

Multi-Modal Transit User Research Report

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Context

Research Goals

Main Questions

Focus Area

Research Goals

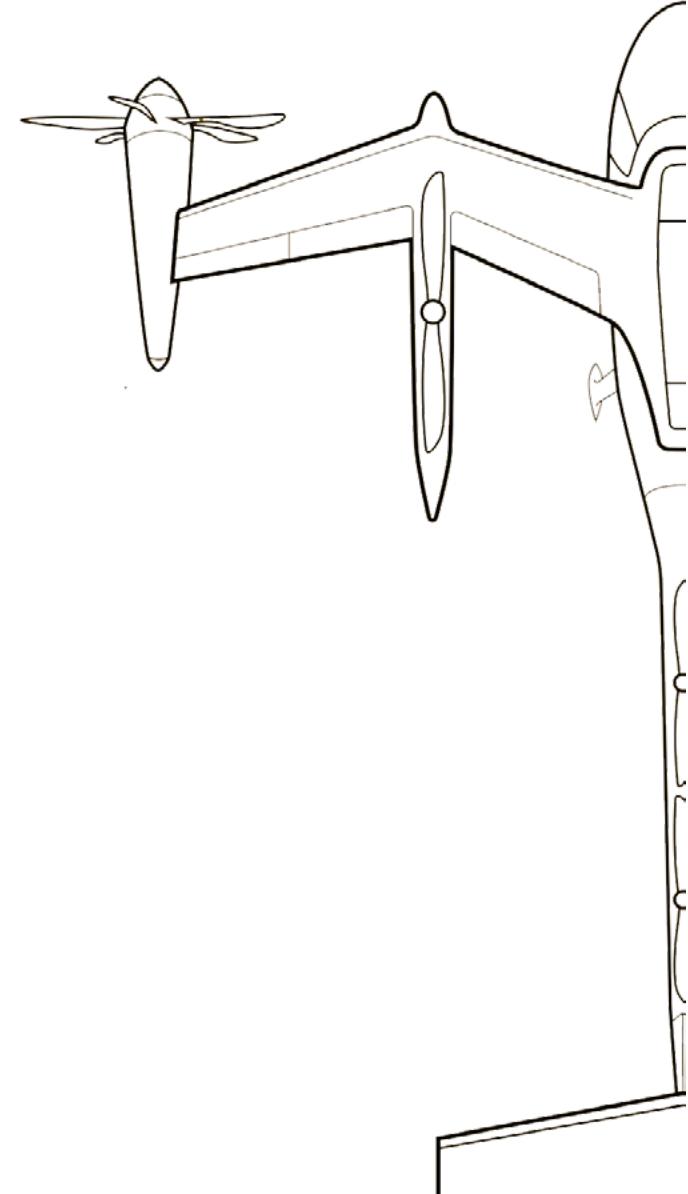
Understand how multi-modal transportation is used in the context of perceived efficiency, convenience, reliability and affordability and its effect on the door to door experience.

Main Questions

- What transit routes do people prefer to take? Why?**
- What contexts heavily sway their transit decisions?**
- How do people perceive multi-modal transit?**
- When do users decide to use alternative private modes of transit?**
- What opportunities areas are there for improving the door to door experience?**

Focus Area

My team decided to focus on commercial aerial autonomous vehicles as a means for multi-modal transportation. The “Air Taxis” utilise Electrical Vertical Take Off and Landing (EVTOL) Vehicles to easily maneuver cityscapes as well as reduce noise and air pollution.



Current Concepts

Uber Elevate

Airbus Vahana

Dubai Drone Taxi

Kitty Hawk

Uber Elevate

Uber started work on EVTOL transit and has intentions to launch test flights in 2020. The company plans to roll out UberAir, the commercial side, in 2023 in Los Angeles and Houston. Their white paper released in 2016 lays out all the plans for everything from air traffic control to its impact on local economies.

The actual user experience and user interface of this transit mode is yet to be officially developed.



Airbus Vahana

Airbus completed its first test flight of an EVTOL in January 2018. They are currently partnered with Uber and are expected to be the main outside manufacturers for UberAir commercial operations.



Dubai Drone Taxi

Dubai flew an autonomous drone air taxi in 2017, the first in the world to do so. Working with the German company Volocopter, the design follows more of a helicopter structure and operation. By increasing the number of routers, the vehicle is significantly quieter, safer and more efficient than a helicopter. Dubai is doing further testing before going fully commercial with its operations.



Kitty Hawk

Larry Page, co-founder of Google, runs another company called Kitty Hawk which has been building and testing EVTOLs since 2010. They are currently undergoing a certification process from both the New Zealand Civil Aviation Authority (CAA) and the United States Federal Aviation Administration (FAA). If approved, the passenger-drone system would be legal. Kitty Hawk has plans to launch their first model to the public in New Zealand as soon as possible.



Literature Review

Teammates With Transit Mobility & the Sharing Economy

Commuter Pain Study

Teammates with Transit: Can Transportation Network Company Partnerships Improve Transit Accessibility and Efficiency?

By Larson Holt

“As autonomous vehicles (AVs) become closer to an urban reality, transit network companies (TNCs) have a unique opportunity to offer even lower-cost travel that could both supplement and/or compete with existing transit.”

Pairing with public transit hubs would greatly increase user experience for potential passengers creating a fluid transfer between AVs and lower-cost public transit modes.

Teammates with Transit: Can Transportation Network Company Partnerships Improve Transit Accessibility and Efficiency?

By Larson Holt

“In California’s Silicon Valley commuters often reach the Caltrain system through TNCs or privately operated commuter shuttles. Using cars to reach transit highlights the “last mile problem” (LMP), the fact that transit networks may place potential destinations outside of an accessible distance from their nodes, particularly in low-density suburban areas. The LMP is one of transit’s key challenges across the board in all regions of the world”

The “Last Mile Problem” is a huge opportunity area to improve on for the door to door transit experience.

Mobility and the Sharing Economy: Potential to Facilitate the First- and Last-Mile Public Transit Connections

By Susan Shaheen and Nelson Chan

“Shared mobility has proliferated in global cities not only as an innovative transportation mode enhancing urban mobility but also as a potential solution to address first- and last-mile connectivity with public transit. It can extend the catchment area of public transportation, potentially playing a pivotal role in bridging gaps in the existing transportation network and encouraging multimodality for first- and last-mile trips rather than driving alone.”

Multi-modal transportation solutions can be applied to the “Last Mile Problem”.

Australian cities not keeping up with commuter needs: Commuter Pain Study

By IBM

“In Sydney, residents spend seven whole working weeks each year commuting, two of which are wasted unproductively stuck in train and car gridlock”

Sydney especially needs multi-modal transit solutions that keep up with commuter needs.

