
GOOGLE MAPS VS APPLE MAPS: A USABILITY STUDY OF NAVIGATION APPS



Google Maps



Apple Maps

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English 317

Fall 2025

Table of Contents:

Introduction.....	3
Methodology.....	3
Test Environment and Equipment.....	3
Task List.....	3
Evaluating Criteria.....	4
Results.....	4
Task 1: Determine user preference of navigation app usage.....	4
Task 2: Identify users' experience using both apps.....	5
Task 3: Determine accuracy and responsiveness of each app.....	6
Task 4: Determine the interface clarity and map design.....	7
Task 5: Determine the reliability of traffic updates.....	8
Task 6: Determine the accessibility and ease of finding locations.....	9
Task 7: Find customization options such as route preferences.....	10
Task 8: Identify offline usability and map loading performance.....	11
Conclusion.....	13
Bibliography.....	13
Appendix.....	14

Introduction:

Navigation applications have become a daily necessity for most smartphone users. They help people find the fastest routes, explore new places, and estimate travel times. Among the most popular options are Google Maps and Apple Maps, two platforms that dominate the navigation market.

This usability study compares Google Maps and Apple Maps to determine which app provides a better overall user experience for typical smartphone users. The target users are college students and everyday drivers with moderate technical ability who rely on mobile devices for daily navigation. The study evaluates each app based on five key usability components: effectiveness, efficiency, engagement, error tolerance, and ease of learning.

Methodology:

Test Environment and Equipment:

The usability test was conducted indoors under stable network conditions to maintain consistency. Both apps were tested on two devices:

- ❖ Google Maps: One Plus Nord N30
- ❖ Apple Maps: iPhone 16

Each phone was updated to the latest software version, and all tests were performed using the same Wi-Fi connection. Background applications were closed to ensure smooth operation and accurate results.

Task List:

Participants completed the following tasks designed to simulate real-world navigation situations:

- ❖ Search for a nearby restaurant.
- ❖ Start turn-by-turn driving directions.
- ❖ Add a stop along the route.
- ❖ Check real-time traffic updates.
- ❖ Switch to walking mode.
- ❖ Save and share a location.
- ❖ Customize route preferences such as avoiding tolls or highways.
- ❖ Test offline map loading and navigation accuracy.

Each task began with a clear instruction using an action verb (e.g., Find, Add, Check) to promote consistency across both apps.

Evaluating Criteria:

Each task was rated based on the five main usability components:

- ❖ Effective: Could users complete the task successfully?
- ❖ Efficient: Was the task completed quickly and with minimal effort?
- ❖ Engaging: Was the interface visually appealing and satisfying to use?
- ❖ Error Tolerant: Could users easily recover from mistakes or wrong inputs?
- ❖ Easy to Learn: Was it simple for new users to understand and perform tasks?

All criteria were measured using a 5-point Likert scale as shown below:

Rating	Description
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

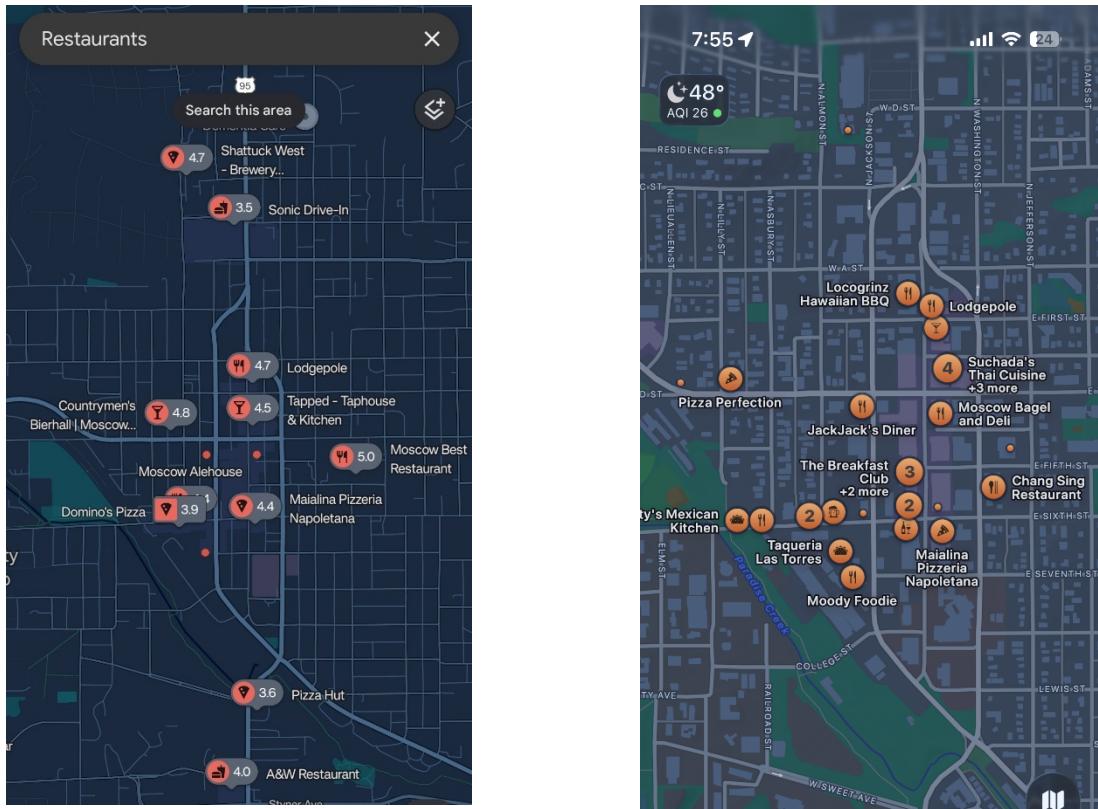
Results:

Below are the results for each task, including descriptions and scoring.

Task 1: Search for a nearby restaurant

Google Maps Result: Quickly displayed multiple restaurants with ratings.

Apple Maps Result: Displayed fewer results, but with cleaner visuals.



Google Map

Apple Map

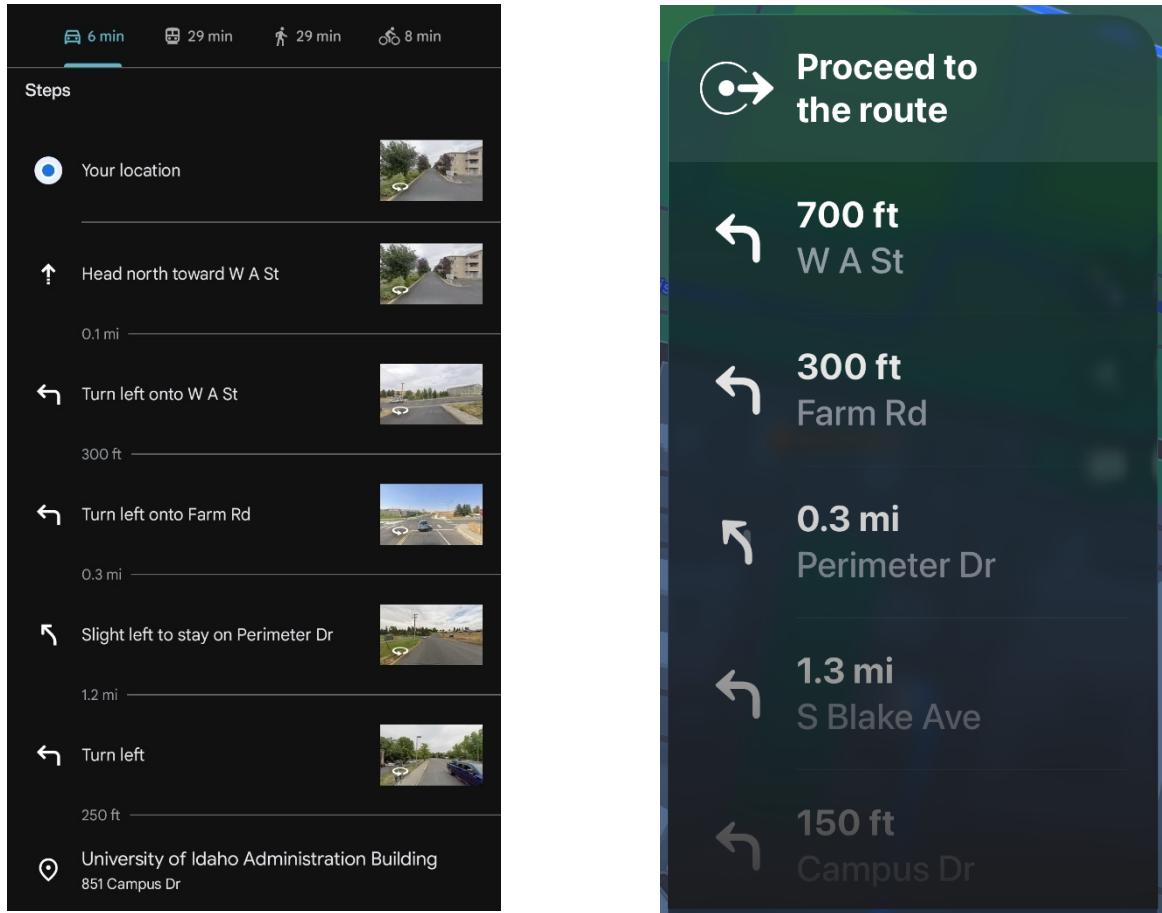
Figure 1. Searching for restaurants on both apps.

