***Ask professors/experts for decision help. Old decisions kept for reference.***

***HOW DOES (IF AT ALL) DO DRIVEWELL OR OTHER COMPANIES KEEP DEVICE ESPECIALLY WITH BATTERIES IN HOT CARS?? Ignoring atm bc less important KPI***

***How long can it go without syncing to phone? Can it sync in the background?***

**OBDII**

Future upsell. Bluetooth ones on aliexpress for $2. Likely would need to make/ buy a BLE Version because those don’t work with IOS. Maybe already BLE ones. Maybe existing regular Bluetooth ones can talk to mount. Either way, certainly upsell in future but less important now.

## **Arms**

Make them slant even more or have a hook design to handle the case that the arms press the power or volume buttons of the phone. That is bad and all mounts ignore this atm

## **Open/Close Button**

Consider putting it on the back so user can grab the phone in one motion instead of a side button where they would have to press and then grab. Make it easy for the user.

**Feet**

Do not feel obligated to use the existing design where the foot slides up with the arms. That might be good or bad but it seems unreliable and inconsistent with a variety of types of phones. A mechanical slide might be better. Or have the foot clamp separately than the arms and auto adjust for Qi

## **Form Factor**

I think gravity based mounts are completely underutilized and I think they are the future of non electronic phone mounts. The problem is that they are the least insecure and the minimalist market is already captured by magnet designs, pop sockets, and a million other variations. I have a competitive advantage in the electronic arms because my product already has a PCB so this is an easy integration. It would save costs not having this feature but I am identifying my brand with top technology and top safety so I am ultimately deciding on electronic arms.

**Mic**

For ambient noise or seeing if the driver is talking on the phone, listening to stuff, or talking with passengers

## **Qi charging:**

The qi charging element of the design was also a tough decision. Its a large cost for a design especially when a customer may or may not use it. I think its possible in future variations to have no qi charging but my competitive advantage of the existing PCB and brand association makes this a better choice to start with.

## **Battery**

The battery I have decided will not be able to be recharged by the user. Its possible a lithium ion battery is used nonetheless but more for that battery chemistries other advantages. The rechargeability adds unnecessary costs, makes the product lifetime unpredictable, introduces risks, hurts recurring revenue, and may or may not be used by the user. The idea of having a li-ion battery be recharged when the holder is plugged into the 12v charger is a good one and one that might have a future in later generations but it does not make sense right now.

Lithium-ion and lithium metal batteries: are commonly used in electronic devices and are known for their high energy density, good performance at high temperatures, and low self-discharge rate.

CR2032: 220mAh

CR2450: 550mAh

CR2477: 700mAh

CR2: 800mAh

Ex: smoke detector uses CR ⅔ which is a larger CR2032 battery. These are lithium based but do not squarely fit into a more specific category like lithium metal

Ex: Pedometer using lithium coin cell

Ex: Iottie coin cell for whatever. Does not appear to work without direct power.

## **Plastic for Base**

Polyethylene terephthalate (PET): PET is a type of plastic that is known for its low thermal conductivity and high resistance to heat. It is commonly used in applications where high temperatures are a concern, such as in the insulation of electrical wires and cables, and in the manufacture of food packaging materials.

Polyethylene (PE): Polyethylene is a type of plastic that is known for its low cost, flexibility, and good chemical resistance. It is commonly used in applications where flexibility and chemical resistance are important, such as in the manufacture of cable insulation and protective packaging materials.

Polypropylene (PP): Polypropylene is a type of plastic that is known for its high strength, stiffness, and resistance to chemicals. It is commonly used in applications where strength and chemical resistance are important, such as in the manufacture of automotive parts and household appliances.

Acrylonitrile-butadiene-styrene (ABS): ABS is a type of plastic that is known for its good impact resistance, toughness, and ability to be molded into a variety of shapes and sizes. It is commonly used in applications where impact resistance and toughness are important, such as in the manufacture of electronic housings and automotive parts.

