



Smart Information for a Sustainable World

Overview of Telvent DTN Transportation Industry Weather Capabilities

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Telvent Company Overview



Telvent DTN Company Overview

■ Telvent DTN – Specialized, high accuracy weather solutions

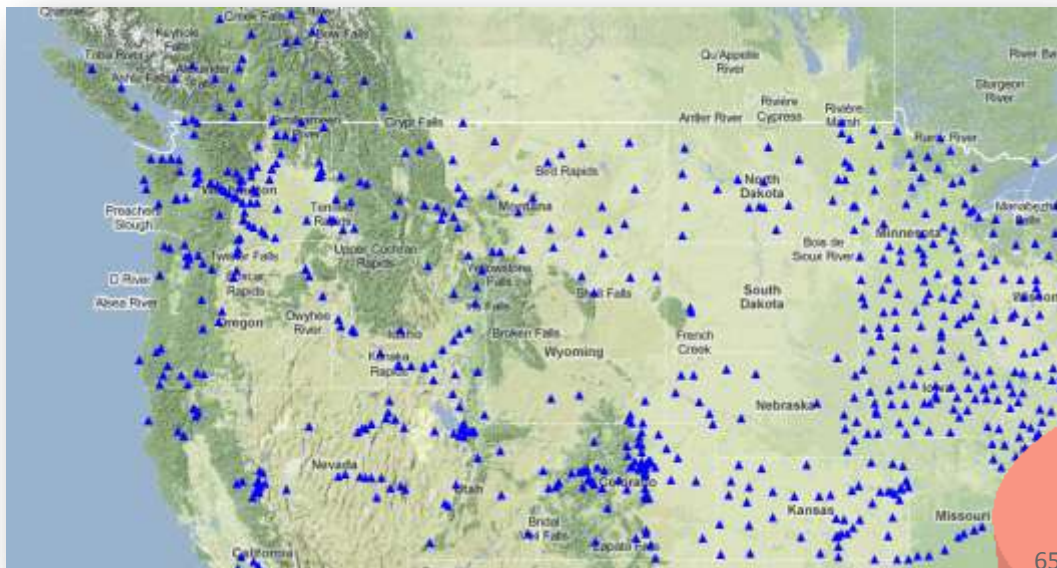
- Transportation 
- Energy 
- Aviation 
- Public Safety
- Sports & Recreation 

“Approximately 70% of US Energy companies use Telvent DTN load forecasts”

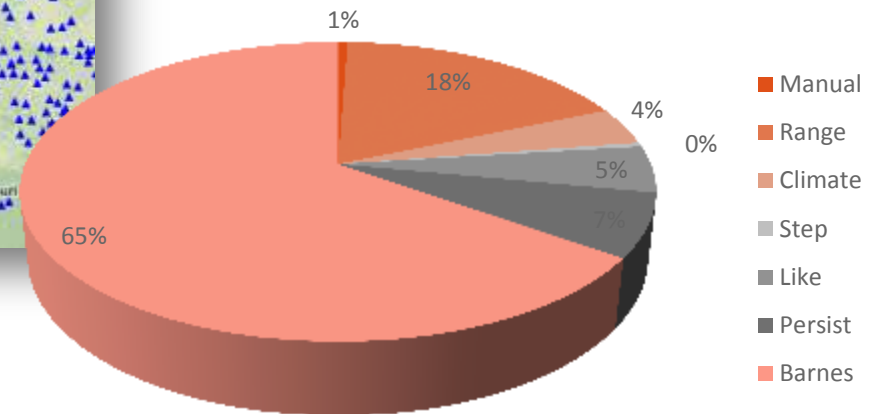


Clarus

- Telvent DTN is the largest operational user of Clarus data.
- We are actively engaged in evaluation of Clarus Quality Control checks and have provided operational feedback to the program.



