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Final Report

Project Management Software: Practical Applications for Improved Project Management

Research

MINNESOTA DEPARTMENT OF TRANSPORTATION

LRRB
LOCAL
ROAD RESEARCH
BOARD
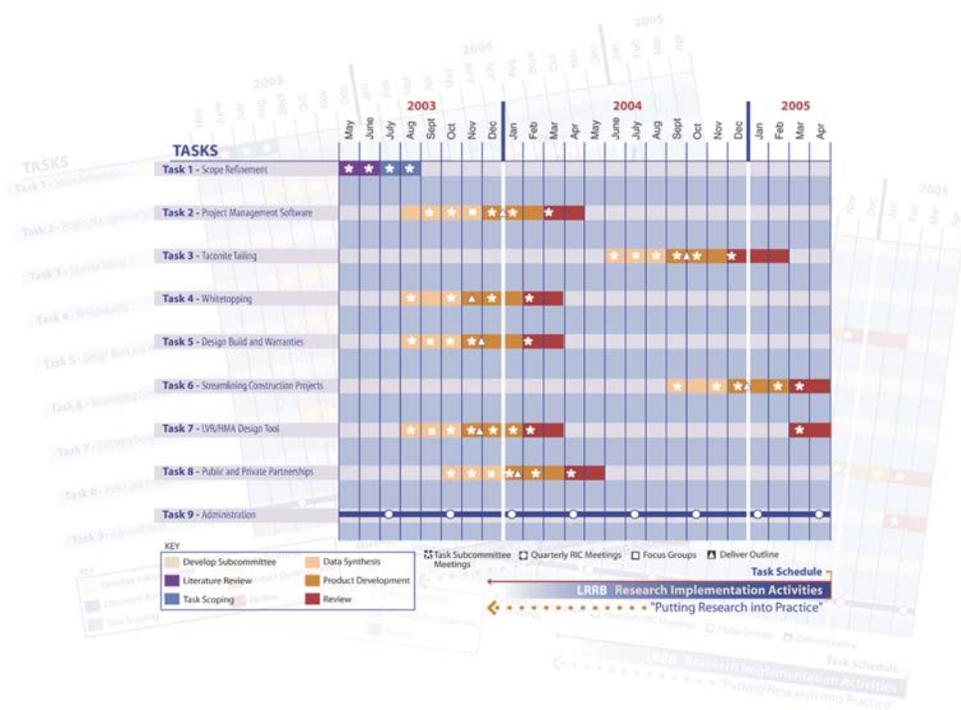
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16. Abstract (Limit: 200 words)

Project management software is designed to make the job of a project manager easier and more efficient, providing applications to aid in planning, to manage project costs, and to track activities and monitor schedules. As more and more public works departments face the realities of increasing workloads and shrinking resources, finding technology applications that allow productivity gains becomes ever more important. The use of project management software as a tool for managing and organizing work has grown and continues to grow at a rapid pace in all industries. This paper reviews the ways in which it is currently being used in the course of transportation project delivery in Minnesota, and provides a tool to assist in choosing the right application to meet a local city or county's needs.

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Project Management Software:

Practical Applications for Improved Project Management

FINAL REPORT

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INTRODUCTION

Project management software is designed to make the job of a project manager easier and more efficient, providing applications to aid in planning, to manage project costs, and to track activities and monitor schedules. As more and more public works departments face the realities of increasing workloads and shrinking resources, finding technology applications that allow productivity gains becomes ever more important. The use of project management software as a tool for managing and organizing work has grown and continues to grow at a rapid pace in all industries. This paper reviews the ways in which it is currently being used in the course of transportation project delivery in Minnesota, and provides a tool to assist in choosing the right application to meet a local city or county's needs.

TASK BACKGROUND AND PURPOSE

The Local Road Research Board (LRRB) undertook this research implementation study to develop an understanding of how project management software was (or was not) currently being used by county and city engineers in Minnesota, and to provide a tool summarizing an appropriate range of existing, commercially-available, project management tools. It is important to note that the scope of this investigation was intended to encompass all phases of transportation project development, from initial planning activities through final construction. Many products are available to manage the process of construction; a tool that has broader applications for overall project management, in addition to construction management, was the focus of this investigation.

This task was first proposed to the LRRB as a means of defining how technology applications could help city and county engineers better manage their projects. The observation was made that, although technology was being used in many aspects of public works projects, there was little use of broad project management technology applications to attempt to manage multiple ongoing projects, to archive project materials so they could be readily accessed when needed, and to comprehensively track project activities. Although there was some general understanding that a few cities and counties may be using project management software, there was the belief that a more strategic summarization and evaluation of what off-the-shelf tools did exist to manage public works projects was needed at this time.

The resulting documentation should be understood as a review of project management software tools; not a recommendation for any one product. As discovered during the course of this task, project management software applications are designed to meet certain niche needs and therefore must be evaluated on the course of their own merits. The decision to purchase and use one product over another must be made based on the individual users' or agencies' requirements.

