Crash Editing Tool

Design Document

March 2010

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1. Introduction and Project Background

MDOT has an existing ladder process that is used to place crash location data on a map. Crash data that falls out of this process due to errors, or that is placed incorrectly, must be added to the map manually. The purpose of the Crash Editing Tool is to provide an interface to place or edit crash location data/information. ******** conducted a Workshop on-site at MDOT January 26, 2010 and several subsequent on-line meetings, to review the Crash Editing Tool requirements from the Statement of Work. This document provides the design details as mutually agreed between ******** and MDOT as result of the Workshop and meetings.

During the Workshop, MDOT provided background information regarding the need for the Crash Editing Tool. Each day, MDOT stages approximately 250-300 crash records from an Access database posted by the Department of Public Safety in preparation for adding those records to the Safety Analysis Management System (SAMS). Public Safety is not currently validating the quality of the crash records as they are entered into the system. There are numerous errors and conflicting data in the incoming crash records, which calls into question the accuracy of the crash record database. MDOT has determined it needs to review the input crash records; verifying and/or correcting both the tabular and spatial information in each record so that the data that is processed into the SAMS is reliable. The end result will be to improve the quality of the analysis and resulting decisions that are based on the crash records in SAMS.

MDOT identified the following as typical problems found in the crash records: road name errors/misspellings, incorrect directions, conflicts between the narrative and other record data, poor quality or missing GPS locations, incorrect data entry values, and others. Due to the breadth of the potential errors, MDOT believes that the crash record data must be reviewed in a holistic manner in order to determine how to correct the data. This will require both attribute and map views in the Crash Editing Tool. MDOT provided a draft layout of the proposed screens for the application, and discussed how they envisioned that the application might be used.

In additional to validating new crash records, MDOT will also use the Crash Editing Tool to validate and correct historical data in SAMS, as time and resources allow. Therefore the Crash Editing Tool will need to accommodate the search and retrieval of historical crash record data.

Finally, MDOT discussed the need for tracking the usage of the Crash Editing Tool via an Activity Log. This is needed to retrieve information related to each user's edits, the edits completed, and the date when edits were done.

The following task descriptions are based on the requirements submitted by MDOT and ********'s current understanding of MDOT's processes. This document provides the design details for the Crash Editing Tool, as mutually agreed between ******** and MDOT as result of the Workshop and subsequent on-line meetings.

2. Workshop Participants

The Workshop was conducted by the following ******** staff:

********, Project Manager

********, Technical Lead

********, Transportation Industry Manager

The following MDOT staff participated in the Workshop:

Jim Willis, Project Sponsor

Jizhan Gou, Project Manager

Rusty Cooke, IT

Talha Farooqi, IT

Chris Kimbrell, End User

Daniel Helms

Howard Webb

Jim Lane, DBA

3. High-Level Requirements Statement

As stated in the Statement of Work for the Crash Editing Tool, the application will include the following high-level requirements:

Task 1 - Develop an interface for placement, update, and deletion of crash location data; displaying crash related data; modifying other crash record fields.

- Displaying and Editing crash data elements identified by MDOT
- Ability to display crash narrative and diagram
- Provide high performance mapping capabilities using:
  - SAMS Roadnetwork_L
  - Google Map for reference location and GeoMedia WebMap location updates using Network and GIS data
- Provide an activity log to track user activities and record changes
- User groups and rights management.
- Provide ability to query for particular SAMS Crash ID Numbers (SCID), counties, date, and certain crash record fields such as Route Name and Intersection Route Name
- Ability to sort column names on query results or tabular view pages

Task 2-- Provide the ability to locate a crash location point on an existing route or intersection. The new location will be stored as Longitude / Latitude attributes. The map will reflect the new crash location. The before and after location information for the crash will be maintained for future review.

Task 3 -- Develop a detail intersection crash editing screen that:

- Includes an intersection diagram image with radio buttons representing the zones. Each radio button will equate to the number for the zone.
- When the user selects a radio button for the crash, the application will populate a column in the database with the number of that zone.

Task 4 – User's Manual

Task 5 -- User Training (one 1 hour virtual session)

The requirements were reviewed during the onsite Workshop, and the more detailed requirements and revisions elicited during the Workshop discussions are listed in the remainder of this document.

4. Technical Environment

The Crash Editing website will be configured and installed on an MDOT system with the specifications listed below.

4.1 Server Software

The Crash Editing website will use the following software: GeoMedia WebMap 6.1, Oracle 10g (v 10.2.0.4).

4.2 Development Environment

The development environment will be Visual Studio 2008, code written in Visual Basic and ASP.NET 3.5. Components may also include the Ajax Control Toolkit and Extensible JavaScript.

4.3 Client System

Client machines running the Crash Editing Tool will be configured with dual 19" monitors (4:3), set at 1280x1024 screen resolution. The browser will be Internet Explorer v 7 and 8. All client machines will be identical in processor and memory specifications, running either Windows 7 or Windows Vista. MDOT is not using any 3rd party screen management software, but relies on the screen management within Windows. Applications open in the same screen where they were previously run.

4.4 MDOT Server/Network Environment

System Description

GeoMedia WebMap will be installed in a VM Ware environment meeting the specifications as described in the GeoMedia WebMap Installation Guide.

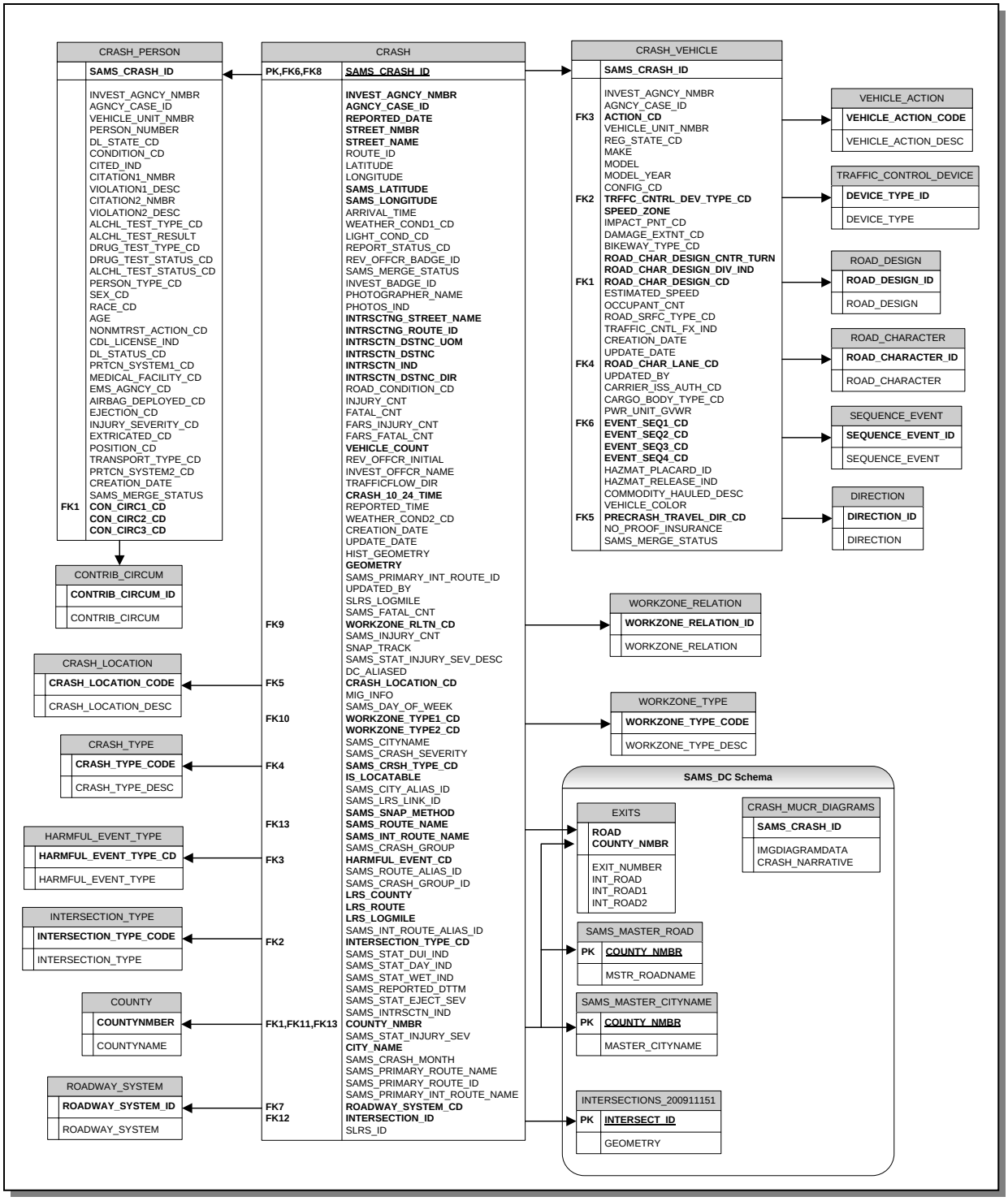
Oracle will be hosted on a separate server (Solaris 9)

Access and security control will be managed by MDOT staff, using Windows Authentication. MDOT will establish appropriate user groups within a single domain in order to allow access to the Crash Editing website. Website administrators will be a separate group with access to the Activity Log as well as the Crash Editing website.

Crash Editing website users will be in a separate MDOT location from the web and database servers, which are housed at MDOT's central office. Internet access will be via fiber connection to ensure adequate performance.

5. Data Model and Test Data Requirements

MDOT provided a data dictionary for the SAMS database, including the SAMS road network.