Research Methods

Immersion

Commuter Interviews

Expert Interviews

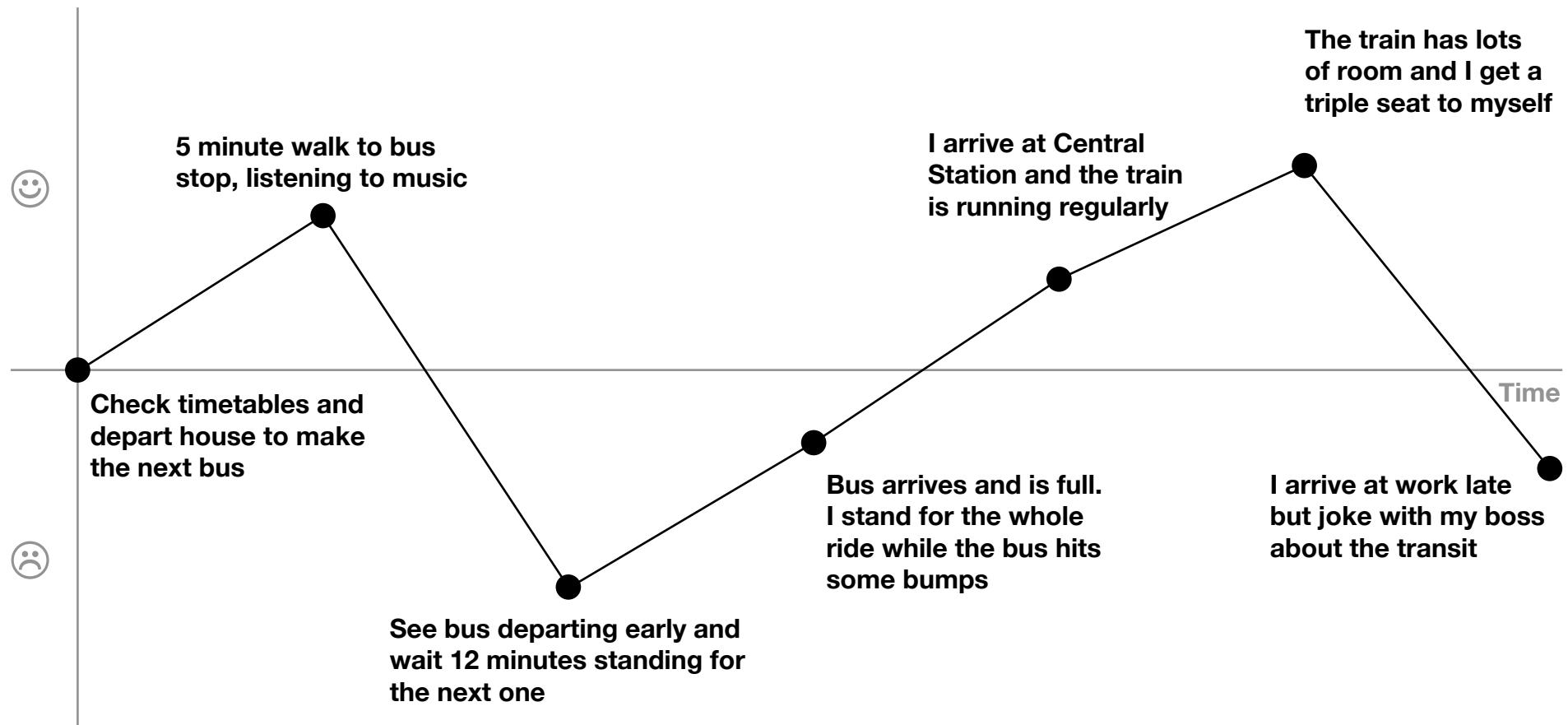
Focus Group

Survey

Immersion

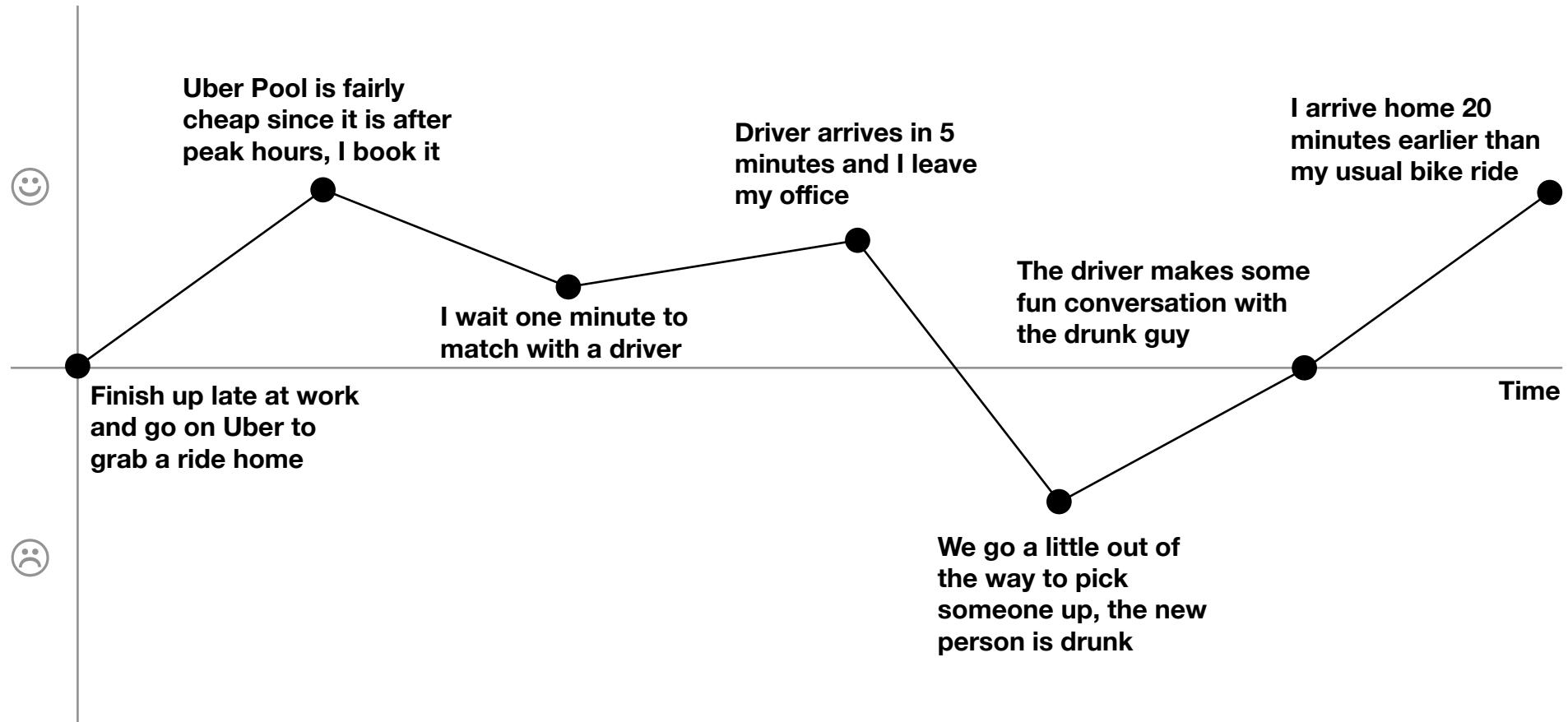
To best understand how to formulate research methods to accomplish my research goals, I first immersed myself in both public and private forms of multi-modal transit. Through exposing myself to the real world, I could better understand how to critically search for new insights. Over a week, I traveled to work in the morning by bus & train and home at night by Uber Pool instead of biking.

Immersion Journey Maps – Bus & Train



Over the week I learned to leave early for the bus, as it was unreliablely early and late. The train was always a better experience, except for one time when the previous train was canceled and we were all impatiently squished into one. Tapping on and tapping off made multi-modal payment easy. It was nice never having to order an Uber and wait, I knew the timetables.

Immersion Journey Maps – Uber Pool



The journey mapped ride was my most eventful one, for the most part the process was smooth and effortless. It was sometimes nice to be commuting with another person, I had a couple good conversations with both Uber drivers and fellow passengers. The community and exploration of Uber Pool is something I want to preserve personally in a new transit solution.

Commuter Interviews

Wanting to get more qualitative data about what drives people's transit choices and why, the semi-structured interview method allowed myself to steer the conversation while still allowing new insights and takeaways to emerge. I completed 15 interviews with commuters who work around the world to open up opportunities to learn from the good and bad of transit systems overall. Notes from all the commuter interviews are in the appendix.

Commuter Interview Cities Represented

8 – Sydney

4 – New York

3 – San Francisco

2 – Washington D.C.

1 – Copenhagen

1 – London

1 – Paris

1 – Singapore

1 – Mumbai

***7 people had worked in multiple cities and both of their commutes were discussed in the interviews**

Commuter Interview Highlights

Context — Worst transit experience

“There’s nothing worse than your walking and waiting totaling up to longer than your train ride”

Christina, New York

Key Takeaways

- Walking to a transit option should be met with little waiting
- Sometimes public transit isn’t the best option to get somewhere
- If it is not the best option, clearly display that it’d be faster through another mode

Commuter Interview Highlights

Context — Walking longer distances to catch public transit

“The more you walk, the more risk you have missing public transit”

Tewis, New York

Key Takeaways

- Walking estimates are perceived as inaccurate
- The status of public transit is unreliable
- Transit isn't very reliable until you get on it

Commuter Interview Highlights

Context – Most important factor in choosing transit

“Time is my biggest factor. It is a lot faster with Uber. If I have to be somewhere by a certain time, I don’t know I’ll be there on time if I take public transit”

Jordan, San Francisco & Washington D.C.

Key Takeaways

- In the business field time is money
- People don’t think public transit is reliable
- Some consider Uber the clearly more reliable, efficient and convenient option

Commuter Interview Highlights

Context — Tipping point with public transit

“When something breaks down, this city never has a backup. You need to go to private forms of transit”

Chenny, Sydney

Key Takeaways

- People have become accustomed to transit breaking down
- Private transit is more reliable
- Having transit backups is important to the user experience

Commuter Interview Highlights

Context – Trip to daily client meetings

“There’s no way I’d take multi-modal public transit to a client meeting, its not reliable enough”

Gloria, Sydney & Singapore

Key Takeaways

- Public transit is perceived as unreliable
- For some, being on time is worth more money
- Comfort of having transit run on your time is important to some

Expert Interviews

Outside of potential Air Taxi passengers, there are other core stakeholders like public transit officials and pilots that interact with and analyse these systems every day. I decided to interview a couple experts in these fields to get an alternative perspective on the general users experience with current multi-modal transit and get a glimpse into the small plane flying experience. Notes from all the expert interviews are in the appendix.

