JK LAKSHMIPAT UNIVERSITY
Institute of Design
NAAC 'A' Grade Accredited

TSaavari:
Your Digital Gateway to Hyderabad Metro

VOL. 1 of 2

Student : **Taruni Vadlamudi**

Sponsor : **L&T Metro Rail Hyderabad**

Mentor : **Binil Mohan**

Programme :
Bachelor of Design (B.Des)
Interdisciplinary Design

THE GRADUATION PROJECT 2024

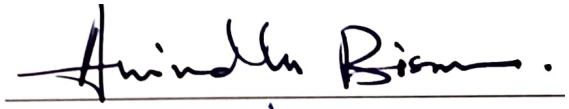
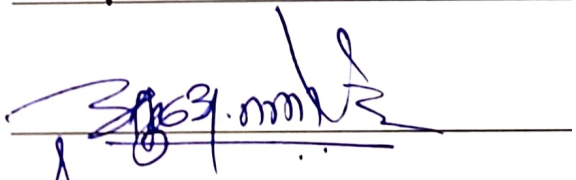
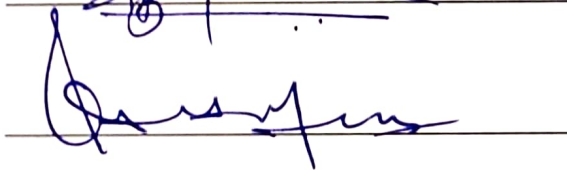
The Evaluation Jury has recommended **Taruni Vadlamudi**

for graduation from **Institute of Design, JK LAKSHMIPAT UNIVERSITY**

with specialization in Interdisciplinary design

Herewith, for the project titled "**T-Savaari : Your Digital Gateway to Hyderabad Metro**"

on fulfillment of requirements by

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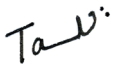
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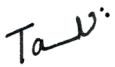
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Student Name in Full: Taruni Vadlamudi

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“Socrates said, “Know thyself.” I say,
“Know thy users.” And guess what?
They don’t think like you do.”

Joshua Brewer
Founder & CEO of Habitat

Acknowledgement

I would like to extend my heartfelt gratitude to the following individuals and organizations whose support and guidance were instrumental in the completion of this project.

L&T Metro Rail (Hyderabad) Ltd.

I am deeply grateful to L&T Metro Rail Hyderabad for providing a remarkable opportunity for young designers like myself to contribute meaningfully. Your trust in us, coupled with the access to valuable resources and the autonomy to explore diverse areas of interest, was invaluable. We are particularly thankful for the warm and cooperative environment that facilitated our studies and research across the metro system.

Mr. Sudhir Chiplunkar, Chief Operating Officer
L&T Metro Rail (Hyderabad) Ltd.

I am deeply thankful to Mr. Sudhir Chiplunkar for giving us the opportunity to work on this project and for the invaluable insights he provided. Your key insights into the metro system and the challenges it faces were instrumental in shaping the direction of our work. I greatly admire your vision for the Hyderabad Metro and your commitment to enhancing the passenger experience.

Mr. Murali Vardarajan, Chief Strategy Officer
L&T Metro Rail (Hyderabad) Ltd.

I will always remember our first encounter at the L&T office gates, when we had nothing but our classroom project from the Delhi Metro to show. Your eye for potential and your belief in our work were pivotal in connecting us with the right people. Your insightful words about the impact of design, "no idea is small, even small design changes can have a huge impact in shaping an experience," continue to inspire me. I truly admire your visionary approach to the Hyderabad Metro.

Mr. S. Sundarapandian, Assistant Manager – Operations & Safety, Mentor
L&T Metro Rail (Hyderabad) Ltd.

As our mentor throughout this project, your profound depth of knowledge and your generous willingness to share it made an immense difference in our work. Your patience in answering our questions provided a strong foundation that helped us navigate the complexities of the project with confidence. At the same time, you gave us the freedom to explore our interests and approach the project creatively. The valuable discussions we had were instrumental in refining our ideas and shaping the direction of our work. I appreciate not only your expertise but also your forward-thinking mindset.



Left to right: Aparna Rajanala, Taruni Vadlamudi (me), S. Sundarpandian, Yash Aratagi, Murali Vardarajan.



with mentor S. Sundarpandian

Mr. Rajeev Ramesh, Senior Deputy General Manager – Customer Experience
Keolis Hyderabad Pvt. Ltd.

The first person we approached at the L&T office, and your support was pivotal in opening the door to this invaluable opportunity with L&T Metro. Thank you for your efforts to advocate for us within the organization ensured that we could contribute meaningfully to the Hyderabad Metro.

Aparna Rajanala and Yash Aratagi
Co-Interns, Students
JK Lakshmipat University,

I would like to thank Aparna Rajana and Yash Aratagi, students of JK Lakshmipat, Co-Interns at L&T Metro Rail and dear friends, for their invaluable contributions during the initial research stages of this project. Their collaborative insights were instrumental in shaping the foundation of my work. Without their support, this project would not have reached its full potential. Thank you for being such an integral part of this journey.

JK Lakshmipat University
Institute of Design

I am also thankful to JK Lakshmipat University for endorsing our work and credibility, and for the unwavering support in our endeavor to collaborate with the Hyderabad Metro.

Mr. Binil Mohan, Faculty Mentor
JK Lakshmipat University

Thank you for granting us the creative freedom to explore and identify problem areas, which was crucial to the innovative nature of our project. Your insightful guidance in organizing our thoughts and structuring our approach played a key role in transforming our ideas into a cohesive and impactful design. You not only helped us refine our concepts but also provided invaluable advice on how to present our work in a professional and compelling manner.



JK Lakshmipat University, Jaipur. Photo Credit: JKLU Website Gallery



Prologue

> This section provides a comprehensive overview of the project, establishing its context and significance.
>
> From March to August 2024, I undertook a project as part of my graduation thesis in Bachelors of Design in Interdisciplinary Design. This documentation captures the process and learnings from this project.

Prologue

As part of my academic journey at JK Lakshmipat University, I was required to complete a Graduation Project with a client organization. This project involved working on a comprehensive design brief that aligned with my field of study, allowing me to apply my design knowledge and skills in a real-world setting. The project demanded academic rigor, incorporating systematic research and informed design decisions.

For this project, I worked with L&T Hyderabad Metro Rail, focusing on redesigning their official transit app – TSavaari, to improve the overall passenger experience. This initiative aimed to streamline the user journey from start to end of their journey. The project also tackles other adjacent problem areas related to awareness among passengers and digital information exchange.

The project required an in-depth understanding of the current system and its users. To achieve this, I conducted extensive field research and ethnographic studies across multiple stations and varied user groups. Engaging with the client and industry experts, and studying similar projects, helped me build a thorough understanding necessary for critical analysis and ideation of effective solutions.

This document serves as a reference for the design process followed during the project, detailing each stage from research to implementation. It reflects on the challenges faced, including understanding diverse user needs and integrating feedback into the design.

Through this project, I gained valuable insights into designing for complex systems and became more sensitive to the needs of the users. It underscored the importance of user-centered design and the role of empathy in creating effective solutions. Working with L&T Hyderabad Metro Rail provided me with hands-on experience and a deeper understanding of the practical aspects of design, reinforcing my commitment to impactful design practice.


Welcome to Telangana Savaari
Book QR Ticket
Card Recharge
Network Map
Metro Services
Nearby Metro
Plan Trip
Tour Guide
Trips
Stations
Track Trip
Custom
Custom
rapido
BIKE TAXI
AMP
ESI
6 Mins Away
Train no. 57
Network Map
ESI Hospital
Paradise
Fare
₹45
Time
48 Mins
Distance
16.3 Kms
Stops
15
Departure
ESI Hospital
Arrive
Paradise
Purchase ticket

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1. Introduction

1.1 Client
1.1.1 History
1.1.2 Organizational Structure

1.2 Student

1.1 Client

L&T Metro Rail Hyderabad Ltd (L&TMRHL), was established by the construction company Larsen & Toubro to develop the Hyderabad metro rail project.

The Hyderabad Metro is a modern, high-speed rail transit system that serves as a vital component of the city's transportation infrastructure. It spans around 69.3 kilometers with 57 stations and three lines. Launched in phases, it aims to alleviate traffic congestion, reduce travel time, and provide a reliable and efficient means of urban mobility. The metro network spans key areas of Hyderabad, connecting major business districts, residential neighborhoods, and landmarks. By enhancing connectivity and offering a sustainable alternative to road transport, the Hyderabad Metro plays a crucial role in supporting the city's growth and development.

This project is one of the largest metro systems globally and serves as a prominent example of a successful Public-Private Partnership (PPP) in India's infrastructure development. Hyderabad Metro, uniquely developed through this collaborative model, highlights the effectiveness of combining public and private sector efforts in creating a major urban transit system.

Contract: The private partner, L&T Metro Rail (Hyderabad) Limited, is responsible for designing, building, financing, operating, and eventually transferring the metro system to the government after a specified concession period.

Source: https://www.ltmetro.com

1.1.1 History

Project Launch and Planning

The Hyderabad Metro project, one of the largest Public-Private Partnership (PPP) initiatives in India, was undertaken by L&T Metro Rail (Hyderabad) Limited, with the project initiated by Hyderabad Metro Rail Limited (HMRL), a government entity.The planning phase began in the mid-2000s, and after several years of land acquisition, planning, and delays, construction officially began in 2012.

Significant Milestones

- The Hyderabad Metro began operations on November 29, 2017, with the inauguration of the first two stretches (Miyapur to Ameerpet on the Red Line and Nagole to Mettuguda on the Blue Line).
- As of February 2020, a total of 67.21 km is operational, with further extensions and Phase II of the project in planning.

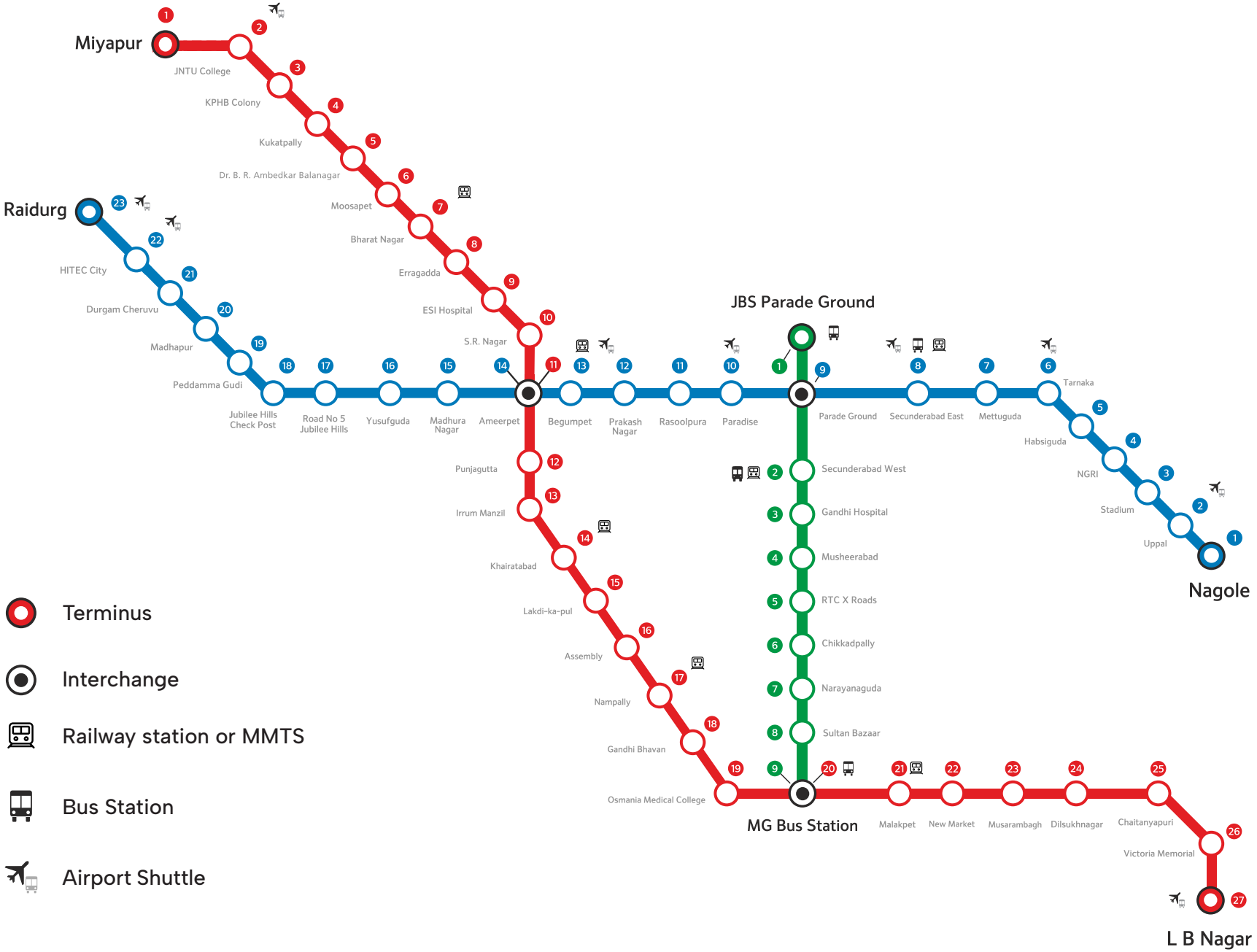
Current and Future Expansions

Phase II expansion is planned to cover an additional 85 km, including a direct Airport Express line from Raidurg to Rajiv Gandhi International Airport (RGIA).
Upon completion, the Hyderabad Metro is expected to significantly improve connectivity across the city, reducing travel times and easing congestion.

Phase I Construction

The project was divided into three corridors spanning a total of 69.21 km, all of which are all elevated.

- Red Line (Corridor 1):
  Miyapur to LB Nagar(29.21 km)
  This was the first corridor to become operational, with the stretch between Miyapur and Ameerpet opening on November 29, 2017. The full line was operational by September 24, 2018.
- Blue Line (Corridor 3):
  Nagole to Raidurg (29 km)
  The first stretch from Nagole to Mettuguda was inaugurated alongside the Red Line in November 2017. The final stretch to Raidurg opened on November 29, 2019.
- Green Line (Corridor 2):
  JBS to Falaknuma (15.2 km)
  The first operational section, from JBS to MGBS (9.6 km), opened on February 7, 2020. The remaining stretch to Falaknuma is still under construction.


Miyapur
JNTU College
KPHB Colony
Kukatpally
Dr. B. R. Ambedkar Balanagar
Moosapet
Bharat Nagar
Erragadda
ESI Hospital
S.R. Nagar
Raidurg
HITEC City
Durgam Cheruvu
Madhapur
Peddamma Gudi
Jubilee Hills Check Post
Road No 5 Jubilee Hills
Yusufguda
Madhura Nagar
Ameerpet
Begumpet
Prakash Nagar
Rasoolpura
Paradise
JBS Parade Ground
Parade Ground
Secunderabad East
Mettuguda
Tarnaka
Habsiguda
NGRI
Stadium
Uppal
Nagole
Punjagutta
Irrum Manzil
Khairatabad
Lakdi-ka-pul
Assembly
Nampally
Gandhi Bhavan
Osmania Medical College
Secunderabad West
Gandhi Hospital
Musheerabad
RTC X Roads
Chikkadpally
Narayanaguda
Sultan Bazaar
MG Bus Station
Malakpet
New Market
Musarambagh
Dilsukhnagar
Chaitanyapuri
Victoria Memorial
L B Nagar
Terminus
Interchange
Railway station or MMTS
Bus Station
Airport Shuttle

1.1.2 Organizational Structure





L&T Metro Rail Office Nagole Depot

L&T Metro Rail Hyderabad

L&TMRHL

A special purpose vehicle (SPV) established by Larsen & Toubro (L&T) to execute the Hyderabad Metro Rail project on a Design, Build, Finance, Operate, and Transfer (DBFOT) basis. It is primarily responsible for the construction, operation, and maintenance of the metro system.

HMRL

Hyderabad Metro Rail Limited, a government-owned company, is the nodal agency responsible for overall project supervision, policy-making, and coordination. It holds a minority equity stake in L&TMRHL.

Sources:
www.ltmetro.com, www.hmrl.co.in

L&T Construction
Viaduct, Stations & Depot, Power Supply, SCADA & Traction

Hyundai Rotem, South Korea
Rolling Stock

Thales, Canada
Signaling & Train Control

Thales, Portugal
Communication

L&T Construction along with Voest Alpine Austria, Tata Corus France & Vossloh – Germany
Track works (Turnouts / Rails / Fastening system)

Keolis Hyderabad
A fully owned subsidiary of Keolis S.A)
O&M Operations and Management, Operator

Samsung, South Korea
Automatic Fare Collection (AFC) Infrastructure

OTIS, US
Elevators & Escalators

Source: www.ltmetro.com

1.2 Student

Taruni Vadlamudi

I'm Taruni Vadlamudi from Hyderabad, Telangana. I am currently in my final year of the Bachelor's of Design program in Interdisciplinary Design at JK Lakshmipat University, Jaipur. I am a passionate designer with a deep interest in creating user-centered experiences. I am particularly drawn to the fields of UX Research, System Design, and Visual Communication. My fascination with design is rooted in a love for solving complex problems through creative solutions, where every element serves a purpose and enhances the overall user experience.

I was drawn to this project because it offered me the chance to apply my design skills to a real-world infrastructure initiative that impacts millions of people daily. The challenge of improving public transportation, an area where thoughtful design can make a significant difference, deeply resonated with me. I was motivated by the opportunity to contribute to such a prestigious and large-scale project, allowing me to gain valuable experience in system design and user experience

I was particularly motivated to take on this project because of my personal connection to the Hyderabad Metro, which is a regular part of my life. As someone who uses the metro frequently, I wanted to contribute to improving a system that plays such an important role in my daily routine and the lives of many others in my city. Additionally, I believed that my experience from a previous project with the Delhi Metro would prove valuable in this endeavor. Having worked on a similar large-scale infrastructure project, I felt equipped to bring insights and design solutions that could benefit Hyderabad Metro and its users. This project gave me the chance to make a meaningful contribution to my own city.

Contact : tarunivadlamudi@gmail.com

> Working on this project was an enriching and deeply personal experience. I gained valuable experiences that have significantly shaped my approach to design and problem-solving.



Photographed by Akshitha Nomula

2. Project

2.1 Project Brief

2.2 Project Timeline

2.3 Process

2.4 Background

2.1 Project Brief

My primary objective was to redesign the user interface and experience of the official Hyderabad Metro app, T-savaari, to enhance passenger satisfaction and streamline their journey. This involved conducting comprehensive passenger surveys and user interviews to gather insights into user behaviors, preferences, and pain points.

Under the guidance of our mentor, Sundarapandian Sir, we were given the opportunity to explore and identify our own areas of interest within the vast landscape of L&T Hyderabad Metro's objectives. He encouraged us to think independently and align our passions with the real-world challenges that L&T was facing.

L&T, as an organization, had clearly identified several key areas where they sought improvement. These included enhancing the effectiveness of their signage systems, addressing complex issues related to passenger behavior both in trains and across platforms and concourses, and improving the functionality and user experience of the T-savaari app.

With these broad focus areas in mind, we were given the freedom to delve into the aspects that resonated most with us, allowing us to tailor our research and design efforts in a way that would not only meet L&T's goals but also align with our personal and professional growth as designers.
My team comprised three interns: Aparna Rajanala, Yash Aratagi, and myself. Following our initial research cycle, we were able to narrow down and focus on specific problem areas that aligned with both our personal interests and L&T's goals. Each of us chose a distinct project brief, with a unique problem statement that reflected our individual areas of focus. Although we conducted the initial research phase together, we subsequently worked independently, each bringing our project to fruition based on our specific research findings and design approaches.

I also focused on understanding the working systems of the metro to align the redesign with operational realities. Working within the scope of L&T's responsibilities, I was mindful of certain limitations, such as the fact that parking facilities fall under HMRL's purview and were not within the scope of my project. Additionally, I aimed to ensure that my research and findings would contribute insights for future studies and projects.

2.2 Project Timeline

Total Duration: 5 months

Dates: 18th March 2024 to 12th August 2024

Phase 1:
Research and Understanding of the System
2 months (8 weeks)

This phase involves gathering comprehensive information about the Hyderabad Metro system. It included frequent station visits for direct observations and interactions with passengers and metro staff. Structured user interviews and surveys were conducted to gather both qualitative and quantitative data, aiming to thoroughly understand passenger behavior and preferences.

Phase 2: Analysis
1.5 months (6 weeks)

In this phase, I analyzed the data collected during the research phase. This involves identifying patterns, extracting insights, and defining key user needs and issues. The goal is to develop a clear understanding of the problems and opportunities for improvement or changes in the current experience.

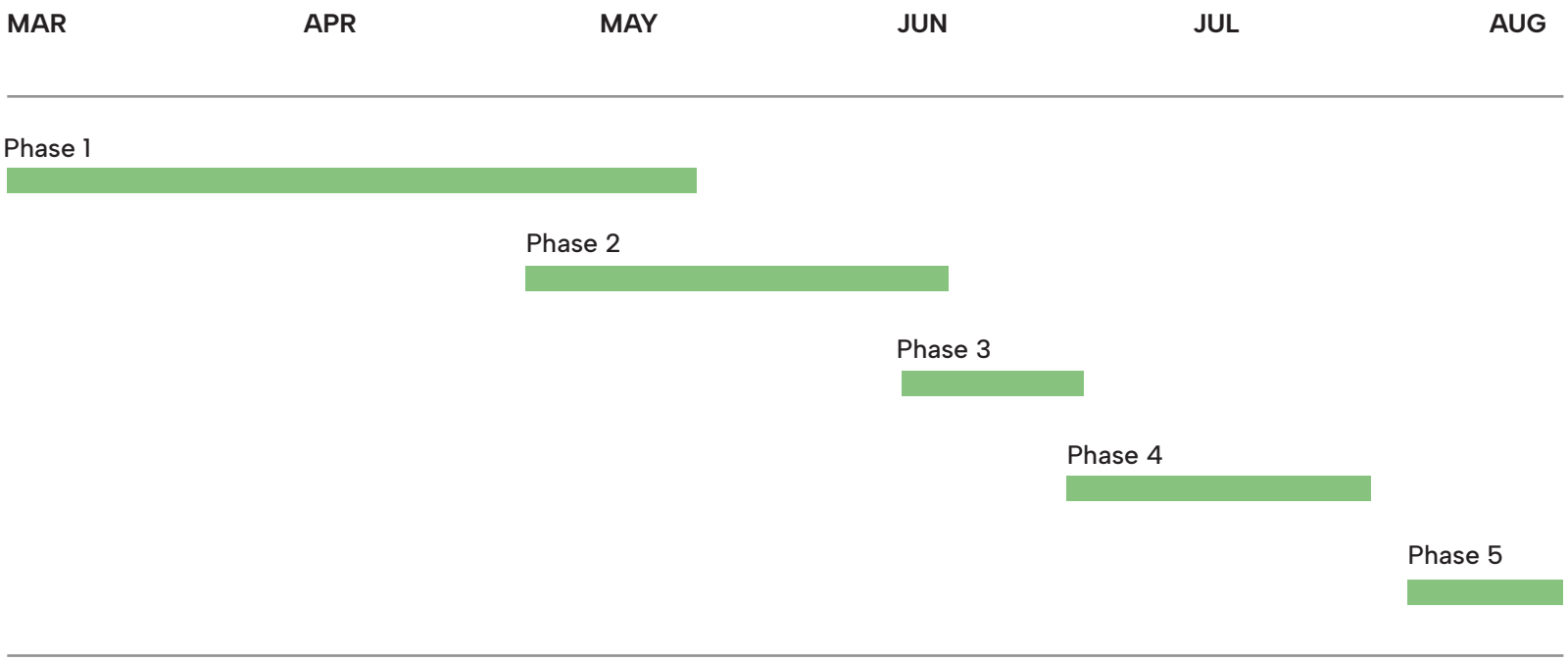
Phase 3: Ideation
3 weeks

Ideation phase includes brainstormed for ideas and possible solutions. This includes sketching ideas, creating wireframes, and developing initial concepts for improving the app's user interface and experience.

