Bainbridge Township Service

Snow and Ice Operational Efficiency

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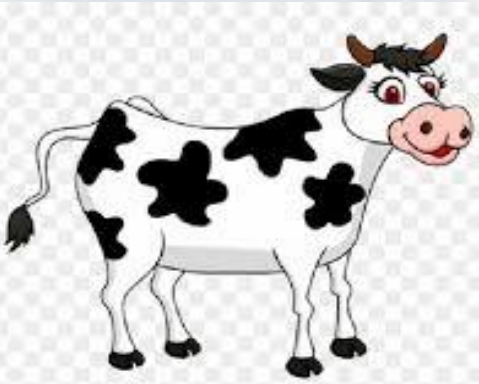
Bainbridge Township

- Located approximately 20 miles east of Cleveland on the south western edge of the “snow belt”
- 11,500 residents
- 85 miles of township roads
- 25 miles of County and State roads



Rising expectations

- If some salt is good, wouldn't more salt be better?
  - 2014-2015 3500 tons
  - 2015-2016 3800 tons
  - 2016-2017 4000 tons
  - 2017-2018 4200 tons
  - 2018-2019 4000 tons

The Environment / The Budget

- Excessive road salt use causes
  - Polluted waterways
  - Infrastructure damage
  - Poor vegetation growth along roadways
  - Budgetary nightmares