Expert Interview Highlights

Context – Current issues with SF Metro

“People want to have better wayfinding between modes of transit. We have an issue here in San Francisco with people getting lost, even with signs everywhere”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

A mobile interface that utilises GPS could provide solutions that signs can't.

Expert Interview Highlights

Context – Current issues with SF Metro

“The key thing that public transit fails at currently is single fare. From a customer experience viewpoint, you have to consider multiple forms of transit in most cities and paying for each leg separately”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

Look into ways to encapsulate a multi-modal transit ticket into one price and purchase.

Expert Interview Highlights

Context – Connection with passengers

“The best part of bringing friends and family out for a flight is their genuine interest in the flying process. The pilot-passenger connection is so important, it builds needed trust, especially in smaller planes”

Riley Marsh
New York Pilot and Air Traffic Control Expert

Trust is going to be essential in getting any passenger into a small plane.

Focus Group

After talking to a wide array of individuals about multi-modal transit, I decided to bring together a focus group to see how a group of commuters living in Sydney would pick their way home. Through an hour-long discussion with each other, their feelings and opinions about different transit emerge. The participants explore and discover how they would operate as individuals first, then as a group. The setup and artifacts can be found in the appendix.

Focus Group Participants

I targeted business background commuters for the focus group, mainly to see under what conditions people would choose private and different types of multi-modal transit. I obtained 4 people who work out of Wynyard and Surrey Hills, and live at least 30 minutes outside the Sydney central business district.



Focus Group Observations

Efficiency

- Everyone was willing to walk up to 10 minutes to get to a destination earlier
- One participant spent their money on the shortest trips so that they could take the most amount of Ubers over the six proposed commutes home from work
- “I’d rather be efficient a more days and have to take a longer commute one or two days”
- One participant prioritised their spending on the largest transit to Uber time differences, thus they saved the most amount of time over the 6 days”
- “I don’t mind walking a bit from the station, as long I have people I like with me or my headphones and it’s faster”

Convenience

- No participants would take a train then a bus when another option was available
- Participants preferred to stay on the same mode of transit as long as it wasn’t very inefficient
- “There are so many bus stops near the train stations here. I’m always wondering where’s Stand G... where’s Stand C. I don’t like buses because they are hard to find”
- There was a disagreement in the group over getting picked up closer to your location or getting dropped off closer to your destination

Reliability

- Everyone hated taking buses since they don’t follow a strict timetable and sometimes skip stops
- Some participants did not trust the time and estimation for Uber
 - “I’ll never trust something with AD next to it after working in advertising. They are showing you the best case scenario”
- Some participants did not trust the walking time estimation, while others claimed it was “right on the dot every time”
- “With Sydney trains if you are 5 seconds late from your walk the doors will always be shut already. It’s a blessing and curse how reliable the trains are. Except those rare occasions when everything gets messed up, then it is a complete mess”

Affordability

- Participants were more likely to take an Uber with other participants since it’s closer to the cost of a group of public transit tickets
 - “I’ve only ever taken an Uber with other people. Even if I’m alone, I’ll get an UberPool for the cheaper shared price”
- Some participants said their work paid for their Ubers in certain situations
 - “Unless the commute is almost half, I would rather save my money than take an Uber”

Overall Qualitative Data Affinity Diagram Synthesis Results

This method was used to synthesis *all my qualitative data from immersion, interviews and the focus group*. The final synthesis of my findings is summarised below. This synthesis was used to inform all of my insights along with quantitative data collected in the survey. The full affinity diagram can be found [in the appendix](#).

Clarity - Multi-modal private and public choices should be clear with more information

Need Faster Options - Efficiency needs to increase for more people to try private transit

UX Matters - Private transit should cater to the user experiences to increase its worth

Make It Easy - Transit should be easy so people can focus on other things

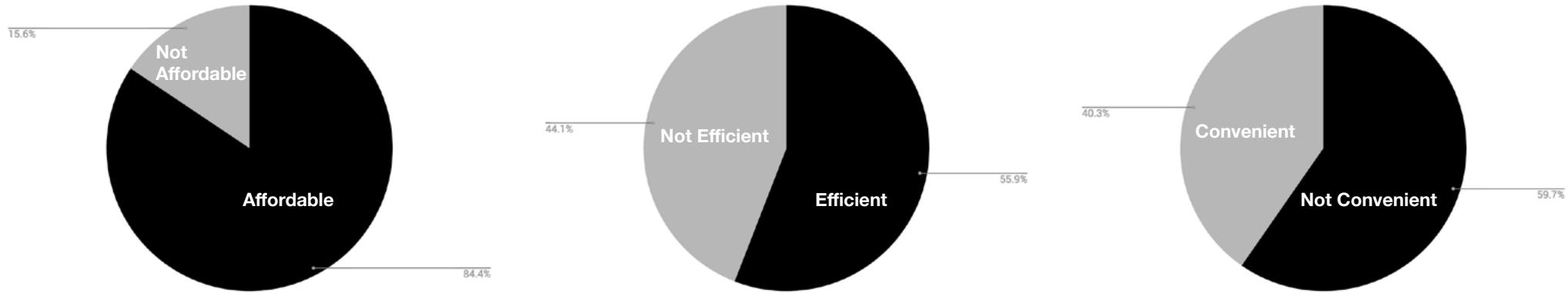
Intercepting Survey

After gathering and synthesising large amounts of qualitative data, I decided to pursue survey based quantitative data on people's transit choices. I tried intercepting surveys at Wynyard and North Sydney stations, but I couldn't get enough time with people to gain the quantitative information I needed. In the end I got 18 responses, but scrapped the survey results for a more quantitative online survey that was more easily distributable.

Online Survey

Extending the model from the focus group, I created a survey where people simply chose which route of the given options they would take home from a day at work. Instead of asking people what influences their transit decisions, I could obtain enough transit decisions (over 2000) to analyse what they do instead of what they say. Since the survey was straight forward but a little longer, online was the best platform for acquisition. Setup and responses can be found in the appendix.

Online Survey Analysis



With the tagged transit options, people on average would sacrifice convenience for more efficient and affordable trips home. In a few situations though, people would call Ubers for their superiority in all three categories.

Online Survey Analysis



With the tagged transit options, people on average would take public transit combined with walking and/or multiple modes. This matches peoples' preference for efficiency over convenience, since they are willing to walk or switch modes of transit to be more efficient. Uber's share of 15.6% of transit choices is also still impressive given how relatively new the service is.

Insights
Personas
Storyboards
Stakeholder Map
Opportunity Areas
Reflection & Next Steps

Personas

Goals, motivations and frustrations for each persona can be found [in the appendix](#).



Judy Millar

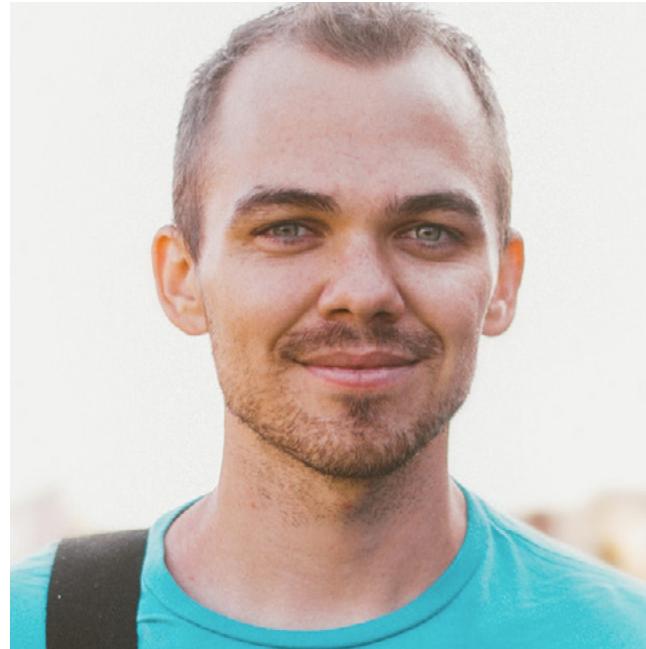
Age: 27

Job: Business Development

Family: Single

Location: Newtown

“This other meeting ran late and I’ve got a client meeting in 10 minutes in North Sydney”



