

Western States One-Stop Shop for Rural Traveler Information Requirements Document

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Prepared for the
Federal Highway Administration
United States Department of Transportation
Washington, D.C.

December, 2010

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ACKNOWLEDGEMENTS

The authors wish to thank the Federal Highway Administration for its financial support of this work. They also thank the Western States Rural Transportation Consortium for its contributions to the scope of this project. Finally, the authors thank Sean Campbell, Ian Turnbull, Ed and Lamkin of Caltrans, Galen McGill of the Oregon Department of Transportation, Ted Bailey of the Washington Department of Transportation and Denise Inda of the Nevada Department of Transportation for their support of this work.

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Revision History

| Version | Description | Date |
|----------------|--------------------|-------------------|
| 1.0 | Draft | December 28, 2010 |
| 2.0 | Revised Draft | January 18, 2011 |
| 3.0 | Finalized | January 21, 2011 |
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1.0 Scope of System

One of the primary items of interest to travelers on the nation's roads, particularly those who will be traveling long distances, is the weather they will encounter en-route. While existing real-time traveler information services provide some weather and other information to travelers, the breadth and depth of useful information currently offered is limited. Existing systems are typically designed to conform to specific jurisdictional lines, such as state boundaries, whereas many trips will span multiple such jurisdictions. While many entities have sought to provide traveler information via the Internet, the result has been considerable variation in the level of detail provided. This is particularly true of weather information, which is often provided only for major routes in a manner that may not be decipherable to the average traveler.

Real-time traveler weather information is a valuable tool in maintaining and enhancing both traveler safety and mobility. From a safety perspective, it is important for travelers to know before a trip about potential challenges that may impact their travel, including snow, ice, high winds and other hazards that may degrade mobility. While such information may currently be available through a variety of sources, there is inconsistency in the types and quality of information available. In addition, the information is generally scattered over numerous web-based (and sometimes non-web-based) sources, meaning travelers must spend significant amounts of time assembling this information before making a trip. As a result of the effort involved with compiling this information, many travelers do not seek out all the information they need, if they even choose to seek it at all. This may result in increased delays and diminished safety for the traveler.

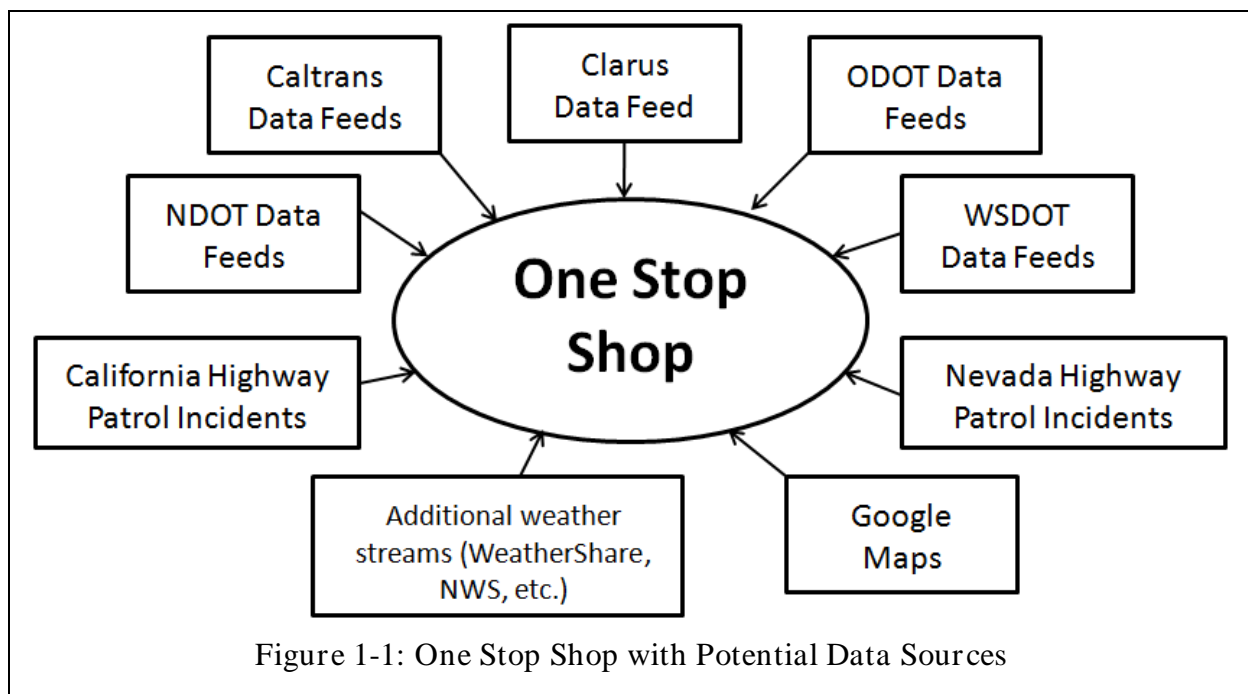
To address the shortcomings of current web-based weather information sources for travelers (and transportation agency personnel), this project will develop a website displaying multi-state Clarus Environmental Sensor Station (ESS data), along with other information streams as available, such as Intelligent Transportation System (ITS) field elements, closed circuit television camera images (CCTV), planned and active closures, incidents, weather sensor readings from non-DOT sources (National Weather Service forecast information, etc.) and other features. The objective of this project, therefore, is to integrate a variety of real-time information together in a single web-based location and in a user-friendly format. The region covered will include all of California, Nevada, Oregon and Washington. The developed product will display weather information for this region in a manner that would be easily accessed and understood by users. As a result of this work, the use and presentation of Clarus data across multiple states in conjunction with other traveler information streams will be demonstrated, and travelers and agency personnel will be provided a useful planning and management mechanism.

