



Start-Up Pitch Report

This report is a detailed pitch for a new public transport networking tracking system. The proposed business, 'InOut Tracking' is intended to be a licensable product for major public transport providers, for their commuters to have accurate reliable tracking data and arrival times. For this pitch, many elements such as risk, market, business model and sustainability have been covered, for optimal design of the business.

Presented by Team 35

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1st June 2022

Ms A. N. Gel

Director of Angel Investors Pty Ltd.

Angel Investors Pty Ltd.

Brisbane Qld 4072

Dear Ms A. N. Gel,

RE: Start-up Pitch Proposal and Development of InOut Tracking Transport Mobile Application

InOut Tracking has undertaken an investigation into a potential business investment in the public transport sector of South-East Queensland. Findings of the investigation conclude a significant profitable investment for Angel Investors.

The start-up pitch proposal includes the following:

- Value proposition
- Market and customer overview
- Business Model, including strategy and timeline
- Assessment of sustainability using the Five Capitals Model
- Preliminary financial analysis, containing business value and proposed return on investment
- Risk identification, assessment, analysis, and treatment

If you have any concerns or queries and would like to speak further do not hesitate to contact our team at InOut Tracking.

Sincerely,

The InOut Tracking Team



Matthew Choy



Charlie Hargreaves



Zhongyang Zheng (Jeff)



Amy Beckett



Lucas Moisey



Jordan Gill

Executive Summary

This section is intentionally left blank, as it will be replaced with individual Executive Summaries

1.0 – Addressing a Need

In the current day and age, reliability and access to information are vital for distribution systems to operate efficiently and effectively. A distribution network cannot function without information such as arrival/departure times, delays over the travel route, the estimated travel time and the current location of the items being distributed. For example, modern day freight logistics relies heavily on reliability and consistency in the routes and methods used to transport goods, and all journeys are planned meticulously to ensure maximum efficiency in the supply line. Moving people in their daily commutes is no different. People require information such as bus/train arrival and departure times, bus/train routes, bus/train stop locations to effectively work their commutes in with their already busy daily schedules. It is for this reason that there are many phone applications already available to give this information to users. For example, in South-East Queensland, hundreds of thousands of people use the public transport network, TransLink, to commute to work, university and school (Department of Transport and Main Roads, 2018). However, as a group we identified that the current TransLink app was unreliable and did not always accurately report public transport location. This is an issue we plan to address, as we believe that commuters' both want and need to know accurate, live GPS location of all available public transport to plan their journeys more efficiently.

To determine the true scope of this issue, we conducted a survey with nearly forty participants. Through this survey, it was discovered that over 50% of public transport users rate the timeliness of public transport as below average, 80% of public transport users do not rate the reliability of their current commute planning app as very reliable and over 50% of participants want a more user-friendly interface and more reliability from commuting apps. As well as this, 25% of respondents labelled the current TransLink app as one of the most inconvenient components of public transport, while 62% reported transport being late as the most inconvenient aspect (see Figure 1). This clearly demonstrates a gap in the market for a product to facilitate more accurate public transport tracking for commuters.

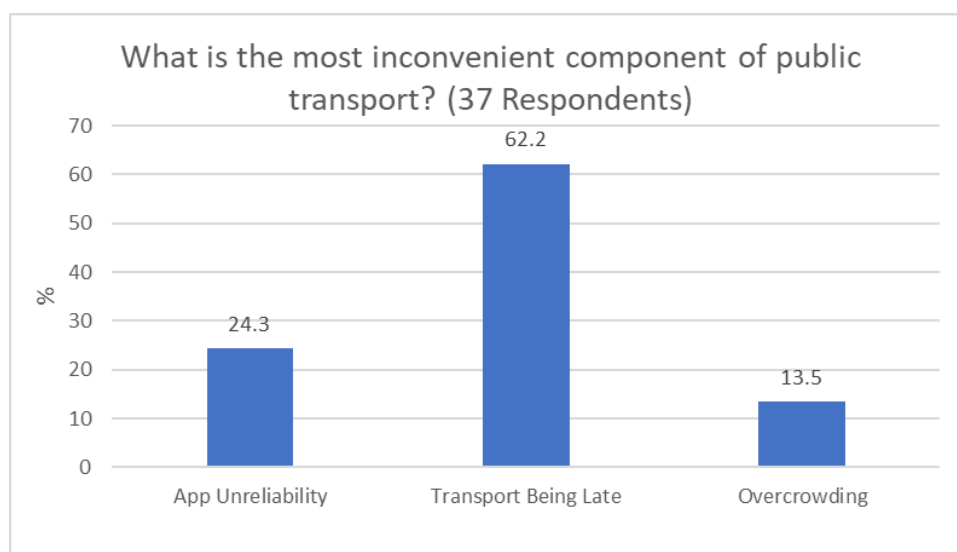


Figure 1 - Survey response regarding current inconveniences

The product we are proposing to fill this gap is a phone application, called InOut Tracking. Table 1 below describes the key features of InOut Tracking, and how it provides a superior service in comparison to current, similar apps.

Table 1 - InOut tracking features

| Feature | Description | Advantage |
|-------------------------|--|---|
| Live GPS location | Allows user to view real-time location of public transport vehicles, allowing for optimal planning and scheduling on the user's behalf. This will provide a visual element, which will help commuters visualise their journey. | Current apps do not offer such detailed, accurate data, often providing a rough estimate of arrival/departure times in number form. |
| Journey planning | Allows user to plan journeys by providing all possible routes from one point to the intended destination. Includes all services (bus, train, tram, walk), and organises in time order. | Current apps do offer such features, but not as effective or easy-to-use. |
| Easy-to-use interface | InOut Tracking will have an easy-to-use, simply lay out which will provide the app with accessibility for all demographics, enhancing user experience exponentially when compared to current apps. | Current apps are difficult to use, do not refresh often enough and do not allow users to open and close the app without restarting. |
| Interactive station map | This map will show all bus, train and tram stops in the area displayed on the map and will give a timetable for each stop. This will allow users to easily view which stations and stops are within range of them and plan their commutes accordingly. | Current apps do not offer maps with live public transport vehicle locations. |

The aim of this product is to not only provide the public with a more accurate, reliable, and easy to use route planning app, but to also provide public transport providers such as TransLink with a viable alternative to developing their own less effective software. Our application will enhance the experience of commuters in the SEQ region, as it addresses several concerns raised in the initial survey (See Appendix 9.7). By achieving this goal of appeasing current TransLink users, we will also be addressing TransLink's issue of not being able to provide an appropriate app for their commuters to use. This will improve their user satisfaction immensely, which will in turn increase the volume of users using the TransLink network and increase the revenue generated. This guaranteed revenue partnered with our extensive market/customer overview, in-depth business model and detailed financial analysis clearly demonstrates InOut Tracking's ability to generate revenue and satisfy commuters for many years to come. As well as this, our comprehensive sustainability assessment has ensured that our product has minimal negative social, economic and human impacts on the environment. InOut tracking is seeking to revolutionise the way commuters travel, and it is evident that we have developed an app and a business that is not only superior to current options, but also many, many years ahead of any competitors.

2.0 – Market and Customer Overview

In 2019, it was estimated the total patronage for public transport in South-East Queensland was 189 million (Department of Transport and Main Roads, 2019). This averages to approximately 520,000 passengers every single day, who use public transport to service their transport needs. With an exponentially growing city like Brisbane, which is extensively upgrading their infrastructure in response to the 2032 Olympic win, these numbers will continue to increase.

The extent of our market reaches from the bottom of the Gold Coast to the top of the Sunshine Coast, from the East tip of Redland Bay to the western Ipswich/Rosewood area. With opportunities to expand further, our target market area is already approximately 45,000,000 square meters, see Figure 2.



Figure 2 - Market area approximation

Our business start-up intends to target the mass market as our customer segment, people that are hoping to optimize their transport journeys. Our customer segment could also be arguably targeting a multi-sided market, as we require commuters to continue travelling, whilst requiring Translink to continue running the services. Regardless, the market exists and is of high quantity.

Market characteristics are unfortunately difficult to quantify due to the global pandemic which impacted the public transport industry. As seen in Table 2, growth was sighted from 2018 to 2019, however a large reduction occurred due to COVID-19. With this in mind, it is reasonable to suggest that without the presence of COVID-19, public transport would have likely continued its growth of passengers.

