

**TRANSPORTATION IMPROVEMENT ASSOCIATION**

# **HOW TO USE DRONES FOR TRAFFIC INCIDENT MANAGEMENT**

**SOUTHEAST MICHIGAN REGIONAL TRANSPORTATION  
OPERATIONS COORDINATING COMMITTEE**

**JULY 14, 2023**

# JIM SANTILLI

- **CEO of the Transportation Improvement Association (TIA)**
  - **22 years of traffic safety experience**
- **8 years of experience flying unmanned aircraft**
  - **Multicopter**
  - **Fixed-wing**
- **Served on a sheriff aviation unit for 4 years**
- **Served on the Michigan Aeronautics Commissions' Unmanned Aircraft Systems (UAS) Advisory Committee**



- **Trained professionals from 131 agencies (federal, state, county, local, tribal, and college/university) and companies in:**
  - **Alabama**
  - **Florida**
  - **Michigan**
  - **Ohio**
  - **South Carolina**
  - **Tennessee**
  - **Virginia**



- Flown numerous public safety missions, including:
  - Drug trafficking
  - Fatal and severe injury crashes
  - Fire
  - Homicide
  - Natural disaster
  - Police involved shooting
  - Search for missing and armed persons



ABOVE: The Macomb County Sheriff's Office recently purchased four drones for its new Unmanned Aerial Vehicle Unit. The largest of the four drones is equipped with a thermal imaging camera for better investigating at night or over the water.

LEFT: Macomb County Sheriff's Office deputies Jim Santilli and Mike Dixon demonstrate the capabilities of one of the drones July 20.

Photos by Deb Jacques



- Flew search missions for Hurricane Ian



# **PUBLIC SAFETY USES**

- **Barricaded Gunman**
- **Disaster Assessment and Response**
- **Energy Infrastructure Emergency**
- **Fire**
- **Hostage**
- **Missing Person**
- **Search and Rescue (Inland and Water)**
- **Special Response Team Operations**
- **Traffic Crash Investigation**
- **Traffic Incident Management**
- **Transportation Infrastructure Inspections**

- **Firefighting**
  - **Quickly locate victims, identify hot spots, and screen for fire risks to draft targeted rescue plans while keeping personnel safe**
- **Law Enforcement**
  - **Gain critical intel in conflicts or emergencies to make timely and informed decisions without putting teams in harm's way**
- **Search and Rescue**
  - **Scan search areas to locate stranded persons and quickly dispatch rescue teams**

# FEDERAL REGULATIONS



- **Part 107 and COA's**
- **Knowledge**
  - **Federal Aviation Regulations**
  - **Aeronautical Charts**
  - **Airspace Classification and Flight Restrictions**
  - **Airport Operations**
  - **Night Operations and Physiology**
  - **Aviation Weather**
  - **Physiological Factors Affecting Pilot Performance**
  - **Maintenance and Preflight Procedures**
  - **Crew Resource Management and Aeronautical Decision Making**
  - **Loading and Performance**
  - **Hazards and Emergency Procedures**
- **Operating Restrictions**

# **SAMPLE QUESTION 1**

**What are the characteristics of a moist, unstable air mass?**

- a) Turbulence and showery precipitation**
- b) Poor visibility and smooth air**
- c) Haze and smoke**



# **SAMPLE QUESTION 2**

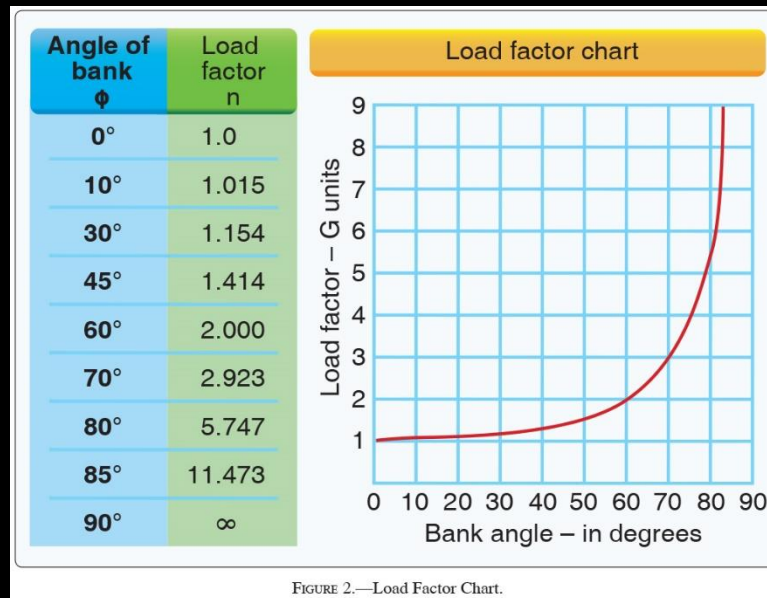
**What effect does high density altitude have on the efficiency of a UA propeller?**

