

Western States *Clarus* One-Stop Shop for Rural Traveler Information

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Road Weather Management Stakeholder Meeting 2011

***Clarus* Regional Demonstrations**

Thursday, September 8, 2011

1:40 PM

Disclaimer

The opinions, findings and conclusions expressed in this presentation are those of the authors and not necessarily those of the U.S. Department of Transportation, the California Department of Transportation, or Montana State University.

Western States One Stop Shop

Broad Agency Announcement No. DTFH61-10-R-00015

- Posted by FHWA on March 15, 2010
- Proposals Due April 14, 2010
- *The goal of this Broad Agency Announcement (BAA) is to support research and scientific study on the use of Clarus System data to improve surface transportation weather management/operations, create innovative interfaces, and/or develop new applications including weather-responsive traffic management tools. The FHWA anticipates making up to seven (7) awards, but reserves the right to make more or fewer than seven (7) awards.*

WTI Proposal

- Proposal Submitted on Time
- Included signed letters of support from WSRTC member states: California, Oregon, Washington and Nevada
- GOAL: Expand the One-Stop-Shop Prototype to cover all of California, Oregon, Washington and Nevada
 - ... to address the shortcomings of current (multi-state) web-based weather information sources for travelers (and DOT personnel) ...
- Project awarded on 9/24/2010

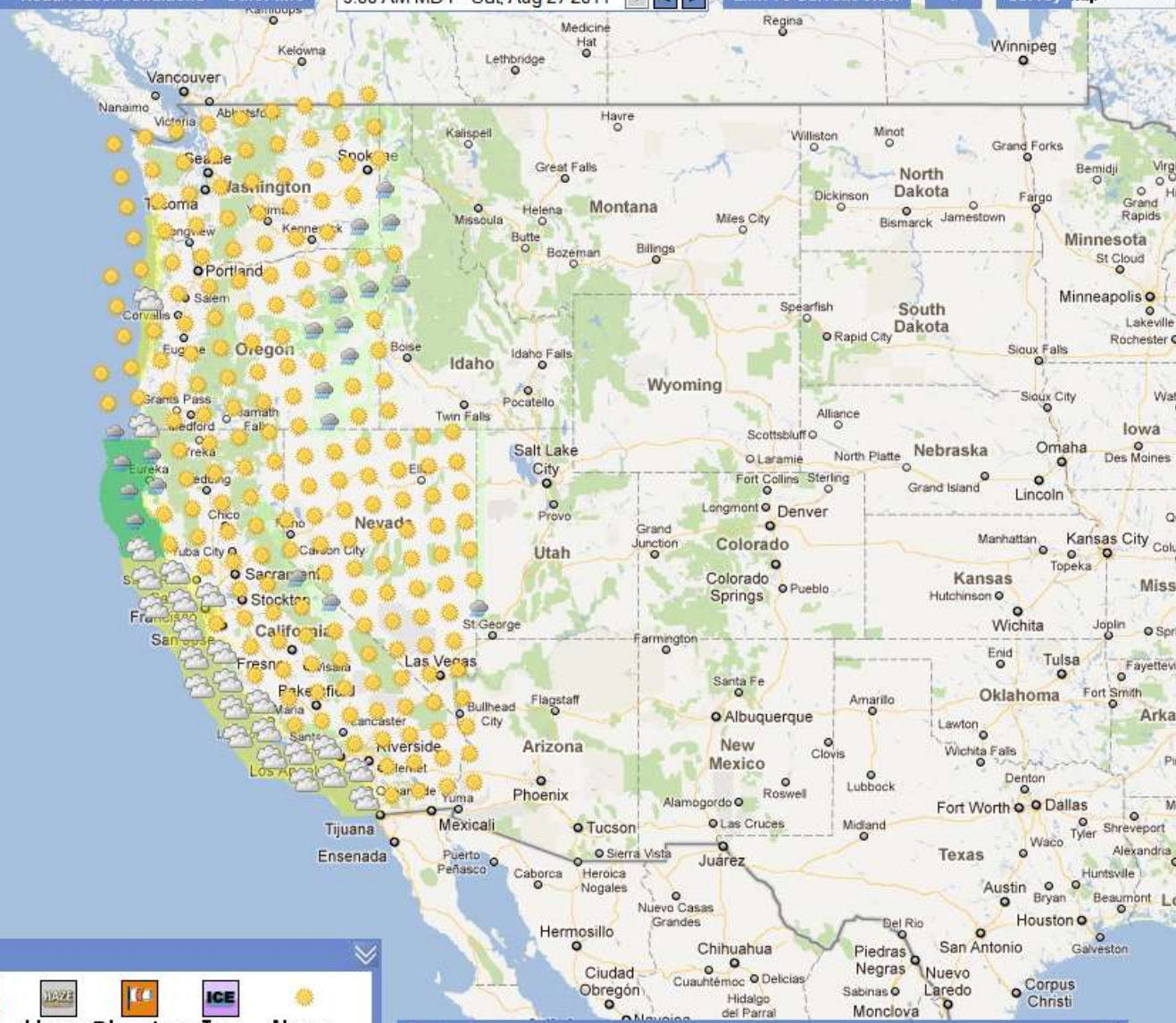
Data Sources Identified in Proposal

Source	Dataset	Known Coverage/ Availability
<i>Clarus</i>	ESS Sensor Data	CA, OR, NV, WA
MADIS and Mesowest	Other Weather Sensor Data	CA, OR, NV, WA
NOAA - NWS	National Digital Forecast Database (NDFD)	CA, OR, NV, WA
NOAA - NWS	Weather Warnings, Alerts, Advisories, Special Weather Statements	CA, OR, NV, WA
USGS	Elevation Data	CA, OR, NV, WA
State DOTs	CCTV Images	CA, OR, WA
State DOTs	Chain Requirements	CA, OR
State DOTs	Incidents	CA
State DOTs	Construction	CA, OR
State DOTs	Other Points of Interest: , Vista Points, Rest Areas, Truck Scales	CA

Progress

- FHWA and Consortium members were invited to review the site and comment on it via an evaluation survey. We have compiled results to date.
- In general, we have included all of the anticipated data sets, including coverage of Washington with nearly all layers. (Additional layers have been identified.)
- We're working on the final report ...

An Overview ...



Weather

Fog	Rain	Snow	Severe	Mix	Haze	Blowing	Ice	None

Route Planner

The Layers

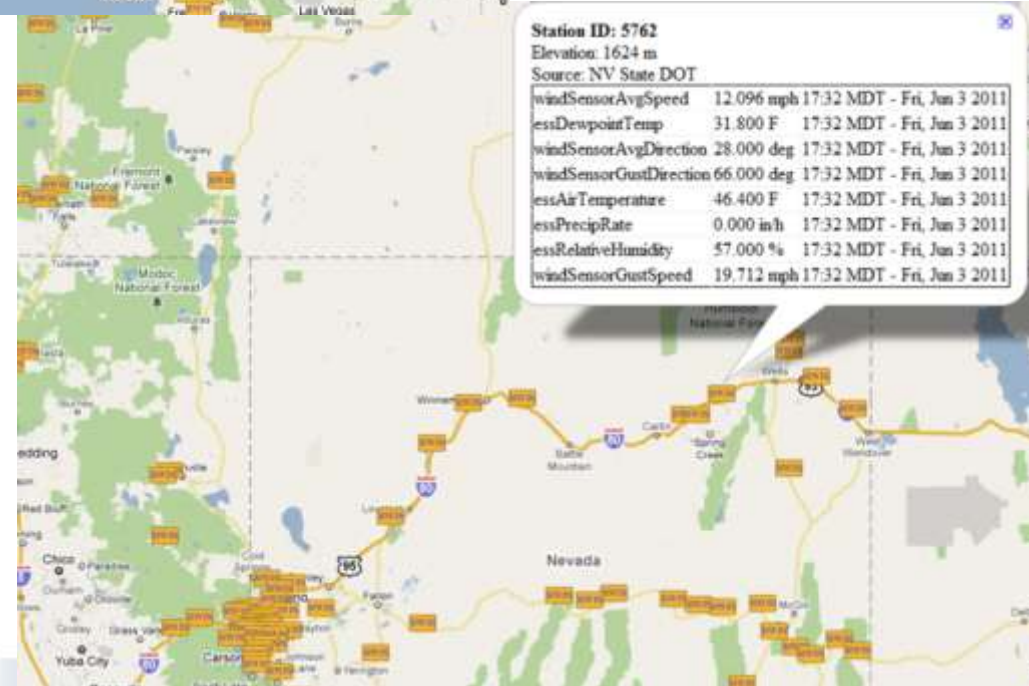
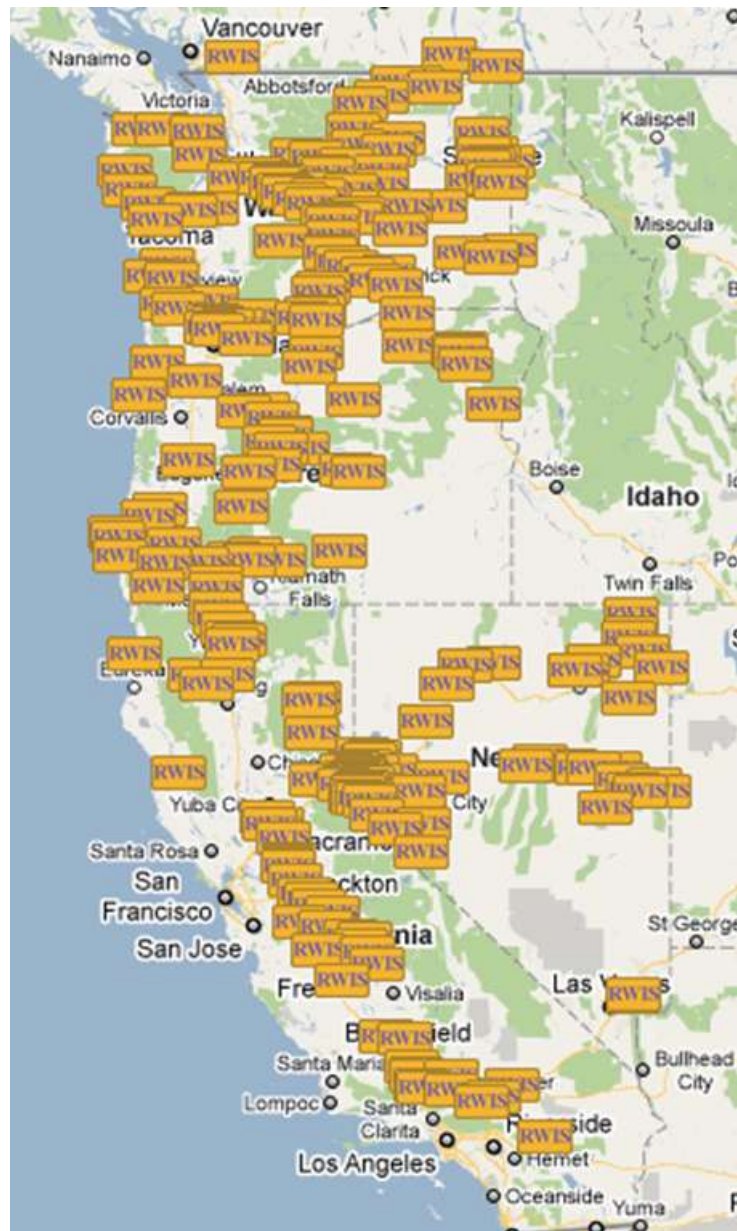
Current Weather	Forecast Weather	Road/Travel Conditions	Other Traveler Info
Air Temperature			
Relative Humidity			
1 Hour Precipitation			
24 Hour Precipitation			
AHPS 24 hr Precip.			
Wind			
Clarus Stations			

