Crash Magic Online

Training Notes

SAMPLE

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www.pdmagic.com

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1 Introduction

1.1 Welcome

General information

About this document

This document serves as an outline for both the instructor and the training attendees. We encourage you to browse through it prior to the training and make notes about those sections that interest you most. At the training, there will be opportunities to request that certain areas be focused on or re-examined.

As with most outlines, we will probably stray from it periodically. New technology, program enhancements, and questions often arise that are not directly addressed in the outline.

1.2 Schedule

Each training can be, and usually is customized for our client.

For most two-day training events, a common schedule will apply. Each of the two days are divided into morning and afternoon. The following are how those four parts are presented:

1. **Software overview and capabilities** - This part of the training introduces the attendees to the more important facets of the software. It provides a basis for the rest of the training.

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This first part of the training is the most appropriate for administrators that will have limited use of the software, but need to understand what options are available.

2. **Deep dive into software** - In this second part, we cover the same steps as in part 1, but in far greater detail with an emphasis on "how to". This part is still primarily an instructor demonstration, rather than hands-on. Importantly, parts 1 and 2 do not use client data. This is an intentional move to avoid data discussions and instead focus on software functionality.
   At the end of this part, we usually spend an hour or so examining the administration interface and role.
3. **Hands on** - By this time, everyone will be ready to begin operating the software themselves. The instructor will guide the attendees as they create reports and perform analysis using client data.
4. **Assisted analysis** - The final part of the training is hands-on with minimal guidance. The instructor will present tasks for the attendees and will assist one-on-one while they are worked out. Advanced users may proceed with their own desired analysis while receiving assistance from the instructor.

1.3 History

- Pd' Programming was founded over 25 years ago, in 1987 with the first release of the crash records analysis product "Intersection Magic".
- In 2005, development began on "Crash Magic Online". This product became very popular with state DOT's.
- We now exclusively produce Crash Magic Online . A Map Magic ESRI plugin is also available.
- Intersection Magic support is now in maintenance mode. IMW requires a 32-bit operating system.
- Crash Magic currently supports
  - diagrams (including corridors)
  - charts
  - individual crash and aggregate location pin-maps (supported completely internally utilizing ESRI's ArcGIS.com)
  - listings
  - cross-tabs
  - high crash location lists
  - data entry
  - inter-program communication. (i.e. from your other crash data software)
  - unlimited number of fields and most data types.

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All of these reports are user-customizable. Hundreds of permutations are possible.

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2 General information

This section contains general getting-started information.

2.1 Browser Based

- Crash Magic operates as a web server, providing reports to client browsers.
- The server that hosts Crash Magic maintains all reports, filters, settings, configuration information, database connections, user information, etc.
- The client browser contains no unique data or software that needs to be backed up or configured.
- Any browser that can connect with the server can be used for analysis.
- Printing done through PDF templates
- Updates to the software are performed on the server, never on the client computers
- SVG or Silverlight viewers provide interactive graphics (working on HTML5 diagrams, perhaps embedded in GIS maps)
- Administration is also performed through a browser, but uses a different entry point.
- Security is defined for "Analysis", "Data entry", "Group administrator", "Master administrator" and "Installation administrator"

2.2 Data flow through Crash Magic

Crash Magic connects directly to standard SQL databases including Oracle, MS SQL Server, DB2 and MySQL.

Most of our users have unique data. This means table layouts, relationships, list of fields, field meanings, and data structure. In order for the program to make use of your unique data, Crash Magic uses settings stored in several xml records. These records, when taken together are described as your "configuration". Preparation of this configuration is usually a part of the purchase of the program.

The access to crash data from the analysis side of the program is "read only". This means that there is no data conversion or even the possibility of changing your crash data from the analysis side of Crash Magic. While reading your crash data, the program uses "calculated fields" to "normalize" the data for use in the program.

In addition to the data to be analyzed, (crash data) Crash Magic requires a “system” database which holds configuration information as well as the projects, studies, reports, users and report settings. Users of the program do not typically address the system database directly.

Unlike Intersection Magic, there are no restrictions on number of fields or field types. There is full support for officer annotations, photos, scanned reports, etc.

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2.2.1 Cloud hosted

Pd' Programming uses Microsoft SQL Server for our hosted service.

Data may be provided to Crash Magic through a variety of methods. All data imports use XML as their final import format. Pd' Programming provides the ability to convert data from other formats to XML prior to import:

- Data entry module for Crash Magic
- Import from ASCII files (such as SWITRS, ALISS, etc.)
- Import from MS Access (mdb) data files
- Import from any MS ADO supported data format

In addition, Pd' Programming can set up a periodic sync to an existing SQL Server.

Files may be sent via FTP or HTTP (within the program)

2.3 Demonstration

- Login (www.GovernmentTools.com)
- Intersection diagram
  - Labels
  - Legend
  - Click on
- Report types
  - collision diagrams - intersection and corridor
  - pin maps
  - hot spot/high crash location lists
  - charts
  - crosstabs
  - tabular field listings
  - layouts - PDF documents containing a combination of reports
- Methods of gathering data
  - Street & cross street
  - Intersection corridor
  - Intersection id
  - Route and mile point
  - Control section and log mile
  - Latitude, longitude
  - "All data" ad-hoc starting with date range
  - Crash num.
  - Additional types

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        - Address
        - CID
        - case id 2
- Field list for diagram
    - Select new fields
    - Show as individual pin map
    - Show filter select
- Day off week chart
    - Select new category list - time of day
    - Clear filter to demonstrate study data
- Layout
    - Load a new layout
    - Create a layout for other studies
- Templates
    - Add template to report buttons
- Help system

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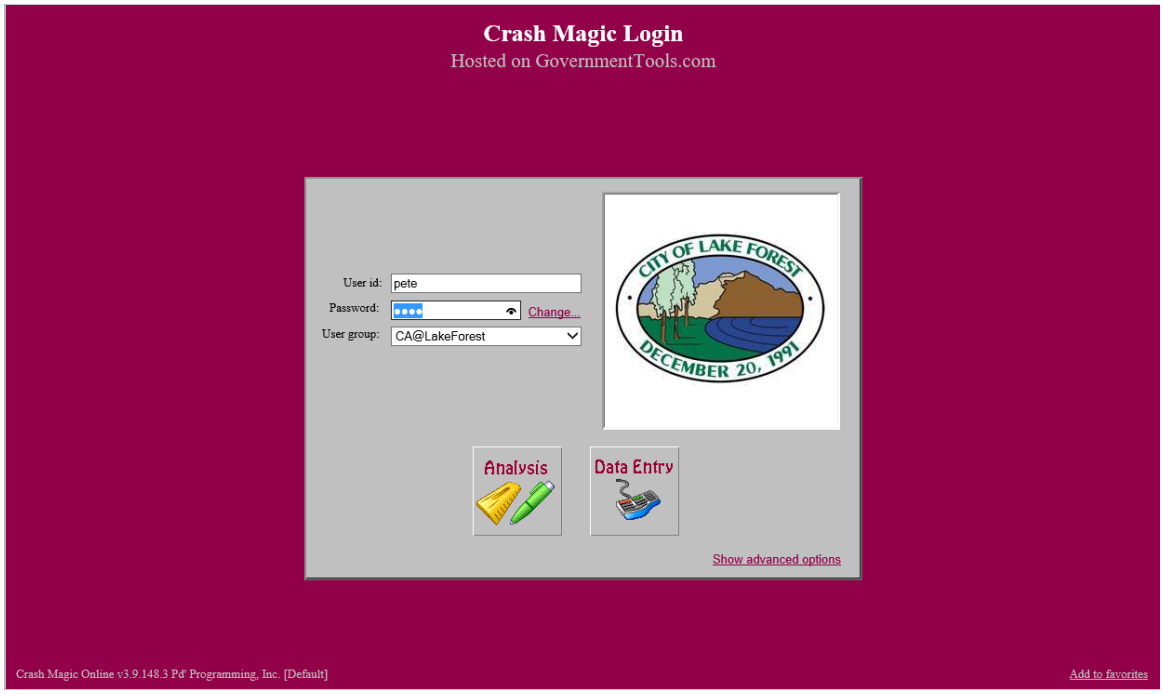
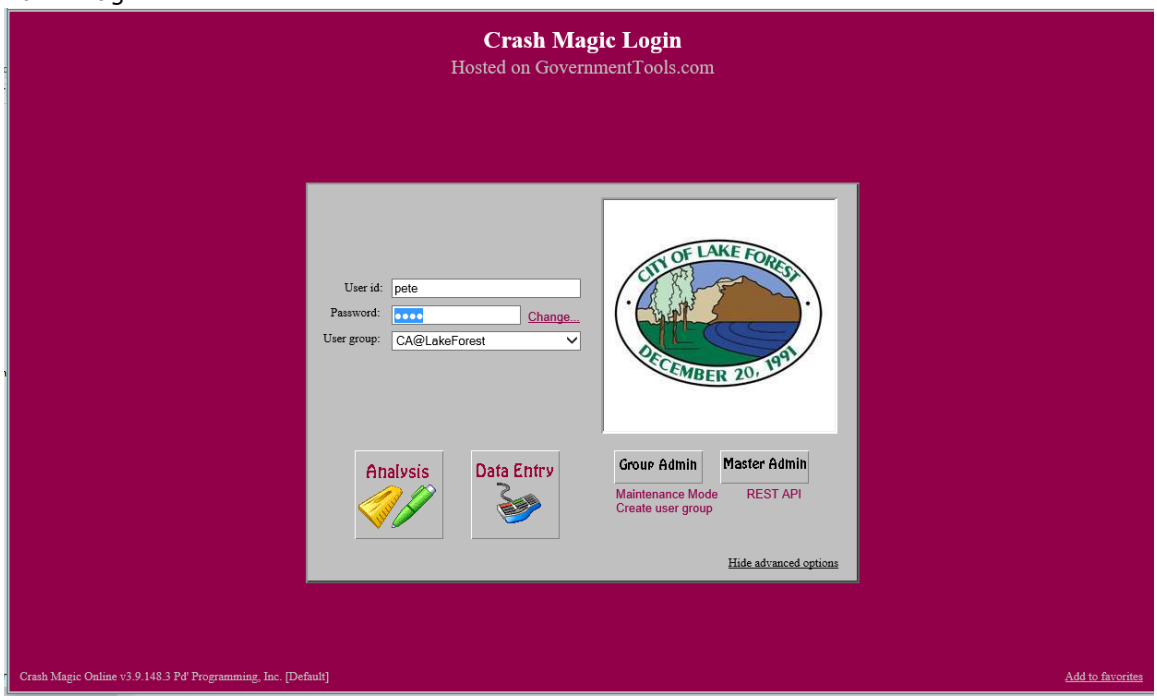
2.4 Login form

- Analysis login:



- Admin login:



3 Projects

Crash Magic uses projects to organize your work. When you first log in, a project called "Main" is created for you. For some, this will be the only project they ever use. For others, projects will be the basis for groups of work or data they are analyzing. Some project uses:

- Pedestrian or bicycle studies
- Red light running studies
- Injury or Fatality reporting
- End of year report
- Response to specific resident or City Council question / complaint
- Group of reports to share with colleagues
- Collection of data/reports prepared for the media

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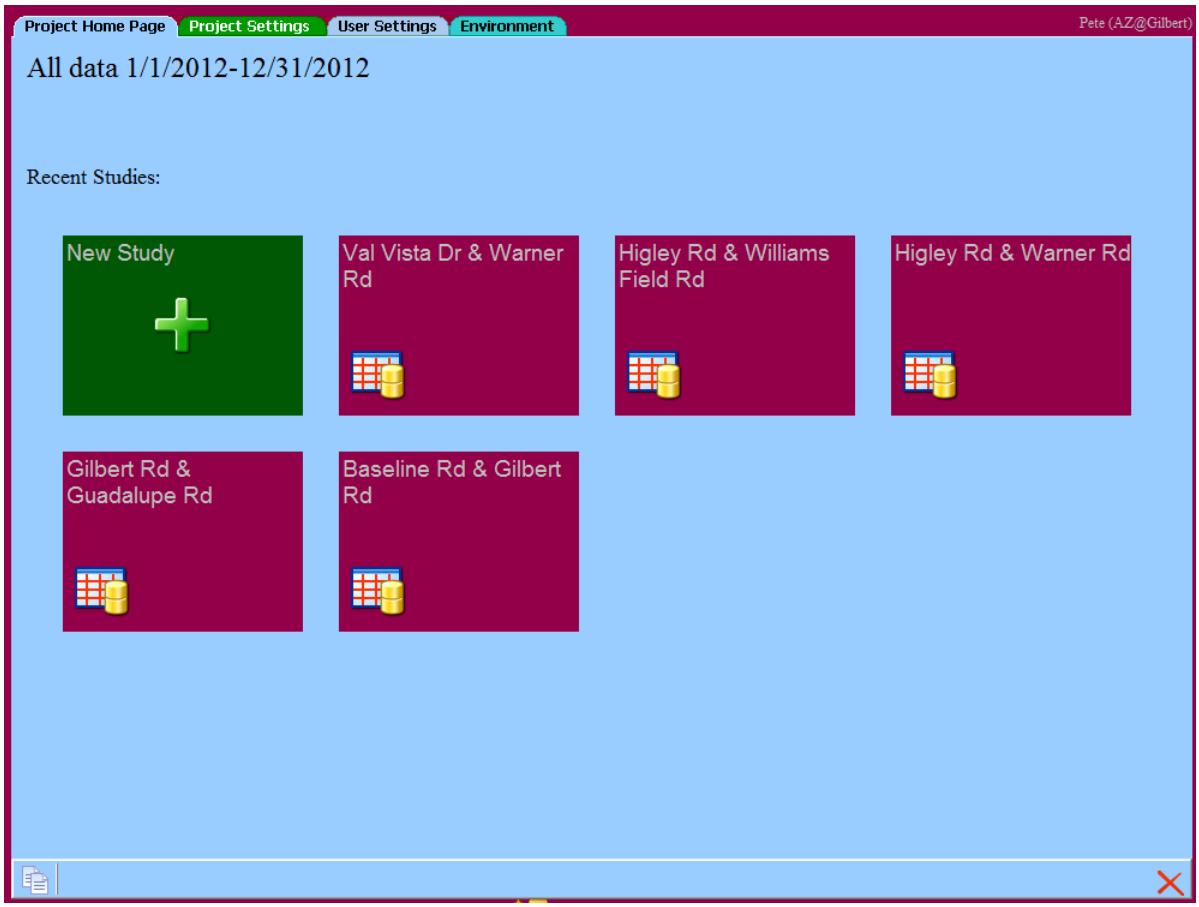
3.1 Home Page

The default page for Crash Magic is called the "Project home page". This page contains references to recent studies, as well as project settings. Each project has its own home page.