This document lists the requirements for the Western States One-Stop Shop for Rural Traveler Information (henceforth referred to as the One Stop Shop or website) project's traveler information website. These requirements are new and do not serve to replace or supplement any existing requirements. They reflect the current and expected needs identified by researchers at the Western Transportation Institute (WTI), as well as the entities participating in this research effort with respect to the website which will be developed to disseminate Clarus ESS data and traveler information (defined in subsequent sections) for California, Nevada, Oregon and Washington. The website is a prototype for providing route-based traveler information in a rural

environment. The website will provide the user with all available information for a route based on their trip's specified origin and destination. The primary users of the website will be short and long-distance travelers (i.e. motorists), the goods movement industry (trucking companies), and, to a lesser extent, transportation agency personnel.

The website will provide travelers in the previously cited states with comprehensive, real-time data that can be employed in planning their trip. This information will consist of both traditional information (routing, weather, imagery, etc.), as well as other route-specific information (elevations, rest areas, etc.). As a prototype, the website will provide travelers with an initial design of a web platform that can be reviewed and critiqued, with the opportunity to complete a user survey online following use of the website.

Figure 1-1 illustrates the envisioned One Stop Shop website's data sources. As illustrated, the website serves as the central collector and disseminator of data. Data will be pulled from various agencies data streams for elements of interest, while providing travelers with a seamless presentation of this information in a unified map format. The One Stop Shop will focus on the collection of data from a variety of sources, including Clarus ESS data, the California Department of Transportation (Caltrans), the Nevada Department of Transportation (NDOT), the Oregon Department of Transportation (ODOT), the Washington Department of Transportation (WSDOT), public safety agencies, and Google maps (the trip routing).



1.1 Overview of Existing Systems

At present, Clarus, Caltrans, NDOT, ODOT, WSDOT and other agencies (ex. the California Highway Patrol (CHP)) disseminate the respective information they collect to the public via a number of individual websites. In addition to being provided to the public, the information serves as an important element in an agency management capacity (i.e. data support for traffic

management, etc.). As a result, the data collected via many of these elements are updated with a good level of frequency (i.e. in near real-time).

Data from Clarus is disseminated via its website. Additional weather data from other sources (ex. National Weather Service) is typically disseminated via HTTP or FTP. Finally, weather information presently collected and disseminated by WeatherShare will be employed in the development of the One Stop Shop.