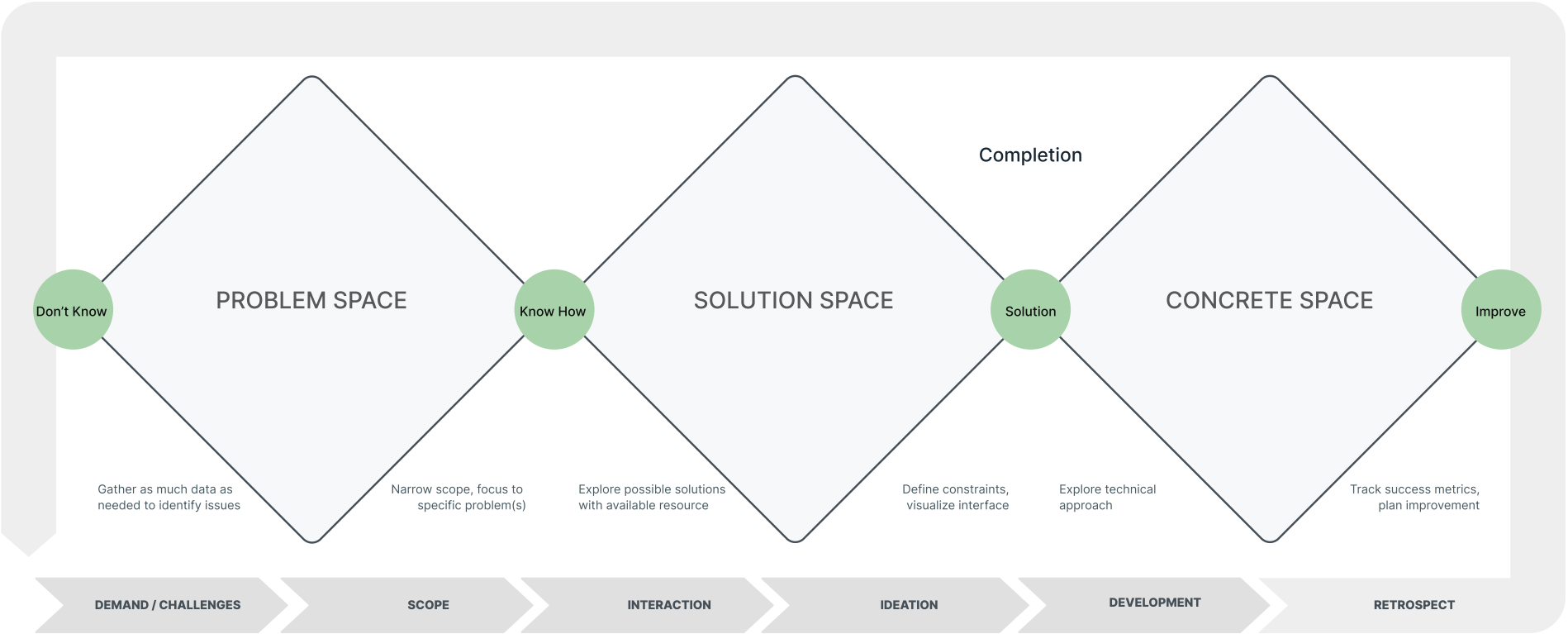
Phase 4: Design
1 month (4 weeks)

This phase focuses on translating the refined concepts into detailed design prototypes. Created app screens, prototypes, with a focus on visual design. The aim is to develop a user-friendly design that enhances the overall passenger experience of passengers with the T-Savaari app.

Phase 5: Documentation
0.5 months (2 weeks)
The final phase involves documenting the entire project process. Compiling a comprehensive report and presentation that summarizes the project's outcomes.


MAR
APR
MAY
JUN
JUL
AUG
Phase 1
Phase 2
Phase 3
Phase 4
Phase 5

2.3 Process


Completion
Don't Know
PROBLEM SPACE
Know How
SOLUTION SPACE
Solution
CONCRETE SPACE
Improve
Gather as much data as needed to identify issues
Narrow scope, focus to specific problem(s)
Explore possible solutions with available resource
Define constraints, visualize interface
Explore technical approach
Track success metrics, plan improvement
DEMAND / CHALLENGES
SCOPE
INTERACTION
IDEATION
DEVELOPMENT
RETROSPECT
DISCOVER
problems
DEFINE
problems to solve
DESIGN
potential solutions to these problems
DELIVER
feasible solutions to these problems
DEVELOP
solutions into product

2.4 Background

Hyderabad, the capital of Telangana, is a vibrant city that seamlessly blends rich history with modern development. Known as the “City of Pearls,” Hyderabad boasts a unique cultural heritage, with iconic landmarks like the Charminar and Golconda Fort reflecting its glorious past. The city is also a major hub for technology and innovation, earning it the nickname “Cyberabad.” With its bustling markets, diverse cuisine, and thriving arts scene, Hyderabad offers a dynamic urban experience while maintaining its traditional charm.

The Hyderabad Metro, managed by L&T Metro Rail, plays a crucial role in the daily commute of thousands of passengers in the city, with an average of 5.6 lakh commuters using the service each day.

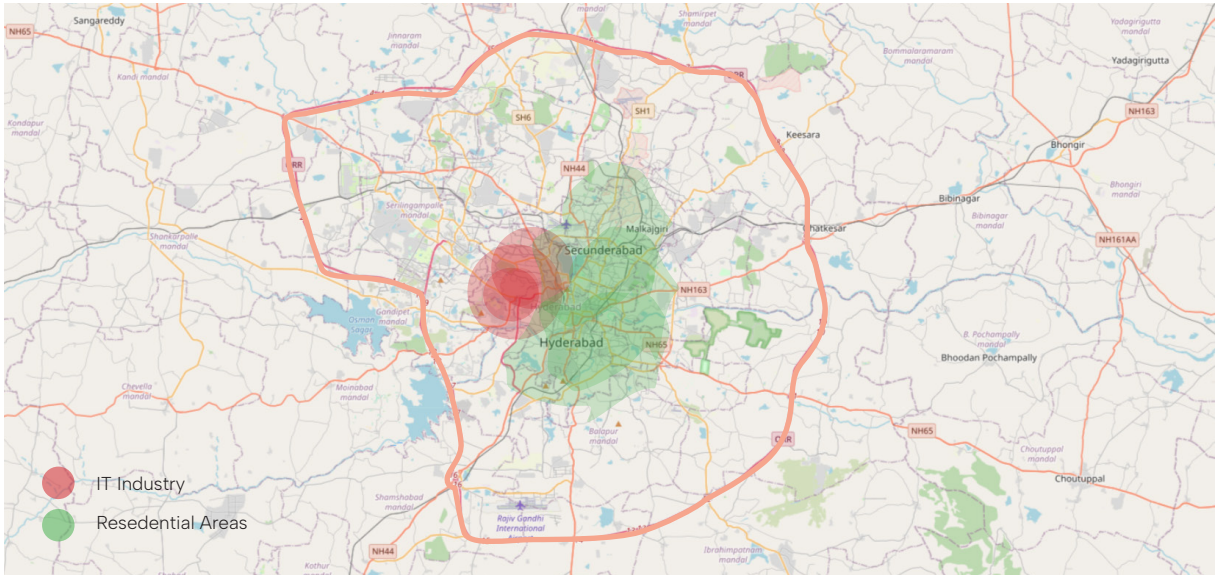


Image source: Open Street Map, Geographic distribution of Hyderabad City

With urbanization and population growth, the demand for a seamless public transportation system has intensified, putting significant stress on the Hyderabad Metro as it strives to utilize its limited resources to their full potential. The metro system, which operates with 57 trains, each consisting of 3 coaches, faces a substantial influx of passengers during peak hours, leading to overcrowded conditions. During these times, trains are often jam-packed, making it difficult for commuters to find space. Additionally, with one-third of a coach reserved for women, accommodating the growing demand becomes even more challenging. This map of Hyderabad highlights the geographic distribution of the city’s IT sector and residential areas. The IT sector is primarily concentrated in the western part of the city, particularly in HITEC City, Gachibowli, and Madhapur. In contrast, residential areas are dispersed across the city

The imbalance in the distribution of residential and work areas leads to significant traffic congestion and other challenges for residents who commute between distant parts of the city for work. Particularly during peak hours, traffic congestion on the roads is a major headache for office-goers in Hyderabad.

This encouraged commuters to choose public transportation. In recent years, the metro has become the city’s lifeline, allowing passengers to bypass ground traffic and avoid the stress of driving, all while benefiting from budget-friendly, subsidized fares. After all, while the saying goes “all roads lead to Rome,” in Hyderabad, it seems “all roads lead to Raidurg” – the epicenter of IT parks and a traffic zone that’s practically a commuter’s rite of passage.

Important Stations

Raidurg Metro Station

Raidurg is the busiest metro station in Hyderabad, serving as the terminal point for the Blue Line. It is a major hub for IT professionals due to its proximity to the IT corridor. The station sees a massive footfall daily, making it a crucial transportation node.

Nagole Metro Station

Nagole is a terminal metro station on the Blue Line of the Hyderabad Metro. Situated in the eastern part of the city, it serves as a crucial transportation hub for residents of the rapidly developing areas of Uppal, LB Nagar, and surrounding localities. The Nagole Metro Station also serves as a depot.

Stadium Metro Station

Stadium station is located right next to the Rajiv Gandhi International Cricket Stadium in Uppal. While it generally experiences low foot traffic throughout the year, it becomes a bustling hub during the IPL season. Cricket fans from across the city flock to this station to attend matches at the stadium, significantly increasing its usage during this period.

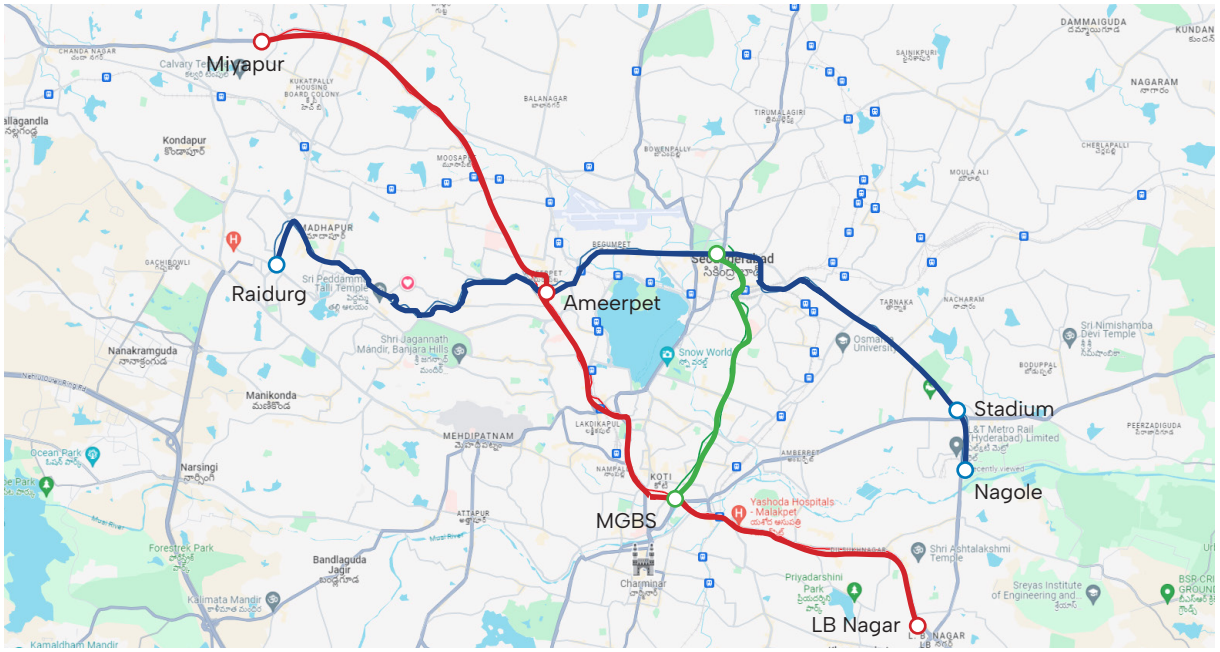


Image source: Google maps, Hyderabad Metro lines

Ameerpet Metro Station

Ameerpet is a significant interchange station connecting the Red and Green lines. Known for its commercial and educational institutions, this station experiences high passenger traffic throughout the day. Its central location makes it a convenient transport option for residents and commuters.

Miyapur Metro Station

Miyapur Station is the terminus of the Red Line and serves as a crucial hub in the city's public transportation network. Miyapur is surrounded by a mix of residential complexes, commercial spaces, and industrial zones, parking grounds and metro depot.

LB Nagar Metro Station

LB Nagar Station is a terminal station of the Red Line. It serves as a major transit hub for passengers from eastern and southeastern Hyderabad. Its located in a dense residential area in close to key government offices, hospitals, and educational institutions.

MGBS Metro Station

Mahatma Gandhi Bus Station) is not only the largest metro station in Hyderabad but also one of the largest in Asia. Its an intersection station of the Red and Green Lines. Its proximity to the MGBS bus terminal, one of the largest bus depots in South India, makes it a crucial node in Hyderabad's public.


P2
17:14
:02
:02
JKLU
enovo

3. Research

3.1 Research Cycle 1
3.1.1 Ethnographic Studies
3.1.2 Literature Review

3.2 Research Cycle 2
3.2.1 Survey
3.2.2 User Interviews

3.1 Reasearch Cycle 1

Research Cycle 1 was a comprehensive exploration aimed at understanding the needs and challenges of Hyderabad Metro passengers. It began with ethnographic studies, where direct observations were made to capture real-life commuter behaviors and pain points.

This was followed by a literature review to build a theoretical foundation and identify best practices in public transportation systems and user experience design.

A structured survey provided quantitative data on travel habits and satisfaction levels, while in-depth user interviews offered qualitative insights into individual experiences and expectations. Finally, these findings were synthesized to identify key opportunity areas for improving the T-Savaari app, focusing on enhancing the overall user experience.

3.1.1 Ethnographic Studies







Visit to the Operations control room (OCC)

Guided by Mr. S. Sundarpandian

From a service operation perspective, the metro system runs 57 trains, with the number in operation fluctuating based on peak hours, holidays, and maintenance requirements. Train intervals varied across corridors, adjusting for peak and non-peak traffic to optimize passenger flow. Safety protocols were strictly followed, with train speeds reduced or stopped entirely in response to high wind speeds or seismic activity, as detected by the meteorological department. Nighttime was reserved for maintenance activities when the metro was closed to the public.

Passenger assistance was notably well-coordinated. I observed that station controllers were informed ahead of time if a passenger required assistance, ensuring they could provide support from the start to the end of the journey.

Common incidents, such as falls on escalators and platform accidents, were recorded in incident logs, with observations pointing to the need for heightened safety awareness, particularly among older passengers and those distracted by mobile devices. Misuse of emergency buttons and tailgating, though rare, were also noted, with penalties enforced as needed.

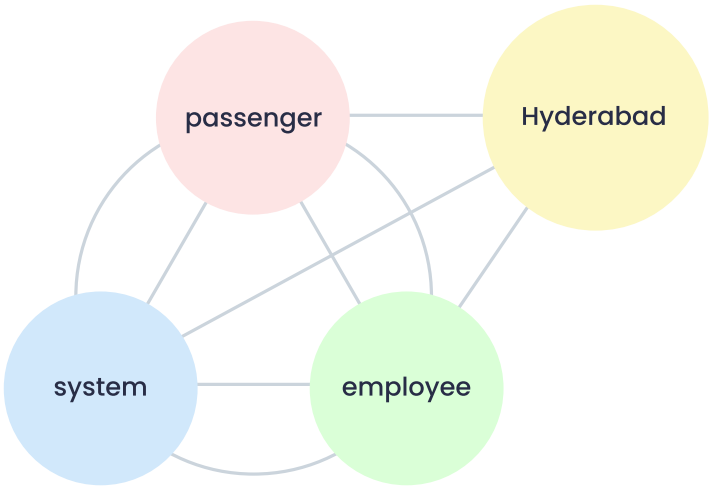
These observations highlight the complex, yet efficiently managed, operation of the Hyderabad Metro, and the critical roles played by staff at various levels to ensure passenger safety and satisfaction.

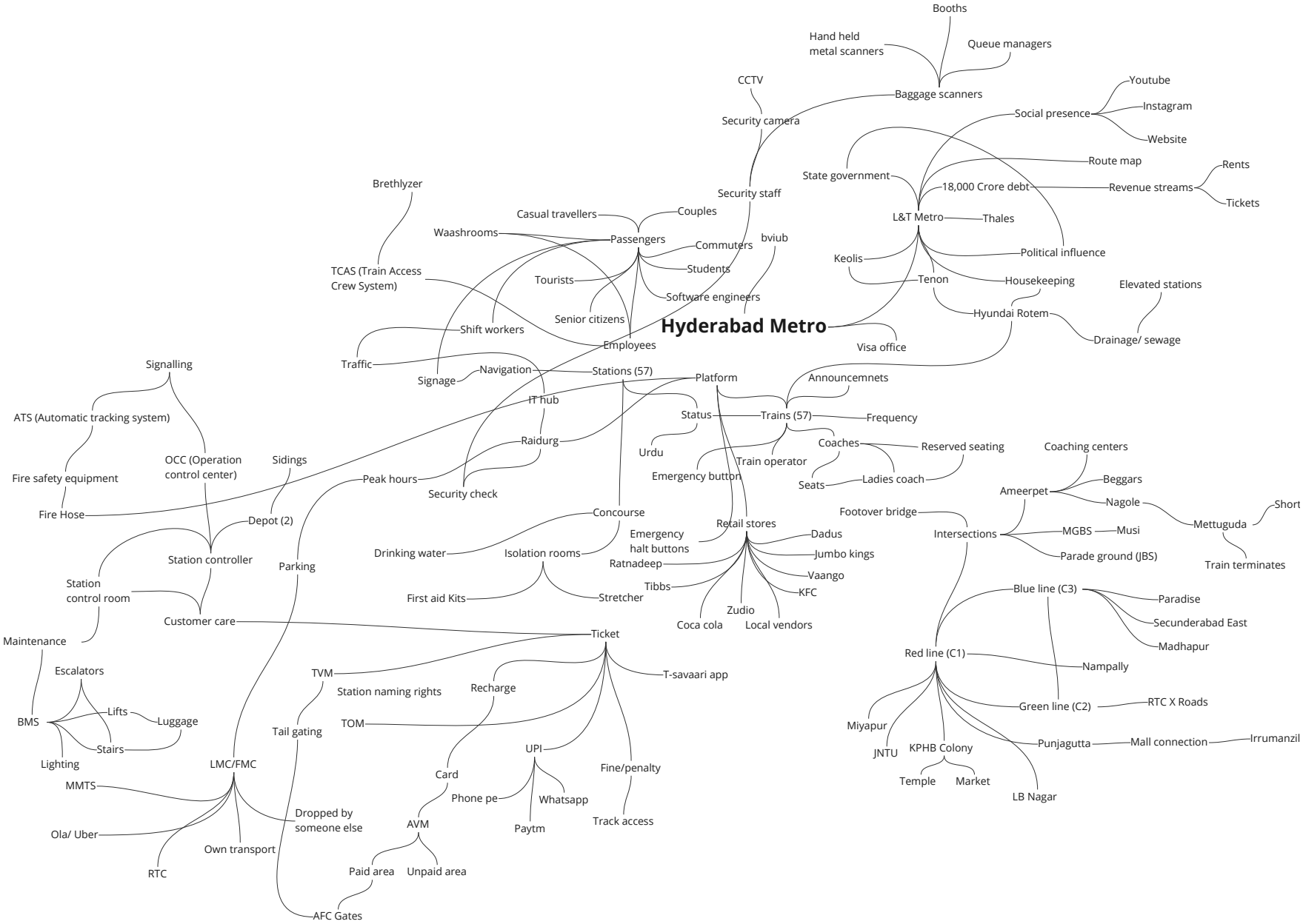
Understanding the system

Understanding how these components interact and impact each other is crucial for gaining insights into the overall functionality and efficiency of the metro system. The interaction between passengers, metro employees, and the infrastructure creates a complex web of dependencies and influences.

For instance, the design and placement of stations affect passenger flow and accessibility, while the efficiency of ticketing processes impacts user satisfaction and operational smoothness. Additionally, the unique geography, demographics, and cultural aspects of Hyderabad play a significant role in shaping the metro system's usage and performance.

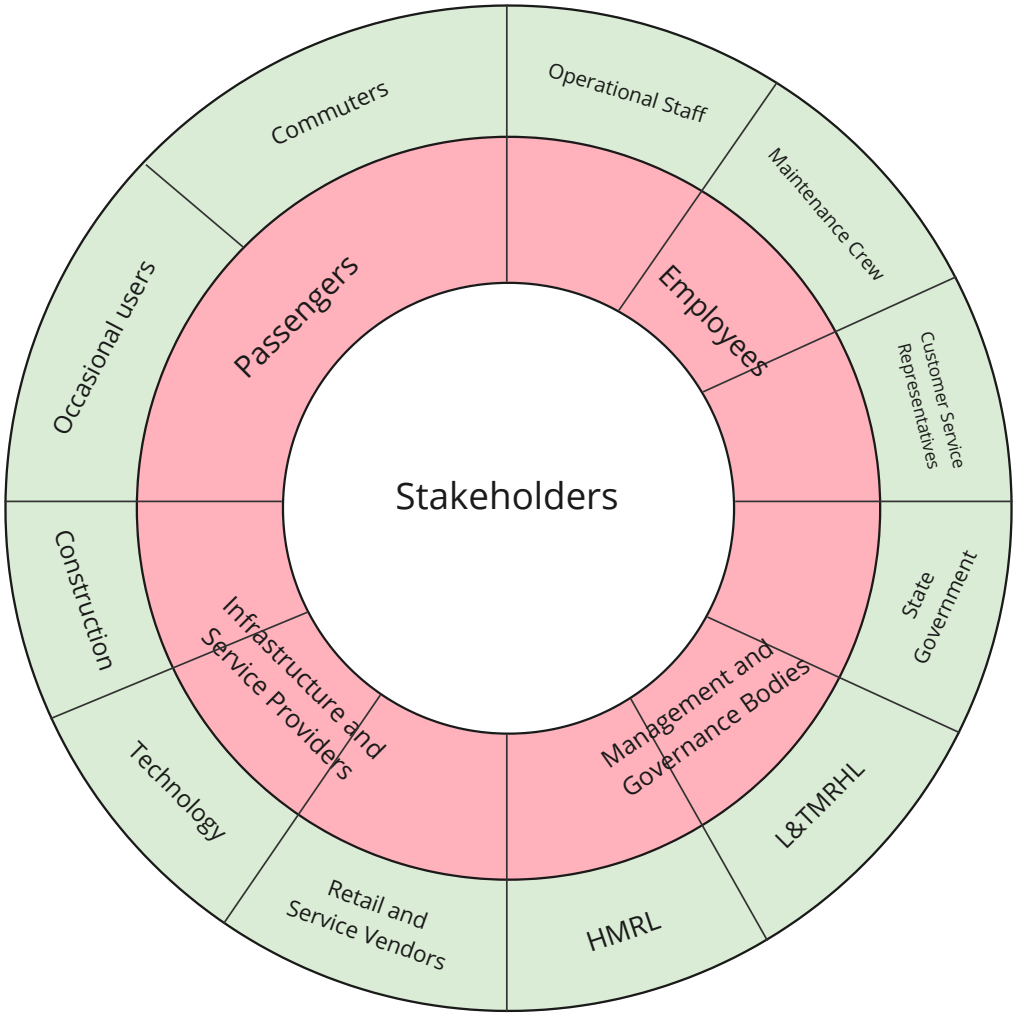
The city's diverse population and varying travel needs require the system to adapt and cater to a wide range of user preferences and behaviors. Analyzing these factors helps to identify challenges and opportunities for improvement, ensuring that the metro system effectively meets the needs of its users while integrating seamlessly into the city's broader context.




Hyderabad Metro
Booths
Hand held metal scanners
Queue managers
Baggage scanners
CCTV
Security camera
Security staff
Brethlyzer
TCAS (Train Access Crew System)
Casual travellers
Couples
Waashrooms
Passengers
Commuters
Students
Tourists
Software engineers
Senior citizens
Shift workers
Employees
bviub
Traffic
Signage
Navigation
Stations (57)
IT hub
Raidurg
Peak hours
Security check
Platform
Announcemnets
Status
Trains (57)
Frequency
Urdu
Train operator
Emergency button
Coaches
Reserved seating
Seats
Ladies coach
Retail stores
Dadus
Jumbo kings
Vaango
KFC
Zudio
Local vendors
Coca cola
Ratnadeep
Tibbs
Concourse
Drinking water
Isolation rooms
First aid Kits
Stretcher
Emergency halt buttons
Parking
Signalling
ATS (Automatic tracking system)
Fire safety equipment
Fire Hose
OCC (Operation control center)
Sidings
Depot (2)
Station controller
Station control room
Customer care
Maintenance
BMS
Escalators
Lifts
Luggage
Stairs
Lighting
Ticket
TVM
Station naming rights
Tail gating
TOM
Recharge
T-savaari app
UPI
Card
Phone pe
Whatsapp
Paytm
Fine/penalty
Track access
AVM
Paid area
Unpaid area
AFC Gates
LMC/FMC
MMTS
Ola/ Uber
RTC
Own transport
Dropped by someone else
Youtube
Instagram
Website
Social presence
Route map
State government
18,000 Crore debt
Rents
Revenue streams
Tickets
L&T Metro
Thales
Political influence
Keolis
Tenon
Housekeeping
Elevated stations
Hyundai Rotem
Drainage/ sewage
Visa office
Coaching centers
Beggars
Ameerpet
Nagole
Mettuguda
Short
Train terminates
Footover bridge
Intersections
MGBS
Musi
Parade ground (JBS)
Blue line (C3)
Paradise
Secunderabad East
Madhapur
Red line (C1)
Nampally
Green line (C2)
RTC X Roads
Miyapur
JNTU
KPHB Colony
Temple
Market
Punjagutta
Mall connection
Irrumanzil
LB Nagar

Stakeholder mapping

Categorizing stakeholders based on their roles, influences, and interests, and understanding how their needs and actions impact the project. In the context of a metro system, stakeholder mapping is crucial because it helps to ensure that all relevant parties are considered in decision-making processes, facilitates effective communication, and helps address potential conflicts or issues.



