Roadsoft 2021 Work Plan Updates

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Annual RUG Meeting and Work Plan Survey

Events like the annual Roadsoft User Group (RUG) meetings are vital opportunities for the Center for Technology & Training (CTT) to get in touch with users about what they want and need from Roadsoft. During 2020's fall RUG meeting, we reviewed progress on the 2020 work plan and opened the floor for discussion of new ideas for the 2021 work plan. This article will give a brief overview of what's been done and what's on the way in terms of improvements and additions to Roadsoft.

2020 Roadsoft User Group Meeting Updates

Last August we held our annual RUG meeting, where we update users on the progress we have made on the year's work plan and open the floor for suggestions of features and improvements users would like to see in the future. Following the meeting we sent out an online survey to Roadsoft users in order to gauge the interest of potential development ideas for the next year. Forty-one people attended the meeting, a recording of which is available at http://mtu.adobeconnect.com/p8iyirss5d3h/.

Senior Software Architect Nick Koszykowski and Technical Specialist Scott Bershing hosted the meeting, during which Koszykowski went over some of the program enhancements and improvements that were accomplished as part of the 2020 work plan. These enhancements and improvements included adapting the Drainage Structure Module to the Roadsoft Mobile app; a major overhaul of framework data from Michigan Geographic Framework v17 to Roads & Highways v20, with ongoing plans for streamlining the data conversion process for v21; and additional improvements to pavement management features like the Strategy tool, Project Planning & Selection tool, and deterioration models.

Work Plan Discussion

After the meeting, an online survey was released to Roadsoft users detailing potential development ideas for the 2021 work plan. This year we received 54 submissions, where participants rated proposed features and improvements to Roadsoft and submitted additional comments and ideas. The CTT thanks everyone who has been a part of the development conversation and encourages anyone with thoughts or ideas to get in touch, whether at conferences, webinars, or by emailing us at roadsoft@mtu.edu.

Survey responses involved rating development ideas for Roadsoft, but not all tasks are created equal. Some are easier and more straightforward to implement than others, and some involve different devices and operating systems. Because of this, the survey divides ideas into three groups and has participants vote on the most relevant topics for their agency from each group. The three groups are major tasks, which are the biggest developments like creating new modules and tools and occupy the most time and effort from our programming team; maintenance tasks, which are smaller tweaks and improvements to existing features that are implemented when programmers have time between larger projects; and mobile tasks involving the team developing the Roadsoft Mobile app for Android and iOs devices. For major and maintenance tasks, participants voted on the five tasks most relevant to their agencies, while for mobile tasks, they rated the seven available entries from most to least relevant. Mobile tasks that were rated more important are given a higher rating in the graph.

Proposed Major Tasks

There were a total of twenty-six major tasks included in the survey, compiled from staff ideas, user suggestions, and items left from previous years. The list of ideas included:

Roadsoft Roundup

- Continued module standardization (adding the multi-edit tool, forms, dashboards, calendars, improved filtering)
- Creating a web-based Roadsoft program
- Continued Project Planning & Selection Tool enhancement (enhanced reports, maps, inclusion of more types)
- Adding a custom report builder (including user-chosen fields, layouts, and formatting)
- Adding a right of way module
- Adding an efficient driving route builder for planning data collection

- Adding a buffer zone to the map to show nearby roads in adjacent jurisdictions
- Adding a bicycle facility module (for bike paths and associated data)
- Expanding the Capital Plan Tool (adding more asset types)
- Adding traffic study information to the Intersection Module
- Adding schematic diagramming feature to the Point Pavement Marking Module
- Adding more tools and controls for administrators (more permissions to grant users, locking fields, tracking database