Data from Caltrans is disseminated via a number of mechanisms, of which only limited streams are currently available in a usable format to the public. These include dissemination via District websites, via FTP (Commercial Wholesale Web Portal, or CWWP), and via GIS files (for point features, such rest areas). In addition, messages displayed on CMS signage are available internally via a web text file.

Data from the Nevada DOT is disseminated primarily through agency websites. At present, limited data streams are available in a usable format to the public. This consists primarily of the data presented for Nevada on the traveler information website.

ODOT currently disseminates data through its own central repository, the TripCheck Traveler Information Portal (TTIP). This portal acts as ODOT's version of a data clearinghouse, bringing data from disparate sources together for dissemination via the TripCheck website, as well as for archiving purposes. For the development of the One Stop Shop, Oregon data will be drawn in via this portal, as well as GIS files.

Data from the Washington DOT is disseminated via two primary mechanisms. The first is the department traveler information website, which provides CCTV imagery, incidents and weather information. In addition, messages displayed on CMS signage are available for specific geographic areas. The second mechanism is via GIS files (for point features, such rest areas).

The California Highway Patrol (CHP) provides active incident information via their Traffic Incident Information webpage, as well as an xml file. The information provided is primarily crashes and other incidents that result in a road closure or obstruction and consists of a general location and additional details specific to the event. The Nevada Highway Patrol (NHP) provides this same information in a similar format via its Road Closure and Incident webpage.

Google maps will serve as a background data feed for the One Stop Shop prototype, and will also play an integral role in the identification of the route a traveler will take between their beginning and ending points.

1.2 Users

There are three groups of users who are expected to ultimately draw data from the One Stop Shop clearinghouse: local and long distance travelers, the goods movement industry, and transportation agency personnel. In addition, it is possible that other user groups may also emerge, such as state police, and local emergency responders/communities, although these groups are not addressed here.

- *Local and Long Distance Travelers* are the primary intended users of the One Stop Shop. Specifically, the target audience is highway travelers making trips in rural areas where the data available on traditional traveler information websites has been historically limited. Rather than requiring the traveler to search multiple webpages and websites in order to find all available information pertinent to their trip, the One Stop Shop will provide travelers with everything available for an identified route on one webpage/map. These travelers would be the end recipients of data received via the previously discussed sources, using it to plan and facilitate a safer and more efficient trip as they are provided real-time information on current conditions.
- *Goods Movement* includes the trucking industry, who, although long distance travelers, have different information needs from those of the general traveling public. This group consists of truck drivers, as well as company dispatchers and any other parties who may provide the driver with routing for a particular shipment. This user group is interested in the location of rest areas, weigh stations, mountain passes and weather. The One Stop Shop will incorporate such information, providing the goods movement industry with timely, reliable information to employ in pre and en-route trip planning.
- *Transportation Agency Personnel* include those who are responsible for managing traffic and maintaining roadways. The One Stop Shop will consolidate information that they employ in various ways in one centralized location, reducing the time spent tracking down specific items. In addition, they are the primary personnel providing timely data into various electronic databases that ultimately will serve as an input to the One Stop Shop website (CMS messages, chain control status, etc.).

2.0 Referenced Documents

The following documents are referenced in this requirements document:

ASE Consulting LLC, Knowledge Systems Design and Siemens ITS, *Systems Engineering Guidebook For ITS, Version 2.0*, Prepared for the California Department of Transportation, Division of Research & Innovation, January 2, 2007. Accessed at <http://www.fhwa.dot.gov/cadiv/segb/files/segbversion2.pdf> on February 11, 2009.

Veneziano, David, Christopher Strong, Douglas Galarus and Shaowei Wang. *California and Oregon Advanced Transportation Systems (COATS) Phase 3: Rural Integrated Corridor Management Clearinghouse Requirements*. Prepared for the California Department of Transportation, Division of Research & Innovation and Oregon Department of Transportation. Western Transportation Institute. April, 2008.

