Developing a Local Roads Website Compendium of Best Practices

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16. Abstract The compendium serves as an internet clearinghouse for selected local road issues important to local transportation stakeholders. The compendium allows local officials to quickly access existing manuals, reports, ordinances, policies, articles, best practices, and projects pertaining to local roadway issues. Having full access to local roads related resources is particularly important. Currently, valuable local roads information is scattered around the Internet accessible from a variety of locations and search engines, some more visible than others. This compendium consolidates available information and efficiently maintains it. It provides current and applicable content for a variety of transportation officials' needs in a user-friendly format. In the long run, the compendium strives to encourage an online community of local roads professionals to be actively involved generating and maintaining the content that comprises it. For the purpose of protecting the quality of the website, the levels of participation are informed by membership levels tied to specified permission levels.		

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List of Abbreviations

APWA	American Public Works Association
CFIRE	National Center for Freight and Infrastructure Research and Education
CMS	Content Management System
DoIT	University of Wisconsin–Madison, Department of Information Technology
DOT	Department of Transportation
DPW	Department of Public Works
FHWA	Federal Highway Administration
LAMP	Linux/Apache MySQL PHP
LRSC	Local Roads and Streets Council
LTAP	Local Technical Assistance Program
RITA	Research and Innovative Technology Administration
TAM	Transportation Asset Management
TDA	Transportation Development Agency
TIC	Transportation Information Center
UW-Madison	University of Wisconsin–Madison
WCHA	Wisconsin County Highway Association
WiDNR	Wisconsin Department of Natural Resources
WisDOT	Wisconsin Department of Transportation
WISLR	Wisconsin Information Systems for Local Roads
WisTrans	Wisconsin Transportation Center

Executive Summary

The Local Roads Compendium serves as an Internet clearinghouse for selected local roads issues important to the interests of local transportation stakeholders. The compendium allows local officials to quickly access existing manuals, reports, ordinances, policies, articles, best practices, and projects pertaining to local roadway issues. Currently, valuable information is scattered around the Internet accessible from a variety of locations and search engines, some more visible than others. This compendium consolidates and efficiently maintains available information and provides current and applicable content to meet the needs of local transportation officials.

The compendium strives to present information to a membership-based online community of local roads professionals. As a result, the compendium encourages active involvement of its members in order to generate and maintain the content. The compendium is search-engine-friendly for easy navigation of its large database. Content represents what is currently important to local roads management and is submitted, rated, and commented upon by members of the site.

The website's core content consists of:

- *Resources*. This section contains the majority of the website's content. It contains information in a few different formats, provides links to outside sources, and provides contact information for experts who can help answer related questions. Under the *Resources* heading, content has been divided into *Publications*, *Design Tools*, *Policies and Ordinances*, *Experts*, and *Videos*.

- *Forum*. This section facilitates dynamic discussion among members on a variety of local roads topics.

- *Training and Events*. This section displays all training and events in local roads management in the Wisconsin area.

- *News*. This section displays recent local roads related news or updates.

1. Introduction

One of the core missions of the Local Roads and Streets Council (LRSC) is to improve the communication and partnership between local associations and the Wisconsin Department of Transportation (WisDOT). This mission is important because the LRSC serves as a member on the advisory committee to the WisDOT Secretary on issues affecting the local road network in Wisconsin. To enhance communication and partnership between these parties the LRSC has expressed interest in establishing an online compendium of best practices covering aspects of local transportation ranging from ongoing construction and maintenance programs to freight, asset management, and financing.

The Local Roads Compendium serves as an Internet clearinghouse for selected local road issues important to the interests of local transportation stakeholders. The compendium allows local officials to quickly access existing manuals, reports, ordinances, policies, articles, best practices, and projects pertaining to local roadway issues. Having full access to local roads related resources is particularly important. Currently, valuable information is scattered around the Internet accessible from a variety of locations and search engines, some more visible than others. This compendium consolidates and efficiently maintains available information and provides current and applicable content to meet the needs of local transportation officials.

This report documents the development of the compendium and serves as a resource for future enhancements to the compendium. The report includes the following sections:

1. *Introduction.* This section provides an overview of the compendium's purpose, target audience, user roles, and website development methodology.
2. *Functional Requirements.* This section explains findings from website reviews, associated literature, and interviews and documents the functional specification of the compendium website.
3. *System Architecture.* This section discusses the Drupal Content Management System (CMS) and the system architecture employed to build the compendium website.
4. *Hosting and Maintenance Plan.* This section describes the hosting and maintenance of the compendium website at the University of Wisconsin–Madison.

1.1. Website Goals

The research team, in collaboration with the LRSC, set goals for the website at the project outset.

> *This compendium website will be an accessible resource for Wisconsin's local and state agencies to help them improve key aspects of managing local roads.*

Centralizing information into a well organized, "one-stop shop" information portal benefits everyone involved in the local transportation decision-making processes. The compendium effort saves agencies valuable time and allows researchers, policy-makers, and agency officials quick access to an abundance of applicable information that was previously documented but difficult to obtain. This consolidation results in reduced time spent on searches and targets Wisconsin-specific information. The compendium also increases awareness of research and projects undertaken by a variety of transportation agencies. Ultimately, the compendium may foster relationships and better communication between local agencies, increasing efficiency and productivity throughout the field.

