

Mapping Applications Findings and Best Practices

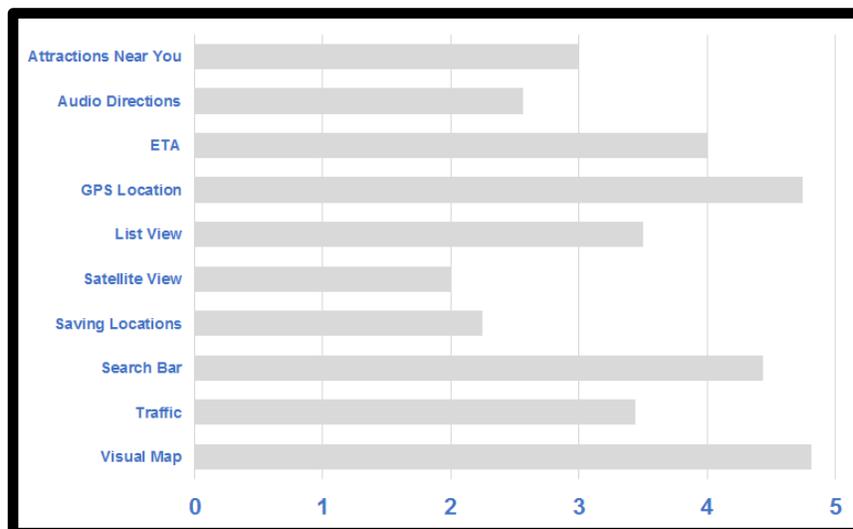
Positive Findings

Finding 1: Defaulting to a Map View with automatic GPS location.

We observed that the majority of our participants elected to use the Map View while navigating regardless of the application they were using. We had participants identify how they value different elements or features on mapping applications on a scale of 1 to 5 with 5 being the Most Important. Of all the features that we had listed, Map View was ranked as the Most Important with an average importance rate of 4.8. It's critical to note that both MapQuest and Google Maps default to a Map View when opened. Knowing current GPS location on a mapping application was the second most important element to participants and had an average importance rate of 4.75. Both MapQuest and Google Maps also default to the Map View showing the user's current location on the map.

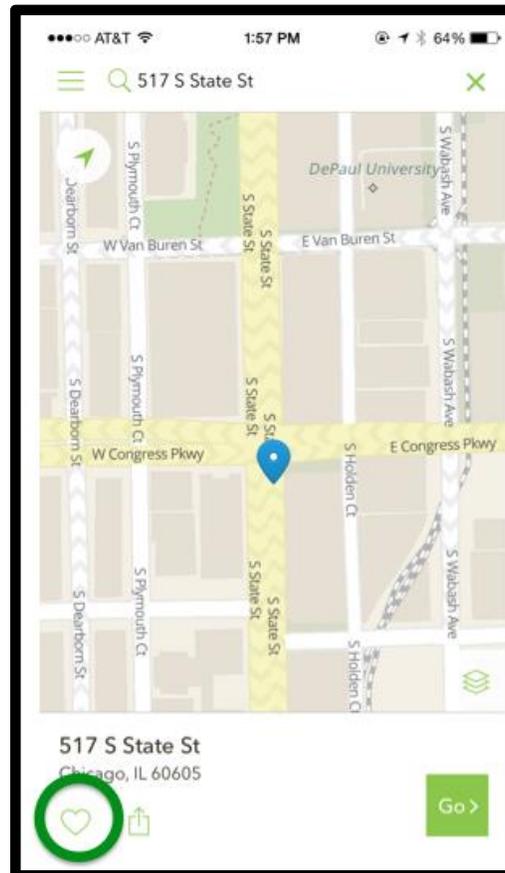
Feature Importance Ranking																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Audio Directions	3	1	1	3	1	1	2	1	4	5	1	4	5	5	2	2
Attractions Near you	3	3	1	1	2	3	3	2	4	4	3	3	4	4	4	4
ETA	4	1	3	3	5	3	4	5	4	5	3	4	5	5	5	5
GPS Location	3	5	5	5	5	4	5	5	5	5	5	5	4	5	5	5
List View	5	4	3	5	1	3	1	4	5	4	2	3	5	5	3	3
Satellite View	1	2	1	2	1	2	3	4	2	1	2	3	1	3	3	1
Saving Locations	1	1	2	1	1	1	4	2	3	4	1	1	5	5	1	3
Search Bar	5	5	3	5	2	5	5	5	5	5	5	3	5	5	4	4
Traffic	1	1	4	2	5	3	4	1	5	2	2	5	5	5	5	5
Visual Map	5	5	5	5	5	5	5	5	5	5	5	3	5	4	5	5

(1 being not important, 5 being very important)



Finding 2: The icon for saving a location on MapQuest is intuitive and it is not buried under separate screen.