Kevin Brewer

Age: 36

Job: Co-Founder, Software Engineer

Family: Married, 2 Kids

Location: Blacktown

“Ah crap, I forgot to leave at 6pm. I was supposed to be at dinner 5 minutes ago”



Robert Hill

Age: 67

Job: Retired, Former Professor

Family: Married, 4 Grandchildren

Location: Central Coast

“Don’t forget kids, the journey matters just as much as the destination”

Storyboard – Multi-Modal Efficient & Affordable



I check TripView to figure out the fastest way home from work



I decide to walk to another express station instead of catching the local train nearby



I timed my walk perfectly, the train is pulling into the station as I get to the platform



I get off at my station and catch the bus near the station home instead of walking



I arrive at home earlier than the local train

Storyboard – Multi-Modal Convenient & Reliable



I check Uber to book my Uber Pool trip home from work



I get picked up a few doors down at the intersection 5 minutes later



I have a nice conversation with the Uber driver about The Beatles



We go out of the way home a bit to pick up someone else also heading home



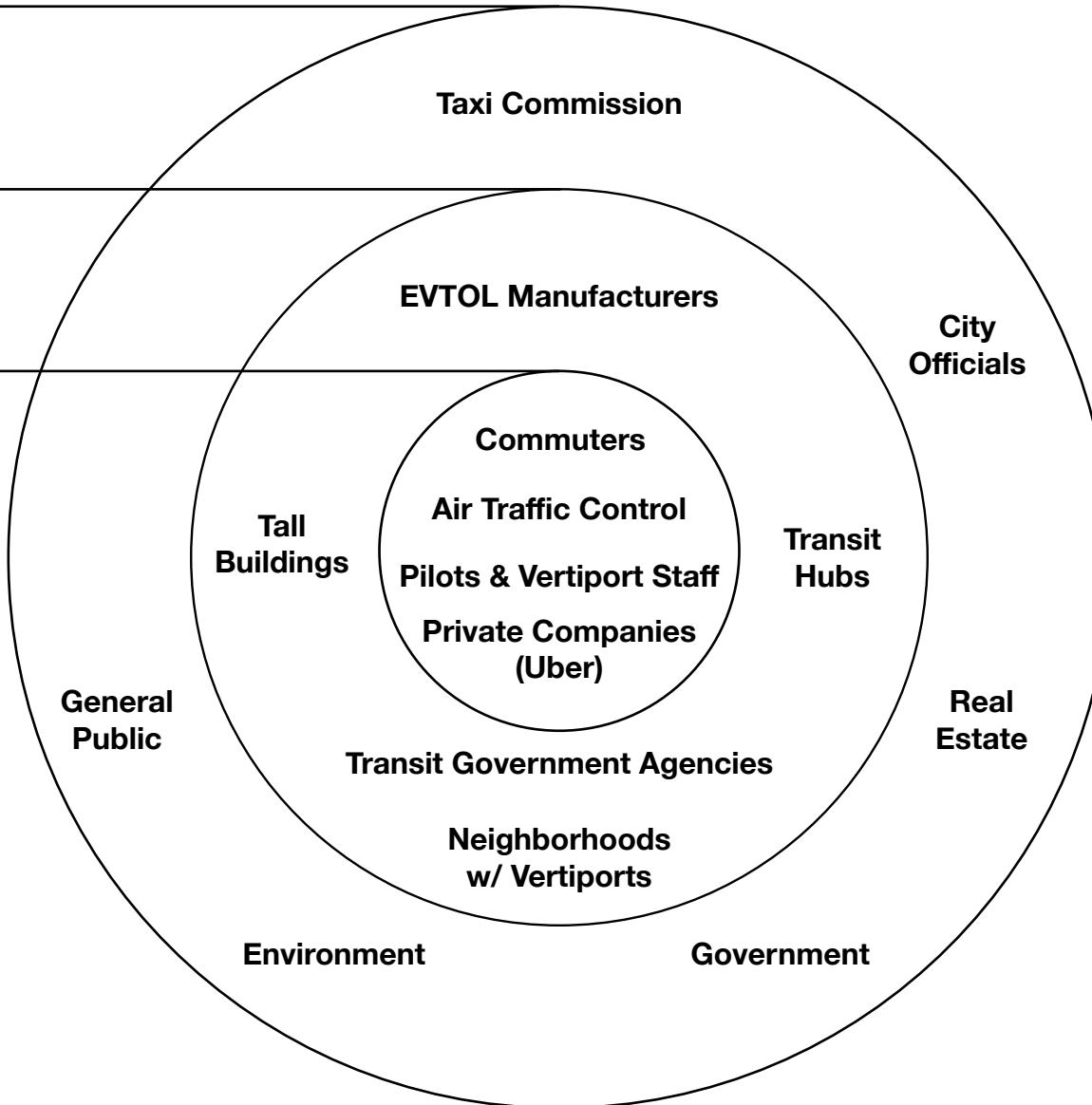
I get dropped off right at my house before the fast bus arrives

Stakeholder Map

Indirect

Direct

Core



Opportunity Areas

Trust – Through human connection and clear communication, trust is an area of improvement needed for new multi-modal transit solutions

Wayfinding – Helping people easily find their way from a drop off to a pick up, even if in the same station, is essential to people having a smooth multi-modal experience.

Payment – If payment for an entire multi-modal trip was payable at once, it would reduce stress and concerns changing between modes.

Reliability – This component which wasn't in my original research goals is the key to people using your system. Be reliable and communicate it clearly. Always have a backup if something goes wrong so that you don't ruin the user experience.

Efficiency – Clearly communicate with people the most efficient route. Also possibly include a ticker that stores the time they have saved with your service.

Choice – Give people the clear choice of how they get to different legs of a trip.

Reflection & Next Steps

After conducting the initial user research, I can clearly see a need for improving multi-modal transit with emerging technologies. The Last Mile Problem is something experienced by almost all commuters and it'll be exciting to try to solve with seamless multi-modal solutions. This technology needs to partner and complement existing infrastructure and public transit still in order to create the ideal door to door experience.

Next steps will include jumping into our first round of prototypes for this problem space and getting feedback at every step of this new products development journey.

Appendix

Commuter Interview Notes

Expert Interview Notes

Focus Group Artifacts

Affinity Diagram

Survey Results

Personas

Commuter Interview Notes

For each interview I went in with a few main questions that I hoped to discuss. With a mix of in-person and video interviews, it was easiest to take notes during the interview. In these notes I wrote in shorthand and made sure to highlight any quotes that provided further insight into my research area. Below you will find my processed notes from all 15 interviews and the main key takeaways that I got from each one.

Commuter Interview Questions

General:

What do you do for work?

Where is your work located?

Do you like traveling or using public transit?

Transit:

Walk me through your normal commute to work?

Do you budget for your transit expenses?

What are your feelings about public transit?

Walk me through the best transit experience that you had

Walk me through the worst transit experience that you had

Multi-mode:

Do you mind taking multiple modes of transportation?

Have you ever taken an uber or taxi instead of public transit?

Let's say you have to take a bus and a subway train home, how do you feel?

How do you feel about walking to a train stop? Or bus stop?

Uber specific:

What's the tipping point with public transit that makes you take an uber?