Polycarbonate (PC): Polycarbonate is a type of plastic that is known for its high strength, toughness, and transparency. It is commonly used in applications where high strength, toughness, and transparency are important, such as in the manufacture

## **Enclosure Design**

Incorporating a sleek and slim design to make the car mount less obtrusive and more visually appealing.

Using materials with a high-quality finish, such as metal or glass, to give the car mount a premium look and feel. Competitors use something called “mirror tempered glass panel” for the front rather than plastic

Integrating a color scheme that complements the user's car interior or personal style.

Adding a visually interesting feature, such as a unique shape or texture, to make the car mount stand out.

Incorporating lighting elements, such as LED lights, to add a touch of sophistication and make the car mount more noticeable in low light conditions.

## **Product coloring**

I think it might be worth it to differentiate by color as well. I think copying a lot of Apple colors and being associated with certain colors that scream sophistication and quality. For example, space gray, silver, ash gray, deep red (prone to degradation to UV) starlight, midnight greywhite. Obviously the effect of UV will be the biggest consideration but there are UV resistant coatings that can be applied.

*Pros of a gray phone mount:*

Neutral color that may match well with a variety of different phone cases.

May be less prone to showing dirt and grime than a lighter colored mount.

Can be considered as more durable and scratch resistant than a lighter colored mount.

Less affected by sunlight comparing to white mount.

*Cons of a gray phone mount:*

May be less conspicuous than a darker-colored mount.

If you have dirty or oily fingers it can leave smudge or stains on the mount.

As always overall whether a gray phone mount is a good choice will depend on the specific use case and personal preferences. Weighing the pros and cons can help to make a decision that best suit your needs.

*Pros of a silver phone mount:*

Sleek and modern look that may match well with a variety of different phone cases and car interiors.

Can be considered as more durable and scratch resistant than a lighter colored mount.

Less affected by sunlight comparing to white mount.

*Cons of a silver phone mount:*

May be more prone to showing fingerprints and smudges.

Can look less conspicuous than a darker-colored mount.

*Pros of a white phone mount:*

May blend in well with the surrounding environment and be less noticeable.

Neutral color that may match well with a variety of different phone cases.

*Cons of a white phone mount:*

*I used to be concerned about UV light didscoloring it but windshields are way too effective at blocking UV rays. Also plastics like PC would be resistant anyways.*

More prone to showing dirt and grime than a darker-colored mount.

More easily scratched or scuffed than a mount that is a darker color.

If you have a dirty or oily fingers it can easily leave a smudge or stains on the mount.

Can be affected by sunlight and start to look discolored over time

Considered as less durable than other colours as it can be more prone to discolouration

## **Motor Type:**

*Stepper motors*

*Servo motors*

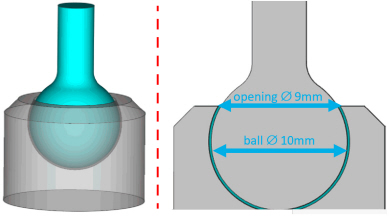
*Brushless DC motors*

The arm that sticks out is called the output shaft. Comes in a variety of shapes, sometimes with a gear included. The pitch diameter in mm matters a lot and the number of teeth for a gear matters a lot.

## **Jellybean Plastic Parts:**

*I have been using the word ‘jellybean’ but want to deliberately note a better term for this is catalog component of COTS (commercial off the shelf) component.*

Ball and socket joint for rotating phone holder around the phone mount stand Often a snap fit joint itself but something that a user could not easily take apart… The cylinder would be a snap fit connection to one pole and be slid the ball joint pole first in assembly. Tamper proof…



Clamping ring/collar to tighten and lock the ball and socket joint.

Alternatively a lever method could be used, to open a clamping ring. Try to use an existing solution and just buy the part,

Grip pad for arms and legs of the phone mount. Typically this is adhered to the phone mount with an acrylic adhesive, silicone adhesive, or a double sided tape

LED diffusers, the transparent plastic that is used in combination to give a cleaner and consistent lighting effect. Typically polycarbonate.

