Fairmont Municipal Airport (FRM)

Airport Master Plan Forecasting and Facility Inventory

October 16, 2024

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Agenda

- New Inventory Findings
- Review of Forecast
- Outreach
- Runway Length/Threshold
- Obstructions
- Taxiway width
- Drainage
- Open Discussion



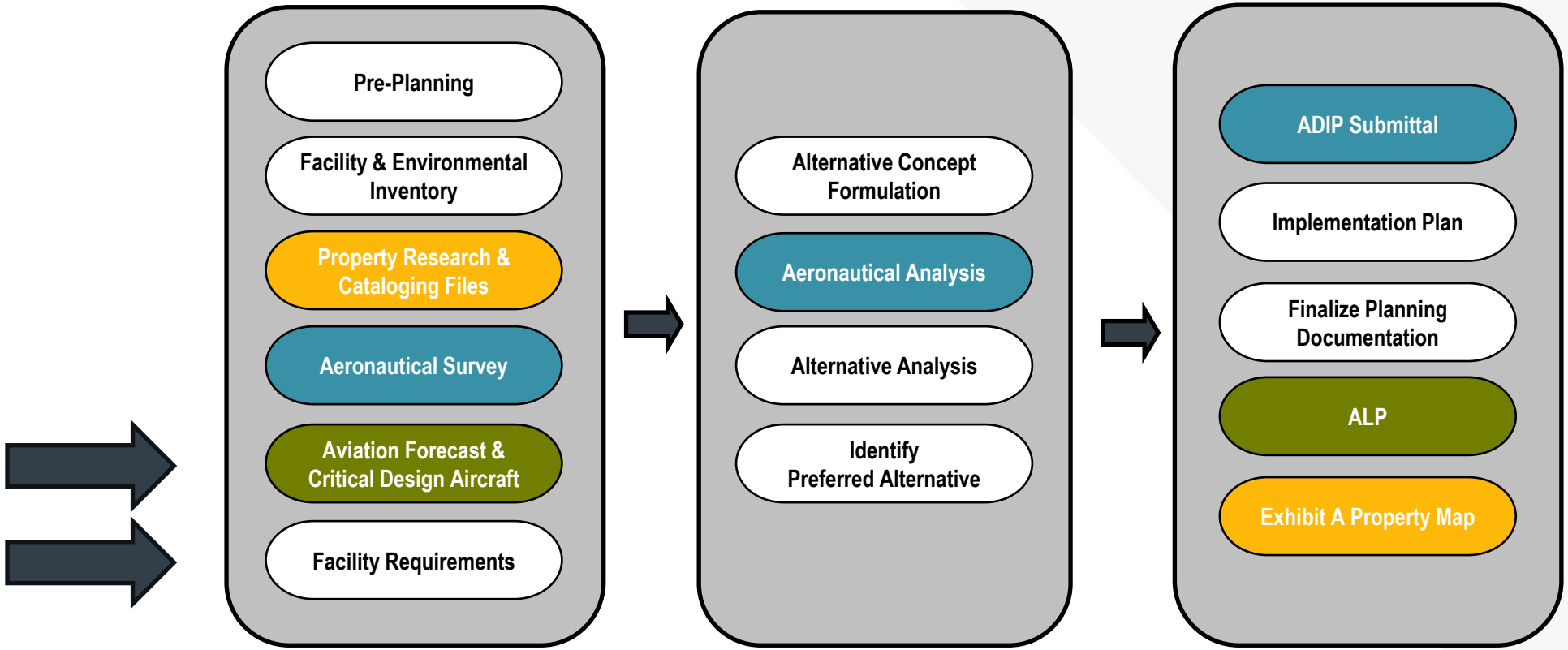




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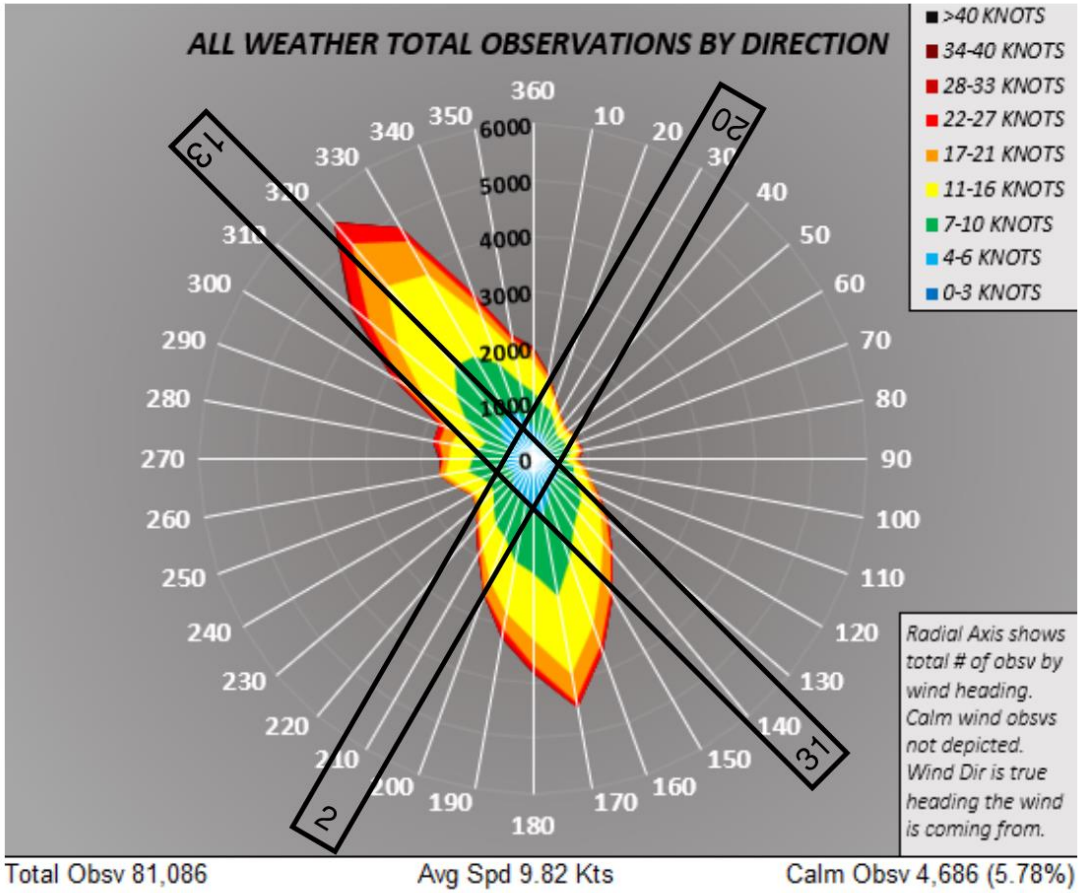
Project Workflow



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Wind Analysis



ALL-WEATHER WIND COVERAGE				
CONFIGURATION	CROSSWIND COMPONENT			
	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 13-31	89.31%	95.41%	98.23%	-
RUNWAY 2-20	78.28%	87.00%	93.03%	-
	-	-	-	-
COMBINED	97.49%	99.28%	99.84%	-
SOURCE: AWOS (1/01/2014-12/31/2023, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER; 81,625 TOTAL OBSERVATIONS				

INSTRUMENT FLIGHT RULES (IFR) WIND COVERAGE				
CONFIGURATION	CROSSWIND COMPONENT			
	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 13-31	85.74%	93.61%	97.57%	-
RUNWAY 2-20	-	-	-	-
	-	-	-	-
COMBINED	85.74%	93.61%	97.57%	-
SOURCE: AWOS (1/01/2014-12/31/2023, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER; 8,344 TOTAL OBSERVATIONS				
IFR = VISIBILITY LOWER THAN 3 MILES OR CEILING LOWER THAN 1,000 FEET				

Table B-1. Allowable Crosswind Component per Runway Design Code (RDC)

RDC	Allowable Crosswind Component
A-I and B-I *	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through D-III D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI	20 knots
E-I through E-VI	20 knots

Note: * Includes A-I and B-I small aircraft.

