Designing for Sustainable and/or Active Travel to Campus

BUS BUDDY

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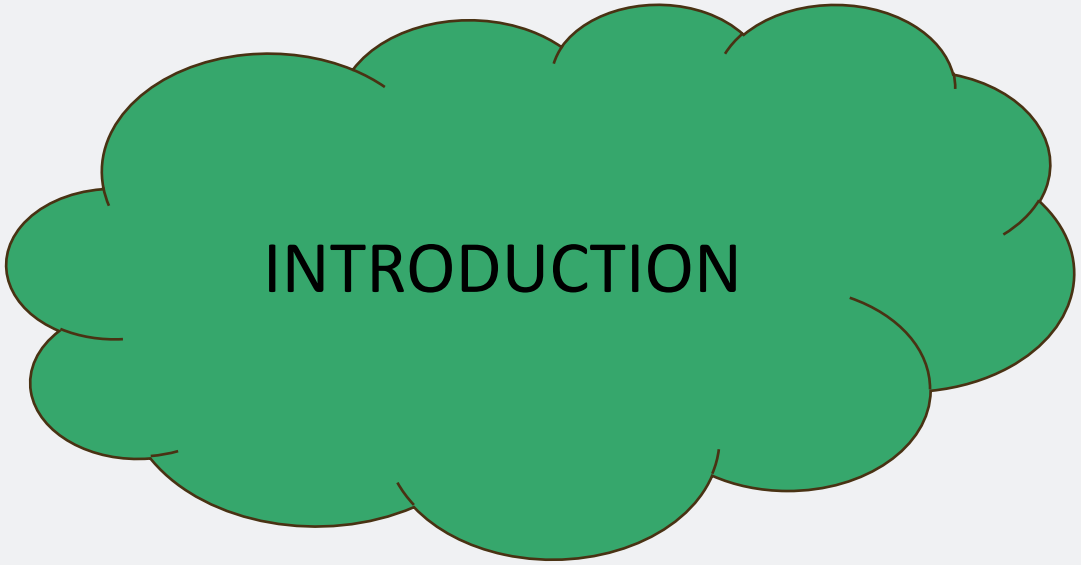
INTRODUCTION

BRIEF

* DEVELOP A PROJECT THAT SUPPORTS, FACILITATES AND/OR ENABLES SUSTAINABLE AND/OR ACTIVE TRAVEL MODES TO, FROM, AND ON CAMPUS.
* CHOSE TWO METHODS, COLLECT DATA USING THESE METHODS, SUBJECT THE DATA TO ANALYSIS USING THE OPN FRAMEWORK, AND ENTER INTO A PERIOD OF IDEATION AND CONCEPT DEVELOPMENT BASED ON THE DATA.

THE TEAM

* JAHRED JUELE (22354077)
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* SECOND YEARS IN DIGITAL MEDIA DESIGN (INTERACTION DESIGN)

RESEARCH QUESTIONS

* HOW CAN PUBLIC TRANSPORT USERS GIVE FEEDBACK TO TFI?
* HOW CAN THE USABILITY OF DIGITAL PRODUCTS IMPLICATED IN PUBLIC TRANSPORT BE IMPROVED?

GOAL

TO ENCOURAGE INDIVIDUALS TO TRAVEL IN A MORE ENVIRONMENTALLY FRIENDLY MANNER BY IMPROVING THE CURRENT TFI MOBILE APPLICATIONS AND MAKING THE OVERALL EXPERIENCE WITH PUBLIC TRANSPORT MORE ENJOYABLE FOR ITS USERS.

SECONDARY LITERATURE

IET INTELLIGENT TRANSPORT SYSTEMS - BUILD AN APP AND THEY WILL COME? LESSONS LEARNT FROM TRIALLING THE GETTHEREBUS APP IN RURAL COMMUNITIES

- EXPLORES CHALLENGES AND SOLUTIONS FOR REAL-TIME PASSENGER INFORMATION (RTPI) IN RURAL AREAS, FOCUSING ON THE GETTHEREBUS APP
- INCLUDES RELEVANCE, INNOVATIVE APPROACH, AND A COMPREHENSIVE LITERATURE REVIEW
- THE DEVELOPMENT PROCESS IS WELL-DOCUMENTED, SHOWCASING A USER-CENTRIC AND ITERATIVE APPROACH
- PROVIDES VALUABLE INSIGHTS INTO CHALLENGES AND POSSIBILITIES OF RTPI IN RURAL
- TRANSPARENCY IN FUNDING ACKNOWLEDGEMENT ADDS CREDIBILITY TO THE STUDY
- DEEMED CREDIBLE AS IT IS A RESEARCH ARTICLE FROM THE INSTITUTION OF ENGINEERING AND TECHNOLOGY
- AREAS FOR IMPROVEMENT INCLUDE USER RECRUITMENT CHALLENGES, LIMITED GENERALIZABILITY, AND THE NEED FOR TECHNOLOGY ADOPTION CONSIDERATIONS
- NEGATIVE ASPECT: CONCENTRATED ON RURAL COMMUNITIES IN THE UK, PUBLISHED IN 2018

SECONDARY LITERATURE

MOBILE APP FOR PUBLIC TRANSPORT: A USABILITY AND USER EXPERIENCE PERSPECTIVE

- EXAMINES THE USABILITY AND USER EXPERIENCE OF A MOBILE APP DEVELOPED FOR PUBLIC TRANSPORT WITHIN THE MOBILITY BROKER PROJECT
- ADDRESSES CHALLENGES IN COMBINING VARIOUS PUBLIC TRANSPORT SERVICES, AIMING TO CREATE A CENTRAL PLATFORM FOR PLANNING AND BOOKING JOURNEYS
- EMBARKS A PERTINENT ISSUE—USABILITY OF A PUBLIC TRANSPORT APP IN THE CONTEXT OF INCREASING SMART DEVICE USAGE
- INCLUSION OF AN EMPIRICAL STUDY WITH 32 PARTICIPANTS ADDS PRACTICAL VALUE BY OFFERING CONCRETE INSIGHTS INTO USER PERCEPTIONS
- TRANSPARENT ACKNOWLEDGEMENT OF STUDY LIMITATIONS ENHANCES USEFULNESS BY PROMPTING FURTHER EXPLORATION IN DIVERSE USER GROUPS
- DEEMED CREDIBLE AS THE AUTHORS ARE AFFILIATED WITH RWTH AACHEN UNIVERSITY AS WELL AS COLLABORATION WITH VARIOUS ENTITIES IN THE MOBILITY BROKER PROJECT
- TRANSPARENCY IN FUNDING ACKNOWLEDGEMENT ADDS CREDIBILITY TO THE STUDY

SECONDARY LITERATURE

DOES REAL-TIME TRANSIT INFORMATION REDUCE WAITING TIME? AN EMPIRICAL ANALYSIS

- PROVIDES INFORMATION ON THE IMPACT OF REAL-TIME INFORMATION (RTI) APPS ON WAITING TIMES IN PUBLIC TRANSIT SYSTEM
- EMPLOYS EMPIRICAL DATA FROM A MEDIUM-SIZED U.S. CITY
- COMBINING EMPIRICAL DATA WITH SURVEY-BASED METHODS AND MATHEMATICAL SIMULATIONS STRENGTHENS THE STUDY'S VALIDITY
- OFFERS PRACTICAL INSIGHTS FOR TRANSIT AGENCIES AND USERS, COMPARING DIFFERENT RTI-BASED STRATEGIES FOR MORE EFFICIENT TRANSIT PLANNING
- DEEMED CREDIBLE BECAUSE OF AFFILIATION WITH THE OHIO STATE UNIVERSITY
- USING REAL-TIME BUS LOCATION DATA ENHANCES EMPIRICAL VALIDITY, BUT GENERALIZABILITY TO OTHER URBAN AREAS NEEDS TO BE CONSIDERED
- NEGATIVE ASPECT: CONCENTRATED ON U.S. CITY, SOMETIMES CHALLENGING TO UNDERSTAND WITHOUT PREVIOUS KNOWLEDGE OF PUBLIC TRANSPORT SYSTEMS AND THE RTI SYSTEMS


RESEARCH METHODS

OBSERVATIONS

WE CHOSE OBSERVATIONS AS WE WANTED TO GET REALISTIC DATA FROM DIVERSE USERS, AND OBSERVATIONS SEEMED TO BE THE BEST APPROACH.

THEY ARE ALSO PARTICULARLY USEFUL FOR CAPTURING NON-VERBAL BEHAVIOURS SUCH AS FACIAL EXPRESSIONS, BODY LANGUAGE, AND GESTURES. IT HELPED US IDENTIFY PATTERNS AND FURTHER DEVELOP OUR RESEARCH.

THEY PROVIDED US WITH DATA FROM THREE DIFFERENT LOCATIONS AT FOUR DIFFERENT TIMES THROUGHOUT THE DAY WITH AN ARRAY OF DIFFERENT USERS.

ZOE DID HER OBSERVATION IN THE CAR PARKS OF UL TO FIND WAYS TO MOTIVATE CAR USERS TO SWITCH TO A MORE SUSTAINABLE WAY OF TRAVELLING TO UL.

JAHRED AND ANNIKA DID THEIR OBSERVATION AT BUS STOPS. JAHRED AT A BUS STOP IN SHANNON AND ANNIKA AT THE UL STABLES BUS STOP AS WELL AS ON THE 304A BUS. THESE OBSERVATIONS HELPED GET REALISTIC DATA ON THE CURRENT PUBLIC TRANSPORT SYSTEM AND AREAS OF IMPROVEMENT.

SURVEY

WE CHOSE A SURVEY AS OUR SECOND RESEARCH METHOD AS WE NEEDED AN EFFICIENT WAY TO COLLECT DATA FROM AS MANY PEOPLE AS POSSIBLE.

WE WANTED TO GATHER FURTHER DATA ON THE USE OF PUBLIC TRANSPORT IN CASE WE MISSED BEHAVIOURS DURING OUR OBSERVATIONS. HOWEVER, WE ALSO WANTED TO GAIN KNOWLEDGE ON THE TFI RESOURCES THAT ARE ALREADY AVAILABLE AS WE PLANNED TO IMPROVE THEM.

BY THE TIME WE DEPLOYED THE SURVEY, WE HAD ALREADY DEVELOPED SOME FIGMA FRAMES, SO WE ADDITIONALLY WANTED TO TEST IF PEOPLE LIKED OUR APP AND IF IT WOULD IMPROVE PEOPLE'S EXPERIENCE WITH PUBLIC TRANSPORT.

WE USED MICROSOFT FORMS TO CREATE THE SURVEY. WE SPLIT IT INTO FIVE SECTIONS TO GATHER INFORMATION ON DEMOGRAPHICS, PUBLIC TRANSPORT USAGE, THE TFI RESOURCES, OUR APP PROPOSAL AND ADDITIONAL COMMENTS.

EXCERPT FROM OUR SURVEY

SURVEY ON A NEW TFI APP

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY. THIS STUDY AIMS TO IMPROVE THE TFI APPS CURRENTLY AVAILABLE. YOUR INPUT IS VITAL AND WILL ASSIST US IN GAINING VALUABLE INSIGHTS INTO THE USAGE OF THE CURRENT TFI APPS AND INTEREST IN OUR NEW AND IMPROVED VERSION.

THIS SURVEY IS COMPLETELY ANONYMOUS, AND YOUR RESPONSES WILL BE KEPT PRIVATE. NO IDENTIFYING INFORMATION WILL BE SHARED OR LINKED TO YOUR ANSWERS. ALL INFORMATION GATHERED WILL BE ANONYMISED AND USED ONLY FOR RESEARCH PURPOSES.

BY COMPLETING THIS SURVEY, YOU ARE PROVIDING YOUR INFORMED CONSENT TO PARTICIPATE IN THE STUDY. YOUR PARTICIPATION IS FULLY VOLUNTARY, AND YOU ARE FREE TO STOP WITH THE SURVEY AT ANY TIME.

