ROAD WEATHER
MANAGEMENT PROGRAM
OFFICE OF OPERATIONS

U.S. Department of Transportation
Federal Highway Administration

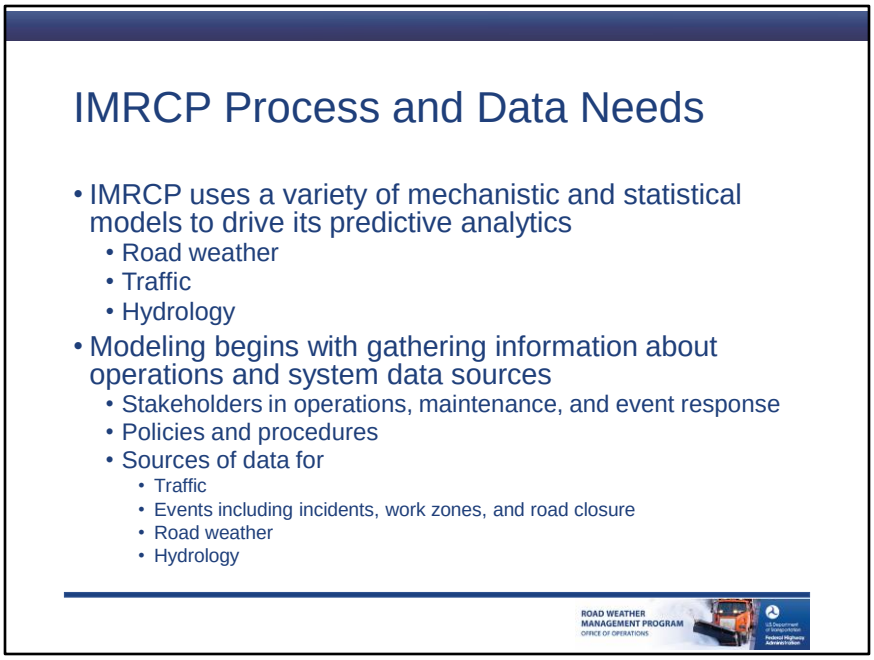
Integrated Modeling for Road Condition Prediction (IMRCP)

Louisiana User Training
April 28, 2021

Training Objective and Topics

- Understand the purpose and application of the IMRCP program
- Use the system and access its data
  - Map
  - Reports
  - Scenarios
- Explore example use cases and events

IMRCP Deployment Concepts



The IMRCP system can support transportation operations with enhanced situational awareness of current and forecast traffic and weather conditions, what-if analysis for decision making, and event records for after action reviews.

Deterministic and statistical methods are used to provide network-wide views of current and forecast conditions. IMRCP collects and used information from other public and commercial sources such as the National Weather Service and traffic data providers, and then generates additional forecasts of traffic and road conditions.

