

# RIDESAFE



**VTID THIRD YEAR + GENERAL MOTORS**

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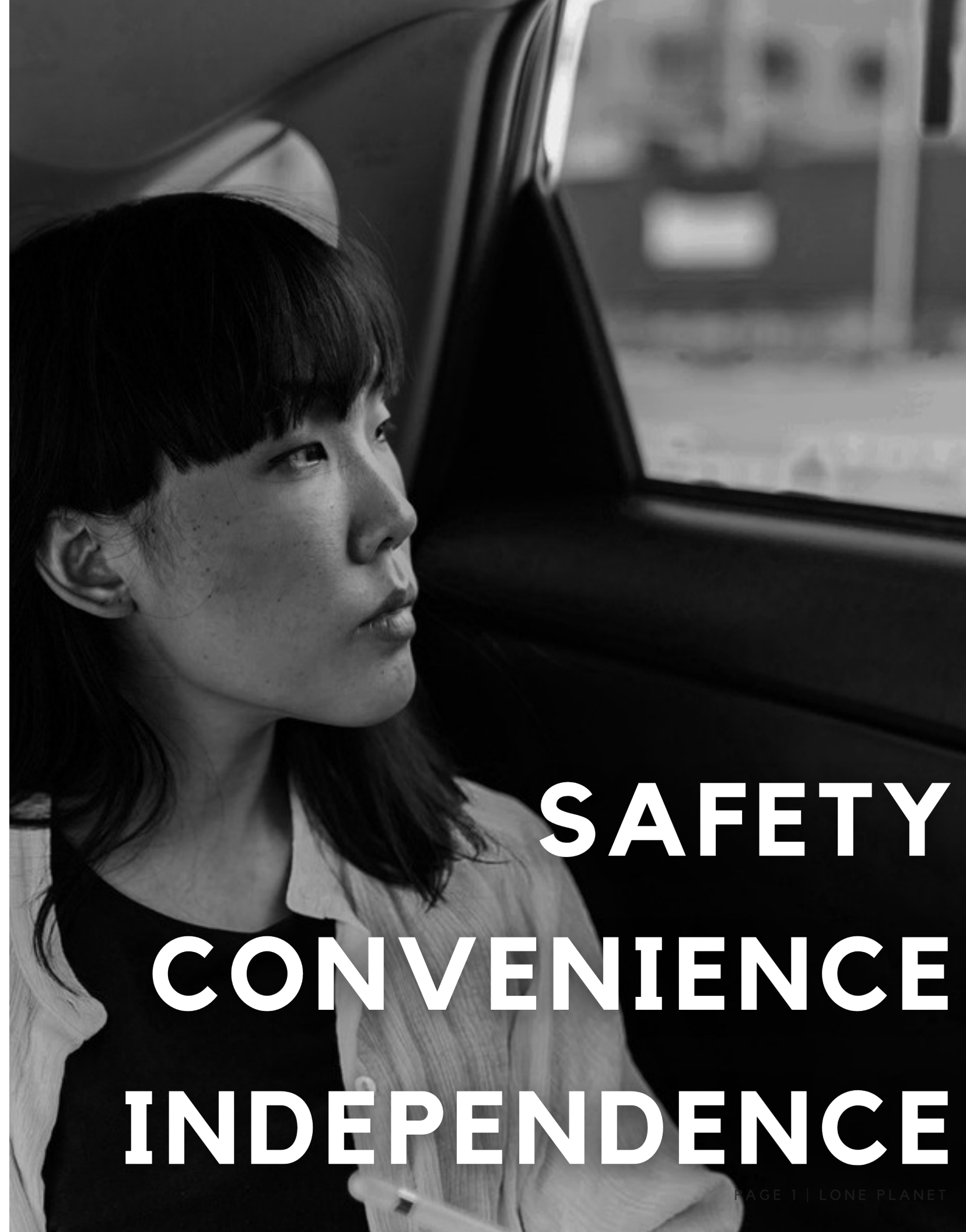
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# HOW CAN WE CREATE ASSISTIVE TECHNOLOGY ACCESSORIES TO AID THOSE WITH VISUAL IMPAIRMENTS OR CHRONIC ILLNESSES IN RIDESHARE OR PERSONAL VEHICLES?

Accessibility in rideshare experiences has often times been an afterthought. It is commonly addressed by different companies by offering "accessible vans" who are only wheelchair accessible. The typical rideshare experience for the customer and the driver is not accessible beyond those "accessible vehicles" that lack tools for those with chronic illness', vision/hearing impairments, and others to feel supported and confident with their ride and travels. We were not only interested in assuring convenience and independence, but safety as well! Through our research we have uncovered many safety concerns for those with disabilities or impairments that would benefit from assistive technology being implemented or offered in their rideshare vehicles.

As a team we decided to investigate different assistive technology in hopes to be able to create products that would be able address the lack of safety for the many users with disabilities or impairments. Every rideshare user and driver deserves to have a safe, comfortable, convenient, and when possible independent experience. Including assistive technology in everyday vehicles improves every single user's experience. Our original idea for accessible ride-share included both add-on technology for those drivers who want to update and make their current vehicles more accessible as well as integrating accessible technology and programs into vehicles from the beginning when they are originally manufactured and sold.



**SAFETY**  
**CONVENIENCE**  
**INDEPENDENCE**



# NOW

## WHAT GM CAN DO NOW

"The Now" is the first stage of The General Motors Ridesafe. It focuses on the ability to integrate key accessibility features into new General Motors vehicles. With an anticipated two to three years until the technology is ready for the market, The Now ensures that rideshare drivers and standard customers alike can have non-obtrusive safety and accessibility capabilities that improve the passenger experience regardless of their mobility.



