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Park It! Essay

Introduction

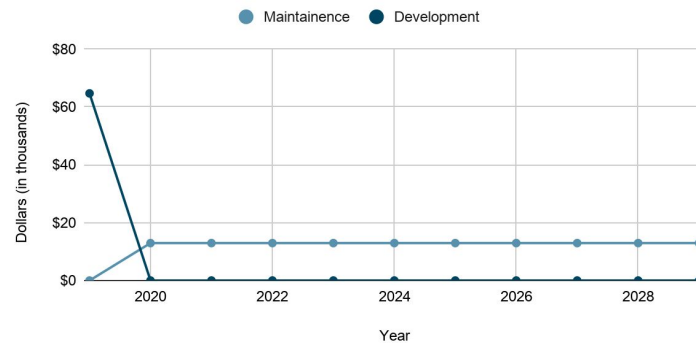
Park it! is an application that furthers the need in transportation by implementing advanced systems that enable open street parking spots to be detected. By creating a system that produces an easier and more accessible way to find consistent parking in busy places, we believe that it will enhance the overall driving experience. City parking information will be available in our app to help users avoid parking violations. Park It! will also show users the prices of nearby parking structures that have open parking spaces. Additionally, heat maps of city activity will be shown to help further enhance our user experience. These heat maps will be calculated based on the average number of drivers in specific locations throughout given time intervals. Park it! is more than just a way to find parking spots; it is also a full navigation system that interacts seamlessly with our parking technology. Our technology works by utilizing city cameras, user locations during parking, and user information to provide the most accurate information for which spots are open or taken. Also, ratings will be given for user accuracy on how long they will be in a parking spot. We believe that cities will allow Park It! to use their city cameras once they see the benefits our app will have on our economy and our environment. Our app will also create value for commercial drivers by providing the quickest routes to their destinations based on the heat maps of city activity. All users of Park It! will be offered our premium service, costing \$3.00 a month, which will offer no advertisements and enhanced customer support, or our baseline service, which will contain advertisements. Furthermore, a small priority is given to our premium users if parking is scarce to create a more exceptional experience for our premium users. With partnered companies, we will offer banner and location-based advertisements to create the best experience for our users and our partners. We will offer two programs for our partners. For our basic ad plan, we will show 1,000 people their ad per 2 dollars a month. For our premium ad plan, we will show 30,000 people their ad per 60 dollars a month. Also, partners for more significant ad purchases will have the opportunity to work directly with our personnel to find the perfect ad plan. Park it! is the next application in navigation that continues to innovate and provide the best user experience.

Costs

Our product will be very successful. We expect our estimated costs to be relatively low in comparison to other companies due to the low overhead of an application rather than a physical product. Our full cost structure can be viewed through the following bullet points:

Costs

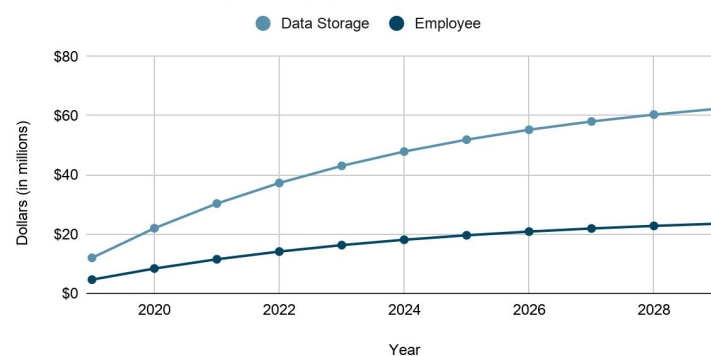
Comparison of Development and Maintenance Costs



- Maintenance Costs: Increasing
 - Our monthly development costs consist of app maintenance, map API fees, and data storage. We have estimated our app maintenance to be 20% of development costs. Map API fees stem from Google Maps (dynamic) API, which goes up in price in relation to the number of users. 0 - 100,000 users equates to about \$200 a month.
- Development Costs: Decreasing
 - The estimation for our application will cost about \$64,974 by looking at other similar companies' application costs and consulting an app development firm, Imaginovation, in order to get the most accurate information. In a more in-depth breakdown, we have estimated that the map and other API integrations will cost about 5000 dollars. Payment processing will cost 6000 dollars to integrate.