Station Visits

Madhura Nagar
Guided by Mr. G Shiva Kumar

Accompanied Mr. Shiva during his audit at the Madhura Nagar Metro Station. This allowed us to gain a concise understanding of the operational and maintenance aspects of the Hyderabad Metro. During our visit, we observed several smaller subsystems within the metro station

The station control room operates six key systems: ATS for monitoring train and station status, Building Management System (BMS) for managing lighting and escalators, CCTV for surveillance, AFC for tracking passenger movements, Auxiliary Sub-System (ASS) for power supply surveillance, and Customer Care (CC) for handling passenger queries.

The station is divided into paid, unpaid, and platform areas, with platforms typically 130 meters long. Accessibility features like wheelchairs and tactile paths for the visually impaired are provided.
Fire safety measures, including fire extinguishers and hose reels, are strategically placed, though passenger awareness of emergency protocols appears limited. Each metro coach has emergency call points for passenger use, and train dwell times vary between 20–30 seconds at most stations, extending to one minute at more crowded stations.



Mens security check queue, Nagole

Ameerpet Station

We interviewed security guards, metro personnel, and passengers to gather insights on the daily operations and challenges at the metro stations especially at a big intersection station like Ameerpet, which garners high daily footfall.

The guards, especially during peak hours, handle crowds with empathy and rely on whistles for communication, avoiding harsh behavior even when passengers make mistakes. The female guards focus on maintaining order in the women's section, often dealing with incidents where women require first aid. Passengers shared their experiences, including an elderly couple from Gujarat who found the station announcements inaudible and signage inadequate.
Observations revealed that many passengers rely on mobile devices for entertainment or work.
Passengers at Ameerpet station frequently experience confusion and tend to exhibit herd behavior, following those ahead of them to reach their interchange platform rather than relying on the signage. This often makes it the most hectic and disorienting part of their journey.

Ameerpet is a bustling station, with numerous retail stores like Zudio, KFC, Ratnadeep, and Tibbs Frankie attracting passengers who often indulge in some recreation before continuing their journey. Many passengers take the opportunity to grab a water bottle or cold drinks from these stores.



Crowded Platform in Raidurg during peak hours, Thursday 16:50 HRS



Traffic under Raidurg metro station, Thursday 19:00 HRS

Raidurg
Guided by Mr. S Sundarpandian

During our 3-day ethnographic study at Raidurg Metro Station, we observed a range of significant challenges in passenger behavior and station operations. The observations were conducted throughout the working hours of the day, 9 AM to 8PM. Raidurg, one of the busiest stations on the Hyderabad Metro, handles 30,000-35,000 exits daily, and the sheer volume of passengers, especially during semi-peak hours, was overwhelming. Our end-to-end journey on the Blue Line from Nagole to Raidurg highlighted how intense the crowding can be, particularly during evening entries, which are more concentrated compared to the more spread-out exits. The lack of siding at Raidurg also led to passengers boarding trains in the wrong direction in an attempt to secure seats.

The station was extremely crowded throughout the day. Passengers often crossed the yellow line before trains arrived, engaged in pushing and shoving to secure seats, and exhibited urgency that exacerbated crowd management difficulties. Passengers carrying luggage or using digital payment apps for multiple tickets contributed to further delays and congestion. Feedback from user interviews with passengers, station controllers, and security personnel validated many of these observations. The need for improved experience and crowd management strategies was evident, emphasizing the importance of reducing passenger wait times and enhancing operational efficiency. Despite the challenges, the metro remains a preferred transport mode, underscoring the need for continued improvements to better serve both passengers and staff.



Parade grounds metro, Parking, onlooking JBS Parade grounds metro station



MG Bus Stand metro station, onlooking the MG Bus Depot

Parade grounds

Parade Ground station serves as the interchange between the Green and Blue lines, and is notably busy with a diverse crowd that includes students, IT employees, and passengers heading to bus stations. The Green line (C1) operates with a train frequency of 12-13 minutes. The station infrastructure includes a foot over bridge with a T intersection connecting Parade Ground to JBS station, and a parking facility is available between these stations.

MG Bus Stand

The MGBS station stands out as India's largest metro station, Hyderabad's tallest, and one of the largest in Asia. It features skywalks that connect one arm of the station to the MGBS bus depot and another over the Musi river to the Chaderghat area. Notably, these skywalks are open to the public, including those without a metro ticket, which raises concerns about safety for metro passengers. This openness to the public might impact the overall user experience, highlighting the need for enhanced security measures in the station design.
At MGBS station, cash transactions dominate due to a large influx of first-time travelers, many of whom arrive from the bus station, contrasting with the online transaction trend at other stations. The crowd is mostly low-income or from villages, and most passengers use it to visit the VISA office. The station was massively underutilized, with empty retail space, less staff, and lines at ticket machines.

The station has two arms, one extending toward Chaderghat (Arm A) and other extending to the bus station (Arm B). fThe arm that extended towards Chanderghat, somewhat had an eerie and deserted atmosphere, which is poorly surveilled and blocked by pillars, reducing the flow of passengers and contributing and the smell of the garbage dump on the banks of the Musi river created a negative sensory experience.



Crowd in Stadium Station, on match day (SRH vs CSK)

Stadium station Visit

On match days, Stadium station experiences a massive influx of passengers, with around 18,000-20,000 individuals compared to just 2,000-3,000 on regular days. To manage this crowd, the station significantly increases its security presence from 4-5 guards on a typical day to 20, along with additional support staff and police officers.

Train frequency is adjusted to accommodate the surge, and station gates are reconfigured to handle the bi-directional flow, with most gates serving as exits. Hyderabad Metro Rail (HMRL) and Hyderabad Cricket Association (HCA) work together to anticipate crowd size and inform L&T of the required resources, including extra police for patrolling the premises.

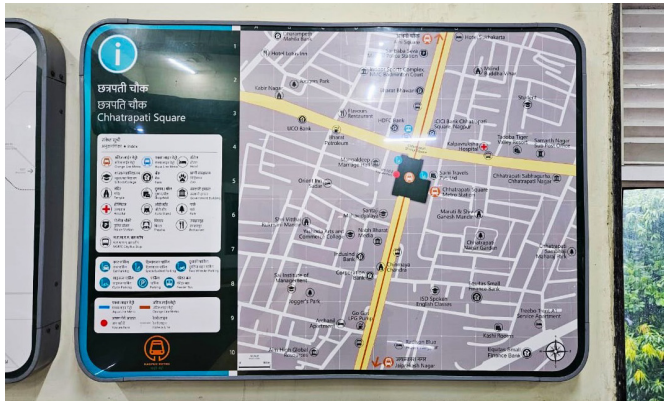
The crowd behavior on match days is notably different, with passengers often displaying impatience and engaging in disruptive actions such as line-breaking, taking pictures, and chanting as they exit the train. Ticketing issues are prevalent, with many passengers mistakenly buying tickets for the Uppal station instead of the Stadium station due to its common reference as Uppal Stadium. Additionally, the station sees increased lingering in both paid and unpaid areas as people wait for friends or visit retail stores, leading to further congestion.

Additionally, street vendors set up their shops right at the station exits, selling jerseys and match-related merchandise.

Chatrapati Square (Nagpur Metro Station)

During a visit to Nagpur, I had the opportunity to explore the Chatrapati Square Metro Station. This station serves as a key stop for tours and travel vehicles in the city, much like the Paradise and Miyapur metro stations in Hyderabad. The Nagpur Metro, a relatively new network, spans around 24 kilometers.

The infrastructure appeared modern, with improved signage that was well-lit and strategically placed to assist passengers in navigating the station. AFC gates had a much simpler user interface. The station's utilization of space appeared to be quite tight and not as well-equipped to handle large crowds that we often see in Hyderabad's metro stations.



Signage at Nagpur Metro, Chatrapati Square

3.1.2 Literature Review



City Mapper, Google playstore



Oyster Card, London transit



Chalo Card, Mumbai

Research Papers

Objectives:

- Evaluate Technological Advancements in Urban Transportation
- Analyze the Role of Mobile Applications in Urban Transportation
- Impact of Mobile Fare Payment Systems in Mass Rail Systems
- Identifying Challenges and Opportunities in Smart Urban Transportation
- To be able to provide a Holistic Perspective on Urban Transportation Improvements throughout the years.

The rise of mobile applications has further transformed urban travel patterns. Mobility apps that offer real-time information, multimodal transport options, and user-friendly interfaces are crucial for reducing reliance on private vehicles and alleviating congestion (Casquero Soler et al., 2022).

These apps enable users to plan their trips more efficiently by integrating various transportation modes into a single platform, thereby promoting sustainable travel behaviors. This integration aligns with the broader trend of using digital solutions to improve public transportation and reduce traffic congestion.

Mobile fare payment technologies also play a significant role in enhancing public transit efficiency. By reducing waiting times and simplifying fare transactions, these systems improve the overall user experience and help transit agencies lower operational costs (Owusu-Agyemang et al., 2024).

Despite their advantages, challenges such as equitable access to technology and the need for inclusivity must be addressed to ensure that all users benefit from these advancements.

Understanding user behavior is crucial for designing effective solutions for the transportation systems. A study on factors influencing travel behavior reveals that travel cost, convenience, and environmental consciousness are pivotal in shaping transport mode choices (Marasinghi et al., 2015).

Individuals with higher income levels may prioritize speed and convenience, leading to a preference for private vehicles, while those with lower incomes often opt for more affordable public transport. This study underscores the need for policymakers to consider these factors when designing transportation policies aimed at encouraging sustainable travel behaviors.

Effective mobility apps are characterized by several key features that significantly enhance urban transportation. Integrating real-time data from various transport modes—such as buses, trains, and ride-hailing services—is crucial for helping users make informed travel decisions and optimize their routes.

The ability to offer multimodal transport options allows users to seamlessly combine different forms of transportation, improving overall travel efficiency and convenience.

User-friendly interfaces are essential for broad adoption, as they ensure that the app is easy to navigate and use. Personalization and customization features further enhance user satisfaction by tailoring travel information and options to individual preferences. Accessibility is also a critical consideration, ensuring that the app is usable by a diverse range of users, including those with disabilities. Together, these elements contribute to more efficient, convenient, and inclusive urban transportation solutions. (Siuhi et al., 2016)

The studies reviewed in this literature review collectively underscore the importance of integrating technology and user-centric approaches in urban transportation systems. Intelligent transportation systems, mobile applications, and smart city initiatives all contribute to making urban travel more efficient, sustainable, and user-friendly. As cities continue to grow and evolve, the insights from these studies can guide policymakers and urban planners in creating transportation systems that meet the demands of modern urban life while promoting sustainability and inclusivity.

Overall, integrating intelligent systems, mobile apps, and smart technologies into urban transportation infrastructure presents both opportunities and challenges. While these innovations offer substantial benefits in terms of efficiency and user satisfaction, issues such as technology access and data security remain critical considerations. A collaborative approach involving governments, technology providers, and the public is essential for developing transportation systems that are not only advanced but also inclusive and sustainable. This holistic view is crucial for addressing the diverse needs of urban populations and creating effective, equitable transportation solutions.

Social Media

During my research on social media platforms like Reddit and Twitter, I uncovered a variety of user experiences and concerns regarding the Hyderabad Metro. These platforms provided a candid glimpse into the daily challenges faced by commuters and areas where the metro system could improve.

One of the recurring issues mentioned on these platforms was the overcrowding during peak hours, particularly at Raidurg. Commuters expressed frustration over the limited train frequency, long waits and packed trains. Never being able to get a seat is a common frustration among commuters, especially during the evening rush when people are exhausted after work. Securing a seat is a primary concern for the large crowds, particularly for those who have long distances to travel. Some even mentioned that despite using the metro for over three years, they've never managed to find a seat.

Payment and ticketing issues were another hot topic, with several users discussing the challenges of using UPI payments and metro cards. Some reported difficulties in recharging their cards or facing transaction failures, which caused delays and inconvenience.

Many users also expressed dissatisfaction with the T-savaari app, noting that it does not adequately support their needs. A common request was for the inclusion of train tracking features, which would allow passengers to better plan their journeys by knowing exactly when a train will arrive.

It baffled me how unaware the general public was of the challenges faced by the Hyderabad Metro system. Many people casually suggested, "Just add more coaches" or "Run more trains," without considering the significant costs and constraints involved. L&T is doing its best with the limited resources available, pushing the system to its limits.

This provided me with valuable insight into the mindset of metro passengers. Their primary focus is on themselves—everyone is eager to get home as quickly as possible and everyone is in a hurry to secure a seat. Despite being in a crowded environment, many are surprisingly unaware of those around them. For example, young people often take seats without offering them to elders, and several Reddit threads pointed out the issue of men entering the women's section. In some cases, these men behave inappropriately, while in others, they simply move into the women's section due to overcrowding, only to be forcibly removed from the trains.

I also experienced a situation that made me think about how common such disruptive incidents might be. While using social media on my phone, a man sitting next to me glanced at my screen, noticed my username, and later attempted to contact me. This incident made me wonder how frequently these types of situations occur, affecting not only the user experience but also the overall impression of the metro system.

r/hyderabad • 2 yr. ago
your_inner_satan

Frustrating experience in Hyderabad metro

Rant/Vent

Had an appaling experience in metro today. I boarded from raidurg metro station. At Madhapur station, a lady boarded the train, tapped on my shoulder and asked to vacate the seat for her. Had she politely asked, I would've happily vacated for her. But the way she did was very rude. Anyways I stood up and politely told her that ladies coach is the last coach and this seat is neither reserved for ladies or anyone else. She seemed to be in her mid 30s. But to my surprise she started cursing me! I said I'm addressing you as "mam" and being very polite, why are you abusing like that! She still didn't relent and told ladies around that I'm telling her that this isn't ladies section and she shouldn't be here and get lost. I said that's utter lie! But the other ladies also ganged up on me and told me to get out of the metro at next station else they'll complain against me for harrassment!! I didn't want to create a scene So i left and waited for the next train. But this experience rattled me and I felt so helpless! I respect women a lot but what to do about these b*tches who act so entitled and brazenly in metro!

r/hyderabad • 7 mo. ago
nerdy_ace_penguin

Why is Gachibowli and Kondapur not included in Hyderabad metro route ?

AskHyderabad

I lived in Hyderabad for 2 months during 2015. My office was in Gachibowli and i lived in Kondapur. It is surprising to learn that Gachibowli with lots of offices like Wipro, Infy, Microsoft, Polaris, Deloitte is lacking a metro station. Kondapur is also a densely populated area with lots of IT guys living there. It is ano brainer to connect these two places via metro. I checked the metro plan and there is no metro line planned for these routes in future too. Do you know why they are not included in metro plan ?

u/Striking-Glass351 • 3 mo. ago

DONT USE METRO TO GO TO RAIDURG!!!

Commuting to Raidurg for work is an absolute nightmare! There's barely any breathing room on the trains. Why on earth can't the government step up and add more carriages or increase the frequency of trains? KCR squandered public funds, and now Revanth will likely follow suit. It's like this country is doomed to perpetual incompetence and mismanagement!

u/rnarjnl • 3 mo. ago

The crowd levels are extremely terrifying

I was thankfully going towards Nagole the other day from Mettuguda, but i was looking at the other platform. An empty train entered the station and the passengers just rushed into the train like they never saw a seat in their life. I hope something is improved about the commute in Hyderabad Metro.

Source: Reddit

r/hyderabad • 18 days ago
smartharty7

Hyderabad metro vs Japan

Culture

Japan's metro system has professional pushers that apologize to the commuters before pushing them inside, so that the doors can close

Hyderabad metro needs professional pullers instead!

r/hyderabad • 4 mo. ago
FrontMasterpiece4503

Metro Packed!

AskHyderabad

IK i might sound a bit ignorant but, why doesnt HMRL make the number of carriages on the Hyderabad Metro six instead of just three? On peak hours coming to and from Raidurg Station you legit cant get on the first three trains unless you wanna be squished by a hundred people in the same carriage

r/hyderabad • 6 mo. ago
ramrajlg

Hyd Metro | Lack of lane discipline

Current Events

There's absolutely no lane discipline in Hyd metro. People just barge in and there are no Metro staffs to solve this issue. Things were very streamlined back in bangalore.

r/hyderabad • 1 mo. ago
milio_o1

Are there any apps to live track Hyderabad metro trains?

Travel

r/hyderabad • 3 mo. ago
bcosynot0969

Is the Metro Card Worth It?

AskHyderabad

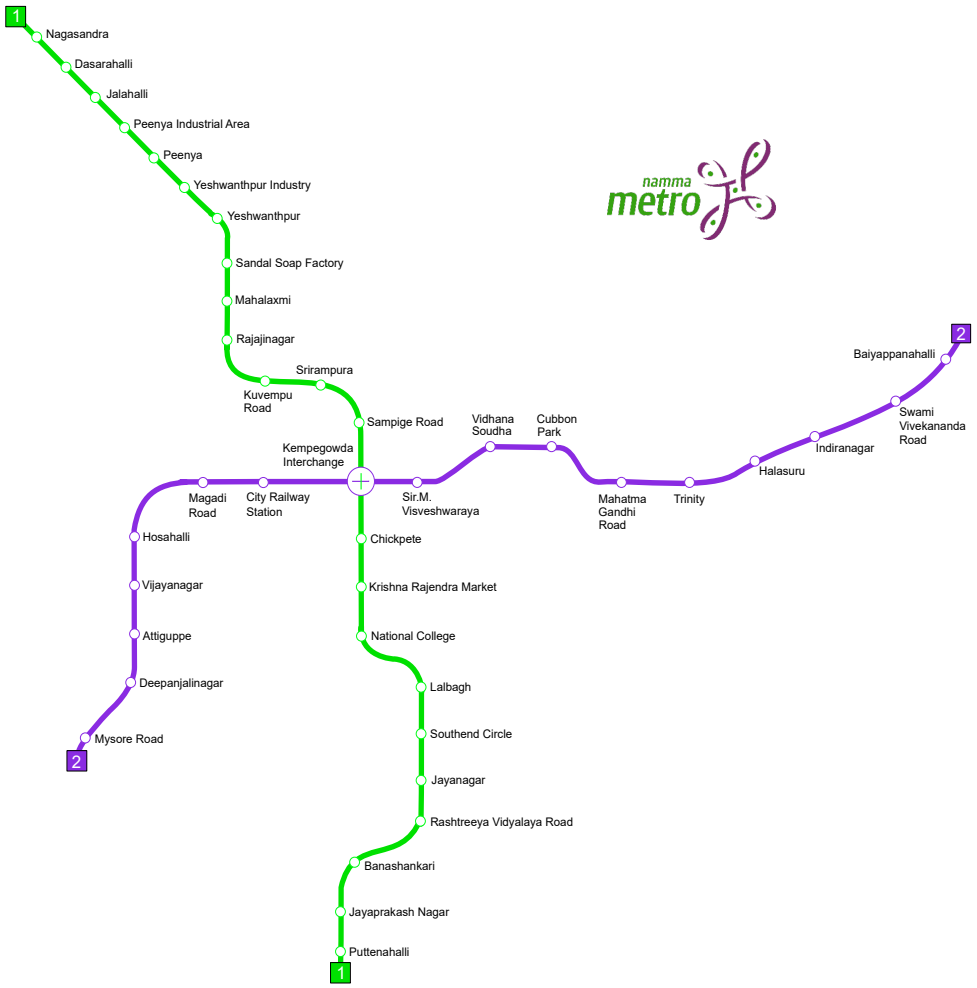
I have a summer internship near Chikkadpally, and will have to travel daily from Raidurg. Is it worth getting a metro card and stuff just for the summer? (I'm only here for 3 months)

Also please tell me what the process and stuff is

Case Study

Bangalore Metro (Namma Metro) serves as an ideal comparative study for Hyderabad Metro due to the striking similarities in urban context, network scale, and the challenges both systems face. Both cities are major IT hubs in India, experiencing rapid urbanization, which has led to increased traffic congestion and a growing demand for efficient public transportation. With similar network sizes and ongoing expansions, the operational challenges and opportunities for growth in both metro systems are closely aligned. Moreover, the cities share comparable commuter demographics, with a significant population of tech professionals and students, making the study of passenger behavior and peak hour management highly relevant.

Both metro systems are at the forefront of digital integration, utilizing advanced ticketing systems, mobile apps, and real-time updates to enhance the user experience. By comparing the functionalities and user adoption rates of their respective apps, Hyderabad Metro can identify areas for improvement in the T-savaari app. Additionally, Bangalore Metro's strategies for managing urban density, implementing sustainability initiatives, and addressing logistical challenges provide valuable lessons for Hyderabad Metro as it continues to expand. Understanding public perception, sustainability efforts, and operational practices in Bangalore can help tailor more effective solutions for the unique needs of Hyderabad's metro system.



Bangalore's population is a vibrant mosaic reflecting India's diversity. According to the 2011 census, the city had a population of approximately 8.4 million, with a significant youth bulge due to its status as an education and employment hub. Bangalore's culture is a unique blend of traditional Kannada heritage and modern cosmopolitanism.

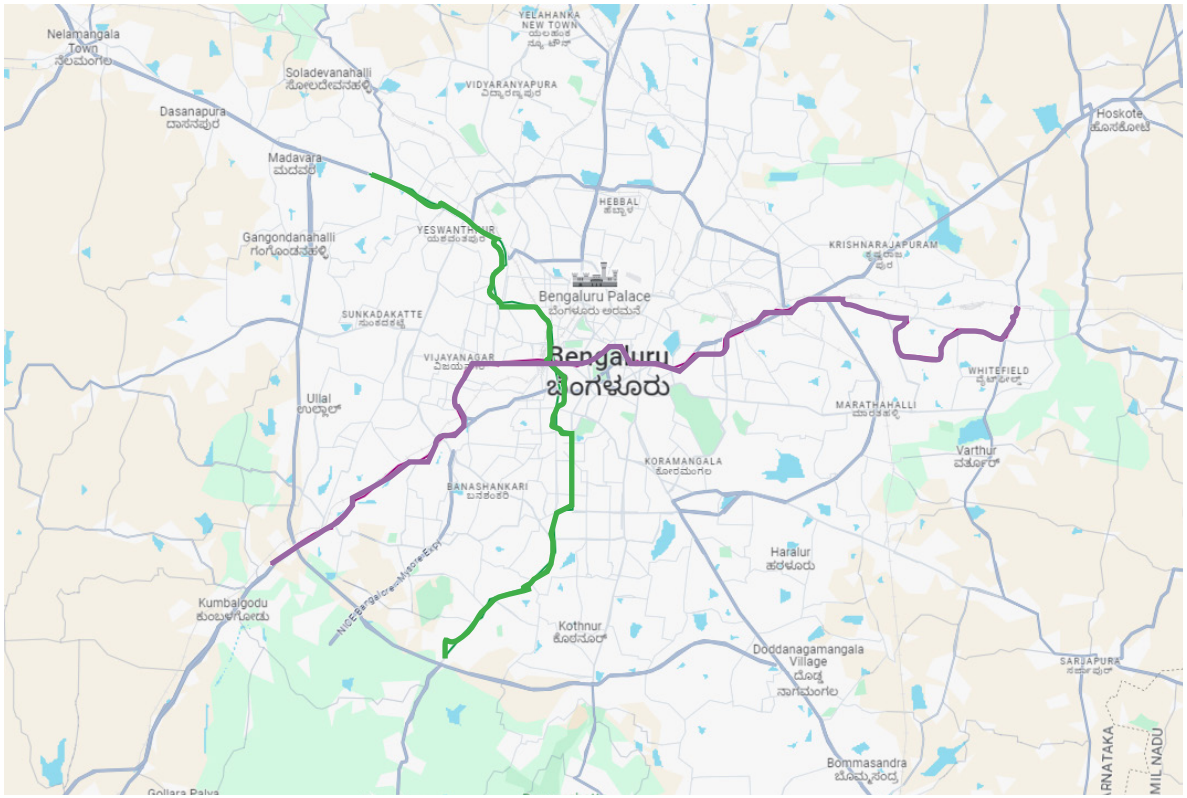
The city's demographics exhibit a mix of:

IT professionals
A large segment of the population comprises highly skilled IT professionals from across India, contributing to the city's cosmopolitan atmosphere.
Students:Bangalore is a major educational center, attracting students from various parts of the country.

Service Industry
The city's burgeoning service sector employs a substantial workforce, contributing to its economic growth.

Blue-collar workers
The city's infrastructure development and growing economy have led to an influx of migrant workers from rural areas.

While public transportation has improved, challenges such as traffic congestion and inadequate infrastructure persist. The city is continuously working on expanding and upgrading its transportation network to meet the growing demands of its residents.

