Lake Elmo Airport
ADVISORY COMMISSION
LEAAC

Lake Elmo Airport 101
Commission Member Orientation

Outline

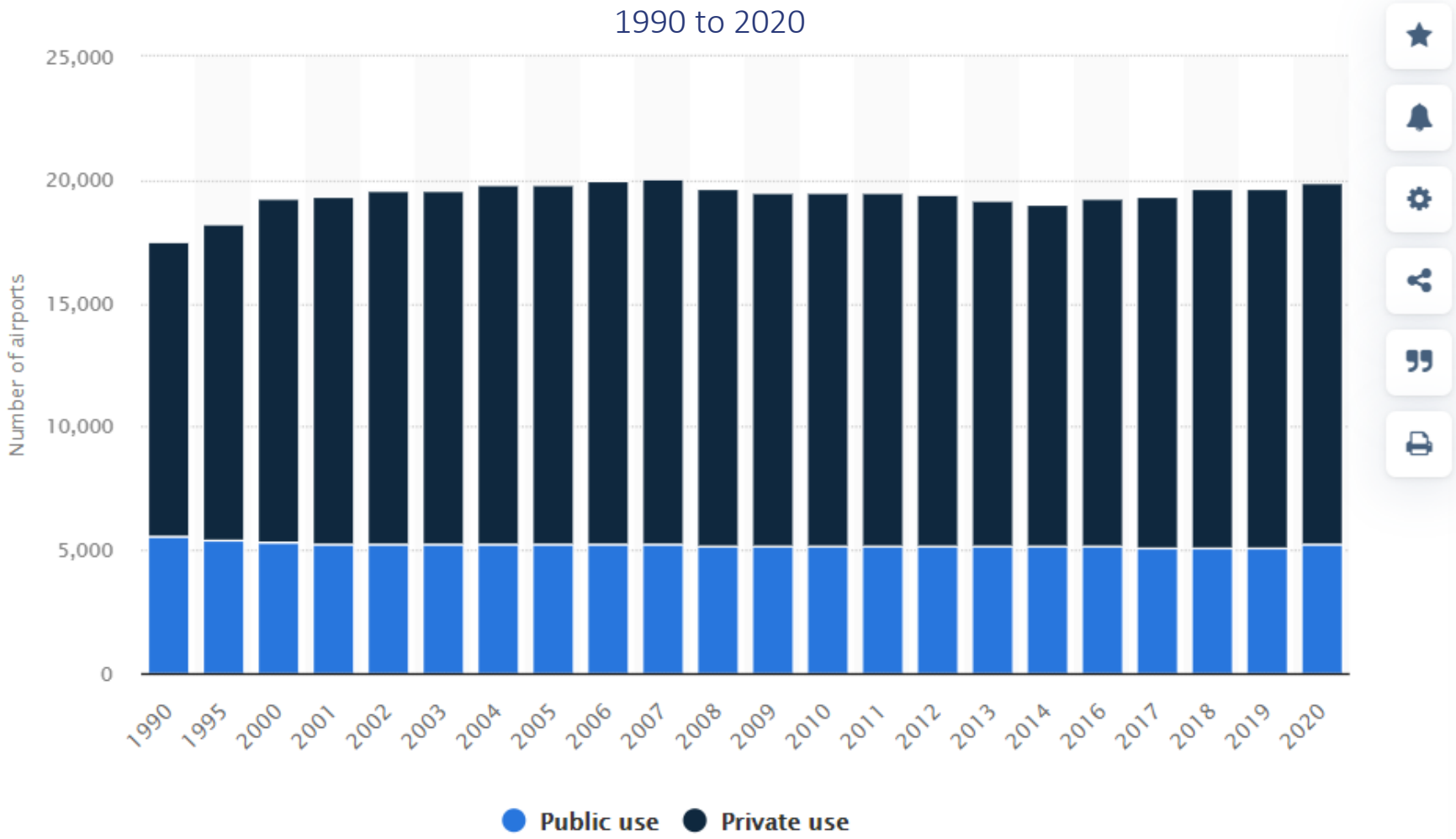
1. Overview of Aviation
2. Aircraft & Aerodynamics Fundamentals
3. Overview of Local Aviation
4. Airport Regulators
5. Airport Funding & Economic Output
6. Anatomy of Lake Elmo Airport
7. Aircraft Operations Trends
8. Long Term Planning & Noise Abatement
9. Noise Complaints Trends
10. Aviation Stakeholders
11. Community Resources & References
12. Aviation Events

1. Overview of Aviation

- ✓ English is the official language of aviation worldwide, and Coordinated Universal Time (UTC/Zulu) is the official clock: Military time add 6 hours for 21D local time (5 hours during daylight savings)
- ✓ Federal Aviation Administration has sole jurisdiction over aviation in the United States National Airspace System (Pilots, Aircraft, Airports, Airspace, Flight Procedures, etc.)
- ✓ Airspace is public in the United States except where protected for special uses
- ✓ The busiest time to fly is 6 a.m. -10 p.m., across the U.S. airspace
- ✓ Each airport in the world is assigned a four-character code –K21D is Lake Elmo Airport's code (All airport codes in the U.S. start with 'K')
- ✓ When referring to local airports, the 'K' is dropped from the code for simplicity
- ✓ There are 5,217 public-use airports in U.S.

Number of Public & Private U.S. Airports

1990 to 2020



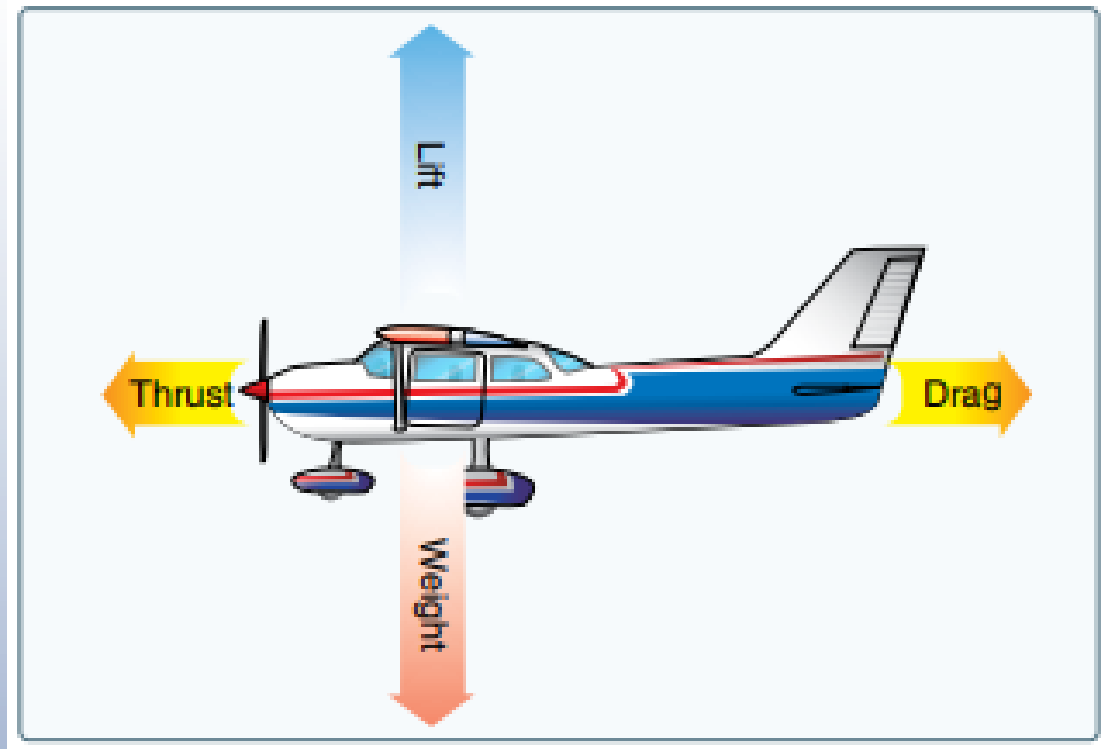
In 2020, there were 5,217 public airports in the U.S., a decrease from the 5,589 public airports operating in 1990. Conversely, the number of private airports increased 2,801 over this period from 11,901 to 14,702.

© Statista 2021

2. Aircraft & Aerodynamics Fundamentals

The most common type of aircraft that operates at MAC reliever airports has a single-engine and fits 1-4 people

Aircraft of all sizes and types utilize a headwind as much as possible during takeoff and landing to help generate lift.



3. Overview of Local Aviation

- ✓ There are 133 airports in Minnesota
- ✓ MAC owns seven airports: one commercial aviation airport (MSP) and six general aviation airports (ANE, FCM, LVN, MIC, STP, and 21D)
- ✓ Airports are classified according to the role they serve in the airspace system
- ✓ Lake Elmo Airport is included in a classification that restricts runways to 5,000 feet or shorter according to Minnesota Law and Metropolitan Council policies
- ✓ The Lake Elmo Airport (21D) is established as a secondary Reliever Airport, along with Crystal Airport and Airlake Airport, to enhance and support aviation system needs and relieve corporate air traffic congestion at MSP
- ✓ Reliever airports are maintained to the same safety standards as MSP

Flight Operations at 21D

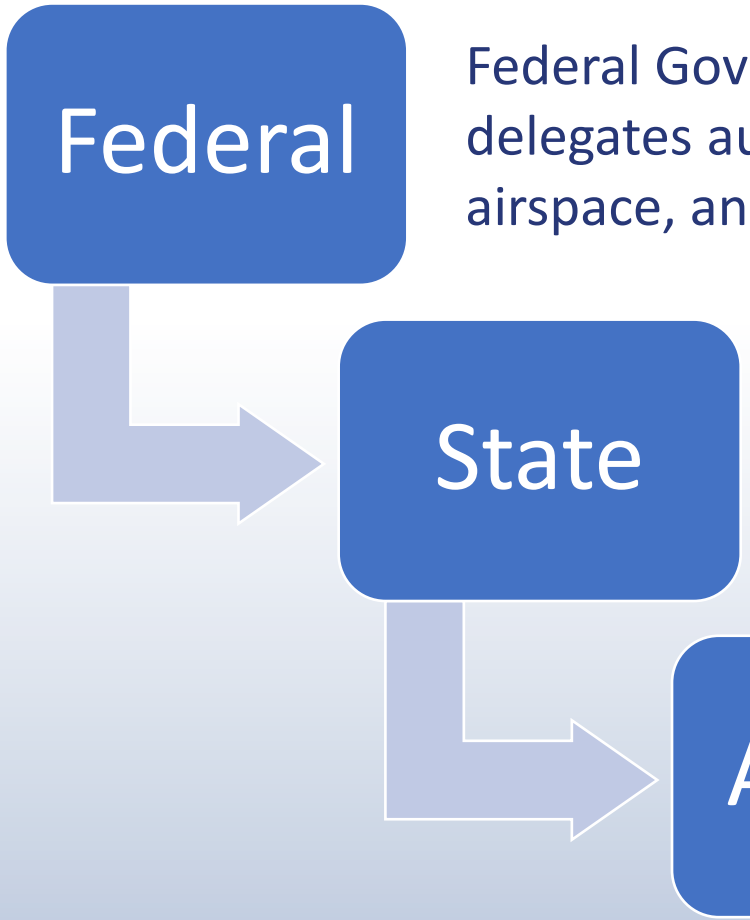
- ✓ Flight operations at 21D are regulated by the FAA