Lowering expectations

- How do we lessen our reliance on rock salt while maintaining an acceptable level of safety on our roadways?

Identifying Stakeholders

“It's all about the buy in”

- Trustees
- Employees
- Residents

Limit salt application during active storms

- Concentrate treatment on hills, curves and intersections above 25 degrees F
- Allow hard pack of roads during extended sub 25 degree F periods

Approximate 60% less material usage

Limit salt application during low traffic hours

- Suspend operations 10pm to 4am
  - Potential savings $2500 per night in wages
  - Potential savings $20,000 per night in material

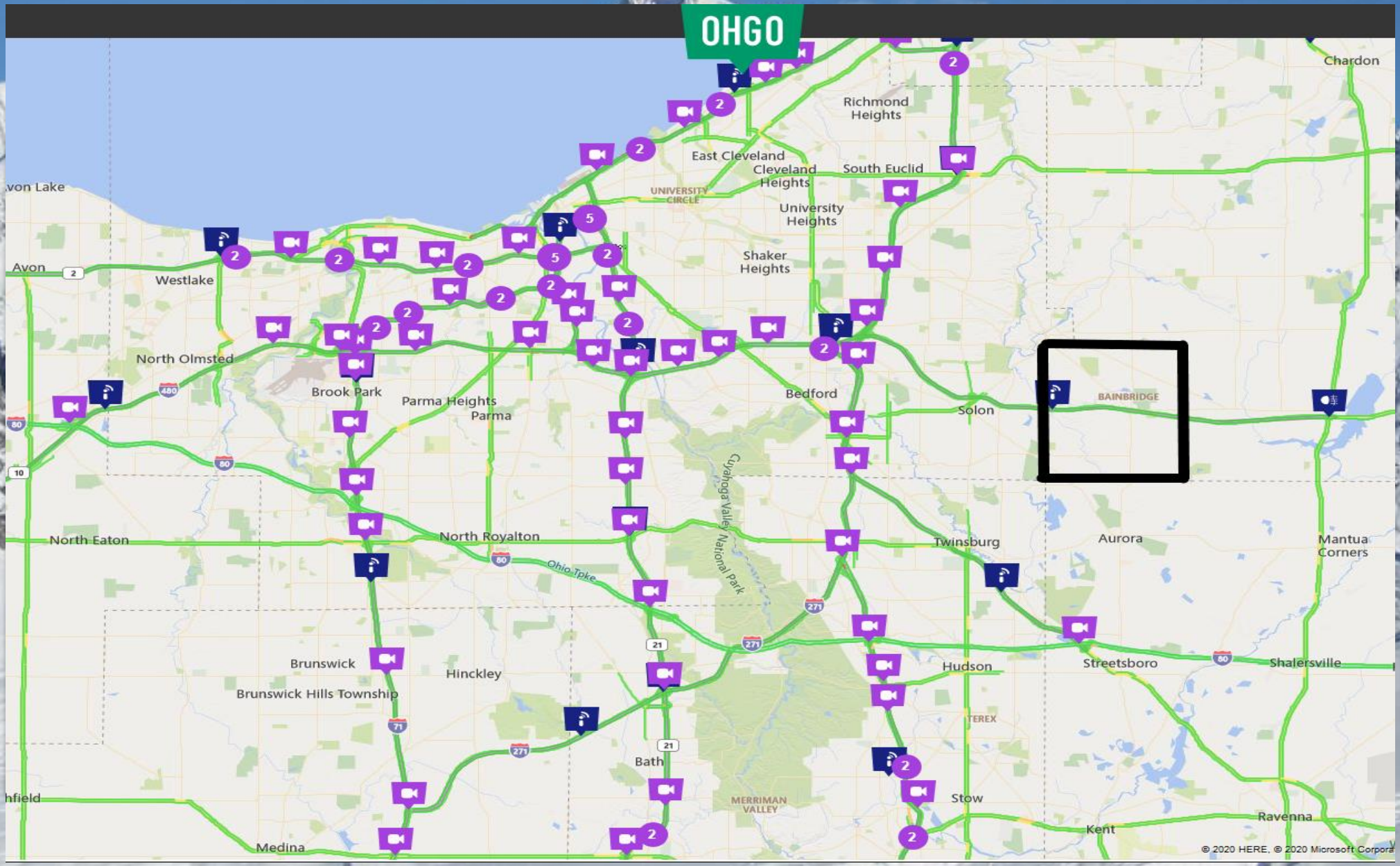
Incorporate products proven to enhance the performance of road salt