Potential 2021 Work Plan Major Task Rankings

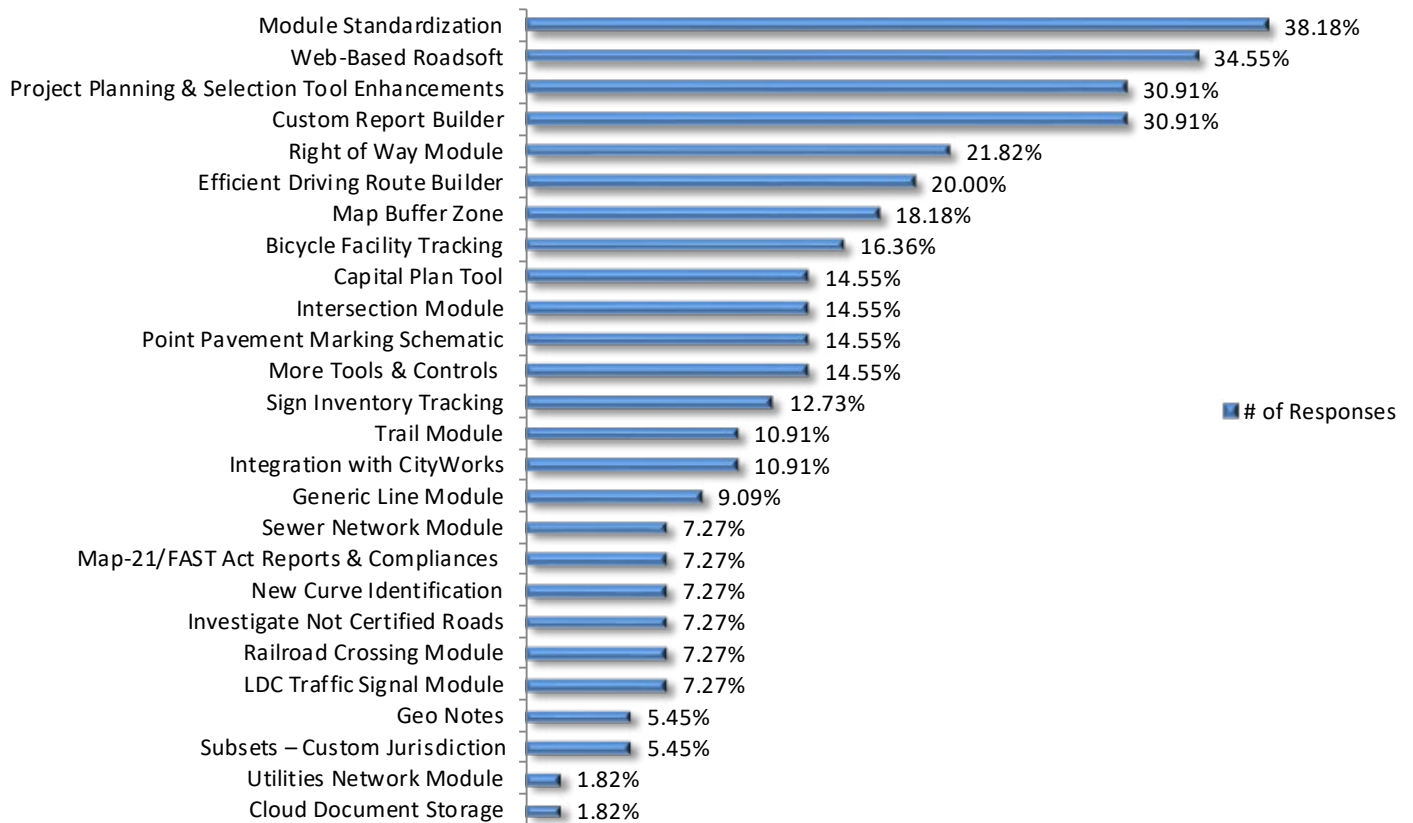| Task	# of Responses
Module Standardization	38.18%
Web-Based Roadsoft	34.55%
Project Planning & Selection Tool Enhancements	30.91%
Custom Report Builder	30.91%
Right of Way Module	21.82%
Efficient Driving Route Builder	20.00%
Map Buffer Zone	18.18%
Bicycle Facility Tracking	16.36%
Capital Plan Tool	14.55%
Intersection Module	14.55%
Point Pavement Marking Schematic	14.55%
More Tools & Controls	14.55%
Sign Inventory Tracking	12.73%
Trail Module	10.91%
Integration with CityWorks	10.91%
Generic Line Module	9.09%
Sewer Network Module	7.27%
Map-21/FAST Act Reports & Compliances	7.27%
New Curve Identification	7.27%
Investigate Not Certified Roads	7.27%
Railroad Crossing Module	7.27%
LDC Traffic Signal Module	7.27%
Geo Notes	5.45%
Subsets – Custom Jurisdiction	5.45%
Utilities Network Module	1.82%
Cloud Document Storage	1.82%