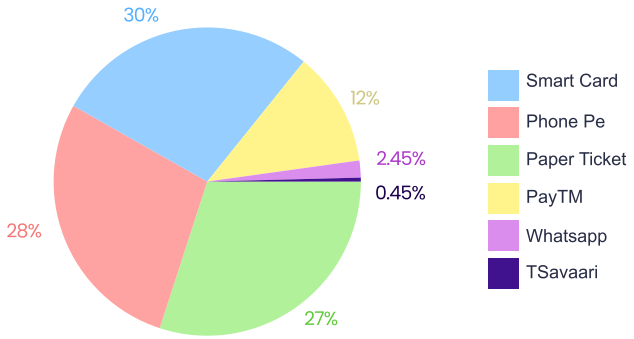


Source : Googe Maps

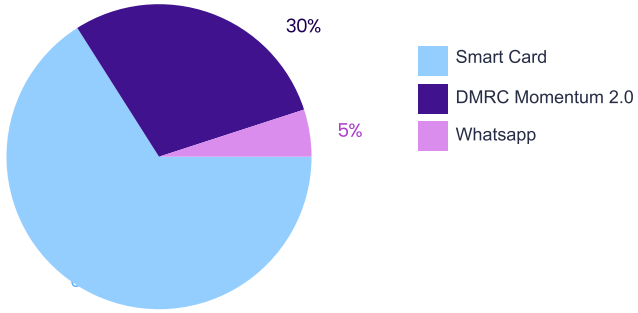
Namma Metro Banglore	Hyderabad Metro
Operational Length 73.75 km	**Operational Length** 69.3 km
Stations 66 (57 elevated, 8 underground, 1 at-grade)	**Stations** 57 (All elevated)
Ridership (2024) Daily average of 636,000, peak ridership of 8.08 lakh	**Ridership (2024)** Daily average of 5,46,000
Ticketing Namma Metro employs various fare collection methods, including contactless smart tokens, QR-based tickets, and smart cards. The Varshik card, priced at ₹50, allows for multiple journeys and provides a discount on fares. Automated Ticket Vending Machines (ATVMs) and online recharge options have been introduced to streamline the process. The introduction of the National Common Mobility Card (NCMC) aimed to integrate various forms of transportation, though its adoption by other local transport systems is still in progress.	**Ticketing** The Hyderabad Metro offers a variety of ticketing options to meet the needs of its diverse passenger base. Passengers can use Nebula Cards, which are smart cards ideal for frequent travelers, or opt for the Paper QR Ticketing system for single journeys. The metro has also embraced digital payment methods, allowing passengers to purchase tickets via UPI using platforms like Paytm, PhonePe, and WhatsApp. Ticket Vending Machines (TVMs) and Automatic Vending Machines (AVMs) at stations are often out of service, leading to a reliance on manual ticket sales at customer care booths.
Bus Rapid Transit (BRT) Dedicated bus lanes and modern buses offer a faster and more comfortable commuting option.	**TSRTC** Telangana, offering extensive bus services across urban and rural areas to connect people within the state.

Sources: Metro Rail Today, BMRCL Website, Times of India

Statistics



Hyderabad Metro Ticket Distribution

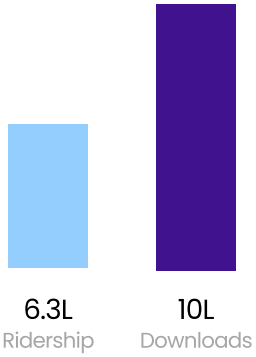


ii. Delhi Metro Ticket Distribution

More than 40% of Hyderabad Metro tickets were purchased through UPI ticketing, but less than 0.45% of users used the T-Savaari app for booking tickets. In comparison, about 30% of Delhi Metro users purchased tickets through the DMRC app, and approximately 11.5% of Namma Metro users used their official app for ticketing.

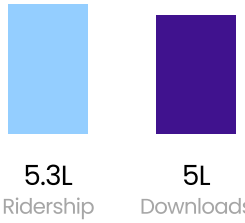
The Hyderabad Metro launched its official app, T-Savaari, in 2018, while Bangalore Metro introduced its app shortly after its network expansion. Delhi Metro's app was initially launched in the early 2010s and was significantly promoted, becoming a benchmark for user experience among Indian metro apps.

The Delhi Metro Rail Corporation (DMRC) updated its app in 2023, renaming it DMRC Momentum 2.0, setting a new standard in terms of features and usability for metro apps across India.



iii. Namma Metro : Average Daily Ridership vs APP downloads in Lakhs (L)

Source : Google Playstore



Hyderabad Metro : Average Daily Ridership vs APP downloads in Lakhs (L)

Source : L&T , BMRCL

1,71,000 Total Unique Users

475 Average new users per month

380 Returning users per month

T-Savaari App Retention Rate

Source : L&T

3.2 Reasearch Cycle 2

There is a significant 64.5% difference in the adoption rates between the Bangalore and Hyderabad Metro apps, highlighting the gap in user engagement.

Additionally, the Hyderabad Metro app, T-Savaari, shows a concerningly low user retention rate of just 0.25%, indicating that only a small fraction of users continue to engage with the app after initial use. This suggests challenges in maintaining long-term user interest and satisfaction with the app.

3.2.1 Survey

Sample size: 200
Medium : Google forms

Objectives:

- To gather a foundational understanding of the overall user base. Included introductory, quantitative, and descriptive questions to establish context and insights.
- To uncover potential problem areas and challenges faced by users during their metro journeys.

Questionnaire:

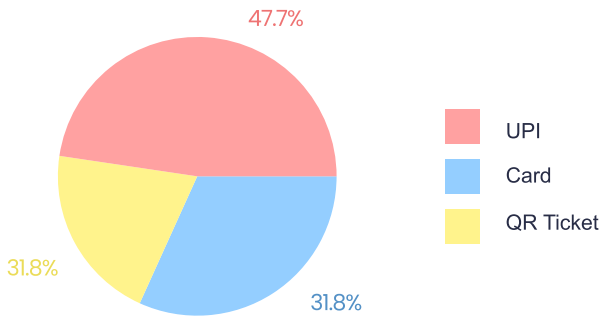
The survey begins by collecting foundational information about passengers, including their name, age, profession, gender, and travel frequency on the metro. These introductory questions help to establish the demographic profile of the respondents and provide context for their answers. Understanding who uses the metro and how often they travel is crucial for analyzing patterns and trends in the data.

The next section explores passengers' travel behaviors and preferences, focusing on how they purchase and recharge their metro cards, where they store them, and their most frequently used metro lines and stations. By examining these aspects, the survey seeks to identify common practices and preferences in ticketing and travel routes. This information is valuable for understanding user habits and preferences related to metro travel.

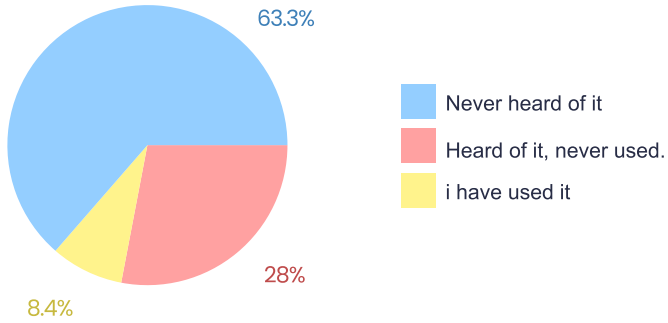
Experience and feedback are then assessed, with questions evaluating satisfaction with UPI ticketing, identifying chaotic stations, and reporting any delays or disruptions related to ticketing issues. This section aims to uncover specific problems and areas for improvement within the metro system. By understanding user experiences and challenges, the survey provides insights into how the current systems and processes might be enhanced.

Finally, the survey covers how users navigate and plan their journeys, their behavioral observations on trains, and their opinions on the metro service's efficiency, comfort, and cleanliness. Respondents are also invited to suggest improvements and provide photos of issues encountered. This comprehensive approach gathers a wide range of insights, from practical tips for first-time users to visual evidence of challenges, enabling a thorough evaluation of the overall passenger experience.

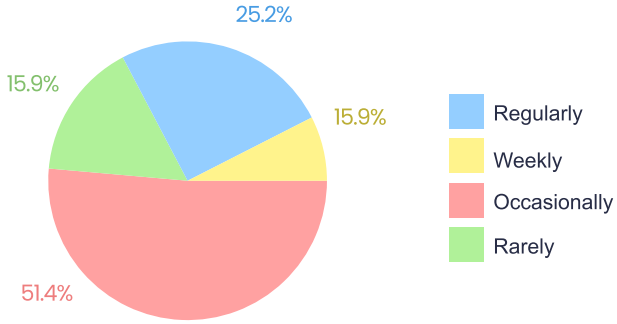
See Appendix A for Questionnaire and Survey Results Vol. 2 (Pg 157 - 166)



How do you purchase your metro tickets?



Are you aware of the T-Savaari app?



How often do you travel in metro



Average star ratings

See Appendix A for Questionnaire and Survey Results Vol. 2 (Pg 157 - 166)

3.2.2 User Interviews

Sample Size: 60

The objectives of these interviews are to immerse in the users' daily experiences, empathize with their challenges and needs, inquire about their specific behaviors and preferences, and probe further into their responses to uncover deeper insights.

To achieve these goals, the interviews were conducted utilizing a combination of structured, semi-structured, and focus group methods.

Structured interviews will provided consistency and comparability across responses.

Semi-structured interviews will allow for more flexible, in-depth exploration of individual experiences, and focus groups will facilitate dynamic discussions and the sharing of diverse perspectives among participants.

This multi-method approach aims to gather comprehensive and nuanced data to inform improvements in the metro system.



User Statements

" In the metro I usually listen to music and scroll Instagram "

" When I was new to the metro the person in customer care asked me to install TSavaari, I used a few times and i stopped, the app was not sufficient for me"

" I have to search on google maps every time I need to look for the closest metro station. "

" I'm skeptical of not being able to find my QR ticket so i take a screenshot of it every time. "

" I have to search on google maps every time I need to look for the closest metro station. "

" I once missed my stop because I couldn't hear the announcement and it was too late by the time i could see the screen "

" I travel with my office friends, 2 off us start from Mettuguda and another one joins us at Jubliee hills, it is better to pass time and i dont feel as irritated as when i'm travelling alone "

" During peak hours, it's difficult to find a place to sit or even stand comfortably, and the congestion gets too overwhelming. "

" The ticket purchasing process on the old app was a nightmare. It was often unresponsive, and I had to try multiple times before I could complete a transaction."

" I've missed out getting down on my station because i could'nt hear the announcements "

" I've lost my ticket like thrice- I started taking photo of it or I need to pay a fine "

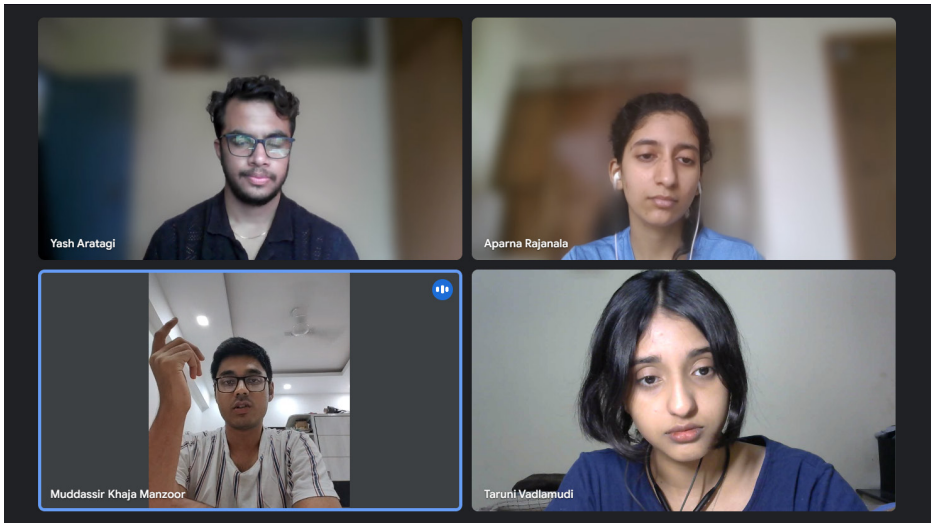
" I'm so exhausted that I'm at my breaking point. We've reached a stage where we all avoid going out to meet each other anymore."

" The guards push people inside to make sure the doors close properly. It's a bit chaotic—just imagine how crowded it must be inside the train."

" Traveling from Tarnaka to Prakash Nagar by road takes 40 minutes during the morning rush, but the metro covers it in just 14 minutes."

" I wish the metro station was closer. The auto fares to the station are higher than the cost of the metro ticket itself. "





Focus groups

A focus group is a qualitative research method where a small, diverse group of participants discusses a specific topic under the guidance of a moderator. This setting allows for dynamic interaction, where participants can express their views, challenge each other's opinions, and build on ideas collectively.

I gathered a group of students who travel daily to their college using the metro for one of my focus group discussions. This specific group was chosen because of their frequent use of the metro system, giving them a unique perspective on its strengths and weaknesses. During the discussion, they shared their daily experiences, challenges, and expectations, which provided valuable insights into how the T-Savaari app could be improved to better serve their needs.

Findings

Passengers are often glued to their mobile phones during travel.

Many passengers wear earphones to watch something or listen to music, blocking out crowd noise, but causing them to miss announcements.

Passengers are often unaware of their surroundings.

Some miss their stops because they move too late toward the metro doors.

Display boards frequently show station names in Urdu when the doors are opening.

Passengers lack information about station amenities.

Passengers booking QR tickets near AFC gates causes crowding and stress.

Multiple users share one phone to scan QR codes, leading to shuffling of the phone back-and-forth

Dark mode on phones prevents proper QR scanning.



Long lines form at customer care counters for smart card recharges and ticket disruptions

Passengers lack information about station amenities

Tedious task to locate closest metro station near you.

Most users who initially installed Tsavaari were early adopters of metro services. Over time, Tsavaari struggled to keep up with user demands, leading to decreased awareness among recent users over the past year.

People generally prefer to plan their journeys in advance, including: Checking the nearest metro or destination station and reviewing available FMC options

UPI ticketing is the most preferred option among survey demographics, likely due to: Post-COVID work culture, where many people visit the office only once or twice a week hence they deem metro cards as unnecessary.

When traveling in a group, one person usually takes the lead in purchasing tickets for the entire group.

There are currently numerous apps available for customers: Up to 3-4 options for UPI ticketing and 4-5 options for booking FMC and LMC.







Area of Intervention

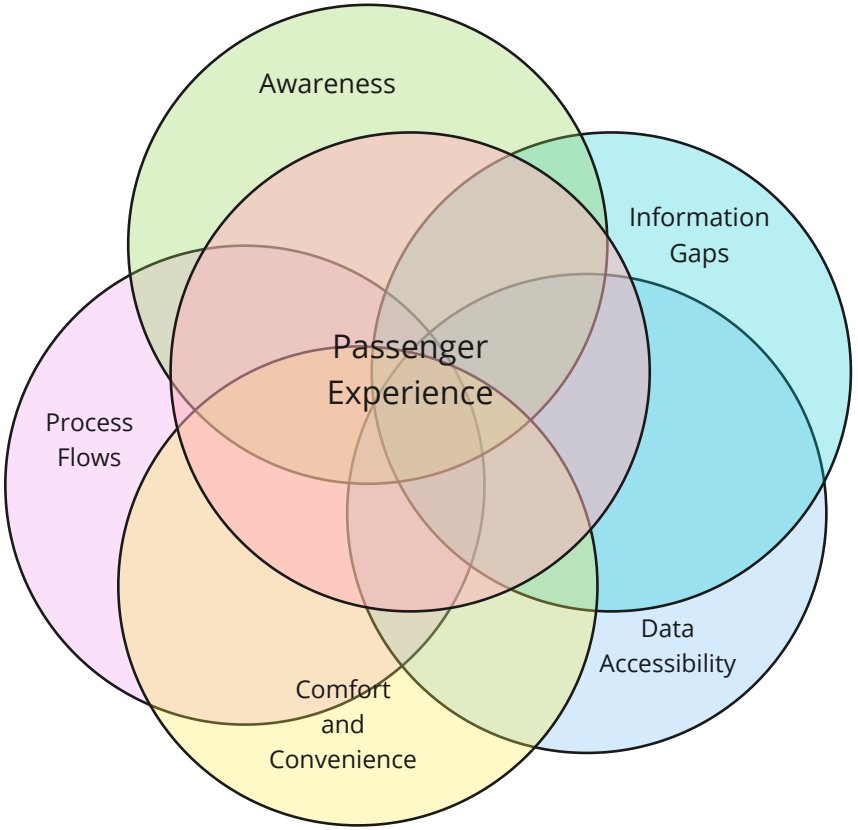
Awareness: This area focuses on how well passengers are informed about the metro system, including its features, routes, and services. As well as awareness of T-Savaari App and their general awarenessduring the journey.

Comfort and Convenience: This aspect evaluates the overall comfort and ease of use of the metro system.

Data Accessibility: This area examines how easily passengers can access relevant data, such as train schedules, real-time updates, and station information.

Information Gaps: To help passsenger access crucial information like station facilities and important updates.

Process Flows: This area looks at the efficiency and effectiveness of the various processes within the metro system, such as ticket purchasing, boarding, deboarding etc.



4. Analysis

4.1 User Journey

4.2 User Personas

4.3 Causal Loops

4.4 Root Cause Analysis

4.1 User Journey

The user journey of a metro passenger encompasses several key stages that collectively shape their overall experience.

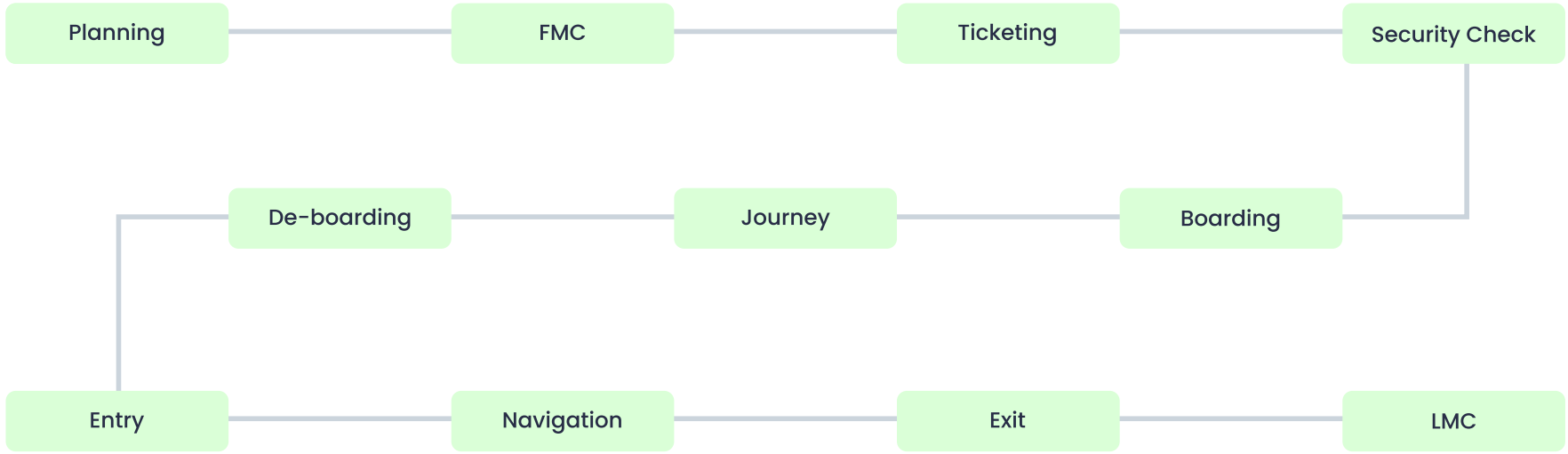
It begins with Planning, where passengers determine their travel routes and schedules. Entry involves accessing the metro station, FMC (First mile connectivity) followed by Ticketing and potentially, where they purchase or recharge their cards.

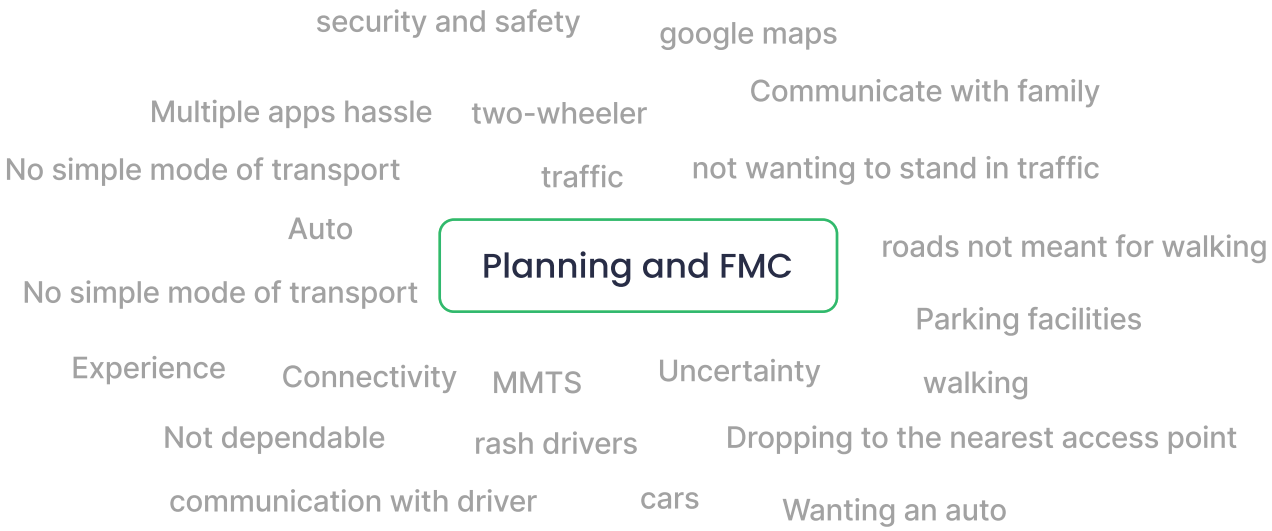
Security Check ensures safety before passengers proceed to Boarding the train.

The Journey phase is the core of the travel experience, culminating in De-boarding at their destination station.

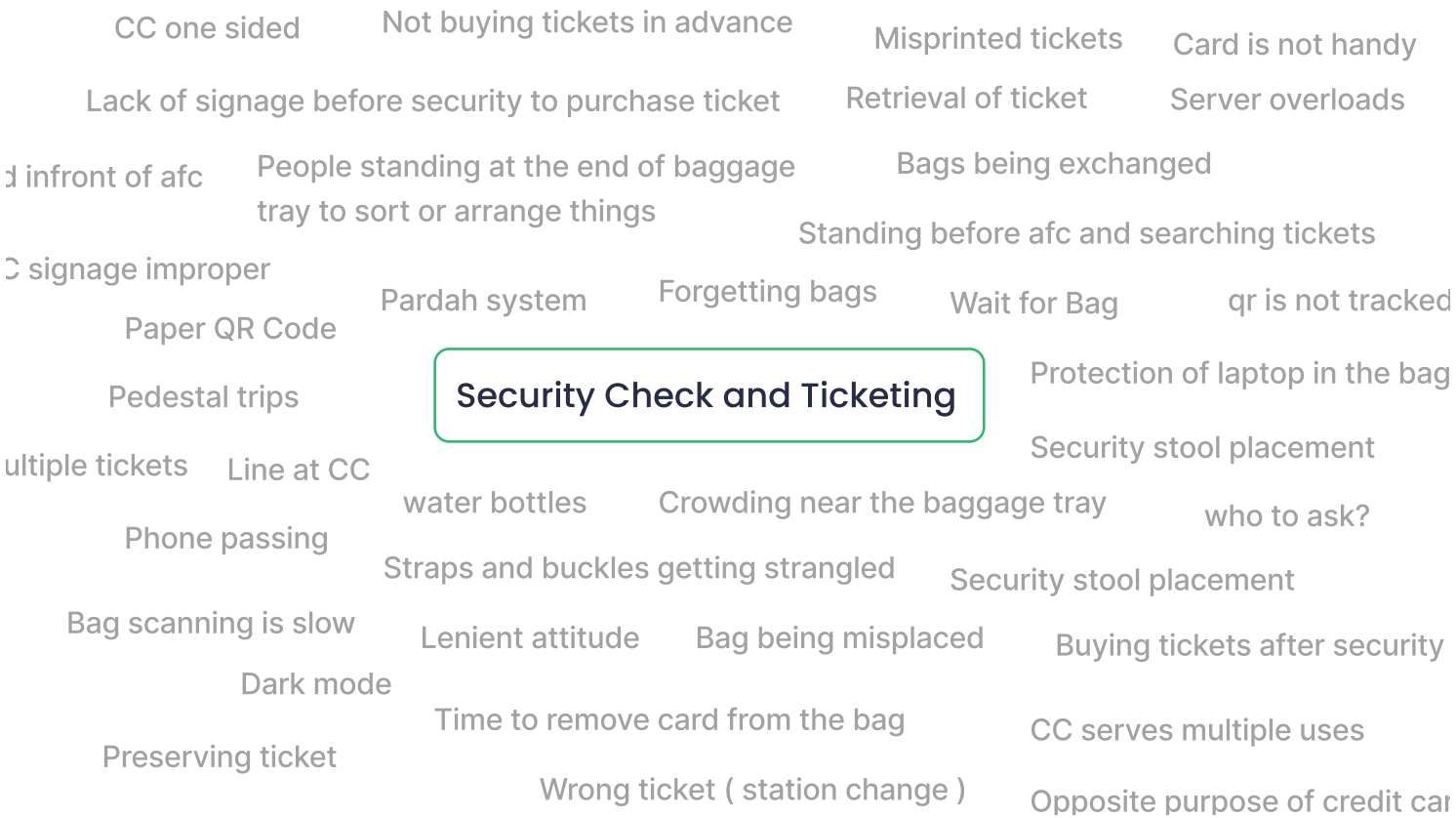
Navigation within the station helps them find their way, and Exit marks the final step as they leave the metro system.

