Integrated Roadway Asset Management

Roadsoft is a roadway management system for collecting, storing, and analyzing data associated with transportation assets. Built on an optimum combination of database engine and GIS mapping tools, Roadsoft provides a quick, smooth user experience and almost unlimited data handling capabilities.

Roadsoft was developed and is supported by the Center for Technology & Training, which is a part of the Department of Civil & Environmental Engineering at Michigan Technological University.

Types of Data

Roadsoft manages a variety of data associated with transportation infrastructure:

- Roads
- Bridges
- Signs
- Culverts
- Driveways
- Guardrails
- Intersections
- Pavement Markings
- Sidewalks
- Traffic Counts
- Traffic Signals
- Vehicle Crashes

Key Features

GIS-Based Map Interface provides a clear visual representation of the roadway assets in the database. Using map layers, you can easily display or hide specific types of data and you can adjust colors, sizes, and shapes to customize the view.

Proprietary Map Reference Generation System software enables us to create custom GIS maps for use in Roadsoft by either drawing roads directly over an ortho photo, or importing road data from existing GIS source files (such as TIGER or ESRI.shp).

Mobile Data Collection using a GPS connected to our Laptop Data Collector utility is a convenient way to collect and maintain accurate data for the system.

Inventory of Assets includes detailed data for pavements, signs, guardrails, and other roadway assets in your jurisdiction.

Asset Management Analysis Tools enable you to create and implement efficient and effective construction and maintenance strategies to maximize the return on your transportation investment.

Data Mining and Report Generation Capabilities provide summaries of specific data in the database, and enhance understanding for yourself and between you and the other transportation stakeholders in your jurisdiction.

Getting Started

Roadsoft software, technical support and training is provided to public transportation agencies in Michigan at no cost. For more information or to arrange a live web-based demonstration, please contact the Center for Technology & Training at 906-487-2102 or roadsoft@mtu.edu. Additional information is also available on the Roadsoft Web site at www.roadsoft.org.
GIS-Based Map Interface

A Geographic Information System (GIS) is the technology used to organize, analyze, and view data from a geographic—or spatial—perspective. A GIS map organizes information into layers. The layers allow you to display different types of data simultaneously. In Roadsoft, each layer of the map is connected to data in the database. When you select an item on a layer, the system makes available the database records associated with that item.

Roadsoft uses an integrated database, which means the data for all of the layers is interconnected between multiple databases. This integration of data streamlines the process of establishing relationships between different types of data and it allows complex data analysis functions.
Mobile Data Collection

The time required to collect and enter data is often the highest hurdle standing between you and a useful information management system. How can you get over this hurdle? The Roadsoft Laptop Data Collector (LDC) will give you a boost.

The LDC, a mobile data collection utility designed specifically for entering data into Roadsoft, enables you to collect and enter pavement, signs and other asset information from the passenger seat of a moving vehicle. To get started, simply install it on your laptop, load the appropriate map and data files, attach a low-cost GPS, and you’re ready to go. It’s easy to use, convenient and proven.

Easy to Use

The passenger seat of a moving vehicle is a difficult place to use software. The Roadsoft development team understood this fact, which is why they designed the LDC unlike other pieces of software. “Plug-and-play” communication with the GPS, fields that fill in automatically, and extensive use of keyboard shortcuts make the LDC amazingly easy to use – in the office or on the road.

Convenient

The LDC uses the same map files as Roadsoft, but requires only a small piece of the main database, which makes data transfer and synchronization simple, quick, and convenient. And the LDC connects easily to any GPS that meets NMEA 0183 requirements. In fact, the less expensive GPS units work best because they don’t include proprietary security features like many of the more expensive units.

Proven

Since 2003, almost 300 local and regional agencies in Michigan and the Michigan Department of Transportation have used the LDC to collect Pavement Surface Evaluation Ratings (PASER) on the State’s federal aid and local road networks, logging over 250,000 miles of data collection travel.

“The Laptop Data Collector is efficient and easy-to-use; rating roads is a breeze. It’s obviously designed with the end-user in mind.”

Vince – GIS Coordinator and Transportation Planner
Inventory of Assets

You’re probably responsible for several different types of roads, thousands of signs, miles of guardrails, and many other valuable assets within your jurisdiction. Wouldn’t it be nice to know that you’re doing everything you can to manage and maintain these assets at an optimum level of effectiveness? Millions of dollars worth of transportation assets are wasted every year within roadway systems across the U.S. simply because people are overwhelmed by all the information.

How can you manage it all so it makes sense? Roadsoft can help.

Roadsoft enables you to build and maintain a complete, detailed inventory of transportation assets for your jurisdiction. With Roadsoft you never have to wonder or guess; you’ll know exactly what you have, where it is, and what to do to keep it working well. The bottom line: you’ll enjoy a clearer view of your bottom line.

The Roadsoft database enables you to build and maintain an inventory of roads, signs, culverts, guardrails, pavement markings and other assets. For each type of asset in the database, Roadsoft stores the following basic information:

- Location along a road using a linear reference or GPS coordinates
- Physical description
- Construction, maintenance, inspection, and rating information

In addition to the basic information, Roadsoft stores the following additional information for specific types of assets:

- Curb and gutter, shoulders, and traffic counts for roads
- Individual records for signs and supports
- Approaching and departing terminals for guardrails, along with individual records for beams, blocks, and posts
- Culvert entrance and exit structures, depth of cover, and skew angle.
- Application date for pavement markings
- Much more – contact the Center for Technology & Training at (906) 487-2102 for more information.