Figure 1 - The major tasks that survey participants voted for. Item ranking is based on the number of responses received in the survey

Proposed major tasks list continued from page 2

changes, etc)

- Adding a sign inventory tracking feature (to track sign materials an agency has on hand)
- Adding a trail module (including those not along roadways)
- Integrating with CityWorks to allow data imports
- Adding a generic line module (create a customizable line module similar to the Sidewalk Module)
- Adding a sewer network module (create a point, line, and polygon module similar to the Drainage Network Module)
- Improving Map-21/FAST Act Reports & Compliances (adding features, formulas, and datasets to comply with new reporting requirements from the Moving Ahead for Progress in the 21st Century Act and the Fixing America's

Surface Transportation Act)

- Adding new curve identification algorithms for crash rankings
- Investigating making a not-certified roads module (for decertified and private roads that may not be under agency jurisdiction)
- Adding a railroad crossing module
- Adding the Traffic Signal Module to the LDC
- Adding geo notes to the map
- Adding subset options for creating databases with custom groups of jurisdictions
- Adding a utilities network module (for assets from other utilities such as electricity, telephones, and cable)

Potential 2021 Work Plan Maintenance Task Items Rankings

Task Item	# of Responses
Enhanced Map Printing	42.31%
Search by Memo Field (all modules)	32.69%
Multi-Edit of Status for Projects/Routine Maintenance	26.92%
Ability to Copy/Paste Sign & Maintenance Data	19.23%
Add/remove/re-order Selection Information	19.23%
Archived Sign/Support Changes	19.23%
LDC Import Preview	19.23%
Link to Project Builder from Road Module	17.31%
Add Dates to Filter Definitions	17.31%
Routine Maintenance Filtering	15.38%
Investigate Screen Mirroring from LDC to tablet	15.38%
Carry Offsets forward	13.46%
Night Mode	13.46%
LDC Point Pavement Marking Enhancements	13.46%
Culvert Photo Attachments	13.46%
Ability to Archive Culverts	11.54%
Ability to Reorder Routine Maintenance Activity Types	9.62%
Date Stamp on Project Memo	9.62%
Ability to Archive Guardrails	7.69%
Auto-Logout	5.77%
Agency level help comments associated with fields	1.92%

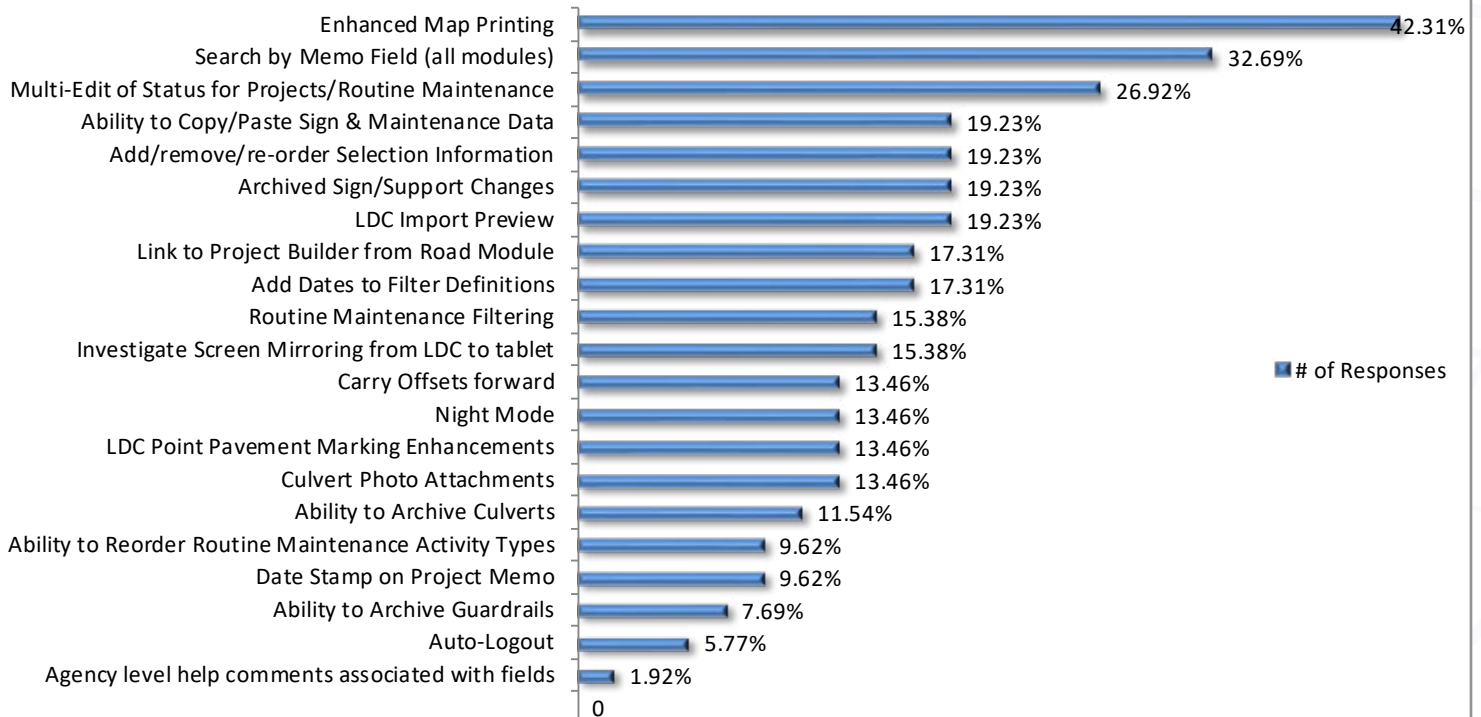*Figure 2 - The maintenance tasks that survey participants voted for. Item ranking based on the number of responses received in the survey*

