

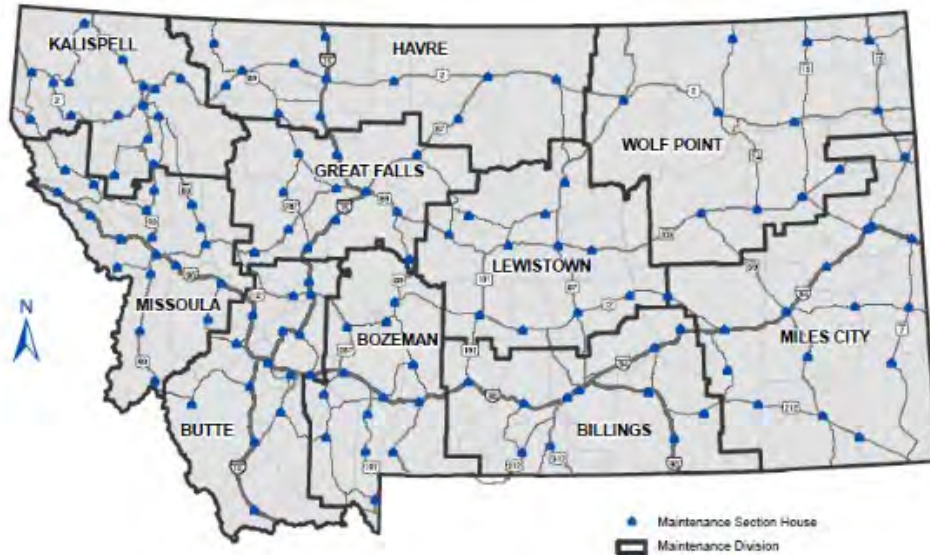


Montana TMC

Curtis Buckley



MDT Stats



- 4th largest state in the U.S. by area
- MDT maintains 25,000 lane miles
- 5 Districts with 10 Maintenance Areas and 116 Maintenance Sections
- Montana has recorded snow fall every month of the year



Winter Weather

- Montana has recorded snow fall in every month of the year.
- Conditions can change drastically in minutes.



Rock Fall

Melting snowpack and rain increase likelihood for rock fall.



Wildfires

Wildfires can spread quickly in areas of Montana with dryer climates especially following lighter winter seasons.



Culvert Failures

Culvert failures can lead to sink holes or road collapse.



Flooding and Water on Road

When temperatures warm and snowpack melts, standing water on the road or flooding can occur when riverbeds exceed capacity/flow rate.



High Wind

Certain corridors are prone to strong winds which results in blowing and drifting snow, in addition to increased blow over risk for high profile vehicles.



Traffic Incidents

Managing traffic incidents on high traffic rural routes with limited ITS poses unique challenges.





Pre-TMC Operations

- Traveler information, ITS, and communication services were decentralized and managed in each of the five MDT Districts.
 - Each office was staffed from 7:00 am to 5:00 pm Monday through Friday.
 - From November to March, temporary staff were hired to provide 24-hour support.
- Operations were managed at the District level with limited interaction with MDT HQ staff, minus communication for major incidents.
- Traveler information program oversight was done directly from MDT HQ.
- MDT's Traveler Information Program Manager was on-call for emergency reporting, communication, and after-hour ITS control.
- MDT HQ distributed call down lists to PSAP's and state patrol dispatch staff for after-hour MDT communication.



After-hour Communication Process

- State Patrol Dispatch and PSAP's had call down lists that were maintained by MDT HQ. The lists contained all maintenance section supervisors and their chain of command.
 - Centers would use these lists to call-out or communicate information with MDT field staff outside of business hours.
 - This process resulted in MDT HQ being unable to consistently manage the criteria, appropriateness, or validity of calls to field staff.
 - Lists were also difficult to maintain and at times not updated timely, resulting in calls to former MDT staff.
 - The MDT HQ Travel Information Program Manager was also contacted at times after-hours by State Patrol Dispatch and/or PSAP's but seldomly.

Limitations

- Ineffective and inconsistent use of ITS statewide
- No statewide radio communication or after-hour dispatch for MDT staff
- After-hour call volume increased putting strain on MDT field staff and anyone assigned to on-call
- Indirect supervision of travel information, ITS, and communication services posed challenges to standardization
- Lack of consistent department standards for managing routine events

Proposed Benefits of TMC

- Centralized 24-hour support of traveler information, ITS, and communication services and direct program supervision.
- Establish 24-hour agency POC and increase employee safety
- Improved public information
- Ability to effectively manage future ITS deployments
- Standard operating procedures for routine events



Decision

- Rural TMC Concept approved...
- Approached Legislature in 2019 for 7 new full-time positions
 - Secured effective 7/1/2020
- Transitioned existing District positions to HQ



TMC Implementation





Timeline

- **May 2019:** Secured FTE with funding available July 1, 2020
- **April-September:** Remodeling and construction of TMC facility
- **July 2020:** Job profiles and career ladder developed
- **August 2020:** Completed comprehensive Standard Operating Procedures (SOP's)
- **September-October 2020:** Hired 6 dispatchers and completed training period
- **September 2020:** Hired a communication technician to support the TMC
- **Late October 2020:** Hired and trained temporary seasonal dispatchers to supplement permanent dispatchers during the winter months
- **October 17, 2020:** TMC went live and had a record statewide winter storm the first two days of operation



TMC Design and Construction

- Technical architecture and operational layout were designed internally between IT and Facilities bureau staff.
 - Remodel and construction was done during the pandemic prior to shortages in supply chain.
 - Designers did tour some other local centers prior to final design approval.

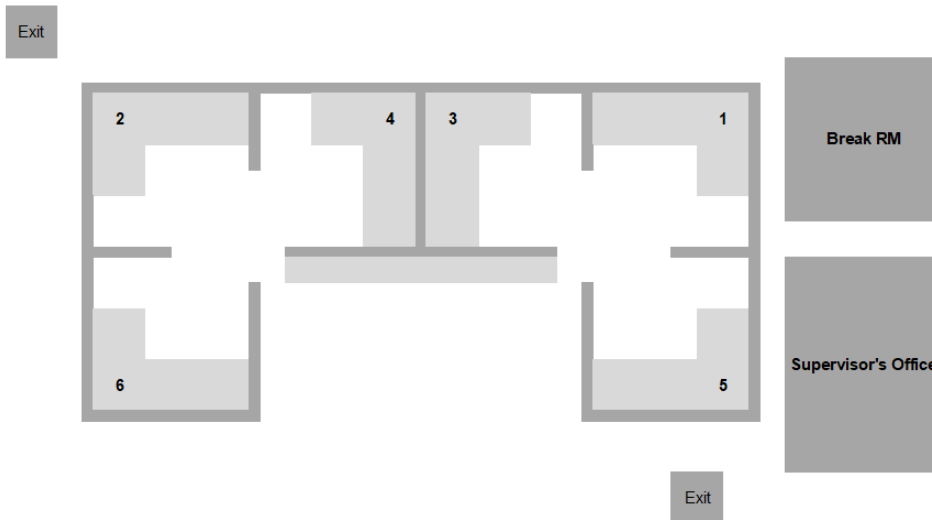
Facility

- Considered co-locating with State Patrol dispatch but space was limited and would've required MDT to upgrade radio system.
- Repurposed an existing unused training area in MDT HQ for TMC.

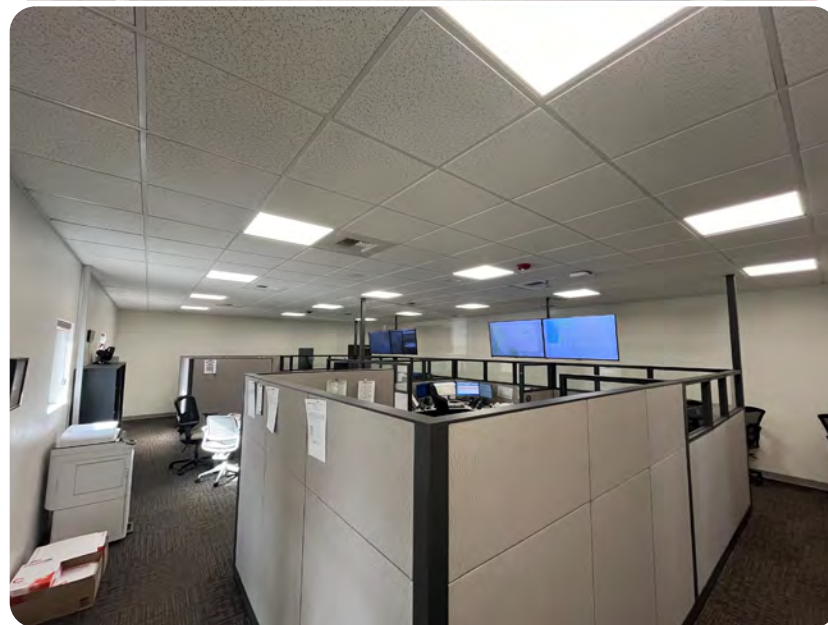
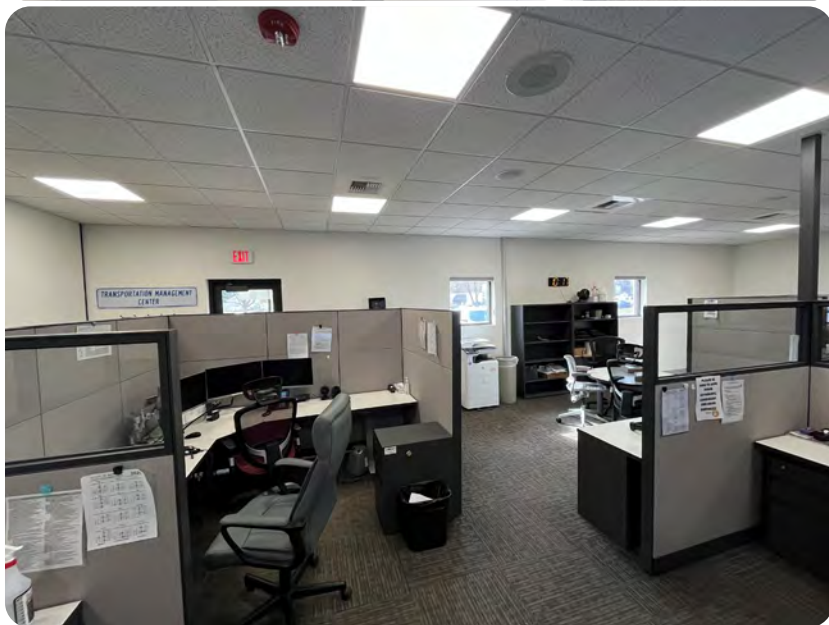
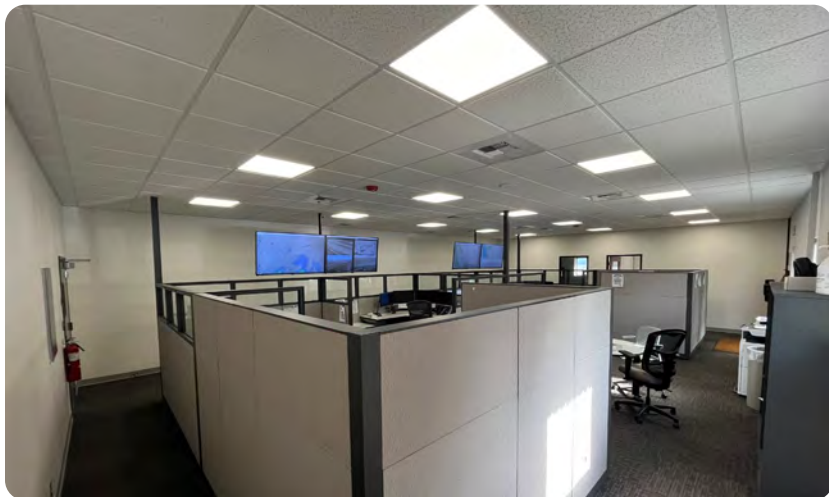


