SD Department of Transportation
Office of Research

Design, Construction, and Maintenance of the Office of Research Web Site

Study SD99-14
Final Report

Prepared by
Office of Research Room 239
700 East Broadway Ave.
Pierre, South Dakota

August, 1999

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TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. SD99-14-F	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Design, Construction, and Maintenance of the Office of Research Web Site		5. Report Date August, 1999	
		6. Performing Organization Code	
7. Author(s) Alicia Ripley		8. Performing Organization Report No.	
9. Performing Organization Name and Address South Dakota Department of Transportation Office of Research Pierre, South Dakota 57501-2586		10. Work Unit No.	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address South Dakota Department of Transportation Office of Research 700 East Broadway Avenue Pierre, SD 57501-2586		13. Type of Report and Period Covered Final; May 1999 - August 1999	
		14. Sponsoring Agency Code	
15. Supplementary Notes An executive summary of this report is published as SD99-14X.			

16. Abstract

This report presents the procedures involved in the design, construction, and maintenance of the South Dakota Department of Transportation Office of Research Web Site. The Office of Research believed refinement of its existing web site would improve communication with other DOT offices, consultants, contractors, the public, and other state and federal agencies. Completion of this project required fulfilling three objectives by performing thirteen tasks. The objectives involved designing and building a functional web site for the Office of Research, and documenting all design and maintenance procedures. The researcher fulfilled the research objectives by completing the assigned tasks. A literature search was performed, and a meeting was held to discuss the project. After the project was defined the researcher sent out surveys to potential Office of Research web site users. After all suggestions from the surveys were recorded, the researcher created the web site layout. Upon completion of the layout, the researcher designed the theme for the web site. After the layout and theme were created the researcher met with the technical panel. After a layout and theme were chosen, the researcher constructed the template for the web site. The site was presented to the technical panel, and a usability study was created. The usability study was sent out to the same group of potential Office of Research web site users. Additions and changes resulting from the usability study were incorporated, where possible. The site was then presented to the technical panel for any further recommendations.

Users of the revised web site will be better informed about the Office of Research, it's planned, on going, and completed research projects, products and services. The Office of Research web site will also provide an opportunity to improve the solicitation of new research projects ideas, and increase the number of researchers who bid on projects. Overall, the web site will improve communication between the Office of Research and other SDDOT offices, consultants, contractors, the public, and outside state and federal agencies.

17. Keywords		18. Distribution Statement No restrictions. This document is available to the public from the sponsoring agency.	
19. Security Classification (of this report) Unclassified	Security Classification (of this page) Unclassified	21. No. of Pages 30	22. Price

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Chapter One

Executive Summary

This report presents the findings and recommendations on the design, construction, and maintenance of the South Dakota Department of Transportation, Office of Research (SDDOT OOR) Web Site. It is believed that refinement of the Office of Research's existing web site will improve communication with other SDDOT offices, consultants, contractors, the public, and outside state and federal agencies. Users of the refined web site will be better informed about the Office of Research, it's planned, on going, and completed research projects, products and services. The Office of Research web site will also provide an opportunity to improve the solicitation of new research project ideas, and increase the number of researchers who bid on projects. Overall, the Office of Research web site will strengthen the communication between the other DOT offices, consultants, contractors, the public, and outside state and federal agencies.

Research Objectives

The technical panel overseeing Research Project SD 99-14 "Design, Construction, and Maintenance of the Office of Research Web Site", defined the following objectives for the study:

1. *To design a functional web site for the Office of Research.*
2. *To build a functional web site for the Office of Research.*
3. *To document all web site design and maintenance procedures.*

The results of SDDOT Research Project SD99-14 presented herein address each of these objectives and are intended to provide a basis for the implementation of a web site that will improve the communication between other DOT offices and potential users of the site.

Research Approach

Thirteen specific tasks were performed to meet the above objectives:

1. *Perform a literature search.*
2. *Meet with the technical panel to discuss the project.*
3. *Interview potential users of the OOR web site in and outside of DOT.*
4. *Create the web site layout.*
5. *Design the theme for the web site.*
6. *Meet with the technical panel and present site layout and theme.*
7. *Design the web page templates.*
8. *Insert test information into web site.*
9. *Present web site to panel.*
10. *Perform usability study.*
11. *Meet with the technical panel to discuss results of the usability study and receive direction regarding possible additions or changes to the web site layout.*
12. *Prepare a final report and executive summary of the research methodology, literature review, and interview results, findings, conclusions, and recommendations. The final report is to include web site design and maintenance procedures.*
13. *Make an executive presentation to the SDDOT Research Review Board at the conclusion of the project.*

Literature for this project came from existing state DOT, University, and other pertinent web sites. Consultants, contractors, the public, and state and federal agencies considered potential users of the Office of Research web site were interviewed to obtain suggestions

on additions or changes to the web site. Much of the information obtained from these studies was incorporated into the design, construction, and maintenance of the web site.

After the researching and interviewing was completed, the design of the web site began. By constructing a flow chart, the researcher was able to display how the pages were going to be set up and linked together. Following this, the chart was put into use in FrontPage® 98. Within Front Page the web site was built and became active (http://www.state.sd.us/dot/Research1/index.htm). From this point, the site went under construction, and the researcher began developing pages, backgrounds, buttons, hyperlinks, etc., that contained information that would be shared on the World Wide Web. This information will be useful to all consultants, contractors, and Universities accessing the site.