THE SURVEY SHOULD TAKE APPROXIMATELY 7 MINUTES TO COMPLETE, DEPENDING ON THE DEPTH OF YOUR RESPONSES.

YOUR WILLINGNESS TO TAKE PART IN THIS STUDY IS APPRECIATED. PLEASE CONTINUE WITH THE SURVEY AND ANSWER THE QUESTIONS BELOW TO THE BEST OF YOUR ABILITY.

THANK YOU FOR YOUR TIME AND COOPERATION.

LINK TO OUR SURVEY AND THE COLLECTED DATA:
https://tinyurl.com/3nnjcy4c


FINDINGS

OBSERVATIONS FINDINGS

EACH GROUP MEMBER DID AN OBSERVATION OF 2.5 HOURS, WHICH PROVIDED US WITH OBSERVATION DATA FROM 7.5 HOURS.

THE OBSERVATION DATA PROVIDED SEVERAL PROBLEMS REGARDING PEOPLE USING PUBLIC TRANSPORT.

FURTHERMORE, THEY PROVIDED INSIGHTS INTO THE CHALLENGES COMMUTERS FACE, THE IMPACT OF PEAK HOURS ON PUBLIC TRANSPORT, AND AREAS FOR POTENTIAL IMPROVEMENT IN SCHEDULING, COMMUNICATION, AND TECHNOLOGY RELIABILITY.

OBSERVATIONS FINDINGS

DATE: 06-11-23

LOCATION: SHANNON BUS STOP CRONAN GARDENS

ACTIVITY: OBSERVING BUS TIMES AND PEOPLE

LENGTH: 10:30 AM - 11:30 AM, 4 PM - 5:30 PM

BUSES GENERALLY ARRIVED WITHIN 5-10 MINUTES OF THE SCHEDULED TIME, BUT OCCASIONAL DELAYS OF UP TO 15 MINUTES WERE OBSERVED. PASSENGER VOLUME VARIES THROUGHOUT THE DAY. PEOPLE ENGAGED IN VARIOUS ACTIVITIES WHILE WAITING, SUCH AS CHECKING PHONES, CONVERSING, LISTENING TO MUSIC, WORKING ON LAPTOPS, READING BOOKS, AND SNACKING. THE MOOD WAS GENERALLY CALM AND CONTENT, BUT DELAYS, ESPECIALLY DURING PEAK TIMES, LED TO IRRITATION.

OBSERVATIONS FINDINGS

DATE: 06-11-23

LOCATION: UL BUS STOP; 304A TO MONALEEN

ACTIVITY: OBSERVING PEOPLE GETTING ON AND OFF THE BUS, WAITING TIMES, ARRIVAL TIME OF BUSES, WAY OF PAYING; OBSERVING PEOPLE ON THE BUS, PAYING FOR THE BUS JOURNEY

PARTICIPANTS: COMMUTERS, BUS DRIVERS, PEOPLE TAKING THE BUS

LENGTH: 9:00 AM – 10:00 AM; 3:30 PM – 5:00 PM; 5:00 PM – 5:20 PM

THE BUSES AND THE BUS STOP QUICKLY BECAME OVERCROWDED WHEN THERE WAS A DELAYED OR NO-SHOW BUS. THIS INCREASED THE FRUSTRATION AMONG THE WAITING PASSENGERS. SOME WALK RATHER THAN WAIT FOR THE NEXT BUS OR SIT ON AN OVERCROWDED BUS.

THERE WERE LONGER WAITING TIMES IN THE MORNING THAN IN THE EVENING.

OBSERVATIONS FINDINGS

THERE WAS EXTENSIVE PHONE USAGE DURING WAITING TIMES, WITH PEOPLE STRUGGLING TO HOLD THEIR PHONES AND LEAP CARDS WHEN THE BUS ARRIVED.

THE DIGITAL TIMETABLES/ DISPLAYS AT THE BUS STOP AND ON THE BUS DO NOT ALWAYS DISPLAY ACCURATE INFORMATION AND SOMETIMES DON'T WORK.

THE BUS WAS STUCK IN TRAFFIC. THERE WAS GENERAL DISCOMFORT DUE TO CROWDED SEATING AND UNEXPECTED STOPS BECAUSE OF A DIVERSION.

OBSERVATIONS FINDINGS

DATE: 06-11-23

LOCATION: UNIVERSITY OF LIMERICK CAR PARKS

ACTIVITY: OBSERVING CAR PARKS IN UL

LENGTH: 8:00 AM - 10:30 AM

THE CAR PARKS WERE INITIALLY EMPTY AND GRADUALLY FILLED, REACHING PEAK OCCUPANCY BY 8:50 AM.

SOME STUDENTS RESORTED TO UNCONVENTIONAL PARKING AS THEY COULDN'T FIND PARKING SPOTS, LEADING TO CONGESTION AND LATE ARRIVALS.

DUE TO LIMITED PARKING, SOME PEOPLE OPTED FOR WALKING, BIKING, OR CARPOOLING.

SURVEY FINDINGS

THE SURVEY REACHED 53 RESPONSES.

DATA WERE GATHERED ON DEMOGRAPHICS, TFI USAGE, TFI RESOURCES AND OUR APP PROPOSAL.

52 OUT OF 53 PARTICIPANTS WERE AGED 18 TO 25. ONE WAS AGED 26 TO 35.

53% WERE FEMALE, 45% WERE MALE, AND 2% WERE NON-BINARY.

88% OF THE PEOPLE RESPONDING TO THE SURVEY WERE STUDENTS.

89% USE THE PUBLIC TRANSPORT SYSTEM IN IRELAND.

MOST PEOPLE WHO ANSWERED 'NO' DON'T USE THE PUBLIC TRANSPORT SYSTEM BECAUSE THEY HAVE A CAR OR THE BUS CONNECTION IS TOO UNRELIABLE.

MOST TAKE THE BUS WEEKLY (23), FOLLOWED BY DAILY USAGE(15).

THE PUBLIC TRANSPORT SYSTEM RECEIVED AN NPS SCORE OF -79.

MOST USE THE BUS TO GO OUT (38) OR COMMUTE TO SCHOOL/UNIVERSITY (34).

SURVEY FINDINGS

45 OUT OF 53 HAVE A LEAP CARD AND RATED THE APPLICATION PROCESS 3.6 OUT OF 5.

THE MOST COMMON CRITIQUE THE APPLICATION PROCESS RECEIVED WAS THAT IT TOOK TOO LONG, THAT A PICTURE ID WAS NEEDED, AND THE PHOTO-TAKING PROCESS.

40 OUT OF 53 USED THE TFI GO AND LIVE APPS BEFORE, WITH AN AVERAGE RATING OF 3 OUT OF 5.

THE MOST COMMON FAVOURITES IN THE TFI APPS WERE THE JOURNEY PLANNING FEATURE (3), AND THE TRACKING (6).

3 OUT OF 53 DIDN'T LIKE ANYTHING ABOUT THE TFI APPS.

THE MOST COMMON DISLIKES WERE THAT THE BUS INFO WAS INACCURATE (19) AND THAT THE APPS WERE DIFFICULT TO NAVIGATE (6).

MOST DIDN'T THINK IT WAS CLEARLY STRUCTURED OR VISUALLY APPEALING.

SURVEY FINDINGS

53 OUT OF 53 ANSWERED THEY WOULD USE OUR APP.

38 SAID THEY WOULD BE MORE LIKELY TO USE PUBLIC TRANSPORT WITH OUR APP.

14 ANSWERED ‘MAYBE’, AND 1 ANSWERED ‘I DON’T KNOW’.

OUR APP PROPOSAL RECEIVED AN NPS SCORE OF 32.

THE MOST IMPORTANT FEATURE BASED ON OUR PARTICIPANTS IS THE DIGITAL LEAP CARD, CLOSELY FOLLOWED BY REAL-TIME TRACKING.

OVERALL REQUESTED FEATURES INCLUDED:

- SHORTCUT FOR FREQUENTLY TRAVELLED ROUTES/ FAVOURITE STOPS
- NOTIFICATIONS AND ALERTS
- ROUTE/ JOURNEY PLANNER; MULTIPLE LEG AND GROUP TRIP OPTION
- TRACKING OF BUSES/ TIMETABLES
- AN ALL-IN-ONE APP WITH OTHER TRANSPORT METHODS INCLUDED

SURVEY FINDINGS

- BUYING TICKETS

- DIGITAL LEAP CARD THAT CAN BE ADDED TO APPLE WALLET; TOP-UP FUNCTION; PAYING FOR A FRIEND OPTION

- POINT SYSTEM LIKE COUPONS FOR TAKING THE BUS

- FEEDBACK FUNCTION (REPORTING ANTI-SOCIAL BEHAVIOUR)

- PHOTOS OF THE BUS STOP

- OPTION TO REPORT HOW BUSY THE BUSES ARE AND IF THE WHEELCHAIR SPACE IS OCCUPIED

- REWARD SYSTEM

FINDINGS

ACCORDING TO OUR RESEARCH, MANY PEOPLE ARE DISSATISFIED WITH THE PRESENT TFI MOBILE APPLICATIONS, RATING THEM ON AVERAGE AT 3/5, BECAUSE THEY ARE COMPLEX TO USE AND UNSTRUCTURED. MANY PEOPLE WANT TWEAKS AND DIFFERENT FEATURES TO MAKE THE APP MORE BENEFICIAL.

WE GATHERED DATA ON THE CURRENT TFI RESOURCES TO COLLECT IMPORTANT FEATURES FOR PUBLIC TRANSPORT USERS.

ADDITIONALLY, WE OBSERVED THAT MANY PASSENGERS STRUGGLED TO HOLD THEIR PHONES AND LEAP CARDS IN HAND WHILE BOARDING THE BUS, WHICH MADE US IMPLEMENT A DIGITAL LEAP CARD.

THIS IDEA WAS SUPPORTED BY THE SURVEY DATA COLLECTED.

OUR APP, BUS BUDDY, WILL HAVE AN ARRAY OF INTERESTING FEATURES COMPILED FROM EXISTING TFI APPS AND OUR RESEARCH.

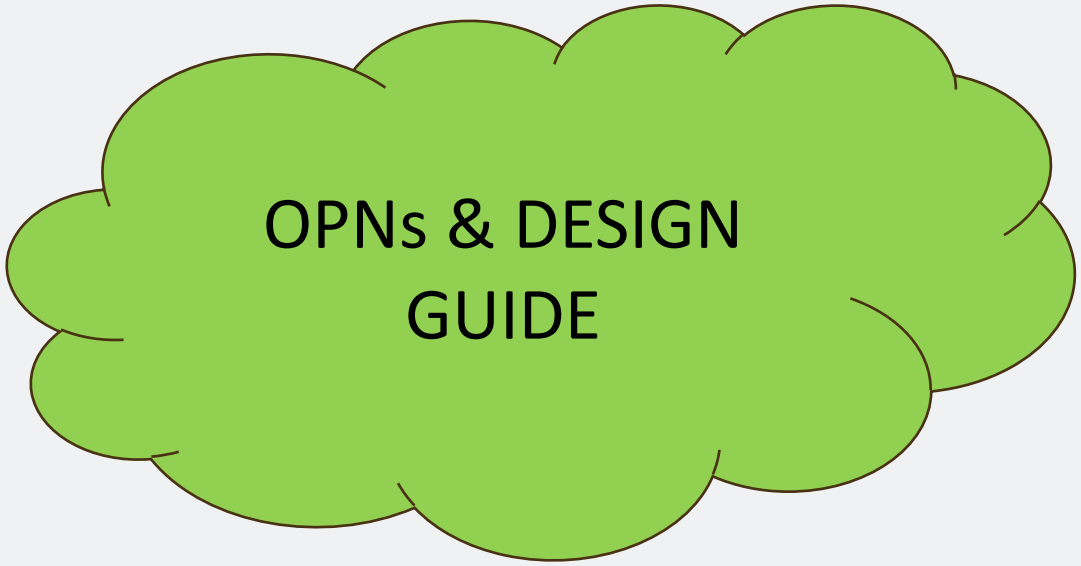
THE INCLUDED FEATURES ARE AS FOLLOWS:

- DIGITAL LEAP CARD THAT YOU CAN ALSO ADD TO YOUR PHONE'S WALLET,
- A LEAP CARD TOP-UP OPTION,
- A TAP-TWICE FUNCTION TO PAY FOR A FRIEND,

FINDINGS

- AN OPTION TO SEE YOUR LEAP CARD BALANCE,
- A REAL-TIME TRACKING OPTION WITH A MAP AND MINUTE DISPLAY
- AN ‘ON THE BUS’ FEATURE TO PROVIDE REAL-TIME TRACKING FOR OTHERS IF NEEDED,
- A NEWS AND ALERT CENTRE IN CASE OF ROUTE CHANGES DUE TO CONSTRUCTION OR DELAYS,
- BUYING ONLINE TICKETS,
- A JOURNEY PLANNER WHO HAS THE OPTION TO BE COLLABORATIVE,
- AN OPTION TO PROVIDE FEEDBACK OR REQUEST ADDITIONAL STOPS ON A ROUTE,
- A SOCIAL FUNCTION TO SHARE YOUR BUS JOURNEYS WITH OTHERS AND ENCOURAGE EACH OTHER TO TAKE THE BUS THROUGH A COMPETITION FEATURE,
- A REWARD SYSTEM THAT GIVES USERS DISCOUNTS ON TICKET PRICES IF THEY USE THE BUS FOR A CERTAIN AMOUNT OF TIME,
- AN OPTION TO CHANGE THE APP'S LAYOUT FOR THE ELDERLY SO ONLY THE NEEDED FEATURES ARE DISPLAYED, LIMITING CONFUSION.

ALL OF OUR DOCUMENTATIONS: https://tinyurl.com/2p9m56bp


OPNs & DESIGN
GUIDE

OPNs & DESIGN GUIDE

WE CREATED THE OPN FRAMEWORK FOR OUR OBSERVATIONS BY EACH GOING THROUGH OUR OBSERVATION NOTES AND SEPARATING OUT THE INDIVIDUAL OBSERVATIONS. THEN, WE CREATED THE PROBLEMS FOR EACH OBSERVATION AND PRODUCED THE NEED STATEMENTS.

FOR THE SURVEY, WE WORKED TOGETHER TO CREATE THE OPN FRAMEWORK. BOTH OPN FRAMEWORKS WERE THEN COPIED AND PASTED INTO AN EXCEL DOCUMENT. THERE, THE NEED STATEMENTS WERE RATED FROM 1 TO 5, WITH 1 BEING NOT IMPORTANT AT ALL AND 5 BEING ESSENTIAL. FOLLOWING THAT, THE NEED STATEMENTS WERE SORTED BASED ON THEIR RATING. WE CREATED A FEATURE PER NEED STATEMENT THAT COULD BE IMPLEMENTED INTO OUR APP IDEA. THERE WERE A COUPLE OF NEED STATEMENTS THAT WE DEEMED IMPORTANT BUT COULD NOT BE IMPLEMENTED INTO THE APP. NONETHELESS, WE FELT THAT THEY WERE IMPORTANT TO MENTION.

THE REFINED FOCUS STATEMENT THAT RESULTED FROM OUR DESIGN GUIDE IS AS FOLLOWS:

OUR PROJECT WILL AIM TO REDESIGN THE CURRENT TFI MOBILE APPLICATIONS TO INCREASE ACCESSIBILITY AND THE USAGE OF PUBLIC TRANSPORT.

OPNs

Observation	Problem	Need Statement	Importance (1-> Not at all; 5 -> Essential)	Featuer to be implemented
People highly value the inclusion of a digital Leap Card in the app.	Traditional physical Leap Cards prone to loss, negativly affecting the public transport experiece.	Way to implement a user-friendly and secure digital Leap Card to enhance convenience and reduce reliance on physical cards.	5	As a QR code on the home screen and option to add it to Wallet
Boarding being delayed by people paying for a friend with their Leap Card.	Boarding being delayed by Leap Card needing to be tapped twice.	Way to implement pay for a friend feature.	5	Tap-twice function within the Leap Card
Real-time tracking with a map and minute display is a preferred feature among participants.	Lack of real-time information can lead to uncertainty, causing inconvenience for commuters who rely on timely bus arrivals.	Way to develop a real-time tracking system that provides accurate information, enhancing the overall reliability of public transportation and reduce wainting times.	5	Reuse Dublin Coaches approch for 304, 304A, 310, 323 buses
A journey planner feature is seen as valuable by survey respondents.	Lack of a reliable journey planner can make it challenging for users to plan efficient routes and connections.	Way to develop a comprehensive journey planner that considers various transportation modes, schedules, and potential disruptions to provide users with optimal travel plans.	5	Journey plan with a collaborate function
Passengers visibly expressing frustration during delays.	Occasional delays in the 343 schedule.	Real-time information displays for accurate schedules.	5	Reuse Dublin Coaches approch for 304, 304A, 310 buses
The majority of the respondents are between the ages of 18-25 and one between 26-35 years of age	Might not be too familar with the TFI system	Making sure that the app is easy to access and understand ensuring all age groups can find their way through the app	5	Clear and structured UI with appealing colours
The ratings for the TFI Live app varied among participants, providing a diverse perspective on user satisfaction. Notably, the majority of participants selected ratings in the mid-range, with 16 individuals choosing 3 stars and 12 individuals opting for 4 stars	a significant portion of participants, 4 individuals, rated the app with only 1 star, and 6 individuals gave it a 2-star rating.	Investigate the reasons behind the low ratings (1 and 2 stars) to identify specific pain points or issues that users are encountering. This could involve gathering detailed feedback through surveys, interviews, or reviews.	5	Feedback outlet within app
Common dislikes center around concerns of inaccuracy, difficulty in navigation, and outdated bus information	Users express dissatisfaction with perceived inaccuracies, emphasizing the importance of reliable information.	Improvements in data accuracy, user interface design, and overall app functionality.	5	Clear and structured UI with appealing colours; provide 'On the bus' function to let users provide real time information for other users
The ratings for the TFI Go app varied among participants, with a distribution across different star levels. Notably, a relatively higher number of participants opted for mid-range ratings, with 14 individuals selecting 3 stars and 13 individuals choosing 4 stars.	a combined total of 12 participants rated the app with 1 or 2 stars, indicating a subset of users who may have encountered challenges or expressed dissatisfaction.	Explore the reasons behind the lower ratings (1 and 2 stars) to identify specific issues or concerns users may have encountered. This could involve collecting detailed feedback through surveys or direct communication.	5	Feedback outlet within app
Lack of integration with public transportation options.	Limited connectivity with buses or trains.	Collaborate with public transportation services to improve connectivity and reduce individual car usage.	5	Statistics and social function to make PT more fun and sharable
Passengers offering assistance to those unfamiliar with the route.	Lack of clear bus stop names.	Clear route information for the 343.	5	Tracking and Planning option/ feature
Passengers signaling the bus driver for upcoming stops.	Occasional confusion about the Shannon 343 route.	Clear route information and signage for the Shannon 343.	5	Tracking and Planning option/ feature; Feedback option to report if signage is wrong or missing
Leap Cards for payment is the most regcognised and fastest payment method.	Passangers without a Leap Card have longer boarding times.	A way to make the Leap Card more accessible and provide better alternatives.	5	Make it digital and the application process easier, widen the age restrictions
Bus diversions causing confusion among passengers.	Diversions lead to confusion and uncertainty among passengers.	A way to ensure timely and accurate communication of bus diversions to passengers to limit confusion.	5	New outlet and notification and alert center
The digital timetable at the bus stop often shows incorrect due time or the wrong bus direction.	People waiting for the bus are confused and at risk to take the wrong bus.	A way to ensure the right times and directions are displayed on the digital timetable.	5	Feedback option to report if this does not happen which allows change within the app

OPNs

Observation	Problem	Need Statement	Importance (1-> Not at all; 5 -> Essential)	Featuer to be implemented
The bus skips the stop	People can't go to where they want due to the bus skipping their stop	A way to ensure the bus stops at the right bus stop.	5	Feedback option to report if this does not happen
Other vehicles other than busses parking at the stop	The bus can't find a place to stop	A way to be more strict in the parking areas ensuring only the busses can stop at the bus stop	5	Feadback option to inform TFI about situation
People wanting more features in the app.	Too many features could make the app too complex.	Way to prioritise the important features.	5	Put requested features on the home screen
Digital displays on the buses malfunctioning or not updated to reflect bus diversions	Inaccurate or non-functional displays fail to provide accurate information about bus routes and stops potentially causing passenger to miss their stop.	Improve maintenance and real-time updates of digital displays to reflect route diversions accurately.	5	provide 'On the bus' function to let users provide real time information for other users
The majority of respondents (38) express a positive inclination ("Yes") towards using the proposed public transport app.	Current public transport services might not sufficiently meet user expectations or provide the desired level of convenience, potentially leading to underutilization.	Way to enhance and implement the app features to meet user expectations, ensuring an alternative to current public transport services.	5	Put requested features on the home screen
People reporting the wish for a simple design.	App layout could be overwhelming with exisitng features.	Way to simplify the layout and design.	4	Clear and structured UI with appealing colours
A small percentage, 10%, agreed that the app is visually appealing, indicating a relatively low number of participants finding the app visually satisfying.	A majority, 44%, disagreed with the statement, indicating that a significant portion of participants do not find the app visually appealing.	Improvement in the app's design and aesthetics to enhance user satisfaction and engagement.	4	Clear and structured UI with appealing colours
Absence of covered waiting areas for buses.	Users exposed to weather conditions while waiting for buses.	Provide covered waiting areas to enhance the comfort of bus users.	4	Option to provide feedback and information on waiting areas within the app
Users express interest in a social function to share bus journeys and participate in friendly competitions.	Lack of social engagement features in existing public transport apps may result in a missed opportunity to build a sense of community and encourage public transport use.	Way to develop and integrate a social function within the app, incorporating features like sharing bus journeys and friendly competitions to foster a sense of community and encourage public transport use.	4	Incoperate feature that lets you share statistics or journey planned
A respondent suggests the need for an option to report unsocial behavior.	Instances of unsocial behavior on public transport might go unaddressed, leading to discomfort for passengers and potentially deterring others from using public transportation.	Way to allowing users to report instances of unsocial behavior, ensuring a safer and more comfortable travel environment for all passengers.	4	feedback option, alert notificatio to other user
Absence of incentives for sustainable commuting.	Limited motivation for individuals to choose eco-friendly transportation.	Introduce incentives such as discounts, rewards, or recognition for individuals opting for sustainable commuting options.	4	statistics and with certain statistics option to unlock rewards (reduce fare)
A lack of presence of a ticket vending machine or fare payment system.	Challenges with fare payment systems.	Improved fare payment systems for passenger convenience.	4	buy option in app
A minority, 19%, agreed that the app is clearly structured, indicating that a relatively small portion of students find the app's layout and organization clear.	28% of students disagreed with the statement, indicating that a significant portion of participants do not perceive the app as clearly structured.	Enhance the app's organization for improved user experience.	4	Clear and structured UI with appealing colours
"The 304 is delayed to an unknown extent as more and more people wait at the bus stop."	"More and more people are delayed in their travels as well as the volume of people of two buses will need to board the next bus"	A way to reduce delays as well as inform bus takers about delays so they can adjust their journey.	4	Alert center within app
Confusion among elderly passengers regarding bus schedules and routes.	Lack of accessible information or assistance causes confusion and inconvenience for elderly passengers.	A way to provide clear information and assistance tailored to the needs of elderly passangers.	4	Clear and structured UI with appealing colours; alternative UI that can be activated for selected options to be displayed only
1/53 respondents have lived in Ireland for 2-5 years and 3/53 have said that they've lived in Ireland for less than a year and 3/53 have said that they've lived in Ireland for a year	People who are new to Ireland or the TFI app could find it difficult to access the app	A way to make the TFI system more accessible for people new to the app	4	Clear and structured UI with appealing colours
Payment delays due to technological issues with payment systems.	Technological malfunctions lead to delays in payment and boarding processes.	A way to improve and maintain the reliability of payment systems to expedite boarding.	4	Improve Leap Card by making it digital