  (Note: the MAC does not have authority over aircraft flying to or from any of its airports)
- ✓ MAC airports are open for public-use 24 hours per day
- ✓ 21D is available for pilots to arrive and depart using most FAA-certificated aircraft types.
- ✓ The traffic pattern altitude at 21D is 1,000 feet above ground
- ✓ Aircraft in the process of taking off or landing do not have minimum altitudes

  (14 CFR 91.119)
- ✓ Pilots follow federally-established standard operating procedures when operating at non-towered airports such as 21D

MINNEAPOLIS CLASS B
MODE C & ADS-B OUT 30 NM
GOPHER
117.3 Ch 120 GEP
ANOKA COUNTY-BLAINE (JANES FLD) (ANE)
CT - 132.4 ATIS 120.625
912 L 50
122.95
RP 18,27
See NOTAMs/Supplement for Class D eff hrs
ANOKA CO RCO
122.55
PRINCETON
FOREST LAKE (25D)
930 L 27 122.7
LINO AIR PARK
(Pvt)
907 - 24
SURFSIDE (8Y4)
880 - 65 122.9
BUFFALO MUNI (CFE)
AWOS-3 120.45
968 L 32 122.8
Buffalo
Rogers
Hanover
golf course
Rockford
Montrose
Delano
Watertown
Mound
St Bonifacius
Mayer
Waconia
Chaska
Cologne
Hamburg
Shakopee
Prior Lake
CRYSTAL (MIC)
CT - 120.7
ATIS 124.475
869 L 32 122.95
INGLESIDE (Pvt)
1021 - 17
BENSON (Pvt)
942 - 20 122.7
Stillwater
LAKE ELMO (21D)
AWOS-3 120.075
933 L 28 122.8
ST PAUL DOWNTOWN HOLMAN FLD (STP)
CT - 119.1
ATIS 118.35
705 L 65
122.95
RP 27
STADIUMS
VOR-DME MINNEAPOLIS
115.3 Ch 100 MSP
PRINCETON
MINNEAPOLIS
1272 bldgs
100 SFC
POINT (Pvt)
936 - 50
122.8
WILDHURST PINES (Pvt)
928 - 46
THE PASS (Pvt)
930 - 70
LAKE PIERSON (Pvt)
966 - 20
VOR-DME FLYING CLOUD
117.7 Ch 124 FCM
FLYING CLOUD (FCM)
CT - 119.15
ATIS 124.9
906 L 50
122.95
RP 10R, 28R
SOUTH ST PAUL MUNI RICHARD E FLEMING FLD (SGS)
AWOS-3 119.425
821 L 40
122.7
NO SVFR
MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN (MSP)
CT - 123.675 123.95 126.7
ATIS 135.35 239.275
842 L 110 122.95
See NOTAMs/Supplement for Class D eff hrs
Woodbury
Cottage Grove
Hastings
Prescott
Trimbelle
Hudson
Roberts
Lakeland
River Falls
school
ST CROIX RIVIERA (Pvt)
895 - 17
STOCKER (Pvt)
855 - 20
Scandia
Copas
East Farmington
Marine on St Croix
Star Prairie
Cedar Lake
hospital
BEER (Pvt)
920 - 22
MISSISSIPPI RIVER
plant
V 78
V-171
V 412
297°
260°
236°
085°
103°
125°
159°
269°
339°
45°

4. Airport Regulators

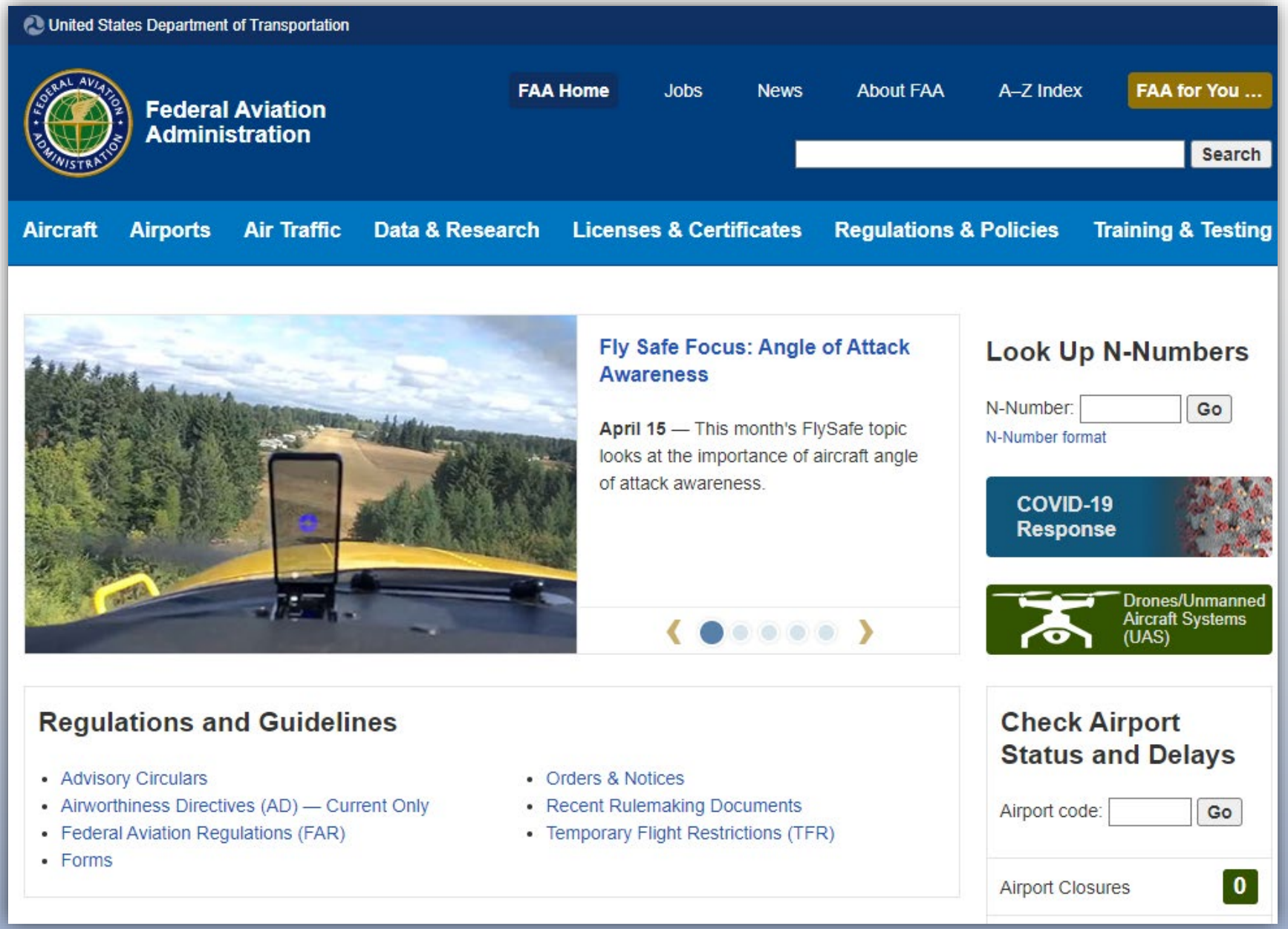


Federal Government: U.S. Department of Transportation delegates authority to the FAA to oversee airports, aircraft, airspace, and flight procedures in the United States

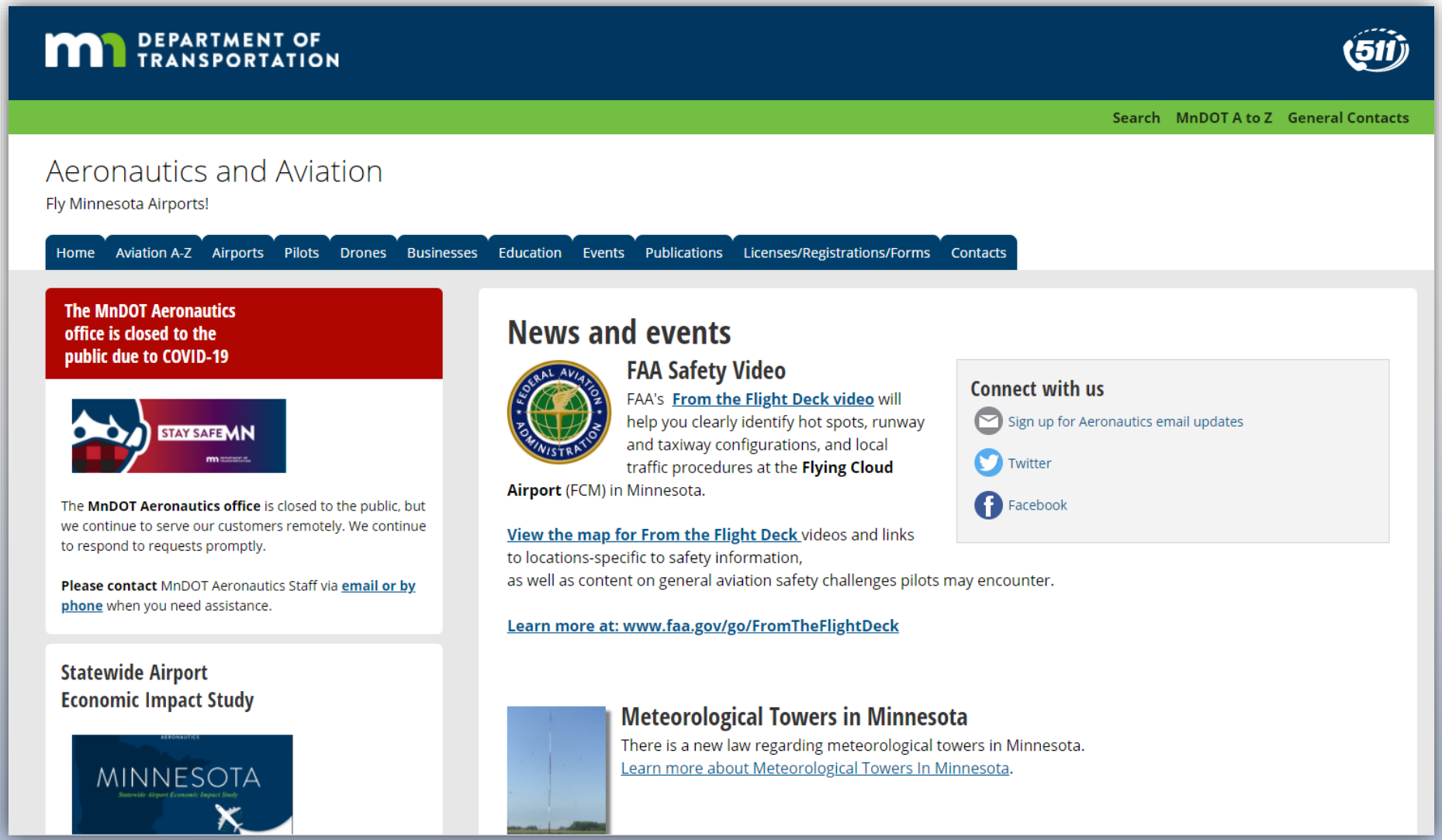
State of MN permits airports and heliports, grants registration for based aircraft, and created the MAC to oversee a system of airports for the twin-cities metropolitan area