After the information was inserted into the site a usability study was sent out to the same group of potential users who were first interviewed. The usability study contained simple procedures on using the site to determine how "user friendly" the site was. The results, comments, and suggestions were documented and applied to help make the site more "user friendly".

Findings and Conclusions

This study focused on the need to improve communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The users of the site, will be better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services.

Finding 1:

      The process of sending out a potential user questionnaire was a valid and reliable method.

           The process of sending out a potential user questionnaire was a valid and reliable method for several reasons. The results proved to be worthwhile,

in that they provided positive information about what should be included in the site. The users also became aware of what information would be on the site. They were given the opportunity to suggest any helpful information they wanted on the site that wasn't already planned to be on there.

Finding 2:

The process of sending out a potential user usability study was a valid and reliable method.

The process of sending out a potential user usability study was a valid and reliable method for several reasons. The results that were received by sending out the usability study were positive. This study was meant to determine how "user friendly" the site was. This provided an opportunity for the users to suggest any changes that they believed would be useful for the site to better assist them. It also provided an opportunity for the researcher to gather more input on how to make the site more "user friendly".

Finding 3:

The South Dakota Department of Transportation, Office of Research Web Site has been proven to be a useful and productive site.

The South Dakota Department of Transportation, Office of Research Web Site has proven to be a useful and productive site for many reasons. The web site will now provide the opportunity for the SDDOT to improve communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The users of the site, will become better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services.

Implementation Recommendations

 Three specific recommendations to the process of designing, constructing, and maintaining the Office of Research (OOR) web site were given to the Research Review Board for their consideration:

Recommendation 1:

> ***The maintenance of the ORR web site should be regular, occurring two to three times a month.***

> > The OOR web site should be maintained regularly in order to guarantee that it contains the correct content to help inform its users. If the OOR wants to inform its users with up to date information it must maintain its site at least two to three times a month.

Recommendation 2:

> ***The person responsible for maintenance should work on the project right along with the researcher.***

> > This ensures that the maintenance will be done efficiently and correctly. It also would eliminate any confusion the person responsible for the maintenance would have concerning the site.

Chapter Two

Problem Statement

The South Dakota Department of Transportation, Office of Research wishes to continually enhance the communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The Office of Research therefore believes through the improvement of the already existing web site, a more effective communication will be obtained. Upon the completion of the web site, the potential users will be better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services. The Office of Research web site will also provide an opportunity to improve the solicitation of new research project ideas, and increase the number of researchers who bid on projects. Overall, the Office of Research web site will improve communication with other DOT offices, consultants, contractors, the public, and outside state and federal agencies.

Background Summary

Information used on this research project was obtained by observing existing DOT web sites, University web sites, and many other useful web sites. Consultants, contractors, the public, and state and federal agencies considered potential users of the Office of Research web site were interviewed and asked to suggest additions and/or changes to the web site. Information gathered from observing existing web sites, along with may suggestions obtained from these studies and interviews, was incorporated into the design, construction, and maintenance of the web site.

Chapter Three

Objectives

The primary objective of this research project was to create an effective Office of Research web site that will improve communication between the South Dakota Department of Transportation, Office of Research and other DOT offices, consultants, contractors, the public, and outside state and federal agencies.

Objective 1:

To design a functional web site for the Office of Research.

A flowchart was generated to show the suggested layout for the web site. After the layout was designed, a theme was created. To display many ideas and suggestions, more than one theme was designed. The technical panel met to vote on the best theme, which was then chosen for use on the Office of Research web site.

Objective 2:

To build a functional web site for the Office of Research.

The SDDOT, OOR web site was built using FrontPage® 98. The individual pages and templates were set up and constructed. The pages contained backgrounds, shared borders, images, buttons, hyperlinks, etc. Test information that is used to inform the potential users about the Office of Research web site was entered into the web pages.

Objective 3:

> *To document all web site design and maintenance procedures.*

> After completion of the first two objectives, the design and
> building procedures were documented to assist with maintenance of the
> web site. The documentation contains step by step instructions on how the
> site was developed and how it should be maintained.

Chapter Four

Task Description

The work plan and methodology for carrying out the research objectives is detailed below. The information obtained in the accomplishments of these tasks is discussed in greater detail in *Chapter Five*.

Task 1:

Perform a literature search.

> A literature search was conducted using information that was made available to the SDDOT, OOR from existing web sites. These web sites are of other state DOT's, Universities, and many other useful web sites available. These sites contained useful and valid information. This information was documented and kept for further reference. From this literature search the researcher learned what kind of information would be useful for the Office of Research web site.

Task 2:

Meet with the project's technical panel to discuss the project.

> The researcher met with the panel to review the work plan and interview document. The meeting was intended to provide an opportunity for the panel to ask any questions and provide additional input on the work plan and/or interview document. All of the suggested changes, which were approved by the panel, were incorporated into the work plan and/or interview document. The researcher also solicited, from the panel, a list of people to interview regarding their Office of Research web site needs.

Task 3:

Interview potential users of the Office of Research web site in and outside of DOT to determine web site content.

The researcher used a questionnaire to interview potential web site users, including SDDOT personnel, consultants, contractors, the public, and state and federal agencies that may use the Office of Research web site. Any suggestions that were made were brought before the panel for further recommendation. The researcher documented and incorporated results of the interviews.

Task 4:

Create the web site layout.

The researcher created a document, in a flowchart format, that suggested the web site layout. This layout contained each page in the site and how they were going to be linked together. This layout was then distributed to each panel member for review. The panel made all necessary changes and approved the layout.

Task 5:

Design the theme for the web site.