# NEXT

## GM'S NEXT STEPS

The General Motors Ridesafe, the second stage of the process is The Next. Expected to be implemented in a three to five year timeframe, this section focuses on the ability to add accessibility capabilities to existing cars with the goal of improving the rideshare experience for disabled individuals. With features such as RFID vehicle identification, interactive passenger displays, and opportunities for seamless passenger pickup experiences, The Now enables existing rideshare services to improve their accessibility in collaboration with General Motors.



# FUTURE

## THE FUTURE OF GM

The final installment of the General Motors Accessible Rideshare System is The Future. This stage is intended to be implemented with the General Motors subsidiary, Cruise, an upcoming autonomous rideshare vehicle. Taking the integrated features of The Now one step further, The Future looks approximately seven years ahead and aims to ensure that accessibility considerations are carried through to the next stage of General Motors vehicles while continuing to advance technologically.

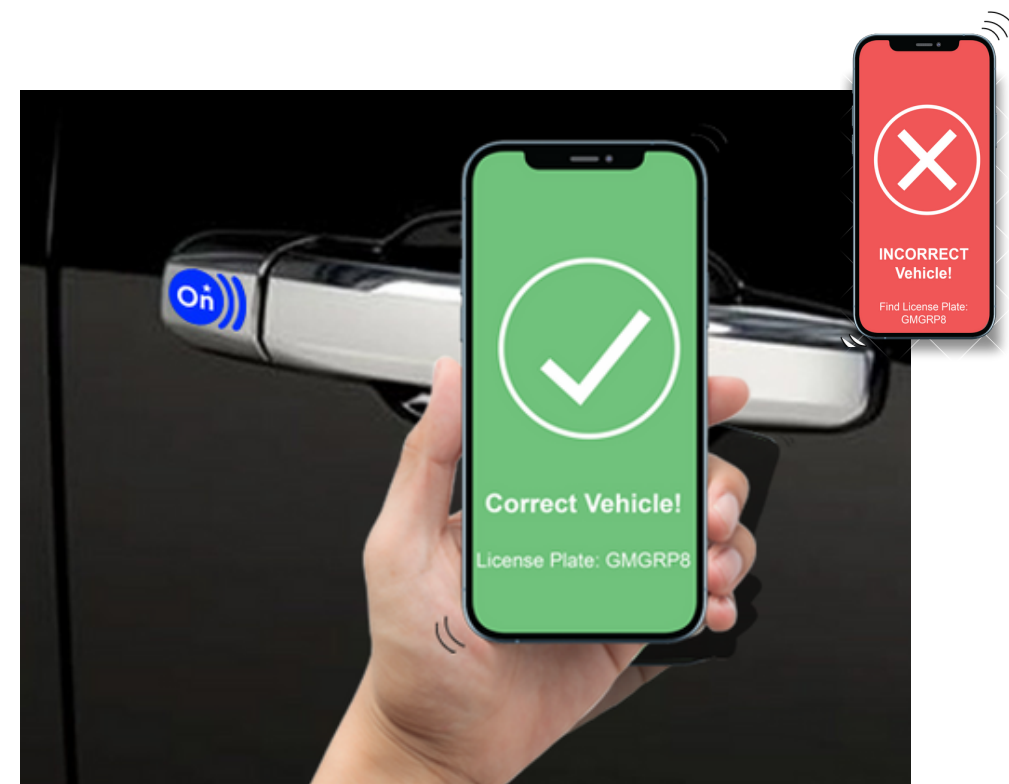
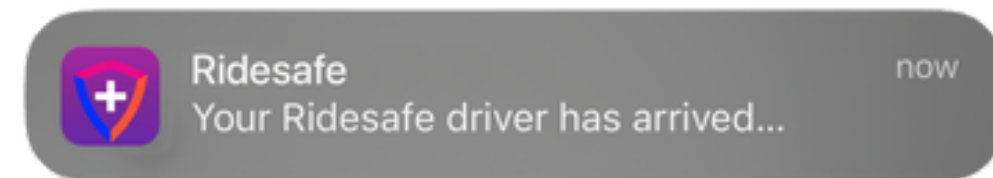


# NOW

The General Motors Company (GM) Ridesafe technology consists of three distinct phases, each aimed at improving the experience for disabled individuals. The first phase is the **Now**, which focuses on integrating this technology into a line of GM's upcoming vehicles.

In the ridesharing experience for disabled individuals, certain points in the journey have consistently posed challenges. Among visually impaired riders, many have expressed concerns with identifying the correct vehicle. Without visual cues like the car's make, model, color, license plate, or even the driver's appearance, the pickup process is often much more stressful for visually impaired individuals than for sighted ones.

This technology will feature an interface powered by OnStar, which will also work in tandem with an Ridesafe ridesharing app. The aim of this technology is to expand upon the primary goals of safety, convenience, and independence for ridesharing users, making GM vehicles more accessible and accommodating to the ridesharing industry as a whole. By incorporating these features, GM hopes to provide an improved and more inclusive ridesharing experience for all individuals, regardless of ability. A discount can be offered for rideshare drivers as an incentive to buy GM vehicles. This technology will be market ready in 2-3 years.



## DOOR HANDLE CHIP

An RFID verification chip is integrated into GM's vehicle door handles and serves as both a personal and public key for opening car doors. It functions similarly to auto-unlocking with paired car keys for personal use. When applied to rideshare, the ID verification chip can **enhance safety** by allowing riders to **verify** the vehicle and driver using the **Onstar app** on their phone. Display appearance, haptic feedback, and audio cues will indicate if the **correct vehicle** has been approached, providing an additional safety precaution for **both drivers and riders**.