PROJECT MANAGEMENT SOFTWARE SURVEY PROCESS

In order to determine current usage and desired functionality of project management software in Minnesota, two data sources were relied upon. The first tool was a survey developed and administered by the Technical Advisory Panel (TAP) overseeing this research implementation task, and the second tool was a survey conducted by the University of Minnesota's Construction Management Program.

CITY AND COUNTY ENGINEER'S SURVEY

One of the first activities of this research implementation task was to survey Minnesota city and county engineers, querying them regarding their use of project management software, in addition to the desired functions of such software. An important distinction to make for respondents was to discuss project management software, encompassing all phases of project development, not just construction management software. The survey focused on determining whether respondents currently used any project management software, and whether this software was commercially available. In addition, a question was asked regarding the respondents' opinion as to the most important functions software should have to aid their project management.

The survey was administered via e-mail, with a total of 43 responses submitted by the response deadline. Results of the survey are listed below each question. The percentage is calculated on the total number of respondents that answered a particular question (i.e., if 43 people answered question number one, the percentage of "yes" answers was calculated by dividing the number of "yes" votes by 43). Significant findings are summarized below, with the full survey summary included in the appendix to this report.

- Few city or county engineers currently use project management software.

    Yes = 5 responses (12 percent)
    No   = 38 responses (88 percent)

    43 people responded to this question

- Of those respondents using project management's software, most use commercially available products.

    Yes = 4 responses
    No = 1 response

    5 people responded to this question.

- Types of commercially available software used were listed as the following:

    – Microsoft Project (three responses)
    – FastTrack Schedule Plus v7.03 (AEC Software, Inc.)

- Important project management software functions were identified by the survey respondents as follows.

  – Ease of use   (21 responses)
  – Critical path reporting   (20 responses)
  – Documentation/Reporting   (10 responses)
  – Networkability/Portability   (9 response)
  – Scheduling   (5 responses)

CONSTRUCTION FINANCIAL MANAGEMENT ASSOCIATION SURVEY

The Construction Financial Management Association, with support from the University of Minnesota's Construction Management Program, conducted a survey of software products used by general contractors as part of construction management. Although focused on a more limited spectrum of project development, namely the construction phase, this survey was examined as part of the LRRB's investigation of potential software for improved project management as some of the tools used may be applicable, with modifications, for other phases of project development/management.

The survey was administered to general contractors, highway and heavy (H&H) contractors, and specialty contractors. A full summary is included in the appendix to this report, with noteworthy findings summarized below.

- Almost a third of respondents (32 percent) indicated they did not use any project management software.

- Of those that were using software, two different Primavera® packages, Primavera® Expedition® (18 percent) and Primavera® Enterprise® (6 percent) were the most commonly used. The second most used software was Prolog® Manager (Meridian Project Systems) used by 9 percent of respondents. (A total of 61 different project management software packages were used by respondents.)

  General Contractors: General contractors were more likely than the overall group to use project management software, with 25 percent using Primavera® Expedition® and 17 percent using Prolog® Manager.

  H&H Contractors: Overall, H&H contractors were not likely to use project management software (33 percent). Of those that do, Primavera® Expedition® is the most commonly used package (38 percent).

  Specialty Contractors: Almost half of specialty contractors responding to the survey do not use any project management software (47 percent). Of those that do, Primavera® Expedition® and Primavera® Enterprise® are the most commonly used.

SOFTWARE EVALUATION PROCESS

SELECTION OF SOFTWARE APPLICATIONS

After completing the survey process, the next step in this research implementation task was to develop a process to summarize an appropriate range of existing, off-the-shelf, project management applications. The outcome would be a tool to assist local jurisdictions in choosing the appropriate application to suit their needs. Parameters established to guide this process included 1) that the application be appropriate for project management, not just construction management and, 2) that the application be an "off-the-shelf" product widely available.

The survey of Minnesota city and county engineers was used as a starting point in the identification of software applications. However, since only two off-the-shelf products were identified in this process, the identification of software was widened to include input from the TAP, as well as input from instructors from the University of Minnesota's Construction Management Program.

A total of six applications meeting the evaluation parameters resulted from this process included the following:

Constructware ASP
Constructware is an internet-based program which allows online communications between all parties involved in a project. It is geared most directly towards contractors, and allows streamlining of project design, bid solicitation, project costing, etc. Since the program is internet-based, there is no versioning, no data backup, and upgrades are installed automatically by Constructware. It is estimated that internet-based solutions cost up to 60-80 percent less than client-server applications.

FastTrack Schedule 8
This program allows users who do not know complex project management concepts to easily schedule projects. This program's strength is its advanced graphical abilities which can be used to create clear project timelines and charts. The software includes templates and over 50 example schedules. FastTrack is available in a standalone version, which resides on the user's computer, or a concurrent user version, which is hosted on a server. FastTrack can interact with Microsoft Project, and has cross-platform compatibility between Mac OS and Palm OS. FastTrack Schedule can be installed as a stand alone application or as a client-server application.