Instrument Approaches

Weather Condition	Percentage	Days per Year	Hours per Year
VMC	89.78%	327.7	7,865
Usable IMC	8.15%	29.7	714
Usability	97.93%	357.4	8,577
Below Current Weather Minimums*	2.07%	7.6	182
Achievable Weather Minimums**	0.93%	3.4	81
Still Below Weather Minimums	1.14%	4.2	101
Total	100.0%	365.0	8,760

Source: KFRM AWOS (2014-2023, hourly) from National Climatic Data Center, 8,1625 total observations
**Current IFR minimums are 400-foot cloud ceiling and ½ mile flight visibility for Runway 31 approach*
*** Reduce IFR minimums to 200-foot cloud ceiling and ½ mile flight visibility for Runway 31 approach*

- Runway 31 – 400’ & ½ mile
- Runway 13 – 300’ & 1 mile
- Glideslope Limitations
- Reduce 31 to 200’ + 0.93% 3.4 days
- Reduce 13 to ¾ mile + 0.11% 0.4 days

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Based Aircraft Forecast

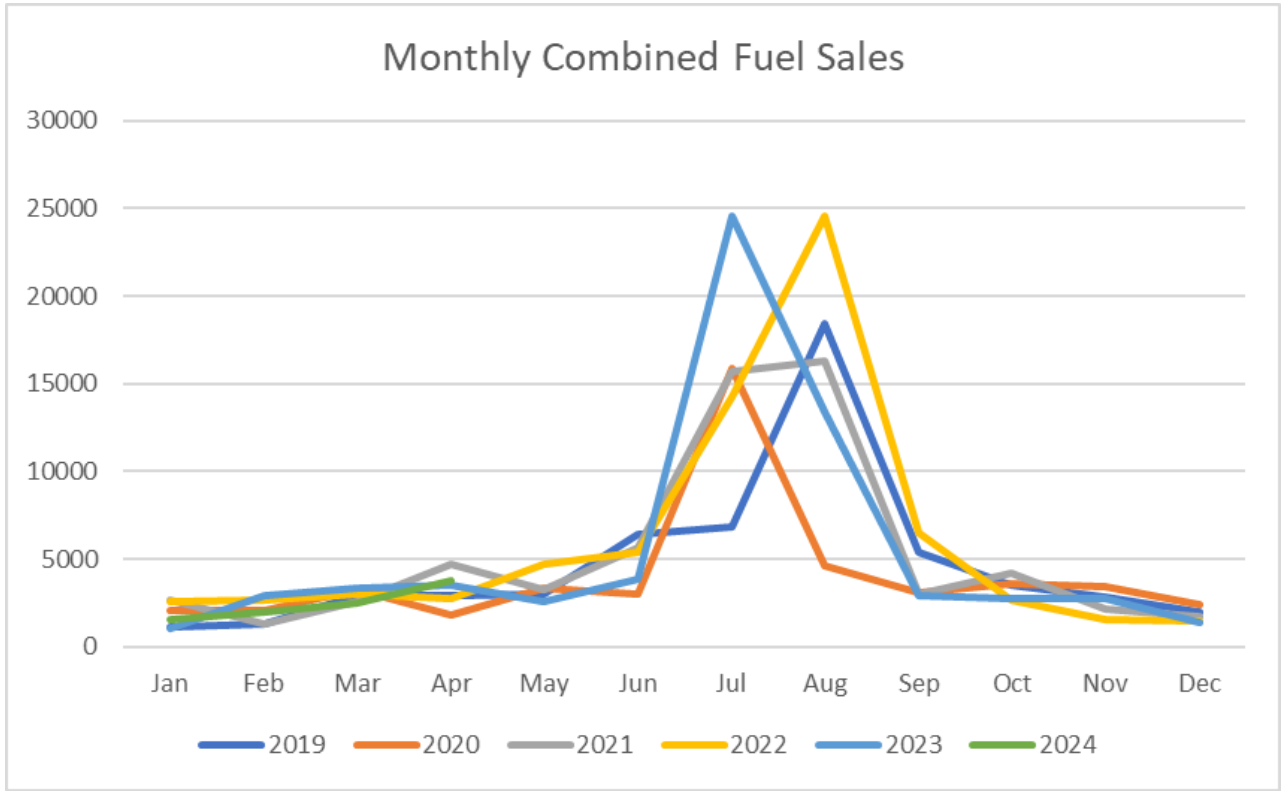
Metric	2024	2029	2034	2039	2044	CAGR
Single-Engine	27	27	27	27	27	0.07%
Multi-Engine	1	1	2	2	2	4.00%
Turboprop	2	3	3	4	4	4.00%
Jet	1	1	2	2	3	4.81%
Helicopter	0	0	0	0	0	0.00%
Other	0	0	0	0	0	0.00%
TOTAL	31	32	34	35	37	0.82%

- 31 Validated Based Aircraft (as of 5/2024)
- 2 contested aircraft
- Forecasted growth rate of 0.80% (Socioeconomic)
- 37 based aircraft by 2044

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Fuel Sales



- Most fuel sales occur in July and August
- Average Annual Total: 61,138 gallons
  - Jet A: 38,471 gallons
  - 100LL: 22,667 gallons