The LRSC is committed to continuing its efforts that support the preservation, maintenance, and improvement of existing local roads by identifying examples of best practices, policies, and processes. Providing this resource—the compendium and the tools that enable and promote communication between those concerned with local roads—to the state is essential to these efforts.

1.2. Target Audience

The target audiences for the compendium include the following types of users:

- City engineers, street superintendents, directors of public works or any other local officials in the state of Wisconsin who are responsible for the management of local roads.
- University researchers and engineering consultants who work in Wisconsin local roads management.
- Federal and state DOT practitioners who are interested in addressing issues on Wisconsin local roads.
- Members of the general public who are interested in learning more about local roads management in Wisconsin.

1.3. Website Development Methodology

The compendium will be developed with a priority placed on data content and functionality more than its visual appearance. This prioritization has been made so that the expected functionality of the website is in place and so that it meets the website goals as discussed in Section 1.1. Table 1 illustrates the stages of the compendium's development.

Table 1. The Compendium Website Development Plan

Development Stage	Detailed Actions
Stage 1 Collect and expand initial ideas.	• Review relevant existing websites. • Interview and survey potential users. • Identify initial topics for resources. • Design content structure and oversee website functionality.
Stage 2 Design preliminary structure.	• Create content outline. • Construct system architecture and interface design. • Design user interaction flow and navigation. • Soft launch and feedback. • Populate data content.
Stage 3 Design enhancement and documentation.	• Follow up on provided feedback and troubleshooting. • Develop promotional material. • Compile development documentation and maintenance instructions. • Populate data content.
Stage 4 Final implementation and website launch.	• Finalize all functions. • Continue pre-launch data population. • Develop maintenance policy • Hard launch.

2. Functional Requirements

2.1. Existing Online Transportation Communities

The project team conducted a detailed review of eleven transportation-related websites to learn about existing online transportation resources and the way that they perform. These websites were selected based on the understanding that they have similar goals to those of the compendium. They all provide assistance to transportation professionals in order to help them perform their tasks. Researchers examined the websites of the following organizations:

- American Public Works Association (APWA)
- Federal Highway Administration (FHWA)-Operations Knowledge Communities
- Midwest Transportation Knowledge Network
- Minnesota Local Technical Assistance Program (LTAP)
- National Local Technical Assistance Program (LTAP)
- Research and Innovative Technology Administration (RITA) National Transportation Library
- Transportation Asset Management (TAM) Today
- Transportation Development Association of Wisconsin
- Transportation Information Center (TIC), University of Wisconsin–Madison
- Transportation Research Board
- Wisconsin Transportation Builders Association

2.1.1. Review Focus

The project team focused on four items during the review stage: navigation systems, document formats, levels of participation, and breadth of resources.

- *Navigation Systems.* Navigation systems are important because the target audience may not necessarily be comfortable with operating a computer or an Internet–based tool. Therefore, it has been important to design a navigation system that is easy and intuitive to compendium users.
- *Document Format.* Electronic documents are presented in a number of different formats. Understanding what is typically available and most frequently accessed is helpful when developing the system architecture for the compendium.
- *Participation Levels.* One of the goals in the development of the compendium is to facilitate the active interaction of local officials so that they can discuss local roads issues. A system that does not effectively facilitate active user engagement may need to be re-examined in order to determine any barriers to this engagement. Providing timely resources that are important to users is an important factor in increasing the level of participation.
- *Breadth of Resources.* Finding a breadth of resources that reflect current trends or issues commonly faced by local officials is crucial. Providing information across multiple areas of interest also makes the website valuable for generalists.

2.1.2. Review Findings

The project team learned a number of general lessons from this review:

- Most information available on the reviewed websites was listed on a page. In other words, information was not designed so that visitors could find it easily. Rather, visitors need to scan the page in order to find particular information. The absence of database searching mechanisms in most of these websites requires visitors to spend more time finding the

information they are looking for. This issue is compounded for local officials who are unfamiliar using computers in the completion of daily tasks.

- Information on these websites is delivered in six different formats: PDF, MS Word documents, MS Excel spreadsheets, presentations, traditional web pages, MP3 audio podcasts, and streaming videos. Regarding these last two formats, some have been integrated into the website while others will need to be downloaded to a local computer before being viewed or listened to.
- Some sites provide a discussion feature (TAM Today and FHWA). However, it was found that many of the member-generated posts have low response rates and that the majority of them have zero responses. This implies that if the discussion feature is not well maintained it may be used ineffectively. In some cases, the system setup does not encourage member participation; in others, the target audience may not have been well defined by the website's creators. Both of these cases cause a disconnection between the materials provided and the members or general visitors.
- Most transportation-focused websites have been designed for planners, engineers, and managers at the policy- or decision-making level. Topic areas covered by these websites are therefore targeted for these groups. As a result, adopting the types of topic areas presented in these websites may not be ideal for this compendium as we are targeting local officials, who usually do not function at the policy- or decision-making level. The interviews discussed in Section 2.2 were used to mitigate this disconnection and to build up the compendium's resources.