## **Reducing Noise**

Mounting: Using isolation mounts to separate the motor from the rest of the device or from the surface it sits on, can significantly reduce noise transmission.

Enclosing: Enclosing the motor in an acoustically insulated enclosure can also help reduce noise. The enclosure should be airtight, so that the sound doesn't escape, and the walls should be made of materials that absorb sound.

Lubrication: Proper lubrication can help reduce friction between moving parts which can lead to reduced noise. Make sure to use the right type of lubricant and apply it correctly.

Speed control: Lowering the speed of the motor can also help lower the noise. This can be achieved through reducing voltage, increasing the size of the pulley on the motor, or using a gear reducer.

Vibration damping: Vibration is a major contributor to noise, which can be reduced through adding vibration-damping materials to the motor or its mounting surface, such as rubber or cork.

Selecting a Quieter Servo Motor Model: Some servo motors have been specifically designed to reduce noise which could be used depending on your needs and the application.

## 

## **Adhesive Types:**

*Iottie description of their adhesive pad: “The underside of the pad is a high quality, semi-permanent acrylic tape which provides superior sticking strength. When used properly in combination with the dashboard mounting base, this pad prevents potential damage that may occur if suction cup is applied directly to the dash. For one-time use only. Not recommended for use on leather dashboards.”*

*The sticky pad iottie uses also has heat related problems and falls off in very very hot weather*

3M VHB Tape: This is a high-performance, double-sided foam tape that can be used to bond a wide range of materials. It is known for its strength and durability, and can be used to bond metal, plastic, and glass. It is also weather resistant and can withstand extreme temperatures.

Dow Corning 795 Silicone Building Sealant: This is a neutral-cure silicone sealant that is ideal for bonding glass and metal. It is flexible and has a long-lasting bond. It is also weather resistant, UV resistant, and can withstand temperature changes.

Loctite Power Grab Construction Adhesive : This is a heavy-duty adhesive that is designed for interior and exterior construction projects. It is ideal for bonding metal, wood, brick, and other materials. It is also weather resistant and can withstand temperature changes.

Gorilla Super Glue Gel: This is a fast-drying, gel-based adhesive that can be used to bond metal, plastic, and glass. It is also waterproof and can withstand temperature changes.

Recommendations for adhesives to attach a 10 pound weight to a textured ABS plastic surface that is heat resistant up to 150 degrees Fahrenheit:

The adhesives do not necessarily have to be made of glue if meant to stay on semi permanently.

Epoxy: Epoxy is a strong, heat-resistant adhesive that can bond to a variety of surfaces, including ABS plastic. It is a two-part adhesive that requires mixing before use and has a relatively long cure time, but it is very strong and can withstand high temperatures.

Polyurethane adhesive: Polyurethane adhesives are also strong and heat resistant, making them a good choice for bonding ABS plastic. They are available in a variety of viscosities, so you can choose the best one for your application.

Acrylic adhesive: Acrylic adhesives are a good choice for bonding ABS plastic because they are strong and heat resistant. They are also resistant to water and UV light, which makes them a good choice for outdoor applications.

Cyanoacrylate glue (also known as "super glue"): This fast-setting adhesive is strong and can bond to a variety of surfaces, including ABS plastic.

Contact cement: This adhesive is specifically designed for bonding plastic and provides a very strong bond. It is also heat resistant and can withstand temperatures up to 150 degrees Fahrenheit.

Two-part acrylic adhesive: This type of adhesive is a good choice for bonding ABS plastic because it is strong and heat resistant. It is also resistant to water and UV light, making it suitable for outdoor use.

Silicone adhesive: This adhesive is flexible and heat resistant, making it a good choice for bonding ABS plastic. It is also resistant to water and UV light, making it suitable for outdoor use.

Polysulfide adhesive: This adhesive is strong, heat resistant, and resistant to water and UV light, making it a good choice for bonding ABS plastic in outdoor applications.

Neoprene adhesive: This adhesive is strong, heat resistant, and resistant to water and UV light, making it a good choice for bonding ABS plastic in outdoor applications.