Table 2 - Public transport market statistics

| Year | Passenger trips (million's per year) | Average passenger trips per day | Growth (p.a.) |
|-----------|--------------------------------------|---------------------------------|---------------|
| 2012-2013 | 153 | 419,200 | [-] |
| 2017-2018 | 182 | 500,903 | +3.9% |
| 2018-2019 | 189 | 519,795 | +3.8% |
| 2019-2020 | 152 | 418,054 | -19.6% |
| 2020-2021 | 119 | 326,193 | -22% |

Figures based on Department of Transport and Main Roads Annual reports from 2018 – 2021 (Department of Transport and Main Roads, 2021).

The concept of bus live tracking is not new, nor is it even emerging. Many other rivalling competitors have tried to source the most efficient solution to meet people's demands, some successful, others are failures. Our competitors include but are not limited to:

1. Chalo (Indian live-tracking and financial software)
2. AnyTrip (Australian live-tracking software still in its beta version)
3. Rollcall (School bus tracking software)

These competitors have been reviewed in detail and have been examined further in **Appendix 1**. The key takeaways were that even though a live tracking software like AnyTrip exists, its user-friendliness was lacking, and it didn't optimize for unique routes and offer public transport options.

It is critical to consider that Translink still offers selective bus services which have GPS trackers, but 'guesses' the position of others without GPS, or simply uses their timetabled time. The goal of the start-up is primarily to standardise the tracking system to the same quality for all routes, to a 'within 60 seconds' range of accuracy, matching that of the competitor Chalo.

Our stakeholder community is quite large, but also quite stable. They include but are not exclusive of:

- Regular users of public transport
- Translink, Myki, Opal, TransPerth, MyWay and other public transport service providers in Australia
- Bus and Train drivers.
- Cloud computing partners (e.g., AWS, Oracle)
- Referral marketing services (for additional revenue streams)
- Local / State Government
- Travellers within our market region (Figure 2)

How we manage each of our stakeholders is extremely important and thus have been ranked by their power and influence. Figure 3 - Stakeholder Management Map visualises the power and influence of our stakeholders and how we intend to manage them.

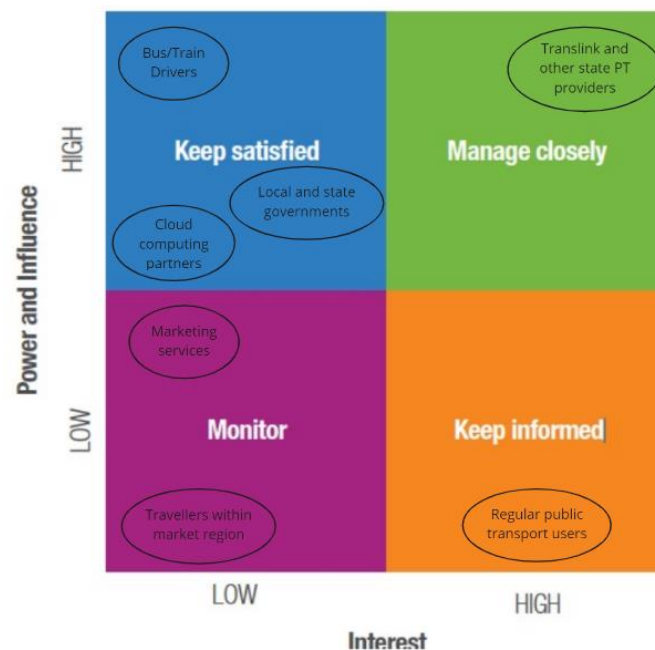


Figure 3 - Stakeholder Management Map

3.0 – Business Model

3.1.1 – Key Partners

Who can help you leverage your business model – you won't own all the key resources yourself, nor perform all key activities.

TransLink / Transport Service Providers Need to collaborate with Transport Service Providers to integrate with their existing systems, such as payment (tap-on and tap-off system) and potentially bus-tracking services.

Cloud Computing Partners As a start-up, it will be difficult to invest significant sums of money on computing hardware. Taking the cloud computing approach, we do not own the hardware ourselves and must partner with cloud service providers. Popular cloud service providers include Amazon Web Services (AWS), Oracle Cloud Infrastructure (OCI) or Microsoft Azure.

Investors To make this project a reality, we require the funding from investors to pay for the initial wages and capital investment (among other things) until the business is profitable.

Regulators and Government This business, like all other businesses must comply with local and federal rules and regulations and we must therefore engage with the government to ensure that we meet all requirements.

PCB and Electronics Design Consultants We will partner with individuals who have extensive experience in the electronics design and manufacturing industries to provide advice, guidance, and support in developing our proprietary GPS tracking devices

3.1.2 – Key Activities

What do you need to do well for your business to succeed?

Software Development The software development of the (cross-platform) application and its associated supporting infrastructure (servers that provide the real-time information of bus locations) underpins the entire business' activities. Software Development is fundamentally what the company does, and one of the ways that it provides value, not only for its end users but also for shareholders.

Electronics Design (Implementation of GPS Devices) Whilst there is a significant cost associated with the R&D of our own GPS tracking devices, this will ensure that we are able to provide high-quality GPS tracking that is isolated from the TSP network. This means that we can modify how the device behaves based on our own needs. These modifications may include but are not limited to:

- How it transmits the data (e.g., 4G, wireless protocol to base station such as LoRaWAN)
- How often it transmits data

3.1.3 – Key Resources

Which assets are indispensable in your business model? What infrastructure do you need to create, capture, and deliver value to customers?

Computing Hardware and Management Services Computing Hardware such as servers, the underlying infrastructure that they work off (networking, power) and the software system used to manage them (Docker, Kubernetes, Oracle Cloud Infrastructure Dashboard). We will not own this hardware ourselves – see the BMC section on [Key Partners](#).

Continuous Integration and Continuous Delivery Pipeline Setting up automated tests and checks for every significant version of the application to check that core functionality is not broken is not only a best practice in Software Engineering, but a vital part of ensuring quality and efficiency in a business. There is much less effort involved if this is done in small incremental steps, rather than a massive push all at once.

3.1.4 – Value Propositions

For each customer segment there's a corresponding value proposition. Bundles of products and services that you're creating that provide value for a specific customer.

Investors By providing the promised rate of return of 15% p.a. with options to extend the contract with further negotiations

Commuters By reducing the cognitive load, effort and frustration required to catch public transport in a timely manner. Achieved through a simple, intuitive user interface and accurate up-to-date information about the current position of public transport vehicles.

TransLink / Transport Service Providers By incentivising commuter use of public transport, we predict a significant increase in patronage across all modes.

3.1.5 – Customer Relationships

What kind of relationships are you developing with customers?

Small Scale In the initial stages, we initially anticipate a small volume of users, and intend to connect the development team directly with customers to receive feedback, building customer loyalty through quality support.

Scale-Up Phases As the business initially scales up, the development team will not be able to provide support to customers anymore (as the volume of support requests will inevitably go up). However, continuing the trend of building customer loyalty through high-quality support, we will hire support staff here in Australia with a tight feedback loop to project management.

3.1.6 – Channels

How are you interacting with customers and delivering value to your customers?

Organic Growth / Word-of-Mouth Spread through recommendations between friends and acquaintances. For this to be successful, the application must be quick to set-up and to use such that the person can set it up on the spot.

Marketing As the business scales, we will employ the skills of a marketing team to sell the product through channels such as social media, given a significant proportion of public transport patrons are young adults.

3.1.7 – Customer Segments

Which customer segments is your business targeting? Do your customers have the same, or diversified needs? Are you serving a single group of customers or multiple distinct groups?

Mass Market target for the application when considering consumers – they need to know how they can get from A to B, when they need to leave and when they will arrive.

Multi-Sided Market when considering all stakeholders – we are providing value for investors, Transport Service Providers and commuter.

3.1.8 – Cost Structure

What are the costs associated with running the business?

Fixed Costs are costs that don't change as the company scales. These include the initial capital expenditure and hardware costs (at least for the initial stages)

Variable Costs Salaries, Rent, Utilities, Advertising, Insurance, Additional Equipment, Maintenance

3.1.9 – Revenue Streams

How does your business capture the value you have created?

- **Licensing Fees** from transport service providers

3.2 – Scale-Up Plan

The following is a 5-year plan of how we intend to scale up, with accompanying stage definitions below. Observe how as the start-up matures, our capacity for more parallel tasks increases.

