# The 5G-Powered Transit Companion

# Project Overview

## The product:

Design an AR Transit Companion app to enhance the post-COVID public transit experience for university students and young professionals using ION trains and subways.

## Project duration:

July 2021 - September 2022

# Project Overview

### The problem:

Transit riders faced confusion and uncertainty during their commutes, especially in the post-COVID context.

### The goal:

To enhance the public transit journey using AR and 5G technology by delivering real-time, context-aware information through smart glass.

# Project Overview

## My role and the team

User Experience Researcher

Project Owner

User Interface Designer

Interaction Designer

Front-end Software Developer

Backend Developer

## Responsibilities:

Led user research from start to finish, including literature review, field studies, data collection and synthesis. Conducted thematic analysis, contributed to ideation, co-created personas and journey maps, and facilitated guerrilla usability testing in collaboration with the design team.

# Understanding the user

- User research
- Personas
- User journey maps
- Field Study

# User Research: Summary

For this project, I conducted a mix of field observations, survey, and a literature review.
We assumed post-COVID commuters were mainly concerned about safety and hygiene.
But research showed their top pain points were lack of real-time updates, unclear routes, and crowding.
This shifted our focus to delivering context-aware, real-time transit info to reduce stress.

# User Research: Pain Points

1

### Pain point

Uncertainty about crowd levels on trains and platforms

2

### Pain point

Difficulty making informed boarding decisions

3

### Pain point

Lack of clear visual cues for safe, uncrowded pathways

4

### Pain point

Limited access to real-time safety and crowding information

# Working Professional

**AGE**
25 - 34 years old

**STATUS**
Single or Partnered

**INCOME**
CAD 79,000 - 100,000

**LOCATION**
Kitchener

**BIO**
Working professional who lives in the Kitchener-Waterloo area and currently either works fully remotely or hybrid (going into the office once or twice weekly via the LRT). Their average commute to work is 20 minutes.

**GOALS**

- ➔ Commute to (and from) work safely and on time
- ➔ Avoid crowded vehicles/platforms
- ➔ Being happy and relaxed
- ➔ Saving Money

**PAINS**

- Limited time
- Fear of using public transit
- No work-life balance

**GAINS**

- Saving time
- Easing stress
- Staying safe

**VALUES**

- Mental Health
- Relaxation

# Commuting Student

**AGE**
15 - 24 years old

**STATUS**
Single

**OCCUPATION**
University student

**LOCATION**
Kitchener

## BIO

A university student commuting from Kitchener to the University of Waterloo. Balancing academics, social life, and budgeting for an affordable and efficient commute.

## GOALS

- ➔ Balancing social life with school
- ➔ Commute to campus and around Kitchener-Waterloo
- ➔ Saving Money

## PAINS

- Balancing school, social life and work
- Stress from long & unpredictable commutes