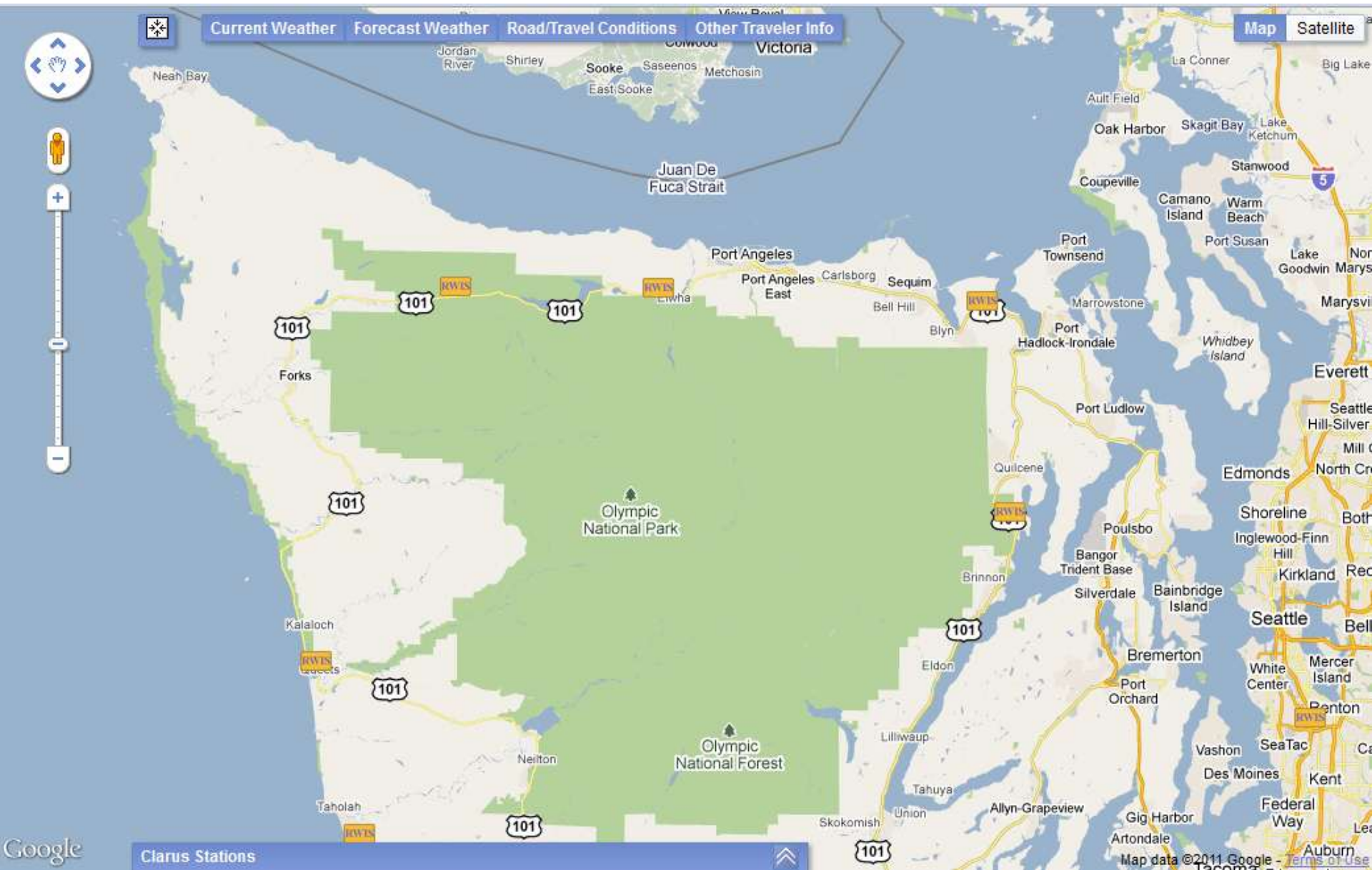
Current Weather	Forecast Weather	Road/Travel Conditions	Other Traveler Info
	Air Temperature		
	Wind Speed		
	Wind Gust Speed		
	Humidity		
	Sky Cover		
	12-Hour Chance of Precipitation		
	6-Hour Precipitation		
	Snow		
	Weather		

Current Weather	Forecast Weather	Road/Travel Conditions	Other Traveler Info
			Chain Requirements
			Road Information
			Incidents
			CMS
			CCTV

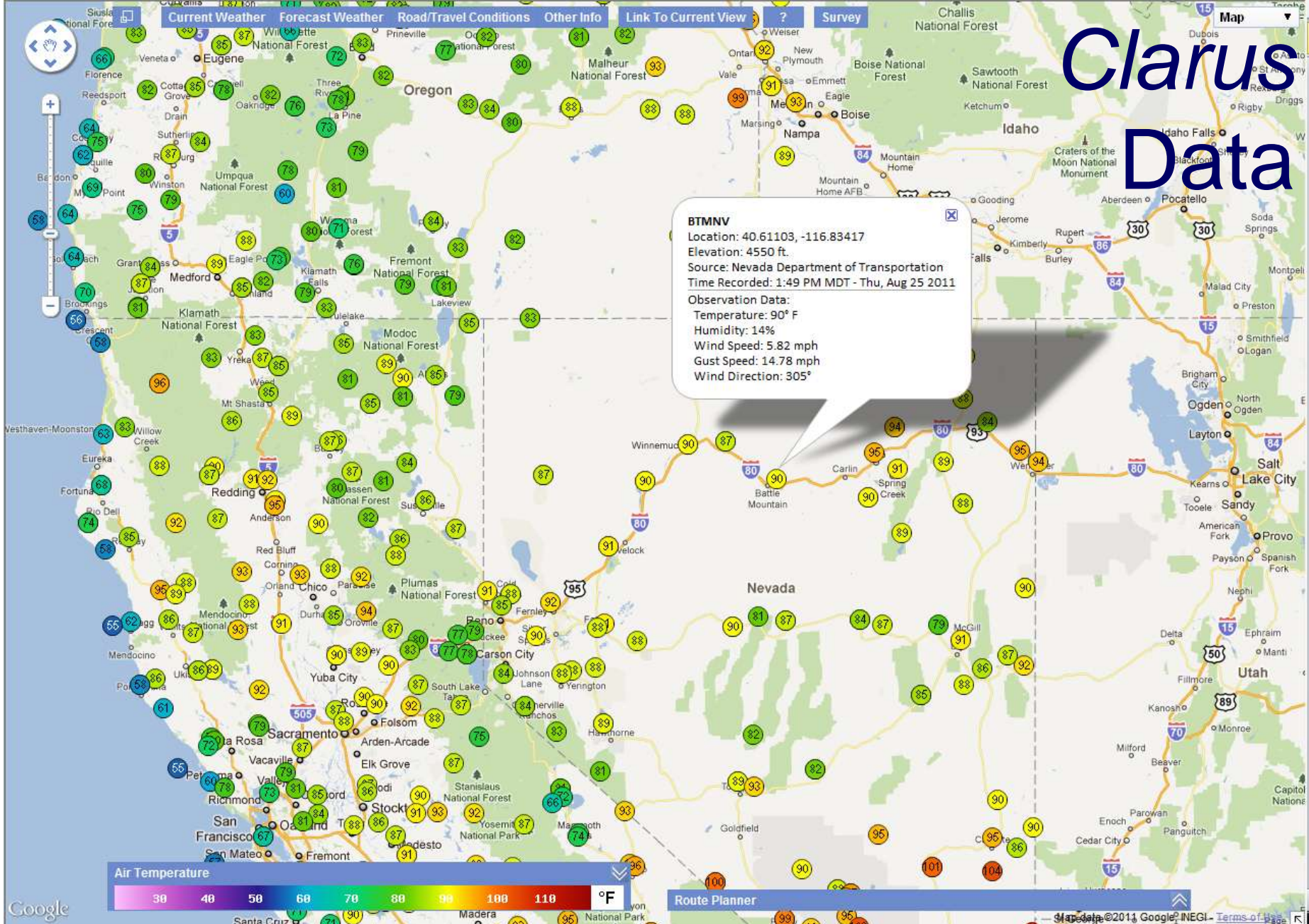
Current Weather	Forecast Weather	Road/Travel Conditions	Other Traveler Info
			Rest Areas
			Features of Interest
			Truck Scales
			Summit Locations

Clarus Data





Clarus Data



CCTV Images



Central Yreka



I-5 at Exit 6 Near Siskiyou Summit

I-5 at Exit 6 Near Siskiyou Summit

Updated: Jun 09 2011 8:05 AM

Looking North



Elevation 4100

TripCheck.com

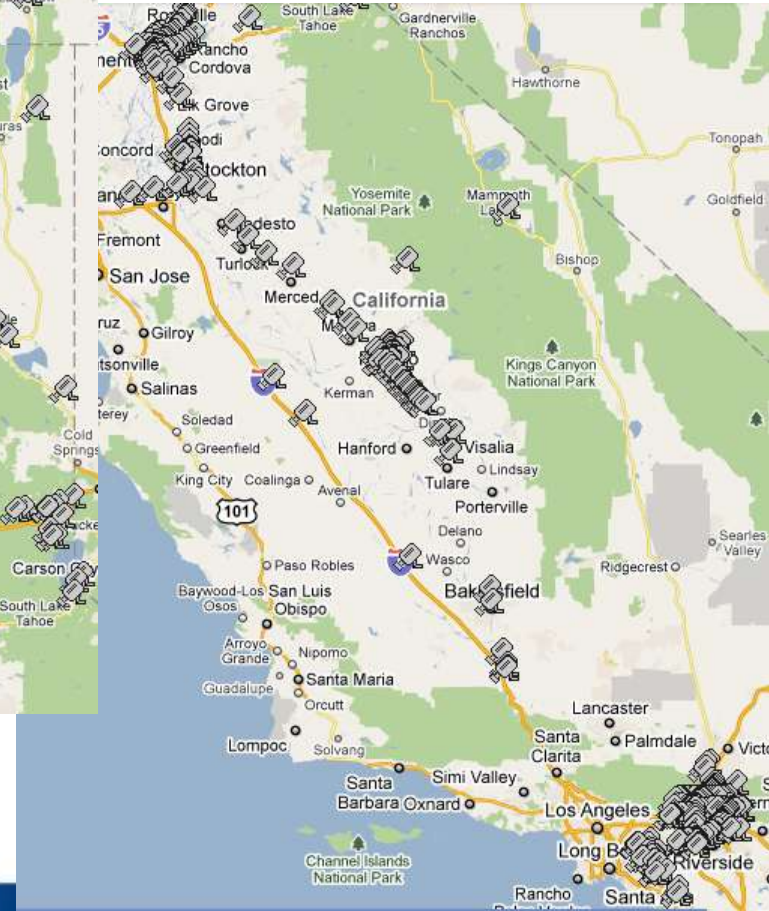
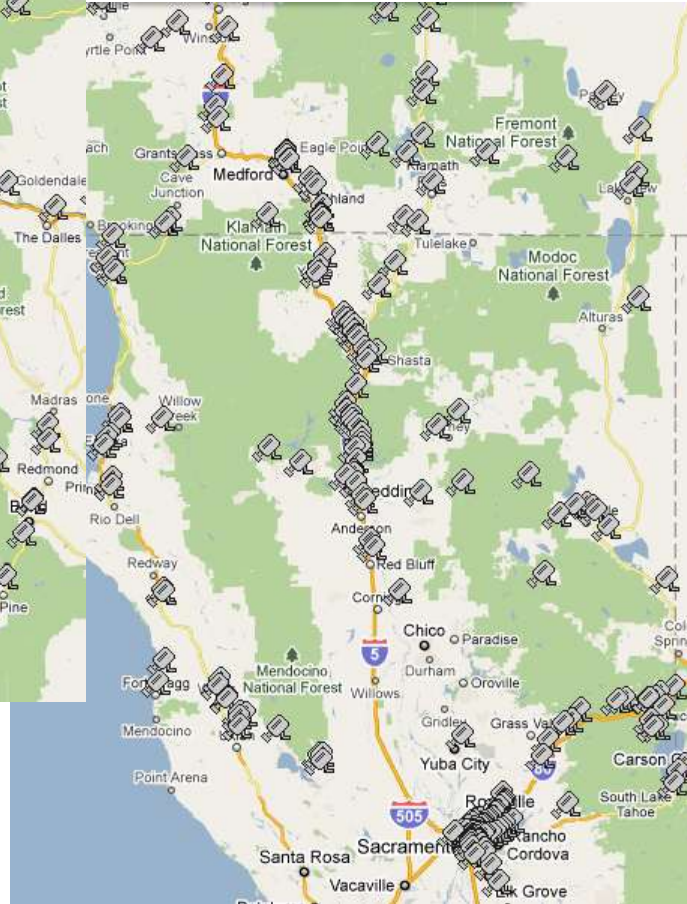
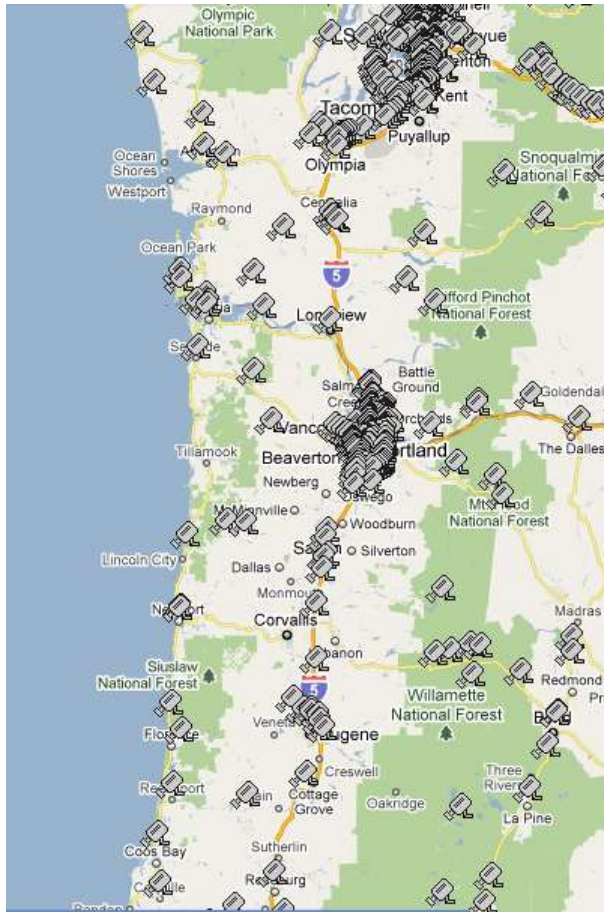
Milepost 5.00

Temperature 51.1F

Wind E

MPH 2

Route Coverage: Los Angeles to Seattle



CCTV Images convey a lot of information ...