CRASH_PERSON
SAMS_CRASH_ID
INVEST_AGNCY_NMBR
AGNCY_CASE_ID
VEHICLE_UNIT_NMBR
PERSON_NUMBER
DL_STATE_CD
CONDITION_CD
CITED_IND
CITATION1_NMBR
VIOLATION1_DESC
CITATION2_NMBR
VIOLATION2_DESC
ALCHL_TEST_TYPE_CD
ALCHL_TEST_RESULT
DRUG_TEST_TYPE_CD
DRUG_TEST_STATUS_CD
ALCHL_TEST_STATUS_CD
PERSON_TYPE_CD
SEX_CD
RACE_CD
AGE
NONMTRST_ACTION_CD
CDL_LICENSE_IND
DL_STATUS_CD
PRTCN_SYSTEM1_CD
MEDICAL_FACILITY_CD
EMS_AGNCY_CD
AIRBAG_DEPLOYED_CD
EJECTION_CD
INJURY_SEVERITY_CD
EXTRICATED_CD
POSITION_CD
TRANSPORT_TYPE_CD
PRTCN_SYSTEM2_CD
CREATION_DATE
SAMS_MERGE_STATUS
FK1 CON_CIRC1_CD
CON_CIRC2_CD
CON_CIRC3_CD
CONTRIB_CIRCUM
CONTRIB_CIRCUM_ID
CONTRIB_CIRCUM
CRASH_LOCATION
CRASH_LOCATION_CODE
CRASH_LOCATION_DESC
CRASH_TYPE
CRASH_TYPE_CODE
CRASH_TYPE_DESC
HARMFUL_EVENT_TYPE
HARMFUL_EVENT_TYPE_CD
HARMFUL_EVENT_TYPE
INTERSECTION_TYPE
INTERSECTION_TYPE_CODE
INTERSECTION_TYPE
COUNTY
COUNTYNMBER
COUNTYNAME
ROADWAY_SYSTEM
ROADWAY_SYSTEM_ID
ROADWAY_SYSTEM
CRASH
PK,FK6,FK8 SAMS_CRASH_ID
INVEST_AGNCY_NMBR
AGNCY_CASE_ID
REPORTED_DATE
STREET_NMBR
STREET_NAME
ROUTE_ID
LATITUDE
LONGITUDE
SAMS_LATITUDE
SAMS_LONGITUDE
ARRIVAL_TIME
WEATHER_COND1_CD
LIGHT_COND_CD
REPORT_STATUS_CD
REV_OFFCR_BADGE_ID
SAMS_MERGE_STATUS
INVEST_BADGE_ID
PHOTOGRAPHER_NAME
PHOTOS_IND
INTRSCTNG_STREET_NAME
INTRSCTNG_ROUTE_ID
INTRSCTN_DSTNC_UOM
INTRSCTN_DSTNC
INTRSCTN_IND
INTRSCTN_DSTNC_DIR
ROAD_CONDITION_CD
INJURY_CNT
FATAL_CNT
FARS_INJURY_CNT
FARS_FATAL_CNT
VEHICLE_COUNT
REV_OFFCR_INITIAL
INVEST_OFFCR_NAME
TRAFFICFLOW_DIR
CRASH_10_24_TIME
REPORTED_TIME
WEATHER_COND2_CD
CREATION_DATE
UPDATE_DATE
HIST_GEOMETRY
GEOMETRY
SAMS_PRIMARY_INT_ROUTE_ID
UPDATED_BY
SLRS_LOGMILE
SAMS_FATAL_CNT
FK9 WORKZONE_RLTN_CD
SAMS_INJURY_CNT
SNAP_TRACK
SAMS_STAT_INJURY_SEV_DESC
DC_ALIASED
FK5 CRASH_LOCATION_CD
MIG_INFO
SAMS_DAY_OF_WEEK
FK10 WORKZONE_TYPE1_CD
WORKZONE_TYPE2_CD
SAMS_CITYNAME
SAMS_CRASH_SEVERITY
FK4 SAMS_CRSH_TYPE_CD
IS_LOCATABLE
SAMS_CITY_ALIAS_ID
SAMS_LRS_LINK_ID
SAMS_SNAP_METHOD
FK13 SAMS_ROUTE_NAME
SAMS_INT_ROUTE_NAME
SAMS_CRASH_GROUP
FK3 HARMFUL_EVENT_CD
SAMS_ROUTE_ALIAS_ID
SAMS_CRASH_GROUP_ID
LRS_COUNTY
LRS_ROUTE
LRS_LOGMILE
SAMS_INT_ROUTE_ALIAS_ID
FK2 INTERSECTION_TYPE_CD
SAMS_STAT_DUI_IND
SAMS_STAT_DAY_IND
SAMS_STAT_WET_IND
SAMS_REPORTED_DTTM
SAMS_STAT_EJECT_SEV
SAMS_INTRSCTN_IND
FK1,FK11,FK13 COUNTY_NMBR
SAMS_STAT_INJURY_SEV
CITY_NAME
SAMS_CRASH_MONTH
SAMS_PRIMARY_ROUTE_NAME
SAMS_PRIMARY_ROUTE_ID
SAMS_PRIMARY_INT_ROUTE_NAME
FK7 ROADWAY_SYSTEM_CD
FK12 INTERSECTION_ID
SLRS_ID
CRASH_VEHICLE
SAMS_CRASH_ID
INVEST_AGNCY_NMBR
AGNCY_CASE_ID
FK3 ACTION_CD
VEHICLE_UNIT_NMBR
REG_STATE_CD
MAKE
MODEL
MODEL_YEAR
CONFIG_CD
FK2 TRFFC_CNTRL_DEV_TYPE_CD
SPEED_ZONE
IMPACT_PNT_CD
DAMAGE_EXTNT_CD
BIKEWAY_TYPE_CD
ROAD_CHAR_DESIGN_CNTR_TURN
ROAD_CHAR_DESIGN_DIV_IND
FK1 ROAD_CHAR_DESIGN_CD
ESTIMATED_SPEED
OCCUPANT_CNT
ROAD_SRFC_TYPE_CD
TRAFFIC_CNTL_FX_IND
CREATION_DATE
UPDATE_DATE
FK4 ROAD_CHAR_LANE_CD
UPDATED_BY
CARRIER_ISS_AUTH_CD
CARGO_BODY_TYPE_CD
PWR_UNIT_GVWR
FK6 EVENT_SEQ1_CD
EVENT_SEQ2_CD
EVENT_SEQ3_CD
EVENT_SEQ4_CD
HAZMAT_PLACARD_ID
HAZMAT_RELEASE_IND
COMMODITY_HAULED_DESC
VEHICLE_COLOR
FK5 PRECRASH_TRAVEL_DIR_CD
NO_PROOF_INSURANCE
SAMS_MERGE_STATUS
VEHICLE_ACTION
VEHICLE_ACTION_CODE
VEHICLE_ACTION_DESC
TRAFFIC_CONTROL_DEVICE
DEVICE_TYPE_ID
DEVICE_TYPE
ROAD_DESIGN
ROAD_DESIGN_ID
ROAD_DESIGN
ROAD_CHARACTER
ROAD_CHARACTER_ID
ROAD_CHARACTER
SEQUENCE_EVENT
SEQUENCE_EVENT_ID
SEQUENCE_EVENT
DIRECTION
DIRECTION_ID
DIRECTION
WORKZONE_RELATION
WORKZONE_RELATION_ID
WORKZONE_RELATION
WORKZONE_TYPE
WORKZONE_TYPE_CODE
WORKZONE_TYPE_DESC
SAMS_DC Schema
EXITS
ROAD
COUNTY_NMBR
EXIT_NUMBER
INT_ROAD
INT_ROAD1
INT_ROAD2
CRASH_MUCR_DIAGRAMS
SAMS_CRASH_ID
IMGDIAGRAMDATA
CRASH_NARRATIVE
SAMS_MASTER_ROAD
PK COUNTY_NMBR
MSTR_ROADNAME
SAMS_MASTER_CITYNAME
PK COUNTY_NMBR
MASTER_CITYNAME
INTERSECTIONS_200911151
PK INTERSECT_ID
GEOMETRY

6. Crash Editing Tool User Workflow

The following diagram shows the current data flow used by SAMS and also illustrates that the new Crash Edit Tool verifies SAMS data after the staging process.

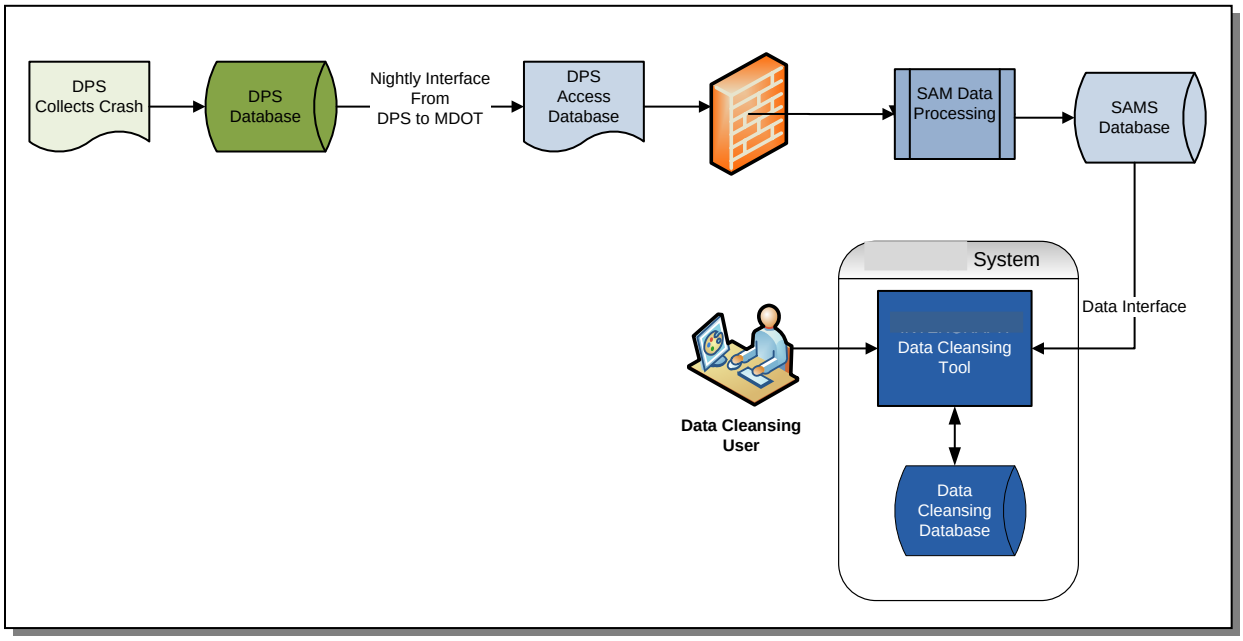


Figure 2. Data flow diagram overview

The diagram shown in Figure 3 illustrates the workflow of the Crash Edit Tool. There will be three main components to the Crash Edit Tool: Nightly File, Historical Records, and Activity Log. The Activity Log option will only be available for SAMS administrators. The interface used to review and edit crash location information will be same for both the Nightly File and Historical record editing.