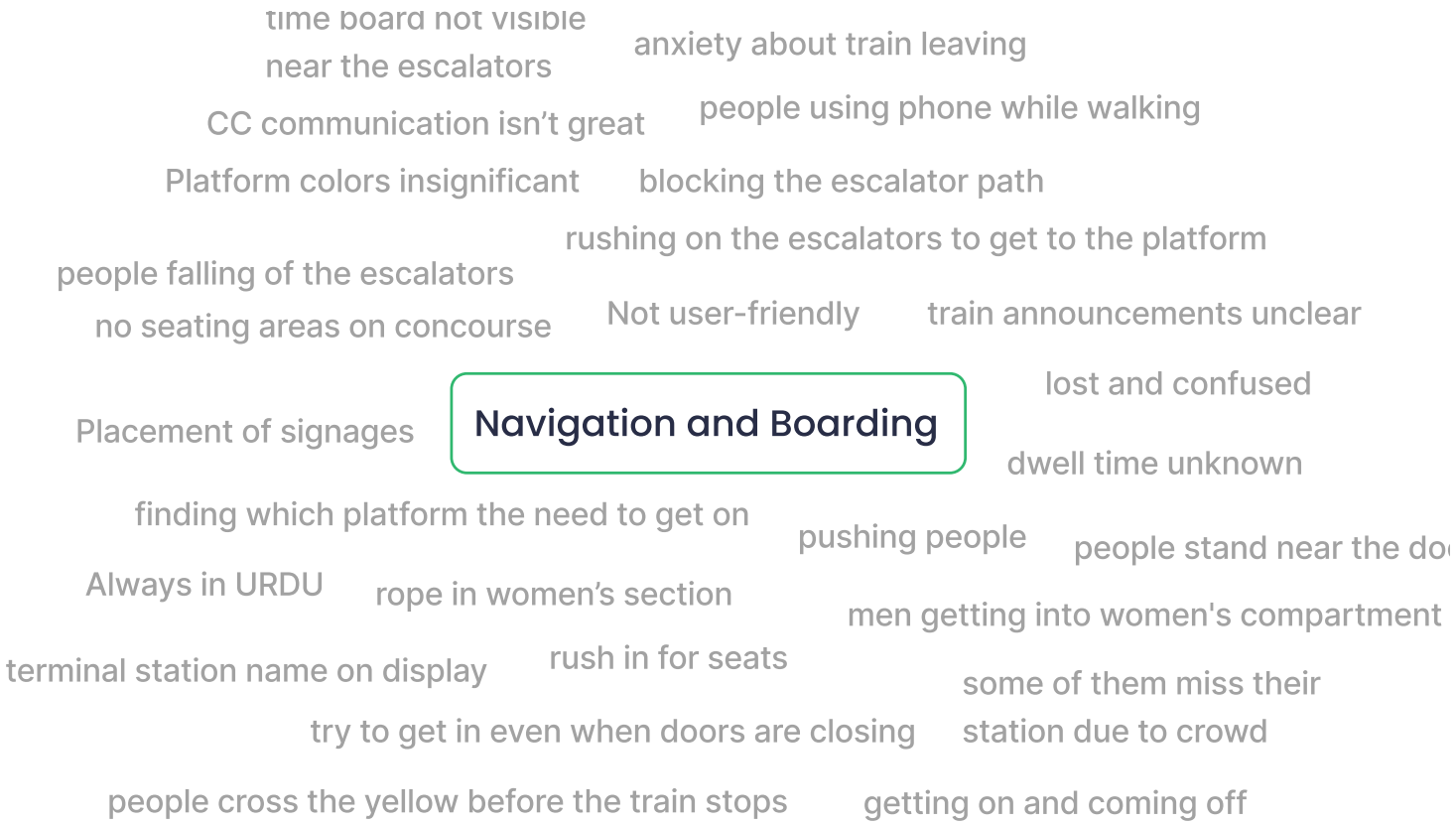
Additionally, LMC (Last Mile Connectivity) addresses the final segment of their trip, ensuring seamless connectivity to their final destination. Each stage is crucial for delivering a smooth and efficient metro experience.

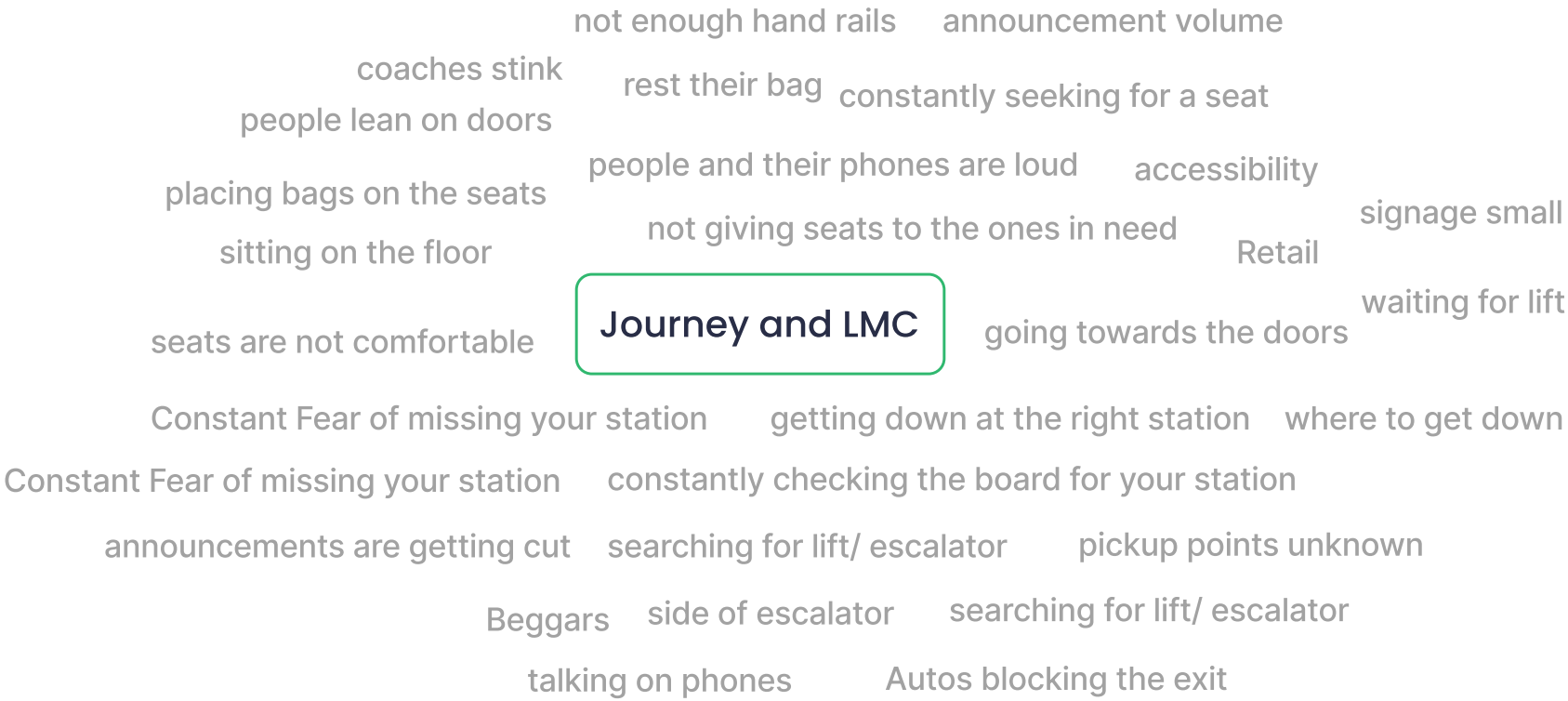




Problems word cloud according to stages of user journey


CC one sided
Not buying tickets in advance
Misprinted tickets
Card is not handy
Lack of signage before security to purchase ticket
Retrieval of ticket
Server overloads
d infront of afc
People standing at the end of baggage tray to sort or arrange things
Bags being exchanged
Standing before afc and searching tickets
C signage improper
Pardah system
Forgetting bags
Wait for Bag
qr is not tracked
Paper QR Code
Security Check and Ticketing
Protection of laptop in the bag
Pedestal trips
Security stool placement
ultiple tickets
Line at CC
water bottles
Crowding near the baggage tray
who to ask?
Phone passing
Straps and buckles getting strangled
Security stool placement
Bag scanning is slow
Lenient attitude
Bag being misplaced
Buying tickets after security
Dark mode
Time to remove card from the bag
CC serves multiple uses
Preserving ticket
Wrong ticket (station change)
Opposite purpose of credit car


time board not visible
near the escalators
anxiety about train leaving
CC communication isn't great
people using phone while walking
Platform colors insignificant
blocking the escalator path
rushing on the escalators to get to the platform
people falling of the escalators
no seating areas on concourse
Not user-friendly
train announcements unclear
lost and confused
Placement of signages
Navigation and Boarding
dwell time unknown
finding which platform the need to get on
pushing people
people stand near the do
Always in URDU
rope in women's section
men getting into women's compartment
terminal station name on display
rush in for seats
some of them miss their
station due to crowd
try to get in even when doors are closing
people cross the yellow before the train stops
getting on and coming off


not enough hand rails
announcement volume
coaches stink
rest their bag
constantly seeking for a seat
people lean on doors
people and their phones are loud
accessibility
placing bags on the seats
signage small
not giving seats to the ones in need
sitting on the floor
Retail
waiting for lift
Journey and LMC
seats are not comfortable
going towards the doors
Constant Fear of missing your station
getting down at the right station
where to get down
Constant Fear of missing your station
constantly checking the board for your station
announcements are getting cut
searching for lift/ escalator
pickup points unknown
Beggars
side of escalator
searching for lift/ escalator
talking on phones
Autos blocking the exit

4.2 UserPersonas

Rishika, 21 F



"Headphones on, world off!"

- Commutes to her college campus using the metro.
- Chooses metro because its the Cheapest means of transport and avoids traffic.
- During her metro rides, she always listens to music, using it as a way to escape and relax.
- She prefers engaging activities that make her commute feel shorter and more enjoyable, like texting or watching Netflix.

Santhi, 40 F



"I can't find the QR Ticket in my bag!"

- Santhi only uses the metro occasionally, usually for visiting relatives.
- She is Easily Overwhelmed: She can easily become confused or flustered when navigating the metro.
- She often feels anxious when she can't quickly find her ticket or when she's unsure about the next step in her journey.
- Purchases her QR ticket from CC.

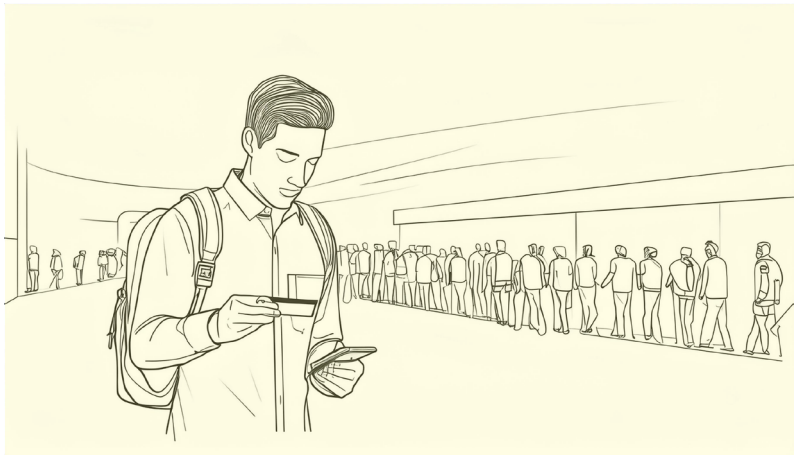
Arav, 24 M



"I'm at Ameerpet, where are you?

- Uses the metro mainly for casual outings, cafe hopping, visiting friends place.
- Feels more comfortable and enjoys the metro experience more when traveling with friends.
- Often struggles with coordinating meet-ups, leading to frequent confusion about meeting locations.
- Uses Mobile QR ticketing

Venkat, 35 M



"I'll do anything to not stand in line."

- Travels to and from work on the metro every day.
- Works in a software company and values efficiency in his commute.
- Prioritizes finding a seat on the metro to relax after a long day.
- Focused on minimizing travel time and avoiding delays.
- Dislikes waiting and will take any measures to avoid standing in line, whether it's for tickets, boarding, or exiting the metro.

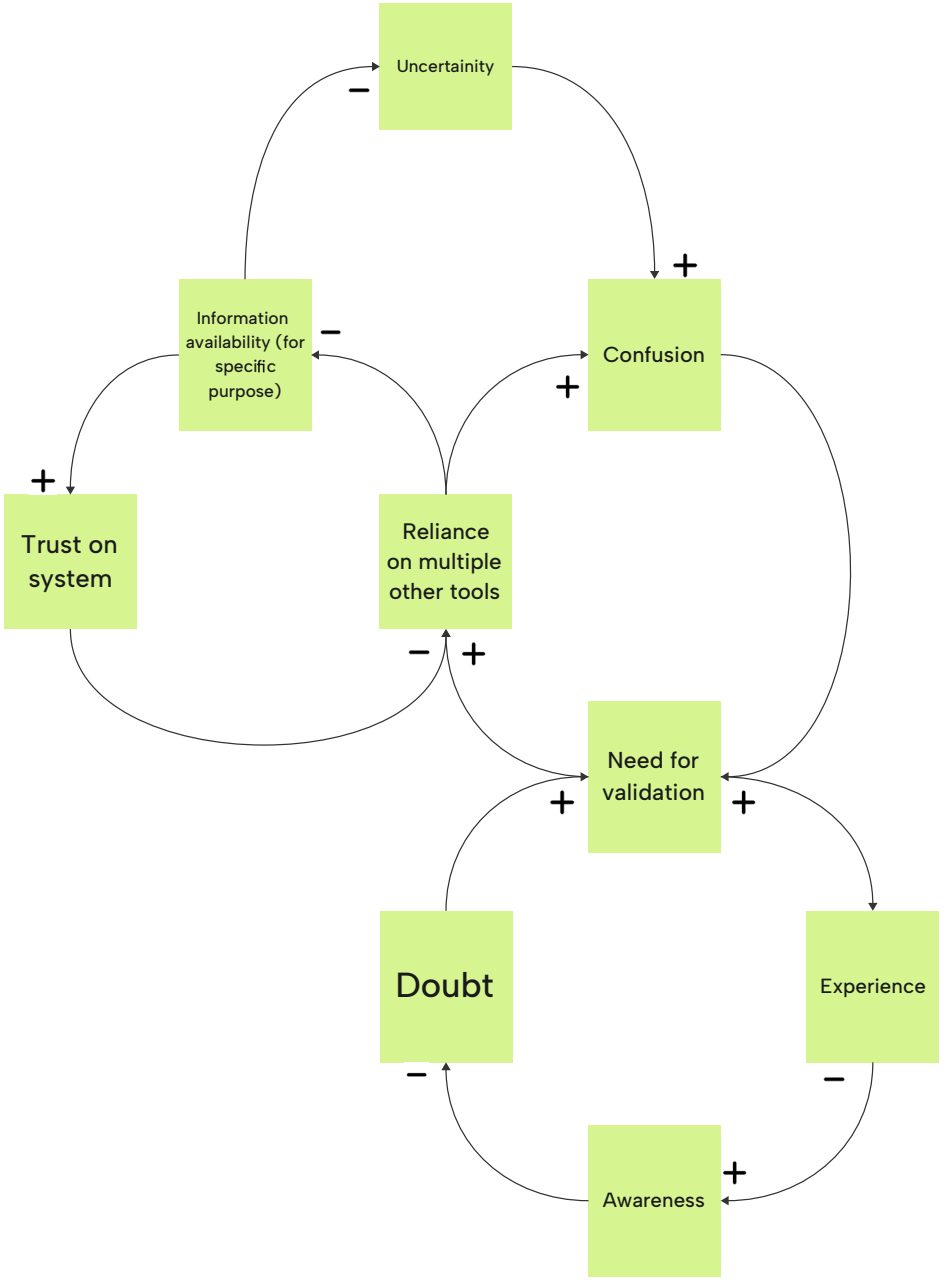
4.3 Causal Loops

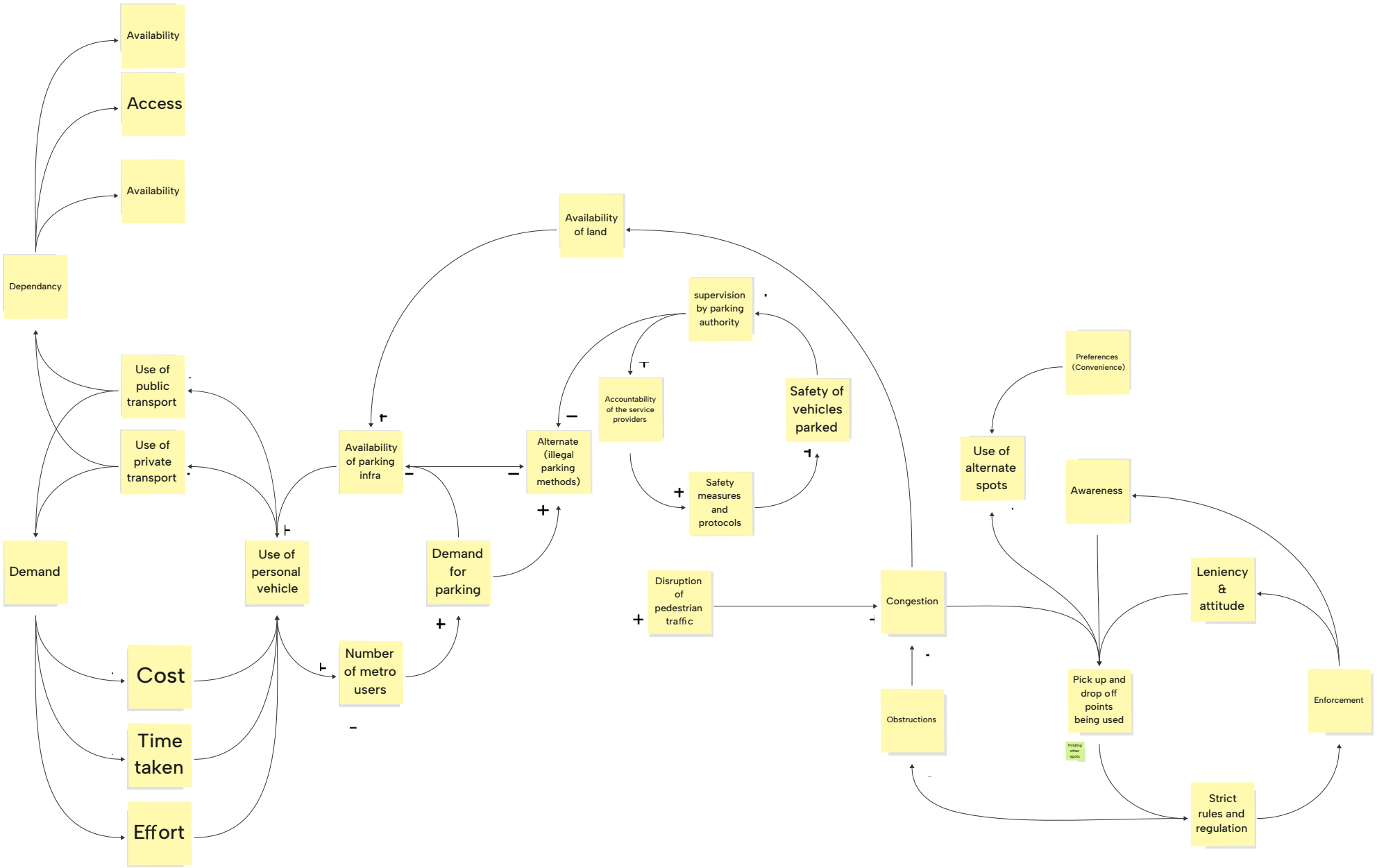
Causal loops, also known as feedback loops, are systems thinking tools used to understand the relationships between different variables in a system.

They depict how changes in one element can affect others and, in turn, influence the original element, creating a cycle of cause and effect.

In a causal loop diagram, arrows represent the direction of influence between variables, and each arrow is labeled with either a plus (+) or minus (–) sign. A plus sign (+) indicates a positive correlation, meaning that an increase in one variable causes an increase in the connected variable, or a decrease leads to a decrease.

Conversely, a minus sign (–) represents a negative correlation, where an increase in one variable causes a decrease in the connected variable, or vice versa.



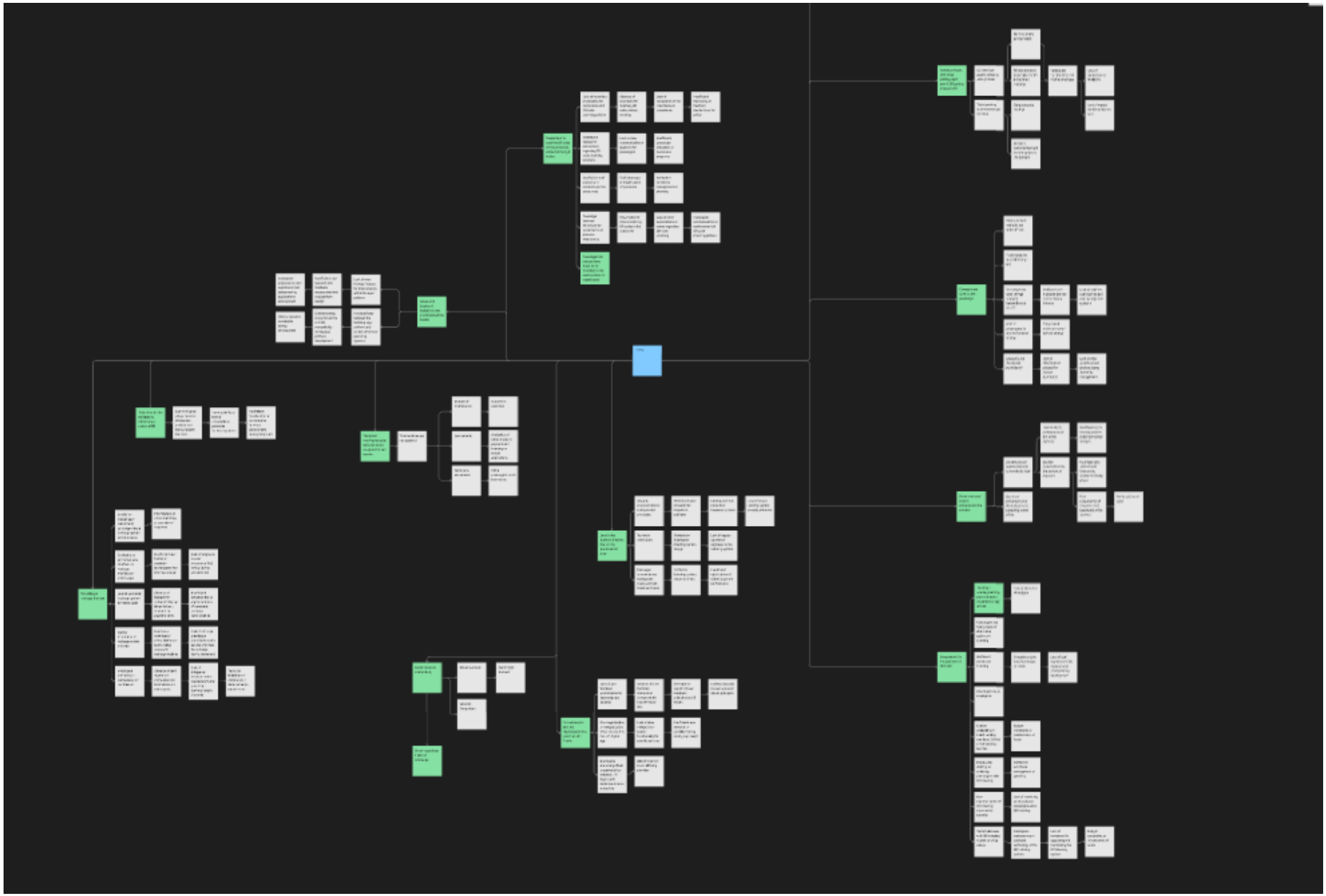

Availability
Access
Availability
Dependancy
Availability of land
supervision by parking authority
Use of public transport
Use of private transport
Availability of parking infra
Alternate (illegal parking methods)
Accountability of the service providers
Safety of vehicles parked
Safety measures and protocols
Preferences (Convenience)
Use of alternate spots
Awareness
Demand
Use of personal vehicle
Demand for parking
Disruption of pedestrian traffic
Congestion
Leniency & attitude
Cost
Number of metro users
Pick up and drop off points being used
Enforcement
Time taken
Obstructions
Effort
Strict rules and regulation

4.4 Root Cause Analysis

The 5 Whys technique is a simple yet powerful problem-solving tool used to explore the root cause of an issue by asking “Why?” five times in succession. The process begins with identifying a problem or undesirable outcome, and then asking why that problem occurred.