Commuter Interview Notes

Context – Running late to a client meeting

“Even waiting for an Uber is too much on an inconvenience sometimes. I’ll catch a taxi instead”

Tewis, New York

Key Takeaways

- When people are in a rush, efficiency is the biggest factor
- Some people will do and pay anything to get to a place the fastest
- Wait times for shared ride needs to be low if there are other fast modes around

Commuter Interview Notes

Context — Tipping point when you choose private transit over public transit

“Time is the essence”

Tewis, New York

Key Takeaways

- When people are in a rush, efficiency is the biggest factor
- Duration of trip (time of arrival too) should always be communicated and updated

Commuter Interview Notes

Context — Walking longer distances to catch public transit

“The more you walk, the more risk you have missing public transit”

Tewis, New York

Key Takeaways

- Walking estimates are perceived as inaccurate
- The status of public transit is unreliable
- Transit isn't very reliable until you get on it

Commuter Interview Notes

Context — Worst transit experience

“There’s nothing worse than your walking and waiting totaling up to longer than your train ride”

Christina, New York

Key Takeaways

- Walking to a transit option should be met with little waiting
- Sometimes public transit isn’t the best option to get somewhere
- If it is not the best option, clearly display that it’d be faster through another mode

Commuter Interview Notes

Context – Worst transit experience

“The long stress of indecisiveness of whether it is more efficient to stay on a delayed train or leave is always my worst experience”

Christina, New York

Key Takeaways

- Delay lengths are essential to efficient route planning
- People have lost trust in transit delays estimates
- Offering clear alternative routes always is key

Commuter Interview Notes

Context — Best transit experience

“When booking an Uber in New York, it is low effort. I don’t have to plan it out or schedule”

Christina, New York

Key Takeaways

- People like transit to run on their time
- Running on a schedule can cause unneeded stress
- The more flexible and reliable the transit system, the better the experience

Commuter Interview Highlights

Context – Worst transit experiences

“I love using Ubers, they are the best option for traveling across the city, but I mostly take them with friends because it costs less and I feel safer”

Nimat, New York

Key Takeaways

- Shared transit is preferred for safety and cost reasons for some
- Uber is perceived as efficient but not very affordable alone

Commuter Interview Notes

Context – When have you taken Uber

“I’ve only used Uber once, and it was for business purposes. Otherwise, I’m willing to take the train everywhere. Uber isn’t that much faster from my Suburb”

Nessa, Sydney

Key Takeaways

- The trade-off in efficiency for Uber needs to be higher to justify the cost for some
- Business settings care highly about efficiency

Commuter Interview Notes

Context – Preferences for Uber

“If I needed to get somewhere on time, I’d rather take public transit. Generally, the difference in time that Uber takes is not high enough for the price for me”

Shelley, Sydney

Key Takeaways

- The more efficient an option, the more likely someone will take it
- Affordability steps in when choosing an Uber
- Some forms of transit are faster than cars so Uber doesn’t make sense

Commuter Interview Notes

Context – Least favourite aspects of current public transit

“It’s so frustrating how they designed the transit here, it adds an extra 40 minutes to my commute from home to work going up to central and back down. It’s not like this in Mumbia”

Vimal, Mumbai & Sydney

Key Takeaways

- People can see their routes and get frustrated by clear detours to get from A to B
- Beware of having a central transit hub, decentralisation offers more options to riders

Commuter Interview Notes

Context – Least favourite aspects of current public transit

“The big problem is from the hub and spoke system, it doesn’t scale when there are multiple developing areas spread out”

Chenny, Sydney

Key Takeaways

- People can see their routes and get frustrated by clear detours to get from A to B
- Beware of having a central transit hub, decentralisation offers more options to riders

Commuter Interview Notes

Context — Best parts of Uber

“Some of these Uber drivers are philosophers, I swear. The human connection is something that public transit is missing these days”

Chenny, Sydney

Key Takeaways

- The human element of private transit improves the experience
- If people pay more for transit, they expect a more individual experience

Commuter Interview Notes

Context – Least favourite aspects of current public transit

“Central isn’t the geocentral of Sydney, it doesn’t always make sense to go there to get everywhere else”

Chenny, Sydney

Key Takeaways

- People can see their routes and get frustrated by clear detours to get from A to B
- Beware of having a central transit hub, decentralisation offers more options to riders
- Focus on having transit hubs in the main city centers first

Commuter Interview Notes

Context — Tipping point with public transit

“When something breaks down, this city never has a backup. You need to go to private forms of transit”

Chenny, Sydney

Key Takeaways

- People have become accustomed to transit breaking down
- Private transit is more reliable
- Having transit backups is important to the user experience

Commuter Interview Notes

Context – Tipping point with public transit

“If I need to get somewhere on time, I’ll never depend on public transport. It needs to be reliable with my type of work, so I’ll always take an uber”

Chenny, Sydney

Key Takeaways

- Public transit is not reliable and lets people down
- Uber is more reliable and efficient, thus is used for work commitments

Commuter Interview Notes

Context – Worst transit experiences

“I get bus anxiety if it’s not exactly on time, they’ve been late or not shown up so many times”

Doreen, Sydney

Key Takeaways

- Current transit is so unreliable that some people assume the worst
- Clearly communicating status of transit modes is key to reducing transit anxiety

Commuter Interview Notes

Context — Worst transit experiences

“Standing on a bus is my definition of a bad time”

Julia, Sydney

Key Takeaways

- Getting squeezed into transit is a horrible experience
- People get tired or like to work during transit and prefer to sit

Commuter Interview Notes

Context – Most important transit factor

“I heavily factor opportunity cost, so efficiency covers affordability if I save time”

Lucas, Paris & Sydney

Key Takeaways

- If efficiency is high enough transit could be perceived as more affordable
- Different people have different tipping points for opportunity cost

Commuter Interview Highlights

Context – Most important factor in choosing transit

“Time is my biggest factor. It is a lot faster with Uber. If I have to be somewhere by a certain time, I don’t know I’ll be there on time if I take public transit”

Jordan, San Francisco & Washington D.C.

Key Takeaways

- In the business field time is money
- People don’t think public transit is reliable
- Some consider Uber the clearly more reliable, efficient and convenient option

Commuter Interview Highlights

Context – Thoughts on multi-modal transit

**“If one of my modes was walking or taking the bus,
It’d be really annoying going up and down hills with
my work supplies”**

Jordan, San Francisco & Washington D.C.

Key Takeaways

- Geographical locations and features like hills factor into people’s transit decisions
- Considering people’s luggage and baggage will be important to successful transit

Commuter Interview Highlights

Context – Thoughts on multi-modal transit

“For each additional mode of transport, there’s hidden time that’s hard to see”

Jordan, San Francisco & Washington D.C.

Key Takeaways

- Each time someone switches modes, they must wayfind to the next location and wait
- Wait time between modes is currently hard for commuters to see with Google Maps
- Clearly communicating this time could gain more trust from commuters

Commuter Interview Highlights

Context – Would your work pay for a faster private transit option

“If you increase our billable hours, my work would definitely pay for faster transit. We need better transit options”

Jacyln, San Francisco & Washington D.C.

Key Takeaways

- The increase in efficiency can be more affordable in the workplace
- Some current companies aren't happy with the mid-distance commuting options

Commuter Interview Highlights

Context – Worst transit experiences

“I hate it when we are told by a conductor or driver that there are delays but get no information about why or how long”

Stov, San Francisco & Copenhagen

Key Takeaways

- Communicate delays and at least suggest that you are looking into a delay estimate
- People in general prefer to be informed

Commuter Interview Notes

Context – Worst transit experiences

“With Singapore transit, when there was a 2 hour delay on one line, the entire city freaked out. The head of our transit stepped down”

Gloria, Singapore & Sydney

Key Takeaways

- Not all transit hubs have the same operational difficulties
- When transit is perceived as reliable, and then fails, it is catastrophic to people

Commuter Interview Notes

Context – Walking from a bus to the train station

“Having to walk between transit stops makes me reevaluate what route I’m taking”

Gloria, Singapore & Sydney

Key Takeaways

- Walking between transit stops is perceived as inefficient
- People prefer the convenience of transit hubs for transfers
- Multi-modal trips can be perceived as inefficient without the longer alternatives known

Commuter Interview Notes

Context – Trip to daily client meetings

“There’s no way I’d take multi-modal public transit to a client meeting, its not reliable enough”

Gloria, Singapore & Sydney

Key Takeaways

- Public transit is perceived as unreliable
- For some, being on time is worth more money
- Comfort of having transit run on your time is important to some

Commuter Interview Notes

Context – Issues with your transit system

“Travel by bus also adds to London’s road congestion problem, making the bus a particularly unreliable option for those wishing to get into work during peak morning and evening times.”

India, London & New York

Key Takeaways

- Current road based transit is victim to congestion and delays from traffic jams
- Peak morning & evening times will be a challenge and should be considered

Commuter Interview Notes

Context – Issues with your transit system

“Further to the lack of reliability and constant repairs for signal failures during operational hours, accessibility is also an issue for a large portion of the London community.”

India, London & New York

Key Takeaways

- There aren't enough accessible transit options, especially multi-modal
- Be consistent and reliable during operational hours, especially if your service isn't 24/7

Expert Interview Notes

Both of these interviews were over video chat so I recorded with their consent our conversations. I approached the experts with a more open structured interview structure and gave them more context into our focus area, allowing them to provide the most useful insights and additional opportunity areas for my research. Below you will find my processed notes from both interviews and the main key takeaway that I got from each one.

Expert Interview Notes

Context – Current issues with SF Metro

“People want to have better wayfinding between modes of transit. We have an issue here in San Francisco with people getting lost, even with signs everywhere”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

A mobile interface that utilises GPS could provide solutions that signs can't.