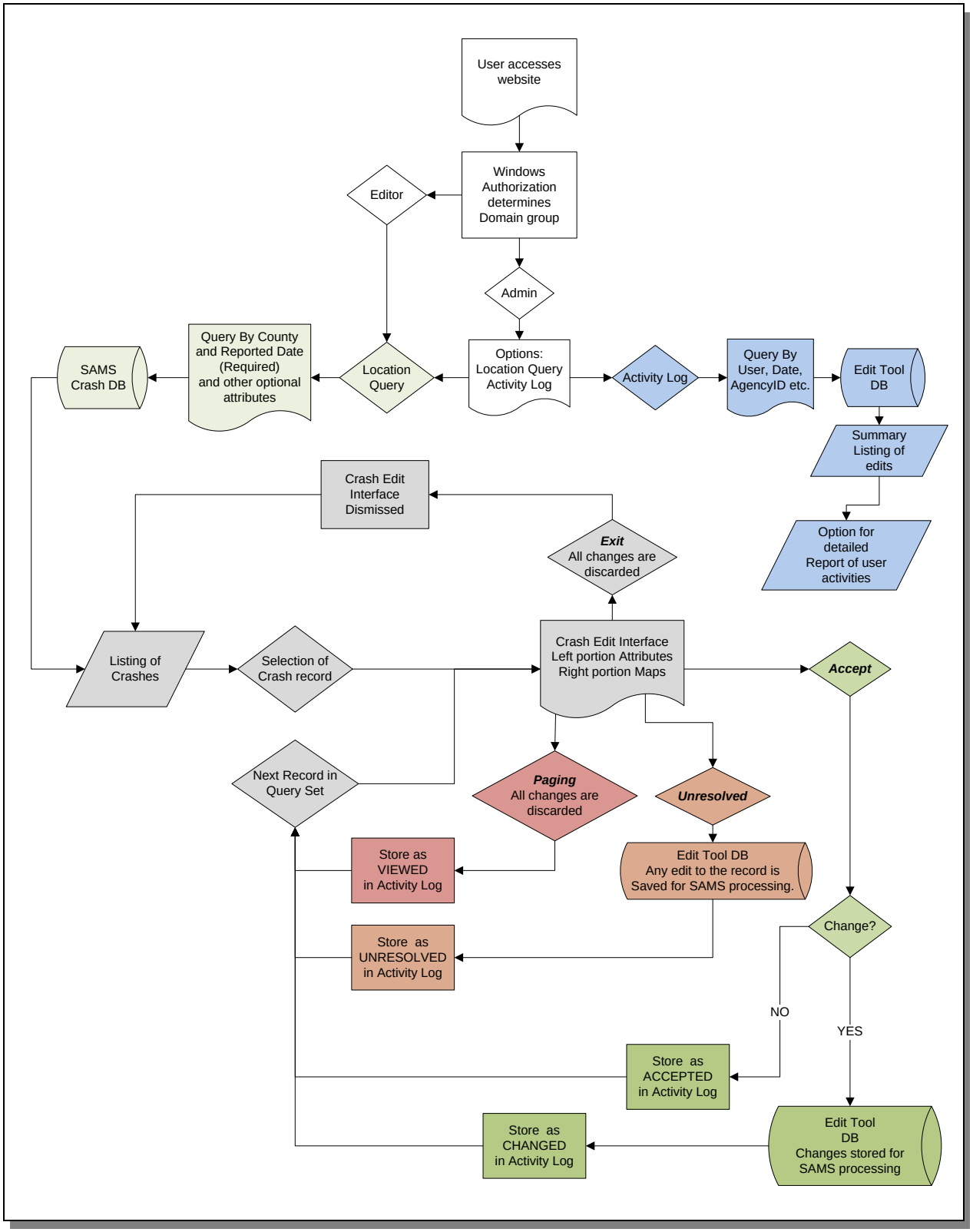


Figure 3. Edit Tool flow diagram

The Crash Edit Tool will utilize Windows authenticity to determine a user's domain login and group. The domain group assigned to a user will dictate the options presented in the top menu of the website. All users assigned to the "SAMS Edit" group will only be allowed to perform a Location Query and subsequently update or review the records details through the edit interface. An additional option will be shown to users assigned to the "SAMS Admin" group, allowing them to generate reports from an Activity Log in order to monitor the progress made on SAMS data cleansing.

When the user first accesses the website, a splash screen will be shown similar to Figure 4. This initial page will perform user validation and set the appropriate parameters according to the validation. SAMS Edit group users will automatically be redirected to Location Query, and SAMS Admin users will be redirected to Activity Log by default. If the accessing user is not assigned to one of the appropriate domain groups, a message will appear indicating the user is not a valid Crash Edit Tool user and an email link to notify the administrator will be provided as shown in Figure 5.

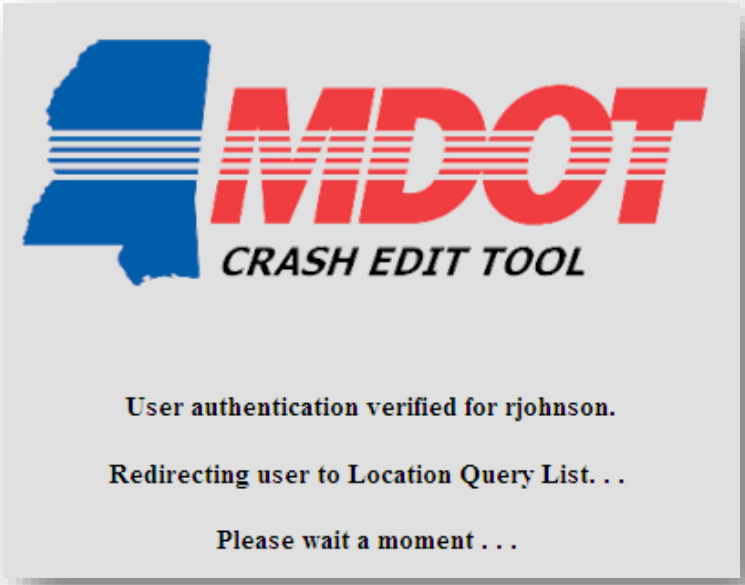


Figure 4. Initial Crash Edit Tool Screen for authorized user

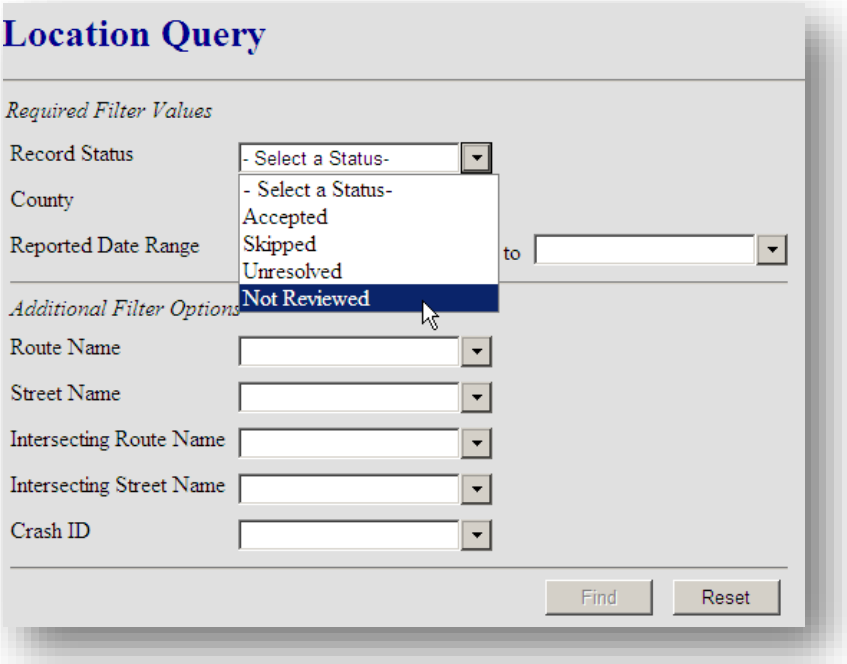
Figure 5. Initial Crash Edit Tool Screen for unauthorized user

6.1 Location Query

Selection of the Location Query option will present the user with several options to query for crash locations in the SAMS databases. The fields that will be available to query are: COUNTYNAME, REPORTED_DATE, SAMS_CRASH_ID, SAMS_ROUTE_NAME, STREET_NAME, SAME_INT_ROUTE_NAME, and INTERSECTING_STREET_NAME. In addition, the Record Status (such as Accepted or Unresolved) can be used to further restrict the query results.

