

STUDY SERIES
(Survey Methodology #2009-04)

**An Accessibility and Usability Evaluation of the
MAF/TIGER Partnership Software Viewer Application**

Lawrence Malakhoff

Statistical Research Division
U.S. Census Bureau
Washington, D.C. 20233

Report Issued: February 27, 2009

Disclaimer: This report is released to inform interested parties of research and to encourage discussion.
The views expressed are those of the authors and not necessarily those of the U.S. Census Bureau

**AN ACCESSIBILITY AND USABILITY
EVALUATION OF THE MAF/TIGER
PARTNERSHIP SOFTWARE VIEWER
APPLICATION**

Human-Computer Interaction Memorandum Series # TBD

Submitted to:

Kathryn Wimbish

U. S. Census Bureau

Geography Division

Submitted by:

Lawrence Malakhoff

U. S. Census Bureau

Statistical Research Division

Washington, D.C.

Final, December 30, 2008

Note: The information in this report is proprietary to the U. S. Census Bureau Usability Laboratory. It may be used only to communicate findings to the organizational unit requesting the study and for professional research purposes.

INTRODUCTION

Since June 2001, federal regulations have required that U. S. Government Web sites and other software developed by or for the U. S. Government provide comparable access to the information for all users¹. Computer users who have visual and or other disabilities are entitled to have the same access as users who do not currently have any disabilities

Some practitioners consider accessibility to be a subset of usability, while others think of accessibility as related, but separate from usability. Accessibility guidelines have several checkpoints that address general usability issues, such as a logical tab order, dividing large information blocks into manageable groups, and using the clearest and simplest language appropriate. Even if the application complies with the regulation, it still may not be usable, as the Census Bureau's Usability Lab has found in other testing. Both usability and accessibility testing need to be done to identify problems that actual users may have.

BACKGROUND

This accessibility evaluation was performed on the MAF/Tiger Partnership Software (MTPS) viewer application. This application enables persons to view roads and features on maps used for official U.S. Government purposes. The Geography Division (GEO) requested that the Statistical Research Division (SRD) use its expertise to verify and/or identify accessibility problems in the SRD accessibility lab.

PURPOSE

The purpose of this evaluation is to report and rate the severity of accessibility problems to the developer of the software so that the problems can be resolved. The priority for accessibility problems is rated high, medium, or low. An item flagged as high means that the user could not perform the task at all. An item flagged as medium means that the user could perform the task, but with difficulty. An item flagged as low priority means that the user with visual or other disabilities is not presented the same information as the able-bodied user, but can still perform the task.

SCOPE AND METHOD

This evaluation is primarily focused on testing accessibility for computer users with visual disabilities. Accessibility testing was performed using the Job Access With Speech (JAWS) 9 screen reader software². The MTPS viewer application requires the user to have normal vision to be able to zoom or pan on a map, but it is possible that persons with limited vision may use a screen magnifier. Screen magnifiers announce button labels when accessed by the tab key, so the JAWS 9 screen reader was used to check tab navigation and button labels. For the purpose of this report, an item is judged to be accessible (compliant with the regulations) if it can be accessed by keyboard commands. Usability problems are detected by visual inspection by an analyst familiar

¹ <http://www.section508.gov/index.cfm?FuseAction=Content&ID=3>

² <http://www.freedomscientific.com>

with usability. These problems are included in this report as issues to evaluate in formal usability testing if resources are available.

FINDINGS

This application cannot be fully accessible for people with severe visual impairments because some functions rely exclusively on sight, such as zooming in or out on a map and panning left, right, up, or down. However, accessibility can be improved for persons using a screen magnifier or those individuals who cannot use a mouse for long periods of time. It will require a moderate level of effort to make the MTPS viewer application usable and accessible. **All accessibility and usability issues are high priority.** The MTPS viewer has these accessibility issues:

- Incorrectly labeled buttons (Figures 1 and 2).
- Incorrect tab order (Figure 5).