Metric	Google	Apple
Effective	5	4
Efficient	5	4
Engaging	4	5
Error Tolerant	5	4
Easy to Learn	5	5

Task 2: Start turn-by-turn driving directions

Google Maps Result: Fast route loading and accurate travel times.

Apple Maps Result: Clearer voice instructions but slightly slower route load.



Google Map

Apple Map

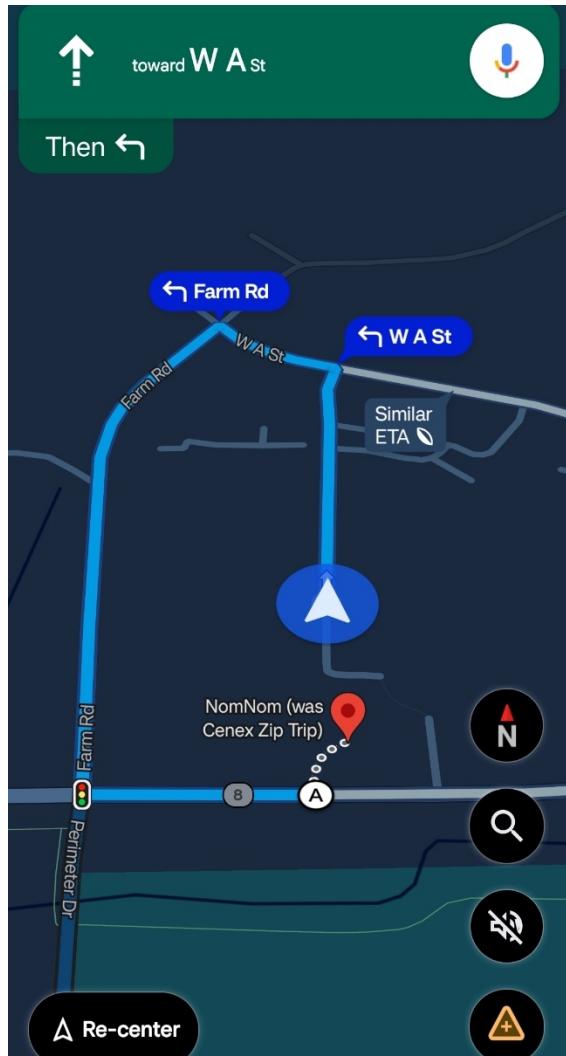
Figure 2. Turn-by-turn navigation screens.

Metric	Google	Apple
Effective	5	5
Efficient	5	4
Engaging	4	5
Error Tolerant	5	4
Easy to Learn	5	5