Polyimide adhesive: This adhesive is heat resistant and can withstand temperatures up to 500 degrees Fahrenheit, making it a good choice for bonding ABS plastic in high-temperature applications.

Urethane adhesive: This adhesive is strong and heat resistant, making it a good choice for bonding ABS plastic. It is also resistant to water and UV light, making it suitable for outdoor use.

Polyethylene adhesive: This adhesive is strong and heat resistant, making it a good choice for bonding ABS plastic. It is also resistant to water and UV light, making it suitable for outdoor use.

Butyl rubber adhesive: This adhesive is strong, heat resistant, and resistant to water and UV light, making it a good choice for bonding ABS plastic in outdoor applications.

## **Mount Pad**

Car dashboards are typically made of a plastic material called polyvinyl chloride (PVC). This material is chosen for its durability, low cost, and ability to be molded into a variety of shapes. PVC is resistant to UV radiation

Here is a ranking of the materials for a car dashboard mount based on their temperature resistance, UV resistance, cost, and flexibility:

TPE (thermoplastic elastomer): TPE is a strong, flexible, and durable material that is resistant to temperature extremes, UV radiation, and water. It is also relatively inexpensive compared to some other materials, making it a good overall choice for a car dashboard mount.

TPU (thermoplastic polyurethane): TPU is a strong, flexible, and durable material that is resistant to temperature extremes, UV radiation, and water. It is generally more expensive than TPE, but it may be a good choice for applications that require extra durability or resistance to chemicals.

OQTIQ mount for curved dash uses this

Polyurethane: Polyurethane is a strong, flexible, and durable material that is resistant to temperature extremes, UV radiation, and water. It is generally more expensive than TPE and TPU, but it may be a good choice for applications that require extra durability or resistance to chemicals.

Silicone: Silicone is a strong, flexible, and durable material that is resistant to temperature extremes and UV radiation. It is generally more expensive than rubber, but it may be a good choice for applications that require extra durability or resistance to temperature extremes.

Rubber: Rubber is a flexible and durable material that is resistant to temperature extremes and UV radiation.

**LEDs:**

Replace LED: invisible /hard to see led 99% of the time but when the power is low it says “low battery” with the led. This is an alternative to a simple led that just turns on when the battery is low and the end user does not know what it actually means… the basic led is a poor call to action.

Tamper LED:

Lights up permanently if fucked with

Charging/not charging/ obstructed LED:

**PhoneBelt Removal/Attachment**

The method I am considering at the moment is a push push mechanism/latch. The downside is that a spring or additional plastic parts may be needed. The exact method for SIM cards appears to be patented by Nokia. Maybe this is only for the nokia design.

**Mount Placement**

Having it be in the line of sight is a trade of making the phone more of a temptation but making it safer to use in peripheral vision.

The Driver's side near the corner allows for less of the view of the road to be obscured by the device.

Having it at face level to allow for facial recognition could be a good or bad thing. Less time spent positioning the phone.

Having it on the left side puts the phone away from the infotainment system/charger and would require wires to be all over the place

Most folk in the US are right handed. The mount being on the left side may discourage use.

## **Battery Preservation Methods**

Battery pull tabs: These are small plastic tabs that are inserted between the battery's terminals, preventing electrical contact and conserving the battery's charge.

Battery isolation: This method involves physically separating the battery from the device, either by removing it completely or by using a switch or other mechanism to disconnect it. Kidde smoke alarm appears to use this method.

## **Types of mounts:**

Air Vent

They are bad because they are the least secure, only compatible with cars that certain styles of air vents, are placed in suboptimal locations ( in terms of visibility and line of sight with the road), and alter the air flow in uncomfortable ways

Windshield Mount

The big problem with these are that they are illegal in many states. In the states that do allow them there are strict rules on where on the windshield they may be placed. They also tend to have a harder time dealing with vibrations that other mount types and can be difficult to read.

Dash Mount

The problem with dash mounts is that all dashes are different and that adhesion to non-flat surfaces can be a problem when mounting to the vehicle. Possible mounting locations vary from vehicle to vehicle. Dash mounts tend to be the most bulky of all mount types.