During the process of accessibility testing, these usability problems were detected:

- The Log-in screen is poorly designed, causing an undue burden to users (Figure 1).
- All links on the MTPS viewer are blue, even when visited. Links should change color, from blue to magenta (purple) (Figure 2).
- Zoom capability is not apparent because there is no indication that the slider can be moved vertically up or down. (Figures 3 and 4).

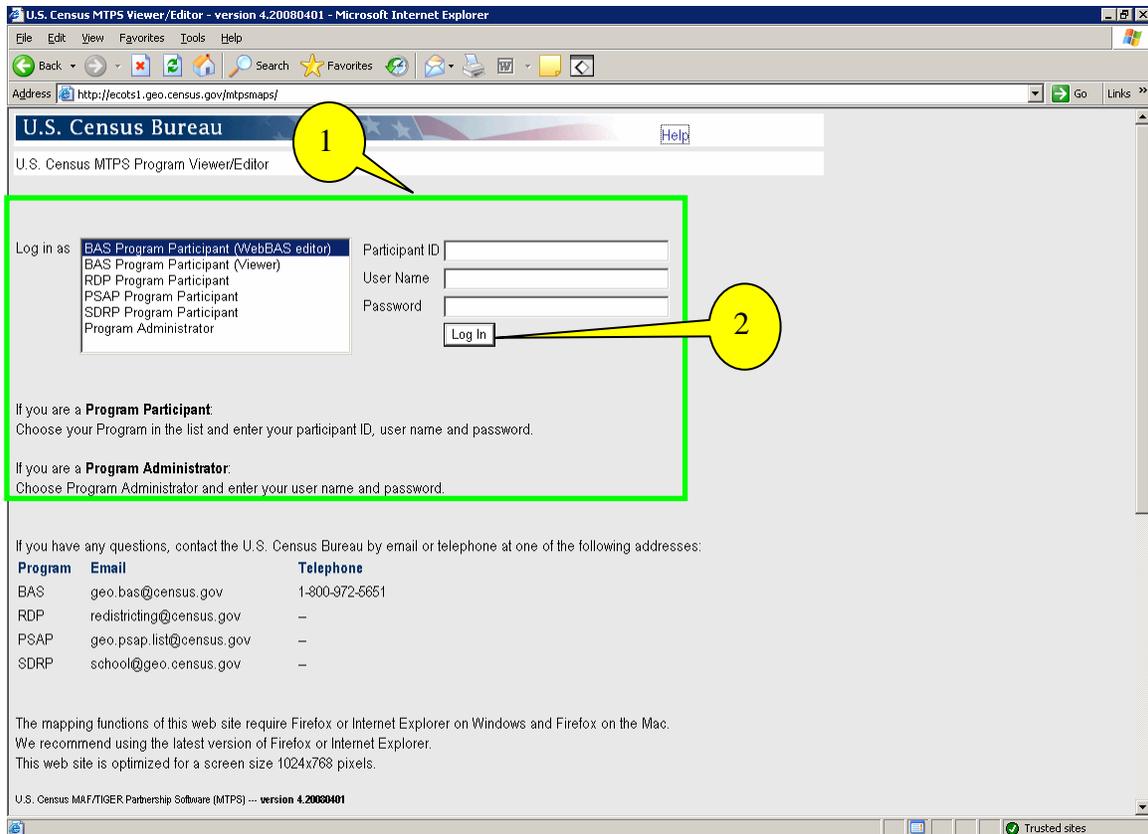


Figure 1. The log in screen is accessible but has poor usability.

1. The login process is overly complex. Users must identify their participant type, and then enter an ID, name, and password. The instructions given are a work-around for poor programming. The type of user should be irrelevant and the requirement to enter a participant ID is an unnecessary burden. We recommend just having a user name and password, letting the database lookup determine who is a participant or administrator. Once this screen is reprogrammed, login instructions could be eliminated. If the login process cannot be reprogrammed, the instructions should be placed above the login area.

2. The login button is vocalized as “login button button.” The title attribute for this button should just be “login” because the screen-reader already announces “button” after the title text.