- a) Propeller efficiency is increased**
- b) Propeller deficiency is decreased**
- c) Density altitude does not affect propeller efficiency**

# SAMPLE QUESTION 3

If an unmanned airplane weighs 33 pounds, what approximate weight would the airplane structure be required to support during a 30 degree banked turn while maintaining altitude?

- a) 34 pounds
- b) 47 pounds
- c) 38 pounds



# SAMPLE QUESTION 4

What is the floor of the Savannah Class C airspace at the shelf area (outer circle)?

- a) 1,300 feet AGL
- b) 1,300 feet MSL
- c) 1,700 feet MSL



# SAMPLE QUESTION 5

While monitoring the Cooperstown CTAF you hear an aircraft announce they are midfield left downwind for RWY 13. Where would the aircraft be relative to the runway?

- a) The aircraft is East
- b) The aircraft is South
- c) The aircraft is West



# SAMPLE QUESTION 6

**What are the current conditions for Chicago Midway Airport (KMDW)?**

- a) Sky 700 feet overcast, visibility 1-1/2SM, rain**
- b) Sky 7,000 feet overcast, visibility 1-1/2SM, heavy rain**
- c) Sky 700 feet overcast, visibility 11, occasionally 2SM, with rain**

**SPECI KMDW 121856Z 32005KT 1 1/2SM RA OVC007 17/16 A2980 RMK RAB35**

# AIRCRAFT AND PAYLOADS





# DJI MATRICE 30T (M30T)

- Approx. \$13,999
- 200x Max. Hybrid Zoom
- 640 × 512 Thermal Resolution (20x Zoom)
- Laser Range Finder
- Max. Flight Time is 41 Minutes
- With IP55 protection, the M30T can handle adverse weather
- Payloads



# DJI MATRICE 300

- Approx. \$13,199
  - Camera: Approx. \$11,209
- 23× Hybrid Optical Zoom  
200× Max Zoom
- 640 × 512 Thermal  
Resolution
- Max. Flight Time is 55  
Minutes
- With IP55 protection, the  
M30T can handle adverse  
weather
- Payloads



