

# The Bridge

Linking Transportation Research and Practice



## Maximum bang for the transportation buck

### Asset management leads to improved roads in Roscommon County

By John Rynanan, Editor, and Trevor Kuehl, Student Intern, Center for Technology & Training

The Roscommon County Road Commission (RCRC), like most local road agencies, faces constant pressure from politicians to fix roads that motorists identify as needing improvement. Tim O'Rourke, RCRC manager, quickly became familiar with the process when he was hired in 2006. "When I started, road maintenance was influenced heavily by political pressures," O'Rourke said. "We took a 'worst first' approach to fixing roads, and the most insistent elected officials who served the loudest group of constituents most often got their roads fixed first." In one of the first meetings as manager of the RCRC, his road commissioners identified over \$500,000 in maintenance needs for Roscommon County's roads, but had only \$60,000 available to spend. That year, the RCRC rebuilt a half-mile of politically-charged road, and as a result was unable to perform basic maintenance on well-traveled roads that were rapidly deteriorating. O'Rourke knew it was time for a change.

#### Change starts with education

Change started from the ground up in the form of a new maintenance strategy. O'Rourke spearheaded the creation of an asset management program in Roscommon County that identified roads in need of maintenance using hard data instead of political pressure. "You need to approach road maintenance as a business process, not a political process, and education helps remove the politics from roadway management decisions," O'Rourke said. "The only way to convince decision-makers to adopt an asset management approach is if they understand what is being presented."

Based on this philosophy, O'Rourke and his staff adopted education as the cornerstone of his asset management program. To get started, the RCRC sent staff and elected officials to Pavement



Terry Asphalt Materials Inc.

Crack sealing, which prevents water from penetrating into the base material of a road, is a key component of Roscommon County Road Commission's asset management program.

Surface Evaluation and Rating (PASER) training and also hosted an Asset Management for Elected Officials workshop. Both events were sponsored by the Michigan Transportation Asset Management Council (TAMC) and were conducted by the Center for Technology & Training (CTT). "The workshops helped to familiarize our decision-makers with asset management theory and also provided a first step toward getting the data we needed," O'Rourke said.

Jackie Bertsch, chair of the Roscommon County Road Commission, attended both workshops. "The training sessions provided a very practical and easy to understand view of transportation asset management," she said. "They were especially helpful for those who didn't have a technical background."

#### Inventory, ratings and education

Implementing an asset management program involves building an inventory of roadway assets, inspecting and rating the condition of the assets, and then putting together a combination of maintenance and rehabilitation treatments to meet the needs of the assets at every stage their life cycle.

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## The importance of the “after” photo

When the City of Houghton and MDOT teamed up to reconstruct about 1/2 mile of US-41 through downtown Houghton last summer, one of the first things they did was put together an artist’s rendering of what the business district would look like after the project was completed.

When big developers build in major cities, they often post a picture of the finished project on the fence surrounding the job site so passersby can appreciate what’s going on while the project is underway.

On a wall high above the checkout counters in the largest grocery store in Houghton there hangs a black and white photo of a tiny food store. The neat shop with a striped awning and big plate glass windows flanking a single door is where the current business got its start.

The “after” photo is important at all phases of a project. Before a project begins, the after photo builds confidence; it gives stakeholders in a project clear goals and it helps them get started. When a project is underway, the after photo reassures; it serves as a reminder of the ultimate destination for those involved in and impacted by the project. After a project is complete, the after photo is a great motivator and momentum builder; when compared to a “before” photo it makes accomplishments clear and excites people to try to accomplish more.

Tim O’Rourke, manager of the Roscommon County Road Commission, has done a nice job of using the after photo concept to accomplish great things for roads in Roscommon County. Using a pair of bar graphs – one showing the current distribution of road ratings, the other showing what the distribution could (or should) look like – O’Rourke and his staff have implemented a county-wide asset management plan. Every township in the county is involved and engaged in the process, and as a result roads in Roscommon County are being transformed. The cover story in this issue contains all the details.