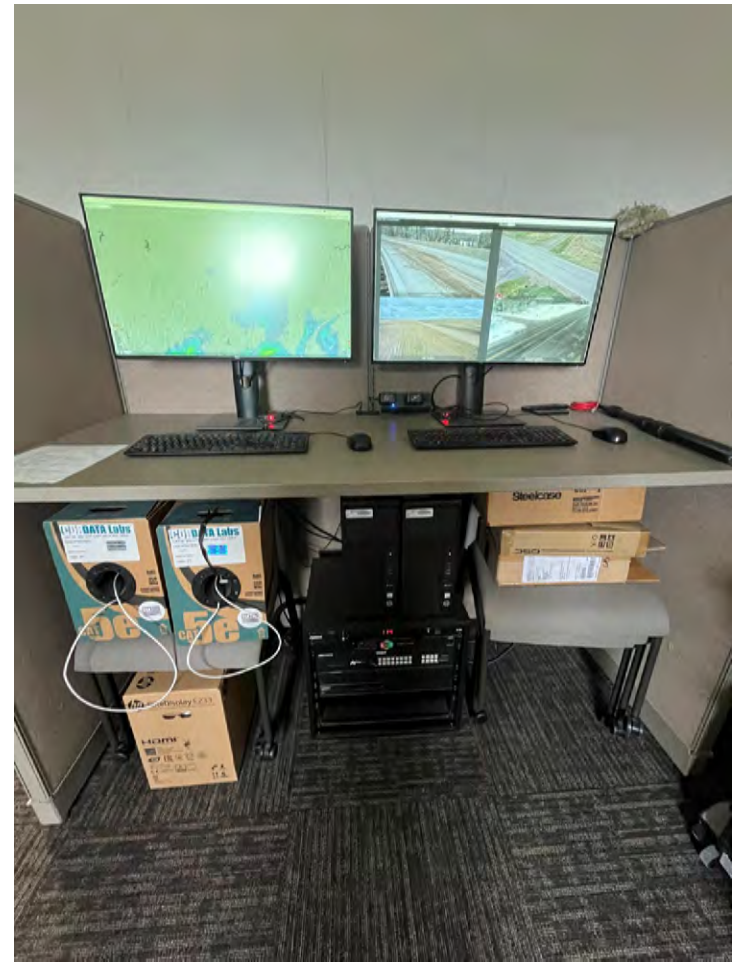
TMC Layout

- 6 workstations
- AV room/break area
- Supervisor's office

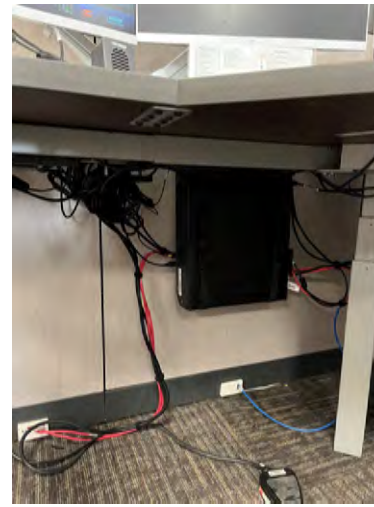


TMC Floor layout





Audio/video room and break area for staff



Workstation configuration

- 4 monitors, 2 PC's (one PC and monitor dedicated to radio)
- 1 Phone
- Desk surface raises and lowers electronically

Hiring the first TMC Operators

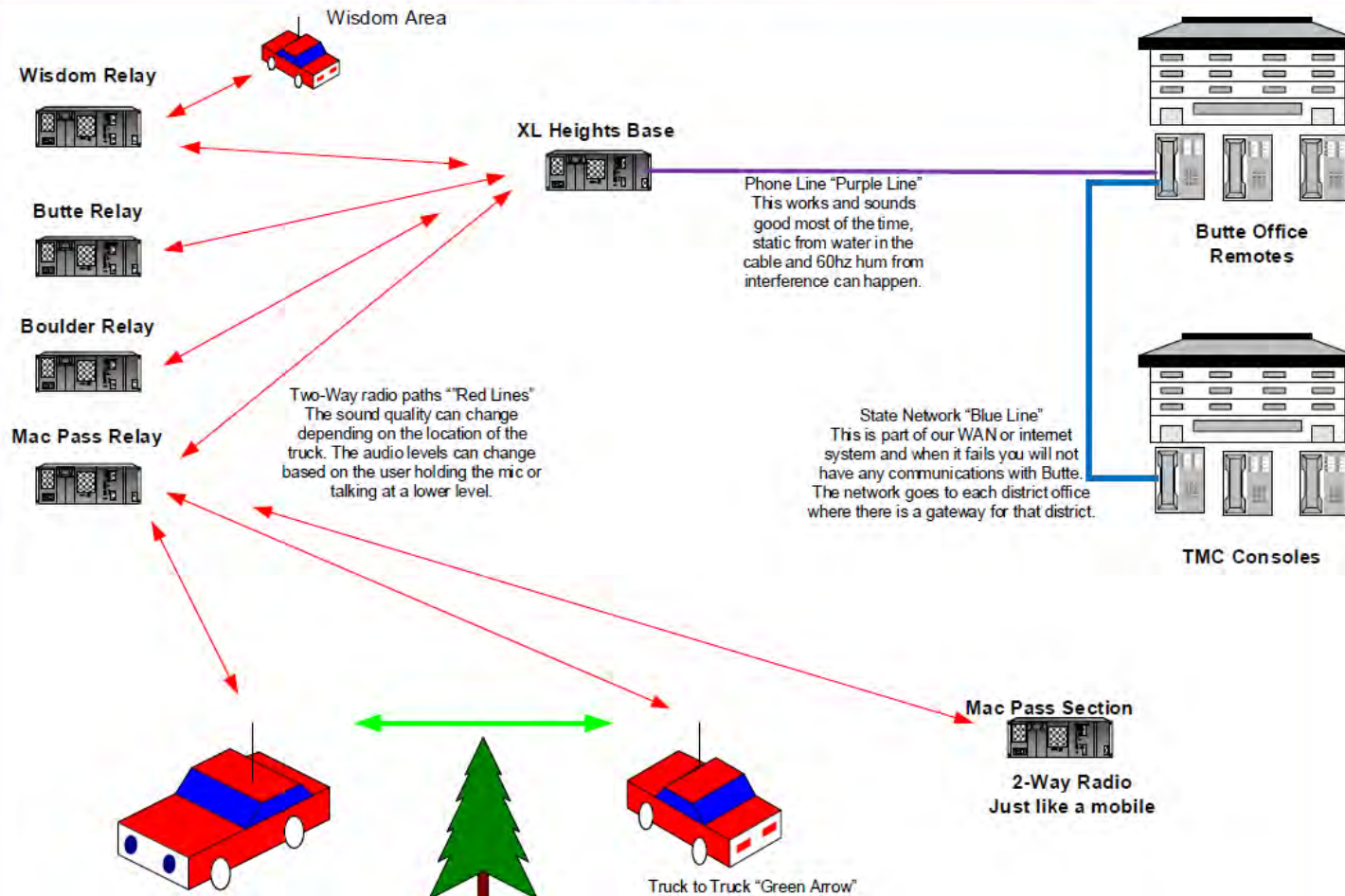
- Initial hiring, diverse group of staff:
 - MDT HQ Admin Assistant
 - MDT Missoula District Admin Assistant
 - MDT Great Falls District Seasonal Road Reporter (8+ years)
 - MDT Billings District Seasonal Road Reporter (15+ years)*
 - *Hired seasonally only
 - MHP Dispatcher (15+ years exp)
 - Retired MHP Dispatcher and Gallatin County 911 Supervisor
 - Wyoming TMC Dispatcher (4+ years exp)



Establishing Statewide Radio

- Radio communication was already established but piped into District offices only.
- Considered going with Motorola solution but ZETRON equipment was already in place in District offices and the cost was significantly lower.
- Landed on ZETRON's MAX Dispatch solution...Radio over IP (ROIP)
- Communications staff had to install audio gateways in the District offices to transport audio to HQ over state network.
 - The gateways converted analog signals to digital

Butte Radio System Operation



ROIP Setup

Audio Gateway

- Audio gateways convert analog audio to digital format
- Route the audio packets from the District office over the state network to the TMC





Other radio info

- MDT owns some tower sites
- MDT also has radio equipment installed at tower sites owned by other agencies (by agreement)
- Land mobile radio network is RF to ZETRON gateways
- State Patrol and most PSAP's are using the statewide interoperable (trunked) system, including MDT's Motor Carrier Services Patrol Units
- Interagency radio comms are seldom but done using the analog system on Ch.4 (Mutual Aid/Gold Channel)
 - Units using the interoperable system cannot monitor both at the same time



MDT owned site

- Judith Peak



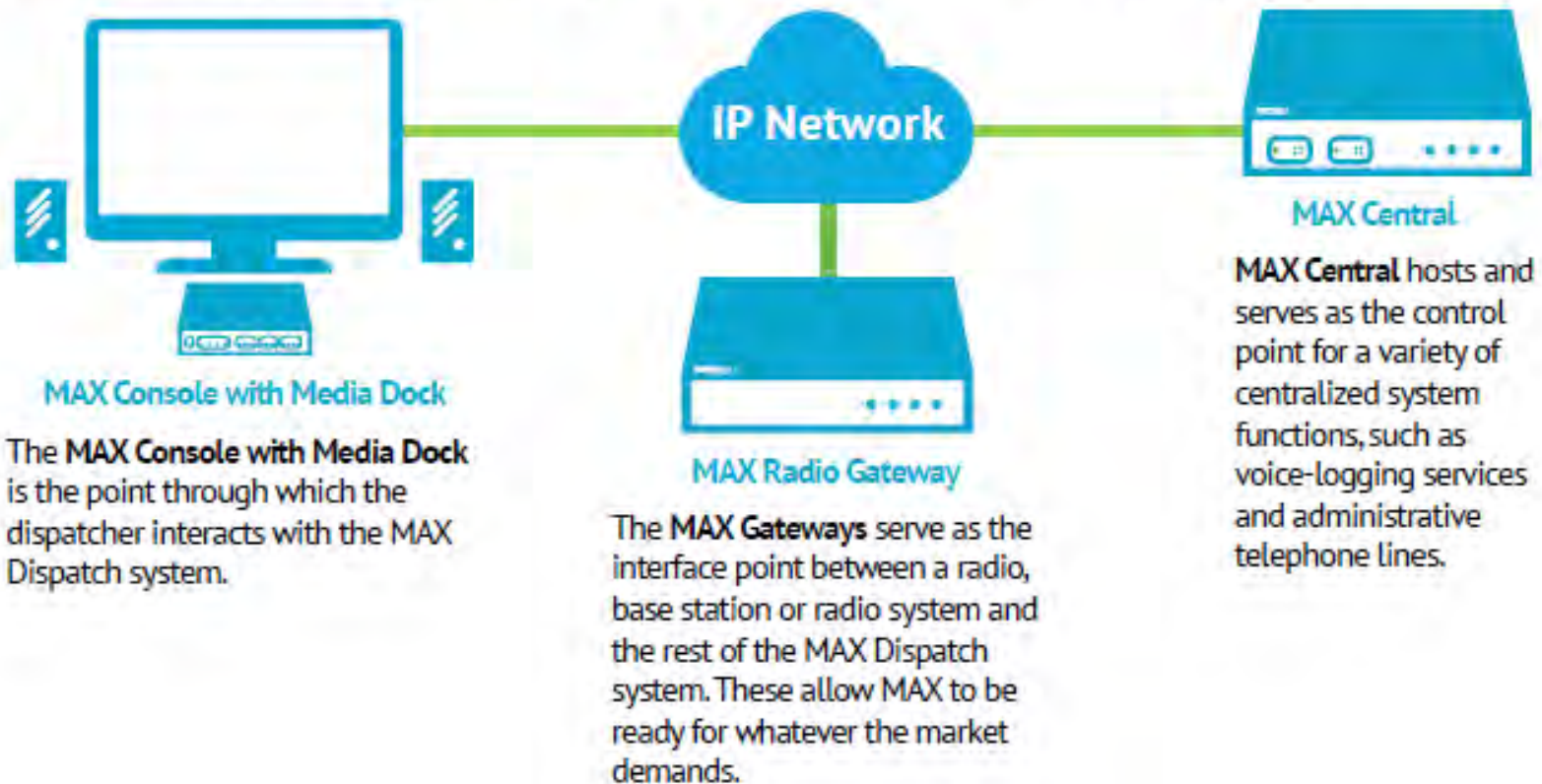
Back-up generator at radio tower site



Radio equipment at MDT owned site (multi-agency)

How MAX Dispatch Works

Three basic components—the **MAX Console with Media Dock**, the **MAX Gateway**, and **MAX Central**—form the building blocks of each MAX Dispatch system. The size and capabilities of your system will determine how many of each of the three basic components your system will require. The flexibility and simplicity of the MAX Dispatch architecture allows you to easily scale your system up or down to accommodate changes in your organization.





Images are from Supervisor's office. Media docks at workstations are hidden under the desk.

ZETRON MAX Dispatch – Radio equipment
Radio runs on dedicated PC



More about MAX Dispatch

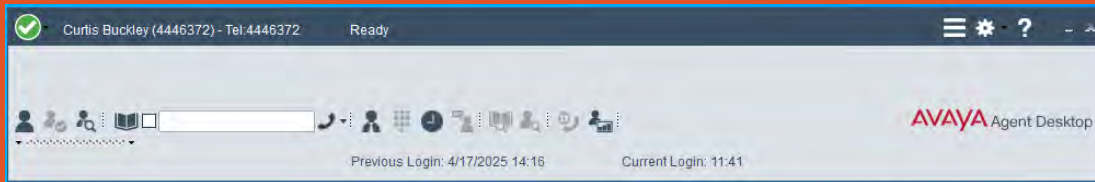
- Instant play-back for 8-12 hours
- Select and unselect audio routing
- Complex volume adjustment for zones
- Paging screen to program audible tones for flasher activation
- Audio recordings are not stored currently



Headsets

- Plantronics HW510 Single-Ear Call Center Headset
- Operators are required to use headsets during winter months
- During the summer, operators may choose to use the desk mic and speakers

Telephone System VOIP



- Avaya Phones with Call Center software
- Operator's login to the physical phone, then to the call center software on their PC.
- Inbound calls ring to one station at a time, after 3 rings they change the Operators status to Not Ready and begin ringing at the next Operators station who is set to Ready.

