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4Ride Mobile: Business Proposal and Social Impact

**Project Overview**

In the heart of Washington DC, George Washington University is subject to many complex transportation issues. The university faces the challenge of having a mix of large, small, urban, and rural campuses across DC and Virginia. The unique demands that come with such diversified operations have prompted the university to establish a wide array of transportation services. GW supports intercampus transportation in the form of the VSTC and Vern Express, a number of student parking locations, and the campus 4Ride service. Every day thousands of students depend on these services as they commute to or within campus. As students drive one of the primary revenue streams of the university, it is in GW's best interest to make transportation as streamlined as possible. This business proposal seeks to optimize a number of inefficiencies in the campus 4Ride system. For one, students report many incidents in which their requested 4Ride does not show up. Whether because the request is not serviced or the student does not wait long enough, this presents a major headache that results from inadequate scheduling and communication.

As an alternative to the unreliable and antiquated web-based scheduling service, this business proposal seeks to create a mobile application framework with a more robust scheduling system and more effective communication between 4Ride drivers and their clients. The application takes two forms – a driver-facing interface and a client-facing interface. Capturing existing GPS feeds on 4Ride vehicles, a central dispatch server optimally matches client pickup requests to vehicles in order to reduce arrival and travel times.

The first component of this proposal, the 4Ride Mobile: Client application, will provide a clean and intuitive interface to students in contrast to the confusing layout of the existing web service interface. Using familiar UI principles, this application will present all critical functions within a single view. A full-screen map will lie beneath all menu items. These items will intelligently disappear and reappear, reflecting that a user will need access to different information and controls when he or she has issued a vehicle request. The application will allow a student to issue a request, view a map of all 4Ride vehicle locations, and view the location and driver information for their assigned vehicle.

The second component of this proposal, the 4Ride Mobile: Driver application, will further provide a clean and informative interface to 4Ride drivers. Maintaining the single-view concept, drivers

will be able to use the application hands-free for the majority of their routes. The application will display a real-time list of pickup and drop-off locations in the order they should be executed. If required, the driver will be able to override itinerary items to mitigate algorithmic inefficiencies. This interface will balance the full benefits of the scheduling algorithm with driver experience.

Lastly, the third component of this proposal is the central dispatch server. Both requests and cancellations issued from the client application will prompt a real-time scheduling recalculation on the server. The resulting assignments will then be pushed to all effected drivers and clients. For readability, the server will provide its own UI that actively plots vehicle routing data on a map. This will allow GW to actively monitor dispatching and analyze the impact of the scheduling algorithm.

Frequent communication between GW's Student Association and transportation division will be key to meeting the needs of the clients and drivers. Data analytics and simulations will be performed in partnership with GW Systems Engineering students to provide additional algorithmic reliability. Furthermore, understanding the existing organization of the system is pertinent to migrating existing services to a mobile application. This has resulted in an ongoing collaboration with the transportation division and GW IT services.

**Economic Potential**

Primarily, this business proposal targets an internal demand within George Washington University. The university is challenged by expansive and spread-out operations that require efficient transportation services. This business proposal first aims to offer a cheaper solution than outside vendors. The transportation department is aware of the inefficiencies in its current system, and it is currently considering both internal as well as third party options. Thus this product aims to differentiate itself primarily as a cost-cutting alternative to products offered by third party vendors, with development occurring in-house free of charge. However most of the savings will occur in the long term. This is due to the custom-tailored benefits of this business proposal. Third party vendors will charge a high initial cost for their products, but their real disadvantages over 4Ride mobile derive from long term limitations. Third parties only offer black box products, where the university will need to send all data to outside servers without benefiting from internal analytics. 4Ride Mobile will present solutions developed and tailored internally, which will best reflect the unique constraints of the university. These solutions will provide a knowledgebase that can then be applied to similar services such as the Vern Express or VSTC Express. With this portability, the university will save on additional contracts as it continues to expand.

Furthermore, this business proposal aims to offer increased revenue for the university. Since transportation services are heavily utilized by students, their efficiency influences the attractiveness of the university and thus impacts future cash flows. As an example, the inefficiency of the Vern Express system has lowered the appeal of the Mount Vernon Campus. This has effectively lowering the attractiveness of the campus to prospective students despite heavy investment by GW. A custom-tailored solution proposed by 4Ride Mobile will maximize the efficiency of transportation services and ensure the highest financial value of GW's spread-out operations. Moreover, GW's primary source of revenue is derived from its real estate business. Thus the liabilities on the university's balance sheet are primarily long term. These liabilities are largely offset by semiannual tuition payments. Thus the university runs a major risk from unforeseen revenue loses. This product helps to safeguard the university from potential tuition losses due to future expansion without adequate transportation infrastructure.