# HURRICANE IAN





Palaco Grande

SPEED  
LIMIT  
40

LEFT TURN  
YIELD  
ON GREEN

GUTTER  
PRO

CENTURY  
Selling Part  
TRAINING & EVENT



















































# TRAFFIC CRASHES



# FIRE





2023-02-16 10:55:06  
42.839603°N 83.014217°W 1085.924ft





2023-02-16 10:57:57

42.839549°N 83.013553°W 1085.412ft



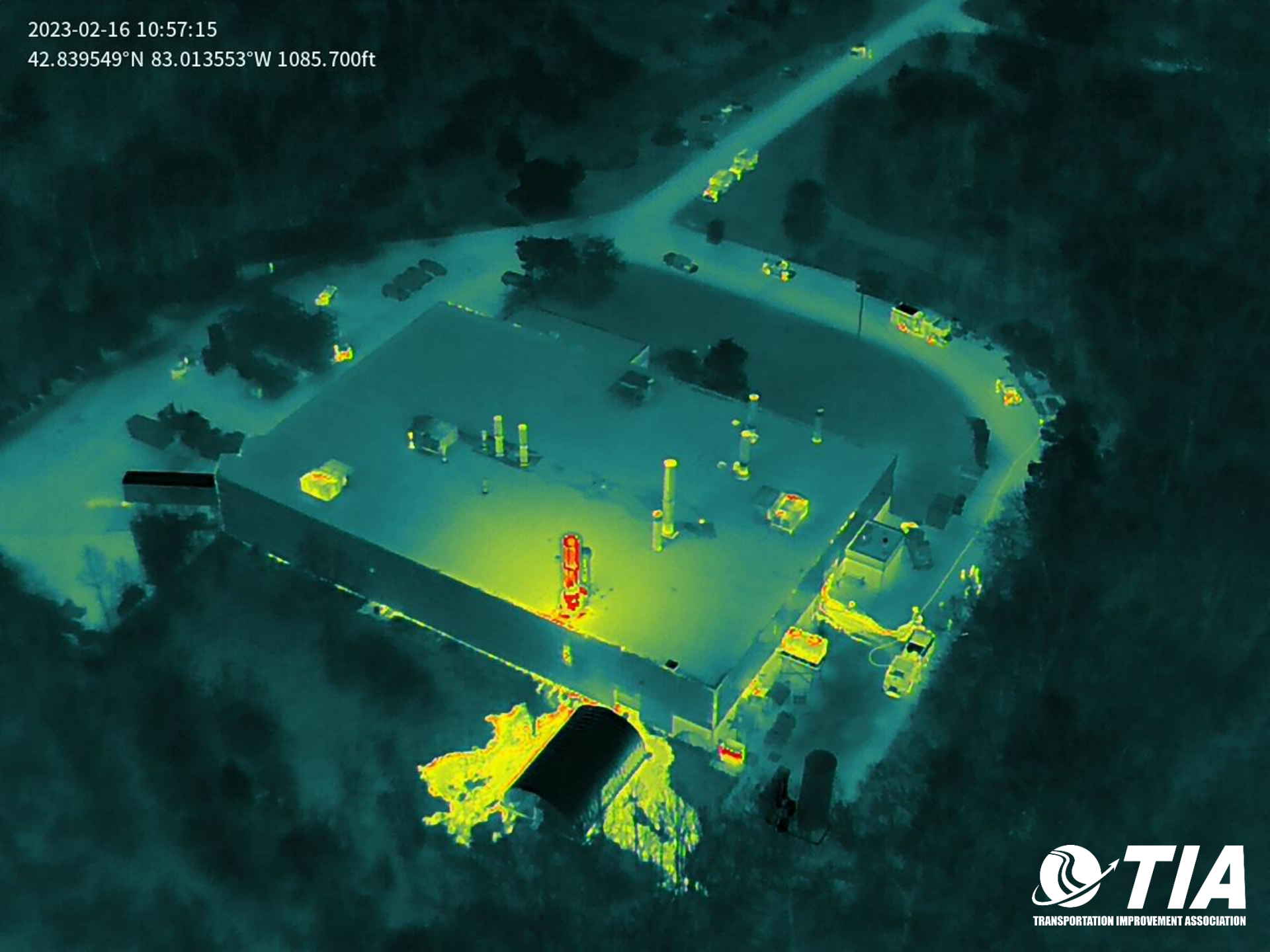
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42.839549°N 83.013555°W 1085.647ft