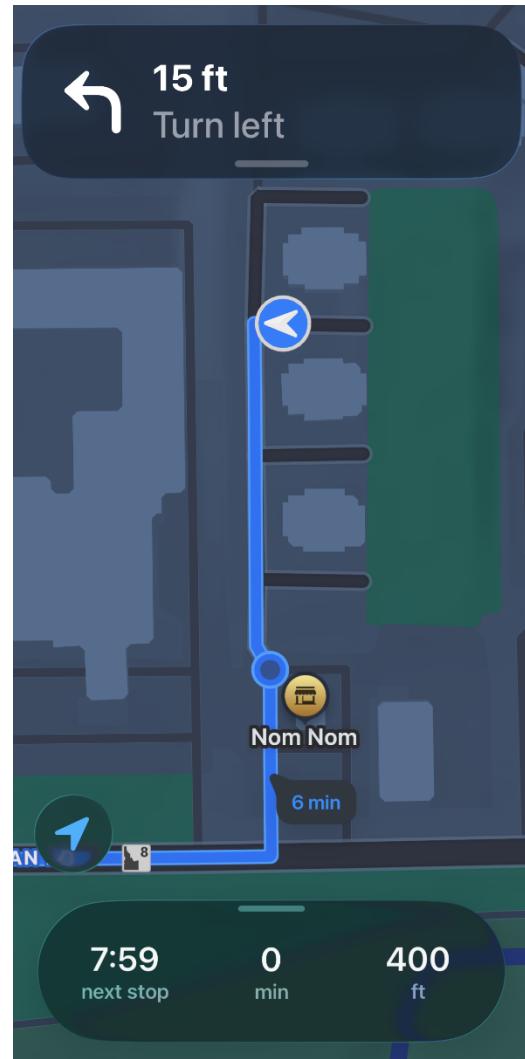
Task 3: Add a stop along the route

Google Maps Result: Easy to add stops directly from the navigation bar.

Apple Maps Result: Adding stops required more steps. And it's not accurate.



Google Map



Apple Map

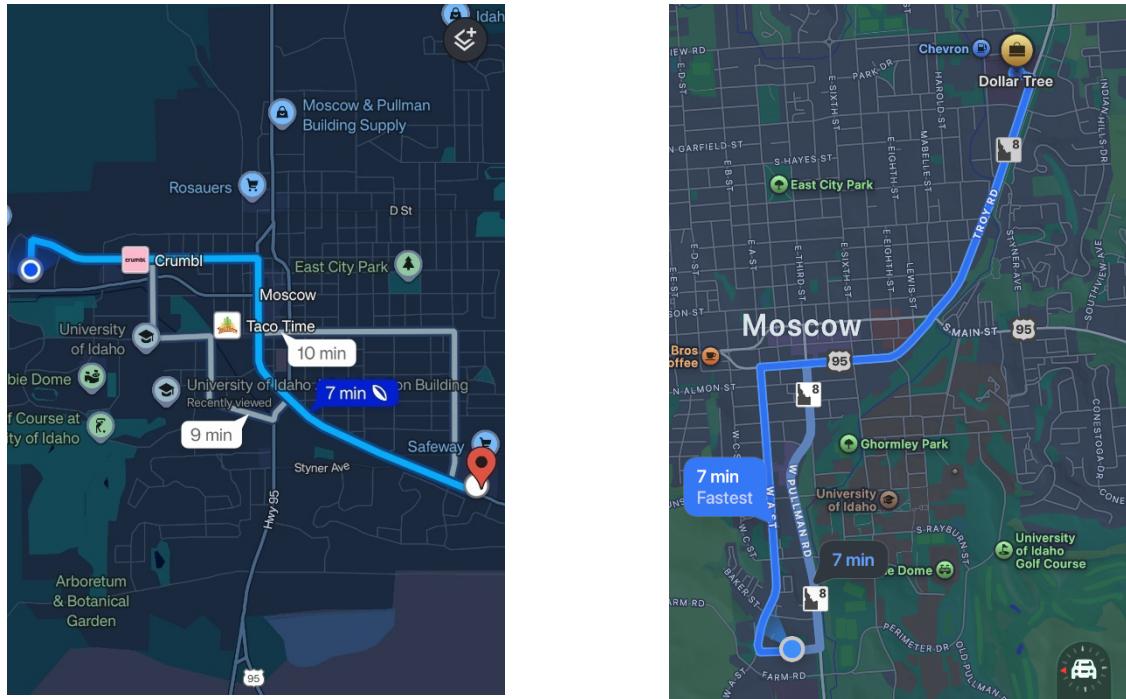
Figure 3. Adding a stop.

Metric	Google	Apple
Effective	5	4
Efficient	5	3
Engaging	4	4
Error Tolerant	5	4
Easy to Learn	4	3

Task 4: Check real-time traffic

Google Maps Result: Traffic view updates instantly, color-coded.

Apple Maps Result: Traffic updates slower; fewer details.



