The Project Kabar (to Keep and Bear Arms Responsibly)

Aims and Objectives

- Reduce the frequency of mass school shootings
- Obstructing the flow of stolen firearms into the black market
- Bring firearm owners and gun control advocates together

Imagine

Imagine the firearms used in a school were traced to Fort Braggs. Imagine the gun that killed a seven year old girl caught in the crossfire of a driveby shooting was stolen from a police precinct. Imagine firearms used in a mass shooting at a shopping mall were stolen from an ATF facility. The fallout from any of these events would be unimaginable.

To prevent the unimaginable, law enforcement agencies and the US military use radio frequency identification (RFID), real-time locating systems (RTLS), and GPS tags to track their weapons 24/7.

Now imagine that the firearm used in the Oxford shooting was tracked, and the parents were notified by an app on their phone that the firearm had been moved and the app allowed law enforcement to track the firearm in real time. The possibility exists that in the future such tragedies will become, once again, unimaginable. The possibility also exists that firearms stolen from gun stores and private homes can be recovered within hours, prior to migrating into the blackmarket and taking innocent lives.

Overview

- Asset tracking and management system providers such as [Williams Software Associates](#) and [Vizinex](#) offer a hybrid solution of radio frequency identification (RFID), real-time locating systems (RTLS), and GPS tags to allow the Army, Air Force, Navy, Marines, DEA, and Law Enforcement to track their multitude of weapons 24/7.

- Additionally, these systems enable automatic alerts if the gun enters/exits geozones, if the gun is moving/stationary at pre-set times, if the SOS button has been pressed, and if the gun is fired.

- Several school shootings, including the recent tragedy in Michigan, often occur because gun owners are unaware that their firearms have been accessed without their permission. Stolen firearms, even those kept securely, migrate to the black market where their illicit use contributes to gun violence and taking of innocent lives.

- The availability of tracking technology for civilian firearm owners could significantly reduce the frequency of school shootings while impeding the flow of guns to the black market.

- While the infrastructure costs of the tracking systems used by military and government agencies are prohibitive for civilian use, existing bluetooth trackers such as [Apple AirTags,](#) [Samsung SmartTags,](#) and [Tile trackers](#) present a cost-effective solution for civilian use.

- Including gun owners in the solution is likely to face court challenges or other forms of resistance.

Solution

Introduction

Among our motivations for moving forward with this project is the frequency of school shootings, including the recent tragedy in Michigan, which often occurs, unfortunately, because gun owners are unaware that their firearms have been accessed without their permission. We hope that empowering gun owners with the real-time tracking of their firearm assets will provide a solution to reducing the frequency of school shootings while protecting the rights of lawful, responsible gun owners.

Gun owners are not heartless villains, and no gun owner ever wants his/her firearm to be misused in the taking of innocent life. We further hope this technology will stymie gun theft and improve recovery efforts of stolen firearm assets, providing security to both gun owners and gun control advocates that these firearms will never be misused in such a way.

Background

[Williams Software Associates](#), also known as SmarTrack Agile Asset Tracking and Management, is a full-service custom software development shop specializing in U.S. Government and Law Enforcement asset tracking and management systems. Their SmarTrack Global Asset Tracking system is designed specifically for tracking and managing assets, locally and globally, using a hybrid solution of radio frequency identification (RFID), real-time locating systems (RTLS), and GPS tags.

SmarTrack is a fully automated, electronic information software application and database asset visibility management system, specializing in commercial, government, and military environments. SmarTrack comes in versions for Army, Air Force, Navy, Marines, Advanced Maintenance Operations, DEA, Law Enforcement, and warehouse versions. All versions include the use of optional RFID tagging, GPS tracking, and RTLS tracking in addition to alerts such as SOS, gun firing, rail tamper.

We discussed the possibility of providing this technology to civilian firearm owners with a representative from [Vizinex](#), the manufacturer of the Sentry 2607 and Sentry 2505 RFID technology that Williams employs at [Fort Bragg.](#) He explained that the fixed cost of infrastructure when spread across several weapons units is cost effective but that the same cost associated with a small number of weapons for a single civilian owner would be cost prohibitive. He also shared that existing bluetooth tracking technology could provide a solution for civilian firearm owners and that the tracking infrastructure is presently in place. Having explored this option, we share our findings below.

Present Scenario - Bluetooth Tracking Technology

Technology

Existing bluetooth trackers – which include [Apple AirTags,](#) [Samsung SmartTags](#), and several [Tile trackers](#) – communicate with bluetooth enabled devices to map their location. Hence, they communicate, not in absolute real-time like GPS, but, rather, update their location whenever they come in contact with a bluetooth enabled device, which could be [every minute in high traffic areas or every ten minutes in low traffic areas](#) and, of course, [not at all in isolated areas.](#)

Firearms that would be used in schools or trafficked on the blackmarket would likely come within range of several bluetooth enabled devices, so tracking using bluetooth technology is feasible.

Limitations of Bluetooth Technology for Tracking Firearm Assets

One drawback of existing trackers, however, is that they are designed to help individuals find misplaced personal effects, not to recover stolen property. Accordingly, they are not designed to be affixed securely on a particular device although the [Tile Sticker](#) has been demonstrated to remain affixed reasonably securely.

