

WYDOT Road Condition Reporting App



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Road Condition Reporting App

Allows maintenance employees to use a computer to perform the functions previously done over the radio:

- Make road condition reports
- Report incidents
- Get weather data
- See what's posted on DMS
- Recommend changes to VSLs

The screenshot shows the Road Condition Reporting App interface on a tablet. The top status bar displays the date and time (06/08/15 16:11), location (I-80 West Lower, CHEYENNE (D)), and various status indicators (14 MPH S, VSL Active 75 mph, sun icon, and a green 'X' icon). The main screen features a grid of buttons for reporting road conditions: 8-1 Dry Road, 8-2 Wet Road, 8-3 Slick, 8-4 Slick Spots, 8-5 Drifted Snow, Black Ice, No Unnecessary Travel, 9-1 Favorable, 9-2 Snowing, 9-3 Raining, 9-4 Strong Winds, 9-5 Fog, 9-6 Blowing Snow, and 9-7 Reduced Visibility. A 'SEND' button is located at the bottom center, and a 'CLEAR' button is at the bottom left. A sidebar on the right contains a 'TEST Application' button and a list of menu items: Reporting, Route Info, Messages, Map, Event Log, and Settings. The bottom of the screen shows a navigation bar with the number 10, a page indicator 8 / 9, and the text VSL.

Road Condition Reporting App



- **Goals**
- **Background**
- **System Description**
- **App Description**
- **Demonstration**

Goals



RCR App: Goals



- Reduce radio traffic
- Streamline TMC processes
- Improve timeliness, accuracy of road condition reporting
- Provide more information to maintenance workers
- Increase efficiency
- Improve roadway safety

Background



RCR App: Background



- **WYDOT's Transportation Management Center serves as a hub for maintenance vehicle dispatching and road condition reporting for the entire state**
- **It is staffed 24 hours a day, seven days a week**
- **In 2014, TMC operators made more than 106,000 updates to the WTI, nearly 75 percent of those updates happened during storm conditions**

RCR App: Background



- **There is a strong demand for road condition information in Wyoming**
 - During the 2014-15 Winter season (October to May)
 - 679,860,988 hits to the text pages of wyoroad.info alone. This does not include hits to the map portion of the website.
 - 15,338,050 total visitors, an average of 63,288 visitors per day
 - 511 Notify Service sent information to 33,365 subscribers, who subscribed to an average of 33 topics
 - 511 Phone System received 502,505 calls

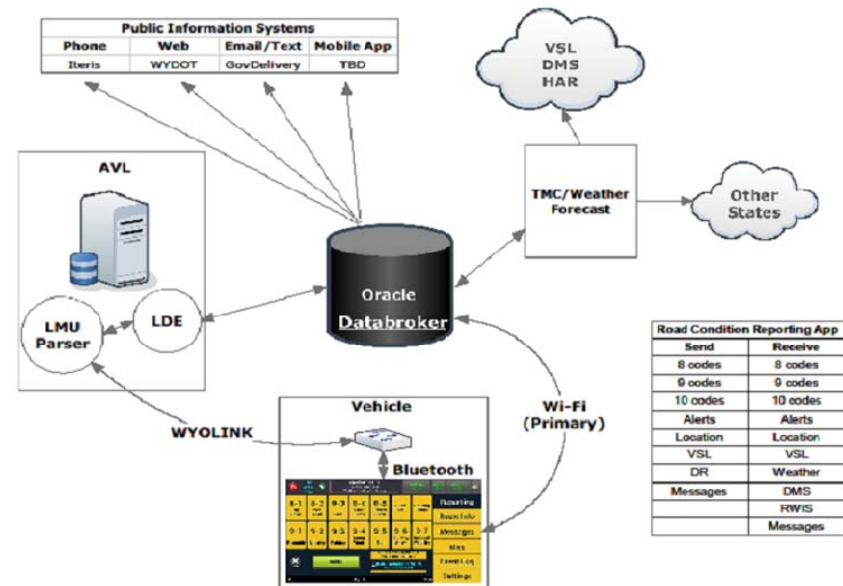
RCR App: Background



- As the state adds ITS devices to make it easier to share information with the public, the demand on TMC operators' time increases, while staffing levels remain the same
- One of the project's goals was to eliminate a portion of the TMC's workload so they could focus on other tasks, while at the same time making condition reporting easier for maintenance