Google Map

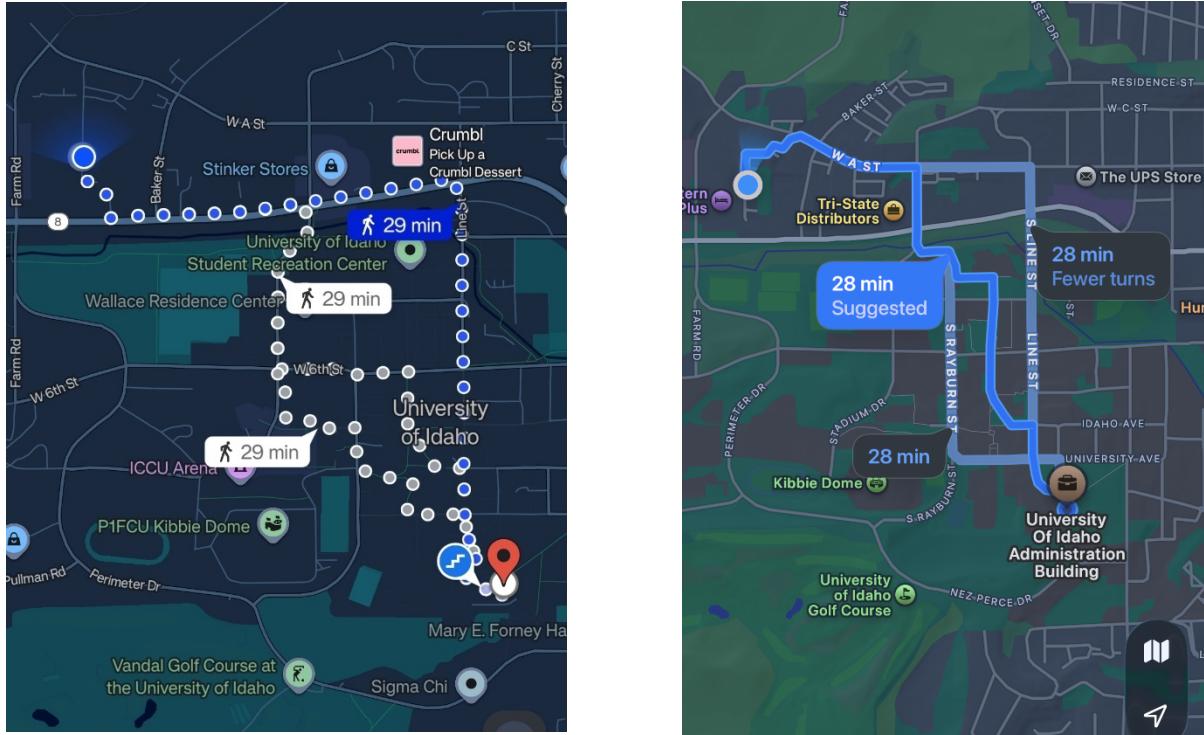
Apple Map

Figure 4. Traffic comparison.

Metric	Google	Apple
Effective	5	4
Efficient	5	4
Engaging	4	4
Error Tolerant	5	4
Easy to Learn	5	5

Task 5: Switch to walking mode

Both apps performed well, but Google displayed more pedestrian-friendly paths.



Google Map

Apple Map

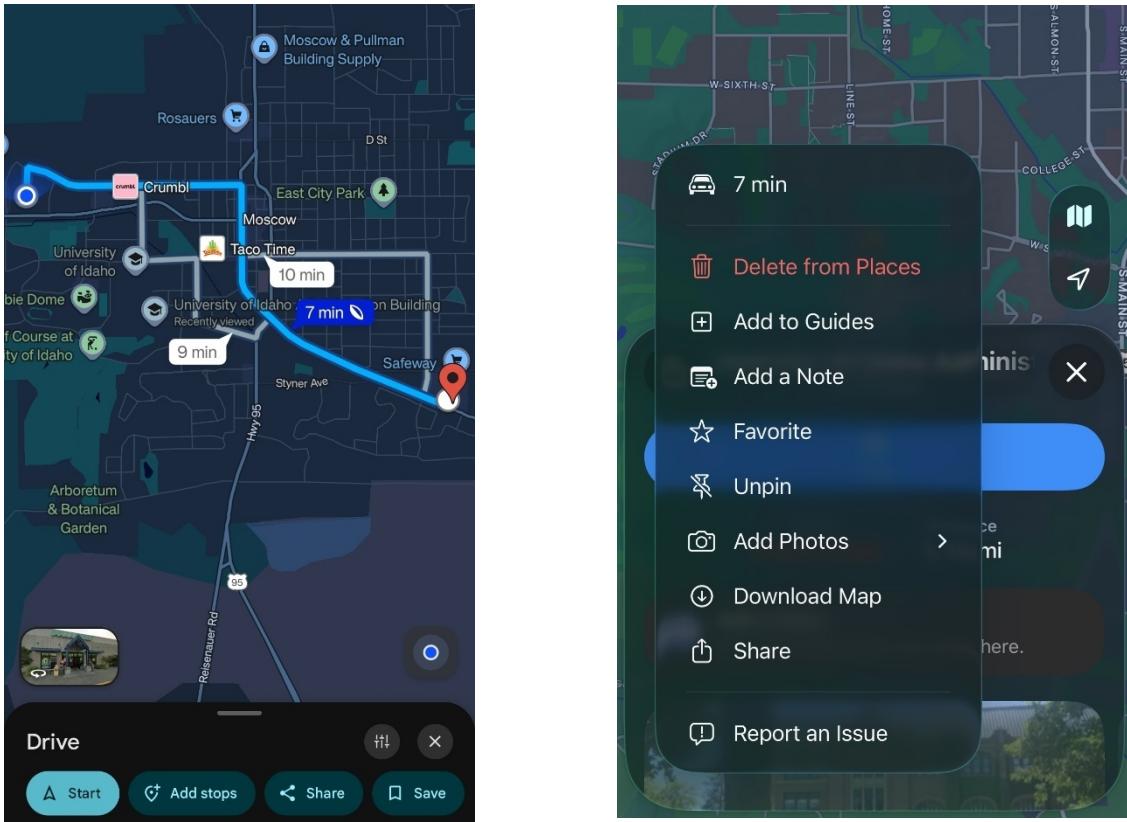
Figure 5. Walking mode screens.