MAC owns and manages airport facilities for seven airports: MSP, STP, FCM, ANE, MIC, 21D, and LVN

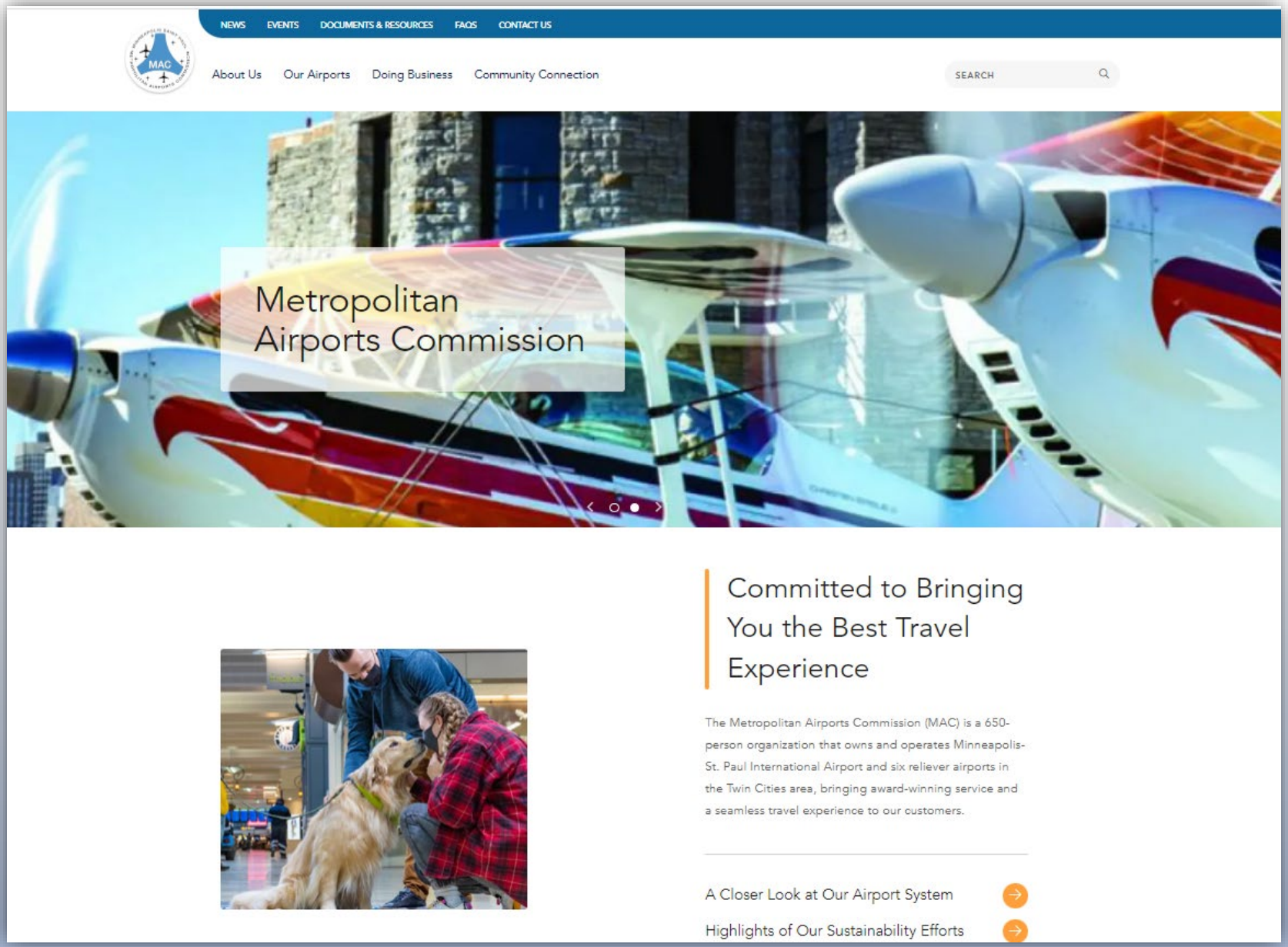
Federal Aviation Administration: faa.gov



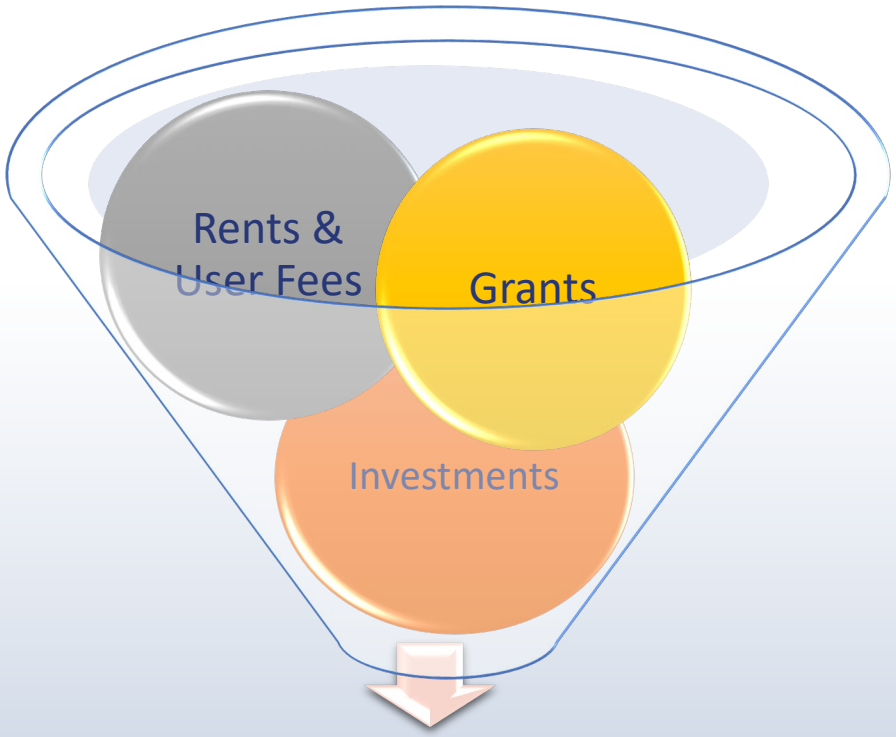
State of Minnesota: dot.state.mn.us/aero



Metropolitan Airports Commission: metroairports.org



5. Airport Funding & Economic Output



Airport Spending

Lake Elmo Airport

Direct Jobs:	14
Total Jobs:	60
Total Economic Output	***$12.8 million***

The MAC can levy taxes but has not done so in more than three decades.
The MAC cannot spend airport revenue outside airport property without FAA approval.

LAKE ELMO AIRPORT (21D)
BY THE NUMBERS

189
based aircraft

143
leases

13
pieces of equipment
maintaining the airfield and airport grounds

31,693
annual flight operations

$12.8 M
economic output annually

$347,778
annual operating revenue

624
acres

1
fixed based operators

60
jobs supported

2
runways

5,347
total feet of runway pavement

390
runway and taxiway lights

1 Flight school • No air traffic control tower • **1** Experimental aircraft association

In the community since 1951 • Owned by MAC since 1951 • On-site public viewing area

Updated October 2021

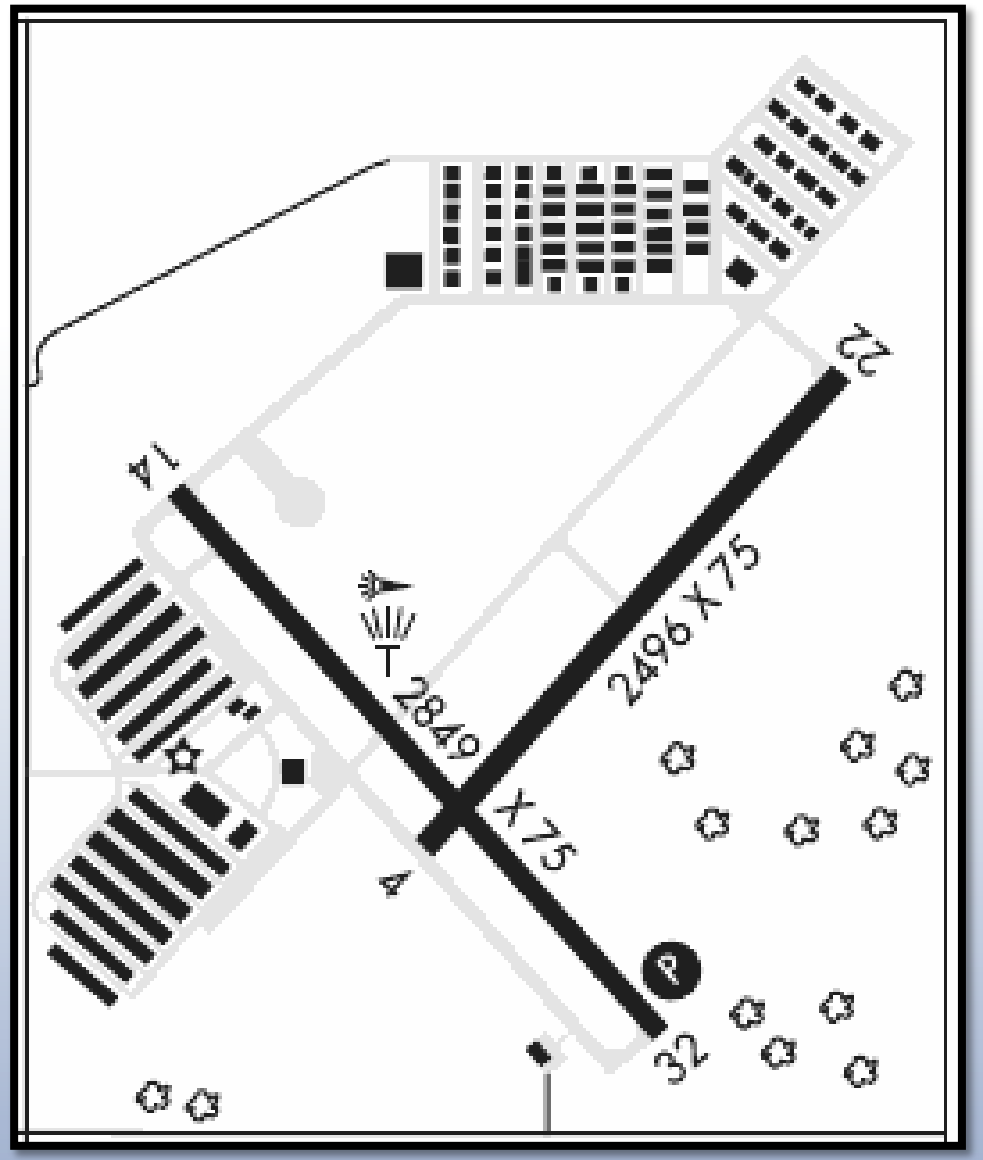
6. Anatomy of Lake Elmo Airport (21D)

