

Usability Study Report

Google Maps Desktop Application

Remote Interviews

User Experience Design III : Usability Evaluation

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Introduction

Remote testing of Google Maps provided key insights into several of the strengths and weaknesses of the Google Maps desktop application. In our study we attempted to identify issues with Google Maps based on our participants' experiences with a list of seven tasks we presented them with. This report outlines those issues and analyzes them based on the ISO 9241 heuristics, and finally provides suggestions for changes that would mitigate them. It also compares the results of remote testing of Google Maps with previous results from face-to-face testing and analyzes the patterns and differences that emerged.

Executive Summary

This report is based on a remote usability test of Google Maps that we conducted with two participants. Participants were asked to complete a total of seven tasks each. We interviewed each participant for a 30 minute session via web-conferencing and screen sharing. We asked each participants to think aloud as they complete each task. We then conducted a short exit interview. Based on the results of these tasks we compiled a list of four usability issues and three design successes. We used ISO 9241's heuristics to evaluate them, and rated them on a scale of 0-4, 0 meaning no issue at all and 4 meaning the issue is critical and must be fixed at once.

Issues:

Saving and labeling Places - Users had difficulty figuring out how to save places to their favorites or add labels to them. Some had never heard of these features and had a hard time finding the correct path to use them.

Severity: 2

Heuristics: Controllability; Conformity with User Expectations; Suitability of Individualization; Suitability for Learning

Depart at/Arrive by and Options - the depart at/arrive by/last available drop down menu in the directions interface is separate from the other "Options" menu. It seems unclear why they are a separate menu, and this caused a user error during our testing.

Severity: 2

Heuristics: Conformity to Users Expectations, Controllability

Switching between directions page and search page - It's not always clear to users that pressing the "X" button allows users to switch from the directions page back to the normal search interface.

Severity: 2

Heuristics: Controllability, Conformity with the User Expectations, Self-Descriptiveness

Ordering of trips - The path needed for switching the order of stops in the directions interface when there are multiple stops on a route is not clear. There are no indications that users can drag and drop stops to reorder them.

Severity: 2

Heuristics: Controllability, Conformity with the user Expectations, Self-Descriptiveness

Recommendations:

- Modify the design architecture of the system to provide cohesion between the search feature and the directions feature.
- Modify the “X” button that allows users to go back from the directions page to make it look more like a back button/arrow.
- Clarify what constitutes a trip “option” versus settings for arrival/departure time.
- Conduct further research on the popularity and utilization of favorites and labels by users. Based on findings either upgrade the design and functionality or remove in favor of showcasing other Google Maps’ features.
- Sync the desktop and mobile functionalities for driving directions and searching for locations or businesses

Successes:

Ratings and reviews - The ratings and review that appear in the info cards Maps provides for the businesses it lists are very clear. They provide useful information for analyzing the qualities of a business that is easy to understand at a glance.

Driving directions display and interface - It’s very easy to control the directions feature and plot a route. The visuals Maps provides offer high clarity about the route, including the trip time and different route options.

Error tolerance of search bars - Google Maps’ search bars provide a high degree of error tolerance, often correcting typos automatically or clearly telling users when queries are unsearchable.

Based on the design issues and successes we noticed during our testing, we conclude that Google Maps is a very sophisticated and usable mapping program, although it we believe there are certain areas where it could be improved. We believe Maps is highly suitable for most tasks users would need to use mapping services for, is highly controllable at almost all points of use, conforms with users’ expectations of other Google services and internet standards as a whole, tolerant of most common user errors, and has features that allow for fairly useful individualization.

However, we found that not all of its features were self-descriptive enough, causing confusion, and that the site as a whole falls short a bit of its suitability for user learning. Compared to the results of our previous face to face study of Maps, our remote study participants had fewer errors on comparable tasks, but this could have been due to several factors, include questions becoming easier after being modified slightly, participants being more relaxed in a remote environment, and the remote participants being generally more experienced with Maps. There were also certain tasks, such as labeling/saving places and using the option to schedule train travel arriving before or after a certain time, that both groups had difficulty with. While testing with larger samples would be needed to draw more solid conclusions, we still feel confident that Google Maps is a highly usable and well-designed program.

Description of the Google Maps Interface

Google Maps is a web-and-mobile-based application that uses GPS functionality and detailed environmental and user generated data to provide a virtual map of the world. It also provides navigation services, socially accrued information about locations, photographic details such as 360 degree views of specific areas, and other non-traditional mapping program content.

The majority of the desktop interface is a labeled map of the user's surrounding area. The maps' designs are similar to both paper and digital maps found on common websites and programs. Users can scroll around the map by clicking and dragging or using arrow buttons or their keyboard. Users can also zoom in and out; view geo-tagged photos that other users have uploaded; and enter "street view", allowing the user to view the chosen location as if they were physically there.

Other functionalities of Google Maps are accessible through a combination search bar and hamburger menu in the top left. The search bar allows users to search for locations on the map using names or general keywords. Users can search for directions for traveling by different modes of transportation such as automobile, public transit, biking, or walking. Users are also able to schedule trips at specific times or to customize routes. The directions given to the user provide traffic updates and estimated arrival times. Finally, clicking on the button to the left of the search bar expands the hamburger menu and presents the user with a variety of other options, including the ability to save locations to a favorites list, view the map in different modes such as terrain and satellite, get help with using the website, and more.