Additionally, while most bluetooth trackers can be readily secured to larger weapons such as shotguns, rifles, and rifle-style pistols, the smallest trackers such as the [Tile Sticker](#) and [Apple AirTags](#), while possible to affix to handguns, could obstruct their use.

Finally, each tracker communicates with only those bluetooth enabled devices on the network of its manufacturer. AirTags communicate only with Apple devices, SmartTags with Samsung devices, and Tiles with Android devices.

Next Steps

Customized trackers for owners to track and recover their firearm assets would need to be small, durable, securely attached (preferably in a concealed way). Furthermore, manufacturers might consider sharing device communication protocols across all platforms to widen the tracking capability of each tracking device brand, given the security concerns to the public.

Protecting Our Children

Current tracking technology allows geozones – boundaries set around specific locations on the app map – that gives alerts when the tracker enters or exits a geozone. Among the present proposed modifications is an app that would include a Common Firearm Tracking MApp (CFTM), which would have preset geozones that include all schools. Specifically, school district officials can set a geozone around their schools in the CFTM for all Firearm Trackers. Firearm Trackers could be separately designated so that entry into and tracking within school geozone can be shared with school officials in real-time.

Protecting Rights of Lawful Gun Owners

We feel such technology would significantly reduce the concern that firearms can be stolen and unlawfully used. Tracking technology would empower lawful gun owners with the capability of demonstrating 24/7 in relative real-time that their firearm assets are in a secure location and can be recovered quickly while apprehending perpetrators if stolen.

More importantly, proposed modifications such as SOS and gun firing alerts can immediately inform authorities in real-time if a gun owner is under threat and the owner's location, so the gun owner can engage the threat without having to field a phone call to police. This could potentially increase their use among firearm owners.

Budget Estimates

Phase	Description of Work	Estimated time
Proof of concept	Making a simple device with ready made modules to make a proof of concept	2 ~ 4 weeks
Product Prototype	Including choosing the exact components and develop the controller	24 ~ 36 weeks
PCB Design	Make PCB Design for the final product	2 weeks
Product Design	Design the product casing and developing it	4 ~ 8 weeks
Product testing	Testing the application and the accuracy and the efficiency of the product	2 ~ 4 weeks
Application Development	Developing website and Mobile application and UI/UX.	12 ~ 24 weeks

Proof of Concept

In this phase, open-source apps and high level microcontrollers such as Arduino, Raspberry Pi and ESP will be used to make a prototype with basic functions of the intended product. The size and power efficiency doesn't matter for this phase. Approximately 1 or 2 Engineers will work 2 to 4 weeks.

Product Prototype

Software Flowchart Solution

A software developer will create a flowchart that shows the different scenarios for the final product software and how it is going to function between the end user and the application – i.e. how the product is going to work. After having the final decision on the product and its feature, the final product's design will be conducted to determine which framework will be used for the apps and/or website development.

Component Selection

An electrical engineer will conduct a full study on the available commercial components used in the market and choose the most suitable components and solutions for the final product. The developer will finalize the essential parts that can be integrated into a single integrated circuit (IC) for size optimization.

Embedded Systems Solution

An embedded systems engineer will develop the embedded system software and build the structure for the software. An IoT specialist will integrate the embedded system solution on the internet and optimize it to become real time (RLT) functional).

NOTE: The embedded systems solution will **<u>not</u>** be part of this funding opportunity.

PCB Design

An electronic engineer takes the product prototype circuits and produces a PCB that is optimized in size to be valid for commercial usage.

Product Design

The final casing will be designed and manufactured for the product. This phase usually takes four (4) weeks to make the design and manufacture the prototype to get the best shape and durability

Product Testing

This phase takes approximately one (1) month for a software tester to test the final product. The application and website and reporting for any bugs to the developers.

Application Development

Assuming the final app would have a website and mobile application, this phase will require 4 web developers and 2 UI/UX developers, a front end developer, a back end developer, an IOS developer, and an android developer.

NOTE: This funding will cover a **skeleton android app** with a map and basic functions used in testing.

Phase	Estimated Cost
Proof of Concept	$800
PCB Design	$3,000
Product Design	$5,000
Software Flowchart Solution	$20,000
Component Selection	$15,000
Skeleton Android App Development	$4,000
Materials, web/cloud hosting, misc. expenses	$2,500
Total for Funding Opportunity	**$50,000**
Embedded Solution and Product Testing	$100,000
UI/UX Web and Mobile App	$100,000

Components	Price
NodeMCU Lua ESP8266 ESP-12F	$ 6.99
Bluetooth HC-06	$ 8.49
GSM Module	$ 9.99
GPS Module	$ 11.99
Maduino A9G Board	$ 28.80
Total for the proof of concept	**$ 66.26**
GPS	$ 2
Bluetooth	$ 5.66
GSM	$ 1
Microcontroller	$ 0.3
Total for Final Product	**$ 8.96**
Website Hosting	**$75 / year**
Cloud Server for Data	**$60/ month**