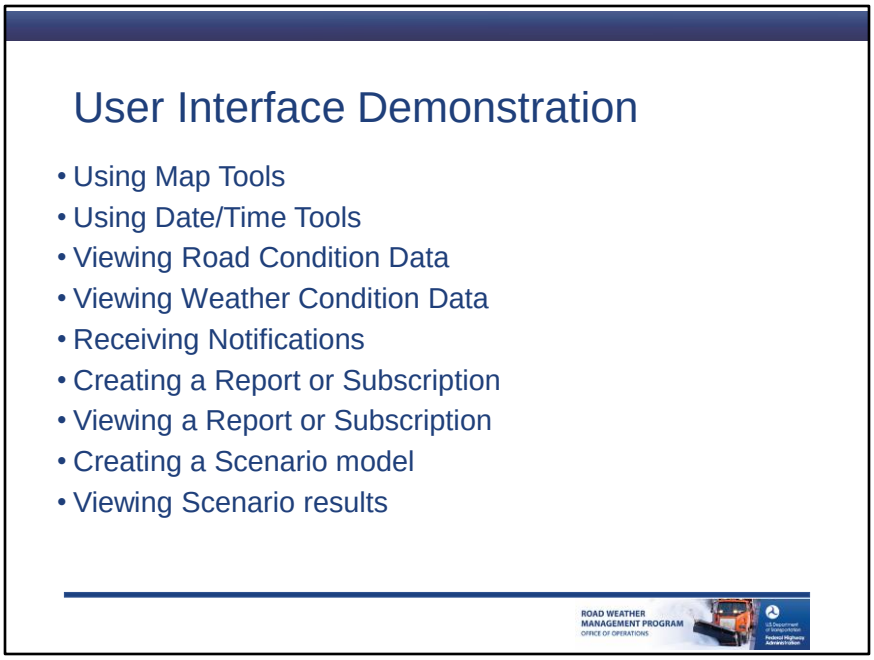
These models take advantage of a wide variety of data sets. IMRCP collects atmospheric weather and river, stream and coastal hydrological data and forecasts from NOAA/NWS. Transportation data come from agencies and commercial providers. Traffic speeds, incidents, work zones, traffic controls such as variable speed limit (VSL) zones, road closures, maintenance activities, road weather information systems… all of these are gathered by IMRCP to feed its road condition forecasts.

Training

IMRCP User Interface

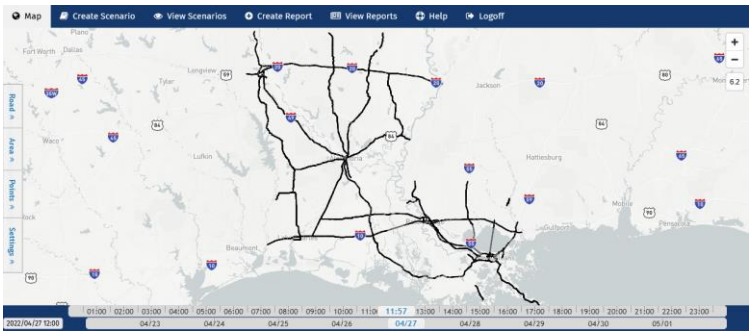
- The IMRCP system uses a web-based interface
  - Time-variable map
  - Notifications
  - Reports
  - Scenario decision support tools
- Administrators send user names, passwords and instructions to authorized users

The next few slides will walk through the functions and features of the IMRCP user interface. The address to the IMRCP is listed at the bottom of the slide. User names, passwords, and instructions are sent by email to system users. Instructions can also be found in the Help tab of the user interface.



The user demonstration will walk through:
-Using Map Tools
-Using Date/Time Tools
-Viewing Road Condition Data
-Viewing Weather Condition Data
-Viewing Alerts
-Viewing Routes
-Receiving Notifications
-Creating a Report or Subscription
-Viewing a Report or Subscription

Using the Map Interface



Source: USDOT/FHWA

Once logged in to the system, users will see a map interface.

Users can zoom in and out of the map using the zoom controls in the upper right hand corner of the map page and can pan the map by clicking and dragging on the map.

The time selector at the bottom of the map can be dragged to the right or left to change the time domain of the data displayed on the map.