The drop-down fields provided for selection will be generated from the available values in the CRASH table. The CRASH table currently contains over a million records, each with a unique Crash ID. In order to generate the drop-down listings, it is necessary to narrow the search selection to a reasonable number of records for performance and usability. Therefore, the form will require that three values be selected, Remaining query filters will be optional. The user will first be provided only an option to select the record status (Accepted, Skipped, Unresolved, or Not Reviewed). Once the status is selected, the user must select a county from the listing of 82 counties in Mississippi, and then a start and end date. It might be necessary to automatically reduce the size of the record set to provide acceptable performance and a reasonable number of records for editing. If the query returns more records than are defined in a customized variable, the user will be alerted and only the specified number of records will be presented in the query results.

The options in the date drop-downs will be generated automatically from available dates in the CRASH table for the selected county. The default start and end dates will be the latest date stored. Once the user has defined all three required filters, the remainder of the options, shown in the “Additional Filter Options” area as shown in Figure 6, will be available, showing unique values for the selected status, county, and dates. Selection of the Find button will generate a list of crash records based on the query options selected as shown in Figure 7. The resulting query record listing will display the Date, Crash ID, Route Name, and Intersecting Route Name. The listing results can be sorted by selection of a column heading text. In addition to the record attributes, an edit option will be presented for each record. Selection of the edit option will invoke the edit interface, displaying additional data for the selected crash record.



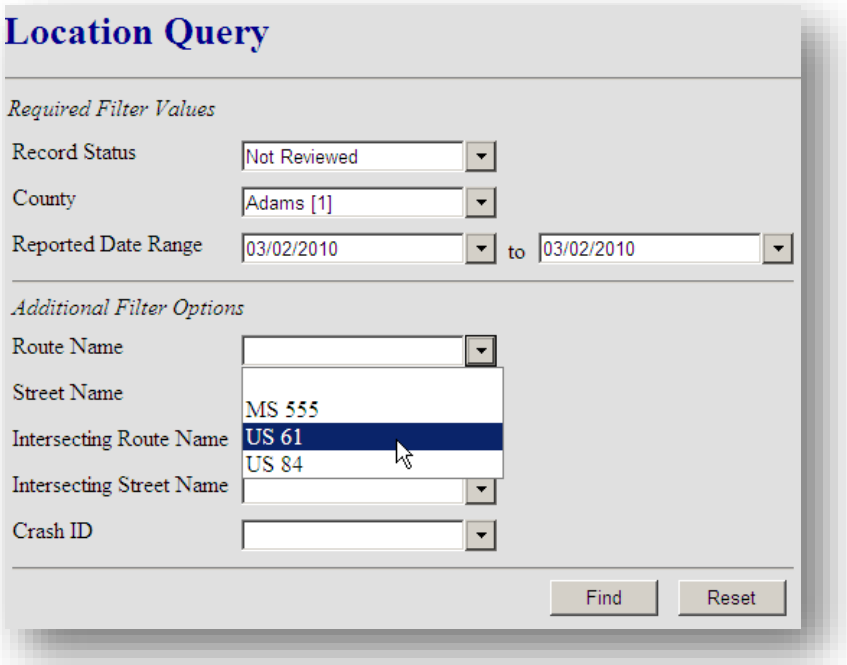


Figure 6. Example of Location Query selection

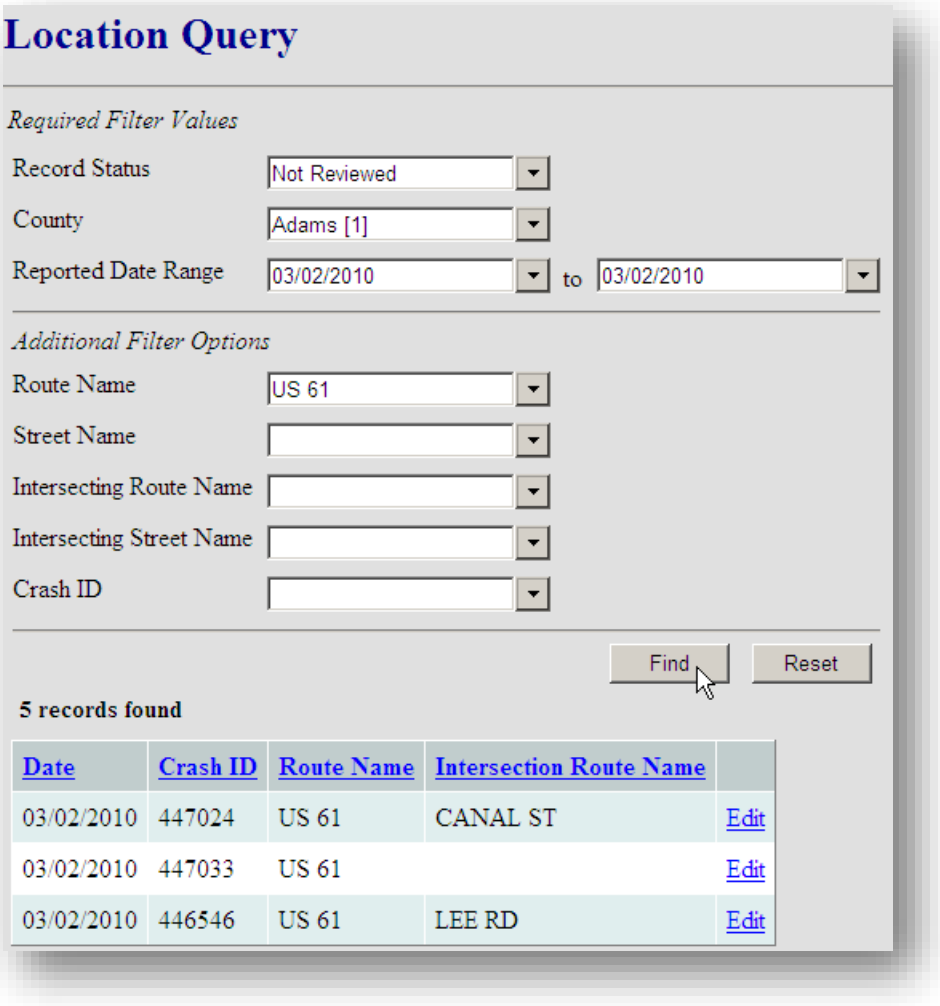


Figure 7. Example of Location Query listing

6.2 Activity Log

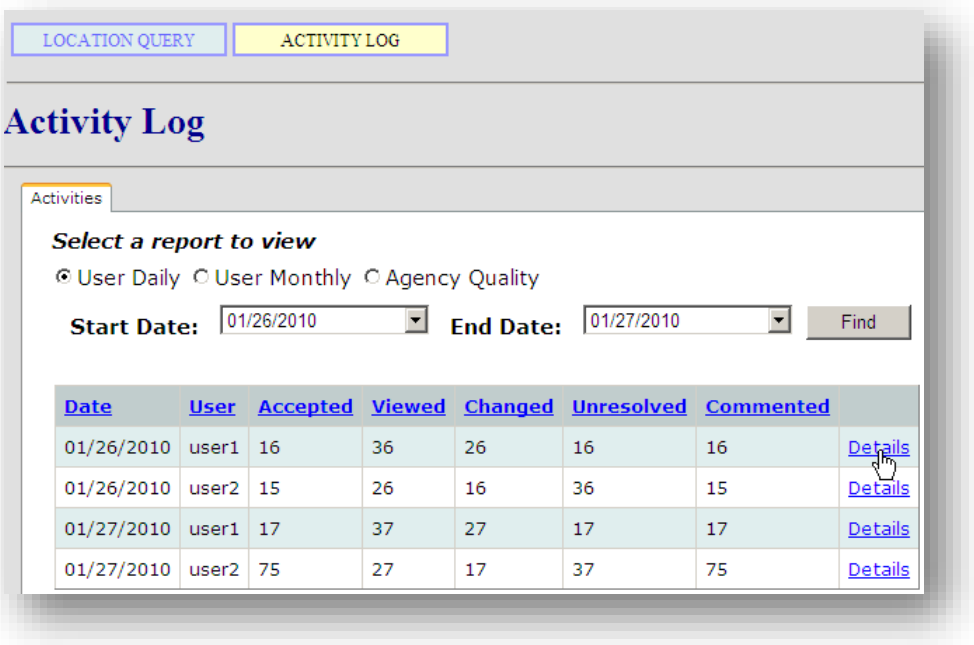
The Activity Log option will only be available for those users who been assigned to the SAMS administrator domain group. This option can be used to track how SAMS data is being reviewed and/or edited using the Crash Edit Tool. Selection of this option will present a user with the option to generate a User Daily, User Monthly, or Agency Quality report as shown in Figure 8. The report generated will be a summary report similar to the examples shown below. The administrator will also be provided the option to select one of the summary records to get a more detailed report, showing Crash ID, County, City, and Route Name for the individual records used in the summary. A date range is used to return only records that were reviewed and/or modified between those dates. In order to see the individual attributes for a specific crash record, the administrator can select the details option once again. This final report will display a side-by-side comparison of the original values for those attributes next to any changes made to the record by the editor. The final report will only display attributes which are available for editing in the edit interface. Each report will be presented as a separate tab, allowing the user to easily switch between reports when desired. This allows the user to work from a high level of detail down to more specific details for a particular user or agency.