Some of the features highlighted in this review are:

- *On-site video streaming* (Minnesota LTAP). Various kinds of transportation-related videos can easily be found on YouTube. However, having an outside source may create difficulties if they are removed. This feature allows a video to be kept internally on our own server.
- *Find/add trainer* (National LTAP). This feature is unique, found only on this website. Information about trainers, or experts, will provide options to members in directing their questions or problems.
  In addition to this trainer information, there is a feature that allows members to share their own information. In this example the feature allows members or visitors the ability to find a trainer. Secondly the National LTAP provides an additional feature where a trainer can also be added into the database. There are two points we can learn from this feature:
    o The data population system was designed to allow visitor participation. This system will reduce some of the database maintenance tasks by allowing users the ability to update and revise this area of the database.
    o The visitor participation in this part of the database maintenance will also help ensure the website is meeting audience's needs by being a direct result of their contributions.
- *Design Tools* (Minnesota LTAP). Most local officials responsible for local roads maintenance will work at the level of performing the daily maintenance tasks. Information about ready-for-use resources, as available in this section, will effectively reduce the time needed to complete a task.
- *Search Online Database* (National LTAP). When a database contains a wide variety of information, a search mechanism will help visitors find what they are looking for and reduce the time needed to find information.
- *Video borrowing* (Minnesota LTAP). VHS tape may not be the most used resource in the era of digital information. However, some valuable information that was created in the past has not yet been transferred to digital format. This feature allows for the availability of information resources created in the past despite their outdated format.
- *Events* (APWA). A list of a variety of events will help visitors keep informed of upcoming business-related activities and their locations.

2.2. Interview Summary

Interviews were conducted with a selected number of local officials in Wisconsin to determine how they would use an online resource tool like the compendium and so that the development of the compendium would meet their needs. The following is the summary of the interviews.

Local roads information sought by local officials typically falls into technical and administrative categories. In the technical category, there is pavement maintenance and restoration, traffic control, and manual and standard requirements. In the administrative category, there is contracting, ordinances, staffing and production levels, and budgeting. Local roads officials generally get this information by contacting peers or colleagues in the APWA, the League of Municipalities, the Department of Public Works, Wisconsin County Highway Association (WCHA) and TIC, as well as highway commissioners and engineering consultants. While the Wisconsin Information Systems for Local Roads (WISLR), Transportation Development Association (TDA), WisDOT, WiDNR, and TIC websites were indicated as sources for practical information, familiarity with the information flow within these websites is still an issue. Respondents also indicated a lack of confidence in using unknown sources that have been taken from the Internet. Interviewees also indentified a number of printed publications: *Better Roads*, *Public Works*, and *American City and County*. However, these publications are considered to be too broad and for larger communities. Some interviews indicate that *Municipality* magazine from the League of Wisconsin Municipalities and the *Crossroads* newsletter from the TIC are publications that are more practical and relevant to Wisconsin municipal officials.

Interviewees did not view the availability of current local roads information on local roads websites with favor. They indicated that too much information was available and the absence of a systematic organization led to difficulties retrieving the desired information. Lack of collaboration among municipalities and the absence of a clearinghouse were also mentioned as barriers to obtaining information. Networking in formal gatherings at local or state level associations is thought to be useful for filling these gaps. Sending staff members for formal training related to local roads is also another way for getting more updated information; however, budgeting then becomes an issue.

The interviews indicated that the website has to be synchronized with the target audience so that information can be directed specifically to that group. The variety of levels of knowledge and user needs should also be accommodated in the website with the organization of information. To ensure this kind of quality, an early test, prior to launching, should be done to fill the gap between what is conceptualized by the web-developer and actual end-user utilization.

The questions used in these interviews are listed in Appendix A.

2.3. Key Functional Specifications

Based on interviews and discussions, the research team identified key functional specifications for the compendium. These requirements are subject to change in response to user needs once the compendium is launched.

- The compendium strives to present to an online community for local roads professionals. As a result, the compendium should have a feature that allows active involvement of its visitors so that they can generate and maintain the content. For the purpose of protecting the quality of the website, the levels of participation should be informed by membership levels tied to specified permission levels.
- The compendium should be search-engine-friendly for easy navigation. Finding what one needs with the most ease is especially important considering the large size of the database.
- Content should be representative of what is currently important to local roads management. In order to achieve this goal, content will be submitted, rated, and commented on by visitors to the site and reviewed by impartial parties.

- o *Submission.* Content submission will be fully accessible to all users. In order to maintain certain standards, any new content should pass an approval stage administered by a content manager.
  - o *Rating.* Each visitor will be able to assess how helpful or useful particular content is to him or her.
  - o *Comment.* Addition to rating, this feature will be available for a detailed description of and discussion about individual content within the compendium.
- The website's core content will be:
  - o *Resources.* This section contains the majority of the website's content. It contains information in a few different formats, provides links to outside sources, and provides information on experts who can help answer some questions.
  - o *Forum.* This section facilitates dynamic discussion among members on various kinds of local roads topics.
  - o *Training and Events.* This section displays all training and events in local roads management in the Wisconsin area.
  - o *News.* This section displays recent local roads related news or updates.
- For the purpose of database organization, content is categorized as follows:
  - o *Publications.* Articles, websites, reports, pamphlets, and brochures.
  - o *Design Tools.* Technical documents ready for use for local officials in the field. For example this type of document may include rating sheets or design forms.
  - o *Policies and Ordinances.* Municipal ordinances and policies concerning local roads management.
  - o *Experts.* Information needed to help visitors get in contact with local experts.
  - o *Videos.* Videos that concern local roads management.
- For the purpose of database organization, content is divided into thirty topics (listed below). These topics will be used to organize the content under the *Resources* section as well as the *Forum* section. The topics have been designed without a parent topic in an attempt to be simple and user-friendly.