Proposed major tasks list continued from page 3

- Adding an option for cloud document storage of images and documents

As *Figure 1* shows, module standardization, Project Planning & Selection Tool (PPST) enhancements, and a web-based Roadsoft were some of the most voted for major tasks. Based on our plans and resources for the next year, module standardization and PPST enhancements will be a priority, and we may begin investigations into creating an online Roadsoft program.

Proposed Maintenance Tasks

There were also twenty-one maintenance tasks included in the survey. The list of ideas included:

- Adding enhanced features and functions for map printing (adjusting size and location, selecting townships and jurisdictions, etc)

- Adding a search by memo function

- Adding the multi-edit feature for project and routine maintenance statuses

- Adding a copy and paste feature for sign & maintenance data

- Adding the ability to add, remove, and reorder selection information fields

- Adding sign and support filters, archiving date stamps, and a memo field

- Adding an import preview to verify LDC data before downloading it to a database

- Adding a link to the Project Builder from the Road Module

- Adding relevant dates to filter definitions (day created, last modified, last run, etc)

Potential 2021 Work Plan Mobile Task Rankings

Interest Rating

Task	Rating
Guardrail Collection/Work Orders	4.54
Linear Pavement Marking Collection/Inspection	4.44
Point Pavement Marking Collection/Inspection	4.39
Drainage Structure Lines Collection	4.26
Mobile Sign Module Filtering	4.08
Driveway Data Collection	3.84
Traffic Signal Collection	3.2

Figure 3 - The mobile tasks that survey participants voted for. Item ranking based on the number of responses received in the survey

Proposed maintenance tasks list continued from page 5

- Adding filters for Routine Maintenance reports
- Investigating screen mirroring from the LDC to tablets
- Adding a feature to carry offset settings for linear pavement markings in the LDC to the next marking
- Adding a night mode to the LDC (a dark background to help maintain night vision)
- Adding legend settings for point pavement markings in the LDC to change asset colors based on condition assessments, and offsetting these colors to show multiple conditions
- Revising how the Culvert Module handles photo attachments and works with Stream Crossing Surveys
- Adding the ability to archive culverts
- Adding the ability to reorder Routine Maintenance field layouts and delete or archive maintenance
- Adding date stamps to project memos
- Adding the ability to archive guardrails
- Adding an auto-logout for programs after 12 hours of inactivity
- Adding help comments (descriptions for data fields that agencies can edit to provide context)

As *Figure 2* shows, some of the most voted for and highest rated maintenance tasks were a search by memo feature, enhanced map printing features, and the ability to use the multi-edit tool on project and routine maintenance statuses. These will be given priority when maintenance tasks are done, though there is always some flexibility in what maintenance tasks are done and in what order those tasks completed.