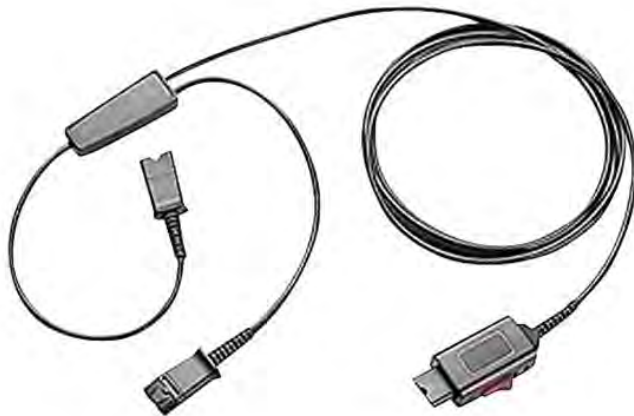


Telephone Issues

- Early on State Dept of Admin was not accustomed to supporting a 24-hour operation. Communication breakdowns regarding system maintenance and outages interfered with TMC operations.
- Better coordination today with Dept of Admin staff on outages and impacts to TMC ops.
- If all operators miss an in-bound phone call, all new calls will be put into a holding tree with no alert to operators.
 - Solution, operators must be diligent about setting their status to Not Ready and changing back to Ready when stepping away from their workstation to avoid missing a call unexpectedly.
- Operators had to use handset to answer calls, radio headset unable to integrate with telephone

Merging Radio and Phone Audio

Headset Y-splitter



Headset cable compatible with Plantronics headset



- Red selector (pictured left) is used to switch between the radio and phone connection. If selected on radio, audio to the telephone is muted.
- Cable (pictured right) is plugged into the telephone headset jack and run to the splitter (pictured left).

Redundancies



- TMC has priority service on state network to maintain optimal network performance during high latency events
- TMC facility is on back-up generator and UPS for hold over during an outage.
 - TMC has not been interrupted during outages, but UPS failures have led to unexpected outages.
 - District offices and radio tower sites have back-up generators as well to maintain radio operation during extreme events.
 - Some radio tower sites are not reachable during the winter months, even by air.
- State Dept of Admin supports TMC phone system with failover rules to route calls to the TMC cell phone or during major outages to the two dedicated land line phones in the TMC.



TMC Email

- Early on, the TMC communicated via email using a standard distribution list that included all dispatchers. This posed problems with excess emails for staff to go through after days off, etc.
- Switched to a shared email account that all dispatchers had access to and could monitor during their shift. Resulted in limited emails to review after days off and improved management of emails.
- TMC has trialed text messages from email to communicate but doing so requires the operator to know the cell phone carrier of the line they send to, rendering a phone call more effective most the time.

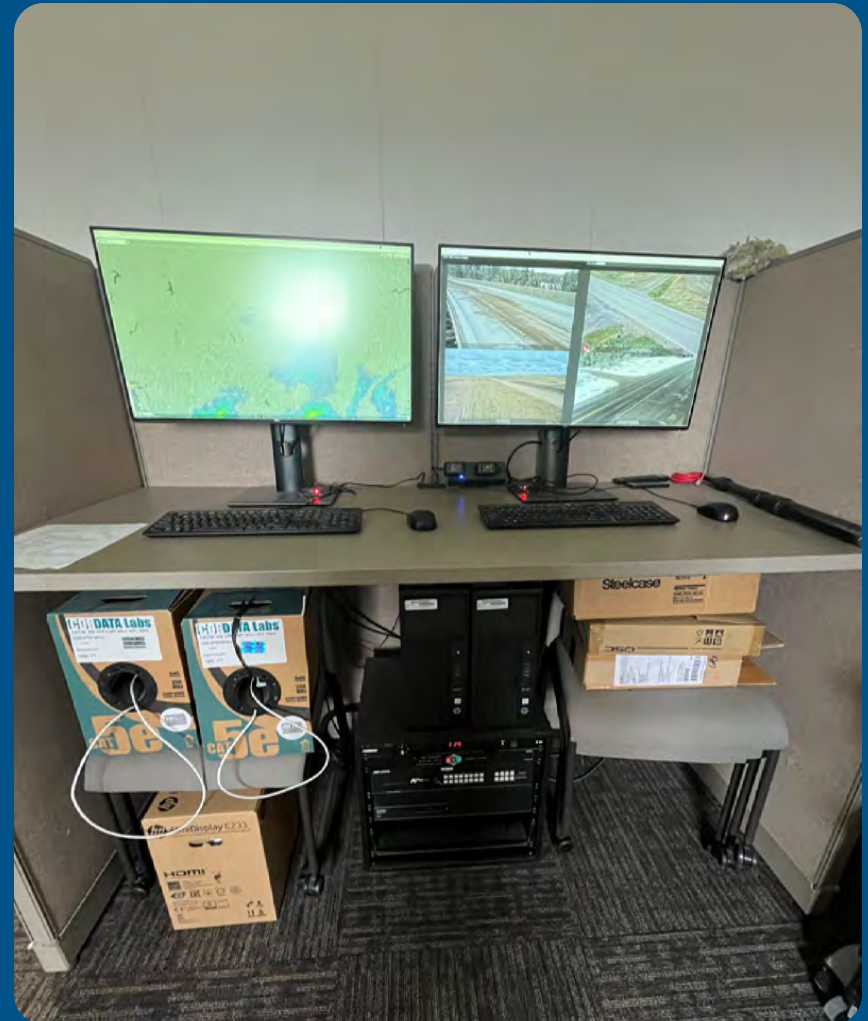
Overhead Displays



- All screens are 4k resolution
- Not really being used by TMC operators right now. Some stations face the opposite direction...
- Content usually displayed is:
 - State Patrol incident map, VentuSky weather, Travel Info map, and RWIS image carousel

Overhead Displays continued

- Content is fed using high resolution capable PC's and monitors in the AV room/break area.
 - Two monitors, each hooked to separate PC
 - Display port switchers allow operator to switch between Display 1 and 2 on each machine to load content on the 4 displays
 - PC 1 Display 1 is mapped to screen 1, Display 2 is mapped to screen 2, PC 2 Display 1 is mapped to screen 3, Display 2 is mapped to screen 4



Pictures of AV Set-up



Display port switcher

- Allows the operator to toggle between Display port 1 and 2 on each machine to configure/change content display on overhead TMC screens



Configuration Screen

RWIS TMC Camera Display

Display on Page: Configuration

Display 1 Configuration

Quadrant 1cycle

Quadrant 2cycle

Quadrant 3cycle

Quadrant 4cycle

Display 2 Configuration

Quadrant 1cycle

Quadrant 2cycle

Quadrant 3cycle

Quadrant 4cycle

Save Display Configuration

Refresh time: 04:00 PM 3/5/2025

Display 1 Preview



St. Marie MT-24 MP 18.0:
St. Marie - Horizon Elev 2750



Gardiner US-89 MP 11.0:
Gardiner - North Elev 5115



Avon North MT-141 MP 8.1:
Avon North - South Elev 5085



Homestake Pass I-90 MP 233.0:
Homestake Pass - Overpass Deck
Elev 6385

Display 2 Preview



East of Denton MT-81 MP 17.0:
East of Denton - Intersection Elev
3557



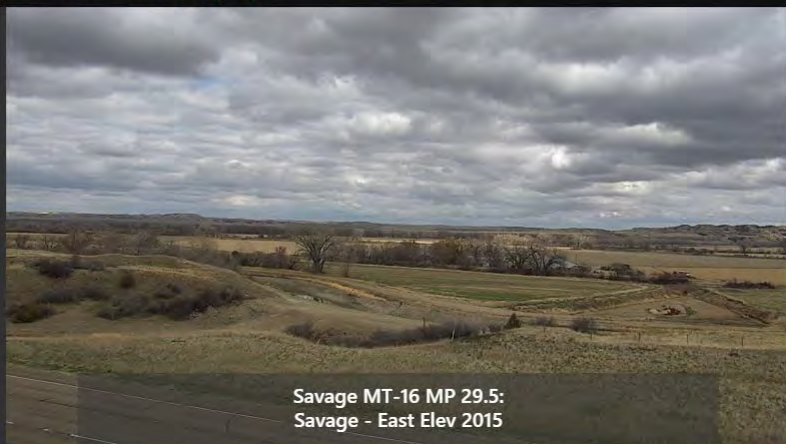
Lewistown Divide MT-200 MP
90.3:
Lewistown Divide - Roadway Elev
4622



Navajo MT-5 MP 15.7:
Navajo - East Elev 2570



Swan Lake MT-83 MP 47.0:
Swan Lake - Roadway Elev 3567



- 4 quadrants, each quadrant starts at a different RWIS site (from alphabetical order) when set to 'Cycle'
- Any quadrant can be set to only cycle through one RWIS sites images
- Capable of displaying up to 8 cameras by having two 4-quadrant displays with a different configuration

TMC Responsibilities

- 24-hour statewide communication services for MDT and POC for emergency communication centers
- Manage in/out service times for MDT staff and provide services related to employee safety
- Manage all content on 511
 - Road conditions, incidents, closures, road work, restrictions, etc.
- Control DMS messages on all state-owned permanent and portable DMS



MDT RWIS Cameras

- 110+ RWIS sites in Montana all with cameras
- Montana does not record or store video
- Guard tour used to manage image positions, PTZ cams take still images every 15 minutes
 - Images are stored for 36 hours

Maps

Montana State Map

Cameras

RWIS Cameras

Adjoining State and Province Cameras

RWIS Summaries

Billings
Cameras
Surface Sensors

Aberdeen Hill
Arrow Creek Hill
Ballantine
Decker
Hysham
Reed Point
Roscoe Hill
Yellowstone River Bridge

Bozeman

Butte

Glendive

Great Falls

Havre

Camera Summary

Current Time: 05/08/2025 12:48 PM

Aberdeen Hill
I-90 MP 552.3



05/08/2025 12:45 PM

Alzada
US-212 MP 139.4



05/08/2025 12:45 PM

Arrow Creek Hill
I-90 MP 468.6



05/08/2025 12:45 PM

Ash Creek
MT-7 MP 55.2



05/08/2025 12:45 PM

Avon North
MT-141 MP 8.1



05/08/2025 12:45 PM

Baker
MT-7 MP 14.2



05/08/2025 12:45 PM

Ballantine
I-94 MP 15.0



05/08/2025 12:45 PM

Beacon Hill
US-87 MP 35.0

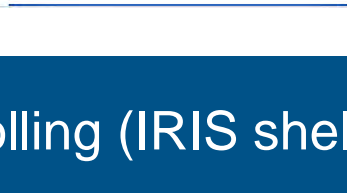


05/08/2025 12:30 PM

Bearmouth
I-90 MP 145.8



Beaver Hill
I-94 MP 234.8



Biddle
MT-59 MP 0.9



Big Hole Pass
S-278 MP 32.0



ATMS Phase 1 – RWIS polling (IRIS shell)

Maps

Montana State Map

Cameras

RWIS Cameras

Adjoining State and Province Cameras

RWIS Summaries

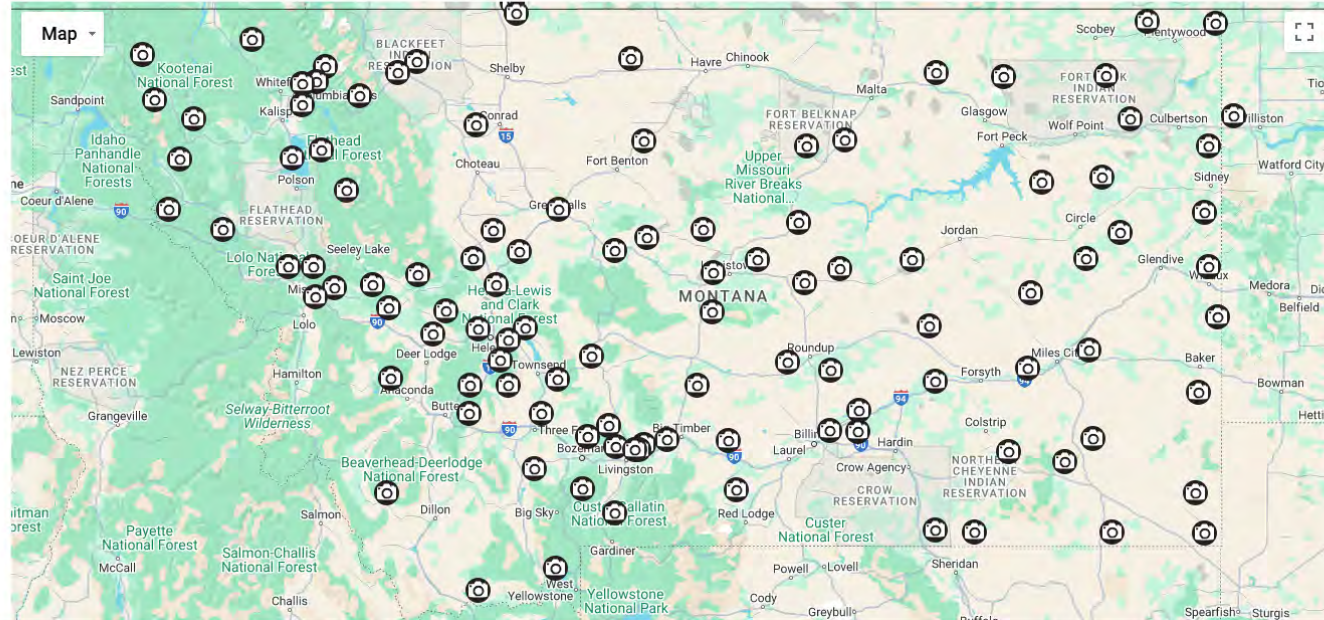
- Billings
- Cameras
- Surface Sensors
- Aberdeen Hill
- Arrow Creek Hill
- Ballantine
- Decker
- Hysham
- Reed Point
- Roscoe Hill
- Yellowstone River Bridge
- Bozeman
- Butte
- Glendive
- Great Falls
- Havre

Montana Department of Transportation RWIS

Montana's Road Weather Information System (RWIS) consists of strategically located sites across the state which provide accurate, real time weather information.