- Asphalt Pavements
- Bicycles, Pedestrian and Sidewalks
- Biodiversity and Environmental Impacts
- Bridges
- Concrete Pavements
- Drainage
- Education and Training
- Erosion Control
- Freight and Local Roads
- Gravel and Unimproved Roads
- Intelligent Transportation Systems
- Intersections and Interchanges
- Low Volume Roads
- Management, Budget and Policy
- Parking
- Pavement Maintenance
- Road Construction and Inspection
- Road Planning and Design
- Roadside Maintenance
- Roundabouts
- Soils and Geosynthetics
- Street Lighting
- Traffic Engineering and Operations
- Traffic Safety
- Traffic Signs and Pavement Markings
- Utilities and Permits
- Vehicles and Equipment
- Winter Road Maintenance
- Work Zones
- Worker Safety

To create an initial data set for the *Resources* section, the research team integrated all of the issues of *Crossroads*, the newsletter the Transportation Information Center, Wisconsin's Local Technical Assistance Program. Additionally, the research team performed Internet searches for some of the above topics.

Additional information was prepared for and added to the compendium by Wisconsin DOT professional staff and contractors.

2.4. User Roles

There are two types of users in the target audience: anonymous users and authenticated users. Anonymous users are those who want to learn more about Wisconsin local roads but do not have a login account which gives a user the ability to contribute to discussions, post comments to content, assign rating levels to content, or add new content to the website. Authenticated users have login access to different functions of the website, depending on their authorized user level. The authenticated user will need approval before their username and password are activated. The are four types of authenticated users:

- *Member.* This is the basic membership assigned to any user, which provides the ability to view content, rate content, and comment but requires approval to post content.
- *Content Manager.* Responsible for the maintenance of content standard quality, as well as the accuracy and consistency of keyword assignments.
- *Web Technician.* Responsible for the technical aspects of the website to ensure that it runs smoothly. For example, this user will perform a regular maintenance check, run updates when they become available, update modules and blocks, and troubleshoot technical problems.
- *Administrator.* The omnipotent overseer of the website. This user may be the least active user, but has access to everything. This user will passively oversee how the website functions in all aspects and has the power to override the whole system in an emergency situation.

Table 2. User Permissions Levels and Allowed Actions for Each User Role

User Permission Levels	Anonymous User	Member	Content Manager	Web Technician	Administrator
View full content of the compendium	X	X	X	X	X
Perform content search	X	X	X	X	X
Submit new content		X	X		X
Post and engage discussion in the forum		X	X		X
Provide comments without approval—for both resource content and forum content		X	X		X
Rate content		X	X		X
Contact other members		X	X	X	X
Approve new users and assign user roles			X		X
Review and edit new content			X		X

User Permission Levels	Anonymous User	Member	Content Manager	Web Technician	Administrator
Approve new content			X		X
Update the list of resources: add, delete, or edit the category of resources			X		X
Administer the forum—this includes adding, deleting, or editing the parent topics			X		X
Update Drupal Core				X	X
Update modules and administer blocks				X	X
Update database systems, MySQL, and PHP				X	X
Administer the backup-restore system				X	X
Administer site building and configuration				X	X
Assign member permissions				X	X

3. System Architecture

3.1. Content Management Systems

In response to the key functional specifications indicated above, the implementation of a content management system (CMS) seemed to be the most appropriate. The large amount of content found in the *Resources* section requires a search-engine-friendly website, which is efficiently facilitated by a CMS.

A content management system is a collection of procedures for managing the workflow in a collaborative environment. Battles (2008) outlines some of the major advantages of a CMS, which:

- Accommodates a large number of registered-users who can contribute to the website.
- Allows non-technical users to contribute content without needing any web-development and web-design skills.
- Offers full control of access to the content based on user roles and permission levels.
- Facilitates an easy storage system and retrieval mechanism for the data.
- Houses nearly any type of data—documents, movies, pictures, phone numbers, scientific data, etc.
- Stores the content in a database and separates the website design from the content.

3.2. Drupal

There are a number of common, publicly available content management systems suited to building a website such as the compendium. Of the four well-known, open source content management systems—Drupal, Joomla, Plone, and Wordpress—the project team selected Drupal, which better meets the functional requirements as it is more search engine friendly, it supports extensive content, and it is expandable (CMS Matrix, 2010).

Drupal is highly modular, allowing customization, and yet is highly functional in its basic, core form. Additional functionalities can be enabled from its built-in modules, added from third-party modules, or created from scratch. In this way, websites that do not need particular modules can still run efficiently, while those websites that need more modules can add them as they see necessary. See Appendix B for a list of additional Drupal modules used by the compendium website.

Drupal is also customizable by simply overriding the core without having to modify the code in the core. The Drupal online communities, facilitated by the Drupal Association, have strived to continually improve the software. This makes Drupal highly secure and keeps it updated. Some high-profile sites that utilize Drupal in their website system architecture are the White House, the United Nations, the Discovery Channel, Yahoo, and the Onion.

3.3. System Architecture

The project team has developed a website architecture based on the key functional specifications assessed in Section 2. With the task of building a local roads online community and meeting user needs for local roads information, this website architecture needed to be modifiable. As the compendium continues to be used, reviewed, and refined, it will be possible to make alterations and additions with greater ease in the future.