Conducting the Usability Test

We interviewed two participants for thirty minute remote sessions. We used a team member's laptop to video conference with each participant. We recorded audio and video of the screen during each session. Each participant used a designated Google account which was created solely for the study. Each participant's search history was erased after their session.

Participants Previous Experience with Google Maps

At the beginning of each session, each participant was asked to respond to a series of four questions designed to address their current use patterns and familiarity with Google Maps and other mapping programs. Both participants claimed to use Google Maps on a computer "Often." Both participants also reported that they were quite confident in their abilities to use Maps and each felt fairly familiar with the system features (Table 1).

	Participant 1	Participant 2
How often do you use Google Maps on a computer? 1= <i>Never used</i> to 6= <i>Very often</i>	5	5
How confident are you using Google Maps? 1= <i>Not at all</i> to 10= <i>Very confident</i>	9	7
How familiar are you with the features of Google Maps? 1= <i>Not at all</i> to 10= <i>Very familiar</i>	6	7
What other mapping programs online have you used?	waza, apple maps	not many, GIS

Table 1. Overview of participant previous experience with Google Maps and mapping programs.

Tasks Summary

The participants were then asked to perform a series of tasks.

1. Locate a coffee shop in New Brunswick that you would choose to go to.
Follow up: What influenced your decision to choose that shop?
2. Add the coffee shop you've chosen to your favorites.
2b. Add a label to that favorited place.
3. Plan the fastest automobile travel route from Piscataway to Cape May, considering traffic.
Follow up: If you left now, how long would it take you to get there?
4. Your friend asks you to pick them up along the way to Cape May. Your friend is at Rutgers Gardens. Find a way to add Rutgers Gardens as a stop and add it to your trip.
5. Plan train travel from Union Station in Washington D.C. to the New Brunswick train station, arriving after 4:30pm tomorrow.
6. Find a street view image of Rutgers High Point Solutions Stadium.
7. Submit a review of a restaurant you've eaten at lately.

Overall, participants were able to complete most of the tasks successfully and with little or no assistance (see Figure 1).

Only one task was troublesome for participants: adding a label to a place in their favorites. This task took the most time, with participants averaging almost 2 minutes and one participant was unable to complete it. Otherwise, all the of the tasks were completed by both participants. Adding a stop along a route took the least amount of time across both participants. On average, the tasks were each completed in between 1 to 2 minutes (see Figure 2).

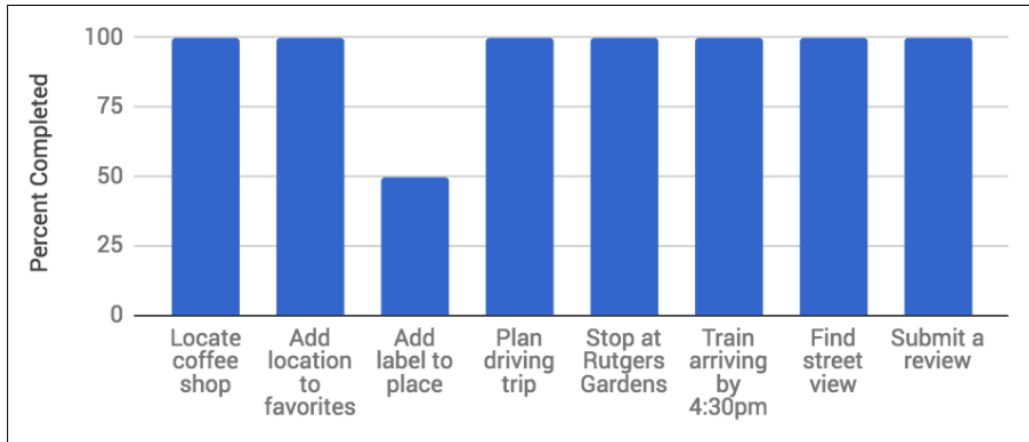


Figure1. Percentage of participants who successfully completed each task.