essSurfaceTemperature QC Failures



RWIS Error Reporting

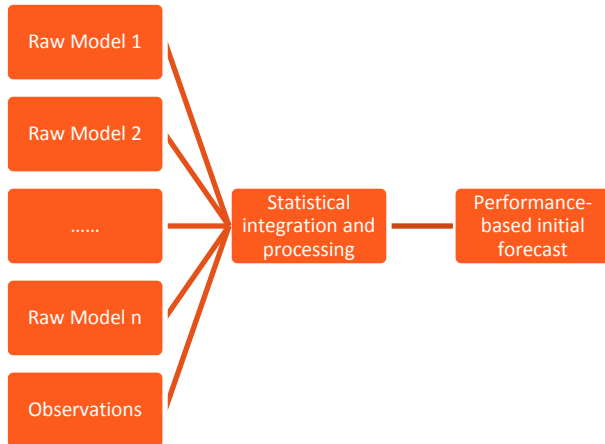
Time (CDT)	Air Temp (°F)	Dew Point (°F)	Rel Hum (%)	Wind (mph)	Vis (miles)	Precip Detection	Precip Intensity	Precipitation Type	Rate (in./hr)	Surface Condition			Road Temp (°F)		Bridge Temp (°F)		Surface Temp (°F)	
										0	1	2	0	1	2	Min	Max	
5:02AM	62.2	51.1	66	WNW 3 G 6	7	No	None	None	0.00	Dry	Error	Dry	70.0	621.8	67.5	67.5	70.0	
5:12AM	61.9	51.1	67	WNW 5 G 7	7	No	None	None	0.00	Dry	Error	Dry	69.6	621.8	67.1	67.1	69.6	
5:22AM	62.1	51.1	67	NW 5 G 7	7	No	None	None	0.00	Dry	Error	Dry	69.3	621.8	66.7	66.7	69.3	
5:32AM	61.9	51.1	67	NW 5	7	No	None	None	0.00	Dry	Error	Dry	69.1	621.8	66.6	66.6	69.1	
5:42AM	61.7	50.9	67	NW 5 G 7	7	No	None	None	0.00	Dry	Error	Dry	68.9	621.8	66.4	66.4	68.9	
5:52AM	61.3	51.1	68	NW 3 G 6	7	No	None	None	0.00	Dry	Error	Dry	68.7	621.8	66.2	66.2	68.7	
6:02AM	61.0	51.1	69	NW 5	7	No	None	None	0.00	Dry	Error	Dry	68.5	-	65.8	65.8	68.5	
6:12AM	61.0	51.3	70	NW 5 G 7	7	No	None	None	0.00	Dry	Error	Dry	68.2	621.8	65.5	65.5	68.2	
6:22AM	60.6	51.3	71	WNW 3 G 6	7	No	None	None	0.00	Dry	Error	Dry	67.8	-	65.1	65.1	67.8	
6:32AM	60.4	51.3	71	NW LV G 6	7	No	None	None	0.00	Dry	Error	Dry	67.8	621.8	64.9	64.9	67.8	
6:42AM	60.1	51.4	72	NW LV G 6	7	No	None	None	0.00	Dry	Error	Dry	67.6	621.8	64.8	64.8	67.6	
7:02AM	59.5	51.8	75	LV	7	No	None	None	0.00	Dry	Error	Dry	67.1	-	64.2	64.2	67.1	
7:12AM	59.4	52.2	76	WNW LV G 5	7	No	None	None	0.00	Dry	Error	Dry	66.9	621.8	64.0	64.0	66.9	
7:22AM	59.0	52.2	77	W 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	66.7	-	63.9	63.9	66.7	
7:32AM	58.6	52.0	78	W LV G 5	7	No	None	None	0.00	Dry	Error	Dry	66.4	621.8	63.5	63.5	66.4	
7:43AM	58.5	52.0	78	LV	7	No	None	None	0.00	Dry	Error	Dry	66.2	-	63.3	63.3	66.2	
7:52AM	58.3	52.0	79	W LV G 3	7	No	None	None	0.00	Dry	Error	Dry	66.0	621.8	63.1	63.1	66.0	
8:02AM	58.1	51.8	79	LV	7	No	None	None	0.00	Dry	Error	Dry	65.8	-	63.0	63.0	65.8	
8:12AM	57.9	51.8	80	W LV G 5	7	No	None	None	0.00	Dry	Error	Dry	65.7	621.8	63.0	63.0	65.7	
8:22AM	57.9	52.0	80	WNW 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	65.5	621.8	62.6	62.6	65.5	
8:32AM	57.9	51.8	80	W 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	65.3	621.8	62.4	62.4	65.3	
8:42AM	57.6	51.6	80	LV	7	No	None	None	0.00	Dry	Error	Dry	65.1	621.8	62.2	62.2	65.1	
8:52AM	57.6	51.6	80	WSW LV G 5	7	No	None	None	0.00	Dry	Error	Dry	64.9	621.8	61.9	61.9	64.9	
9:02AM	57.6	51.4	80	LV	7	No	None	None	0.00	Dry	Error	Dry	64.6	621.8	61.7	61.7	64.6	
9:12AM	57.4	51.3	80	WNW 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	64.6	621.8	61.7	61.7	64.6	
9:22AM	57.4	51.3	80	LV	7	No	None	None	0.00	Dry	Error	Dry	64.4	621.8	61.5	61.5	64.4	
9:33AM	57.4	51.3	80	WNW 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	64.2	621.8	61.2	61.2	64.2	
9:42AM	57.4	51.3	80	W 3	7	No	None	None	0.00	Dry	Error	Dry	64.0	621.8	60.8	60.8	64.0	
9:52AM	57.2	51.3	80	W 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	63.9	621.8	60.6	60.6	63.9	
10:02AM	56.8	51.1	80	W LV G 5	7	No	None	None	0.00	Dry	Error	Dry	63.7	621.8	60.4	60.4	63.7	
10:12AM	56.8	51.1	80	W LV G 5	7	No	None	None	0.00	Dry	Error	Dry	63.3	621.8	60.3	60.3	63.3	
10:22AM	56.5	50.9	81	W 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	63.3	621.8	60.1	60.1	63.3	
10:32AM	56.3	50.9	81	W 3 G 5	7	No	None	None	0.00	Dry	Error	Dry	63.1	621.8	59.9	59.9	63.1	