Veneziano, David, Douglas Galarus, Shaowei Wang, Daniell Richter, and Skyler Neidrist. *Rural Traveler Information Needs Assessment and Pilot Study: One Stop Shop Website Requirements*. Prepared for the California Department of Transportation, Division of Research & Innovation. Western Transportation Institute. March, 2009.

3.0 Requirements

This chapter lists the requirements associated with the One Stop Shop website prototype. In this section of the document, the prototype is simply referred to as the website. This is done primarily for simplicity and to minimize redundancy.

The *Systems Engineering Guidebook for ITS* divides requirements into seven categories: functional, performance, interface, data, non-functional, enabling, and constraints. These requirements together are used to define what the system should do, how well it is to perform, and under what conditions or constraints. However, some of these aspects do not apply to the website to be developed. As a result, only requirements pertaining to functional, performance, interface, data, and enabling aspects are included in this document. In defining the requirements for the website, the research team recognized that it is a challenge to specify requirements for a system which has previously been developed in a limited prototype capacity for a concept which is still in its infancy. As a result, this document is considered to be a work in progress, with requirements added and modified as new data become available and other changes occur.

3.1 Definitions

This section provides definitions that are used throughout this chapter.

| Term | Definition |
|-------------|---------------------------------------------------------------------------------------|
| Caltrans | California Department of Transportation |
| CMS | Changeable Message Sign |
| CCTV | Closed circuit television |
| DMS | Dynamic Message Sign |
| GIS | Geographic Information Systems |
| HAR | Highway Advisory Radio |
| ITS | Intelligent Transportation Systems |
| Interface | Abbreviated name for the client (HTML) interface that will display One Stop Shop data |
| NDOT | Nevada Department of Transportation |
| NWS | National Weather Service |
| ODOT | Oregon Department of Transportation |
| RWIS | Road Weather Information System |
| VMS | Variable Message Sign |
| WSDOT | Washington Department of Transportation |

3.2 Functional Requirements

The functional requirements describe what the website is supposed to do. As described previously, there are three groups of users who will use the website: local and long distance travelers, the goods movement industry, and transportation agency personnel. For the prototype being developed here, only the groups discussed in Section 1.1 will provide data to the website.

- 3.2.1.1. The website shall function to collect and disseminate various traveler information data elements via a map-based platform.

3.3 One Stop Shop Data Set

The central feature of the One Stop Shop is its service as a traveler information data source. As such, the first key set of functional requirements relates to the data that the website acquires, stores, manages and disseminates.

3.3.1. Weather Data

- 3.3.1.1. The website shall acquire and disseminate all available weather data in the study region¹.

3.3.1.1.1. Clarus ESS data shall be acquired directly from the Federal Highway Administration source (<http://www.clarusinitiative.org/>) for the study region.²

3.3.1.1.2. Weather data presently aggregated for California by the WeatherShare platform shall be acquired from the Western Transportation Institute directly to avoid redundant downloads.

3.3.1.1.3. Supplemental weather data for the other study states shall be acquired, when available, from additional sources, such as the National Weather Service (NWS) - MADIS, and other entities such as Mesowest.

3.3.2. DMS Data

- 3.3.2.1. The website shall acquire and disseminate all available DMS³ sign messages in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).

3.3.2.1.1. DMS message data shall be supplied from Caltrans via a delimited text file.

¹ For the purposes of this Requirements document, the study region shall consist of California, Nevada, Oregon and Washington State.

² ESS sensor reading types vary by site across the study region, with some sites reporting nearly 20 different sensor readings and others reporting just several – for instance, one site in Oregon reports just windSensorAvgDirection and windSensorAvgSpeed. Further consideration will need to be given as to which readings are most relevant to prospective users of the system, and how to best display those readings. A tabular view similar to that used on the Clarus System website is one possibility for display of sensor values at a given site. WeatherShare and Caltrans One Stop Shop have taken this approach along with tabbed groupings in prior development. This approach may further be coupled with a more intuitive and user-friendly display of thematic icons for a particular sensor reading type such as essAirTemperature. The project team will work with the sponsor and state DOT project champions to determine how to best accomplish these displays within the scope of this project.