OPNs

Observation	Problem	Need Statement	Importance (1-> Not at all; 5 -> Essential)	Featuer to be implemented
9/53 respondents have dual roles, such as being both a student and a deli worker or a retail assistant	The participants relying on public transport for commuting, indicating a more cost-effective mode of travel	A way to enhance in the payment system making it easier to make transactions	4	Improve Leap Card by making it digital
Majority of respondents, 40 out of 53, have used the TFI Live or Go app before, while 13 out of 53 have not.	This suggests a higher adoption rate among the surveyed individuals, with approximately 75% having experience with the app.	Way to gathering feedback from users or exploring reasons for non-use, could provide additional insights into the app's overall reception and potential areas for improvement.	4	Feedback outlet within app
The survey indicates a desire for a news outlet feature, especially in the case of route changes due to construction.	Lack of timely information about route changes can result in confusion and inconvenience for passengers.	Way to implement a dedicated news outlet within the app to communicate important updates, such as route changes or disruptions, ensuring passengers stay informed.	4	New outlet and notification and alert center
People getting on the 310 and can't pay for their journey because the 310 only accepts Leap Cards.	The availability of the 310 is limited and the unknowness about it can delay the bus departure.	More accessable payment on the 310 or clearly indicate only payment via Leap Card is accepted.	3	Option to see what payment is accepted
The likelihood to recommend the app is generally high, with a significant number of respondents (15) giving a rating of 10.	Traditional public transport apps may lack features or user experience that encourage users to actively promote and recommend them to friends and family.	Focus on maintaining a high-quality user experience, incorporating features that users find valuable, and promoting positive word-of-mouth recommendations.	3	feedback option
The majority of the individuals in the provided list are students, with a few working part-time or full-time jobs.	People with different occupations are travelling back and forth from work, college, home	Ensuring that the app is accessible to users with various backgrounds and needs, including language support and user-friendly interfaces.	3	ability to change language on app
Lack of integration with campus events and parking planning.	Inadequate preparation for increased parking demand during events.	Develop a system to anticipate and accommodate parking needs during special events.	3	live updates on events
Users desire more accurate and reliable real-time information on bus schedules.	they want notifications about changes to regularly used routes for enhanced planning.	Continuous improvement and innovation to meet user expectations.	3	feedback option
A minority, 12%, reported feeling lost when opening the app, indicating a relatively small but noteworthy group experiencing challenges with the app's initial interface or usability.	32% of participants disagreed with the statement, indicating a majority who did not feel lost when opening the app.	App's onboarding process or user interface to enhance the overall user experience.	3	feedback on apps aesthetics
Overcrowding at the bus stop during peak hours due to buses arriving in clusters.	Clustered bus arrivals create overcrowding and confusion among passengers.	Adjust bus schedules to stagger arrivals, reducing overcrowding and improving passenger flow.	3	option to request times or stops within feedback option
Many people have at least their phones and Leap Cards in their hands when boarding the bus.	"People are more likely to drop an item as there hands are full with multiple items."	A way to minismise the amount of individual items needed when boarding the bus.	3	allow everything to be digital on phone
Bus drivers leaving buses unattended, causing delays and confusion for passengers.	Unattended buses lead to confusion and inconvenience for waiting passengers.	A way to implement protocols for bus driver breaks to minimize delays and confusion.	3	feature to see when the bus drivers pass over to a different driver
People having to wait for the next bus due to an overcrowded bus.	Overcrowded buses leave passengers standing, causing discomfort and inconvenience.	A way to alleviate overcrowding.	3	option to recieve information on how full buses are
Variation in parking behavior with drivers using unconventional spaces.	Lack of adherence to designated parking areas.	Enforce parking regulations and communicate consequences for unauthorized parking.	2	
Not enough space at bus stops leading to buses stopping on the road.	Limited space at bus stops results in buses stopping on roads, causing traffic and safety concerns.	Redesign or expand bus stop areas to accommodate bus parking without obstructing traffic.	2	
When buses were early, they would wait at the bus stop for their due time.	buses waiting often blocked the bus stop which made it unavailable for other buses.	A way to ensure early buses dont block the bus stop.	2	
Some individuals opting for alternative transportation due to limited parking.	Increased reliance on alternative modes of transportation due to parking challenges.	Develop and promote sustainable transportation options, such as improved bike racks or shuttle services.	2	

OPNs

Observation	Problem	Need Statement	Importance (1-> Not at all; 5 -> Essential)
Environmental impact of increased traffic congestion.	High carbon footprint due to congestion and idling vehicles.	Promote eco-friendly transportation options and incentivize carpooling.	2
Inconsistent utilization of bicycle racks despite limited parking.	Underutilization of alternative transportation options.	Promote and improve facilities for bicycles to encourage sustainable commuting.	2
Inadequate provision for secure bicycle storage.	Limited options for cyclists to store their bicycles safely.	option.	2
Limited availability of charging stations for electric bicycles.	Inability to support the growing use of electric bicycles.	Install charging stations for electric bicycles to encourage sustainable commuting options.	2
Unorganized pedestrian pathways within parking lots.	Pedestrian safety compromised due to unclear walkways.	Improve signage and designated pathways for pedestrians to navigate safely.	2
Inadequate lighting in certain parking areas.	Reduced safety and visibility during early morning or evening hours.	Upgrade lighting infrastructure to enhance safety and security.	2
Uneven distribution of parking payment options.	Some areas lacking electronic payment options, causing inconvenience.	Standardize and expand electronic payment options across all parking facilities.	2
Inconsistent maintenance of parking payment systems.	Technical glitches causing inconvenience during payment.	Regularly update and maintain parking payment systems for smooth transactions.	2
Inconsistent maintenance of parking facilities.	Poorly maintained areas affecting the overall appearance and functionality.	Regularly inspect and maintain parking lots to improve aesthetics and safety.	2
The university parking area at 8:00 AM appears relatively empty.	Low utilization of parking spaces during the early hours.	Optimize parking resource allocation to accommodate early arrivals.	2
A significant portion of participants, 41%, demonstrated a good understanding of how to find the timetable, indicating a satisfactory level of knowledge among this group.	21% of participants admitted to partially not knowing how to find the timetable, indicating a degree of uncertainty or lack of clarity within this group.	Notable percentages indicating uncertainty or lack of knowledge, emphasizing the importance of user education or improvements in communication regarding timetable accessibility.	2
31%, demonstrated a clear understanding of how to plan a journey, suggesting a satisfactory level of knowledge among this group.	9% of participants were uncertain about their ability to plan a journey, indicating a lack of clarity or mixed feelings within this subset.	Need for user education or improvements in communicating the journey planning feature.	2
Lack of covered parking spaces.	Insufficient protection for vehicles from weather conditions.	Invest in covered parking structures to protect vehicles and improve user experience.	2
No visible assistance for drivers searching for parking spaces.	Lack of support for individuals facing parking challenges.	Introduce parking attendants or a helpdesk to guide drivers and facilitate a smoother parking process.	2
Limited green spaces within or near parking areas.	Insufficient aesthetics and environmental friendliness in parking zones.	Integrate green spaces and landscaping to enhance the visual appeal of parking facilities.	2
Absence of dedicated parking for electric vehicles.	Limited support for sustainable transportation choices.	Install electric vehicle charging stations and designate parking spaces for electric cars.	2
Inadequate surveillance in parking areas.	Increased risk of theft or vandalism.	Install additional security cameras and enhance surveillance measures.	2
Limited accessibility for individuals with disabilities.	Inadequate parking spaces with accessibility features.	Increase the number of accessible parking spaces and ensure compliance with accessibility standards.	2
Potential safety hazards with vehicles parked along curbs and in grassy areas.	Unsafe parking practices leading to potential accidents or damage.	Improve safety measures and invest in proper infrastructure to prevent unsafe parking.	2
Traffic congestion within the parking area as a result of increased occupancy.	Inefficient traffic flow within the parking facility.	Implement traffic management measures to improve the flow and organization of vehicles.	2
Individuals circling the parking area for an extended period in search of a spot.	Inefficient parking search process causing frustration and delays.	Implement technology solutions like parking availability apps to guide drivers to open spaces.	2

OPNs

Observation	Problem	Need Statement	Importance (1-> Not at all; 5 -> Essential)
Gradual filling of parking spaces over the next hour.	Inefficient use of parking spaces during the initial period.	Implement strategies to encourage early arrivals and distribute parking demand evenly.	2
Lack of clear information regarding available parking spaces.	Drivers spending unnecessary time searching for open spots.	Implement real-time signage or digital displays indicating available parking spaces.	2
Noise pollution in the parking area due to constant traffic circulation.	Negative impact on the surrounding environment and user experience.	Implement measures to reduce noise pollution, such as speed limits or designated traffic routes.	2
Inefficient use of parking space by oversized vehicles.	Large vehicles occupying multiple spaces, reducing overall capacity.	Implement guidelines or designated areas for oversized vehicle parking.	2
Absence of designated loading and unloading zones.	Disruption caused by loading and unloading activities in inappropriate areas.	Implement designated zones for loading and unloading to maintain smooth traffic flow.	2
Lack of a formal carpool matching system.	Difficulty for individuals to find compatible carpool partners.	Implement a centralized carpool matching system to facilitate convenient carpooling arrangements.	2
Late arrivals struggling to find parking spaces beyond 10:00 AM.	Inadequate parking availability for latecomers.	Explore solutions such as overflow parking lots or staggered class schedules to ease demand during peak times.	2
Peak occupancy reached by 8:50 AM, causing a shortage of parking spaces.	Insufficient parking capacity during peak hours.	Expand parking infrastructure or implement dynamic pricing to manage peak demand.	2
Absence of designated parking for rideshare services.	Unorganized drop-off and pick-up points for rideshare users.	Establish specific areas for rideshare services to enhance efficiency and reduce congestion.	2
Limited availability of parking spaces discouraging potential visitors.	Insufficient parking affecting the university's accessibility.	Enhance visitor experience by providing dedicated parking spaces or information on nearby alternatives.	2
People running for buses and experiencing confusion due to closed doors.	Closed bus doors and absence of drivers cause confusion and inconvenience for boarding passengers.	Develop a system to ensure doors remain open or communicate driver absence clearly to waiting passengers.	2
Inability to predict parking availability before arriving.	Lack of pre-arrival information causing uncertainty.	Develop a system for providing real-time parking availability information to users before they reach the campus.	2
Insufficient infrastructure for carpooling coordination.	Difficulty in coordinating ridesharing efforts.	Develop a platform or system to facilitate and encourage carpooling among students and staff.	2
Some drivers resorting to parking in unconventional areas due to limited space.	Inadequate designated parking spaces leading to haphazard parking.	Designate additional parking areas or improve signage to guide drivers to available spaces.	2
Passengers getting in the bus with shopping bags or groceries.	They put their grocceries on the floor, which the floor can be dirty	Consistent cleanliness standards for the bus.	2
Uneven distribution of parking demand across different university departments.	Some departments experiencing higher parking demand than others.	Conduct a department-specific parking needs assessment and allocate spaces accordingly.	2
University parking consistently reaching full capacity by 8:45 AM.	Regular occurrence of parking shortages during peak hours.	Conduct a comprehensive parking demand analysis and implement strategies to meet peak demand without causing congestion.	2
Local and National buses stop at the same bus stop.	" National buses increasing traffic around the bus stop."	A way to divert national buses to decrease traffic at the bus stop.	2