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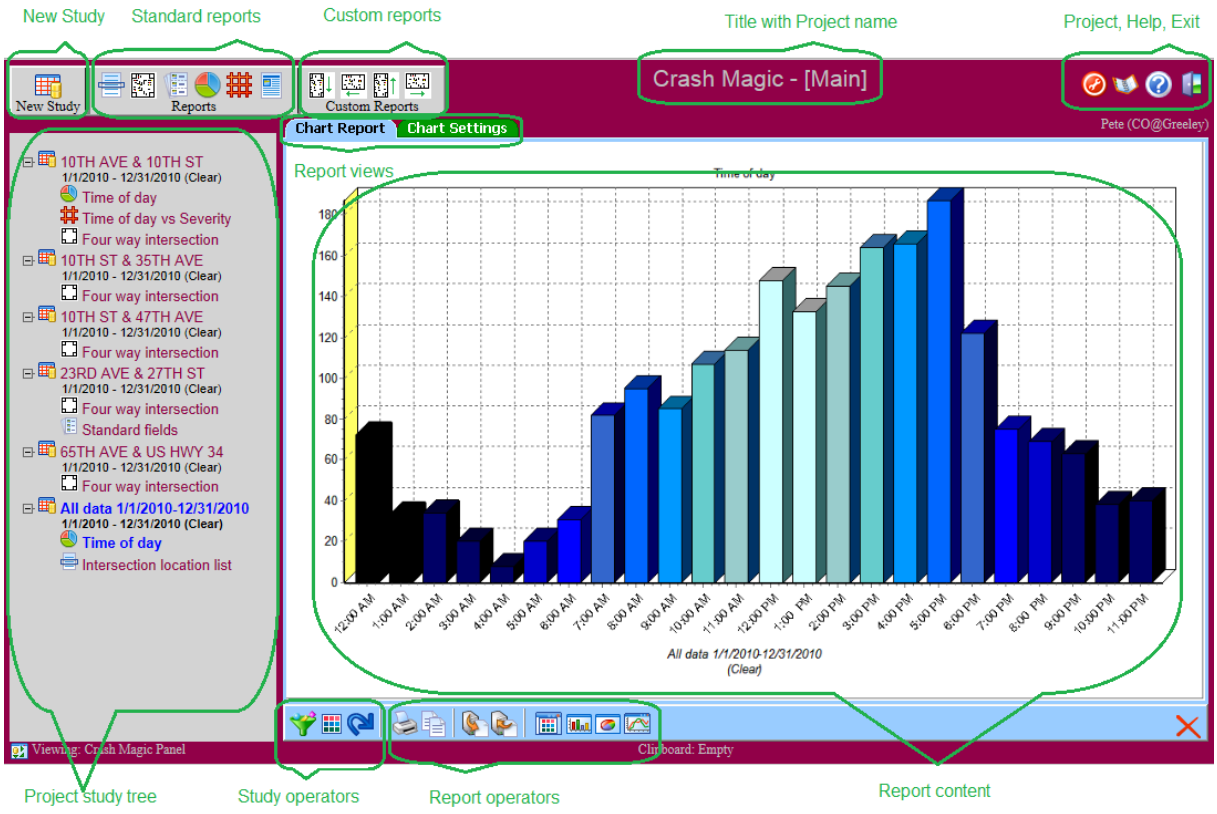
3.2 Main form

The "main form" always contains the following elements:



- **New Study** - This is where query criteria is specified. Before any reporting is done, a study must be created that specifies what data will be analyzed.
- **Reports** - These icons provide access to all of the available report templates that you have access to.
- **Custom Reports** - These icons are user-defined and provide direct access to specific templates you have specified.
- **Title with Project Name** - Will always say "Crash Magic - " and your current project name.
- **Project, Help and Exit** - Add or edit projects, get program help, exit the program, closing and saving your session.
- **Project Study Tree** - This tree contains a list of all of the studies in the current project. It also contains the reports you've created under each study. Your project tree is preserved between sessions and is available wherever you login from.
- **Study operators** - These buttons provide access to the study parameters from within any report or study panel. These are items like filters, category lists, data export, etc.

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- **Report operators** - These buttons act on the current report. They include basics like printing, copy, paste and template operations. They can also include report-specific operations such as changing the type of a chart.
- **Report content** - This area contains the report content - listings, charts, diagrams, etc.
- **Report views** - All panels include a blue tab containing information output. A green tab is available that provides access to all settings for that project/study/report.

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4 Reports

4.1 Collision diagrams

A collision diagram is a schematic representation of a group of crashes. The template used to arrange the crashes on the display is referred to as a diagram schematic. A variety of schematics are available that describe location types such as intersections, T's, corridors, etc. There are about 100 different schematics packaged with the program. Custom schematics can be created (in administrator mode) by copying an existing schematic or starting from scratch.

Collision diagrams provide a click-on report to show the details of a particular crash record. This report may show a map, scanned report, photo, any fields from the database, or other crash-related information.

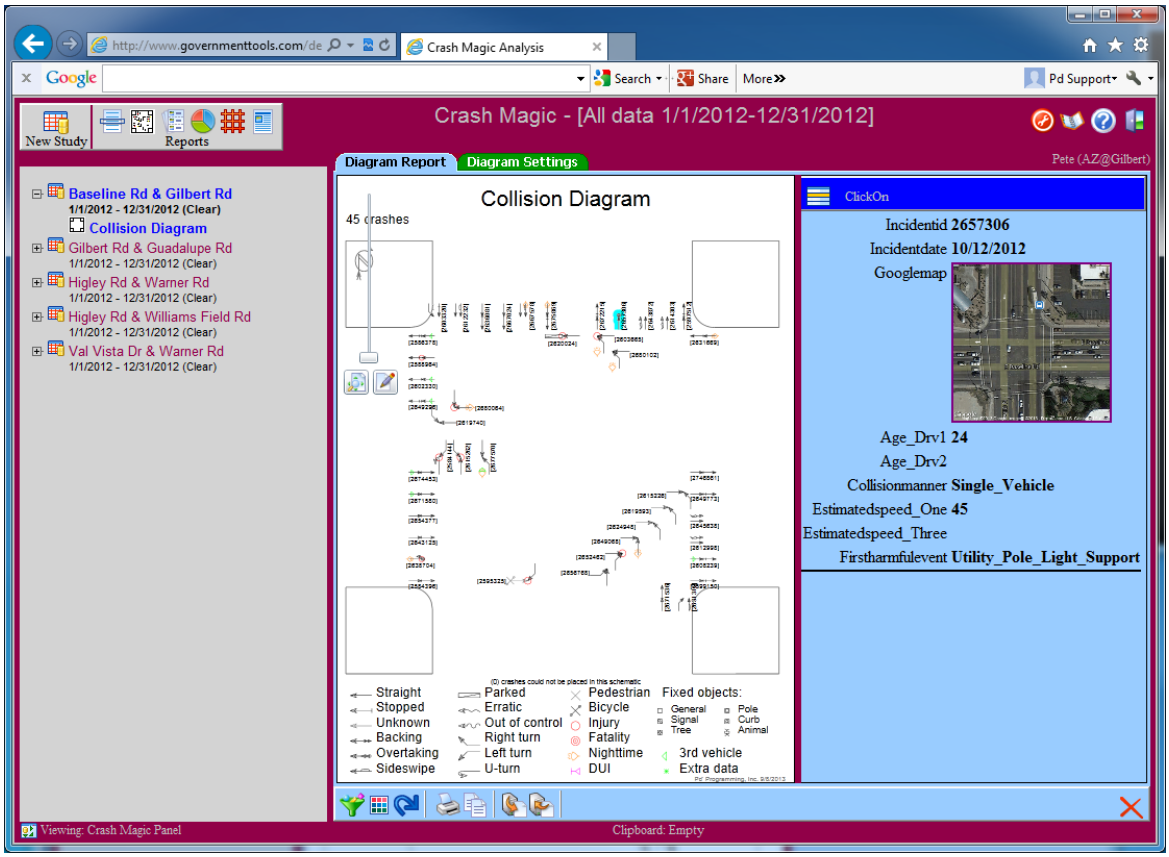

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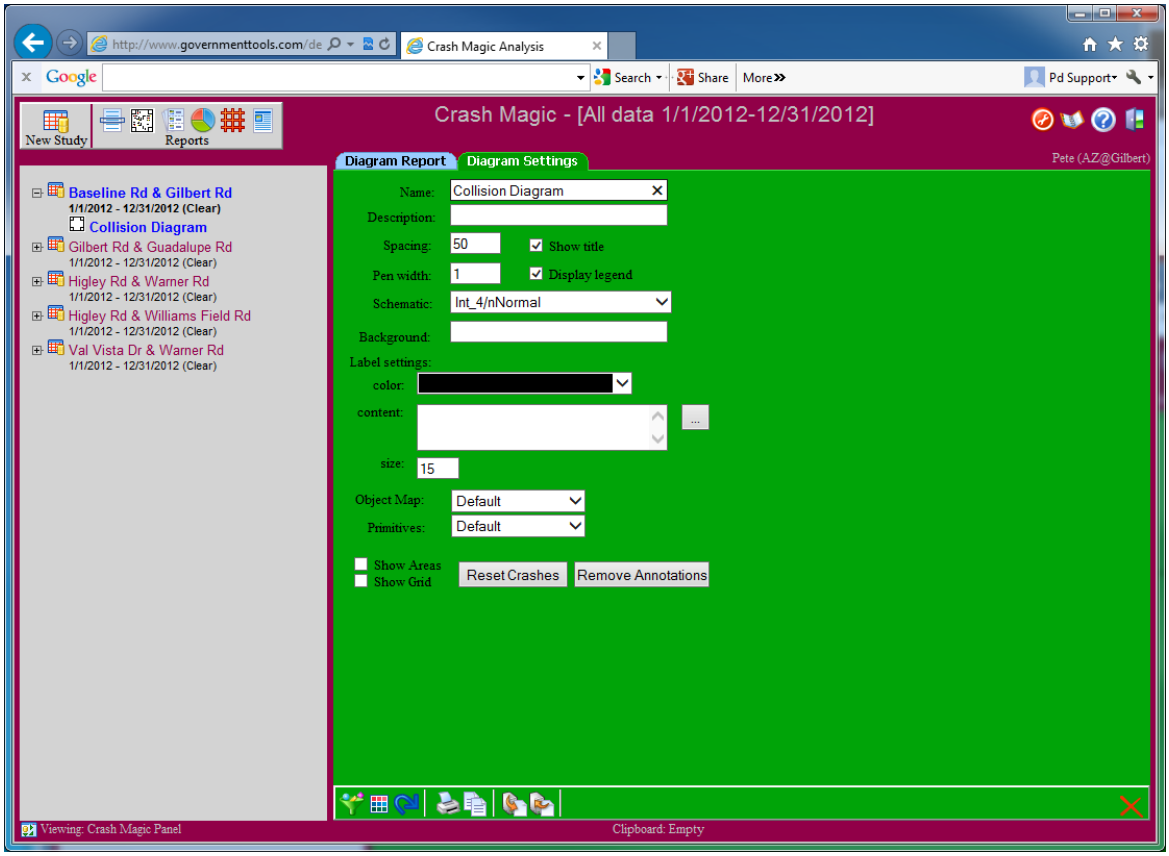
Diagram attributes

Most diagram settings are made using this panel.



4.2 Charts

Creating simple charts

Charts are created using "category lists". A category list is merely a field grouped into categorical values. Any field in the database may be used as a category list, and fields that are already categorical can be used directly.

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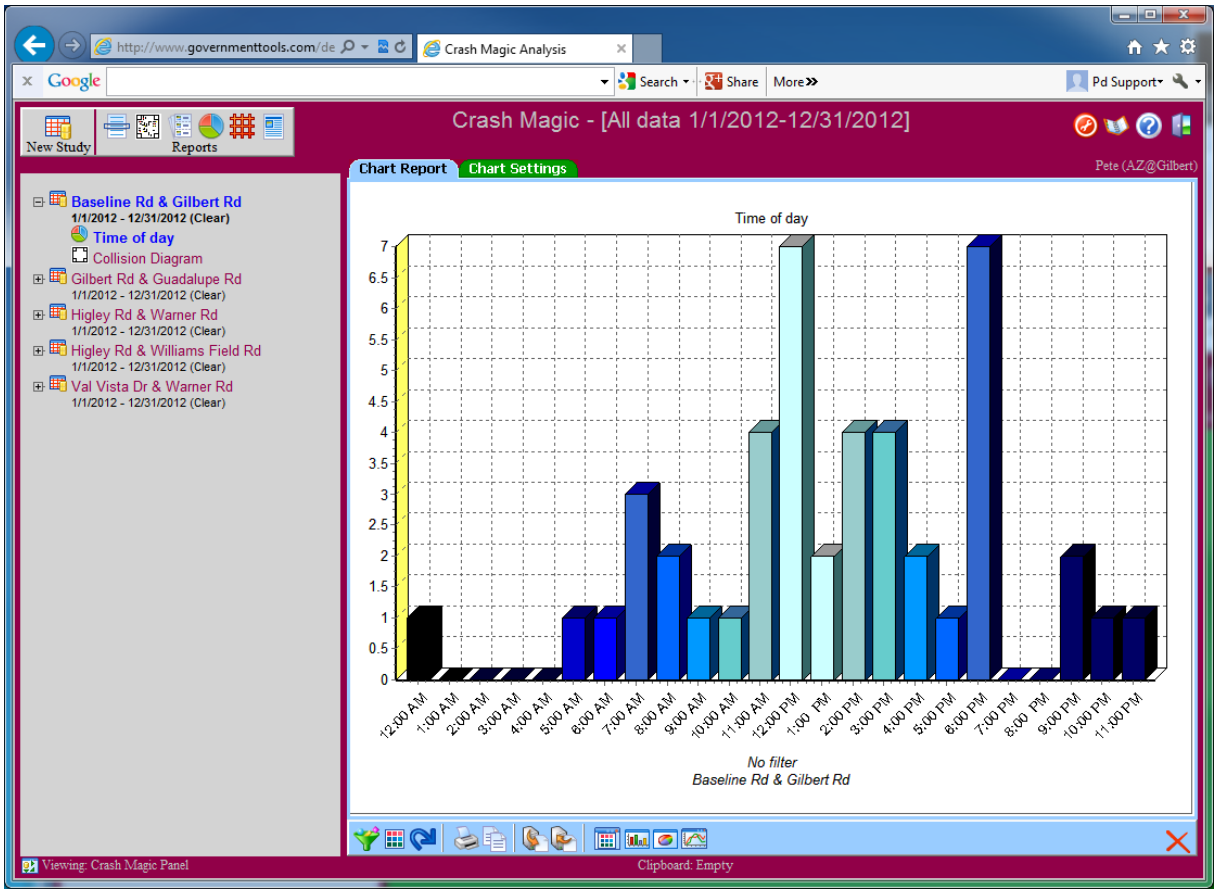

