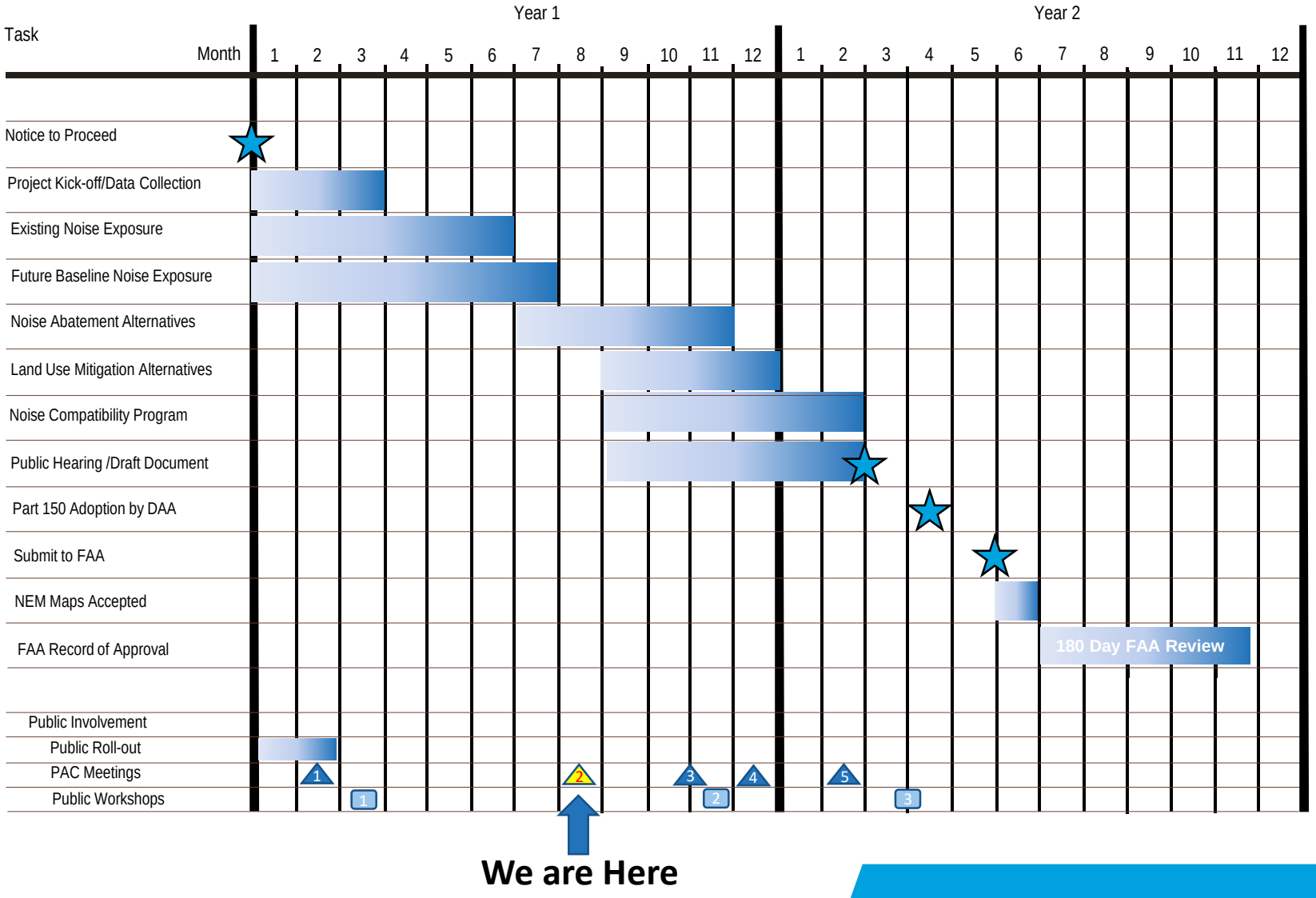


60 DNL Contour shown for informational purposes only

Elements of a Noise Compatibility Program

- **Noise Abatement Alternatives**
  - **Flight Track Location**
  - **Runway Use**
  - **Flight Management**
  - **Ground Activity Restrictions**
  - **Facility Modification**
- **Land Use Management Alternatives**
  - **Preventive**
  - **Corrective**
- **Implementation Alternatives**
  - **Measures designed to assist the implementation of the Noise Compatibility Program (NCP)**

Part 150 Study Schedule



Next Steps

- **Compile Suggested Noise Abatement Alternatives**
- **Begin Evaluation of Noise Abatement Alternatives**
- **Begin Evaluation of Land Use Management Alternatives**
- **Prepare Draft Documentation**
- **Next Advisory Committee anticipated in late Spring of 2020**