The researcher designed several themes for the web site using Paint Shop Pro 5.0, Adobe PhotoDeluxe, and FrontPage® 98. There were several suggested themes due to the many ideas that were given to the researcher during the interview process and panel meeting. Some of these suggestions included things like, adding shared borders, certain colors, certain images, etc. The researcher tried to incorporate all ideas and suggestions.

Task 6:

   Meet with the project's technical panel and present the suggested web site layout and themes.

   The researcher presented and discussed the suggested layout for the web site. The changes were made and the layout was approved. The researcher then presented and discussed the several themes. The panel voted on an overall theme for the web site, and made suggestions that were to be incorporated.

Task 7:

   Design the web site templates.

   The researcher constructed templates that were to be continued throughout the web site using Paint Shop Pro 5.0, Adobe PhotoDeluxe, and FrontPage® 98. These templates all contained a shared border for easier movement within the site. They all contained the same background, fonts, and colors. These templates were created to make the site appealing and easy to follow.

Task 8:

   Insert test information into the web site.

   The researcher inserted the test information to be presented on the web site. The stories were developed and the text was entered in each page. The process of establishing and checking all hyperlinks, bookmarks, gifs, etc, was also performed. The individual pages were created and added to the site. The site consists of individual pages including: a Projects page, which will bring up information regarding any research project from the 1997 to 1999 years; a Request for Proposal (RFP) page, which will bring up an active RFP from any contract project from the 1997 to 1999 years;

and a Guidelines page, which contains information about the Guidelines
for Performing Research for the South Dakota Department of
Transportation, in PDF and WordPerfect format; a Research News page,
which contains recent happenings within the Office of Research; a
Calendar page, which contains a calendar with planned Office of Research
events; a Staff page, which contains information about the staff members
of the Office of Research; a Research Review Board page, which contains
information about the Research Review Board, meeting minutes and
agendas; and finally an External Links page, which contains the Office of
Research's favorite external sites.

Task 9:

   Present web site to panel.

   The researcher presented the proposed web site to the technical panel by
   accessing the site on the World Wide Web. This meeting was intended to
   provide an opportunity for the panel to ask any questions and provide
   additional input about the web site. Any suggestions or changes presented
   and approved were made.

Task 10:

   Perform usability study.

   The researcher created a usability study asking potential users of the web
   site to perform tasks concerning the completeness and usability of the site.
   The researcher documented and incorporated any suggestions, additions,
   and/or changes requested by potential web site users.

Task 11:

Meet with the project's technical panel to discuss results of the usability study, and receive direction regarding possible additions or changes to the web site layout.

The researcher presented and discussed the results from the usability study to the technical panel. This meeting was intended to provide an opportunity for the panel to ask any questions and provide additional input concerning the study.

Task 12:

Prepare a final report and executive summary of the research methodology, literature review and interview results, findings, conclusions, and recommendations. The final report is to include web site design and maintenance procedures.

The researcher prepared the final report and executive summary of the literature review, research methodology, findings, conclusions, and recommendations. The researcher provided a collection of all work materials used to design, create, and maintain the web site, to the Office of Research.

Task 13:

Make an executive presentation to the SDDOT Research Review Board at the conclusion of the project.

The researcher made an executive presentation to the SDDOT Research Review Board on the results of the Office of Research web site.

Chapter Five

Findings and Conclusions

This study focused on the need to improve communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The users of the site, will be better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services.

Finding 1:

> *The process of sending out a potential user questionnaire was a valid and reliable method.*

> > The process of sending out a potential user questionnaire was a valid and reliable method for several reasons. The results proved to be worthwhile, in that they provided positive information about what should be included in the site. The users also became aware of what information would be on the site. They were given the opportunity to suggest any helpful information they wanted on the site that wasn't already planned to be on there.

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> > The process of sending out a potential user usability study was a valid and reliable method for several reasons. The results that were received by sending out the usability study were positive. This study was meant to determine how "user friendly" the site was. This provided an opportunity for the users to suggest any changes that they believed would be useful for the site to better assist them. It also provided an opportunity for the

researcher to gather more input on how to make the site more "user friendly".

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The South Dakota Department of Transportation, Office of Research Web Site has proven to be a useful and productive site for many reasons. The web site will now provide the opportunity for the SDDOT to improve communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The users of the site, will become better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services.

Chapter Six

Implementation Recommendations

Two specific recommendations to the process of designing, constructing, and maintaining the Office of Research web site that should be implemented are as follows:

Recommendation 1:

> *The maintenance of the Office of Research web site should be regular, occurring two to three times a month.*

> > The OOR web site should be maintained regularly in order to guarantee that it contains the correct content to help inform its users. If the OOR wants to inform its users with up to date information it must maintain its site at least two to three times a month.

Recommendation 2:

> *The person responsible for maintenance should work on the project right along with the researcher.*

> > This ensures that the maintenance will be done efficiently and correctly. It also would eliminate any confusion the person responsible for the maintenance would have concerning the site.

References

Shafran, A. <u>Creating Paint Shop Pro Web Graphics</u>. Second Edition. Cincinnati, Ohio: Muska & Lipman Publishing, 1998.

Matthews, Martin S. and Erik B. Poulsen. <u>FrontPage 98: The Complete Reference</u>. Berkeley, California: Osborne/McGraw-Hill, 1998.