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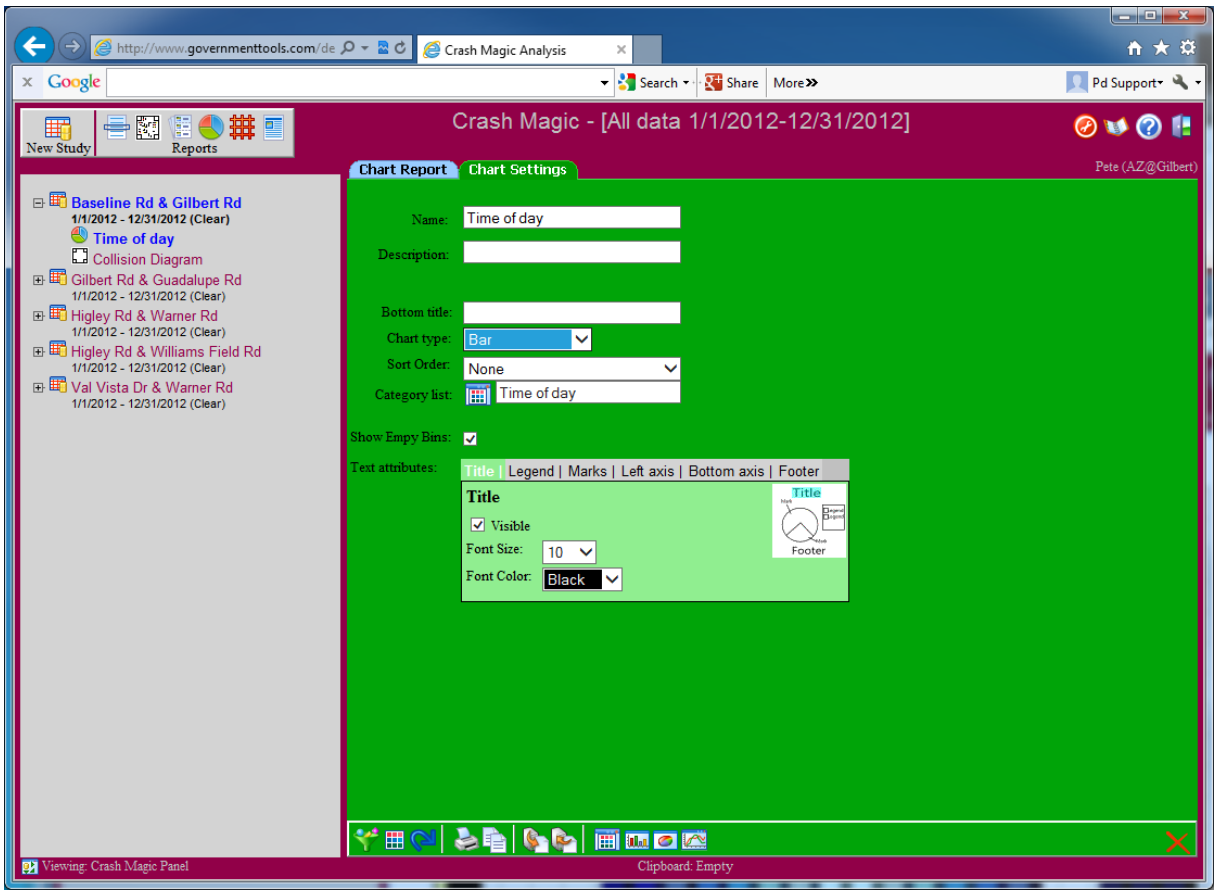
Changing chart types and settings



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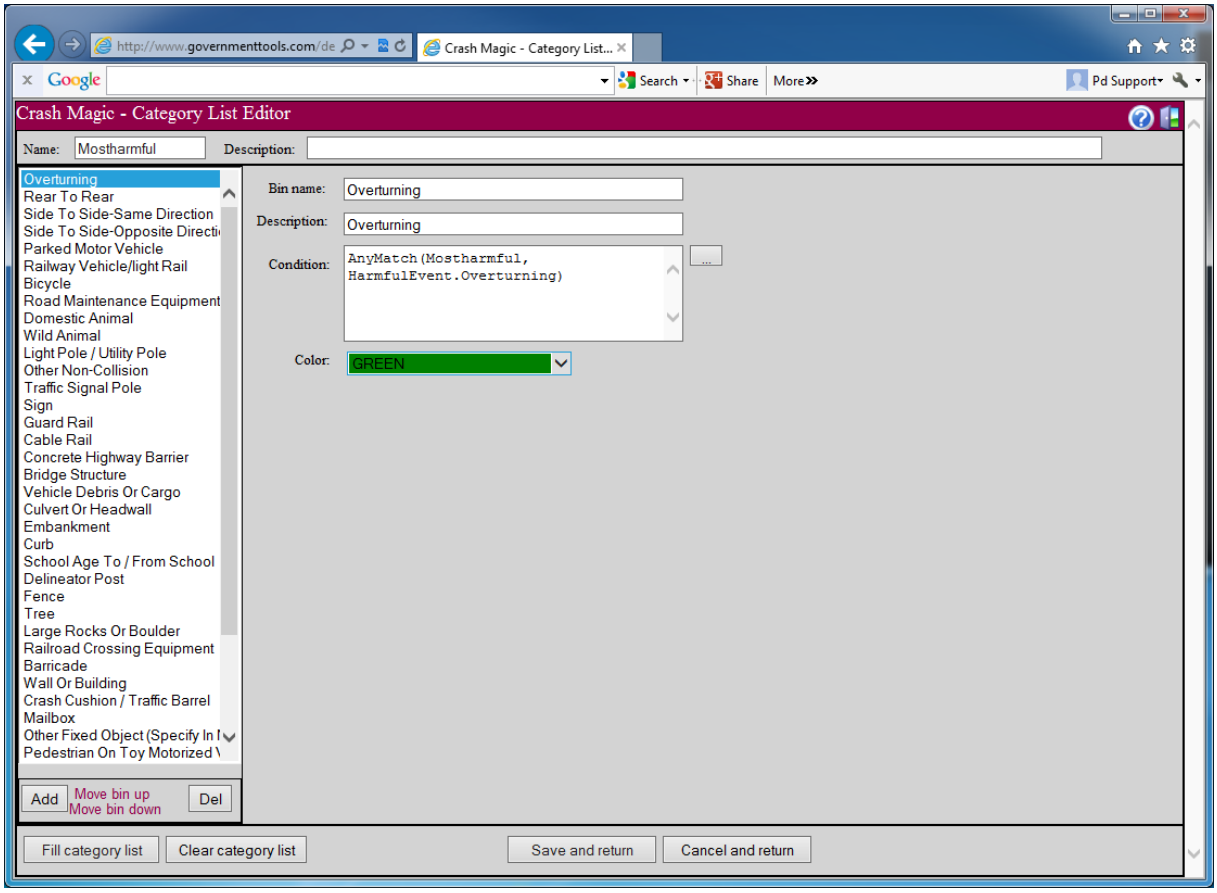
Saving and recalling chart types and settings

Building / customizing charts

- Chart bins
- Automatic population of bins
- Expressions



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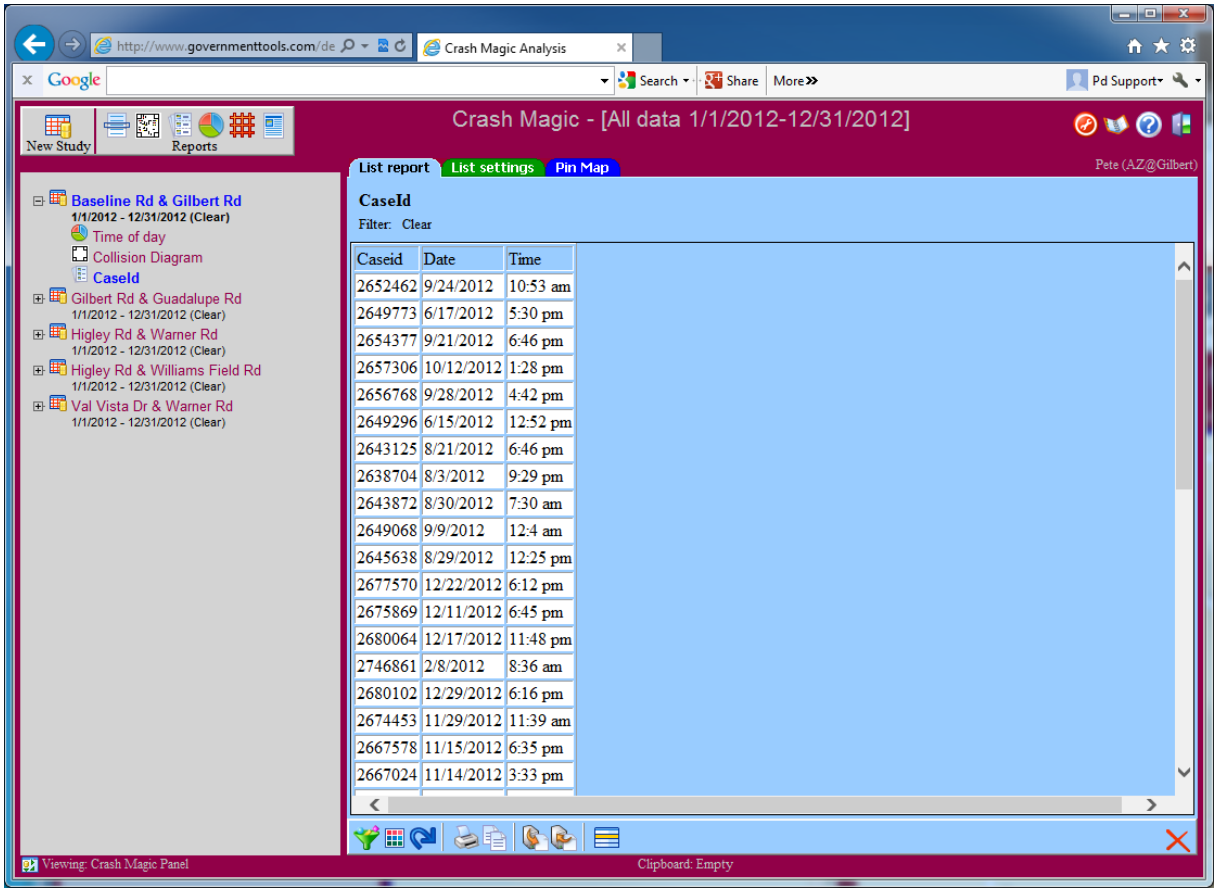
4.3 Crash listings

This report presents you with a list of crashes from the current study. You can select the fields to display by editing the report format.



Caseid	Date	Time
2652462	9/24/2012	10:53 am
2649773	6/17/2012	5:30 pm
2654377	9/21/2012	6:46 pm
2657306	10/12/2012	1:28 pm
2656768	9/28/2012	4:42 pm
2649296	6/15/2012	12:52 pm
2643125	8/21/2012	6:46 pm
2638704	8/3/2012	9:29 pm
2643872	8/30/2012	7:30 am
2649068	9/9/2012	12:4 am
2645638	8/29/2012	12:25 pm
2677570	12/22/2012	6:12 pm
2675869	12/11/2012	6:45 pm
2680064	12/17/2012	11:48 pm
2746861	2/8/2012	8:36 am
2680102	12/29/2012	6:16 pm
2674453	11/29/2012	11:39 am
2667578	11/15/2012	6:35 pm
2667024	11/14/2012	3:33 pm

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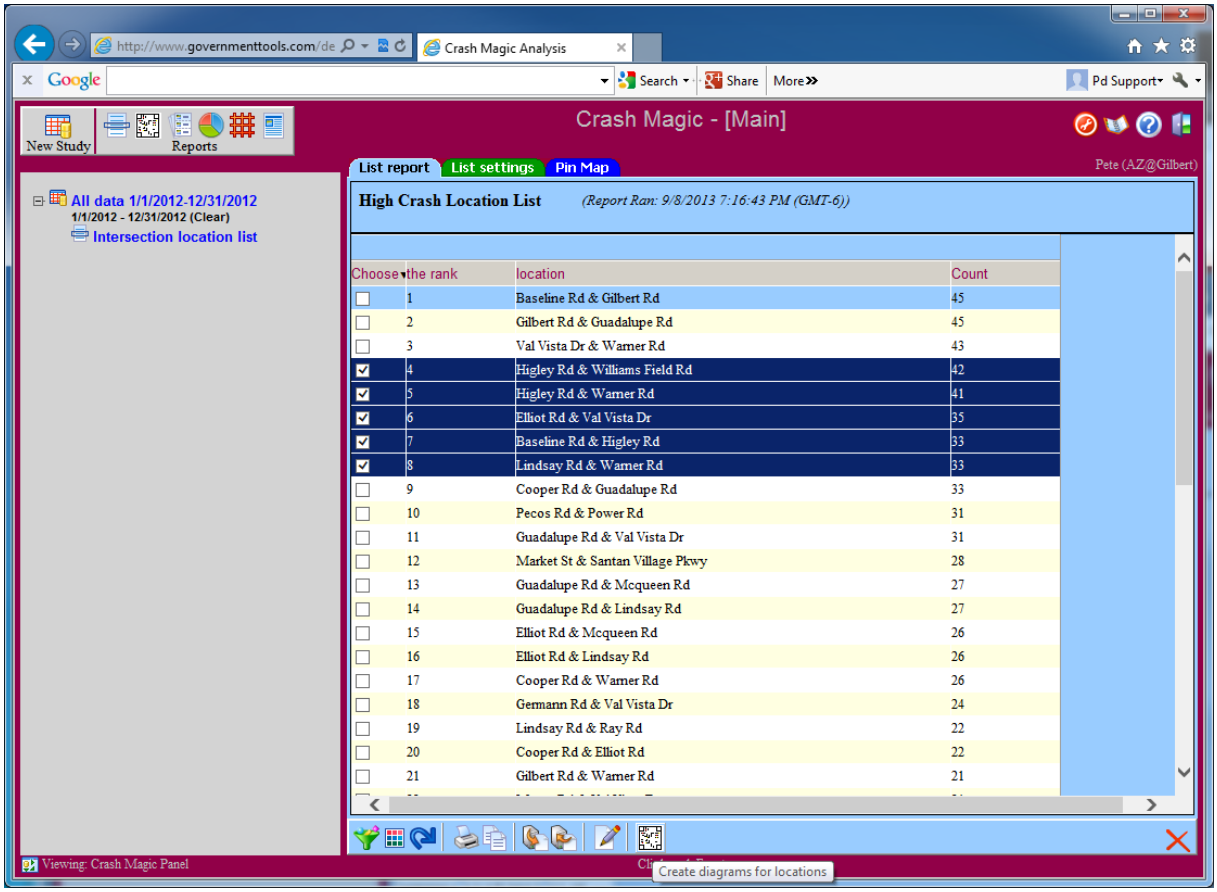
4.4 High crash locations

High crash locations lists are available for intersections and nodes. Development is underway to support sliding spot or "window" reports.

These lists support ranking by user-defined expressions, including access to other databases, such as roadside inventory. The default ranking is count, and a rate report is available as well.



4.5 Crosstab reports

Cross tab reports compare one category list to another. In this example we compare lighting to injury severity.

