Design Proposal Template:

School: <u>Alta Vista Early College High School</u> State: <u>New Mexico</u> Division: Middle School or <mark>High School</mark>

Team Members' Names: <u>Rogelio Betancourt, Adelynn Gamboa, David Garcia, Elianna Sanchez</u>

<u>**Project Title:**</u> Readers should have a general sense for what the project is about and want to read more. (20 word maximum)

WiiTrack: Your Key to Tracking and Recovering Stolen Vehicles.

<u>**Inequity Being Addressed:**</u> Describe the inequity that you will attempt to address with your proposed solution, and why you chose this inequity. Students are able to consider a global perspective related to their inequity. (75 word maximum)

Our prototype supports U.N. Goal 16.4 by enabling the recovery of stolen vehicles, which affects communities both locally and globally, especially in underserved areas. We were inspired to develop WiiTrack after observing frequent reports of vehicle theft in low-income communities such as Las Cruces, NM. WiiTrack is designed to reduce vehicle theft, a significant global issue that results in approximately 750,000 vehicles being stolen each year worldwide due to inadequate security technology.

<u>**Community Research and User Identification:**</u> Explain the process used to identify the inequity and select your user. Include any research done to identify issues in your community and understand which groups face challenges because of these issues. (150 word maximum)

To identify this inequity, we analyzed local crime data and police reports, which revealed that auto thefts in Las Cruces had tripled over three years, reaching 939 stolen vehicles in 2024. Of 390 U.S. cities with more than 100,000 residents, Las Cruces ranked 18th for auto theft rates. Further research showed that low-income residents were affected due to limited access to security technology, making their vehicles targets. Additionally, Hyundai and Kia models were frequently stolen because they lacked security technology that would prevent theft, with 70 Hyundai and 38 Kia thefts in 2024. Recognizing these vulnerabilities, we focused on users like Hailie and Helene, two college students whose vehicles were stolen due to inadequate security features. Their experiences highlight the inequity: financial barriers prevent many community members from protecting their assets, demonstrating the need for accessible security solutions that align with the U.N. goal of asset protection.

User Profile: Provide a detailed description of your selected user. Include information about challenges they face, how those challenges impact their lives, and specific project needs based on user feedback. (150 word maximum)

Our selected users are Hailie and Helene, college students attending New Mexico State University in Las Cruces, who have both experienced car theft while owning Hyundai vehicles. They expressed frustration, saying, "It's heartbreaking that some people may never recover the vehicles they worked so hard for." This experience has left them feeling unsafe and constantly worried about their vehicles being stolen again. Like many students and low-income individuals, they cannot afford expensive security systems, car repairs, or a different car, making them vulnerable.

Based on their feedback and additional research, we identified key project needs:

1. **GPS Tracking:** Accurately detects and provides real-time vehicle location.
2. **Security Alerts:** Instantly notifies users when a break-in occurs.
3. **Accuracy:** Reduces false notifications to avoid unnecessary stress.
4. **User-Friendly Interface:** Ensures an intuitive and simple app experience.
5. **Easy Installation:** The device should be simple to install with minimal assistance.
6. **Affordability:** Keeps costs low to make security accessible.

Project Goals: List your project goals and explain how these goals will address the inequity. Project goals should define the desired outcomes, not specific features of the proposed solution. (150 word maximum)

Our project goals are to:

1. **Increase deterrence of vehicle theft** by ensuring that thieves are discouraged through an immediate, loud alarm from a buzzer integrated into the vehicle.
2. **Enhance the ability of vehicle owners to respond quickly** to theft attempts by sending an immediate notification to their smartphones, significantly improving the likelihood of intervention and prevention.
3. **Improve recovery rates of stolen vehicles** by enabling continuous real-time GPS tracking, providing accurate location data accessible to both owners and, with the user's consent, local law enforcement agencies to assist in recovery.
4. **Create a greater sense of safety and trust** within underserved communities by offering an affordable, accessible, and reliable security solution that allows residents to better protect their vehicles and reduce inequities in access to advanced theft-prevention technologies.

Together, these outcomes aim to substantially decrease vehicle theft, improve recovery rates, and promote community safety, equity, and peace of mind for all users.