Basic Airport Features of Lake Elmo Airport:

- **Runway**
  - Surface designated for take-off and landing movements
  - Named based on alignment with compass headings:

  Runway 14-32 (northwest/southeast)
  2,849 feet long x 75 feet wide
  Runway 4-22 (northeast/southwest)
  2,496 feet long x 75 feet wide

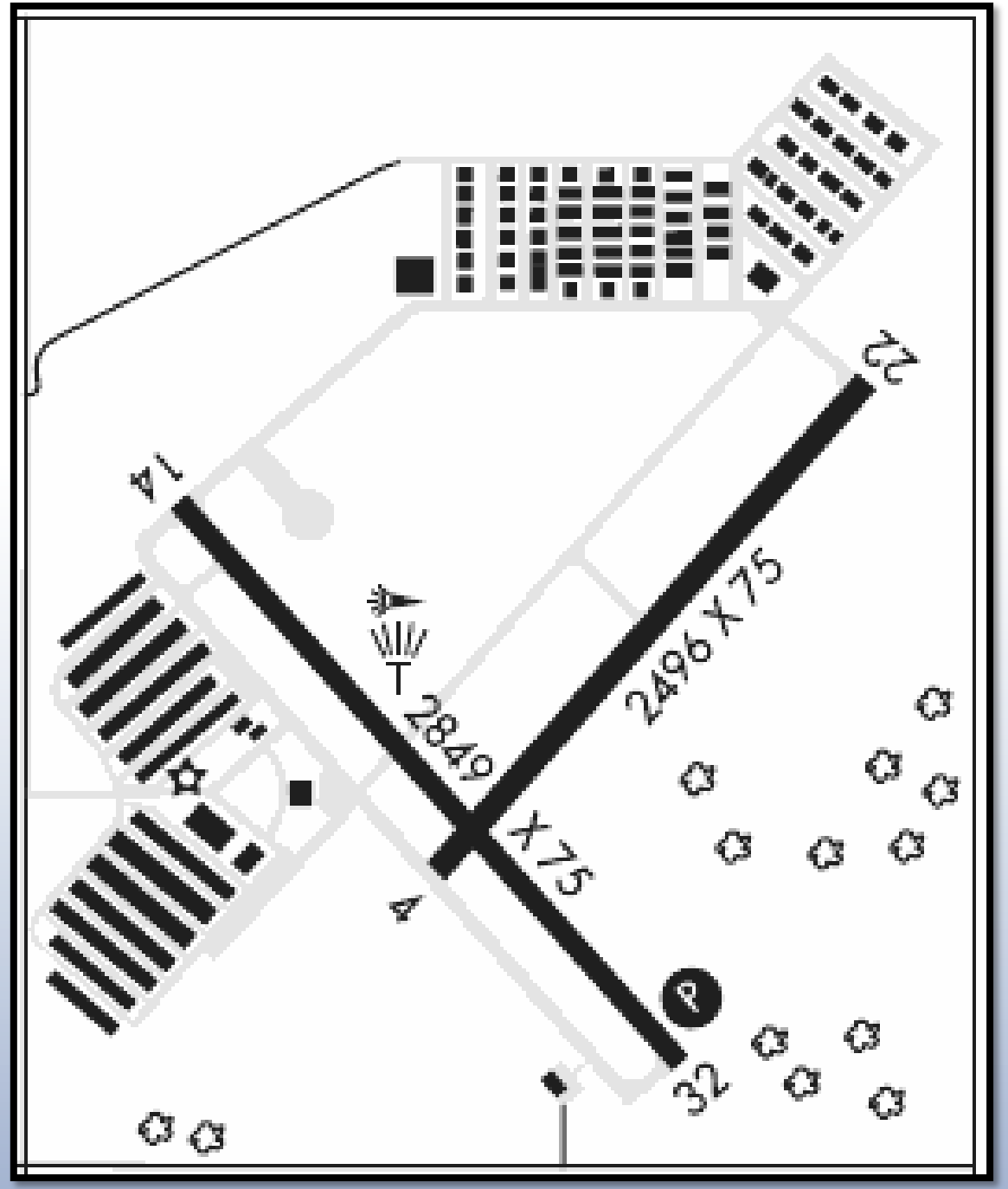
- **Taxiway**
  Surface designed for getting aircraft to and from the runway



Other Basic Airport Features of Lake Elmo Airport:

- **Fixed Base Operator (FBO)**
  Aviation Services Provider
- **Hangar Area**
  Aircraft storage buildings
- **Fence line**
- **Roadways**

Note: 21D is a non-towered airport (it does not have an Air Traffic Control Tower)

