Google Maps AR Anchors

Using breadcrumbs for micro navigation

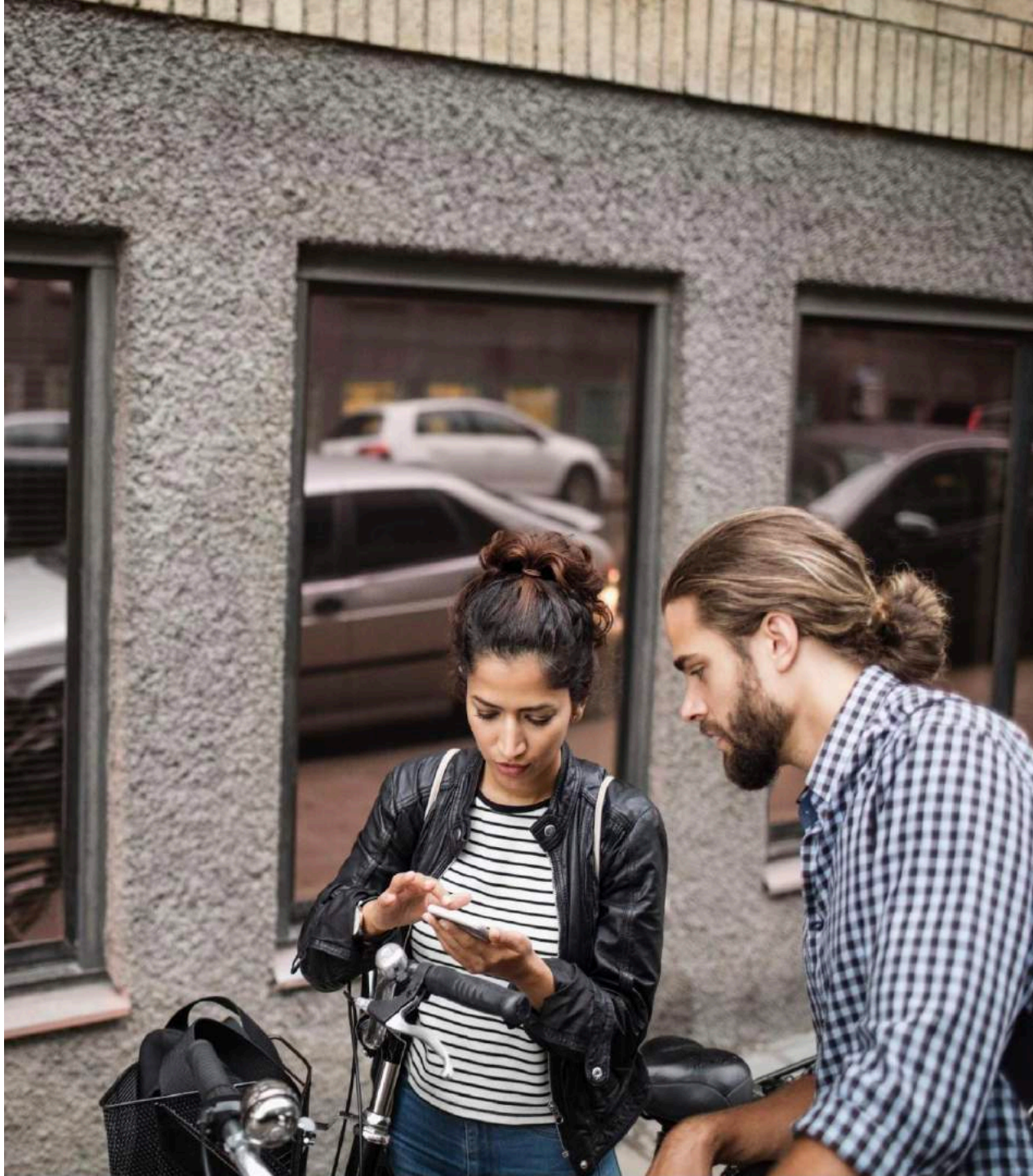
Animesh Gupta & Fatima Rafiqui | Fall'2020

Design Opportunity

It all started with a friend having problems

A friend who is a new settler in New York, had recently come to start his journey as a graduate student. While having casual conversations with him, he often expressed his frustration of getting confused while figuring out the public transportation in New York.

I also got reminded of the time when we last visited the city, and how difficult it was to figure the subway system. This was not the case with subway system back in India. We started investigating the problem to find the design opportunity.



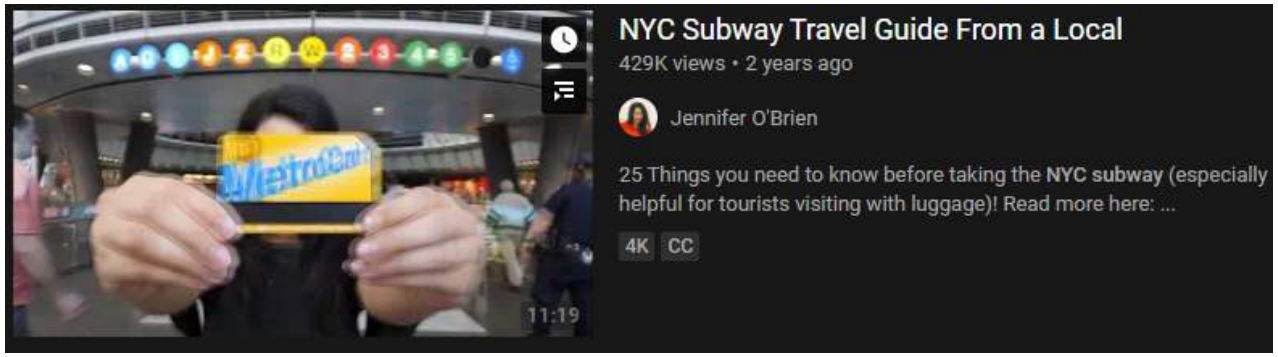
Desk research

Show me the real issue

We conducted several desk research methods which lead us to understand the real problem that public transport system faces in NYC.

We looked at YT videos by well known publishers, read articles about the history of NY subways and news about the current efforts by MTA to improve the experience.

We learnt that there were larger issues at play which could not be solved by tech alone.



Product study

Where were the apps failing?

We found that the apps that we reviewed were robust in their own ways, but none provided an experience that felt complete.

Frequent route delays, learning a new mental model and lack of updated information were issues that popped up.