³ For consistency, only the term DMS is used in establishing requirements. However, this term is used interchangeably, and specific states in the study region may refer to their signs by CMS, VMS or other terms.

- 3.3.2.1.2. *DMS data from NDOT shall be provided via department data feeds, if available.*
- 3.3.2.1.3. *DMS data from ODOT shall be provided via the TripCheck Portal.*
- 3.3.2.1.4. *DMS data from WSDOT shall be provided via department data feeds.*
- 3.3.2.1.5. *The display of an individual DMS message shall include a timestamp of when the source data was last updated.*

3.3.3. CCTV Images

- 3.3.3.1. The website shall acquire and disseminate all available CCTV images in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).
 - 3.3.3.1.1. *Links to CCTV data shall be supplied from Caltrans via the Commercial Wholesale Web Portal (CWWP) and District websites, as needed.*
 - 3.3.3.1.2. *CCTV data from NDOT shall be provided via department data feeds, if available.*
 - 3.3.3.1.3. *CCTV data from ODOT shall be provided via the TripCheck Portal.*
 - 3.3.3.1.4. *CCTV data from WSDOT shall be provided via the department website.*
 - 3.3.3.1.5. *The display of an individual CCTV image shall include a timestamp of when the source data was last updated.*

3.3.4. Chain Requirements

- 3.3.4.1. The website shall acquire and disseminate all available chain requirements in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates). For the purposes of this document, chain requirements include not only requiring vehicles to have chains past a specific location, but also special winter storm traffic control (screening, truck holding, closures, etc. when available).
 - 3.3.4.1.1. *Chain requirements shall include data for all available locations, including passes, if available.*
 - 3.3.4.1.2. *Chain control information shall be supplied from Caltrans via District websites when available.*
 - 3.3.4.1.2.1. *Chain control information throughout California varies in terms of availability. The website shall be designed so that this information may be included if it becomes available at a future date.*
 - 3.3.4.1.3. *Chain control data from NDOT shall be provided via the Highway Controls Report.*
 - 3.3.4.1.3.1. *Based on the data provided, if a latitude and longitude are not provided or cannot be derived, chain control information may not be entirely displayed.*
 - 3.3.4.1.4. *Chain control data from ODOT shall be provided via the TripCheck Portal.*

- 3.3.4.1.5. *Chain control data from WSDOT shall be provided via department data feeds.*
- 3.3.4.1.6. *The display of individual chain requirements for a location shall include a timestamp of when the source data was last updated.*

3.3.5. Planned and Active Lane Closures

- 3.3.5.1. The website shall acquire and disseminate all available planned and active lane closures in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).
 - 3.3.5.1.1. *Planned and active lane closure data shall be supplied from Caltrans via the Commercial Wholesale Web Portal.*
 - 3.3.5.1.2. *Planned and active lane closure data shall be supplied from NDOT via the Road Construction Summary report.*
 - 3.3.5.1.2.1. *Based on the data provided, if a latitude and longitude are not provided or cannot be derived, an incident may not be displayed.*
 - 3.3.5.1.3. *Planned and active lane closure data from ODOT shall be provided via the TripCheck Portal.*
 - 3.3.5.1.4. *Planned and active lane closure data shall be supplied from WSDOT via the Traffic Alerts file.*
 - 3.3.5.1.5. *The display of planned and active lane closures shall include a timestamp of when the source data was last updated, as well as the beginning and ending dates of the closure.*

3.3.6. Incident Data

- 3.3.6.1. The website shall acquire and disseminate incident data (accidents, emergency detours, etc.) in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).
 - 3.3.6.1.1. *Incident data shall be supplied by CHP via an xml file.*
 - 3.3.6.1.1.1. *Based on the data provided in the xml file, if a latitude and longitude are not provided or cannot be derived, an incident may not be displayed.*
 - 3.3.6.1.2. *Incident data shall be supplied by Nevada Department of Public Safety via the department website.*
 - 3.3.6.1.2.1. *Based on the data provided, if a latitude and longitude are not provided or cannot be derived, an incident may not be displayed.*
 - 3.3.6.1.3. *Incident data from ODOT shall be provided via the TripCheck Portal.*
 - 3.3.6.1.4. *Incident data from Washington shall be supplied via the Traffic Alerts file.*

3.3.6.1.5. *The display of incident data shall include a timestamp of when the source data was last updated.*

3.3.7. Safety Roadside Rest Areas

3.3.7.1. The location of safety roadside rest areas shall be acquired and disseminated in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).