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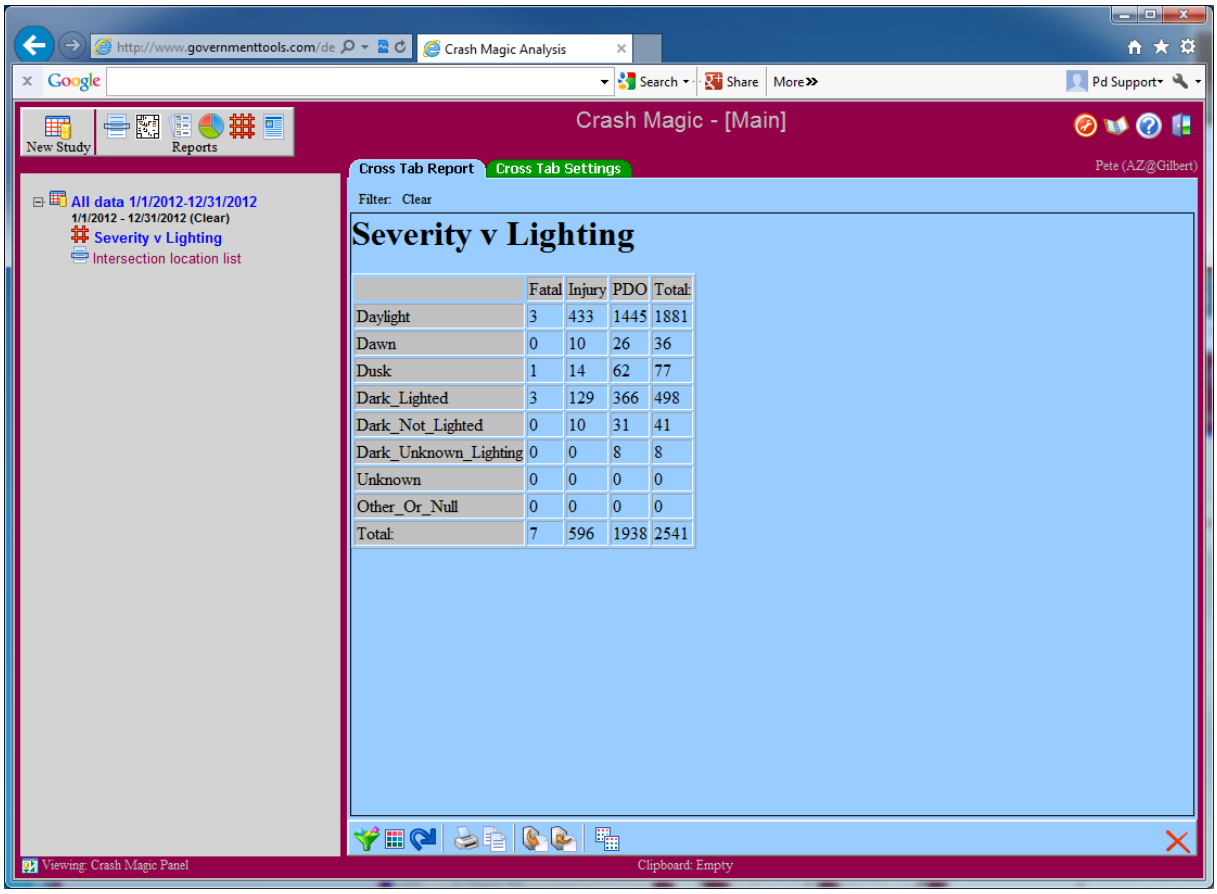

	Fatal	Injury	PDO	Total:
Daylight	3	433	1445	1881
Dawn	0	10	26	36
Dusk	1	14	62	77
Dark_Lighted	3	129	366	498
Dark_Not_Lighted	0	10	31	41
Dark_Unknown_Lighting	0	0	8	8
Unknown	0	0	0	0
Other_Or_Null	0	0	0	0
Total:	7	596	1938	2541

4.6 Pin Map

Pin-maps are rendered using ArcGIS.com. The default is to user the ESRI server and data, but a client-specific ArcGIS Server may also be used to take advantage of your agency's data layers.

Pin-maps are in development this Spring ('17) and changes are occurring weekly. At this time, pin maps are limited to 500 crashes. In the near future, when our HTML5 upgrade is complete, the system will display high data pin-maps as heat maps.

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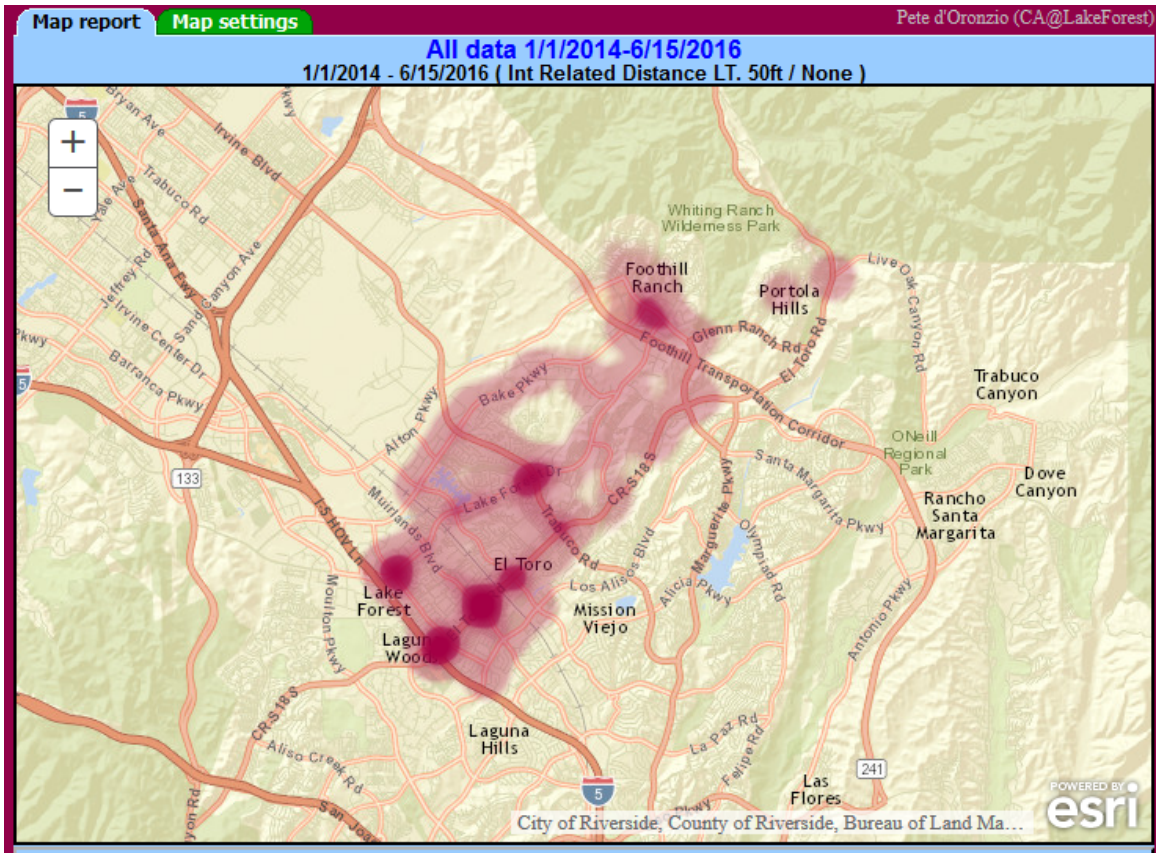

Heat Map

Right now, Crash Magic produces individual pin maps:

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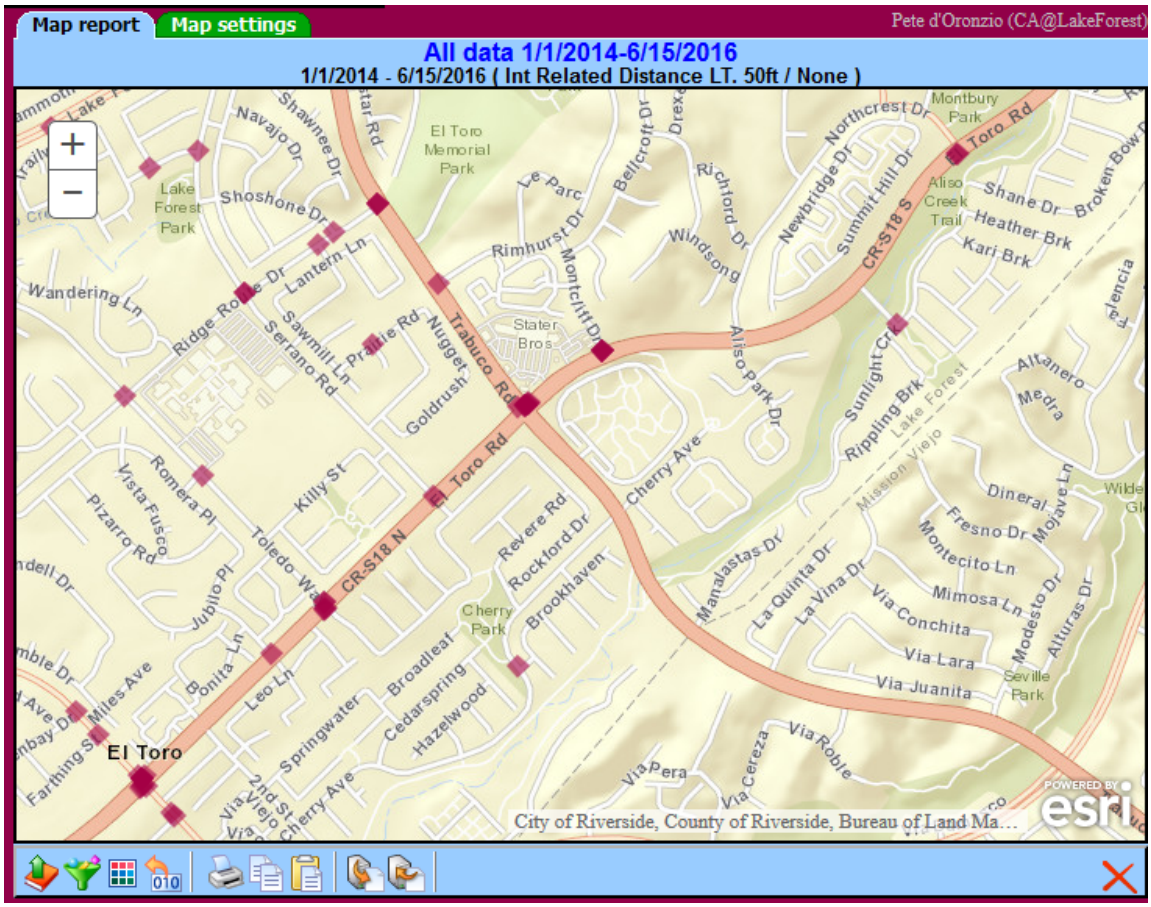

Individual pin map.

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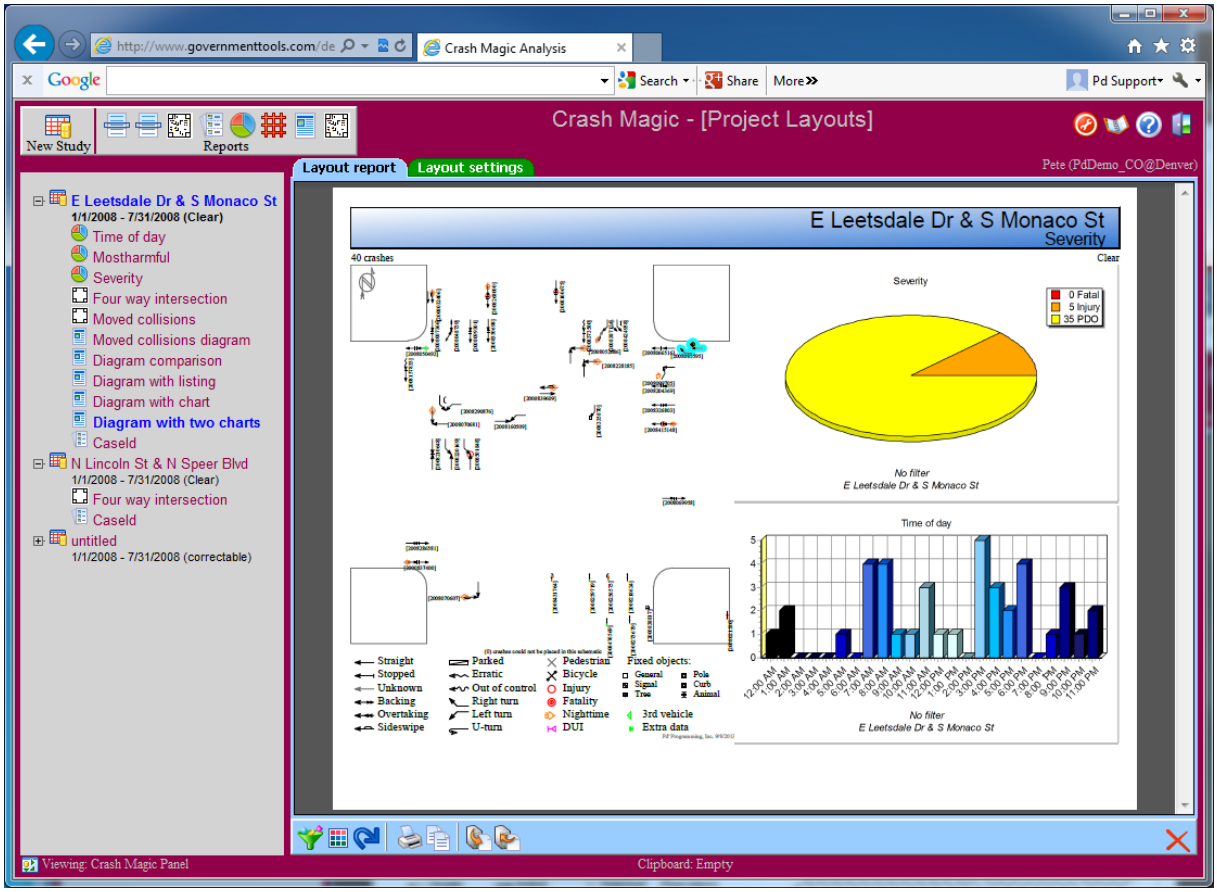
4.7 Layout

This allows the user to select various items to drop on to a report for printing.