Also in this issue, you can get some tips on how to size up your audience before starting to write something. The article, *Technical writing for transportation professionals*, appears on pages six and seven. It’s actually the first part of a three part series of articles dealing with writing and transportation.

Safety is a big and growing deal on our roads. On page three you can find out about two new safety resources that are available on the Web. An announcement on page eight will tell you how to get information about the new Highway Safety Manual, which is available from AASHTO.



## The Bridge

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### Michigan’s Local Technical Assistance Program

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## LTAP Steering Committee

The Local Technical Assistance Program (LTAP) is a nationwide effort financed by the Federal Highway Administration and individual state departments of transportation. It intends to bridge the gap between research and practice by translating the latest state-of-the-art technology in roads, bridges, and public transportation into terms understood by local and county highway or transportation personnel.

The LTAP Steering Committee makes recommendations on, and evaluations of, the activities of the Local Technical Assistance Program based on discussions at the Technology Transfer Interchange and Advisory Committee meeting. This meeting is held annually and is open to all rural and urban agencies, and individuals concerned with the transfer of transportation technology in Michigan.

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# New safety resources available on the Web

## Crash Modification Factors Clearinghouse

[www.cmfclearinghouse.org](http://www.cmfclearinghouse.org)

The screenshot shows the homepage of the Crash Modification Factors Clearinghouse. At the top, there is a navigation bar with links for 'About CMFs', 'Find CMFs', 'Submit CMFs', 'Resources', and 'Contact'. Below this is a 'Quick Search' section with a search input field and several dropdown menus to filter results by countermeasure category, crash type, crash severity, and roadway type. A prominent banner reads 'Read the first issue of our e-newsletter CMF Update' and encourages users to read and subscribe to the quarterly e-newsletter. A 'Recently Added CMFs' section lists several entries with details like 'Provide state combination horizontal alignment / advisory speed signs' and 'Risks standard for wet/ice maintenance'. The footer includes the U.S. Department of Transportation Federal Highway Administration logo and funding information.

### Excerpt:

A crash modification factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. The Crash Modification Factors Clearinghouse houses a Web-based database of CMFs along with supporting documentation to help transportation engineers identify the most appropriate countermeasure for their safety needs. Using this site, you can search to find CMFs or submit your own CMFs to be included in the clearinghouse.

On the CMF Website you can:

- Subscribe to the *CMF Update* a quarterly e-newsletter from the CMF clearinghouse.
- Learn about the features and uses of the Clearinghouse Website through a quick webinar.
- Find out about CMF-related training offered through the National Highway Institute.
- Read about star quality ratings for CMFs.

## Traffic Regulator's Instruction Manual

[www.michigan.gov/documents/mdot/MDOT-TrafficRegulatorsManual\\_327600\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT-TrafficRegulatorsManual_327600_7.pdf)

The cover of the 'Michigan Traffic Regulator's Instruction Manual' features the state of Michigan logo and the text 'Michigan Traffic Regulator's Instruction Manual'. At the bottom, it displays the MDOT logo (Michigan Department of Transportation) and the date 'June 2010 Edition'.

### Excerpt:

To you, the Traffic Regulator:

This handbook has been prepared to assist you in understanding how to properly control traffic through construction, maintenance, and utility work areas. As a Traffic Regulator, your duties are to protect project personnel and provide safe, courteous, and authoritative directions to motorists seeking passage through the work zone.

All Traffic Regulators must review the training requirements described in the current edition of the Michigan Manual on Uniform Traffic Control Devices Part 6, Chapter 6E, prior to performing work.

The role of a Traffic Regulator is crucial to the success of a well-run traffic operation. Study this handbook so that your conduct as a Traffic Regulator is professional and second nature.

Traffic regulating is a full-time job. Careless use of the sign or distraction from duty could cause serious injury to yourself, other workers, or the motoring public. By performing your duty diligently, you can do your part to prevent traffic incidents in your work area.