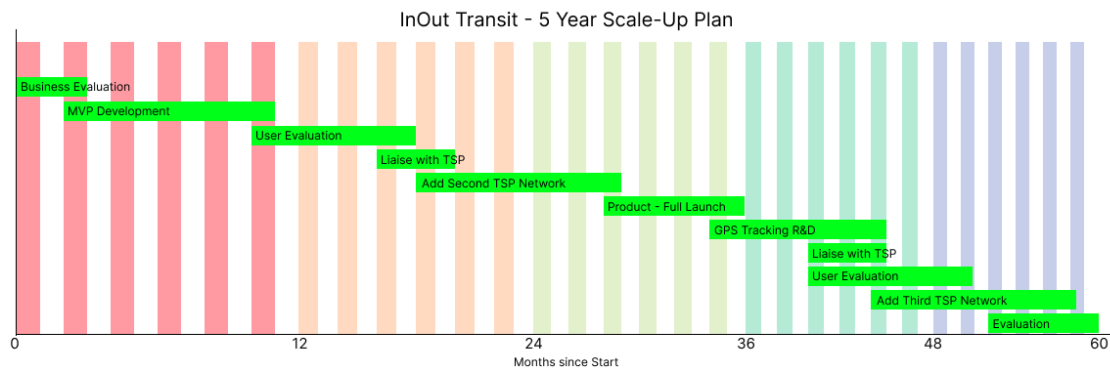


Figure 4: Five-Year Scale-Up Plan

3.2.1 – Business Evaluation

Use the Business Model Canvas to identify the need that the product addresses, and how the business intends to create value for its stakeholders. Perform initial business model validation through analyses of existing products and financial analyses.

3.2.2 – Initial Fundraising

Raise initial capital to fund the first two years of the start-up.

3.3.3 – Delivery of MVP

Deliver a Minimum Viable Product (MVP) to investors and small group of users (n=30) to gain initial user feedback.

3.3.4 – Liaise with TSP

Begin negotiations with a second Transport Service Network (TSP) and integrate their services into the application so that we can serve a larger target demographic.

3.3.5 – Add Second TSP Network

Integration of the second TSP network into our application. At the end of this stage, the vehicles on the second TSP's network should be quickly and accurately displayed through the application.

3.3.5 – Full Launch

Conduct user testing and evaluation, as well as re-investigating the market (to see if it has changed) in preparation for fully launching the product to the open market. By the end of this stage, the application shall be responsive, reliable, and fully polished, ready for mass consumption. The servers (that serve the real-time location of busses) should also be appropriately scaled (and tested) to ensure that they are able to handle the increase traffic.

3.3.6 – GPS Tracking R&D

We additionally intend to deliver greater value to customers by providing them with accurate, real-time positions of busses. Up to this point, we will be relying on the telemetry gathered and distributed by transport service providers (read here for more information). However, we intend to work with TSPs to integrate our own tracking hardware on their vehicles.

3.3.7 – Liaise with Third TSP & Add Third TSP Network

As before (in section 3.3.4 and 3.3.5), we will enter discussions with another transport service provider, allowing our application to reach more customers.

3.3.8 – Performance Evaluation

As the end of our five-year contract with the Angel Investors concludes, we will perform a performance evaluation to analyse how we met the initially proposed deadlines as well as how to continue the business.

4.0 – Assessment of Sustainability Impacts

4.1 – Five Capitals Model

The Five Capitals Model is a sustainability framework developed by the Forum for the Future. The model is a tool for organisations to identify potential positive and negative sustainability impacts. Personalised strategies are then developed to either mitigate or enhance the impacts identified. The framework includes the following five types of capitals (*The Five Capitals - a Framework for Sustainability*, 2018):

1. **Natural:** the natural resources (energy and matter) and processes needed by organisations to produce their products and deliver their services.
2. **Human:** incorporates the health, knowledge, skills, intellectual outputs, motivation, and capacity for relationships of the individual.
3. **Social:** any value added to the activities and economic outputs of an organisation by human relationships, partnerships, and co-operation.
4. **Manufactured:** material goods and infrastructure owned, leased or controlled by an organisation that contribute to production or service provision, but do not become part of its output.
5. **Financial:** assets of an organisation that exist in a form of currency that can be owned or traded, including (but not limited to) shares, bonds, and banknotes.

Each capital is considered equally important to the company's sustainability and success.

4.2 – Sustainability Impacts

The table below, Table 3 identifies potential sustainability impacts of the project. The top five positive and negative impacts have been determined using the Five Capitals Model. The analysis considers the entire life of the project, from development to closure, as well as any long-term effects.

Table 3 - Sustainability Impacts

| Title | Capital | Impact | Stakeholder Group | Description |
|------------------------|--------------|----------|--|--|
| CO2 emissions | Natural | Positive | Local & state government | App will increase use of public transport. This results in less CO2 emissions from reduced fuel use of personal vehicles. |
| Equal access | Social | Positive | Regular public transport users / Travellers within market region | Public transport provides equal access to employment, education, and other services. Decreases isolation for those relying on public transport. |
| Economic productivity | Financial | Positive | Local & state government | Converting to public transport will minimise the cost of road congestion. Furthermore, reduced travel time will maximise productivity of workers. |
| Public health | Human | Positive | Regular public transport users / Travellers within market region | Studies show public transport use improves health of population (Wasfi et al., 2013). Average of 30 minutes of exercise a day is achieved through walking to and from stations/bus stops. |
| Technology development | Manufactured | Positive | Cloud computing partners | Development of sophisticated technology, potentially can be used in other industries. |
| User restriction | Social | Negative | Regular public transport users / Travellers within market region | The app is only beneficial to those capable of accessing the internet and smartphone. In addition, it is assumed users have sufficient knowledge on technology. This results in a user constraint and unequal access to the application. |
| Screen time | Social | Negative | Referral marketing services | App will increase screen time of users if advertising is used as a method of funding. |
| Industry impact | Social | Negative | Translink & other state PT providers | Investment into public transport sector may negatively impact other industries. For example, toll roads, taxis, Uber and other transport platforms. This can result in a decrease of job opportunities in other organisations. |
| Infection control | Human | Negative | Local & state government | Increased chance of spreading disease on public transport. This is due to the proximity of other riders and exposed surfaces. |
| Fare increase | Financial | Negative | Regular public transport users / Travellers within market region | Potential for public transport fare to increase due to development costs. |

4.3 – Strategies

Now that potential sustainability impacts have been identified, the organisation can develop strategies. Enhancement strategies for positive impacts have been developed in Section 4.3.1. Similarly, mitigation strategies for negative impacts have been developed in Section 4.3.2.

4.3.1 – Enhancement

Positive sustainability impacts will be reinforced using the Enhancement Hierarchy seen in Section 10.3 - Mitigation/Enhancement Hierarchy. The hierarchy outlines the three separate scopes of enhancement; project, local area and wider area.

In the table above, InOut Tracking has identified equal access and reduced CO2 emissions to be the two major areas of enhancement. Public transport services allow for equal access to employment, education and other essential areas. Furthermore, for those relying on public transport this decreases isolation. Regarding CO2 emissions, app usage will increase use of public transport, resulting in less CO2 emissions from reduced fuel use of personal vehicles.

To amplify the benefits equal access brings to the consumer, InOut Tracking will facilitate feedback surveys on the app. These surveys will aim to identify areas lacking access to transport, or are in need of additional services. This data will be sent to the Transport Service Provider for action. Additionally, InOut Tracking will partner with TSPs to provide discount fares for commuters travelling long distances. Other incentives will also be developed, such as a point card system for free rides.

To encourage users to reduce their carbon footprint, the InOut Tracking application will include an eco-friendly feature. This feature shows the users estimated CO2 saved from their public transport use. Virtual badges and other gamified incentives will be rewarded to users. InOut Tracking aims to encourage use of public transport through this rewards system to further reduce CO2 emissions.

4.3.2 – Mitigation

Negative sustainability impacts will be alleviated using the Mitigation Hierarchy seen in Section 10.3 - Mitigation/Enhancement Hierarchy. The best course of action is to make changes to the project to avoid the impact entirely. However, where this is not possible the Mitigation Hierarchy includes subsequent steps. InOut Tracking has identified the user restriction to be the most significant negative impact. In Table 3 - Sustainability Impacts above, it was recognized that the proposed app is only beneficial to those capable of accessing the internet and a smartphone. In addition, it is assumed the user has adequate knowledge on technology to be able to access and navigate the application. Therefore, the potential user is limited, and there is unequal access to the application.