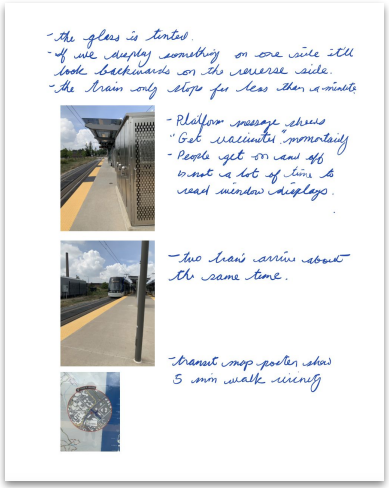
## GAINS

- Saving time
- Staying safe & healthy
- Affordability

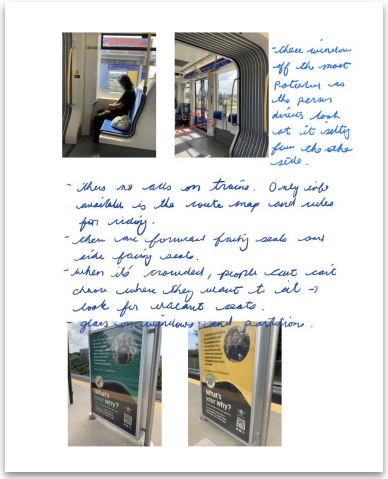
## VALUES

- Affordability
- Time efficiency
- Convenience

# Field Study: Key Observations








# Field Study (Public Displays and