

## Needs and Requirements for Backtrack: Vehicle Tracking Device

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### Team 7

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Customer: Peramuda Bandara

## Introduction

Our customer, Peramuda Bandara, posted a desire for an inexpensive vehicle-tracking device that could monitor speed, location, and route in real time, accessible from most commercially successful modern operating systems. Our team, representing persons skilled in computer science, computer engineering, and electrical engineering, found this project fitting our skillsets and interests, and met with Peramuda Bandara to discuss exactly what his desire for this vehicle-tracking device would be. In regard to the hardware of the device, he indicated he wanted the device to be portable and easily hidden, that is to say around the size of a cell phone, dark, and to be placed inside the vehicle. He also indicated that this device should be durable in regards to weather and shock. Finally, he indicated there must be an LED indicator that displays whether the device is on or off, as well as giving battery information. In regards to software, he indicated he needed to see speed, location, and route in real time, as well as past route location stored back at least one month. He indicated that he needed the software to be compatible with most modern versions of Windows and OS X, installed using an included CD. This software can keep track of multiple vehicle trackers attached to an account. After discussing our customer's needs, our team developed this list of requirements.

## Vehicle Tracker Requirements

### 1. Hardware

- 1.1. The device must be easily hidden.
  - 1.1.1. The device must be no larger in dimension than 6" x 3" x 1".
  - 1.1.2. The device must have black.
- 1.2. The device must be portable.
  - 1.2.1. The device must weigh no more than 150 grams.
  - 1.2.2. The device must have the ability to charge using a mini-USB.
- 1.3. The device must be durable.
  - 1.3.1. The device must survive a five foot fall.
  - 1.3.2. The device must be temperature resistant.
    - 1.3.2.1. Device must function to 120°F (approx. 50°C).
    - 1.3.2.2. Device must function to -20°F (approx. -28°C).
- 1.4. The device must be able to communicate with GPS system.
- 1.5. The device must have a retail price of under \$150.

### 2. Software

- 2.1. The software must be compatible with most modern Windows and Mac OS X Operating Systems.
  - 2.1.2. The software must be compatible with Windows 7.
  - 2.1.3. The software must be compatible with Windows 8.
  - 2.1.4. The software must be compatible with Mac OS X 10.5.
  - 2.1.5. The software must be compatible with Mac OS X 10.6.
  - 2.1.6. The software must be compatible with Mac OS X 10.7.
  - 2.1.7. The software must be compatible with Mac OS X 10.8.
  - 2.1.8. The software must be compatible with Mac OS X 10.9.
  - 2.1.9. The software must be compatible with Mac OS X 10.10.
- 2.2. The software must have an account system.
  - 2.2.1. The account system must allow the registration of multiple devices.
    - 2.2.1.1. Device must be manually registered through key ID system.
  - 2.2.2. The software must allow the customer to change home location.
- 2.3. The software must be installed via CD-ROM or through an internet link.
- 2.4. The software must be able to communicate with GPS system (reference requirement 1.4).

### 3. Functionality

- 3.1. The device must turn on when power toggle is activated while not operating.
  - 3.1.1. The LED on the device must turn light on.
- 3.2. The device must turn off when power toggle is activated while operating.
  - 3.2.1. The LED on the device must be unlit.
- 3.3. The device must give customer information about battery life.

- 3.3.1. The LED on the device must shine green when battery is at 20% or higher.
  - 3.3.2. The LED on the device must shine red when battery is lower than 20%.
- 3.4. The device must relay information to the customer's account in real time.
  - 3.4.1. The device must record speed to the nearest fifth whole number.
  - 3.4.2. The device must record location to the nearest 10 meters.
  - 3.4.3. The account must record the vehicle's route tracing back one month.
- 4. Views
  - 4.1. The software must display all devices that are being tracked.
  - 4.2. The software must display the speed of the vehicle (reference requirement 3.4.1).
  - 4.3. The software must display the location of the vehicle (reference requirement 3.4.2).
  - 4.4. The software must display the route of the vehicle (reference requirement 3.4.3).
    - 4.4.1. The route must be displayed in real-time.
    - 4.4.2. The entire route must be displayed from time A to time B
      - 4.4.2.1. Time will be formatted date and time to the minute.

## Need

Peramuda Bandara approached us primarily to address the market for an individual looking to track a vehicle in case of theft or family security; our initial focus was on filling this need. The device will be cheaper and easier to configure than what is currently available on the market, and will feed real time information to the user that will help deter theft or vehicle misuse. The month history on the device will have the added benefit of helping the user find a thief's home or other point of interest, even if the thief just visits the location once. This device can also track teenage family members with newfound freedom to ensure proper regard to their new responsibility. In addition, a family could track any number of vehicles they needed to from one central software program, allowing ease of use.

Despite its primary use addressing the individual customer market, the applications of this product could certainly benefit a wider range of customers. Any business maintaining a fleet of vehicles would benefit from having current information on where their vehicles currently are, as well as where they have been, when reviewing driver productivity. This information could help law enforcement, as a director could instantly know via the software where the closest responder to an incident is and plan reaction accordingly.

### Summary

Our team set out to fulfill Peramuda Bandara's desire for a vehicle-tracking device primarily used in the private sector. Our primary goals were real time feedback regarding speed, location, and route implemented with a portable, durable device that is easily accessible to modern computer operating systems. Our requirements list addresses hardware, software, functionality, and viewpoints necessary to begin work on developing an actual product that will adopt our primary goals. Our team believes that the market would embrace an inexpensive vehicle tracker with the versatility presented by our requirements; we also believe the applications for this product will transcend the private sector and be applicable in with larger businesses and law enforcement due to its scalable operation ability. We are thankful for the opportunity to design this product, and feel its application will provide a solid return on any investment endeared to it.

### Customer's Agreement

I, \_\_\_\_\_, approve of the list of requirements and vision for this project as laid out by team 7. I understand all intellectual property developed or implemented by team 7 is owned by team 7 and I do not assume ownership over the final product; however, my ideas and insights will be fully respected and the project will fulfill my requests.

Customer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Team Leader Signature: \_\_\_\_\_ Date: \_\_\_\_\_