Some of the state DOT sites, University sites, and other sites visited during the literature search are as follows:

New Mexico's DOT/Research site:
http://www.unm.edu/~nmtrans/

Utah's DOT/Research site:
http://www.sr.ex.state.ut.us/html/research.htm

Washington's DOT/Research site:
http://www.wsdot.wa.gov/ppsc/research/rpage.htm

California's DOT/Research site:
http://dot,ca,gov/hq/newtech/re_page.html

National Transportation Library site:
http://www.nas.edu/trb.html

Federal Highway Administration site:
http://www.fhwa.dot.gov/

American Association of State Highway and Transportation Officials (AASHTO) site:

http://www.aashto.org/

United States Department of Transportation (US DOT) site:

http://www.dot.gov/

South Dakota School of Mines & Technology (SDSM&T) site:

http://www.sdsmt.edu

South Dakota State University (SDSU) site:

http://web.sdstate.edu

Appendix A

Section 1

Home Page	http://www.state.sd.us/dot/Research1/research.htm
Projects	Http://www.state.sd.us/dot/Research1/projects.htm
RFPs	http://www.state.sd.us/dot/Research1/rfps.htm
Guidelines Page	http://www.state.sd.us/dot/Research1/guidelines.htm
News	http://www.state.sd.us/dot/Research1/news.htm
Calendar	http://www.state.sd.us/calendar/index.cfm?Profile=3
Staff	http://www.state.sd.us/dot/Research1/staff.htm
Review Board	http://www.state.sd.us/dot/Research1/reviewboard.htm
Links	http://www.state.sd.us/dot/Research1/links.htm

Appendix A

Section 2

May 12, 1999

To: (Potential User)

From: Alicia S. Ripley, Office of Research Summer Intern

Subject: SDDOT Office of Research Web Site

Hello, my name is Alicia Ripley. I am currently working as a summer intern for the South Dakota Department of Transportation in the Office of Research. I am working on a project involving the design, construction, and maintenance of the Office of Research Web Site. The plan for our web site is to continually improve communication with other DOT offices, consultants, contractors, the public, and outside state and federal agencies. We believe the production of this web site will increase the user's understanding of the Office of Research's products and services. It will also improve the solicitation of new research project ideas, increase the number of researchers who bid on projects, and allow for more effective communication regarding the status of on-going, and completed research projects. I would like any suggestions you have that would help me out in the preparation of our web site. I have researched those sites already existing on the web and have obtained many wonderful ideas, but you can never have enough *intelligent* ideas. If you would, please fill out this questionnaire and promptly return it to me by May 28th, as I am on a time schedule before I head back to school. If two weeks or less works for you that is great. If you wish to access the already existing SDDOT Office of Research web site the address is:

<div align="center">

http://www.state.sd.us/dot/Research/research.htm

</div>

Here are the addresses to other existing Research sites I found helpful:
New Mexico- http://www.unm.edu/~nmtrans/
Utah- http://www.sr.ex.state.ut.us/html/research.htm

Mid August I also will be sending out a message containing a usability survey, and would like your input on whether you would like me to send this to you also. I greatly appreciate your cooperation and look forward to reading your comments and suggestions. Thank You.

1>   If our site would contain subjects such as:
          -Research Projects
                  =Planned, On Going, Completed
                          +their titles, status, and researcher
          -RFP's (Request for Proposal)

-The Guidelines for Performing Research for the SDDOT
                     - Research News
                               =Weather Information
                                        +Available to travelers with Cellular Phones
                               =Topics discussed during recent meetings
                               =Up Coming Events
                     -Research Staff
                               =Profiles
                               =E-mails
                     -Links
                               =External Links
                                        +EX: Federal Highway Administration, AASHTO, US DOT, etc
          do you believe we would cover your (business) needs?

2>   If answer to 1> was no; What would you like to see added to our page to better
          assist you?

3>   How often do you believe you would visit our site after it has been placed out on
          the World Wide Web (containing the information from above)?

4>   If answer to 3> was never; What could we do to change this? How can we make
          it more appealing in order to interest you in visiting again?

5>   If you believe there is something we have left out, what could be added to benefit
                               you/your business?

Appendix A

Section 3

August 11 , 1999

To: (Potential Users)

From: Alicia S. Ripley, Office of Research Summer Intern

Subject: SDDOT Office of Research Web Site

Hello once again. As I informed you earlier, I am currently working as a summer intern for the South Dakota Department of Transportation in the Office of Research. I am working on a project involving the design, construction, and maintenance of the Office of Research Web Site. The plan for our web site is to continually improve communication with other DOT offices, consultants, contractors, the public, and outside state and federal agencies. We believe the production of this web site will increase the user's understanding of the Office of Research's products and services. It will also improve the solicitation of new research project ideas, increase the number of researchers who bid on projects, and allow for more effective communication regarding the status of on-going, and completed research projects. But, now I not only want you to answer questions, I also would like you to perform some tasks for me (a usability study). This should not be too difficult, as it is supposed to show how "user friendly" our site is. I would like to have these out to you and have responses by August 13,1999 (one week). If you have any questions concerning the study or the site you can contact me by e-mail (Alicia.Ripley@state.sd.us) or phone (773-3292). The address to our site (the one you need to use for this study is:
http://www.state.sd.us/dot/Research1/research.htm

Good Luck! and remember this is supposed to be fun! We are trying to determine how "user friendly☺" it really is!

Please follow all directions the best you can.. If there is a problem with something I ask you to do, try it one more time, if it still doesn't work document the problem and go on to the next one. I would also like you to keep track of the time when performing this. Behind each question write the time you started and the time you finished. Thank You Once Again!☺
Alicia S. Ripley

1. There should be an opportunity for you to download the Guidelines for Performing Research for the South Dakota Department of Transportation, please download them.