To mitigate this, the app will include an offline feature for saved destinations. This feature will broaden the scope of use and reduce any adverse effects. Real time bus tracking will be unusable without internet connection. This segment will be replaced with average wait times, based on the destination and time of day. Journey routes, including alternative options, will have a save function for offline viewing. This will expand usage to those able to connect to wi-fi at a set location, for example home, work school etc.

During initial development an app will be the only platform available to users. Expanding the project to alternative platforms is InOut Tracking's strategy to reduce this impact. Therefore, further development to a website is an option at a later stage. Regarding user familiarity to technology, InOut Tracking will mitigate through reduction in the design phase. The application will be specially designed for easy navigation and tested before public release.

5.0 – Financial Analysis

A preliminary financial analysis is a necessary step in determining the financial validity for the start-up and for our investors. In this section, the following key factors have been considered:

- Future costs and revenues
- 5-year discounted cash flow (pre-tax)
- Business valuation
- Proposed return on investment

5.1 - Costs and Revenues

Table 4 - Expected Future Costs (Year 5) Table 4 and Table 5 detail the expected yearly costs and revenues for the start-up's public transport tracking application. The tables below are a summary of this information and highlight the key information (see Appendix 5.4.1 for full cost breakdown).

Table 4 - Expected Future Costs (Year 5)

| Costs | Value (\$AUD) | Description |
|--------------------------|---------------|--|
| Capital Expenditure | \$77,000 | <ul style="list-style-type: none">• Start-up costs such as computers and office equipment |
| Wages | \$856,129 | <ul style="list-style-type: none">• 3x Senior Software Engineers (\$110,000)• 3x Software Engineers (\$80,000)• 1x Project Manager (\$120,000)• 1x Marketing Manager (\$76,000) |
| Operating Costs | \$106,591 | <ul style="list-style-type: none">• Including rent, services, maintenance, software, servers, and advertising |
| Business Loan Repayments | \$10,940 | <ul style="list-style-type: none">• An initial business loan of \$45,000 paid over 5 years at a 5% rate |

Table 5 - Expected Future Revenues (Year 5)

| Revenue | Value (\$AUD) | Description |
|-----------|---------------|---|
| Licensing | \$1,275,410 | <ul style="list-style-type: none">• 4-year contract with TransLink starting in year 2 (\$1,250,000 P.A.)• Salvage value of assets in year-5 (\$25,410) |

The yearly growth of these costs has been considered and are assumed to be at 2.82% in line with the 2021 Australian inflation rate (O'Neill, 2022). This has been accounted for in the discounted cash flow. Furthermore, Year-5 costs differ from Year-1 costs as a significant advertising campaign has been considered, as well as the employment of an additional 4 software engineers in year 2. We believe this correctly accounts for the number of staff required to develop a mobile application for beta testing in Year-1, to further develop the end-product to be distributed to the public in Year-2, and to maintain, update and expand the app over the future years.

Furthermore, we are confident that the proposed license fee of \$1,250,000 per year for TransLink's usage of the app is reasonable as the value of this initial contract was determined through analysing the yearly patronage of public transport in SEQ at a rate of 1c per trip. This number was derived by dividing the yearly patronage in SEQ (119 million in 2021, see Table 2) by the average trips per person per year (~52.45), multiplied by 0.1 (assuming a conservative 10% of public transport users use the app) (State of Queensland, 2022). When, multiplied by a standard price for mobile applications (\$4.99), this yields a yearly return of \$1,130,000, or approximately 1c per trip. We believe the start-up will add value and increase usage of SEQ's public transport network, further increasing this margin, thus allowing for a review of the initial licence at the end of year 5.

Additionally, in 2018, the Queensland Government announced a \$371 million dollar investment with the company Cubic, to upgrade the state's public transport ticketing system (Chanthadavong, 2020). This further validates the willingness of TransLink to fund external companies to help improve the public transport network in SEQ, as well as the degree they intend on spending.

In addition to the proposed asking investment, a \$45,000 small business loan to be paid back at an interest rate of 5% over 5 years will be used to help fund initial capital expenditure and wages in year 1.

5.2 - Discounted Cash Flow

A pre-tax DCF analysis was conducted on the start-up based on the expected costs and revenues, to provide Angel Investors Pty Ltd with a detailed understanding of the business' expected valuation. A detailed DCF is provided in Section 10.4 – Financial Analysis.

and summarised below in Table 6.

Table 6 - Summary of DCF

| Time Period (years) | Discount Rat/ Hurdle Rate (%) | Net Present Value (\$AUD) | Internal Rate of Return (%) |
|---------------------|-------------------------------|---------------------------|-----------------------------|
| 5 | 15% | \$205,965 | 32% |

As seen in the summary, the expected NPV of the investment at the pre-decided hurdle rate of 15% is \$205,965 by the end of year 5. This indicates that the project is profitable for investors and has significant potential for returns. Furthermore, the expected internal rate of return is 32% implying that this is an increasingly beneficial investment for our angel investors.

5.3 - Investment Proposal

InOut Tracking has devised an investment proposal for our angel investors, to assist the start-up in obtaining the required capital needed start the business' operations and application development. The terms of this proposal are summarised below in Table 7.

Table 7 - Business Valuation and Asking Investment

| | |
|----------------------------|---|
| Asking Investment (\$AUD) | \$475,000 |
| % Of Business | 20% |
| Business Valuation (\$AUD) | \$2,375,000 |
| Description | Our investors are being offered 20% of the business for \$475,000 required for start-up costs and wages. The remaining stake in the business will be divided 6 ways between the start-up founders at a rate of %13.33. All initial earnings by the company will be held as equity for the first 5 years of operation to fund developments and future expansion. |

We at InOut Tracking, are more than satisfied with the internal rate of return for the business and investors and see this start-up as a prime investment opportunity. Beyond the next 5 years, a review will be conducted in which additional investment opportunities will be made available for new or existing investors. This will aid the future expansions and endeavours of InOut Tracking, including but not limited to, upgrades to GPS tracking hardware, integration to other public transport systems within Australia and diversification of business operations. Furthermore, we will review the IRR with the view of increasing returns for our investors.

6.0 – Start-Up Risks

6.1 - Introduction

There are various risks that the team may face. Commercial risk refers to all objective economic phenomena that bring opportunities or possibilities for profit or loss to commercial entities due to various uncertain factors in commercial activities. Social risk is the possibility of causing social conflict, endangering social stability and social order. Hence, the consequence of risk is severe. In their detailed review of megaprojects, Flyvberg et al. (2003) concluded that risk can be identified, and their influence reduced by attentively identifying and assigning risks to those best suited to conduct them. In short, risk management is important to a project.

6.2 - Method

This pitch uses a Risk Assessment Model (RAM) analysis to identify the top five risks – the severity of each risk is determined by multiplying their likelihood and impact.

Table 8 - Risk Assessment Table

| ID | Description | Likelihood [1,5] | Impact [1,5] | Severity [1, 25] | Potential Causes | Preventative Action | Potential Impacts | Mitigating Actions | Owner |
|----|---|------------------|--------------|------------------|---------------------------------------|--|-------------------------------------|--|-----------------|
| 1 | Technical difficulties | 5 | 5 | 25 | Lack of technicians and research | Conduct research or hire technicians | Fail to launch the app | Outsourcing | Project manager |
| 2 | Lack of company management experience | 5 | 5 | 25 | Project manager is inexperienced | Refer to the management system of similar companies | Collapse | Performance appraisal | Project manager |
| 3 | Project exceeds budget | 4 | 5 | 20 | Supply issues; Poor management | Add contingency in budget | Loss of profit | Clauses in contract that require budget review for scope changes | Project manager |
| 4 | Hard to compete with existing solutions | 4 | 4 | 16 | Target market is described too barely | Analyse products of competitors to avoid their strengths and find their weaknesses | Loss of profit | Find and then solve your customers' pain points | Project manager |
| 5 | Lack of investors | 3 | 5 | 15 | The concept of the project is not new | More advertising Attend events, gain contacts | Lack of initial capital expenditure | Reach out to contacts for emergency funding | Project manager |
| 6 | Unsustainable | 3 | 4 | 12 | Poor company management | Provide safe workplace | Condemnation of people | Make reasonable project plan | Project manager |
| 7 | Project overruns schedule | 3 | 4 | 12 | Technical difficulties | Make reasonable project plan | Delayed launching the app | Work overtime | Project manager |
| 8 | Lack of engagement / use | 2 | 5 | 10 | The app is not attractive | Conduct Surveys Evaluate market conditions regularly | Loss of profit | More advertising | Project manager |
| 9 | Supply Chain Instability | 3 | 3 | 9 | Unsuitable supply chain management | Make reasonable project plan | Uncompleted devices | Find another supplier | Project manager |
| 10 | Mismanagement of Funds | 2 | 3 | 6 | Lack of funding Poor management | Hire accountants and financial controllers to manage funds | No salary for employees, bankruptcy | Loan Emergency Investment | Project manager |
| 11 | Theft of materials, Intellectual Property (IP) or equipment | 1 | 5 | 5 | Poor security system | Purchase insurance and build security system | Loss of profit | IP Contracts Work overtime | Project manager |
| 12 | Breach of Law | 1 | 5 | 5 | Lack of knowledge | Consult individuals with experience | Fine, debt, jail | Check with lawyers | Project manager |