Telvent DTN Forecast Process

Performance-based initial forecast

Meteorologist enhancement

WeatherSentry Online

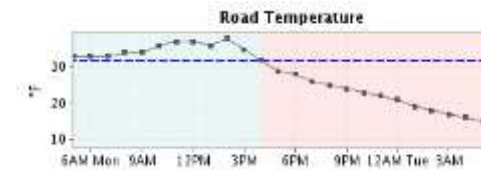


Telvent DTN Meteorologist & GFE



- **Human involvement adds expertise to forecast using GFE**
- **Focus where models do not perform well**

Pavement Forecasts



Precipitation Forecasts



Treatment recommendations

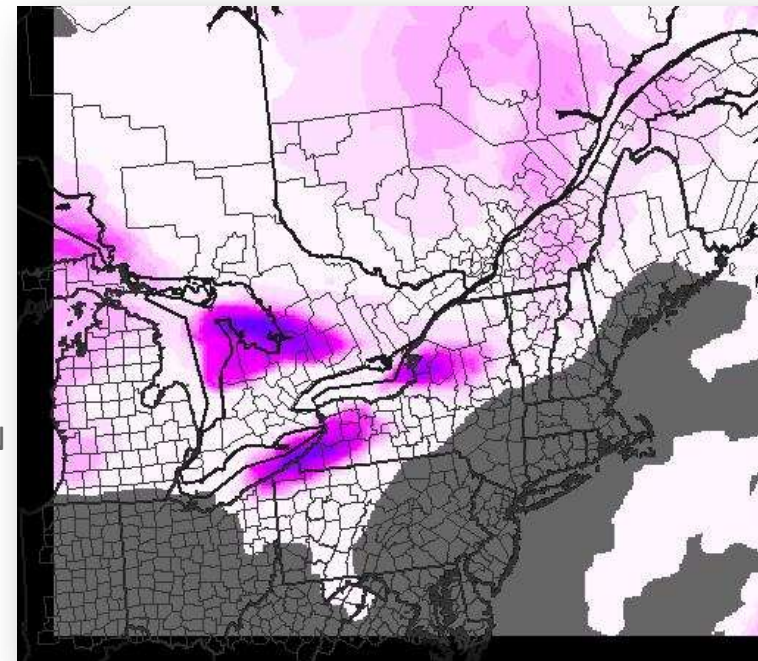
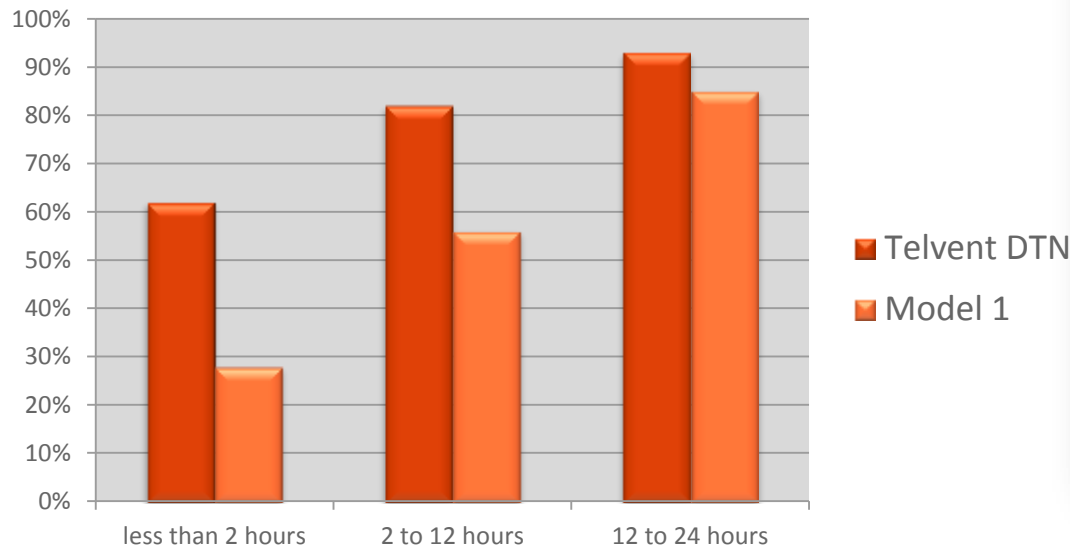