The compendium system architecture is generally presented with the same content outline to all users. There are however slight differences due to permission levels that will be assigned to the different types of users. The differences will be mostly structured through the display of *blocks*. In Drupal, blocks are used to present information customized for certain classes of users. For example, a block displaying tools for the "latest content submitted" will be available for all

authorized users while a block displaying "unpublished content" will only be available to users with the Content Manager permission level. These customized displays are further explained below.

3.3.1. General Display Layout

The display of the compendium site is generally divided into three regions (Figure 1).

Navigation toolbars
Body content
Customized displays
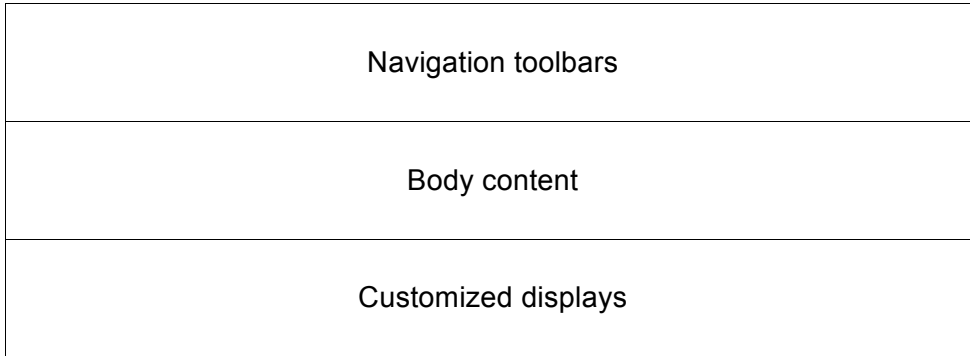
Figure 1. Wireframe drawings for display regions

In the navigation region, there are two levels of navigation toolbars. In Drupal they are called primary links and secondary links.[1] The primary links contain links to pages where the majority of the compendium content will be located. The secondary links contain links to pages that have administrative types of information. The navigation toolbars will remain the same on all of the website's pages.

Below the primary and secondary links, there is a body region where most information will be placed and a sidebar region where an additional toolbar (or supporting information) will be displayed. This part of the page is highly dynamic and the content is different from one page to another.

The customized displays are presented for visitors finding specific information retrieved from information entered in the body content. The customized displays, for example, are latest news articles, upcoming events, recent comments, and new forum topics. The information presented in this region is highly customizable and dynamic. More displays can be added in the future when the need for certain information appears. The region with the customized information will remain the same throughout website pages.

3.3.2. General Content Outline

The content outline illustrates the web pages including links on the navigation toolbar. Each title indicates a page within the website and a link on the navigation toolbar. The bulleted items under each title are items that would be on or linked to from that page.

Home (Figure 2)

- Brief overview about Local Roads Compendium
- Logos and links to UW-Madison, WisDOT, CFIRE, WisTrans, LRSC, and TIC