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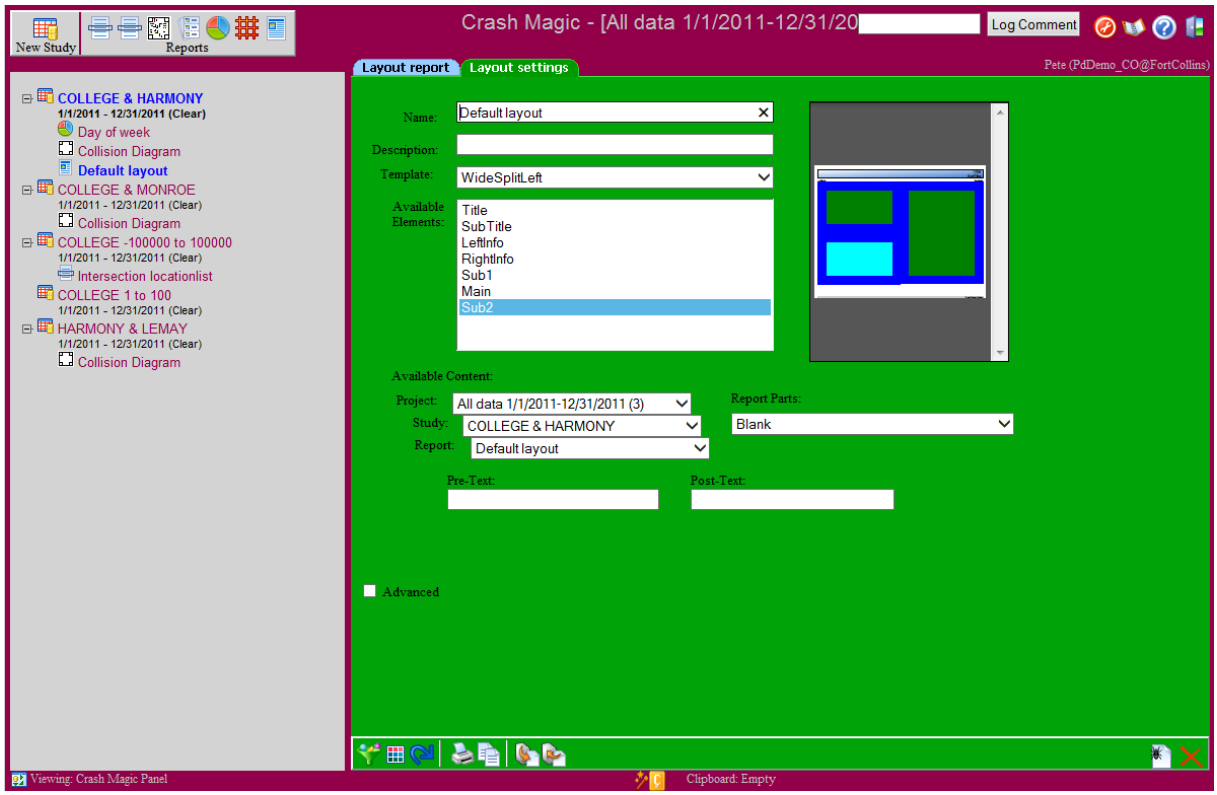

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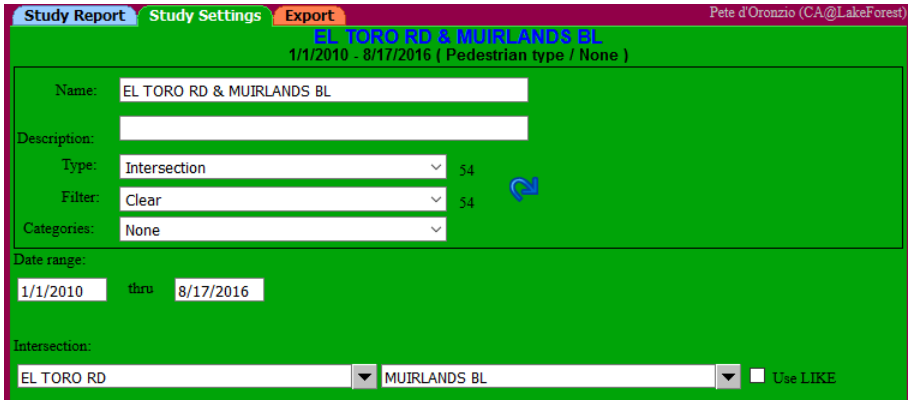
5 Studies

5.1 Intersection

The Intersection Study is for crashes that have been stored by primary street and cross street. The Intersection study provides the ability to query the database by date range plus primary and cross streets. This is the standard study for urban areas and rural areas where mileposts don't exist.



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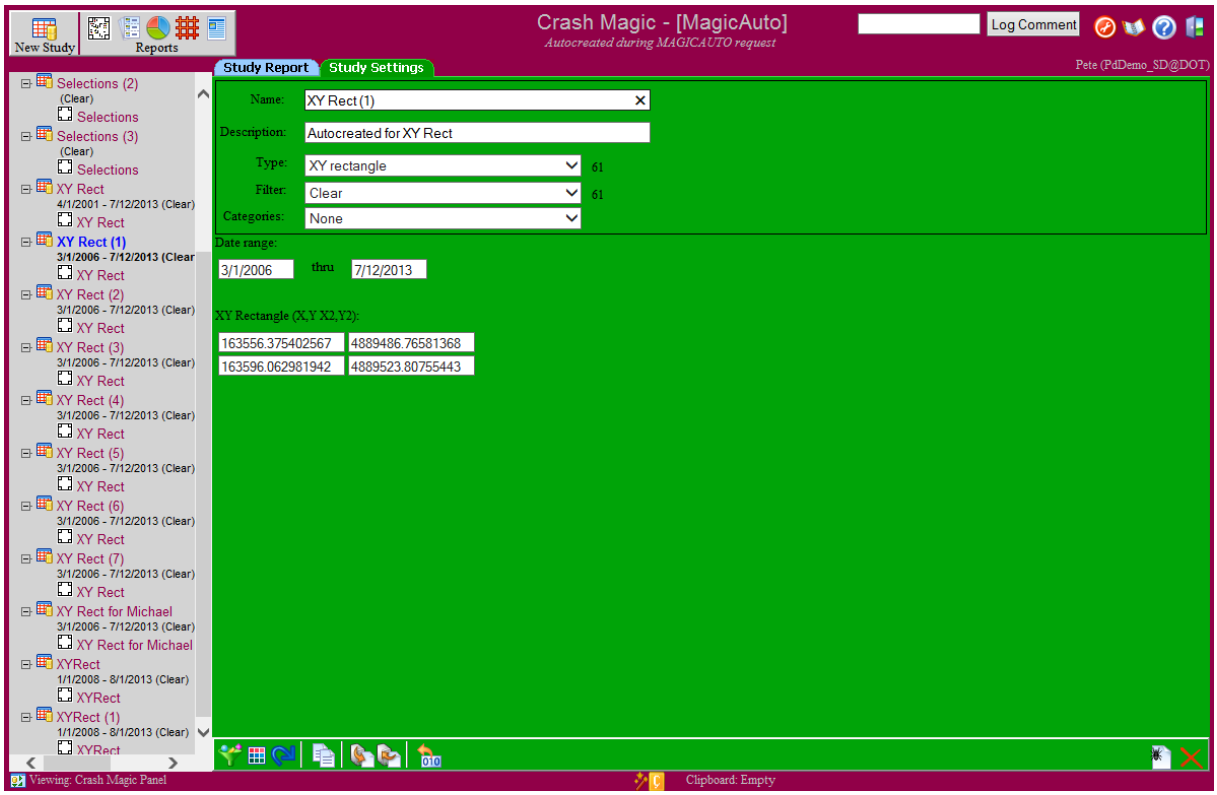
5.2 X,Y Coordinate

The X,Y Coordinate is for crashes that have been stored by X, Y coordinates. The X,Y coordinate study gathers crashes by prompting for a date range plus a rectangular area (X min/max and Y min/max values) that indicates a coordinate range from a GIS system.



5.3 Route + Milepost

The Route + Milepost is for crashes that have been stored by a route and mile post. The Route + Milepost study uses a date range plus a route name/id and milepost range.

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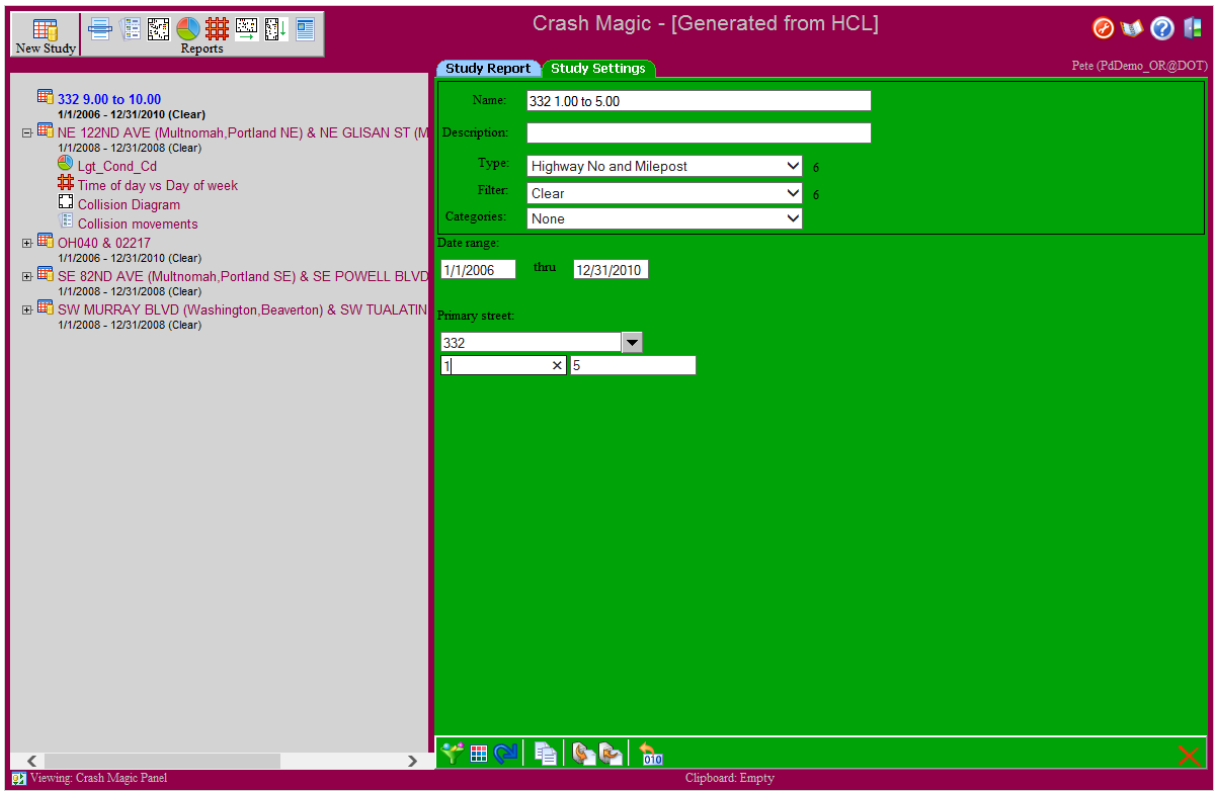

5.4 Address

Address study is for collisions that have been stored by Street and block address. The Address study provides the ability to query the database by date range plus primary and block address. This study is used for collisions that have a valid block address.

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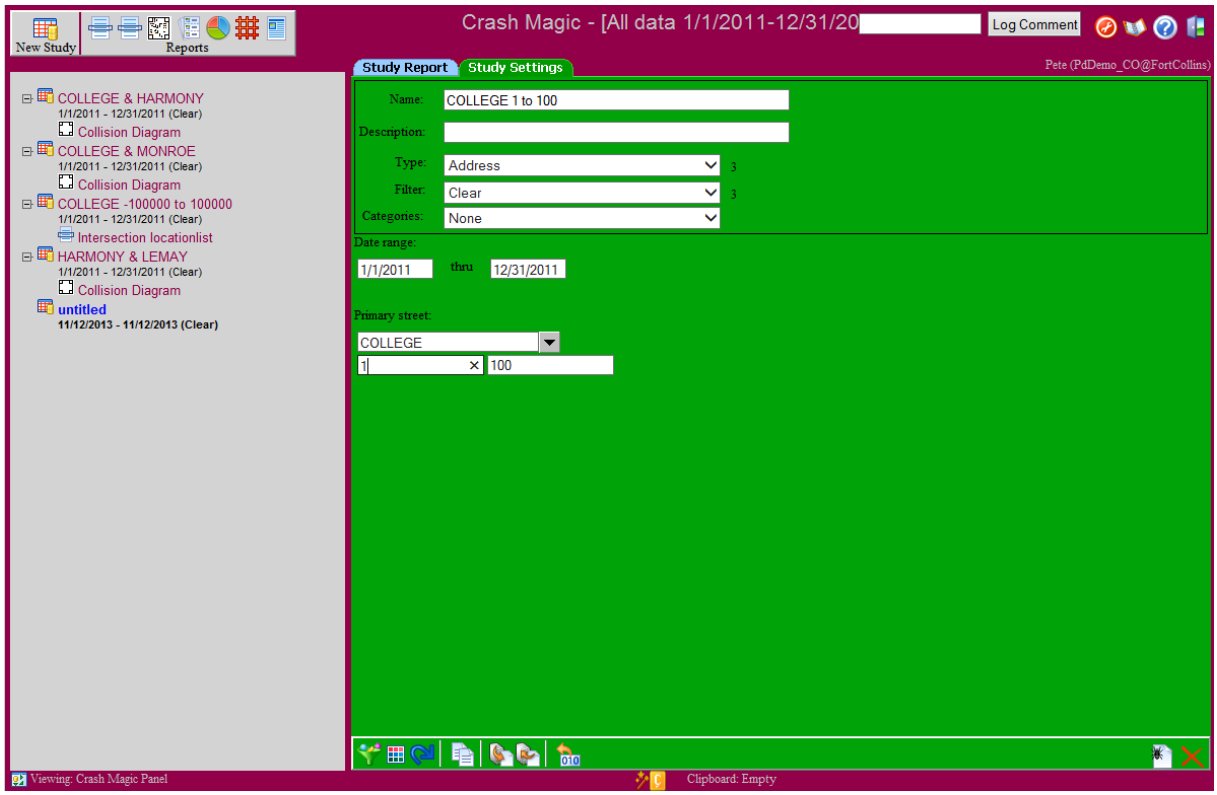