Results - Precipitation Improvements

- Focus on areas where model does not perform well
- Forecaster-enhanced precipitation is 10-30% more accurate than raw model data
- Telvent DTN independently rated as producing the most accurate precipitation forecasts**



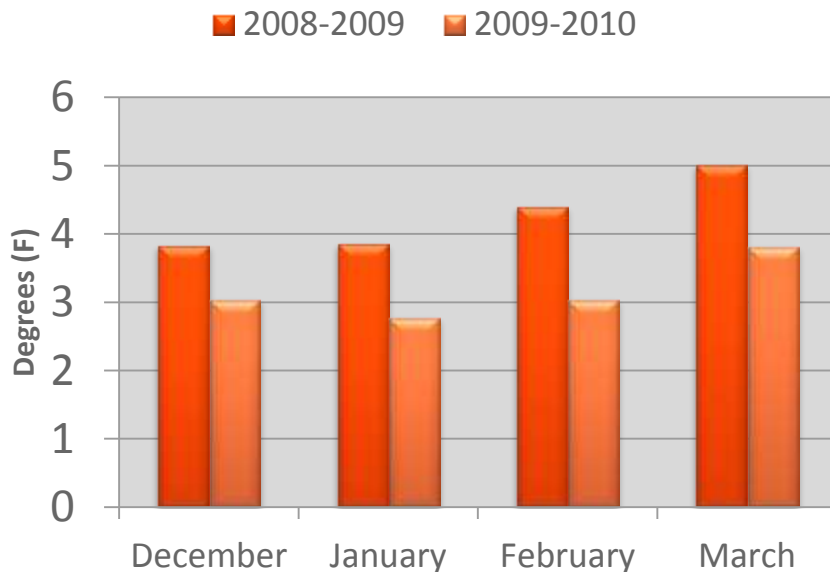
Forecast Accuracy (%) vs. Event Duration
(July - November 2009)