OPNs

Observation	Problem	Need Statement	Importance (1-> Not at all; 5 -> Essential)
Designated seating for individuals with disabilities.	People with no disabilities still sit in the disability designated seats	A way to be more strict in the seating areas	2
Bus stops listed on digital timetable had inaccurate or misleading name.	Incorrectly labeled bus stops cause confusion for passengers and potential missed buses.	Ensure accurate and clear labeling of bus stops to aid passenger navigation.	2
Uneven distribution of buses compared to there demand.	Longer waiting times for people needing to use a certain bus.	A way to adjust the distribution accordingly.	2
Inadequate seating for passengers with mobility challenges.	Diffilcult for people with mobility challenges to find a seating	Enhanced seating options and waiting areas.	2
Lack of adequate shelter leading to discomfort during adverse weather conditions.	Inadequate shelter at the bus stop causes discomfort and inconvenience for waiting passengers during inclement weather.	Enhance or expand shelter options at the bus stop to accommodate waiting passengers during adverse weather.	2
A shelter at the bus stop providing partial protection from rain or sun.	Bus stop shelter providing limited protection.	Additional protection from the elements at the bus stop.	2
Passengers boarding with pets or service animals.	Challenges for passengers with pets or service animals.	Accommodations for passengers traveling with pets or service animals.	2
Cars and taxis stopping in bus lane to drop off people.	Cars and taxis block bus lanes for arriving buses.	A way to supervise and control vehicles stopping in the bus lane to stop unauthorised vehicles from stopping there (Provide altenatives spots).	2
People having to wait for the next bus due to overcrowded bus.	Passangers having to wait for the next bus after seeing how crowded the current bus is.	A way to reduce overcrowding.	2
Limited payment options leading to delays in boarding.	Restricted payment methods cause delays and inconvenience during boarding.	A way to make more payment types available.	2
There are only limited seating during peak hours	This resulting in some passengers standing during peak hours.	A way to Increase seating capacity.	2
Passengers consistently lining up for the Shannon 343 bus during peak hours	Insufficient seating on the Shannon 343 bus leading to discomfort.	A way to Increase seating capacity on the Shannon 343 bus.	2
Lack of any rubbish bins at the bus stops and in the busses	increasing the chances of litter scattered around	A way to implement more rubbish bins around	2
During busy periods, people lining up for the bus and block others from getting off or passing by.	"People have a hard time reaching their destination as the footpath by the bus stop is overcrowded. "	A way to divert people to make the footpath accessible.	2
Insufficient consideration for electric vehicle infrastructure planning.	Inability to support the growing trend of electric vehicle adoption.	Plan and implement charging infrastructure to accommodate electric vehicles.	1
Inconsistent use of technology for parking management.	Manual processes contributing to inefficiencies.	Integrate smart parking solutions to streamline management and enhance the user experience.	1
Limited availability of reserved parking for faculty and staff.	Faculty and staff struggling to find convenient parking spaces.	Increase the number of reserved parking spaces for faculty and staff members.	1
Lack of consideration for future expansion in parking planning.	Inability to accommodate potential growth in the number of vehicles.	Develop a long-term parking plan that considers future increases in demand.	1
Absence of covered walkways connecting parking areas to main campus buildings.	Users exposed to harsh weather conditions during their commute.	Construct covered walkways to improve the walking experience for users.	1
Inadequate information on parking policies and regulations.	Lack of awareness leading to unintentional violations.	Communicate and educate users about parking policies to ensure compliance.	1

DESIGN GUIDE

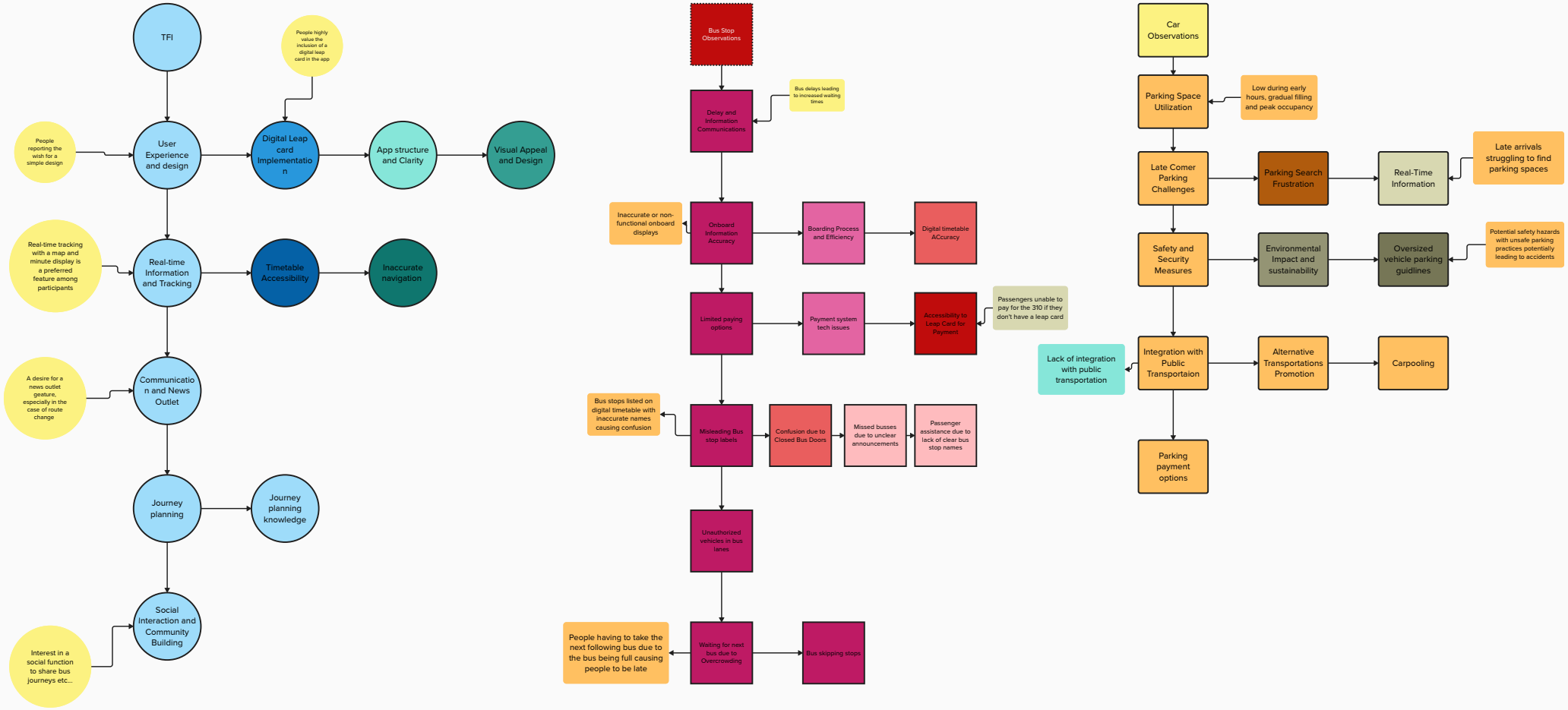
must-haves		nice-to-haves	
Way to implement a user-friendly and secure digital Leap Card to enhance convenience and reduce reliance on physical cards.	As a QR code on the home screen and option to add it to Wallet	More accessable payment on the 310 or clearly indicate only payment via Leap Card is accepted.	Option to see what payment is accepted
Way to implement pay for a friend feature.	Tap-twice function within the Leap Card	Focus on maintaining a high-quality user experience, incorporating features that users find valuable, and promoting positive word-of-mouth recommendations.	feedback option
enhancing the overall reliability of public transportation and reduce wainting times.	Reuse Dublin Coaches approch for 304, 304A, 310, 323 buses	Ensuring that the app is accessible to users with various backgrounds and needs, including language support and user-friendly interfaces.	ability to change language on app
transportation modes, schedules, and potential disruptions to provide users with optimal travel plans.	Journey plan with a collaborate function	Develop a system to anticipate and accommodate parking needs during special events.	live updates on events
Real-time information displays for accurate schedules.	304A, 310 buses	Continuous improvement and innovation to meet user expectations.	feedback option
Making sure that the app is easy to access and understand ensuring all age groups can find their way through the app	Clear and structured UI with appealing colours	App's onboarding process or user interface to enhance the overall user experience.	feedback on apps aesthetics
Investigate the reasons behind the low ratings (1 and 2 stars) to identify specific pain points or issues that users are encountering. This could involve gathering detailed feedback through surveys, interviews, or reviews.	Feedback outlet within app	Adjust bus schedules to stagger arrivals, reducing overcrowding and improving passenger flow.	option to request times or stops within feedback option
Improvements in data accuracy, user interface design, and overall app functionality.	Clear and structured UI; provide 'On the bus' function to let users provide real time information for other users	A way to minisimise the amount of individual items needed when boarding the bus.	allow everything to be digital on phone
Explore the reasons behind the lower ratings (1 and 2 stars) to identify specific issues or concerns users may have encountered. This could involve collecting detailed feedback through surveys or direct communication.	Feedback outlet within app	A way to implement protocols for bus driver breaks to minimize delays and confusion.	feature to see when the bus drivers pass over to a different driver
Collaborate with public transportation services to improve connectivity and reduce individual car usage.	Statistics and social function to make PT more fun and sharable	A way to alleviate overcrowding.	option to recieve information on how full buses are
Clear route information for the 343.	Tracking and Planning option/ feature		
Clear route information and signage for the Shannon 343.	Feedback option to report if signage is		
A way to make the Leap Card more accessible and provide better alternatives.	process easier, widen the age		