Signage)

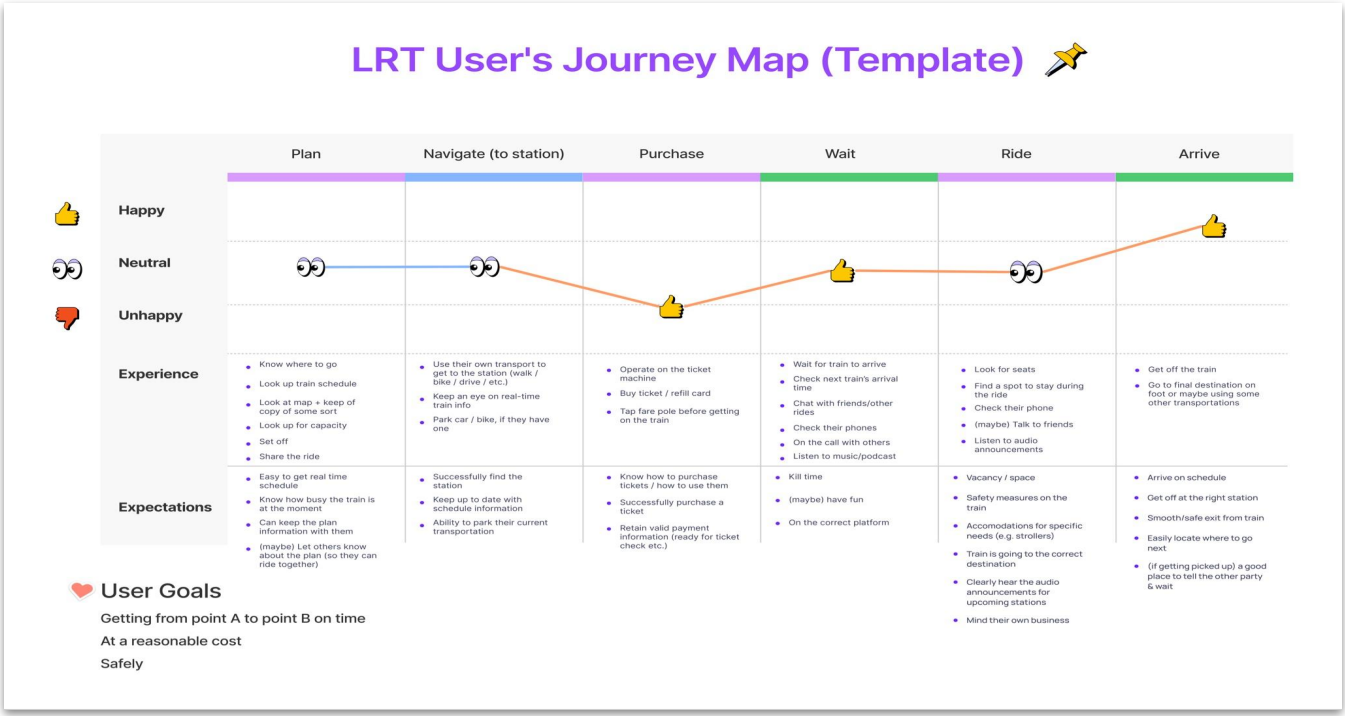
Waiting areas



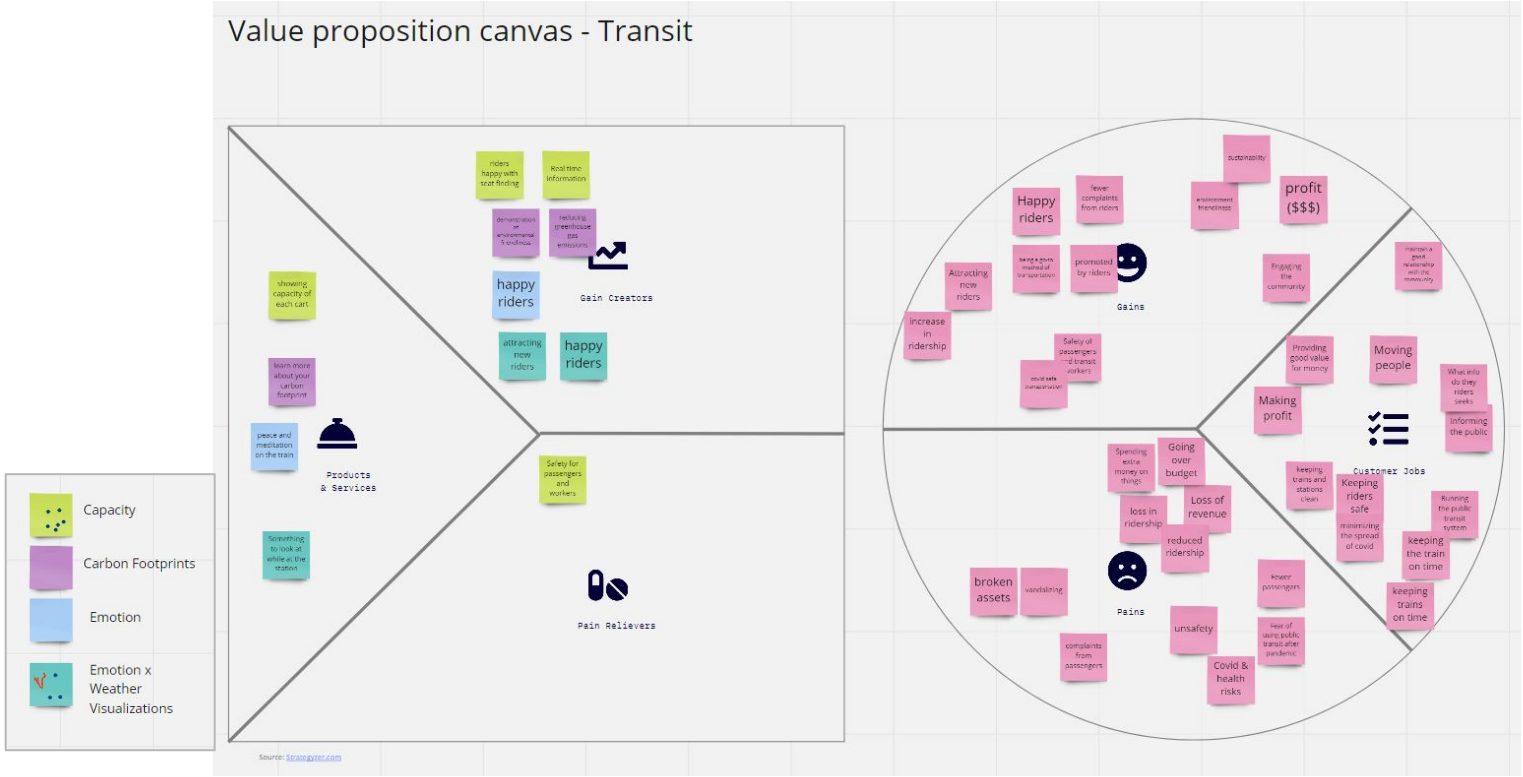
Information/Advertisements


Current display

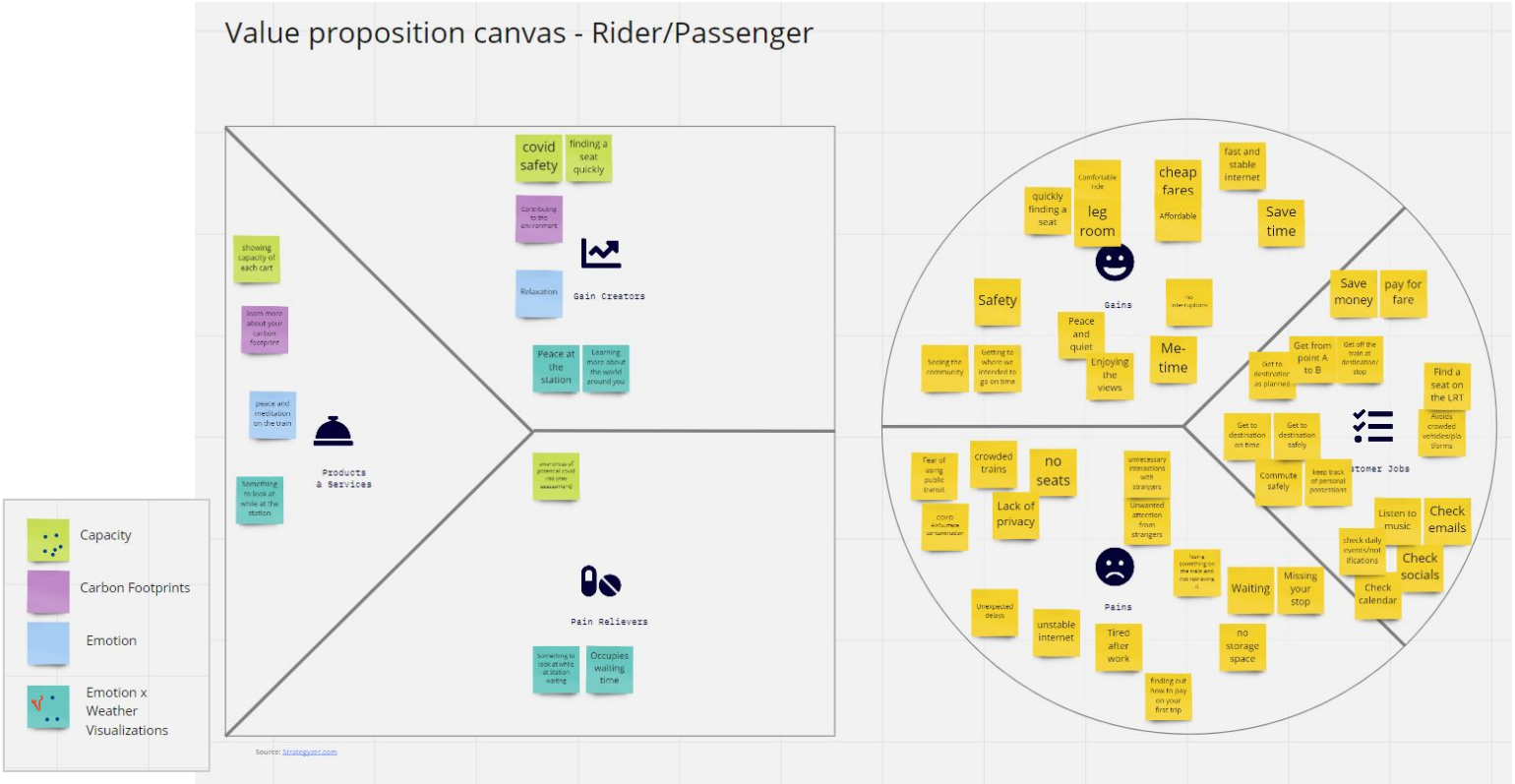
# User Journey Map



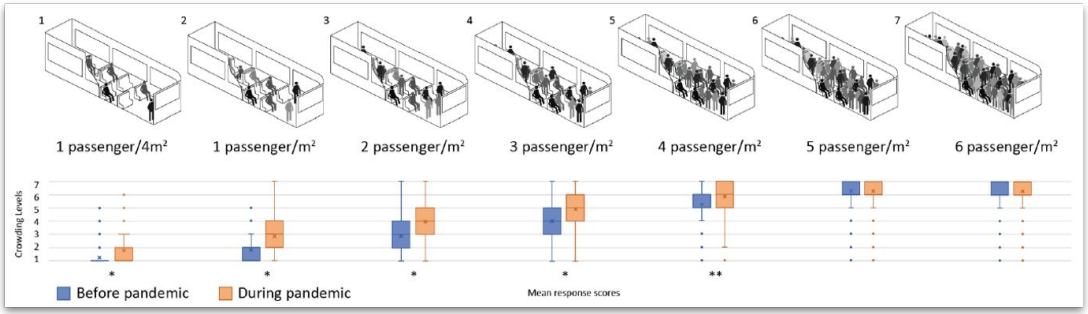