The intuitive favorite (heart) icon makes it easier for users to spot and initiate the correct path to save a location quickly and effortlessly. For that reason, even though most of the participants were familiar with Google Maps, more participants were able to save a location on MapQuest. One participant mentioned, “I have never used MapQuest, I don’t know how to save a location here... Oh! Here we go... I can save it by clicking on the heart.”



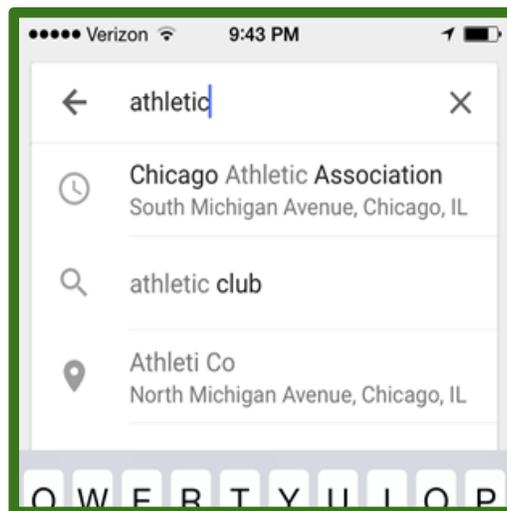
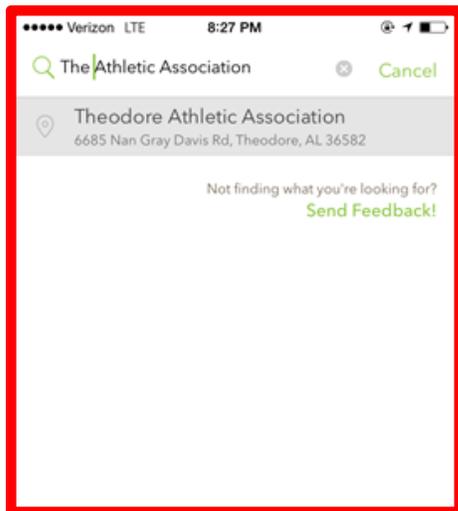
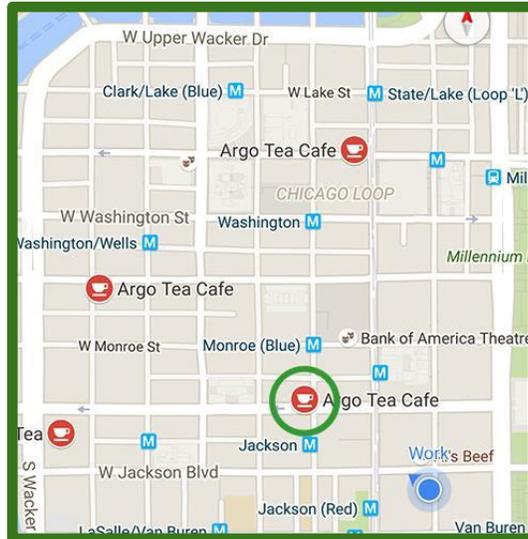
Finding 3: Google Map populates more locations than MapQuest making it easier for users to search places by name.

MapQuest did not have the correct Argo Tea location based on the instructions given, and the user assumed that the pin closest to that location was in fact the correct Argo Tea. Similarly, another participant noted that MapQuest did not pull up the location, “The Athletic Association” when searched from half a mile away. On the other hand, Google Maps immediately brought that location up as the top suggestion part way through searching.

MapQuest



Google Maps



Comparative Findings

Finding 1 - Saving Destinations

Hypothesis 1: Pedestrians are more likely to be successful saving an entered address on MapQuest than on Google Maps.

We conducted a Chi-Square test to compare the task completion rate of Google Maps (69%) to the completion rate of MapQuest (75%) and found no statistically significant difference ($p=0.69$) at the alpha level .05.