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1 For the purpose of consistency, we will use some technical terminology as used by Drupal communities. The consistency will be helpful for future maintenance.
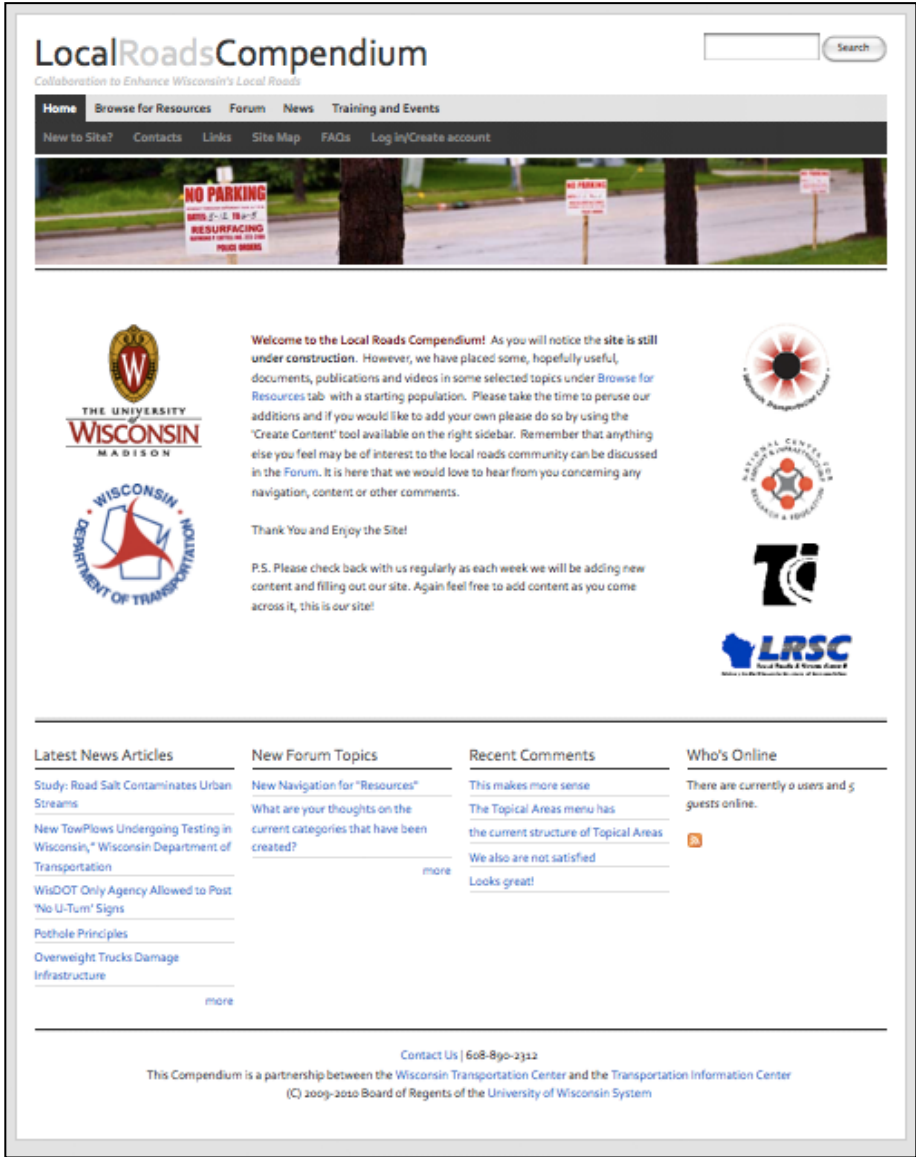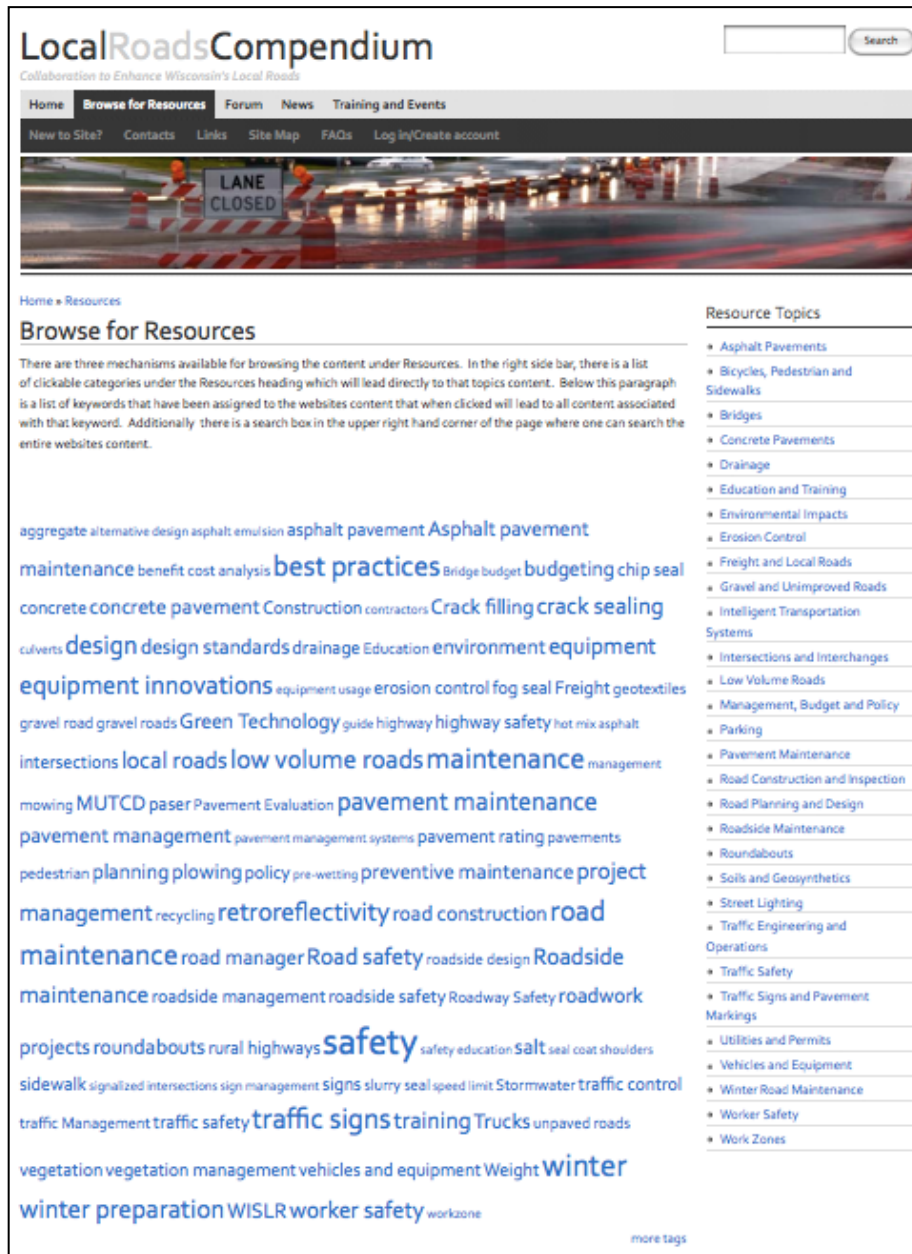
Figure 2. Screen Shot for Anonymous User's *Homepage*

Browse for Resources (homepage, Figure 3)

- List of keywords assigned to content
- All topics under Resources

Figure 3. Screen Shot for the Homepage of *Browse for Resources*

Browse for Resources (content, Figure 4)

- Publications
  - o Top 5 rated publications
  - o Link to more publications
- Design Tools
  - o Top 5 rated design tools
  - o Link to more design tools
- Policies and Ordinances
  - o Top 5 rated policies and ordinances
  - o Link to more policies and ordinances
- Experts
  - o Top 5 rated experts
  - o Link to more experts

