MTO’s Road Weather Information System (RWIS)

Overview of MTO’s Road Weather Information Station (RWIS)

- RWIS for Winter Maintenance
  - Accurate road / weather information for winter maintenance operations
- MTO’s RWIS
  - Network
  - Service provider contract
  - Website features
    - Atmospheric and pavement current conditions and forecasts (Weather warnings / Radar)
    - Spring load restriction forecast
    - Winter Severity Index
    - Data (Archive – contract oversight, innovations analysis, RMIS, FOI)
- Data Sharing with municipalities
- Next Steps
  - Winter Driving Condition Forecast
  - RWIS network expansion (Locations Type of infrastructure (mobile, plow cams))
**Road / Weather Information Stations (RWIS) for Winter Maintenance**

- Accurate road weather information is critical for effective decision making for winter maintenance operations.
- MTO manages 148 RWIS stations across the province to provide road and weather information for maintenance contractors to make effective winter maintenance operations decisions.
  - Apply Direct Liquid Application before the storm
    - Temperature, humidity, precipitation timing, precipitation type
  - Plow when 2cm of snow
  - Salt / sand
    - Temperature needed for application rates and material choice

**MTO’s RWIS Network**

- 148 RWIS stations
  - **Atmospheric Sensors**
    - Temperature
    - Humidity
    - Wind speed & direction
    - Precipitation sensor
    - Tipping bucket rain gages (26 locations)
  - **Pavement Sensors**
    - Surface temperature
    - Sub-surface temperature
    - Freeze point (some locations)
  - **Cameras**
- 9 Spring Load Restriction Stations
  - Temperature & moisture sensors to 2m depth
  - Forecast
- 7 Fixed Automated Spray Systems (FAST)
  - Detect freeze point and spray anti-icing liquids
  - MicroFAST under evaluation
Southern Ontario Network

Northern Ontario Network
**RWIS Service Provider**

- 2016 Tender for RWIS services
  - Poll stations
  - Create RWIS forecasts (atmospheric and pavement)
  - Create Local Area Forecasts
  - Host website
  - Station maintenance
  - Data management
  - Spring load restriction forecast
  - Winter Severity Index
- AMEC Foster Wheeler successful service provider
  - Complete Systems Installation maintenance sub contractor
- Contract 3 years with 2 possible extensions of 2 years each

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**RWIS Website Main Screen**

- RWIS stations (colour indicates road condition)
- Radar Precipitation
- Weather watches / warnings

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Slide 7

Slide 8
RWIS Station Current Conditions Data

- RWIS stations (colour indicates road condition)
- Atmospheric and pavement data
- Camera images (Colour)

RWIS Station Forecast (30 hours)

- RWIS stations (colour indicates road condition)
- Recent temperatures ~ 12 hours
- Current temperatures ~24 hours
- Forecast road, air and dew point ~24 hours
Local Area Forecasts (7 Days)

- Precipitation forecast: type, intensity, time.
- Atmospheric forecast: temperature, humidity, wind.

Graphical displays

Spring Load Restriction: 5 Day Forecast

- MTO models produce 5 day road strength forecast
- Flags when spring load restrictions should be implemented

Sub surface temperature to 2m
Spring Load Restriction: 5 Day Forecast

- MTO models produce 5 day road strength forecast
- Flags when spring load restrictions should be implemented

Winter Severity Index

- Calculation of winter severity by AMC area based on temperature (14 day average, cold days <-12°C), precipitation (snow, ice, rain), wind, blowing snow and shoulder season adjustment factors
Data Sharing

- Data Sharing Agreements
  - Municipalities
  - Quebec
  - Environment Canada (when EC Open Data Architecture ready)
  - Neighboring states

- Training
  - Required for all users
  - On line training for MTO RWIS system specifically
  - RWIS training by OGRA or other recognized 3rd parties

- Duration
  - 5 years + 5 year extension
  - 2 week termination clause

Next Steps

- Optimize network
  - Identify optimal number of stations and implement
  - Continue to evaluation new equipment
    - Light station infill for 2017/18

- Ontario511 modernization fall 2018
  - Track My Plow
    - Pilot underway for 2 years, full provincial coverage expected Fall 2017
  - Spring Load Restrictions
    - Map pilot 2018
    - Interactive system future
  - Winter Driving Conditions Forecast
    - Pilot 2017/18
  - Cameras
    - Standalone cameras
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