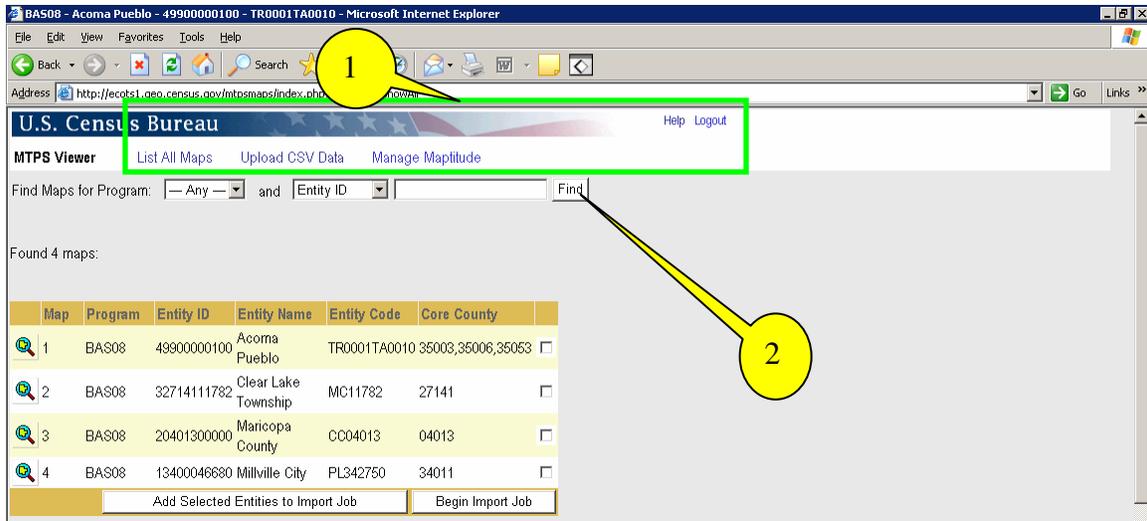


Figure 2. Visited links should turn to magenta and the “Find” button is not correctly labeled.

1. Visited links should turn to magenta (purple). As required by IT Standard 15.0.2, unvisited links should be in blue text and underlined in blue; the color of the text and the underline should change to purple once a link has been visited. (Global)
2. The Find button is vocalized as “Find button button.” The title attribute for this button should just be “Find” because the screen-reader already announces “button” after the title text.