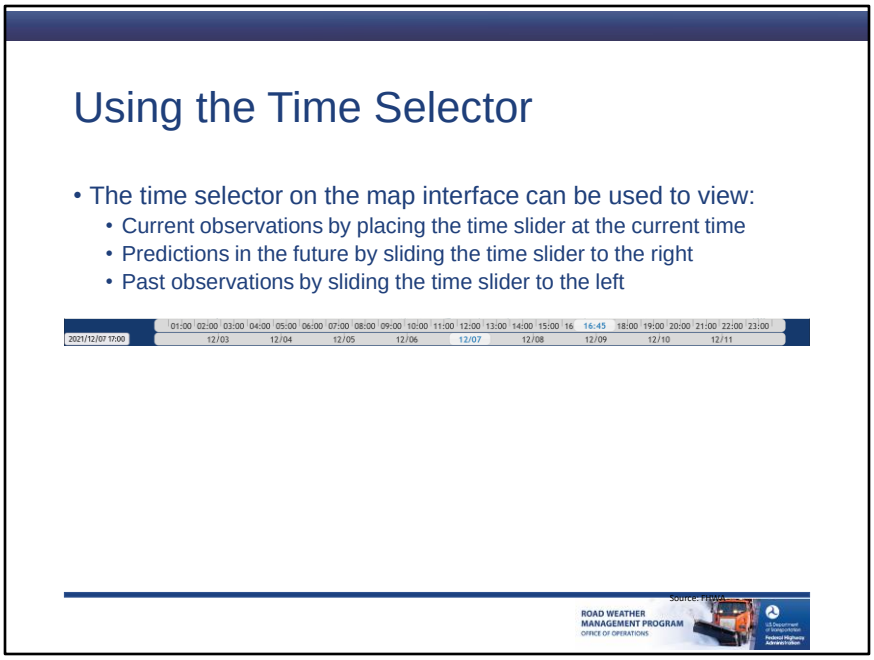
To view layers of data, users can click any of the menu tabs at the left of the page to select layers to be displayed on the map.

Users can also view data by creating a report or subscription using the Report/Subscription button in the bottom left corner of the map page.

Settings for the map are accessed using the “Settings” tab on the left. The 1 minute refresh setting sets the map to update every minute with new data. To turn on notifications, the user can check the notify box. The current settings, including the map location and zoom level, can be saved with user account profile as the default

for future sessions.

The date/time function in the bottom left corner of the map allows users to select a date and time in the past to view data.

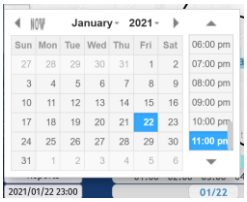


The time selector on the map interface can be used to view:

- Current observations by placing the time slider at the current time
- Predictions up to 5 days in the future by sliding the time slider to the right
- Past observations up to 5 days in the past by sliding the time slider to the left

Using the Date/Time Function

- The date/time function allows users to select a past reference date and time to get a snapshot view of the map at that time.



Source: FHWA

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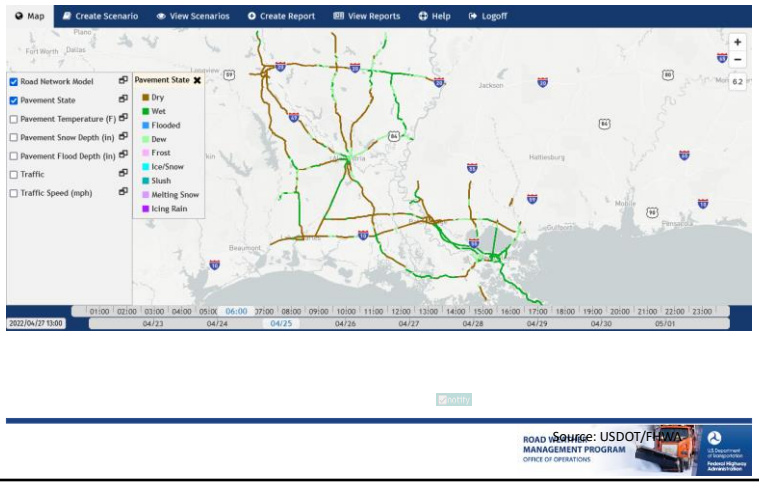
The date/time function allows users to select a past reference date and time to get a snapshot view of the map at that time.

Viewing Road Condition Data



Source: USDOT/FHWA

When a user selects a road condition data layer, segments in the study area are color coded based on the segment‘s data pertaining to that layer. The legend for the layer is displayed on the left side of the map next to the list. Data for each segment may be viewed be selecting a segment.