Costs

Comparison of Data Storage and Employee Costs










- Data Storage: Increasing
 - Data storage cost 20 cents per person per month, which was calculated by looking at other similar applications, such as Uber and Waze, and finding the average of their data storage costs and divided by their number of users to get the most accurate number.

- Employee Costs: Increasing
 - Initially, we will employ forty-two people, which is about one-quarter of the number of Waze employed at the start. About eighty-five percent of our workforce will be software engineers, seven percent marketing and media, two percent marketing and media managers, and five percent in-house counsels. We have estimated we will need one software developer per 138,889 people. Each software engineer will be paid \$107,375. We will start with three marketing and media employees, each making \$62,550. Based on similar companies, we will employ one marketing and media employee per 1,666,667 users. Our marketing and media manager will be paid \$148,137. We will have two in-house counsels with salaries of \$224,466. As we grow in size, the number of employees will increase proportionally.
 - The equation below represents the employee costs. This equation calculates the number of employees needed as our users increase, and multiplies that number by the salaries of each employee.

$$y = \left(\left(\frac{x}{138889} \right) \cdot 107375 \right) + \left(\left(\frac{x}{1666667} \right) \cdot 62580 \right) + \left(\left(\frac{x}{2500000} \right) \cdot 224466 \right) + 148137$$

Business Model Canvas

Business Model Canvas: TEAM Indebted and Alone

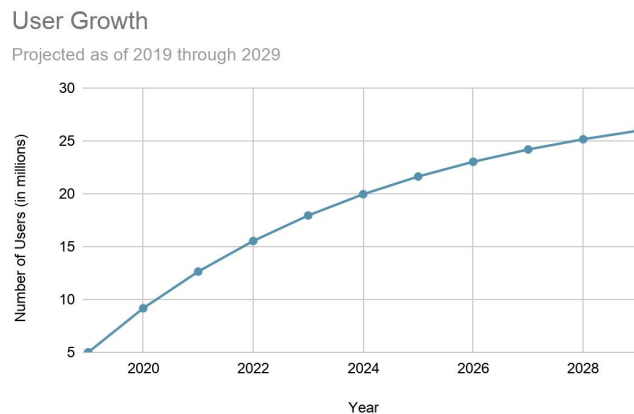
 Key Partners <ul style="list-style-type: none"> - App Store (Apple) and Google Play - The city we are operating in (approval to use cameras) - Google Maps 	 Key Activities <ul style="list-style-type: none"> - Finding open parking spaces - Showing live updated hot maps of the city - Navigation 	 Value Propositions <ul style="list-style-type: none"> - Free method of finding street parking in big cities - A "hot map" of what parts of the city are busy at what times (the network effect) - Gives users information on city ordinances pertaining to parking time and no park zones - User will also have access to navigation services. - Shows location of parking strutures 	 Customer Relationships <ul style="list-style-type: none"> - Park It! provides users with 24/7 access to our helpful automated customer service - Premium members gain access to our customer service call center - Feedback services are provided to every member through the in-app menu 	 Customer Segments <ul style="list-style-type: none"> - Causal drivers - Tourists - City Population - Commercial Drivers
 Cost Structure <ul style="list-style-type: none"> - Fixed: servers, corporate offices, and employees (data scientists, software developers, data analysts, etc.) Variable: servicing the app, managing the data, data storage, wages, etc. 			 Revenue Streams <ul style="list-style-type: none"> - Ads (banner adds based on user location) - Premium account upgrade (no more ads, better feedback, AI chat customer support) 	

Park It! is navigation that differentiates us from our competition through its innovative parking system and many other benefits. The integration of navigation and parking into one place creates a great incentive for consumers to switch from another similar navigation system to ours. Furthermore, with our live hot maps of increased activity in the city and city parking

regulations in specific areas, it diversifies our application into more than just a parking and navigation system, which extends the app's potential market as a whole. Also, we will have a marketing team that will help our app get in the hands of more users.