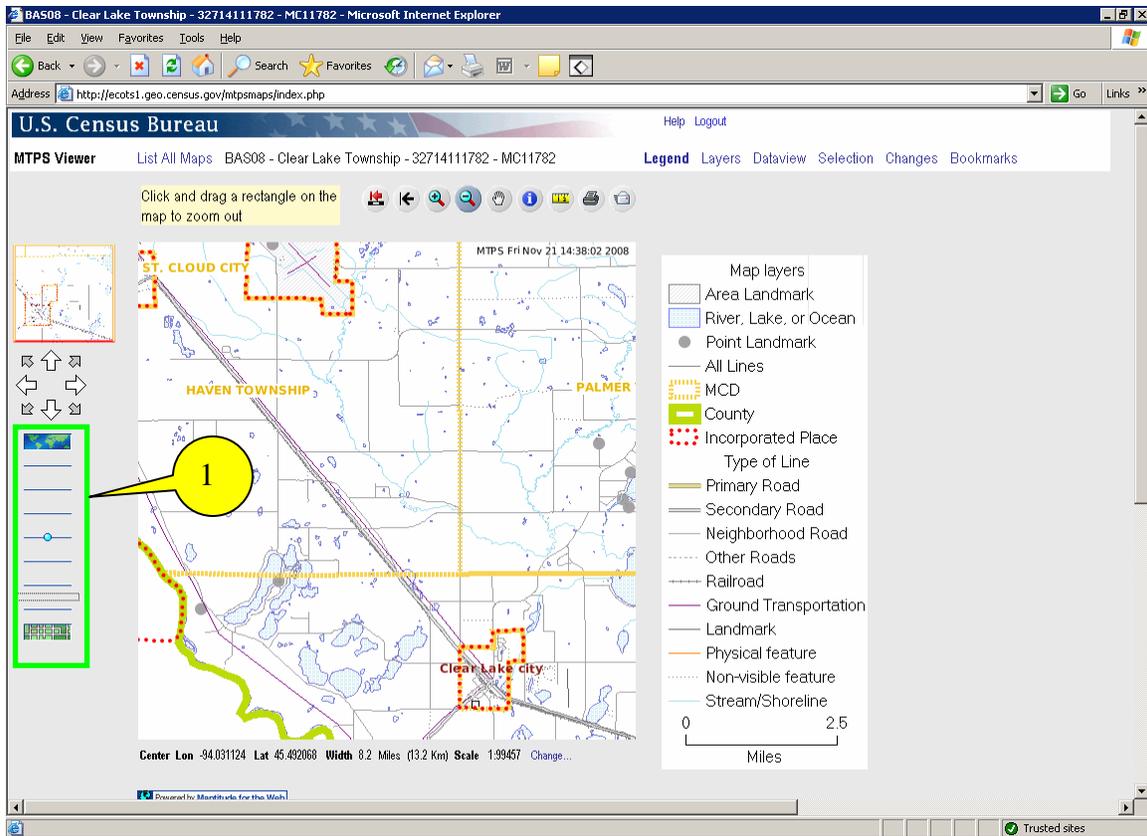


Figure 3. Zoom capability is not apparent.

1. It is unclear what purpose is served by the horizontal lines or the small blue circle under the arrows. Users are more likely to be familiar with the zoom slider used with Google Maps (or MapQuest) shown below in Figure 4.