This information allows MDT's Maintenance Division to schedule personnel and equipment based on current weather and pavement surface conditions. Real time weather information improves response time, increases winter maintenance efficiency, and minimizes the traveling public's exposure to hazardous weather-related roadway conditions.

Montana State Map



MDT RWIS Sites
-- All sites --

RWIS Site Map

Maps

Montana State Map

Cameras

RWIS Cameras

Adjoining State and Province Cameras

RWIS Summaries

- Billings
 - Cameras
 - Surface Sensors
 - Aberdeen Hill
 - Arrow Creek Hill
 - Ballantine
 - Decker
 - Hysham
 - Reed Point
 - Roscoe Hill
 - Yellowstone River Bridge

Bozeman

Butte

Glendive

Great Falls

Havre

Billings - Site Summary

Current Time: 05/08/2025 12:51 PM

Sensor Name	Status	Surface Temp	Sub Temp	Air Temp	Dew Temp	Precip Type	Intensity	Precip Rate	RH	Wind Avg	Avg Dir	Friction	Visibility
Aberdeen Hill (263004) - I-90 MP 552.3										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
South - SB lane MP 552.3 (0)	Dry	104.7F	57.2F	72.0F	36.1F	None	None	-	27%	11 mph	N/NW	-	-
Arrow Creek Hill (263003) - I-90 MP 468.6										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
East - WB lane MP 469.1 (0)	Error	-	61.0F	71.6F	34.9F	None	None	-	25%	13 mph	W	-	-
Ballantine (263006) - I-94 MP 15.0										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
Eastbound driving lane (0)	Dry	104.4F	63.5F	75.4F	44.2F	None	None	0.00 iph	33%	14 mph	W/NW	-	1.2 mi
Decker (263007) - S-314 MP 1.2										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
Roadway (0)	Dry	127.4F	62.4F	76.8F	41.7F	None	None	0.00 iph	28%	2 mph	E	-	1.2 mi
Hysham (263005) - I-94 MP 60.0										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
East - EB lane MP 59.4 (0)	Dry	113.2F	61.5F	74.8F	39.7F	None	None	-	28%	9 mph	W/NW	-	-
Reed Point (263001) - I-90 MP 390.8										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
West - WB lane MP 390.1 (1)	Dry	104.4F	56.8F	75.7F	37.8F	None	None	-	25%	17 mph	W	-	-
Roscoe Hill (263002) - MT-78 MP 19.0										10 Day Historic		Data Time: 05/08/2025 12:45 PM	
West - SB lane MP 19.3 (1)	Dry	95.9F	54.5F	67.8F	20.7F	None	None	-	16%	10 mph	N	-	-

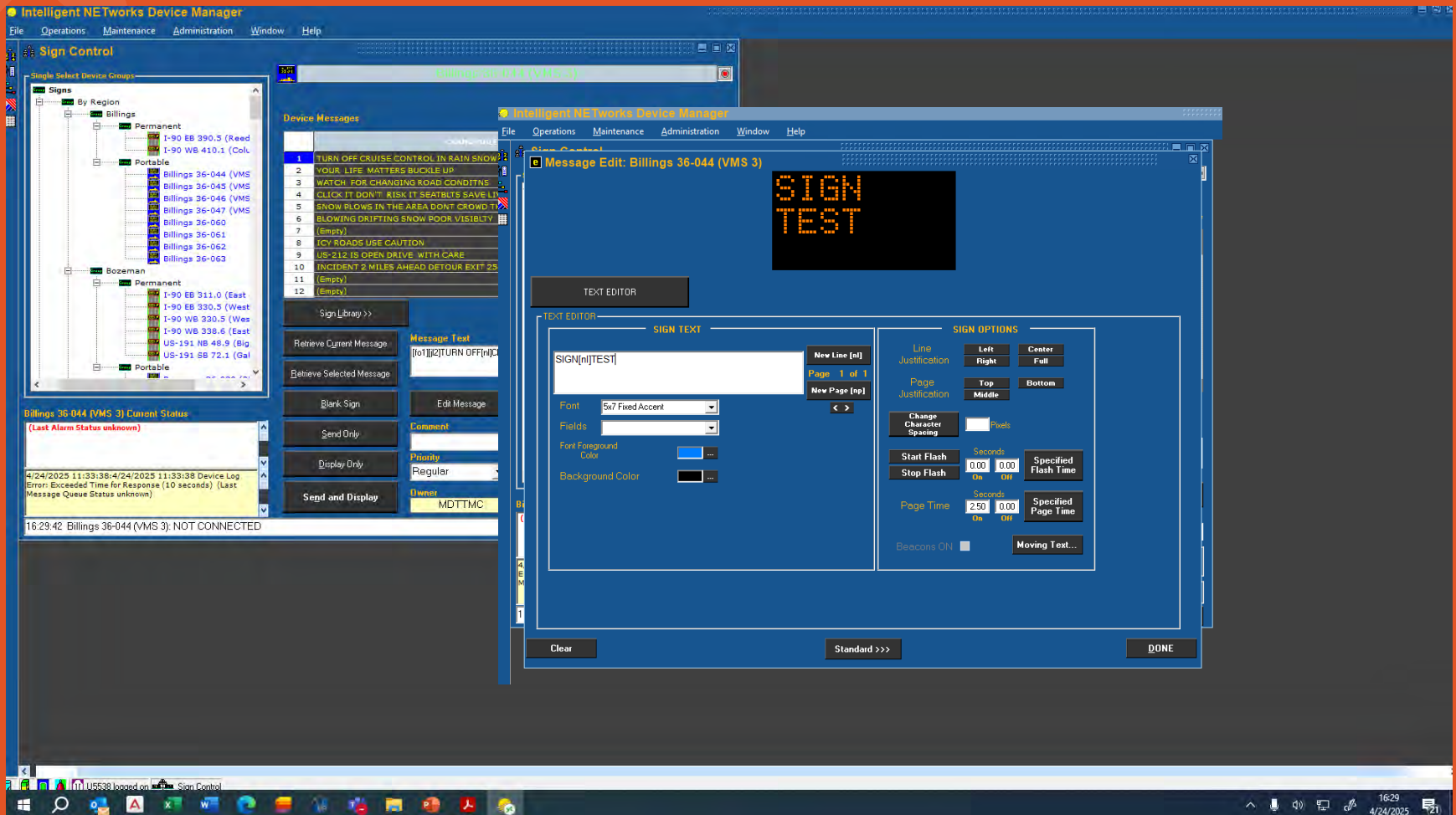
Site Summaries by Maintenance Area's



DMS Challenges

- MDT installed 20+ new full color signs in 2024
- Legacy software could not support full color functionality
- MDT decided to use two separate systems to control DMS
 - Legacy system for portable signs
 - Vanguard client software for permanent signs

Legacy DMS Software – Parsons



Vanguard Client Software (Daktronics)

The screenshot displays the Vanguard Client Software interface. The main window shows a list of messages under the 'List View' tab. The 'Create Quick Message' dialog box is open, showing a preview of a message for 'I-90 EB 494.8 (Hardin)' with the text 'SIGN TEST IN PROGRESS'.

Message List (I-90 EB 494.8 (Hardin) selected):

Name	Number	Currently playing	Last update	Communication	Status errors	Comments
I-15 NB 274.2 (South of Great Falls)	36	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-15 SB 119.5 (Silverbow)	35	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-15 SB 398.0 (Sweetgrass)	40	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 0.0 (Lookout)	46	Quick Message	16:30 4/24/2025	Online		
I-90 EB 227.7 (Continental)	32	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 273.7 (Three Forks)	5	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 275.9 (Three Forks)	7	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 299.0 (Belgrade)	10	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 302.0 (East of Belgrade)	11	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 311.0 (East of Bozeman)	9	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 324.2 (East of Bozeman Hill)	13	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 330.5 (West Livingston)	16	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 368.0 (Big Timber)	20	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 390.5 (Reedpoint)	29	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 407.6 (Columbus)	22	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 435.0 (Laurel)	24	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 454.2 (East Billings)	25	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 EB 494.8 (Hardin)	1	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 16.9 (Haugan)	45	Quick Message	16:30 4/24/2025	Online		
I-90 WB 241.6 (Pipestone)	33	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 273.7 (Three Forks)	6	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 275.9 (Three Forks)	8	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 302.0 (East of Belgrade)	12	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 324.2 (East of Bozeman Hill)	14	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 330.5 (West Livingston)	17	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 338.6 (East Livingston)	18	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 341.4 (East of Livingston)	15	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 369.0 (Big Timber)	21	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 410.1 (Columbus)	19	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 435.0 (Laurel)	23	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-90 WB 455.8 (East Billings)	26	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-94 EB 132.8 (Miles City)	27	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
I-94 EB 209.5 (Glendive)	44	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-12 EB 23.0 (Mac Pass)	34	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-12 WB 34.7 (Mac Pass)	28	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-191 NB 48.9 (Big Sky)	30	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-191 SB 72.1 (Gallatin Gateway)	31	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-2 EB 138.2 (Columbia Heights)	41	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-2 EB 153.2 (West Glacier)	42	Quick Message	16:30 4/24/2025	Online		
US-2 EB 179.9 (Essex)	43	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-2 EB 223.6 (Browning)	37	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-2 WB 209.6 (East Glacier)	39	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		
US-2 WB 223.6 (Browning)	38	Work Zone Awareness Week (April)	16:30 4/24/2025	Online		

Create Quick Message Dialog:

I-90 EB 494.8 (Hardin)
Cancel quick message creation

Create a Message
Create and play a message for the display.

24x15_3_CP1252

Page 1
SIGN TEST IN PROGRESS
Add new page

☐ Enable message duration ☐ Turn on display beacon

Bottom Status Bar:

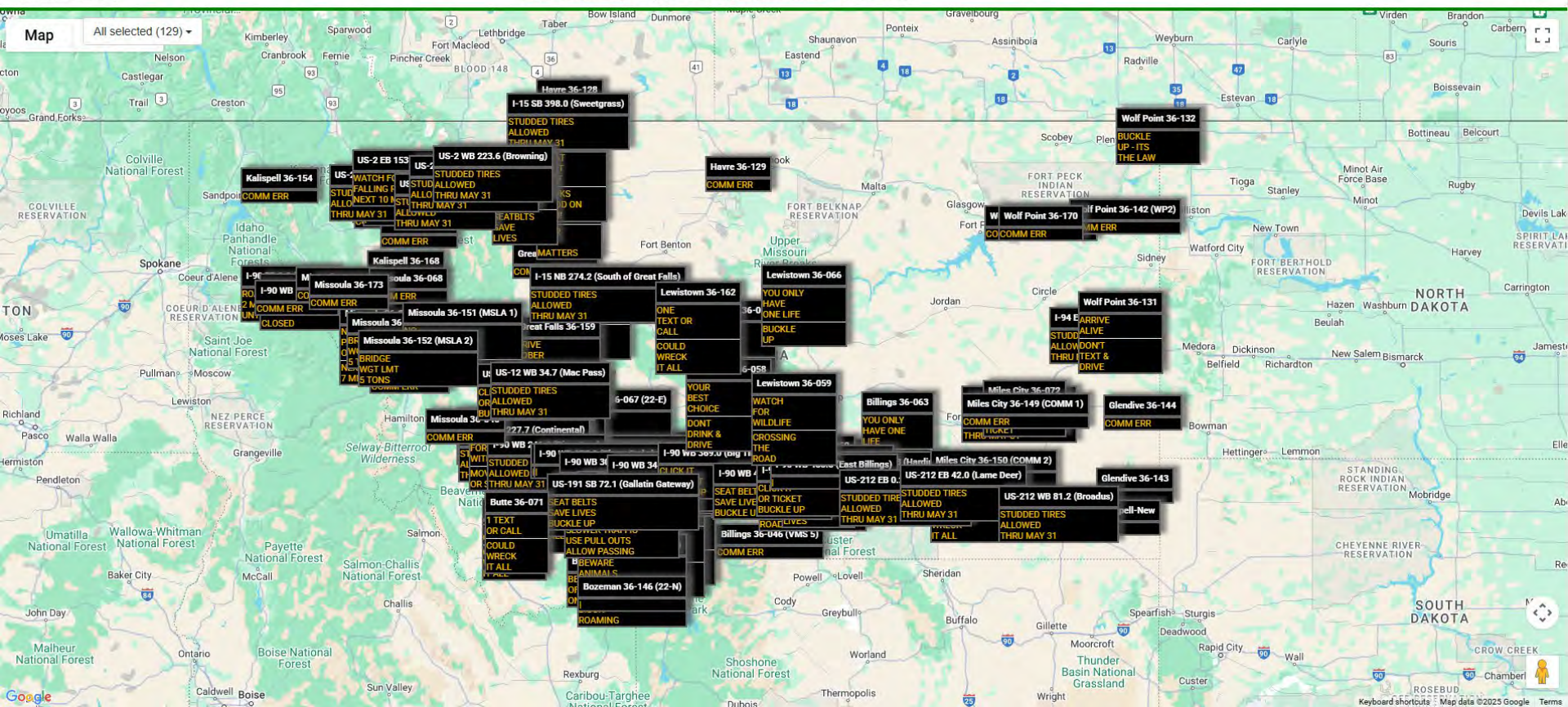
I-90 EB 494.8 (Hardin)
Last update: 16:30 4/24/2025
Communication: Online

Slow Down and Watch for Workers

Running now: Work Zone Awareness Week (April)
Owner: MDTMCVanguard
End time: Continuous

Play message
Quick message
Blank display
Play schedule

16:32
4/24/2025



- DMS Map (from Legacy system)
 - Being added to ATMS DMS module
- All DMS polling is done by Legacy system, but ATMS DMS will take over sign polling starting July 1, 2025.