RCR App: Background

- The app allows maintenance employees to update the database that feeds information systems and to pull information from that database, which frees radio traffic and saves employee time



System Description



RCR App: System Description



- **Android-based operating system**
- **Off-the-shelf Samsung Galaxy Tab 4 with a 10.1-inch screen**
- **Mounting hardware**
 - Ram Ball Mount
 - Havis Universal Mount
- **Less than \$600 to outfit each vehicle, excluding manpower and the systems already installed in vehicles (LMU, radio)**

RCR App: System Description



- **App Development:** Approved a sole-source contract with WYDOT's existing AVL vendor CompassCom because of their experience with two-way communication over the radio network; sub-contractor NeoTreks performed the development work
- **System Integration:** In-house developers, contractors
- **Communication:** Telecom, Versatel
- **Installation:** Telecom

RCR App: System Description



- **The primary communication method is via WiFi**
 - Connects to WYDOT Backhaul
 - ✦ No ongoing communication costs
 - Low-cost, high-gain antennas
 - ✦ Cost about \$200 per site
 - All existing WYDOT hotspots, including trooper's vehicles
 - Only the map portion of the app requires Wi-Fi connectivity

RCCR App: System Description



- **When Wi-Fi is not available, communication is done over the WyoLink radio network, a P25 VHF Trunked radio system**
 - In addition to voice traffic, the system can handle low-speed data, similar to a slow modem
 - The system covers about 80 percent of the roadways in the state, providing superior coverage than cellular networks

RCR App: System Description

- Reports made from the field are integrated into existing road condition reporting software and an existing alerting system for TMC operators

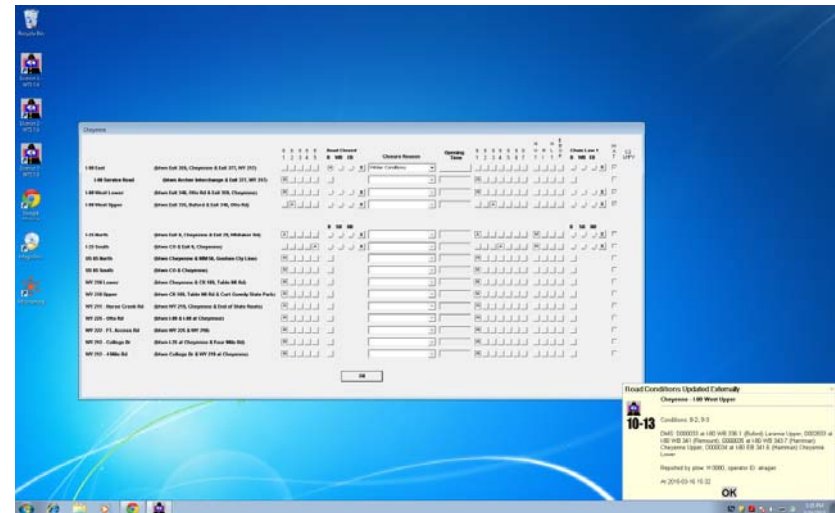
Wyoming State Government Citizen Business Government Visitor

Transportation Reports and Action Console (development)