6.3 - Result

By using the likelihood and impact matrix to define the severity of each risk, the team has identified the top five risks. These are as follows:

6.3.1 - Technical Difficulties

Technical difficulties are occasional device problems, such as data loss or system errors, that make it difficult or impossible to complete the project. If technical difficulties occur, the whole scope might be changed because the project will not be launched successfully. As most businesses have opted for telecommuting over the years, they realize that it is difficult to monitor employees remotely to ensure high productivity. Following that, companies need technology that can help them report employee motivation to work from home. Perera (2011) found that technical difficulties may be due to a lack of options and development opportunities for employees, as well as management issues, especially the need to have optimistic timelines to please outsourcers. In short, not only the project but also the management of the company need professional technical support. Conducting research and hiring technicians are preventative actions. If technical difficulties occur during the process, outsourcing may be considered, and it will be a great expenditure.

6.3.2 - Lack of Company Management Experience

An unsuitable management system will affect the performance of employees and the operation of the company. Project managers may face staff-related conflicts and keep them productive. In addition, supervisors should stabilize budgets, boost revenue, and develop backup plans as much as possible. Ratkovic (2015) concluded that most start-up companies employ a performance appraisal process to ensure productivity. Overall, the company may suffer irreparable from poor leadership. The project manager should refer to the management system of similar companies and build a suitable system in advance. Performance appraisal will be used to test employees to dismiss underperforming employees.

6.3.3 - Project Exceeds Budget

Budget is a plan of income and expenditure for a certain period in the future by the company. The general budget can coordinate the activities of the organization, so that managers can fully consider the interconnection between the entire value chain, the budget is an effective means of communication, and can touch every corner of the enterprise. Polonski (2015) indicated that considering contingency costs at the beginning of a project is crucial from an economic point of view and is in line with the expectations of investors who realize that in the absence of reserve costs it increases the cost of planned investment. Hence, project managers should establish a program to prevent emergencies. For example, pre-reservation incurs contingency costs. Moreover, the understanding concept of investment from the sponsor is also important. To ensure that without the consent of the project, the budget will not be exceeded in any case. If the project cannot be completed using existing methods and budgets, reducing the project scope, or seeking more funding will be recommended.

6.3.4 - Hard to Compete with Existing Solutions

Hardness to compete with existing solutions can be indicative of a serious weak point. The reason for it may be that its target market is described too barely. When initiating a sketch, it's simple to concentrate on specific aspects and ignore the whole scope. Also, while there may not be projects on the market with the same functionality, there may be other companies that are adjacent enough to be identical to potential clients. Briefly, hardness to compete with existing solutions may cause products to be unsalable. Following that, the company will have low profit. Expanding the view of what constituted competition in advance will help the project manager understand the market project served. Finding social media to promote the product is also a kind of preventative action. Adding elements that help improve competition is recommended as mitigating action.

6.3.5 – Lack of Investment

Investing in a corporation could be either intelligent or foolish action. There are several reasons, for example, failure to understand competitors and improper cash flows. Lack of investors may cause lack of initial capital expenditure. Following that, improper cash flows may have a potential impact. In conclusion, lack of investors may cause financial problems. Making meaningful advertising and explanations to let investors know that our company has a detailed business plan and a good understanding of competitors are preventative actions. Loan will be a kind of mitigating action if the company faces fiscal problems.

8.0 – Conclusions and Recommendations

This section is intentionally left blank as it will be replaced by individual team-member written material.

9.0 – References








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10.0 – Appendices

10.1 – Team Contribution Table

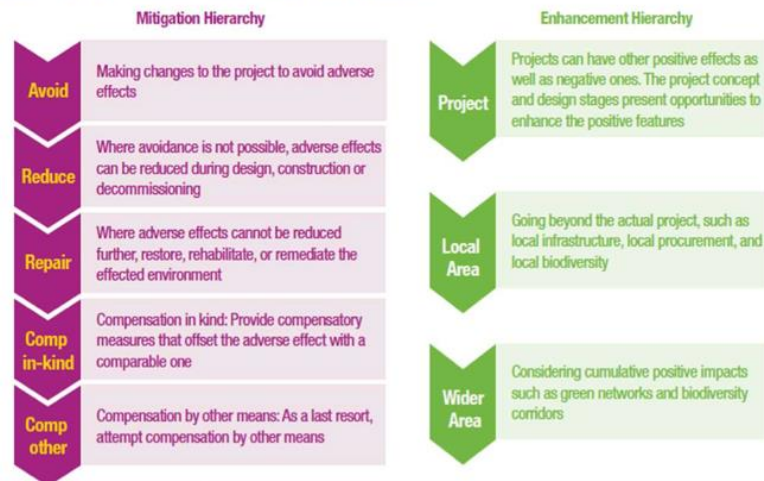
| Group Member | Tasks |
|--------------------|---|
| Amy Beckett | Cover Letter, Sustainability Assessment |
| Charlie Hargreaves | Market Analysis, Stakeholder Investigation |
| Jordan Gill | Value Proposition, Customer Segment Analysis |
| Lucas Moisey | Financial Analysis |
| Matthew Choy | Business Model Canvas, Project Timeline / Scale-Up Plan, Prototype Development, Risk Assessment, Technical Investigations |
| Zhongyang Zheng | Risk Assessment |

10.2 – Business Model Canvas

| | | | | |
|---|---|---|---|--|
| <div>Key Partners</div> <div></div> <div><ul style="list-style-type: none">• Transport Service Providers (e.g., TransLink)• Cloud Computing Partners (AWS, Oracle)• Investors• Regulators and Government• PCB / Electronics Design and Manufacturing Consultants</div> | <div>Key Activities</div> <div></div> <div><ul style="list-style-type: none">• Software Development• Electronics Design• Marketing</div> | <div>Value Propositions</div> <div></div> <div><p>For the Investor, we provide the pledged 15% p.a. rate of return</p><p>For Commuters, we provide value by reducing the cognitive load required to catch public transport</p><p>For Transport Service Providers, we provide value by incentivising commuters to catch public transport, as well as bolster their tracking capabilities with the implementation of new GPS devices</p></div> | <div>Customer Relationships</div> <div></div> <div><p>Initially, build real, personal relationships with the first small group of users.</p><p>As the business scales, hire service staff in Australia to provide high quality, responsive customer service.</p><p>Take customer feedback into account when iterating through prototypes, or deciding to implement new features.</p><p>Innovate and evolve as customer needs evolve.</p></div> | <div>Customer Segments</div> <div></div> <div><p>Considering commuters, we are targeting a mass market, where the target demographic has largely the same needs (especially with figuring out when a bus/train/ferry is arriving).</p><p>Targeting a multi-sided market as we are directly providing value for multiple stakeholders - Transport Service Providers like TransLink as well as commuters.</p></div> |
| <div>Cost Structures</div> <div></div> <div><p>Fixed Costs Capital Expenditure,</p><p>Variable Costs Equipment, maintenance, salaries, rent, utilities, advertising, insurance, R&D</p></div> | <div>Revenue Streams</div> <div></div> <div><p>Licensing Fee to TransLink - revenue is gained by licensing the software to TransLink</p></div> | | | |