Meridian Prolog® Manager
This program is a client-server based program, which has the option to be integrated with the Microsoft SQL Server database. Prolog® Manager Software automates aspects of the construction lifecycle. Multiple projects can be managed in one database. Further, the agency using the software can collaborate with other agencies and companies via Prolog® WebSite, an associated internet application. Prolog® Manager can be integrated with Microsoft Project, SureTrak® project manager, Primavera® Project Planner, and other applications. Meridian also offers an online project management application called ProjectTalk.com, which is powered by its Prolog® application and available via a monthly subscription.

Microsoft Project
Microsoft Project has two levels of use. The stand alone version, Microsoft Project Standard, does not allow collaboration and is best for small organization with limited financial resources. It allows project managers to assign tasks and create schedules. Microsoft Project Professional, Project Server, and Web Access allow collaboration between users, and work together to form a comprehensive project management package. The Project Manager uses Project Professional to assign tasks, request and receive status reports, perform "what-if" analysis and assign resources to projects. After this information is uploaded onto the company/organizations server by using Microsoft Project Server, team members and stakeholders can access the information. In order to access Project Server, users must have Microsoft Web Access installed on their computers. Project Server can be integrated into Microsoft Access to send tasks and manage calendars.

Primavera® Expedition®
Expedition® is a browser based application which can be used within a company's network or over the internet. This software is geared towards the architecture, engineering, and construction industries. Companies using Expedition® host the software on their website, and others can access project information via their web browser. The software allows multiple projects to be compared on the same screen.

Primavera® SureTrak®
This software is geared towards the management of small- to medium-sized projects. The software is client-based, but includes a web-publishing wizard. Project information, screen captures, and activities can be sent to team members, and team members can automatically update information via Primavera® Post Office. Data can be exchanged with Primavera® Project Planner and Microsoft Project. The software was last updated in 2000.

DEVELOPMENT OF REVIEW TOOLS

Developing an appropriate tool allowing for a review of the identified applications by TAP members was a crucial part of the research implementation task. This process took as its key component results from the survey of Minnesota city and county engineers, specifically input regarding desired functionality of project management software. Using the top five responses (as re-stated below) from the survey regarding desired functionality, the TAP then developed a series of queries that would allow these general attributes to be quantified and reported as part of an evaluation. In addition to the top five responses, other categories were added, based on input from the TAP as well as the survey results (#6-9 as follows).

1. Ease of use
2. Critical path reporting
3. Documentation/Reporting
4. Networkability/Portability
5. Scheduling
6. Project Communication
7. Flexibility
8. Other
9. General Comments

The evaluation tool that resulted from this process is included in Appendix C of this report.

After development of the evaluation tool, it became apparent that additional information would be needed in order to make this a tool rich enough for a thorough investigation of the application. To this end, a case study was developed, meant to represent a fairly typical project a city or county may encounter, but one that was complex enough to test fully the capabilities of a project management software application. This case study was developed by the local units of government based on their practical project experience. In addition to the case study, a sample scope of work was developed meant to be used in conjunction with the case study, and again a tool to allow the full capabilities of the applications to be tested. Both of these tools, the case study and the sample scope of work, are included in Appendix C.

It should be noted that examination and discussion of the software installation process was not part of the evaluation tool developed. The reason being that test versions of the software were intended to be available online or available at test sites where software would already be loaded onto a workstation for the evaluator. Installation of the software itself, in addition to memory requirements, networking capabilities, and other issues more oriented towards information technology support staff rather than the project manager, may be significant and should be considered by any agency considering the purchase of project management software. To the extent that these technical considerations could be summarized for the six identified programs, they were. Information on initial and recurring costs, hardware requirement, and support was summarized and is included in Appendix B of this report.

EVALUATION PROCESS

Securing a version of the six software applications was the starting point for the evaluation. In this endeavor, the TAP was greatly assisted by the instructors at the University of Minnesota, who made available via a server connection Microsoft Project and Primavera® SureTrak®. Versions of Constructware and FastTrack Schedule were readily available online. However, receiving test versions of Primavera® Expedition® and Meridian Prolog® Manager was more difficult. In the case of Meridian Prolog® Manager, the account representative indicated that the company policy is to not release test versions of their software, without the opportunity of giving a tutorial session to those interested in receiving the test version. The position of the TAP was that, since the other applications being evaluated were received without benefit of a tutorial, it would not be a fair test to receive such instruction from the Meridian Prolog® Manager account representative. Therefore, no further evaluation of Prolog® Manager was conducted. For Primavera® Expedition®, a somewhat similar issue was encountered; namely, that the TAP would have to pay a fee to attend a tutorial session before receiving a test version of the software. In this instance, since the University of Minnesota has a version of Primavera® Expedition® for use in their instructional programs, the consensus of the TAP was to have a University of Minnesota instructor work with two TAP members to evaluate this program.