Each answer forms the basis for the next “why” question, drilling deeper into the underlying cause of the issue. By the time the fifth “why” is reached, the true root cause of the problem is typically revealed





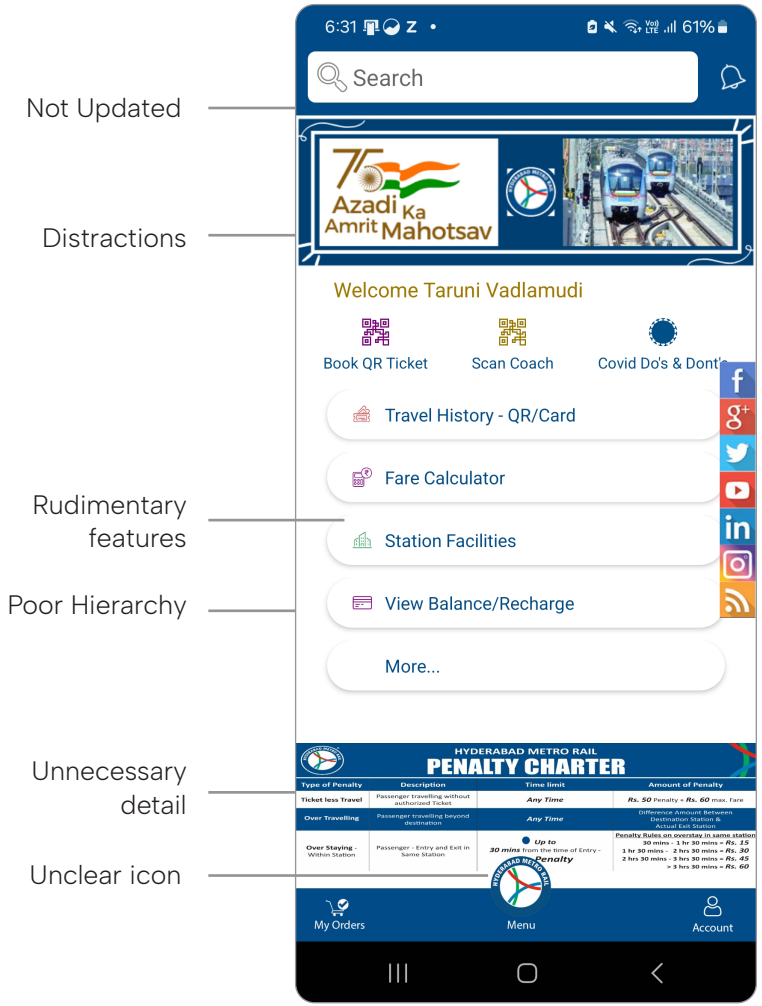
View complete root cause analysis on : https://www.figma.com/board/uB9BnwJ7CY3cx5LDQPhtWy/L%26T?node

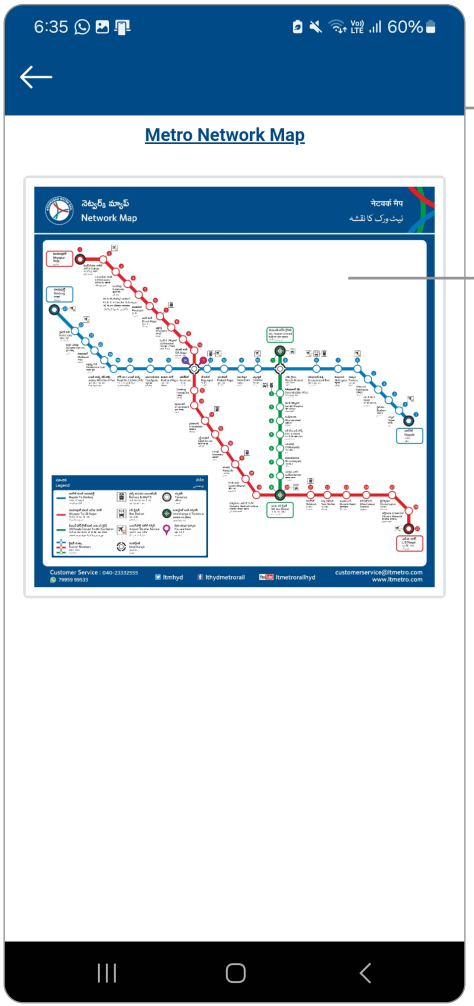
5. T-Savaari

5.1 Hueristic Analysis

5.2 Competetive Analysis

5.1 Hueristic analysis

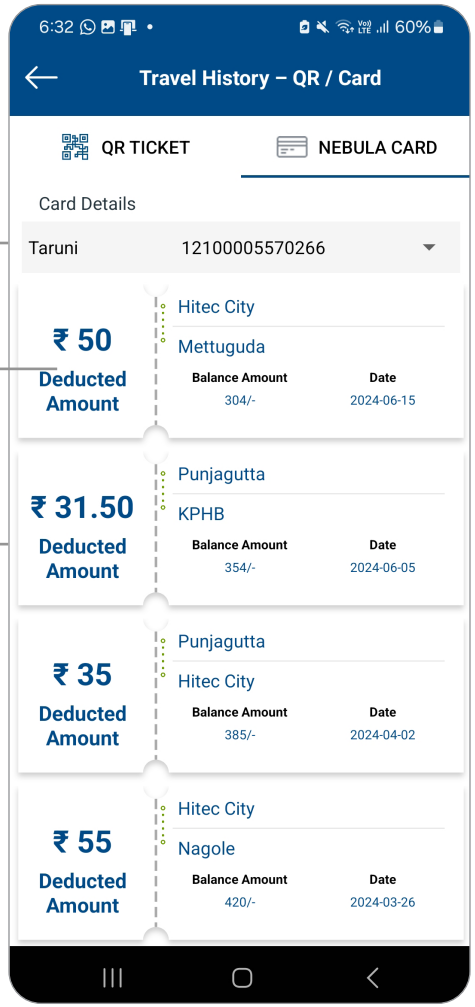


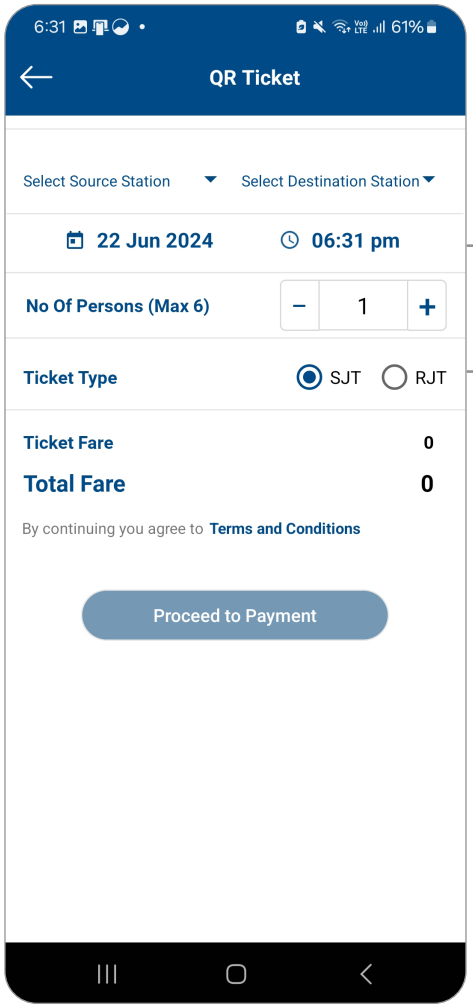


Balance not visible

Difficult User Flow

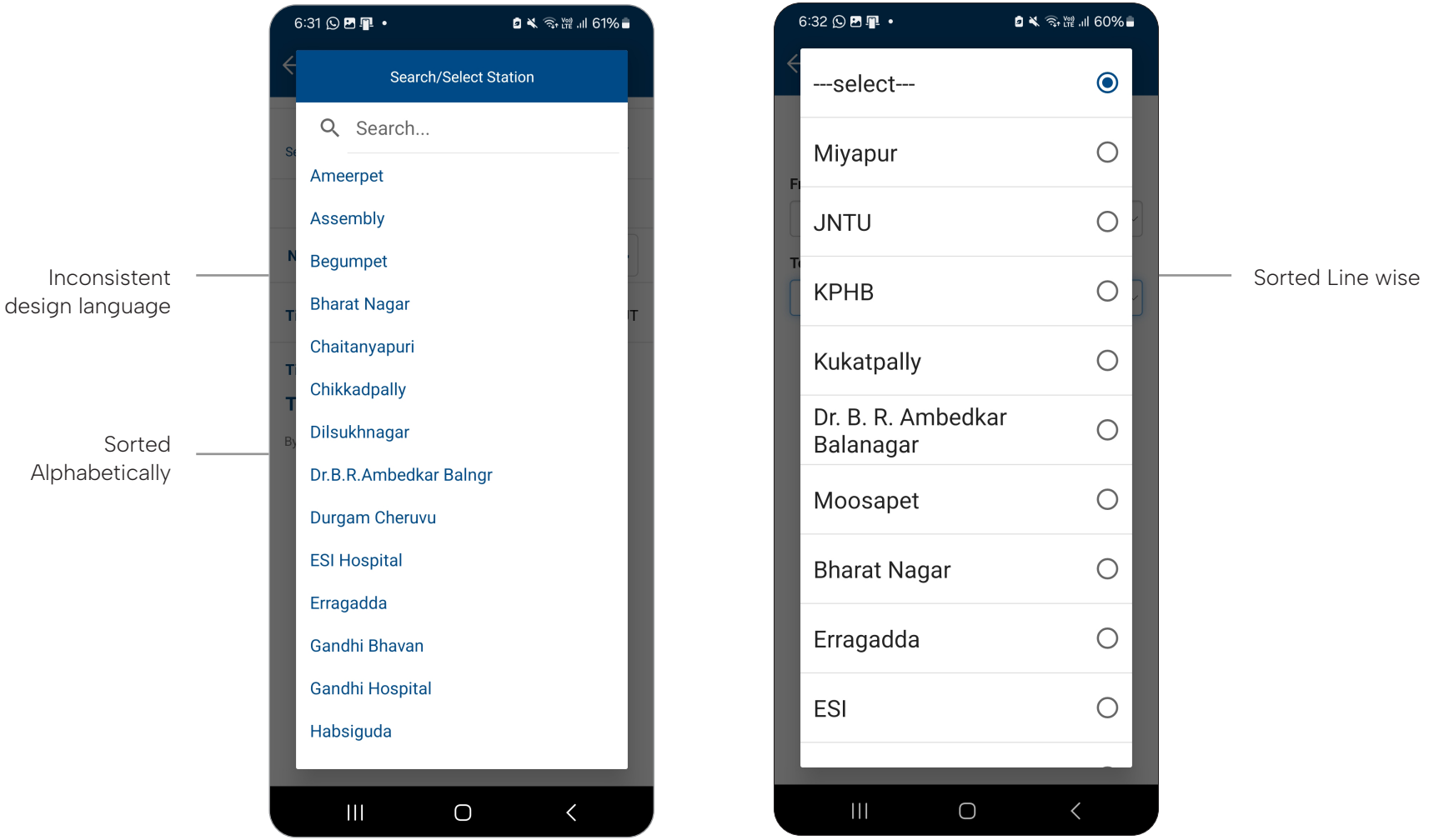
No option to repeat booking

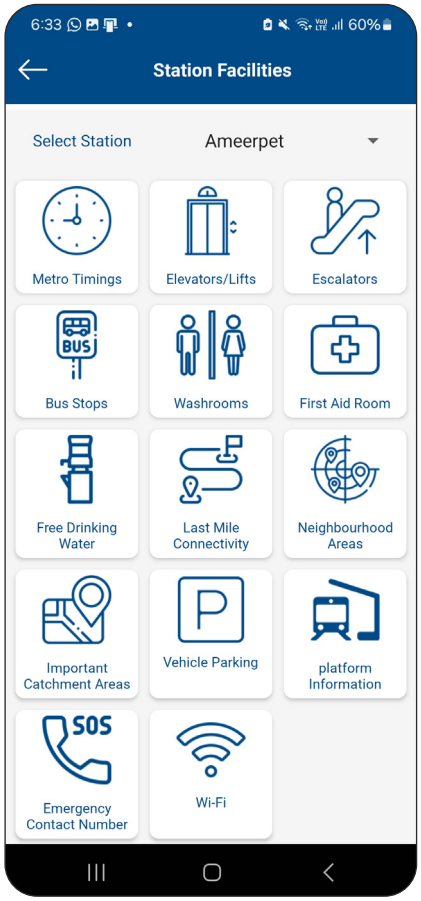


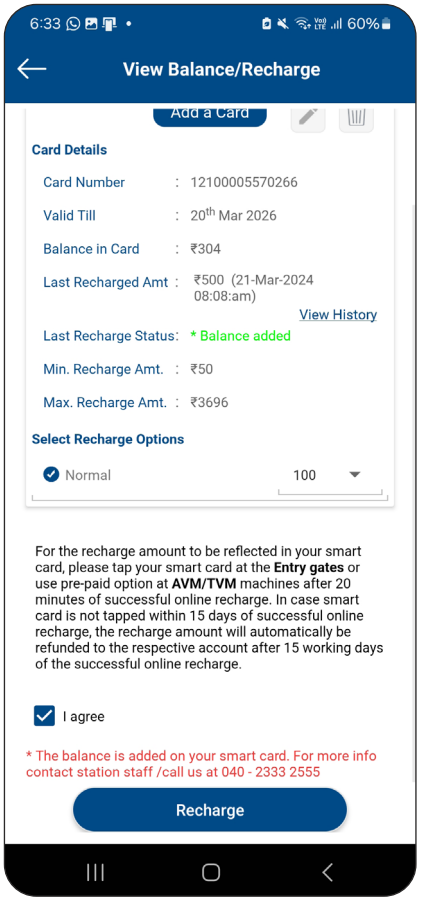


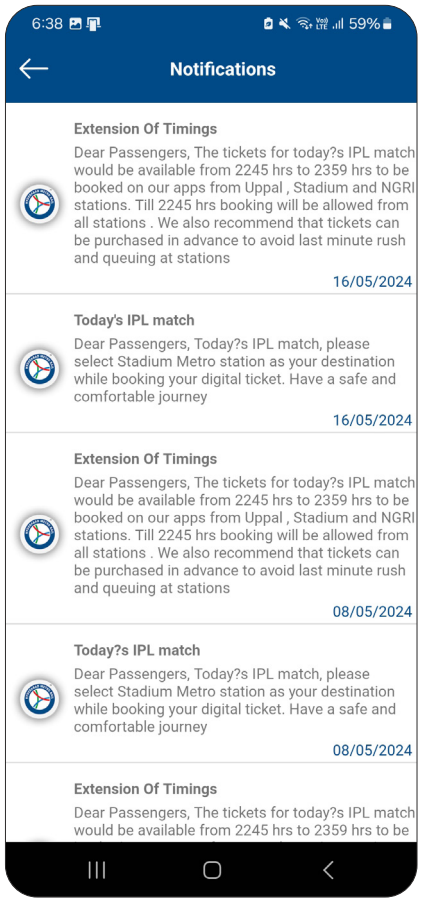
Unnecessary detail

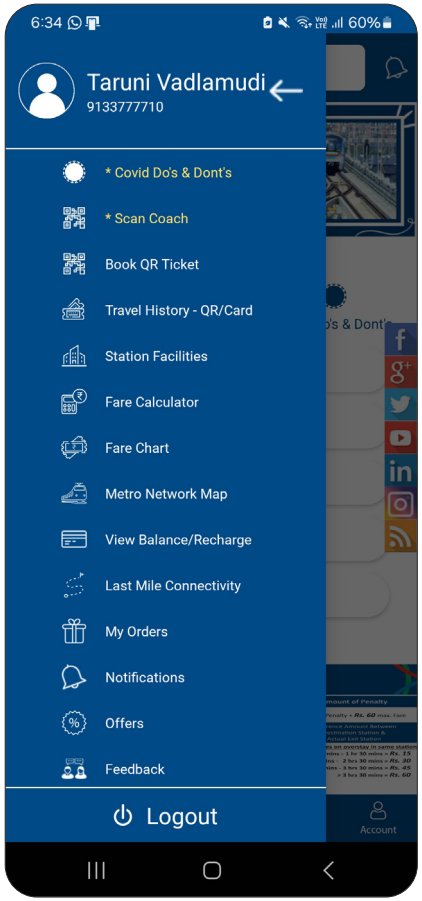
Use of Jargons


Inconsistent design language
Sorted Alphabetically
6:31
61%
Search/Select Station
Search...
Ameerpet
Assembly
Begumpet
Bharat Nagar
Chaitanyapuri
Chikkadpally
Dilsukhnagar
Dr.B.R.Ambedkar Balngr
Durgam Cheruvu
ESI Hospital
Erragadda
Gandhi Bhavan
Gandhi Hospital
Habsiguda
6:32
60%
---select---
Miyapur
JNTU
KPHB
Kukatpally
Dr. B. R. Ambedkar Balanagar
Moosapet
Bharat Nagar
Erragadda
ESI
Sorted Line wise









Other screens

5.2 Competitive Analysis

In conducting a competitive analysis of various metro apps, I examined how different cities and regions approach the user experience in their transit systems.

The Pune and Nagpur Metro Maha Metro apps, both developed for emerging metro systems in India, offer basic functionalities like ticketing, route planning, and station information. However, they lack advanced features like real-time train tracking and detailed journey planning that could enhance the commuter experience.

These apps primarily focus on essential services, which is fitting for newer metro systems, but they have room for improvement in user engagement and technological sophistication.

Comparatively, the Beijing Metro app stands out with its comprehensive features, including real-time tracking, multi-language support, and extensive route planning tools that cater to a massive user base.

Similarly, Citymapper for London, although not specific to the metro, provides an integrated experience across various modes of transport, offering real-time updates, personalized journey planning, and disruption alerts. This app excels in user convenience and adaptability, making it a benchmark for urban transit apps.

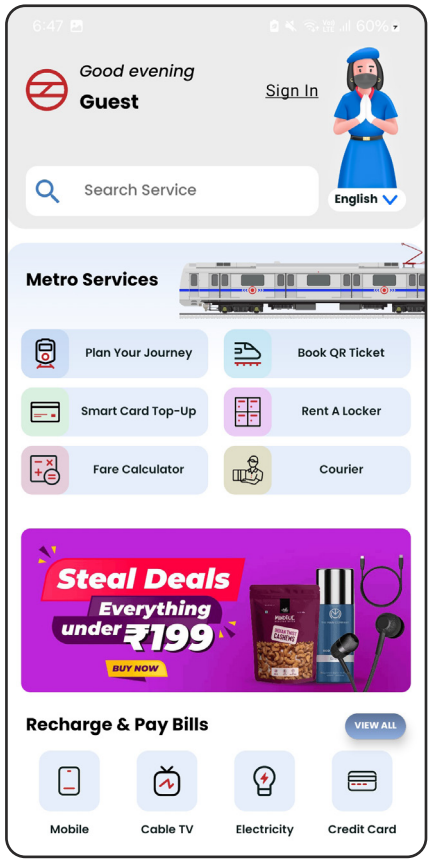
Both Beijing Metro and Citymapper set high standards for functionality and user experience, highlighting the importance of integrating advanced technologies and real-time data in modern metro apps.

In the Indian context, the Namma Metro Bangalore, Delhi Metro DMRC Momentum 2.0, and CMRL Chennai Metro apps are more advanced than their counterparts in Pune and Nagpur. These apps offer features like real-time train updates, route maps, and fare calculators, but they vary in terms of user interface and ease of navigation.

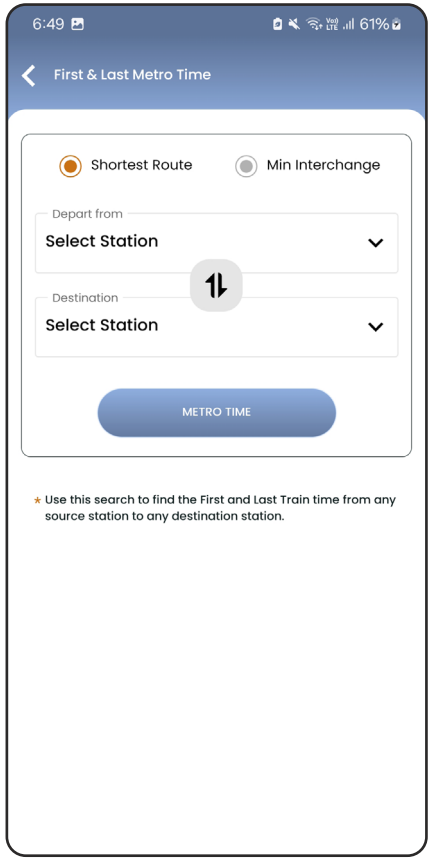
The Delhi Metro Momentum 2.0 app, in particular, has made strides in improving the digital experience by incorporating multi-modal transport options and detailed station information.

Overall, the competitive analysis highlights the varying levels of maturity and innovation across metro apps, with clear opportunities for enhancement in the Indian market.