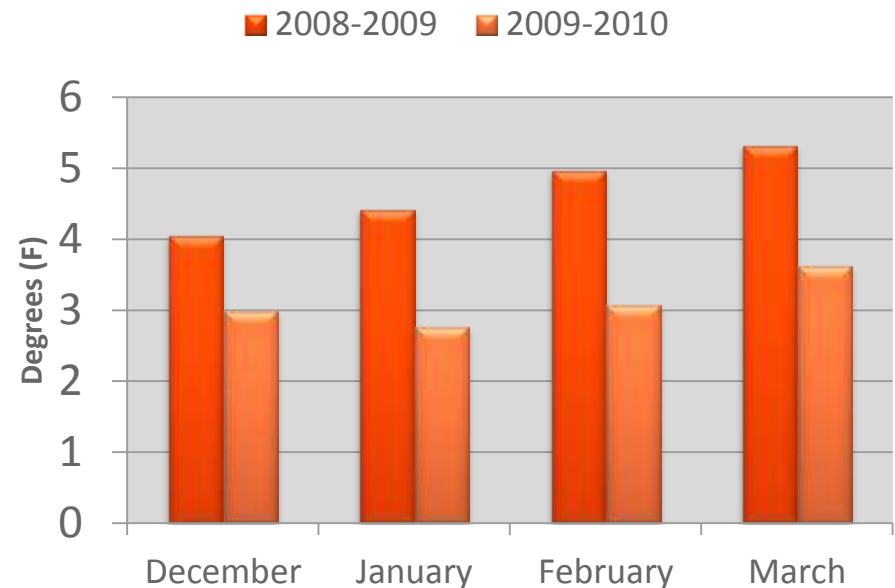
Results – Pavement Forecast Improvements

- Multi year study across several states and provinces.
- Site specific algorithm resulted in 20% to 30% improvement in pavement forecast performance.
- Additional improvements shown in 2010-2011 winter season