Citymapper

Transit

MTA App

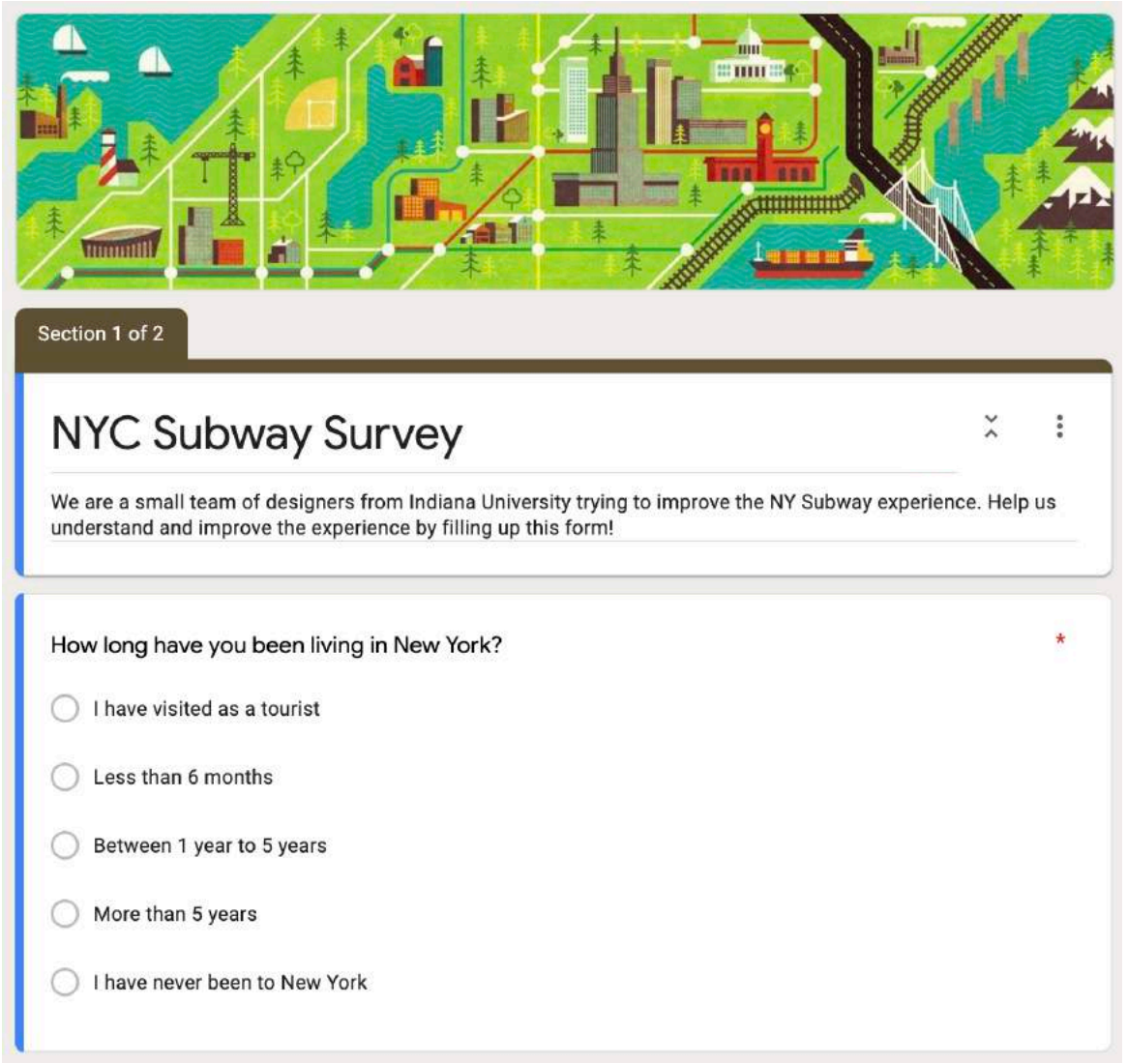
Google maps

Man on the street survey: Coronavirus Edition

Is everybody facing the same challenges?

We conducted a survey to understand if the challenges were similar across the New Yorkers. The key takeaways from our survey were:

- 73 % people use Google Maps for navigation, rather than MTA, Transit or Citymapper.
- 65 % people use subway and public transport bus as opposed to private cabs, bikes etc.
- The major issues identified were complex subway system entrances, route confusion and overly crowded trains.



User Interviews

Diving deeper; we wanted to see what the New Yorkers had to say about it.

1

Contextual information reduces cognitive overload.

“When I first came here, it was very overwhelming. Once I was right at the location, but took 30 minutes to reach my destination”

2

Experiences in a new city might lead to cultural shocks.

“Homelessness, street and subway performances are part of the New York lifestyle, but when I first came here, it was very terrifying for me.”

User Interviews

Diving deeper; we wanted to see what the New Yorkers had to say about it.

3

Google maps need to strike a balance between standard and personalized features.

“Color coding means something else in New Delhi metro, while it is completely different for New York subway”

4

Maps needs to break down the user journey to make it more digestible.

“I only care about what my next step should be. Sometimes it becomes a lot to take.”

Reality Check.

We had to re-evaluate our project plan.

Feasibility Evaluation

Taking a step back, We had to re-evaluate.

We were trying to solve for route delays.

✕ Things that apps cannot solve.

Recommendations, service aggregation, and offline use.

✕ Already Supported by Google.

Support for cultural learning as a pre-travel step.

✕ People would rarely use it.

> We started off by designing for maps on smart watches initially, but through research we realized we were not focusing on the right problem.

We discovered that we were on the wrong road.

Pivot.

Time to reroute our project plan.

Affinity Mapping

How might we?

Onboarding support for travelers on a short visit or new settlers.

Improve the navigation by drawing more from user behavior.

Normalize cultural differences for tourists/new settlers for a short visit.

Revised Design Opportunity

Going beyond initial considerations

We realized that although we might be solving for NYC, we had to introduce a design that could be applied elsewhere. Secondly, the idea had to be something that's not implemented already.

Support culture normalization

Translate mental model

Hyper local navigation

Personalized anchor points

User personas

Meet Bilal

Bilal recently moved to NYC from a small town in Europe. He needs to figure out his way around the city along with adjusting to his new life.

Characteristics

Inexperienced | Cautious | Excited | Overwhelmed

Goals & Motivation

Build a new mental model, Balance between work and settling in, Balance between ensuring safety and exploring the city.

Frustrations

No social connection, Adapting to new culture, Language barrier, Need for belonging, danger to self/belongings.

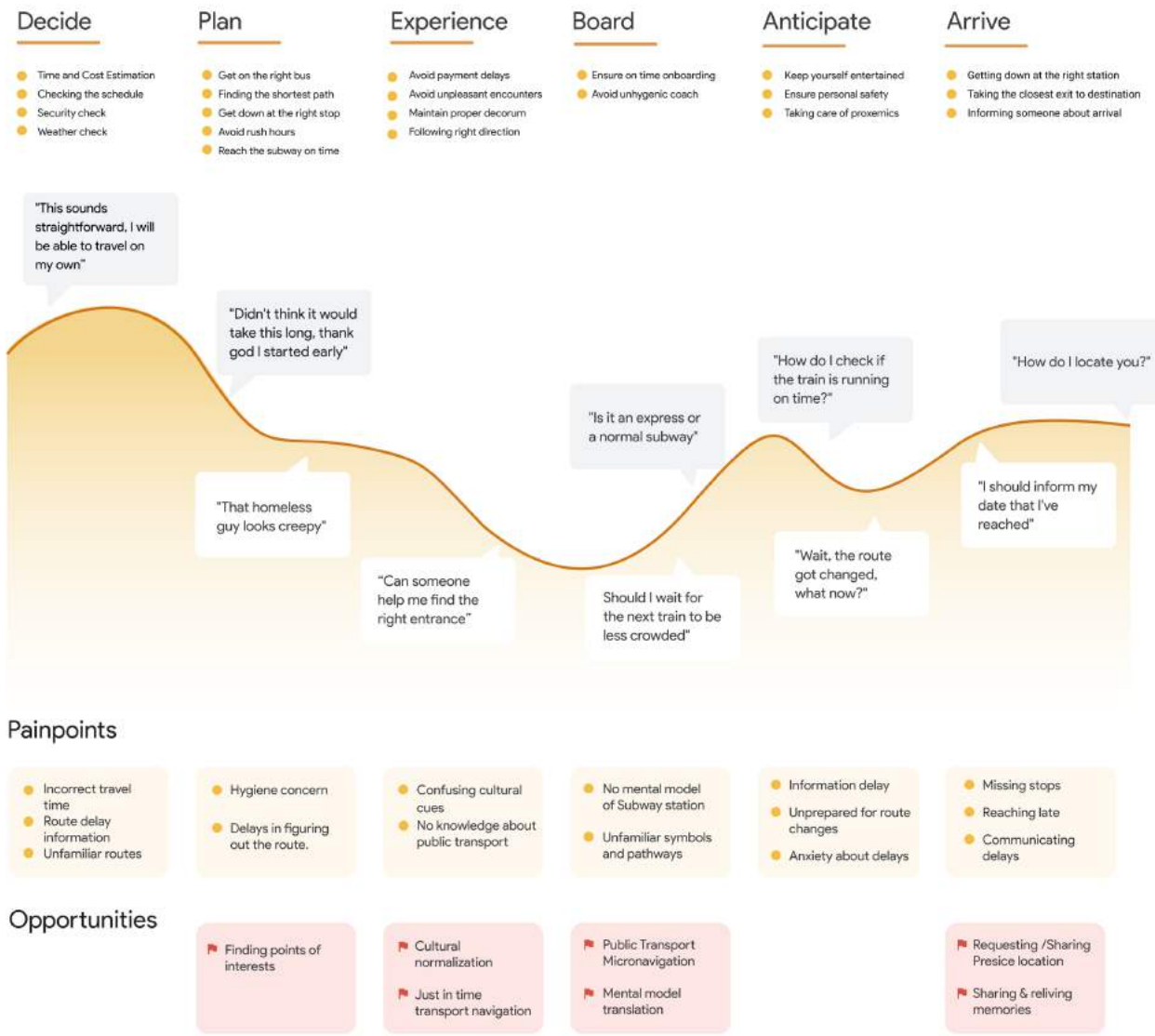
User journey

Let’s take a trip with Bilal

Bilal moves to a New York when he gets a new job at a startup. He has always lived in a small town in Europe.

When he moved to the new city, he finds himself overwhelmed, confused and apprehensive.

He needs to figure out how to use the public transport to meet his date at a restaurant.



Concept Generation & Divergent Thinking

We wanted to think beyond conventional ideas.

We did few brainstorming exercises to make us think divergently and generate out of the box concepts. We also evaluated our ideas to assess feasibility.