Current Weather Forecast Weather Road/Travel Conditions Other Traveler Info

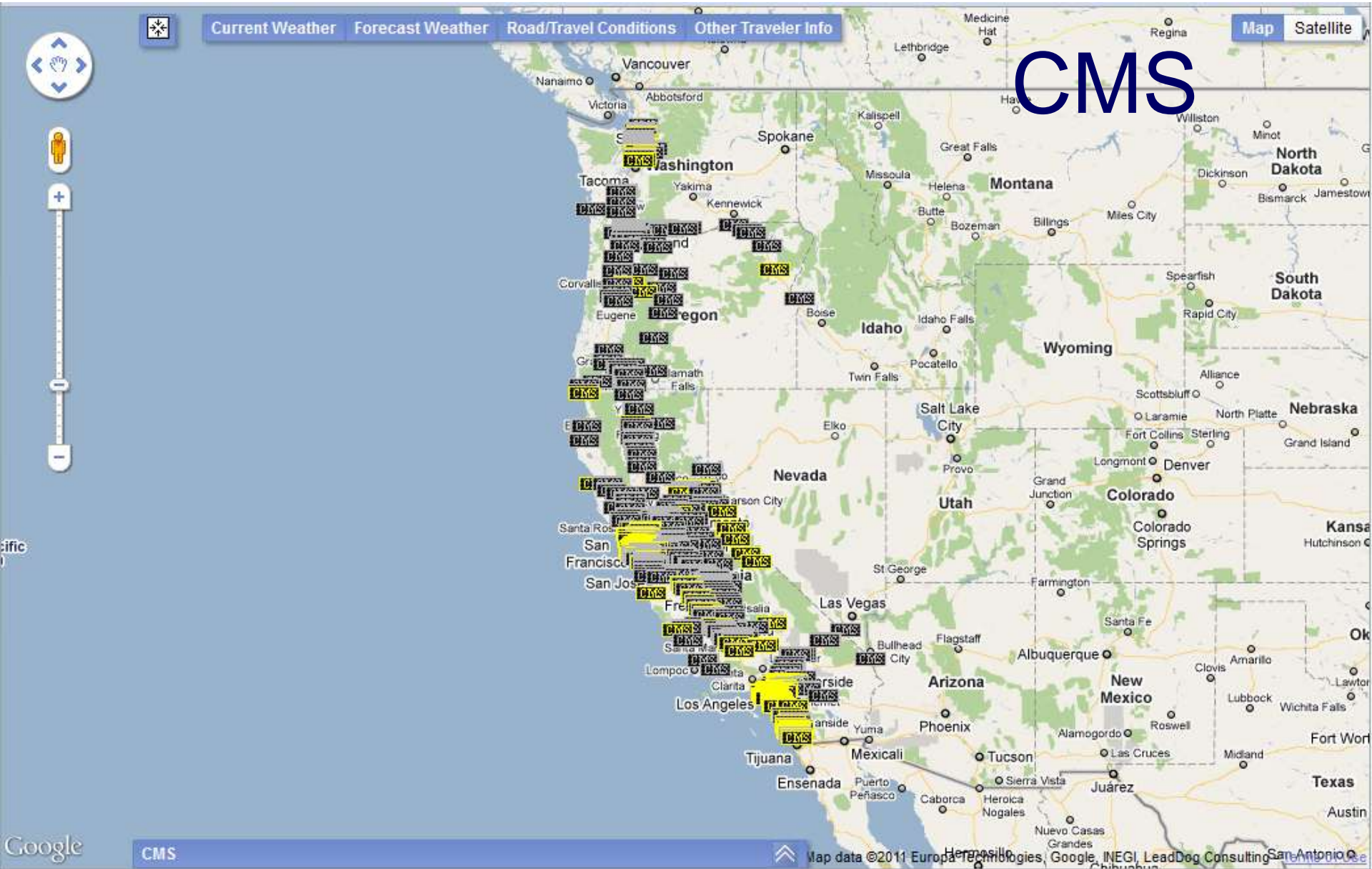
Map Satellite

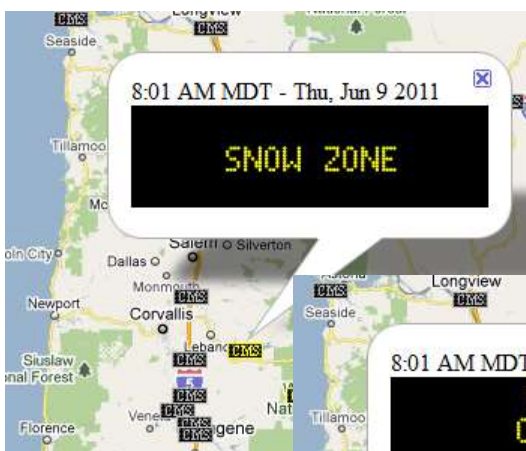


+

-

CMS







Current Weather Forecast Weather Road/Travel Conditions Other Traveler Info

Map Satellite



“Road Information”

ific

Google

Road Information

Map data ©2011 Europa Technologies, Google, INEGI, LeadDog Consulting

HATCHERY CREEK RD

Updated: 5:17 PM MDT - Mon, Jun 6 2011

Type: Construction

Route: 002

Milepost: 91.00

Description: On US 2, west of Leavenworth in Tumwater Canyon Wednesday and Thursday ONLY from 7 a.m. to 4 p.m., on Wednesday and 7 a.m. to noon, on Thursday, expect up to 20 minute delays with single lane flagger controlled traffic while WSDOT Geotech Engineers measure the slope for the steel netting that will be hung when these slopes are stabilized later this summer.

Advice:

UMPQUA

Updated: 8:05 AM MDT - Thu, Jun 9 2011

Type: Maintenance Work

Route: ORE38

Milepost: 18

Severity: Estimated delay under 20 minutes

Description: Traffic control with flaggers for brush cutting crew.

Advice:

Junction w/Route 395 to End of Pavement

Updated: 8:01 AM MDT - Thu, Jun 9 2011

Type: Highway Construction

Route: 270

Milepost: 0

Description: Estimated delay: 20

Advice:

None

Updated: 8:42 AM MDT - Thu, Jun 9 2011

Type: Lane Closure

Route: 090

Milepost: 111.00

Description: Lane Closure for maintenance work on I-90 west bound between milepost 111 to milepost 110 beginning at 7:40 AM on June 09, 2011 until 3:11 AM.

Advice:

PACIFIC

Updated: 8:00 PM MDT - Wed, Jun 8 2011

Type: Commercial Vehicle Information

Route: I-5

Milepost: 0

Severity: Informational only

Description: Effective May 24, 2011, this section of I-5 will be restricted to 16 feet 00 in. in width between the hours of 7:00 AM & 7:00 PM (DAYTIME). Estimated date of completion is June 30, 2011.

Advice:

THE DALLES-CALIFORNIA

Updated: 11:46 AM MDT - Tue, Jun 7 2011

Type: Information

Route: US97

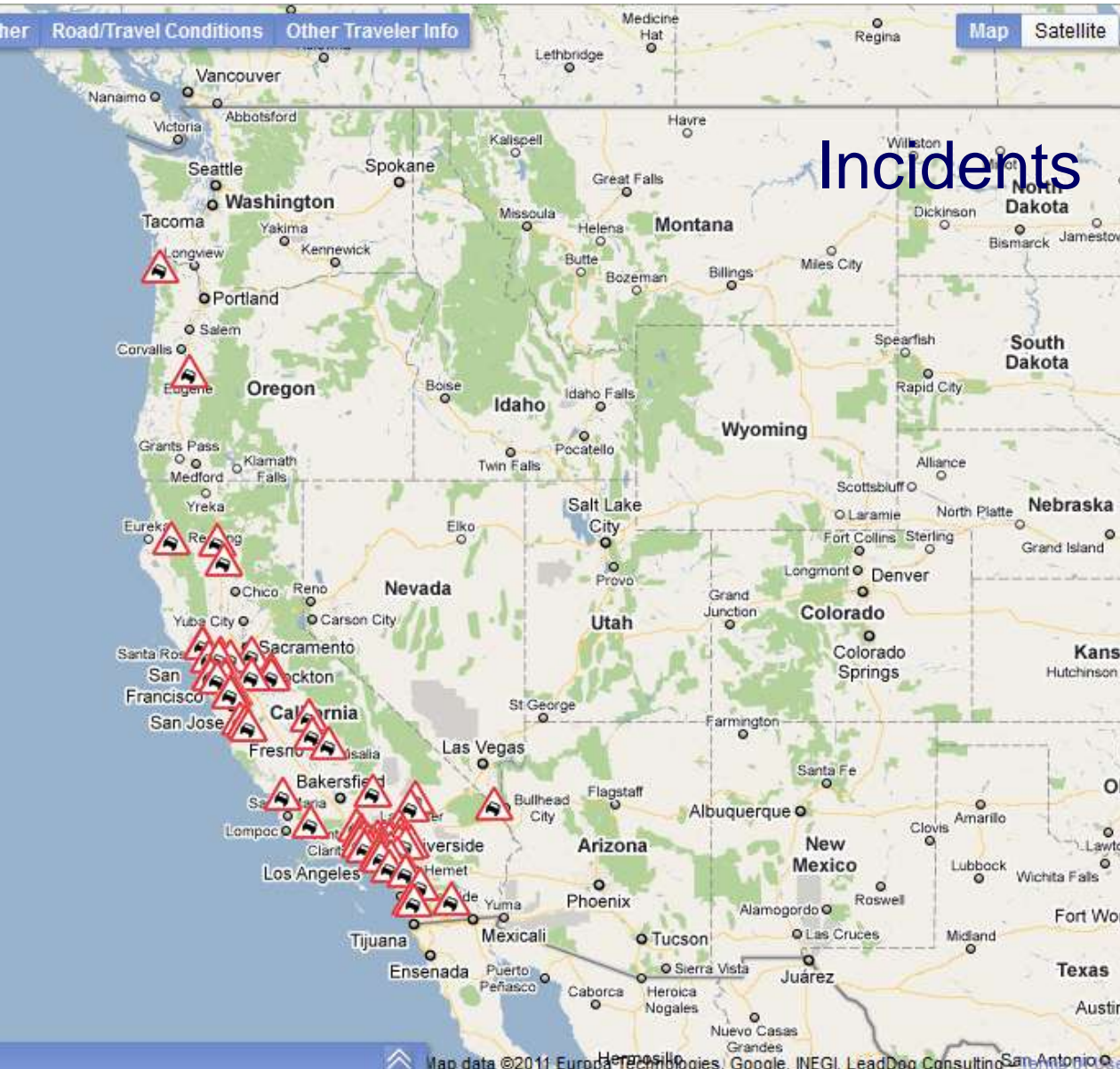
Milepost: 68.9

Severity: Informational only

Description: Cow Canyon Rest Area closed for construction 3/7/11 through 6/25/11.

Advice:

Incidents



Incidents

Map data © 2011 Europa Technologies, Google, INEGI, LeadDog Consulting, and Google

NB I5 JSO NORTH ST ON OFF RAMP

Time: 7:29 AM MDT - Thu, Jun 9 2011

Detail:

8:29AM : 1039 PREMIER
7:15AM : VEH ENTERED SVS //FCN/5431116000994 //TC
6:57AM : 1039 CALTRANS
6:57AM : INFO FOR CALTRANS: APX 10 OF GUARDRAIL DAMAGE / END OF GUA
6:54AM : A/C HAS 15 MIN ETA
6:47AM : 1039 SHASCOM / WILL INQ W/ SGT AND ADVISE
6:46AM : PLS ROLL A/C FOR 1 PUPPY/ BOTH OCCUPANTS WILL BE TRANSPORTI
6:38AM : 1039 PREMIER TOW
6:38AM : ROLL 1185
6:31AM : VEH IN DITCH ON E/SIDE OF RDWY
6:31AM : 1039 SHA CALFIRE
6:30AM : 1039 SHASCOM
6:30AM : JUST SAW SMOKE AND PEOPLE RUNNING ALSO SAW SKID MARKS
6:29AM : SOLO VEH OFF THE RD

NB SR99 AT PAIGE AV

Time: 10:33 AM MDT - Thu, Jun 9 2011

Detail:

9:33AM : WHI BIG RIG, WITH LG LOAD
9:33AM : BIG RIG HAULING LANDSCAPING ROCK, IS TILTED OVER TO 1 SIDE READY TO FALL



NECANICUM

Time: 12:43 PM MDT - Mon, May 23 2011

Route: ORE53

Milepost: 11.25

Type: Crash/Hazard

Severity: Estimated delay under 20 minutes

Detail:

The road surface has collapsed, use caution.
Advice:

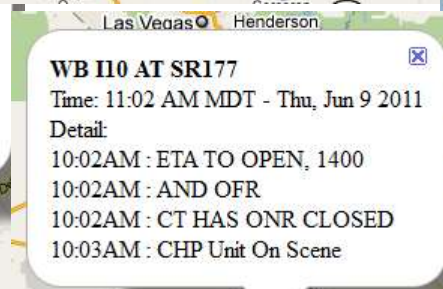


WB I10 AT SR177

Time: 11:02 AM MDT - Thu, Jun 9 2011

Detail:

10:02AM : ETA TO OPEN, 1400
10:02AM : AND OFR
10:02AM : CT HAS ONR CLOSED
10:03AM : CHP Unit On Scene



PACIFIC

Time: 5:46 PM MDT - Wed, Jun 8 2011

Route: I-5

Milepost: 175.4

Type: Crash/Hazard

Severity: Estimated delay under 20 minutes

Detail:

A crash has occurred, use caution.