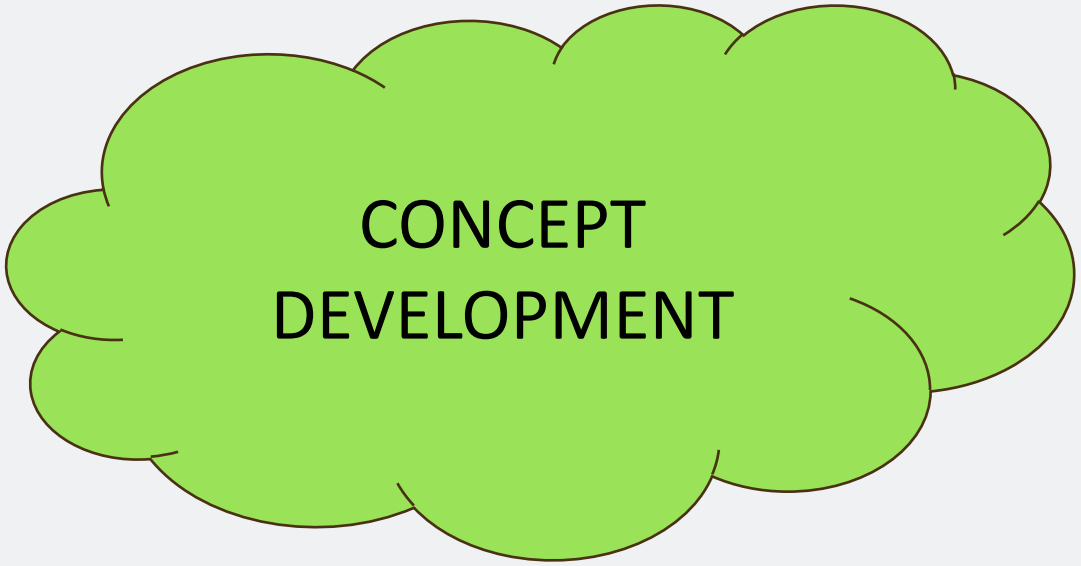
DESIGN GUIDE

must-haves			
A way to ensure timely and accurate communication of bus diversions to passengers to limit confusion.	New outlet and notification and alert center	Way to allowing users to report instances of unsocial behavior, ensuring a safer and more comfortable travel environment for all passengers.	feedback option, alert notificatio to other user
A way to ensure the right times and directions are displayed on the digital timetable.	Feedback option to report if this does not happen which allows change within the app	Introduce incentives such as discounts, rewards, or recognition for individuals opting for sustainable commuting options.	statistics and with certain statistics option to unlock rewards (reduce fare)
A way to ensure the bus stops at the right bus stop.	Feedback option to report if this does not happen	Improved fare payment systems for passenger convenience.	buy option in app
A way to be more strict in the parking areas ensuring only the busses can stop at the bus stop	Feadback option to inform TFI about situation	Enhance the app's organization for improved user experience.	Clear and structured UI with appealing colours
Way to prioritise the important features.	Put requested features on the home screen	A way to reduce delays as well as inform bus takers about delays so they can adjust their journey.	Alert center within app
Improve maintenance and real-time updates of digital displays to reflect route diversions accurately.	provide 'On the bus' function to let users provide real time information for other users	A way to provide clear information and assistance tailored to the needs of elderly passangers.	Clear and structured UI with appealing colours; alternative UI that can be activated for selected options to be displayed only
Way to enhance and implement the app features to meet user expectations, ensuring an alternative to current public transport services.	Put requested features on the home screen	A way to make the TFI system more accessible for people new to the app	Clear and structured UI with appealing colours
Way to simplify the layout and design.	Clear and structured UI with appealing colours	A way to improve and maintain the reliability of payment systems to expedite boarding.	Improve Leap Card by making it digital
Improvement in the app's design and aesthetics to enhance user satisfaction and engagement.	Clear and structured UI with appealing colours	A way to enhance in the payment system making it easier to make transactions	Improve Leap Card by making it digital
Provide covered waiting areas to enhance the comfort of bus users.	Option to provide feedback and information on waiting areas within the app	Way to gathering feedback from users or exploring reasons for non-use, could provide additional insights into the app's overall reception and potential areas for improvement.	Feedback outlet within app
Way to develop and integrate a social function within the app, incorporating features like sharing bus journeys and friendly competitions to foster a sense of community and encourage public transport use.	Incoperate feature that lets you share statistics or journey planned	Way to implement a dedicated news outlet within the app to communicate important updates, such as route changes or disruptions, ensuring passengers stay informed.	New outlet and notification and alert center

FULL DESIGN GUIDE: https://tinyurl.com/yr9zmwtb

AFFINITY DIAGRAMM




CONCEPT
DEVELOPMENT

CONCEPT DEVELOPMENT

OUR APP FOCUSES ON ENHANCING THE PUBLIC TRANSPORTATION EXPERIENCE AND PROMOTING SUSTAINABLE TRAVEL BY REDESIGNING THE CURRENT TFI MOBILE APPLICATIONS. THE PRIMARY RESEARCH QUESTIONS GUIDING OUR PROJECT WERE CENTRED ON HOW PUBLIC TRANSPORT USERS CAN PROVIDE FEEDBACK TO TFI AND HOW THE USABILITY OF DIGITAL PRODUCTS IN PUBLIC TRANSPORT CAN BE IMPROVED.

TO GATHER REALISTIC DATA, WE CONDUCTED OBSERVATIONS TOTALLING 7.5 HOURS. THESE OBSERVATIONS UNVEILED VARIOUS CHALLENGES COMMUTERS FACE, HIGHLIGHTING ISSUES IN SCHEDULING, COMMUNICATION, AND TECHNOLOGY RELIABILITY. FURTHERMORE, 53 PEOPLE RESPONDED TO A SURVEY, REVEALING DISSATISFACTION WITH EXISTING TFI MOBILE APPLICATIONS AND PROVIDING VALUABLE INSIGHTS INTO WANTED FEATURES AND IMPROVEMENTS.

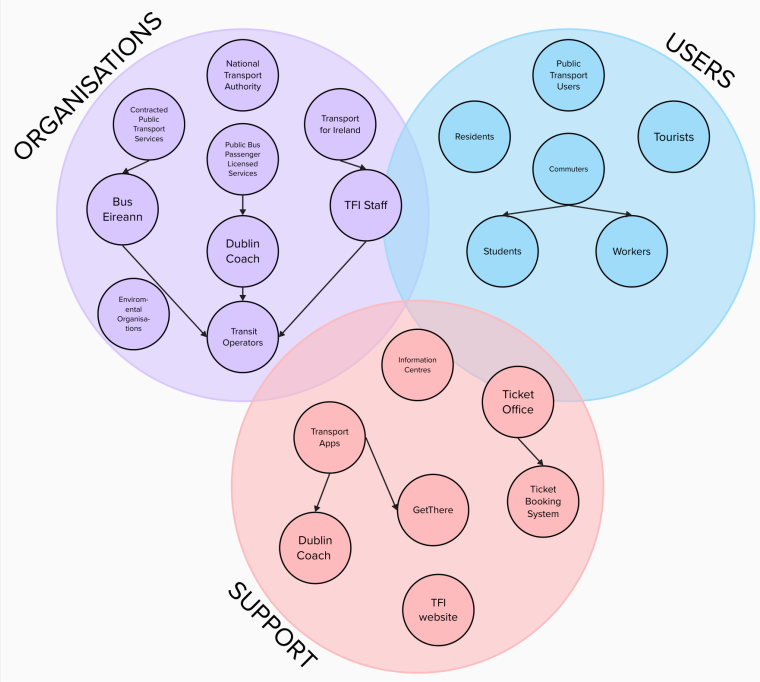
CONCEPT DEVELOPMENT

THE BUSBUDDY APP, CREATED FROM OUR RESEARCH, AIMS TO IMPROVE THE PUBLIC TRANSPORT EXPERIENCE. IT INCORPORATES FEATURES SUCH AS A DIGITAL LEAP CARD, REAL-TIME TRACKING, JOURNEY PLANNING, AND A NEWS/ALERT CENTRE. THE APP ADDRESSES OBSERVED ISSUES, SUCH AS THE DIFFICULTY OF MANAGING PHONES AND LEAP CARDS WHILE BOARDING, BY INTRODUCING A DIGITAL LEAP CARD AND IMPLEMENTING A TAP-TWICE FUNCTION FOR PAYING ON BEHALF OF FRIENDS.

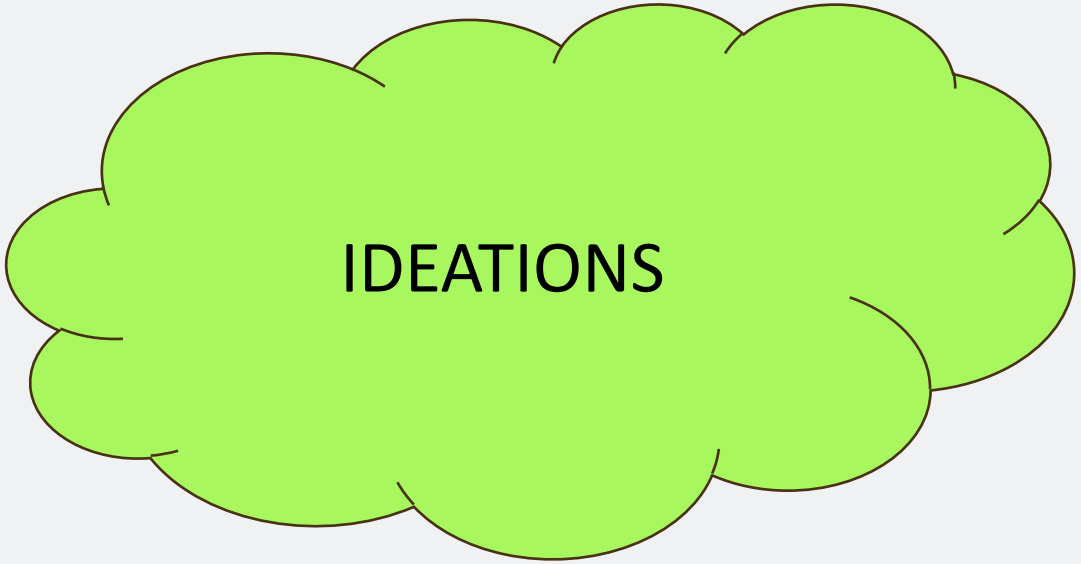
OUR DESIGN PROCESS INVOLVED CREATING AN OPN FRAMEWORK FOR OBSERVATIONS AND SURVEYS, REFINING FOCUS STATEMENTS, AND EMPLOYING DIGITAL TOOLS SUCH AS MURAL AND FIGMA FOR COLLABORATIVE IDEATION AND VISUALISATION. THE REFINED FOCUS STATEMENT EMPHASISES REDESIGNING TFI MOBILE APPLICATIONS TO ENHANCE ACCESSIBILITY AND INCREASE PUBLIC TRANSPORT USAGE.

CONCEPT DEVELOPMENT

IN SUMMARY, OUR APP REVOLVES AROUND DESIGNING A USER-CENTRED APP INSPIRED BY OBSERVATIONS, SURVEY DATA AND IDEATIONS. BY ADDRESSING CURRENT CHALLENGES AND INCORPORATING REQUESTED FEATURES, WE AIM TO ENCOURAGE PEOPLE TO TRAVEL IN A MORE SUSTAINABLE MANNER, ULTIMATELY IMPROVING THE OVERALL PUBLIC TRANSPORT EXPERIENCE.



OUR STAKEHOLDER MAP


IDEATIONS

IDEATIONS

OUR GROUP USED SEVERAL DIGITAL METHODS DURING THE IDEATION PROCESS, AS MOST MEMBERS OF THE GROUP COMMUTE TO UL.

DURING THE INITIAL BRAINSTORMING PROCESS, WE CREATED A **MIND MAP** ON MURAL. WE HAD SIMILAR IDEAS, WHICH SHORTENED THIS PROCESS. BASED ON OUR EXPERIENCES WITH PUBLIC TRANSPORT, WE DEVISED A ROUGH IDEA FOR A PRODUCT. WE ADDITIONALLY PERFORMED A **COLLABORATIVE SKETCHING** EXERCISE TO EXPLORE MORE IDEAS.

WE CHOSE **OBSERVATIONS** AS OUR FIRST RESEARCH METHOD TO PROVE OR DISPROVE THE NEED FOR OUR FIRST IDEAS. AFTERWARDS, WE CAME UP WITH **STORYBOARDS**. THIS HELPED US DEVELOP THE FIRST STAGE OF OUR APP.

ALL OUR DOCUMENTS ARE SHARED IN A ONEDRIVE FOLDER, WHICH ALLOWS EVERYONE TO ACCESS DOCUMENTS AND MAKE CHANGES IN REAL TIME.