Metric	Google	Apple
Effective	5	4
Efficient	4	4
Engaging	4	5
Error Tolerant	5	5
Easy to Learn	5	5

Task 6: Share a location

Google Maps Result: Share button easy to access.

Apple Maps Result: Sharing options buried deeper in the UI.



Google Map

Apple Map

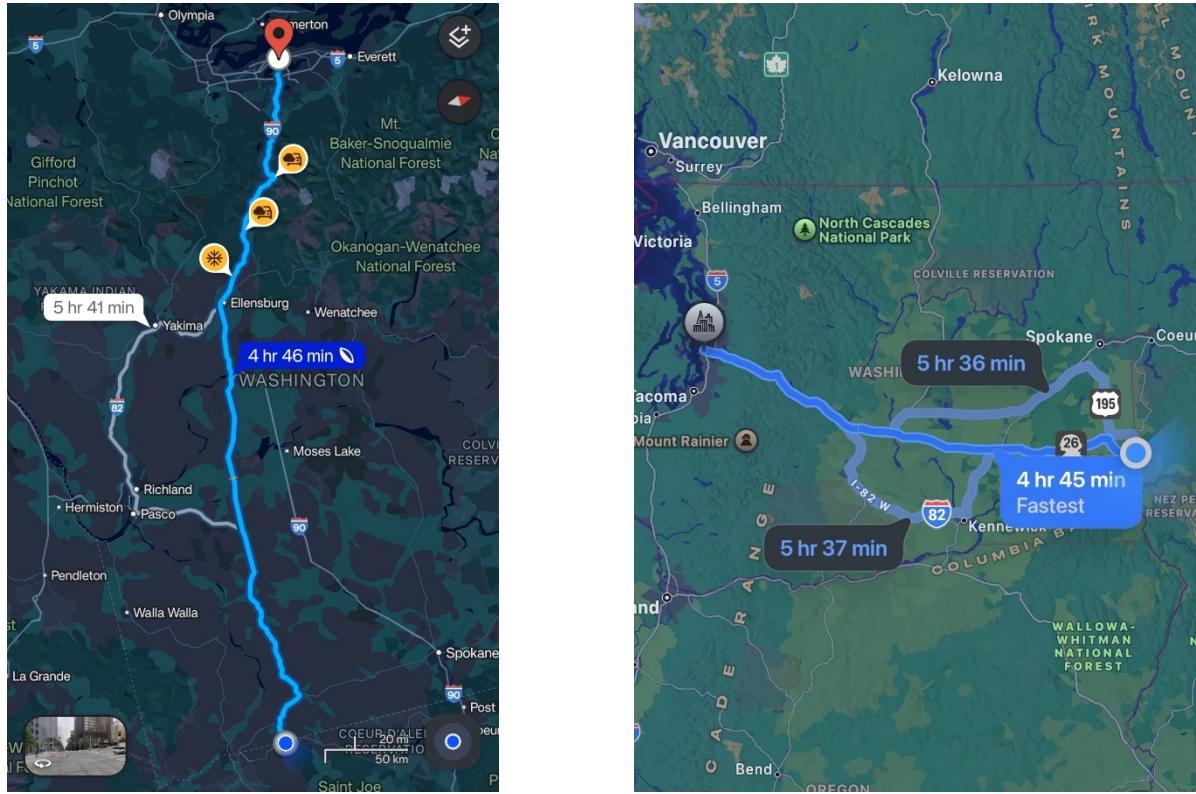
Figure 6. Sharing location feature.