Pavement Forecast Performance



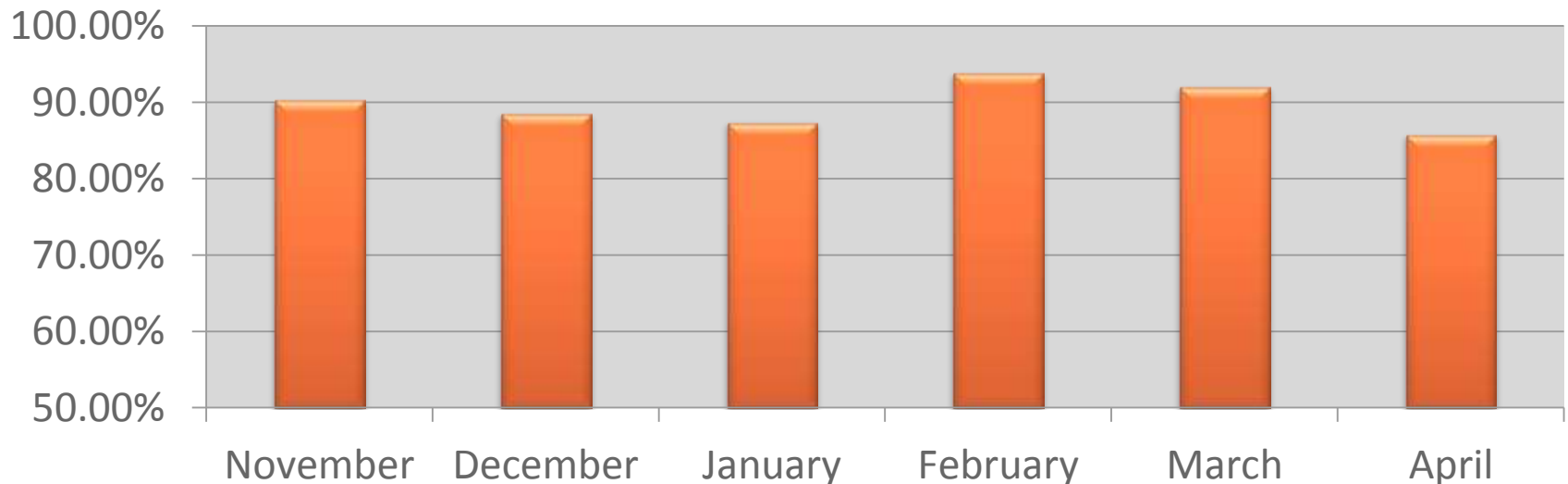
Bridge Forecast Performance



Forecast Performance – Alberta Transportation

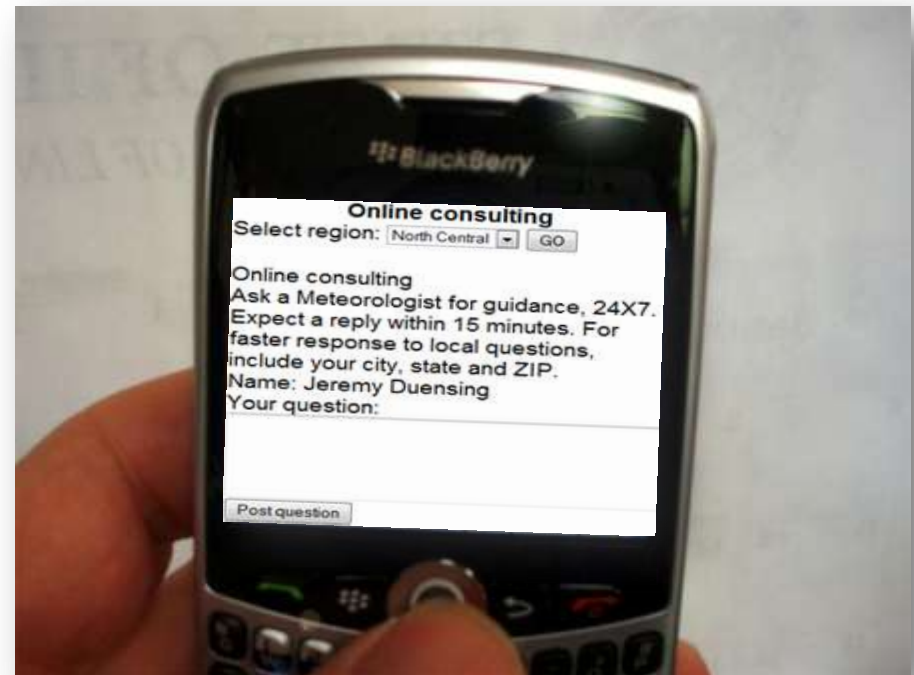
- Performance-based contract driven by forecast accuracy (each increase in percentage equals \$100K in maintenance savings)
- More stringent performance criteria near critical thresholds (0 degrees Celsius)
- Telvent DTN exceeded performance metrics set forth by customer for winter 2009-2010 and again in 2010 -2011

