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# Boutique Solution for University Transportation Services

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## Product Description

We propose a new service that improves Harvard shuttle tracking and integrates with calendar and map services, such as public transportation information and walking time estimates, to help users get to their desired destinations in a timely and efficient manner. With this service, users can receive notifications of when they should leave their homes and what the most convenient route is.

### Similar Services

**PassioGo**
PassioGo provides route tracking and live ETA features for the Harvard shuttle. Its primary function is to show pre-set shuttle routes and real-time shuttle locations, helping riders plan their wait. However, the app has no context for Harvard buildings and cannot provide information on optimal routes to take. The user experience is also buggy and difficult to navigate, with major friction points in determining future shuttle times and the final-leg time from shuttle stop to course buildings.

**Harvard Van**
The Harvard Van Service offers late-night on-demand rides to Harvard affiliates. Rides are scheduled through the web or phone app. The Evening Van only runs at night and has a small fleet with set zones, often resulting in long waits and inconvenient pick-up/drop-off locations.

**Terrier Transport**
Terrier Transport, Boston University's Transport App, provides recent status updates for user-indicated favorite lines, live step-by-step navigation and get-off alerts, and transit updates about potential disruptions. The app itself, however, does not offer integration between the BU shuttle and MBTA transit.

**MBTA Go – Official**
MBTA Go provides up-to-date information on nearby Massachusetts Bay Transportation Authority (MBTA) lines. However, it does not support map features, allowing users to determine the best route to get to their destination. The "Trip Planner" feature

redirects users to MBTA.com, which does not integrate with Harvard shuttle services.

## Product Differentiation

The major differentiation between our application and the current fleet of shuttle apps would be the integration of building/course data into the user experience. PassioGo, which is the current provider of the Harvard shuttle interface, is an out-of-the-box solution servicing many universities/municipalities/etc, as such, it provides the least common viable product for a wide array of institutions. While PassioGo presents a graphical map display of all real-time vehicle activity and enables users to view routes and destinations, there are several ways the end-user (student) experience can be improved. This functionality would drastically increase the complexity of the product, which would likely, in turn, increase the cost of service for Harvard Transportation, but ways to improve the UX should still be considered.

### Current Pain Points

**Inaccurate waiting time:**
Inaccurate waiting times leave users waiting outside, often in poor weather conditions, for longer than necessary. Many users do not trust the waiting times displayed on PassioGo.

**Disappearing shuttles:**
Depending on the activity of specific shuttle buses, shuttles are not always present on the map. This causes inaccurate waiting times and gives users the impression that there are no shuttles available.

**Insufficient buses:**
The weekend buses arrive every 45 minutes. Users must plan their schedules according to the bus schedule in order to effectively utilize the shuttle and minimize transit time.

**Disconnect between schedule and actual route:**
Depending on capacity, buses may leave before the designated time. This causes friction with users who may check the bus schedule to determine when to arrive at a given bus stop. Some users

**Delay notifications:**
Users waiting for shuttles are not clearly notified of delays. Currently, PassioGo displays a single push notification regarding delays for the day. In conjunction with other pain points, this does not give users enough information to make it to their destination on time.

## Proposed Features

**Automated navigation:**
Users would be able to input a desired location (including designated Harvard Buildings), and the App would be able to determine which route and stops to take. Navigation APIs like Google Maps would be able to support custom points of interest like Harvard buildings.

**Future shuttle times:**
The app would readily present the next several shuttle times to users. Current time listings seem to be static, based on the route time tables, which is the simpler implementation. Implementing real-time arrival prediction (based on average transit time, traffic, and current shuttle location). Data storage has become far more affordable, meaning the app would be able to store far more data, enabling things like real-time prediction algorithms.

**Class-contextual navigation:**
Users would be able to input a Course number, and the resulting building would be input to navigation. Because of the Harvard Course API, the app should be able to get and store the course location information for a given semester and then map those rooms to their corresponding buildings in a local database.

**Automated time-contextual alerts:**
Users would be able to integrate their Google Calendar and designate events they want to take the shuttle to (class, section, events in the Quad, etc.). The app will then push an alert to their phone, letting them know if they want to take the shuttle and be on time, they need to leave by ***X*** time. Google Calendar (gCal) integration has become far more popular in the years since PassioGo launched. gCal provides an API enabling users to sync events, so the major roadblock would be ensuring the app itself is factored to interact with these time blocks.

**Integration of first/last leg walking directions:**
Travel durations would factor in the walking time to/from a shuttle stop, from/to a building, providing the user with a complete travel time.

**Integration of M2 & MBTA transit feeds:**
Users would be able to connect Harvard transportation to the wider MBTA system, enabling the user to have a more seamless experience with transit. This should be possible technically, due to the MBTA API but it would be the most difficult to implement as it would also require a navigation API to recognize the Harvard Shuttles as viable options for transit.