## DRIVER INTERFACE

The OnStar Driver Interface is designed to **enhance the pickup process** for ridesharing services. To achieve this, **riders can provide crucial identification details** by filling in blank sentences such as "I am standing next to [a fire hydrant]" or "My shirt is [red]". The OnStar system is compatible with both Apple Car Play and Android Auto, enabling drivers who own GM's accessible line vehicles to view this information on their infotainment screen. In addition, **riders have the option to disclose their disability on their profile**. The driver will be notified of this prior to picking them up. By doing so, this feature helps to **alleviate the stress and anxiety** of the pickup process for both riders and drivers, thereby **promoting safety** during the rideshare experience.



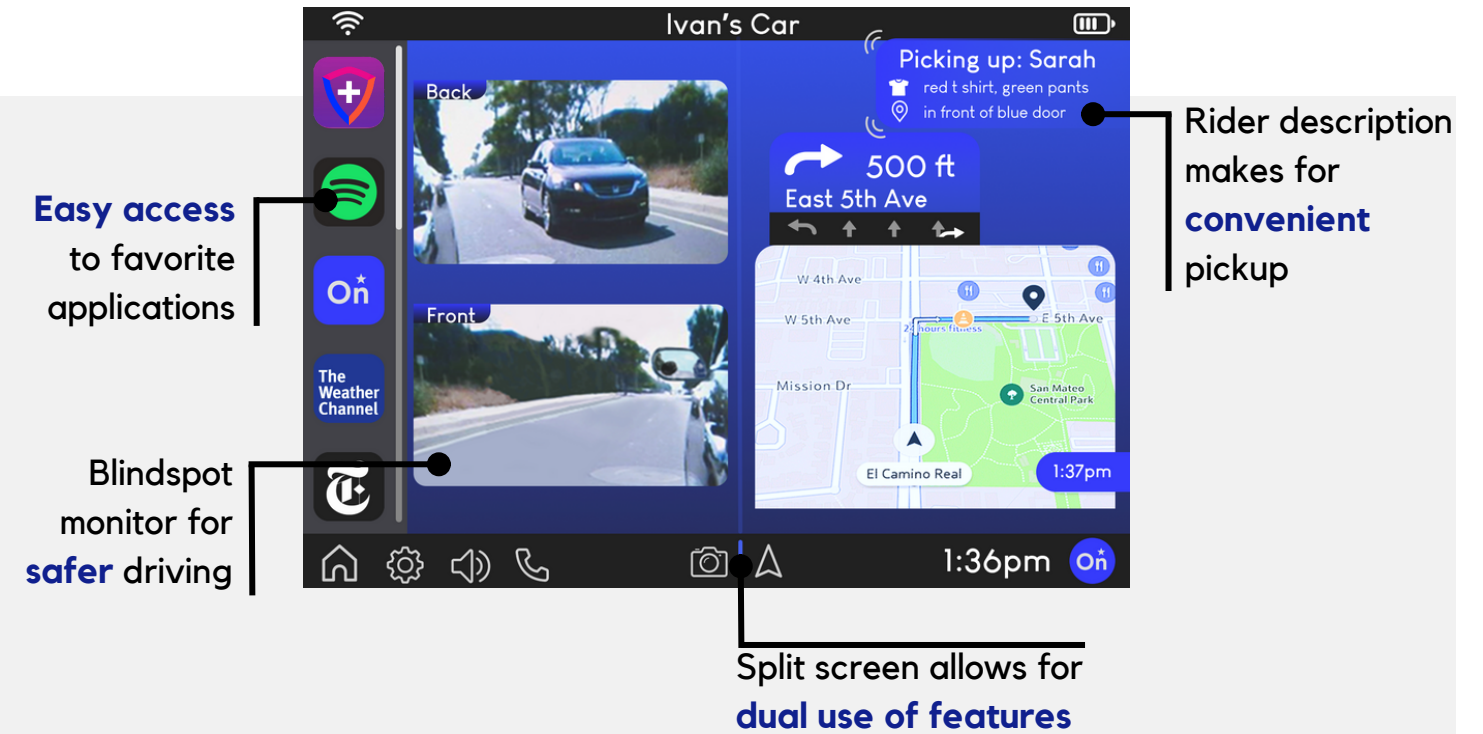
## PASSENGER DISPLAY

The Interactive Passenger Display utilizes **cameras installed in the car's side view mirrors** and an **integrated display in the seat headrests**. The OnStar powered screen shows blindspot footage from the cameras, alongside navigational data and a bird's eye view of the vehicle. This allows passengers in the rear seat to check for obstacles or approaching vehicles while exiting. For passengers with severe vision loss, the display will give **audio cues** ensuring it is safe to exit the vehicle.



# ONSTAR DRIVER DISPLAY

- Access to all vehicle apps
- Rearview and blind spot camera visuals/audio
- GM rideshare navigation map
- Split screen and full screen capability
- Passenger Identification notification visual/audio



# ONSTAR RIDER DISPLAY



- 180° blind spot alerts visual/audio
- GM rideshare trip progress screen
- Split screen and full screen capability
- Access to controls and settings

# THE NEXT

General Motors Company (GM) Ridesafe has three phases. The second phase, called The Next, builds on their long-standing relationship with the rideshare company, Lyft. This partnership with a third-party company allows this tech to expand to a wide range of vehicles.