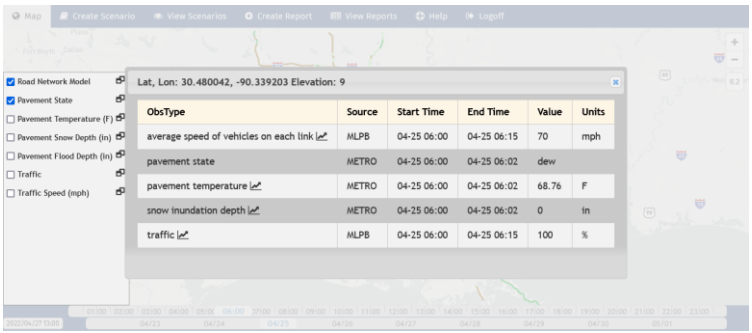
This screen shot shows an example of traffic predictions. The segments are color-coded based on the predicted average speed on the segment relative to the speed limit.

The following road condition data layers can be selected:

- Road Network Model
- Pavement State
- Pavement Temperature
- Pavement Flood Depth
- Pavement Snow Depth
- Traffic

- Traffic Speed
- Traffic Density
- Traffic Flow
- Routes

Viewing Road Condition Data



Sources: RWMP

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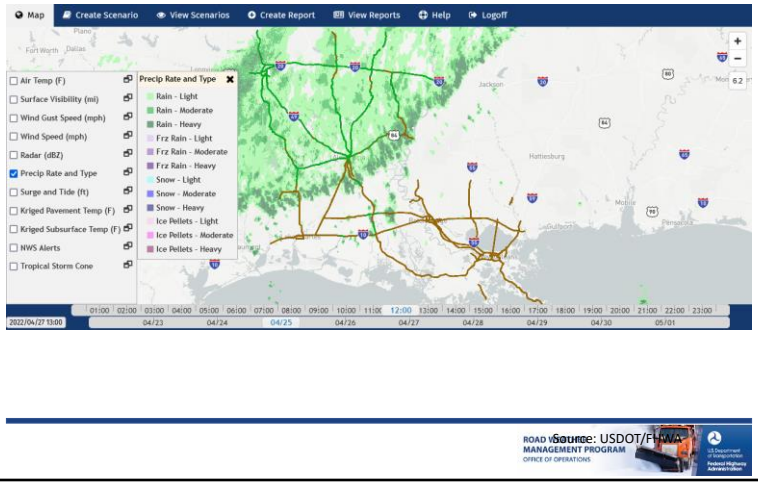
The selected segment's information will be displayed in a pop-up box. A description and the location of the segment will be displayed in the header and each piece of data associated with the segment for the selected time frame will be listed below.

Viewing Weather Condition Data



Source: USDOT/FHWA

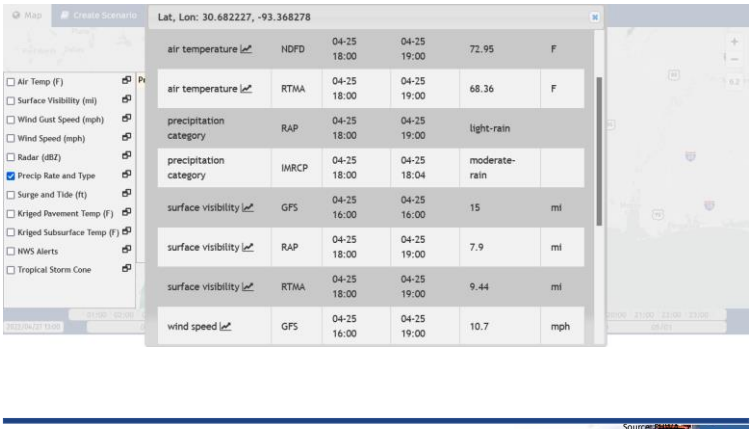
Users can select atmospheric weather area data layers from the list of available data on the left. The legend for the layer can be displayed next to the list. Observations associated with each area may be viewed by clicking on the map where data are shown.