- Videos
  - Top 5 rated videos
  - Link to more videos
- Included Keywords in the resource topic
- All topics under Resources
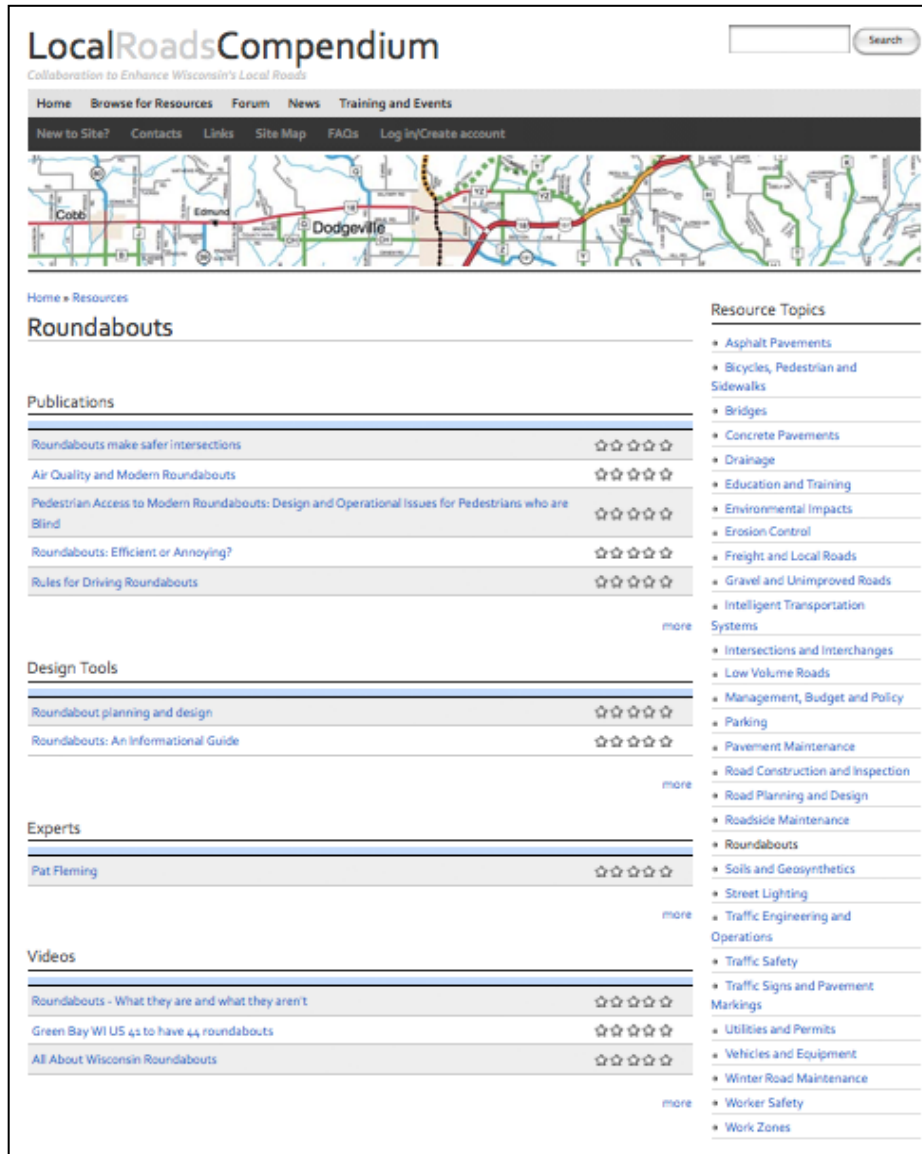
Figure 4. Screen Shot for *Browse for Resources*

Forum

- List of parent topic
  - List of forum topic

News

- List of news articles with in a teaser display

Training and Events

- List of training and events

Secondary Links

New to Site?

- About
- Why Join Us?
- How to Navigate?

Contacts

- Wisconsin Transportation Center
- Transportation Information Center
- Local Roads and Streets Council
- Logos and links to each institution

FAQs

- List of specific questions and answers

Links

- List of major institutions related to this website administratively and substantively
    - Links to individual institutions

Site Map

- Primary Links
- Secondary Links
- Browse for Resources
    - Links to all resource topics
- Forum
    - Links to all forum topics

Log in/Create Account

- Create new account
    - Username
    - Email address
    - Full name
    - Current affiliated information
    - Current job title
    - Interests on local roads issues
    - Anti Spam
- Log in
    - Username
    - Password
- Request new password
    - Username or email address
    - Anti Spam

3.3.3. Display for Authorized Users

The content outline illustrates the website layout including links on the navigation toolbar. The content outline illustrated above will be the same throughout the website to both anonymous and authorized users. Once authorized users are logged in, one or more blocks will appear on the sidebar depending on the role of the user.

The first block that will appear for all authorized users except for *web technician* is the *Create Content* block on the sidebar. This block provides a tool for entering new content. The block shows four links:

- Forum Topic
- News Articles
- Resources
- Training and Events

The second block will appear only for the *content manager*. This block shows a list of new unpublished entries that require review and editing before publication. As indicated before, this process is an attempt to maintain the accuracy of information posted and the consistency of keywords assigned to the content. This block will appear in the sidebar as well.

An administration menu module has been installed and it gives a dropdown menu for most administrative tasks. This module will look like a navigation bar on the very top of the page and it is only available to the *web technician* and *administrator*.