    Were you able to download them? Did you download the document using Adobe Acrobat or WordPerfect?

2. Now go back to the Research Homepage. We have a calendar that contains the office's planned events. I would like you to tell me what event we have planned for August 19th, 1999.

3. Now I would like you to do the following:

    Find the story that contains information about two visitors from Mongolia. I would like you to tell me their names.

4. Now I would like you to answer the following:

    There is an opportunity to see the projects Dr. Rama has done for our Office. Tell me how many he has done. How did you find this number?

5. There is a page that will tell you how many years Virginia Ripley has been with the OOR. How many years is this? How did you find this number?

6. Go back to the Research Homepage. Here is the tough one, perform one more search within our site, your choice. Tell me what it was, why you decided to perform it, and did you find what you expected. How easy it was for you to perform. (Choose One)
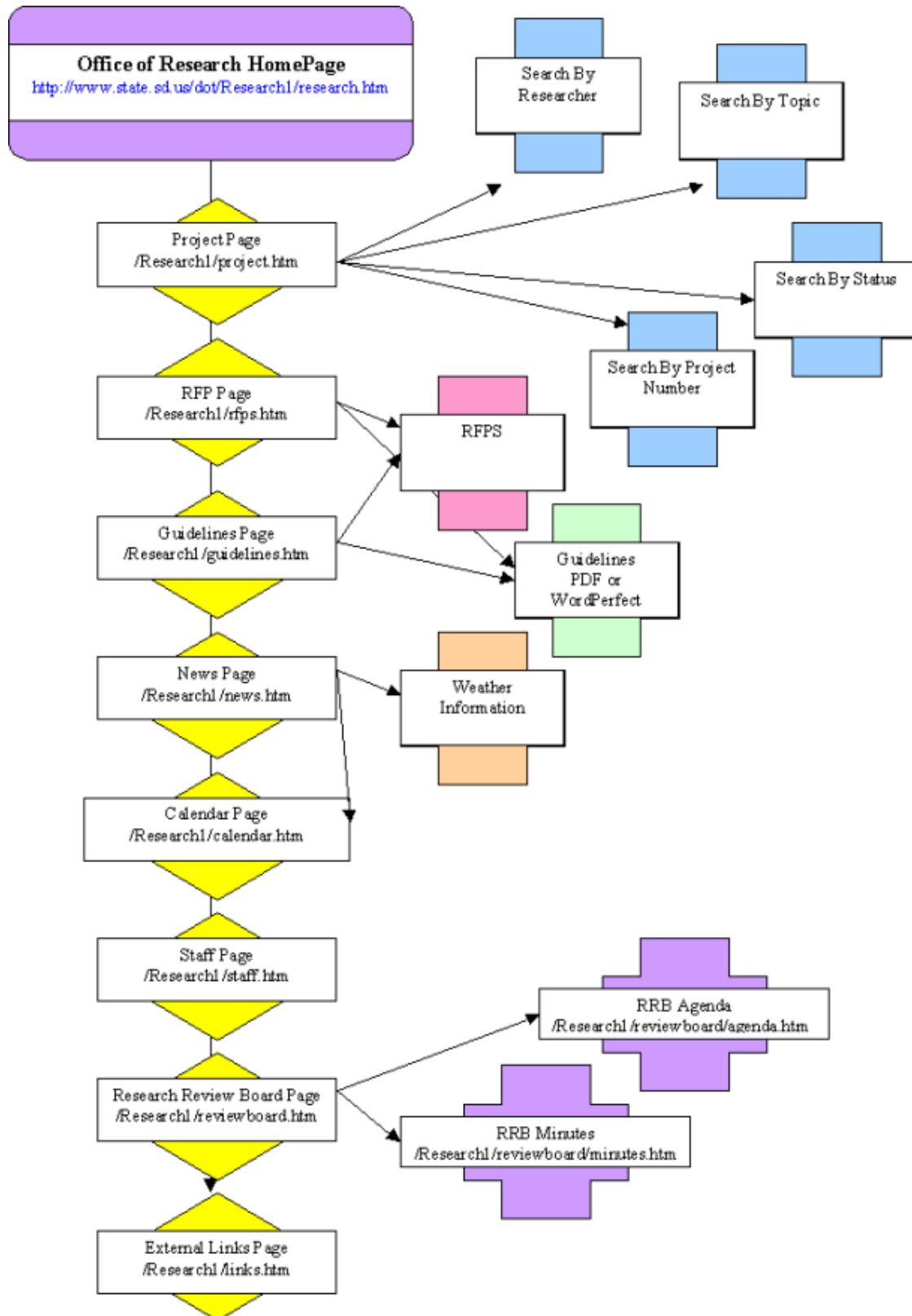
    What a Breeze!   Fairly Easy   Somewhat Difficult   Who? What? Where?