User Growth Model and Revenues

User growth exists represented as the equation $y = x^{1/3} + (x + 10,000,000)^{1/2}$. The reason for this being that the cube root function represented as the $x^{1/3}$ at the beginning of the equation provides reasonable assumptions for user growth over time as represented in the graph below.



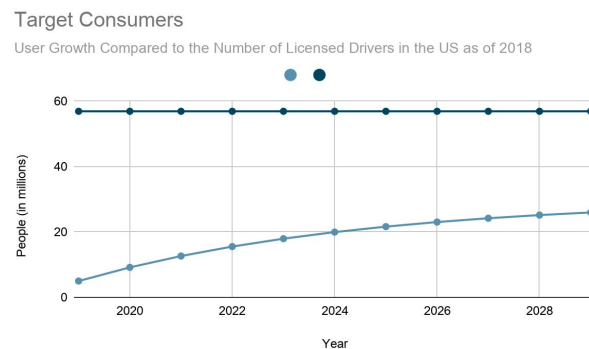
For the base number of 10,000,000 users existing as the only presented non-variable in the equation, the number derives from the fact that Waze, an app with similar construction, compiled a total of 20,000,000 users within its first year. The reason for the user growth projection model using half of the number that Waze had is because Waze exists as an outlier for app growth expectations within the first year of app implementation. The graph's vertical axis represented as the number of users (in the millions) begins at 5 because there is no value on the graph lower than that, the absolute minimum value represented in the projected user growth model. The growth depicted on the graph remains highly probable as in any simulation, the amount of growth over time begins to slow, evident by the data table below, which depicts the number of users in direct relation to the year.

Year	Number of Users
2019	5,000,000
2020	9,166,667
2021	12,638,889
2022	15,532,407
2023	17,943,673
2024	19,953,061
2025	21,627,551

2026	23,022,959
2027	24,185,799
2028	25,154,833
2029	25,962,360

Target consumers represent a different facet of user growth represented as the goal for what user growth will attempt to accomplish. As of 2018, the number of drivers in the U.S. was 227.5 million; however, for the purposes of the target consumers, we chose to assume that an attainable goal would be a quarter of the drivers in the U.S. (56,875,000 people) would constitute an attainable goal as depicted below.

Ad Revenue



Ad revenue represents one half of the revenue income within the ten-year projections. The projections for ad revenue come from Waze, an app of similar construction, charges \$2 per day per ad spend to reach the annual numbers which would be \$24 per 1000 people annually; therefore, the calculations work per user on a basis of 1000 users meaning that annual ad revenue remains dependent on the number of users in direct relation to the user growth model. The equation representing as $y = \$19.2 \left(\frac{x}{1000} \right) \times z$ where x represents the number of users and z the number of entities or firms that utilize the ad service. For the purposes of the projections, the assumption is made that 200 entities would advertise on our service at any given time for the duration of the ten-year sample. The table below illustrates the ad revenue displaying the Ads per year, ads per entity per year, and the annual revenue from ads in a total of 200 firms or entities.

Ad Revenue		
ads per year	ads per entity per year	Annual Ad Revenue
25,915,000,000.00	129,575,000.00	\$19,200,000.00
47,510,833,455.00	237,554,167.00	\$35,200,000.00
65,507,361,030.00	327,536,805.00	\$48,533,333.33
80,504,467,525.00	402,522,338.00	\$59,644,444.44
93,002,056,210.00	465,010,281.00	\$68,903,703.70
103,416,713,630.00	517,083,568.00	\$76,619,753.09

112,095,594,570.00	560,477,973.00	\$83,049,794.24
119,327,995,475.00	596,639,977.00	\$88,408,161.87
125,354,996,290.00	626,774,981.00	\$92,873,468.22
130,377,497,030.00	651,887,485.00	\$96,594,556.85
134,562,914,070.00	672,814,570.00	\$99,695,464.04

The data from the table can be represented as adapted data on average car rides. The average car travel per day is 55 minutes per person. The average commute to work is 26.6 minutes. A person is expected to use Park It! 28.4 minutes per day (the difference between the amount of driving in a day and the commute to work). If there is one ad every 2 minutes then that leaves 14.2 ads available per person per day.

