

WeatherCloud[®]

Hyper-Local Global Forecasting

fat h y m[®]

FORECASTING TODAY

Today's road forecasts are based on precipitation mapping — if it's raining outside the forecast is for wet roads, if it's snowing the forecast is for snowpacked roads.

These forecasts often mislabel the true conditions of the road, leading to costly delays, accidents and maintenance issues.



WEATHER IMPACTS ON TRUCKING INDUSTRY

based on current forecast techniques

4.6% of trucking hours are affected

1.5% of annual revenue is lost

\$8.65B lost annually due to delay

\$20M is lost per \$1B in revenue due to delays

13% of large truck accidents occur during poor weather conditions (heavy rain/snow, poor visibility, high winds)

18% of large truck accidents occur during poor road weather conditions (wet roads and icy roads)

\$34M lost due to accidents



EVOLVING FORECASTING TECHNOLOGY

WeatherCloud has improved the accuracy of road forecasts, allowing WeatherCloud to determine the true condition on the road.

The WeatherCloud route forecast engine relies on cutting-edge machine learning on thousands of fixed observations, as well as proprietary methods to take in multiple weather models/sensor data and blend the outputs of those models into a highly-accurate end result.

For example, it may be snowing, but that doesn't mean the roads are snowpacked since the pavement retains heat.

These hyper-local, highly-accurate forecasts give the trucking industry more accurate ETAs, help them route fleets, and allow maintenance providers to utilize the right materials and personnel for the conditions.



THE WEATHERCLOUD VALUE PROP



Lower Costs



Improve Efficiency



Prevent Accidents



Send Warnings



Learn from Data

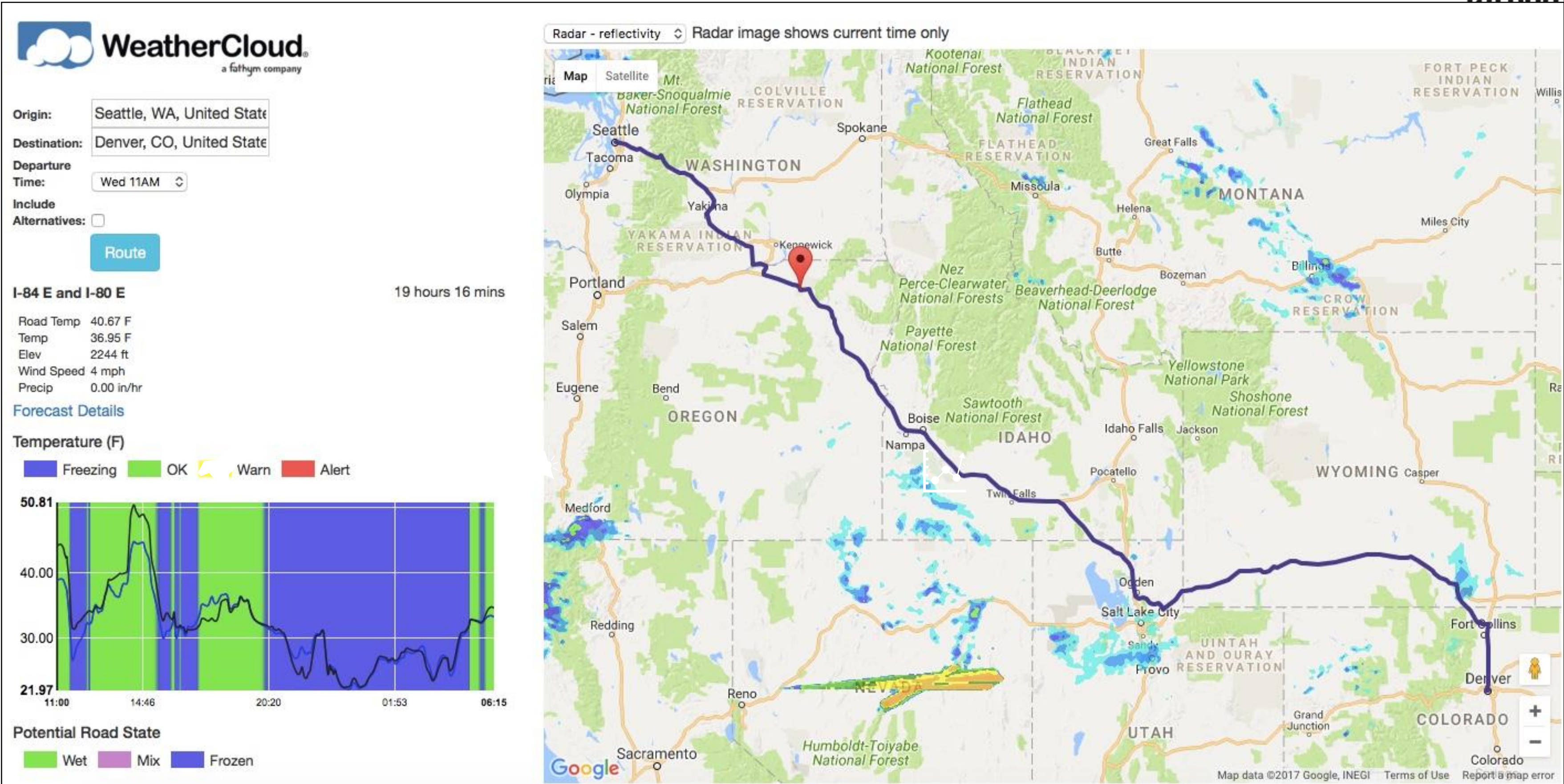
- 1) The WeatherCloud backend forecast system allows for routing around hazardous weather** – Routes optimized for slower speeds around weather events, improve ETA accuracy and driver safety
- 2) Big Data Analysis of routes, speed, direction and operational threats such as high cross-winds, low-visibility and slick roads, can alert the driver prior to an adverse weather event occurring** – Analytics can yield estimated fuel burn by route from head/tail winds, cross-wind threat along routes, slick road warnings, weather-related delay risk for Loads Trending Late applications, and weather-specific idle-time information
- 3) Data Forensics give better insight into weather's affects** – Data management tools and historical data dashboards allow for spatial and temporal investigation into road conditions post accident investigations