This example screenshot shows the Precipitation Rate and Type layer. The map shows a mixture of light, medium, and heavy rain in the study area.

The following area data layers can be selected:

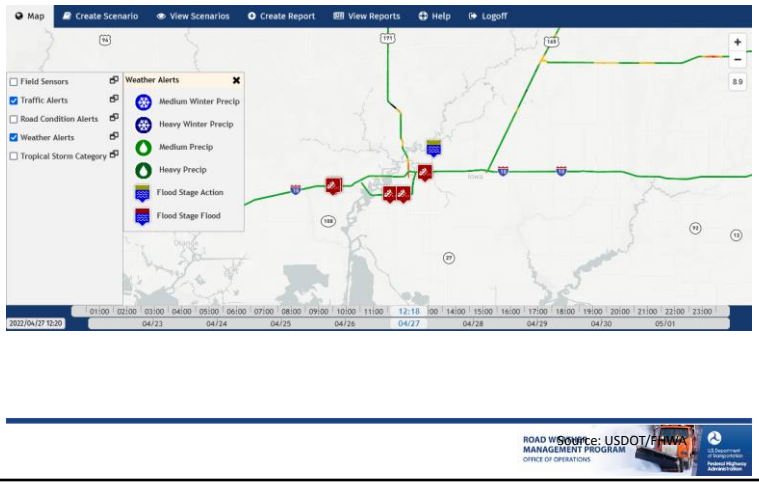
- Air Temperature
- Surface Visibility
- Wind Gust Speed
- Wind Speed
- Precipitation Rate & Type
- NWS Alerts
- Radar

Viewing Weather Condition Data



The selected area's information will be displayed in a pop-up box. A description and the location of the area will be displayed in the header and each piece of data associated with the area for the selected time frame will be listed below.

Viewing Alerts



Source: USDOT/FHWA

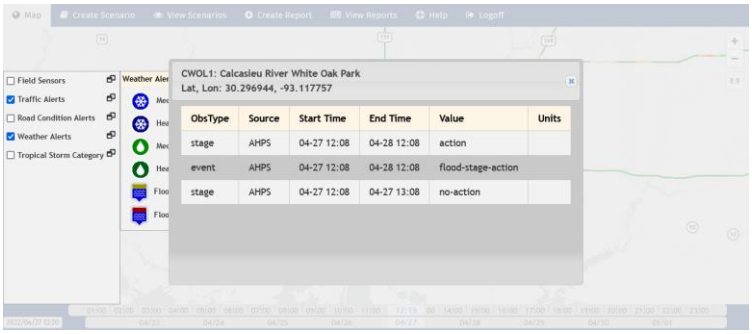
When a user selects an alert layer from the points tab, alerts for the study area are displayed as icons at the location of the alert. The alert description for each alert can be viewed by selecting an alert icon.

The following alert layers can be selected:

- Traffic alerts
- Road condition alerts
- Weather alerts
- All alerts

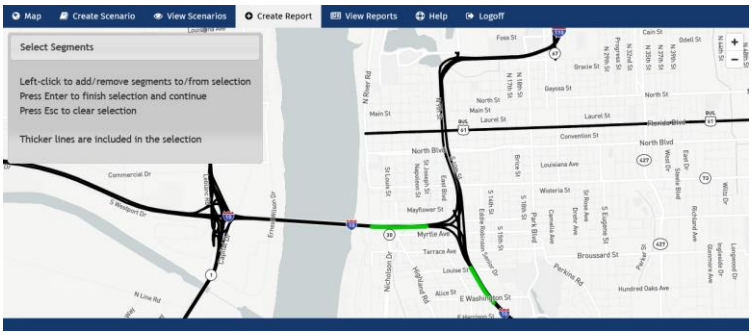
Alerts at high zoom levels may represent multiple alerts of the same type when zoomed in. Incidents are shown on the map for as long as they persist in the transportation management system. Work zones extending along multiple links in the road network model may be shown as multiple icons.