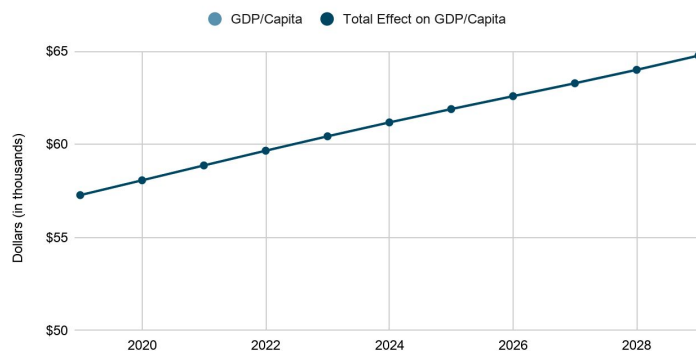
Subscription Revenue

As the projections for subscription exist as a 20% projection per year these ads only represent 80% of the total users as the “premium” feature of the app removes all ads from the service as one of its perks as described above. Thus as the amount of users shifts from year to year, the amount of revenue pulled in from subscription to the premium services increases in tandem. The graph representing revenue comparison below showcases both sources of revenue as parts of the whole revenue model as depicted in the macro model where ad revenue represents a larger portion of the overall revenue by a very small margin.

Time Series Graphs

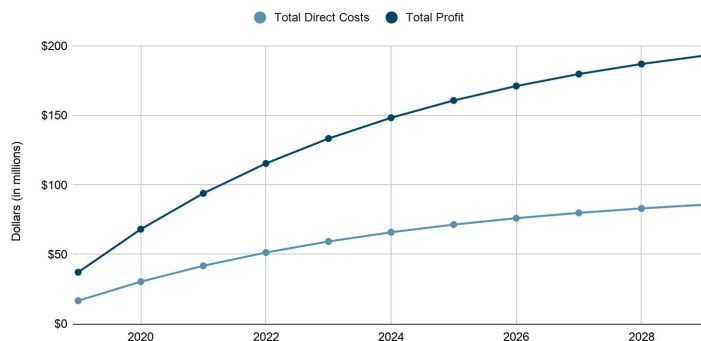
Macroeffect

Effects on the economy depicted from unintended benefits



Ten Year Projection (Micromodel)

Projections based on Total costs and total profits to show gains over a ten year period



Total Direct Costs	Total Profit	Total Unintended per Capita	Total Effect on the Economy	Total Effect on GDP/Capita
\$16,714,919.00	\$37,200,000.00	\$3.13	\$1,072,200,000.00	\$57,276.26
\$29,592,011.26	\$68,200,000.00	\$5.70	\$1,965,700,000.00	\$58,072.46
\$40,740,092.42	\$94,033,333.33	\$7.81	\$2,710,283,333.33	\$58,872.32
\$50,030,160.05	\$115,561,111.11	\$9.53	\$3,330,769,444.44	\$59,664.47
\$57,771,883.08	\$133,500,925.93	\$10.94	\$3,847,841,203.70	\$60,437.93
\$64,223,318.94	\$148,450,771.60	\$12.08	\$4,278,734,336.42	\$61,184.33
\$69,599,515.49	\$160,908,976.34	\$13.01	\$4,637,811,947.02	\$61,900.45
\$74,079,679.27	\$171,290,813.61	\$13.75	\$4,937,043,289.18	\$62,594.30
\$77,813,149.10	\$179,942,344.68	\$14.36	\$5,186,402,740.98	\$63,288.22
\$80,924,373.95	\$187,151,953.90	\$14.84	\$5,394,202,284.15	\$64,009.94
\$83,517,061.33	\$193,159,961.58	\$15.22	\$5,567,368,570.13	\$64,773.23

The time series graphs are our estimations and predictions of our profits and costs, which show how our product will do over the course of the next ten years. Of course, these numbers and graphs are only estimations but have been meticulously researched to be as accurate as possible. As our application continues to grow, all of our predicted costs steadily increase. A similar trend can be seen with our predicted revenues as well.