In order to have an evaluation tool that most closely adhered to local city and county needs, the TAP members representing cities and counties were the ones who conducted the reviews, with the exception of Primavera® Expedition®, which, as explained above, was only available through the University of Minnesota. At least three evaluators looked at each of the applications evaluated.

EVALUATION RESULTS

An important caveat for the reader to make note of in viewing the results of the evaluation tool is this; each software application is designed to meet a certain niche and simply because an application may not, for example, generate detailed schedules of activities does not mean that the software does not have other useful capabilities. In this regard, the information that follows is not meant to be viewed as a recommendation for any one program over another, but simply to provide answers regarding desired capabilities as expressed by Minnesota city and county engineers in the project management software survey.

Responses are summarized and indicated in the following format:

○ denoting instances where all reviewers were in agreement with a "yes" response

◑ denoting instances where reviewers were not in agreement with a "yes/no" response

● denoting instances where reviewers were in agreement with a "no" response

Table 1: Evaluation Results

	Constructware	FastTrack	Microsoft Project	Primavera® Expedition®	SureTrak®
1.0 EASE OF USE					
1.1 Support Documentation					
1.1.1 Support documentation is straightforward and easy to follow	●	◑	○	◑	◑
1.2 Adaptability					
1.2.1 Software can be used for both large and small projects	○	○	○	○	○
1.2.2.1 Multiple projects can be handled at one time	○	◑	○	○	○
2.0 CRITICAL PATH REPORTING					
2.1 Critical Path Reporting Capabilities					
2.1.1 Is critical path reporting part of the program's capabilities?	◑	○	○	○	○
3.0 DOCUMENTATION/REPORTING					
3.1 Creating/Editing Reports					
3.1.1 Process of working with reports is flexible	◑	◑	○	◑	○
3.1.2 Report template can be saved for use with other reports	◑	◑	○	○	◑
3.1.3 Report can be created and exported in a usable format	○	◑	◑	○	○
3.1.4 The interface supports third-party software	●	◑	◑	○	◑
3.1.5 What formats can files be exported in?	Excel	HTML, MPX, Project 2002, XML, PKTURE, JPEG, TXT	Pert, Gantt, HTML, Excel, Access, Text, CSV, MPX, XML, GIF, FoxPro (.dbf)	CSV, Txt, Excel, etc.	ODBC, html, MPK

○ all reviewers were in agreement with a "yes" response

◑ reviewers were not in agreement with a "yes/no" response

● reviewers were in agreement with a "no" response

	Constructware	FastTrack	Microsoft Project	Primavera® Expedition®	SureTrak®
4.0 PROJECT COMMUNICATION					
4.1 Creation and Tracking					
4.1.1 Can you use the program for project communication?	○	◐	○	○	○
4.1.2 What types of project communications can you create?	Information - Request Transmittal Daily Report	Information - Request Transmittal Daily Report	Information - Request Transmittal Daily Report	Information - Request Transmittal Daily Report	Daily Report
4.1.3 Can you send your communications?	○	◐	○	○	○
4.1.4 Can you log your project communications?	○	●	◐	○	◐
5.0 NETWORKABILITY/PORTABILITY					
5.1 Control of Access and Edit Rights					
5.1.1 Access/Edit rights can be controlled	○	○	◐	○	◐
6.0 SCHEDULING					
6.1 Software Ability					
6.1.1 Tasks and activities can be delegated	◐	◐	○	◐	◐
6.1.2 Project Schedules can be generated	◐	○	○	◐	○
6.1.3 Project Schedules can be printed	◐	○	○	◐	○
6.1.4 In what format can schedules be generated and printed?	Text Look Ahead	Gantt, Text, Look Ahead	Pert, Gantt, Text, Look Ahead	Gantt	Pert, Gantt, Text

○ all reviewers were in agreement with a "yes" response

◐ reviewers were not in agreement with a "yes/no" response

● reviewers were in agreement with a "no" response

	Constructware	FastTrack	Microsoft Project	Primavera® Expedition®	SureTrak®
7.0 FLEXIBILITY					
7.1 Data Transferability					
7.1.1 Data can be imported/exported to Microsoft Office products?	◐	◐	○	○	◐
7.1.2 Data can be imported/exported within the same product family?	◐	◐	○	○	◐
7.1.3 Data can be imported/exported to other product families?	●	◐	○	◐	◐
8.0 OTHER					
8.1 Project Monitoring					
8.1.1 Software allows continuous monitoring/management of the project?	○	○	○	○	○
8.2 Archiving					
8.2.1 Archives are stored inside the application	○	◐	◐	○	◐

○ all reviewers were in agreement with a "yes" response

◐ reviewers were not in agreement with a "yes/no" response

● reviewers were in agreement with a "no" response

Appendix A:

Editorial Comments from Reviewers

GENERAL EVALUATION COMMENTS

General comments made by evaluators are summarized below, with the full text of their responses included in the Appendix.