Forecast Accuracy (%)



Impact Based Communications

- WeatherSentry Mobile
 - Weather where you are
- Meteorologist Consultation
 - Understanding of Regional Micro-Climates
 - Trends
 - Latest thinking
- Alerting
 - Online
 - Email
 - Text message



WINS Alert Detail

Mark as Archived

Delete

« Back

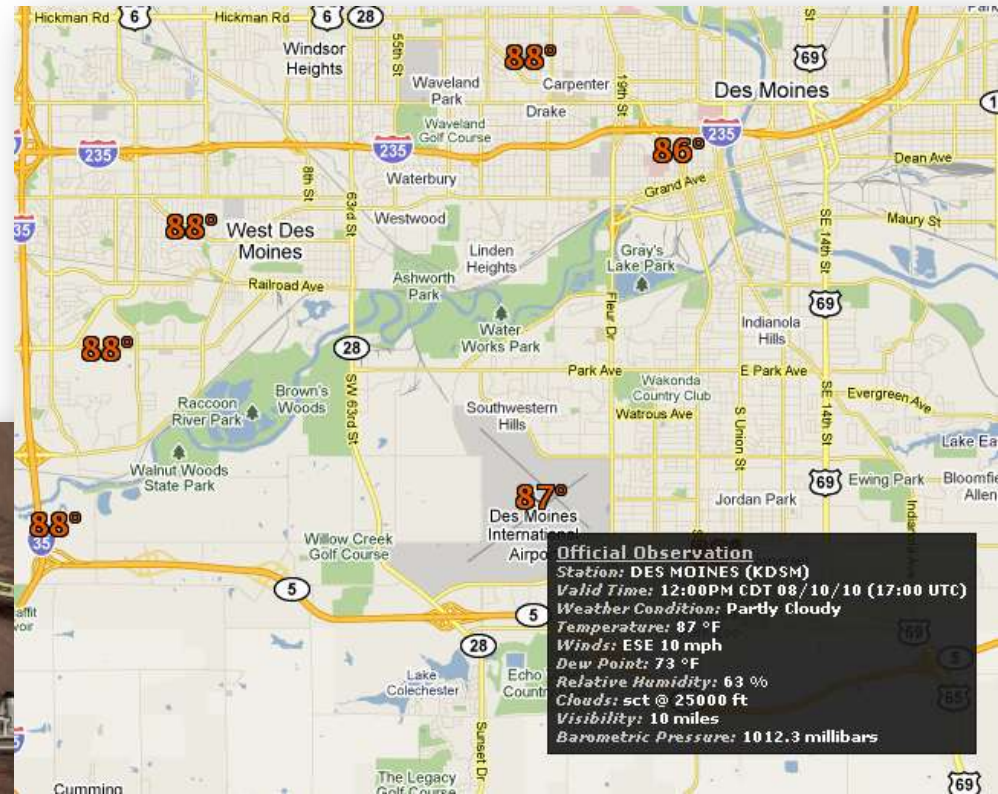
Message

For Home, latest observation from MINNEAPOLIS-LAKEVILLE shows rain in your area.