THE WORLD RUNS ON WEATHER DATA

Fathym’s WeatherCloud® Global Ground Truth data provides true visibility into location-specific forecasts and road condition forecasts, supplying critical data to many end users, including transportation fleets, maintenance providers and connected cars.

Ground Truth datasets utilize multiple weather data sources, as well as proprietary algorithms and machine learning.

Data is available through APIs and custom dashboards, giving access to real-time conditions and forecasts.



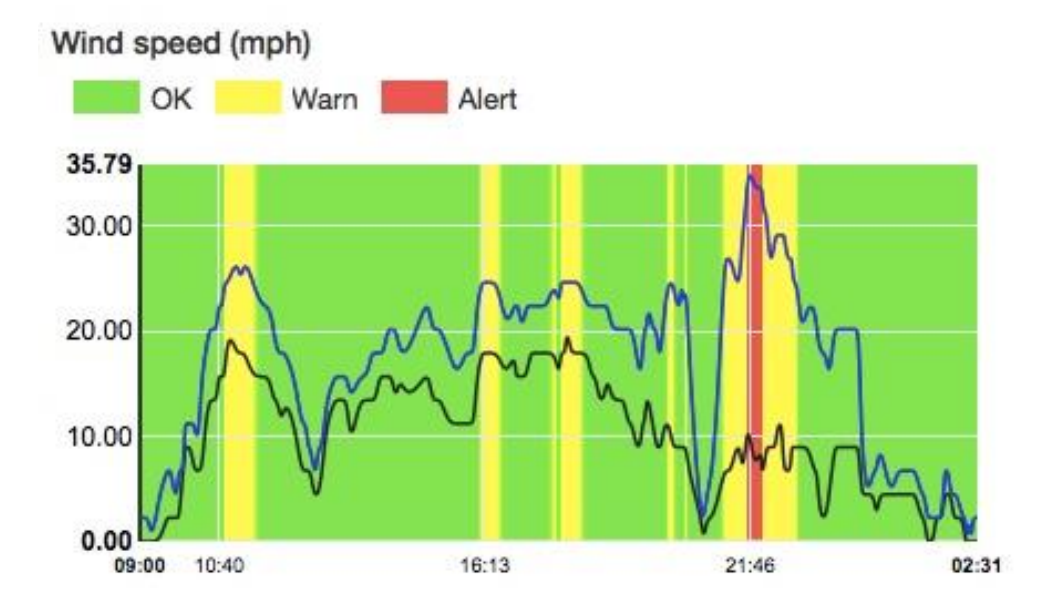
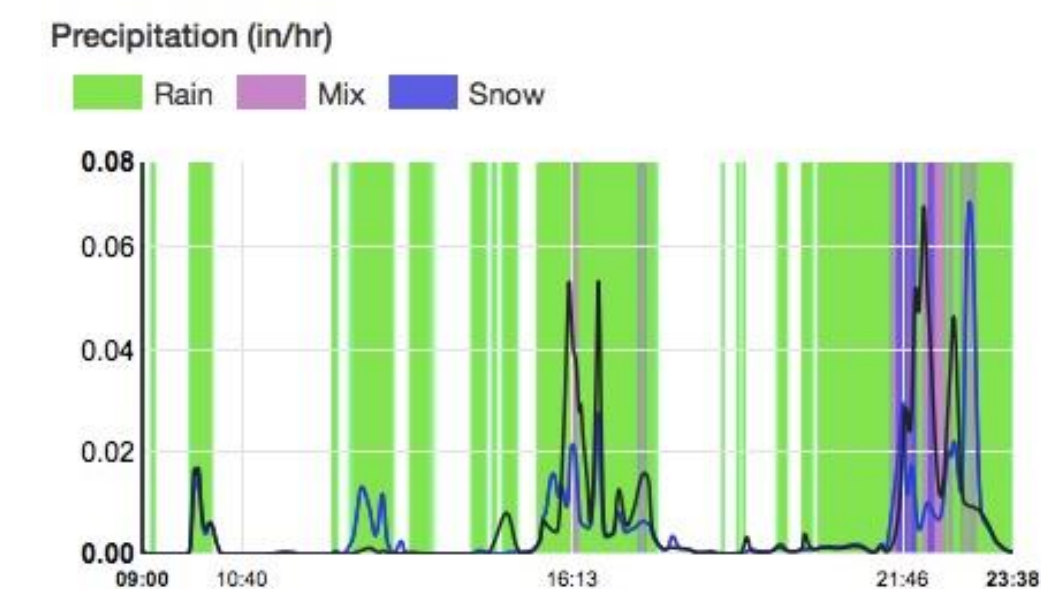
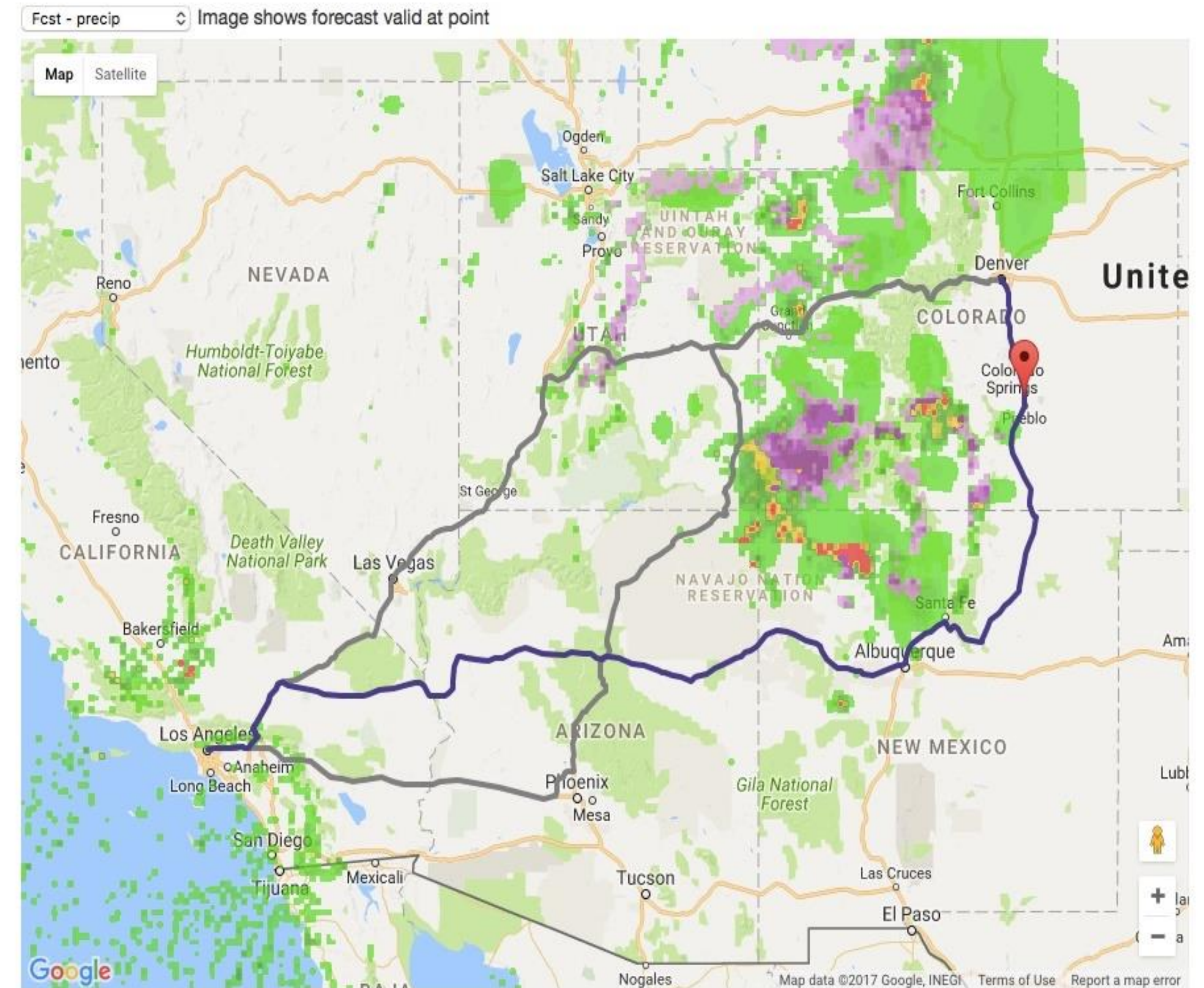
Maps & Tiled Imagery –