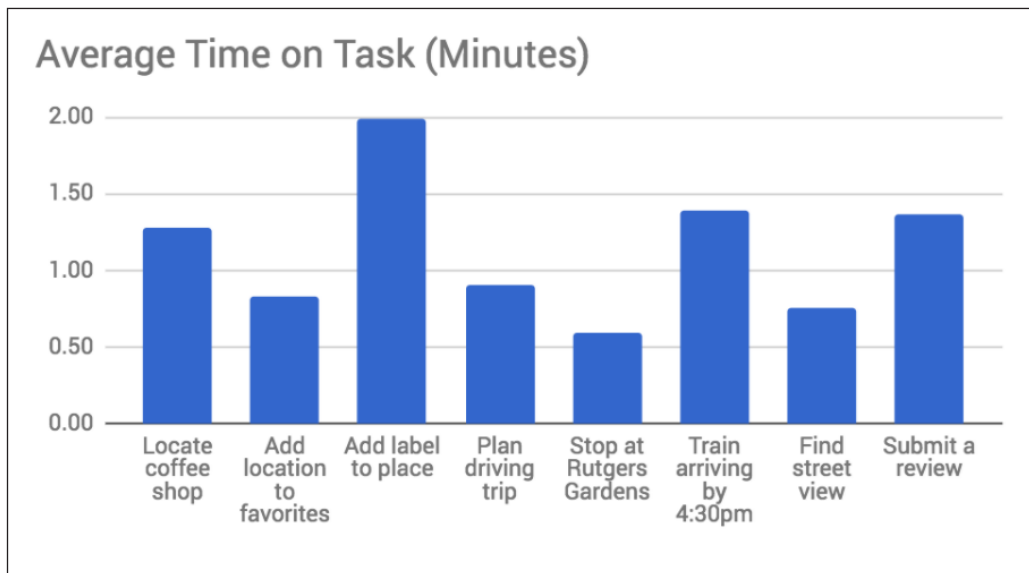


Figure2. Average time (in minutes) for each task

Errors made during tasks were infrequent and minor. Each participant made 1 to 2 errors across all 7 tasks (Table 2). One participant had difficulty adding a label to their saved location. They commented, "I don't know how to do that." They were unable to complete the task without moderator assistance. After the task, the participant suggested the feature was not something they would use, commenting: "I don't see the use in taking my time to do that" [speaking about creating favorites and labels]. Another participant made an error planning train travel to arrive by a certain time. The participant incorrectly selected "options" instead of the leave by/arrive by menu. The participant was able to recover from their error without assistance.

	Participant 1	Participant 2	Total
1. Locate coffee shop	0	0	0
2. Add location to favorites	0	0	0
2b. Add a label	2	0	2
3. Plan trip from Piscataway to Cape May	0	0	0
4. Stop at Rutgers Gardens	0	0	0
5. Train travel arriving after 4:30 PM	0	1	1
6. Find street view of stadium	0	0	0
7. Submit a review	0	0	0
Total Errors	2	1	3

Table 2. Total number of errors for each task

Overall Reactions to Google Maps

Overall, participants were pleased with their experience using Google Maps. Participants reported an average of 6.5 out of 7 to the statement “The capabilities of Google Maps meets my requirements” and an average of 5.5 out of 7 to the statement “Google Maps is easy to use.” (Figure 3)

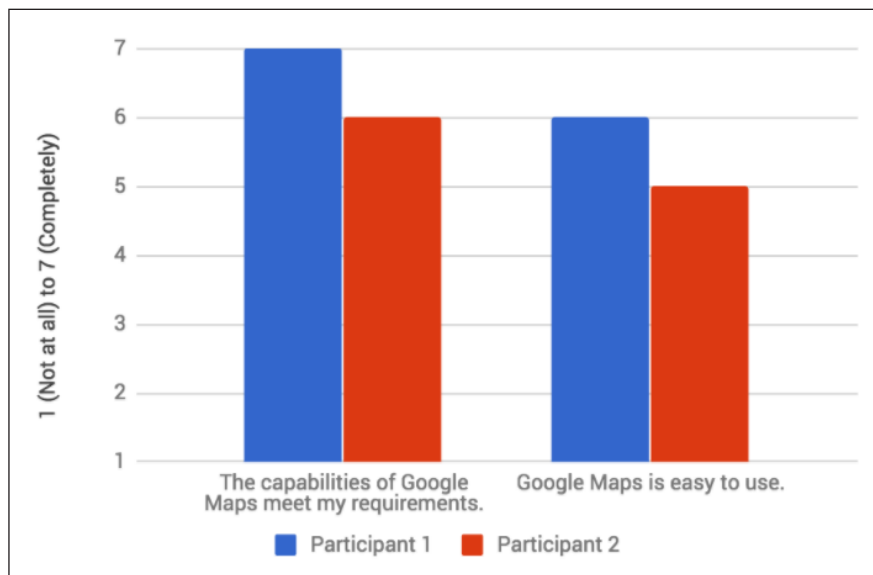


Figure3. Overall Ease/Satisfaction with Google Maps

We also asked participants to respond considering aspects they liked, aspects that were frustrating, the easiest and hardest tasks from the session, as well as any suggestions for overall system improvements. Participant responses are provided below.

Likes:

- "I like it a lot! I use it find food places or service or stores. I use google maps a lot."
- "There are so many features. So many things you can do--many different unique things you can do right from Google Maps."

Aspects that are frustrating:

- "Sometimes things aren't on there. But nothing super frustrating."
- "There are too many places to type things. I had to remember to go back [from directions to the search page], so going back and forth is annoying."
- "Finding a place to add a label."

Aspects that are easiest/most user friendly:

- "Searching for a location."
- "[Getting directions from] Piscataway to Cape May and adding the stop. This was easy because I've done that before."

Suggestions for improvement:

- "Make the search bar and two destination areas in the same place, so you don't have to go back and forth between the two. Keep everything in one place."