Crazy Concepts

Idea Generation

Idea Mashup

Principle Generation

Exemplar Collection

Feasibility Testing

Exemplar Collection

What would Google do?

To find existing products to inspire our project, we looked within the Google ecosystem.

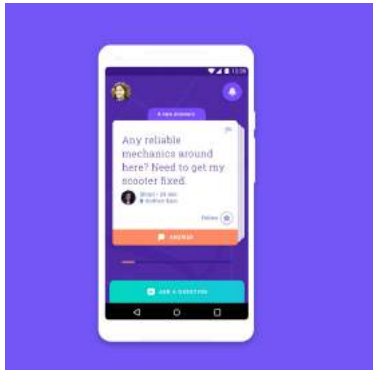
We found several technologies and products that tried to implement similar ideas but with a different intent. Our aim was to leverage these to argue for the feasibility of our idea.

Live AR

AR navigation

Playground

AR stickers



Neighbourly

Crowdsourced information

Tour Creator

Immersive 360 Tours

Guiding Principles

Design principles

To form our design principles, we used design ideation technique such as idea mashup to generate crazy solutions for the problems we were trying to solve.

Although these solutions were far from implementable, we formed design principles that would be incorporated in our project.

Preparedness

Travel expectations

Reliability

Navigation reliability

Familiarity

Cultural awareness

Delightful

Exploratory wonder

Design Phase.

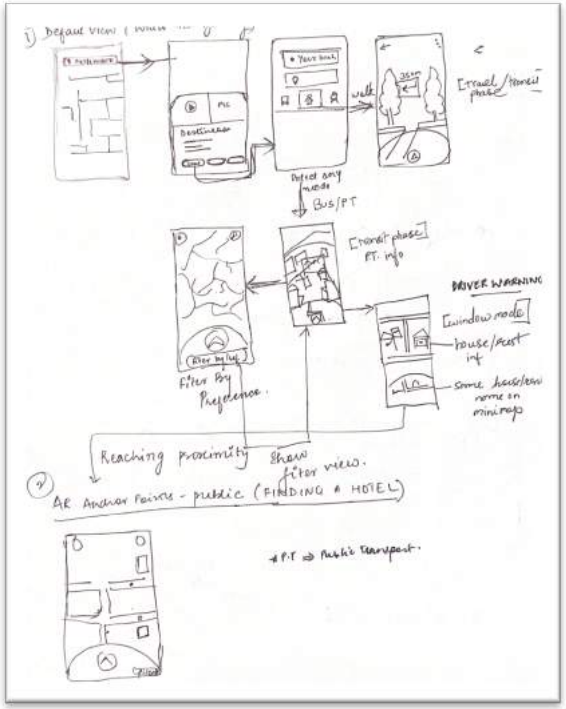
Design Iteration 1

Starting off by Sketching

We started sketching concepts using the design principles and our research insights.

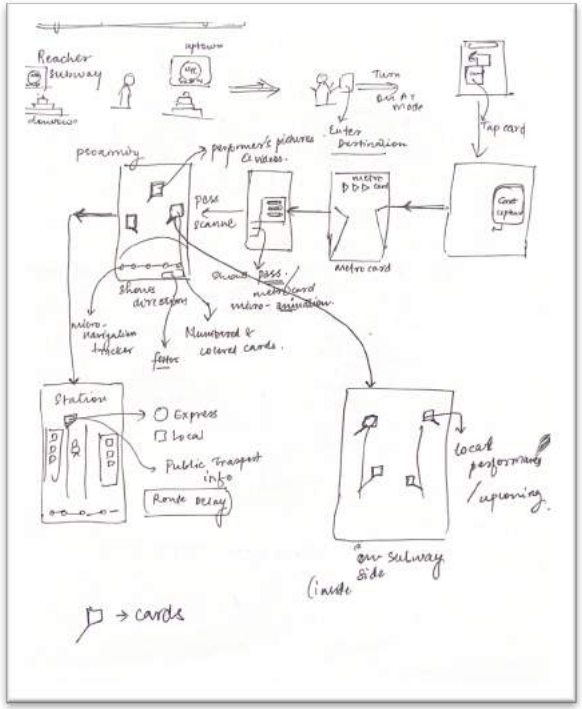
From our survey, we found Google Maps to be widely used. People hated switching between apps to get reliable information.

Therefore, we focused on exploring solutions that worked within the confines of Google Maps.



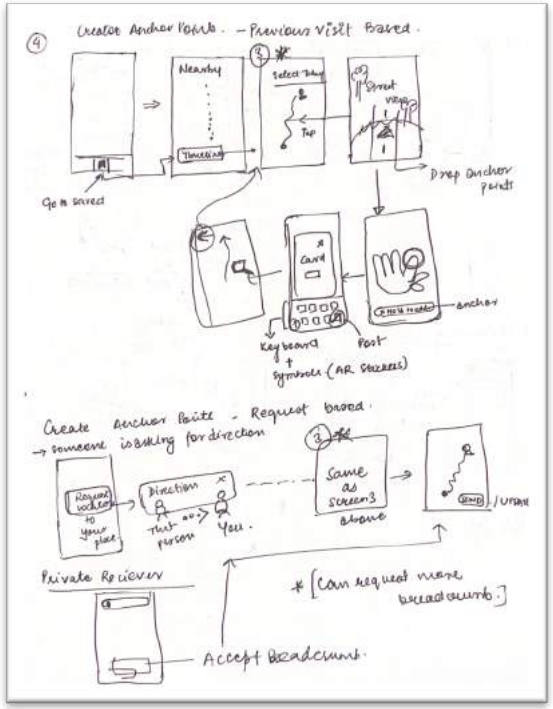
Complex route navigation

Idea Generation



Cultural Normalization

Principle Generation



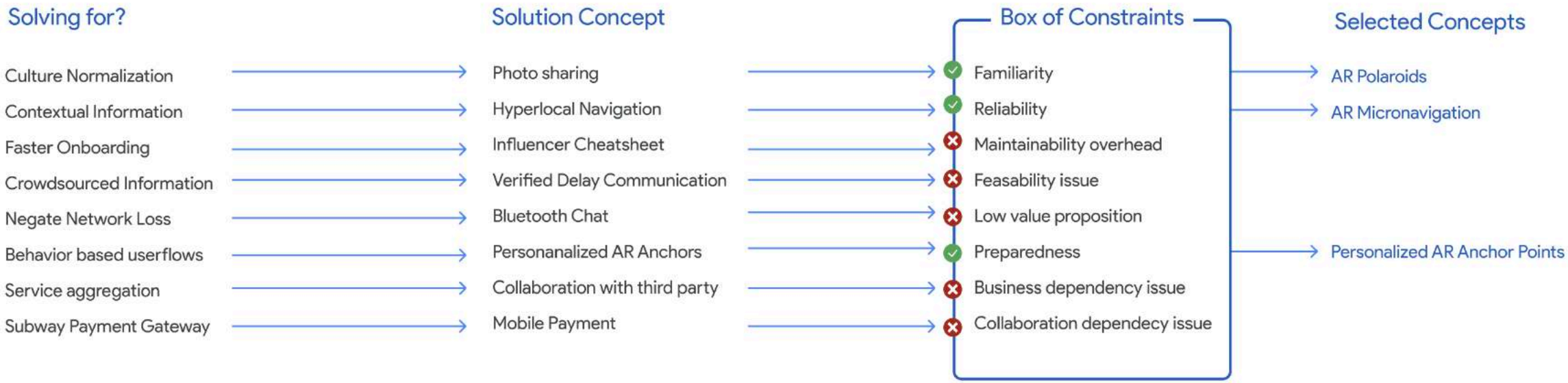
Exemplar Collection

Feasibility Testing

Design Iteration 2

Narrowing Down & Refinement

We evaluated all our concepts against our set principles as constraints.