# Value Proposition Canvas - Transit

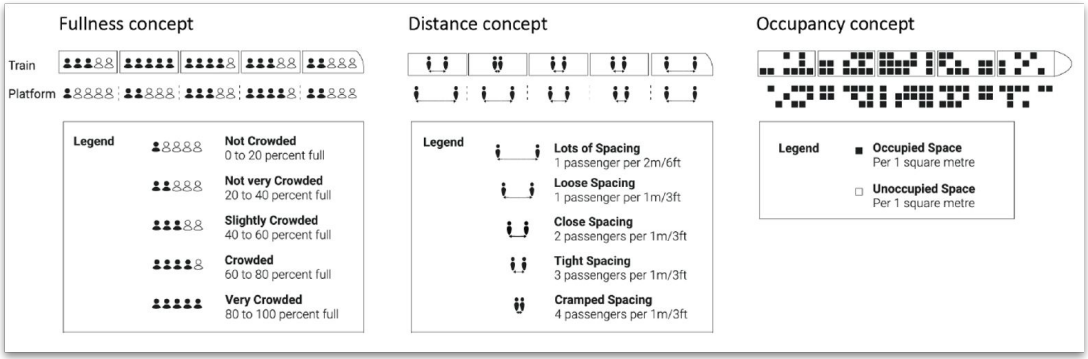


# Value Proposition Canvas - Rider



# Survey


1
2
3
4
5
6
7
1 passenger/4m²
1 passenger/m²
2 passenger/m²
3 passenger/m²
4 passenger/m²
5 passenger/m²
6 passenger/m²
Crowding Levels
Before pandemic
During pandemic
Mean response scores