Design Issues

Though both of our participants were very comfortable in using the Google map application, usability testing unveiled several design issues that we describe below in this section. For each issue, we describe the issue, note the severity of the issue and its related heuristic, and provide recommendations to improve the design for a more user friendly system.

Issue #1: Saving and labeling Places

One of the useful features provided to Google Maps users is that they can add places, save places, and label them in their favorites. During our testing we discovered that both of the participants had difficulty in either saving the place or adding the place to their favorites. While saving the destination or adding it to Favorites can help the users to save time, some participants did not see the purpose of this feature. Lastly, some users who have privacy concerns may not want to have favorites, and may not understand how to remove these locations from their stored personal data.

Severity Rating 2

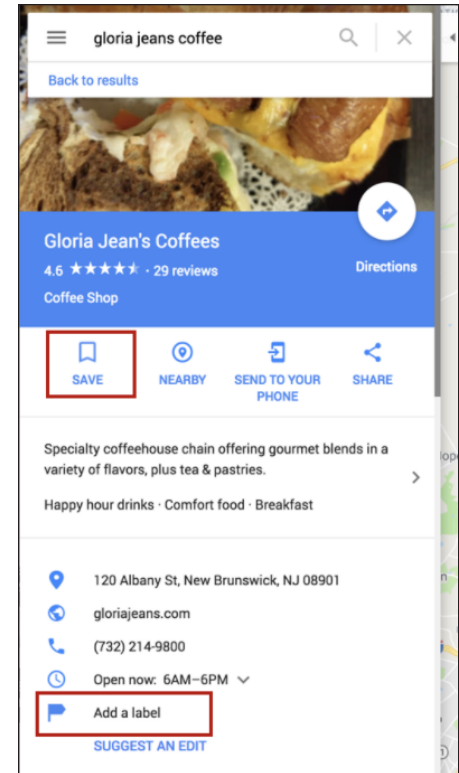
Heuristics: Controllability; Conformity with User Expectations; Suitability for Individualization; Suitability for Learning

Example from Usability Testing:

Both of the participants had not previously used these features and expressed some confusion while beginning the task. One participant was unable to distinguish between labeling and saving place. One participant was able to save the place and add it to their favorites but was not able to label it. This participant made an error by making a comment instead of labeling it and tried to change the name on the favorite list. Both participants expressed concern that these features would not be used on daily basis. These findings are consistent with the results of our face-to-face usability test.

Recommendations:

Labels may or may not be needed on this application at all. At first we would highly recommend to collect qualitative and quantitative data on the use of this feature because the study concluded that both of the participant did not find the purpose of labeling feature and was not motivated to create the favorites and label feature. We recommend compiling more analytical data on the use of this feature. If the data shows that this feature is desirable, we would recommend improving its visibility by moving it in the container and/or changing the font color and size. Favorites options should also be more prevalent in the application, with more visibility once a user is logged in.

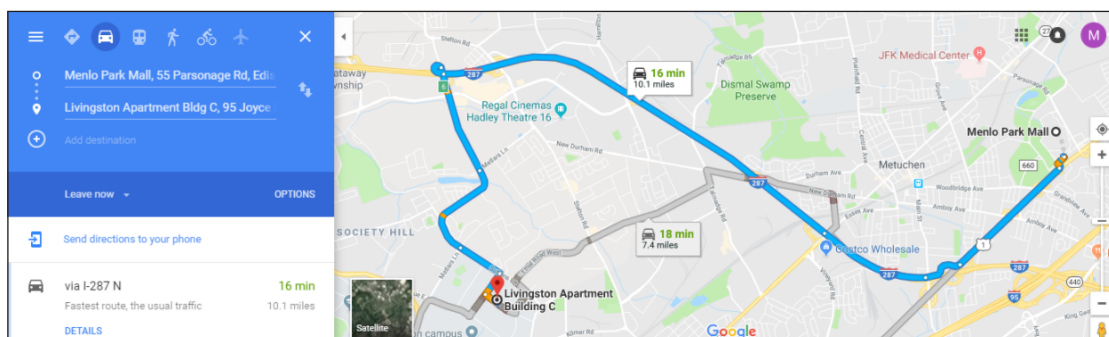


Issue #2: “Options” for trips and managing “arrive by” and “leave by” times

For each planned trips, “options” provides users with additional settings for their trip preferences. However, Google Maps also provides options for users to set their desired arrival or departure time. It is unclear which features should be under the options link and why the “leave now” and “arrive by” settings would not be trip options. One participant was confused in setting trip preferences and selected options by mistake. This participant had difficulty differentiating the functions of these two tabs.

Severity: 2

Heuristics: Conformity to Users Expectations, Controllability.



Example from Usability Testing:

While one participant was able to complete this task correctly, the other participant quickly clicked on the “options” button when they were trying to set the arrival time of their trip. This demonstrated the participant’s cognitive map that setting arrival times would be considered an “option” for the trip. In this case, the options menu did not conform to the user’s expectations.

Recommendation:

We recommend to create a clear system that clarifies the meaning of the options tab to the users. If it is determined that departure/arrival times should be considered an option, we recommend combining these two features. If it is determined they should be kept separate, we believe that option menu should not be placed right next to the leave now tab on the same container bar because it creates confusion the users, or alter the label to read “More Options” so it is clear that arrival/departure times are the first option.