As illustrated in Figure 3, an ACCEPTED record is one for which the editor has selected the Accept button after reviewing. A VIEWED record is when the editor has selected one of the paging options, essentially skipping the record for later acceptance. A CHANGED record is one that was modified and the Accept button was selected. UNRESOLVED occurs when the user modifies the record and selects the Unresolved button, because the editor determines that some record information needs to be verified prior to accepting the record. COMMENTED refers to any record for which the editor updated the Remarks field. The detailed Activity Log reports will be generated from a new Oracle table which will track all changes made to a record. The editor's Windows user name, SCID, Agency ID, and all editable fields will be stored for both before and after record information.

Figure 8. Example of Activity Log Report Options

The initial tab of Activity Log page, the three different activity report logs are presented as radio buttons. Note the menu option at the top to switch to Location Query. Although Activity Log is the default for a SAMS Admin, the option exists to switch to Location Query if desired.

Report option 1: User Daily report



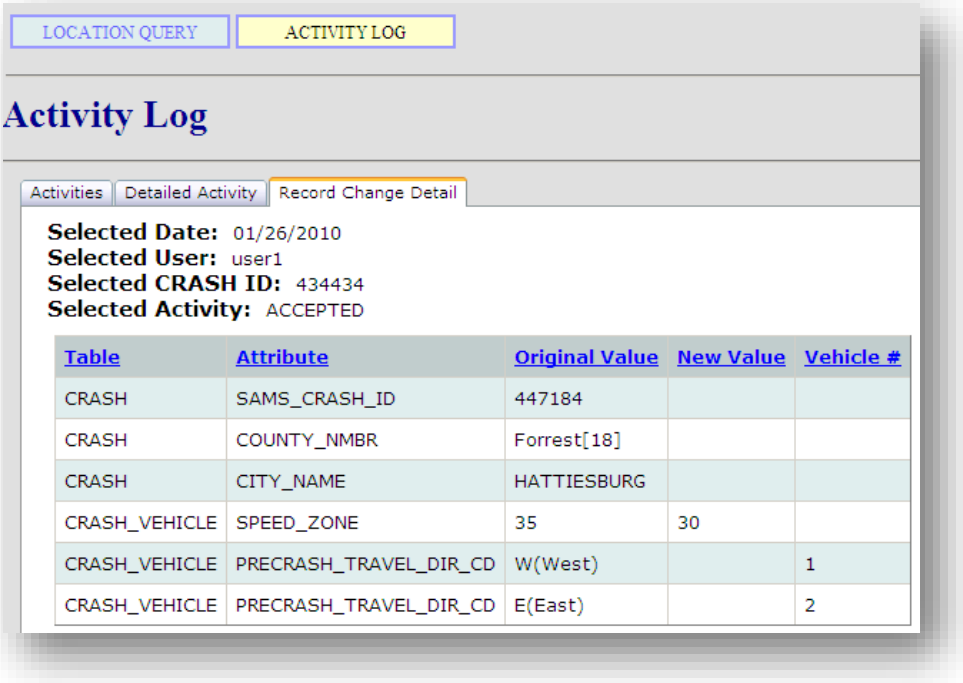
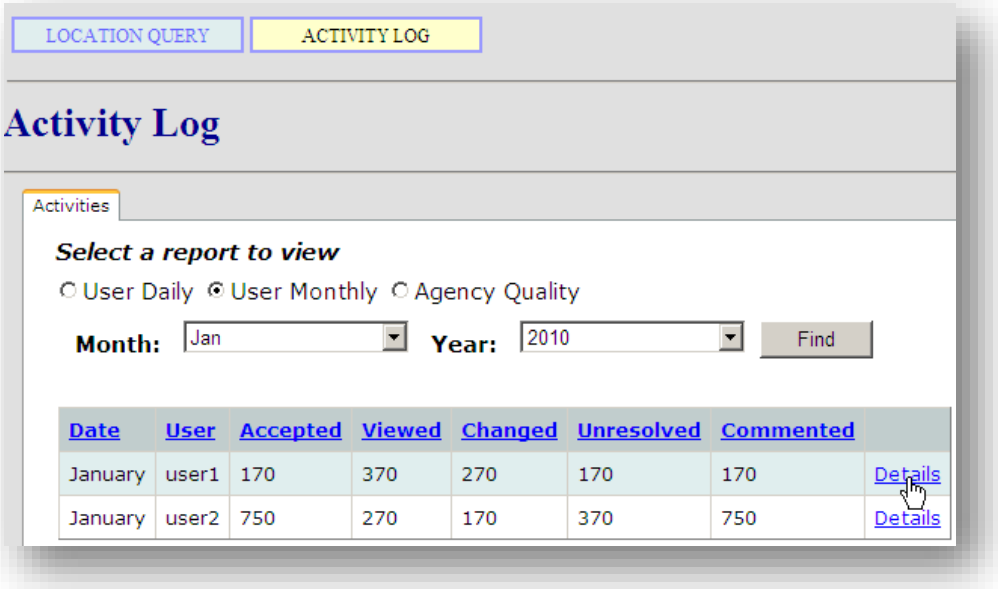
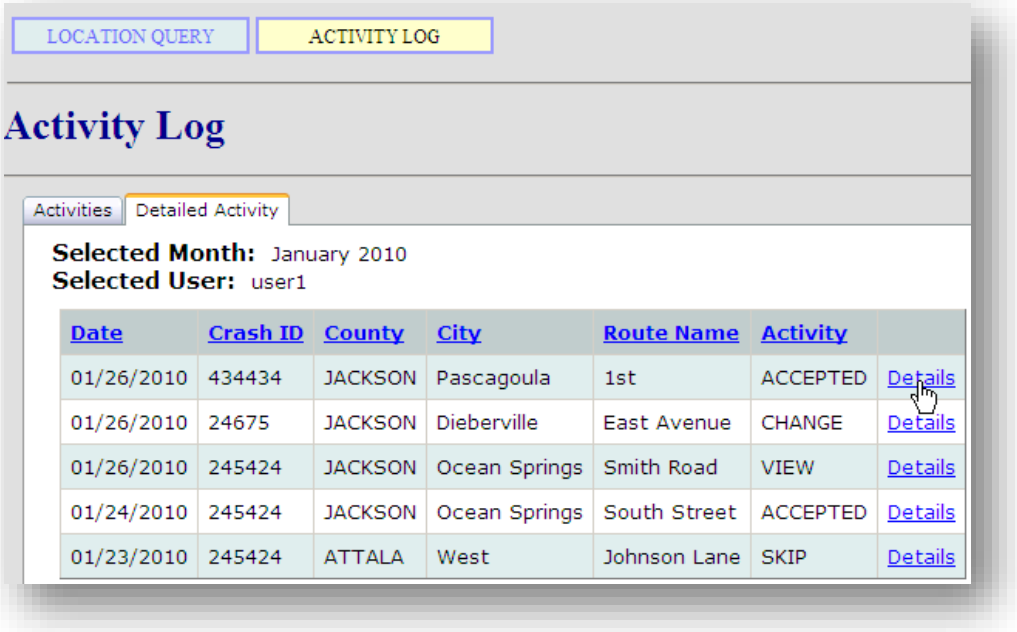


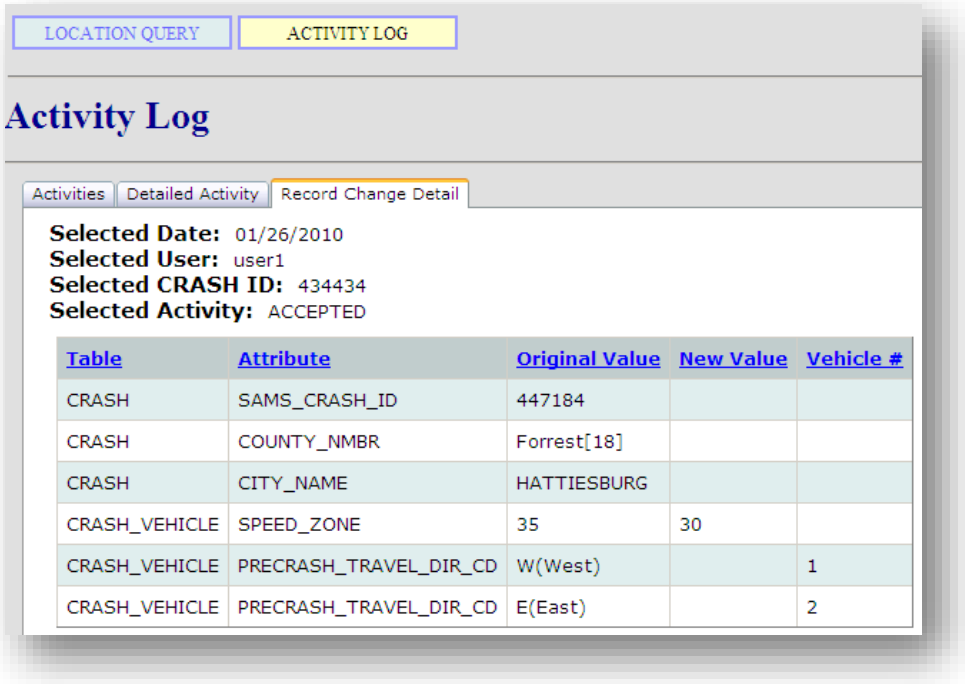
Table	Attribute	Original Value	New Value	Vehicle #
CRASH	SAMS_CRASH_ID	447184		
CRASH	COUNTY_NMBR	Forrest[18]		
CRASH	CITY_NAME	HATTIESBURG		
CRASH_VEHICLE	SPEED_ZONE	35	30	
CRASH_VEHICLE	PRECRASH_TRAVEL_DIR_CD	W(West)		1
CRASH_VEHICLE	PRECRASH_TRAVEL_DIR_CD	E(East)		2