Fullness concept
Train
Platform
Legend
Not Crowded
0 to 20 percent full
Not very Crowded
20 to 40 percent full
Slightly Crowded
40 to 60 percent full
Crowded
60 to 80 percent full
Very Crowded
80 to 100 percent full
Distance concept
Legend
Lots of Spacing
1 passenger per 2m/6ft
Loose Spacing
1 passenger per 1m/3ft
Close Spacing
2 passengers per 1m/3ft
Tight Spacing
3 passengers per 1m/3ft
Cramped Spacing
4 passengers per 1m/3ft
Occupancy concept
Legend
Occupied Space
Per 1 square metre
Unoccupied Space
Per 1 square metre

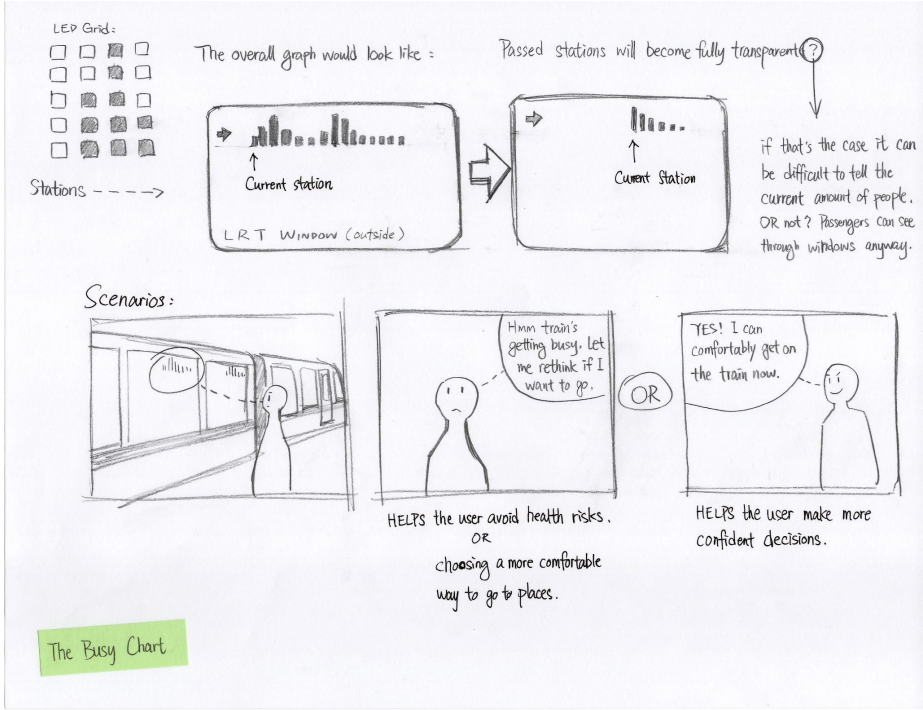
# Starting the design

- Paper wireframes
- Digital wireframes
- Usability studies

# Paper Wireframes

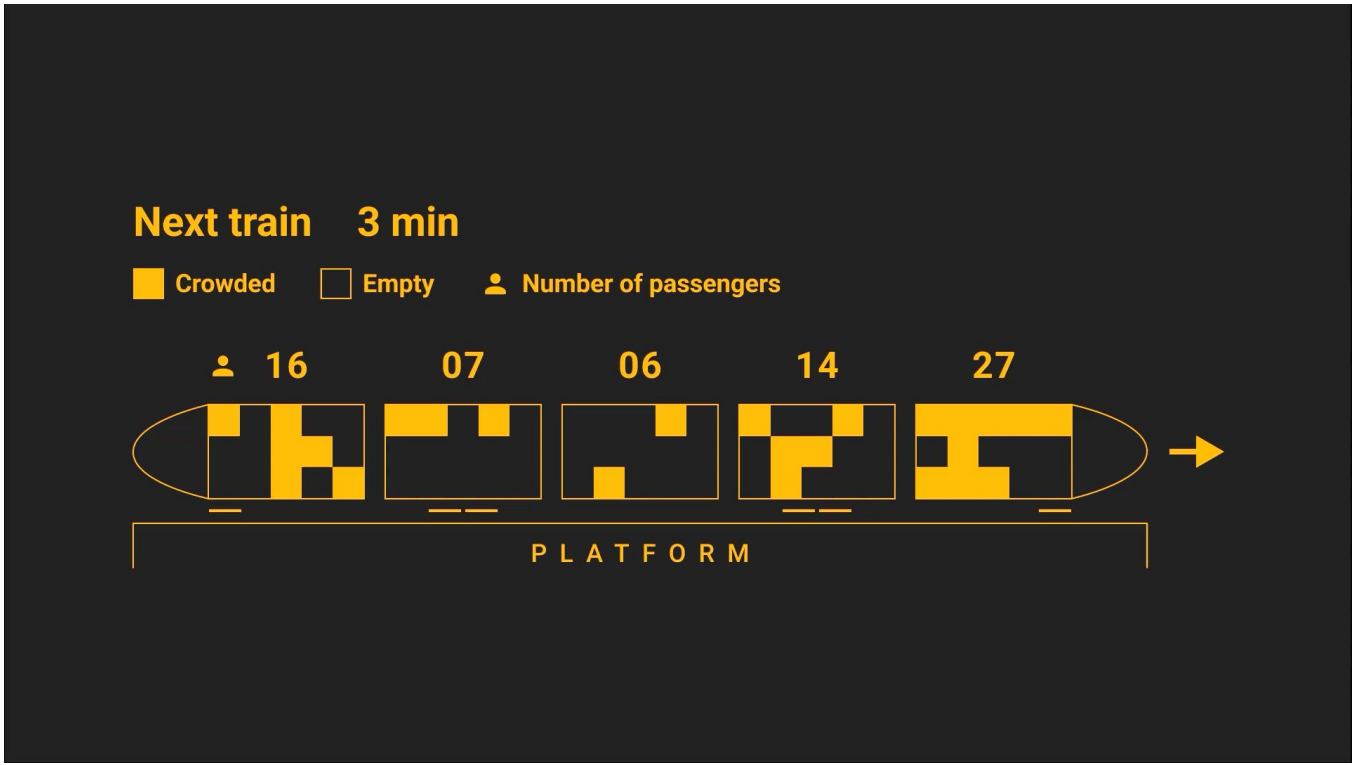
**User goals:**

- Arrive at destination (Point A to B) on time
- Keep transportation cost reasonable
- Ensure personal safety throughout the journey



# High-Fidelity Prototype: Fullness Concept

# High-Fidelity Prototype: Occupancy Concept



# Usability Testing



# Usability Study: Findings

We evaluated two crowding visualizations—Fullness and Occupancy—to understand how well they support passengers' boarding decisions. Participants rated both visualizations on a 5-point Likert scale and shared qualitative feedback on their experience.

## Fullness Concept

1. Fullness was seen as simpler and faster to interpret, with a higher median score for understandability.
2. Terms like "crowded" were seen as subjective, making it hard for users to judge the actual space available on the train.