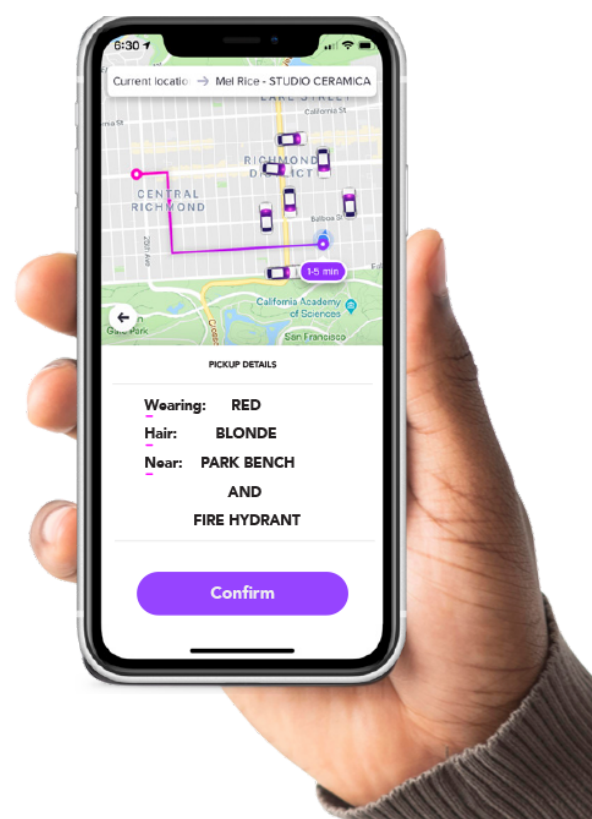
To make older vehicles more accessible, GM can offer aftermarket products of The Now's assistive technology that incorporate more accessibility features. This enables rideshare drivers with older cars to be just as accessible as those with vehicles that have more current technology. The aftermarket step will also allow drivers without GM vehicles to be able to participate in accessibility initiatives.

The technology from The Next is expected to be ready for the market in three to five years. This timeframe will provide ample time for further design, manufacturing, more refined user interface design, implementation of the software, and other considerations. From the previous integration of The Now's technology, The Next will be able to address any design factors that can be added to add-on technology.

Many visually impaired users expressed concern over identifying the correct vehicle. Without visual indications such as the make, model, color, license plate, or the driver's appearance, the pickup experience is much more stressful than that of a sighted person.

The main purpose of this step is to expand upon the three primary rideshare design goals: safety, convenience, and independence. These goals all have the intent to make disability-compatible cars more accessible throughout the rideshare industry.

The Next provides benefits to General Motors, Lyft, and disabled riders alike. In this system, GM manufactures the aftermarket products, selling them to Lyft drivers. The drivers with the add-on technology would then receive priority when seeking out work. Additionally, drivers with the General Motors Accessible Rideshare System



## DOOR HANDLE BAND

The Door Handle Band Accessory allows rideshare users to conveniently identify if the car they are approaching is the correct vehicle. Using **RFID technology**, riders can simply tap their phone to the accessory band, allowing their mobile device to deliver **haptic and audio feedback**. This would indicate if the vehicle is or is not correct, making for a **safer pickup experience**.



## DRIVER INTERFACE

The Driver Interface in collaboration with Lyft aims to make the rideshare pickup experience even more seamless. Riders are able to input **key identifying information** by answering **fill-in-the-blank sentences** such as, "My shirt is [red]" or "I am standing next to [a fire hydrant]". Using Lyft's compatibility with Apple Car Play and Android Auto, Lyft drivers will be able to view this information when collecting their passenger, **reducing stress** and **improving safety** for both parties.



## INTERACTIVE DISPLAY

The Interactive Passenger Display Accessory is designed to **improve the drop-off experience** for rideshare drivers and users alike. By **attaching after-market cameras** to their vehicle, drivers are able to have peace of mind knowing that their passengers are comfortable in their care. The rider would have access to features such as **blind-spot detection**, **a bird's-eye view of their surroundings**, and **a live-map of their Lyft journey** to keep them updated about the status of their ride. For visually impaired users, the a setting can be selected to **audibly update and signal the passenger**.