Expert Interview Notes

Context – Current issues with SF Metro

“The key thing that public transit fails at currently is single fare. From a customer experience viewpoint, you have to consider multiple forms of transit in most cities and paying for each leg separately”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

Look into ways to encapsulate a multi-modal transit ticket into one price and purchase.

Expert Interview Notes

Context — New opportunity areas

“There’s a real opportunity with emerging technologies to better plan each leg as one door to door trip and pay for one ticket.”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

A single payment multi-modal transit ticket is possible even today.

Expert Interview Notes

Context – Sydney as a location for an air taxi service

“Moving more to regionalised transit, which exists in Sydney, is key to single fair multi modal transit working”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

Regional transit is both the perfect opportunity area for automated air vehicles as well as single payment multi-modal transit tickets.

Expert Interview Notes

Context – Current issues with SF Metro

“Transit focuses too much about improving metrics instead of customer experience currently”

Larson Holt
San Francisco Metro Operations Officer
Urban Policy MPA Candidate, Columbia University

The is a huge opportunity area with regional transit with a great customer experience.
Although metrics matter, it's not what is going to drive the success of a service.

Expert Interview Notes

Context – Connection with passengers

“The best part of bringing friends and family out for a flight is their genuine interest in the flying process. The pilot-passenger connection is so important, it builds needed trust, especially in smaller planes”

Riley Marsh
New York Pilot and Air Traffic Control Expert

Trust is going to be essential in getting any passenger into a small plane.

Expert Interview Notes

Context – Feasability of the autonomous flying vehicles in Sydney

“It actually would be more feasible in Sydney because of the heavy general flight regulations. The more restricted the air space, the more opportunities for cities to allocate operations to an air taxi service”

Riley Marsh
New York Pilot and Air Traffic Control Expert

Working with authorities to regulate the service will be the easiest path to a scalable product.

Expert Interview Notes

Context – Feasability of the autonomous flying vehicles in Sydney

“The less free air space in the city, the better. The automated paths play to your benefit, but any unmanned vehicles will take time to get approval”

Riley Marsh
New York Pilot and Air Traffic Control Expert

We may have to work with semi-automated vehicles due to regulations.

Focus Group Artifacts

This focus group was run at 6pm on a weekday with real Sydney example routes to give further context to choosing a journey home after a long day of work. The strategy of the focus group setup allows all participants to pick their ideal rankings before others options could affect their own decisions. In the end, the group must choose only one option home for each prompt; this prevents participants settling for their favourite getting ranked high but not as the top choice. This strategy was successful in stimulating great discussions amongst the group that provided many insights.

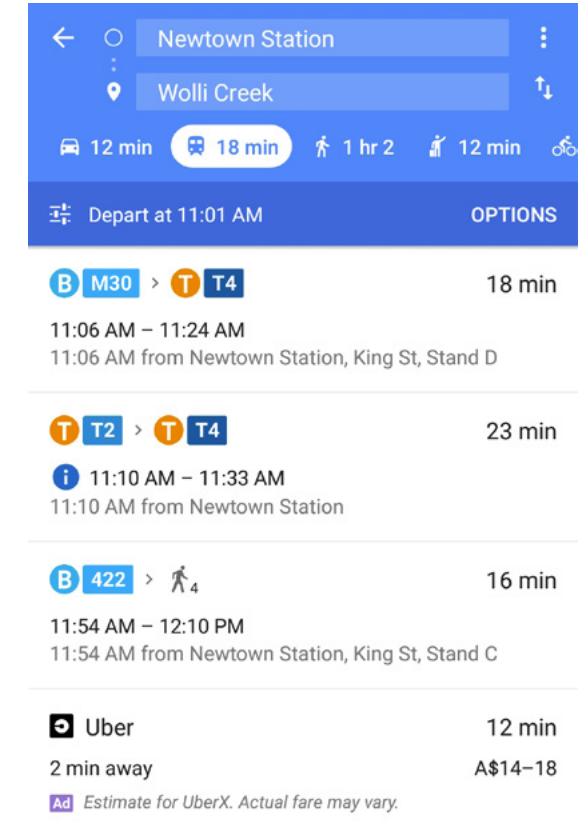
Focus Group Setup

1. Present the group with 6 days of transit journeys home. Route options are distributed as screenshots from Google Maps. Each participant is given \$100 that they can spend on Ubers.

2. Everyone ranks their personal choices.

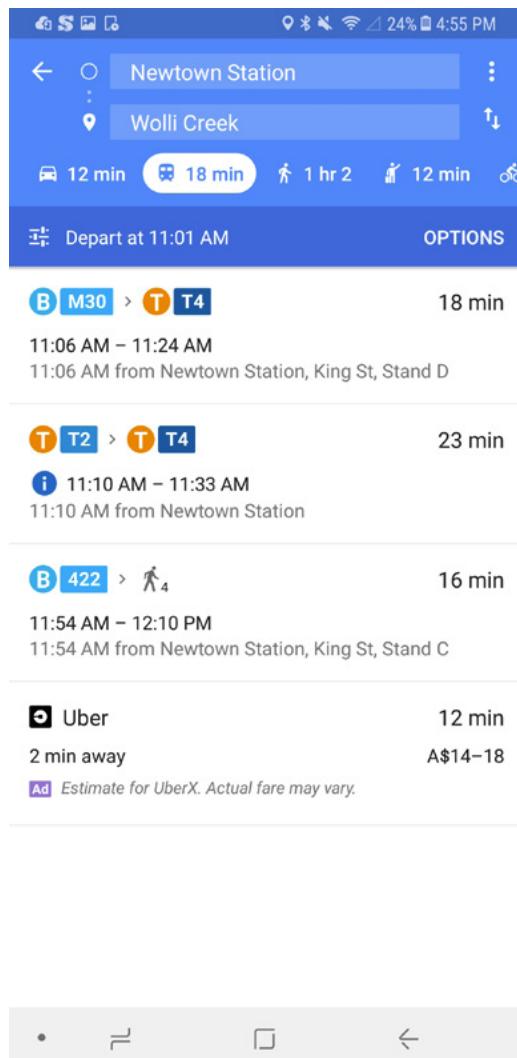
3. The group then is given \$100 to share to get home as a group.