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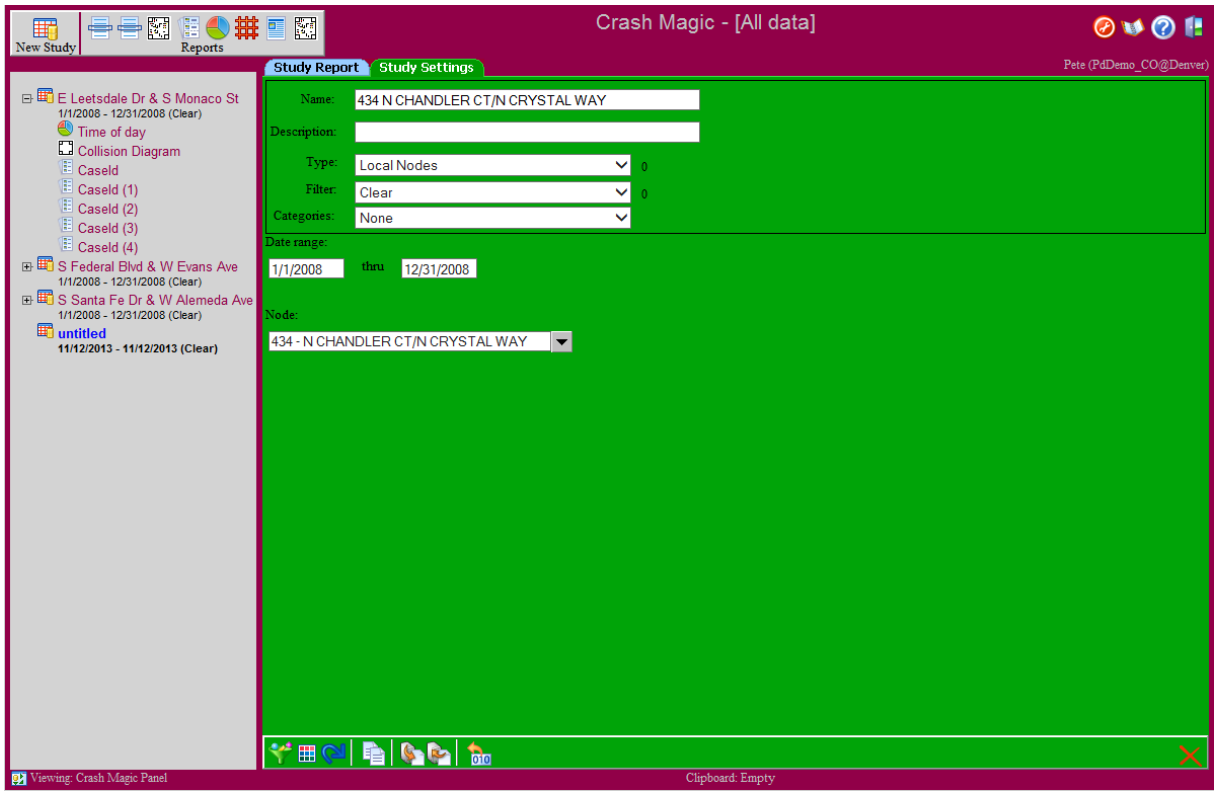
5.5 Node

The Node Study is for crashes that have been stored by a node to identify the crash location. The Node study uses a date range, a node identifier, and optionally one or two additional unique identifiers. These unique identifiers might specify a county, city, zip code, etc. The unique identifiers are only needed if multiple, non-unique instances of the node number occur in the database.



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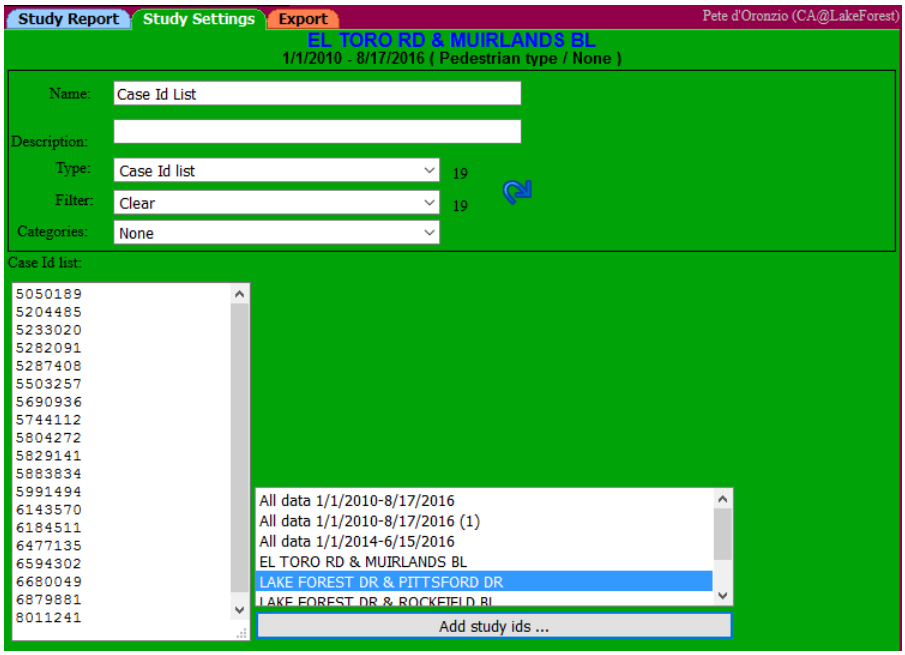
5.6 Case ID

This study allows you to select crashes based on a stored list of crashes in the database. This study is auto generated only by the Map Magic selection tool and has no button to create it.



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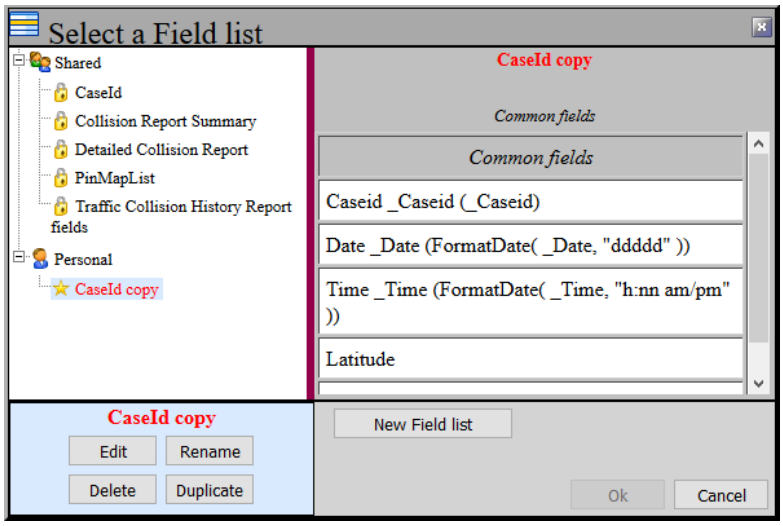
6 Common Themes

We've found that using similar or identical dialogs or forms for many purposes makes learning the system that much easier.

Here are some common screens that will help you use Crash Magic.

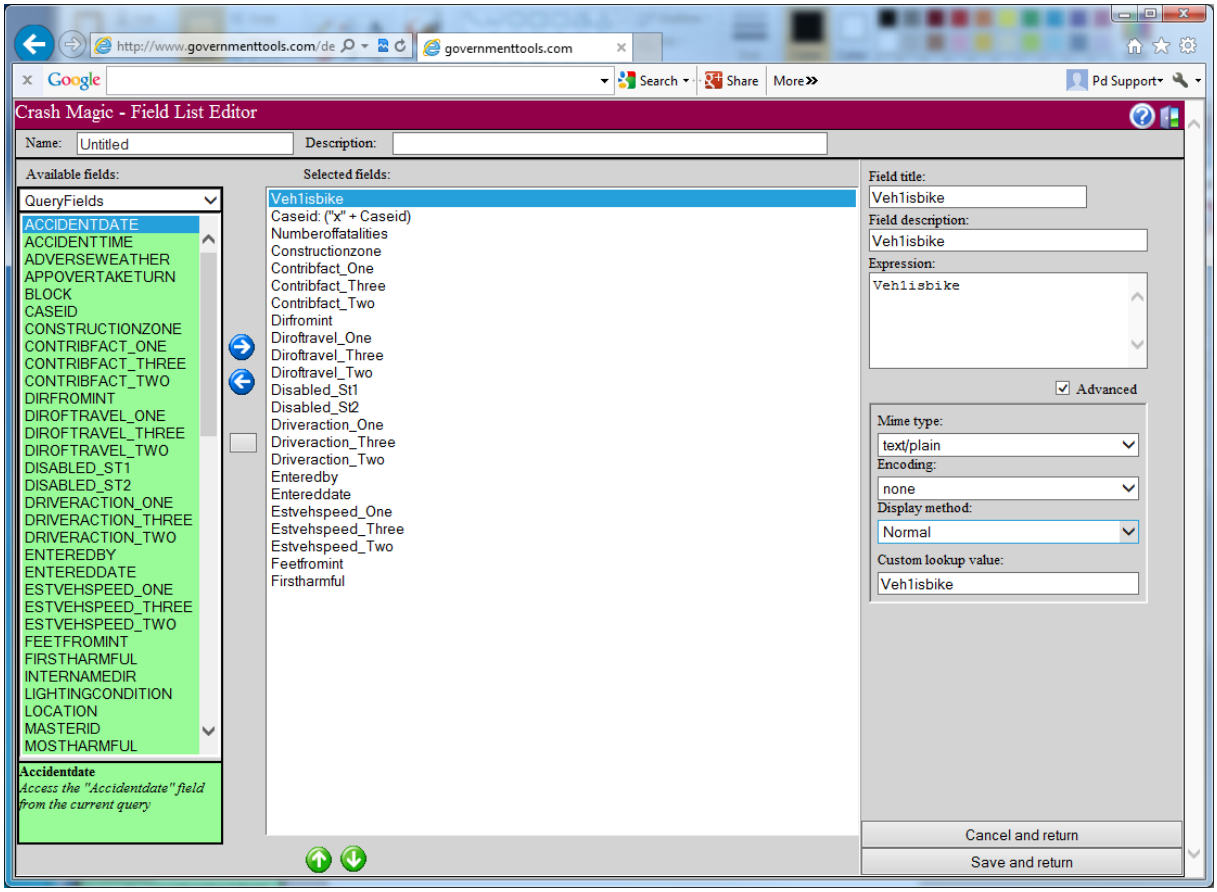
6.1 Field list selection



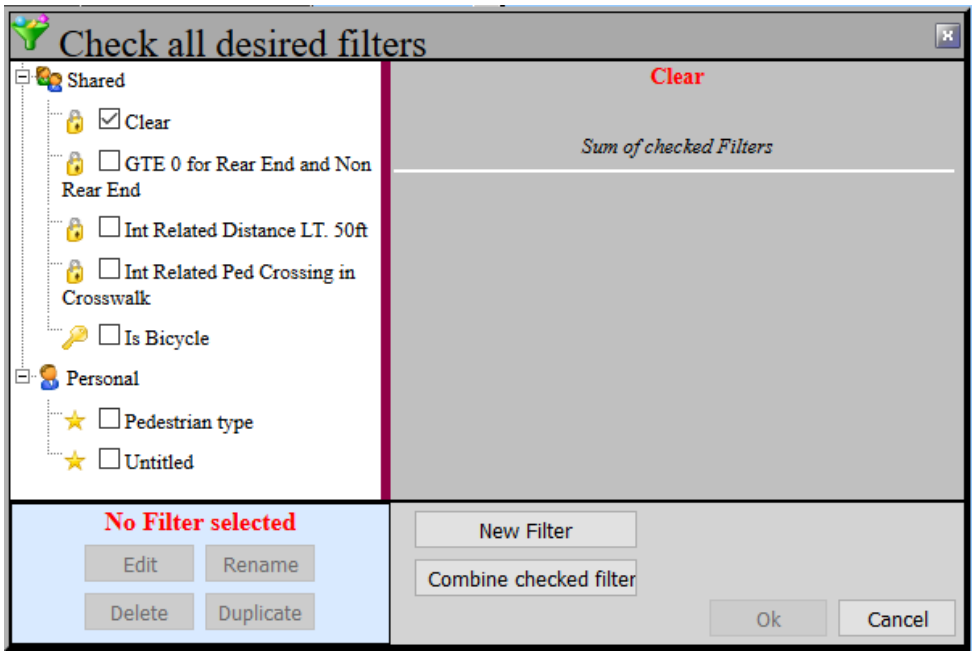
6.1.1 Field list editor

Field lists contain a list of fields, field titles and lookup information.

Field lists are used for crash listings, click-on reports and labels.



6.2 Filter selection



The new filter selection dialog enables the selection of multiple filters which will be "AND'd" together.

6.2.1 Filter editor

The filter editor, also used as the expression editor, is available for any study and a number of other locations in the program.

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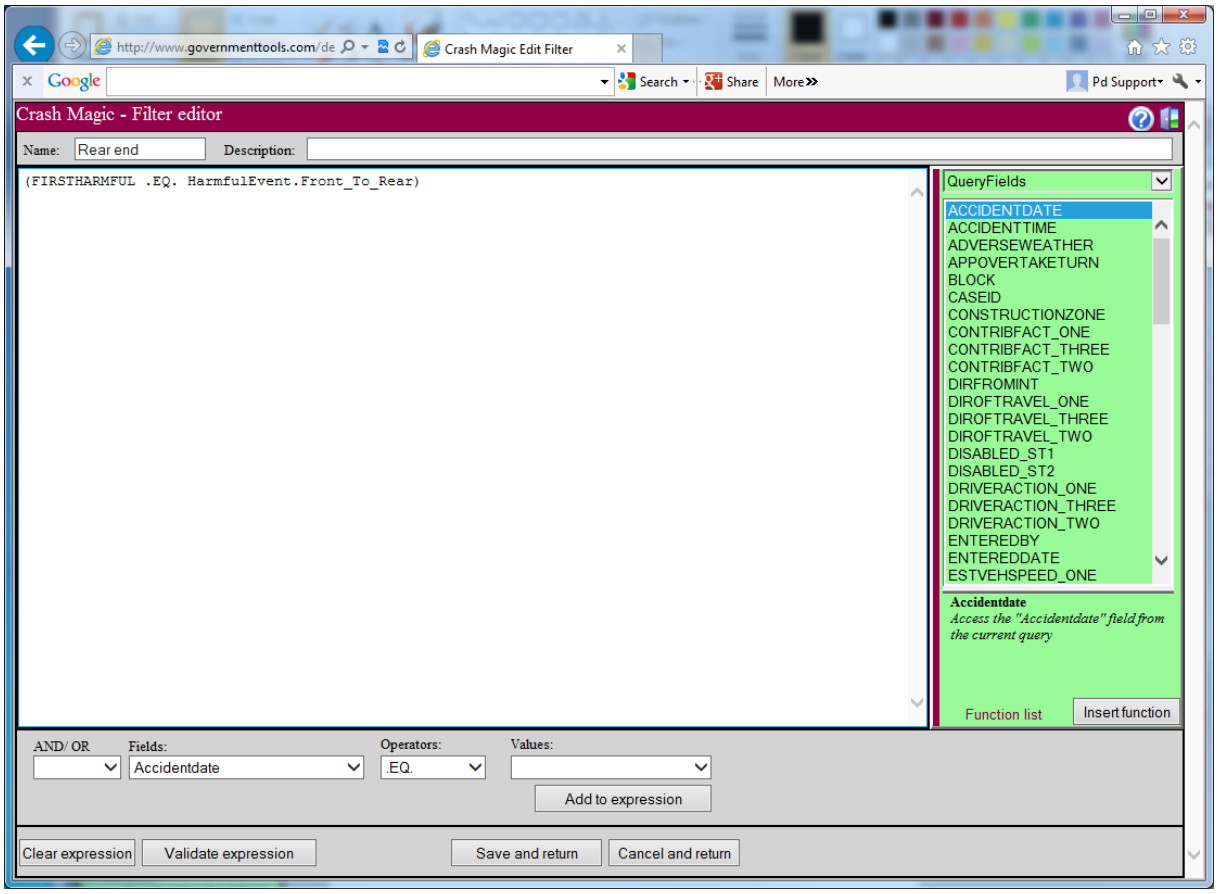

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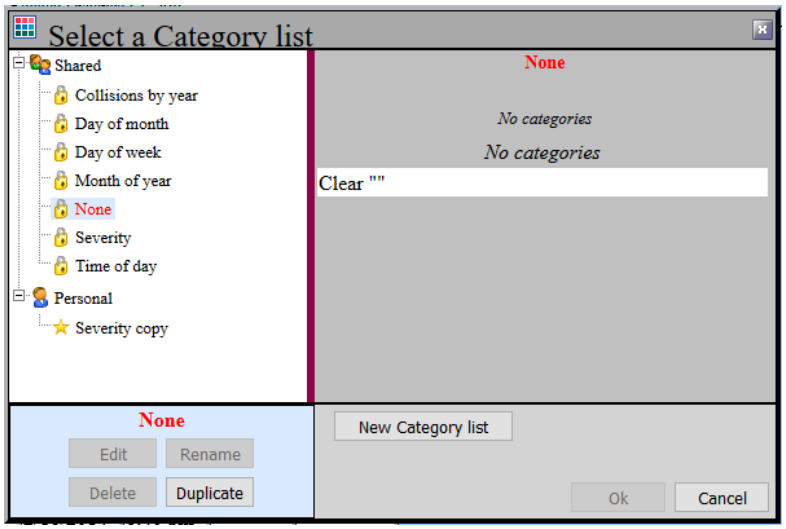
6.3 Category list selection



6.3.1 Category editor

Category lists are used for highlighting, charts and cross-tabs. This editor enables the user to create category lists for any field type.