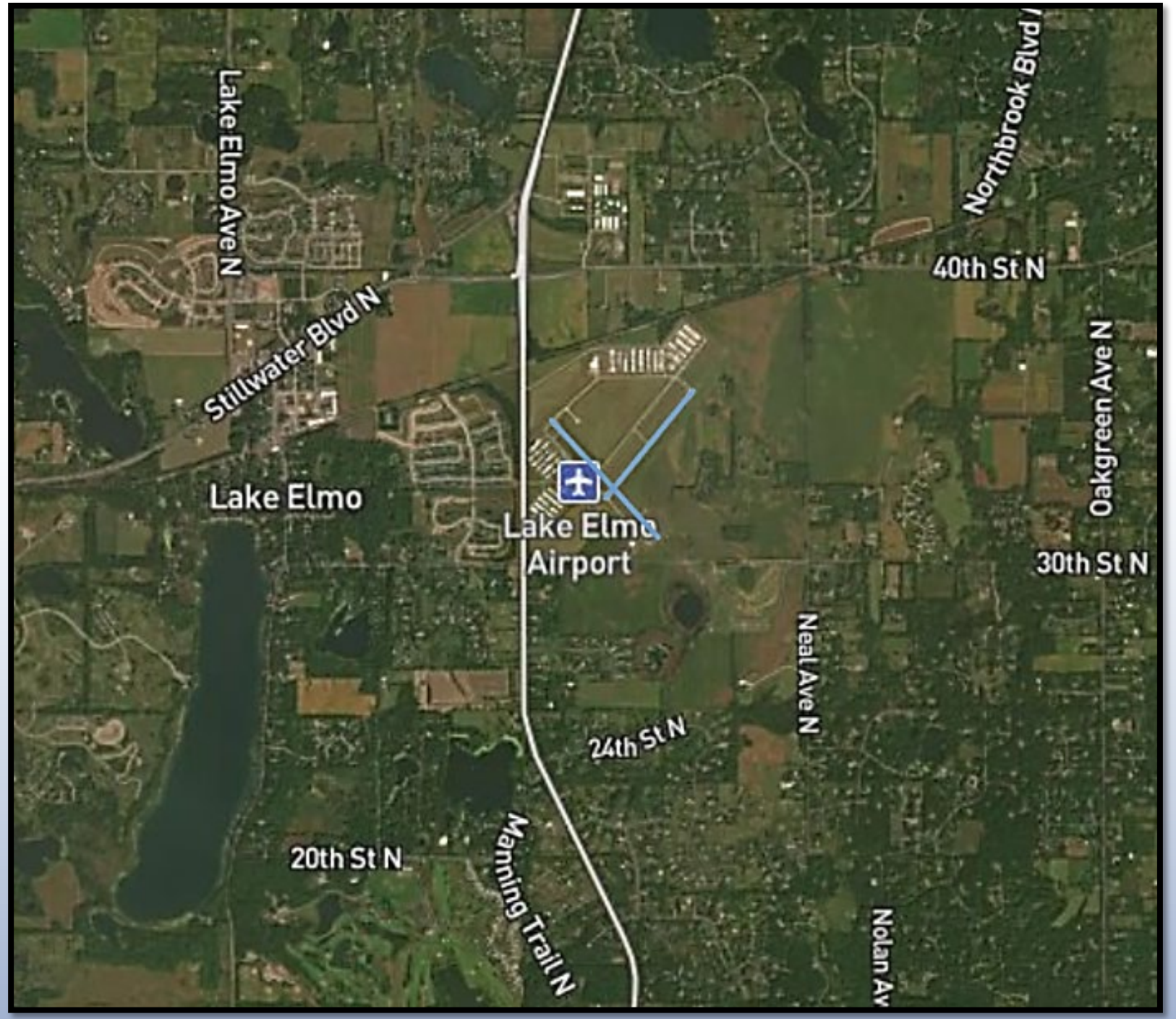


Lake Elmo Airport

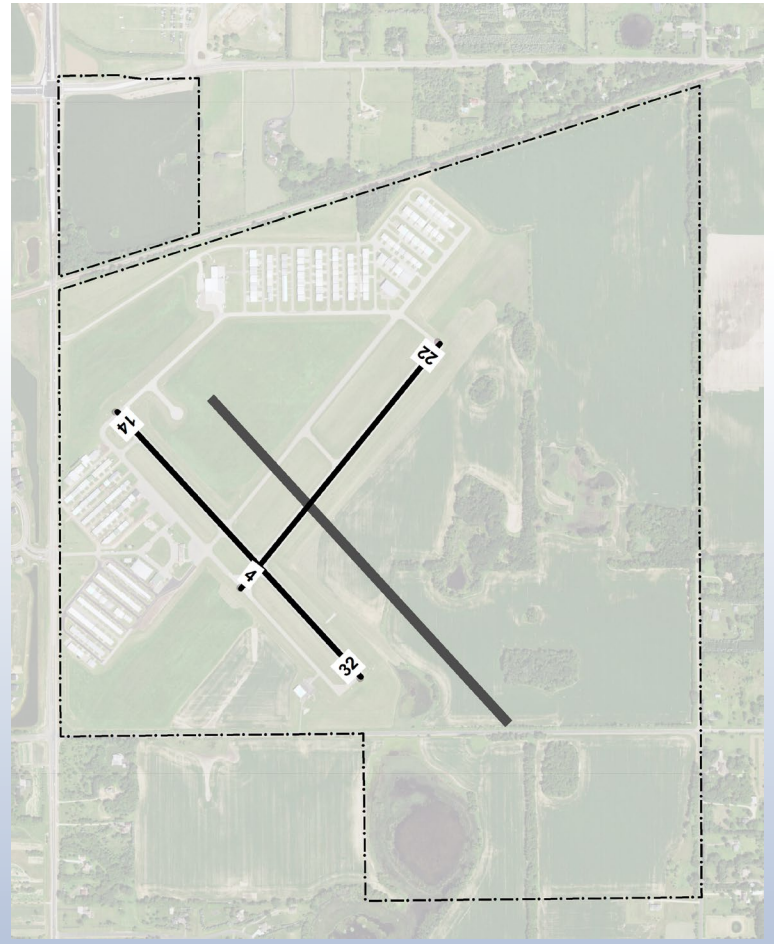
Then…

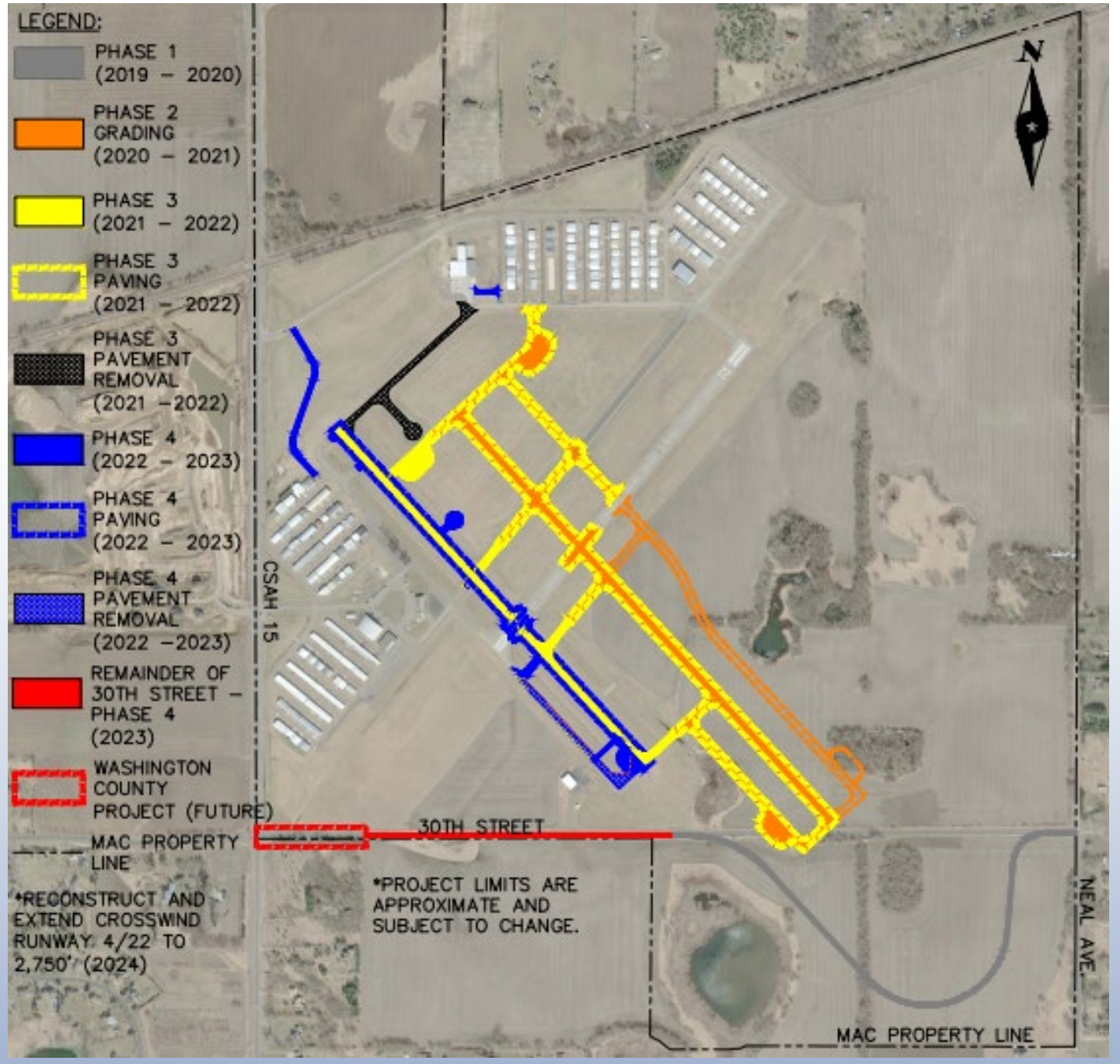
Lake Elmo Airport

Now…



Lake Elmo Airport
… in the Future



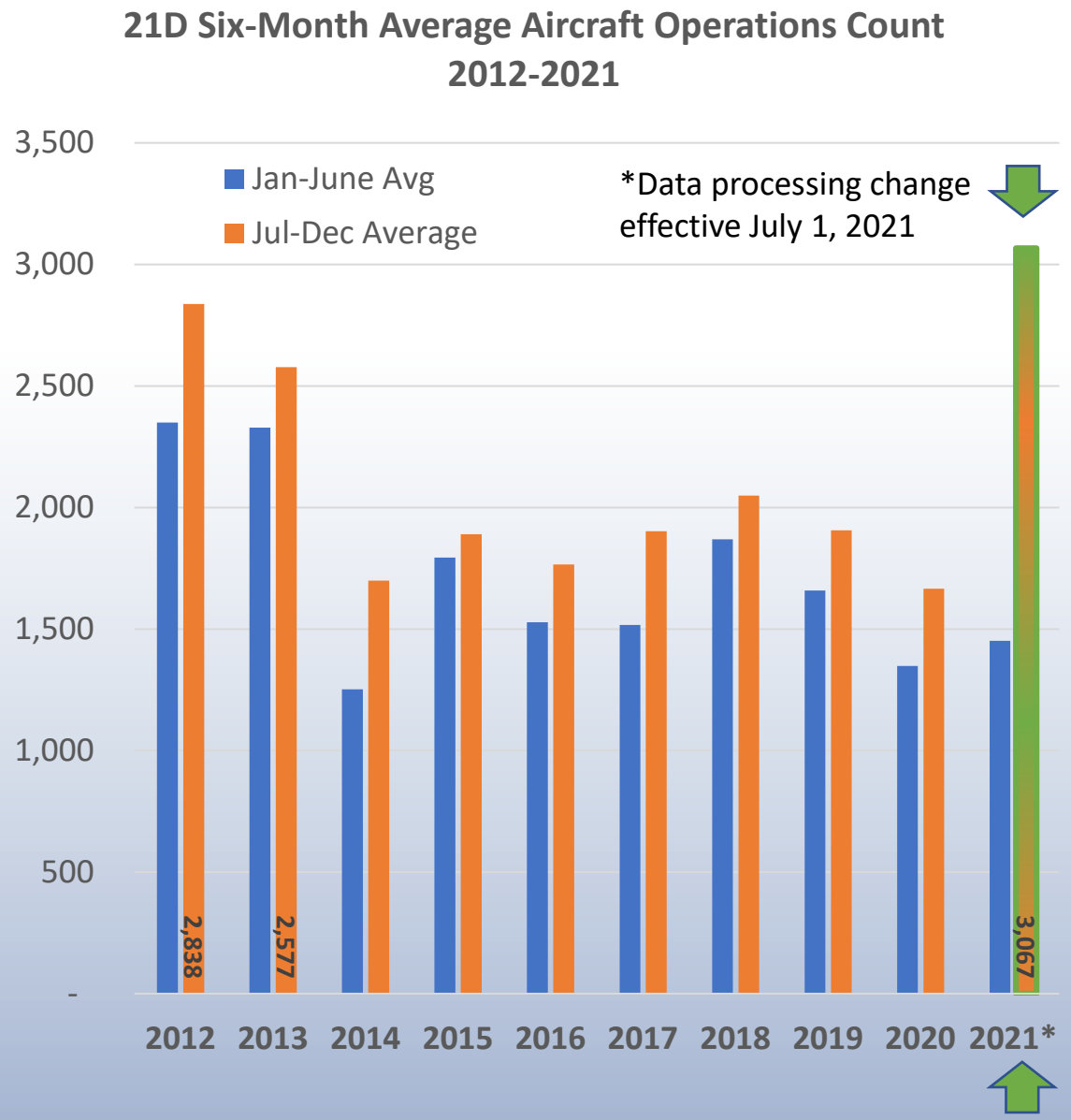


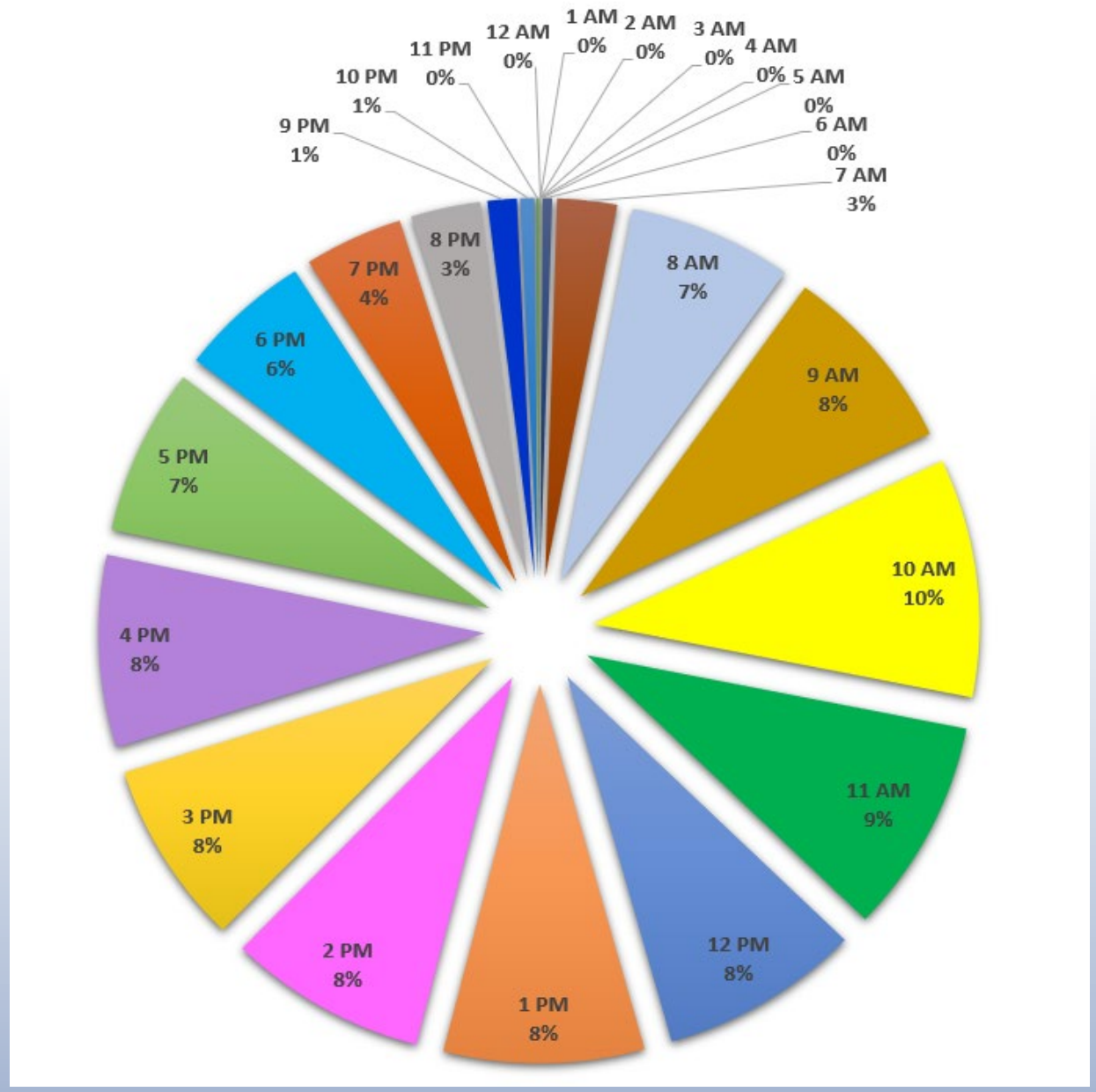
7. Aircraft Operations Trends

- ✓ Flight tracking data (MACNOMS) are used to determine the number of takeoffs and landings at 21D.

- ✓ A change in data processing effective July 1, 2021 now reflects more takeoffs and landings at 21D. Before the change, each flight track was counted as one takeoff and/or one landing even when the flight track included multiple takeoffs and landings.

Average Monthly & Hourly Aircraft Operations at 21D





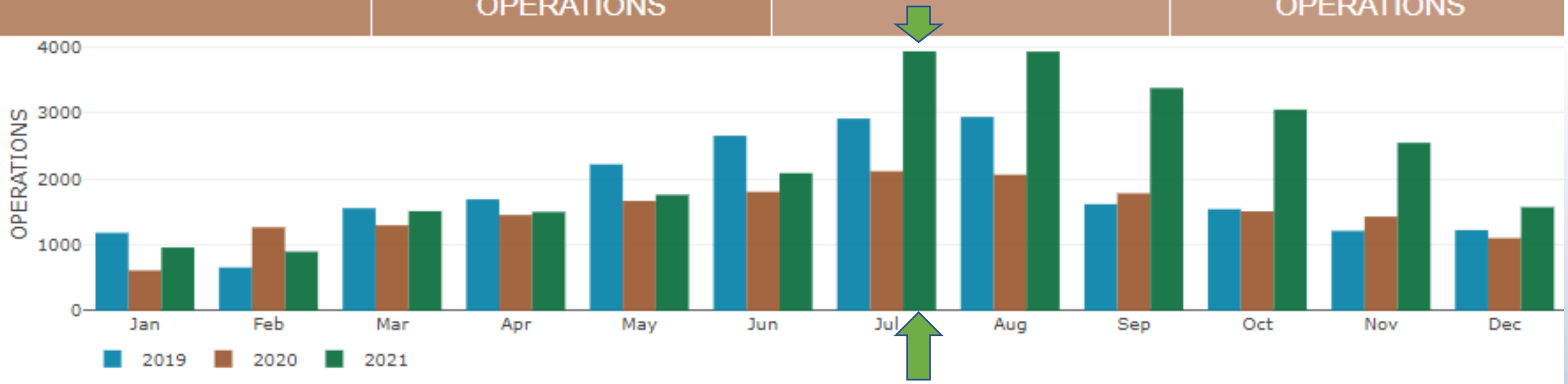
2021* Aircraft Operations per Hour each Month

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12 AM				3	3	2	1	1		1	1	
1 AM						1				1		
2 AM			1						1			
3 AM	*Historical data counts prior to July 1, 2021 cannot be					1						
4 AM	directly compared to current data as a result of data					1						
5 AM	processing improvements.				4	3	1			1		
6 AM		2	2	4	7	19	24	25	7	12	3	2
7 AM	10	10	21	32	49	74	109	148	84	60	62	19
8 AM	28	24	74	99	102	143	276	313	290	202	191	117
9 AM	70	59	101	120	127	201	279	350	288	257	212	127
10 AM	77	92	129	**140**	**172**	193	**396**	**405**	**352**	**312**	276	**211**
11 AM	100	98	138	139	152	**204**	358	272	250	278	**285**	200
12 PM	77	99	113	117	144	143	309	321	290	247	264	153
1 PM	104	102	**159**	123	123	145	322	333	248	259	218	137
2 PM	**131**	92	148	119	130	162	296	259	227	293	242	153
3 PM	120	**108**	131	131	144	116	263	227	274	192	266	147
4 PM	106	94	147	108	133	116	328	272	234	271	244	165
5 PM	65	66	158	122	115	102	253	259	258	307	143	77
6 PM	35	23	96	96	131	105	219	274	229	211	66	23
7 PM	17	13	49	86	107	123	189	224	187	76	38	13
8 PM	11	8	27	36	83	134	197	145	81	36	22	11
9 PM	5	5	11	15	15	59	69	61	56	13	11	12
10 PM	2		3	8	12	28	40	32	16	18	1	3
11 PM	1		2		4	11	4	7	4	2		

Source: MACNOMS

2021 Q4 and Monthly Aircraft Operations

2021		2020	
7164 OPERATIONS	**45** NIGHTTIME OPERATIONS	**4035** OPERATIONS	**24** NIGHTTIME OPERATIONS



NOTE: Green arrows highlight start of new data processing. Beginning on July 1, 2021, the MACNOMS methodology for counting operations was updated to more accurately reflect total aircraft departures or arrivals at MAC airports.

Annual Aircraft Operations for MAC Reliever Airports

MAC Airport Operations	2021	2020	Change 2020 - 2021
21D	32,645	29,799	9.6%
ANE	74,657	70,852	5.4%
FCM	131,593	124,382	5.8%
LVN	36,259	31,314	15.8%
MIC	37,845	39,509	-4.2%
STP	39,196	30,188	29.8%
Operations Total	352,195	326,044	8.0%

8. Long Term Planning & Noise Abatement