Advice:



SR14 AT CALIFORNIA CITY BLVD

Time: 10:30 AM MDT - Thu, Jun 9 2011

Detail:

9:32AM : 59-1 WILL CHECK LOG 457 FIRST THEN THIS LOG
9:30AM : GOAT OR A SHEEP WALKING IN THE RDWY
9:41AM : CHP Unit Assigned



SB I5 JNO CAMINO CAPISTRANO

Time: 9:39 AM MDT - Thu, Jun 9 2011

Detail:

8:55AM : ALL LANES WILL BE OPEN SHORTLY
8:55AM : PER 57, FSP CLEARING EVERYTHING TO THE RS
8:53AM : 1039 S&K
8:51AM : #4 IS BLOCKED
8:50AM : FSP 97 W/ BLK TOYT PK - JNO CAM CAP - FIRE 97
8:44AM : PART BLKG SLOW LN
8:41AM : 1039 STA 91
8:39AM : VEH INTO RS RAILING , BLEW A TIRE
8:50AM : CHP Unit On Scene
8:56AM : CHP Unit On Scene





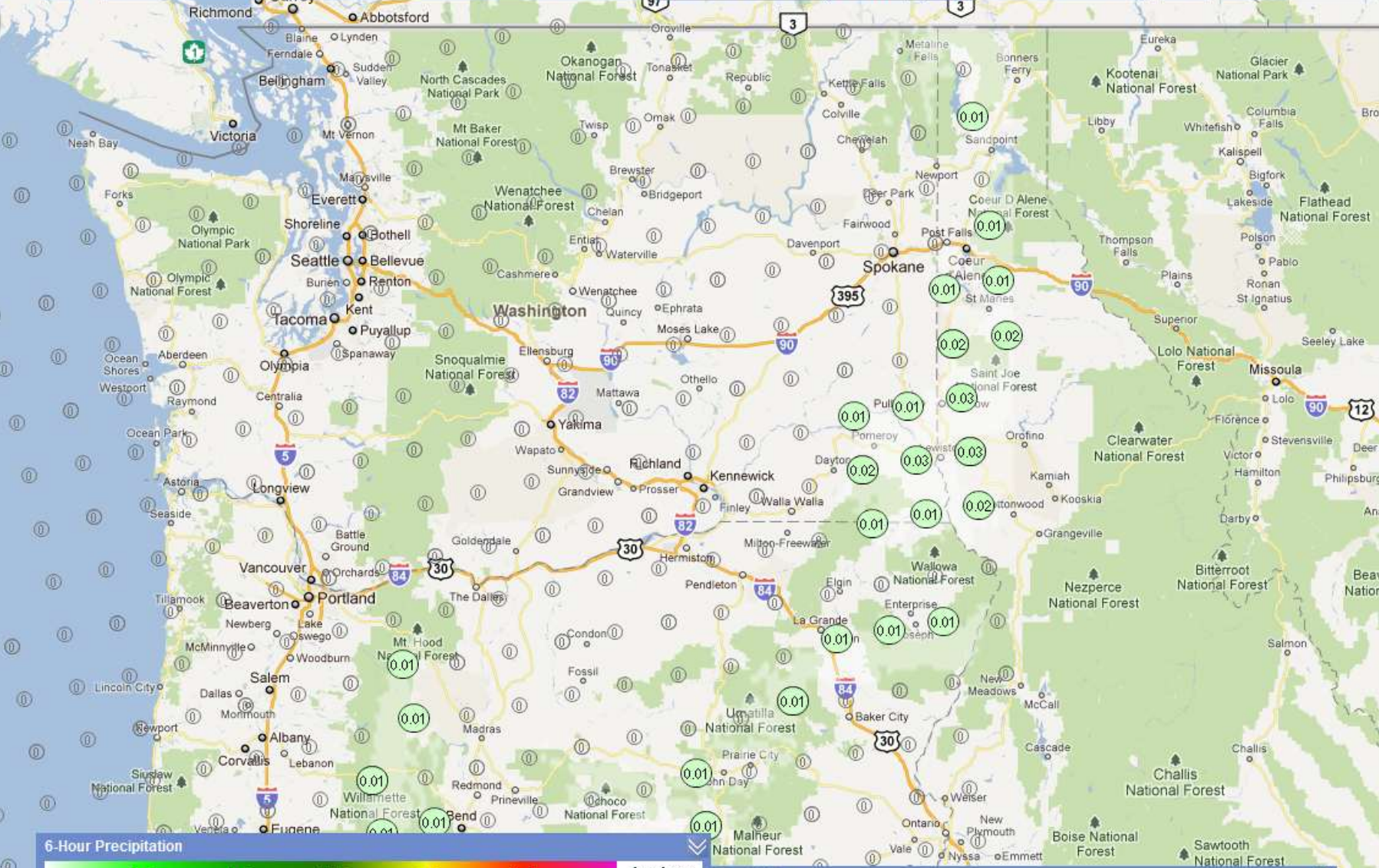
Weather Forecasts

- 3:00 AM MDT - Sat, Aug 27 2011
- 6:00 PM MDT - Thu, Aug 25 2011
- 9:00 PM MDT - Thu, Aug 25 2011
- 12:00 AM MDT - Fri, Aug 26 2011
- 3:00 AM MDT - Fri, Aug 26 2011
- 6:00 AM MDT - Fri, Aug 26 2011
- 9:00 AM MDT - Fri, Aug 26 2011
- 12:00 PM MDT - Fri, Aug 26 2011
- 3:00 PM MDT - Fri, Aug 26 2011
- 6:00 PM MDT - Fri, Aug 26 2011
- 9:00 PM MDT - Fri, Aug 26 2011
- 12:00 AM MDT - Sat, Aug 27 2011
- 3:00 AM MDT - Sat, Aug 27 2011
- 6:00 AM MDT - Sat, Aug 27 2011
- 9:00 AM MDT - Sat, Aug 27 2011
- 12:00 PM MDT - Sat, Aug 27 2011
- 3:00 PM MDT - Sat, Aug 27 2011
- 6:00 PM MDT - Sat, Aug 27 2011

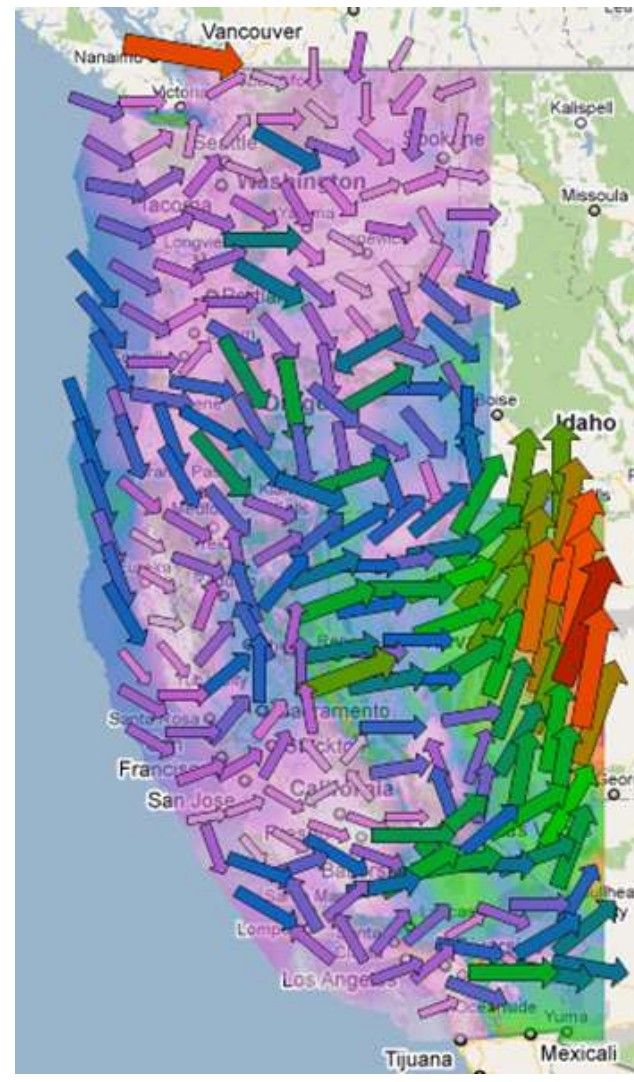
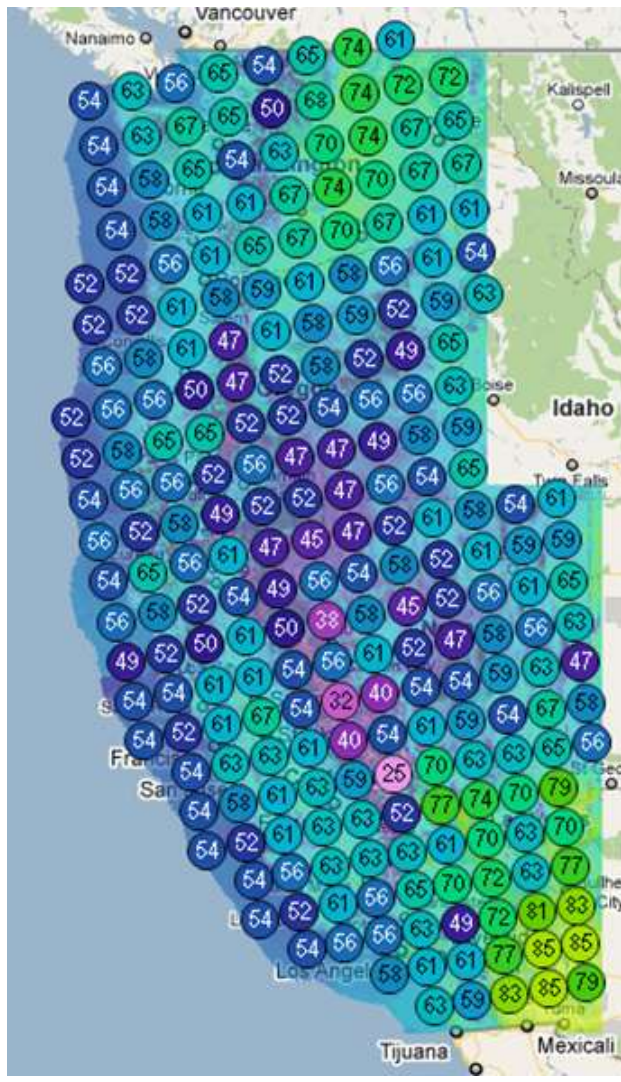
Weather