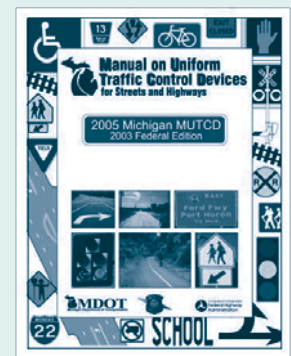
## Get a 2005 Michigan MUTCD for next to nothing

Michigan's LTAP has a limited number of 2005 Michigan MUTCD packages available. Each package includes a sturdy printed version in a three-ring binder and a searchable PDF version on CD. To clear out our inventory before the new version is published, we're offering them at a reduced price. Call now to pick one up for your agency.

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**Reduced price: \$35.00 for one (74% off), \$50.00 for two (81% off), \$65.00 for three (84% off)**

**Call Michigan's LTAP at 906-487-2102 to get a copy.**



**Maximum bang, from Page 1**

The RCRC began collecting PASER ratings on their roads in 2006, and completed the process in 2008. Based on that data, the county developed a five-year maintenance plan and a three year comparison study to see if an asset management plan was effective. “Our five-year goal was to have 70% of our roads in good condition, which is a six or higher on the PASER scale,” O’Rourke said.

Having a balanced and strategic asset management plan enables a road commission to maintain the quality of an entire road network instead of struggling to replace only failed or politically significant roads. “Our goal is to fix the roads before we lose them,” O’Rourke said. “By focusing our attention on roads that are rated in the middle, which is a PASER value of 4, 5 or 6, we hold the deteriorating roads together as long as possible.” The RCRC decided to use RoadSoft® to complement their asset management program. RoadSoft is a PC-based roadway asset management system designed for use by local agencies. It was created and is supported by the Center for Technology and Training at the Michigan Tech Transportation Institute. RoadSoft includes features for establishing a detailed inventory of assets, a utility for mobile data collection, and tools for creating, evaluating and communicating detailed maintenance strategies.

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*“Our goal is to fix the roads before we lose them...we hold the deteriorating roads together as long as possible.”*

Tim O’Rourke – Roscommon County Road Commission

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**Mixing the fixes and clearing the last hurdle**

A key component of RCRC’s asset management education program involved “training” RoadSoft to work with the RCRC’s maintenance practices. To do so, O’Rourke’s team entered cost estimates for each type of maintenance activity into RoadSoft and then customized the program’s pavement deterioration model to align with the county’s maintenance practices. The RCRC’s “mix of fixes” included revised cost and service life estimates for crack sealing and pothole filling, and wedges, chip sealing, and overlays to fix rutted and cracking roads. “When we combined traditional maintenance practices with less intensive fixes like Durapatching and crack sealing, we had a model that included improvements for every road in the system over the next five to ten years,” O’Rourke said.

Although the RCRC set specific goals for the entire county and also established a clear plan to achieve them, the last hurdle was the trickiest: how to convince the decision-makers and the public to buy into the plan. To do so, O’Rourke followed one of the simplest (but easiest to overlook) rules of effective communication – he adjusted his message to meet the needs and levels of understanding of his audience. To begin, he considered road maintenance from the perspective of a road commissioner and a motorist. Then he used RoadSoft to generate a series of reports that showed the current and future condition of roads based on PASER data and projected maintenance activities. Finally, O’Rourke put together several different variations of spreadsheets, graphs and charts to help decision-makers understand the impact and importance of preventive maintenance activities.

**Roscommon County Road Commission’s “Mix of Fixes”**

**Crack Seal**



Used on roads that have a PASER rating of 6 or 7. Expected to extend service life of road 1 to 2 years. Cost per center line mile: \$4,500.

**Wedging and Chip Seal**



Used in conjunction with crack sealing on roads that have a PASER rating of 4 to 7. Expected to extend service life of road 3 to 5 years. Cost per center line mile: \$25,000.

**Ultrathin Overlay**



Used in conjunction with wedging and crack sealing on roads that have a PASER rating of 4 or 5. Expected to extend service life of road 4 to 6 years. Cost per center line mile: \$78,000.

**Durapatch**



Used as a short-term fix on roads that have a PASER rating of 4 or lower. Durapatch is useful for holding roads together until more extensive rehabilitation work can be performed. Expected to extend service life of road 1 to 2 years. Cost per center line mile: \$8,500.