7. Include any other comments, suggestions, and/or changes you have. And Again
    Thank You☺

Appendix A

Section 4

Office of Research HomePage
http://www.state.sd.us/dot/Research1/research.htm

Search By Researcher

Search By Topic

Project Page
/Research1/project.htm

Search By Status

RFP Page
/Research1/rfps.htm

RFPS

Search By Project Number

Guidelines Page
/Research1/guidelines.htm

Guidelines PDF or WordPerfect

News Page
/Research1/news.htm

Weather Information

Calendar Page
/Research1/calendar.htm

Staff Page
/Research1/staff.htm

RRB Agenda
/Research1/reviewboard/agenda.htm

Research Review Board Page
/Research1/reviewboard.htm

RRB Minutes
/Research1/reviewboard/minutes.htm

External Links Page
/Research1/links.htm

Appendix A

Section 5

Set of Instructions

Pages

1.   The Home Page should not require any routine maintenance.

2.   The Projects Page will require routine maintenance. There will be new project information that will need to be put into the database on a regular basis. When this is done there is also work that needs to be done with the site. If a new project is added to the database the information will automatically be entered onto the site. But, if there is a picture that needs to be added, you must save the picture (save it as the project number for easier reference(ex: XX-XX.jpg). Save it under the "projects" folder in FrontPage. After you have it saved in FrontPage, enter the file name in the Project Picture field in the database. If a report becomes available on a project, make sure you save the report as a PDF (save it as the project number for easier reference (SDXX-XXfinal.pdf), and save it in the "projects" folder in FrontPage (same as pictures). After the report is save in FrontPage, enter the file name in the Reports Available field in the Study Evaluation form in the database.

3.   The RFP Page will only require maintenance if the path of the "Guidelines" changes or there is a newer version <u>Guidelines</u>. Make sure you save this new file in FrontPage Explorer in the guidelines folder. Then… you right click on the Download Guidelines button and click on Java Applet Properties…go to link to: and click on Browse…click on the Research1 guidelines folder… then click on the correct file name… then click on OK. Do this for both buttons (PDF and WordPerfect)

4.   The Guidelines Page will only require maintenance if the path of the "Guidelines" changes or there is a newer version of the <u>Guidelines</u>. Follow instructions from above.

5.   The Research News Page will require routine maintenance. If it is information that changes on a regular basis it will need to be changed upon receiving new information. When entering new information: if the information is presented in paper form, type it in the space provided on the page. If the information is presented in e-mail or document form copy and paste the information in the space provided on the page. You may need also to keep checking the "Weather Info" link to make sure it is still active (it should stay the same since it is from our old page). If it happens to change… right click on the button and click on Java Applet Properties…and change the link to address to whatever it needs to be (like I said it should not change, but if it

does and you don't know what the new address is ask Kris Sandal). The link to the Calendar Page should stay the same.

6.   The Research Calendar Page will require routine maintenance. If new events need to be entered, ask Kris Sandal to put them in. She is the only one allowed to do so.

7.   The Research Staff Page will only require maintenance if the e-mail addresses change… just replace the existing address with the new one… it should underline itself, if it doesn't, retype it and push the space bar at the end…you will also have to change the link from the e-mail button…right click on the button…click on Java Applet Properties…change the address in the link to box to mail to: (Jon.Doe@state.sd.us). If any of the profile information needs changed replace the old with the new.

8.   The Research Review Board Page should not require routine maintenance.

9.   The Research Review Board Minutes Page will require routine maintenance, depending on what information is going into it. If it is information that changes on a regular basis it will need to be changed upon receiving new information. When entering new information: if the information is presented in paper form, type it in the space provided on the page. If the information is presented in e-mail or document form copy and paste the information in the space provided on the page. The same with the Agenda Page.

10.   The External Links Page will require routine maintenance. The links will need to be check on a regular basis. Check each link to make sure it is still active. If the address to the link has changed right click on the button… click on Java Applet Properties…etc.

11.   If you need to add a Page… go into FrontPage Explorer and click on the Research1 folder… right click on the right hand side (has a list of the folders under Research1)…click on New Page…right click on the new page…click on rename… rename as the new page name. Never rename as "New Page". Name it as close to the topic of the contents as possible. When you are working on the new page and go to save it… click on save as… click on the Research1 folder… click on the new page (should have a name) (this will show up as a path in the URL box)… then make sure the title matches the name you gave it.

Saving

1.   When saving a page… follow instructions given in **Pages/#11**.

2.   When saving a picture… it will automatically ask you if you want to save the picture…you can rename this picture if it is new, but if it already exists leave the name the same…you can change where it will place the picture, but I usually did this later after I was done messing with that certain page for the day. Then I went into

FrontPage Explorer and moved that picture file into the image folder and then into the appropriate folder (buttons, staff, etc.).

3.   When saving the web site… make sure you have the Research1 folder open and it lists the files and folders on the right side…click on File… click on export…and choose the path to the shared drive (K:/Prob99/Prob9914/WebSiteFiles) (I should have existing pages already saved… overwrite with the revised pages) Also save on designated disk… follow instructions from above, but change the path to A:.

Adding Text

1.   When entering new information…if you are adding on to existing information the color and font should stay the same… if you are copy, pasting, you will need to change the font to Arial, and change the color to match… to do this… click on any existing word and click on the text color button…click on define custom colors…the purplish color should be displayed in the color/solid box… click on add to custom colors… click on OK… highlight the text you entered… click on the text color button… click on the new custom color (purplish color) and click OK.

Importing and Exporting Files

1.   When exporting files… make sure you have the Research1 folder open and it lists the files and folders on the right side…click on a File/Folder… click on File… Export…and choose the path to the shared drive (K:/Prob99/Prob9914/WebSiteFiles)… I should have existing pages already saved… overwrite with the revised pages. Also save on designated disk… follow instructions from above, but change the path to A:.

1.   When importing files… make sure you have the Research1 folder open and it lists the files and folders on the right side…click on File… Import… click on Add File… choose the web site files from the shared drive… click on one file/folder at a time.