Constructware

– Microsoft standard help interface with index search and glossary tools.

– In program Help menu. Help described how to use each section, but I could not find a way to search for information on a specific question.

– Complicated and clumsy software designed for private development projects. Extensive functionality for those who spend time to learn software.

– This product is suited for the construction phase of a project. Some in charge of a large project may want to consider this for project management.

– I found this program difficult to use and apply the assigned project requirements. I could not define project resources to match our criteria (public works director, planner, etc.).

– I give this a thumbs-down. I was completely lost compared to other software applications evaluated. I believe this is more directed to architectural (building) design. I just did not know where to start.

Fast Track Schedule 8

– I like the project wizard in setting up a project. I believe there are things this software could do if I had more time for trial and error.

– Standard MS Help application.

– Good for simple scheduling activities.

– I would suggest taking the 30-day free trial period and take the on-line training sessions or other training sessions that may be offered to fit your needs.

– Simple to use. Quality of graphics excellent. Limited in flexibility to define task constraints. Very good product for simple project management.

– I thought this was the easiest program to work with. I really like the Project Wizard to set up the project. The only problem was that I was limited to 25 lines/entries, but what I was able to do seemed to work well.

Microsoft Project

– Standard MS Help interface with welcome page.

– Quick Preview, Help/Search Menu.

– Can be used for any size project. Very useful but complex in use. Task constraint types confusing. Training needs to be proficient. Resource usage and leveling very difficult.

– Good for scheduling and resource tracking. Easy to learn, intuitive.

– Assigning hours to resources can be tricky as unit assignments can override inputted hours.

Primavera® Expedition®

–   Standard MS Help interface.

–   Clumsy, not tailored for public projects. Requires SureTrak® in order to set up the schedule.

–   Roles and templates are already set up in the program but not for road or public infrastructure projects, they were for building construction and architecture projects.

–   Conclusion, you will need training to run this program.

–   It is difficult to run and is too much information for projects that is unrelated to roadway projects/public improvement projects.

–   I am a good tester, since I've never used a program like this before. I felt it was very easy to figure out, and many templates are provided for the first time user.

–   There is a significant cost-tracking element on this software that I couldn't quite figure out. But, with more time, I probably could have master it.

–   The charts and graphs were easy to view and print. Very nice appearance as well.

–   Complicated and clumsy software designed for private development projects. Extensive functionality for those who spend time to learn software.

SureTrak®

–   I had problems understanding the tutorials. A lot of jump from text to look at the tutorial. Did not really step you through.

–   I would suggest seeking a demonstration from a company representative before purchasing this product.

–   I was able to enter my data, but found this software hard to learn. I would need to be able to spend a lot more time working with this software than I had to give at this time. I believe it could be good once you had a good understanding of how it works.

Appendix B:

Project Management Software
Costs and Requirements

	Approximate Price[1]		Costs					Hardware Requirements				Promotional Materials	Platform[2]	Supplemental requirements
								Server	User					
	New	Upgrade	Type of license	Recurrance of licensing costs	Availability of Help Line	Training for novice users	Cost of training	Network Space	Memory	Processor	Hard Drive Space			
Constructware														
	per license				8am-8pm (phone)	yes	$695	Varies	32MB			Requested	Browser-Based	
FastTrack Schedule														
●Regular[4]	$299	$139	stand-alone copy		Free for registered users, 8AM-5PM EST	yes	$199 (E-training) $399 (hands on, $349 if purchased with a license)		16MB	Pentium	50MB	Requested	Client-Server (with web access)	
Meridian ProLog Manager														
	$1995 (per user)		$399 annual maintenance (per user)		Tech support plan available (live 5am-5pm)	yes	$700	Initial use is 30MB, total size varies	64MB (128MB rec)	Pentium 200Mhz (500Mhz rec.)	270MB	Requested	Client-Server (with web access)	needs Microsoft SQL Server
Microsoft Project														
●Project Standard[3]			Client access license for each user (grouped with other programs	Renewable every 2-3 years, but paid continually by institution. Varies by type of license program	2 incidents and installation are free. Rest of service is available via paid contract	yes	$289		128MB	233Mhz	130MB	Demo CD costs $7.95	Client only	
Primavera SureTrak														
	$499	$99			24hr (phone, fax, email, webchat)	yes	$895	Varies	16MB	Pentium	40MB		Client-Server (with limited web access)	
Primavera Expedition														
	$2,500 (per user)	(included in maint. cost)	Concurrent licensed software	Annual maint. cost = 20% of software owned	24hr (phone, fax, email, webchat)	yes	$1,295	Varies	512MB	Windows NT, Windows XP, Windows 2000	2 GHZ	Requested	Browser-Based	