Location	Event Type	Message Type	Issue/Valid Date Time	Expire Date Time	Status
Home	Obs Rain	Weather Event	08-10-2010 10:00AM CDT	08-10-2010 12:46PM CDT	New

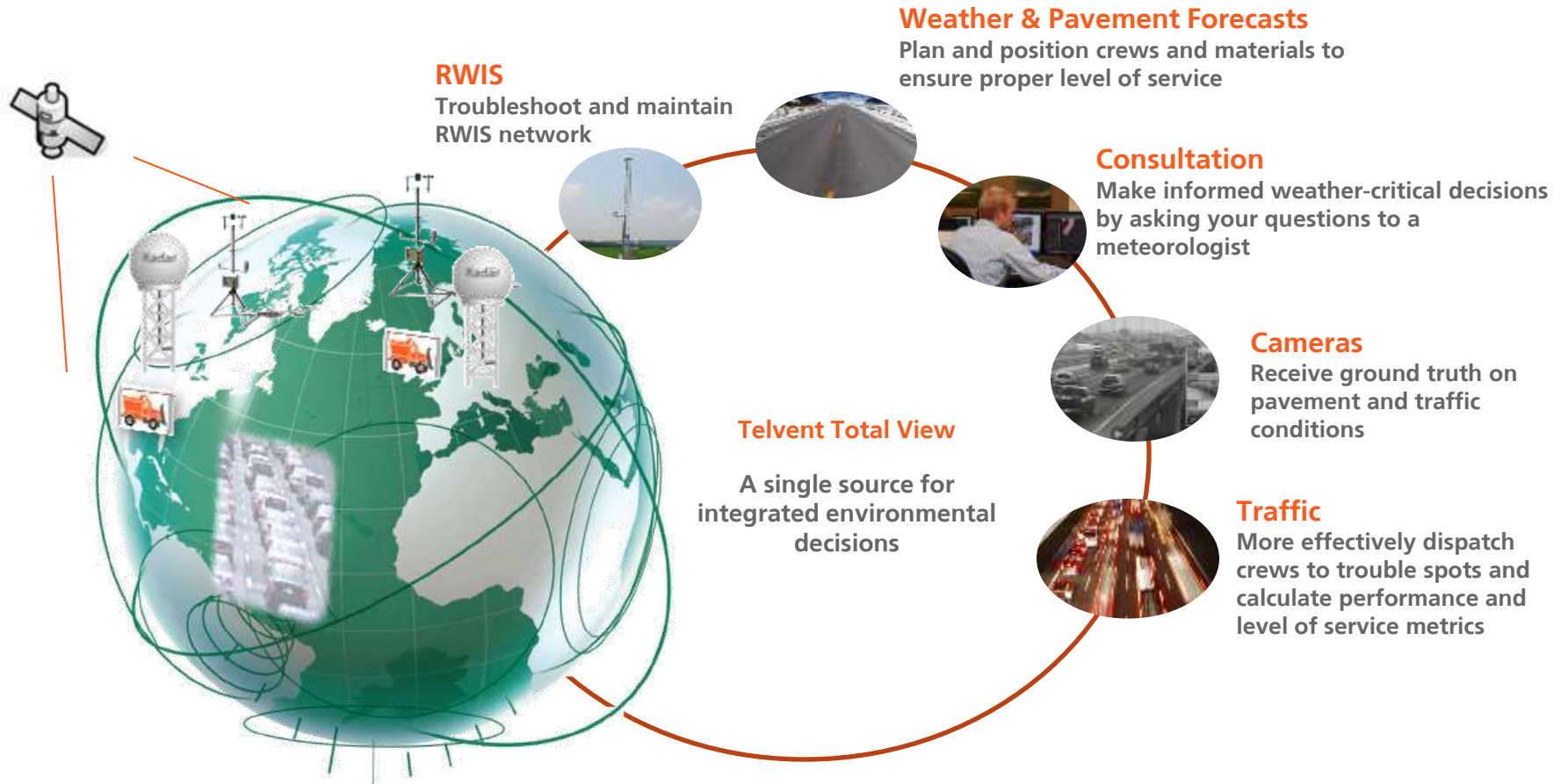
Google Maps Platform

- "Open Platform"
 - Hyper-local weather display
 - ▶ Atmospheric and pavement observations
 - ▶ State of the atmosphere for your area of interest
 - ▶ Street-level analysis



Lays the foundation for open systems, interoperability and global support.

Newest Version – Total View



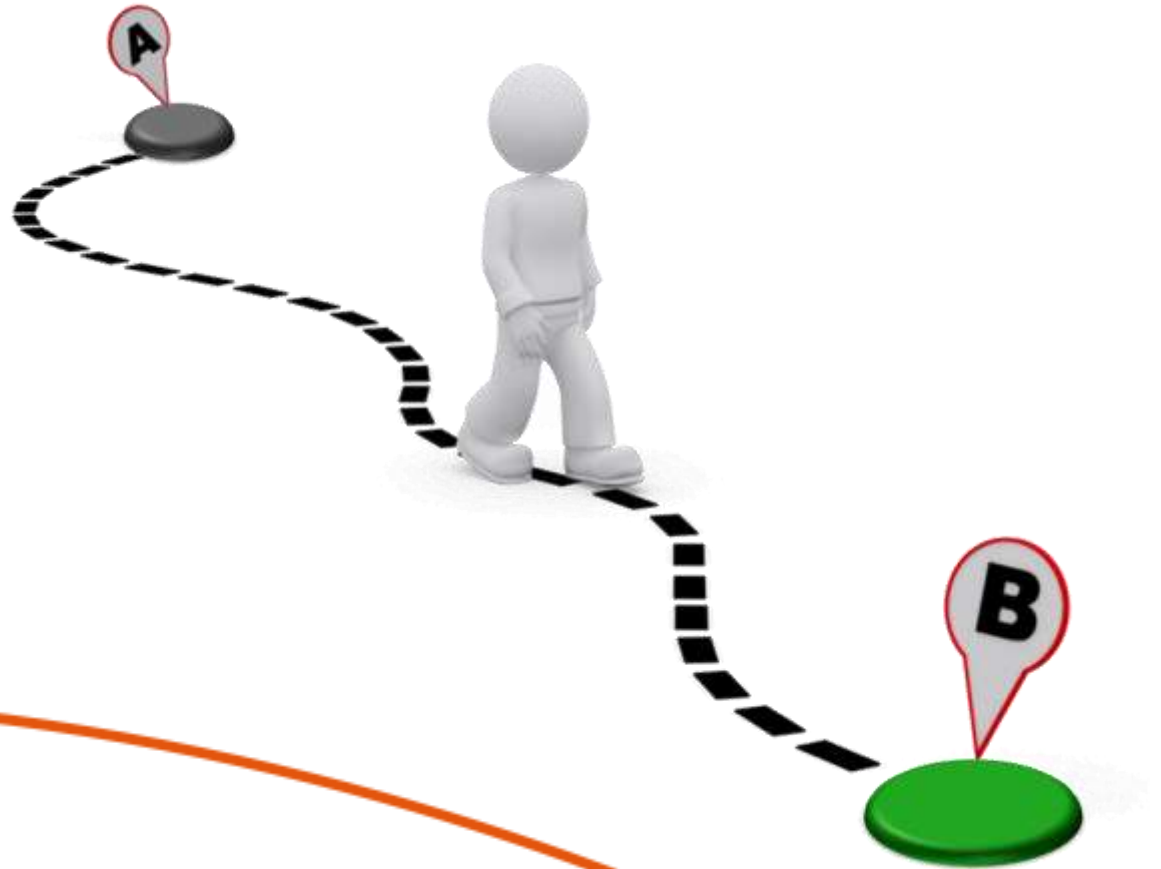
Key Customer Benefit

Provides customer with single decision support system from which to make weather-critical decisions and save time, money and lives.

Contact

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World Leader in Forecasting and Transportation Solutions



Thank You