3.3.7.1.1. *Safety roadside rest area data shall be acquired and disseminated from Caltrans' Office of GIS as a point file.*

3.3.7.1.2. *Roadside rest area data shall be acquired and disseminated from NDOT department data files, as available.*

3.3.7.1.3. *Roadside rest area data shall be acquired and disseminated for Oregon from a GIS point file.*

3.3.7.1.4. *Roadside rest area data shall be acquired and disseminated from WSDOT via department data.*

3.3.8. Features of Interest

3.3.8.1. The location of vista points and points of interest shall be acquired and disseminated in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).

3.3.8.1.1. *The location of vista points and points of interest shall be acquired and disseminated from Caltrans' Office of GIS as point files.*

3.3.8.1.2. *Comparable data on location of vista points and points of interest shall be acquired and disseminated for Nevada when available.*

3.3.8.1.3. *The location of vista points and points of interest shall be acquired and disseminated from a GIS point file.*

3.3.8.1.4. *Comparable data on location of vista points and points of interest shall be acquired and disseminated for Washington when available.*

3.3.9. Commercial Vehicle Enforcement Facilities

3.3.9.1. The location of commercial vehicle enforcement facilities shall be acquired and disseminated in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).

3.3.9.1.1. *The location of commercial vehicle enforcement facilities shall be acquired and disseminated from Caltrans' Office of GIS as a point file.*

3.3.9.1.2. *Comparable data on location of commercial vehicle enforcement facilities shall be acquired and disseminated for Nevada when available.*

- 3.3.9.1.3. *Comparable data on location of commercial vehicle enforcement facilities shall be acquired and disseminated for Oregon from a GIS point file.*
- 3.3.9.1.4. *Comparable data on location of commercial vehicle enforcement facilities shall be acquired and disseminated for Washington from their GeoData catalog.*

3.3.10. Summit Locations

- 3.3.10.1. The location of state highway system summits shall be acquired and disseminated in the study region, provided spatial referencing is available to facilitate mapping (ex. route/milepost or geographic coordinates).
 - 3.3.10.1.1. *The location of state highway system summits shall be acquired and disseminated from Caltrans' Office of GIS as a point file.*
 - 3.3.10.1.2. *The location of state highway system summits shall be acquired and disseminated for Nevada when available.*
 - 3.3.10.1.3. *Comparable data on location of state highway system summits shall be acquired and disseminated for Oregon when available.*
 - 3.3.10.1.4. *The location of state highway system summits shall be acquired and disseminated for Washington via department data.*

3.3.11. Additional Data Elements

- 3.3.11.1. Additional data elements may be added to the website either during the development of the prototype or at a future date if deemed beneficial.

3.3.12. Future Data

- 3.3.12.1. The website shall be designed such that it can incorporate additional data in the future, such as Traffic Monitoring Station (TMS) data.

3.4 User Functions

As a prototype which is focused on the provision of traveler information, the primary users of the One Stop Shop will be local and long distance travelers planning a trip. Other user groups discussed in this section include goods movement and transportation agency personnel.

3.4.1. Local and Long Distance Travelers

- 3.4.1.1. The website shall be map based with textual elements as needed and display the information of the data set for study region. The website shall present an overview map for the entire region prior to user entry of a trip origin and destination.
- 3.4.1.2. The website shall provide a mechanism to the user to enter an origin and destination for their trip.

- 3.4.1.3. The website shall primarily display information on the map in the form of icons, rasters and polylines.
- 3.4.1.3.1. *Data for the route generated for the user-specified origin and destination and surrounding areas shall be displayed on the map.*
- 3.4.1.4. When selected, an icon shall display concise textual information regarding the selected item in a balloon.
- 3.4.1.5. The user shall have the ability to return to the initial, regional overview map.
- 3.4.1.6. If the user adjusts the route initially presented by the website, the data displayed on screen will reset, with only data for the area of the new route or location displayed.