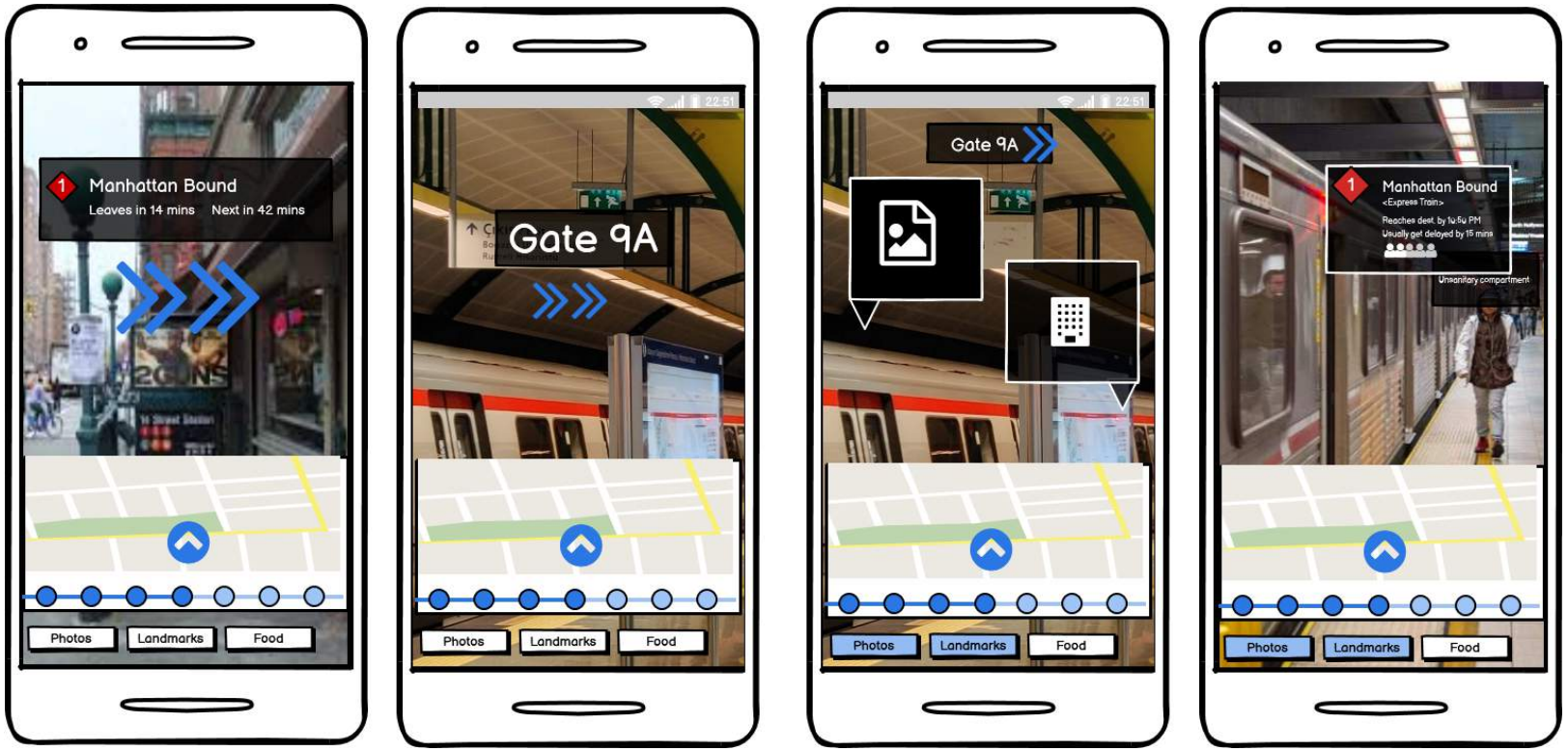


Design Iteration 3

Low fidelity Prototyping

Once we had our initial sketches ready, we used Balsamiq to make our low fidelity prototypes.

We went through 3 rounds of iterations to refine our AR mode design based on feedback from New Yorkers.



Final Concept Overview

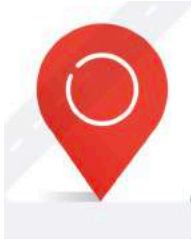
Adding navigational layer on the world through AR

AR anchor points allowed us to solve complex navigational issues without incurring a cost to make changes to the real world.

Our concepts solve for not only the public transport issue, but also location sharing and cultural normalization.

Micro navigation

Public transport navigation



AR anchors

Navigational Breadcrumbs

Polaroids

AR Image Sharing

Introducing our Final Solution

The Final solution

#1 Concept

AR Micro navigation

AR micro-navigation for subway is designed to help travellers and commuters alike. The cards help people gather relevant travel information while reducing the friction that comes with deciphering travel information boards.

The anchored AR cards will also help users reach their platform faster through micro navigation. To add user delight to the user's journey, we have added filters which provide fun and informational tidbits that exist around the user.

AR Cards

- Micro-navigation direction
- Train schedule and delay information
- Subway car information

Journey Information

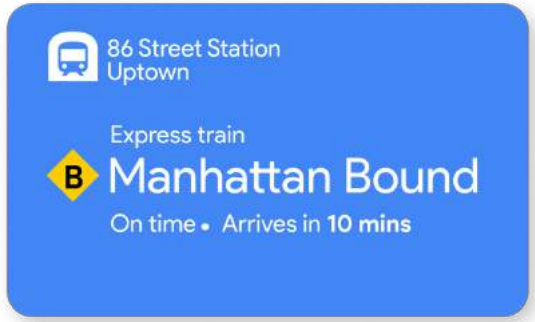
- Contextual information
- Reusable space to show relevant information