DELHI METRO



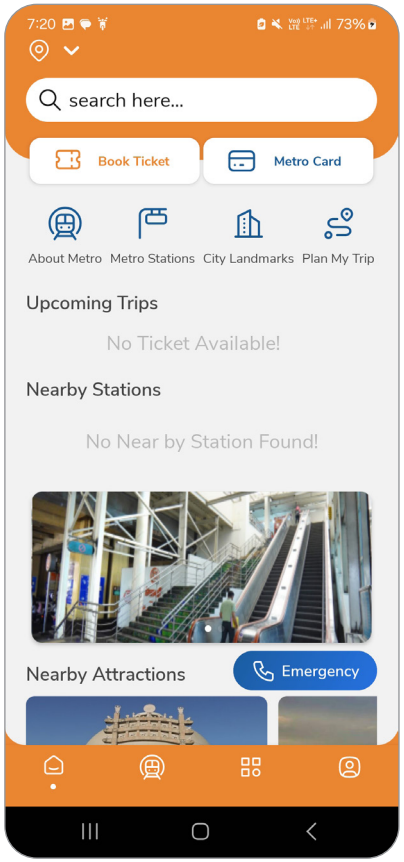


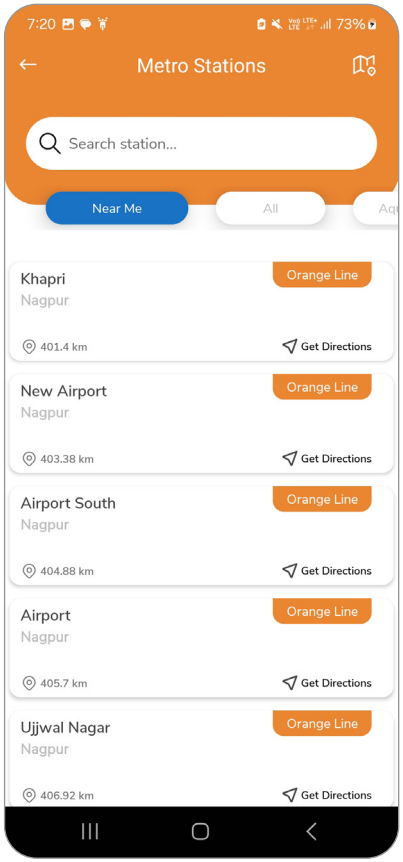


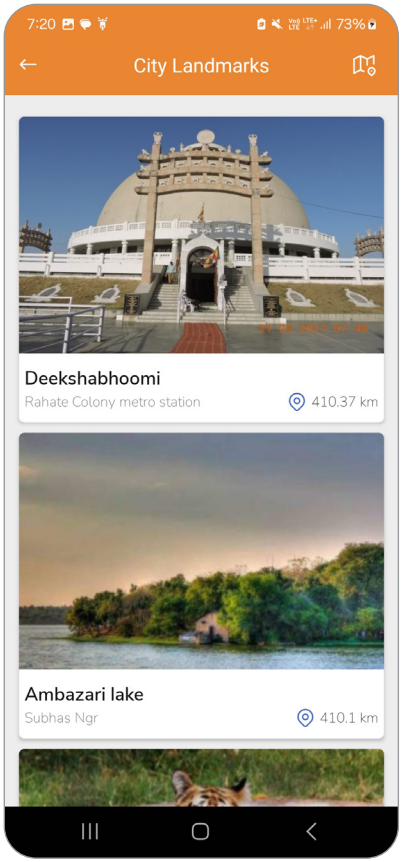


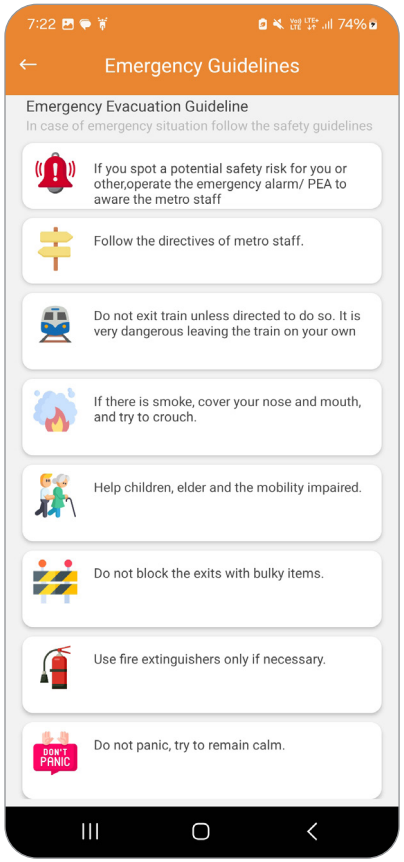
DMRC Momentum 2.0, Delhi Metro App

NAGPUR METRO





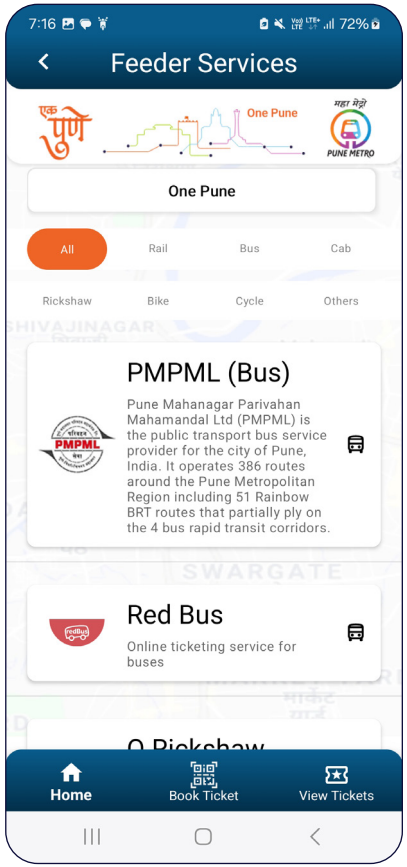


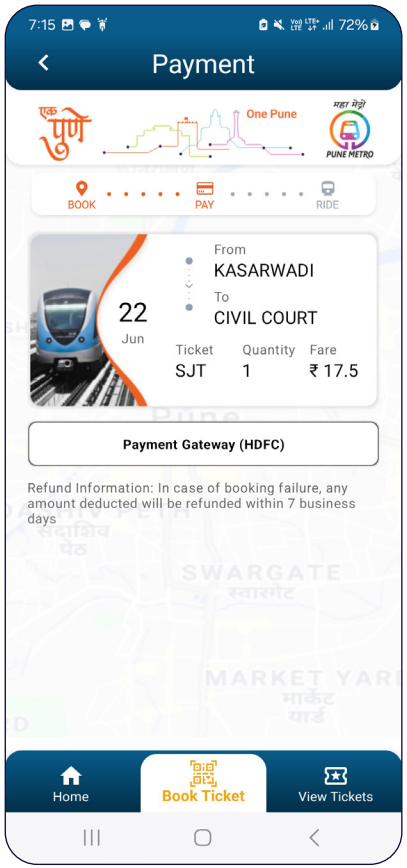


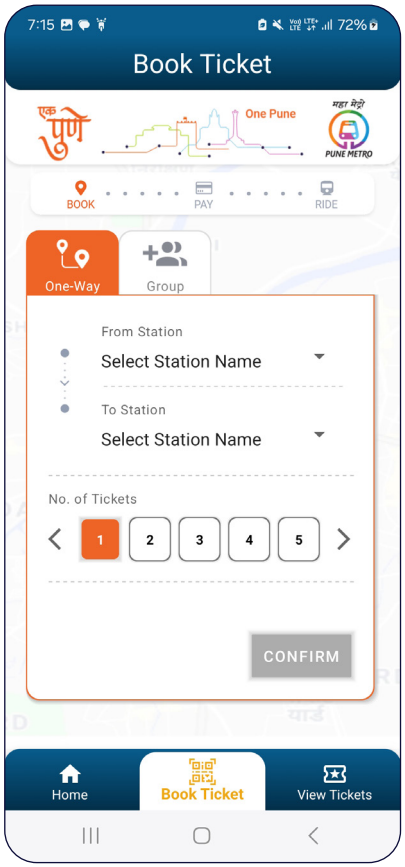
Nagpur Metro App

महा मेट्रो
PUNE METRO

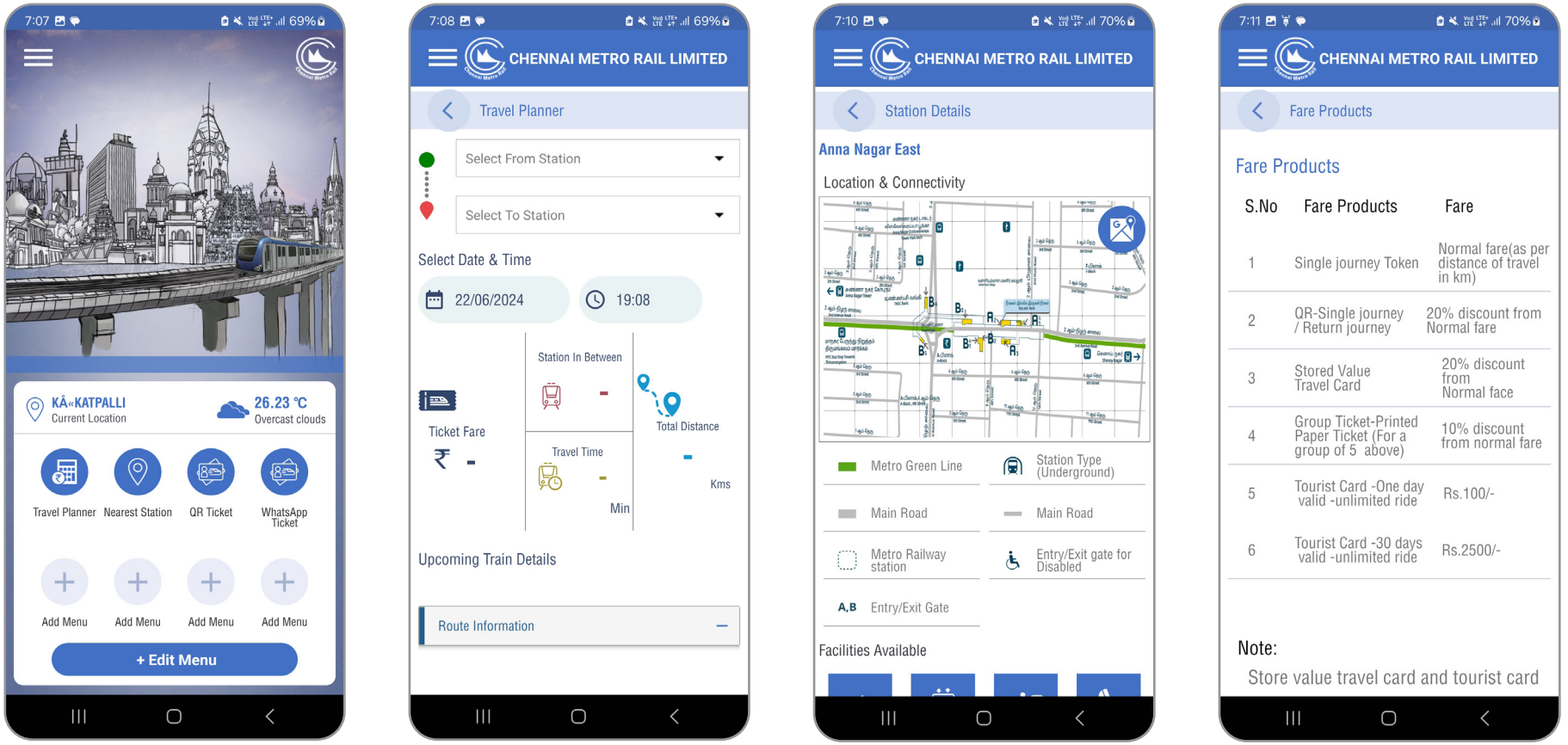




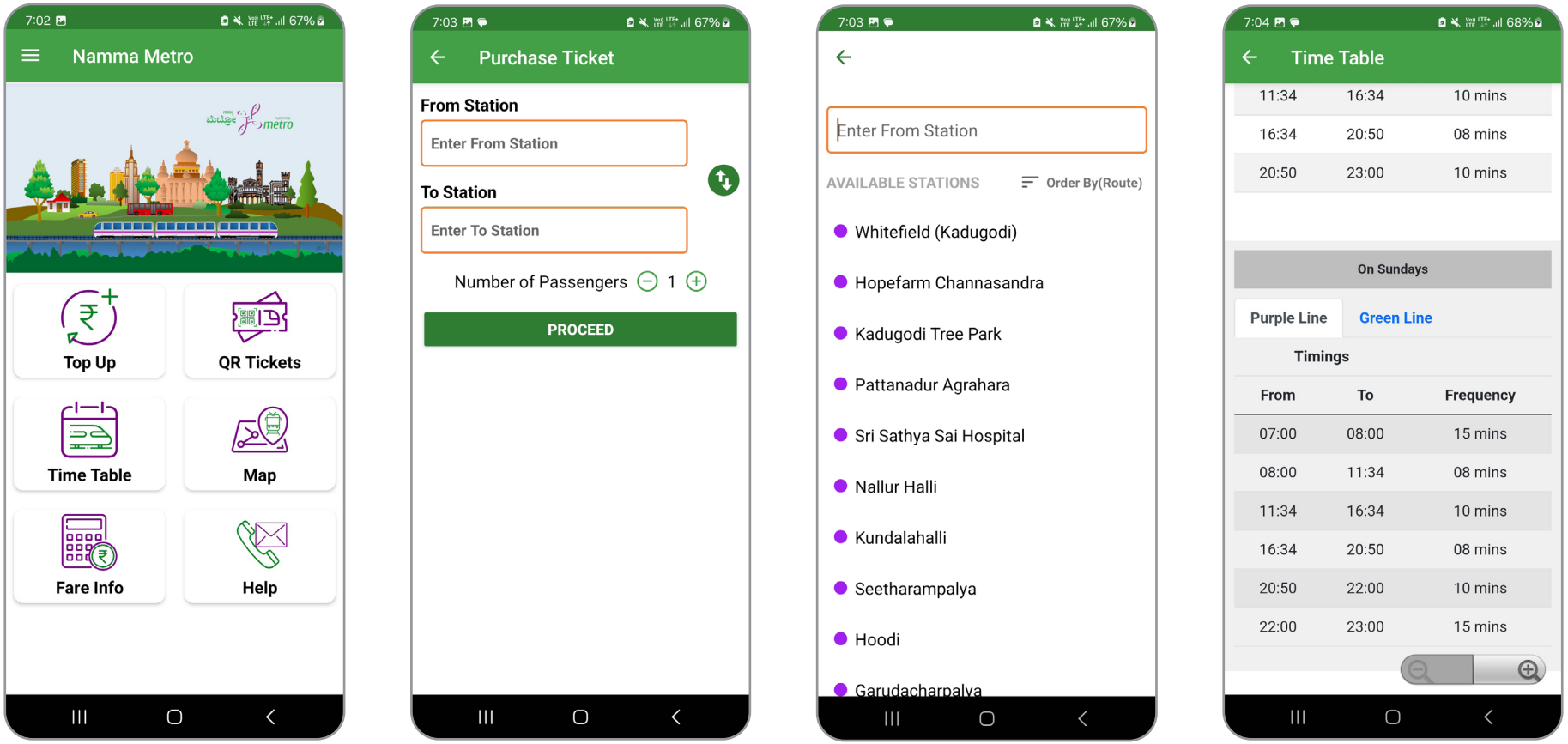




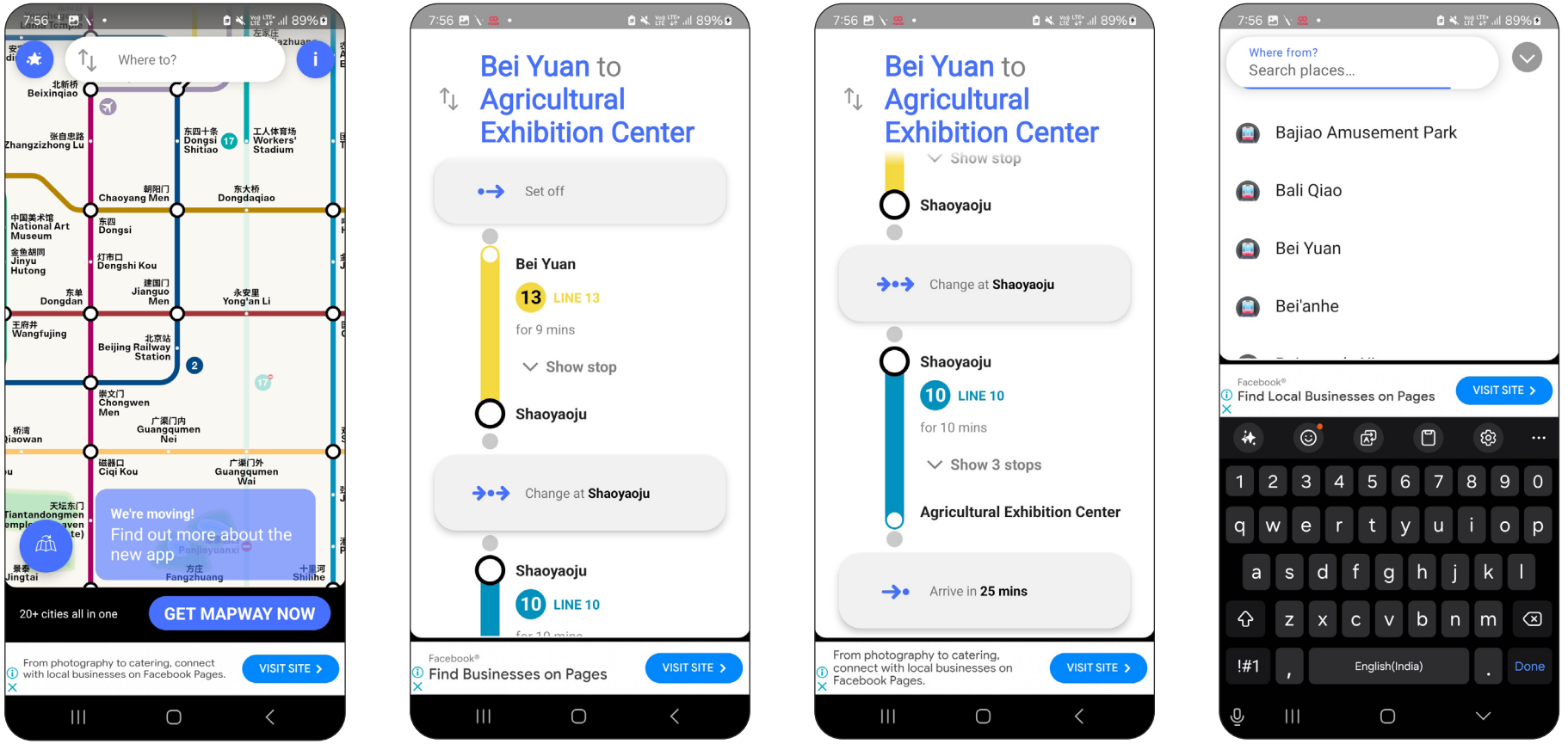
Pune Metro app



CMRL, Chennai metro app

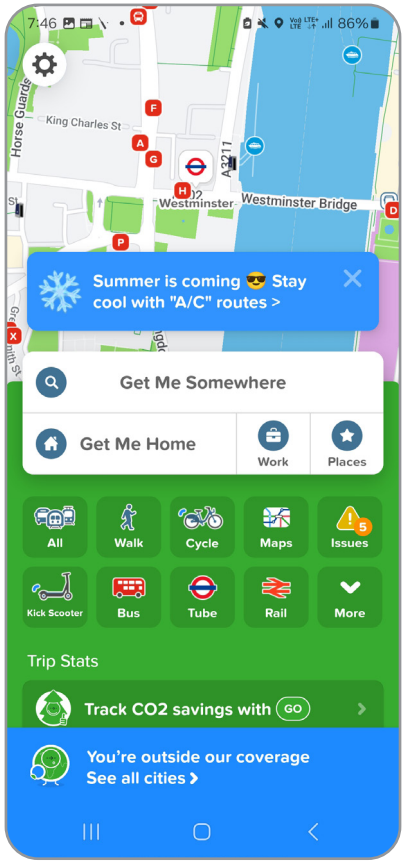


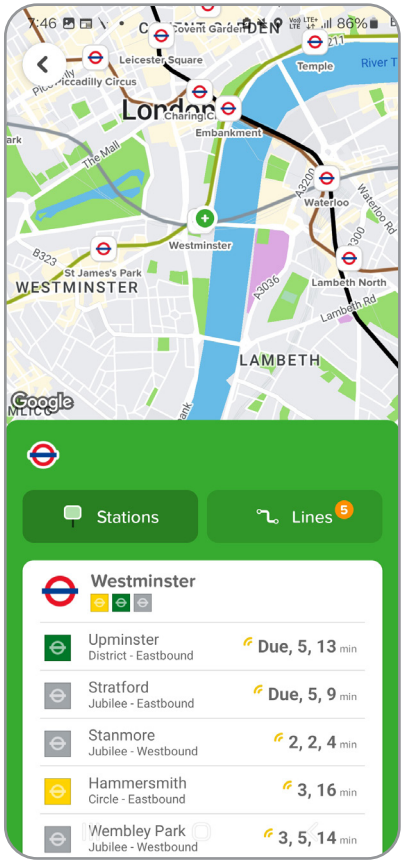
Namma Metro, Banglore metro app

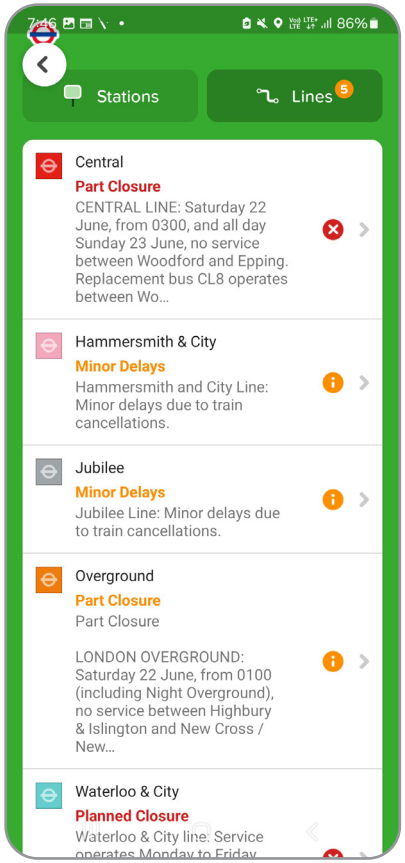


Mapway, Beijing transit app

Citymapper









City Mapper, London transit

Comparision of Features

Features	DMRC Momentum 2.0	Namma Metro	CMRL (Chennai metro)	T-Savaari (Hyderabd Metro)
Purchase qr ticket	✓	✓	✓	✓
Recharge smart card	✓	✓	✗	✓
Travel Planner	✓	✓	✓	✗
Nearest metro	✓	✗	✗	✗
Fare Calculator	✓	✓	✗	✓
Resizable Map	✗	✗	✗	✗
Station Information	✓	✓	✓	✗
Alerts & Updates	✗	✗	✗	✗
Feedback	✗	✓	✓	✓
Journey History	✓	✗	✓	✓
Advertisements	✓	✓	✗	✗
Penalty Charter	✗	✓	✗	✓
Tourism data	✓	✗	✗	✗
Weather	✗	✗	✓	✗
LMC Details	✗	✗	✗	✗

5. Ideation

5.1 Concepts

5.2 Iteration

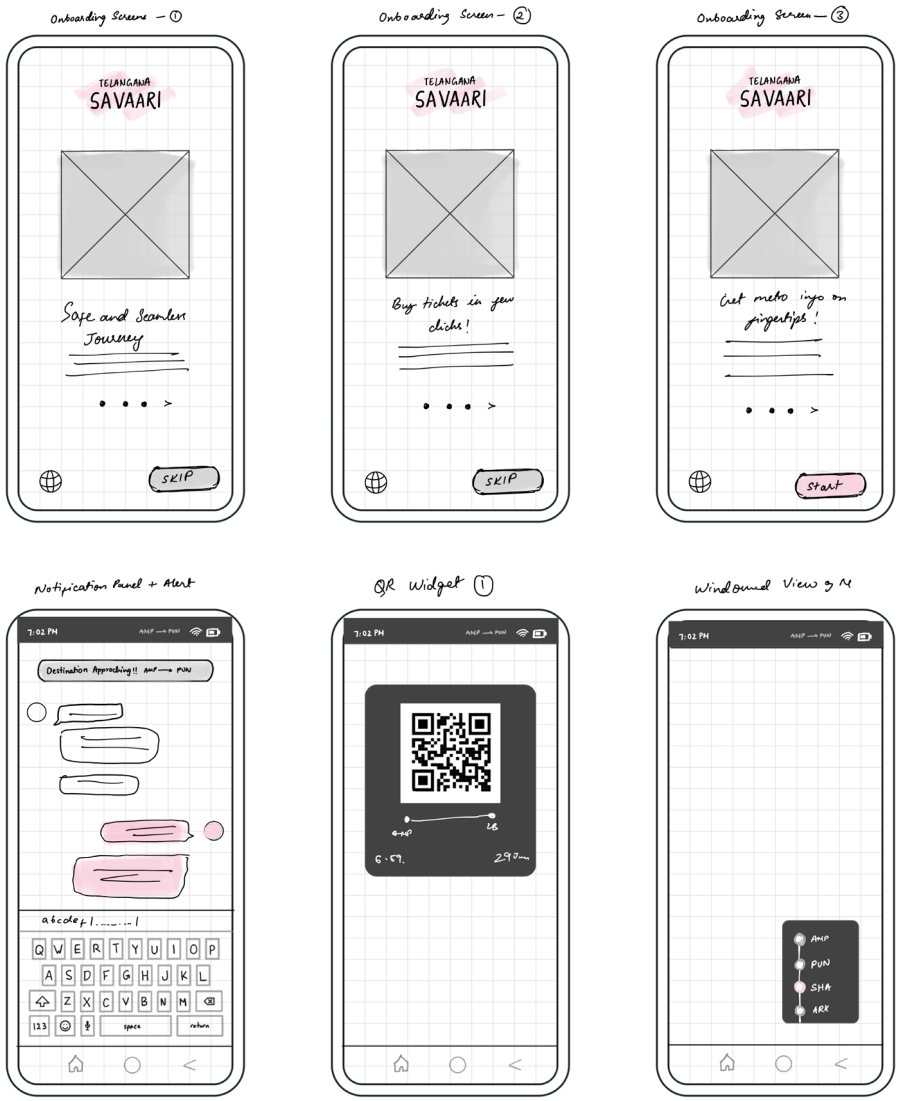
5.3 Information Architecture

5.1 Concepts

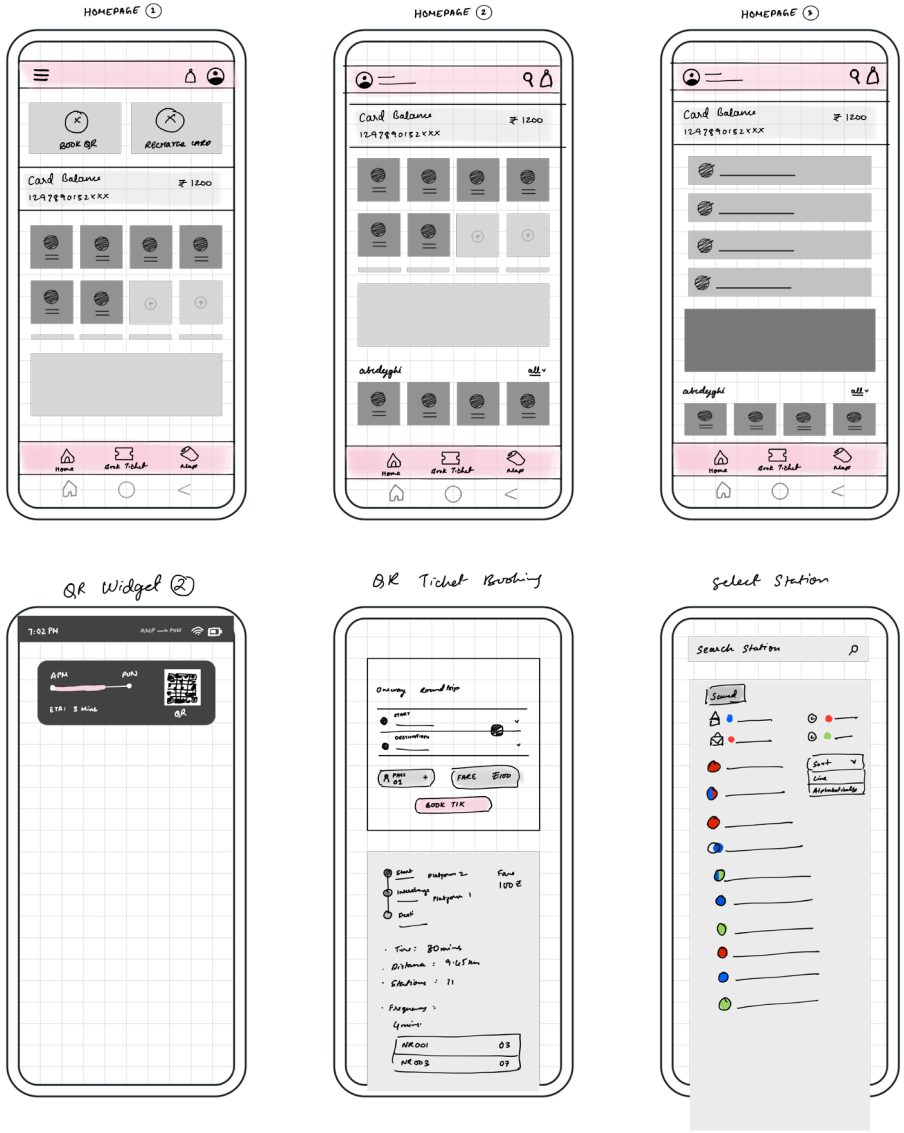
During the ideation process for my project, I utilized various creative techniques to generate potential solutions.