Proposed Mobile Tasks

There were also seven mobile tasks included in the survey, including:

- Adding guardrail data collection and work orders
- Adding linear pavement marking data collection
- Adding point pavement marking data collection and inspections
- Adding linear drainage structure data collection
- Adding sign type filtering
- Adding driveway data collection
- Adding traffic signal data collection

As *Figure 3* shows, while it was close, guardrail data collection, point pavement marking data collection, and linear pavement marking data collection were the highest rated mobile tasks. Based on our resources and user interest, guardrail data collection will be a part of the 2021 work plan, with other modules added as time and budget allow.

Comments and Conclusions

There were eighteen additional comments and suggestion submitted by participants in the final question of the survey. The final question serves as a way for participants to provide general input by submitting questions, comments, suggestions, and concerns related to any of the Roadsoft products. User feedback is vital to making sure we're developing a program that provides real service and value to our customers, and we thank everyone who submitted them. Each and every comment is read and considered, and some participants have received follow-up responses from our development staff to get more information.

Overall, the annual survey gives us important feedback on what people are interested in seeing from Roadsoft in the future. We thank everyone who participated, and we hope you like what comes next!

If you missed the survey, but still have general feedback, comments, suggestions, or feedback for our developers, please feel free to send an email to roadsoft@mtu.edu.

RUCUS 2021
Roadsoft User Conference of the United States
Wednesday, December 15th • 8 a.m. - 4:30 p.m.• Mt. Pleasant, MI
Tuesday, December 14th • Hands-On Introduction or Advanced Roadsoft Training

MARK YOUR CALENDARS!

Have an idea for a topic? Interested in presenting? Know someone else willing to present?
Visit **roadsoft.org/rucus** to suggest a topic or speaker.

Roadsoft Staff Spotlight

Sidona DeBrule
Center for Technology & Training

This issue's spotlight articles are for Luke Peterson and Nick Koszykowski, two senior software programmers who've been with the CTT for decades. With their skills and experience they help lead the Roadsoft team and design the overall architecture of Roadsoft.

Luke Peterson

Principal Programmer Luke Peterson

Luke Peterson joined the CTT in 1999 and currently works as a principal programmer for the CTT. Thanks to his two decades of experience coding for Roadsoft, the Laptop Data Collector (LDC), and the Roadsoft Mobile apps for Android and iOS, Peterson has a well of knowledge for himself and his fellow programmers to pull from. In addition, his experience means Peterson not only codes the software, but helps direct the future structure or 'architecture' of the code as well.

A principal programmer, as described by Peterson, is a high-level software engineer who has been around long enough to have the experience and skills to not only write code but also help shape the future development of Roadsoft. Peterson's deep knowledge helps him to assist his fellow software engineers as well. He credits this to the fact that after so long working with a program, "You're going to be someone that other people rely on if there's a very difficult decision or difficult problem because of the years of experience you have."

Peterson spends much of his time in the office writing code, where his particular focus is with the LDC and mobile device apps. He explained there are some major differences between coding for desktop computers and smaller, more mobile devices like smartphones: primarily, the processing power of the computer. "You're a lot more handcuffed on mobile. Mainly because you don't have access to as powerful of a machine as even just a laptop. So you're more focused on what you can do." Peterson added that maintaining the mobile apps for iOs and Android at the same time also presents some unique challenges. "A lot of our code is reused in both iOs and Android, but there's still a branch that you have to go towards. So if I'm going to make a change, I'm usually testing it in Android. And then you have to go and test it in iOs as well." As an app for mobile devices, Roadsoft mobile also needs to be designed so it can run on devices with a wide variety of screen shapes and sizes: anything from a smartphone to a tablet. This means the menus and modules need to be carefully designed so they are easy to read no matter the size they are or position they have on the screen. Overall though, Peterson concluded the various Roadsoft programs each have their own uses in supporting each other, with the LDC and Mobile being useful for gathering data and Roadsoft serving as a central repository for working with that data.