3.4.2. Goods Movement

- 3.4.2.1. The website shall be map based with textual elements as needed and display the information of the data set for study region. The website shall present an overview map for the entire region prior to user entry of a trip origin and destination.
- 3.4.2.2. The website shall provide a mechanism to the user to enter an origin and destination for their trip.
- 3.4.2.3. The website shall primarily display information on the map in the form of icons, rasters and polylines.
- 3.4.2.3.1. *Data for the route generated for the user-specified origin and destination and surrounding areas shall be displayed on the map.*
- 3.4.2.4. When selected, an icon shall display concise textual information regarding the selected item in a balloon.
- 3.4.2.4.1. *In areas with multiple icons in close proximity, placing the mouse pointer above the area shall enable the icons to spread out for easier viewing (similar to the function of Google Earth).*
- 3.4.2.5. The user shall have the ability to return to the initial, regional overview map.
- 3.4.2.6. If the user adjusts the route initially presented by the website, the data displayed on screen will reset, with only data for the area of the new route or location displayed.

3.4.3. DOT Traffic Management/Operator/Maintenance

- 3.4.3.1. The website shall be map based with textual elements as needed and display the information of the data set for study region. The website shall present an overview map for the entire region prior to user entry of a trip origin and destination.
- 3.4.3.2. The website shall provide a mechanism to the user to enter an origin and destination for their trip.

- 3.4.3.3. The website shall primarily display information on the map in the form of icons, rasters and polylines.
- 3.4.3.3.1. *Data for the route generated for the user-specified origin and destination and surrounding areas shall be displayed on the map.*
- 3.4.3.4. When selected, an icon shall display concise textual information regarding the selected item in a balloon.
- 3.4.3.4.1. *In areas with multiple icons in close proximity, placing the mouse pointer above the area shall enable the icons to spread out for easier viewing (similar to the function of Google Earth).*
- 3.4.3.5. The user shall have the ability to return to the initial, regional overview map.
- 3.4.3.6. If the user adjusts the route initially presented by the website, the data displayed on screen will reset, with only data for the area of the new route or location displayed.

3.5 Performance Requirements

Performance requirements refer to measurable system capabilities. This section includes discussions of the updating and delivery frequency requirements for the website.

3.5.1. Updating and Delivery Frequency

- 3.5.1.1. The website shall check for new data to pull in from the data sources at periodic intervals.
 - 3.5.1.1.1. *The frequency of checks made by the website shall be five minute intervals.*
 - 3.5.1.1.2. *The data source providers shall maintain their traditional updating frequencies for their respective data feeds (i.e. the website shall not require changes to current procedures on the part of data providers).*
 - 3.5.1.1.3. *Data elements that are not dynamic (ex. rest area locations, summits, etc.) will not require interval checks for data updates.*
- 3.5.1.2. The website shall pull data from specified sources; no data source/provider shall push data to the website.
- 3.5.1.3. The website shall only serve as a dissemination platform for travel information, not a data entry mechanism.
- 3.5.1.4. The website shall display only the data most recently acquired during data source scans, along with static point information (ex. rest area locations, summits, etc.).

3.5.2. Quality Control

- 3.5.2.1. The website shall not serve as a quality control monitor for the data supplied by agencies.

- 3.5.2.2. Quality control activities with respect to the website shall consist solely of checks made to ensure fixed data sources (CCTV, chain control, rest areas, etc.) are displayed in the correct geographic location.
 - 3.5.2.2.1. *To the extent possible, quality control activities will also be performed for data that takes on a floating form (incidents, etc.). However, it is acknowledged that the display of such information relies on the accuracy of the data entered by the source agency.*
 - 3.5.2.2.2. *The website will not address or correct locational issues for the floating data discussed in the previous point.*

3.6 Website Requirements

This section in a typical requirements document discusses a system's hardware and software interfaces; i.e. how a system is supposed to interact with other systems. Since the extent of interaction between the website and other systems will be the acquisition and dissemination of data, this section will focus on the requirements specific to the website itself.