**Crush and Shape**



Used to rehabilitate roads that have structurally failed, Cost per center line mile: \$165,000 to \$195,000.

## Practice makes perfect

Before delivering a presentation in an actual meeting with decision-makers, O'Rourke arranged "practice" meetings with several Roscommon County townships so he could test the content and delivery of his message. During the practice meetings he asked his audience to provide feedback on key elements of the presentation. He then made changes immediately and presented the new information to confirm its effectiveness. Using this method of real-time feedback and revision, O'Rourke gained a deeper understanding of the needs and interests of his target audience while tailoring his message to meet those needs perfectly.

Through the practice meetings, O'Rourke learned that a simple "before-and-after" comparison of road conditions made the most sense to his decision-makers. To create comparisons for each township, he developed two bar graphs using the PASER data extracted from *RoadSoft*. One graph showed the current distribution of PASER ratings in a township, and the other showed an expected (or ideal) distribution of ratings (see graphs below). Each graph was color-coded to clearly indicate the center line miles of road that were rated low defect (PASER = 10–6), in need of maintenance (PASER = 5–4) and structurally deficient (PASER = 3–1). "Used together, the graphs helped decision-makers in each township understand the actual condition of their road network compared to what it should look like," O'Rourke said. "The colors got their attention but the numbers were most important. Having real numbers gave us a solid starting point for discussing maintenance options."

## Putting it all together

The RCRC asset management program involves intensive use of *RoadSoft* and year-round communication and collaboration with stakeholders. The program is based on a seven-year plan for primary roads in the county, and individual five-year plans for local roads in each township. O'Rourke and his staff begin the process each year by evaluating the five-year plan for each township. Next, they create a maintenance

strategy for the upcoming construction season based on funding available for road maintenance in each township. They then run the strategy for each township through the *RoadSoft* strategy evaluation and optimization tool to determine the combination of maintenance activities that will yield the greatest improvement in road conditions system-wide. Finally, the RCRC team meets with township officials and the RCRC board to identify roads that are good candidates for improvement.

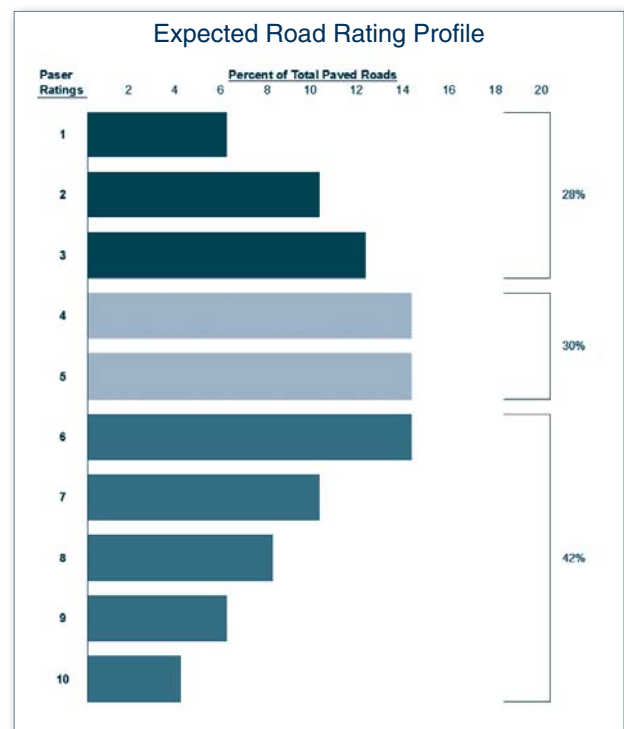
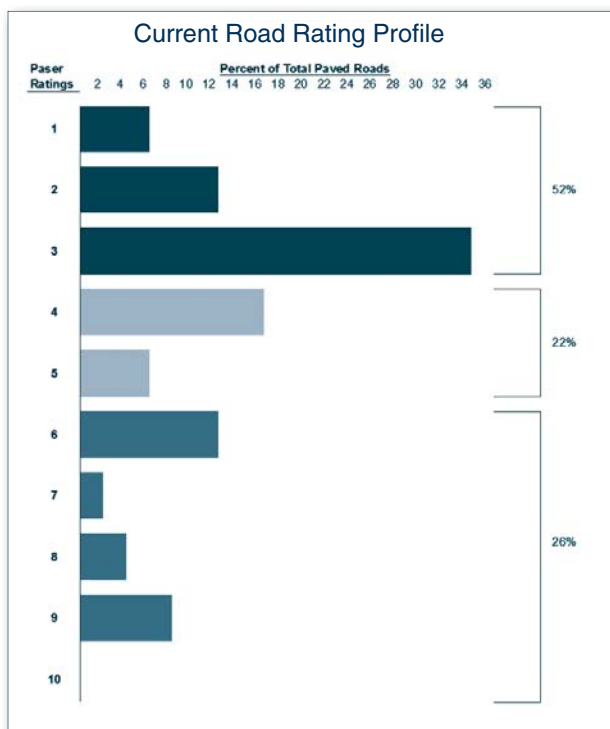
The entire process reinforces the advantage of making decisions based on data instead of politics, and it makes clear the importance of "mixing the fixes" instead of fixing the worst roads first. "Having the PASER data in *RoadSoft* makes it easy to explain the entire life cycle of a road," O'Rourke said. "You can see the lights turn on in people's heads when they begin to understand how asset management fits into the big picture. Our decision-makers and the public understand that when we resurface a road, we're going to have to crack seal it several years later in order to maintain a decent rating."