- ✓ Long Term Comprehensive Plans established for each airport (MAC and Met Council)
- ✓ Land Use Planning in Comprehensive Plans (Local Communities)
- ✓ Long term plans that support airport access and consider flight paths are essential for managing community expectations
- ✓ Open space and non-residential areas in vicinity of airports are most compatible
- ✓ Pilots use voluntary noise abatement flight procedures at each MAC airport

Airport Access Restrictions in United States

The Airport Noise and Capacity Act of 1990 (ANCA) requires federal approval for access restrictions proposed for public-use airports in accordance with 14 CFR Part 161.

Lake Elmo Airport Adapting to its Community

21D IS A NOISE SENSITIVE AIRPORT

Avoid Noise Sensitive Residential Areas When Possible

Pilot Information and Noise Abatement Plan (NAP)

A voluntary Noise Abatement Plan (NAP) for 21D is the result of cooperative efforts between airport users and pilots, surrounding communities, and the Metropolitan Airports Commission.

NOTE: FAA regulations and requirements take precedence over noise abatement procedures. RECOMMENDED PROCEDURES ARE NOT INTENDED TO CONFLICT WITH INSTRUCTIONS FROM ATC OR THOSE THAT ARE THE EXCLUSIVE AUTHORITY OF THE FAA

Preferred Runway Use

Runway 32 is the calm wind runway. Communicate runway use intentions on UNICOM/CTAF.

Traffic Pattern Procedures

The following procedures shall be adhered to while operating in the 21D traffic pattern:

1. The traffic pattern altitude at 21D shall be 1933 msl.
2. Multiple training events by turbojet aircraft in the traffic pattern are prohibited.
3. Keep traffic pattern as close to runways as possible.
4. When departing the traffic pattern, choose a path that avoids overflying residential areas if possible. Follow preferred departure routes if possible (green arrows in map).

NIGHTTIME MEASURES

1. Pilots are asked to avoid operating during nighttime hours (2200 – 0700 local) if possible
2. Training flights are discouraged between the hours of 2400 - 0700 local
3. Intersection takeoffs are discouraged at all times, and prohibited from 2200-0700 local
4. Any aircraft not meeting 14 CFR Part 36 is prohibited between 2200 - 0700 local

HELICOPTER PROCEDURES

1. Helicopter training in the traffic pattern area is prohibited from 2200 - 0800 local
2. Avoid flow of fixed wing aircraft
3. Avoid low-level training and repetitive activity over residential areas whenever possible

DEPARTURE PROCEDURES

1. Intersection takeoffs at the airport are discouraged at all times
2. Departing aircraft should climb to 500 feet agl before initiating a turn
3. Avoid overflying noise sensitive residential areas if possible
4. Gain as much altitude as possible before overlying residential areas
5. Follow NBAA Noise Abatement Departure Procedures