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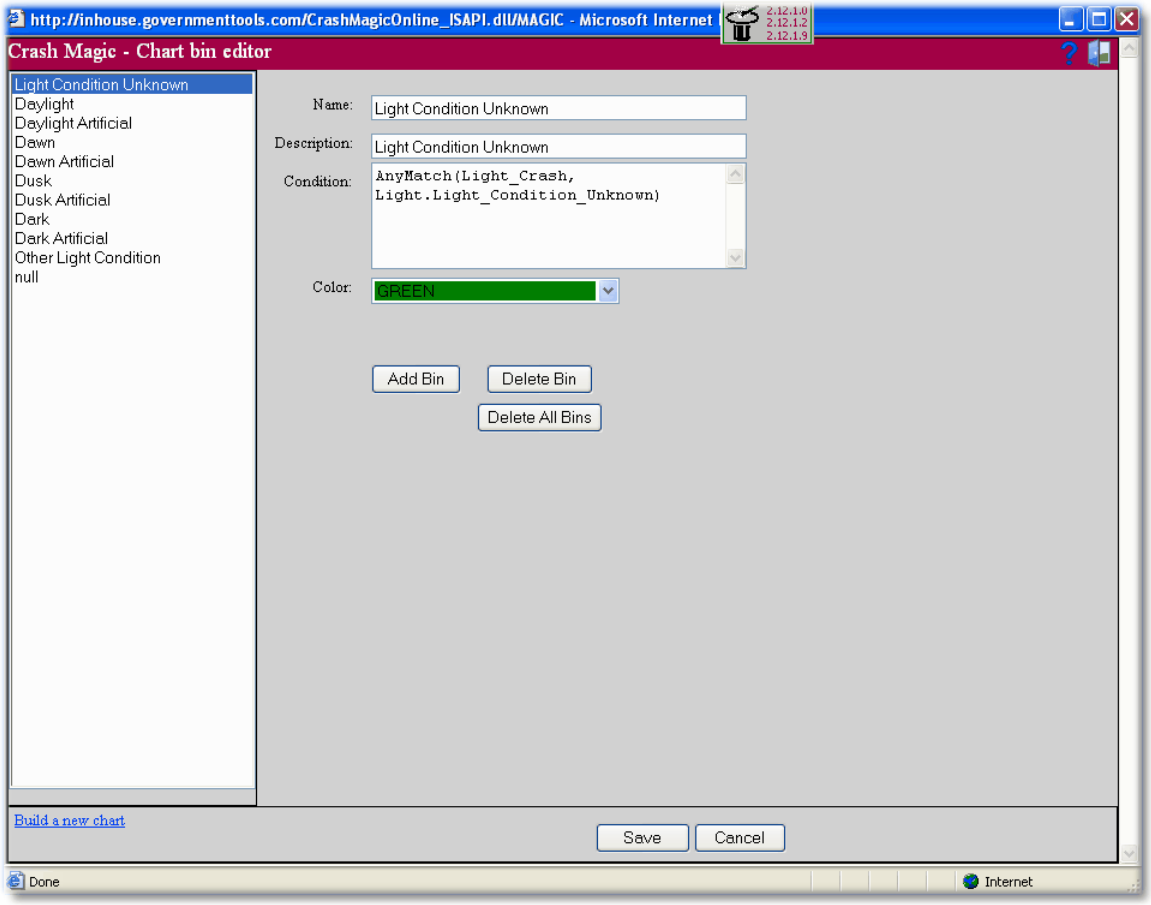

6.4 Template load and save

Templates are settings that are saved for future use. Pretty much anything can be saved to a template including:

- Studies
- Reports (diagrams, lists, high crash locations, cross-tabs, charts)

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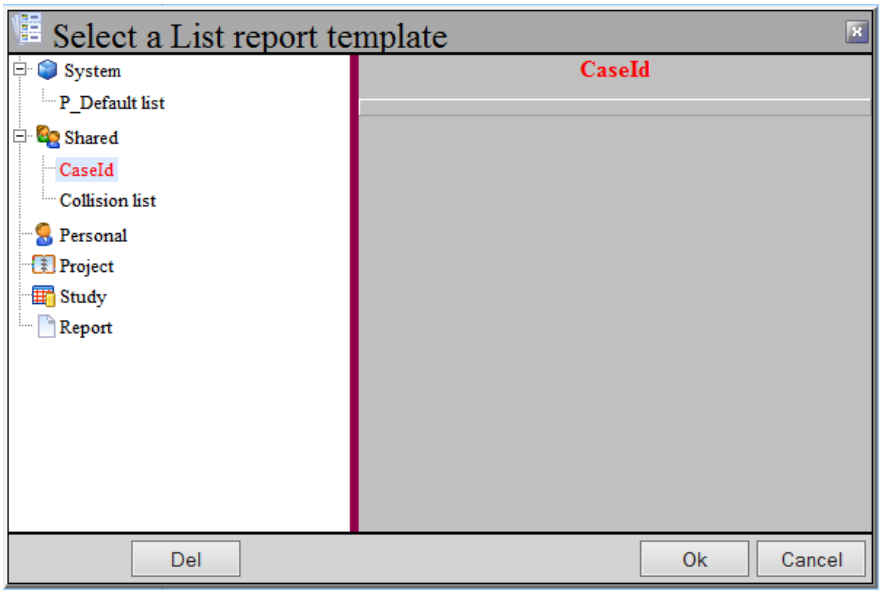
- Filters
- Layouts (for printing)
- Field lists (for printing, exporting, click-on)
- Category lists (used by charts and cross-tabs)

Templates allow the user to save settings used for a report, and then apply the same settings to other reports.

Template load. Then the same user can apply the same template to another report by selecting the report to apply the template to and clicking on the load template button



Template Save. Settings can be saved by clicking on the save template button.

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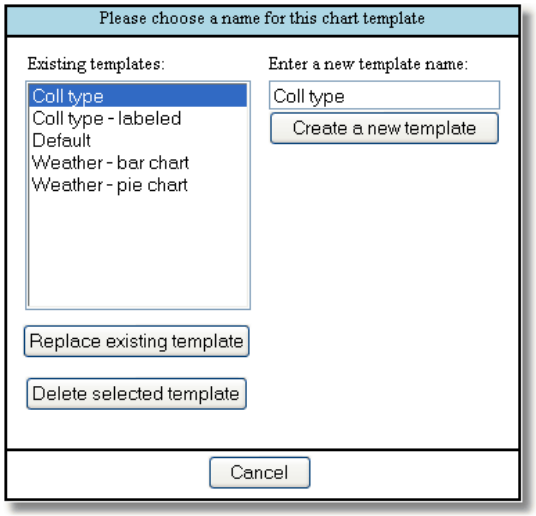

**this dialog box will be updated to the new standard shortly*

6.5 Template Inheritance

When a template is requested by the user, the system looks for it in several places.

- First, the current user's account is checked.
- Second, the user group's "shared" account is checked.
- Finally, the built-in "master" "shared" account is checked.

When a user saves a template, that template is stored in the user's account. Group administrators may copy or move that template to the group "shared" account for others to use as well.

This "inheritance" mechanism provides the following benefits:

- One user's changes do not affect the other users on the system.
- Each user may name and organize their templates as desired.
- It is safe for a user to experiment with different settings and templates. Returning to the default configuration is simply a matter of deleting the undesired templates.
- For administrators, repairing a broken account is as simple as deleting a user's customized templates.

Note,for administrators and power users, the inheritance mechanism also applies to all the configuration attributes. This makes is possible, and even easy, to provide a specific user

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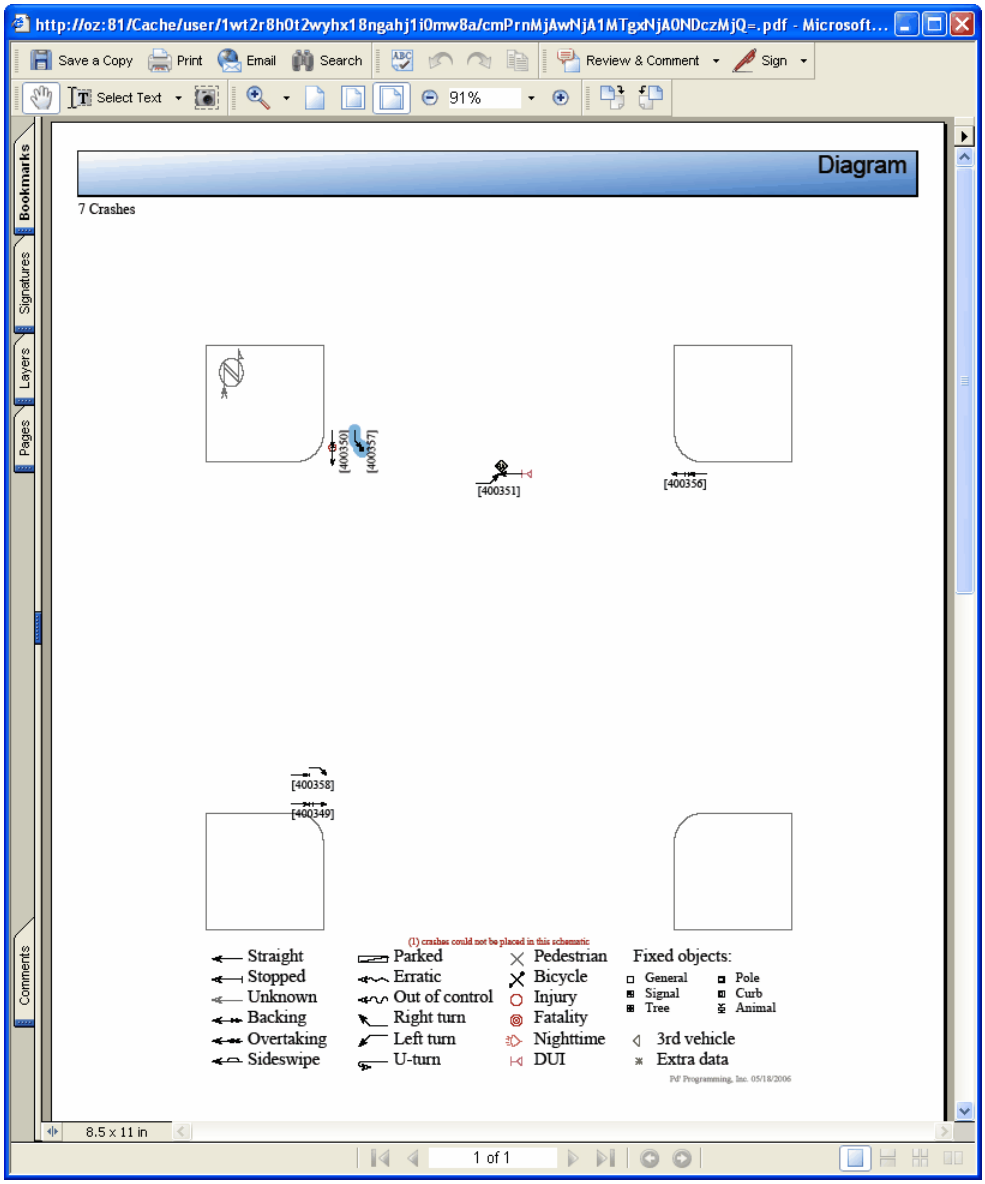
with their own connection, query or other configuration attribute that will then override the one provide to the rest of the group in the "shared" account.

6.6 Printing

Adobe Acrobat (pdf) output



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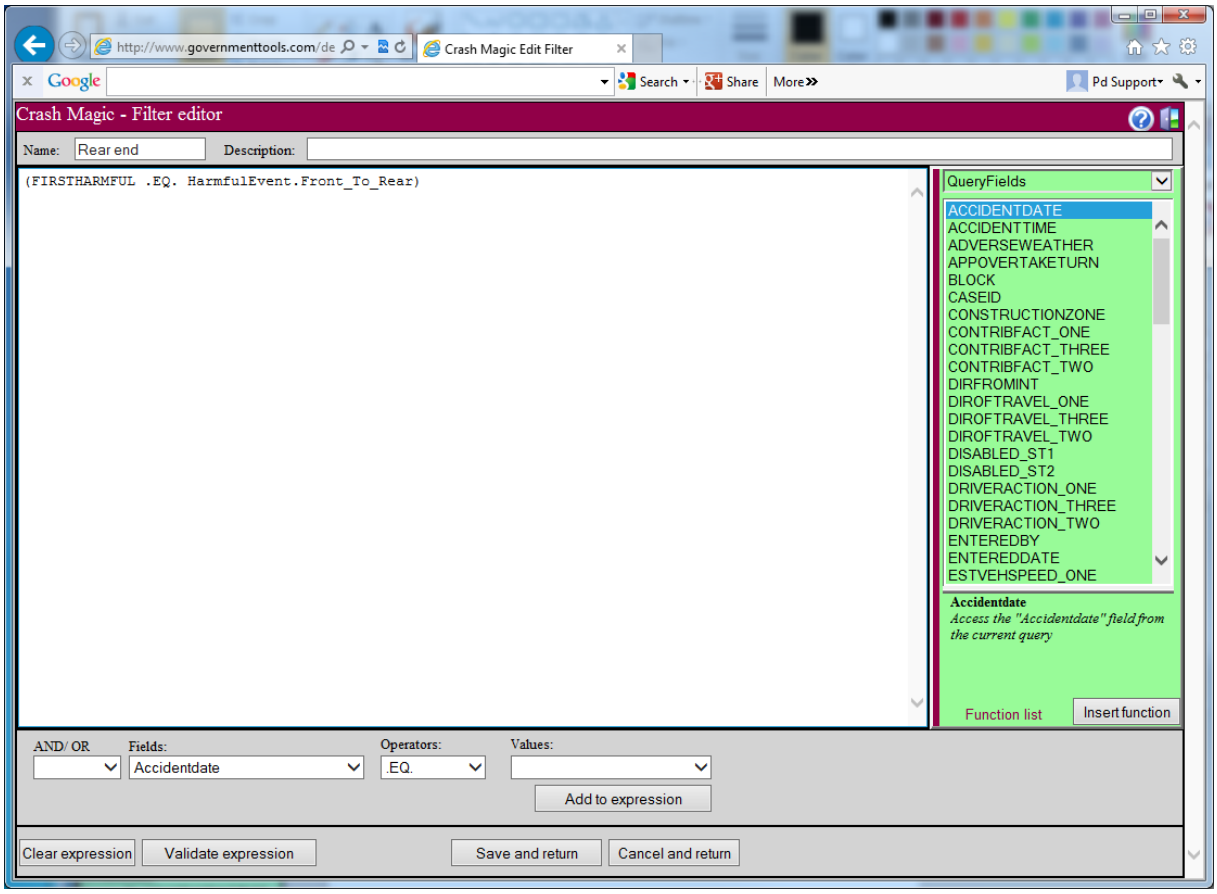
7 Filters

7.1 Simple Filters

Field / value comparisons



Filter scope

Filters are applied at the study level and affect all reports in that study. Most reports contain a button for modifying the study filter.