New DMS Software in ATMS

- Will replace legacy software. Testing begins May 2025, go-live mid-late June 2025
- Phase 1: control all portable signs
- Phase 2: control all permanent signs

The screenshot displays the MDT ATMS DMS Software interface. A 'Create Quick Message' dialog box is open, titled 'Create Quick Message - Great Falls 36-175'. The dialog features a 5x7 grid of orange dots forming the text 'SIGN TEST'. Below the grid, there is a 'Page 1' preview and an 'Add Page' button. At the bottom of the dialog, there are checkboxes for 'Enable message duration' and 'Turn on display beacon', a 'Multistring Preview' field containing the text '[I3]SIGN[n][I3]TEST', and 'Cancel' and 'Play' buttons.

The background interface shows the 'DMS Sign List' with a table of signs. The table has columns for 'Name', 'Sign Type', 'Status', 'Last COM Date', and 'Maintenance Division'. The 'Great Falls 36-175' sign is highlighted in blue.

Name	Sign Type	Status	Last COM Date	Maintenance Division
I-15 SB 119.5 (Silverbow)	VMS FULL			
I-90 EB 0.0 (Lookout) - full small (po...	VMS FULL			
I-90 EB 273.7 (Three Forks)- 96x35...	VMS FULL			
I-90 EB 435.0 (Laurel) - 90x240 full ...	VMS FULL			
Helena 36-176	PORTABLE VMS FULL			
Great Falls 36-175	PORTABLE VMS CHAR			
Havre 36-161	PORTABLE VMS CHAR			
Havre 36-129	PORTABLE VMS CHAR			
Test for Door Open Error	VMS FULL			

The interface also includes a 'MONTANA.GOV OFFICIAL STATE WEBSITE' footer and a system clock showing 12:13 on 4/22/2025.

Year 1

2020-2021

- Opened officially on October 17, 2020
- Proposal approved to add two year-round part-time dispatchers
 - Total dispatchers increased from 6 to 8
- 511 – Oracle database, no internal mapping system.
 - Delays on publishing, bugs, hosted internally, network instability caused excess down-time
 - Staff had to check public facing map to verify content was showing up as expected
- DMS – Parsons Intelligent NETworks Device, primarily portable signs (all Ver-Mac), less than 25 permanent signs (all monochrome-Daktronics)
- Call Log – Excel file in Microsoft Teams to allow editing by multiple users simultaneously, very manual, no data security
- Personnel check-in/out – managed in separate excel sheets in Call Log share file, each maintenance area had a sheet for check-in/out each day

Year 2 2021-2022

- September 2024 – discontinued use of internal 511, switched to Iteris Inc. COTS product
 - Stable, hosted on AWS server, over 99% up-time, increased update frequency
 - Established internal mapping solution that mirrored public facing map, Roadway Management System (Iteris Inc.)
- DMS – no changes to signs or software
- Call Log – switched to in-house SharePoint List
 - Allowed for enhanced data security, timestamping, more user-friendly, and supported multi-user editing.
 - Used list item comments to capture user and time info for entries
 - Personnel check-in/out – module added to RMS

Year 3

2022-2023

- 511/RMS – no changes but learned more about limitations related to the system being built around IVR.
- DMS – no changes to software
 - Added two permanent signs on US 191 (Gallatin Gateway/Big Sky)
 - Added GPS antennas to all portable DMS to track location
- Call Log – discovered item limitations with SharePoint online license, limiting items in a list to 5000.
 - Determined that a new call log would be necessary each year to keep call log performance optimal.
 - Experimented with a custom form built in Power Apps on this version of the build but learned of some major limitations with exporting historical data
 - Encountered integration bugs between SharePoint and PowerApps that occasionally caused data to be lost when entering notes.
- Personnel check-in/out – added filter for Employees in service over 9 hours to provide a trigger for safety checks on staff in-service

Year 4

2023-2024

- 511/RMS – no changes
- ATMS – Phase 1 = RWIS (IRIS shell) went live October 2023
- ATMS – Phase 2 = DMS (IRIS shell) go-live scheduled for July 2025
- Call Log – SharePoint released new functionality which allowed for better tracking of user action/note logging
- Personnel check-in/out – no changes
- Plow Cams – Switched from LiveView to Samsara
 - Displayed on 511 during winter months
 - Most cams installed on tow-plows

Year 5

2024-2025

- 511/RMS – no changes
 - Initial talks underway about eliminating 511 IVR in Montana due to associated costs, declining use, and flexibility to expand reporting when not tied to older technology
- ATMS – DMS phase 2 on track to go live July 2025
 - 10-year Contract expires on 6/30/2025, not renewing with Parsons
 - Added **22** new permanent full-color DMS between April and October 2024
 - I-90 Three Forks to Billings, I-90 Hardin, I-94 Miles City, US-212 (I-90 to WY)
 - **2** perm full-color DMS being added (summer 2025) in SD for messaging info re: US-212
 - **6** new permanent DMS approved this session to be placed near Missoula and Drummond on I 90 and near Garrison Junction I 90 - US 12
 - MDT acquired Vanguard client software to control full-color DMS
- ATMS – RWIS
 - Added 6 new PTZ cameras on DMS structures, more to come in 2025-2026 and will be standard on all new DMS contracts
- Call Log – still using SharePoint, working on next version to launch on July 1, 2025, initial talks about Call Log being Phase 3 of ATMS
- Personnel check-in/out – still being managed in RMS, talks about adding this functionality to Call Log build in the future

AutoSave Off TMC Comms Log 10172020-09012021.xlsx

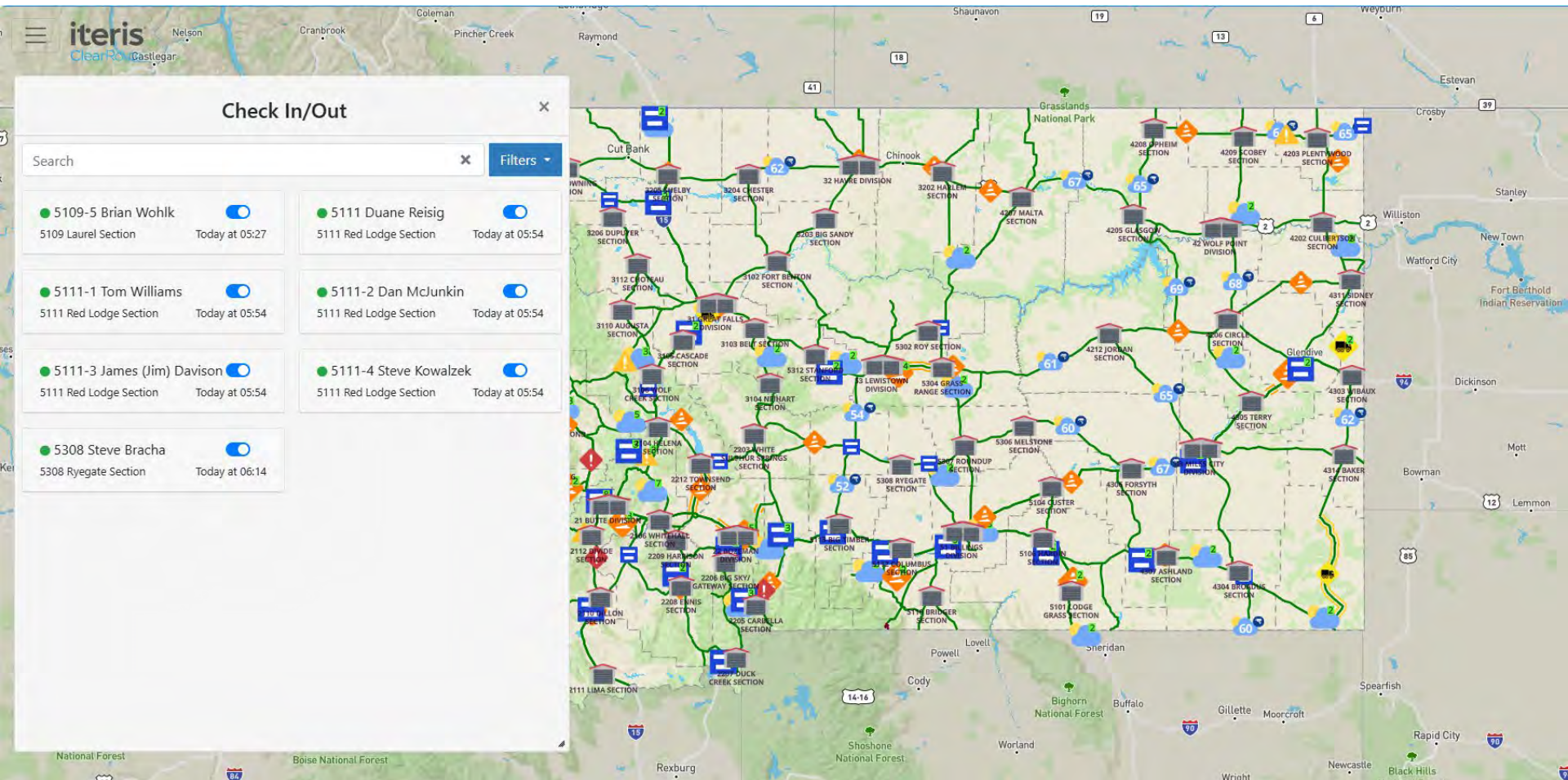
File Home Insert Page Layout Formulas Data Review View Automate Developer Help Power

Clipboard Font Alignment

	A	B	C	D	E
1	DATE	CALL SIGN	TIME IN	TIME OUT	REMARKS
6530	05/26/2021	2109-1	04:30		
6531	05/26/2021	2110-10	09:00	17:30	
6532					
6533					
6534	05/28/2021	2115-2	19:00	20:25	
6535	05/28/2021	2114-2	19:00	20:25	
6536					
6537					
6538	05/29/2021	2103	21:00	01:00	
6539	05/29/2021	2103-1	21:00	01:00	
6540					
6541					
6542	05/30/2021	2103-4	03:30	05:26	
6543	05/30/2021	2103-5	03:30	05:26	
6544	05/30/2021	2103-2	11:38	13:43	
6545					
6546	06/01/2021	2101-10	09:00	17:30	
6547					
6548	06/02/2021	2101-10	09:00	17:30	
6549					
6550	06/02/2021	2101-10	09:00	17:30	
6551					
6552	06/04/2021	2109-1	04:30	13:00	
6553	06/04/2021	2101-10	09:00	17:30	
6554	06/04/2021	2103-1	18:00		
6555					
6556					
6557	06/07/2021	2101-10	09:00	17:30	
6558					
6559	06/08/2021	2101-10	09:00	17:30	
6560					
6561	06/09/2021	2101-10	09:00	17:30	
6562					
6563	06/10/2021	2111	03:00	04:30	
6564		2101-10	09:00	17:30	
6565					
6566	06/11/2021	2109-1	04:30		
6567		2101-10	09:00		

In/out of Service Times (2020 – Excel)

- Staff would document in/out times manually in an excel sheet, one sheet was used per area for tracking.



In/out of Service Times (2024 – RMS, ITERIS Inc.)