[1] Cost of software depends on the number of project managers, users, and the size of the organization

[2] Explanation of Software Platforms:

Client Server: The project manager uses software installed on his/her computer to update projects and assign resources. This information is stored on the organization's server. The project manager may have limited ability to update information from o

Browser-Based: The project manager inputs project information and assigns tasks and resources directly into a web browser. He/she can access and update information from anywhere with a web connection. Team members and stakeholders can access the info

[3] Project Standard does not include collaboration tools, Project Professional includes collaboration, but requires server installation. More information is available in the attached Project Management Software Overview

[4] A Concurrent-User edition is available that allows collabortation between multiple users. Requires server installation

Appendix C:

Project Management Software
Review Materials

1. Case Study

2. Software Evaluation Sheet

Local Road Research Board (LRRB) Investigation of Project Management Software

Case Study

NOTE: The following case study is to be used in conjunction with the Project Management Software Evaluation Sheet. By inputting the case study information into the program, you will be able to evaluate the experience of using each project management software package. The project timeline and tasks are meant to evaluate the software and are **not** representative of a real project.

You are the City Engineer of Clear Springs, Minnesota and your City's Public Works Committee (consisting of city and county officials) has informed you that you need to begin planning for a new road reconstruction project. This road, which is currently a two-lane rural section, lies at the fringe of an urban area. The City Council wants to upgrade the road to a four-lane, undivided urban section to increase capacity and to facilitate the extension of urban services. A further component of the project will be to extend a bicycle/pedestrian trail outside the roadway right-of-way. The project includes storm sewer improvements, landscaping, signal installation, and street lighting. It will be necessary to acquire right-of-way, including partial and total takes from adjacent property owners, to construct the proposed improvements. The project is one mile in length; you anticipate total construction costs of $2 million, with overall costs, including right-of-way, to total approximately $4 million.

Major tasks within this project include:

- Completing an application to receive federal funding.
- Selecting a design consultant.
- Completing preliminary and final design layouts.
- Completing a traffic study assuming future urban development of the area (retail and housing).
- Completing an Environmental Assessment (EA).
- Acquiring rights-of-way from property owners in the study area.

A preliminary schedule has been established for the project and is detailed on the enclosed scope of work. Your staff will work with consultants to complete some aspects of the project including the layout and traffic study. Consultant costs are fixed by their budges, and your average, fully-burdened hourly staff rate is $100.00 per hour. NOTE: "critical path" schedule elements have been highlighted in **bold** text. If these steps do not occur, then the project steps that follow cannot occur.

- Project Kickoff Meeting: April 2004
- Complete application for project funding: April – August 2004
- Public Works Committee approves application: July 2004
- Submit funding application to FHWA: August 2004
- Conduct an area Traffic Study   November 2004– January 2005

- Receive Traffic Counts   November 2004
- Preliminary Plan Layout Completed: January 2005
- **City Council to Approve Preliminary Layout:**   **February 2005**
- Conduct an Environmental Assessment: February – November 2005
- Draft EA Submitted for Agency Review: August 2005
- Public Open House to Review EA: October 2005
- **FHWA and Mn/DOT sign EA FONSI:**   **March 2006**
- **Receive Right-of-Way Certificate:**   **April 15, 2006**
- Award Project: June 2006
- Start Construction: June 2006
- Finish Construction: October 2006

After you have inputted the information from the scope of work into the project management software, you will test the software's ability to deal with possible complications that can affect your project's schedule and budget by following these scenarios:

- You present the preliminary project concept to your Public Works Committee, and they are displeased with how you and your staff plan to limit access to adjacent parcels. They direct you to re-work the concept to provide developers with greater levels of access. This will take approximately 75 hours of additional staff time and the work must be completed before submitting the project funding application to FHWA in June 2004. If you miss this deadline, your next opportunity to submit the project for Federal funding will not occur until June 2006. Will you be able to make the deadline?

- Your sub-consultant gives you traffic counts, but they are drastically different than what you would expect. Upon looking at the data, you discover that the sub-consultant conducted their counts on Labor Day. Because it is an obvious mistake to conduct counts on a holiday, you recommend that this sub-consultant not be paid in full for their work and you direct your design consultant to find another sub-consultant to do the work correctly. Now, the traffic study will not be completed until January 2005. How will this delay affect the total project's timeline?

- During early coordination with resource agencies for the EA, you discover that the roadway project may potentially disturb some native prairie species. The Department of Natural Resources requires you to hire a consultant to do a detailed environmental inventory of the study area which identifies the extent of the native plant population and its potential to be disturbed by roadway construction. You must negotiate with the City Council to get funds to hire an environmental consultant. The environmental consultant tells you that their inventory process will take 3 weeks to complete. What does this do to your schedule?

- While preparing for a City Council meeting, you need to print a report that documents project progress and budget expenditures to date. How easy is it to accomplish this?