Hypothesis 2: Pedestrians will take more steps to save a specific destination on MapQuest than on Google Maps.

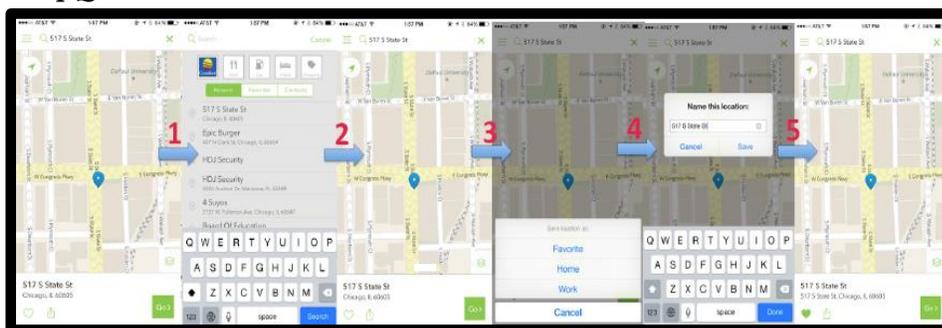
We conducted a paired t-test to compare the number of steps to save a specific location between Google Maps and MapQuest. We found no significant difference ($t_{(9)}=1.41, p=0.19$) at the 0.05 alpha level, such that there was no difference between participants using MapQuest ($M=4.4, SD=0.69$) than when using Google Maps ($M=5, SD=1.25$).

Of the 16 participants, 5 failed to save an address on Google Maps and 4 failed to save an address on MapQuest. 14 of our participants use Google Maps regularly while only 2 use MapQuest regularly. Although all of the participant's use one of the mapping applications regularly, most of them had never used the save feature before. Two participants specifically stated that they would "never use this" (saving a location feature).

Completion Success - Saving an Address																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MapQuest	X	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
Google Maps	X	✓	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓

Although Google has fewer steps than MapQuest to complete saving a specified location, more participants succeeded at saving a location on MapQuest.

MapQuest



Qualitative Data:

Based on our statistical significance tests, we observed that the number of steps makes no difference for completing the task of saving an entered address in terms of efficiency. We speculate

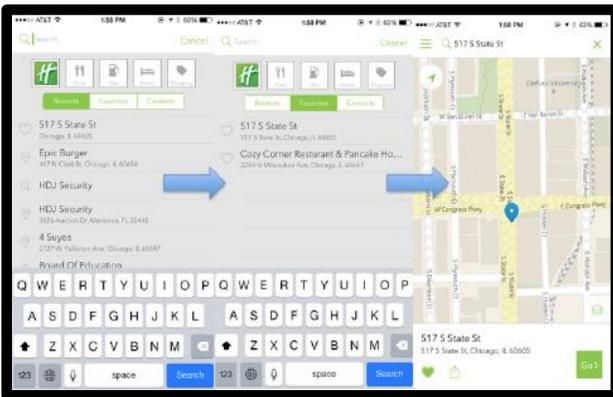
that as long as the user knows where to locate the "save location feature" the task is easy to complete. One of the participants said "It's difficult to find out how to save your address on MapQuest, but once you figure it out, it's easy."

Both applications take the same number of steps to retrieve a saved address. All participants that succeeded in saving a location were able to locate their saved address.

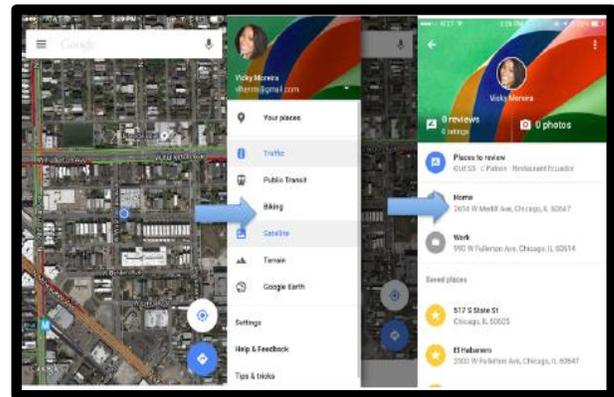
Qualitative Data:

There was one outlier in the number of steps taken to locate a saved location on MapQuest; that participant took 10 steps to complete while other participants on average took only 2 steps. One participant thought she had completed the task because she had searched for the location and then upon being asked to locate that previously "saved" location - she found it in the history. Thus, this was considered as an incomplete task.