Although 4Ride Mobile will begin as an internal cost reduction initiative at GW, this product can be scaled up and offered in the marketplace. Many universities, both public and private, are undergoing similar expansionary initiatives as GW. This is largely due to the demand of education in the marketplace. As the United States and other countries continue to grow and place emphasis on education, the size of the market for efficient student transportation solutions is increasing. Colleges and their operations are continuing to grow across spread-out areas. In urban environments, the ability to grow a university is constrained by land availability, and often universities like New York University are forced to decentralize operations and rely on a network of transportation services. These schools are already looking into third party vendors to establish more reliable services. However, the options proposed by these vendors are currently inadequate. They rely on cutting edge data analytics that focus on factors such as traffic patterns, but are not producing scheduling solutions that best weigh the factors affecting a university campus. These vendors take products developed under generic requirements and sell them to universities that have more specific needs. The 4Ride Mobile initiative instead plans to develop a scheduling algorithm based on research and analytics customized for a university setting. Factors such as class times, library hours, and exam periods will weigh on the priority of vehicle routing.

As a more capable product, 4Ride Mobile will be able to target a growing demand in the higher education market. Another benefit to universities, the product is highly extendable. Although the development of client and driver iOS applications is part of this business proposal, the dispatch server and its corresponding scheduling framework will be the cornerstone of this project's value. The server will provide scheduling and dispatching through web service calls, which are compatible with any

internet-enabled device. Thus the framework is platform-independent and able to adapt to any new internet-enabled technology in the foreseeable future. Instead of developing another scheduling platform from scratch every time technology trends shift, only the mobile applications will need to be rewritten and adapted to the server's protocols. This drastically increases the value of this framework through the reduction of replacement costs down the road. Furthermore, the product will not be black-boxed as with those of third party vendors. Instead of sending data to be computed on outside servers, this product will be deployable internally. This will allow buyers to further refine the product for the needs of their institution.

After GW successfully implements and realizes the success of 4Ride Mobile, the university will act as a testament to the product's effectiveness as both a revenue booster through transportation efficiencies and a cost cutting measure compared to third party products. At this point the product can be successfully marketed for its benefits and placed on the market. Differentiation will be maintained as long as third party vendors continue to produce generic products. At the point when a viable competitor emerges, 4Ride Mobile will be highly valued and easily sold to maximize investor returns.

Nonetheless, there are risks associated with this business proposal. Although the cost of internal development is negligible for GW, the internal cost of maintenance for this product runs the risk of being higher than for products on the market. Further, if this product were pushed onto the larger market, the cost of running support services in the short term would likely be higher than for established firms. The magnitude of these costs will determine the returns to investors as well as the viability of the product. Additionally, the value of the product will be determined by effective advertising. As a product entering a saturated marketplace, conveying its value is key to its differentiation.

Despite this proposal's risks, I believe that this product is in a great position to succeed. First of all, GW has a better understanding of the demands in this market than any third party vendor. Further, I believe I have a better understanding of students expectations for the service than existing vendors. As a result, the resources proposed are the best suited for this type of product. Moreover, the proposed product is scalable, extendable, and low cost.

**Social Impact**

Aside from a cost cutting and revenue gaining opportunity, this initiative is also aimed at creating an all-around better product. At competitive prices, universities will be able to transfer these benefits to university students in the US and beyond. The increased efficiency of these services could also make decentralized universities more attractive to prospective students and decrease long term

costs, allowing universities to transfer some of these long-term gains to students in the form of overall decreased tuition or expanded scholarship programs. Placing a downward force on costs that are likely to increase with long-term expansion will help keep education affordable.

Furthermore, efficient transportation systems – especially in the case of 4Ride – will lead to safer college campuses. Currently, the ineffective system utilized by 4Ride has placed students in unsafe situations. First of all it is difficult to know if a vehicle has responded. As a result, students have to either wait at late hours until a vehicle request is serviced or walk home alone. 4Ride Mobile allows students to requests a vehicle and automatically receive feedback on the driver's name, phone number, and exact location. Students will be informed immediately if a driver is not coming without having to wonder why his or her vehicle did not show up. As a result, students will not be placed at risk due to the decentralization of college campuses. Statistically, this will offer the greatest benefit to young women living in large cities.

Lastly, the analytics obtained from this software can be used by university police departments. Falling in line with safety, this use would allow police to monitor travel patterns around campus. Increased traffic inflows onto campus would be of concern to police, allowing the department to better track the likelihood of an incident. Increased inflows could be correlated with crime rates in a given month or time of day. The access to location information could also allow police to better respond to an incident. The central dispatch server will have access to all student vehicle assignments and itineraries. Tracking travel could help find individuals on campus. Additionally knowing the locations of all transportation shuttles could help the department reroute students in the event of an emergency. Long term analytics could allow police to understand student behavior and prepare the department for surges in student-related incidents.

With access to a large amount of personal data, 4Ride Mobile also poses unethical risks. Those who have access to the information will be able to locate a large number of students at a given time. They will also have access to outside data feeds being used as factors in the scheduling algorithm, not all of which may be public. Lastly, students may have to enter personal credentials such as a school ID that will need to be authenticated on the server. Thus this information will also be accessible within the service. While 4Ride Mobile suffers from these risks, the nature of its implementation poses less risk than third party options. In the case of other software solutions, all data must be sent to private servers outside of the university. Thus the use of this personal data is no longer in the university's control. 4Ride Mobile implements its dispatch server internally, allowing schools like GW to isolate the data from outside parties.