Atmospheric and road weather visualizations; both gridded and road network

Lookback – Historical look back of observations, forecasts, and visualizations

Points – Global location-specific weather and road-weather forecast data

Delay Risk – User-friendly 0-3 delay risk based on weather variables



SIMPLIFIED DATA ACCESS

Fathym's WeatherCloud® Global Ground Truth data forecasting system provides easy access to a wide range of weather datasets and tools.

The forecasting process integrates data from all of the world's major weather data sources. Using highly specialized data analysis techniques and algorithms, this data can be used to provide improved forecasting over any area of the globe.

Web services and APIs give easy access to complete datasets.

```
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  "data": { //all arrays match the length of valid times
    "gust": [...], //Wind Gust - MPH
    "spd": [...], //Wind Speed - MPH
    "temp": [...], //Air Temp - F
    "road_temp": [...], //Road Temp - F
    "road_state": [...], //Road State - 1=Wet,2=Mix,3=Frozen
    "precip": [...], //Precip Rate - in/hr
    "ptype": [...], //Precip Type - 1=Wet,2=Mix,3=Frozen
    "vtimes": [...], //Valid Times - unix timestamp UTC
  }
}
```

Routing – Gives user ability to call on specific point forecasts for the duration of their journey or specific times in the future.

Site-Tuned Forecasts – Advanced data mining techniques developed specifically for weather-based applications offer significant improvement over standard forecasts

Sensor Data Storage - Historical look back of observations, forecasts, and visualizations retrievable in time period defined batches

Tiled Imagery – Global tiled imagery for all forecast products and radar

Web Services – Data available at your fingertips with a wide range of web services providing simple user interfaces for JSON, CSV or XML data

WEATHERCLOUD USE CASES



Routing / ETA Optimization

Use Case:

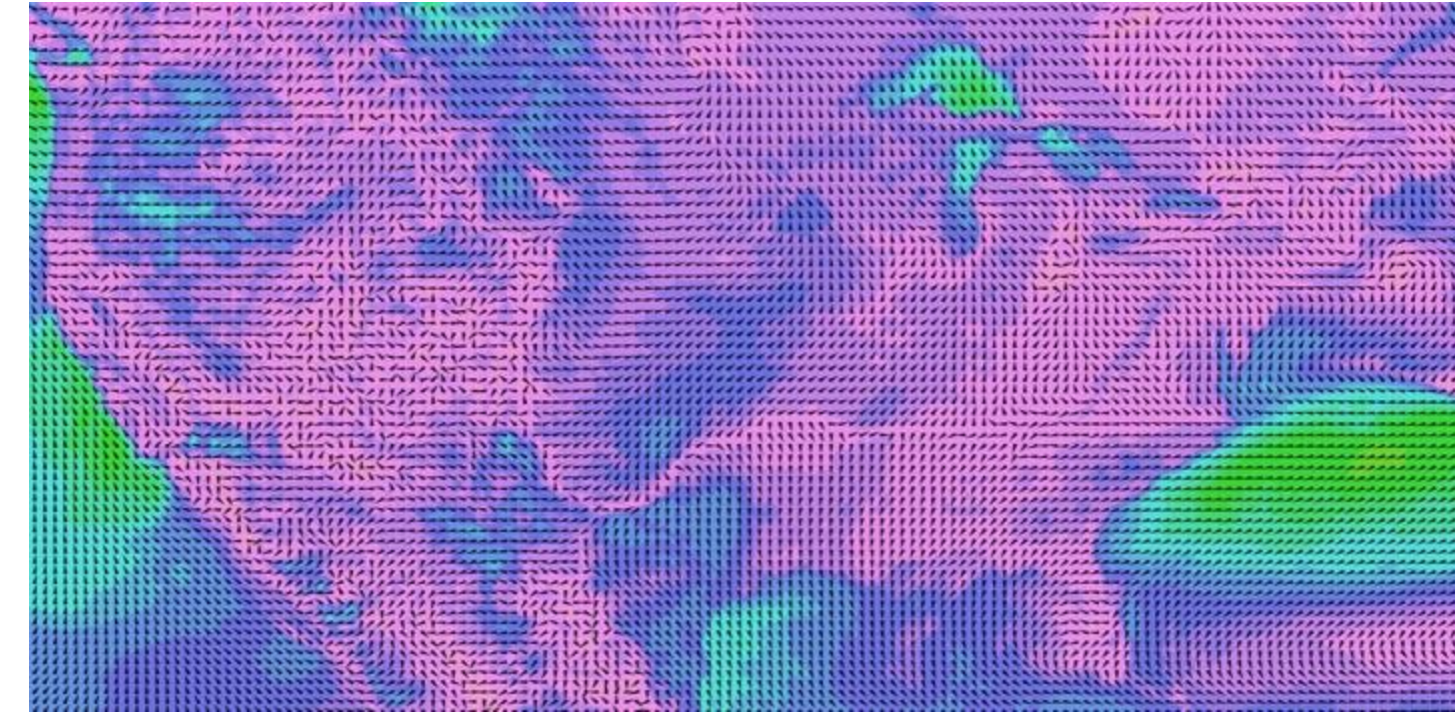
Integrate road weather and condition forecast into commercial routing/ETA engines(Delay Risk/Loads trending late variables)

Applicable to:

- Long haul trucking/Fleet mgmt
- Telematics companies

Benefits:

- Mitigate travel delays, improve on-time arrival, optimize driver time and safety
- Real-time alerts to warn driver of reduced road friction, slower speeds required



Wind Speed & Direction Analytics

Uses Case:

Road Network Wind Speed Analysis

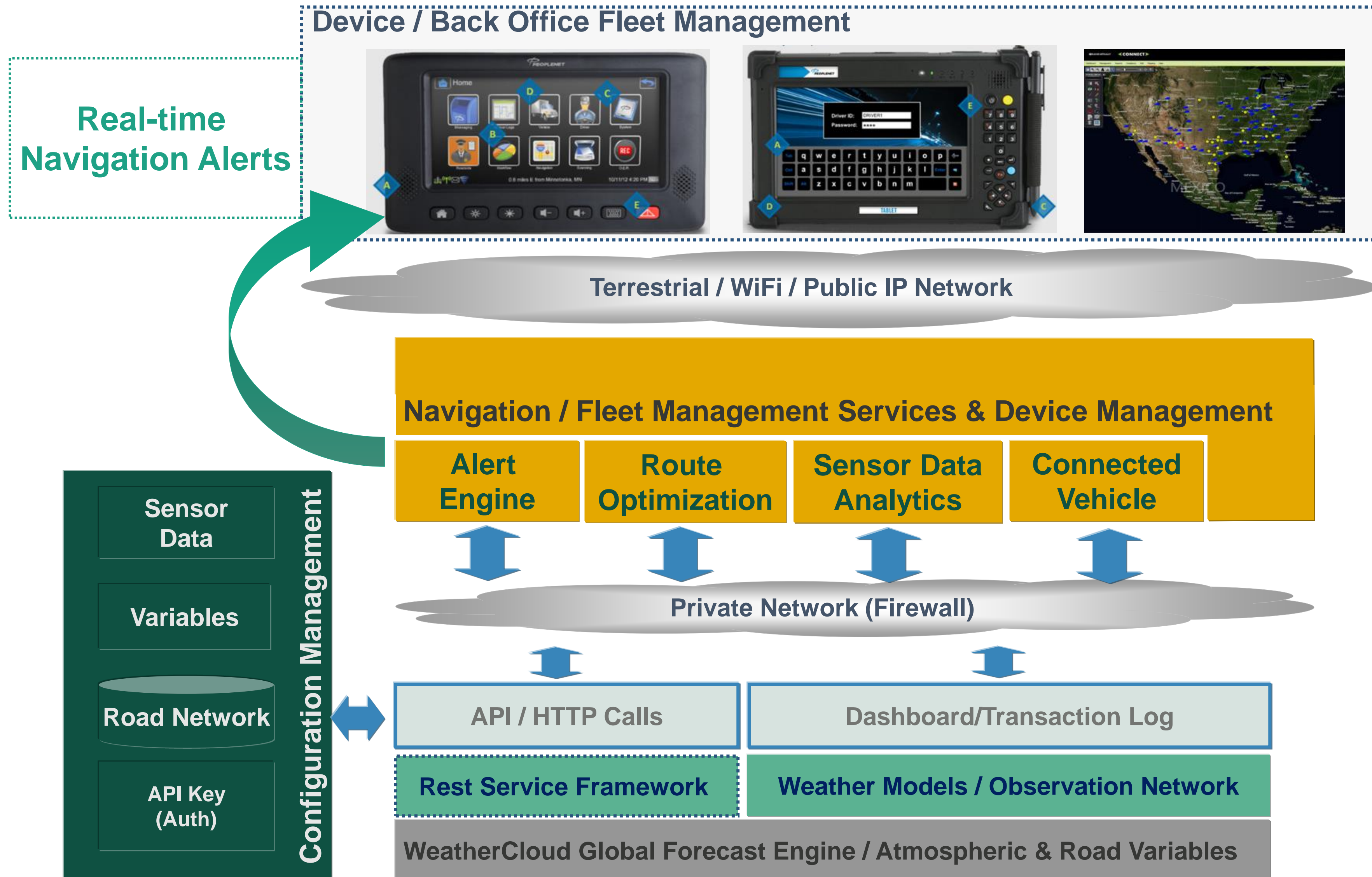
Applicable to:

- High profile vehicle blow over threat
- Overpass + 80-meter wind gusts
- Head wind analysis

Benefits:

- Cross-wind speed/gust forecast to mitigate vehicle blow over
- Above ground wind gust alerts
- Route optimized for head wind / fuel burn

WEATHERCLOUD FORECAST ENGINE ARCHITECTURE



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