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Critical Design Aircraft

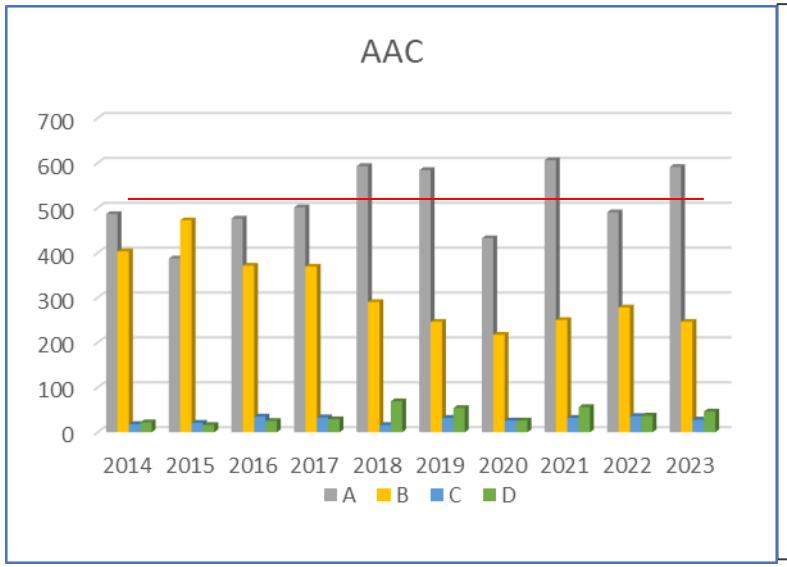
ID	Make	Model	Type	AAC	ADG	TDG	MTOW (lbs.)	10-Year Ops	2023 Ops
BE20	Beechcraft	King Air 200	Turboprop	B	II	2-A	12,500	562	28
BE30	Beechcraft	Super King Air 300	Turboprop	B	II	2-A	14,000	19	0
BE36	Beechcraft	Bonanza 36	Piston	A	I	1-A	3,650	1,525	154
BE9L	Beechcraft	King Air C90	Turboprop	B	II	1-A	10,100	99	6
C25A	Cessna	Citation CJ2	Turbojet	B	II	2-A	12,500	8	2
C25B	Cessna	Citation CJ3	Turbojet	B	II	2-A	13,870	110	10
C340	Cessna	340	ME Piston	B	I	1-A	5,990	415	54
C425	Cessna	Conquest I	Turboprop	B	I	2-A	8,600	101	2
C500	Cessna	Citation I	Turbojet	C	I	2-A	9,850	9	4
C525	Cessna	Citation CJ1	Turbojet	B	I	1-A	10,700	31	10
C550	Cessna	Citation II	Turboprop	B	II	2-A	15,100	49	6
C560	Cessna	Citation Ultra	Turbojet	D	II	2-A	16,630	232	34
C56X	Cessna	Citation Excel	Turbojet	D	II	2-A	20,200	88	10
C68A	Cessna	Citation Latitude	Turbojet	B	II	1-B	30,800	25	2
CL30	Bombardier	Challenger 300	Turbojet	C	II	1-B	38,850	81	2
CL35	Bombardier	Challenger 350	Turbojet	C	II	1-B	40,600	13	3
CL60	Bombardier	Challenger 650	Turbojet	C	II	1-B	43,100	31	0
E550	Embraer	Legacy 500	Turbojet	C	II	1-B	42,858	4	2
E55P	Embraer	Phenom 300	Turbojet	B	II	1-A	17,968	89	20
F900	Dassault	Falcon 900	Turbojet	B	II	2-A	49,000	69	8
FA50	Dassault	Falcon 50	Turbojet	B	II	2-A	39,700	46	0
G280	Gulfstream	G280	Turbojet	B	II	1-B	39,600	4	0
GLEX	Bombardier	Global 7500	Turbojet	C	III	2-B	106,250	4	2
GLF5	Gulfstream	G-V	Turbojet	D	III	2-B	90,500	40	2
H25B	Hawker	Hawker 800	Turbojet	C	II	1-B	28,000	18	2
HDJT	Honda	HA-420	Turbojet	B	I	2-A	9,040	110	16
LJ40	Learjet	40	Turbojet	C	I	1-B	21,000	36	8
LJ45	Learjet	45	Turbojet	C	I	1-B	20,500	50	5
P46T	Piper	Malibu Meridian	Turboprop	A	I	1-A	4,850	1,644	254
PC12	Pilatus	PC-12	Turboprop	A	II	2-A	10,450	61	0
PC24	Pilatus	PC-24	Turbojet	B	II	2-A	18,300	4	4
	Various	Other TFMS Operations		A/B	I/II			2,275	286
	Air Tractor	502	Turboprop	A	II	1-B	9,600	-	700
	Grumman	Ag Cat	Piston	B	I	1-A	5,990	-	200
	Various	Other Ag Sprayers		A	I	1-A	≤ 4,800	-	1,300
							Total Verified Annual Operations		**3,136**

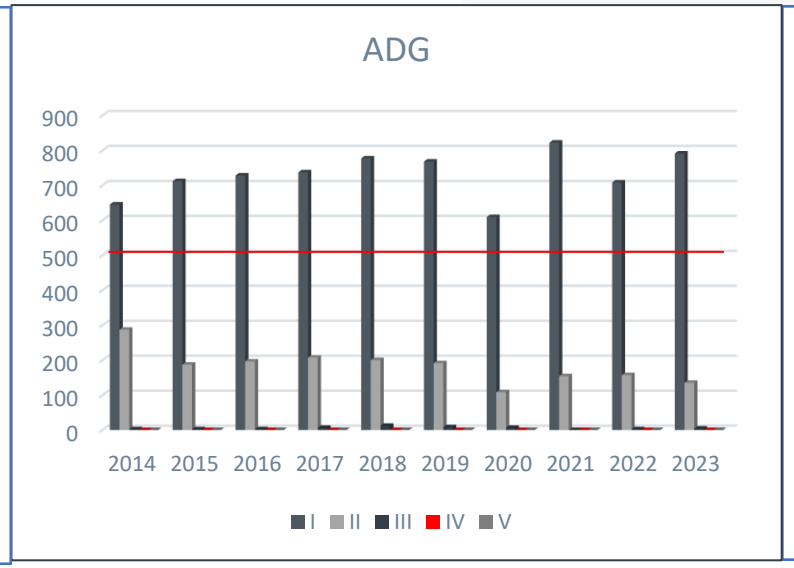


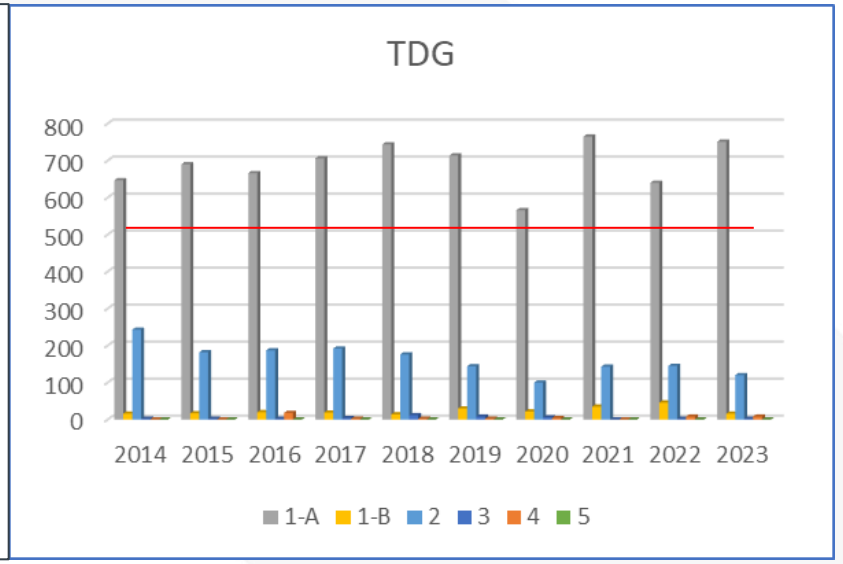
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Critical Design Aircraft