Fog	Rain	Snow	Severe	Mix	Haze	Blowing	Ice	None

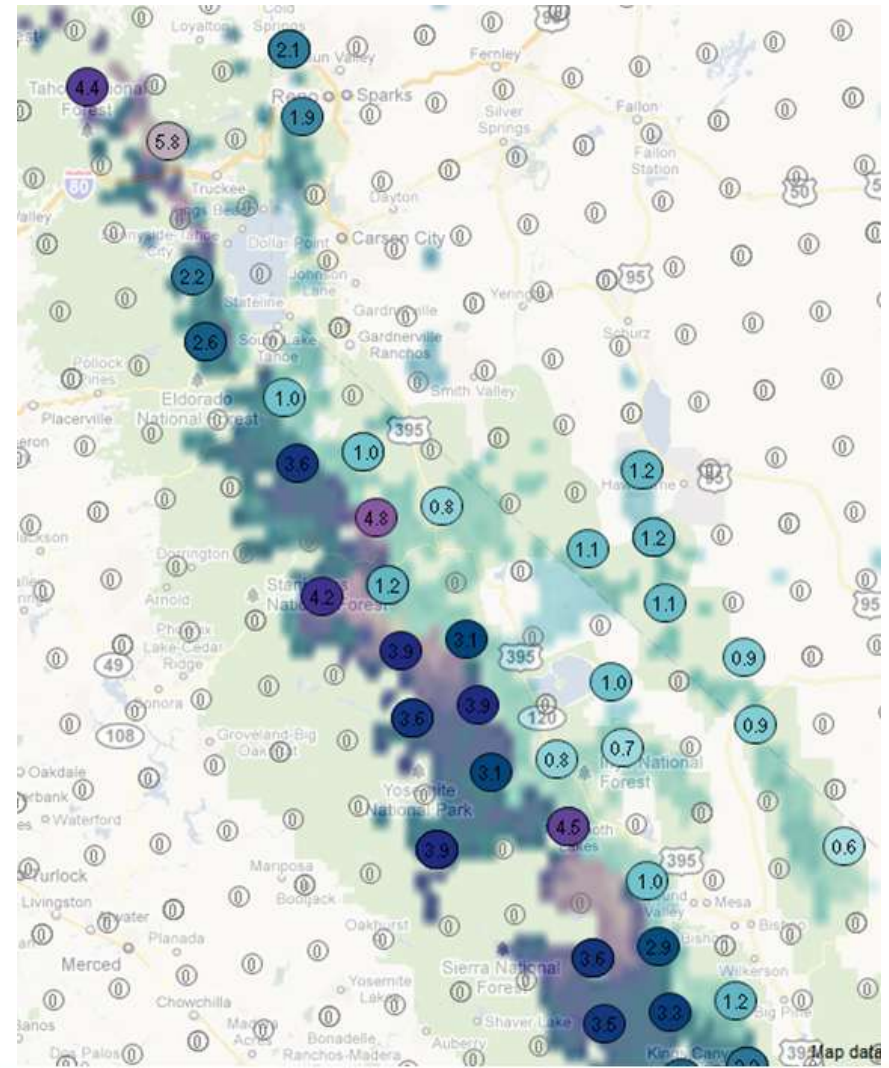
Route Planner

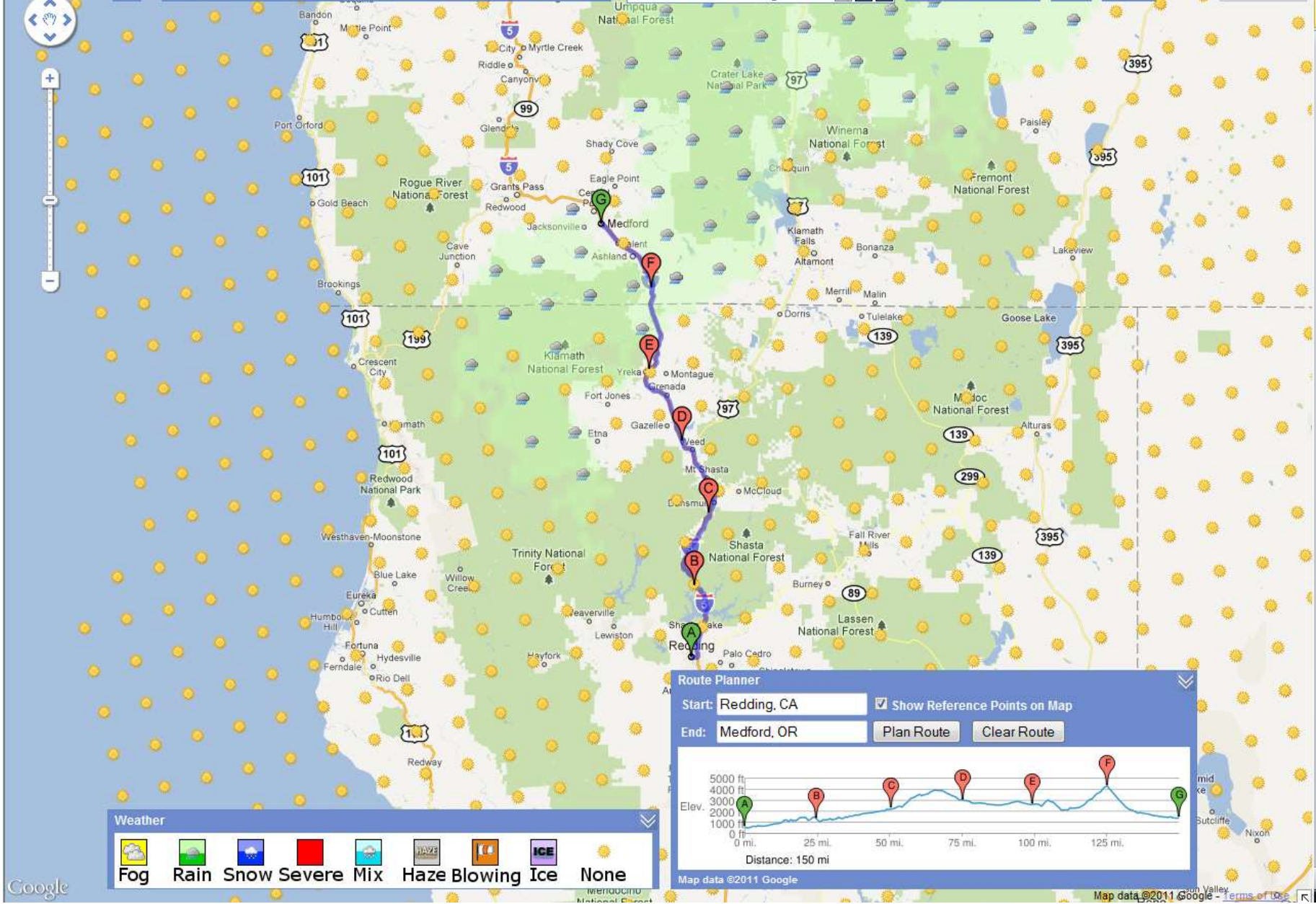


Information at a Glance



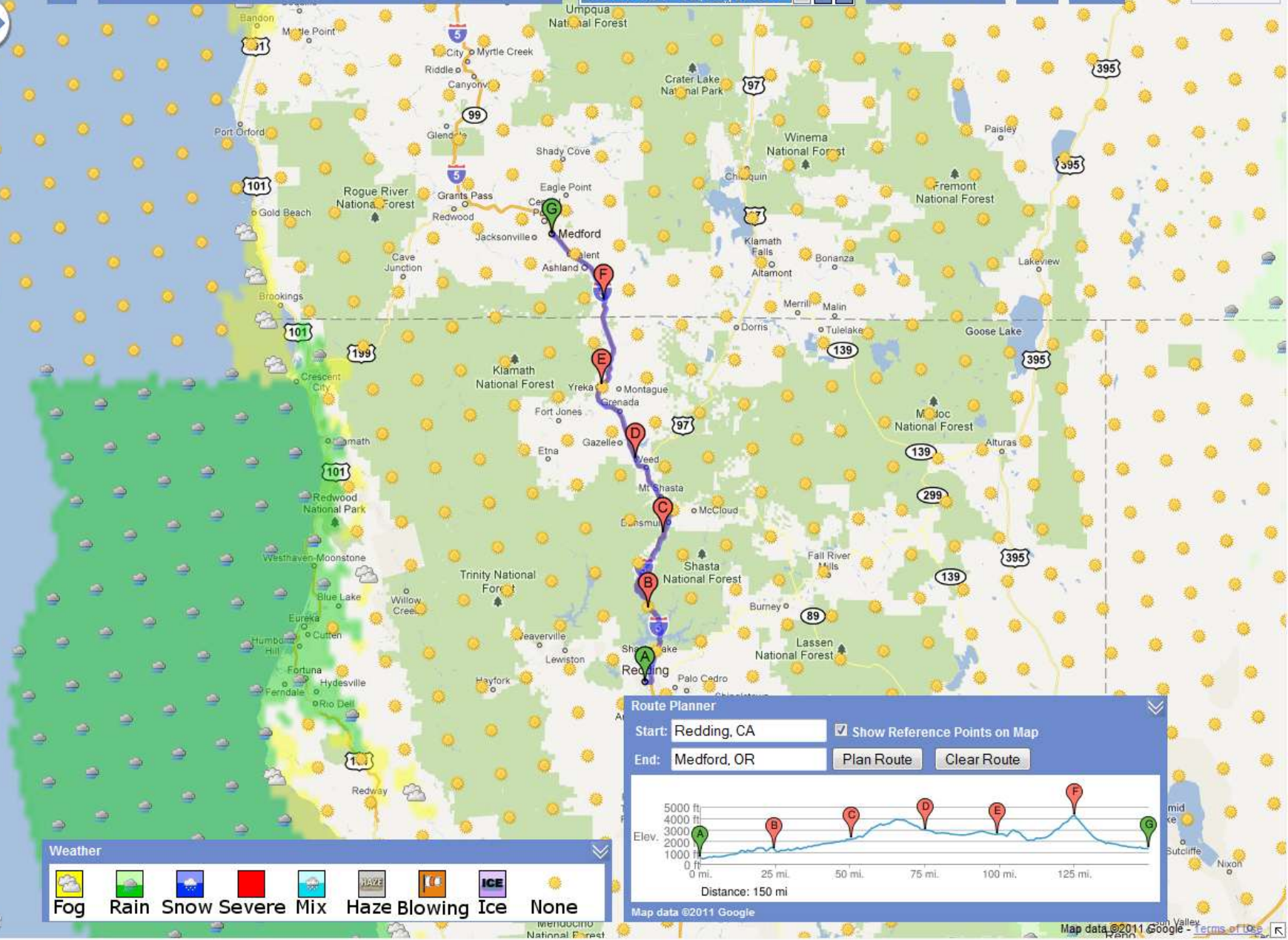
Further Detail Upon Zoom





Google

Map data ©2011 Google



Weather

Fog
 Rain
 Snow
 Severe
 Mix
 Haze
 Blowing
 Ice
 None

Route Planner

Start: Show Reference Points on Map

End:

Distance: 150 mi

18 - DN 101 PM 20.57 - Cushing Creek - FNB
Updated: 2:59 PM MDT - Thu, Aug 25 2011

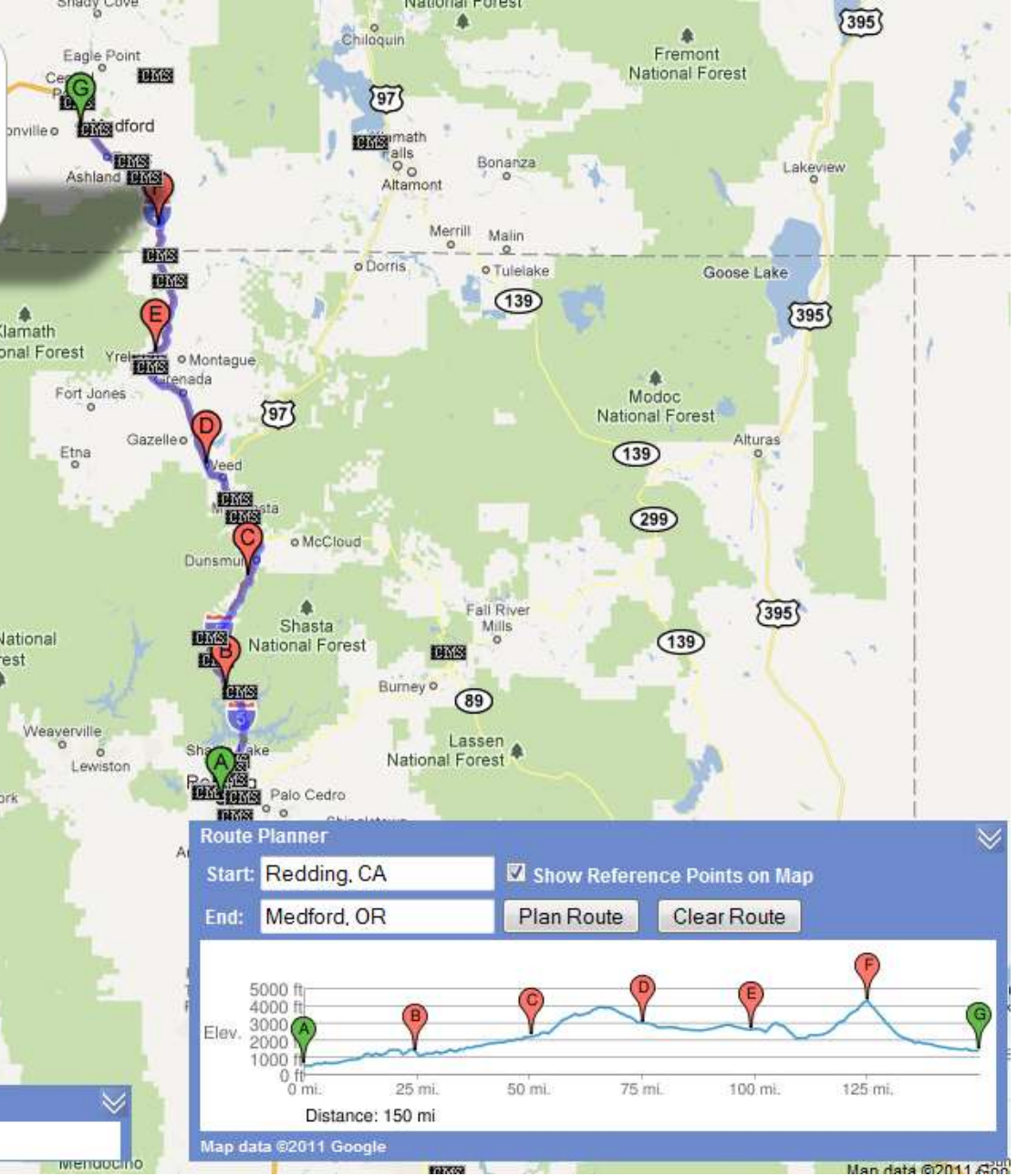
SHARP CURVES
STEEP GRADE

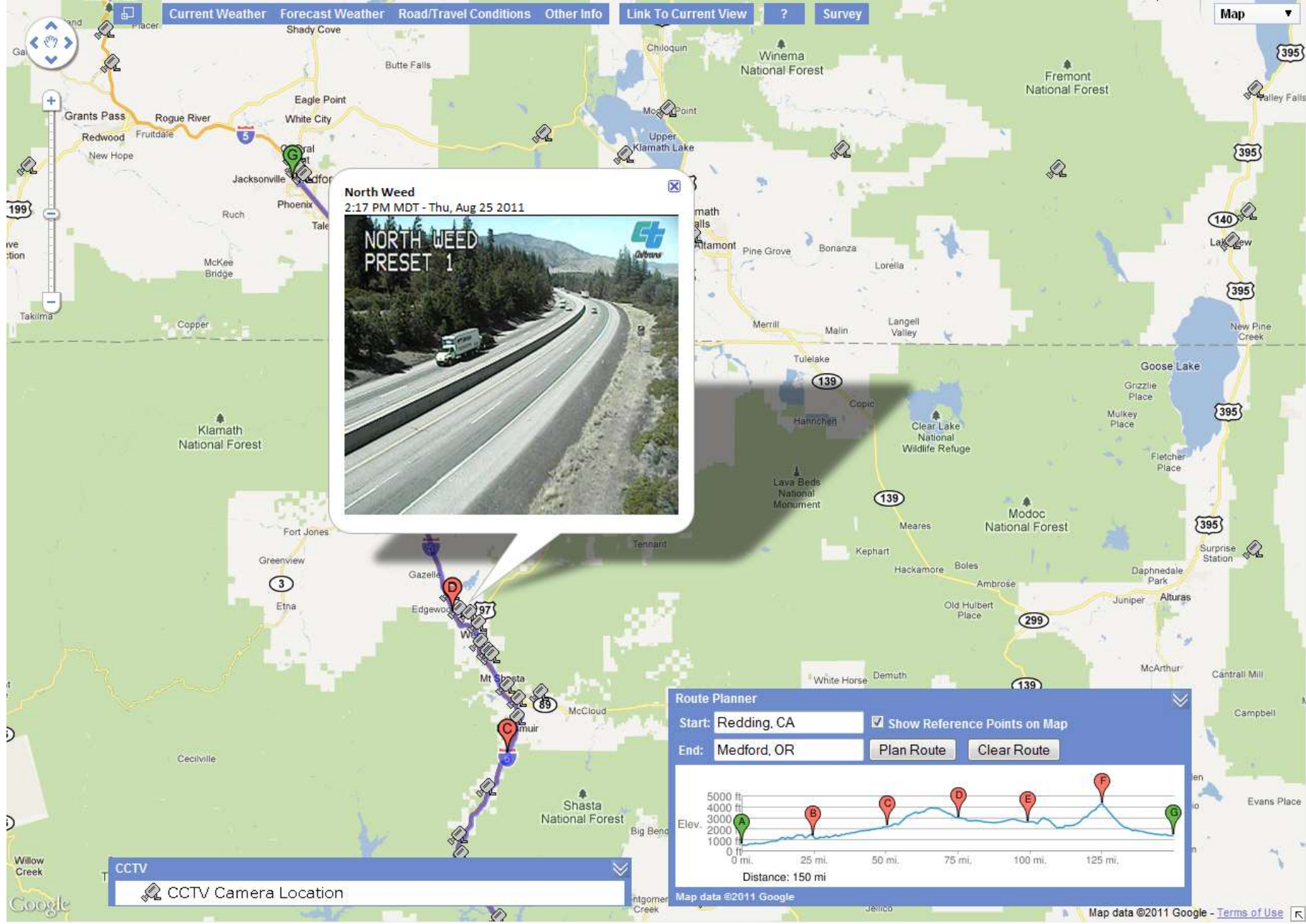
18 - DN 101 PM 20.57 - Cushing Creek - FNB
Updated: 2:59 PM MDT - Thu, Aug 25 2011