Proposed Solution: Describe your proposed solution, including any innovative and unique features, and explain how this solution will address your users' needs and the inequity they face. (150 word maximum)
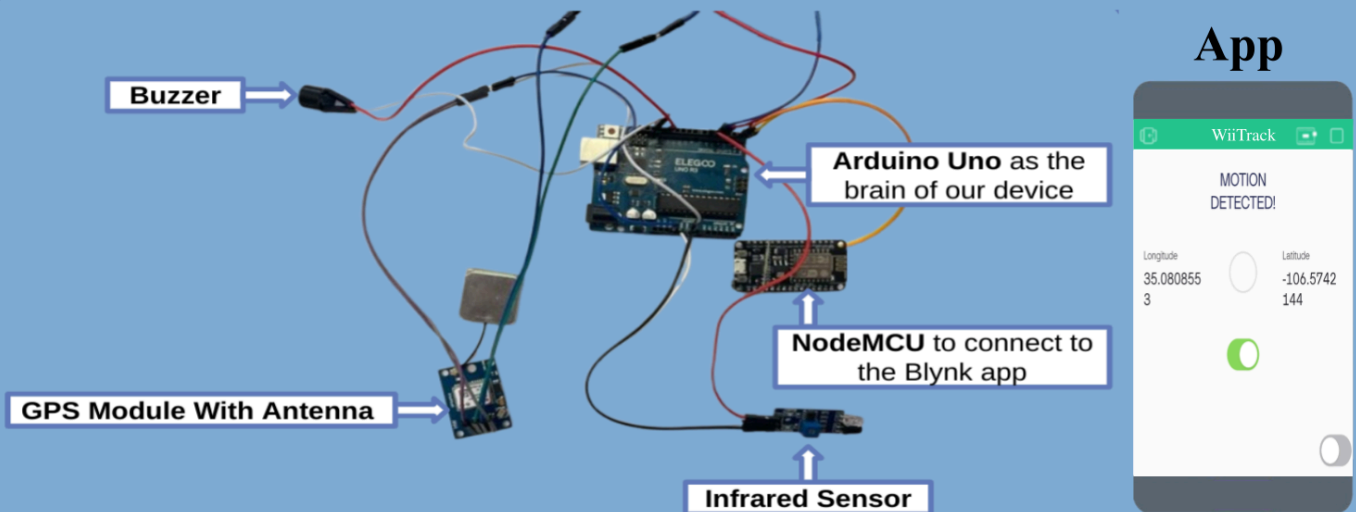
Our proposed solution is designed to address our users' needs by combining advanced detection, deterrence, and recovery capabilities, addressing the inequity that low-income individuals face in keeping their vehicles safe.

Upon detecting a break-in, WiiTrack triggers a loud alarm to deter thieves while instantly notifying the owner through a mobile app. Simultaneously, it activates GPS tracking, providing real-time location data to capture evidence of the theft. For enhanced recovery, the system offers the option to notify local law enforcement, sharing live GPS coordinates to expedite vehicle retrieval.
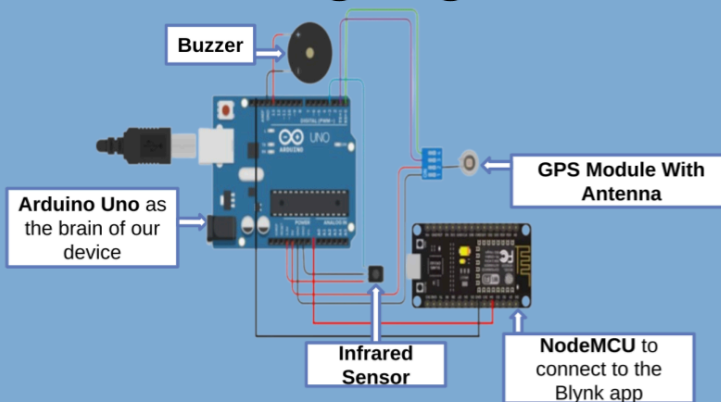
Compared to other systems, WiiTrack is innovative because it accurately detects vehicle theft, provides instant notifications, and offers real-time tracking. A pre-installed car alarm will only attract attention from other people, and an AirTag will only alert the user to the vehicle's location. This may not be as effective as WiiTrack, which combines features and creates an innovative solution to an important problem.

Initial Design: A single graphic of your first design idea with key features adequately labeled. It should be easy to understand and the reader should have a general understanding of how the prototype functions by looking at the graphic. Max size 8.5" x 11"

Prototype and Prototype Detail

App

Buzzer

Arduino Uno as the brain of our device

NodeMCU to connect to the Blynk app

GPS Module With Antenna

Infrared Sensor

WiiTrack

MOTION DETECTED!

Longitude
35.080855
3

Latitude
-106.5742
144

Wiring Diagram

Buzzer

Arduino Uno as the brain of our device

Infrared Sensor

GPS Module With Antenna

NodeMCU to connect to the Blynk app

Device On a Car

Infrared Sensor

Rest of components hidden on dashboard