AR Filters

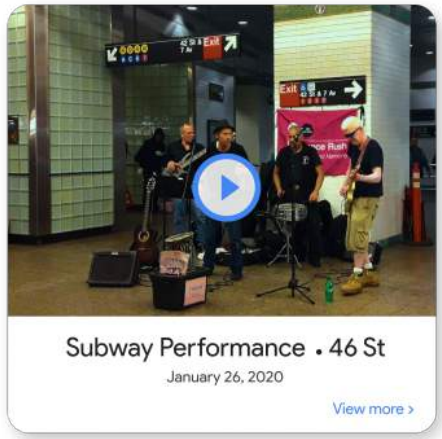
#1 Concept

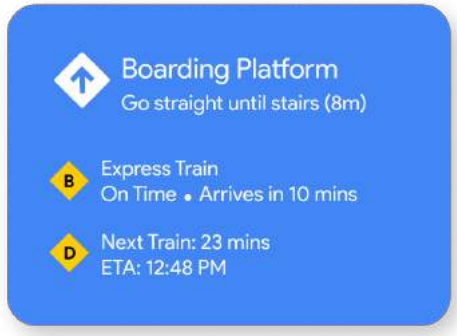
Subway Navigation Cards

Subway Entrance

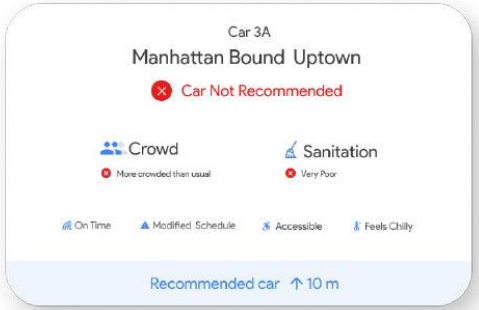


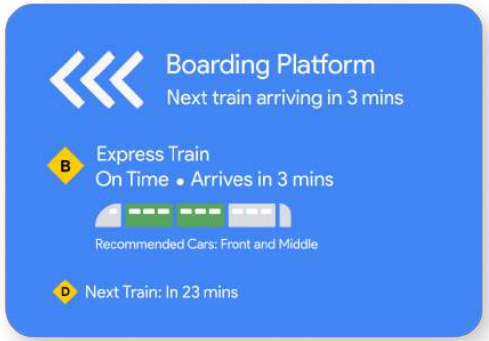
Concourse level





Platform level

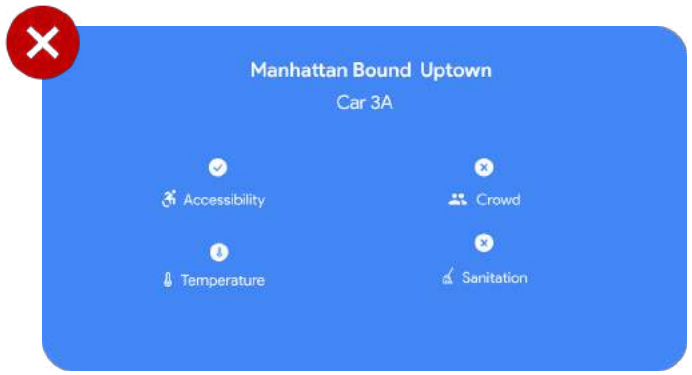




#1 Concept: Iteration after Testing

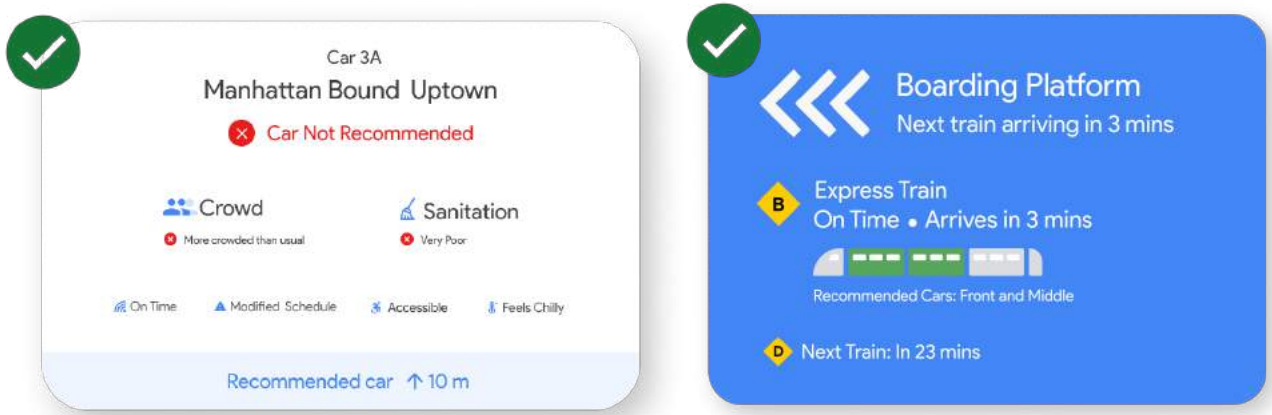
Design Decisions

Initial Design



The initial card design lacked visual hierarchy and the information was not grouped in a way to give users information at one glance.

Revised Design



The revised cards har better hierarchy, were easy to follow can consisted of subway car suggestion as well based on crowdsourced data.

“ I am glad that I know where to stand in anticipation of the right subway car, it is a must have information.”

- Testing Participant

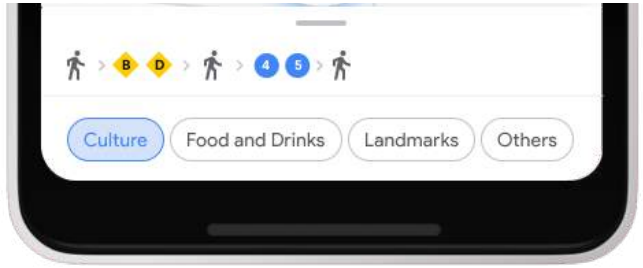
#1 Concept: Iteration after Testing

Journey Information

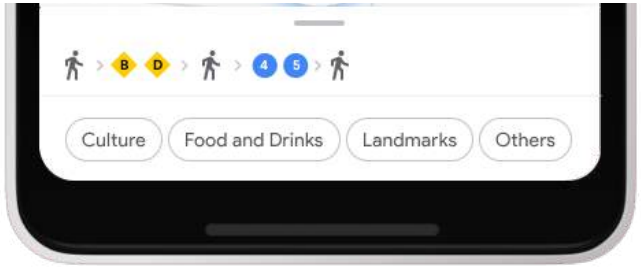
Using the existing pattern for a journey breakdown for navigation, we designed the journey information section of our prototype.

To expand on the concept, we decided to make this space contextual to use.

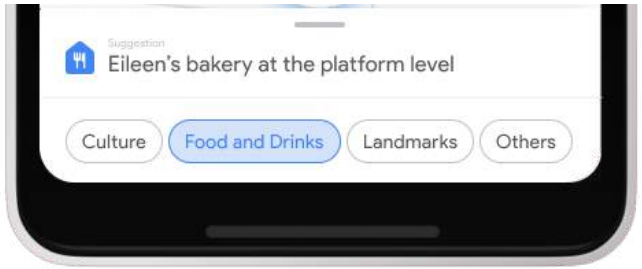
Depending on breaking information, user filters or travel information, the user will be shown the most relevant thing they need to learn about. If the user is interested to know more, they no longer have to leave the AR view. They can directly swipe up to expand the bottom card.



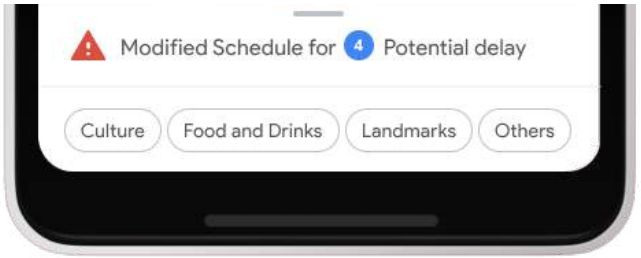
Culture filter selected



Default view



Food and drinks filter selected,



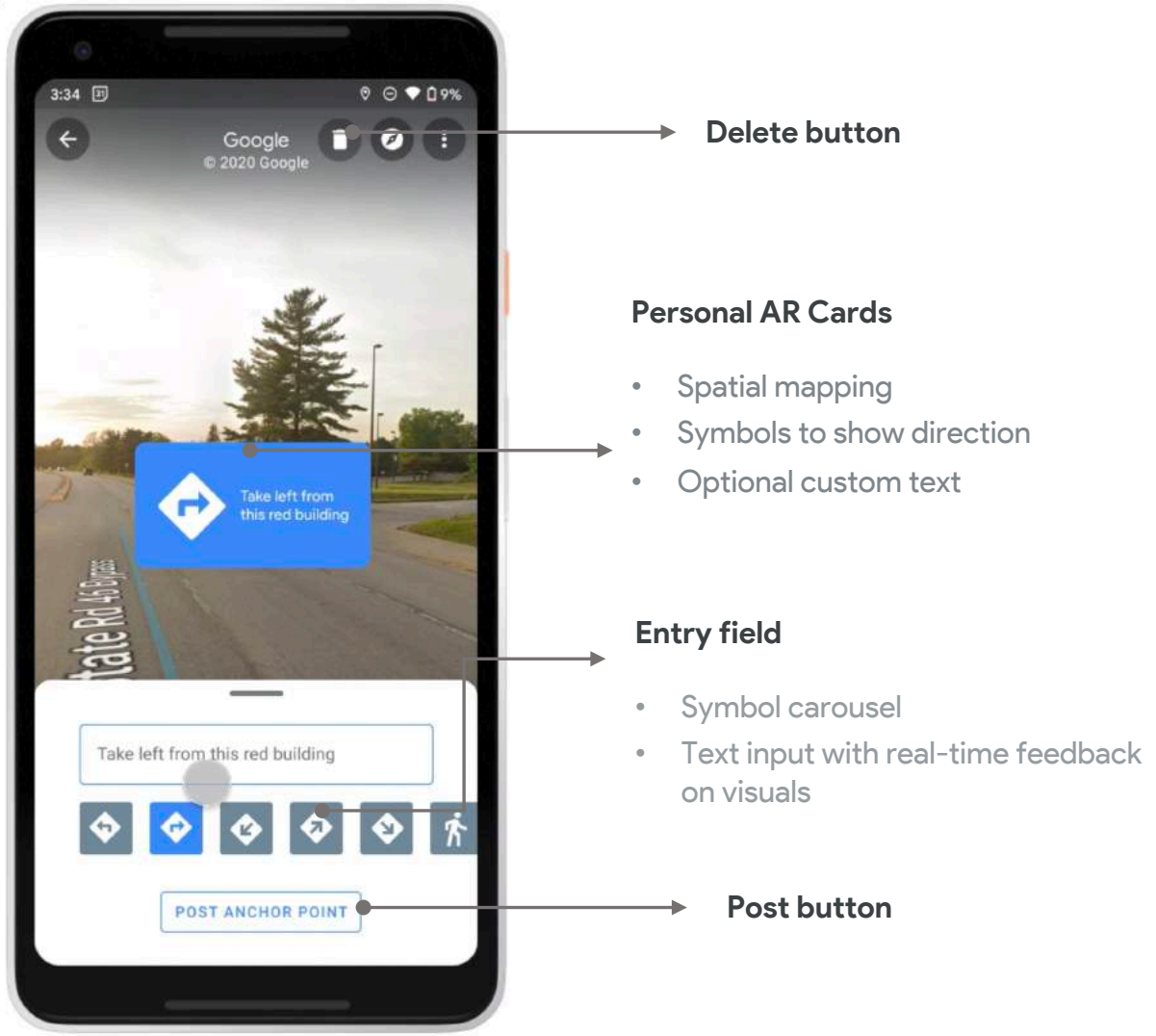
Highlighted delay information

#2 Concept

Personalized AR Anchors

Bilal being new to the city has a tough time navigating when the person on the other side is giving direction based on landmarks. The problem intensifies when the landmark itself gets too complex to explain by the person guiding Bilal.