- Apply at 6 gallons per ton, adjust for conditions
- Use brine solution above 25F ($0.36/ton)
- Use BeetHeet/brine 60/40 mix below 25F ($5.40/ton)
- Allows 50 – 100 lbs reduction in salt usage per lane mile with liquid
- Potentially saving $1.60 to $3.25 per lane mile in rock salt

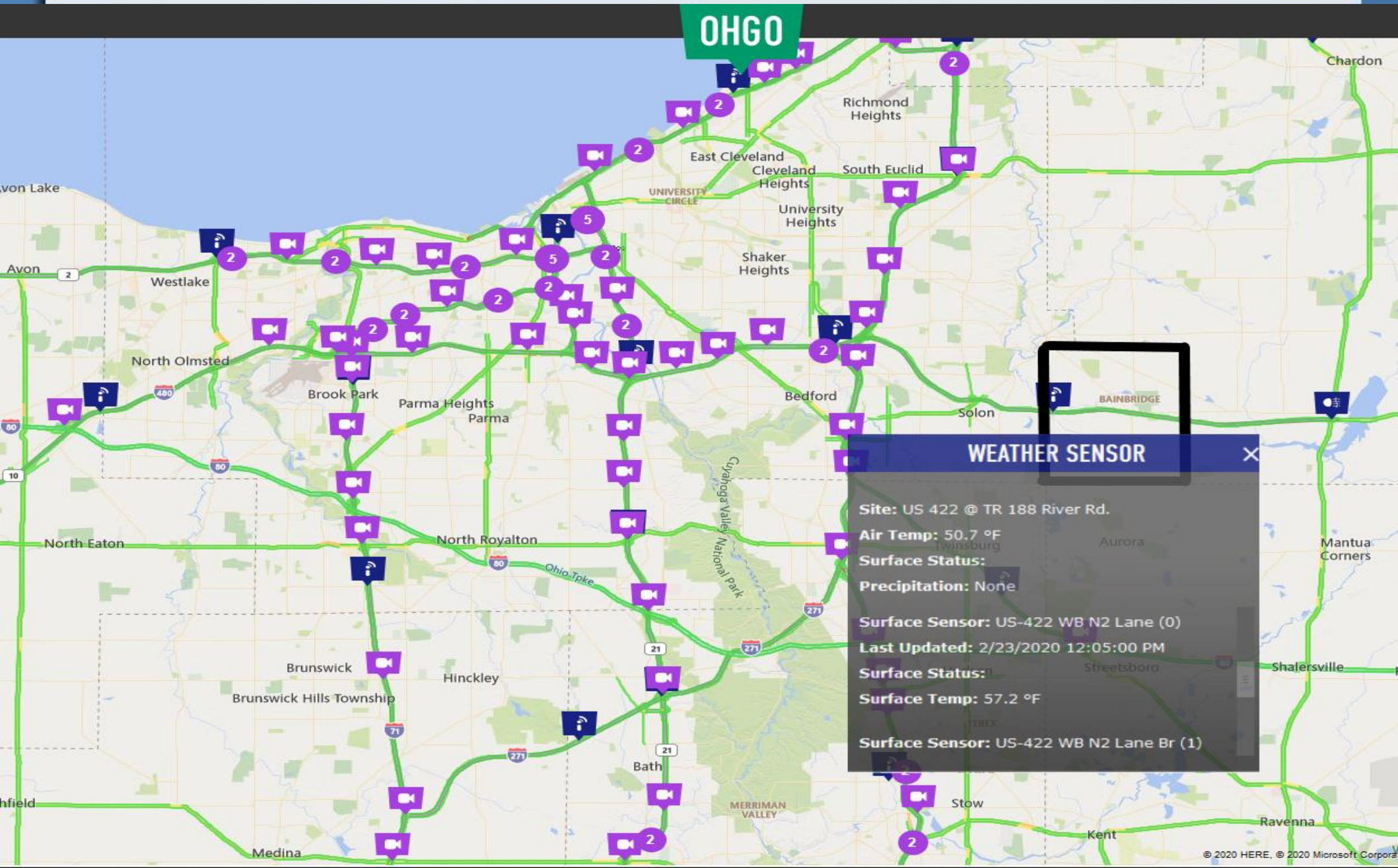
Advanced forecasting

- ODOT weather stations
  - Real time surface temps
  - Live streaming traffic cams
  - NOAH weather charts