Viewing Alerts



Alert information is displayed in a pop-up display box when an alert icon is selected.

Creating Reports/Subscriptions



Sources: FHWA

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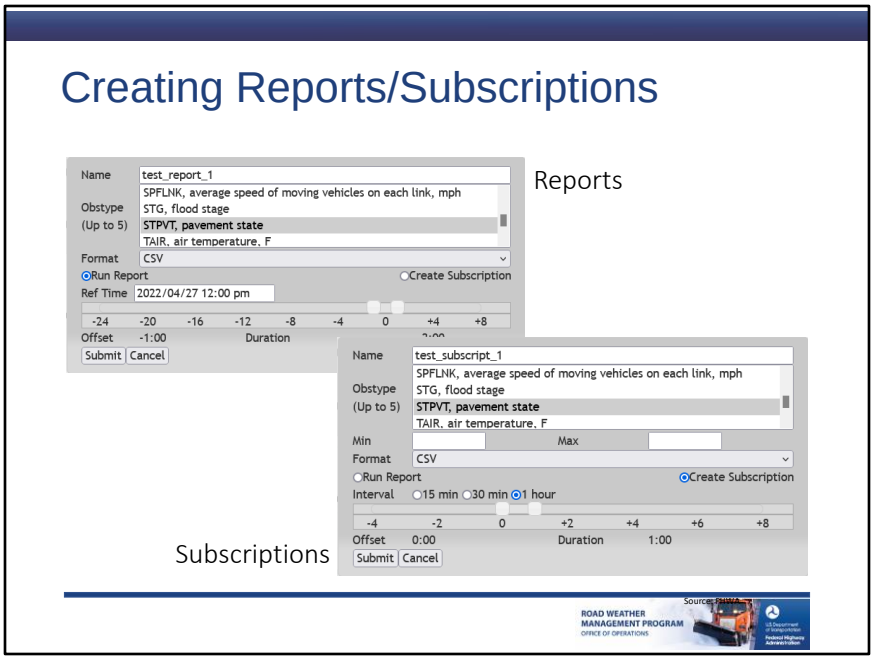
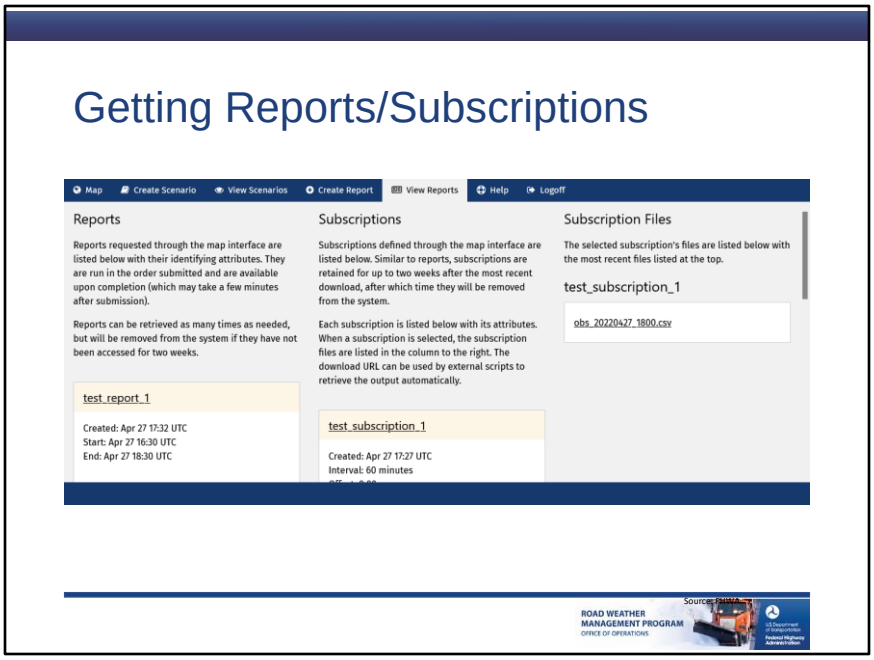
Selecting the Create Report tab on the top menu enables users to select segments for which to generate a report. After the user has made their selections, they press Enter to begin the Report/Subscription wizard.



