Integrating *Clarus* Data with the 511 New York Traveler Information System

Road Weather Management Stakeholder Meeting

September 8th, 2011
Agenda

- Project Background & Goals
- Inputs into Road Segment Alerting
  - Why is Clarus Data Important?
- About 511NY
- Demonstration Scenarios
- Observations and Results
- Next Steps
- Questions?
Project Background

- Project part of the Federal Highway Administration (FHWA) Broad Agency Announcement
  - Research on *Clarus* System Data
  - Winter/Spring 2010
  - Solicitation Number DTFH61-10-R-00015

- “…develop new or improved road weather management/operations procedures, create innovative user interfaces, and develop new applications including weather-responsive traffic management tools.”
Additional Uses of *Clarus* Data continued

- Received 15 proposals, made 8 awards (5 academic, 3 private)
- Period of performance: 12 months, thru Sept. 2011

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AMEC Americas Ltd</td>
<td>Add Nova Scotia &amp; New Brunswick to <em>Clarus</em></td>
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<tr>
<td>University of Idaho</td>
<td>Integrate <em>Clarus</em> data into Traffic Signal Sys. Ops.</td>
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<tr>
<td>GST Inc.</td>
<td>Fuse <em>Clarus</em> data &amp; MoPED Data for alerting &amp; DST</td>
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<td>University of Maryland</td>
<td>Integrate <em>Clarus</em> data into Regional Integrated Transportation Information System (RITIS)</td>
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<td>Univ. of North Dakota</td>
<td>Validate quality of mobile wx data from state fleets: MN, ND &amp; SD DOTs</td>
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<td>Montana State Univ</td>
<td>Integrate <em>Clarus</em> data into Rural Travel Wx DST</td>
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<tr>
<td>Michigan Tech. Univ</td>
<td>Integrate <em>Clarus</em> data &amp; Crash Data for travel DST</td>
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<td>Telvent-NY Inc.</td>
<td>Road Segment Alerts with <em>Clarus</em> data; NY 511</td>
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Project Goals

Collect and integrate *Clarus* observations and disseminate road-segment alerts for use in the New York 511 system and Connected Vehicle Program.
Road Segment Alerting Inputs

Defined by:
• Highway segments
• Landmarks
• NY511 road segments
NYSDOT Road Network

Project coverage – Two New York transportation corridors

I-87 west of the Hudson River to the Canadian Border

Long Island Expressway (I-495)
Road Segment Alerting Inputs

Atmospheric Observations
• Wind Speed

Observations
Road Network
Road Segment Alerting Inputs

Observations

Road Network

NYSDOT RWIS from Clarus
Why is *Clarus* data valuable for Road Segment Alerting?

Alerting on observations from Airports…
- Typically 1-3 miles (or more) from a major roadway
- Report atmospheric (non-roadway) variables only
  - Air Temperature, Wind Speed & Direction…
Why is *Clarus* data valuable for Road Segment Alerting?

- Alerting on observations from RWIS…
- Located *on* the roadway
- Report atmospheric and surface (roadway) variables
  - Air Temperature, Wind Speed & Direction…
  - Road Temperature, Road Condition…
Clarus Stations Used

- Schodack
- Albany Toll Plaza
- Clifton Park
- Medford
- Greenvale/CW Post

Five (5) NYSDOT RWIS stations used, delivered via Clarus
Clarus RWIS versus Roadway

- Radius of influence around the RWIS selected from *Clarus*
- 8 miles
Road Segment Alerting Inputs

- Intensity (Light, Moderate, Heavy)
- Type (Rain, Snow, Mix)

Radar

Observations

Road Network
Road Segment Alerting Inputs

- Winter Storm Warning
- Blizzard Warning
- Tornado Warning

NWS Warnings

Radar

Observations

Road Network
Road Segment Alerting Inputs

- Storm Corridors
- NWS Warnings
- Radar
- Observations
- Road Network

- Storm “cat-scan”
- Rotation (tornados)
- Hail potential
Road Segment Alerting Inputs

**Storm Corridors**  
Which storms have a potential tornado? Where is it moving?

**NWS Warnings**  
Where are Blizzard Warnings posted?

**Radar**  
Where is heavy snow falling?

**Observations**  
Where are pavements observed to be wet? Below freezing?

**Road Network**  
Which specific road segment is having issues?
About 511NY

www.511ny.org

Welcome to 511NY

511NY is New York State's official traffic and travel info source. Whether you drive or take public transit, click below for precisely what you need, or simply dial 511 on your phone. Wherever you're going, 511NY is here to get you there.