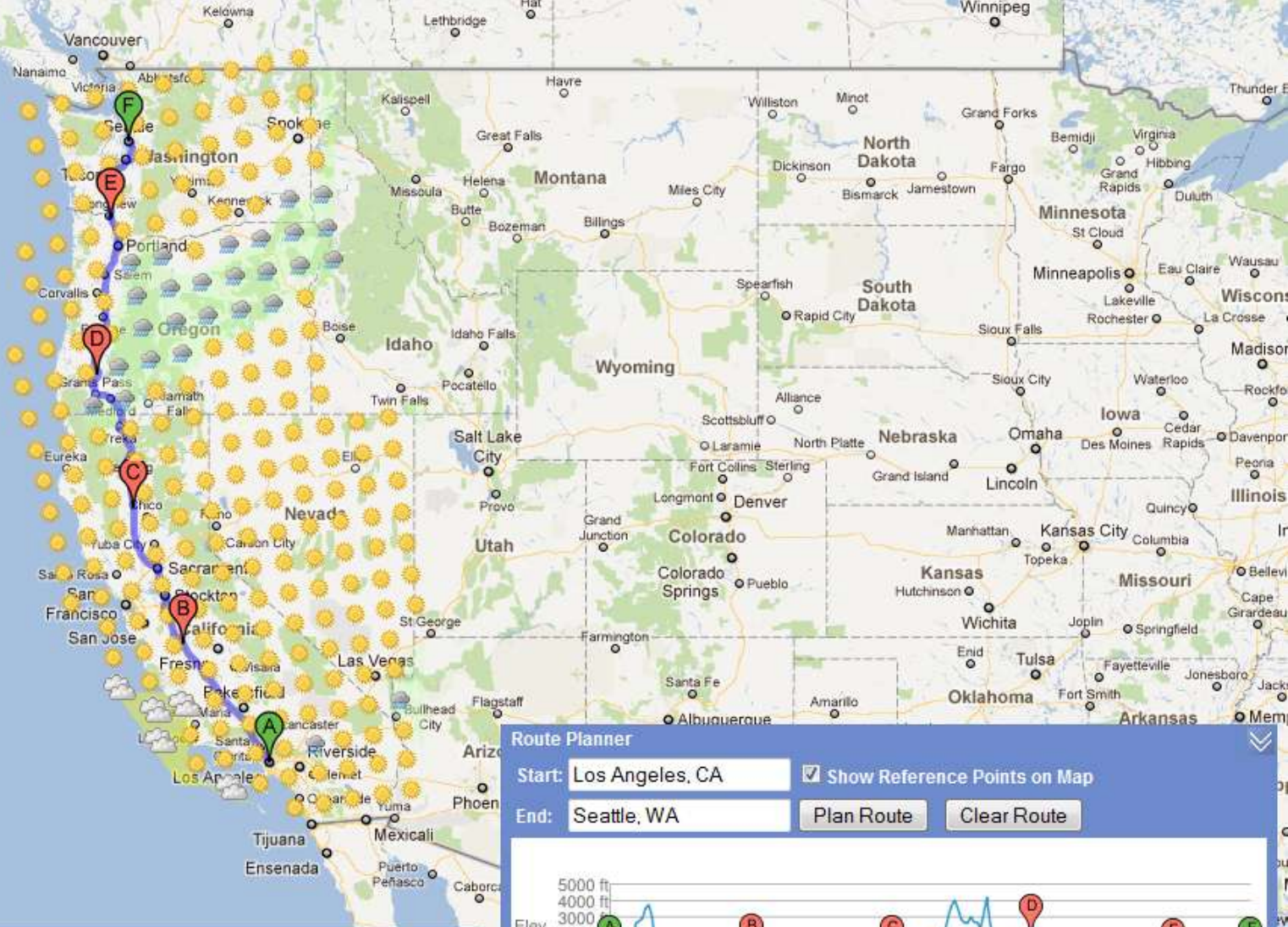
REDUCE SPEED
NEXT 2 MILES

Second Screen
of Message

CMS
Active CMS Blank CMS







Route Planner

Start: Show Reference Points on Map

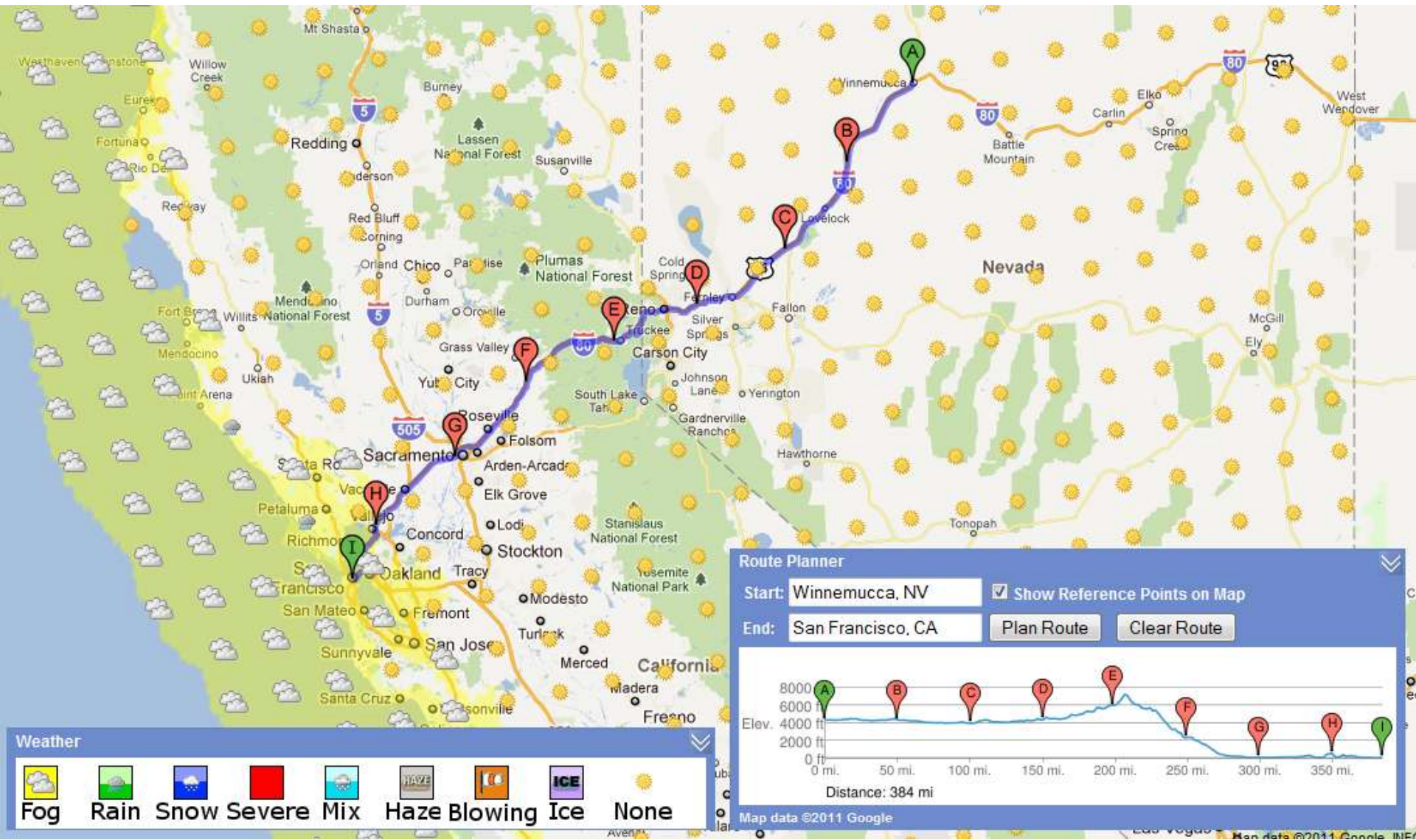
End:

Distance: 1135 mi

Map data ©2011 Europa Technologies, Google

Weather

Fog
 Rain
 Snow
 Severe
 Mix
 Haze
 Blowing
 Ice
 None



Western States
OSS on the big
screen in the
Caltrans
Division of
Research and
Innovation
lobby in
Sacramento



Photo by Sean Campbell

Brief Live Demonstration

- If time, network, etc. allow ...

Western States OSS

- Survey results
 - Total of 13 responses – somewhat expected
 - Responses received from California, Nevada, Oregon, Washington State and Washington, D.C.
 - Survey feedback complimented by data from Google Analytics

Western States OSS

- User visitation

How often do you visit the website?	Response Percent	Response Count
First time visitor	76.9%	10
Website is open all the time	0.0%	0
Hourly	0.0%	0
Daily	0.0%	0
Weekly	23.1%	3
Monthly	0.0%	0
Other (please specify)		0

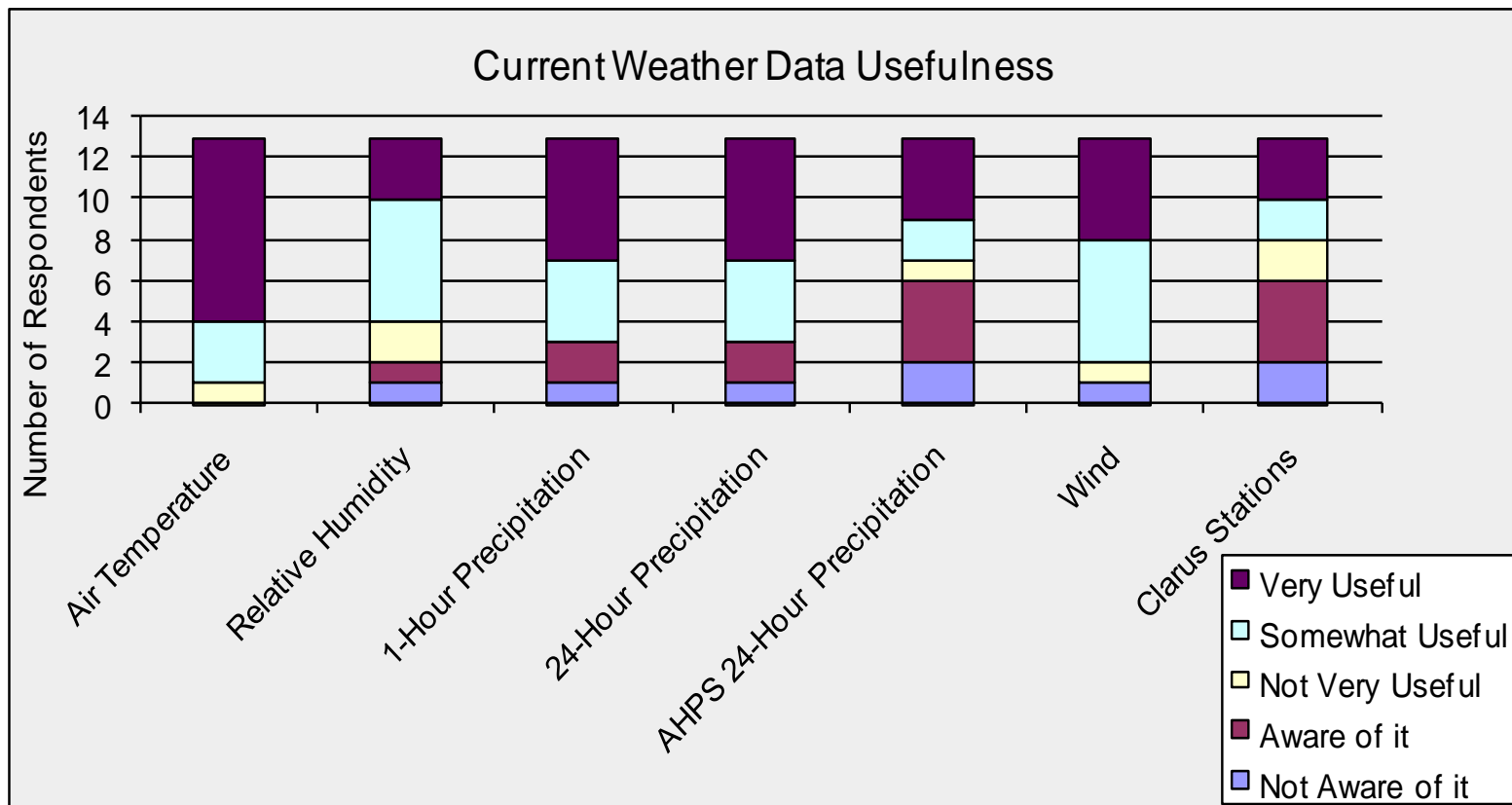
Western States OSS

- Uses of information

When/why will/do you use (or intend to use) the information?	Response Percent	Response Count
Trip planning	92.3%	12
Under changing conditions only	23.1%	3
During incident conditions (storm/fire etc)	61.5%	8
Daytime hours	15.4%	2
Nighttime hours	15.4%	2
Other (please specify)		1