Once the segments for the Report or Subscription has been selected, the user will be guided through the report/subscription wizard. Users can select the coordinates, name, observation type(s), and format.

In addition to those parameters, users can select the reference time, offset and duration for a report and the interval, offset and duration for a subscription.

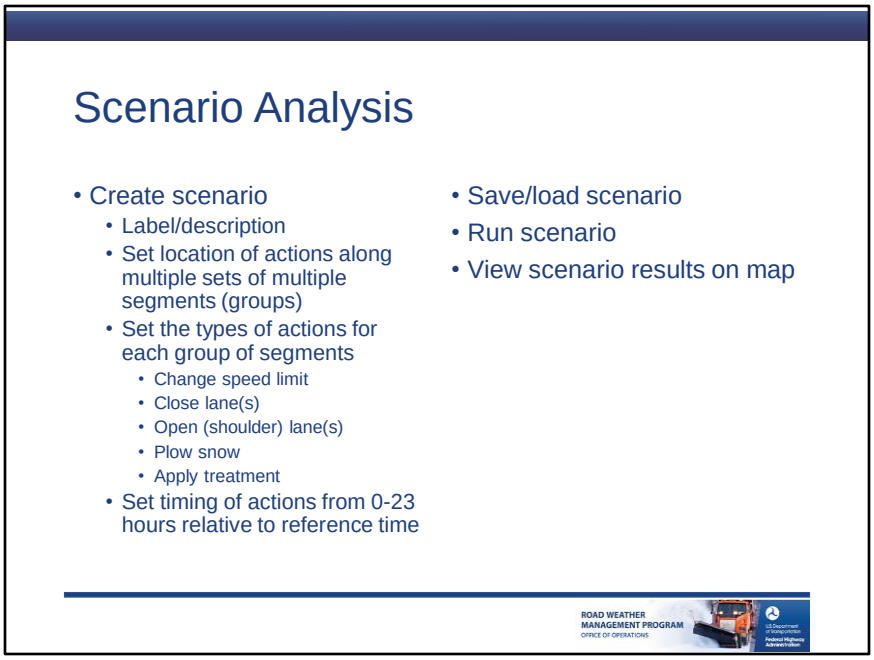
Selecting the submit button starts the processing of the report. A pop-up dialog will confirm that the report is submitted.



To view reports and subscriptions, users can select the View Reports tab on the top menu. In the left hand column, users can select a report to view be clicking on the name of the report.

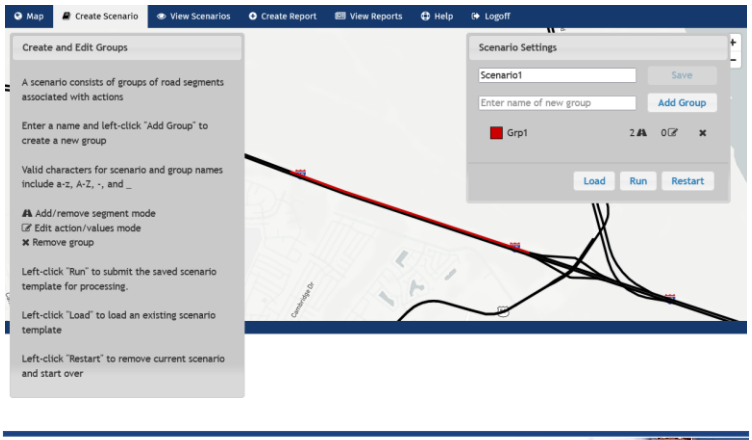
In the middle column, a subscription can be selected by clicking on the name of the subscription. The files within the subscription will be populated in the right hand column. Selecting a file in the right hand column will open the file. A subscription can also be downloaded using script for entry into other systems.