- Agriculture spraying operations drive the critical design aircraft
- TDG-1B and ADG-II Design Standards



Source: TFMS Operations

Critical Design Aircraft

- Aircraft Approach Category (AAC) – **B (Small)**
  - Represents the speed that the aircraft approaches runway
  - 91 to 121 knots
- Airplane Design Group (ADG) – **II**
  - Represents wingspan and height of aircraft
  - 49’ to 79’ wingspan
- Taxiway Design Group (TDG) – **1B**
  - Represents pavement width and turning clearance needed by aircraft
  - Main Gear Width – 0’ to 15’
  - Cockpit to Main Gear – 20’ to 40’

AAC		ADG		TDG		MTOW	
A/B	2,788	I	2,230	1-A/1-B	2,912	< 12,500 lbs	2,949
C/D	65	II	882	2-A/2-B	163	≥ 12,500 lbs	117

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Stakeholder Outreach

- Questionnaire sent to airport stakeholders and local businesses



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Bevcomm

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AGCO
Your Agriculture Company

- Questions Included
  - Type of use
  - Factors that drive them to use FRM
  - Improvements users would like to see
  - Future fleet changes
- Reponses
  - Key things
    - Runway Length
    - Heated hangar/deicing services

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Runway Length

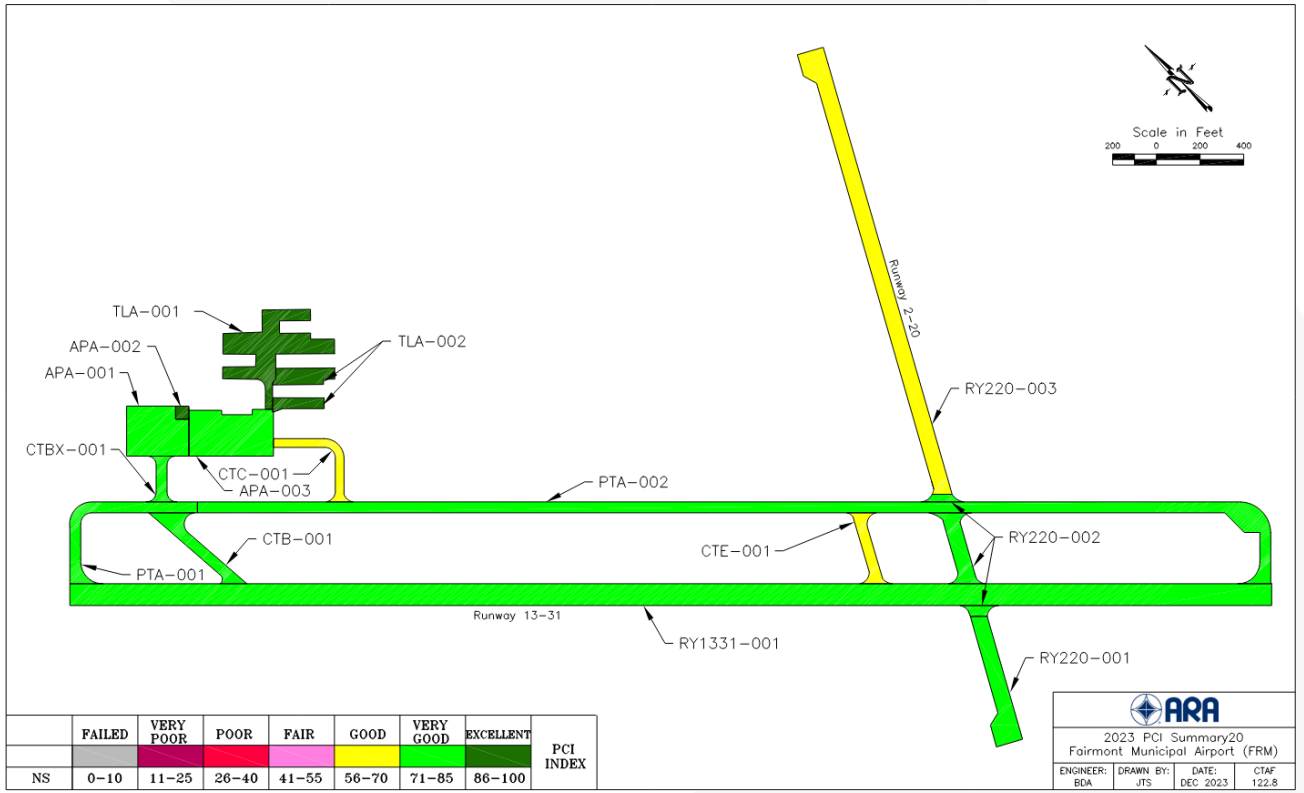
Airport and Runway Data		
Airport Elevation	1,161.8 feet	
Mean Daily Maximum Temperature of Hottest Month	86.9°F	
Aircraft Classification	**Recommended Runway Length**	
Small Airplanes 12,500 Pounds or less		
10 or more passenger seats	4,400 feet	
Less than 10 passenger seats at 95 percent of fleet	3,400 feet	
Small Aircraft Runway Length Analysis Tool	**Dry**	**Wet**
Cessna CitationJet 1	4,171 feet	**4,797 feet**
Cessna CitationJet 3	3,511 feet	**4,038 feet**
Cessna 560 XL	4,038 feet	**4,644 feet**
Cessna 340	3,976 feet	**4,572 feet**
Beechcraft King Air 200	3,749 feet	4,311 feet
Embraer Phenom 300	3,634 feet	4,179 feet
Additional Notable Aircraft	**Dry**	**Wet**
Air Tractor 502	3,055 feet	
Air Tractor 802	4,900 feet	

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Pavement Condition (2023 PCI)

- Runway 13-31 in very good condition
  - Next major rehabilitation in 2032
- Runway 2-20 in good condition
  - Large transverse cracks, sealed this year
  - NOTAM – grass in cracks
  - Next major rehabilitation in 2037