10.3 - Mitigation/Enhancement Hierarchy

Mitigate or enhance the impact



10.4 – Financial Analysis

10.4.1 – Cost and Revenue Breakdown

| CAPITAL EXPENDATURE | 0 | 1 | 2 | 3 | 4 | 5 | DESCRIPTION |
|----------------------------|----------|-----------|-------------|-------------|-------------|-------------|---|
| Laptops | \$24,000 | - | - | - | - | - | 6x Laptops @ \$3,000 |
| Phones | \$16,000 | - | - | - | - | - | 6x Phones @ \$2,000 |
| Projectors | \$1,000 | - | - | - | - | - | 1x Projector @ \$1,000 |
| Desks | \$16,000 | - | - | - | - | - | 6x Desks @ \$2,000 |
| Monitors | \$8,000 | - | - | - | - | - | 12x Monitors @ \$500 |
| Printer | \$1,000 | - | - | - | - | - | 2x Printers @ \$500 |
| Peripherals | \$4,000 | - | - | - | - | - | Cables, USB hubs, mice, headsets |
| | | | | | | | |
| WAGES | 0 | 1 | 2 | 3 | 4 | 5 | DESCRIPTION |
| Senior Software Engineer | - | \$110,000 | \$330,000 | \$330,000 | \$330,000 | \$330,000 | 3x Senior Engineers @ \$110,000 |
| Software Engineer | - | \$80,000 | \$240,000 | \$240,000 | \$240,000 | \$240,000 | 3x Engineers @ \$80,000 |
| Project Manager | - | \$120,000 | \$120,000 | \$120,000 | \$120,000 | \$120,000 | 1x Project Manager @ \$120,000 |
| Marketing Manager | - | \$76,000 | \$76,000 | \$76,000 | \$76,000 | \$76,000 | 1x Marketing Manager @ \$76,000 |
| | | | | | | | |
| OPERATING COSTS | 0 | 1 | 2 | 3 | 4 | 5 | DESCRIPTION |
| Rent | - | \$42,000 | \$42,000 | \$42,000 | \$42,000 | \$42,000 | 60 sqm Brisbane CBD Office |
| Building Utilities | - | \$4,560 | \$4,560 | \$4,560 | \$4,560 | \$4,560 | Electricity, Gas, Water Bills |
| Building Maintenance | - | \$4,200 | \$4,200 | \$4,200 | \$4,200 | \$4,200 | Cleaning, Repairs |
| Software | - | \$2,160 | \$2,160 | \$2,160 | \$2,160 | \$2,160 | Microsoft 365, Development Applications |
| Server | - | \$450 | \$450 | \$450 | \$450 | \$450 | Oracle Server |
| Server Maintenance | - | \$2,000 | \$2,000 | \$2,000 | \$2,000 | \$2,000 | Server Repairs/Upgrades |
| Advertising | - | - | \$200,000 | \$40,000 | \$40,000 | \$40,000 | Initial/On-going Campaign |
| | | | | | | | |
| LOANS | 0 | 1 | 2 | 3 | 4 | 5 | DESCRIPTION |
| Business Loan Repayment | - | \$9,000 | \$9,450 | \$9,923 | \$10,419 | \$10,940 | \$45,000 paid over 5 years @5% |
| | | | | | | | |
| REVENUE | 0 | 1 | 2 | 3 | 4 | 5 | DESCRIPTION |
| Translink License | - | - | \$1,250,000 | \$1,250,000 | \$1,250,000 | \$1,250,000 | 4-Year License @ \$1,250,000 P.A. |

| | | | | | | | |
|----------------------------|----------|-----------|-------------|-------------|-------------|-------------|-----------------------------------|
| Salvage Value | - | - | - | - | - | \$25,410 | 33% Return on Capital Expenditure |
| | | | | | | | |
| SUM | 0 | 1 | 2 | 3 | 4 | 5 | DESCRIPTION |
| CAPITAL EXPENDATURE | \$77,000 | - | - | - | - | - | - |
| WAGES | - | \$386,000 | \$787,601 | \$809,812 | \$832,648 | \$856,129 | - |
| OPERATING COSTS | - | \$55,370 | \$262,571 | \$100,825 | \$103,668 | \$106,591 | - |
| LOANS | - | \$9,000 | \$9,450 | \$9,923 | \$10,419 | \$10,940 | - |
| REVENUE | - | - | \$1,250,000 | \$1,250,000 | \$1,250,000 | \$1,275,410 | - |

10.4.2 – Cost and Revenue References

| CAPITAL EXPENDATURE | SOURCE | COST (EACH) |
|----------------------------|---|--------------------|
| Laptops | https://www.microsoft.com/en-au/d/surface-laptop-studio-for-business/8 | \$3,000 |
| Phones | https://www.telstra.com.au/mobile-phones/mobiles-on-a-plan/samsung/ | \$2,000 |
| Projectors | https://www.epson.com.au/products/business-projectors/?grouptypeID=29 | \$1,000 |
| Desks | https://desky.com.au/products/dual-hardwood-stand-up-desk?variant=39592257945756 | \$2,000 |
| Monitors | https://www.samsung.com/au/monitors/all-monitors/ | \$500 |
| Printer | https://www.epson.com.au/shoponline/shop/browseproductGroup.asp?catid=6&typeid=33&gid=113 | \$500 |
| WAGES | | |
| Senior Software Engineer | https://www.payscale.com/research/AU/Job=Senior_Software_Engineer/Salary/ef00e4b3/Brisbane | \$110,000 |
| Software Engineer | https://www.payscale.com/research/AU/Job=Software_Engineer/Salary | \$80,000 |
| Project Manager | https://au.indeed.com/career/software-project-manager/salaries | \$120,000 |
| Marketing Manager | https://www.payscale.com/research/AU/Job=Marketing_Manager/Salary/611174ae/Brisbane | \$76,000 |
| OPERATING COSTS | | |
| Rent | https://www.commercialrealestate.com.au/advice/how-much-does-it-cost-to-rent-office-space-57245/ | \$42,000 |
| Building Utilities | https://www.canstarblue.com.au/electricity/how-much-electricity-does-a-business-use/ | \$4,560 |
| Building Maintenance | https://www.fieldinsight.com/blog/building-maintenance-cost-calculator/ | \$4,200 |
| Software | https://www.microsoft.com/en-au/microsoft-365/business | \$2,160 |
| Server | https://www.oracle.com/au/cloud/compute/pricing.html | \$450 |
| Server Maintenance | https://www.nexusone.com.au/blog/110-the-true-cost-of-on-site-it-infrastructure | \$2,000 |
| Advertising | - | \$40,000 |
| REVENUE | | |
| Translink License | https://translink.com.au/about-translink/reports-and-publications/performance | + \$1,250,000 P.A. |

10.4.3 – Pre-Tax Discounted Cash Flow

| WACC (Discount Rate) | 15% | | | | | |
|---------------------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | YEAR | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 |
| CE (Capital Expenditure) | \$(77,000) | - | - | - | - | - |
| Salvage Value (Asset Sale) | - | - | - | - | - | \$25,410 |
| Revenue | - | - | \$1,250,000 | \$1,250,000 | \$1,250,000 | \$1,250,000 |
| Wages | - | \$(386,000) | \$(787,601) | \$(809,812) | \$(832,648) | \$(856,129) |
| Operating Costs | - | \$(55,370) | \$(269,976) | \$(106,591) | \$(103,668) | \$(106,591) |
| Loan Repayments | - | \$(9,000) | \$(9,450) | \$(9,923) | \$(10,419) | \$(10,940) |
| EBIT/EBITDA | - | \$ (450,370) | \$ 182,973 | \$ 323,675 | \$ 303,265 | \$ 301,750 |
| FCF (Free Cash Flow) | \$(77,000) | \$(450,370) | \$182,973 | \$323,675 | \$303,265 | \$301,750 |
| DF (Discount Factor) | 100% | 87% | 76% | 66% | 57% | 50% |
| DCF (Discounted Free Cash Flow) | \$(77,000) | \$(391,626) | \$138,354 | \$212,821 | \$173,393 | \$150,023 |
| | | | | | | |
| NPV (Net Present Value) | \$205,965 | | | | | |

10.4.4 – Internal Rate of Return Computation

| NPV (Net Present Value) | \$0 | | | | | |
|--------------------------------------|-------------------|--------------------|------------------|------------------|-----------------|-----------------|
| | YEAR | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 |
| DF (Discount Factor) | 100% | 76% | 57% | 43% | 33% | 25% |
| DCF (Discounted Free Cash Flow) | \$(77,000) | \$(340,309) | \$104,471 | \$139,644 | \$98,864 | \$74,331 |
| | | | | | | |
| IRR (Internal Rate of Return) | 32% | | | | | |

10.5 – Competitor Research

The concept of bus live tracking is not new, nor is it even emerging. Many other rivalling competitors have tried to source the most efficient solution to meet people's demands, some successful, some not so much. It is our responsibility in this initiative to gather insight into those start-ups (both successful and failures) and source what is critical for achieving desirable results and what is needed to go that extra step further and make our model more enticing. Some of the researched competitors are:

10.5.1 - Chalo

Chalo is an Indian based company that has live-tracking and financial software. It is currently used in 22 different cities within India and is seeking to expand further. It uses a software model named 'Passenger Information System' or PIS, which allows users to view a live display of specific bus on a map relative to their position. The system also allows users to store their ticket information on their phone, thus no need for paper tickets.