Report option 2: User Monthly report

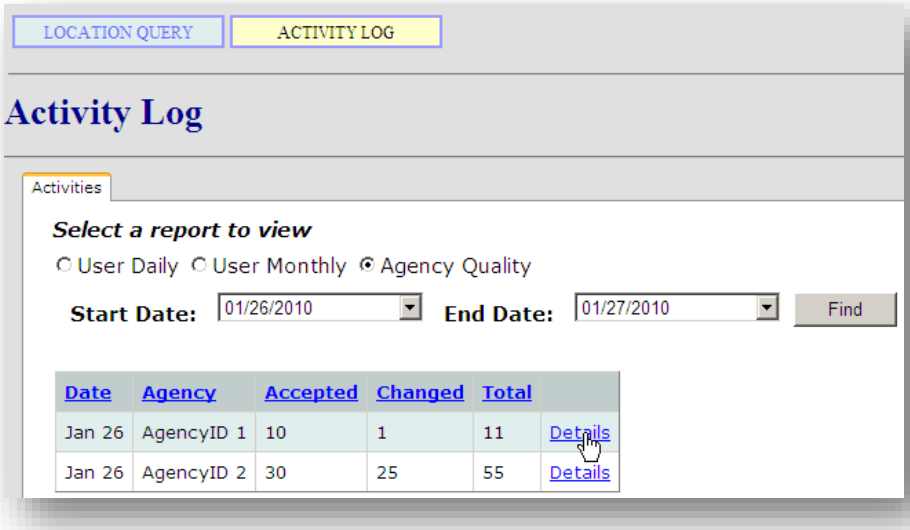


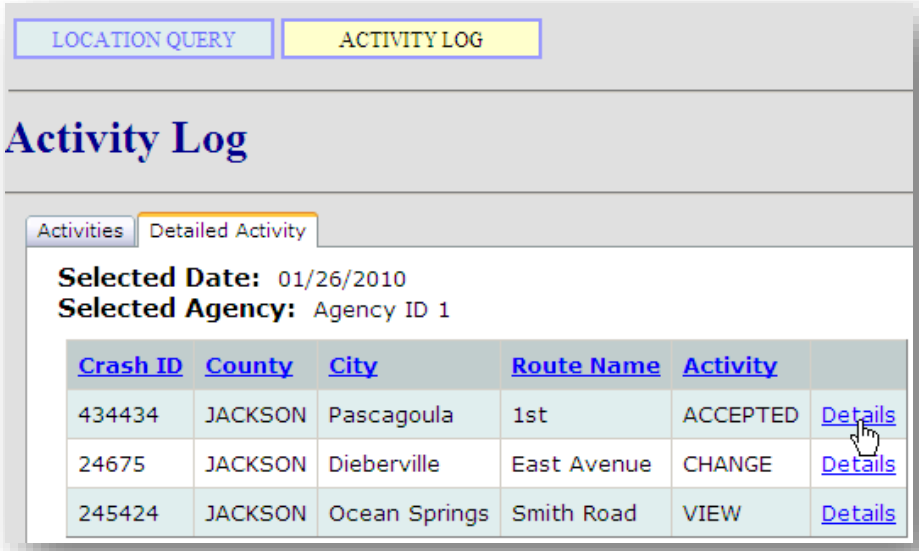
Date	User	Accepted	Viewed	Changed	Unresolved	Commented	
January	user1	170	370	270	170	170	Details
January	user2	750	270	170	370	750	Details


LOCATION QUERY
ACTIVITY LOG
Activity Log
Activities
Detailed Activity
Selected Month: January 2010
Selected User: user1
Date | Crash ID | County | City | Route Name | Activity
01/26/2010 | 434434 | JACKSON | Pascagoula | 1st | ACCEPTED | Details
01/26/2010 | 24675 | JACKSON | Dieberville | East Avenue | CHANGE | Details
01/26/2010 | 245424 | JACKSON | Ocean Springs | Smith Road | VIEW | Details
01/24/2010 | 245424 | JACKSON | Ocean Springs | South Street | ACCEPTED | Details
01/23/2010 | 245424 | ATTALA | West | Johnson Lane | SKIP | Details


LOCATION QUERY
ACTIVITY LOG
Activity Log
Activities
Detailed Activity
Record Change Detail
Selected Date: 01/26/2010
Selected User: user1
Selected CRASH ID: 434434
Selected Activity: ACCEPTED
Table | Attribute | Original Value | New Value | Vehicle #
CRASH | SAMS_CRASH_ID | 447184
CRASH | COUNTY_NMBR | Forrest[18]
CRASH | CITY_NAME | HATTIESBURG
CRASH_VEHICLE | SPEED_ZONE | 35 | 30
CRASH_VEHICLE | PRECRASH_TRAVEL_DIR_CD | W(West) | 1
CRASH_VEHICLE | PRECRASH_TRAVEL_DIR_CD | E(East) | 2

Report option 3: Agency Quality report





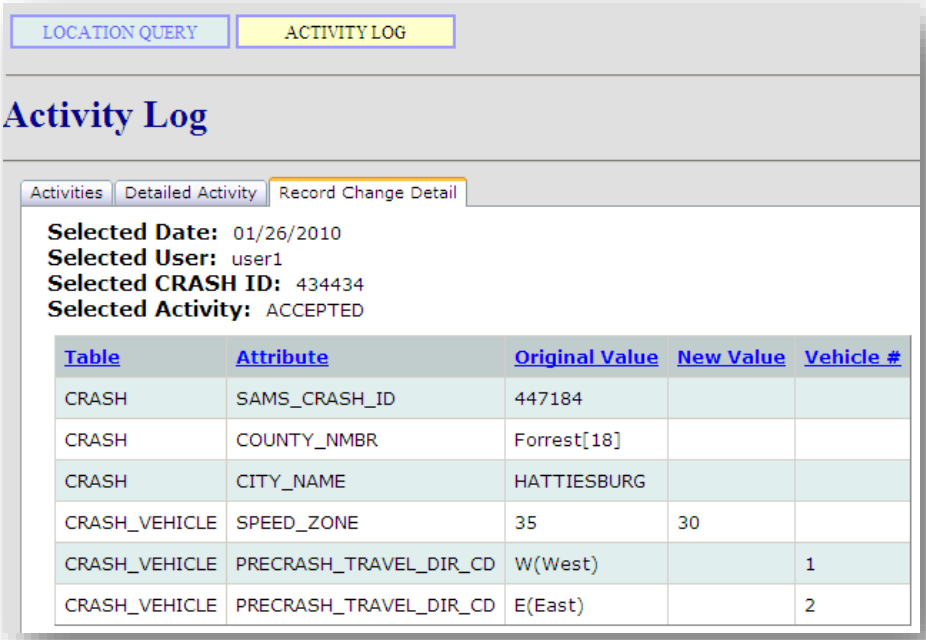


Table	Attribute	Original Value	New Value	Vehicle #
CRASH	SAMS_CRASH_ID	447184		
CRASH	COUNTY_NMBR	Forrest[18]		
CRASH	CITY_NAME	HATTIESBURG		
CRASH_VEHICLE	SPEED_ZONE	35	30	
CRASH_VEHICLE	PRECRASH_TRAVEL_DIR_CD	W(West)		1
CRASH_VEHICLE	PRECRASH_TRAVEL_DIR_CD	E(East)		2

6.3 Edit Tool Left Monitor (Attribute) Interface

The primary interface that the editor will use is comprised of one browser window that will be stretched across two monitors. In some cases, the user may have to resize the window to appropriately fit their dual screen monitor configuration. The left monitor will consist of several drop-down lists and text fields that represent attributes present in the SAMS database for a specific crash. Some of the attributes will be shown as read-only, to be used as reference. The read-only fields will be disabled and “grayed-out.” The remainder of the form objects can be updated as needed by the editor. The table in Appendix A details the relationship between the form objects in the edit interface and the SAMS database, showing which attributes are used to populate each of the form objects.

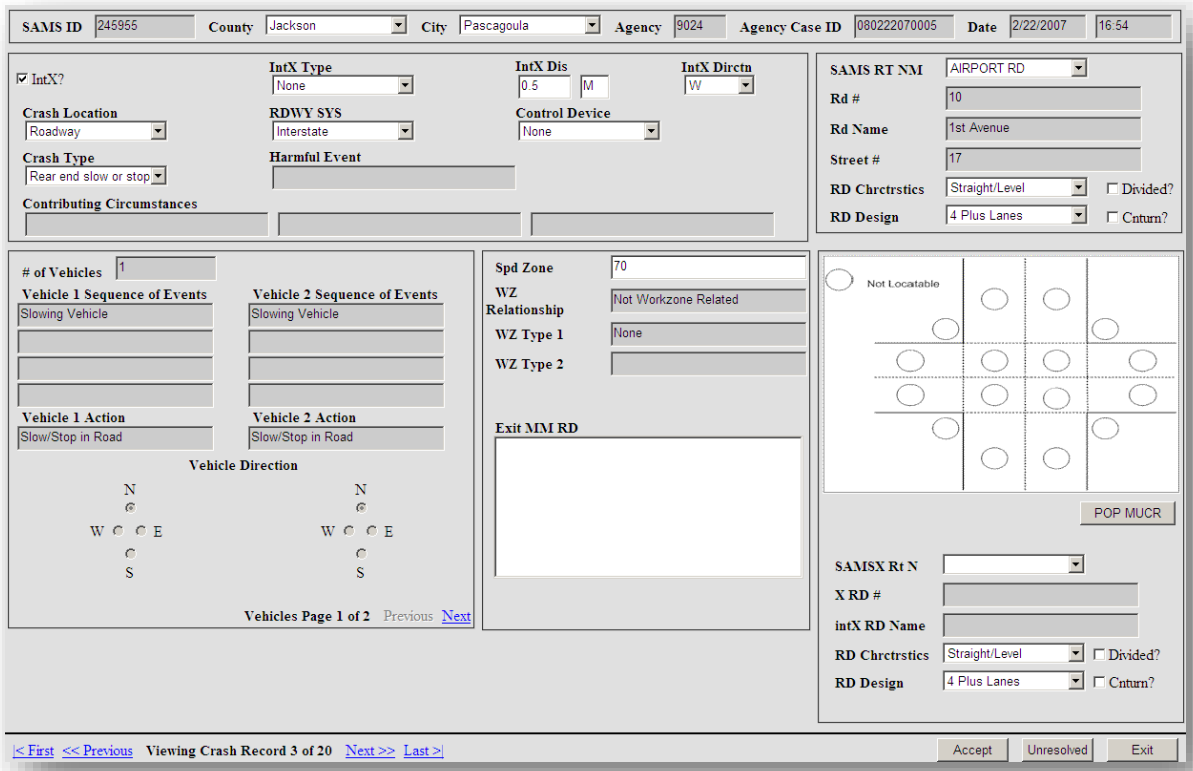


Figure 9. Example of left monitor edit interface

Once the user has reviewed and made all necessary edits to the data presented, the user will select one of three buttons: Accept, Unresolved, and Exit.

