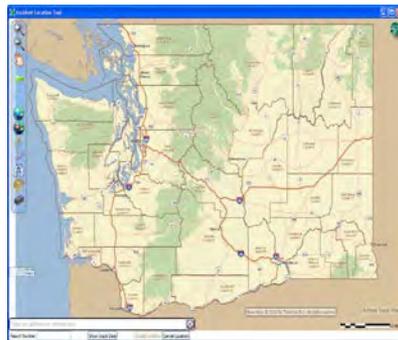
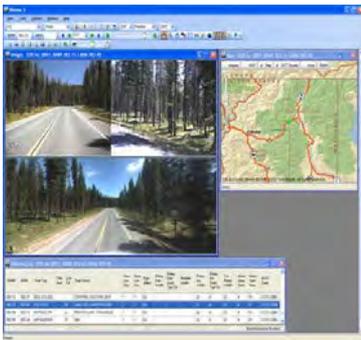


Incident Location Tool

Getting Better Locations for Collisions

A detailed traffic collision report form. It includes fields for 'REPORT NO.', 'CASE #', 'DATE', 'TIME', 'LOCATION', 'TYPE OF COLLISION', 'VEHICLE TYPE', 'DRIVER', 'WITNESSES', 'POLICE OFFICER', and 'REPORTING AGENCY'. There are also checkboxes for 'PROPERTY DAMAGE', 'PERSONAL INJURY', and 'FATALITY'. The form is designed for data entry and includes a barcode at the top left.

Warren Stanley
Collision Project Manager

Paula Hammond
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Chief of Staff

Introduction

The Washington State Department of Transportation is responsible for establishing the locations of all collisions that take place on all public roadways in Washington State. Our success depends on how well we apply our limited funding to most effectively improve safety. We need to know where collisions are taking place and what's causing the collisions.

WSDOT processes approximately 130,000 collision reports from 272 law enforcement agencies each year. Collision reports are converted to data elements and entered into a database. The collision data is provided to Department of Licensing, cities, counties, and local law enforcement agencies.

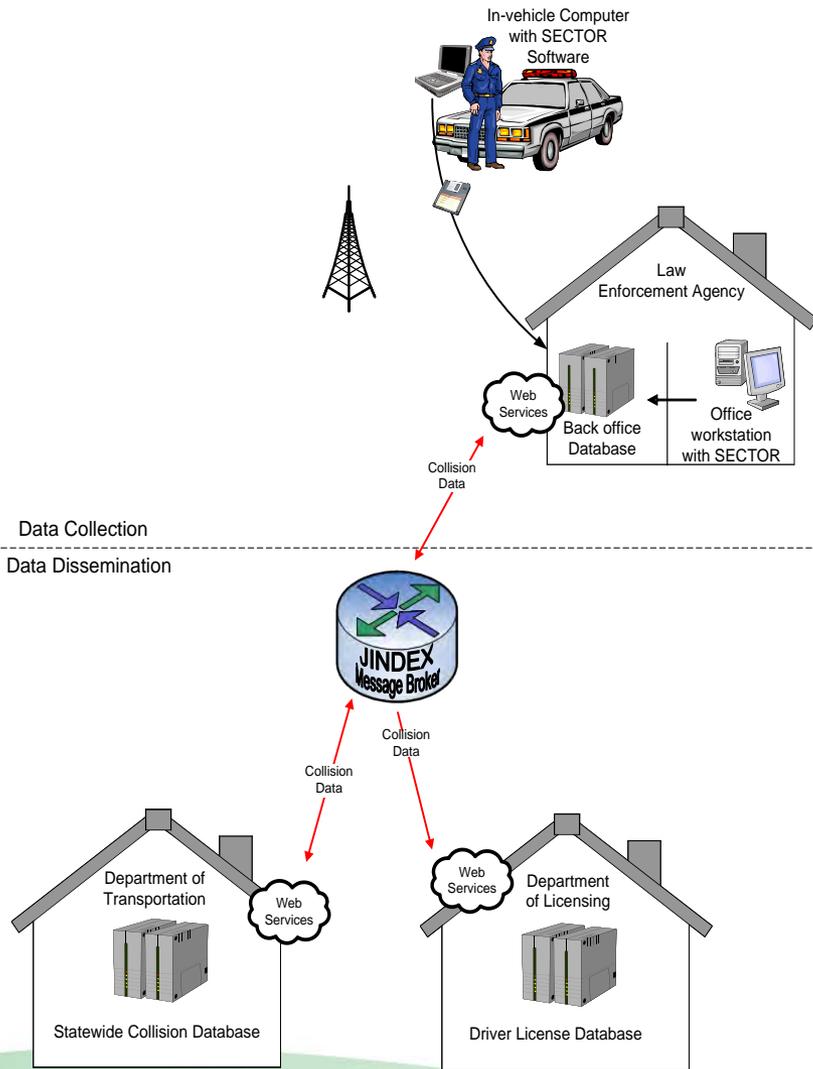
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Introduction Continued