RCRC Chair, Jackie Bertsch, appreciates how good data, a specific plan and good communication helps strengthen relationships with stakeholders and streamlines decision-making. "Local elected officials change often; consistent data and a good plan are essential for making good maintenance decisions," she said. "The five year plans that all of our townships have adopted are extremely beneficial. When we meet with township officials every year to plan our maintenance activities, they see asset management holding roads together in black and white. It's easy for them to understand why roads receive certain ratings and why we perform certain types of maintenance on them, whether they were part of the process the previous year or not."

## The big picture gets bigger

Additional stakeholders have also become a part of the RCRC's asset management program through a newly established Asset Man-

**See *Maximum bang* on Page 7**



*Tim O'Rourke, manager of the Roscommon County Road Commission, uses a simple "before-and-after" comparison of road conditions to help elected officials understand the impact and importance of preventive maintenance activities.*

# Technical writing for transportation professionals

## A simple strategy for sizing up your readers and their needs

By Richard Kronick, freelance technical writer and writing trainer. *Reprinted with permission from Minnesota LTAP, University of Minnesota.*

**This article is the first in a three-part series. Part two: Define your purpose will be published in the next issue.**

I have been a technical writer specializing in transportation issues for 20 years and a teacher of technical writing for 22 years. So, when asked to write a series of how-to articles on technical writing for transportation professionals, I knew right away that my first topic should be Rule #1 for tech writers: **Get to know your readers and their needs.** But then I realized it would be ironic if I didn't practice what I preach. So I asked a couple of experienced civil engineers who are good writers what they see as the biggest writing problems among their colleagues. The one thing both of them mentioned was "not writing for the reader." That settled it!

### The School Writing Trap

The problem of not writing for the reader sneaks up on you during your school years. For each high school and college assignment, it was obvious that your audience was one person—your teacher or professor. In most cases, this was someone you knew pretty well—someone with whom you had a face-to-face relationship. But now that you're in business or government, you are in a totally different situation. Though you often address a business document to just one person, everything from a major proposal to a quick e-mail is read by more than one person. Furthermore, readers other than the one addressed are often crucially important to your success. For example, an RFP may tell you to direct your proposal to one person, but in most cases it will be several other people who actually decide who gets the project. And yet, if you don't stop to think carefully about who these important readers are, there's a strong tendency to act as though you were still in college writing for the single, obvious audience. I call this the School Writing Trap.