Gooseneck:

The are less aesthetic and are more parts than others’ but they appear to be the most legal out of all mounts since they do not interfere with the windshield at all

Other types:

Cup holder mount, rear-view mirror mounts, & friction mat

## **Tamper Resistant design**

Vapor barrier tape. Perhaps other similar names and variations like electrical tape which is very similar.This is plastic feeling tape to hide screws and add to the aesthetics. This tape is used on things like mice.This can be used for both the base and the actual phone holder.

Unusually shaped screws. Hidden screws

Epoxy/glue in certain areas

Snap fit connectors for easy assembly and horrific disassembly that likely breaks it

## **Other Characteristics:**

I want a red led to flash when motion is detected but the car is not in motion. I want it to flash in tandem with the speaker chiming. I want it to stay on if the phone is never connected while the beeping may stop. The LED form factor can be a circle with a line running through it or the seat belt logo flashing. My only concern is that it might make for a slightly negative connotation with the brand but it would look really nice.

Smaller unit size to focus on the aesthetic more and focus less on the customization for the user. Will alienate some customers but the small size reduces costs, increases aesthetic, and further discourages unnecessary viewing.

Magnetic Isolation Plate

Coming in a single piece to make installation as and as standardized as possible.

Low battery indicator. Ideally the light says low battery so the user is not confused to the meaning and has a stronger call to action. Could incorporate an extra ding when low battery or flash instead of permanently on.

Gamifying it could be a simple led indicator tank that fills slowly and blinks wherever its at and if driving phoneless over time and if it reaches a full tank or line or whatever it glows green with a check mark

Gap on bottom for charging devices.

Perhaps a mute button on the back for the case when someone does not have their phone on them or the rare case their phone does not fit (E.G. rental cars) … If I do want this… I will make it a pain to use by having it in the back and require that it needs to be held down for 5 seconds.

Release button on top not sides? idek.

SAVING SPEAKER/BUZZER DECISION TILL FINAL MANUFACTURING STAGE. WILL TEST MANY VERSIOBS FIR BEST SOUND

PCB on base and not on phone holder? The motor still needs to be in the holder

Retractable holder arms and bottom lip?

Have the bottom lip that holds the phone not be arms abut instead a curved lip that is one big piece but curves like a parabola allowing for a gap in the middle for charging. Less pieces and more aesthetic.

Auto opening then 1 second closing like iottie

Iottie’s new model will have a tiny fan that accompanies the charger to make overheating much more rare.

If I include Qi charging, don’t put Qi on the front. It looks tacky as hell.

Three panel base so it can be on a curved surface. Perhaps PCB in middle panel

## **Possible Future Features:**

Battery inside that holds are charge used for other crap like gps

Overall, I think that cell phone use logging, gps data telematics, driver monitor etc are very very lucrative and valuable V2s but ever complicating the technology is a pit and I should not try to do everything for the first launch. Adding the connection to the internet, cloud, website, and app make for such a longer path to launch especially while the concept still needs proving. Lastly, it would create a different model for B2B and B2C and while in the long run that is reasonable the first launch should be as widely accessible as possible and as simple as possible with minimally different parts and packaging,

Adding holders for ipads and laptops for other b2b users. This is also a surprisingly big market with sellers like ram mounts, cta digital, arkon mounts, the joy factory doing this already and each unit costing several hundreds Maybe ELD holder too

Integrate electronic logging device that truckers have to use

Connectivity to or creating our own mile tracking app for travel logging for tax write offs etcetera. This is already a **booming** business itself and we would have a competitive advantage to integrate into and automate what the driver would have to be doing manually. The current system has each driver for a company, fleet, contractor, have an app downloaded that tracks this in the background. They charge for the service on a per vehicle basis. The problem with this is that every employee needs the stupid app on their cell phone and they all need to run and use it. A built in solution for all fleet vehicles might be a better solution.

