MDSS and Mobile Data Collection as an Integrated ITS Technology

Michael Howarth
VP Business Development
Intelligent Devices, Inc.
Intelligent Devices, Inc.

• Leader in NTCIP technology
• Legacy protocol translators
• Provider of NTCIP central software
MDC and Maintenance Decision Support

If you know...

- Road characteristics
- Current conditions
- Weather forecast
- Physics & chemistry of snow, ice, chemicals
- Available resources (material, equipment, schedule)

...then you can recommend...

- Treatment type
- Application rate
- Optimal timing

...and predict

- Future road conditions with or without treatments
South Dakota DOT Pilot Project

- Assess suitability of SDDOT fleet for MDC
- Develop functional and physical specifications for MDC
- Define NTCIP-based protocols for truck-to-center communications
- Build and evaluate a functioning field controller
- Recommend a cost-effective deployment strategy
Mobile Data Collectors

- Light weight
- Durable
- Remotely updateable
- Windows based
- Expandable
- Easy to install in vehicle
Mobile Data Collection

- Automatically Collected:
  - Vehicle Location
  - Speed
  - Direction
  - Material Application Rate
    - Solid
    - Pre-Wet
    - Liquid
  - Plow Blade Position
  - Road Temperature
  - Air Temperature
Mobile Data Collection

• Operator Enters:
  – Plow/Treat Lanes
  – Material Application
  – Visibility
  – Precipitation
  – Snow Accumulation

<table>
<thead>
<tr>
<th>ROAD CONDITIONS</th>
<th>MAIN MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRY</td>
<td></td>
</tr>
<tr>
<td>DAMP</td>
<td></td>
</tr>
<tr>
<td>WET</td>
<td></td>
</tr>
<tr>
<td>FROST</td>
<td></td>
</tr>
<tr>
<td>SNOW</td>
<td></td>
</tr>
<tr>
<td>DRIFTED SNOW</td>
<td></td>
</tr>
<tr>
<td>SLUSH</td>
<td></td>
</tr>
<tr>
<td>ICE</td>
<td></td>
</tr>
</tbody>
</table>

| SURFACE TEMP | 27°F |

<table>
<thead>
<tr>
<th>WEATHER CONDITIONS</th>
<th>MAIN MENU</th>
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<tbody>
<tr>
<td>PRECIP TYPE</td>
<td>NONE</td>
</tr>
<tr>
<td>HAIL</td>
<td>DRIZZLE</td>
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<tr>
<td>SNOW</td>
<td>RAIN</td>
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<tr>
<td>FLURRIES</td>
<td>SLEET</td>
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<tr>
<td>CLEAR</td>
<td>BABIT</td>
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<tr>
<td>FOG</td>
<td>SMOKE</td>
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<tr>
<td>BLOWING SNOW</td>
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</tr>
<tr>
<td>NEAR ZERO</td>
<td>&lt;1/4 mile</td>
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<tr>
<td>&gt;1/4 mile</td>
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</tr>
<tr>
<td>WIND (mph)</td>
<td>CALM &lt;10</td>
</tr>
<tr>
<td>LIGHT 10-20</td>
<td>MEDIUM 20-30</td>
</tr>
<tr>
<td>MEDIUM 20-30</td>
<td>STRONG &gt;30</td>
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</table>
Maintenance Decision Support

- Driver receives MDSS recommendation
- Driver receives regional weather

<table>
<thead>
<tr>
<th>MDSS DISPLAY</th>
<th>CHANGE SITE</th>
<th>➤ MAIN MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Map Image" /></td>
<td><img src="image2.png" alt="Map Image" /></td>
<td><img src="image3.png" alt="Forecast Image" /></td>
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</tbody>
</table>

- **Recommended Actions**
  - For Hwy 93A, MP 11.8 to 15:
    - Condition Time: 0.27PM Mon Oct 10, 2005
    - Lane: 1 (3 hrs 31 mins)
    - Material: SALT/SAND (1 hrs 31 mins)
    - Post Rate: 75 (1 hrs 31 mins)
    - Road Cond: WET (1 hrs 31 mins)
    - Snow: 0 (1 hrs 31 mins)
    - TxBow: 6 (1 hrs 31 mins)
    - Weather: SNOW (1 hrs 31 mins)

- **Forecast**
  - Time (hrs): Mon 01:00 PM
  - Wind Speed (mph): N
  - Wind Precip (in): TS
  - Temp (°F): 30
  - Humidity (%): 0.00
  - Visibility (mi): 40
Configurability

- Screen brightness
- Plow blade
  - Automatic monitoring
  - Manual monitoring
- Device password
- Device settings
- On board camera
Configurability

- XML configurable
- Uses Windows XP
- Support for any NTCIP objects
- Materials list and URL list fully configurable by agency
Web Services

- Limited or full web browser
- Ease of navigation through touch screen
Route Optimization – Map View

- Displays turn by turn instructions for full route
- Color coded actions
  - Blue – Spreading
  - Green – Deadheading
  - Red – Plowing
- 7 Zoom levels
- Text to speech
MDSS and MDC as an Integrated ITS Technology

- Open Standard
- Integration with TMC
- Combined fleet and traffic management
- Works with any NTCIP compliant central software
- Motorists are provided more information on current driving conditions
  - DMS Signs
  - Highway Advisory Radios (HAR)
  - Public Website
Questions?

Please Contact:

Michael Howarth
Intelligent Devices, Inc.
Phone: 770-831-3370
mhowarth@intelligentdevicesinc.com
4411 Suwanee Dam Road, Suite 510
Suwanee, GA 30024