TMC FY 21 CFS LOG															
CFS	OPERATOR	DATE	TIME	REPORTING PARTY	PHONE NUMBER	TYPE	LOCATION	CROSS STREET	COUNTY	REMARKS	HANDLING	NOTES	INCID	PROJ SEQ #	CLOSED
06731	REDMOND	07/15/2021	10:52	1213		ABANDON VEH (HAZARD)	US-2 MM65.8		LINCOLN	FROM THE PAVEMENT ON THE ABANDONED 5TH WHEEL ESCALADE TRAILER, DRE PL #	MHP	DESCRIPTION. HE WILL TALK TO JASON AND SEE WHAT THEY WANT TO DO ABOUT IT			X
06732	REDMOND	07/15/2021	10:52	1213		ABANDON VEH (HAZARD)	US-2 MM 65.7		LINCOLN	ABANDONED COACHMAN MOTOR HOME, MT LP# 35-3788A, BEEN	MHP	10:55 - ADV MHP			X
06733	REDMOND	07/15/2021	11:03	MILES CITY DISPATCH/MHP		DEBRIS (HAZARD)	I-94 WB MM 184		PRAIRIE	HAY BALE BOTH WB LANES, REQ PICK UP	4305	11:15 - ADV 4305 11:16 - ADV MHP 11:56 - 4305 ADV HE HAS CLEARED THIS			X
06734	MERCER	07/15/2021	11:30	GALLATIN CO DSIP		DEBRIS (NO HAZARD)	US 191 RM 45	BEAVER CREEK ROAD	GALLATIN	A GARBAGE TRUCK LOST IT'S LOAD AND THE DEPUTY ON SITE IS REQUESTING A LARGE MACHINE TO HELP GET RID OF THE DEBRIS	2206	NOTIFIED 2206, THEY WILL GO TAKE CARE OF IT BUT IT WILL BE ABOUT 45 MIN. CALLED GALLATIN CO DISPATCH BACK TO LET THEM KNOW THAT AND HE SAID OK 12:02 - GALLATIN CO ADV THIS REQUEST HAS BEEN CANCELLED. SOMEONE WAS ABLE TO GET THERE WITH A FRONT LOADER. ABW 12:02 - ADV 2206. ABW			X
06735	MERCER	07/15/2021	13:20	5113-2		CRASH	I-90 RM 371.5		SWEET GRASS	SEMI GOING EB CROSSED OVER WB LANES, THROUGH A FENCE AND IS SITTING BY THE RR TRACKS AT PRESENT. HE IS	MHP	12:21 NOTIFIED MHP 12:22 - LEFT A MSG ON SWEET GRASS CO SHERIFF DEPT NUMBER			X
06736	BARKER WILLIAMS	07/15/2021	13:37	PARK CO DISPATCH/ SARAH		DEBRIS (HAZARD)	I-90 WB RM 336		PARK	TRUCK LOST 4X8 PANELS. HE LEFT THE BUSTED ONES. THEY ARE IN THE MIDDLE OF THE ROAD	2202	13:39 - RADIOED 2202. NO RESPONSE. 2205 RESPONDED ADV HE IS IN THE AREA. ADV 2205 OF DEBRIS. HE STATES 2202 WAS JUST HEADING OVER TO CHECK THAT OUT 13:45 - 2202 ADV THEY GOT THE DEBRIS OFF THE ROAD 14:05 - CALLED AND ADV MHP OF CLOSURE 14:04 - 2113 CALLED BACK AND ADV THEY ARE ALSO CLOSING THEIR END PLEASE CHANGE VMS 14:03 - CALLED 11-1. LEFT MESSAGE ADV OF ROAD CLOSURE. ABW 14:05 - CALLED MHP ADV ANGIE. ABW 14:05 CALLED AND ADV - BEAVERHEAD COUNTY 14:12 - CALLED SUSAN DES AND ADV HER 14:18 - SENT FHWA EMAIL 14:19 - CHANGED VMS BOARDS 14:40 - LEFT MSG ON 2113 CELL COULD NOT GET VMS 029 TO ACTIVATE 14:40 - UPDATED ROADS IN ORACLE 14:44 - CALLED AND LEFT MSGS ON 21-1 CELL AND OFFICE 15:09 - 2113 RETURNED CALL AND SAID HE WOULD TRY TO FIND SOMEONE TO GO RESET 029 VMS 07/16/2021 - 08:12 - 1110 ADV THAT ROAD IS OPEN WITH 35 MPH SPEED LIMIT 08:17 - ADV MHP AND DES COORDINATOR 08:18 - ADV BEAVERHEAD CO. 08:25 - INC UPDATED IN ORACLE PR 08:40 - EMAIL SENT TO FHWA PR 08:40 - UPDATED ALL VMS. ABW 10:48 - CREW MOVED VMS #166 TO DIVIDE INSTEAD OF USING #034. ASKED THAT I PROGRAM IT TO READ FIRE ACTIVITY WEST OF WISDOM. CHANGED MESSAGE. ABW 20:59 ROAD CLOSURE IN EFFECT AGAIN. UPDATED VMS AND ORACLE INCIDENTS TO REFLECT CLOSURE. RZ 07/17/2021 @ 0648 HRS - 2113 IS ENROUTE TO A MEETING REGARDING THE MT 43 14:20 - CALLED JASON LIVINGSTON. HE ADV THEY ARE WORKING ON RUMBLE STRIPS 14:25 - OPENED INC IN ORACLE 07/21/21 - EMAILED JOSH FOR UPDATE. HE ADV THIS HAS CLEARED. ABW	8893 8894		X
06737	MERCER	07/15/2021	14:00	1110-2		INCIDENT FIRE	MT 43 RM 0 - 26		BEAVERHEAD	THE FIRE ACTIVITY HAS CAUSED CLOSURE AGAIN	1102/2113				X
06738	BARKER WILLIAMS	07/15/2021	07:19	EMAIL/JOSH RICE		WORK ZONE	MT-56 RM 0-16.5		LINCOLN	EMAIL SENT WAS UNCLEAR ABOUT WHAT WAS BEING DONE AT THIS LOCATION CENTERLINE RUMBLE STRIPS. TAR ALL OVER HIS SEMI, IT'S ONLY TWO MONTHS OLD AND	1287 CREW		8944		X

First Call Log Version (2020 – Excel)

TMC Call Log 2024 version (SharePoint Online – Microsoft Lists)

add new item Edit Edit in grid view Undo Share Copy link Delete Automate Search this list

og ★

ew Uses filters that you [can view and edit here](#)

Status	ID	Created	Modified	Expired
OPEN	9905	5/14/2025 13:23	5/15/2025 8:47	
OPEN	9940	5/15/2025 19:30	5/15/2025 19:40	
OPEN	9951	5/16/2025 11:21	5/16/2025 11:21	
OPEN	9946	5/16/2025 9:22	5/16/2025 10:56	
OPEN	9908	5/14/2025 14:06	5/14/2025 17:59	
OPEN	9522	4/26/2025 13:52	4/28/2025 10:16	
OPEN	2567	10/22/2024 14:55	11/6/2024 14:14	
OPEN	5607	1/20/2025 8:38	5/14/2025 15:25	
OPEN	8947	5/18/2025 9:35	5/16/2025 10:17	
OPEN	9943	5/16/2025 7:52	5/16/2025 7:53	
OPEN	9945	5/16/2025 9:05	5/16/2025 9:08	5/16/2025 15:30
OPEN	9672	5/5/2025 7:30	5/12/2025 8:53	5/16/2025 17:00
OPEN	9610	5/1/2025 7:02	5/11/2025 5:03	5/16/2025 17:00
OPEN	9950	5/16/2025 10:11	5/16/2025 10:13	5/16/2025 19:00
OPEN	9863	5/13/2025 9:43	5/13/2025 9:43	5/16/2025 15:30
OPEN	8694	3/28/2025 15:24	3/28/2025 15:24	
OPEN	9516	4/25/2025 9:14	5/15/2025 15:03	
OPEN	9790	5/8/2025 17:35	5/8/2025 17:35	
OPEN	2530	10/21/2024 10:36	3/21/2025 20:44	

Count 28

Edit all Copy link

CFS 9947

Notes

Mercer, Ariene [5/16/2025 10:17](#): 4202-2 CALLED IN AND ADV THAT THIS IS SUPPOSED TO BE AT RM 655 NOT 654.5

Blais, Michèle [5/16/2025 9:36](#): EVENT CREATED IN RMS

Blais, Michèle [5/16/2025 9:35](#): 4202-2 VIA PHONE - SEMI PARTIALLY BLOCKING EB LANE - MECHANIC IS AT THE SCENE - WILL CALL BACK WHEN THE SEMI IS GONE

CFS Type *

INCIDENT

Remarks

SEMI BLOCKING EB LANE

Route

US-2

Mile Marker Start

654.50

Mile Marker End

—

City

—

County

ROOSEVELT

Section *

4202

VMS

Expired

—

Status *

OPEN

EMPLOYEES ON LEAVE - ACTIVE - CLOSED - REST AREAS

VMS

NOTICE

DRK TUES, MAY

I-90 EB 302.0 (East of Belgrade) I-90 EB 311.0 (East of Bozeman) I-90 EB 324.2 (East of Bozeman Hill) I-90 WB 330.5 (West Livingston)

FROM (SLEW TO)

Bozeman 36-133 Bozeman 36-134 Bozeman 36-065

OF WAY

HANC / \$30+/HR / Havre 36-161 Havre 36-160

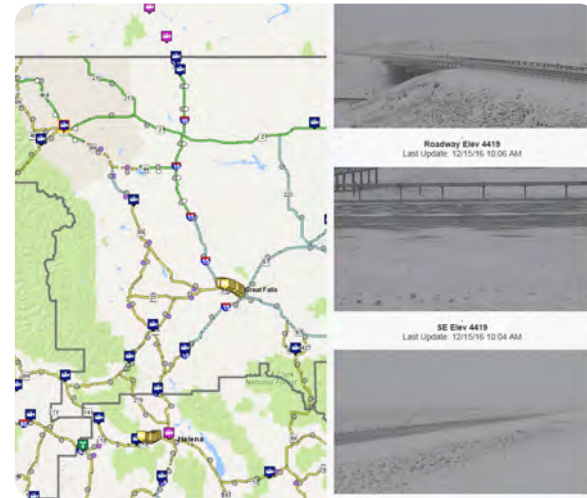
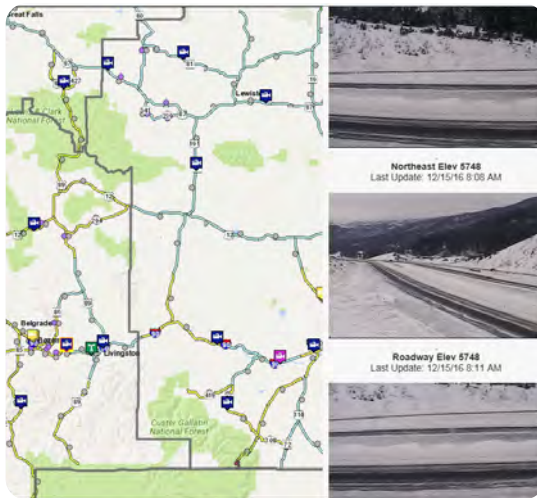
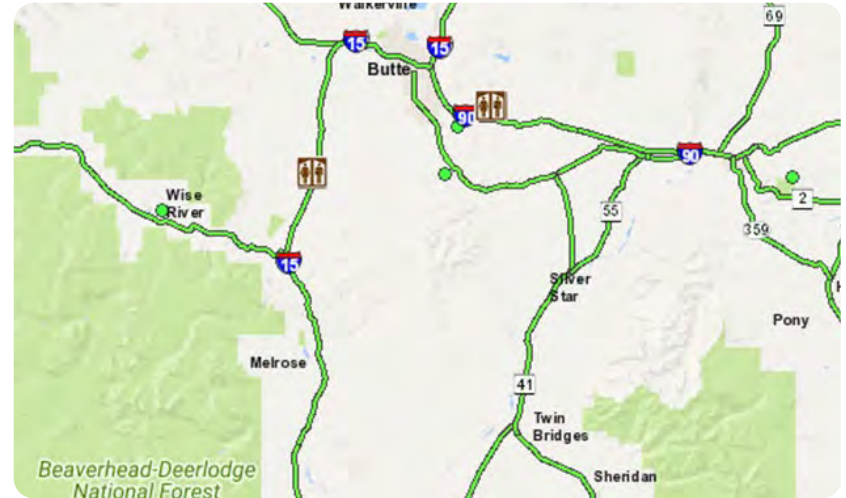
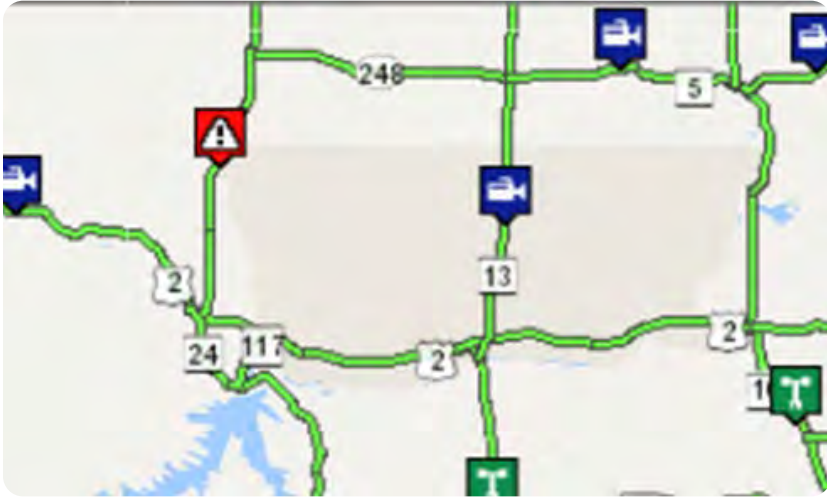
Missoula 36-151 Missoula 36-037