I have decided against the user rechargeable battery because I want replacement parts to be more predictable. It only works if the user charges their cell phone with the qi charger. Only work for sales to the car rental companies.

I have rethought the battery type for B2B sales. I almost do not know what I was thinking. Of course it makes the most sense to hard wire it to the car’s fuse box instead of using external batteries that constantly need replacing. As the technology scales to more complex tasks like logging, internet connection or integrating with a dash cam this will become much more important. This lastly makes for a much stickier moat and allows for the servicing side of the business to grow in significance. Can get rid of accelerometer and allow for phone detection based on whether the accessory power is available IE car is turned on.

A vehicle telematics system/device is often used in tandem with fleet management technology but they are not necessarily the same. The telematics gets vehicle diagnostics from the vehicle and transmits that. I could do vehicle telematics without necessarily doing all of fleet management

Magnetic versions can still be dash mounted. Magnets that attach to phone will block qi charging in certain positions so if that's important a smaller magnet can be placed on the very bottom of the phone so that the usual magnet spot can touch charger

View only & anti-swipe screen, rechargeable batteries, NFC to tell phone to go into driving mode/ do not disturb, Logging (app and cloud connection), gps and logging to monitor hard braking, accidents, swerving.

Partnering with Google and becoming Google certified and bashing Apple for not allowing nfc tech could be a method to pressure Apple to allow for NFC integration with DND. Might help with exit opportunities because if I get the NFC to go to a website that say sorry apple does not care about your safety or saving lives and really presses the issue apple will immediately want to do something about it. This could be a method to get major hardcore press for the product and let me be the champion of car safety. **This is actually a brilliant fucking idea** because it can be on every headline of every tv station. It might be possible to use BLE tech to interface with apple products but seems like that too is impossible.

Create a driving score based on logged behavior

Adding dash cam capabilities directly to the product or allowing a connection to a separate camera and servicing both technologies.

Having the dash cam help with monitoring traffic and announcing potential hazards

Fleet management that allows the company to remotely track and manage their fleet of vehicles, monitor usage and location, and receive alerts for maintenance and repairs.

Moving the mount to the center console for better camera visibility.

Bluetooth connection to other IOT monitors like oil pressure, and temperature sensors

Logging

Adding IOT integration and selling remote locking/unlocking and automation service for when vehicles are parked in a base lot for example or for when drivers lock their keys in their car.

Adding remote start capabilities, idk why this would be wanted but it might be a useful feature for rental companies to have for themselves or to pass onto customers through an app or whatever. Same with remote locking/unlocking as this too can be passed down to customers via an app or smartphone nfc wallet.

Fuel cut off capabilities for security, deterring unnecessary car usage, improper use, late vehicle returns.

Communication service for operators to communicate with drivers without needing the users phone or if its dead proving a method of communication or if the phone is unknown

Gps for vehicle tracking

Gps for purposes of driving instructions updates, movement around blocked areas, dispatching and routing

**Fleet Management/IOT**

Remote diagnostics: a feature that allows the company to receive real-time alerts and notifications for any issues with the car, such as low battery, check engine light, or other warning indicators.

Automated maintenance and repair scheduling and tracking

Automatic accident reporting and emergency response

Alerts to drivers/ fleet managers regarding undesired behaviors like speeding or idling

Driver authentication and ID

Geofencing: setting virtual boundaries around specific area for coming or going. Cross a border in an unauthorized way or entering a designated lot etc

AI to optimize the best allocation of vehicles between locations that fixes itself instead an army of humans doing it day by day.

Monitoring cargo status in the trailer including temperature, humidity, and tilt sensor data, etc

I guess folks like uber drivers love driver facing cameras so maybe they are not as bad as i think. The integration of ring cam is very interesting. I see a scenario where I interface with them or adding cameras to my device both front and back facing.

Pros of logging:

Logging will allow for more business models and allow for monthly recurring service subscriptions and encourage an ongoing fee structure.

Logging will at worst be an irrelevant feature and at most be a feature that is a deal maker and a feature that could easily scale the price paid by users especially in the B2B market.