4. The group picks a top choice together.



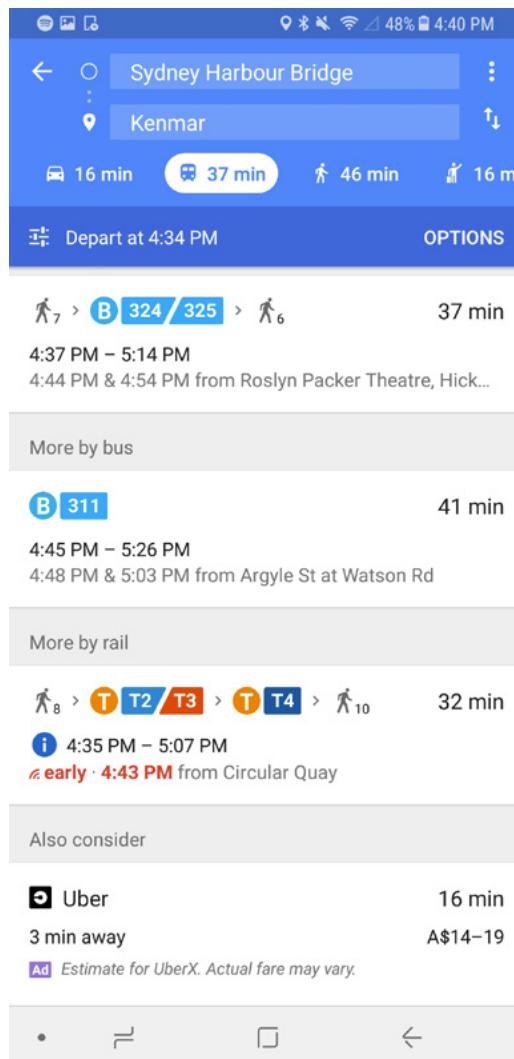
Sample Transit Journey for One Day

Focus Group Rankings - Overall Trip 1



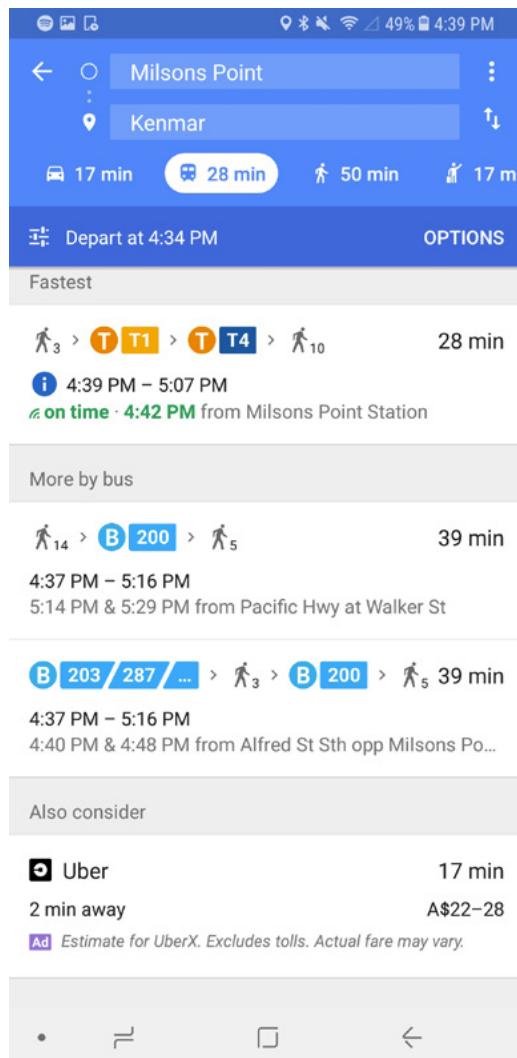
Libby	Shells	Shubham	Minjie	Together
4	3	1	1	
3	2	2	2	1
2	1	4	3	
1	4	3	4	

Focus Group Rankings - Overall Trip 2



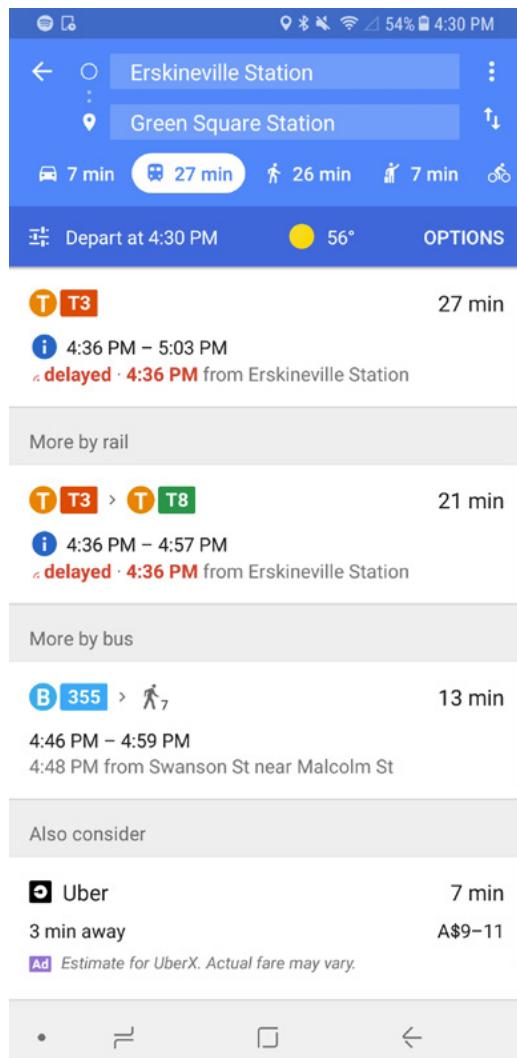
Libby	Shells	Shubham	Minjie	Together
2	2	3	2	
4	1	2	3	
3	3	4	1	
1	4	1	4	1

Focus Group Rankings - Overall Trip 3



Libby	Shells	Shubham	Minjie	Together
2	1	2	1	
3	2	4	2	
4	3	1	3	
1	4	3	4	1

Focus Group Rankings - Overall Trip 4



Libby	Shells	Shubham	Minjie	Together
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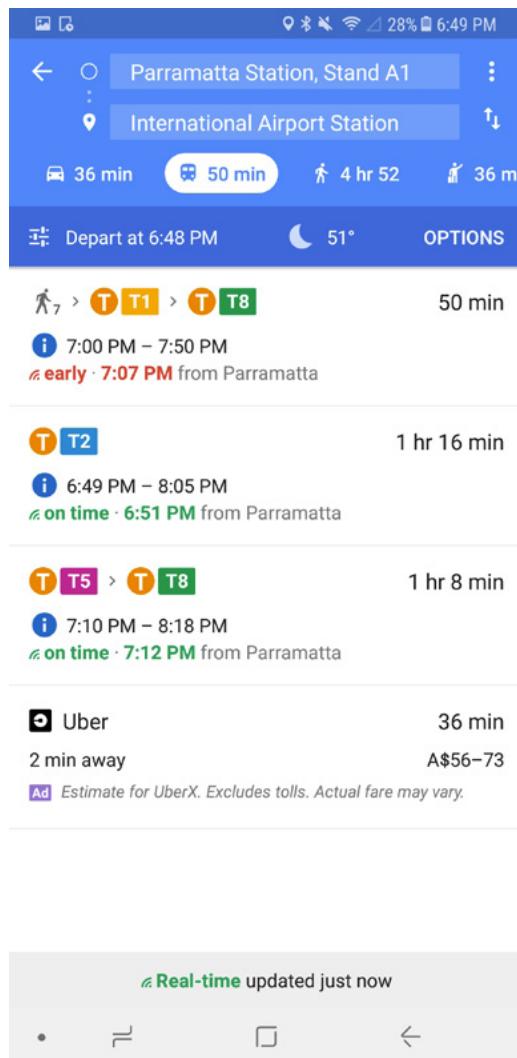
3	2	2	3	
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4	3	3	2	
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2	1	4	1	
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1	4	1	4	1
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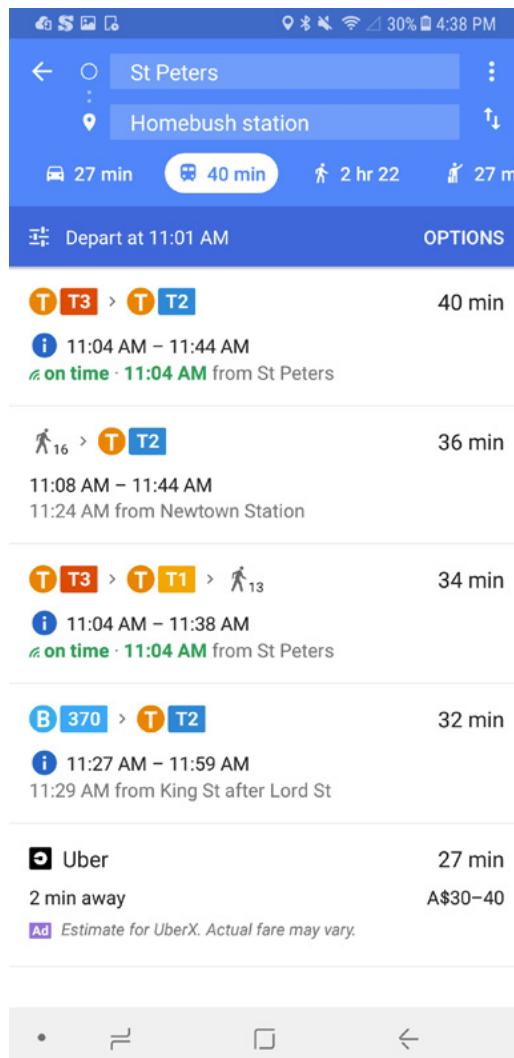
Focus Group Rankings - Overall Trip 5



Libby	Shells	Shubham	Minjie	Together
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2	1	2	2	
1	2	1	3	1
3	3	3	4	
4	4	4	1	

Focus Group Rankings - Overall Trip 6



Libby	Shells	Shubham	Minjie	Together
4	1	1	3	1
2	4	2	2	
3	3	5	1	
5	2	4	4	
1	5	3	5	

Affinity Diagram

Combining all my qualitative data together for the affinity diagram allowed me to discover themes throughout my research. These themes were synthesised from all the key takeaways placed on the yellow notes. Although these themes were helpful in identifying my future opportunity areas, some of those areas didn't make it to the green theme notes but were still just as impactful. My diagram is below to provide further background in my research and how I arrived to my final insights.

Affinity Diagram Synthesis



Online Survey

Learning from my intercepting survey, the design of the questions had to be more engaging and easy for the users. I decided to build a Choose Your Own Adventure survey providing people with various real transit options to go home from work. These options were all tagged and used to analyse insights into people's actual transit preferences. To spread the survey, I used friends, co-workers, and various transit enthusiast facebook pages.