- Can you create a change order, a daily log, and other project-related communications, such as a transmittal letter and requests for information?

- You need to print a copy of the most recent version of the project schedule for a city staff meeting. Can you print it in a legible, easy-to-use format for discussions at the meeting?

EVALUATOR INFORMATION:

Type of Software: _____   Name: _____

Agency or Institution: _____

E-Mail: _____

Phone No.: _____

Local Road Research Board (LRRB) Investigation of Project Management Software

Project Management Software Evaluation Sheet

1.0 EASE OF USE		
1.1 Support Documentation		
1.1.1 Support documentation is straightforward and easy to follow	YES	NO
1.1.2 Please describe the process of using support documentation		
1.2 Adaptability		
1.2.1 Software can be used for both large and small projects	YES	NO
1.2.2 Activities supported		
1.2.2.1 Multiple projects can be handled at one time	YES	NO
2.0 CRITICAL PATH REPORTING		
2.1 Critical Path Reporting Capabilities		
2.1.1 Is critical path reporting part of the program's capabilities?	YES	NO
3.0 DOCUMENTATION/REPORTING		
3.1 Creating/Editing Reports		
3.1.1 Process of working with reports is flexible	YES	NO
3.1.2 Report template can be saved for use with other reports	YES	NO
3.1.3 Report can be created and exported in a usable format	YES	NO
3.1.4 The interface supports third-party software	YES	NO
3.1.5 What formats can files be exported in?		

4.0	PROJECT COMMUNICATION		
4.1	**Creation and Tracking**		
	4.1.1 Can you use the program for project communication?	YES	NO
	4.1.2 What types of project communications can you create? (Circle all that apply.)	**Information Request Transmittal Daily Report**	
	4.1.3 Can you send your communications?	YES	NO
	4.1.4 Can you log your project communications?	YES	NO

5.0	NETWORKABILITY/PORTABILITY		
5.1	**Control of Access and Edit Rights**		
	5.1.1 Access/Edit rights can be controlled	YES	NO

6.0	SCHEDULING		
6.1	**Software Ability**		
	6.1.1 Tasks and activities can be delegated	YES	NO
	6.1.2 Project Schedules can be generated	YES	NO
	6.1.3 Project Schedules can be printed	YES	NO
	6.1.4 In what format can schedules be generated and printed? (Circle all that apply.)	**Pert Gantt Text Look Ahead**	

7.0	FLEXIBILITY		
7.1	**Data Transferability**		
	7.1.1 Data can be imported/exported to Microsoft Office products?	YES	NO
	7.1.2 Data can be imported/exported within the same product family?	YES	NO
	7.1.3 Data can be imported/exported to other product families?	YES	NO

8.0	OTHER		
8.1	**Project Monitoring**		
	8.1.1 Software allows continuous monitoring/management of the project?	YES	NO
8.2	**Archiving**		
	8.2.1 Archives are stored inside the application	YES	NO

9.0	GENERAL COMMENTS

Please share any additional comments or observations you have about this project management software program.

_____

_____

_____

_____

Appendix D:

Project Management Software Survey Summaries

1. City/County Engineer's Survey

2. CFMA Survey of Contractors

LRRB Project Management Software Survey Summary of Minnesota City and County Engineers

As part of the Local Road Research Board's task providing a tool for understanding and evaluating project management software, an e-mail survey was administered to Minnesota city and county engineers. An important distinction to make for respondents was to discuss project management software, encompassing all phases of project development, not just construction management software. The survey focused on determining whether respondents currently used any project management software, and whether this software was commercially available. In addition, a question was asked regarding the respondents' opinion as to the most important functions software should have to aid their project management.

The survey was administered on September 16, 2003, with a total of 43 responses submitted by the response deadline. Results of the survey are listed below each question. The percentage is calculated on the total number of respondents that answered a particular question (i.e. if 43 people answered question number one, the percentage of "yes" answers was calculated by dividing the number of "yes" votes by 43).

1. **Do you currently use project management software?**

   Yes = 5 responses (12 percent)
   No = 38 responses (88 percent)

   43 people responded to this question

2. **If yes, is the project management software commercially available?**

   Yes = 4 responses
   No = 1 response

   (5 people responded to this question.)

   Types of commercially available software used were listed as the following:

Name of Software
Microsoft Project (three responses)
FastTrack Schedule Plus v7.03 (AEC Software, Inc.)

   The one respondent who indicated that the software used was not commercially available stated that the reason was that he had developed a template using Microsoft Excel including project dates and phases. This template has been shared with the TAP for this research task to review.

3. **Please list the five most important functions software should have to aid in your project management?**

This open-ended question generated many responses. For the sake of clarity, similar responses have been combined in general "buckets" or categories, and the responses are summarized as follows, with the five most frequently cited buckets listed, and other responses listed in no particular order.