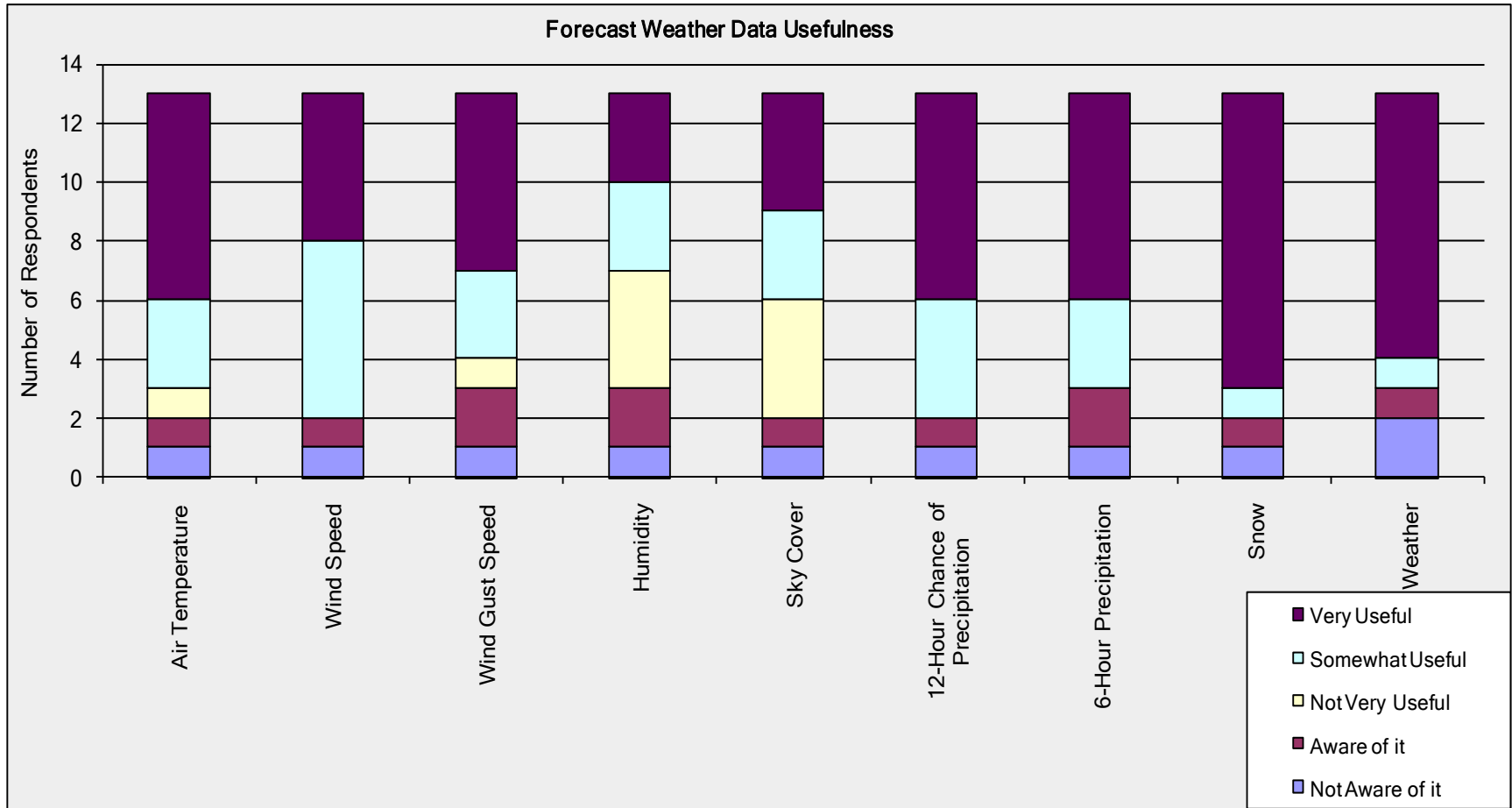
Western States OSS

- Utility of Current Weather Data



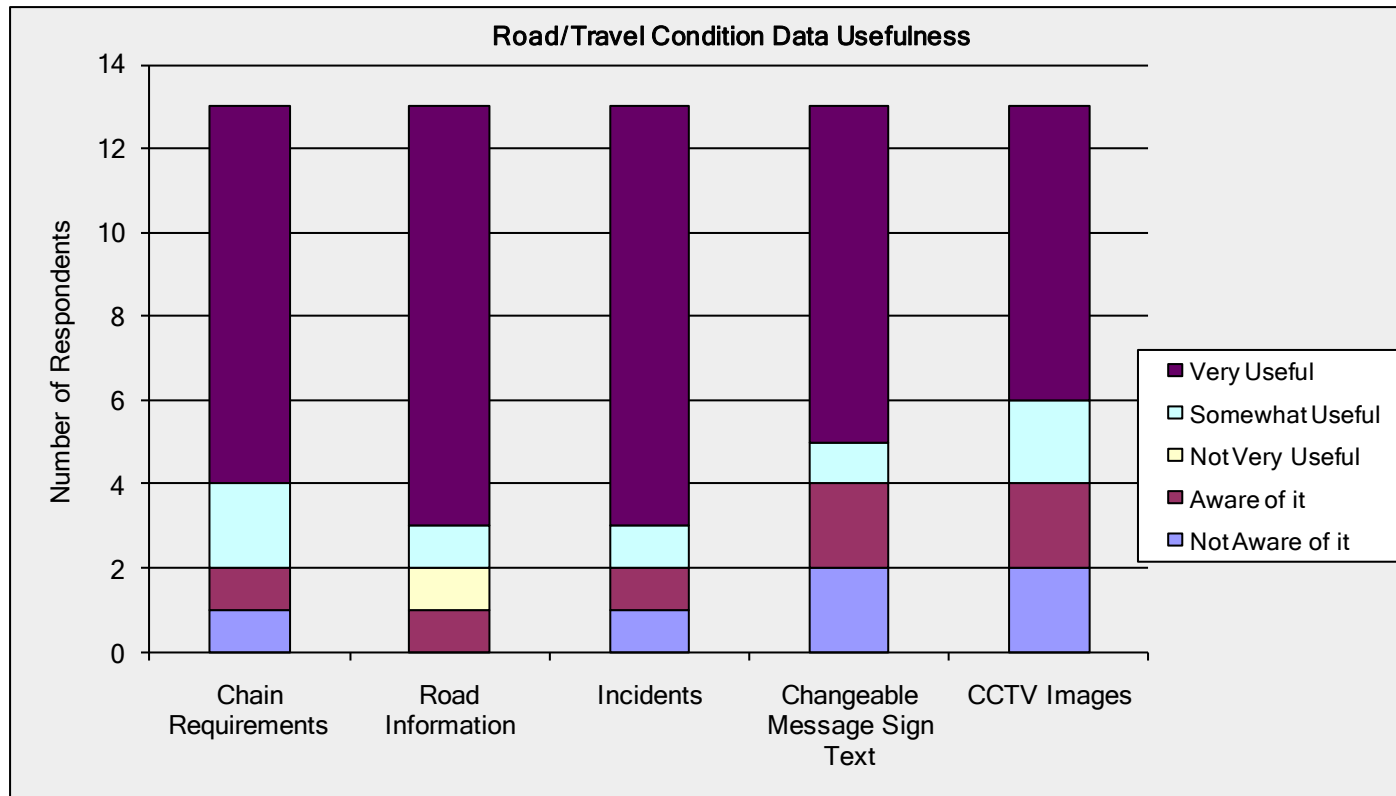
Western States OSS

- Utility of forecast weather data



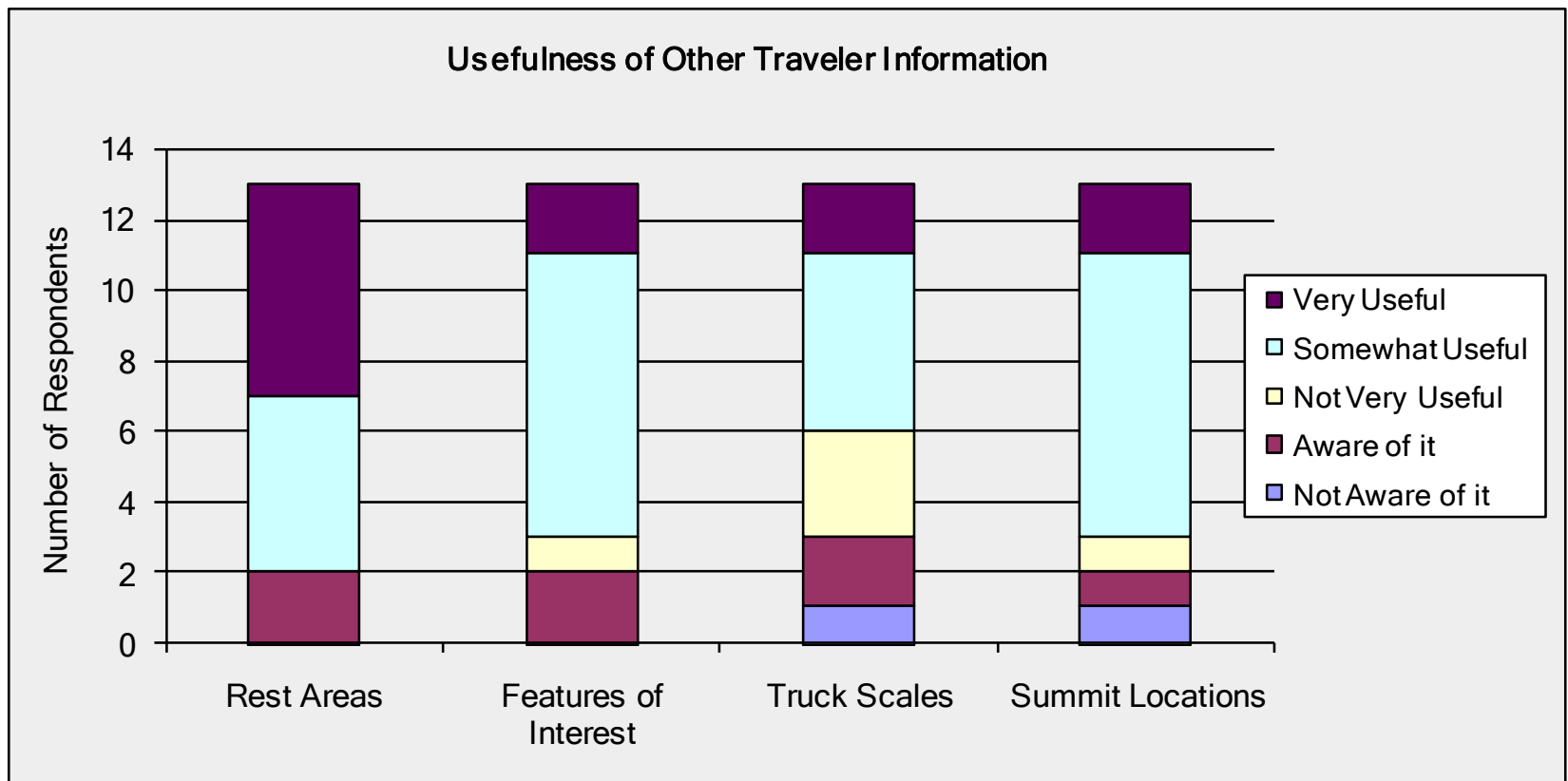
Western States OSS

- Utility of Road/Travel Condition data



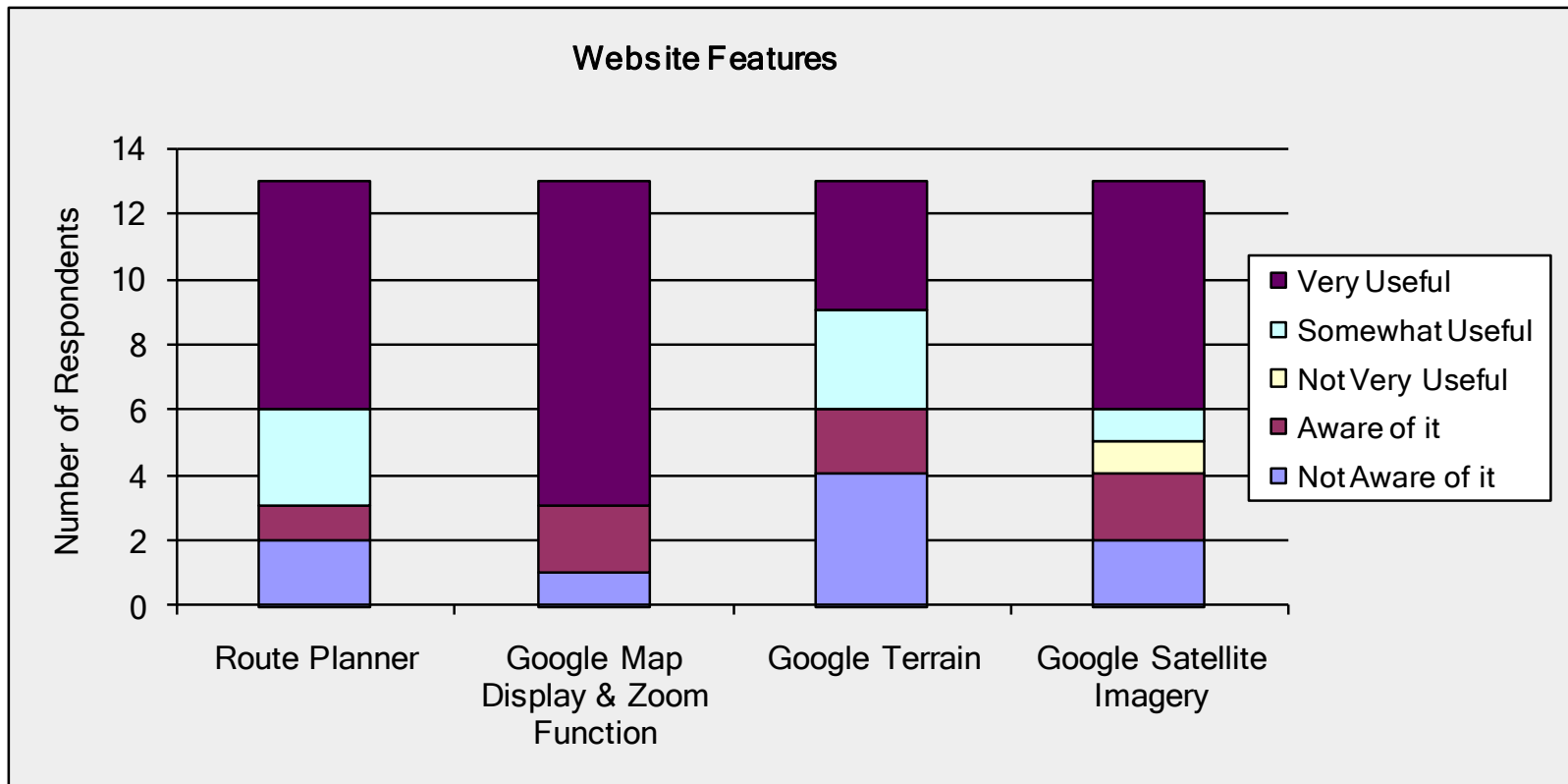
Western States OSS

- Utility of other data



Western States OSS

- Website features



Western States OSS

- Website perceptions

Perceptions of website	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	Count
The site is well organized and user friendly.	6	7	0	0	0	13
The site presents the right amount of information.	5	6	1	1	0	13
I would like to see additional information added.	2	2	5	4	0	13
I would like to see less information presented.	0	3	2	6	2	13
Information should be presented in a different format than the current one.	1	2	3	6	1	13
I find the information presented timely and useful.	9	3	1	0	0	13
I find the information presented accurate and understandable.	7	6	0	0	0	13

Western States OSS

- Feedback on additional data

- *Highway Advisory Radio activation and messages.*
- *Nothing additional, very good content.*
- *There are no Features of Interest for Washington State. Please add.*
- *"It was confusing where some of the functions required that you click on the icons to obtain information whereas other "icons" were actually the information. There's a bit of a Human Factors element going on here. I realized it after playing with the site, but I wonder if a wider audience might become more easily frustrated.*
- *You may want to consider for the static icons indicating the unit of measurement on the drop down menu (i.e. Celsius vs. F).*
- *More States included, this is an incredible tool and I would use it even more if I could use this for more states. Great job team! Very practical and intuitive! I'm sharing this with everyone that I know who travels in those regions!*
- *Continuous profile of weather forecast. Especially precipitation and alerts for potential ice/chain control on roadways.*
- *Under the "Road/Travel Conditions" tab I would like to see flow data available as an option. WSDOT data is available through our API at: <http://webpub3qa.wsdot.wa.gov/traffic/api/>*

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- Benefits of website

- *Weather on route I'm taking, information on potential travel delays.*
- *Pre-trip planning and the ability to actually view conditions (CCTV, Chain Control, CMS, etc.) along a route seamlessly.*
- *Provides information concerning road conditions and weather forecasts on one website.*
- *Being able to actually see the road and weather conditions via the CCTV images is great. Seeing the things that could affect travel, such as incidents and construction, right on the map is definitely useful. The terrain is also interesting and gives a good perspective. The wind display is just cool.*
- *Information for road travel.*
- *Weather hobbyist and amateur radio operator. This site will be interesting from a hobby point of view and will be helpful during bad weather.*
- *Current and future weather conditions along planned route. Current incidents and future/ongoing roadwork along planned route.*
- *There are so many, I love that you can see the CMS signs, that gives great data to a traveler, and to be able to see them in advance, awesome, The weather forecast data was very useful as was the current weather data. I love all of the different features on here.*
- *Trip planning.*

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- Website improvements

- *The route planning box covers up part of the route on my screen. If planning box could be moved rather than the map being moved on the screen reading would be easier.*
- *More information in Nevada. Alerts. Quality control or flags? Current weather sky cover.*
- *It was hard to understand some of the coding for the areas cited, for instance when looking at the temperature for a certain area.*
- *Road Information has too many flags. Noticed that one closure had hundreds of flags going along the length of the closure. It is too much and overkill. Is there a way to separate out the daytime and nighttime closure? There's generally a lot more nighttime closures which overpowers the daytime closure flags. Most commuters/non-commercial drivers are only interested in daytime closures.*
- *I have accessed this site from different PCs/networks and load and refresh rates seem a bit sluggish. This will not inhibit me from using the site.*
- *Present "Route Planner" more prominently and, as an option, limit Road/Travel Condition icons to the planned route only. The temp and other weather circle icons on the map make it very busy. Try making the weather and temperature "circles" an optional display or another alternative is to simply remove the circles and use text only on a color map.*
- *Again, I thought it was very intuitive, I would just like to see it include more states to add to its usefulness*
- *User guide videos (short 1-3 mins) will be useful as well because I don't think we are used to having this much useful information in one place!*
- *Currently you can only see one "Road/Travel Condition" element at a time. It would be nice if these features were layers on the base map that could be overlayed, enabling us to see several different features concurrently.*