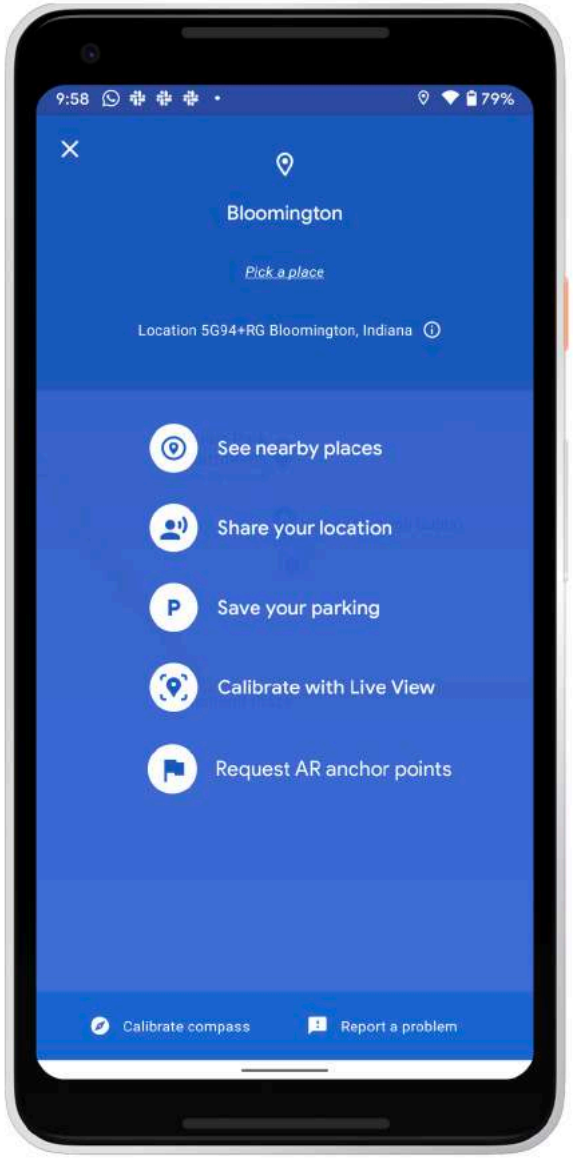
Hence, we present our solution of AR Anchor Points.



AR Anchor Points

Request Anchor Points

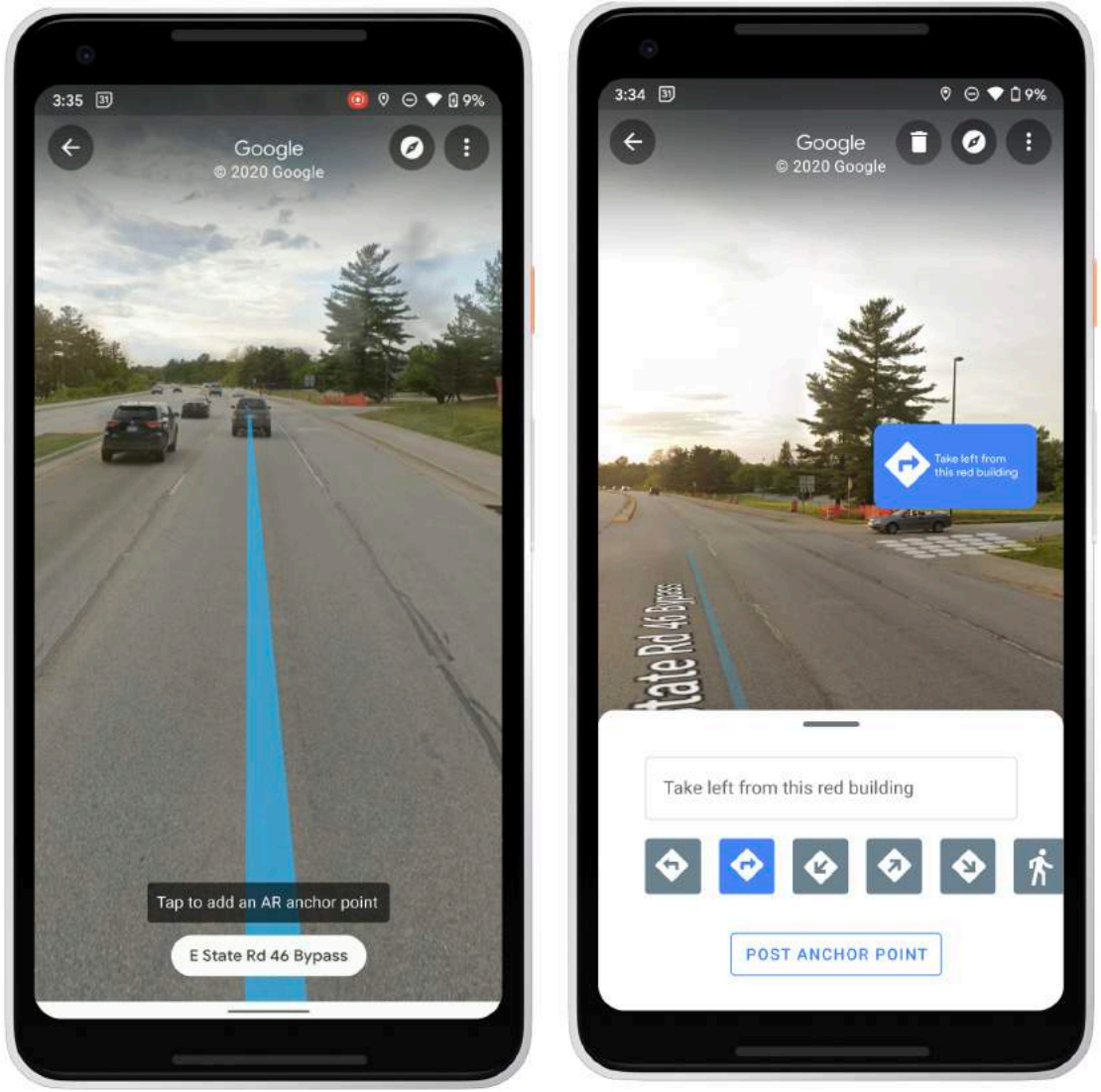
When leaving his place, Bilal asks his friend to send him an AR anchor point guided directions so that he could familiarize with the route and travel with preparedness.



AR Anchor Points

Create Anchor Points

Bilal's friend on receiving the request to share anchor points, views the overall journey from his location to where Bilal is currently. He taps on different sections of the journey to create the relevant anchor points.