Reports and subscriptions are set to expire and be removed from the system after 2 weeks of not being downloaded.



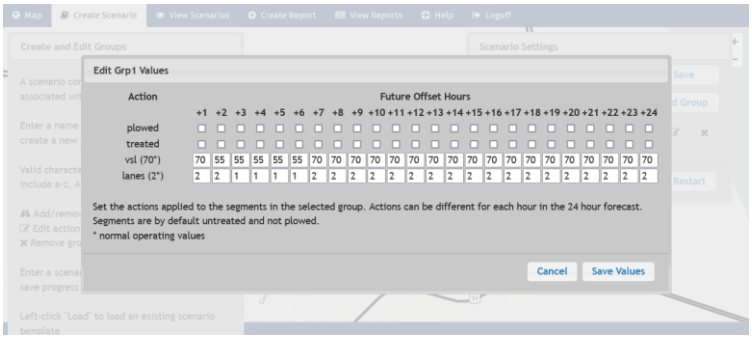
Scenarios are used to run "what if" analysis of potential operations and maintenance activities. These can include changing speed limits, closing one or more lanes, opening (shoulder) lanes, plowing, and applying treatments.

Creating Scenarios



Creating scenarios starts with naming the scenario and adding groups of segments and actions. In the example, a group of segments was selected and named “Grp1.”

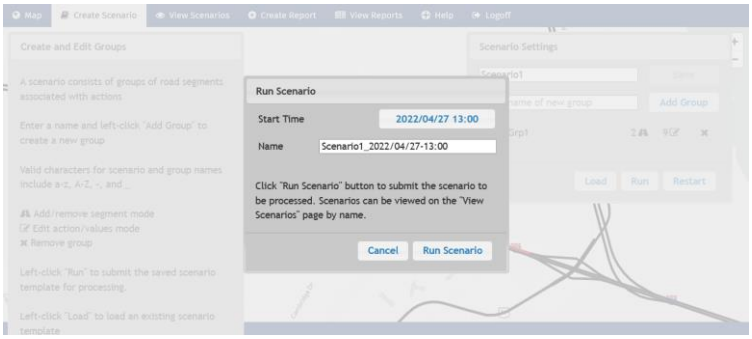
Creating Scenarios



Source: FHWA

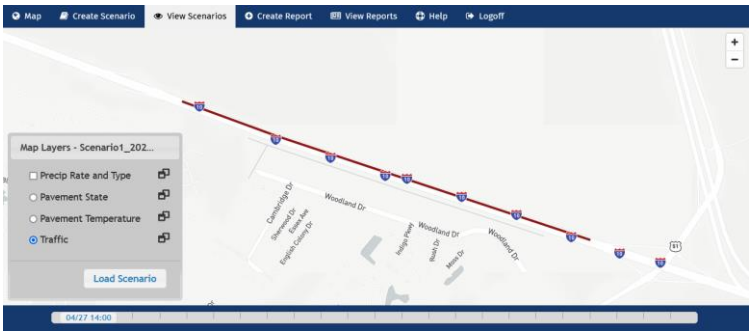
The actions to be taken on those segments are to close one of the two lanes and reduce the speed limit from 70 to 55 mph for five hours, starting one hour after the beginning of the scenario.

Run Scenario



Running the scenario will create view of what would happen if the actions were taken on those segments starting at the time set in the dialog box. The scenario is queued up to run and will be available on the “View Scenarios” tab when it is finished.

View Scenarios



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Scenario results are listed on the intro “View Scenarios page, from which they are loaded and then presented on a page that looks much like the default “Map” view. View layers and controls are limited to the results that might be changed as a result of the actions taken in the scenario.

Next Steps

Discussion

Contacts

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