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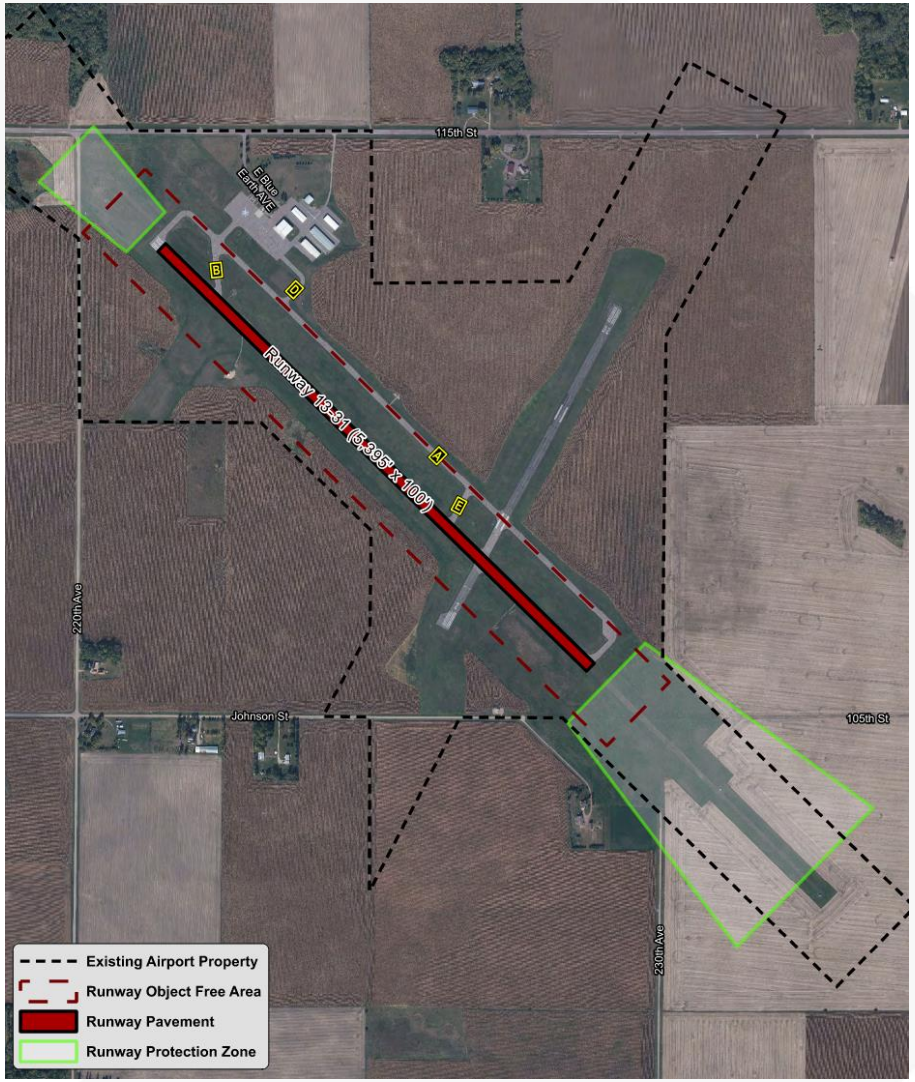
Existing



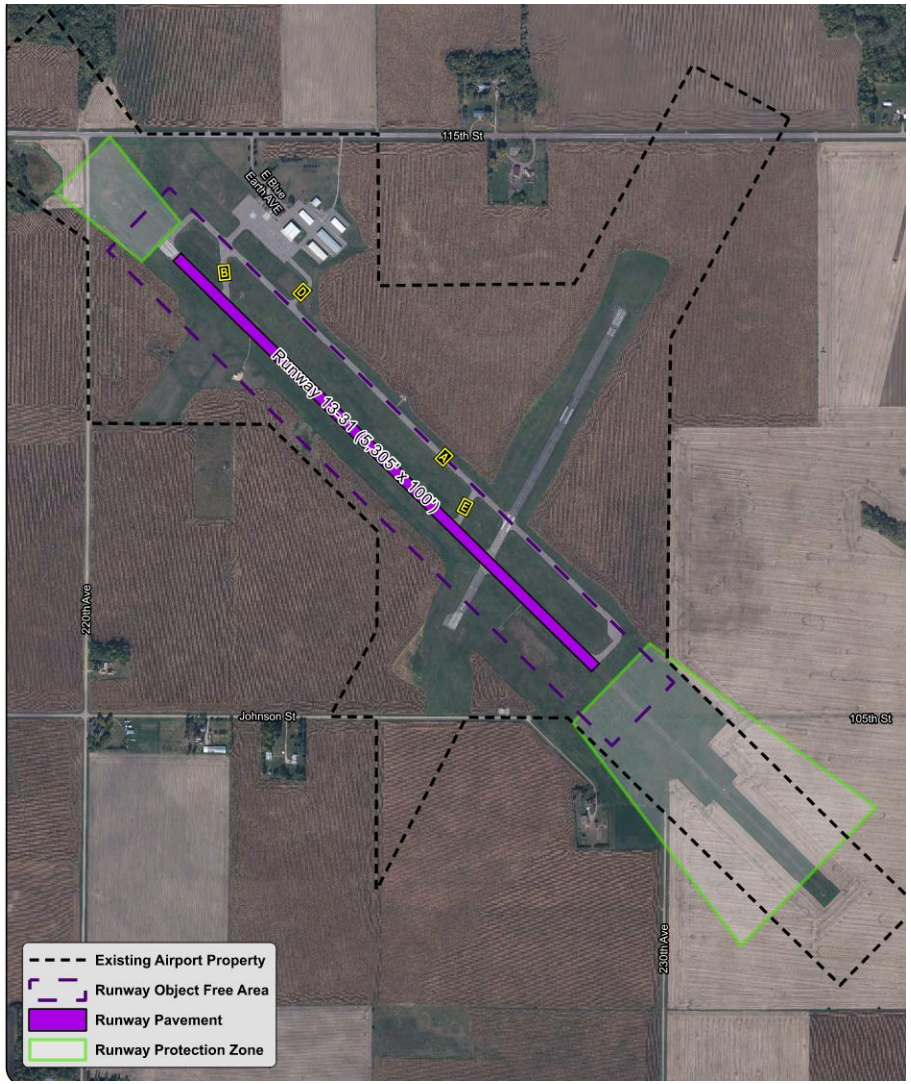
Existing:
5,505 feet
ROFA within roadway Right-Of-Way
RPZ over both roadways
Part 77 penetrations on both roadways

Option 1:
5,395 feet
ROFA outside roadway Right-Of-Way
RPZ over both roadways
Part 77 penetrations on both roads