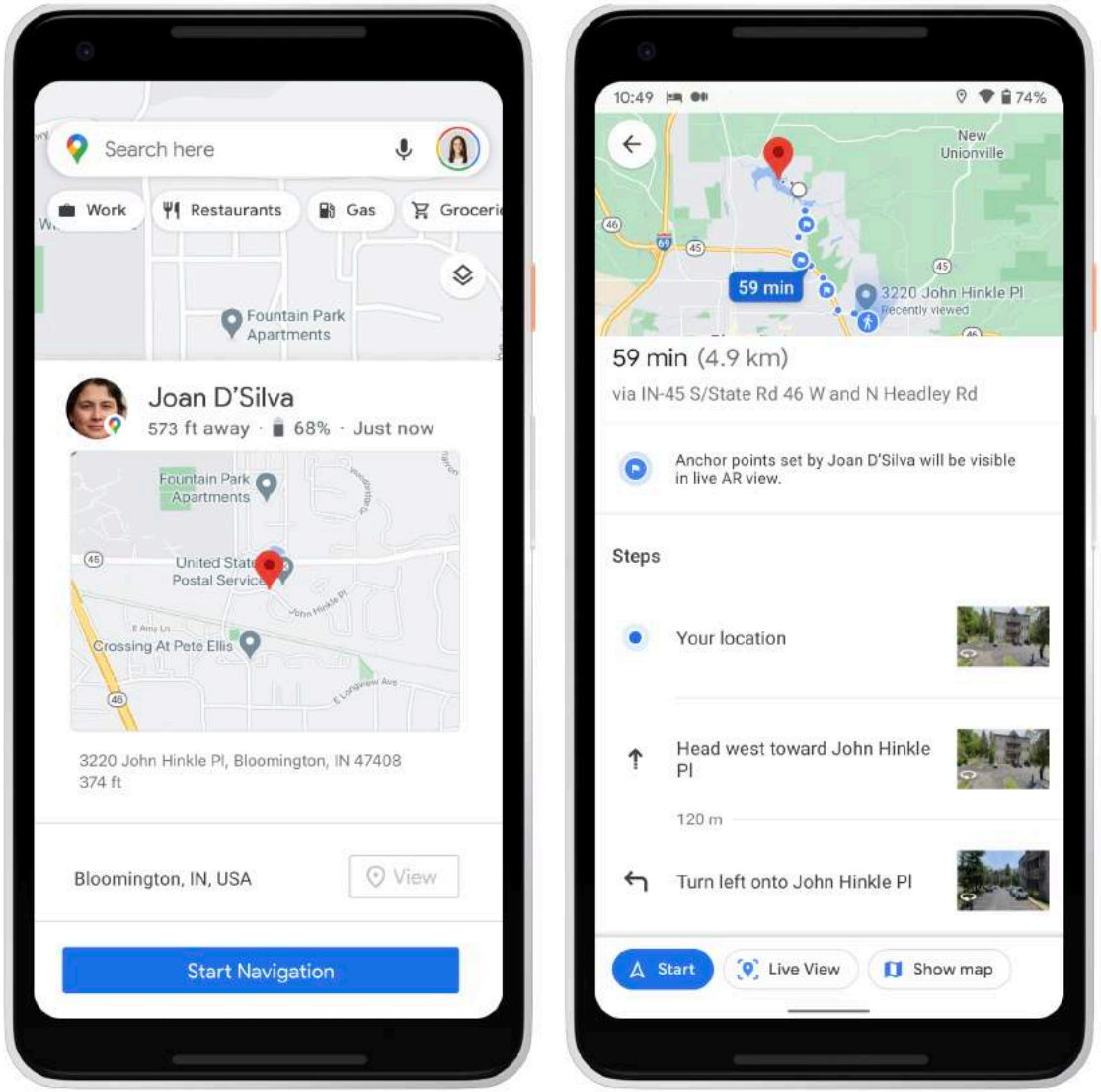


AR Anchor Points

Receive Anchor Points

After receiving the location with AR anchor points, Bilal can look up custom personal stickers his friend left along the way. These personal stickers will help Bilal navigate complex spaces where GPS based navigation alone won't be able to guide.

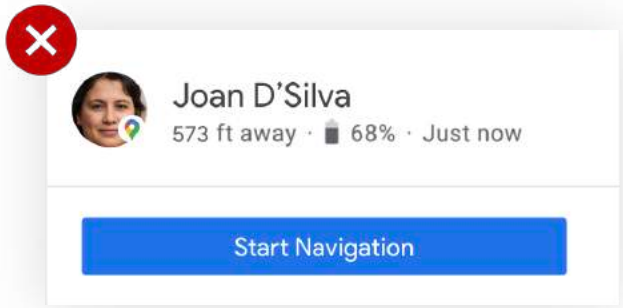
The friend also has the option to check on the journey and update the route to ensure Bilal reaches the location safely.



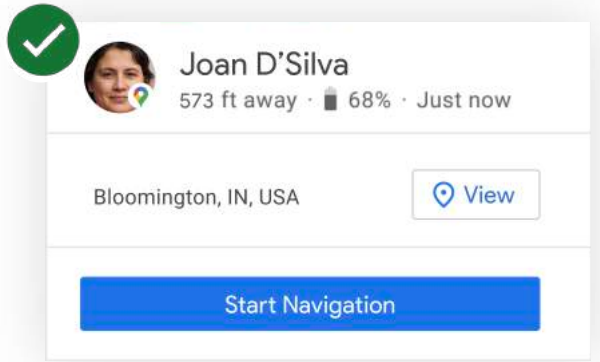
#1 Concept: Iteration after Testing

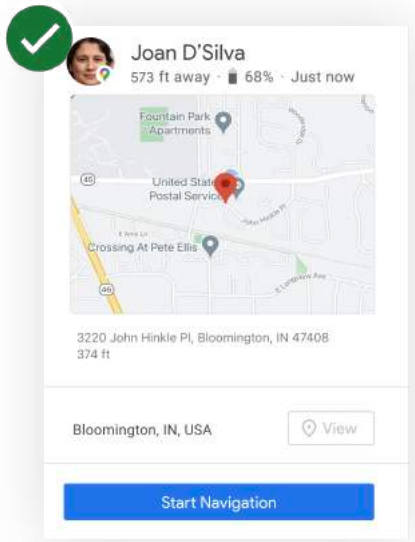
Design Decisions

Initial Design



Revised Design





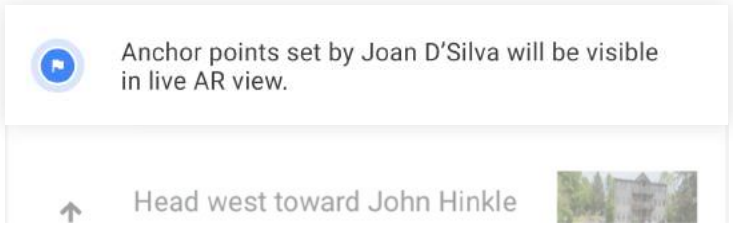
The initial card design did not give enough information about the system status. The user did not know what he would be expecting without clicking on the start button.

The revised card allowed users to view a snapshot of the location of the sender. By making this interaction, user would be assured that he would be travelling to the right location.

#1 Concept: Iteration after Testing

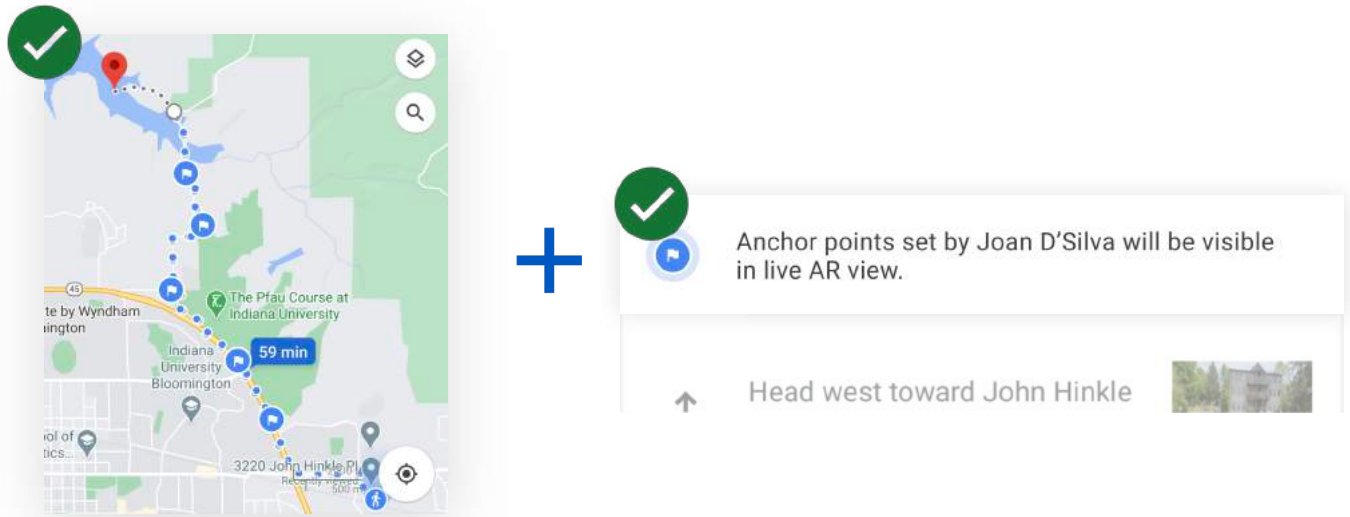
Design Decisions

Initial Design



To help the user get a sense of anchor points, the *steps & more* showed the anchor points. However, there was no visual information present on the map to show the personal anchor points.

Revised Design



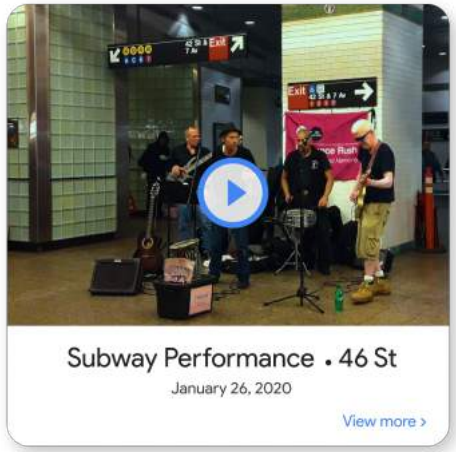
The revised design showcased flags on the map which served as a visual indicator for the anchor points left behind by the creator.

#3 Concept

AR Polaroids: Cultural Normalization

Bilal feels apprehensive about taking the subway. He feels he will be confronted with situations where he does not understand the social cues. The situation themselves make Bilal uneasy as they are something Bilal hasn't seen or faced before.

