DOT

South Dakota
Department of Transportation

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Introduction

sddot.com serves as an informational resource to inform users about the conditions of roads, traffic alerts and other details about public transit.

A usability test is intended to determine the extent an interface facilitates a user's ability to complete routine tasks. Typically the test is conducted with a group of potential users either in a usability lab, remotely (using e-meeting software and telephone connection), or on-site with portable equipment. Users are asked to complete a series of routine tasks. Sessions are recorded and analyzed to identify potential areas for improvement to the web site.

Executive Summary

The purpose of the test was to identity the problem areas of the website. Once we identify all of the issues, it will then drive our designs and come up with the appropriate solutions. We had 30 participants taking our usability test with an average testing length of twelve minutes. Each task our participants were asked to do were timed and recorded. After the tasks were completed, the participants were asked to complete a post survey that gave us information to find the SUS (System Usability Scale) score.

Our usability tests were completed in a range of 8–15 minutes. The participants included college students ages 21–30 coming from various parts of the Midwest. Other participants included adults of the ages between 35–65 with occupations that require them to travel.

Based on the usability testing results and SUS scores, we have found several problems with the SDDOT website that we need to address. Problems were identified based on the resulting time it took for each task and SUS scores. For a task to pass, the SUS score needed to be 68 or greater. The average SUS scores of our participants was 19.2. An immense failure.

Our group conducted a usability test with participants that fit our user profiles to identify problems of the South Dakota Department of Transportation website (www.sddot.com) on November 15–18, 2018. The purpose of the test was to assess the usability of the web interface design, information flow, and information architecture.

30 participants completed our usability test that included 8 tasks that we identified as the most important components to the website based on our exploration and our user profiles. Testing sessions lasted approximately 8–15 minutes with an average testing completion length of 12 minutes.

In general 96% of the participants scored under the minimum success SUS number of 68, will only 4% of the participants scored above (SUS score: 70).

The test identified several major problems including:

- Interface is overwhelming, busy, and distracting
- Interface is old-fashioned and out of date
- Interface is not user friendly, confusing and stressful to use
- Some information on interface appears to be useless

- In need of hierarchy
- Interface has too much information at once
- Lack of drop down tabs
- Lack of points of interest
- Lack of engaging design

This document contains the participant feedback, task completion rates, ease or difficulty of completion ratings, time on task, errors, and recommendations for improvements. A copy of the scenarios and questionnaires are included in the Attachments' section.

Methodology

Sessions

We recruited our participants based on our user profiles. We asked our participants if they could spend 10 minutes to take our usability test. Most the participants complied. Each individual session lasted approximately 12 minutes. During the session, the test administrator explained the test session and asked the participants to use the their mouse cursor to follow the movement of their eyes in order for us to analyze their eye movement across the website. After each task was completed, the next corresponding task was given verbally by the test administrator.

After the testing was completed, the administrator asked the participant to rate the interface on a 5-point Likert Scale with measures ranging from Strongly Disagree to Strongly Agree. Post-task scenario subjective measures included:

Ease of use
Frequency of use

Difficulty to keep track of location in website
Learn ability - how easy it would be for most users to learn to use the website
Information facilitation – how quickly participant could find information
Look & feel appeal – homepage's content makes me want to explore the site further
Site content – site's content would keep me coming back
Site organization

In addition, the test administrator asked the participants the following overall website questions in the form of a survey:
What the participant liked most.
What the participant liked least.
Recommendations for improvement.

Participants

All participants fell into our categories of each user profile.
There were 30 participants total over four days of testing. Of the 30, there were fourteen males and 16 females.