1. Ease of use   (21 responses)
2. Critical path reporting   (20 responses)
3. Documentation/Reporting   (10 responses)
4. Networkability/portability   (9 response)
5. Scheduling   (5 responses)

Other responses to this question are summarized below in no particular order:

- Affordability/Inexpensive
- Ability to work with Federal, Mn/DOT, SALT, CARS forms processes
- Ability to provide cost estimates
- Compatibility with other software/Microsoft Office products
- Flexibility to add tasks/update functions, information
- Upgradeability
- Interface with other city/county departments (payroll/timekeeping)
- Adaptability to all types of projects
- One-time data entry/reduction in redundancies
- Access and edit rights can be controlled
- Ability to assign tasks to personnel
- Link between progress/acceptance/payments
- Generate presentation materials/graphical or charting ability
- Public domain availability
- Management of correspondence
- Impact module to determine SEE impacts
- Cost/benefit module

6. **Any general questions or comments?**

Again, this open-ended question generated a variety of responses. They are summarized below:

❖ Two respondents stated that, since their program is comparatively small, they don't typically have a large number of ongoing projects, so the need for a complex program to manage multiple project was limited.

❖ A simple database customized for Mn/DOT requirements would be useful. This tool should start at planning (five-year plan point) and go to project completion.

❖ A lot of what we can/cannot use is driven by other areas like financial services of IT/IS.

❖ I am currently looking at software and see a real need for project management software for good efficient management.

❖ Good if some type of standard or uniform software to reduce learning curve, increase familiarity and use by all in the industry.

❖ Current cost accounting quite adequate. What would help is a means to sift/sort/organize it to produce weekly reports.

❖ Uniform project management techniques/systems are desirable to make key information available to management. To be able to forecast and plan effectively. Our goal is for every dep't within public works to use the same package, to make training/use/maintenance easier. Implementation will require analysis of past ways of doing business and cooperation to make change.

LRRB RIC Task 2: Potential Software for Improved Project Management

Summary of University of Minnesota's Survey of Software Products

The Construction Financial Management Association (CFMA), in partnership with the University of Minnesota's Construction Management Program, conducted a survey of software products used by general contractors as part of construction management. Although focused on a more limited spectrum of project development, namely the construction phase, this survey was examined as part of the LRRB's investigation of potential software for improved project management as some of the tools used may be applicable, with modifications, for other phases of project development/management.

The survey was administered to general contractors, highway and heavy (H&H) contractors, and specialty contractors. The results of this survey are summarized as follows:

CAD/Drafting Software: Most contractors used either AutoCAD or Microstation software for their CAD/Drafting software purposes. (A total of 35 different CAD packages were used by respondents.)

Estimating Software: Excel was the most commonly used software package for estimating purposes. Other packages include Precision Collection for general contractors, Heavy Bid for H&H contractors, and AccuBid for specialty contractors. (A total of 96 different estimating software packages were used by respondents.)

Job Costing/Accounting/Payroll Software: Gold Collection is the most widely used software. Other packages included Forefront and ViewPoint (used by H&H and specialty contractors). (A total of 125 different job costing/accounting/payroll packages were used by respondents.)

Project Management Software: It is interesting to note that most respondents (32 percent) indicated they did no use any project management software. Of those that did use such packages, two different Primavera® packages, Primavera® Expedition® (18 percent) and Primavera® Enterprise® (6 percent) were the most commonly used. The second most used software was Prolog® Manager (Meridian Project Systems) used by 9 percent of respondents. (A total of 61 different project management software packages were used by respondents.)

> General Contractors: General contractors were more likely than the overall group to use project management software, with 25 percent using Primavera® Expedition® and 17 percent using Prolog® Manager.

> H&H Contractors: Overall, H&H contractors were not likely to use project management software (33 percent). Of those that do, Primavera® Expedition® is the most commonly used package (38 percent).

> Specialty Contractors: Few specialty contractors use project management software (47 percent). Of those that do, Primavera® Expedition® and Primavera® Enterprise® are the most commonly used.

Project Collaboration Software: Constructware is the most widely used software (4 percent), although the majority of respondents (75 percent) do not use any project collaboration software. Other packages included Meridian ProjectTalk, BuildPoint, and Citadon. (A total of 34 different project collaboration software packages were used by respondents.)

Project Scheduling Software: Microsoft Project was used by 32 percent of respondents, Suretrak® (Primavera®) was another popular package (28 percent). (A total of 58 different project scheduling software packages were used by respondents.)

Accounting/Project Management Integration: Linking project management software and accounting functions becomes more important as accounting solutions become more complex. For the largest companies in the study, 39 percent have linked project management and accounting software.

Online Project Management Access: Most companies (75 percent) provided on-line access to their project managers.

Job Cost Access by Project Management: Overall, 59 percent of project managers were able to access real-time job cost data, with larger companies being more likely (81 percent) than smaller companies (36 percent) to have this capability.