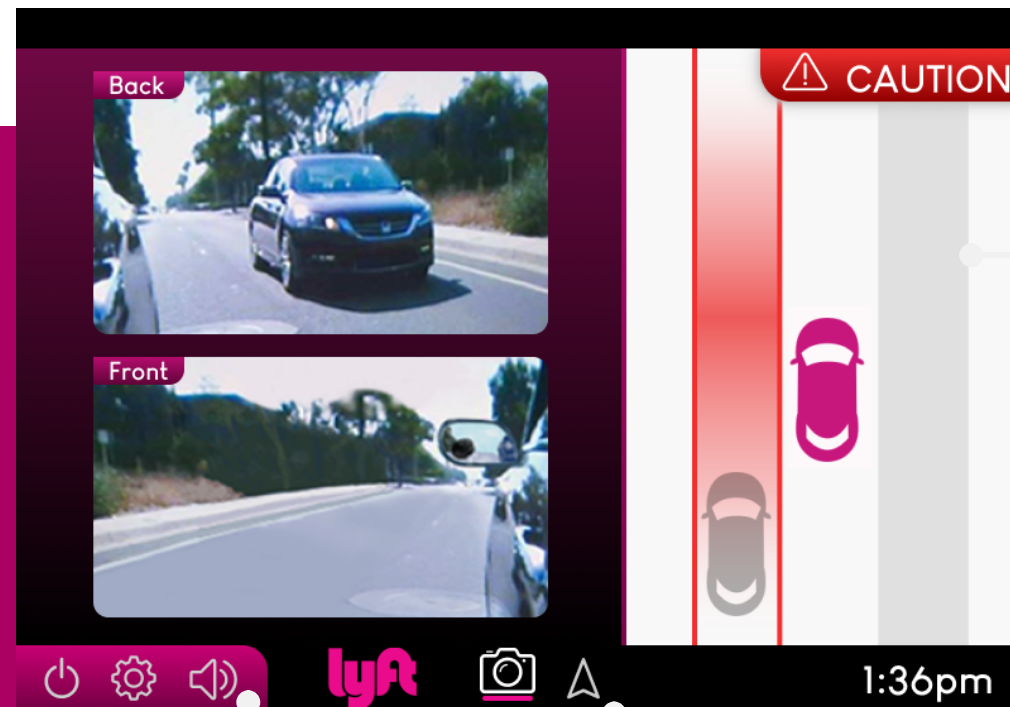
# LYFT RIDER DISPLAY

180 degree blind spot alerts visual/audio

GM rideshare trip progress screen

Split screen and full screen capability

Top view of lane image recognition



Overhead view makes blindspot obstructions easily detectable

Volume control for accessible and independent ride

Toggle display for cameras or navigation

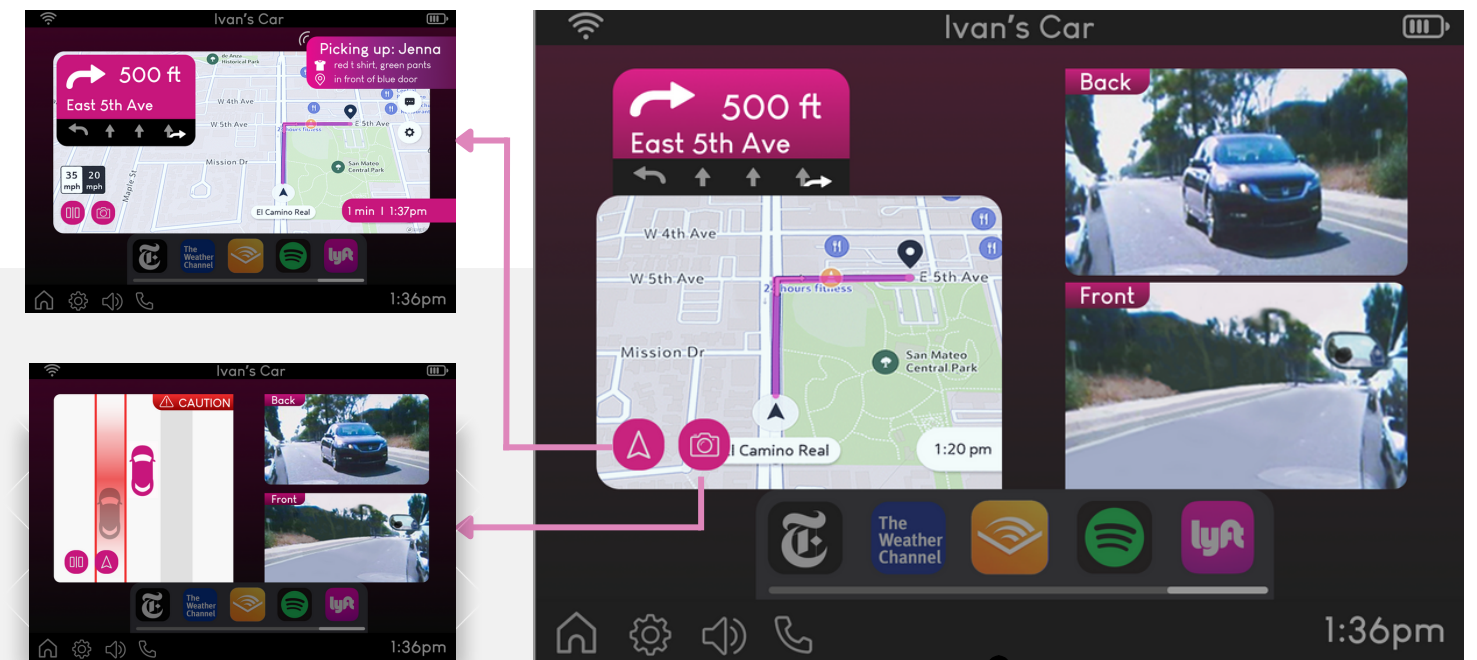
# LYFT DRIVER DISPLAY

Android Auto and Apple CarPlay compatible

Rearview and blind spot camera visuals/audio

Split screen and full screen capability

Passenger Identification notification visual/audio

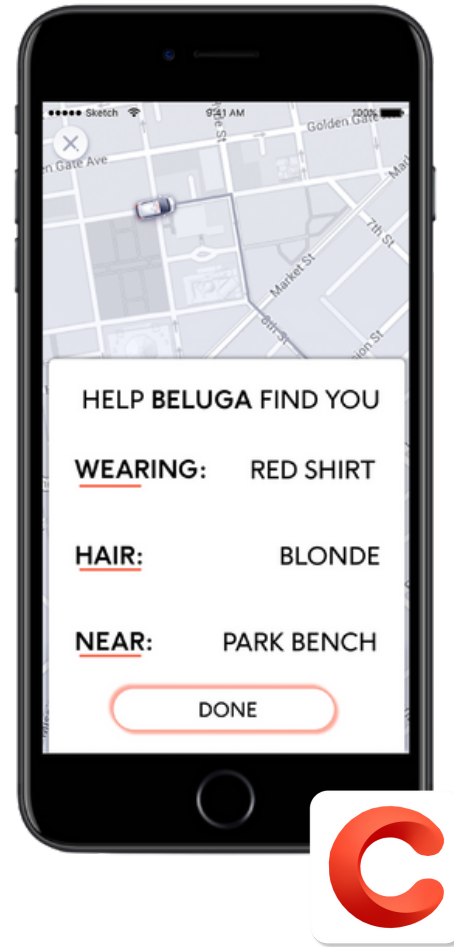


Toggle between full and split screen for driver's convenience and ease



The GM Accessible Rideshare System has three phases, with the third phase focusing on "Cruise," a subsidiary of GM. Cruise has developed a fully autonomous minibus called the Origin, which works with a ridesharing app. This vehicle aims to revolutionize the ridesharing industry by eliminating the need for a driver and running fully on electricity. Cruise claims that the Origin will spend most of its lifetime in motion, which is a significant improvement over the current scenario where vehicles are inactive for 95% of their lifetime. While the Origin is a game-changer for the future of ridesharing, there are still areas for improvement in terms of safety, convenience, and independence.

To address these concerns, RideSafe technology can be installed in the Origin to enhance its accessibility. This technology would ensure that riders with Vision Impairment and Chronic illness can also enjoy the convenience that Cruise intends to offer to all of its customers. This technology will be market ready in 7 years.



## UNLOCKING PAD

Currently, Cruise Origin has an "open" button and keypad for a code to be entered to open the doors. Instead, the **integrated door handle chip** would replace the button and the doors would **automatically open** when the phone confirmed that this was the correct ride.