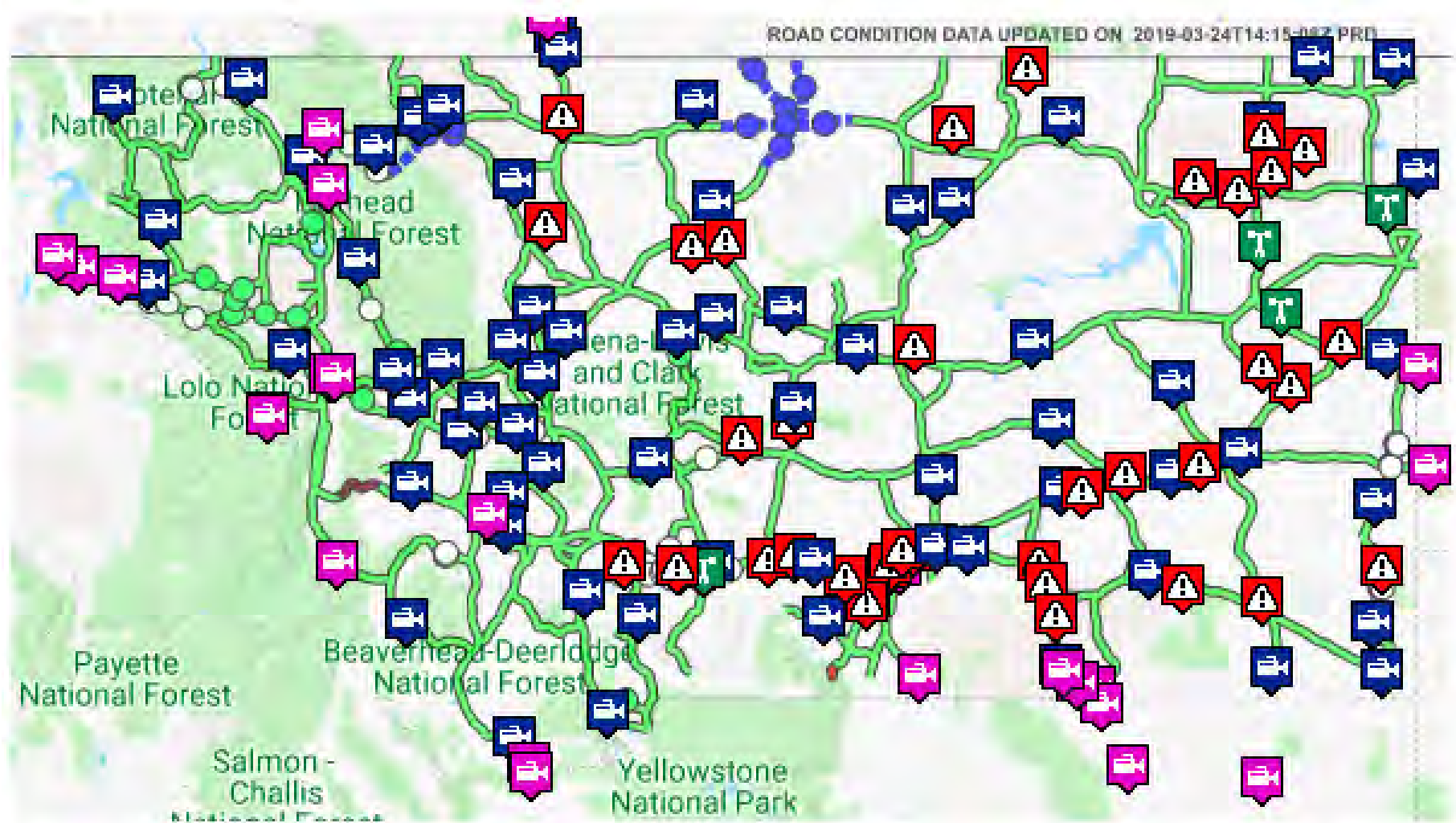
Billings 36-047

N OLD HWY 10 W Missoula 36-041 Missoula 36-152

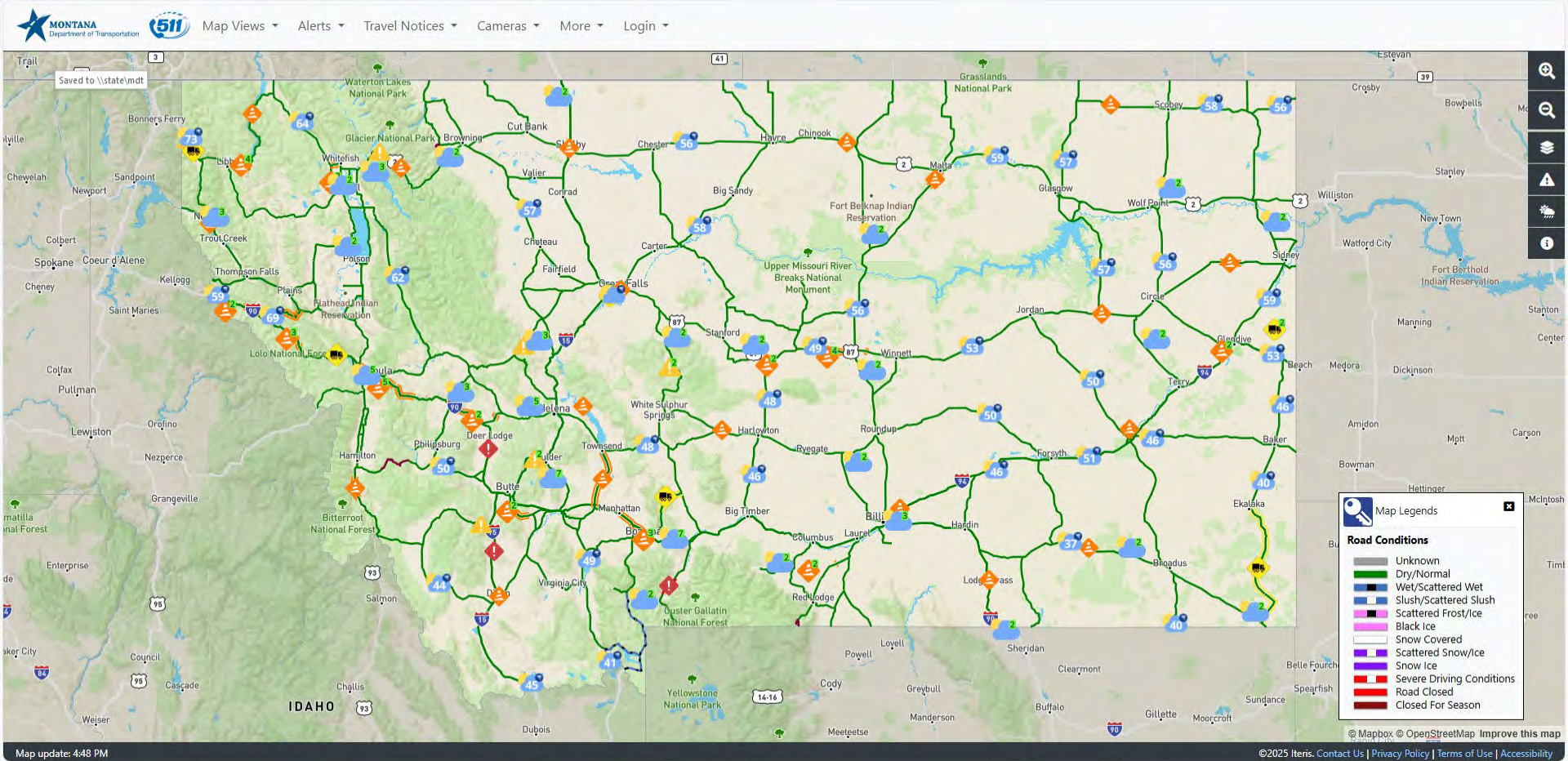
- Call Log – Call for Service entry form

Old 511 Travel Info Map

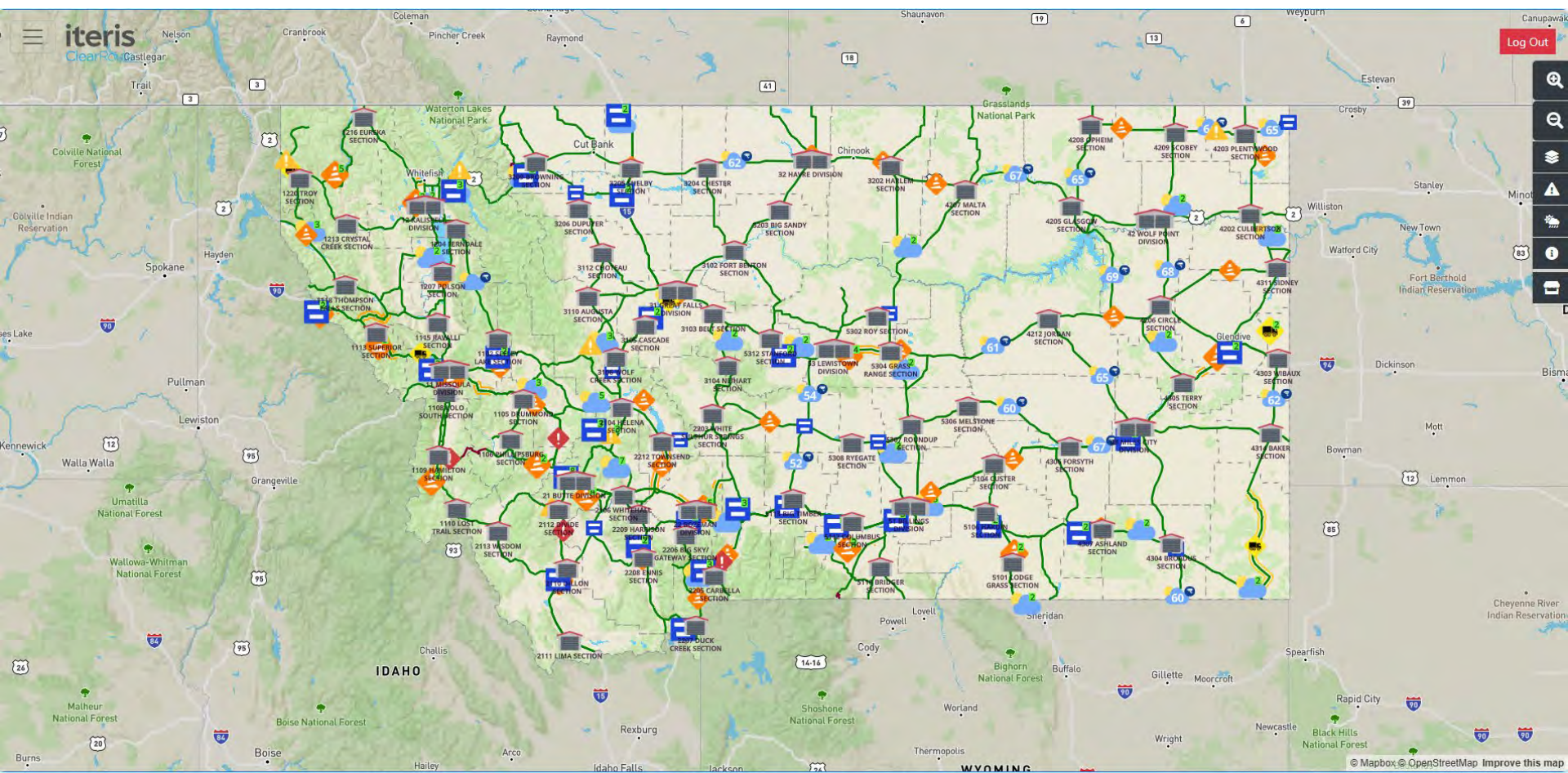




Old Travel Info Map (cont.)



New 511 Travel Info Map – ITERIS Inc. (switched to new product September 2021)



Roadway Management System – ITERIS Inc. (replaced Oracle database)



511 Stats

since Sept 2021

- 433k IVR Calls
- 11.6+ million web hits
- 10.5+ million mobile hits



2024-2025 TMC Winter Stats

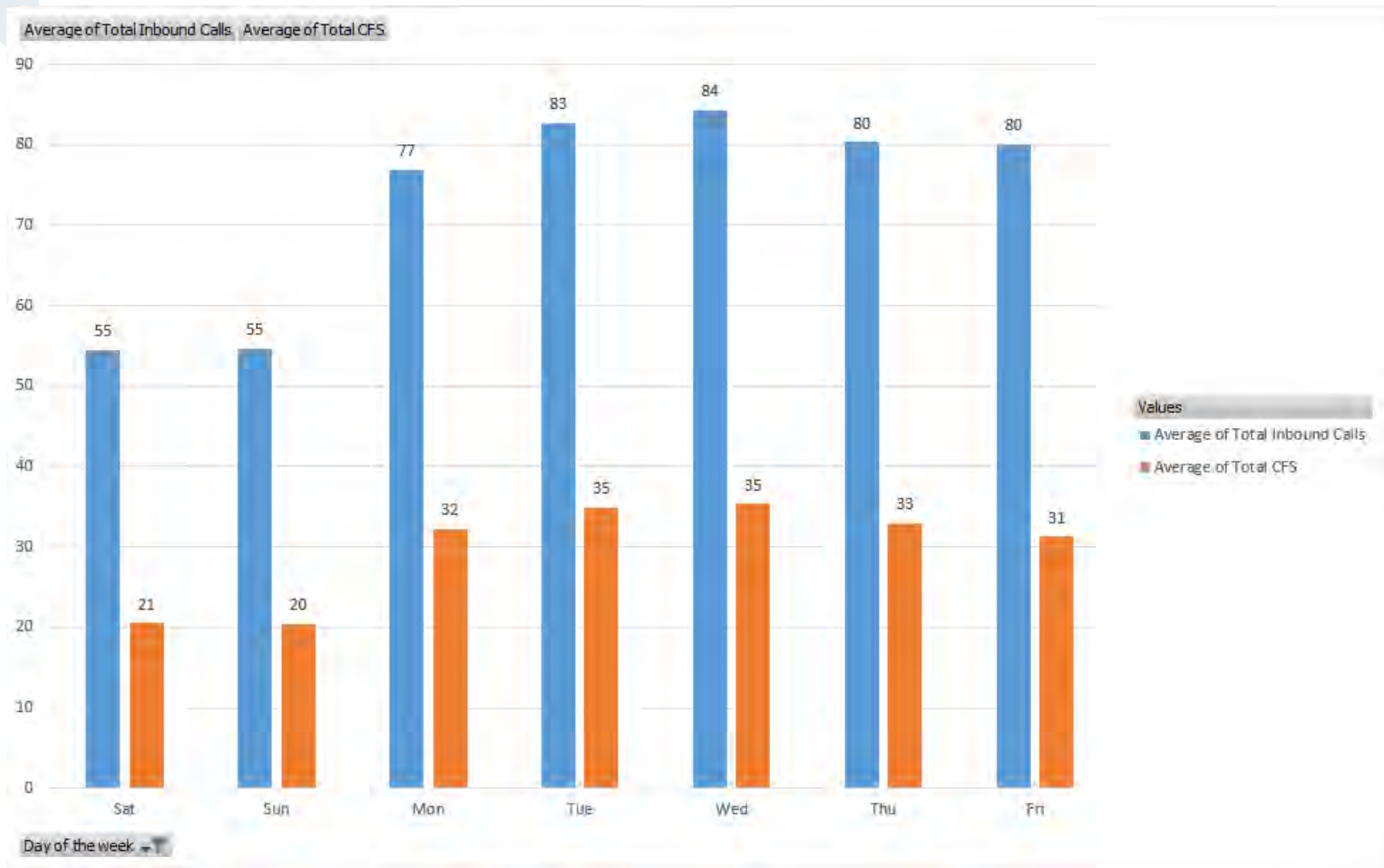
Month	In-bound calls	Calls for Service
November 24	3,009	982
December 24	3,483	953
January 25	4,140	1,498
February 25	4,119	1,682
March 25	2,579	899
April 25 (thru 4/21)	975	641
Total	18,305	6,655