# Direct Stakeholders

| **Stakeholder** | **Role** | **Values** | **Expected Behavior** |
|---|---|---|---|
| *Students* | User | Shuttle reliability, convenience | Use app to get to class/around campus |
| *PassioGo* | Supplier | Keep Harvard as a customer | Provide shuttle tracking data |
| *Harvard Transit* | Customer/Owner | Cost minimization, student satisfaction, safety compliance, operational support | Approves new services, monitors outcomes |
| *Shuttle Drivers* | Employees | Predictable schedules, safely, clearly-defined days | Operate shuttles, report delays |

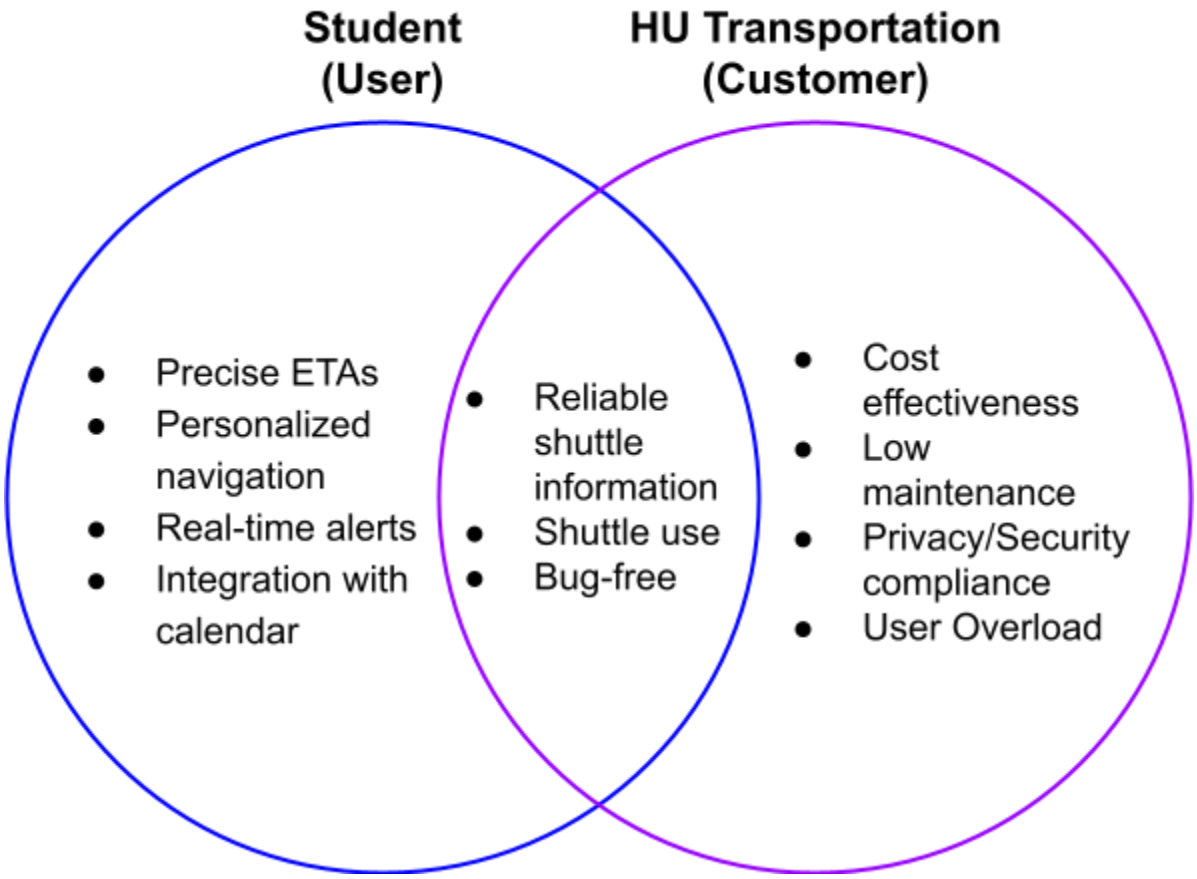
# Indirect Stakeholders

| **Stakeholder** | **Role** | **Values** | **Expected Behavior** |
|---|---|---|---|
| *Proterra* | Electric Bus Supplier | Keep Harvard as a customer | Ensure buses are operational |
| *Professors* | Stakeholder | Students arriving on time | Benefit from fewer late students |
| *Friends (of quadlings and engineering students)* | Stakeholder | Coordinating social plans | Indirectly benefit from improved shuttle reliability |

# User Journey

*Describe one "user journey" or "journey map" per participant on your team. If you are working alone, choose the primary user. If on a team, choose either user and customer (if different) or user and investor (if the same). Address "values tensions" between the subject of the journey and other stakeholders. There is a maximum of 2 pages per user journey.*

Values Chart



# User: Quad Student

Jodie is a quad resident who frequently takes classes in the SEC. They do not have a bike or scooter, and rely on PassioGo to get to and from class and extracurricular activities. When determining when to leave for class, they normally check the routes that go where they are trying to go to determine what time they should wake up and get ready for class. On weekends they have a more free schedule. They usually follow something along the lines of

**Schedule 1 (morning):**

- Get ready.
- Check the live shuttle tracker.
- Quickly eat breakfast.
- Board next possible Quad SEC Express.