MapQuest



Google Maps



Best Practice:

As is implemented by MapQuest and Google maps, give users quick access to their saved and favorite locations. The consistency between the mapping applications allows the users to quickly adapt and succeed at locating their saved locations. For learnability, it would be useful to follow this trend.

Finding 3 - Searching Nearby Spots

Hypothesis 5: Pedestrians who use MapQuest are more likely to use the explore feature over the search bar to find nearby spots than on Google Maps.

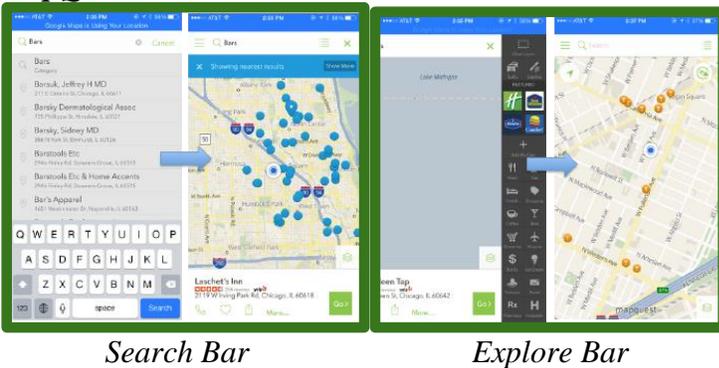
We conducted Fisher's Exact test to compare how often the explore feature was used over the search bar in MapQuest (50%) to the rate of use in Google Maps (13%) and found no statistically significant difference ($p=0.05$) at the alpha level .05. Since p value is trending towards significance, if more studies are done, we might come up with significance.

As shown in the chart below, most participants opted to use the Search bar as opposed to the Explore bar on both applications (MapQuest 9:7 and Google Maps 13:3). We can speculate that this may be due to being unaware about the built-in Explore feature on the applications, and familiarity with search bars in general.

Exploration of Nearby Places Preference																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MapQuest	S	S	S	S	E	S	E	E	S	E	S	E	E	S	E	E
Google Maps	S	S	S	S	S	S	E	S	S	E	S	S	S	E	S	S

S- Search Bar, E- Explore bar

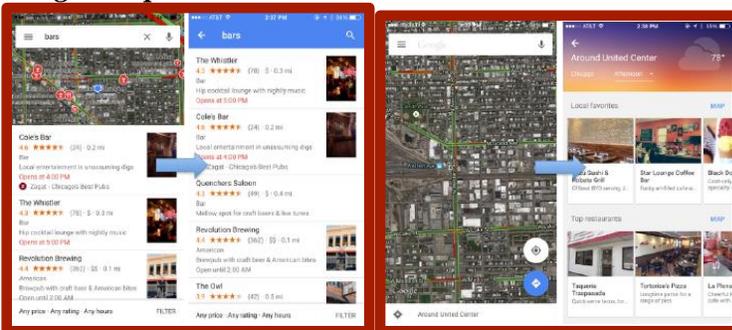
MapQuest



Search Bar

Explore Bar

Google Maps



Search Bar

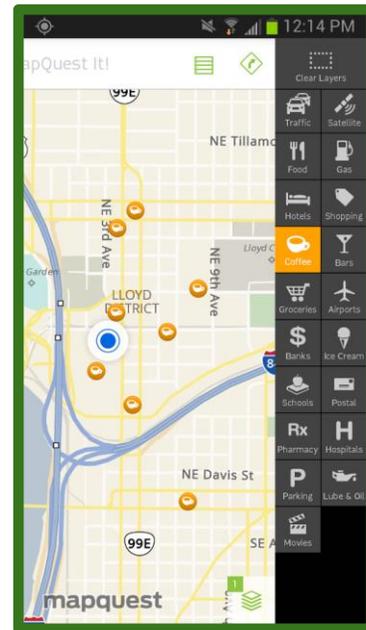
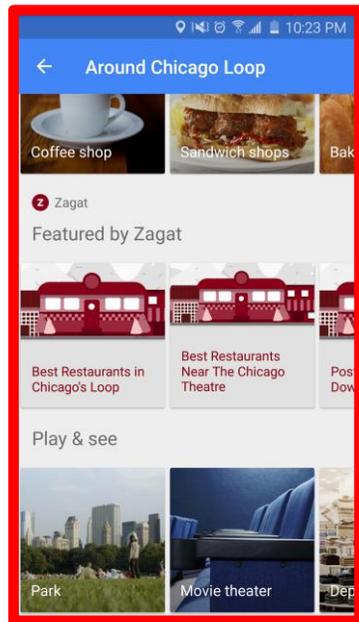
Explore Bar