## INTERIOR PASSENGER DISPLAY

The Cruise Origin is currently fitted with small dinner-plate-sized screens, **situated near waist level** of the seats. Instead, our design would feature another much larger screen above the seats on each side of the vehicle. These screens would be used to display information such as navigational data during the ride, and when exiting the vehicle, footage from blind spot cameras show any potential hazards.

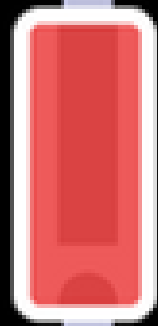


Cruise Origin has a wheelchair accessible version, called **Origin Mobile**. Community members helped Cruise design ways to make rides easier to access with a wheelchair. Audio and visuals were created with blind, low-vision, deaf, and hard of hearing riders in mind (Lee).

## IDENTIFICATION SCANNING

The cruise origin is outfitted with several **cameras** and **lidar** emitters in order to navigate roads autonomously. The cameras specifically are **capable of operating in low light** while retaining a **high resolution feed**. These systems could be used to **scan potential riders** in order to **verify their identity**. After the RFID sensor in the door is alerted to a potential rider's presence, a quick **scan of the face and body** would be performed and **compared against the rider's profile and pickup information** to confirm their identity. After identification is finished, the doors will open allowing the passenger to board





**ARRIVED** at destination.

Please review safety monitors to **EXIT SAFELY!**



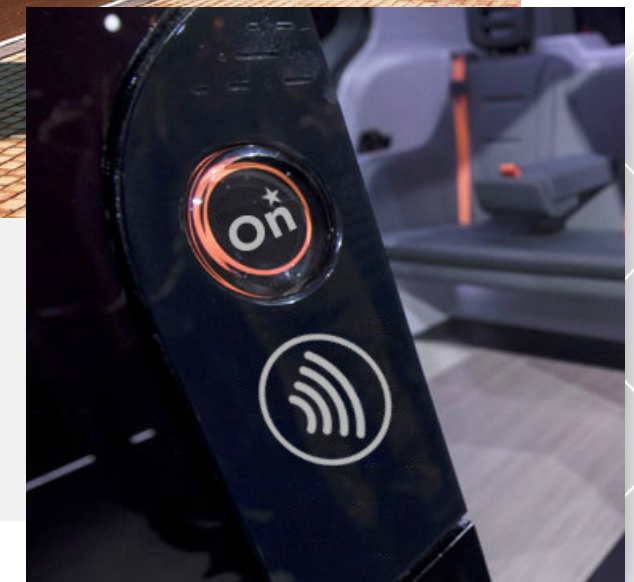
CRUISE PASSENGER DISPLAY

## CRUISE EXPERIENCE

- Passenger/Ride Identification Unlock Pad
- Top View of lane image recognition
- Blind Spot video feed/audio alerts
- Live visual/audio updates of trip delays, remaining time, and/or changes



User approaches and conveniently taps phone to unlock



CRUISE UNLOCKING PAD

## EXPERIENCES

Often trips and falls when going to new places

Has to navigate with pinhole vision after doctors appointments

## FEELINGS

Feels "exhausted" of asking for help

Misses ability to be spontaneous and run errands without planning

## ACTIONS

Takes rideshare to avoid stress of public transit in NYC

Plans outings ahead of time to reduce stress

## PAINS

"My [visual impairment] holds me back from having independence"