- The Accept button is selected when the editor determines that this record has successfully been reviewed and all invalid entries have been corrected. The Activity Log would record either an Accepted if no changes were made, or Changed if edits were made
- The Unresolved button is selected when the editor has made changes to the record but needs to conduct research to validate some of the information before accepting. The changes are saved for inclusion into SAMS and the Activity Log will record Unresolved
- The Exit button is selected to dismiss the edit interface and return to the record listing
- The edit interface will allow paging through the record set. Each time paging is used to move to the next record, this will be recorded as a Skipped record. Note: in order to record meaningful data related to a Skipped record, a record must be visible in the edit interface for at least 15 seconds. This eliminates recording a Skip if a user were to repeatedly select a paging option several times in a quick and consecutive order. The time interval will be a changeable variable.

The number of crash records returned from the location query list will be displayed between the paging controls. The paging control allows the user to navigate from one crash record to another. If a user clicks First or Last, only the record currently viewed will be marked as skipped. All records in between will be ignored. If more than two vehicles were involved in the accident, a paging option will be shown to allow the user to page through all vehicle information.

When a user selects a record from the query results, the edit interface will appear and display the selected record. All records that precede a selected record in the query record set will placed into the edit record set and the user can page backward to access them if desired. As the user reviews and/or edits crash data, selecting the Accept or Unresolved button, or selection of any paging options, the next record in the record set would be presented in the edit interface.

All form objects will be populated from the SAMS database. The primary tables used will be the SAMS.CRASH and SAMS,CRASH_VEHICLE tables. Additional lookup tables will be used to display the appropriate descriptive attribute and not a code value when available. Figure 1 above shows the tables, attributes, and relationships used by the edit interface.

The Pop MUCR button can be selected to display a MUCR diagram image stored as a BLOB in Oracle and/or a narrative stored as CLOB in Oracle. The results would be displayed in a pop-up window for review. MUCR information will be retrieved from the SAMS_DC.CRASH_MUCR_DIAGRAMS table.

An intersection diagram will be shown in the edit interface containing radio buttons, see Figure 10. If the crash was at an intersection, then the editor will select one of the 17 available radio buttons to indicate the location of the crash within the intersection. Note: SAMS currently does not have an attribute to store this data. Selection of a diagram radio button will be stored in a new table along with the SAMS Crash ID. At a later date, this information may be incorporated into SAMS.

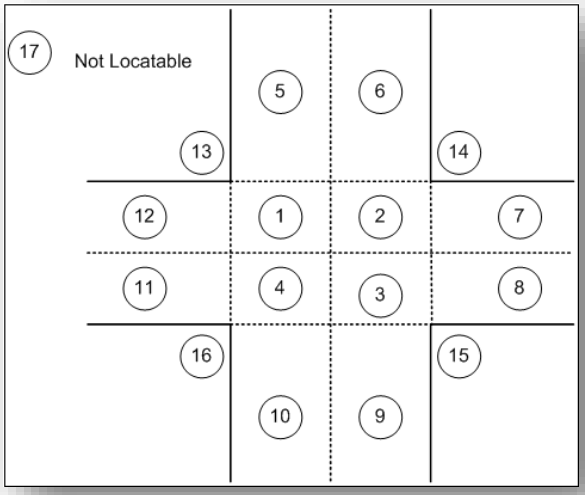


Figure 10. Intersection Diagram with 17 zones

The SAMS_DC.EXITS table will be used to display Exit Numbers and Intersection Road name(s) in a look-up field listing. Only exits that match the route name in the SAMS RT NM form field with the CRASH.SAMS_ROUTE_NAME attribute will be shown. This assumes that the same naming convention is used for the EXITS.ROAD attribute as is present in CRASH.SAMS_ROUTE_NAME. The intent is to allow the user to determine the intersection road name from the look-up when only an Exit has been placed in the report description.

For section crashes, the only information that will populate for the intersection side of the block will be SAMS INTERSECTING ROUTE NAME, INTERSECTING ROAD ID, and INTERSECTING ROAD NAME.

All of the fields in this block should be ‘combo boxes’. These boxes should be county-specific. For example, the SAMS ROUTE NAME and SAMS INTERSECTING ROUTE NAME fields should have ‘combo boxes’ that pull from the MASTER ROAD TABLE and show only the streets located in the corresponding county. Also, in the event that a street name cannot be found and selected from the MASTER ROAD TABLE, an option of ‘OTHER’ in the selection list should be available for the user.

6.4 Edit Tool Right Monitor (Map display) Interface

The right monitor will display two map interfaces showing the crash location, a text area to enter comments, display of previous edits (if present), and a button to open a new browser window. The left map will be an interactive map generated by GeoMedia WebMap, allowing the user to update the location of the crash. The right map will be a Google Map display of the crash location, which is used for reference only. The two maps will initially be centered on the crash location with similar extents, but will work independently of each other using their respective navigation options for zoom and pan.

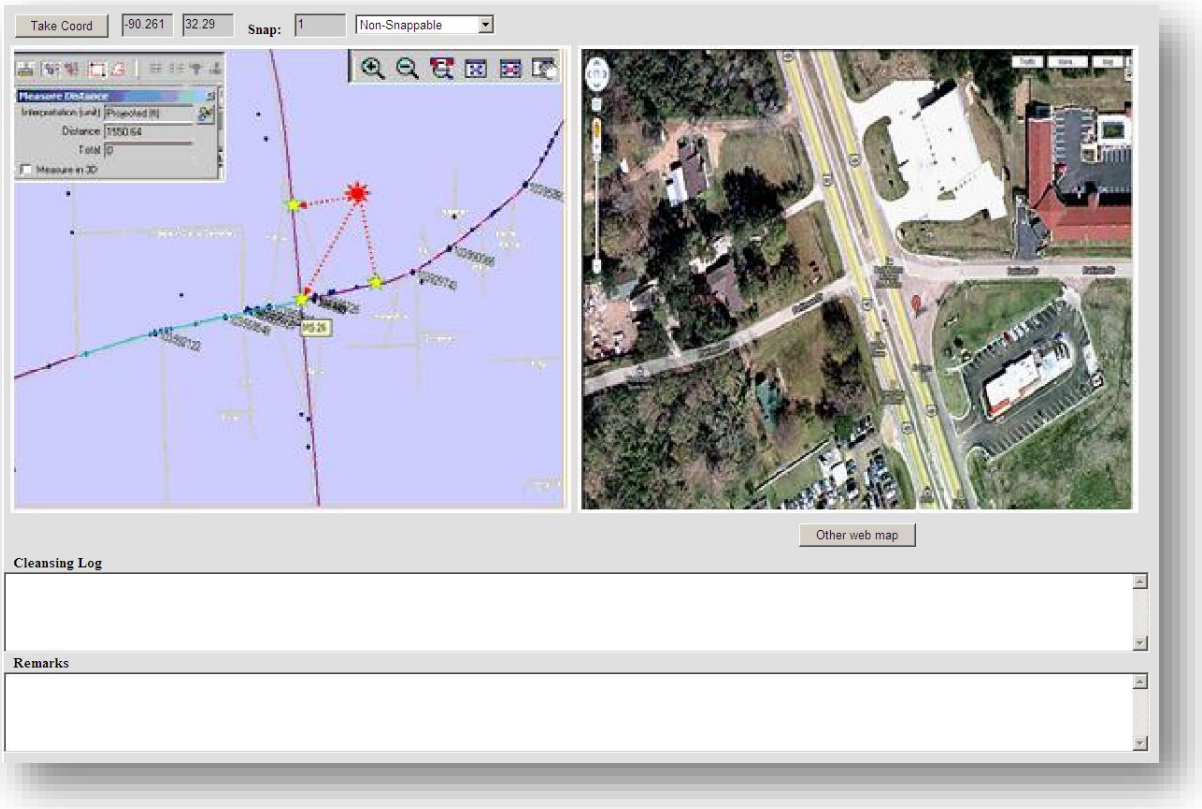


Figure 11. Example of right monitor edit interface

In the left map, the editor will have the ability to measure distances, and then select the Take Coord button to place a location in the map. The user will need to set the appropriate snap mode prior to placement of the point in order to ensure the appropriate snapping method is used. Although SAMS has nine different snap modes, only three will be available for users in the edit interface: Route, Intersection, and Non-Snap. The original snap mode assigned by the SAMS staging process will be shown, but if it is not one of the three acceptable snap options, the user will be prompted to select an appropriate snap method. The snap mode selected will be used when the point location is placed. A snap mode of Route indicates that the point should be placed on the nearest route where the point is placed. A snap mode of Intersection will place the point at the nearest intersection to the point placement. A Non-Snap would obtain the coordinates of the point placed without snapping to either a route or intersection. The point

placed by the user will obtain the Longitude / Latitude location and update the read-only values displayed. The map will be updated to reflect the new point location. In addition to the navigation and measurement options in the left map, an option will be available to reset the map back to the initial location when the crash record was loaded. Selection of this option would reset the longitude/latitude values to their initial values and center the map to that location.