3.6.1. General

- 3.6.1.1. The website shall be available via commonly available web browser software running on a desktop or laptop PC platform.
- 3.6.1.2. The website shall be housed on a server running a widely used operating system, database and web service.
- 3.6.1.3. The website shall pull in data from specific sources and provide that data to user groups via web-based protocols.
- 3.6.1.4. The website shall employ a database to support queries and general data storage.
- 3.6.1.5. A throttle shall be considered that would limit the number of times per minute a user may update their interface data.
 - 3.6.1.5.1. *The throttle shall prevent the denial of service to other users as the result of a user who is tying up the server through constant refreshes.*
- 3.6.1.6. Additional general operating requirements shall be discussed and finalized on an as-needed basis.
- 3.6.1.7. The website shall be designed to keep a record of origins and destinations entered by users.
 - 3.6.1.7.1. *The origin and destination entered and recorded shall consist of general origins and destinations, not specific addresses.*
 - 3.6.1.7.2. *The website shall include a disclaimer notifying users that origins and destinations are being recorded, but that no additional information is recorded.*

3.6.2. Data Format and Standards

- 3.6.2.1. The website shall be capable of reading all data formats of the supplying agencies.
- 3.6.2.2. An investigation shall be made of data standards for system scalability.

3.6.3. Interface Display

- 3.6.3.1. The website display shall be map-based.
- 3.6.3.2. The website shall only display information contained within the view of the Google-generated route as specified by the user's origin and destination points.
- 3.6.3.3. The website display shall consist of an initial viewing pane that presents the study region overall.
- 3.6.3.4. Once the user enters an origin and destination for a trip, two viewing panes will be displayed.
 - 3.6.3.4.1. *The primary viewing pane shall contain a Google map displaying the data from the information stream(s) that are presently toggled on for the specified route, excluding a route elevation.*
 - 3.6.3.4.2. *A second viewing pane shall display the route in profile, including elevations (at an interval to be determined as the research progresses), summits, and weather conditions.*
- 3.6.3.5. The website shall allow users to view all data icons at once or selectively.
- 3.6.3.6. The website shall be designed such that it is clear to the user that a data element is missing or unavailable.
- 3.6.3.7. The development of user profiles using parameterized URLs or cookies shall be employed by the interface to allow the user to save the layers they wish to have appear on their map in subsequent visits.

3.6.4. Control

- 3.6.4.1. The website shall require some interaction on the part of the user (i.e. enter the origin and destination points for a trip and/or dragging the Google-generated route to a different path if desired).
- 3.6.4.2. The website shall allow users to select specific layers of information of interest to display.
 - 3.6.4.2.1. *Each layer may be toggled on and off by the user.*

3.7 Enabling Requirements

Requirements in this section relate to aspects of the website whose functions enable it to properly fulfill its purpose.

3.7.1. Software

- 3.7.1.1. The website shall require no specialized, third-party software to acquire, reformat or disseminate the available information previously detailed.

3.7.2. Installation Design

- 3.7.2.1. The website shall operate in a standard web browser and be designed such that access may be accomplished by the user via a website link.

3.7.3. Website Server

- 3.7.3.1. The initial location of the website server shall be the Western Transportation Institute.
 - 3.7.3.1.1. *The clearinghouse is part of exploratory research into the development of a One Stop Shop for traveler information in a rural environment.*
- 3.7.3.2. The website shall be maintained by the Western Transportation Institute during the course of this project.
 - 3.7.3.2.1. *The future of the website maintenance following the conclusion of this project shall be discussed by the researchers, the sponsor and the participating states as development activities progress.*

3.7.4. Clearinghouse Documentation

- 3.7.4.1. Brief documentation pertaining to the development and coding of the website shall be compiled by the Western Transportation Institute as part of the project final report.
- 3.7.4.2. The website shall include a “Help” link to assist the user through use of the website.