Logging would be easy from a hardware perspective but it would mean adding an app for fleet managers and cloud computing

Allowing logging might make it a better product for b2b sales. X out of Y hours is spent without a phone. Get x discount. Instead of beeping the discount is proportional to time not used for example

Logging would make B2B users much more sticky because switching would also mean losing the data they accumulated with us

If using logging, other features like telling when certain units need replacing and how much life they have and other stuff can be done.

Driver Monitoring

Using gps/ accelerometer and maybe gyro to monitor: Swerving, hard braking, aggressive acceleration, swerving, cornering, distance driven, gas used and how efficient the driver was driving the vehicle relative to the terrain, distracted driving by means of patterns of slowing down and speeding up, racing, drifting, idling, donuts, etc.

Could use dealerships wifi when the vehicle comes back or could add a cellular connection. Lastly could interface with existing gps in vehicles or other tech if present. Fleet dash cams like the AI ones and trucking ones use a cellular connection as a closest analogous product and they are constantly uploading footage and data to the cloud and sometimes giving audible feedback to users

Adding proximity chat external purchase to cars. Start with small sticky groups and grow. Super viral online marketing.

Adding module support so that things like ELD, GPS, or proximity chat can be snapped on and off

General motor cars have technology in their cars called teen driver mode that is activated when the car is driven with a specific key fob versus the adult key fob. This can be configured to limit max speed, max acceleration, high speed warning ring, and a “buckle to drive” mode that makes the driver unable to move out of park for 20 seconds after the brake pedal is pushed or until the seat belt is fastened. Integrating with this. They have the incentive to advertise on our behalf. Alternatively take this method, idea and technology and leverage into other features etc…this is a very promising thing to think about more later. Underdeveloped idea atm.

As a strategic partner, a separate future service/add on, a better moat, or a potential future exit, providing data/services to apps like life360 or ford/gm teen mode

\*\* KEY \*\* I want to make a note here about how the vision has metemorphed recently. I want to speak about how many accessories use the 12v charger which supplies between 10-20 amps in a car but they are all scattered around the car and a person can typically only use it for one or two things. My product aside because that is narrow thinking.. There has got to be a better way to combine some of these accessories and put them into one or allow integration of other accessories into a product. This is a thought on business building instead of product building and different from earlier mentions of adding a gps or adding a dash cam. Certainly phonebelt could be the hub for all of this but i think i still want to do this irrespective of phonebelt meaning phonebelt is not required. Perhaps this is back to reimagining a car charger phone mount as a separate entity as the phone belt and having the phonebelt be a separate product that integrates with this phone mount.

## **B2B vs B2C versions:**

* Two codes with the same hardware so the device is different for enterprise users vs consumer users. Ex: Longer dinging for B2B.
* Different adhesives for the mount for B2B and B2C. B2C gets a medium and extra strong adhesive.
* Varying which components are attached to the same PCB, like data logging hardware

PUT THE RELEASE BUTTON ON THE BACK OF THE HOLDER. THIS ALLOWS YOU TO CLICK AND GRAB WITH ONE HAND IN ONE MOVEMENT AS OPPOSED TO SIDE BUTTONS THAT REQUIRE TWO HANDS

\*match the included wire charger in the same color as the mount?\*

**PCB notes**

**Clock:**

An external clock will increase the cost and is likely not worth it.

On the other hand an external might be more power efficient.

Overall it does not seem to be worth it. The smoke detector does not use one.

**Packages:**

QFN is actually more expensive to manufacture generally than SOIC, SOIC is generally cheaper too. SOIC is a bit larger though and PCB space is indirectly expensive

Through hole is always the most expensive if considering assembly and scrap rate too but they are generally more secure against vibration

**The ac powered smoke detector on the EEVBLOG uses 15mA when ringing for perspective**

The 1µF capacitor should be located as close as possible to the device power pins, and 10µF capacitor should be located as close as possible to VSS. Schottky diode must have a maximum peak current rating of at least 1.5A. For best results, it should have a forward voltage specification of less than 0.5V at 1A and low reverse leakage. Also, the 10mH inductor must have a maximum peak current rating of at least 1.5A. With the IC’s very low power consumption, this project only requires a three-volt DC power supply

Thermal adhesives around certain ICs to dissipate heat?