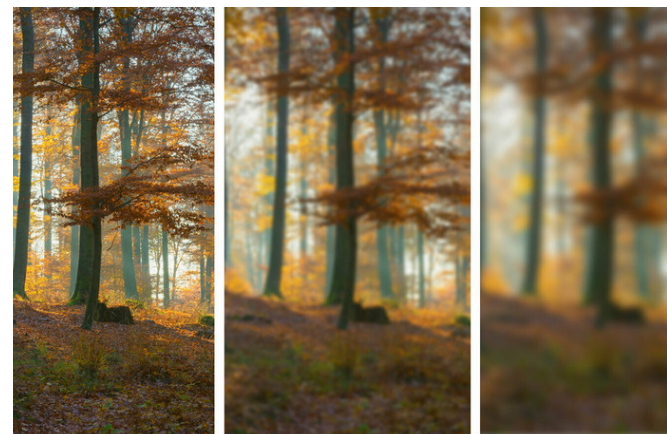
## GAINS

Has experienced kindness from others regarding her disability

INTERVIEW WITH DAWN, 25, BLIND IN ONE EYE

One of the most common vision impairments is colorblindness, or the inability to differentiate between certain sets of colors. Colorblindness effects an estimated 300 million people globally, and more specifically, can be found in 1 in 12 men and 1 out of every 200 women. Colorblindness is a genetic condition and often appears at birth, but in some cases it can also develop later in life. (Clinton Eye Associates)

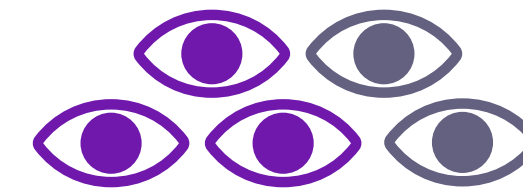
As part of our research, we attempted to replicate select visual impairments on ourselves, and go about our day on campus as we usually would, to better understand and experience living with a visual impairment. We used a series of custom glasses made to replicate conditions such as cataracts, diabetic retinopathy, pinhole vision, colorblindness, and complete blindness, along with a white cane. Navigating around campus was very difficult, especially anywhere with vertical features like stairs or hills. Even spaces we use everyday felt completely different. Having a friend along to act as a guide was necessary.



Normal vision

Moderate cataracts

Severe cataracts



# 3 OUT OF 5

ADULTS OVER THE AGE OF 40 HAVE VISION OR EYE PROBLEMS

On average, vision tends to decline most from the ages between the early 40s to the mid 60s. According to a study done by the National Institute of Health (NIH), vision decline is found to be much more prevalent in women over the age of 50. Something else to keep in mind is that the global population is constantly aging. It is estimated that over the next 30 years, the number of people with vision impairments due to age will double. The specific issues that begin to appear with age include, but are not limited to glaucoma, macular degeneration, diabetic retinopathy, and most commonly, cataracts. In fact, the NIH states that over half of all Americans over the age of 80 either have cataracts or have had them removed in a surgical procedure.

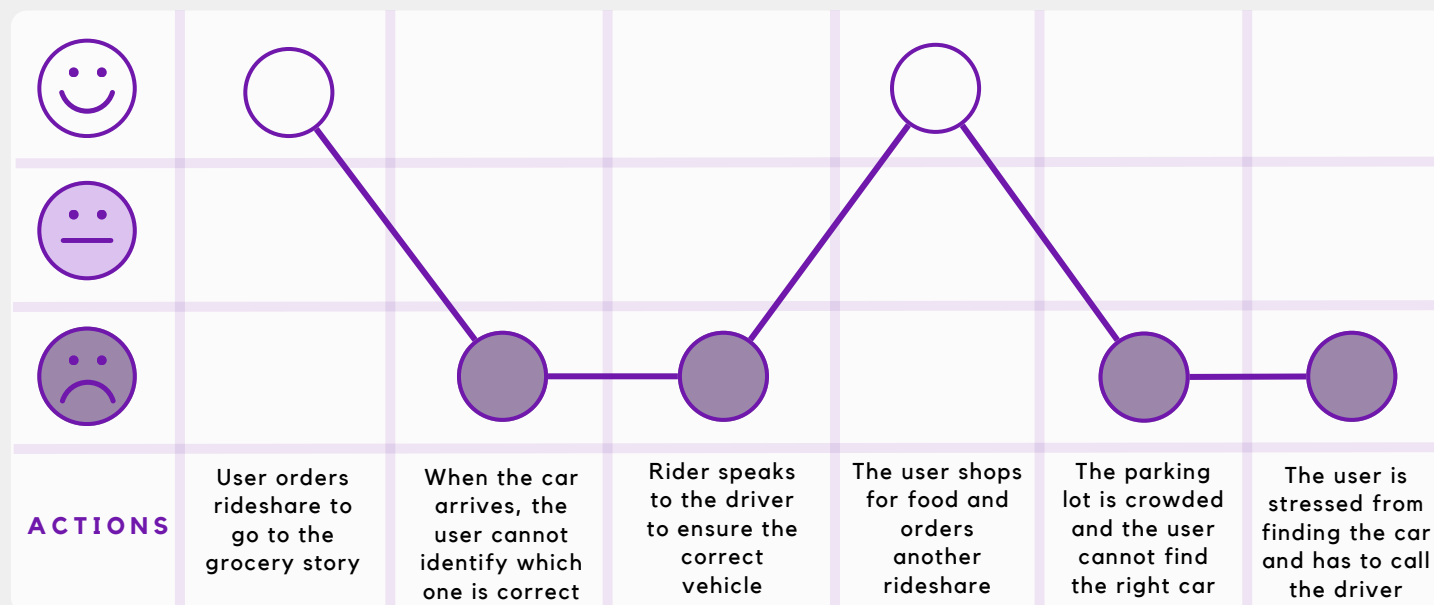
# VISION IMPAIRMENT EFFECTS ON DRIVING

STEFAN MEINERT AND ISABELLE PATRICK

So, how do vision impairments effect driving? In order to successfully obtain a driver's license in the United States of America you must have a visual acuity of at least 0.29 (20/70 vision). Frequency of vision tests and other requirements vary by state. (VaDMV) The relatively broad vision requirements for obtaining a driver's license can result in individuals with vision impairments making the uncomfortable and potentially unsafe decision to drive.