Methods of Estimation

- Costs
 - The estimation for our application will cost about \$64,974 which stems from various sources. We have estimated our app maintenance to be 20% of development costs along with different API fees. For more information on tasks see pages 2 and 3.
- User Growth
 - User growth is estimated using the equation $y = x^{1/3} + (x + 10,000,000)^{1/2}$ as it illustrates the model of growth expected for the number of users perfectly because the function naturally plateaus as it moves across time as seen in the User Growth model graph above (see page 8).
- Revenues
 - Revenues are directly correlated to the number of users as ad and subscription revenue work based on user data. For ad revenue, the assumption is that 80% will not purchase the premium membership and therefore have ads and the assumption remains that 200 entities and firms will advertise on the app at any time. For subscription revenue, the revenue intake is projected as 20% of users will be charged y (\$3 per month) making the projected subscription revenue usable.
- Spillovers
 - Our users will have their time spent trying to find a parking spot reduced by an average of sixty percent. The average driver will save \$207 a year on time, fuel,

and emissions costs. Once tied to our user growth rate, this gives an estimate for how much money in total we are saving our users per year.

Spillovers

One of the most significant unintended effects our app has is reducing the time it takes people to park, reducing the amount of gas burned, which simultaneously reduces the amount of pollution. According to a study performed by INTRIX, the average US driver spends 17 hours each year finding parking. Parking costs \$345 per driver per year on wasted fuel, time, and emissions. With our app, we estimate that we can reduce this by sixty percent, saving sixty percent of \$345 per driver per year. In big cities such as New York, drivers spend an average of 107 hours on parking and waste an average of \$2,243 per driver per year. Meaning at most, a driver will save \$1,345.80, and overall, drivers will save an average of \$207 across the US who are using our app. Our model used the data from INTRIX and multiplied the average amount saved by our growing number of users to find the average amount of money saved per year for our users. We then divided this number by the population to determine how much-unintended value our app adds to the economy per person. One other theoretical spillover is the reduction in people paying to park in parking structures. However, we think that most people using our app's parking feature will be the average person who would not usually park in a dedicated structure. Due to the reasons stated, we believe Park It! will have little to no effect on the number of people paying to use parking structures. Our users who would typically park in a structure would likely use our app only for our maps and directions feature.

Policies

Policy affecting Park It! mainly seeks to appeal to the potential customer segments and expand the number of users based on parking availability. One instance which exemplifies this perfectly would be offering subsidies in which the main qualifiers would be those who show a massive decrease in gas usage; furthermore benefiting Park It!, because it will increase the number of people wanting to not waste gas in the hopes of qualifying for a tax subsidy that benefits them. Also, raising gas taxes decreases the amount of gas someone would want to waste, thus increasing the probability of them turning to an app that would help their car not be idle while finding parking. Lastly, city and state policy and regulation limiting the number of hours in which parking must be paid for or metered would increase the number of people utilizing street or public access parking therefore an app like Park It! that aims to support and utilize public, free parking would become more commonly used. Overall, policy supporting Park It! remain centered on the idea of increasing a potential user's want to decrease gas usage by not having to leave their car idle and public parking availability increasing in a way that provides public, free parking.

Conclusion

Our app will have many positive effects on the economy. Parking in big cities can be expensive and time-consuming. Our innovation will not only help users find parking spaces quickly; it will also provide our users with directions, real-time traffic updates, and the fastest route to their destination. For commercial users, our app will enable companies that focus on driving to minimize the time wasted by driving in traffic, reducing gas costs, and reducing the negative effects of pollution. Users of Park It! will save time, money, gas, and reduce the adverse effects of fuel emissions on our planet. In addition, we will add a large amount of economic activity through our advertisements, our premium subscription costs, and the creation of new jobs. Our projected growth model estimates that we will add over fifteen dollars in value per person by the end of ten years. We believe that Park It! will create enormous value for our users, investors, and our planet as we reduce the amount of time, money, gas, and emissions wasted on parking.