In an article by the 'Telematics Wire', the CTO of Chalo, Vinayak Bhavnani, said that people misunderstood how much work was involved in creating the software (admin, 2020). They even listed out the steps involved in developing the solution. These steps were:

1. Route and bus stop mapping
2. Installing GPS devices
3. The human challenge
4. Mapping buses to their routes

According to the same article, their aim is to '*achieve a live arrival time prediction within 1 minute of the actual arrival time for 97% of all bus arrivals*'. More details can be found on the article in the reference list (admin, 2020).

10.5.2 - RollCall

Rollcall is a software business mainly aimed at school bus services which offers services such as tracking, tap-on/off, information regarding school bus children and others. This is different to what our goal is, as we focus purely on live-tracking, whilst this company focusses more on children boarding times and arrival for safety and welfare.

10.5.3 - AnyTrip

AnyTrip is a [new?] initiative still in its beta version which provides **Brisbane commuters** with a map displaying all live tracked bus, train and ferry services. It offers filters to show buses running on time, late or early, and offers what services will be held near you within a certain time domain. Users can also search up what route they are specifically interested in to isolate the map of all other unnecessary services.

Personally, the website is not super user friendly, nor does this website offer any information on route details, distance from stop, traffic congestion, etc. It simply shows buses on a map, the basic level of live-tracking. You can see the tracker itself here: <https://anytrip.com.au/region/qld> . This business also seems to work with Translink

10.6 – TransLink Real-Time GTFS Feed

At present, TransLink publishes the positions of their busses in real-time through a General Transit Feed Specification (GTFS) feed. In short, we can access the real-time location of any active bus on the TransLink network. The information on how to use this data is available [here](#) and the software documentation available [here](#).

| | | | | | | |
|-----|-----------|-----------------------------|--------------------------------------|-------------------|---|----------|
| 167 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261666-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 168 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261667-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 169 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261668-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 170 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261669-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 171 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261670-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 172 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261671-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 173 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261672-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 174 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261673-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |
| 175 | UQSL-1172 | BCC 18_19-BCC_FUL-Friday-02 | 12261674-BCC 18_19-BCC_FUL-Friday-02 | University of Qld | 0 | UQSL0273 |

With the following lines of code, we can access the real-time data:

```
from urllib import request
url2="https://www.data.qld.gov.au/api/3/action/datastore_search?q=jones&resource_id=b
e7f19e5-3ee8-4396-b9eb-46f6b4ce8039"
fileobj = request.urlopen(url2)
print(fileobj.read())
```

The real-time data is shown below, where we can see currently scheduled busses amongst other information.

```
"records": [
{
  "0": 1,
  "_id": 5995,
  "NORM-1172": "204-1296",
  "BCC 18_19-BCC_FUL-Friday-02": "BT 18_19-MAY_FUL-Saturday-01",
  "12261499-BCC 18_19-BCC_FUL-Friday-02": "12954811-BT 18_19-MAY_FUL-Saturday-01",
  "Norman Park": "Carina, Clem Jones Centre",
  "NORM0024": "2040104",
  "rank": 0.0573088
},
{
  "0": 1,
  "_id": 6169,
  "NORM-1172": "204-1296",
  "BCC 18_19-BCC_FUL-Friday-02": "BT 18_19-MAY_FUL-Saturday-01",
  "12261499-BCC 18_19-BCC_FUL-Friday-02": "12954985-BT 18_19-MAY_FUL-Saturday-01",
  "Norman Park": "Carina, Clem Jones Centre",
  "NORM0024": "2040104",
  "rank": 0.0573088
},
]
```

9.7- Survey Results

Below are the results to the survey questions:

*Please note some of the graphs do not add to 100%, this is due to the fact users could select multiple answers for some questions.

**Please note some responses are inappropriate, this is due to the fact it was unknown respondents could add their own response instead of only the responses available. Hence the inappropriate response of "Visiting ur mom" to one such question. We were unable to exclude the answer, so it regrettably had to remain in the responses.

*** Please note the formatting of Q7 was altered to better suit the format of the report.

Q1

What improvements would you suggest for the app you currently use?

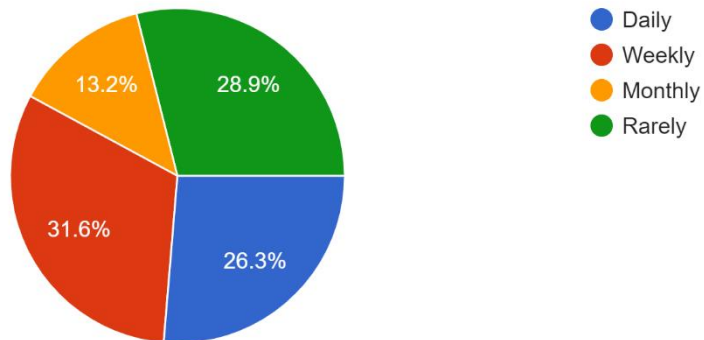
| Survey Responses |
|--|
| What improvements would you suggest for the app you currently use? |
| More reliability, more details on accurate locations of buses |
| Better reliability, crowded |
| If you could see where the bus is in real time |
| More accurate updates whether buses are running ahead of time or are delayed. |
| See what time a specific bus number runs over the next hour |
| Be able to pull up a route on the Translink app whilst already on the bus. |
| Better time indications and let people know when the busy times are |
| Not sure |
| If I switch applications, remember the page I was just on and don't force a reload |
| Show when buses/trains are late, currently app just has you waiting there for ages hoping that the bus will come sometime. |
| More reliable real-time tracking of busses and trains, tracking of frequent trips so it can alert you if your usual route isn't/won't be available |
| Easier to understand/read |
| Improved tracking of buses and increased reliability |
| Better interface, translink app is very clunky |
| Load faster |
| Mine is called moovit on google play: it has lots of ads |
| Be able to link Go Card |
| A more friendly user interface that is easier to understand |
| I hate how you have to set journeys on the translink app. Which is why I usually just use the translink website. |
| TransLink has a bit too much information going on at once on the screen so limiting that would be a nice addition- or adding favourite locations that you can mark |
| Easier to use interface, can be confusing to use sometimes |
| Better up to date info in regards to new roads |
| Less bugs |
| Ease of use |
| Better real time updates of where the bus is |
| Doesn't account for road closures |
| I don't use an app I rely on time screens like trains and sometimes google |

Translink app having a navigation feature like Apple maps when walking to a stop

Q2

How often do you use public transport?

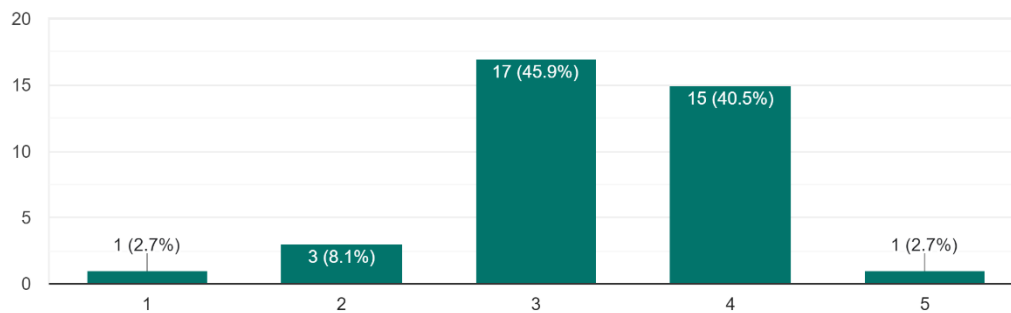
38 responses



Q3

How would you rate the timeliness of public transport?