Since 2003 we have implemented several improvements to our system that focus on the timeliness, accuracy, completeness, and accessibility of the collision data.

One of the main focuses of this effort was the implementation of the Statewide Electronic Collision and Ticketing Online Records (SECTOR) application.

What is SECTOR



66% of Collisions Reports are Submitted Electronically

Benefits:

- **Readability**
- **Receive Data Faster**
- **120 Business Edits**
- **Eliminates Redundant Processes**
- **Officer Safety**

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The Problem

90% of all collisions returned are for location errors

Types of Location Errors

- At wrong milepost on state routes
- Not in jurisdiction being reported
- Streets reported don't intersect
- Street doesn't exist



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10/2/12-10/3/12

Old Business Process

- Collision reports are submitted on paper and digitally
- Collision reports elements are entered into a database
- Collision reports include a wide variety of “location information”

- Street Address
- Route Number and Measure along a Route
- Intersection
- Common Place Name
- Measurement from any of the Above

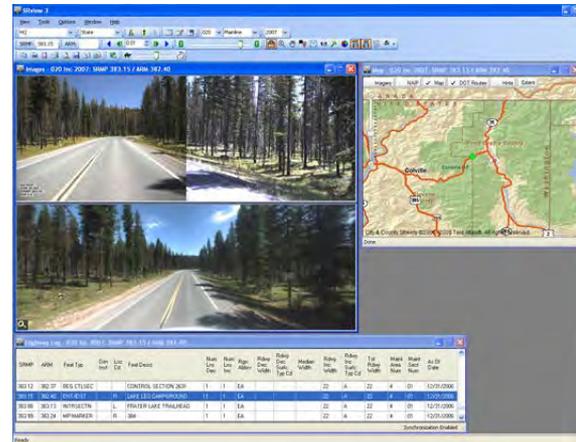
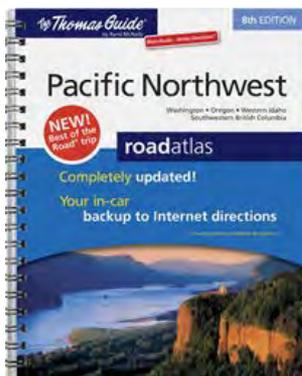
The image shows a Washington State Police Traffic Collision Report form. It includes fields for case and report numbers, local agency, date, time, county, miles, city, street, intersection, restrictions, licensee, and vehicle information. The form is organized into sections with checkboxes and dropdown menus for various details.

- Jurisdictional Analysts and Collision Coders read each collision report and use a paper or computer based map products in order to establish jurisdiction and a general location for a collision

Old Business Process Continued....

Final collision data records include minimal location information and only collisions on state routes can be mapped with any degree of accuracy by state route milepost

- Of the 130,000 reports that are processed each year on over 80,000 miles of public roadways
 - 13,000 are returned to law enforcement agencies for further clarification
 - 11,700 of which have problems with locations