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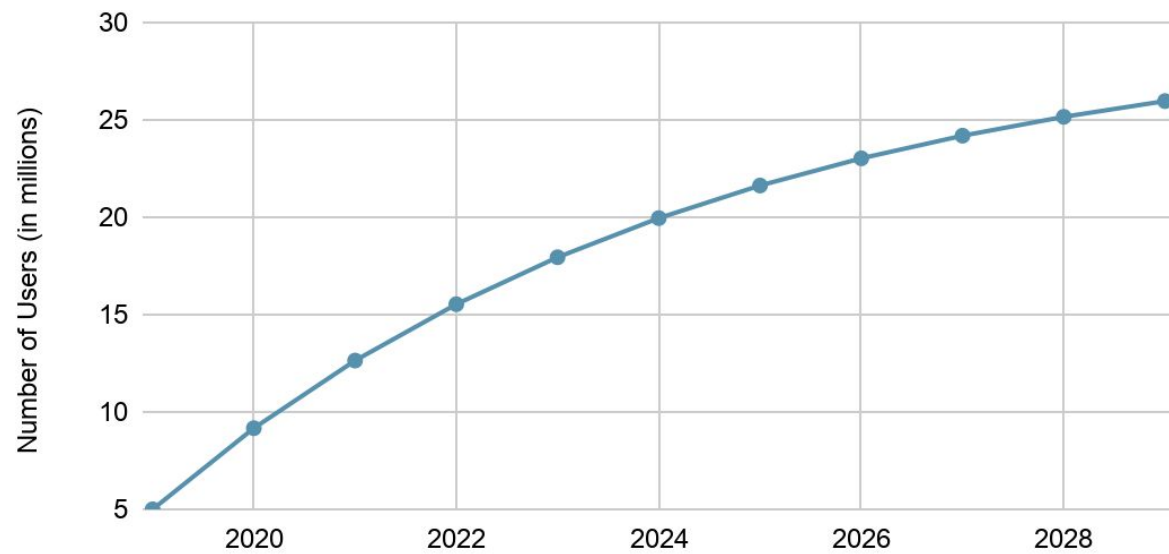
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Figures