One of the key methods I employed was the FiveThinking Hats, which allowed me to approach the problem from multiple perspectives, such as logical, emotional, and creative angles and considering value for different stakeholders. This technique helped me to think more broadly and consider different aspects of the user experience.

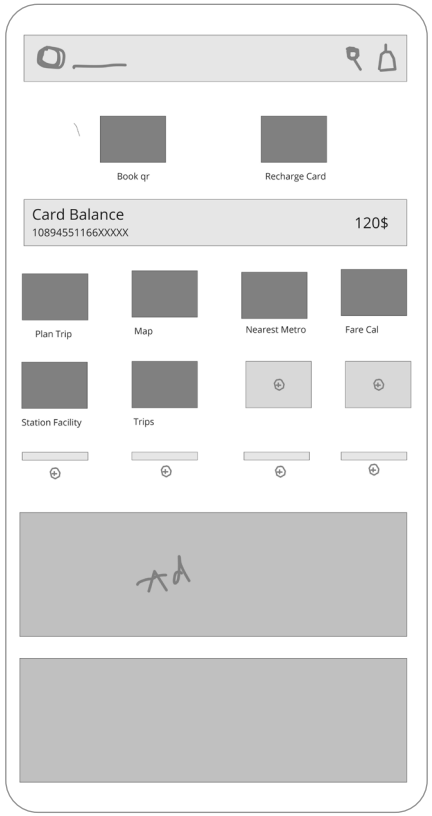
Also used the 'SCAMPER' (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse) technique, to help ensure that the ideation process is dynamic, inclusive, and productive.

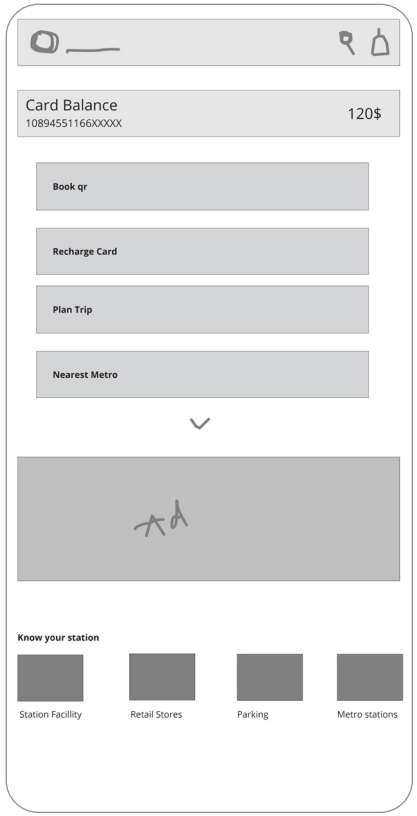


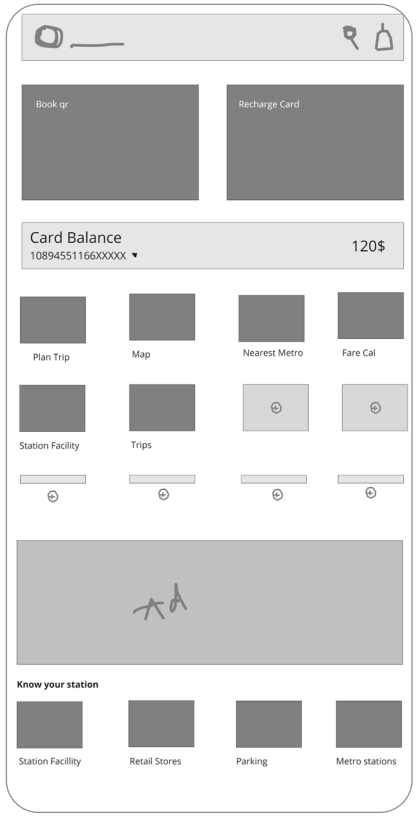

Windbound View & M
QR Widget (2)
QR Ticket Booking
7:02 PM
AMP
PUN
SHA
ARK
ETA: 5 mins
QR
Weather Forecast
Station Facilities
Retail Stores
Raidung

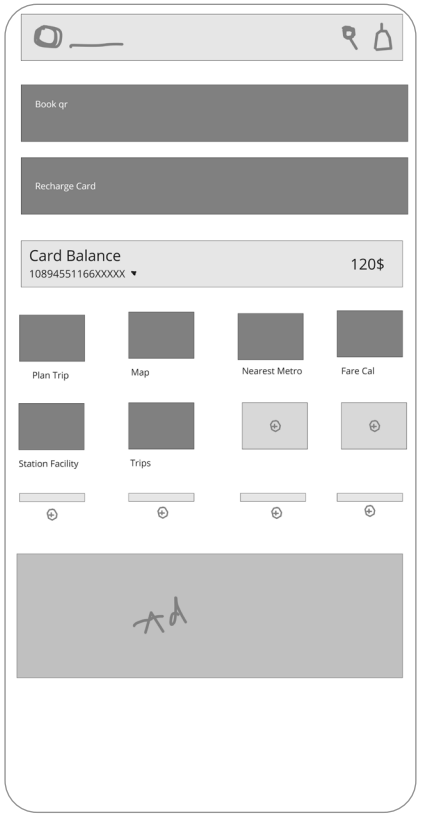

HOMEPAGE 1
HOMEPAGE 2
HOMEPAGE 3
Card Balance
₹ 1200
QR Widget 2
QR Ticket Booking
Select Station
Search Station

5.2 Iteration







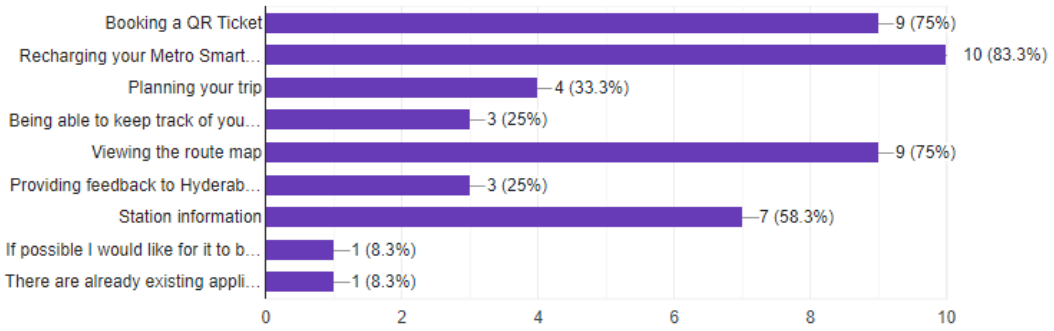


Back and Forth

In the process of designing the UI for the home screen of the T-Savaari app, I explored various wireframes, experimenting with different ways to establish a clear visual hierarchy. My goal was to ensure that the most important features were easily accessible and intuitive for users.

However, as I iterated through multiple designs, I realized that determining the ideal home screen layout wasn't something I could achieve in isolation.

User Survey



To better understand user needs and preferences for the T-savaari app, I conducted a survey with 40 participants.

The survey aimed to identify the most important features that users want in the app to enhance their metro travel experience. Through this process, I gathered valuable insights directly from the users, which helped prioritize the development of features that would have the most significant impact.

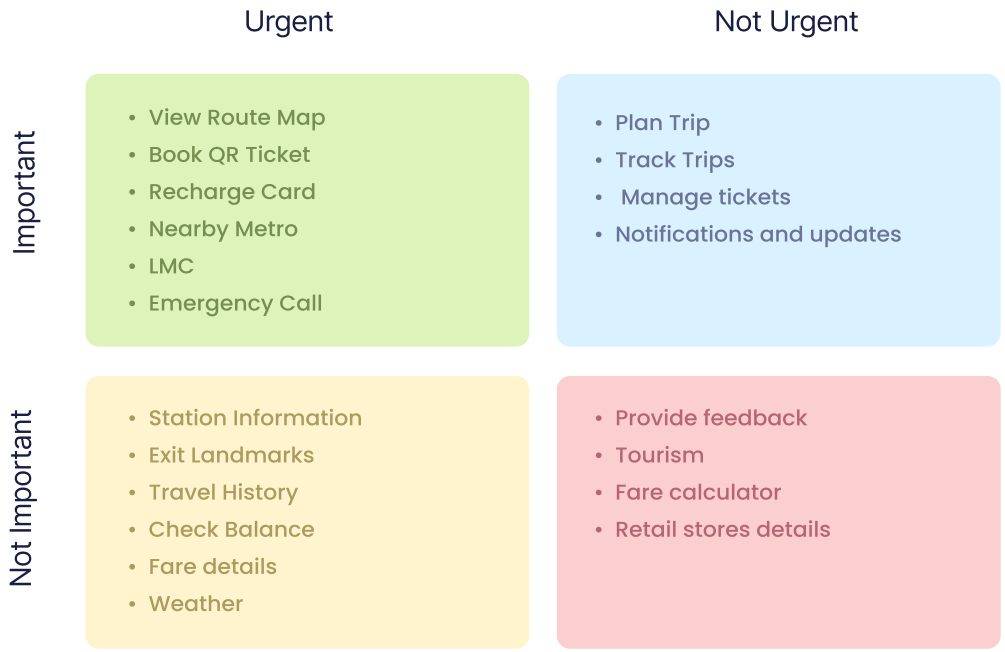
What would you want from the metro app?

5 responses

- Small in size because I don't have storage
- I would want it to be user friendly and not have any complicated hidden features.
- I want everything that related to the metro to be on a single application
- I don't want the app.
- Easy access to recharge metro card, book tickets etc

See Appendix B for Survey Results Vol. 2 (Pg 167-168)

Eisenhover matrix



Organized tasks and features by urgency and importance, so you can effectively prioritize user flows. Important and Urgent (Do First): Tasks that are both critical and time-sensitive. They require immediate attention.

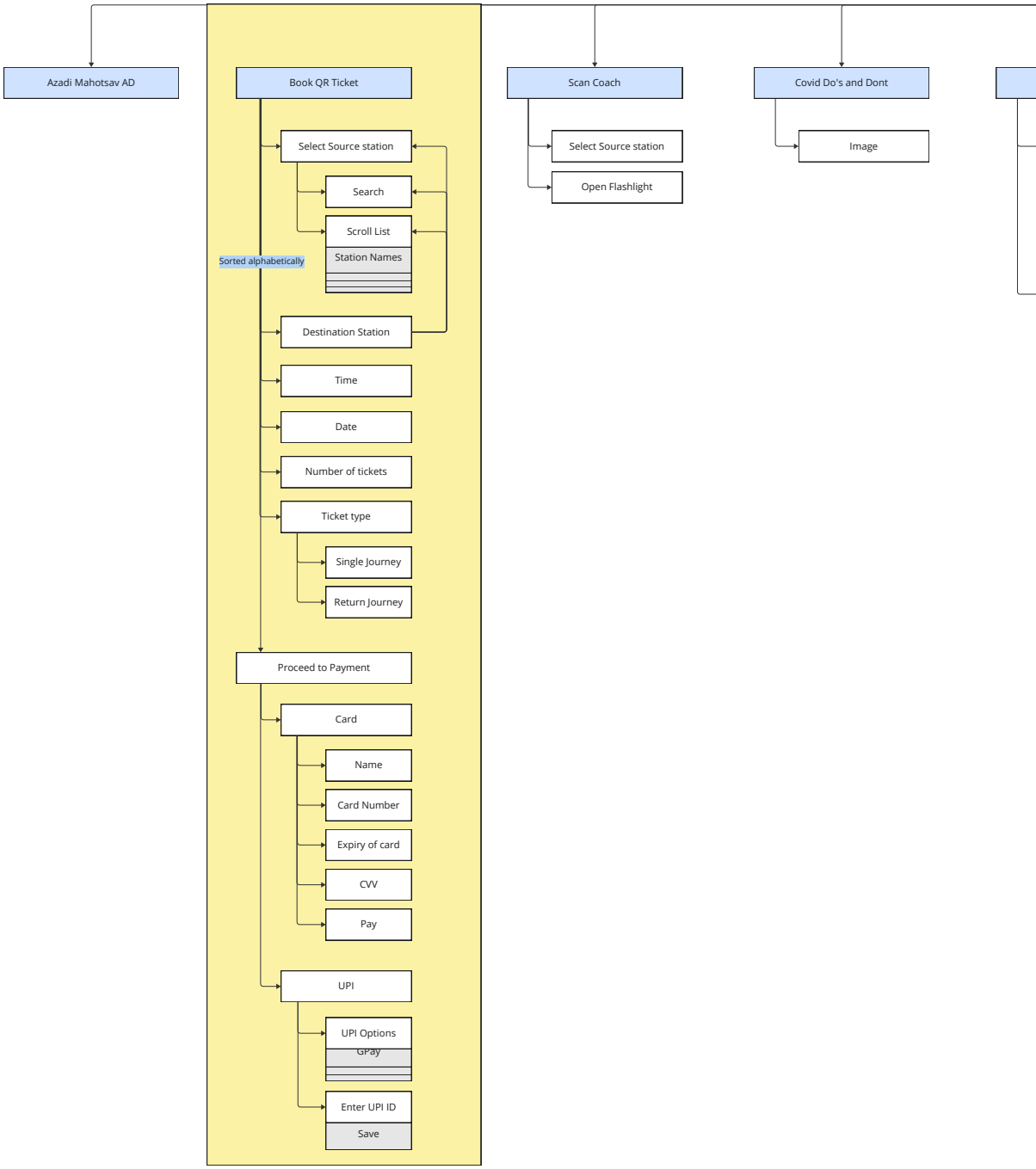
Important but Not Urgent (Schedule): Tasks that are significant but not time-sensitive. These should be scheduled for later.

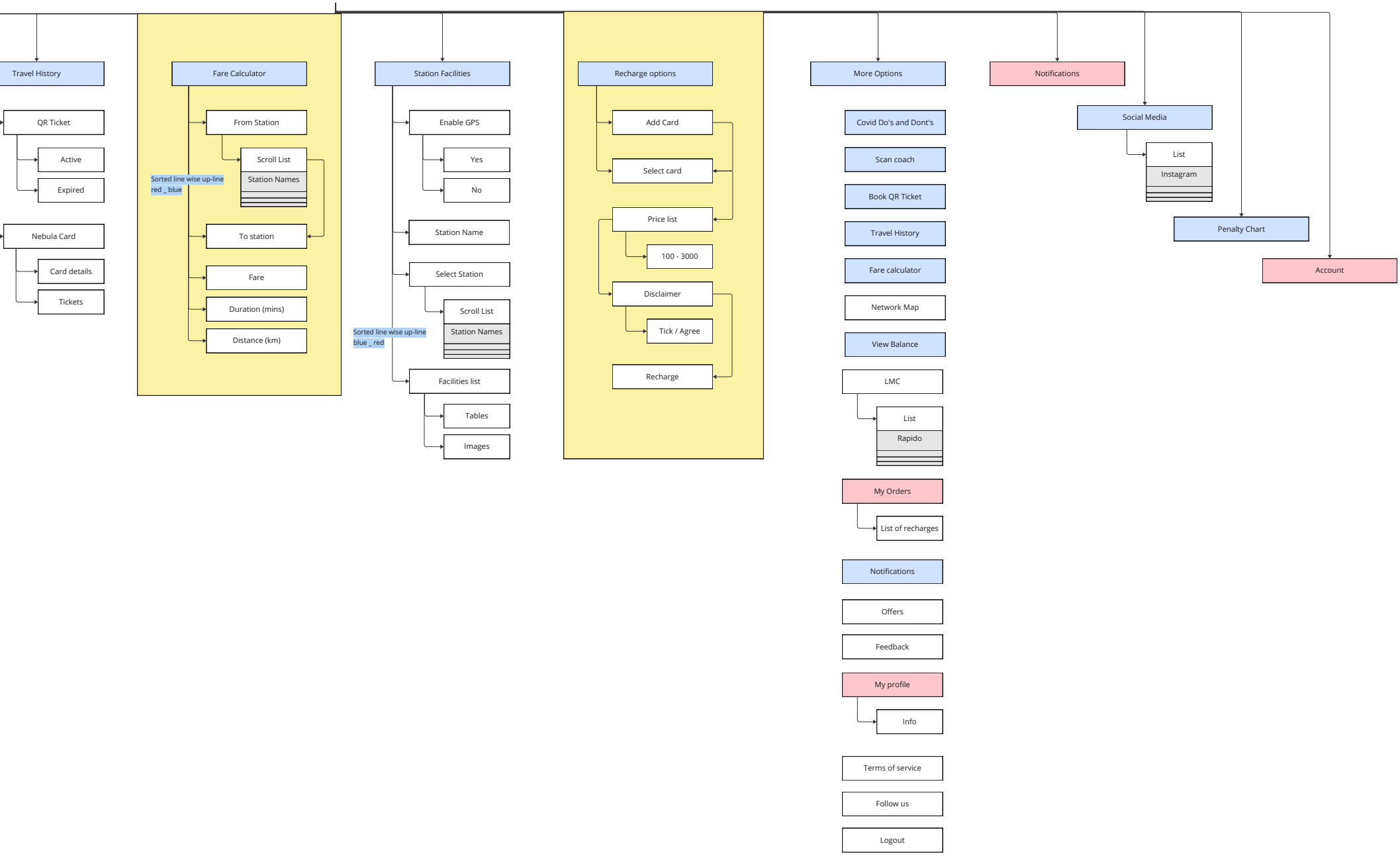
Not Important but Urgent (Delegate): Tasks that are time-sensitive but not critical. They can often be delegated to others.

Not Important and Not Urgent (Eliminate): Tasks that are neither time-sensitive nor critical. They are often distractions and can be eliminated.

5.3 Information Architecture

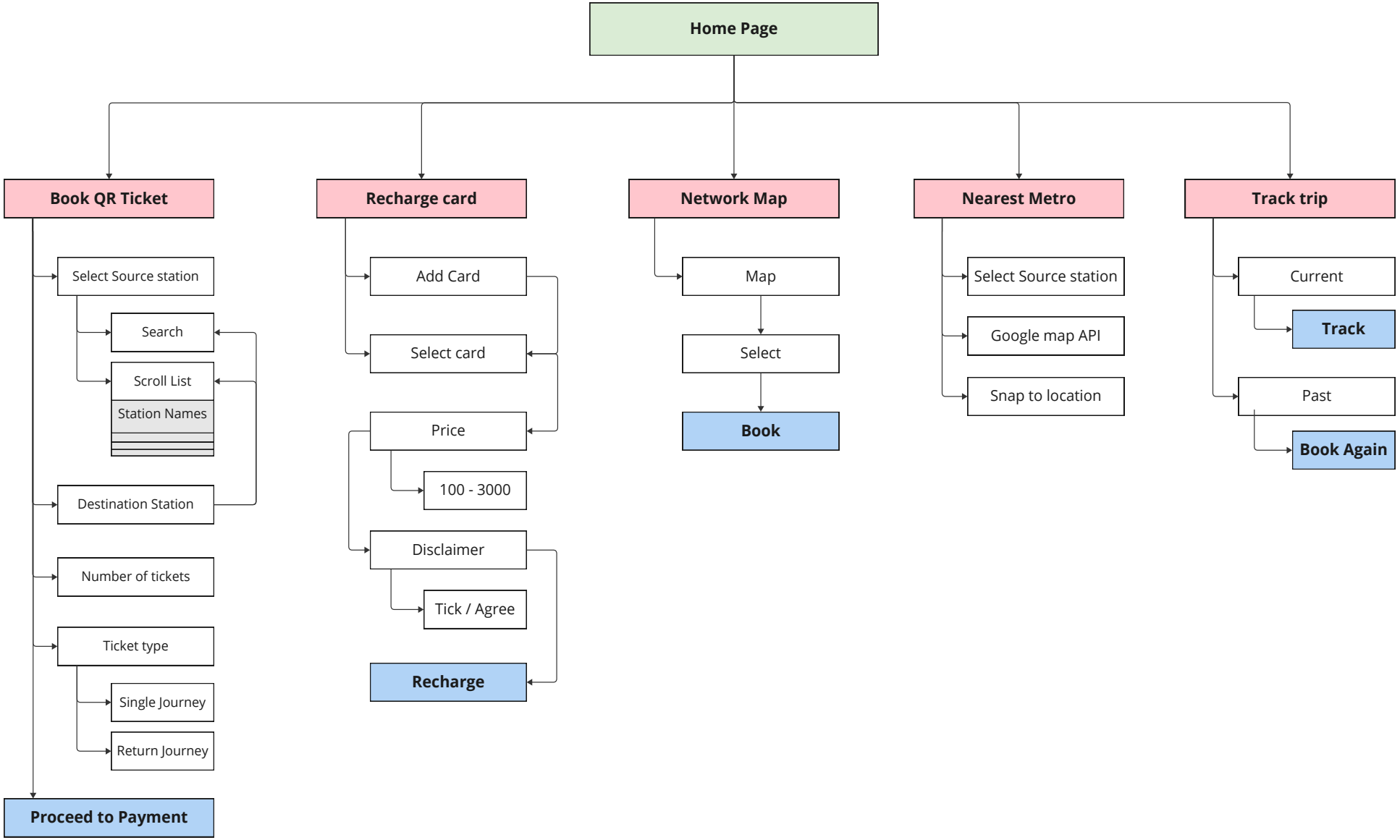
The existing information architecture of the T-savaari app is notably complex and confusing, leading to a cumbersome experience for users. The navigation flow is lengthy, with multiple steps required to access basic features, which frustrates users and makes it challenging to perform simple tasks. The structure lacks clarity and intuitiveness, often leaving users unsure of where to find the information they need. This confusing flow not only hampers the user experience but also detracts from the overall functionality of the app, highlighting the need for a more streamlined and user-friendly design.




Travel History
QR Ticket
Active
Expired
Nebula Card
Card details
Tickets
Fare Calculator
From Station
Scroll List
Station Names
Sorted line wise up-line red _ blue
To station
Fare
Duration (mins)
Distance (km)
Station Facilities
Enable GPS
Yes
No
Station Name
Select Station
Scroll List
Station Names
Sorted line wise up-line blue _ red
Facilities list
Tables
Images
Recharge options
Add Card
Select card
Price list
100 - 3000
Disclaimer
Tick / Agree
Recharge
More Options
Covid Do's and Dont's
Scan coach
Book QR Ticket
Travel History
Fare calculator
Network Map
View Balance
LMC
List
Rapido
My Orders
List of recharges
Notifications
Offers
Feedback
My profile
Info
Terms of service
Follow us
Logout
Notifications
Social Media
List
Instagram
Penalty Chart
Account

Proposed Information Architecture

My proposed information architecture for the T-savaari app is designed to be simple, intuitive, and user-friendly. By streamlining the navigation and eliminating irrelevant details, I focused on creating a structure that allows users to access key features quickly and efficiently. The new design prioritizes clarity, with a logical flow that guides users seamlessly through the app, reducing the number of steps required to complete tasks. This approach not only simplifies the user experience but also ensures that the app meets the needs of its users without overwhelming them with unnecessary information.


Home Page
Book QR Ticket
Select Source station
Search
Scroll List
Station Names
Destination Station
Number of tickets
Ticket type
Single Journey
Return Journey
Proceed to Payment
Recharge card
Add Card
Select card
Price
100 - 3000
Disclaimer
Tick / Agree
Recharge
Network Map
Map
Select
Book
Nearest Metro
Select Source station
Google map API
Snap to location
Track trip
Current
Track
Past
Book Again

Read Volume 2

8. Final Design

8.1 Visual Design
8.2 Flows
8.3 Screens
8.4User Flows

9. Epilogue

9.1 Conclusion
9.2 Retrospect
9.3 References
9.4 Appendix


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