Issue #3: Switching between the search page and the directions page

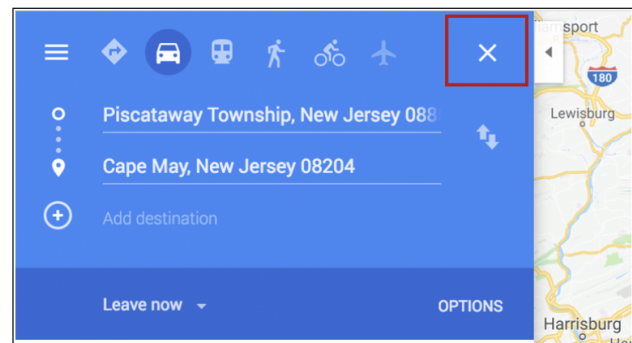
Google Maps has two main pages, the search menu and the directions page. Users can switch between the two windows by clicking the “X” from the directions tab to go back to the search page. While the “X” Button is located upper right corner on the direction page of the Google maps, it functions more as a back button rather than exit, since it brings users back to the search page but does not exit. The “X” functions like a back button, which can confuse users.

Severity: 2

Heuristics: Controllability, Conformity with the user Expectations, Self-Descriptiveness

Example from Usability Testing:

We observed that users were not able to identify how to get back to the search page once they were in directions, nor did they realize that each window provides different functionality. Participants may have been hesitant to click the “X” on the left corner because they thought it would exit completely rather than switch to alternate functions on the search page. Both participants did not use the X button to exit out of the directions page to get back to the search page.



Our user testing suggested that participants were unfamiliar of the functions of the X button and furthermore unfamiliar with the structure of the system that provide two separate feature pages. This suggests that users may believe Google Maps has one unified page while really there are separate pages for searching versus directions. The purpose of this separation is not entirely clear.

Recommendations:

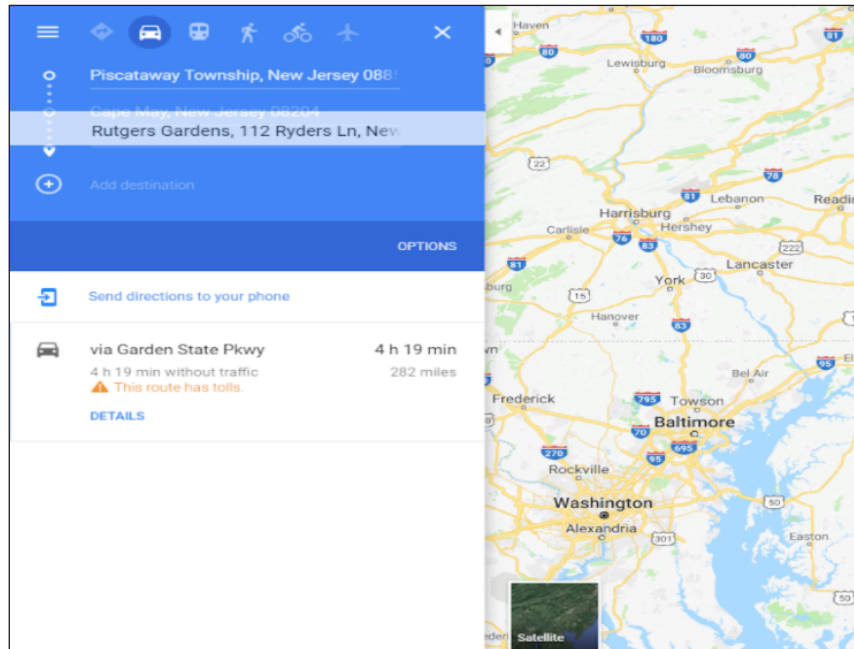
We highly recommend to modifying the design of the “X” button from the directions page to look more like a back button/arrow. This would conform more to users expectations and provide suitability for learning the system. We also recommend potentially combining the search page together with the directions page so that users are more clear about the dual functionality of the system. One user suggested, “ Make the search bar and two destination areas the same place, so you don’t have to go back and forth between the two. Keep everything in one place.”

Issue #4: Managing the order of stops along a trip

Google Maps provides the ability for users to switch the orders of the trips and add more than one destination. However some users are unaware of this advantage. The process for adding a stop along a travel route is different between the desktop and mobile applications. People who are primarily familiar with the mobile application have difficulty adjusting to this feature using the web application.