Online Survey Background

Each transit option was tagged in the background by a set of variables. These included:

- Affordable: If public transit or Uber was taken
- Efficient: The two options that get you home the fastest
- Convenient: The two options with the least amount of walking
- Walking/No Walking: If there was more than 5 minutes walking
- Single/Multi-Modal: If one type of one mode of transit was taken

The survey received 362 individual responses with almost 2,000 tagged transit choices logged.

Survey Results Raw - [Link to Full Response Dataset](#)

Key

- A - Affordable
- E - Efficient
- C - Convenient
- W - Walking Included
- S - Single-Modal
- M - Multi-Modal

Survey Results Breakdown - Q1

🚶₇ > **B** 324 / 325 > 🚶₆

37 min

32% A S

4:37 PM – 5:14 PM

4:44 PM & 4:54 PM from Roslyn Packer Theatre, Hick...

B 311

41 min

27% A C S

4:45 PM – 5:26 PM

4:48 PM & 5:03 PM from Argyle St at Watson Rd

🚶₈ > **T** T2 / **T3** > **T** T4 > 🚶₁₀

32 min

31% A E W M

i 4:35 PM – 5:07 PM

⌚ early · **4:43 PM** from Circular Quay

U Uber

3 min away

16 min

A\$14-19

9% E C U

Ad Estimate for UberX. Actual fare may vary.

Survey Results Breakdown - Q2



T T1

T T4

Walking 10 min

28 min

72% A E W M

i 4:39 PM – 5:07 PM

on time · 4:42 PM from Milsons Point Station



B 200

Walking 5 min

39 min

17% A W S

4:37 PM – 5:16 PM

5:14 PM & 5:29 PM from Pacific Hwy at Walker St



B 203 / 287 / ...

Walking 3 min

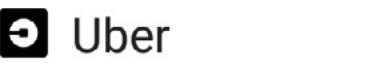
Walking 5 min

39 min

6% A C W M

4:37 PM – 5:16 PM

4:40 PM & 4:48 PM from Alfred St Sth opp Milsons Po...



Uber

2 min away

17 min

A\$22–28

5% E C U

Ad Estimate for UberX. Excludes tolls. Actual fare may vary.

Survey Results Breakdown - Q3



21 min

10% A E M

i 4:36 PM – 4:57 PM

delayed · 4:36 PM from Erskineville Station



27 min

14% A C S

i 4:36 PM – 5:03 PM

delayed · 4:36 PM from Erskineville Station



13 min

67% A W S

4:46 PM – 4:59 PM

4:48 PM from Swanson St near Malcolm St



7 min

3 min away

A\$9–11

9% E C U

Ad Estimate for UberX. Actual fare may vary.

Survey Results Breakdown - Q4

🚶₇ > T  T1 > T  T8

50 min

69% A E W M

 7:00 PM – 7:50 PM

⌚ early · **7:07 PM** from Parramatta

T  T2

1 hr 16 min

19% A C S

 6:49 PM – 8:05 PM

⌚ on time · **6:51 PM** from Parramatta

T  T5 > T  T8

1 hr 8 min

3% A M

 7:10 PM – 8:18 PM

⌚ on time · **7:12 PM** from Parramatta

🚗 Uber

2 min away

36 min

A\$56–73

8% E C U

 Estimate for UberX. Excludes tolls. Actual fare may vary.

Survey Results Breakdown - Q5

*Current order reflects how Google Maps orders them. The order was randomised in the actual survey for each participant.

B M30 > **T T4** 18 min **27% A E C M**

11:06 AM – 11:24 AM

11:06 AM from Newtown Station, King St, Stand D

T T2 > **T T4** 23 min

i 11:10 AM – 11:33 AM

11:10 AM from Newtown Station

B 422 > **步行 4** 16 min

11:54 AM – 12:10 PM

11:54 AM from Newtown Station, King St, Stand C

Uber 12 min
2 min away A\$14-18

13% A C M

56% A W S

3% E C U

Ad Estimate for UberX. Actual fare may vary.

Survey Results Breakdown - Q6

T T3 > T T2

40 min

35% A E C M

i 11:04 AM – 11:44 AM

on time · 11:04 AM from St Peters

W 16 > T T2

36 min

28% A E C W S

11:08 AM – 11:44 AM

11:24 AM from Newtown Station

B 370 > T T2

32 min

34% A M

i 11:27 AM – 11:59 AM

11:29 AM from King St after Lord St

Uber

2 min away

27 min

A\$30–40

3% E C U

Ad Estimate for UberX. Actual fare may vary.

Personas

To further understand the overview of personas, goals, motivations, and frustrations must be taken into account. Below are the full personas to help you identify with examples of commuters who face multi-modal and private transit every day.

Full Persona - Judy Milar



Age: 27

Job: Business Development

Family: Single

Location: Newtown

“This other meeting ran late and I’ve got a client meeting in 10 minutes in North Sydney”

Goals

- Get to places promptly and on time, especially for work
- Have an easy experience; her transit should run on her time
- Have some personal reflections time during her transit
- Have a way to get home after a nice night out with her friends

Motivations

- Seem well put together and professional to clients
- Be efficient with her time and money
- Sometimes an Uber ride is her only break in the day; have a relaxing moment

Frustrations

- Sometimes not even Uber can get her to meetings on time when other events run over
- Sharing transit with drunk men at night, she doesn’t feel safe
- Crowded trains and buses where she can’t sit down or relax

Full Persona - Kevin Brewer



Age: 36

Job: Co-Founder, Software Engineer

Family: Married, 2 Kids

Location: Blacktown

“Ah crap, I forgot to leave at 6pm. I was supposed to be at dinner 5 minutes ago”

Goals

- Get home to his kids as fast as possible after work
- Enjoy some personal time with his wife on their transit home
- Use his time wisely, working in a startup plus being a dad takes up a large chunk of time

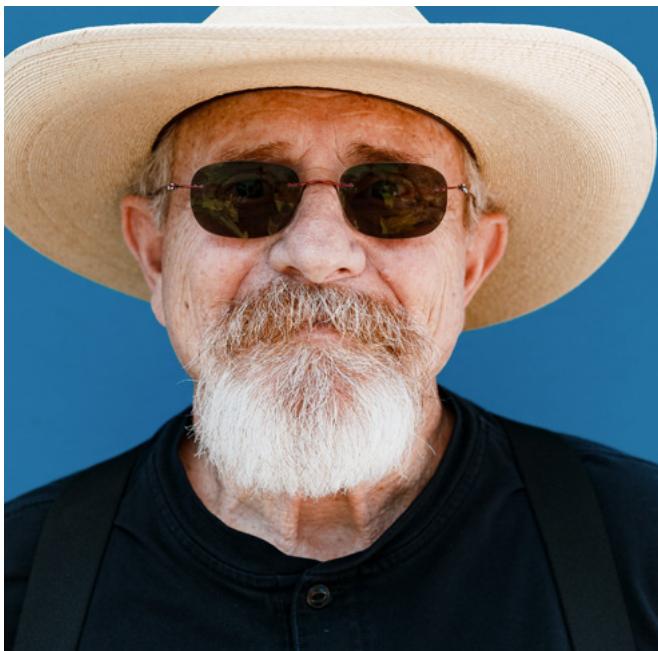
Motivations

- Get more time with his family at home
- Reduce his waste of time waiting for transit after work and at the transfer bus stop
- Utilising his long transit home as personal time with his wife if they leave work at the same time

Frustrations

- When he forgets to leave work on time and there's no way to get home in time for dinner because the train and bus don't match up
- When the train is so packed that he and his wife can't sit down or even have a conversation easily
- Heavily delayed transit, each minute he waits on the platform is

Full Persona - Robert Hill



Age: 67

Job: Retired, Former Professor

Family: Married, 4 Grandchildren

Location: Central Coast

“Don’t forget kids, the journey matters just as much as the destination”

Goals

- Take in all the sights and appreciate the world around him
- Easily venture into CBD when needed to
- Spend time with his children and grandchildren
- Go on adventures to new beaches with his wife

Motivations

- Enjoy the sunrise on the train ride into CBD
- Visit the grandchildren up in the northern shores
- Go to CBD to see his doctor every month

Frustrations

- If there’s an emergency, there’s no easy way for him to get to his main hospital in Sydney
- When he visits his doctor, he usually stays in Sydney overnight since the multi-modal return trip is too exhausting
- Infrequent train and bus service to his home area

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