Metric	Google	Apple
Effective	5	4
Efficient	5	3
Engaging	4	5
Error Tolerant	5	4
Easy to Learn	5	4

Task 7: Customize route preferences

Google Maps allows avoiding tolls, ferries, and highways.

Apple Maps has fewer customizable route filters.



Google Map

Apple Map

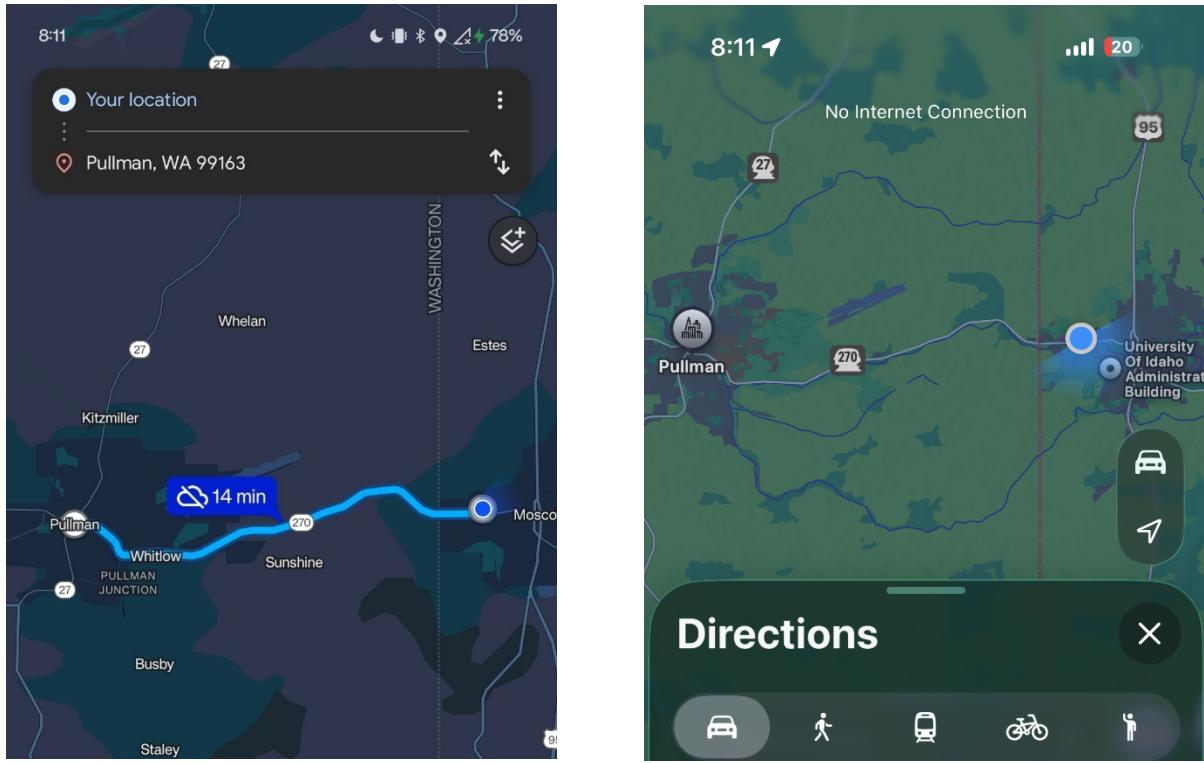
Figure 7. Route customization.

Metric	Google	Apple
Effective	5	3
Efficient	5	3
Engaging	4	4
Error Tolerant	5	4
Easy to Learn	4	3

Task 8: Offline navigation test

Google Maps allows downloading full offline maps.

Apple Maps offers limited offline support, slower load.



Google Map

Apple Map

Figure 8. Offline map mode.