Peterson also tends to be the go-to man for translating new features and modules from desktop Roadsoft to the LDC. After working on four rewrites of Roadsoft over the years Peterson has spent time working with nearly every tool in the software at one time or another. Parts of Roadsoft are often rewritten to add new features and data, as well as to update their layout to match newer modules and help keep Roadsoft's code current, but changes made to one program need to be made in the others as well. Peterson added that a big part of such updates is figuring out and meeting necessary requirements, whether it is the requirements of the users themselves, or larger overseeing organizations. He emphasized that gathering requirements is a major part of software design and making sure our finished product is something users will find helpful. "I'm not writing the software so I can use it. It's so someone else can use it."

Peterson spends some of his free time coaching varsity and junior softball for his daughters in high school, as well as little league baseball for his sons. He was also the varsity head coach of Calumet's high school softball team for a few years during the beginning of the program. Peterson also enjoys playing hockey and the occasional game of golf outside of the office.

Nick Koszykowski

Senior Software Architect Nick Koszykowski

Nick Koszykowski is a senior software architect who has been with the Center for Technology & Training for twenty years. Koszykowski brought years of experience with software development when he joined the team, and now uses his skills in team coordination and data management to help keep the program running smoothly.

Koszykowski says that as a senior software architect he's essentially "the main cat herder" who deals with the big picture and helps coordinate the office programmers so that their projects come together into one cohesive software program. "One programmer has his arm around the elephant's trunk. The other has his arm around the leg. The other one has his arm around the tail. And they all think it's a different thing. I'm the one that has to point out that it's an elephant. So that we know what the big picture is and what we're all working towards." This means his day to day work tends to include a lot of time spent talking to people on the team and taking part in making long-term decisions like the annual work plan as well as programming.

One particular herd of cats is the programming interns working on Roadsoft. One of the bigger perks of working on a university campus is the ready pipeline of students looking for real world practice to go along with their education. Koszykowski said that having the interns is good for the interns, as he helps provide them with, "Real world experience. A lot of mentoring, and a lot of explaining how things are done." Working with the interns isn't just educational for them, Koszykowski noted, but is invaluable to the Roadsoft program as well. "Working with students is fantastic, too. Because you get completely different perspectives and different ideas. They're learning new things, and they will come up with stuff and I'm like, 'Yeah, that's great. Let's do it.' which is fantastic." The expanded intern program is a relatively recent program, added Koszykowski. "Seven, eight years ago, we didn't have as many. We usually had maybe one programming intern at a time, never had a group as large as this. Even then it was just kind of like, eh, it's just another employee except you're here for short hours of the day. Now it's more like it's a team. It's fun, it's not like work." This larger group allows for more collaboration and innovation as they work with Roadsoft programmers and each other on projects.

One of Koszykowski's focuses in Roadsoft is infrastructure, where he works on projects like the user-created filter system and code for Roadsoft reports. Notably, he's also in charge of preparing data for migration, like updates to the framework base map. Over time, agencies may make changes to their road systems like realignments or additions and subtractions to their road network. These changes get submitted to the state to be incorporated into the statewide base map, but they aren't reflected in Roadsoft until their base map in Roadsoft are updated. Koszykowski gets updated map data from the state and prepares it to be distributed to road agencies every spring. The changes made to maps are often raw, and Koszykowski helps to clean it up by doing things like removing extra splits to road segments and making sure that assets attached to specific road miles are still in the correct locations.

One of the hardest parts of his job, Koszykowski says, is estimating how long and how many resources projects will take. It can be difficult to estimate the amount of time and budget a new software project will need because new projects often involve creating new functions and algorithms that the programmers have never done before. As an example, Koszykowski contrasted it to estimating a construction project. "They know how much asphalt costs. They know how much sidewalk costs. They know how much all of these things cost based on the distance, based on time, they know that that project is going to be $2-3 million. Software is completely different. You have to come up with a price for something that you've never done."

Originally from Chicago before growing up in Wisconsin, Koszykowski is a steadfast Bears and Cubs fan who enjoys single-player video games, reading, kayaking, and biking to work during the summer.

Roadsoft Tips & Tricks

Tip #7: Graphing Road Surface Trends

Spotting trends in road surface conditions can be incredibly useful for estimating future changes to roads and planning maintenance to keep up with those changes. Roadsoft can be an ideal place to estimate these changes because agencies often already have their surface condition ratings entered into the database - this is where Roadsoft's Surface Condition Trend Analysis tool comes in. This tool serves as a quick and easy way to turn entered road surface data into graphs, making it easier to visualize changes over time and between specific years. The tool allows users to look at changes either between their whole road system or groups of roads by applying filters, and then they can look at the changes either between two certain years or over an entire range of years.