TRAC Task List

Create new Task Update Now Last updated 2015-03-16 13:29:38

PK	Priority	Source	District	Description	Link	Created	Claimed	Completed	On Complete URL
24023	Emergency	Plow	0	10-50: Crash Ambulance Requested at 41.620691;-108.241334 Plow license plate: H 0080, Operator ID: alragan, Dept: 1035	N/A	2015-03-16 10:17:32 by alragan	Claim 24023	Complete 24023	DELETE https://trac.trac_dev@wtdbd01.gisits.local:84
24035	High	Plow	1	10-13: Cheyenne - I-80 West Upper Conditions: 8-1, 9-1 DMS: D000033 at I-80 WB 336.1 (Buford) Laramie Upper, D002833 at I-80 WB 341 (Remount), D000035 at I-80 WB 343.7 (Harriman) Cheyenne Upper, D000034 at I-80 EB 341.6 (Harriman) Cheyenne Lower Reported by plow: H 0080, operator ID: alragan	N/A	2015-03-16 10:14:30 by alragan	Claim 24035	Complete 24035	null
24022	Medium	Plow	0	10-41: Operator on duty at 0.000000;0.000000 Plow license plate: H 0080, Operator ID: alragan, Dept: 1035	N/A	2015-03-16 10:14:08 by alragan	Claim 24022	Complete 24022	null
24034	Medium	Plow	1	10-7: Out of service Cheyenne - I-25 North - Southbound at Reference Marker 12.5 Plow license plate: H 0241, Operator ID: spretlyman, Dept: 2033	N/A	2015-03-13 14:11:56 by spretlyman	Claim 24034	2015-03-16 07:33:05 by the X	null
24033	Medium	Plow	1	10-8: In service Cheyenne - I-25 North - Southbound at Reference Marker 12.5 Plow license plate: H 0241, Operator ID: spretlyman, Dept: 2033	N/A	2015-03-13 14:04:14 by spretlyman	Claim 24033	2015-03-16 07:33:07 by the X	null
24032	Medium	Plow	1	10-7: Out of service Cheyenne - I-25 North - Southbound at Reference Marker 12.5 Plow license plate: H 0241, Operator ID: spretlyman, Dept: 2033	N/A	2015-03-13 14:02:35 by spretlyman	Claim 24032	2015-03-16 07:33:09 by the X	null
24021	Medium	Plow	0	10-41: Operator on duty at 0.000000;0.000000 Plow license plate: H 0241, Operator ID: spretlyman, Dept: 2033	N/A	2015-03-13 13:47:47 by spretlyman	Claim 24021	2015-03-16 07:33:11 by the X	null
24020	Medium	Plow	0	10-42: Operator off duty at 41.165254;-104.844836 Plow license plate: H 0241, Operator ID:	N/A	2015-03-13 13:46:44	Claim 24020	2015-03-16 07:33:12 by the X	null



App Description



Information Provided by Maintenance

Road and weather
condition updates

Incidents 10 Codes
(road hazards, crashes)

Damage to
infrastructure

Snow performance
measures

Messaging (similar to e-
mail)

Emergency reports

Variable Speed Limit
recommendations



Information Provided to Maintenance

Location Information

Real-time weather data

Weather forecast

Current road condition reports

DMS messaging

Variable Speed Limit data

Vehicle speed data

I-80 356.1 (D) 15:04 06/08/15 16:11 I-80 West Lower, CHEYENNE (D) Plow #H 0226, TMC 8-1, 9-1 14 MPH S MP 353.0 mm 353 VSL Active 75 mph

TEST Application

Reporting

Route Info

Message

Map

Event Log

Settings

NEVER TEXT AND DRIVE

STATE LAW

DMS for current section RWIS

I-80 355.9 (D) 15:04 06/08/15 16:11 I-80 West Lower, CHEYENNE (D) Plow #H 0226, TMC 8-1, 9-1 14 MPH S MP 353.0 mm 353 VSL Active 75 mph

TEST Application

Reporting

Route Info

Messages

Map

Event Log

Settings

Remount mm 340.5 (D)

Air Temp	65 °F
Dew point	
Rel humidity	
Wind Speed Avg	6 mph
Wind Speed Gust	10 mph
Surface Temp	96 °F
Surface Status	Dry/Dry
Visibility	6560 ft
Time Stamp	06/12/2015 14:56:00

Ascending MM

Descending MM

RWIS Conditions

I-80 355.7 (D) 15:04 06/08/15 16:11 I-80 West Lower, CHEYENNE (D) Plow #H 0226, TMC 8-1, 9-1 14 MPH S MP 353.0 mm 353 VSL Active 75 mph

TEST Application

Reporting

Route Info

Messages

Map

Event Log

Settings

MAP

WEATHER

REFRESH LAYERS

Road Closes

Maintenance

Plows

All Gates

Closed Gates

RWIS

I-80 269.6 (I) 15:06 06/08/15 16:11 I-80 West, ARLINGTON (I) Plow #H 0226, TMC 8-45, 9-2 14 MPH S MP 353.0 mm 353 VSL Inactive

TEST Application

Reporting

Route Info

Messages

Map

Event Log

Settings

Conditions

I-25 North, CHEYENNE (D)	TMC
06/08/15 16:12	8-1, 9-5
I-25 North, CHEYENNE (I)	TMC
06/08/15 16:12	8-1, 9-5
I-25 South, CHEYENNE (D)	TMC
06/08/15 16:12	8-24BINUT, 9-6
I-25 South, CHEYENNE (I)	TMC
06/08/15 16:12	8-24BINUT, 9-6
I-80 East, CHEYENNE (D)	alragan
06/12/15 15:05	8-24, 9-2

RWIS

Demonstration



Contact Information



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