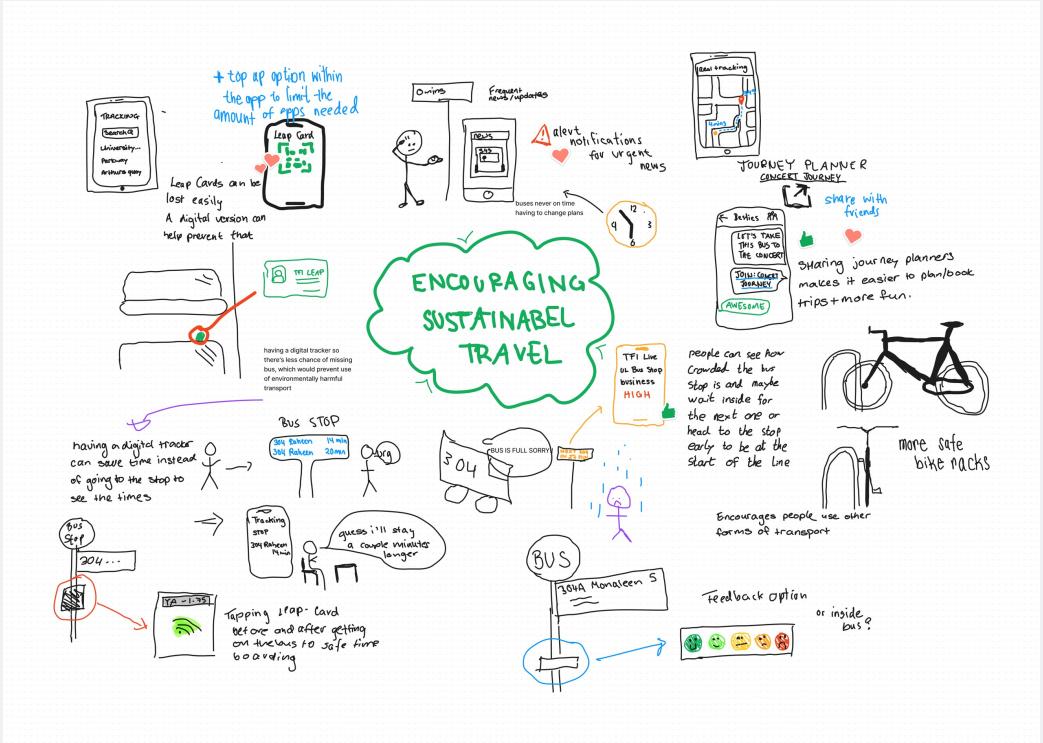
https://tinyurl.com/2p9m56bp

OUR SECOND RESEARCH METHOD IS A **SURVEY**. AFTER WE ANALYSED THE SURVEY DATA, WE DECIDED TO MAKE **SCENARIOS** TO ASSIST US IN THE SECOND DEVELOPMENT STAGE OF OUR PRODUCT. OUR PRODUCT IS DESIGNED IN **FIGMA** TO VISUALISE OUR IDEA. FURTHERMORE, WE ARE EMPLOYED BY THE SCAMPER METHOD TO EXPLORE OUR PRODUCT FROM DIFFERENT PERSPECTIVES AND CHANGE PARTS IF NECESSARY.

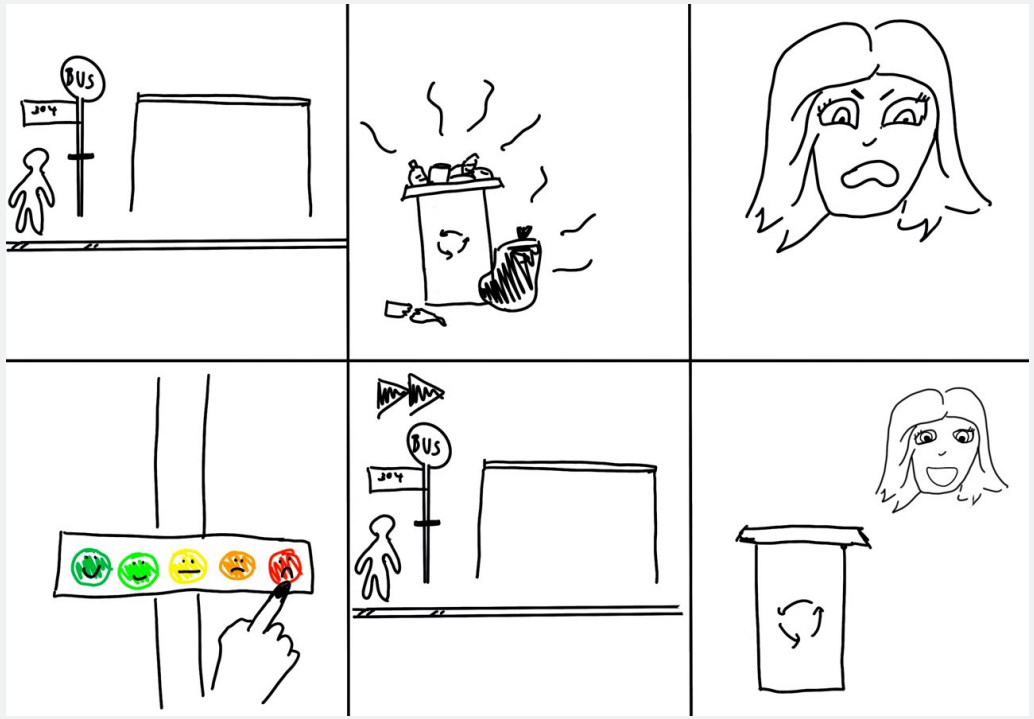
BRAINSTORMING & COLLABORATIVE SKETCHING

FOR THE BRAINSTORMING PROCESS, MURAL WAS USED.

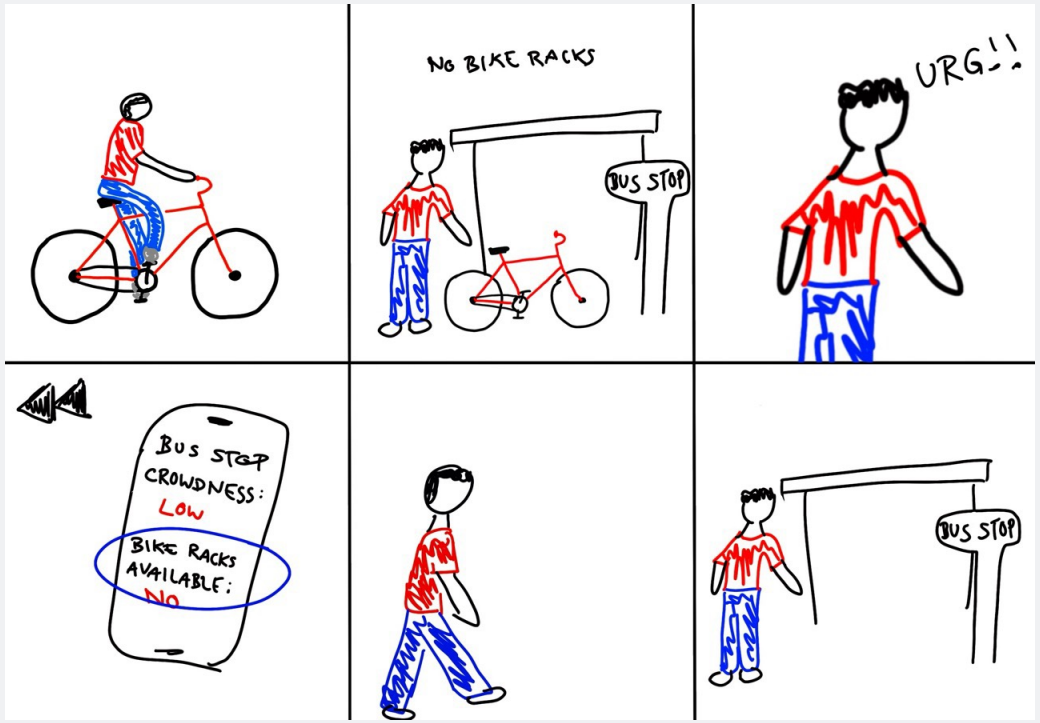
FOR THE COLLABORATIVE SKETCHING PROCESS, FIGJAM WAS USED.



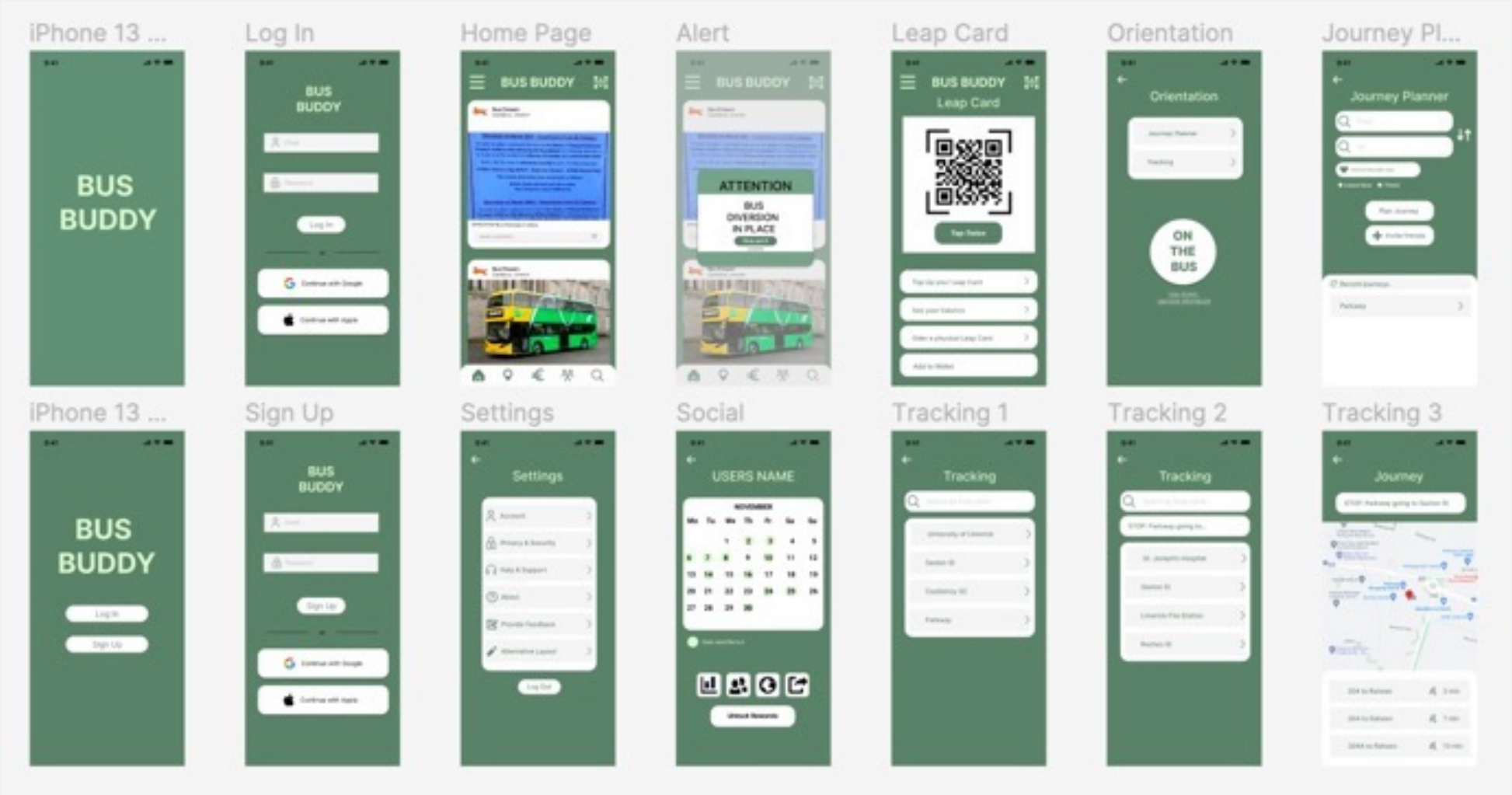
STORYBOARDS



STORYBOARDS



MODELLING IN FIGMA



LINK TO FIGMA: https://tinyurl.com/2p957t9t

SCENARIOS

Scenario 1:

Sarah, a 21-year-old student at Ul, she commutes daily from her rural home in Limerick to her college. Sarah has a daily struggle to get a spot in the college car park because she lives in a small town with few buses. Sarah set up a strict schedule that required an early start because she was determined not to be late for her classes. She needs to leave at 7:45 a.m. every morning. Sarah makes the sacrifice of leaving early to get one of the highly sought-after parking spaces.

She can't help but feel envious of her classmates who live on campus or close by as she made her way to her car. They see the parking problem as an unimportant issue, and Sarah would readily exchange it for a commute that was more comfortable. When she arrives at the college and discovers that the car parks are nearly completely full, her frustration reaches its limit.

Her annoyance is not limited to the parking problem. The lack of public transportation in the town, which mostly consists of buses, made Sarah's daily commute even more difficult. The buses themselves were famously unreliable, and the bus schedule was just as elusive as parking spaces. She unwillingly used the bus system on days when she was unable to locate a parking spot, holding out hope that it would be more dependable than usual.

Sarah often found herself standing at the bus stop, nervously checking her watch to see if the bus would arrive on time or if she would be left stranded. She gets even more frustrated by the inaccurate bus schedules.
As the days pass, Sarah's annoyance with the ineffective transport system in her little town intensifies into a silent conflict. She must decide whether to risk riding the unreliable buses or leave early and find parking every morning. Her frequent juggling act made her yearn for a more stress-free commute and effortless.