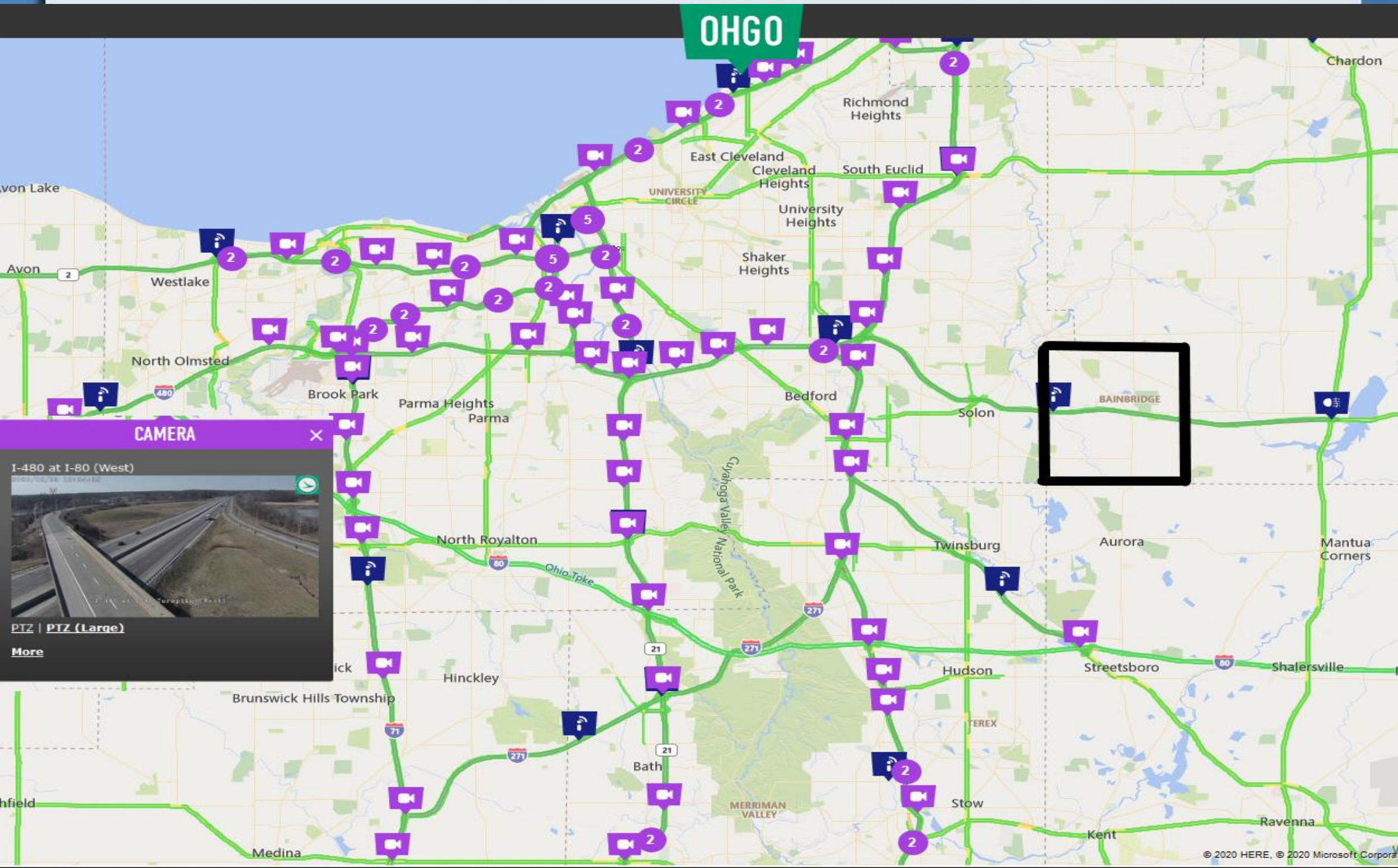
ODOT Weather stations



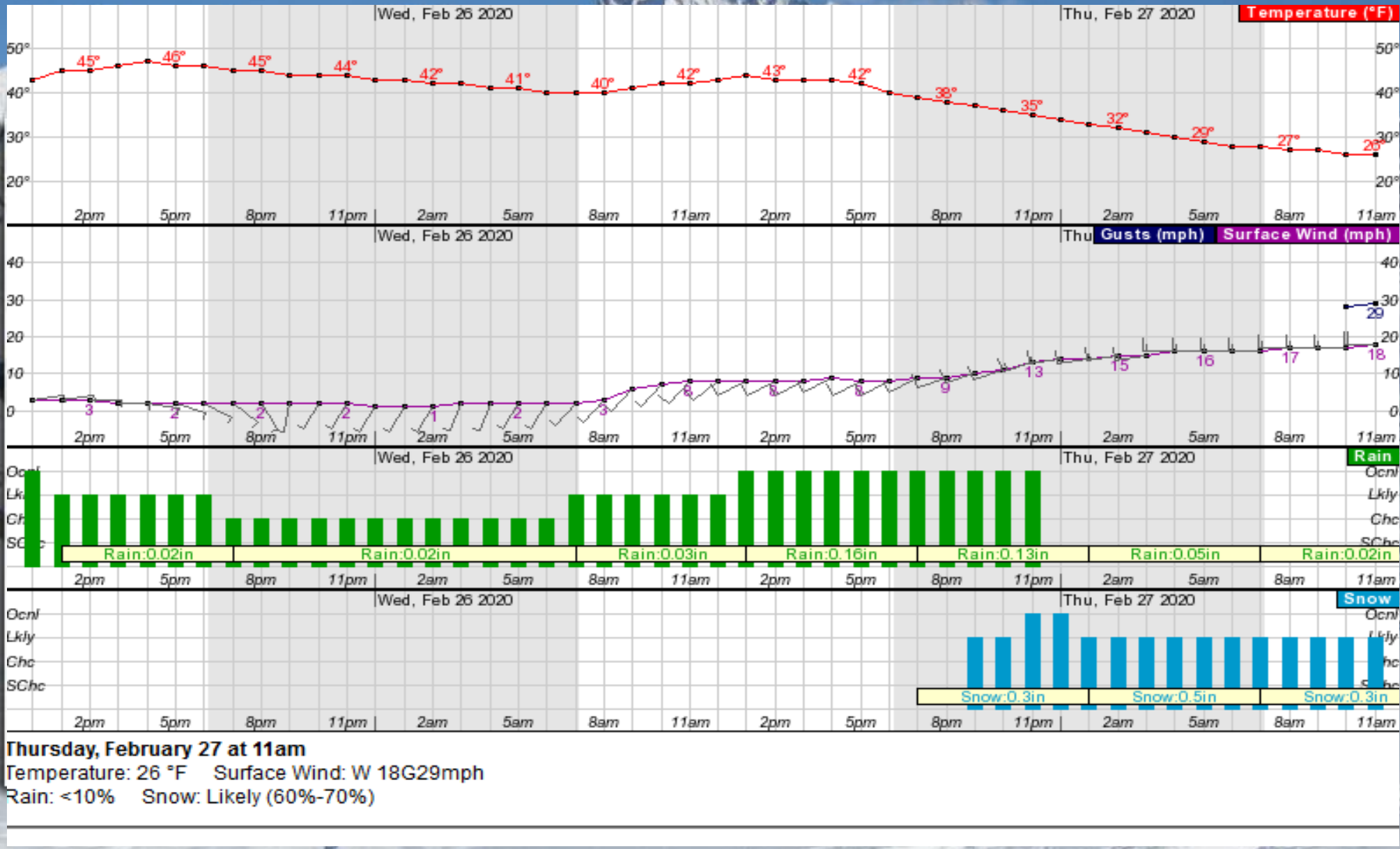
Real time surface temps



Live stream traffic cams



NOAA weather charts



Thursday, February 27 at 11am
Temperature: 26 °F Surface Wind: W 18G29mph
Rain: <10% Snow: Likely (60%-70%)

Pretreat road surface

- Application of brine prior to storm when conditions allow
  - Applied at 50 gallons per lane mile($3.00/mile)
  - May delay or prevent workforce call out during light accumulation potentially saving $500 per hour in wages
  - Prevents ice from bonding to pavement allowing for less material usage during clean up

Storm rating system

- Evaluate length, intensity, and temperatures to create a standardized rating for each storm
- Correlate storm intensity with material usage records to track efficiency
- Allows apples to apples comparison of material usage vs. storm severity for each event

New technologies

- Stay apprised of new developments in the industry
  - Trade shows
    - North American Snow Conference
  - Publications
    - American Public Works Association
  - Websites
    - Pacific Northwest Snow Fighters

Current Collaboration

ODOT

- Provide satellite salt storage
- Provided with state of the art brine maker

Geauga County Engineers

- Agreement that the Township will maintain all County roads within it's borders

Record keeping

- Implement spreadsheet to track and evaluate material usage on a storm by storm and season by season basis
- Ensure we remain on the right path to ever more efficient operation

In Closing

By using the practices outlined in this project our goal is to realize a 25% reduction of our salt usage over the course of the winter.