Inserting Images

1.   When adding images … if your image is saved in a file somewhere … click on Insert … click on Image … search in your files for the picture … click on the right file name and insert the picture. If your image is being copied from another page … right click on the image you are going to insert … click on copy … paste it on the page wherever you wanted it. Or you can click on save image as and find the right path to save it … and then insert it in the page by clicking on insert … image … etc.
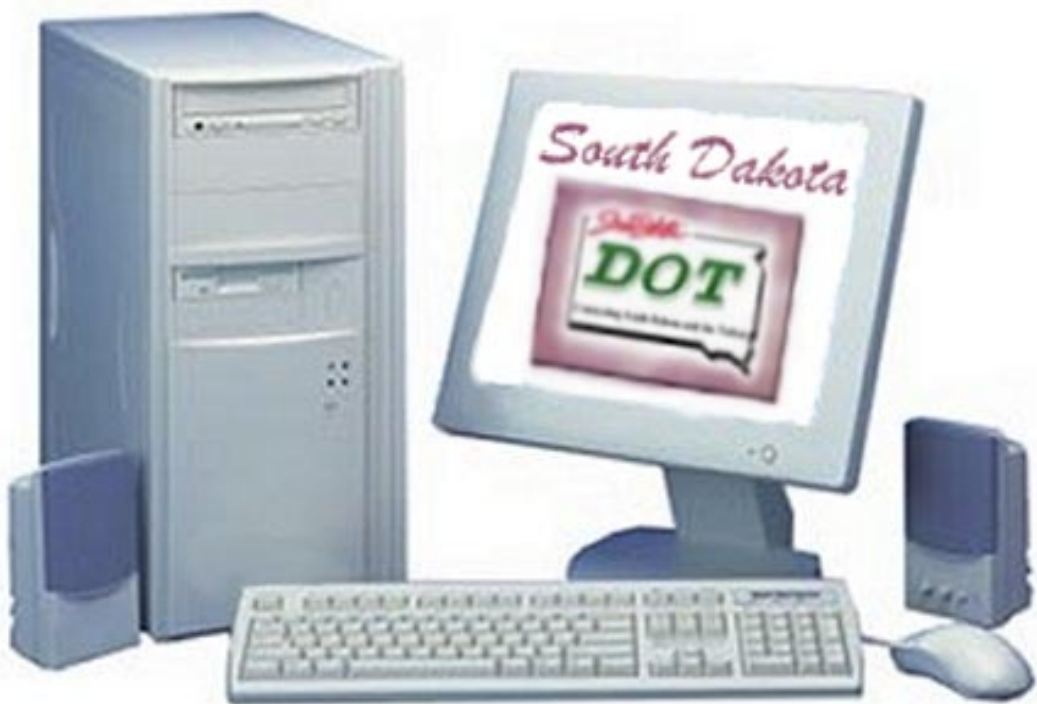
Creating Hyperlinks and Bookmarks

1.   When creating bookmarks … If you want to hyperlink within the same page … highlight the word(s) you want to be bookmarked … click on Edit … click on Bookmark

… make sure the bookmark name is the same as what you highlighted … click OK. Highlight the image(s)/ word(s) you want to hyperlink back to (what you just bookmarked) … click on Edit … click on Hyperlink … find your bookmark name in the drop down box under Optional/Bookmark … click on OK. If you want to hyperlink to a different page … highlight in word(s)/ image(s) you want to be clickable … click on Edit … click on Hyperlink … either find the link by searching through the files or type it in the URL box.

SD Department of Transportation
Office of Research

Design, Construction, and Maintenance of the Office of Research Web Site

Study SD99-14
Executive Summary

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the South Dakota Department of Transportation, the State Transportation Commission, or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

ACKNOWLEDGEMENTS

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. SD99-14-X	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Design, Construction, and Maintenance of the Office of Research Web Site		5. Report Date August, 1999	
		6. Performing Organization Code	
7. Author(s) Alicia Ripley		8. Performing Organization Report No.	
9. Performing Organization Name and Address South Dakota Department of Transportation Office of Research Pierre, South Dakota 57501-2586		10. Work Unit No.	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address South Dakota Department of Transportation Office of Research 700 East Broadway Avenue Pierre, SD 57501-2586		13. Type of Report and Period Covered Executive Summary; May 1999 - August 1999	
		14. Sponsoring Agency Code	

15. Supplementary Notes
A final report of this report is published as SD99-14-F.

16. Abstract
This report presents the procedures involved in the design, construction, and maintenance of the South Dakota Department of Transportation Office of Research Web Site. The Office of Research believed refinement of its existing web site would improve communication with other DOT offices, consultants, contractors, the public, and other state and federal agencies. Completion of this project required fulfilling three objectives by performing thirteen tasks. The objectives involved designing and building a functional web site for the Office of Research, and documenting all design and maintenance procedures. The researcher fulfilled the research objectives by completing the assigned tasks. A literature search was performed, and a meeting was held to discuss the project. After the project was defined the researcher sent out surveys to potential Office of Research web site users. After all suggestions from the surveys were recorded, the researcher created the web site layout. Upon completion of the layout, the researcher designed the theme for the web site. After the layout and theme were created the researcher met with the technical panel. After a layout and theme were chosen, the researcher constructed the template for the web site. The site was presented to the technical panel, and a usability study was created. The usability study was sent out to the same group of potential Office of Research web site users. Additions and changes resulting from the usability study were incorporated, where possible. The site was then presented to the technical panel for any further recommendations. Users of the revised web site will be better informed about the Office of Research, it's planned, on going, and completed research projects, products and services. The Office of Research web site will also provide an opportunity to improve the solicitation of new research projects ideas, and increase the number of researchers who bid on projects. Overall, the web site will improve communication between the Office of Research and other SDDOT offices, consultants, contractors, the public, and outside state and federal agencies.