“The more information I add, the more powerful and useful Roadsoft gets!”

Matt – Engineer Technician
Pavement Management and Analysis Tools

Different types of pavement deteriorate at different rates, and different maintenance activities affect the service life of the pavement differently. Everything costs money and everyone is being forced to do more with less. Plus, political pressures associated with managing roads are steadily increasing. The process of finding the perfect combination of maintenance activities is mind boggling in its complexity.

How can you figure it all out; and how can you possibly explain it to anyone?

The Strategy Evaluation and Strategy Optimization features of Roadsoft cut through the confusion. To begin, you enter current condition values and you define the performance of different types of construction and maintenance activities. Then you enter the amount of money you have available in your budget and the construction and maintenance activities that you want to consider. With a few mouse clicks you can generate a plan that combines construction and maintenance activities to maximize service life across the network of roads being analyzed. The evaluation and optimization features help you to make the most of all your resources. Not only that, but the software creates a plan that is clear enough to explain to whomever else needs to know.

A Mix of Fixes
Historically, our roads have been managed with a “worst first” strategy, and reconstruction has been the preferred maintenance activity. But experience has taught us that carefully administered preventive maintenance activities go a long way toward extending the life of our roads.

The Strategy Evaluation and Strategy Optimization features of Roadsoft use pavement deterioration curves, statistical analysis functions, and other mathematical optimization tools to determine specific combinations of maintenance activities that provide the greatest return on your investment.

“The strategy evaluation and optimization tools help us generate pavement management plans that our decision-makers understand. We’re able to apply the right fix in the right place at the right time.”

Brian – County Highway Engineer

Roadsoft®
Integrated Roadway Asset Management System
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Detailed Reports, Data Mining and Exports

Roadsoft reports provide a simple, clear summary of the status of specific information in the database. Roadsoft includes over 50 default reports, and allows an almost unlimited number of custom reports using the extensive data mining capabilities. You can also export the data from generated reports for use in other database programs and export the entire GIS file for use in other GIS applications.

Real-Time Results
It has been raining hard for hours and snow is melting fast this Spring day. Two major rivers in your jurisdiction are near flood stage. You know from experience that any bit of debris that restricts the flow of water under the roads that cross these rivers can cause serious flooding.

You open the Roadsoft report and filter tool. Within minutes you print a detailed report that lists every culvert along the two swollen rivers. With the report in hand, your maintenance crew heads out to inspect the river crossings. They clean two culverts that are nearly clogged with branches and debris. Together you avoid a minor disaster.
Safety Analysis Tools

Every crash in your jurisdiction is connected to a wealth of information that you can use to make your roads safer. All of that information is useless if you don’t understand it. The safety analysis features in Roadsoft organize your crash data in ways that are easy to understand.

**Key Features**

**Detailed Safety Analysis** tools enable you to analyze intersections, segments and curves, generate graphs to provide visual representations of trends, identify roads eligible for federal safety funding, and more.

**Network Diagnostics** tools enable you to examine individual crashes to establish patterns and relationships, which can help identify areas where engineering changes could reduce the frequency and severity of crashes. Once you’ve identified problem areas, built-in links to NCHRP documentation can help you implement countermeasures.

**Integrated Crash Data** allows you to visually compare crash data to roadway layers such as signs and signals. You can also overlay aerial photos and navigate through all levels of detail, including a public copy of the actual crash form.

**Powerful Reporting** features include detailed standard crash reports and advanced filtering options, which allow unlimited reporting capabilities.

**Collision Diagrams** provide visual representations of crash distributions at specific intersections. Collision diagrams also provide a means for measuring improvements, such as signal timing changes or additional signage.

“The Roadsoft safety analysis tools provide a concise way of looking at complicated crash information.”

Dean – Traffic Engineer
Sign Management Tools

The Roadsoft sign module includes tools and features that allow you to define and implement a location-based sign management system for your agency.

In addition to features for creating and maintaining a detailed inventory of signs and supports, the module includes features for inspecting and recording sign and support condition information, including retroreflectivity.

**Key Features**

**Mobile data collection** is possible using the Roadsoft Laptop Data Collector (LDC), which provides a practical, convenient way to establish a location-based inventory of the signs in your jurisdiction.

**Sign Library** is pre-loaded with a complete set of signs, based on the Federal MUTCD. The Sign Viewer/Loader utility allows you to add your own signs to customize the default library.

**Sign Inspection and Management** features provide a convenient way to create and track sign-specific inspection and maintenance records. Work orders provide a means for clearly communicating maintenance needs to your team, and also help establish a solid audit trail to help resolve any data discrepancies in the future.

**User-Defined Priorities** allow you to adjust the level of urgency for specific types of signs and maintenance tasks to ensure that your most important signs and tasks are completed first.

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“Working for a rural county with limited resources, I appreciate the power and simplicity of the Roadsoft sign module. Without it, I would not be able to keep up with the inspection and maintenance of our 3200 road signs.”

Harold - Road Commission Superintendent