Evaluation Tasks/Scenarios

Test participants attempted completion of the following tasks:

- Find information about road conditions
- Sign up to receive mobile travel advisories
- View camera photos of roads/conditions
- Find rest area map
- Find FAQs page
- Find information about public transit
- Find feedback forum

Results

Task Completion Success Rate

Each task has a failure rate in varying percentages. All participants completed Task 1 (Find information about road conditions) with a 57% success rate. Task 3 (View camera photos of road conditions) was the most difficult task with an abandon rate of 17% and an 83% failure rate, the second highest rate on the list. Task 6 (Find FAQs Page) has the third highest failure rate at 67%, but with no abandon rates. Task 8 (Find the feedback forum) has the highest failure rate on the list at 84% and a 3% abandon rate. Tasks 3, 6, and 8 are carry the largest problems that will be addressed.
(see reference graph 1 & 2 on page 9)

Task Ratings

After the completion of each task, participants rated the ease or difficult of completing the task for three factors:
It was easy to find my way to this information from the homepage.
As I was searching for this information, I was able to keep track of where I was in the website.
I was able to accurately predict which section of the website contained this information.

The 5-point rating scale ranged from 1 (Strongly disagree) to 5 (Strongly agree). Agree ratings are the agree and strongly agree ratings combined with a mean agreement ratings of > 4.0 considered as the user agrees that the information was easy to find, that they could keep track of their location and predict the section to find the information.

Time on Task

The testing software recorded the time on task for each participant. Some tasks were inherently more difficult to complete than others and is reflected by the average time on task.

Tasks 3, 6, 8 took the most amount of time (in seconds).
(see reference graph 3 & 4 on page 10)

Overall Metrics

Overall Ratings
After task session completion, participants rated the site for eight overall measures. These measures include:
• Ease of use
• Frequency of use
• Difficulty of keeping track of where they were in the site
• How quickly most people would learn to use the site
• Getting information quickly
• Homepage's content facilities exploration
• Relevancy of site content
• Site organization

Most of the participants (92%) agreed (i.e., agree or strongly agree) that the website was unnecessarily complex. The majority of participants (85%) agreed they would need the support of someone who frequently uses the site to be able to navigate. 95% of the participants disagreed with the statement that the website was easy to uses. 5% of the participants thought were neutral on the statement.
(see reference graph 5 & 6 on page 11 & 12)

Likes, Dislikes, Participant Recommendations

Upon completion of the tasks, participants provided feedback for what they liked most and least about the website, and recommendations for improving the website.

Liked Most
The following comments capture what the participants liked most:
• Has a lot of important and relevant information
• Has resources for all audience: general travelers, truckers, civil engineers, etc.

Liked Least
The following comments capture what the participants liked the least:
• Busy, distracting, overwhelming
• Old-fashioned/out of date
• Not user-friendly, confusing, stressful
• Boring, bland, generic
• Too much information at once/a lot of information in the one place
• Appears to have a lot of useless information

Recommendations for Improvement

The following comments capture what the participants recommendations:
• More clear titles/visibility of information
• Less complex navigation/less text
• Sub-category drop down tabs
• Better organization/hierarchy of information
• More aesthetically pleasing interface
• More visible maps and alerts
• More visible links/points of interest/important information

Recommendations

The recommendations section provides recommended changes and justifications driven by the participant success rate, behaviors, and comments. Each recommendation includes a severity rating. The following recommendations will improve the overall ease of use and address the areas where participants experienced problems or found the interface/information architecture unclear.

Problem statement: The SD DOT website is cumbersome to use and is not easy to navigate. It should be a site people want to use to find out about road conditions, rather than avoid. General users should be able to easily find the information they're looking for in a short period of time.

FROM SURVEY MONKEY SURVEY
Strengths of website:
Has a lot of important and relevant information; has resources for all audiences: general travelers, truckers, civil engineers, etc.

Weaknesses:
• Busy, distracting, overwhelming
• Old fashioned/out-of-date
• Not user friendly, confusing, stressful
• Boring, bland, generic
• Too much information at once/a lot of information in one place
• Appears there are a lot of useless information
Wants for improvement:
• More clear titles/visibility of information
• Less complex navigation/less text
• Sub-category drop down tabs
• Better organization/hierarchy of information

- More aesthetically pleasing overall
- More visible maps and alerts
- More visible links/points of interest important information

Conclusion

Implementing the recommendations and continuing to work with users (i.e., real lay persons) will ensure a continued user-centered website.