Qualitative Data:

Half of our participants opted to use the explore feature on MapQuest while only two participants used the explore feature on Google Maps. We asked participants at the end of our tasks to rank how important different functions of a mapping application were on a scale of 1 to 5 with 1 being least important and 5 being most important. The average importance for the Explore nearby attractions was a 3 being neither important nor unimportant. On the other hand, the average importance for the search bar was 4.4 leaning towards Important.

Best Practice:

Include a search bar on mapping applications that is visible on all screens. While the explore function was widely used on MapQuest to find nearby locations, overall participants opted to use the search function. The search bar was also used for the navigation and saving location tasks, but could also be used for locating a saved location/user history. However, if you include an explore feature, consider following MapQuest design where the explore function displays a toolkit organized by categories such as food, gas, hotels, etc.



- A. Using the explore feature on Google, users must scroll all the way to the bottom of the page to reach diverse categories. Categories are also listed in a row, with only 2 options on screen at once.
- B. Alternatively, MapQuest's explore feature uses a toolkit design, which shows all categories on the same screen, while also keeping the visual map visible to the user.

Finding 4 - ETA Accuracy

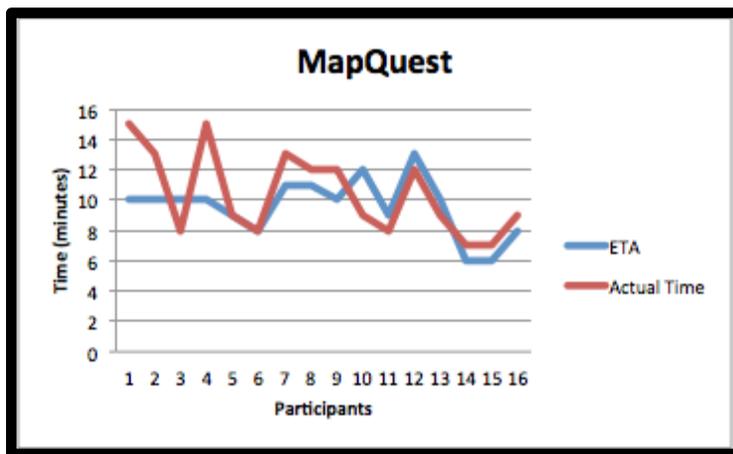
Hypothesis 6: MapQuest ETA is more likely to be less accurate than Google Maps ETA.

We conducted a paired t-test to compare the accuracy of ETA of each application for participants. We found no significant difference ($t_{(15)} = 1.07, p=0.30$) between accuracy of ETA for the Google Maps ($M = -0.56, SD = 2.50$) and MapQuest ($M = -0.81, SD = 2.26$) at alpha level .05.

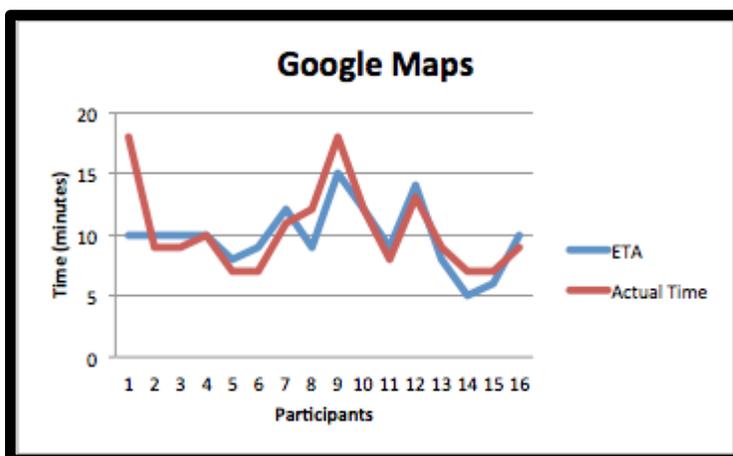
We speculate that Google Maps has a similar algorithm since the median and standard deviation of the two applications' ETA are similar with Google Maps median being -0.56 and MapQuest's - 0.81. The standard deviation of the two are even more similar with Google Maps SD being 2.50 and MapQuest being 2.25. The difference between the two ETA algorithms is apparent when directions on MapQuest take longer to update and recognize convenient paths.