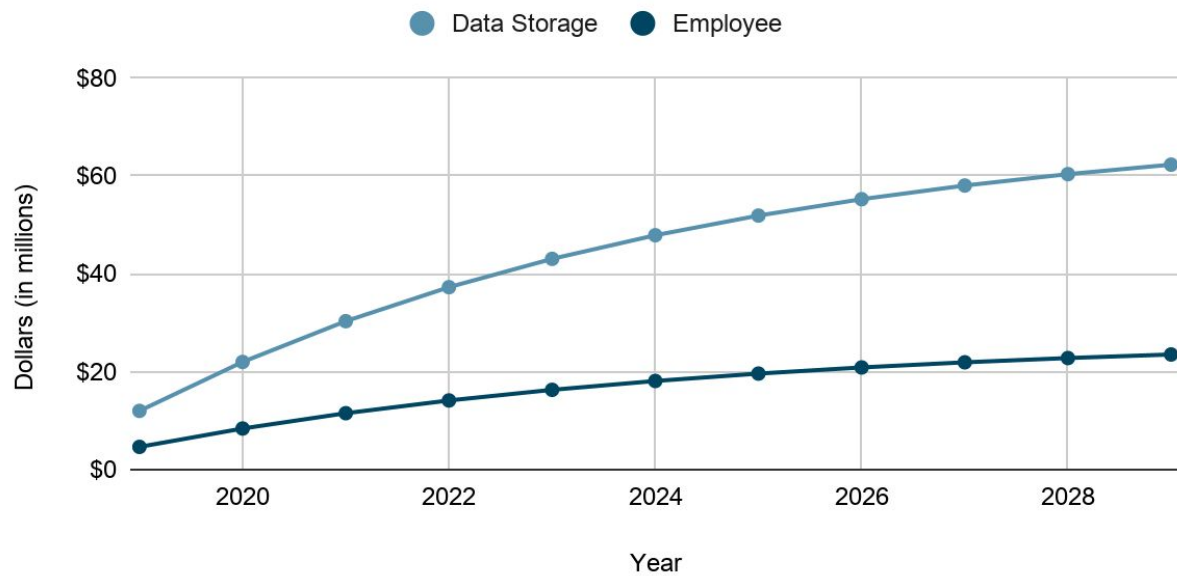
User Growth

Projected as of 2019 through 2029



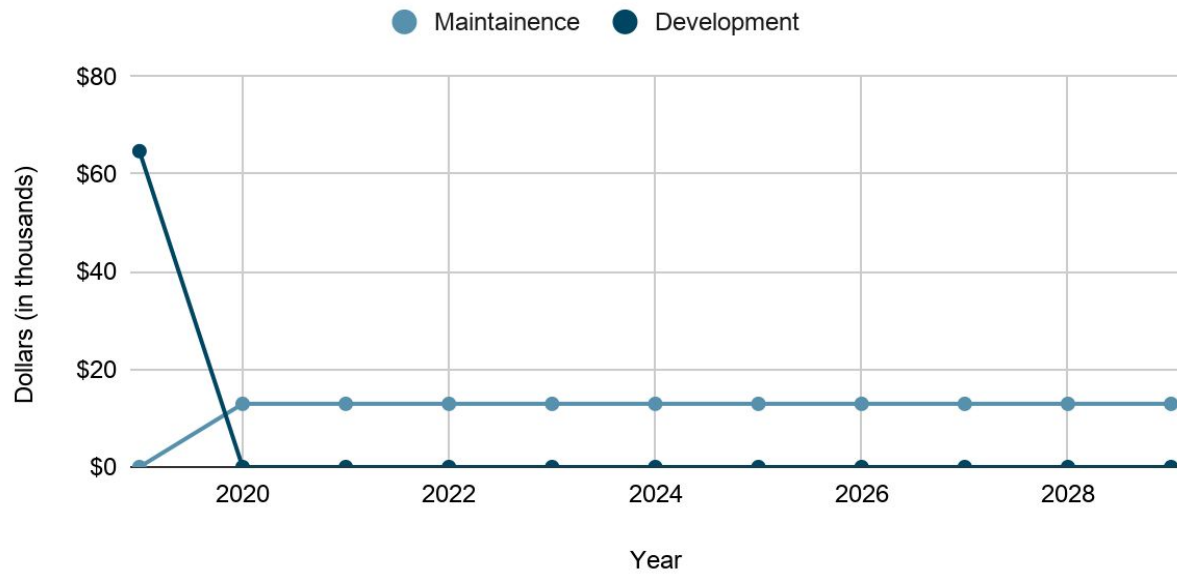
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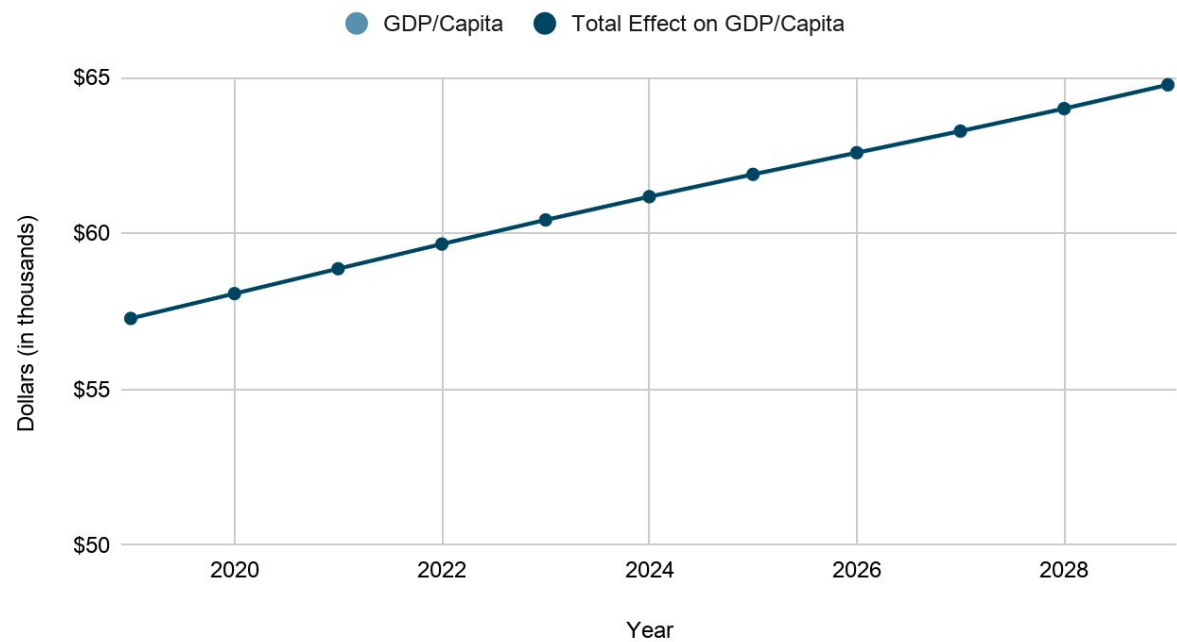
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