To learn more about 511NY, see our Frequently Asked Questions (FAQs).
About 511NY

- Incidents & Closures
- Special Events
- Cameras
- Traffic Speed
About 511NY

A pre-production version of 511NY was used for the Clarus project.

Road Segment Alerts

Winter Travel Advisory

Road segment shading...
Two Demonstration Scenarios

- March 7th, 2011
  - Snow storm
- April 28th, 2011
  - Severe weather outbreak
Scenario #1 – March 7th, 2011

Moderate to heavy snow affecting I-87 north of Albany
## Scenario #1 – March 7th, 2011

### Albany Toll Plaza

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<th>Observation Type</th>
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<th>Persistence</th>
<th>IOP Spatial</th>
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**essSurfaceStatus**: 6 = chemicallyWet

**essSurfaceTemperature**: -3.3°C = 26°F
Scenario #1 – March 7th, 2011

Road segments shaded with “Snow/Ice” color north of Albany
Scenario #2 – April 28th, 2011

Line of severe thunderstorms

NWS Bulletins - Bergen County
- Tornado Warning in effect until 11:15AM CDT 04/28/11
- Flash Flood Warning in effect until 12:45PM CDT 04/28/11
- Severe Thunderstorm Watch in effect until 3:00PM CDT 04/28/11
- Flash Flood Watch in effect until 11:00PM CDT 04/28/11

Click on the county to view the full bulletin text.
Scenario #2 – April 28th, 2011

Crosses I-87 near Queensbury

Tornadic Vortex Signature Detected
Scenario #2 – April 28th, 2011

I-87 near Queensbury
From the Traveler’s Perspective

End user = **Travelling Public**

- Brings information down to the roadway level (*Clarus* & RWIS)
- Insight into weather in-between sensors
- Insight into developing weather situations that will affect the region
“I see nothing falling from the sky but is the road slick?”

“It is sunny now. Am I about to drive into a developing blizzard?”

“Which portion of my route is or will be affected by high winds?”

“I see where the severe weather is now. Which roads will it affect in the next 15-30 minutes?”
Observations & Results

Both NYSDOT and FHWA evaluated the pre-production 511NY system over a 3-month time period.

- **Alert Prioritization**
  - Standardize order of alerts to display (radar versus warnings, etc.)

- **Data Quality**
  - RWIS data quality is key to ensure data can be utilized for alerting

- **Information Clarity**
  - Keep public perception/interpretation in mind…keep it simple
  - Provide additional information on alert types
  - Standardize the colorization and terminology
  - Cease use of Flood Warnings…keep Flash Flood Warnings

- **Thank you NYSDOT & FHWA!**
Next Steps

- Simplify and clarify the alert results

![Weather Alert Diagram]
Next Steps

- Simplify and clarify the alert results
- Explore integration of road segment alerts into 511NY production system
Next Steps

- Simplify and clarify the alert results
- Explore integration of road segment alerts into 511NY production system
- Integrate road segment alerts into the NY Connected Vehicle program

“Heavy snow ahead”
Other Uses for Road Segment Alerting

- XML feed can be integrated into many different applications
  - Connected vehicle initiatives
  - 511 programs
  - Traffic Management Centers
  - Traffic modeling input
  - Signal timing
Thank You

Final Report

www.its.dot.gov/index.htm

Integrating Clarus Data with the 511 New York Traveler Information System

FHWA Publication Number: FHWA-JPO-11-112

Questions?