Through AR polaroid, we aim to normalize cultural difference by making Bilal acquainted with the culture, the people and location. Bilal would be able to see past events, public photos and short form videos so that Bilal knows what to expect when he visits the place.

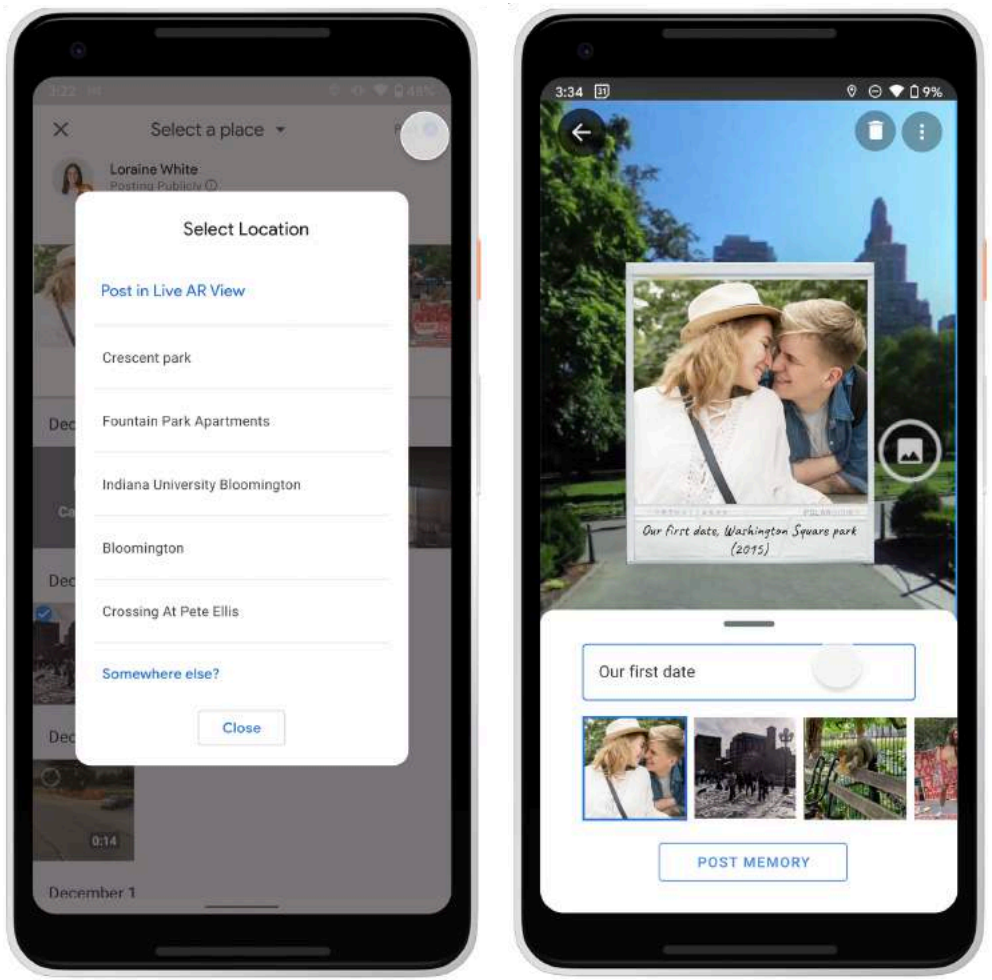


AR Polaroid

AR Polaroids: Revisiting Memories

Taking the concept further, AR polaroid could also be used as a private photo map feature. Bilal could record his experiences of visiting a new place on the map. When he later visits the place again, he can relive the experience by comparing old photos with the real location.

This gives Bilal a chance to reminisce, share experience that feel lived in and form a stronger tie with Google products.



User Anecdotes: Final Testing

People had a lot to say about the idea

I am wondering why Google has not already implemented this!

Participant A

Loved the idea of personalized anchor points. Places like Europe needs this!

Participant B

I did not even know that subway symbols had meaning. Sure, won't have to spend time understanding them anymore.

Participant C

Retrospective: Key Learnings

Designing for Google Maps

Design Pivot

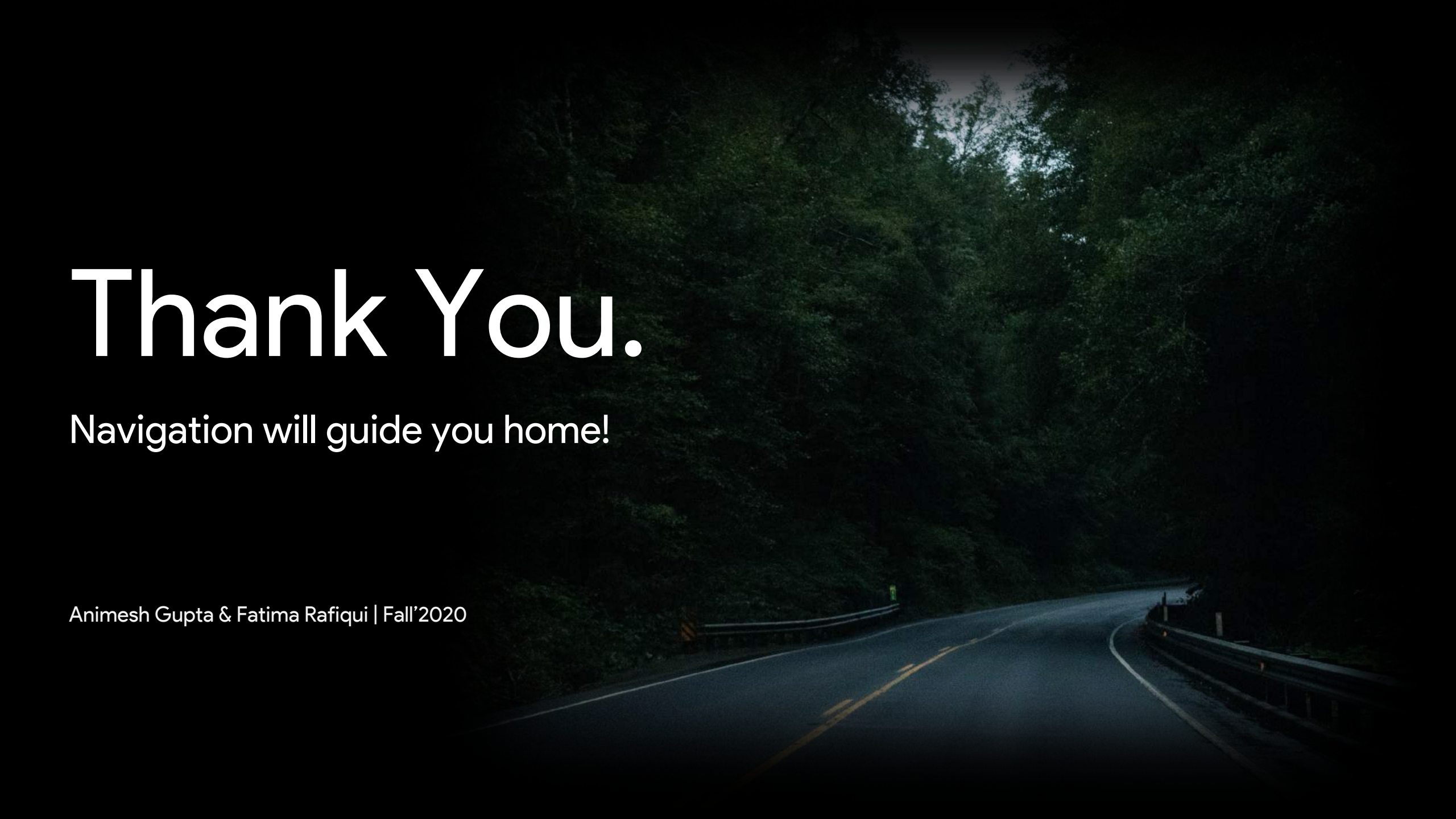
We were at point in our design process where all our concepts fell apart. This project taught me that you can never predict your solution until you complete your groundwork. It is then that you realize the root problem. Trusting the research process can go a long way.

Discoverability Dilemma

Ensuring feature discoverability was a challenge. Knowing that Google Maps is complex and has different moving parts, we had to map the entry point for our features to that of the underlying feature supporting it. This had lower discoverability but had to be done to ensure the main workflow wasn't drastically changed.

Feature Evolution

While exploring the concept of micro navigation, we were able to expand the concept to build upon the features already offered by Google Maps. Micro navigation for instance could be merged with personal location sharing and Local guides.


Thank You.
Navigation will guide you home!
Animesh Gupta & Fatima Rafiqui | Fall'2020