Severity: 2

Heuristics: Controllability, Conformity with the user Expectations, Self-Descriptiveness

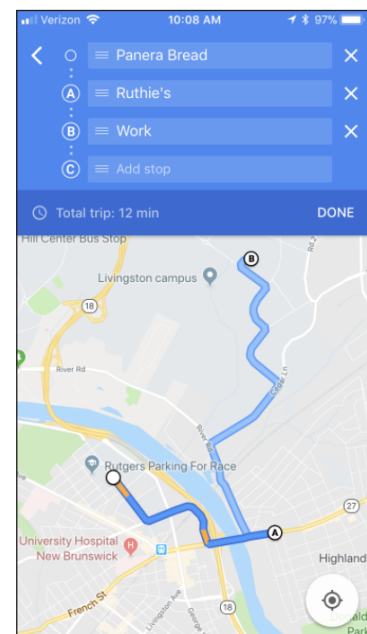


Example from Usability Testing:

One of the participants completed the task by adding the new destination and switching the order of the trips. Another participant was unaware that they could switch the order of trips and instead deleting the end stop to add an additional stop in the middle stop before re-adding the last stop. This was consistent with the findings from our face-to-face testing.

Recommendation:

We recommend providing a more clear system for reordering stops within a multi-part trip. On the mobile app, places are labeled as A, B, C, etc and can be reordered. We suggest adding these labels to the desktop app to sync both applications up programmatically. We also suggest updating the application to search for more relevant locations to the user's route.



Design Successes

Our round of testing with remote users revealed several design successes that we believe are noteworthy for analysis.

Success #1:

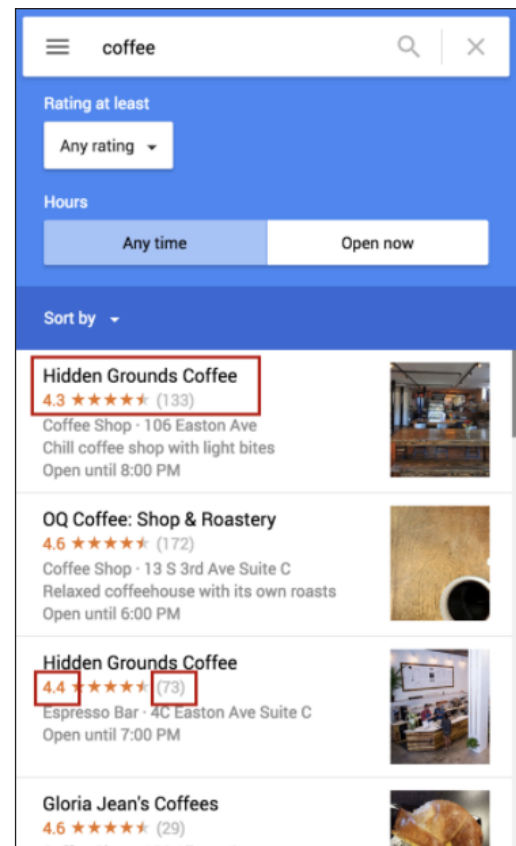
Ratings and reviews of business on Google Maps are easy to understand and provide users with useful information at a glance. Participants both referred to this information in order to accomplish certain tasks and were easily able to use the feature of submitting a review themselves.

Severity Rating: 0

Heuristics: Suitability for the Task, Self-Descriptiveness, Suitability for Individualization, Suitability for Learning

Example from Usability Testing:

One of the tasks we gave our test participants involved searching for coffee shops in a particular area and choosing one to go to. Both participants mentioned that they based their decision of which to choose at least partly on the review information Maps provided for each coffee shop. The visual representation of orange stars, along with a numerical representation in the same orange font placed right next to it, was a very descriptive identifier for how highly a business was rated. One user mentioned that he also referred to the amount of reviews, conveniently placed next to the stars, as well the rating itself in order to determine the validity of the rating. We also had the participants simulate submitted a review themselves, which turned out to be an easy and straightforward process, which we believe also contributes to Google Maps' suitability for individualization. We decided to highlight these features because they were consistently highly useful and usable for our participants, and therefore we believe they should be retained as they are.



Quotes from participants:

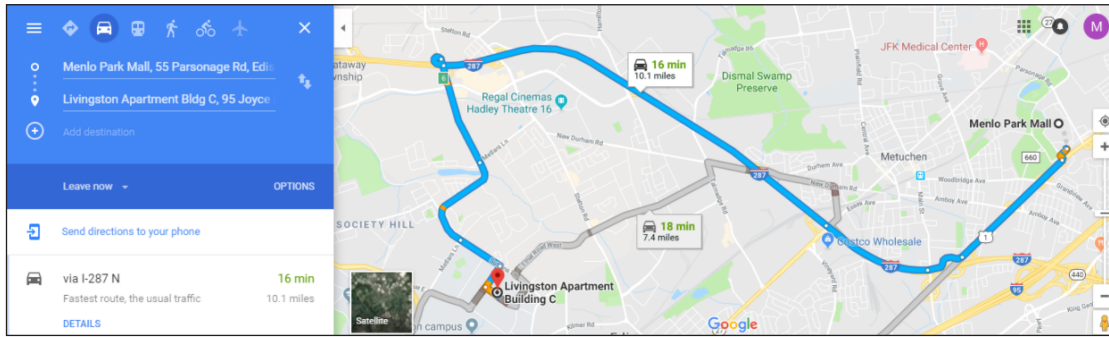
- "This one has 4.4. stars, but one near it has 4.6 stars, so I would check this one out."

Success #2:

Using the directions feature to plan a route is very easy to use and provides clear information about the trip to users. Participants in our study were able to set up routes with very few errors and immediately identified the best navigation options.