17. Keywords		18. Distribution Statement No restrictions. This document is available to the public from the sponsoring agency.	
19. Security Classification (of this report) Unclassified	Security Classification (of this page) Unclassified	21. No. of Pages 4	22. Price

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Executive Summary

This report presents the findings and recommendations on the design, construction, and maintenance of the South Dakota Department of Transportation, Office of Research (SDDOT OOR) Web Site. The Office of Research currently has a web site available, but wishes to continually improve the communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. Therefore the Office of Research believes through the improvement of the already existing web site, a more effective communication will be obtained. Upon the completion of the web site, the potential users will be better informed about the Office of Research, it's planned, on going, and completed research projects, products and services. The Office of Research web site will also improve the solicitation of new research project ideas, and increase the number of researchers who bid on projects. Overall, the Office of Research web site will strengthen the communication between the other DOT offices, consultants, contractors, the public, and outside state and federal agencies.

Research Objectives

The technical panel overseeing Research Project SD 99-14 "Design, Construction, and Maintenance of the Office of Research Web Site", defined the following objectives for the study:

1. *To design a functional web site for the Office of Research.*
2. *To build a functional web site for the Office of Research.*
3. *To document all web site design and maintenance procedures.*

The results of SDDOT OOR Research Project SD99-14 presented herein address each of these objectives and are intended to provide a basis for the implementation of a web site that will improve the communication between other DOT offices and potential users of the site.

Research Approach

Thirteen specific tasks were performed to meet the above objectives:

1. *Perform a literature search.*
2. *Meet with the technical panel to discuss the project.*
3. *Interview potential users of the OOR web site in and outside of DOT*
4. *Create the web site layout.*
5. *Design the theme for the web site.*
6. *Meet with the project's technical panel and present the suggested layout and theme.*
7. *Construct page templates for the web site.*
8. *Insert test information into the web site.*
9. *Present the web site to the project's technical panel.*
10. *Perform a usability study.*
11. *Meet with the project's technical panel to discuss results of the usability study, and receive direction regarding possible suggestions, additions, and/or changes that are to be made for the completion of the project.*
12. *Prepare a final report and executive summary if the research methodology, literature review, and interview results, findings, conclusions, and recommendations.*
13. *Make an executive presentation to the SDDOT Research Review Board at the conclusion of the project.*

The information for this project was obtained by observing existing DOT web sites, University web sites, and all other useful web sites available. Consultants, contractors, the public, and state and federal agencies who were considered potential users of the Office of Research web site were interviewed in order to obtain information concerning suggestions, additions, and changes to the web site. All the information obtained from these studies were incorporated into the design, construction, and maintenance of the web site for effectiveness.

After the researching and interviewing was completed, the design of the web site began. It began by constructing a flow chart of how the pages were going to be set up and linked together. Following this, the chart was put into use in Front Page® 98. Within Front Page the web site

was built and became active (http://www.state.sd.us/dot/Research1/research.htm). From this point, the site went under construction, and the researcher began developing pages, backgrounds, buttons, hyperlinks, etc. From there the site began to contain information that would be shared on the World Wide Web, information that will be useful to all consultants, contractors, and Universities that would be accessing the site.

After the information was inserted into the site a usability study was sent out to the same group of potential users who were first interviewed. The usability study contained simple procedures on using the site to determine how "user friendly" the site was. The results, comments, and suggestions were documented and applied to help make the site more "user friendly".

Findings and Conclusions

This study focused on the need to improve communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The users of the site, will be better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services.

Finding 1:

The process of sending out a potential user questionnaire was a valid and reliable method.

> The process of sending out a potential user questionnaire was a valid and reliable method for several reasons. The results proved to be worthwhile, in that they provided positive information about what should be included in the site. The users also became aware of what information would be on the site. They were given the opportunity to suggest any helpful information they wanted on the site that wasn't already planned to be on there.

Finding 2:

The process of sending out a potential user usability study was a valid and reliable method.

The process of sending out a potential user usability study was a valid and reliable method for several reasons. The results that were received by sending out the usability study were positive. This study was meant to determine how "user friendly" the site was. This provided an opportunity for the users to suggest any changes that they believed would be useful for the site to better assist them. It also provided an opportunity for the researcher to gather more input on how to make the site more "user friendly".

Finding 3:

The South Dakota Department of Transportation, Office of Research Web Site has been proven to be a useful and productive site.

The South Dakota Department of Transportation, Office of Research Web Site has proven to be a useful and productive site for many reasons. The web site will now provide the opportunity for the SDDOT and to improve communication between other DOT offices, consultants, contractors, the public, and outside state and federal agencies. The users of the site, will become better informed about the Office of Research, as well as it's planned, on going, and completed research projects, products and services.

Implementation Recommendations

Three specific recommendations to the process of designing, constructing, and maintaining the OOR web site that should be implemented are as follows:

Recommendation One:

The maintenance of the ORR web site should be continuous, occurring two to three times a month.

The OOR web site should be maintained regularly in order to guarantee that it contains the correct content to help inform its users. If the OOR wants to inform

its users with correct information it must maintain its site at least two to three

times a month.

Recommendation Two:

The person responsible for maintenance should work on the project right along with the researcher.

This ensures that the maintenance will be done efficiently and correctly. It also would eliminate any confusion the person responsible for the maintenance would have concerning the site.