### Map your audiences

For most work-related documents, you know either the names—or at least the job descriptions—of your readers. So, to avoid the School Writing Trap, get into the habit

of listing your audiences as the first step in writing every business document. Actually, the best way is to map your audiences. For example, let's say you're a county engineer writing a proposal for a new highway department building. Your audience map might look like the example above.

By taking a minute to create this map, you forcefully remind yourself that your audience is more numerous and more complex than the five county commissioners. And as soon as you see this reality, you will undoubtedly begin thinking about how

Sample Audience Map



*You only get to write the document once, but you have to communicate to all these different people simultaneously.*

different these people are from each other. This is what makes writing at work so hard! You only get to write the document once, but you have to communicate to all these different people simultaneously. Just the fact that you take one minute to map out your audiences will serve you well. You will begin to strategize about important aspects of writing such as order of presentation, tone of voice, and degree of detail.

### Categorize your audiences

The next step in getting to know your readers is to categorize them. At the most fundamental level, readers fall into three categories:

- Primary audiences: Those who make decisions based on your document.
- Secondary audiences: Those who are affected by the decisions of the primary audiences.
- Intermediary audiences: Those who merely pass your document on to someone else.

### Primary audiences

By definition, primary audiences are the people who have the power to decide how to respond to your document. This gets at a fundamental truth about technical writing, which is that the purpose of

every document is to motivate someone to do something. (The next article in this series will focus in more detail on defining your purpose.) For the document described above—the proposal for a new county highway building—certainly the county board members are primary audiences. But what about their spouses? If they read and discuss the proposal with the commissioners, they become “secret” primary audience members because they will influence the board members’ action—or inaction.

Let's also look at a second example. Say you're that same county highway engineer, but now you're writing a procedure for the road maintenance workers who report to you. For this document, those workers are the primary audience. The decision they will make is whether or not to follow your procedure. My point here is that you should not assume that “decision maker” always means a higher-up person. Your primary audience can be anyone; it depends on the type of document you're writing.

### Secondary audiences

Secondary audiences are those readers who are not in the “driver's seat.” In other words, they don't get to make a decision based on what you have written, the way primary audiences do. Instead, secondary audiences are directly affected by the decisions made by primary audience members. So, in the first example above (proposal for a new facility), if the county board gives you the “thumbs up” response, the consulting architect is one of several people who will be directly affected by the board's decision. In the second example (work procedure), if the road maintenance workers don't understand or don't agree with your procedure, their boss (the maintenance supervisor) is directly

affected. In fact, in this second example, the maintenance supervisor is probably both a primary and a secondary audience. In real life, everything is complicated!

For each work-related document that you write, you have both primary and secondary audiences—and it's very much to your advantage if you identify them and think about these important differences before you begin writing.

## Intermediary audiences

“Intermediary” is a fancy word for a “pass-through” person. I'm sure you've encountered this many times: You address a document to someone—say a boss—but you know the boss is only going to look at your document for a minute and then forward it to someone else with a Post-it that says, “Jane, please take care of this.” If all the boss does is send the document down the org chart to Jane, then you're really writing to her. But documents can also be passed up the org chart. For example, you may address a document to an administrative assistant, knowing full well that he or she will only look at your document for a moment—and then put it in the boss's in-basket. You'll want to identify any intermediary audiences for a given document—so you can disregard them. This is a good thing; it's complicated enough to write to your primary and secondary audiences!

It will take you no more than a minute to categorize your audiences into these three important categories—but it's very much worth your while.

## Analyze your audiences

The third and last part of getting to know your readers is to analyze them. After mapping and categorizing, pick out the most important audience members and, for each one, answer these questions, which I have adapted from the book, *Persuasive Business Writing* by Mary Cross:

### Personal factors

- Job title, department, responsibilities?
- Length of time with the organization?
- Educational background?
- Age and gender?
- Politics, attitudes?
- Knowledge factors?
- How well does the reader know you?
- What does the reader already know about the subject?
- What else does the reader need to know?

### Time factors

- When will the reader read this message?
- How much time will the reader spend on it?
- Is there a deadline by which the reader must act?