If charging capabilities: Semiconductor cooling (thermoelectric cooling). Competitors use this to reduce temperature while charging.

Code Notes

*The IMU must be sensitive enough to detect small changes while driving but insensitive enough to not activate when people are in the car but not driving.*

The likely code structure I think will be best is likely a state machine structured something like:

**Universal rules:**

If battery voltage, as determined from an analog pin, is less than the 1.8 volts, the battery LED is set to high and everything else is deactivated.

While no motion, pause dinging regardless of the state.

If time since last motion>30 seconds, reset data and return to base state.

**States:**

State 1 Deep sleep

Everything is sleeping. A motion generated interrupt from the accelerometer is the only mechanism to leave this state.

State 2: Hall Sensor is true

After a motion generated interrupt has occurred this state is possible. The accelerometer and all other peripherals are turned off while the hall sensor reads true. The hall sensor polls every 5 seconds.

State 3: Hall Sensor is false. Acceleration. Button not pressed.Grace Period.

Clock begins counting to leave this state. Hall effect sensor and accelerometer and button polled.

State 4: Hall Sensor is false. Acceleration. Button Pressed.

System waits while button override is held for 5 continuous seconds. Once completed, the system moves to state 7. Phone LED lights up here

State 5: Hall Sensor is false. Acceleration. Button not pressed. Light warning.

If the hall sensor, accelerometer, and button are all false and the grace period is over, state 5 begins. State 5 consists of the buzzer chirping 3 times with a 4 second gap between each chime and each chime consists of .5 seconds. While the chiming occurs the phone LED flashes with it.

State 6: Hall Sensor is false. Acceleration. Button not pressed. Strong warning.

Once state 5 has completed, Stage 6 commences. The chimes happen every second now and continue for 15 seconds. Phone LED flashes with the chimes. The chiming is louder than the light warning state.

State 7: Hall Sensor is false. Acceleration. Button not pressed. System surrender.

Occasionally polling accelerometer and hall effect sensor. Phone LED remains on.

“Depending on the PIC, the WDT can draw surprisingly large power. One way around that is to use your own external micropower oscillator made from a few transistors, resistors, and caps. This will also need to be calibrated against the internal oscillator. I did that on a 16F630 design once because the WDT was just too power hungry and we needed it to be off until the device was "activated", although the batteries were installed during manufacturing. The whole device runs for over a year on two button cells, and wakes up ever 10 seconds to send an RF and IR message.

Into CMD prompt

*set PATH=%PATH%;C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\*

avr-nm -Crtd --size-sort "C:\\Users\\james\\AppData\\Local\\Temp\\arduino\_build\_555605/verywildforthenight.ino.elf”

## **Innovations:**

Better form factor

Better branding - not Zeehoo

Coming preassembled and not designed to be disassembled. More robust. Easy setup. Tamper proof.

Qi wireless charging.

Non slip automated gripping arms. Your phone won’t fall out!

Easier use. Instead of needing two hands or pulling a lever just place the phone on the mount. PhoneBelt does the rest.

Material. I do not know if it is possible with Qi charging or if its sufficiently UV resistant but a PC holder would be unique and look really good. I want it.

Color. All phone mounts are the same terrible matt black color. Opportunity to differentiate based on color. I think a white and rounded phone mount would sell really really well.

Mounting on curved surfaces, unlike most shitty competitors.

Adhesion type. Heat resistant. Won’t fall off like others.

Using NFC to silence non-urgent notifications

Phone and movement detection to keep drivers off their phones.

Small device? This will make it cheaper to make, package, and ship. Make using the phone while driving harder which may be good or bad. Unsure but leaning to thinking this is good.

The power supply coming from a rechargeable battery/ notion of adding a battery

Release does not work until no motion is detected.