Option 1



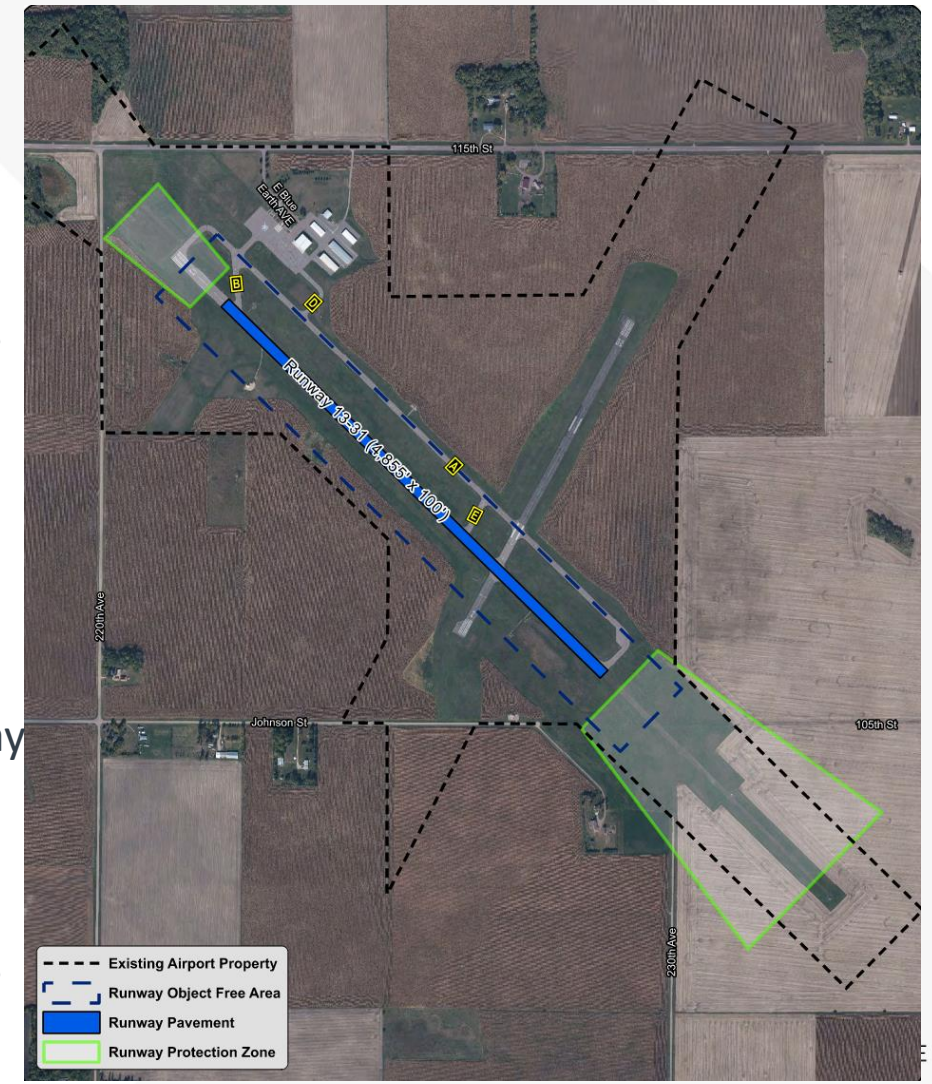
Option 2



Option 2:
5,305 feet
ROFA outside roadway
Right-Of-Way
RPZ over 220th Ave
No Part 77 penetrations

Option 3:
4,855 feet
ROFA outside of roadway
Right-Of-Way
RPZ clear of both roadways
No Part 77 penetrations

Option 3



Runway 13 Threshold

	Existing	Option 1	Option 2	Option 3
34:1 Part 77/ MnDOT Licensing Surface (Based on 15-foot vehicle clearance)	Penetrations on 115th St and 220th Ave*	Penetrations on 115th St and 220th Ave	No penetration	No penetration
ROFA	Outside airport property	Within airport property	Within airport property	Within airport property
RPZ	Over intersection of 115th St/220th Ave	Over intersection of 115th St/220th Ave	Over intersection of 115th St/220th Ave	Within airport property
Linear feet of road in RPZ 115th St (2-lane paved highway) 220th Ave (gravel county road)	 115th St - 215 LF 220th Ave - 670 LF	 115th St - 70 LF 220th Ave - 630 LF	 115th St - 0 LF 220th Ave - 525 LF	 115th St - 0 LF 220th Ave - 0 LF
Residences/Public Assembly in RPZ	None	None	None	None
Reduction in Length	-	110 feet	360 feet	1,350 feet
Total Runway Length	5,505 feet	5,395 feet	5,305 feet	4,855 feet
Meets Length Requirements	Yes	Possible	Possible	No

* Licensing waiver in place with MnDOT

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Taxiway Width (Taxiway A)

- Current Taxiway is 50 feet wide (Supports TDG-3)
- TDG-1 requires 25 feet
- TDG-2 requires 35 feet
- 2023 PCI is 72 and 71
- Maintain until next major rehabilitation is scheduled in the CIP for 2036