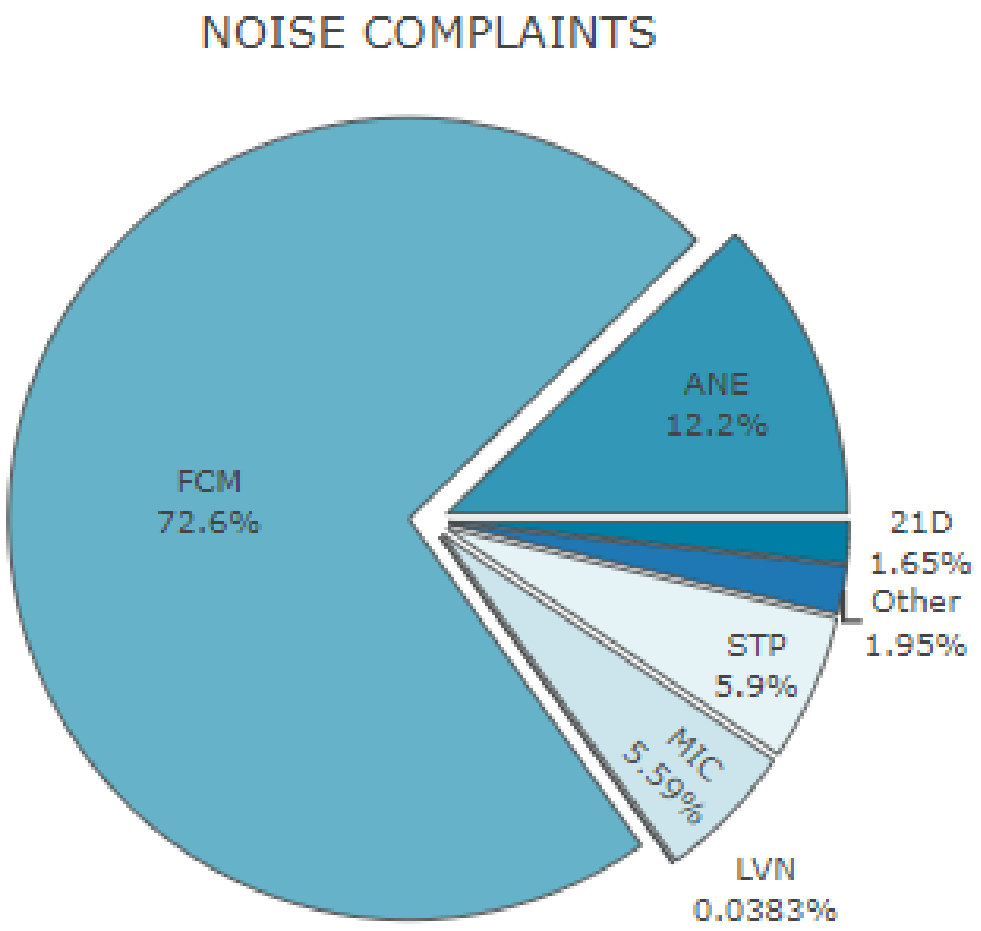
ARRIVAL PROCEDURES

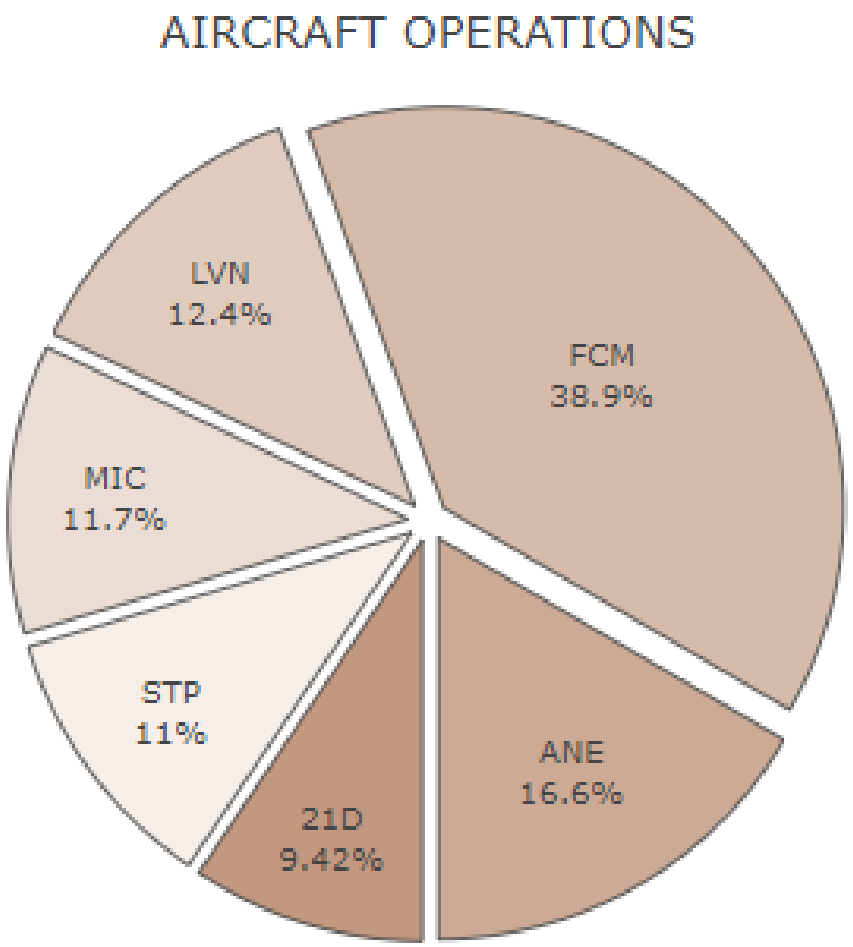
1. On approach to 21D, remain at Traffic Pattern Altitude or higher until descending via PAPI/VASI if available
2. Remain at an altitude at or above the approach slope indicator as much as possible
3. Stop and Go landings are NOT permitted
4. Follow NBAA Approach and Landing Procedures

9. Noise Complaints Trends

- ✓ Aircraft noise complaint feedback is received by MAC through website, email, and 24-hour hotline
- ✓ Details are used for analysis
- ✓ Aircraft noise complaints are correlated with flight tracks based on the details provided in each complaint

Q4 2021 Aircraft Noise Complaints for MAC Reliever Airports





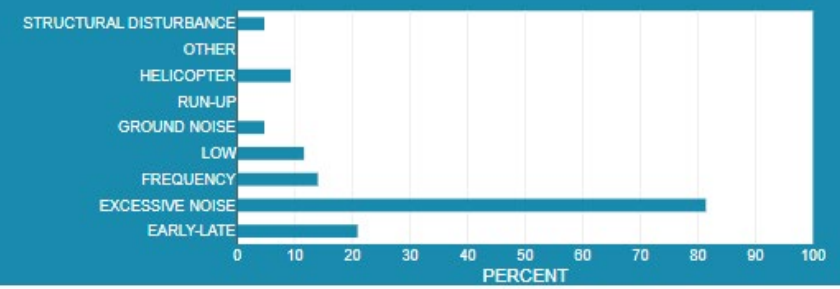
2021 Q4 and Monthly Aircraft Noise Complaints

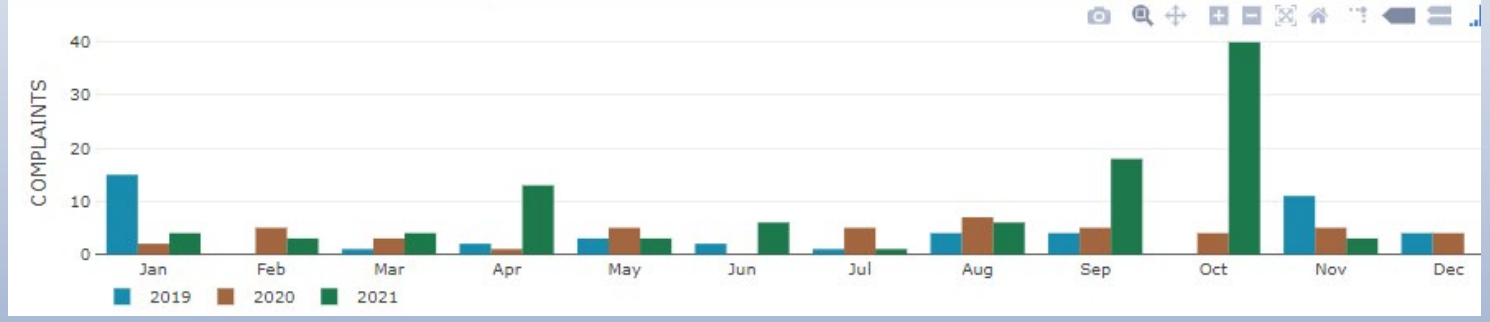
Lake Elmo Airport (21D) — 4TH QUARTER 2021

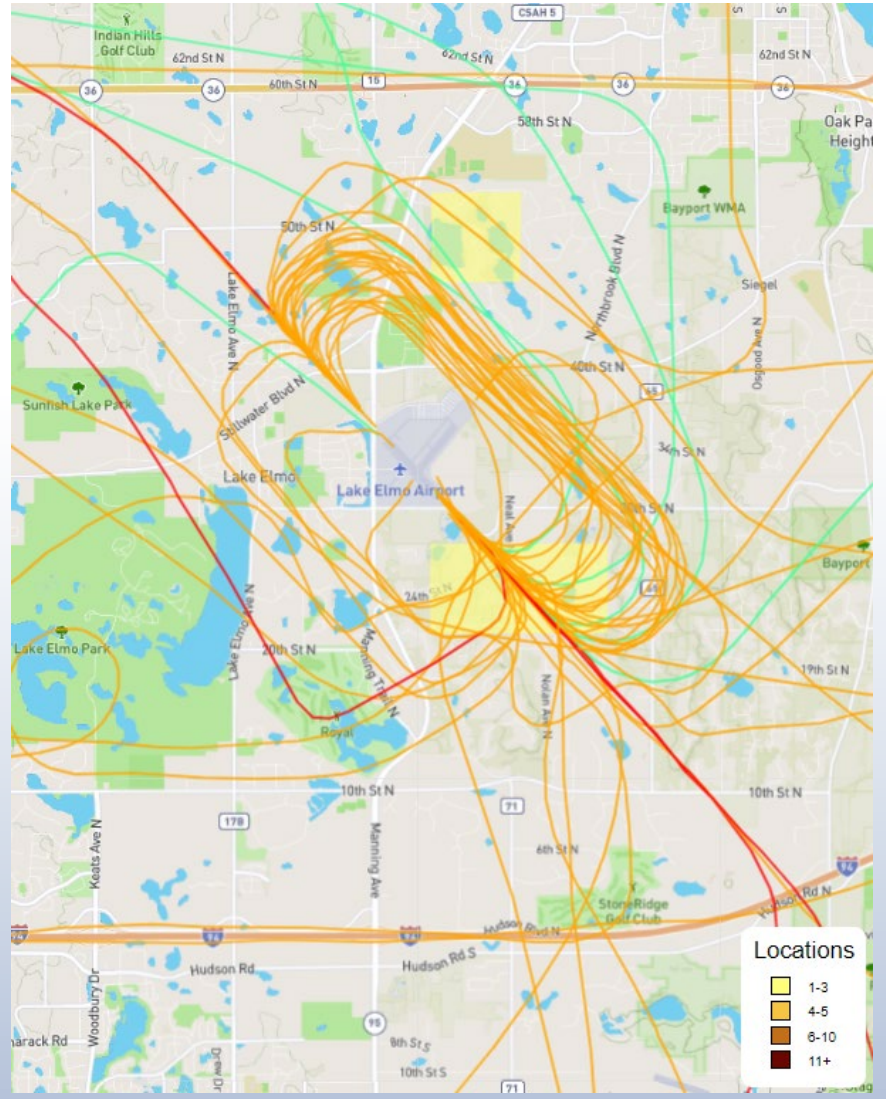
COMPLAINTS

2021	43 COMPLAINTS	4 LOCATIONS	7 NIGHTTIME COMPLAINTS	2 NIGHTTIME HOUSEHOLDS
2020	13 COMPLAINTS	3 LOCATIONS	1 NIGHTTIME COMPLAINTS	1 NIGHTTIME HOUSEHOLDS

COMPLAINT DESCRIPTORS







Lake Elmo Airport ADVISORY COMMISSION

LEAAC

10. Aviation Stakeholders

11. Community Resources and References

- ✓ LEAAC
- ✓ MAC Tools & Data
- ✓ MNDot Data & Reports
- ✓ FAA Data
- ✓ Aircraft Viewing Area

MinnesotaGO
A Collaborative Vision for Transportation

State Aviation System Plan

Lake Elmo Airport Advisory Commission (LEAAC)

GOAL: further the general welfare of the community and the Lake Elmo Airport through minimizing or resolving problems created by the aircraft operations at the airport.