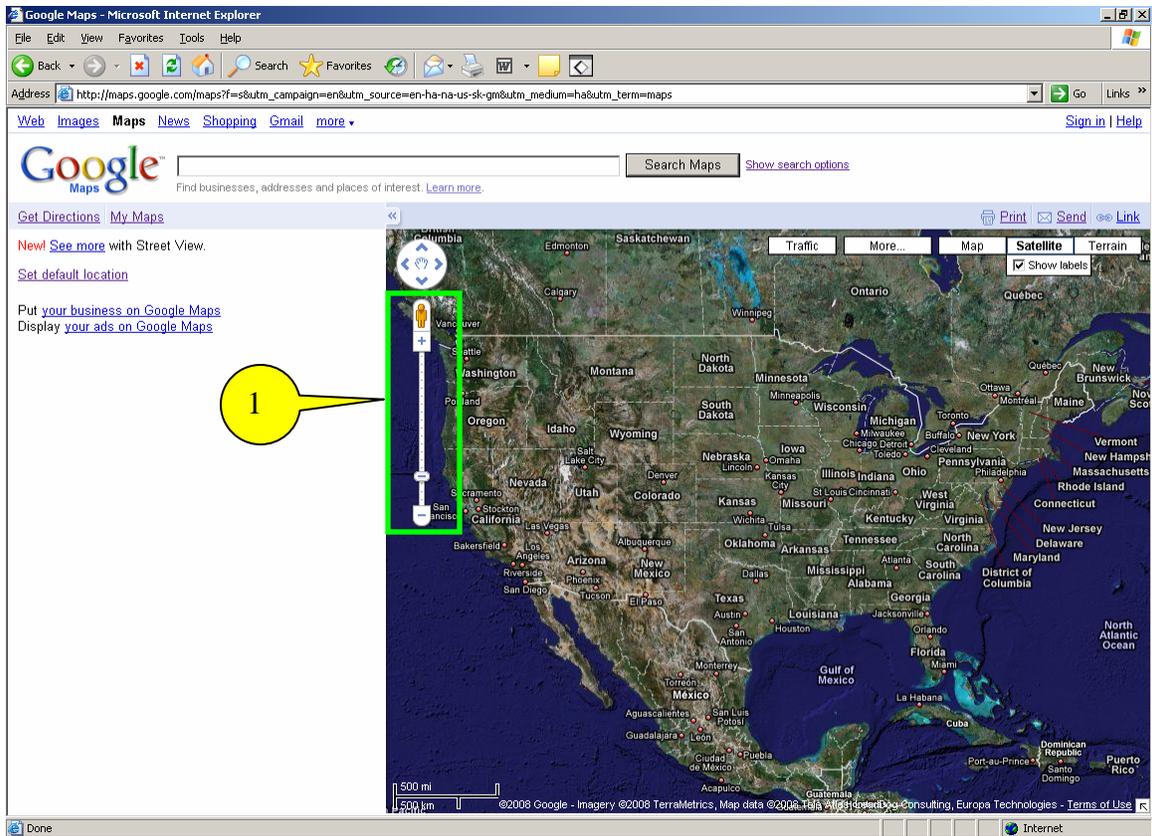


Figure 4. The Google Maps widget implementation for zooming uses a slider located below panning controls.

1. When a user moves the slider towards the plus sign (“+”), the image zooms in and more detail is revealed; moving the slider toward the minus sign (“-“) zooms out the image.

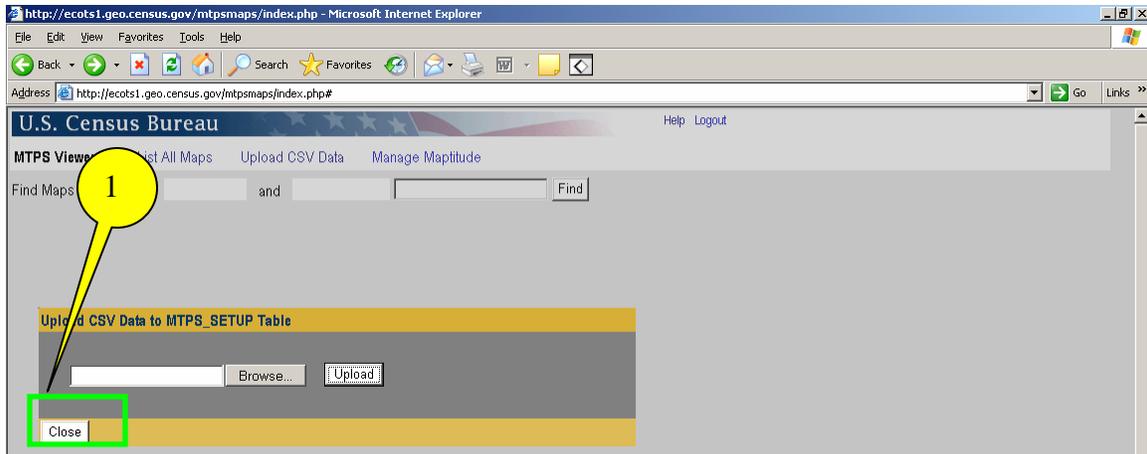


Figure 5. The tab order is incorrect on this screen.

1. The “Close” button precedes the edit field. The “Close” button should follow the “upload” button in the tabbing sequence.

Summary

The MTPS viewer application is inherently visual, so this evaluation was focused on the usability of the interface for persons with normal vision. It is possible that persons with limited vision may use a screen magnifier with this application. Screen magnifiers announce button labels when accessed by the tab key, so the JAWS 9 screen reader was used to check tab navigation and button labels. The MTPS viewer has accessibility issues (all violations of Section 508 Standard 1194.22 paragraph N) with incorrect tab order on one screen and incorrect button labels on two screens.

The primary usability issue with the MTPS viewer is the Log-in screen. Users will likely be puzzled about the requirement to enter a “Participant ID” in addition to a username and password. Additionally, all links on the MTPS viewer are blue, even when visited. The Census Bureau standard (IT Standard 15.0.2) requires links should change color, from blue to magenta (purple) after being visited. It is not apparent how to zoom in and out from the widget appearing on map screens. There are no labels to assist users, and the widget looks different from what is used in the Internet applications MapQuest and Google Maps, which may be more familiar to users.

It will require a moderate level of effort to make the MTPS viewer application usable and accessible. If accessibility and usability recommendations are followed for the MTPS viewer application, users could access MAF/Tiger information more quickly with greater satisfaction and efficiency.