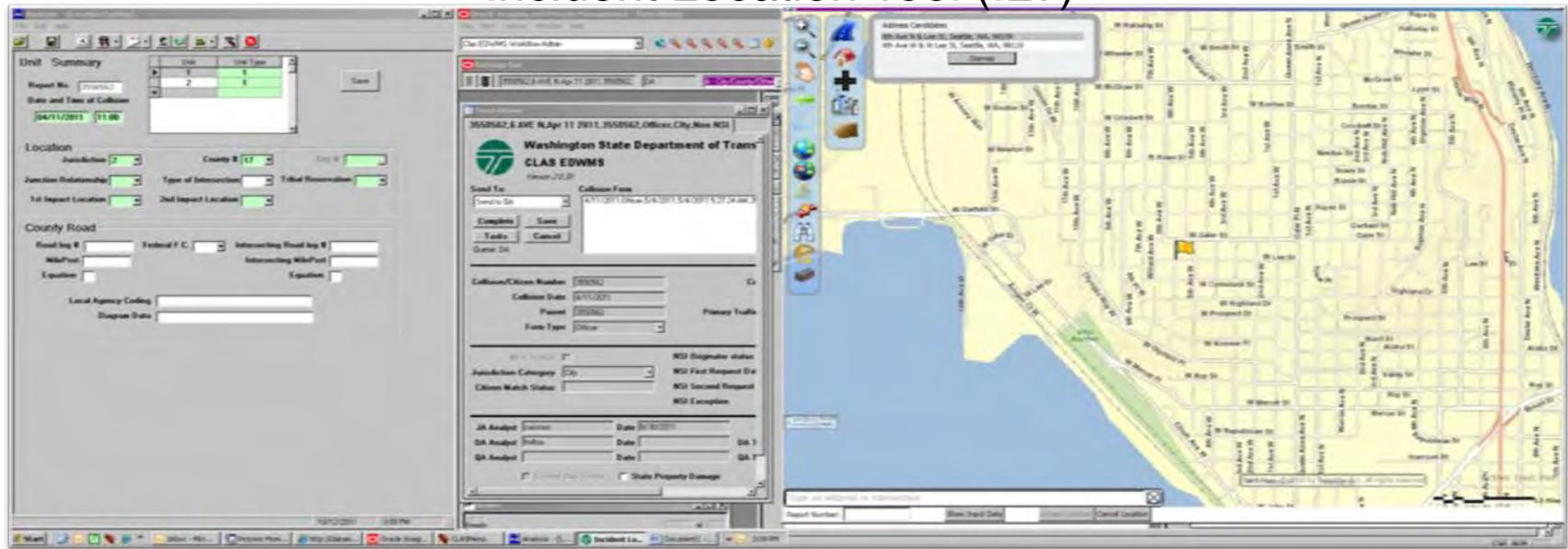


High Level System Requirements

- Replace the wide variety of non-authoritative map resources with a single interactive mapping application
- Deliver significant efficiency to the existing process and eliminate the jurisdictional analysis step
- The application must use GIS to provide each collision record with the X/Y coordinate, Primary Trafficway, Milepost, Block Number, Secondary Trafficway, Distance from Reference and Direction from Reference
- Integrate with existing systems and business processes
- Employ consistent and authoritative data and tools for collision event location and for spatial queries
- The application must be intuitive, easy to use and quick

Solution – A Map-Based Workflow Enhancement System

Incident Location Tool (ILT)



- Improves efficiency in the business process
- Improves accuracy and precision
- Improved data consistency
- Interface with Collision Location Analysis System (CLAS) and eventually Statewide Electronic Collision and Ticketing Online Record (SECTOR)

Development of Incident Location Tool

- We did not build an application that met functional requirements, we built services that were capable of meeting the functional requirements
- We then built a client application that makes use of the services
 - Resulted in a new system that is highly modular
 - Using a robust set of geoprocessing and cartographic services, its capable of supporting various client applications.
 - The client applications can be browser based, mobile, lightweight desktop, heavy desktop or other server based clients.
 - Easy to update/replace and deploy any of the services.
- The current production ILT client is a lightweight desktop application that is integrated with an existing system

Incident Location Tool Major Components

- ILT User Control – Uses C# code and provides the map and user interface functionality
- Host Control – This is the container that runs the ILT control. The host control will continue to have the ability to pass and receive data with the CLAS Services
- Web Services – City Catalog, CountyCatalog, StateRouteCatalog
- Geoprocessing Services – Location information, XY, State Route Milepost (SRMP), GetNearestCity
- Geocoding Services – Address Locator (also SRMP, Intersection, city, County)

Incident Location Tool Major Components Continued..