2023-02-16 10:57:15

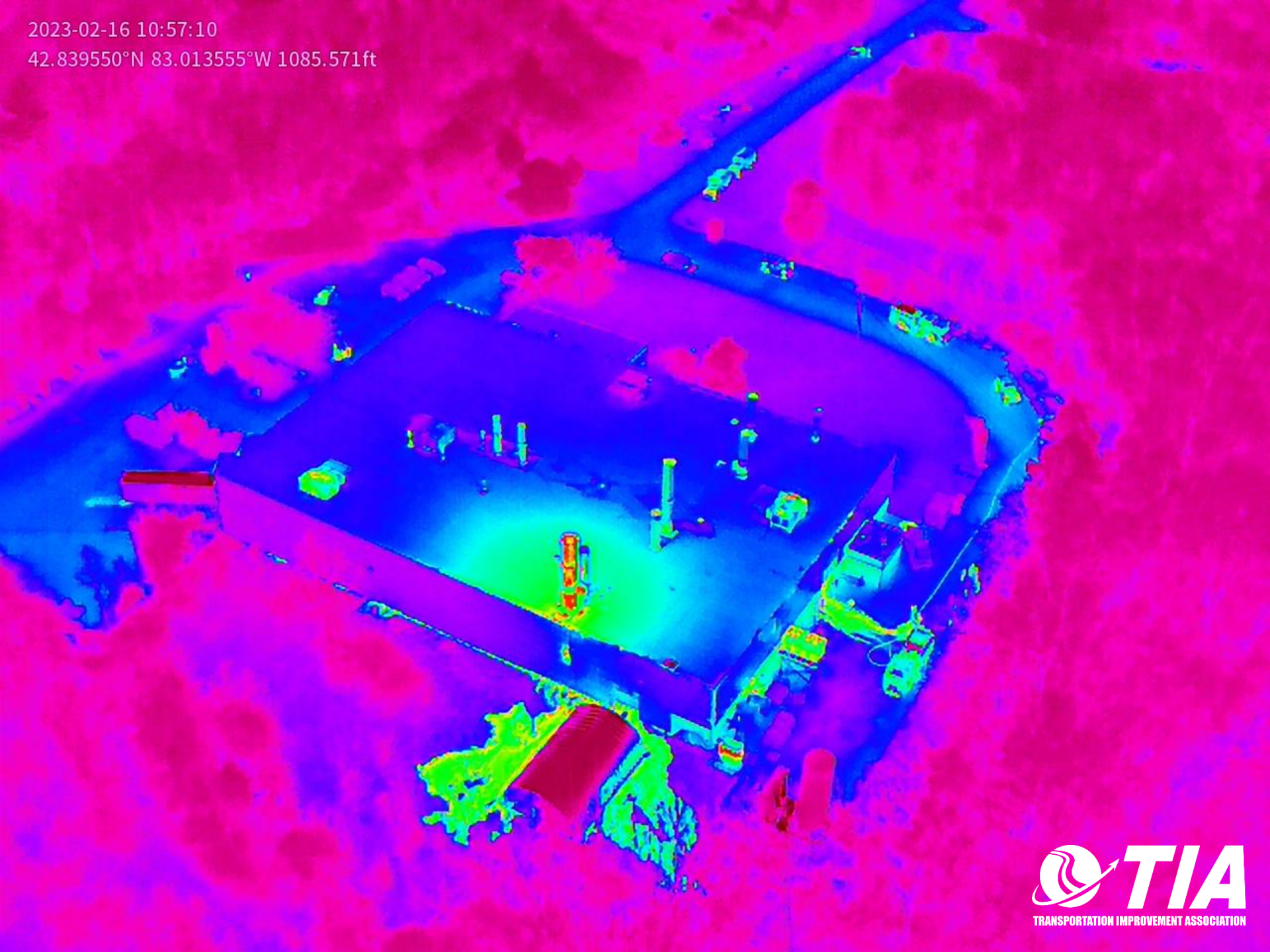
42.839549°N 83.013553°W 1085.700ft





2023-02-16 10:57:10

42.839550°N 83.013555°W 1085.571ft





2023-07-10 16:03:42

42.623868°N 83.060785°W 941.493ft

# TRAFFIC MONITORING





2023-07-10 16:50:19  
42.626574°N 83.045120°W 926.198ft





2023-07-10 16:04:29  
42.623824°N 88.063681°W 919.032ft





2023-07-10 16:10:27  
42.624576°N 83.034588°W 919.051ft





2023-07-10 16:23:39  
42.623189°N 83.060397°W 875.650ft





2023-07-10 16:20:08  
42.624008°N 83.052819°W 900.527ft





2023-07-10 16:42:59  
42.623788°N 83.055910°W 938.774ft





2023-07-10 16:42:59  
42.623770°N 83.055910°W 924.777ft





2023-07-10 16:45:26  