All of our participants found that the website needs a redesign in order to be most efficient to display information to users. The site was cumbersome and unorganized that resulted in confusion and frustration while navigating the desired information. Following our tests, we have highlighted the problems needed to improve the site. This problems points will be the driving force to our website redesign.

Task Results Overview

Legend:
- Success — 30 seconds and under
- Moderate Isssue Severity — 31-45 seconds
- Fail — More than 46 seconds
- Abandon

Task	Success	Moderate Issue	Fail	Abandon
Task 1	57%	20%	23%	
Task 2	47%	10%	37%	6%
Task 3			83%	17%
Task 4	47%	23%	30%	
Task 5	37%	20%	40%	3%
Task 6	23%	10%	67%	
Task 7	77%	6%		17%
Task 8	3%	10%	84%	3%

AVG Task Completion Rate

Legend:
- Success — 30 seconds and under
- Moderate Isssue Severity — 31-45 seconds
- Fail — More than 46 seconds
- Abandon

- 36% SUCCESS
- 14% MINOR ISSUE SEVERITY
- 46% FAIL
- 4% ABANDON

Website Usability Report | 2018

Overall SUS Survey Average

Strongly Agree

4.6

4.1

4.0

4.2

3.9

1.6

1.4

1.8

2.0

1.5

Strongly Disagree

I think I would like to use the SD DOT website frequently | I found the website to be unnecessarily complex | I thought the webiste was easy to navigate | I believe I would need the support of someone who frequents the site to be able to navigate | I found the functions of the site to be well integrated | I thought there was too much inconsistency in the website | I would imagine that most people would learn to use the website very quickly | I found the website very cumbersome to use | I felt very confiden using the website | I would need to learn a lot of things before I could begin to navitage the website

Strongly Disagree ☐ ☐ ☐ ☐ ■ Strongly Agree

AVG Task Completion Time

140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

Time (in seconds)

135.3

111

79

73

57

48.5

42

33.5

Task 1: Find information about road conditions | Task 2: Sign up to receive mobile travel advisories | Task 3: View camer photos of roads/ conditions | Task 4: Find rest area map | Task 5: Find more information on 511 | Task 6: Find FAQs page | Task 7: Find information on public transit | Task 8: Find the feedback form

Time Ranges

Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8
10-249 SECONDS	**7.5-225.4** SECONDS	**79-301** SECONDS	**14-108** SECONDS	**3-175** SECONDS	**4.7-208** SECONDS	**5.5-214** SECONDS	**4.9-312** SECONDS

Task Descriptions List (Appendix)

Task 1: Find information about road conditions

Task Frequency:	High
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 2: Sign up to receive mobile travel advisories

Task Frequency:	Higher
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 3: View camera photos of roads/conditions

Task Frequency:	High
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 4: Find rest area map

Task Frequency:	Medium
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 5: Find more information on 511

Task Frequency:	Low
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 6: Find FAQs page

Task Frequency:	Medium
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 7: Find information on public transit

Task Frequency:	Low
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

Task 8: Find the feedback form

Task Frequency:	High
Target Audience:	Traveling Professional/Student/State Worker/Trucker
Task Prompt:	

	0	10	20	30	40	50	60	70	80	90	100

P1	20
P2	27.5
P3	70
P4	15
P5	35
P6	7.5
P7	12.5
P8	2.5
P9	20
P10	2.5
P11	10
P12	30
P13	47.5
P14	7.5
P15	20
P16	27.5
P17	30
P18	27.5
P19	17.5
P20	2.5
P21	5
P22	27.5
P23	12.5
P24	25
P25	7.5
P26	5
P27	32.5
P28	10
P29	7.5
P30	10
AVG	19.2