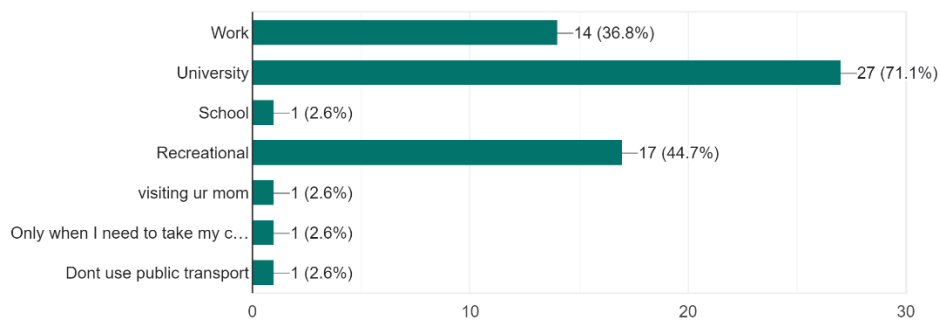
37 responses



Q4, *, **

What do you use public transport for?

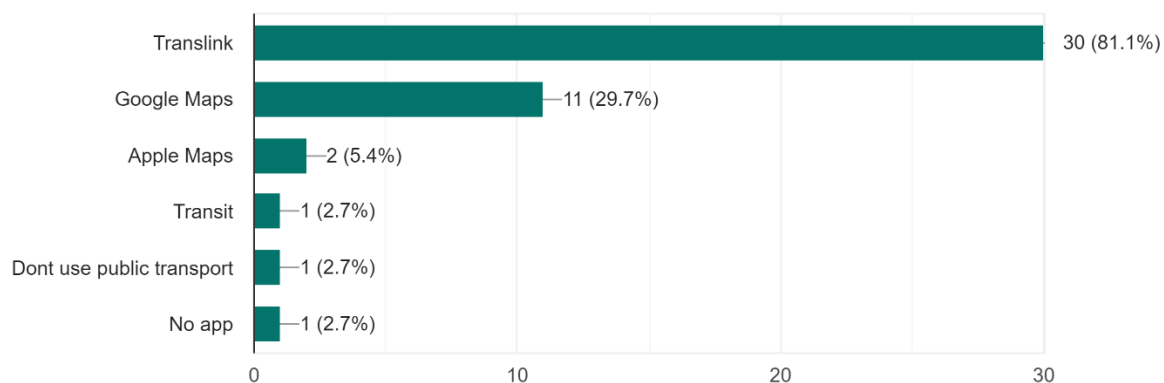
38 responses



Q5 *

What app do you currently use for your public transport?

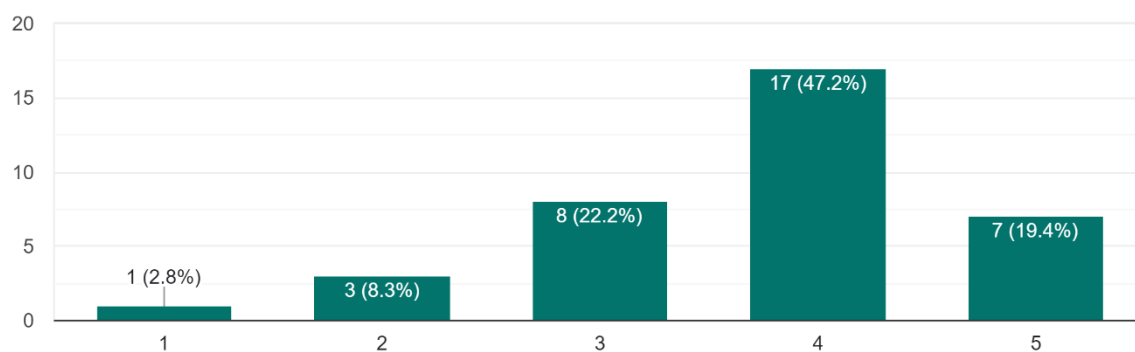
37 responses



Q6

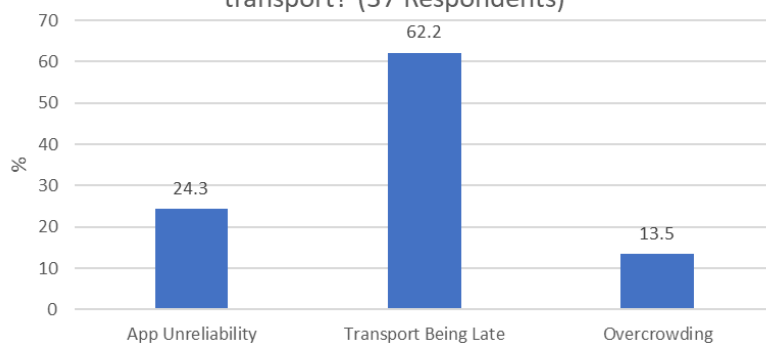
How would you rate the reliability of your current public transport app?

36 responses



Q7 ***

What is the most inconvenient component of public transport? (37 Respondents)



9.8 – Cloud Computing / Server Pricing

As a start-up, it wouldn't be wise for us to purchase expensive hardware to run our own servers, especially when cloud computing services offered by Amazon and Oracle only charge you for what you use. Here are how our cost estimate figures are derived.

Within cloud computing, we have a few concepts that must be introduced:

- **OCPUs** are essentially an equivalent unit to two physical cores of a computer ([Oracle, n.d.](#))
- **Block Storage** is long-term data storage and has two key values:
 - Amount (in Gigabytes)
 - Speed (in Input/Output operations Per Second – IOPS)
- **Data Egress** is the cost of transferring information into and out of the network.

9.4.1 – Oracle Cloud Infrastructure Pricing

- We specify that we initially need a compute instance with the following hardware:
 - 2 OCPUs are sufficient for running an API (Access Point Interface) that allows users to access the real-time information stored on our server instances
 - 8GB RAM is more than sufficient to hold application code + operating system
 - 100GB Block Storage is more than sufficient to hold the real-time locations of busses.
- We are then able to find the costs for each of these:

Figure 5: Oracle Cloud Infrastructure Pricing (Oracle, n.d.) also see (Oracle, n.d.)

| Hardware Component | Specification | Quantity | Amount | Unit |
|--------------------|--------------------------------|----------|----------------|-------------------|
| OCPU | Standard Compute E4 | x2 | \$0.016275 [1] | Per OCPU per Hour |
| Block Storage | Block Volume Storage | 100 GB | \$0.0225 | Per GB per Month |
| | Block Volume Performance Units | 100GB | \$0.0034 | Per GB per Month |
| RAM | | 8 GB | \$0.00195 [1] | Per GB per Hour |

- Note here that the block volume storage has two associated costs – storage of the data itself, and the computation required to access the data. Here we've chosen a "High Performance" tier for the computation units as we will need to frequently access this data.

$$\begin{aligned} \text{OCPU Cost} &= 0.016275 \times 2 \times \left(\frac{365}{12} \times 24 \right) \\ &= \$23.7/\text{month} \end{aligned}$$

$$\begin{aligned} \text{Block Storage Cost} &= (\$0.0225 + \$0.0034) \times 100 \\ &= \$2.59/\text{month} \end{aligned}$$

$$\begin{aligned} \text{RAM Cost} &= \$0.00195 \times 8 \times \left(\frac{365}{12} \times 24 \right) \\ &= \$11.338/\text{month} \end{aligned}$$

$$\begin{aligned} \text{Total Cost} &= \$23.7 + \$2.59 + \$11.338 \\ &= \$37.628 \end{aligned}$$

- These values could be reduced even further if you consider using load balancers.
- The above calculations assume that the compute instances are running 24 hours a day, 7 days a week for a month.
- Load Balancers automatically increase or decrease the number of computing instances as it is required, shutting all of them down when there are no accesses to the service.

Note here that Amazon Web Services are not included as the prices are significantly higher for the same level of computing and is therefore redundant.