These graphics can also be useful for presenting information to other people involved with the road system, from concerned local citizens to politicians in charge of funding. They can be downloaded from Roadsoft and used in anything from reports to PowerPoint presentations or websites.

Refer to the View Surface Condition Trends topic in the online Manual for instructions on how to use the tool.
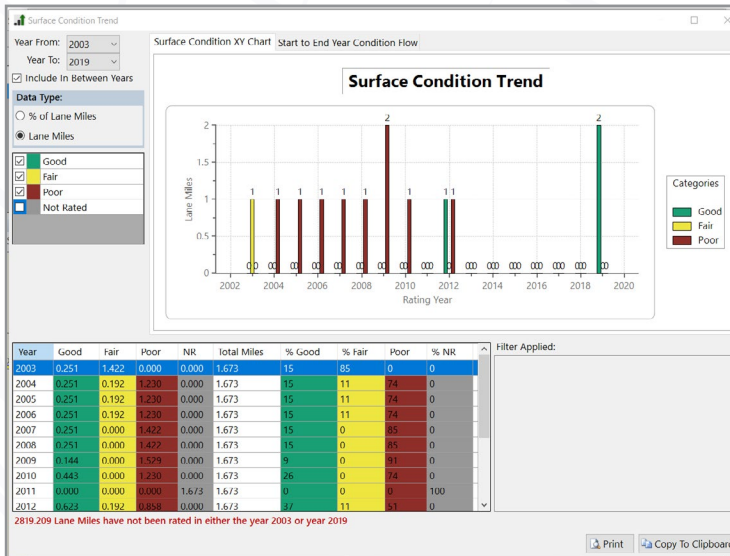

Figure 4 - Surface condition trend graphs can demonstrate overall road surface conditions over time
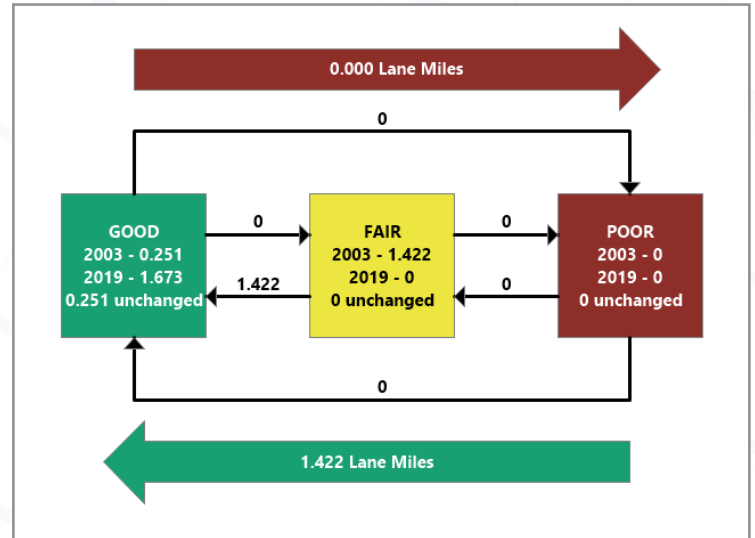

Figure 5 - Condition trend flow charts are useful for examining overall changes in road surface conditions

Roadsoft Tech Assist Tuesdays

Given the uncertainty of planning travel and meeting face-to-face due to COVID-19, the Center for Technology & Training transitioned our *Roadsoft on the Road* technical assistance visits from on-site at your agency to online.

In an effort to provide similar personalized technical assistance to agencies in need, we are offering online sessions for agencies through Zoom and/or Adobe Connect. Both online tools allow for screen sharing and provide a remote experience that allows CTT staff and agency personnel to interact using the agency's data and machines in a similar fashion as in-person sessions.

Sessions are available on Tuesdays until May 25th, with one hour slots at 9, 10, and 11 a.m. This date may be extended based on statewide COVID-19 numbers and any potential travel or meeting restrictions that may still be in place.

Visit roadsoft.org/roadsoft-tech-assist-tuesdays to request a Tech Assist Tuesday session. Roadsoft staff will contact you to make arrangements for the session so you will get the most out of the experience as possible.