42.623779°N 83.055906°W 939.418ft





2023-07-10 16:45:42

42.623770°N 83.055904°W 924.792ft





2023-07-10 16:44:27  
42.623782°N 83.055902°W 939.178ft





2023-07-10 16:44:27  
42.623771°N 83.055908°W 924.995ft





2023-07-10 16:44:48

42.623770°N 83.055906°W 924.840ft



2023-07-10 16:44:40

42.623771°N 83.055907°W 924.749ft



2022-11-04 20:44:58  
42.165094°N 83.783665°W 1070.429ft

# NIGHT OPERATIONS



2022-11-04 19:33:58

42.162726°N 83.789851°W 1082.792ft





2022-11-04 19:33:58

42.162711°N 83.789891°W 1082.758ft



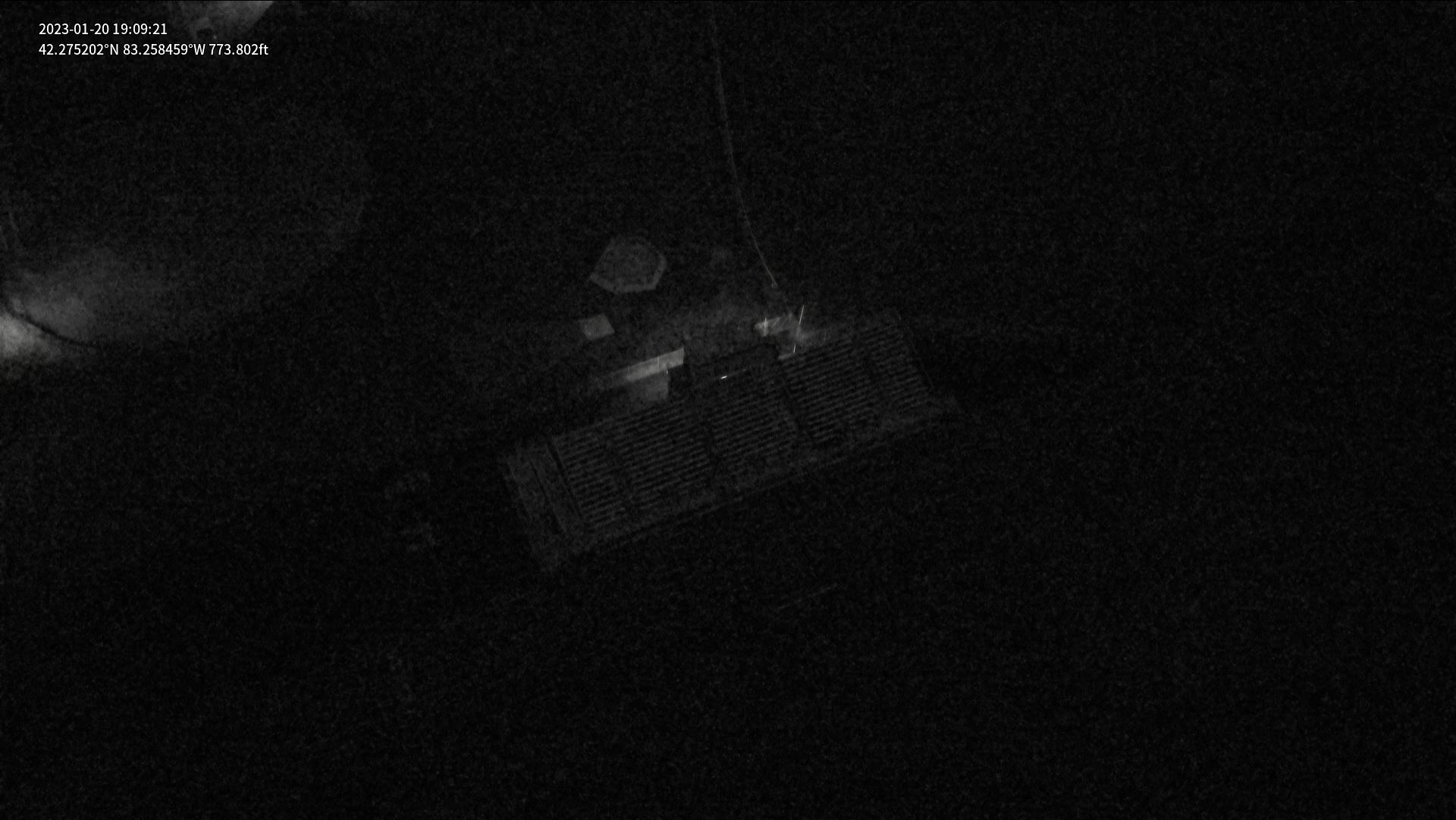
2023-01-20 19:07:09  
42.277472°N 83.255114°W 770.719ft





2023-01-20 19:09:21

42.275202°N 83.258459°W 773.802ft



# QUESTIONS?