TMC Annual Stats

Year	In-bound calls	Calls for Service
2020 <i>TMC Opened 10/2020</i>	6614	1,754
2021	25,111	10,429
2022	27,319	12,217
2023	25,156	9,872
2024	24,854	9,882
2025 (YTD)	11,813	4,720
Totals	120,867	48,874

- Avg over 25,000 in-bound calls each year (25,600)
- Avg over 10,000 calls for service each year (10,600)

Historical Stats Weekend vs. Weekday





Winter vs. Summer Stats

Months	Avg. In-bound calls per day	Avg. Calls for Service per day
Summer (May-Oct)	36	21
Winter (Nov-Apr)	105	37

- Call volume in winter almost triples on average.
- TMC hires an additional 8-12 temporary dispatchers to supplement permanent staff during winter months.

TMC 2025 Summer Schedule

April 5 - October 17, 2025

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Hours
OFF	OFF	6am-2pm	6am-2pm	6am-2pm	6am-2pm	6am-2pm	40
7am-7pm	7am-7pm	7am-3pm	OFF	OFF	OFF	7am-3pm	40
OFF	OFF	OFF	7am-3pm	7am-3pm	7am-3pm	OFF	24
OFF	OFF	7am-3pm	7am-3pm	7am-3pm	7am-3pm	7am-3pm	40
OFF	OFF	3pm-11pm	3pm-11pm	3pm-11pm	3pm-11pm	3pm-11pm	40
OFF	OFF	3pm-11pm	3pm-11pm	3pm-11pm	3pm-11pm	3pm-11pm	40
7pm-7am	7pm-7am	11pm-7am	OFF	OFF	OFF	11pm-7am	40
OFF	OFF	OFF	11pm-7am	11pm-7am	11pm-7am	OFF	24

Summer Schedule

TMC 2024-2025 Winter Schedule

October 19, 2024 - April 4, 2025

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Hours
OFF	OFF	3am-11am*	3am-11am*	3am-11am*	3am-11am*	3am-11am*	40
5am-5pm	5am-5pm	5am-1pm	OFF	OFF	OFF	5am-1pm	40
OFF	OFF	7am-3pm	7am-3pm	7am-3pm	7am-3pm	7am-3pm	40
OFF	OFF	11am-7pm	11am-7pm	11am-7pm	11am-7pm	11am-7pm	40
OFF	OFF	3pm-11pm*	3pm-11pm*	3pm-11pm*	3pm-11pm*	3pm-11pm*	40
5pm-5am*	5pm-5am*	9pm-5am*	OFF	OFF	OFF	9pm-5am*	40
OFF	OFF	11pm-7am	11pm-7am	11pm-7am	11pm-7am	11pm-7am	40
							40
5am-5pm	5am-5pm	OFF	OFF	OFF	OFF	OFF	24
OFF	OFF	3am-8am*	3am-8am*	3am-8am*	3am-8am*	3am-8am*	25
OFF	OFF	OFF	3am-11am*	3am-11am*	3am-11am*	OFF	24
OFF	OFF	7am-3pm	7am-3pm	7am-3pm	7am-3pm	7am-3pm	40
OFF	OFF	OFF	11am-7pm	11am-7pm	11am-7pm	OFF	24
11am-7pm	11am-7pm	11am-7pm	OFF	OFF	OFF	11am-7pm	32
OFF	OFF	3pm-11pm*	3pm-11pm*	3pm-11pm*	3pm-11pm*	3pm-11pm*	40
5pm-5am*	5pm-5am*	OFF	OFF	OFF	OFF	OFF	24
OFF	OFF	7pm-3am*	7pm-3am*	7pm-3am*	OFF	OFF	24
7pm-5am*	7pm-5am*	OFF	OFF	OFF	7pm-5am*	7pm-5am*	40
3am-11am*	3am-11am*	3am-11am*	OFF	OFF	OFF	3am-11am*	32
OFF	OFF	OFF	9pm-5am*	9pm-5am*	9pm-5am*	OFF	24

Winter Schedule (includes temporary employees)

The screenshot displays the Microsoft Shifts App interface for 'MDT TMC'. The top navigation bar includes 'Schedule', 'Requests', and 'Settings'. The main view shows a weekly schedule for May 3-9, 2025. The interface is organized into a grid where rows represent employees and columns represent days of the week. Shifts are assigned to various employees, including Redmond, Patr..., Blais, Michèle, Mercer, Arlene, Duff, Robyn, Ellis, Tami, White, G.W., Zeigler, Rachel, and Kostialik, Steve. The shifts are color-coded: blue for 6 AM - 2 PM, green for 3 PM - 11 PM, purple for 7 PM - 7 AM, and yellow for 11 PM - 7 AM. The interface also shows total hours for each day and a 'Dispatchers' section.

Employee	Sat (May 3)	Sun (May 4)	Mon (May 5)	Tue (May 6)	Wed (May 7)	Thu (May 8)	Fri (May 9)
Redmond, Patr...			6 AM - 2 PM	6 AM - 2 PM	6 AM - 2 PM	6 AM - 2 PM	6 AM - 2 PM
Blais, Michèle			7 AM - 3 PM	7 AM - 3 PM	7 AM - 3 PM	7 AM - 3 PM	VLT 5/9 - 5/13 Michele of 5/9 through 5/13, retur...
Mercer, Arlene	7 AM - 7 PM	7 AM - 7 PM	7 AM - 3 PM				7 AM - 3 PM
Duff, Robyn				7 AM - 3 PM	7 AM - 3 PM	7 AM - 3 PM	
Ellis, Tami			3 PM - 11 PM	3 PM - 11 PM	3 PM - 11 PM	3 PM - 11 PM	VLT 5/9 - 5/13 Tami off 5/9 through 5/13, returnin...
White, G.W.			3 PM - 11 PM	3 PM - 11 PM	3 PM - 11 PM	3 PM - 11 PM	3 PM - 11 PM
Zeigler, Rachel	7 PM - 7 AM	7 PM - 7 AM	11 PM - 7 AM				VLT 5/9 - 5/16
Kostialik, Steve				11 PM - 7 AM	11 PM - 7 AM	11 PM - 7 AM	11 PM - 7 AM Working on day off.

Microsoft Shifts App

- Employees use to view weekly schedule, request/view time off, etc.



2025 TMC Structure

TMC

- 1 Supervisor
- 2 Lead Dispatchers (16-hours of lead support 5 days a week)
- 6 Dispatchers
- 8-12 temporary dispatchers work October – April

TMC Support

- 24-hour support from State Dept of Admin and MDT IT staff
- 1 Communication Technician assigned to TMC
- Communication technicians in each district work closely with TMC on maintenance of DMS, RWIS, cameras, and radio communication.



Challenges

- Road condition reporting times were all the same prior to TMC. We had to find a way to contact and obtain road conditions statewide with a minimum of 3 people.
 - Reporting times were 6:00 am or 6:10 am and 1:00 pm or 1:10 pm
 - Changed to start at 5:30 am and every 15 minutes, concluding at 6:40 am, and 1:30 pm and concluding at 2:40 pm.
- Getting PSAP's on board with contacting the TMC instead of directly contacting field staff in certain areas.
- MDT did not have standards for handling emergency situations due to seldom occurrence and State Patrol dispatch staff usually contacting PASP's on MDT's behalf pre-TMC.



Challenges continued

- Growing pains/opposition of change from field staff, lack of trust, etc.
- Radio audio failure
- SharePoint data/item limit and custom form
- Portable DMS without GPS antenna's
- Addition of full-color signs
- Telecommunications are dependent on cell modems that occasionally go down



Wins and Benefits so far...

- DMS are now being used to actively manage incidents and closures
- Traveler information accuracy and update frequency has improved
- Improved trust, relationships, and communication with MDT staff and other agencies
- Department standards are now consistent for routine events
- AMBER Alert Program Partnership strengthened



More wins and benefits...

- Inter-agency incident management efforts and coordination have improved
- Enforcement of regulatory messaging on DMS is underway
 - Fact sheets have been developed to educate law enforcement on new laws in Montana
- Work zone communication and speed enforcement has improved
- MDT has been asked to teach a course at the Montana Law Enforcement Academy and is being considered.

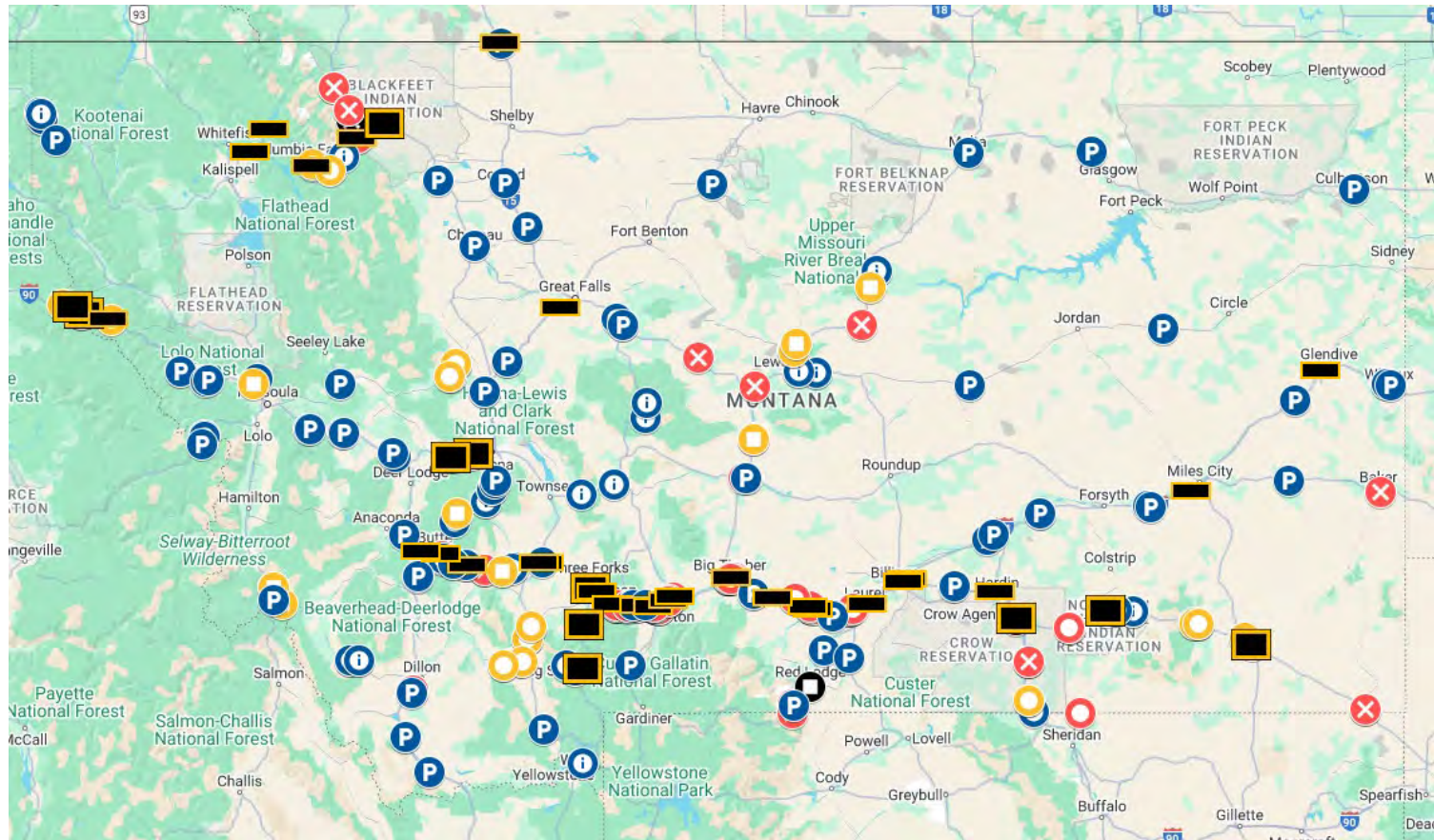


Recent and Future ITS

- Recent
 - 20+ more perm full color DMS
 - Wrong way ramp detection
 - When Flashing signs installed with radio activation capability
- Variable speed limits

ITS Map Demo

ITS Map – Google



What are your questions?

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