3.3.4. Customized Displays

This region will be the location for blocks customized for the use of pulling specific information from the content. This block was created using a view module. Currently, three blocks have been created:

- Latest news articles
- Recent comments
- New forum topics

Since the purpose of this region is for providing specific information, any blocks can be created depending on the needs of the visitors. There is no rule set for the placing of these blocks as long as they are located in this region. A few examples of some potential blocks are:

- Most commented forum topic
- Most rated content (could be made more specific for individual category such as publications, videos, or others)
- Most visited content

4. Hosting and Maintenance Plan

4.1. Hosting

Three web-hosting platforms are currently available: Windows, Linux/Apache, and Java. Linux/Apache is the platform that works best with Drupal's core because it is open source and supports PHP and MySQL.

The Department of Information Technology (DoIT) at UW-Madison through its Shared Hosting service offers the ability to run a Drupal instance on its LAMP platform via Plesk.[2] DoIT is not the only web hosting institution that offers features compatible with Drupal. The decision to use DoIT web hosting however was made due to administrative concerns, as it is an institution within UW-Madison.

The current service provided by DoIT offers unlimited bandwidth for both web traffic and the publishing of content. This will be important for the Local Roads Compendium as we try to build strong online communities. As the number of users increases and the compendium site offers more content and features, a high bandwidth will be important for maintaining its performance.

Considering the nature of member-generated content, the size of the compendium site will eventually be much larger than it is now. Therefore, the overall size of the website needs to be closely monitored as current service only offers 1 gigabyte (GB) of storage. When the needs are apparent, the file quota can be upgraded to 5 GB.

4.2. Maintenance

4.2.1. Backups

DoIT web hosting maintains nightly backups of the website files and any MySQL databases for disaster recovery purposes. Additionally, an internal backup within Drupal has also been configured using a Drupal module.

4.2.2. System Updates

The Drupal system has been set up for an automatic notification when an update becomes available. Some potential updates will include those for the Drupal core and the modules that have been installed in the system.

4.2.3. Options for Maintenance and Future Enhancements

Current web hosting service will be active for one year from January 2010. After the first year of hosting the site on the DoIT server, three possible options are available for continuing hosting and maintenance of the Local Roads Compendium:

- Continue to host at DoIT
- Host on WisDOT server
- Host using a commercially available hosting service

The decision in how the web hosting is continued should consider the costs and the platform, and the required maintenance tasks offered by potential web hosting providers that vary from one another. Prior research on web hosting providers before making this decision will certainly be needed.

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[2] Plesk is a web-based interface for administering the website.

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Appendix A. Interview Questions

- What sort of information do you tend to look for?
- Where would you go first to find it?
- Are there sites/places/people you go to on a regular basis?
- Do you check any websites regularly for practical information?
- Do you check any publications regularly for practical information?
- How satisfied are you with the quality of information you find readily available?
- Do you network for information (attend meetings/conferences/active in any organization)?
- Do you see any issues/challenges/barriers to improving flow of information on local roads?
- How do others in your organization access information?
- What would benefit them the most?
- Do you have any preference as to the format for presenting information?
- (Video/text/audio/online…..)??
- Your thoughts regarding a potential website for local roads information?
- Who is likely to benefit?
- What would enable people to use it most effectively?
- Is there a website you think could be a useful model for us?
- Any thoughts/comments you would like to add?
- Any questions we didn't think of asking that we should have?

Appendix B. List of Third-Party Modules Installed

Module	Description
Administration Menu	Provides a dropdown menu to most administrative tasks and other common destinations.
Advanced Help	Allow advanced help and documentation.
Backup and Migrate	Backup or migrate the Drupal database quickly and without necessary data.
Calendar	Views plugin to display views containing dates as Calendars.
CAPTCHA	Provides a challenge response to determine whether the user is human.
CKEditor	Enables the usage of CKEditor (WYSIWYG) instead of plain text fields.
Custom Breadcrumbs	Allows administrators to define custom breadcrumb trails for node types.
Date	Defines CCK date/time fields and widgets.
Drupal Tweaks	Provides functionality for development tweaks (show or log backtrace on Drupal errors), PHP settings, quick Drupal operation and quick common operation.
External	Opens links to external sites in new tabs
Fivestar	A simple five-star voting widget for nodes.
Global Redirect	Searches for an alias of the current URL and 301 redirects if found. Stops duplicate content arising when path module is enabled.
Google Analytics	Adds Google Analytics javascript tracking code to all the site's pages.
Menu Breadcrumb	Allows the use the menu the current page belongs to for the breadcrumb.
Nodewords	Allows users to add meta tags, e.g. keywords or description. This module doesn't actually implement any meta tags, but requires other modules to implement them.
Page Title	Enhanced control over the page title (in the <head> tag).
Pathauto	Provides a mechanism for modules to automatically generate aliases for the content they manage.

Module	Description
Poormanscron	Internal scheduler for users without a cron application.
Site Map	Display a site map.
Spamspan	The SpamSpan module obfuscates email addresses to help prevent spambots from collecting them.
Tagadelic	Tagadelic makes weighted tag clouds from taxonomy terms.
Taxonomy Access Control	Provides access control for user roles based on taxonomy categories.
Token	Provides a shared API for replacement of textual placeholders with actual data.
Usernews	Allows each member to individually create and publish news articles.
Video	Allows users to submit videos.
Views	Create customized lists and queries from the content database.
Votingapi	Provides a shared voting API for other modules.
Webform	Adds a webform node type for questionnaires, contact or request/register forms, surveys, polls or a front end to issues tracking systems.