### Organizational factors

- Where is this reader on the org chart?
- Where is most of the reader's work done? (at a desk? in the field?)
- Who will this reader confer with before acting?

### Attitudinal factors

- How interested is the reader in the arrival of this message?

- How will the reader feel about it? (good news? bad news?)
- How will the reader's job be affected by this message?

## Small investment—big payoff

Reading this article may have taken you 15 minutes. But doing what I have recommended will take you no more than five minutes, once you've tried it a few times. And you probably don't need to write down any of it; just do it in your head. Five minutes is a small investment of your time, but it will pay off mightily in the quality of your business writing. When you have mapped, categorized, and analyzed your audiences, you automatically will have developed a sophisticated strategy that will serve as the foundation for each document. As a result, you're likely to actually convince people to do what you want them to do!

I'd love to hear from you about how it worked. 


Richard Kronick is a freelance technical writer and writing trainer specializing in transportation, civil engineering, and architecture. He has presented more than 1,000 business writing and technical writing seminars around the world. He can be reached at [www.richardkronick.com](http://www.richardkronick.com).

## Maximum Bang, from Page 5

agement Advisory Board. The board is made up of subcommittees that deal with economics, local government, and transportation entities. The committees meet annually to discuss new developments that could have an impact on county and township asset management plans. For example, the economic committee might present plans for a large new retail business along a road that normally does not receive a high volume of traffic. Using such information, the road commission and townships can adjust their asset management plans to accommodate new requirements efficiently and effectively.

## Looking forward

It's been almost five years since the RCRC first adopted asset management, and O'Rourke is optimistic about meeting his long-term goal of 70% good roads. “Our 2009 data shows that 60 percent of our roads are rated as low defect [PASER = 10–6]; in 2006, that figure was about 50 percent,” O'Rourke said. “In the next year or so we expect to exceed our goal on the local road system and primary roads in Roscommon County to meet the 70% goal, but without additional funding, much of the remaining 30% of primaries will be structurally deficient.”

O'Rourke views RCRC's asset management program as a complete success, but he admits it has not been easy. “I understand why everyone has not embraced asset management,” he said. “Educating people and changing the way things are done requires a huge amount of effort at all levels, but the payoff in the condition of your road system is well worth it.” 

## Additional Resources on the Web

Roscommon County Road Commission  
[www.roscommoncrc.com](http://www.roscommoncrc.com)

Michigan Transportation Asset Management Council  
[www.michigan.gov/tamc](http://www.michigan.gov/tamc)

Asset Management Guide  
[www.roadsoft.org/tamc-links/amguide](http://www.roadsoft.org/tamc-links/amguide)

RoadSoft® Roadway Asset Management Software  
[www.RoadSoft.org](http://www.RoadSoft.org)

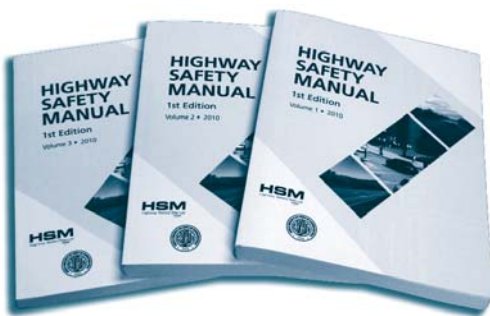
For direct links to these resources and more, go to:  
[www.MichiganLTAP.org/pubs/Bridge](http://www.MichiganLTAP.org/pubs/Bridge)



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The Highway Safety Manual (HSM) was developed to help reduce the frequency and severity of crashes on American roadways by providing tools for considering safety in the project development process. The HSM assists practitioners in selecting countermeasures and prioritizing projects, comparing alternatives, and quantifying and predicting the safety performance of roadway elements considered in planning, design, construction, maintenance, and operation. The three-volume HSM features a synthesis of validated highway research, procedures for including safety in project decisions, and analytical tools for predicting impact on road safety.

For more info:  
[www.highwaysafetymanual.org](http://www.highwaysafetymanual.org)