Severity rating: 0

Heuristics: Suitability for the Task, Self-Descriptiveness



Example from Usability Testing:

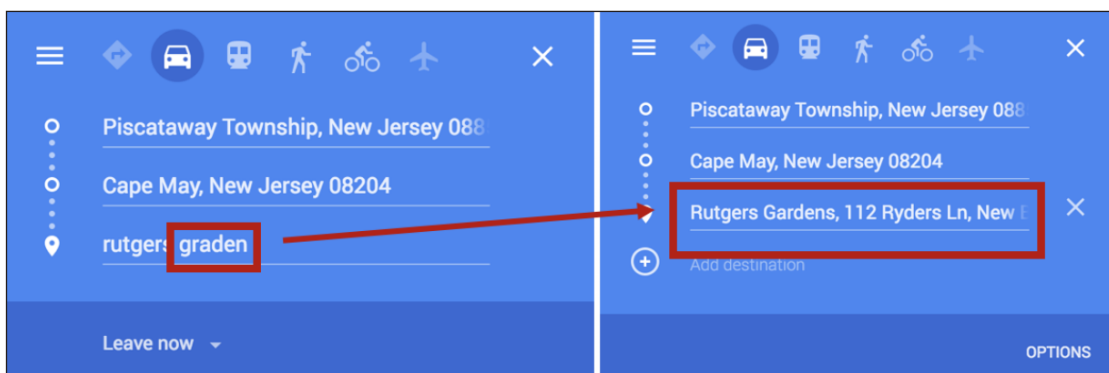
Participants were able to complete the tasks that involved searching for directions in a short amount of time and with very few errors, if any. One of our participants said that she thought the task of finding the fastest route from Piscataway to Cape May was the easiest of all the tasks. The participants seemed to think all the information Maps gave them about their directions and trip time was very clear and descriptive. They both even said the trip times out loud without us prompting them to, which indicates to us that this information is very visible and is one of the first things users will often notice while planning a route. The clarity of this feature is what led us to highlight it as a design success, and based on our participants' ease with using it we recommend it be retained without any major changes.

Success #3:

Google Maps' error tolerance when searching for a location within the directions feature is very high. For most common typos Maps will automatically correct the error and still provide accurate results.

Severity rating: 0

Heuristics: Error Tolerance, Conformity with User Expectations



Example from Usability Testing:

For one of our tasks we had our participants plan a navigation route from Rutgers Gardens. While working on this task one of our participants actually typed "Rutgers Gradens" into the directions search field and initiated the search without realizing it. However, Maps automatically corrected this to "Rutgers Gardens" and established the route to the correct location. The action was completed without the participant even having to realize he had made a

mistake. We were impressed with this level of error tolerance, and believe that many users probably would expect Maps to catch minor errors like this for them, meaning that the system also behaved according to expectations. For these reasons we advocate retaining these corrective qualities of Maps as they definitely add to the site's usability.

General Areas of Success:

There are certain positive aspects of Google Maps' design that are generally present throughout the system's features that make the system highly controllable for the user. We thought this controllability was worthy of mentioning because of how much it stood out during usability testing. Maps makes it possible to search for locations in multiple ways, making things easy for the user by allowing them to control the path they take through the site. Our test participants searched for both specific locations and general keywords, using both the regular search bar and the directions menu search bar, and found what they wanted in just about every case. One of our participants also used the scrolling ability to move around the map to get to the place they wanted, which was not commonly used much in our other test sessions but demonstrates how Google Maps caters to many types of user mentalities. Other smaller, situational features, such as the ability to reverse starting point/destination in the directions tab with the push of a button, customizing routes using the options menu, and many more add a significant amount of controllability to the site as a whole.

Summary of Recommendations from Remote Testing

Overall, we found that Google Maps was an effective and usable system. Several key recommendations have emerged based on our usability testing. First, considering the features of saving and labeling places, both participants were unfamiliar with these features and were not sure of the purpose. We recommend collecting qualitative and quantitative data on the use of these features. If the data shows that this feature is desirable, we would recommend improving its visibility by moving it in the container and/or changing the font color and size. If data shows this is a very seldom used feature, we recommend removing it all together or simplifying it to be labeling, saving, or favoriting, but not all three.

Second, we recommend clarifying what constitutes a trip "option" versus settings for arrival/departure time. If it is determined that departure/arrival times should be considered an option, we recommend combining these two features with one options menu. If it is determined they should be kept separate, we believe that option menu should not be placed right next to the leave now tab on the same container bar because it creates confusion the users, or alter the label to read "More Options" so it is clear that arrival/departure times are the first option.

Third, we recommend to modifying the design architecture of the system to provide cohesion between the search feature and the directions feature. Currently the directions functions are separate from the search functions and are accessed on separate pages. It was unclear to users how to switch between to two, or even that there were two separate pages. If possible, we recommend combining the search page together with the directions page so that users are more clear about the dual functionality of the system. If this substantive change is not possible, we recommend changing the "X" button that allows users to go back from the directions page to make it look more like a back button/arrow. This would conform more to users expectations and provide suitability for learning the system.