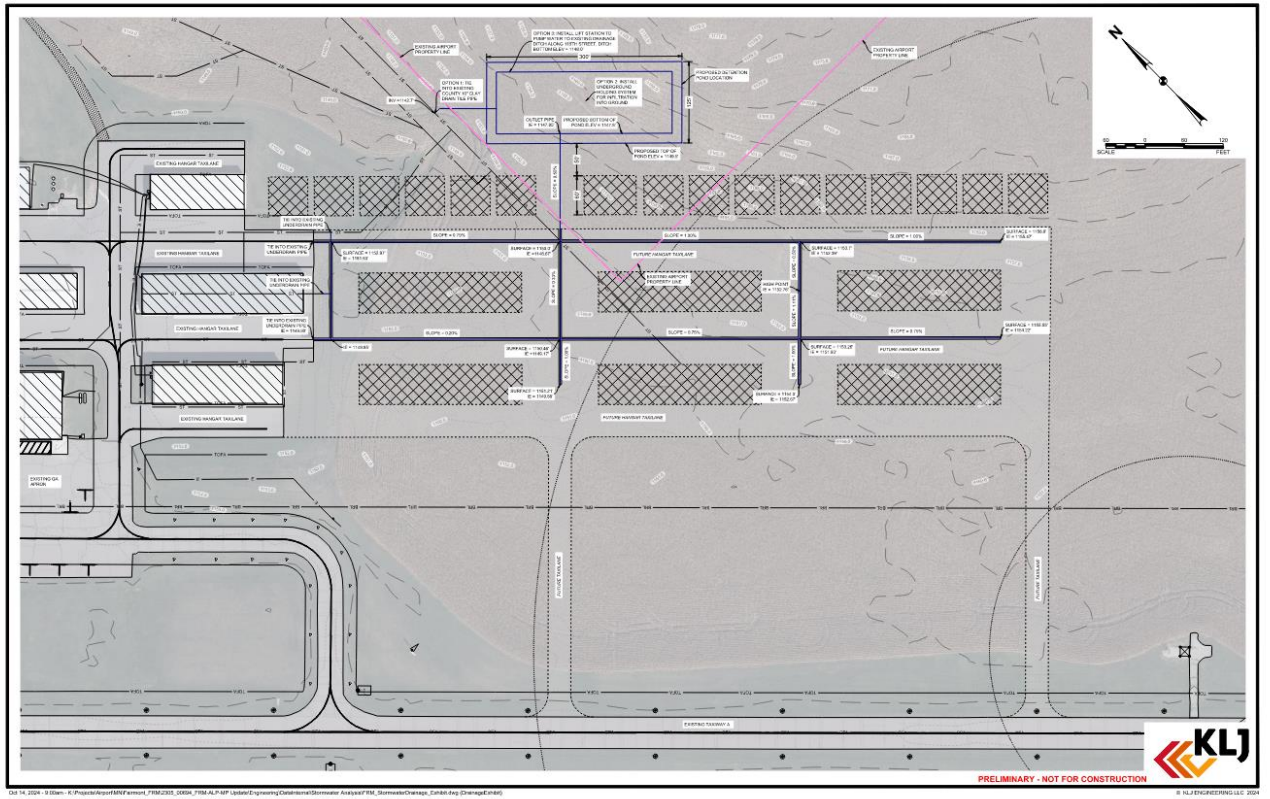


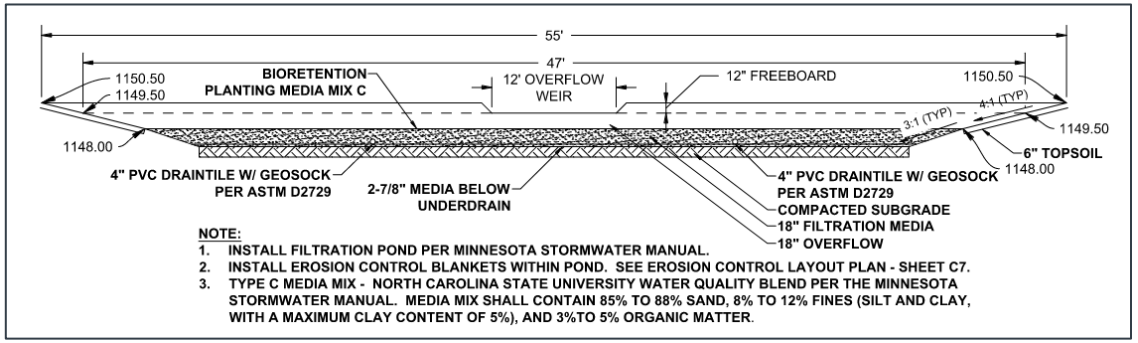
Table 4-2. Design Standards Based on Taxiway Design Group (TDG)

Item	TDG							
	1A	1B	2A	2B	3	4	5	6
Taxiway/Taxilane Width [2]	25 ft (7.6 m)	25 ft (7.6 m)	35 ft (10.7 m)	35 ft (10.7 m)	50 ft (15.2 m)	50 ft (15.2 m)	75 ft (22.9 m)	75 ft (22.9 m)
Taxiway Edge Safety Margin [1]	5 ft (1.5 m)	5 ft (1.5 m)	7.5 ft (2.3 m)	7.5 ft (2.3 m)	10 ft (3.0 m)	10 ft (3.0 m)	14 ft (4.3 m)	14 ft (4.3 m)
Taxiway Shoulder Width [3]	10 ft (3.0 m)	10 ft (3.0 m)	15 ft (4.6 m)	15 ft (4.6 m)	20 ft (6.1 m)	20 ft (6.1 m)	30 ft (9.1 m)	30 ft (9.1 m)

Terminal Area Drainage

- **Design Controls:**
  - **City of Fairmont Ordinance 2022-11**
    - Requires stormwater runoff to remain on-site or to be treated if leaving the project site.
  - **FAA AC 150/5320-5D Airport Drainage Design and AC 150/5200-33C Hazardous Wildlife Attractants on or Near Airports**
    - Recommends detention ponds located on or around airport property be designed to drain within 48 hours of a storm event and to be dry at all other times.
  - **Existing Ground Contours**
    - Controls the Design Profile of the Future Hangar Taxilanes and in turn the Location of Future Detention Pond Location
  - **Future Detention Pond Storage Requirements:**
    - Required Size of Pond: 300’ x 125’
    - Top of Pond Elevation = 1,147.85’
    - Bottom of Pond Elevation = 1,149.5’
  - **10” Clay County Drain Tile Pipe**
    - Elevation of Pipe Next to Detention Pond ~ 1,142.7’
  - **County Drainage Ditch Along 115th Avenue**
    - Elevation of ditch bottom at airport property = 1,149.0’





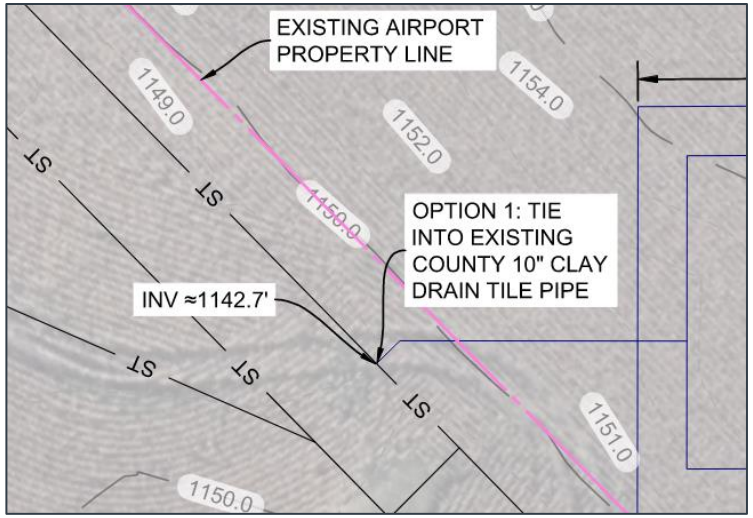
- **Filtration Media Typical Section Example:**
  - 18” Filtration Media
    - Bioretention Planting Media Mix C (Includes Sand, Fines, and Organic Matter)
  - 4” PVC Drain Tile w/ Geofilter Sock
  - 2-7/8” Media
  - Compacted Subgrade

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Terminal Area Drainage

Drainage Alternative 1:

- Filter Stormwater Runoff Through Media in Detention Pond
- Drain Filtered Stormwater to County Drain Tile Pipe
  - Requires approval from Martin County to Connect to Existing Drain Tile Pipe.



Drainage Alternative 2:

- Filter Stormwater Runoff Through Media in Detention Pond
- Drain Filtered Stormwater to Underground Storage Chambers
- Underground Storage Chambers Allow for Stormwater to Infiltrate into Ground slowly.
  - Requires Deeper Investigation of Soils in this area of the airport to determine if the soils will accept the infiltration of water or not.



Drainage Alternative 3:

- Filter Stormwater Runoff Through Media in Detention Pond
- Install Lift Station to Pump Treated Stormwater to County Ditch