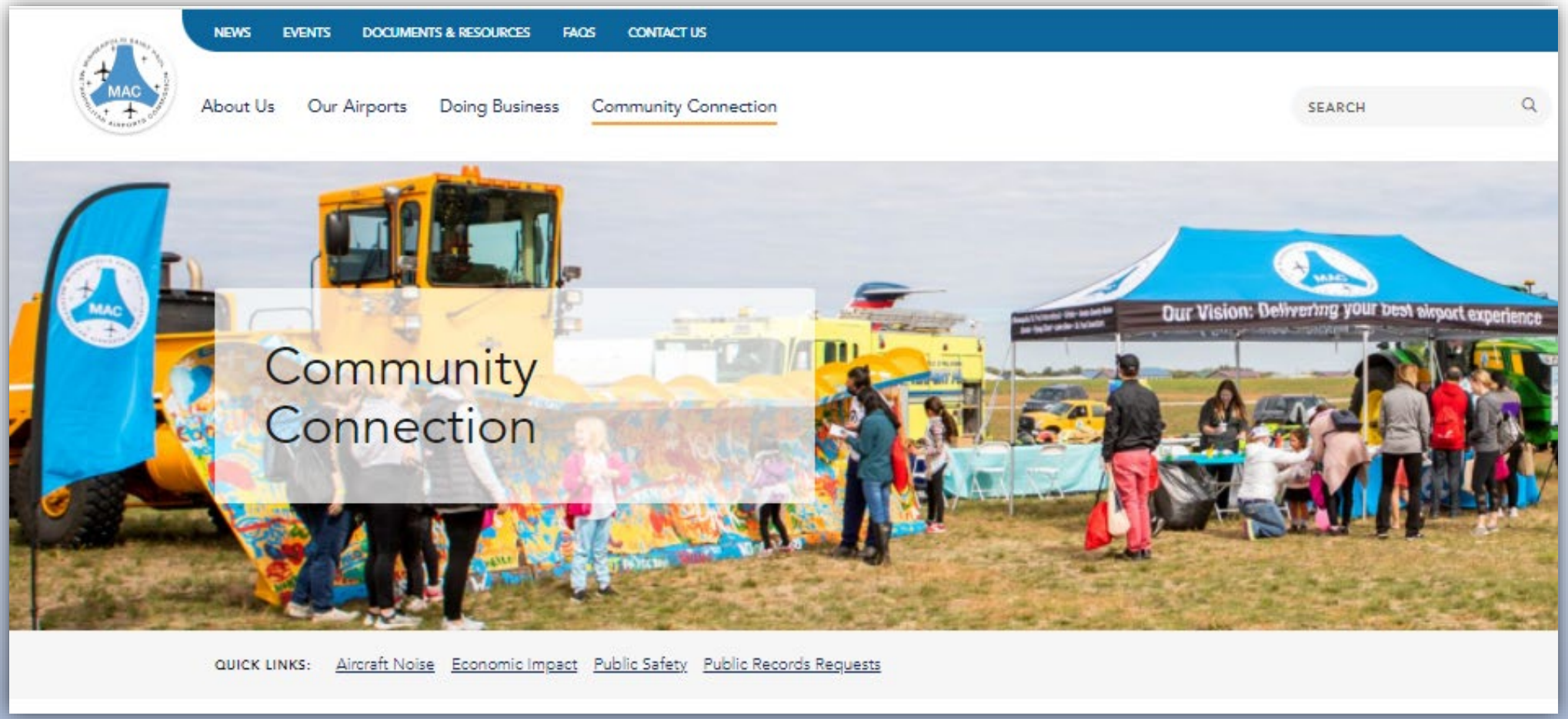
PURPOSE:

1. advise the community and the Metropolitan Airports Commission with regard to all matters affecting the Lake Elmo Airport, the classification, rules and regulations supplied to the operation of the Airport and the development of lands adjacent to the Airport,
2. cooperate with the Metropolitan Airports Commission staff in reviewing matters affecting the use and control of the Lake Elmo Airport, and
3. make recommendations to the Metropolitan Airports Commission regarding any proposal affecting the use or operations of Lake Elmo Airport.

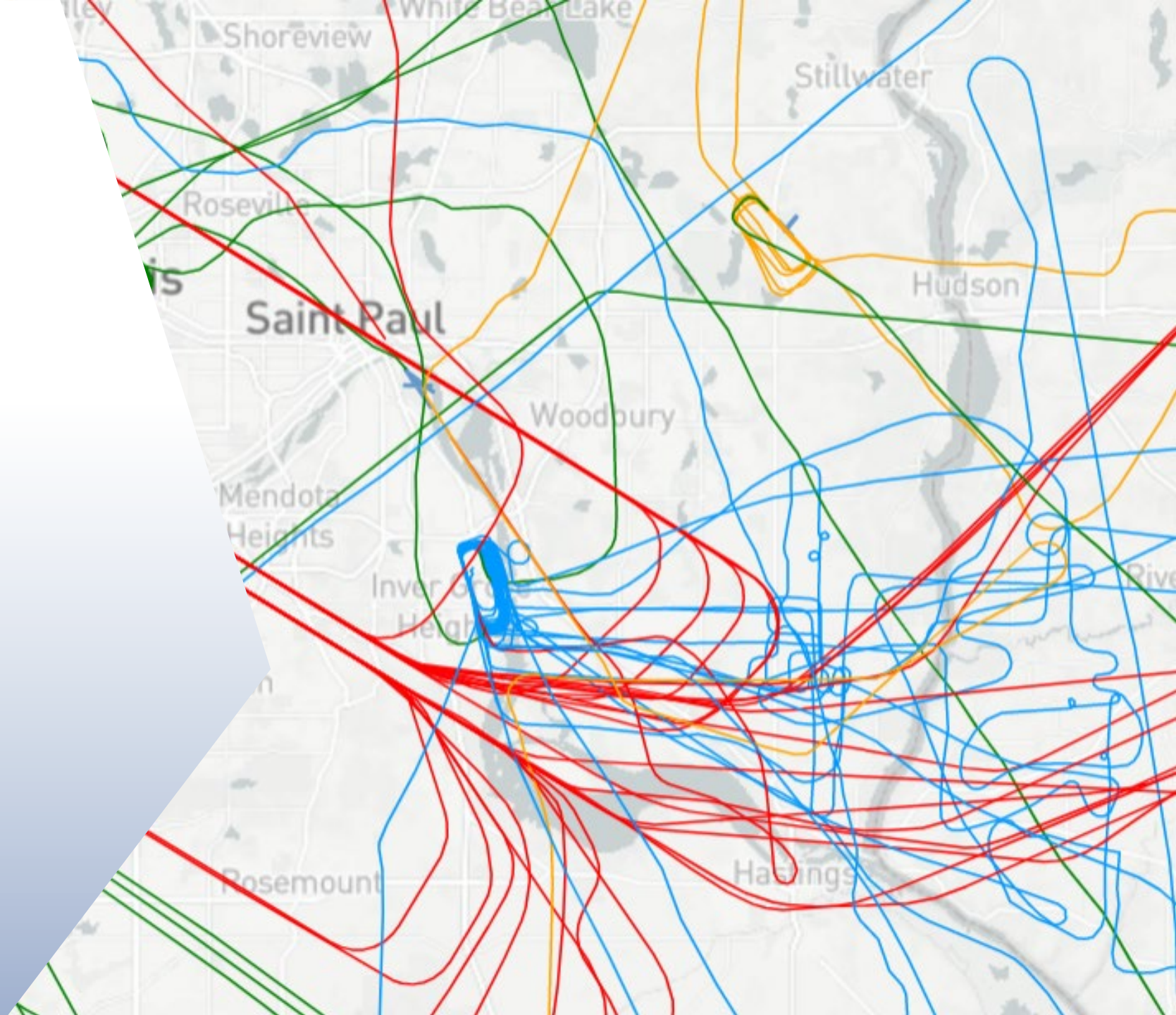
Meetings: convened quarterly and members of the public are encouraged to participate.

Website Resources: metroairports.org/community-connection

FlightTracker
Reports
Videos
Calendar
FAQs



MAC FlightTracker: macnoms.com



Customers.macnoms.com/reports/relievers.html

Home | STP | FCM | ANE | MIC | LVN | 21D

MAC Reliever Interactive Reports

Note: An operation is a takeoff or a landing: 1 Takeoff + 1 Landing = 2 Operations

minnesotago.org/aviation

faa.gov/air_traffic/community_engagement/

Federal Aviation Administration

About Jobs News Search

AIRCRAFT AIR TRAFFIC AIRPORTS PILOTS & AIRMEN DATA & RESEARCH REGULATIONS SPACE DRONES

FAA Home ▸ Air Traffic ▸ Community Engagement

- Air Traffic By The Numbers
- Air Traffic Plans and Publications
- Community Engagement
- Environmental Reviews
- Flight Information
- International Aviation
- National Airspace System
- Obstruction Evaluation
- Separation Standards
- Technology

FAA Community Engagement

Engagement

As the FAA continues to advance the National Airspace Syste
engagement and open dialogue with those affected by airspa
includes working with airports and community leadership thro
forces. We also routinely engage the public through Commur
Complaint Initiative (NCI), to understand specific challenges

Opportunities for Engagement

Changes in airport operations, airspace procedures, aviation
impacts on communities. Part 150 noise compatibility progra
methods by which airports and the FAA can help communitie
changes to aviation services in their community. Learn more
community roundtables here (PDF).

FAA Home ▸ Airports ▸ Regional Airports Offices

Regional Airports Offices

11. Aviation Events

Aviation events bring community together to share information and build understanding about aviation, including:

- Open Houses
- Tours
- Social Gatherings
- Education
- Hands-on experience

Thank you for joining us!