- Diagrams
- Charts
- Listings
- High crash location lists

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7.2 More on Simple Filters

Saving and loading filters

Naming filters

.AND. / .OR. (& / |)

Identifying useful fields

7.3 Complex Filters

Balancing parenthesis

In simple filters, with just a single expression, parentheses don't usually matter. However, once you start working with multiple expressions and mixing and matching AND's and OR's, parentheses become critical.

Mixing fields

Mixing AND's / OR's

Nulls

7.4 Filter Functions

Filter functions can greatly simplify otherwise complex filter expressions. There are about 30 or so functions currently in the library. They handle things like date manipulation, diagram settings, math, Boolean logic, string manipulation, etc.

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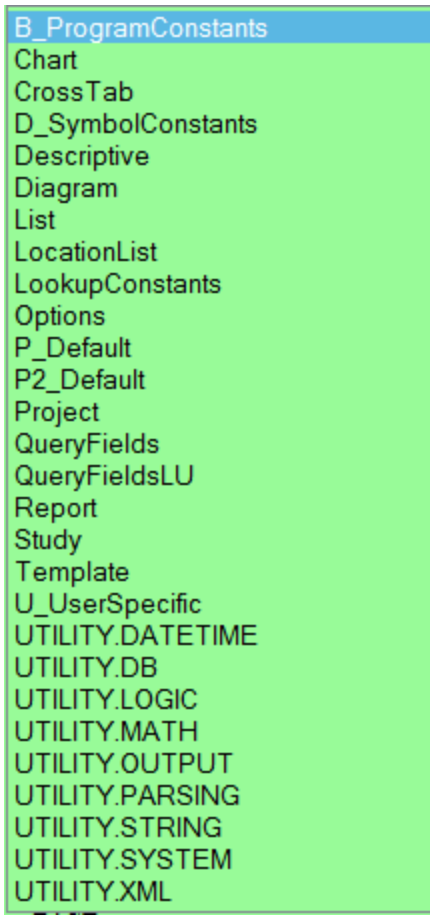

7.5 Calculated Fields in Filters

Calculated fields work just like normal fields in filters

Calculated fields are most commonly used to aggregate multiple fields, but are also used to re-categorize existing fields.

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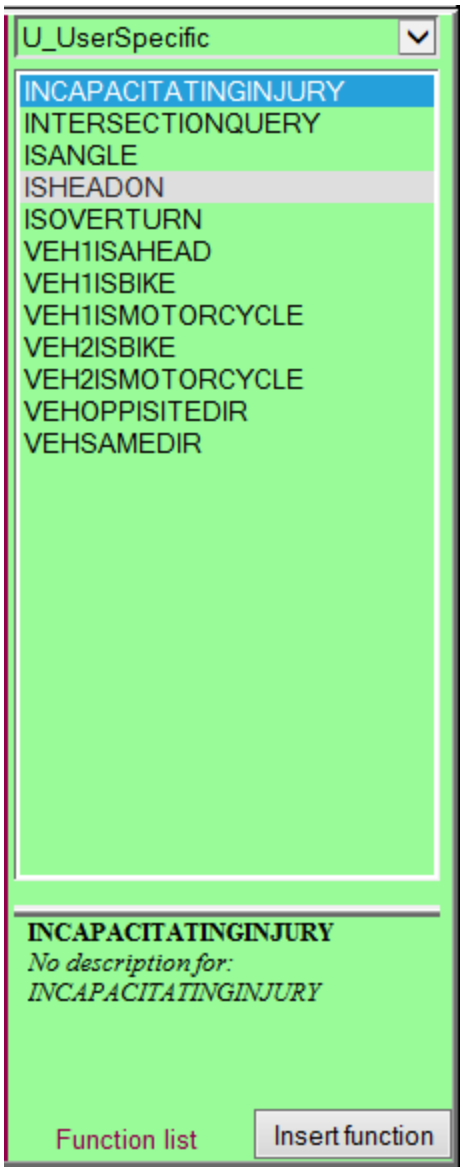

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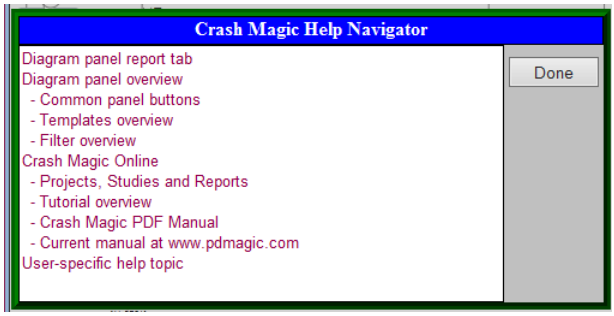
8 Miscellaneous

This section will cover additional items that will increase your productivity in Crash Magic.

8.1 Help

The help button will open Crash Magic's Help Navigator.



The help content is detailed, indexed and cross-referenced.

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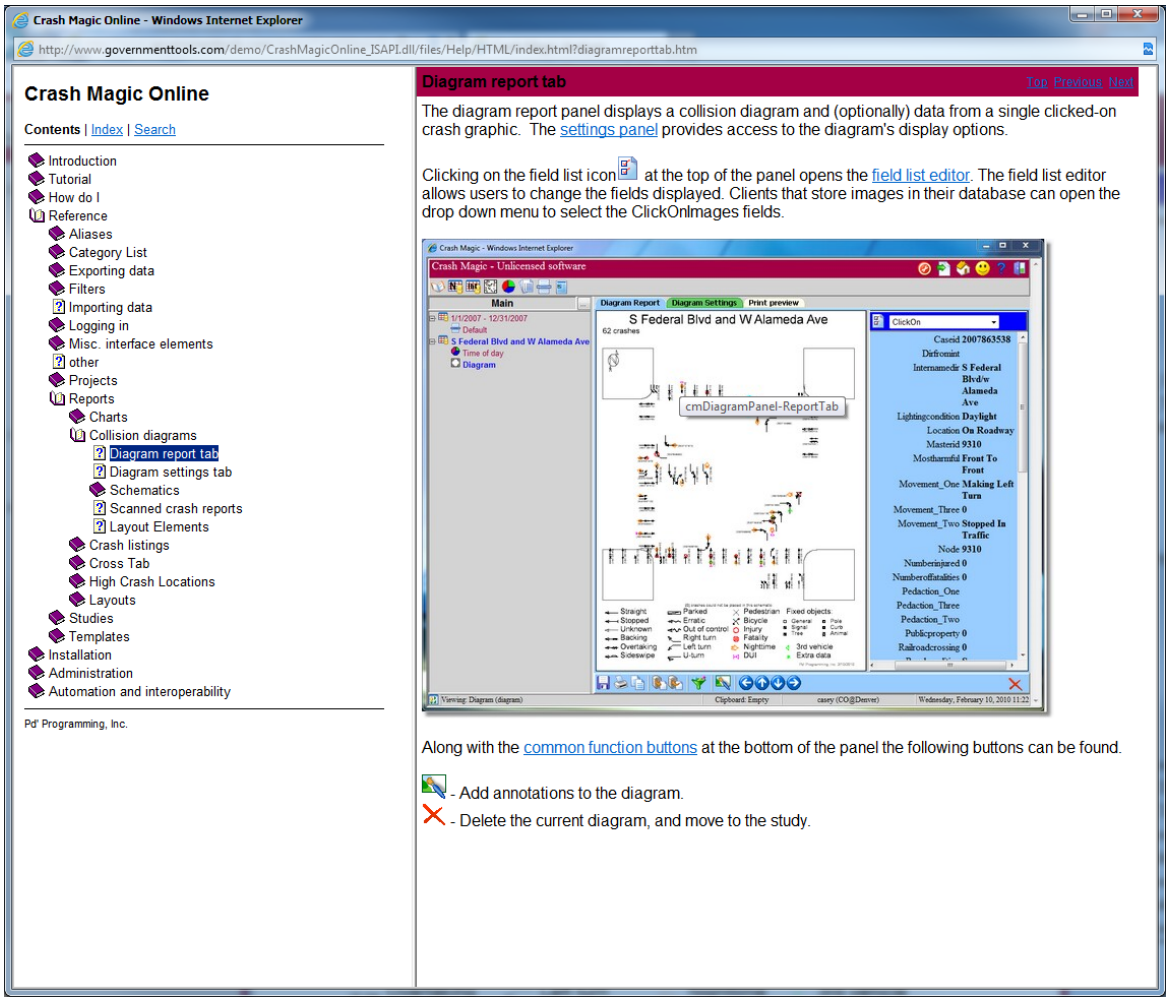

8.2 Copy/Paste

The copy button allows the user to copy an item in his tree to the clip board.

Then using the paste button the user can paste the item from his clip board to another location in his tree.

8.3 Re-issue a Query

The refresh button located in the Study Info panel can be used to re-issue a query against the database if items have changed.

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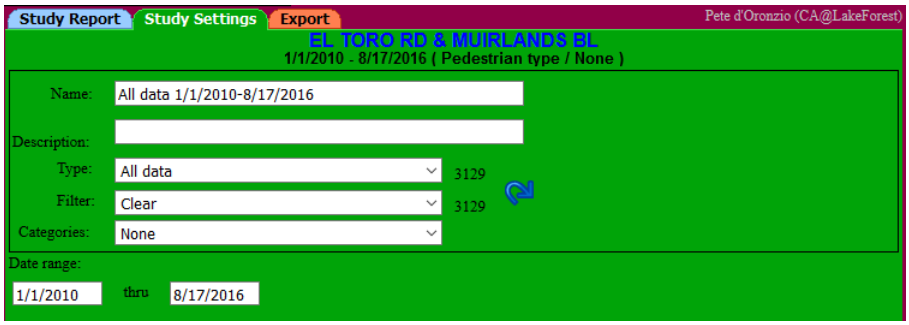
9 Your configuration

Crash Magic is very configurable. Each installation can take advantage of different means of gathering data, different codes and lookups, different types of reports.

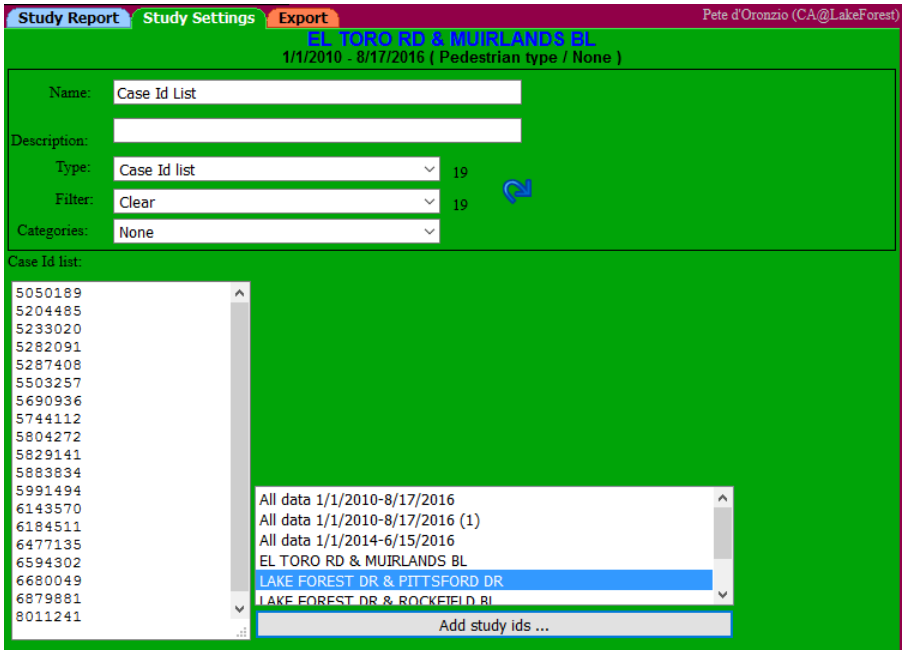
This section is included to describe the studies and reports specific to your installation.

9.1 Study definitions

All Data



CaseId List



Intersection

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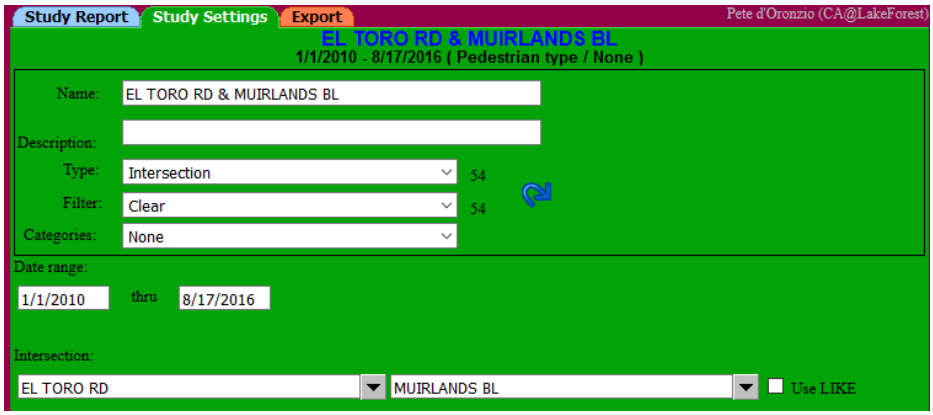

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Back Cover