Ultimately, Sarah's time in college turned into an endurance test as much as an intellectual endeavour. The daily struggles she had, such as finding a place to park and being confused about the bus timetable, shaped her college experience in unexpected ways when she first started her academic journey in her tiny town.

Scenario 2:

Jakes, a 19-year-old student, daily routine involved a delicate dance between buses and walking to ensure he made it to class on time and returned home without freezing in the dark.

Living in a spot that restricted him to a single, unreliable bus route, the 310, Jake chooses to walk 30 minutes to the University of Limerick (UL) rather than take his chances with the bus, hoping it would come in time for his first class. Multiple times, during heavy rain, he was stranded at the bus stop and had to make the walk to UL despite there being a bus scheduled.

The return journey was usually more straightforward. Jake would catch either the 304 or 304A bus, both frequent and spared him from the lengthy walk in the cold and dark. Despite the crowded conditions on these buses, he preferred the discomfort over the chilly walk home.

However, a bus diversion disrupted Jake's routine. He was left in a similar situation to his commute to UL. His only option home is the 304A, which sparsely comes to the UL stop. Missing it meant waiting 40 minutes for the next one, forcing Jake to reconsider his options.

He questions whether he should keep attending his society meetings since if he didn't, he would at least make the walk home while it was still bright. Although he enjoys his society, he is irritated and angered that the unreliableness of the buses makes him question his attendance.

Frustration settled in as Jake. He longs for a way to communicate his dissatisfaction with the bus company or, better yet, a reliable system to track the buses in real time. He envisioned an app that would notify him of delays or diversions, allowing him to stay warm inside for a few more minutes or hustle to the bus stop when necessary.

Scenario 3:

Tom, a 20-year-old student, lives just far enough from UL campus that taking the bus was the most practical option.

He only takes two buses that lead him to UL but every time he waits at the bus stop he can't shake the feeling of uncertainty. The timetable, more of a suggestion than a promise, questioning whether the bus would show up at all.

The more he waited out in the cold the minutes dragged on but there was no sign of the bus, frustrated by the unpredictable nature of public transport. This uncertainty had become a regular part of his morning routine, but it’s slowly getting to him.

As he waited and waited, other buses would arrive at the stop, but his one hadn’t shown up. Worrying that if he misses this bus, he’ll miss the next one. After a while of waiting Tom decided to walk to the next bus stop, hoping the next bus will arrive at that bus stop.

The longer he waits at the stop he questions whether he should keep on taking the busses to UL or if he should start looking for different routes. He wishes for a system that’ll frequently update news on the busses whether they’re going to be late, or they aren’t going to go to the stop. With the lack of notifications of the buses he’s forced to wait outside in the cold for a longer time hoping the bus would arrive.

SCAMPER

SCAMPER

1. Substitute:

- Substitute traditional bus tickets with a unified digital platform that covers multiple bus services.
- Explore the use of alternative transportation modes, such as electric buses or shared shuttles.

2. Combine:

- Combine various bus services under a single, integrated app to streamline the user experience.
- Explore partnerships with other sustainable transportation options like bike-sharing or electric scooter services to offer a comprehensive solution.

3. Adapt:

- Adapt existing bus stops with interactive displays providing real-time information on multiple bus routes.
- Modify bus schedules to better align with college class timings, encouraging students to choose public transportation.

4. Modify/Magnify:

- Magnify the convenience of using buses by implementing features like contactless payments and mobile ticketing.
- Modify the bus app interface to prioritise sustainability tips, showing users their carbon footprint reductions.

5. Put to Another Use:

- Put the existing bus app to another use by incorporating a rewards system for sustainable travel choices.
- Consider using the app as an educational tool, providing tips on eco-friendly practices during commuting.

6. Eliminate:

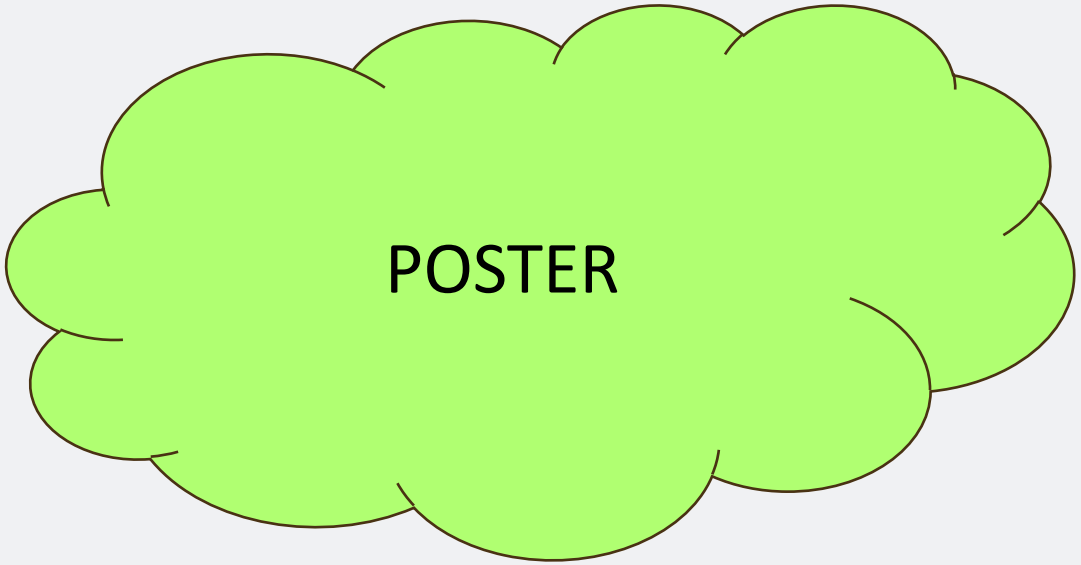
- Eliminate the need for physical bus passes by fully transitioning to digital alternatives.- Streamline information by removing redundant features from existing bus apps to enhance user-friendliness.

7. Reverse/Rearrange:

- Reverse the typical approach by starting a campaign highlighting the environmental impact of individual commuting choices.
- Rearrange the layout of the bus app to feature sustainable travel options and green initiatives prominently.

ANALYSIS OF THE IDEATIONS

The solution must improve the overall experience of TFI	The solution must address as much of the time spend with TFI as possible	The solution must make the TFI experience much more enjoyable
QR codes inside the bus for feedback	Journey planner	Journey planner
Journey planner	Timetables	Timetables
Collaboration features	Live tracking	Live tracking
Timetables	Digital Leap Card	Digital Leap Card
Digital Leap Card	Leap Card Balance Information	Leap Card Balance Information
Leap Card Balance Information	Leap Card Top Up	Leap Card Top Up
Leap Card Top Up	Tap Twice Function for Leap Card	Tap Twice Function for Leap Card
Ticket buying option	Ticket buying option	Ticket buying option
Notification center	Notification center	Notification center
Statistics	Alerts	Alerts
Adding friends	Statistics	Statistics
More safe bike racks	Reward system for taking the bus	Reward system for taking the bus
Live tracking	Adding friends	Collaboration features
Alerts	Collaboration features	Alternative layout for the elderly
Information about how crowded the bus stop is	Modify app interfaces of exsiting TFI apps	Modify app interfaces of exsiting TFI apps
Updated digital screens on the bus during bus divertions	Information about how crowded the bus stop is	On the Bus button to provide live tracking
Accurate digital timetables at bus stop	Alternative layout for the elderly	Feedback Feature rather then Buttons
Modify app interfaces of exsiting TFI apps	On the Bus button to provide live tracking	
Shared shuttles	Feeback Buttons at Bus Stop	
Electric busses		
Tap Twice Function for Leap Card		
Virtual Map to see traffic congestion		
Reward system for taking the bus		
Alternative layout for the elderly		
On the Bus button to provide live tracking		
Feeback Buttons at Bus Stop		
Tapping/Paying before boarding Bus		


POSTER

ENCOURAGING SUSTAINABLE TRAVEL: BUS BUDDY

INTRODUCTION

Many people experience problems with daily commuting, such as buses arriving late or not at all. Our goal was to design an app that users would find helpful and straightforward, encouraging people to travel in a sustainable manner.

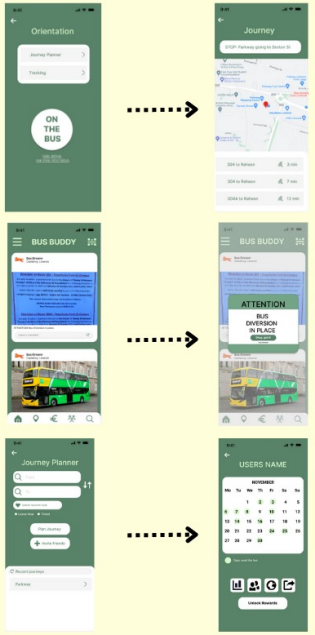
OBJECTIVE

To encourage individuals to travel in a more environmentally friendly manner by improving the current TFI mobile applications and making the overall experience with public transport more enjoyable for its users.

METHODOLOGY

These strategies aided us in gathering data and identifying solutions:

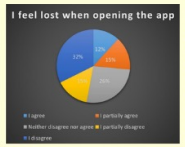
- Brainstorming
- Observations
- Surveys
- Collaborative Sketching
- Storyboards
- Scenarios
- SCAMPER

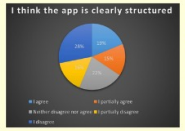


ANALYSIS

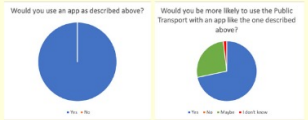
Focus Statement: Our project will aim to redesign the current TFI mobile applications to increase accessibility and the usage of Public Transport.
On the right are some of the data collected from our survey. This data assisted us in identifying problems in the current TFI mobile applications and developing solutions. The data identifies what users like about the existing TFI apps, mainly TFI Go and TFI Live, and points for improvement.
Furthermore, we asked for feedback on the first version of our app, Bus Buddy.
We were able to identify the most significant issues and come up with remedies with the aid of the OPN framework and a design guide.
By ranking the OPNs created from our observations and survey and filtering out the essential Need Statements, we could prioritise needs and develop them into app features.

TFI GO & TFI LIVE





OUR APP PROPOSAL



FEATURES

- digital Leap Card that can be added to a phone's wallet,
- a Leap Card top-up option,
- a tap-twice function to pay for a friend,
- an option to see the Leap Card balance,
- a real-time tracking option with a map and minute display,
- an 'on the bus' feature to provide real-time tracking for others if needed,
- a news and alert centre in case of route changes or delays,
- a ticket-buying option,
- a journey planner with the option to collaborate,
- an option to provide feedback,
- a social function to share bus journeys with others and encourage each other to take the bus through a competition feature,
- a reward system that gives users discounts on ticket prices if they use the bus a certain amount of time a month,
- an option to change the app's layout so only the needed features are displayed, limiting confusion.

RESULTS/FINDINGS

According to our research, many people are dissatisfied with the present TFI mobile applications, rating them on average at 3/5, because they are complex to use and unstructured. Many people want tweaks and different features to make the app more beneficial.

CONCLUSION

Conclusively, considering the apparent discontent with the existing TFI apps, our project's aim to redesign the TFI mobile applications is reasonable. The challenges of the usability of the TFI apps and the ineffective Information Architecture highlight a clear need for improvement. We aimed to improve accessibility while increasing the TFI app's overall productivity by adding new features and user-friendly adjustments. This initiative aligns with users' needs, which is a step towards a more efficient and user-centred public transport experience.

RELATED LITERATURE

- IET Intelligent Transport Systems - Build an app and they will come? Lessons learnt from trialling the GetThereBus app in rural communities
- Mobile App for Public Transport: A Usability and User Experience Perspective.
- Does real-time transit information reduce waiting time? An empirical analysis

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