3. The study revealed a trade-off between simplicity (Fullness) and information richness (Occupancy), highlighting opportunities for hybrid or adaptive design solutions.

## Occupancy Concept

1. 64% of participants preferred the Occupancy visualization, citing better spatial awareness and planning ability.
2. Participants valued the block-based Occupancy view, showing a strong preference for accurate, detailed data to make confident decisions.
3. Users expressed confusion over certain visual elements, particularly and suggested improvements like differentiating seating from standing space.

# Going forward

- Takeaways
- Next steps

# Takeaways

## Impact:

Crowding visualizations empower riders to make safer, more informed decisions by anticipating crowded conditions—supporting post-pandemic confidence in public transit. When integrated with schedule data, they offer real-time insights that benefit both passengers and transit operators.

## What I learned:

- Designing for real-time decision-making requires balancing simplicity and detail to avoid overwhelming users.
- User feedback is essential—what seems intuitive in design may be interpreted differently in practice.
- Context matters as visualizations must account for on-the-go use, ensuring users can quickly comprehend information in high-pressure environments.

# Next Steps

1

Use real-time crowd visualizations for better transit resource planning and traffic management.

2

Expand use cases by applying visualizations to manage crowds at events and in public spaces.

3

Work closely with transit operators and event organizers to tailor solutions for emergency response and operational needs.