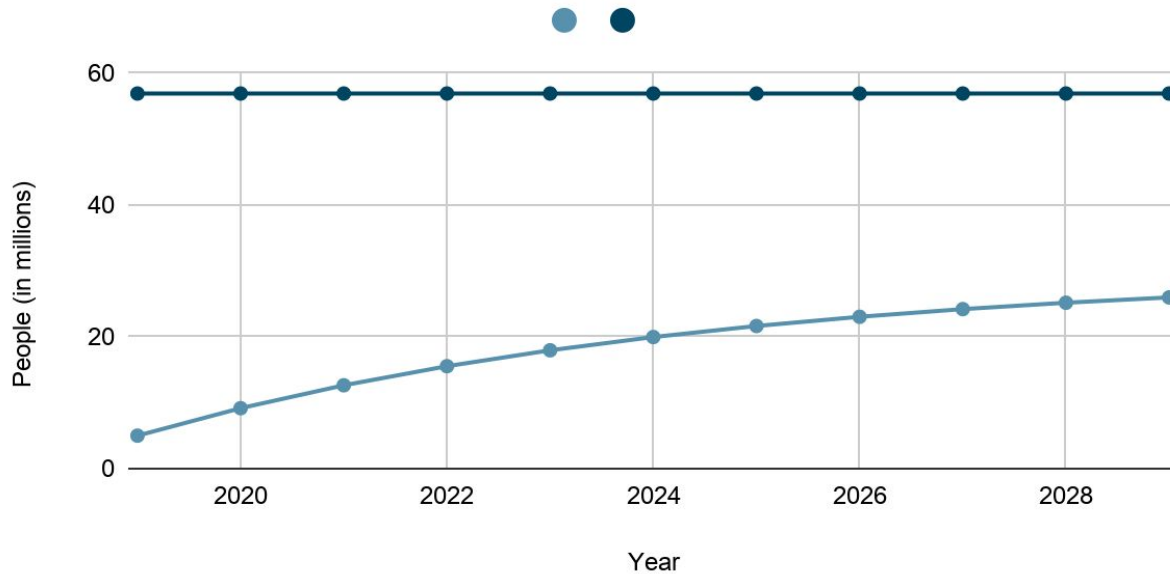
Macroeffect

Effects on the economy depicted from unintended benefits



Target Consumers

User Growth Compared to the Number of Licensed Drivers in the US as of 2018



Business Model Canvas: TEAM Indebted and Alone