Metric	Google	Apple
Effective	5	3
Efficient	5	3
Engaging	4	4
Error Tolerant	5	3
Easy to Learn	4	3

Total Score Comparison (Averages)

App	Average Score (Across All Tasks)
Google Maps	4.78
Apple Maps	4.05

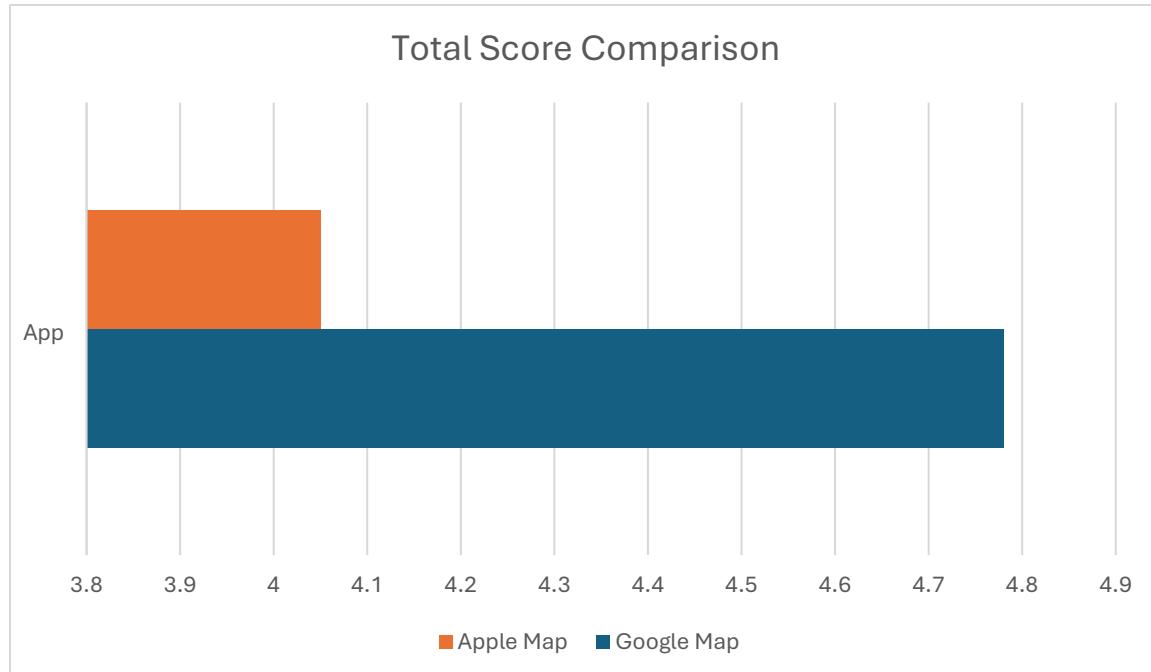


Figure 9: Total Score Comparison Chart

Google Maps outperformed Apple Maps in almost every category, especially in customization, traffic updates, and offline usability.

Conclusion:

The usability testing of Google Maps and Apple Maps showed that both applications are capable navigation tools, but Google Maps consistently provided a stronger overall user experience. It performed better in efficiency, customization, traffic accuracy, and offline usability, making it more suitable for users who rely heavily on navigation or need advanced features. Apple Maps, while less feature-rich, offered a cleaner interface and an easier learning curve, which users found visually appealing and simple to navigate. Overall, Google Maps is the more comprehensive and adaptable option for most users, while Apple Maps remains a strong choice for beginners or those who prefer a straightforward and visually polished design.

Bibliography:

Google Maps. Google LLC, Mobile Application.

Apple Maps. Apple Inc., Mobile Application.

Appendix:

Task	Google Map					Apple Map				
Task 1	Search for a nearby restaurant									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				

Task	Google Map					Apple Map				
Task 2	Start turn-by-turn driving directions									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5					Strongly Disagree Disagree Neutral Agree Strongly Agree 1 2 3 4 5				

Task	Google Map					Apple Map				
Task 3	Add a stop along the route									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5

Task	Google Map					Apple Map				
Task 4	Check real-time traffic									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5

Task	Google Map					Apple Map				
Task 5	Switch to walking mode									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5

Task	Google Map					Apple Map				
Task 6	Share a location									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5

Task	Google Map					Apple Map				
Task 7	Customize route preferences									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5

Task	Google Map					Apple Map				
Task 8	Offline navigation test									
Efficient	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Effective	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Engaging	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Error Tolerant	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
Easy to Learn	Strongly Disagree Disagree Neutral Agree Strongly Agree					Strongly Disagree Disagree Neutral Agree Strongly Agree				
	1	2	3	4	5	1	2	3	4	5