Lastly, we recommend providing a more clear system for reordering stops within a multi-part trip. On the mobile app, places are labeled as A, B, C, etc and can be reordered. We suggest adding these labels to the desktop app to sync both applications up programmatically. Providing consistency between the mobile and web interfaces will conform to users expectations across Google systems and allow for greater task suitability across systems.

Comparison to Face-to-Face Usability Study

We conducted an almost identical study two weeks prior with participants that participated in face-to-face usability testing. While the remote group reported that they used Google Maps for desktop more often, both groups felt they had a relatively equal amount of confidence in using and familiarity with the application. In their interviews after completing the tasks, the face-to-face and remote groups had similar ratings for their assessed level of satisfaction and the ease of use of the program, with an average of 6 and 5.5 out 10, respectively; 1 being not at all satisfied, 7 representing extremely satisfied.

Both groups completed two tasks with no errors and relatively no issues or unorthodox paths taken. They were both successful locating a coffee shop and finding driving directions. However, the face-to-face group had issues adding a stop along the directions' route. We asked both groups to complete this task, but in different ways. We asked the first group to add a type of business, while we asked the second group to add a specific location. Both groups were mostly able to complete the task, with the first group having one error and one incomplete, but the second group did substantially better, completing the task quicker and with no issues or errors. Reasons for this may be the differences in Google Maps' handling of finding non-specific places versus labeled places, or the higher level of familiarity the remote group had with the application.

There were several tasks that both groups of participants had issues completing. Adding a location as a favorite, and its follow up task, adding a label to that favorite, were both taxing on our participants. Both groups had issues understanding how to add a favorite, and both groups had similar issues trying to locate where they can add a label. This further confirms our previous assessment that the favorites and labels could benefit from increased visibility via design adjustments, and should be evaluated quantitatively for its popularity among Maps users. Lastly, both teams did not have much trouble getting train directions from one station to another, though each group had one person make an error when finding the correct train to take arrive after the required time.

Overall, the face to face group had more errors on tasks that matched the remote group's tasks. One explanation for this may be the higher level of familiarity with the application the remote group had on average. Another may be that the questions asked to the remote group, though similar, may have been generally easier to accomplish than the first set. Other factors may include the small sample size for each and personal comfort with the face-to-face group compared to the remote group. In theory the remote group may have felt more comfortable with the study because of pressures one might feel in a more social setting. Conducting the same sets of tests with more people in each setting would help to clarify the differences in results.

Conclusion

Upon conclusion of our second study our assessment of Google Maps has not changed. Though we witnessed the remote group run into similar issues as the face-to-face group in terms of usability, we also saw proof of the Google Maps' success through the participants' successful demonstration and application of five out of seven of ISO 9241's heuristics:

1. **Suitability of the Task** - the application is highly successful at providing popular and common information sought for in a map. It is also highly successful at providing popular services such as directions and information about locations. Users are able to quickly and successfully complete a number of common mapping application purposes.
2. **Controllability** - users have complete control over their interactions with the interface. They are able to navigate themselves around the map and determine what they are and are not seeing at any given time.

Moving between states of interactions and data requests is simple and self-explanatory.

3. **Conformity With User Expectations** - Google Maps' interface follows the common design style found across Google products. Interface design matches common web trends and interactions are consistent with "norms". Map legends are easy to understand and imagery is mostly universal.
4. **Error Tolerance** - Google Maps' successfully corrects user errors. It automatically corrects spelling mistakes and suggests similar locations or routes if input is not clear.
5. **Suitability of Individualization** - With a Google account, a user is able to personalize their locations, favorites, and routes. Frequently visited locations are saved and noted within the system, and Google Maps can interact with the application on other devices, as well as sync with other Google products, such as Google Assistant.

We found that Google Maps' could benefit from further improvement regarding two poorly performing heuristics:

1. **Self-Descriptiveness** - Labeling, favorites, and some deeper menu items are not completely self-descriptive. The functions and purposes of some of these features are not incredibly clear. Users asked to use these features did not understand what they were for or their significance within the program.
2. **Suitability for Learning** - The same features mentioned in the prior heuristic apply here as well. Furthermore, the help section functions more as a message board, with user entries and responses. New features and minor features are not well explained here, and leave the user to explore them individually, which may lead to them never learning of a feature's full potential.

On the whole as an application there is a learning curve when considering some of the other lesser known features, such as street view and favorites. Because of this we offered participants who did not know how to complete or had difficulty with these tasks assistance during the studies. We observed that the participants only needed a small amount of information from us to continue with the task, or understood very quickly how to complete the task in the future. Because of this we conclude that Google Maps' is very easy to learn. After receiving assistance the applicants either expressed that they should have been able to complete the task without help, or the solution was easy to understand.

In conclusion, Google Maps is a successful public mapping application. We still believe that more effort and research should go into improving the more obscure features. We also highly suggest that Google Maps for desktop sync more in tune with the functionality of Google Maps for mobile devices. However, overall, due to the success of the program to date, we do not suggest making any major changes to the interface, unless a major breakthrough in mapping technology or internet standards occurs.