Western States OSS

- Website improvements

- *There is a lot of potential with this project. The work done to date is very good. Speed and performance are much improved. Weather info is useful and the forecast info is good. Need to do quite a bit of work on the look and feel. Menu at top is disjointed and is distracting - make one blue bar across the top with the pull downs. Need to launch with elements and other road related conditions first. Weather is important but should be secondary to the elements (meaning it is all there as it is now but you go to it generally after you have looked at the elements and what is happening on your route). Should come up with elements first (CCTV, CMS, RWIS, HAR, Construction, Chain Control and Incidents) and at a zoom level that is workable. Don't try to show the entire region on the big map upon launching the site. Use a small map (shows just the entire WSRTC region) on the right that has a movable box showing the area covered by the big map. When a new user gets into the site, determine where they are from by their ISP and orient the big map location using that info. They can then move where they want from there (using the small right hand map or on the big map) and adjust the zoom level on their own. When the route planner is launched, show the route on the small map (in addition to part of the route covered on the big map) and orient the big map at the starting point of the route. Try to show the markers associated with mountain passes along the route. I have a few other things we can discuss later.*

Western States OSS

- Site visits

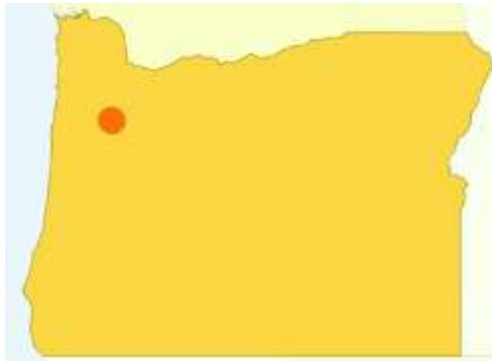
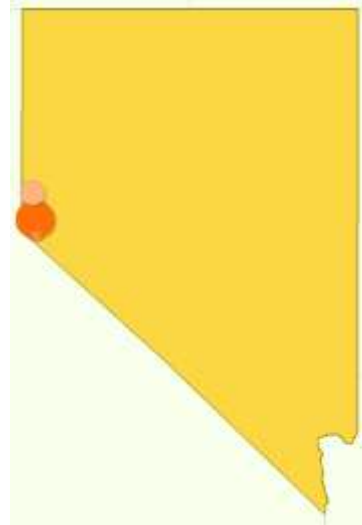
Day	Visits
Wednesday, August 3, 2011	55
Thursday, August 4, 2011	28
Friday, August 5, 2011	32
Saturday, August 6, 2011	0
Sunday, August 7, 2011	2
Monday, August 8, 2011	43
Tuesday, August 9, 2011	13
Wednesday, August 10, 2011	7
Thursday, August 11, 2011	8
Friday, August 12, 2011	4
Saturday, August 13, 2011	2
Sunday, August 14, 2011	0
Monday, August 15, 2011	10
Tuesday, August 16, 2011	11
Wednesday, August 17, 2011	12
Thursday, August 18, 2011	5
Friday, August 19, 2011	6
Saturday, August 20, 2011	3
Sunday, August 21, 2011	3

- Location and duration

Region	Visits	Avg. Time on Site (sec)
Montana	121	514.51
Washington	45	424.97
California	32	158.03
Nevada	27	331.77
Oregon	10	587.90
Texas	2	413.00
Colorado	2	367.50
District of Columbia	2	2713.50
New York	1	0.00
New Mexico	1	1197.00

Western States OSS

- Access locations



Western States OSS

- Access and compatibility

Browser	Visits	%
Internet Explorer	118	0.483607
Firefox	69	0.282787
Chrome	21	0.086066
Safari	20	0.081967
Opera	11	0.045082
Android Browser	5	0.020492

Operating System	Visits	%
Windows	215	0.881148
iPad	13	0.053279
Macintosh	6	0.02459
Android	5	0.020492
(not set)	2	0.008197
iPhone	2	0.008197
Linux	1	0.004098

Western States OSS

- Browser versions

Internet Explorer Versions:		
Browser Version	Visits	%
8	60	0.508475
7	51	0.432203
9	5	0.042373
6	2	0.016949
Firefox Versions:		
Browser Version	Visits	%
5.0	28	0.405797
5.0.1	25	0.362319
3.6.18	6	0.086957
3.6.20	4	0.057971
4.0	3	0.043478
3.6.17	1	0.014493
4.0.1	1	0.014493
6.0	1	0.014493

Chrome Versions:		
Browser Version	Visits	%
13.0.782.107	14	0.666667
12.0.742.122	3	0.142857
13.0.782.112	3	0.142857
12.0.742.112	1	0.047619
Safari Versions:		
Browser Version	Visits	%
6533.18.5	15	0.75
534.5	3	0.15
532.2	1	0.05
534.8	1	0.05
Opera Versions:		
Browser Version	Visits	%
11.5	11	1

Western States OSS

- Marker event selections
- Layer event selections

Event Action	Total Events
CCTV	394
Air Temperature	166
Incidents	158
CMS	157
Road Information	89
Clarus Stations	33
Features of Interest	20
Summits	15
Chain Control	14
Wind	8
Rest Areas	5
Truck Scales	4
Humidity	3
Precip 1hr	3
Precip 24hr	3
Weather	2

Event Action	Total Events
CCTV	76
Incidents	67
Road Information	62
CMS	61
Air Temperature	48
Temperature	36
Wind Speed	34
Clarus Stations	26
Features of Interest	23
Rest Areas	23
Chain Control	22
Wind Gust	22
Wind	21
Weather	20
Pop 12	18
Humidity	17
Precipitation 1hr	16
AHPS	14

Western States OSS

- Evaluation conclusions
 - Website examined by a number of users
 - Visits and surveys from all WSRTC states
 - Well received based on survey feedback
 - Useful insights obtained for future improvements/updates
 - Analytics data show that both weather and traveler information was of interest
 - Still need feedback from goods movement and law enforcement users

Tasks and Deliverables

Contract Start = 9/24/2010

Actual Start = 11/1/2010

End=9/23/2011

	project month	1	2	3	4	5	6	7	8	9	10	11	12
System Concept													
• Concept Report		D✓											
Requirements													
• Technical Memorandum – Requirements			D✓										
Design and Development													
• Technical Memorandum – System Design					D✓								
• Technical Memorandum – System Documentation									D				
• Completed System									D✓				
• User Guide									D✓				
Evaluation/User Survey													
• Survey Instrument										D✓			
• Final Report											D	↩	D

Duration = 12 months

Amount of Award = \$79,995

Western States OSS Phase 2

- Caltrans (\$150,000) and WTI (\$50,000) funded via WSRTC
- To start in late 2011.
- Prepare the system for wider use.

Western States OSS

Try it out:

<http://clarusoss.weathershare.org/>

Questions?