**Schedule 2 (from River House):**

- Check the shuttle route schedule to determine which shuttle stop to go to.
- Walk to the shuttle, aiming to arrive at the shuttle stop 2-5 minutes in advance. Check the live tracker as needed.
- Board Shuttle.

| | | | |
|---|---|---|---|
| **Persona:** Jodie Kuo. *A quad resident who frequently takes classes in the SEC.*<br><br>**Scenario**<br>Jodie has an afternoon class in the SEC and must return to the Quad promptly afterwards. | | **User Expectations**<br>- App gives accurate and up-to-date information about when shuttles are arriving<br>- The shuttle leaves roughly at the scheduled time. | |
| **Phase 1**<br>Planning | **Phase 2**<br>Going to stop/Waiting | **Phase 3**<br>Boarding | **Phase 4**<br>Return Trip |
| **Doing**<br>Check live shuttle locations to see if there is a shuttle they can catch. | Walk to stop.<br>Check the live shuttle location and estimated arrival time. | Check the route.<br>Get on the shuttle if there is sufficient space. If not, walk :( | Leave class as soon as possible to get to shuttle. Check live tracker on PassioGo and confirm with route schedule. |
| **Thinking**<br>“It would be great if I could get to my destination on time.” and “How can I minimize my travel | “I hope it is not full. I’ll cry if it is,” and then “is it worth it to walk and be late or should I just skip?” | “Yay!!” | “This is very inefficient :( I wish people who were going to the Square did not take the Quad |

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| time” and “If I go earlier, I’ll have a better chance of getting a seat.” | | | SEC,”<br>“Why does it say the next shuttle is in over an hour 😡”<br>“Maybe I’ll just walk.” |
| **Feeling**<br>Anticipation | Anxious | Relief | Stress, annoyance, frustration |
| **Insights**<br>- Using the shuttle can act as a stressor<br>- Students cannot rely on shuttles to have space to board.<br>- Students are often distracted at the end of class because they want to get to their next destination. | | **Internal Ownership**<br>- UI Team: the live ETA should inform users of scheduled time during bus shift changes.<br>- UI Team and Bus Drivers: Report the capacity of buses so that students can change their schedule as necessary.<br>- Transportation Services: Number of buses can be increased during peak class times. | |

# Customer: Harvard University Transportation

Harvard Transportation provides safe, convenient, and reliable transportation throughout the Cambridge and Allston campuses. Harvard pays for PassioGo to accomplish this. PassioGo thinks it is sufficient for students to vaguely have the ability to get where they want, even if highly inconvenient. They do not care if it is inconvenient. They do not care if you live in the quad. As such there are multiple pain points that can upend even Harvard's goals and expectations. Let's look at how the adapted system would be able to handle an incident like a shuttle crashing into a burger restaurant (based off of previous events). This event can help us better understand how to handle possible delays or unforeseen circumstances, including traffic, accidents, and mechanical problems.

<table>
<tr><td colspan="2">Persona: Harvard Transportation<br><br>Scenario<br>A campus shuttle, operated under PassioGo tracking, crashes into a restaurant.</td><td colspan="2">User Expectations<br>- App gives accurate and up-to-date information about when shuttles are arriving<br>- The shuttle leaves roughly at the scheduled time.</td></tr>
<tr><td>Phase 1<br>Incident Occurs</td><td>Phase 2<br>Response Coordination</td><td>Phase 3<br>Communication</td><td>Phase 4<br>Service Continuity</td></tr>
<tr><td>Doing<br>Bus driver reports crash via in-app driver dashboard</td><td>Pushes out instant app notification of "Route X disrupted" to students</td><td>App shows rerouting options (MBTA integration + walking directions)</td><td>Deploy backup buses if possible</td></tr>
<tr><td>Thinking<br>"Are students safe?" and then "How bad is service disruption?"</td><td>"We need to keep riders informed in real-time."</td><td>"We can offer alternatives instead of leaving students stranded," and "We can't overrun the remaining shuttles."</td><td>"What can we do to minimize downtime?"</td></tr>
<tr><td>Feeling<br>Reassured by integrated reporting</td><td>Concerned</td><td>Reassured</td><td>Confident</td></tr>
<tr><td colspan="2">Insights<br>- How does the new app enable a more</td><td colspan="2">Internal Ownership<br>- Engineering Team: Implement</td></tr>
</table>

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|---|---|
| dynamic incident response protocol?<br>- How is multi-modal communication improved in unpredicted situations (crashes, traffic, etc.)? | adaptable technology that supports delays by notifying students and reporting real-time data.<br>- Engineering Team: Support incident reporting from bus drivers or students to inform delays. |