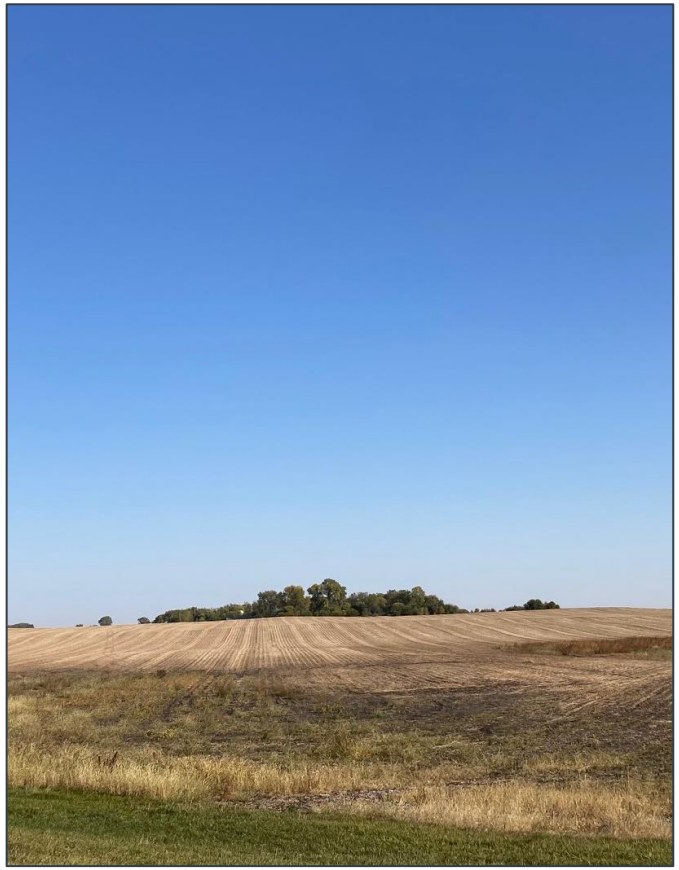


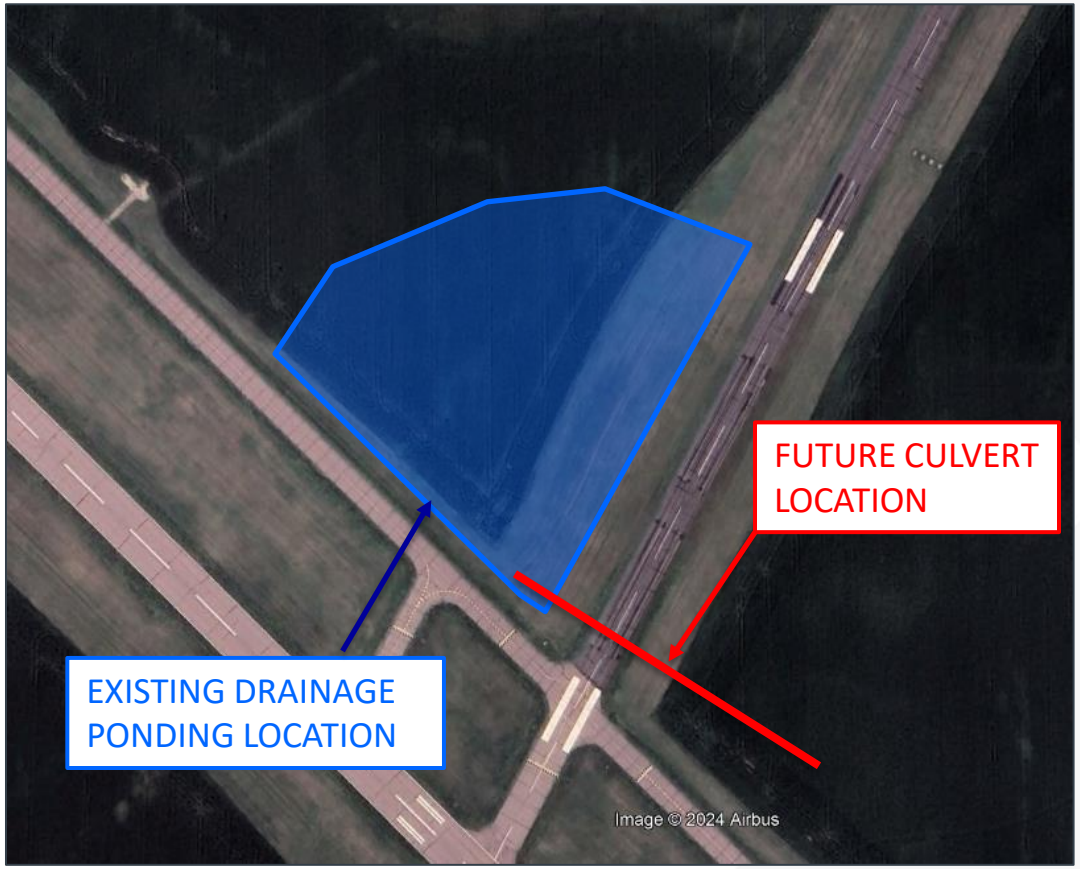
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Runway 2-20 & Taxiway A Intersection Drainage

- Install culvert under Runway 2-20 to relieve ponding issue Northwest of Runway 2-20 and Taxiway A Intersection

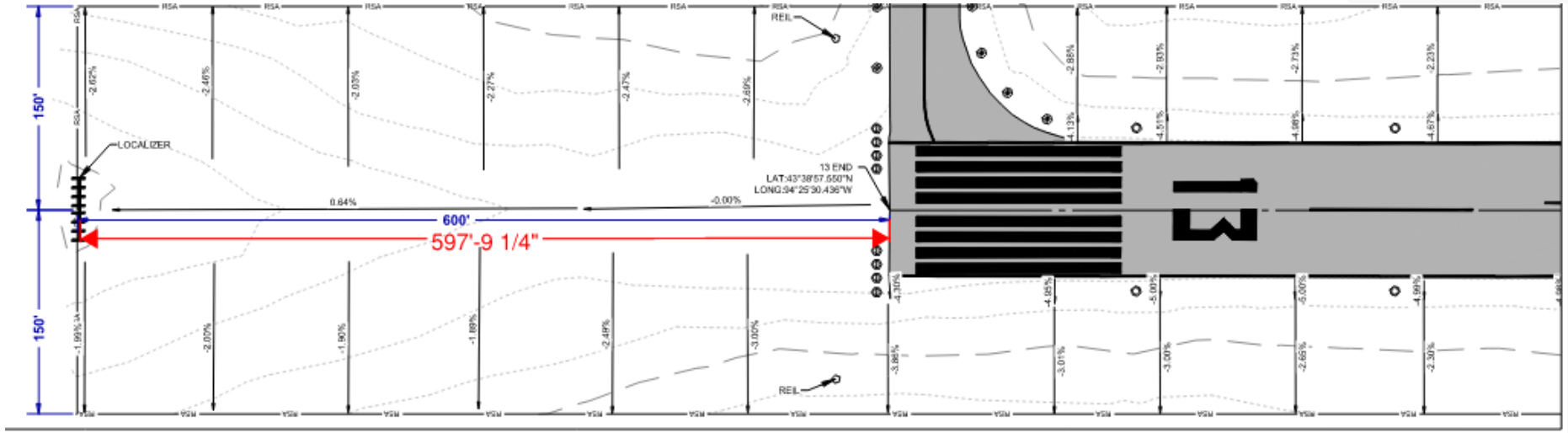




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RSA Determination

- Runway 2-20
  - Grading does not meet standards
- Runway 13-31
  - Grading does not meet standards
  - Existing ILS Localizer is located inside the RSA



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Runway Visibility Zone (RVZ)

- Crop heights of 3, 5 and 8 feet were evaluated
- Crop heights above 5 feet begin to impact RVZ

Crops at 5 feet



Crops at 8 feet



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Environmental Inventory

- Wetlands depicted in blue need to be considered
- Cultural sites (yellow) needs more analysis



Next Steps

- Submit Critical Design Aircraft to FAA
- Draft Facility Requirements
- Develop initial alternatives

- Next Meeting: Facility Requirements/Initial Alternatives

- Website: https://inputcentral.com/fairmont-airport-plan

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Questions/Comments

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