The map Layers/Feature Classes to be displayed on the WebMap interactive map are: COUNTY, CITY, ROADNETWORK_L, TA_LOCAL_ROAD, URBANAREA (default OFF, optional ON), TA_FULL (default OFF, optional ON), LABELS (default OFF, optional ON), and INTERSECTION (default OFF, optional ON). Symbology for these features will be determined by use of information in the SAMS_DD.SAMS_CTL_MAP_PARAMETERS table.

The Cleansing Log area would show a read-only, date-sorted listing of previous changes made to this crash location record. All editable attributes will be shown as column heading and each record will represent a change made to currently displayed accident. The only values shown in this table will be those that were updated in the past.

The Remarks field would allow a user to add comments to this record. Comments would be stored in a new table along with the SAMS Crash ID to be reviewed through the Activity Log option as needed.

7. Approval Signatures

Signature by all parties listed below constitutes acceptance of this Design Document, and notice to proceed with development, testing, and delivery of the Crash Editing Tool.

MDOT	******** Corporation
Approved by:	Approved by:
MDOT Project Manager	******** Project Manager ********
Printed Name	Printed Name
Date	Date

Appendix A – Table of Form Objects and Correlated Database Attributes

Form Field	Attribute	Lookup Table Join Column	Lookup Table Display Attribute
SAMS ID	CRASH.SAMS_CRASH_ID		
County	CRASH.COUNTY_NMBR	COUNTY.COUNTYNMBR	COUNTY.COUNTYNAME
City	CRASH.CITY_NAME	SAMS_DC.SAMS_MASTER_CITYNAME.COUNTY_NMBR	SAMS_DC.SAMS_MASTER_CITYNAME.MASTER_CITYNAME
Agency	CRASH.INVEST_AGNCY_NMBR		
Agency Case ID	CRASH.AGNCY_CASE_ID		
Date	CRASH.REPORTED_DATE		
Time	CRASH.CRASH_10_24_TIME		
IntX?	CRASH.INTRSCTN_IND		
IntX Type	CRASH.INTERSECTION_TYPE_CD	INTERSECTION_TYPE.INTERSECTION_TYPE_CODE	INTERSECTION_TYPE.INTERSECTION_TYPE
IntX Dis	CRASH.INTRSCTN_DSTNC		
	CRASH.INTRSCTN_DSTNC_UOM		
IntX Dirctn	CRASH.INTRSCTN_DSTNC_DIR		
Crash Location	CRASH.CRASH_LOCATION_CD	CRASH_LOCATION.CRASH_LOCATION_CODE	CRASH_LOCATION.CRASH_LOCATION_DESC
RDWY SYS	CRASH.ROADWAY_SYSTEM_CD	ROADWAY_SYSTEM.ROADWAY_SYSTEM_ID	ROADWAY_SYSTEM.ROADWAY_SYSTEM
Cntrl Device	CRASH_VEHICLE.TRFFC_CNTRL_DEV_TYPE_CD	TRAFFIC_CONTROL_DEVICE.DEVICE_TYPE_ID	TRAFFIC_CONTROL_DEVICE.DEVICE_TYPE
Crsh Type	CRASH.SAMS_CRSH_TYPE_CD	CRASH_TYPE.CRASH_TYPE_CODE	CRASH_TYPE.CRASH_TYPE_DESC
1st Hrm evnt	CRASH.HARMFUL_EVENT_CD	HARMFUL_EVENT_TYPE.HARMFUL_EVENT_TYPE_CD	HARMFUL_EVENT_TYPE.HARMFUL_EVENT_TYPE
Contributing Circum	CRASH_PERSON.CON_CIRC1_CD CRASH_PERSON.CON_CIRC2_CD CRASH_PERSON.CON_CIRC3_CD	CONTRIB_CIRCUM.CONTRIB_CIRCUM_ID	CONTRIB_CIRCUM.CONTRIB_CIRCUM
SAMS RT NM	CRASH.SAMS_ROUTE_NAME	SAMS_DC.SAMS_MASTER_ROAD.COUNTY_NMBR	SAMS_DC.SAMS_MASTER_ROAD.MSTR_ROADNAME
Rd #	CRASH.ROUTE_ID		
RD Name	CRASH.STREET_NAME		
Street #	CRASH.STREET_NMBR		
RD Chrctrstcs	CRASH_VEHICLE.ROAD_CHAR_LANE_CD	ROAD_CHARACTER.ROAD_CHARACTER_ID	ROAD_CHARACTER.ROAD_CHARACTER
RD Design	CRASH_VEHICLE.ROAD_CHAR_DESIGN_CD	ROAD_DESIGN.ROAD_DESIGN_ID	ROAD_DESIGN.ROAD_DESIGN
Divided?	CRASH_VEHICLE.ROAD_CHAR_DESIGN_DIV_IND		
Cnturn?	CRASH_VEHICLE.ROAD_CHAR_DESIGN_CNTR_TURN		
Vehicle #	CRASH.VEHICLE_COUNT		
Sequence of Events V1	CRASH_VEHICLE.EVENT_SEQ1_CD CRASH_VEHICLE.EVENT_SEQ2_CD CRASH_VEHICLE.EVENT_SEQ3_CD CRASH_VEHICLE.EVENT_SEQ4_CD	SEQUENCE_EVENT.SEQUENCE_EVENT_ID	SEQUENCE_EVENT.SEQUENCE_EVENT
Sequence of Events V2	CRASH_VEHICLE.EVENT_SEQ1_CD CRASH_VEHICLE.EVENT_SEQ2_CD CRASH_VEHICLE.EVENT_SEQ3_CD CRASH_VEHICLE.EVENT_SEQ4_CD	SEQUENCE_EVENT.SEQUENCE_EVENT_ID	SEQUENCE_EVENT.SEQUENCE_EVENT
Veh1 Action	CRASH_VEHICLE.ACTION_CD	VEHICLE_ACTION.VEHICLE_ACTION_CODE	VEHICLE_ACTION.VEHICLE_ACTION_DESC
Veh2 Action	CRASH_VEHICLE.ACTION_CD	VEHICLE_ACTION.VEHICLE_ACTION_CODE	VEHICLE_ACTION.VEHICLE_ACTION_DESC
Vehicle Direction (1)	CRASH_VEHICLE.PRECRASH_TRAVEL_DIR_CD	DIRECTION.DIRECTION_ID	DIRECTION.DIRECTION
Vehicle Direction (2)	CRASH_VEHICLE.PRECRASH_TRAVEL_DIR_CD	DIRECTION.DIRECTION_ID	DIRECTION.DIRECTION

Spd Zone	CRASH_VEHICLE.SPEED_ZONE		
WZ Relationship	CRASH.WORKZONE_RELN_CD	WORKZONE_RELATION.WORKZONE_RELATION_ID	WORKZONE_RELATION.WORKZONE_RELATION
WZ Type 1	CRASH.WORKZONE_TYPE1_CD	WORKZONE_TYPE.WORKZONE_TYPE_CODE	WORKZONE_TYPE.WORKZONE_TYPE_DESC
WZ Type 2	CRASH.WORKZONE_TYPE2_CD	WORKZONE_TYPE.WORKZONE_TYPE_CODE	WORKZONE_TYPE.WORKZONE_TYPE_DESC
Exit_MM_RD	EXITS	EXITS.ROAD & EXITS.COUNTY_NMBR	EXITS.EXIT_NUMBER,EXITS.INT_ROAD, EXITS.INT_ROAD1, EXITS.INT_ROAD2
SAMSX Rt N	CRASH.SAMS_INT_ROUTE_NAME	SAMS_DC.SAMS_MASTER_ROAD.COUNTY_NMBR	SAMS_DC.SAMS_MASTER_ROAD.MSTR_ROADNAME
X RD #	CRASH.INTRSCTNG_ROUTE_ID		
IntX RD Name	CRASH.INTRSCTNG_STREET_NAME		
RD Chrctrstcs	CRASH_VEHICLE.ROAD_CHAR_LANE_CD	ROAD_CHARACTER.ROAD_CHARACTER_ID	ROAD_CHARACTER.ROAD_CHARACTER
RD Design	CRASH_VEHICLE.ROAD_CHAR_DESIGN_CD	ROAD_DESIGN.ROAD_DESIGN_ID	ROAD_DESIGN.ROAD_DESIGN
Divided?	CRASH_VEHICLE.ROAD_CHAR_DESIGN_DIV_IND		
Cnturn?	CRASH_VEHICLE.ROAD_CHAR_DESIGN_CNTR_TURN		
POP MUCR	SAMS_DC.CRASH_MUCR_DIAGRAMS.IMGDIAGRAMDATA SAMS_DC.CRASH_MUCR_DIAGRAMS.CRASH_NARRATIVE		
Lat	CRASH.SAMS_LATITUDE		
Lng	CRASH.SAMS_LONGITUDE		
Snapable	CRASH.IS_LOCATABLE		
Snap_method	CRASH.SAMS_SNAP_METHOD	SAMS_SNAP_METHOD.SNAP_ID	SAMS_SNAP_METHOD.SNAP_DESC
CLEANSING LOG	Activity Log Table(s) in SAMS_CET Schema		
REMARKS	SAMS_CET.COMMENTS.REMARKS		