- Measure Service – Custom measure tool
- Base Map Service (cached) – Orthos, local roads, State Routes, Tribal reservation boundaries, etc.
- City Limits Map Service (dynamic) – City limits polygons
- Road Labels Services (dynamic) – Annotation

New Business Process

- Collision reports are submitted on paper/digitally
- Collision location elements are entered into a database
- A new GIS application geocodes and maps all usable location elements
- The collision coder uses the interactive GIS application to establish an accurate location
- The GIS application queries map layers and automatically populates several database fields, other fields are still manually entered
- Final collision data records include all of the provided location information and an X,Y location

Benefits of the Incident Location Tool

- Reduction in data entry time
- The process of establishing location is faster and more accurate
- Reduced number of collisions that sent back to officers for corrections
- All collisions are researched and located using consistent maps and tools
- Statewide collision data will be available for mapping and analysis, because they now include X,Y
- All of the server side geospatial services, cartographic and geoprocessing are available for other applications to use
- The services based architecture makes it easy to update geoprocessing and cartographic components with minimal disruption

Incident Location Tool

The screenshot displays the 'Incident Location Tool' interface. At the top, the title bar reads 'Incident Location Tool'. The main area is a map of Washington state, showing county boundaries and major roads. Labeled counties include Clallam, Jefferson, Mason, Thurston, Lewis, Skamania, Clark, Cowlitz, Pacific, Waukegan, Grant, Adams, Whitman, Garfield, Asotin, Columbia, Walla Walla, Benton, Franklin, Yakima, Kittitas, Pierce, King, Douglas, Chelan, Snohomish, Whatcom, Shagit, Okanogan, Ferry, Lincoln, and Pend Oreille. Major cities like Bellingham, Mount Vernon, Seattle, Olympia, Vancouver, Wenatchee, Yakima, and Kennewick are marked. A search bar at the bottom left contains the text 'Type an address or intersection'. Below the search bar are buttons for 'Report Number:', 'Show Input Data', 'Accept Location', and 'Cancel Location'. A scale bar at the bottom right indicates '53 Miles'. The status bar at the bottom right shows 'Active Tool: Pan'. The base map copyright is '© 2010 by TeleAtlas B.V. All rights reserved'.

Incident Location Tool – City/ County Street

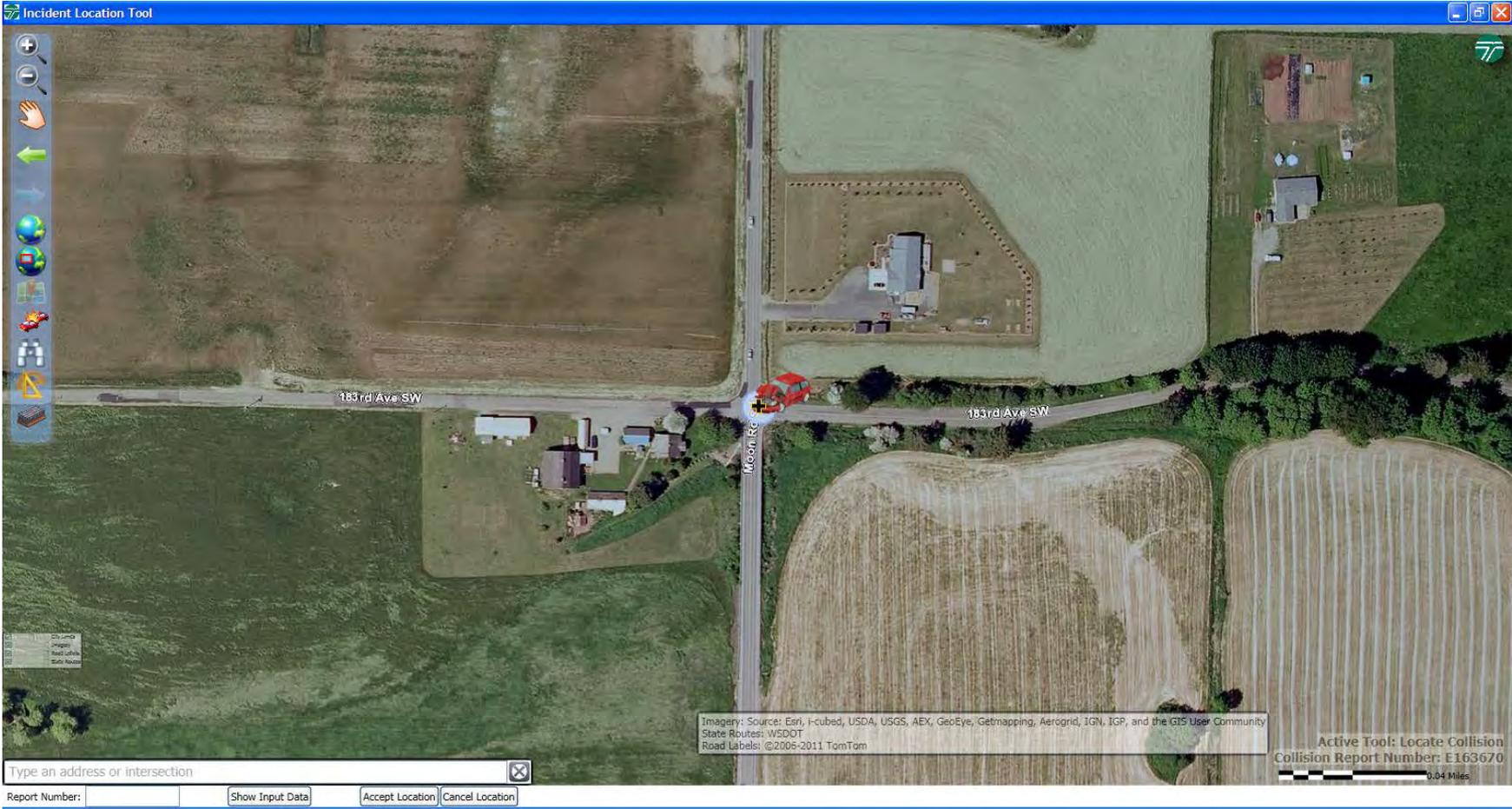
The screenshot displays the 'Incident Location Tool' interface. The main map area shows an intersection of 183rd Ave SW and Moon Rd. A red car icon is positioned at the intersection. A red-bordered popup window contains the following information:

X: 979837.61, Y: 553923.1
City: Oakville (0900)
County: Thurston (34)
Primary Trafficway: Moon Rd SW, Block: 18100
Secondary Trafficway: 183rd Ave SW, Distance to Incident: , Direction to Incident:
Tribe: Chehalis Indian Reservation (1)
Nearest City: 13.38 Miles East of Oakville (0900)

INPUT DATA
City Number: 0615
County Number: 17
Primary Trafficway: 104TH AVE SE
X: , Y:
Report Number: E163670
Collision Date: 4/10/2012 6:11:00 PM

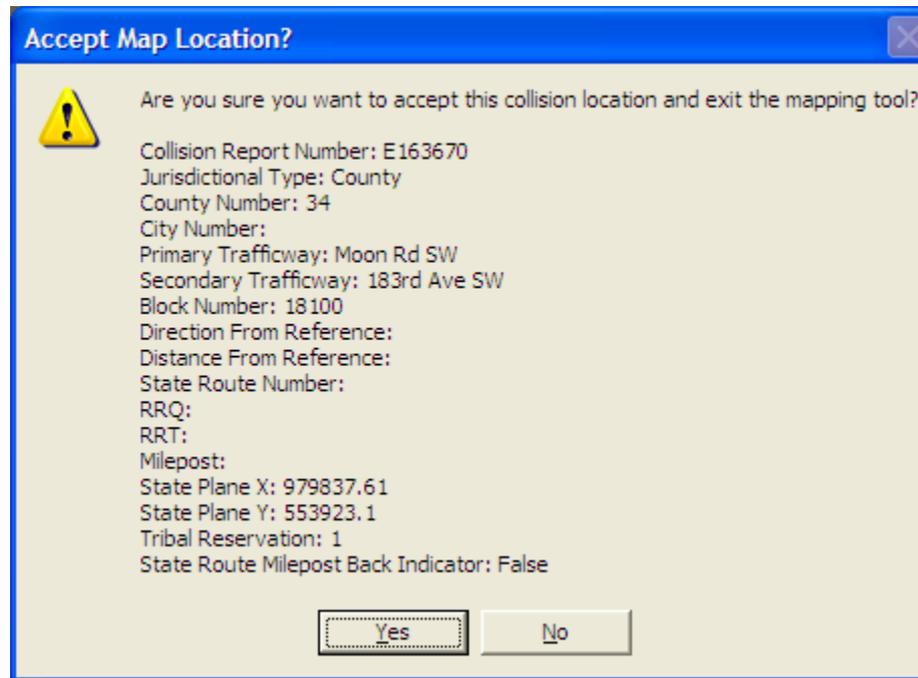
At the bottom of the interface, there is a search bar with the text 'Type an address or intersection' and a search button. Below the search bar are three buttons: 'Report Number:', 'Show Input Data', 'Accept Location', and 'Cancel Location'. In the bottom right corner, there is a scale bar for 0.04 Miles and a status box containing the text: 'Base Map: ©2006-2011 TomTom', 'Road Labels (Basemap): ©2006-2011 TomTom', 'Active Tool: Locate Collision', and 'Collision Report Number: E163670'.