Qualitative Data:

Through a Paired t-test, we found that there is no significance between the two applications' ETA. However, it's visible on the graphs constructed from the data gathered that Google maps' ETA is slightly more accurate than MapQuest's ETA. The ETAs from Google Maps were about just 1 to 2 minutes off from the actual time where MapQuest ETAs varied from 2 to 5 minutes. It must be noted that the first participant is an outlier in this data as she was not able to complete the task close to the ETA time in either of the applications.



The inaccuracy of MapQuest was also apparent when one participant used MapQuest and the directions were displayed on the screen after he had had walked about a block away from the starting point. Another participant had to find another route because the one provided by MapQuest directed her through a path under construction. Another participant commented “okay, well now i'm confused because it sent me to the wrong direction and now this is taking longer than the original ETA”.



Best Practice:

Users do value and remember the estimated time given to them by a mapping application. For credibility, mapping applications should at least follow the standard ETA accuracy as is being done by both MapQuest and Google Maps right now.

There are many elements that effect the difference between the ETA as given by the application and the user’s actual navigation time. Travel time may also be influenced by real variables, such as walking speed, traffic lights, construction, or other impediments or distractions. In the future, it would be useful to create controls that account for these variables.

Finding 5- Ease of Use

Hypothesis 7: Google Maps is more likely to be easier to use than MapQuest for pedestrians (According to wrap-up questions)

We conducted a paired t-test to compare the ease of use ratings participants assigned to Google Maps and MapQuest. We found a significant difference ($t_{(15)} = -3.15, p=0.0066$) at the 0.05 alpha level, such that participants rated Google Maps ($M=1.75, SD=0.68$) easier to use than MapQuest ($M=2.43, SD=0.63$).



Qualitative Data:

After having participants do the same tasks with both applications, they rated both in terms of ease of use. According to our statistical test, Google Maps was easier to use for the participants in comparison to MapQuest. However, we assume that the level of the familiarity of the participants might affect their response for ease of use. According to the data that have been gathered from this question, the two participants that had already been using MapQuest, rated this application easier than Google Maps, and eleven of the participants who were Google Maps user, rated Google Maps as an easier application than MapQuest, the rest rated them equally. One participant mentioned “MapQuest needs to have direction change when you get off course”. He pointed this as a reason that confused him and made it hard for him to use the application. The other participant cited “MQ should be more user friendly with picking favorites” which can be assumed that not being user-friendly triggers to having hard time using the application.

Best Practice:

Taking user feedback into consideration, mapping applications should simplify the steps that it takes to complete a task. Further, it would be beneficial for the mapping application to automatically detect the current fastest commute time and reroute the pedestrian to that route. Overall users seem to value efficiency while utilizing a mapping application. Many users stressed bad cellular signals and bad GPS signals as pain points. Having the mapping application hide or adjust these issues will improve user experiences.

Finding 6: Applications Reliability and Information Accuracy is important

Through our wrap-up questions asked after the completion of the user tasks on both MapQuest and Google Maps, we learned that only 3 of our 16 participants would continue using MapQuest. 5 of the 13 participants attributed the decision to continue using Google Maps to accuracy of the application. One participant exclaimed while trying to find a local bar on MapQuest, “uh... this is not locating stuff near where we are”. However, we noted that of the 16 participants, 7 participants attributed their reasoning for sticking to a specific mapping application based on familiarity; two of those participants were opting to continue using MapQuest.

Mapping Application Preference Before and After Evaluation																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Before																
After																

Best Practice:

For users to continue using your mapping application over competitors, it is crucial to ensure that each element of your mapping application displays accurate information and is reliable for navigating. Consider options such as offline maps and navigation updates on ETA and new routes based on day of the week, time, and user habits.