Incident Location Tool – Ortho View

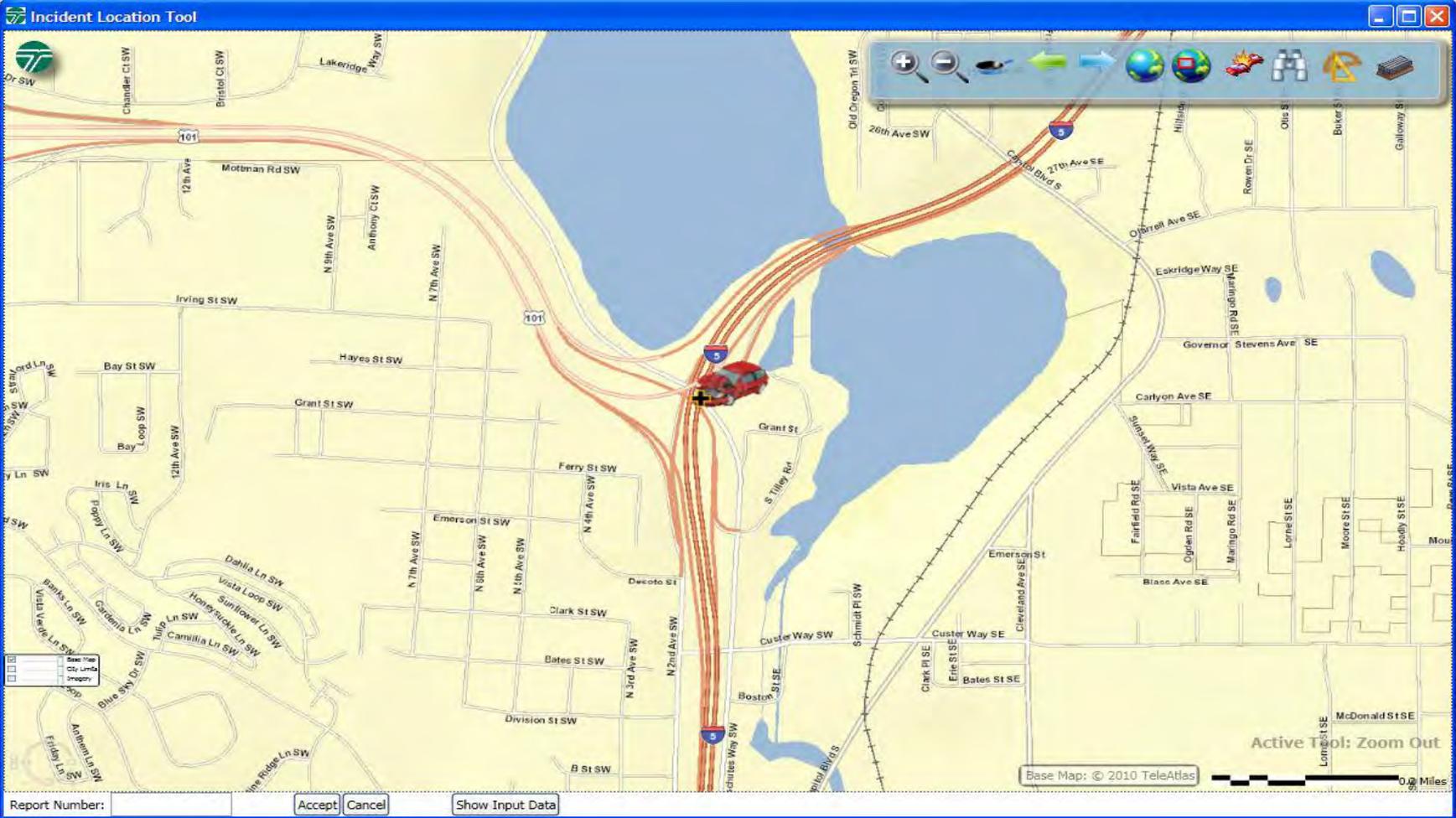


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10/2/12-10/3/12

Location Information Provided



Incident Location Tool – State Route



Incident Location Tool – Ortho View

The screenshot displays the 'Incident Location Tool' interface. The main window shows an aerial ortho view of a highway interchange. A red car icon is positioned on the highway, with a red-bordered popup box containing the following information:

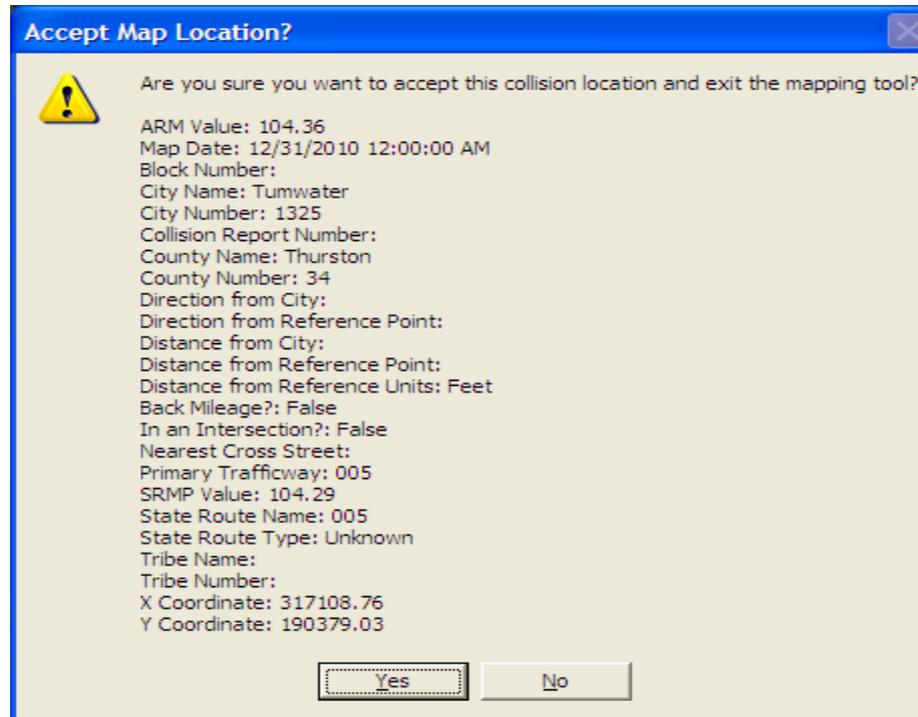
- X: 317108.76, Y: 190379.03
- City: Tumwater (1325)
- County: Thurston (34)
- Nearest Route: 005, ARM: 104.36, SRMP: 104.29
- Tribe: ()

On the right side, a 'Select Primary Trafficway' dialog box is open, showing two options:

- State Route: 005 (Offset Distance: 6)
- Local Road: Deschutes Pkwy SW (Offset Distance: 9.9)

An 'OK' button is located below the dialog box. The top toolbar includes navigation and tool icons. The bottom status bar shows 'Report Number:', 'Accept', 'Cancel', 'Show Input Data', and 'Active Tool: Zoom In'. A scale bar at the bottom right indicates 0.03 Miles. Imagery sources listed at the bottom include ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, and IGP.

Location Information Provided



Next Steps – Integration of the ILT Map into SECTOR

Benefits:

- The ILT will integrate with existing GPS receivers, helping officers to locate the event
- The ILT's interactive map will provide officers with all of the core map layers and tools
- Once the Officer has established a location, with a simple map click, the ILT will pre-populate several of the data fields in SECTOR, saving the office time and allowing for faster collision site clearing
- When the ILT enabled collision reports reach WSDOT for coding, they will already have an X/Y location, this completely eliminates the need for post processing of location

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2012 Tribal – State Transportation Conference
10/2/12-10/3/12