According to a study done by the University of Michigan, "the risk of mortality was 29% higher for participants with mild vision impairment, compared to those with normal vision. The risk increases to 89% among those with severe vision impairment." (Imhoff). With driving being unavailable or unsafe for individuals with vision impairments, there are very limited options for getting around town.

The most readily available options for getting around are public transportation and rideshare programs. Public transportation has not always been made with an accessibility standard in mind, and for that reason, it may be daunting and difficult to use. The more approachable of the two options, rideshare, presents its own set of difficulties. Rideshare services rely heavily on the driver and the passenger to identify one another and complete the pickup and drop-off with little to no communication. Due to these constraints, individuals with impaired vision are unable to use rideshare to its full extent.



# CHRONIC ILLNESS EFFECTING DRIVING

GABRIELA COLON-MELENDZ AND MICHAEL SILVERMAN

**20%** Crashes precipitated by diabetic driver-reported medical emergencies according to a 2009 National Highway Safety Administration study.

**11%** Additional medical emergencies reported due to heart attacks.

The American Diabetes Association estimates that more than 30 million adults in America have the condition. While most can safely operate motor vehicles, diabetics are 12% to 19% more likely to have an accident, according to a meta-analysis cited in an ADA study.

When researching accessibility in the auto industry our group found some interesting developments. Ford is currently working on linking wearable and in-car sensors to monitor heartrate respiration, blood glucose levels and skin temperature. They are also developing a nonintrusive method of measuring brain waves as a way to determine driver alertness.

At GM the Cadillac Super Cruise, available on the CT6 large sedan, can monitor a driver's awareness. The system uses a camera and infrared lights to track the positioning of the driver's head to determine where he or she is looking. Super Cruise can slow the car to a stop, engage hazard lights and call for help if it determines a driver isn't paying attention.

Another example includes the Honda Automated Network Assistant, that will make driving recommendations based on its interpretation of your mood. HANA could recommend soothing music for drivers with elevated heart rates, or ice cream for those with high body temperature.

Emotional state is a large factor in the likeliness of someone who is predisposed to any heart diseases. This can be a major issue for people who are stressed when driving as they are more likely to experience some kind of heart failure. Driving with a clear mind is very important for these individuals and should be taken seriously before getting behind the wheel of a car.



**1 OUT OF 5**

**DEATHS WERE DUE TO HEART DISEASE IN 2020 ACCORDING TO THE CDC.**

## EXPERIENCES

"At night I'd rather take Uber because [diabetes] also effects your eyesight. Even though I had laser eye surgery, I still see halos."

### FEELINGS

Feels weak and light headed when her blood sugar is low

Stressed by frequent need to take medicine and check blood sugar

### ACTIONS

Has to routinely take medicine

Carries juice to raise blood sugar and exercises to lower it

Eats in small portions

### PAINS

Eye sight is impaired in dark environments

Constantly worrying about her blood sugar

### GAINS

Not yet on insulin because the medication works.

Knows when she needs to act based on feeling

INTERVIEW WITH ANITA, TYPE 1 DIABETIC

The National MS Society



Normal Vision

Double Vision

Our research team began to find connections of various chronic illness causing varying degrees of vision loss or impairment. For example Diabetes and Multiple Sclerosis both can impact a person's vision with blurred vision, glaucoma, diplopia (double vision), cataracts and more. These impacts on vision may lead to the person having to change their mode of transportation and how they may go throughout their day and routine.

We spoke to Reinaldo Colon who was diagnosed with Multiple Sclerosis in the 1980's. He mentioned one of the reasons he had to stop driving was because of the blurry double vision he had developed from nerve damage in his eyes. He also mentioned multiple instances where he would get sudden moments of hazy vision and feeling unwell, which has also contributed to him now being driven.

One of our interviews was with Anita Mason who is a 50 year old type 1 diabetic. She was diagnosed in 2005 and has been taking medication since then that's dose has gradually increased throughout the years. She is currently the maximum dose of her medicine before she would have to start on Insulin, so she tries to be very active and incorporate more cardio and diet changes to lower her sugar. She has also developed halos in her eyesight that cause trouble when it is dark outside, therefore she cannot drive at night. She mentioned that she has to be very mindful of how her body feels and that she has to take action quickly.

## A DAY IN JEN'S LIFE



Jen wakes up and takes her daily medication



She then drives herself to work



During her workday, she starts to not feel well and checks her blood sugar. She tests her glucose multiple times a day as a part of her routine with diabetes



She tests rather low and decides to have a snack to bring her glucose back up



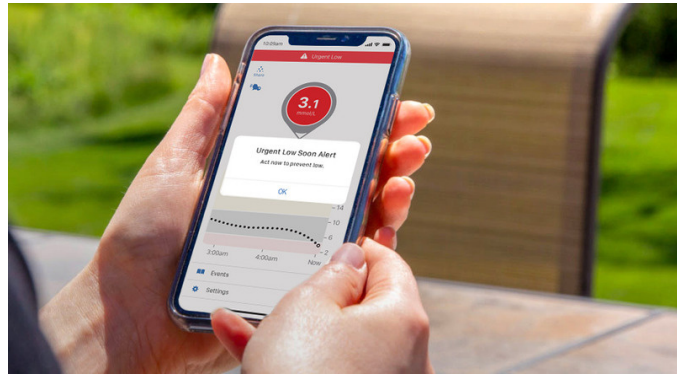
Her workday is done and she drives home



Later, she decides she wants to go see a movie. She's suffered from some cataracts and halos in her vision due to her diabetes, and cannot drive herself at night.

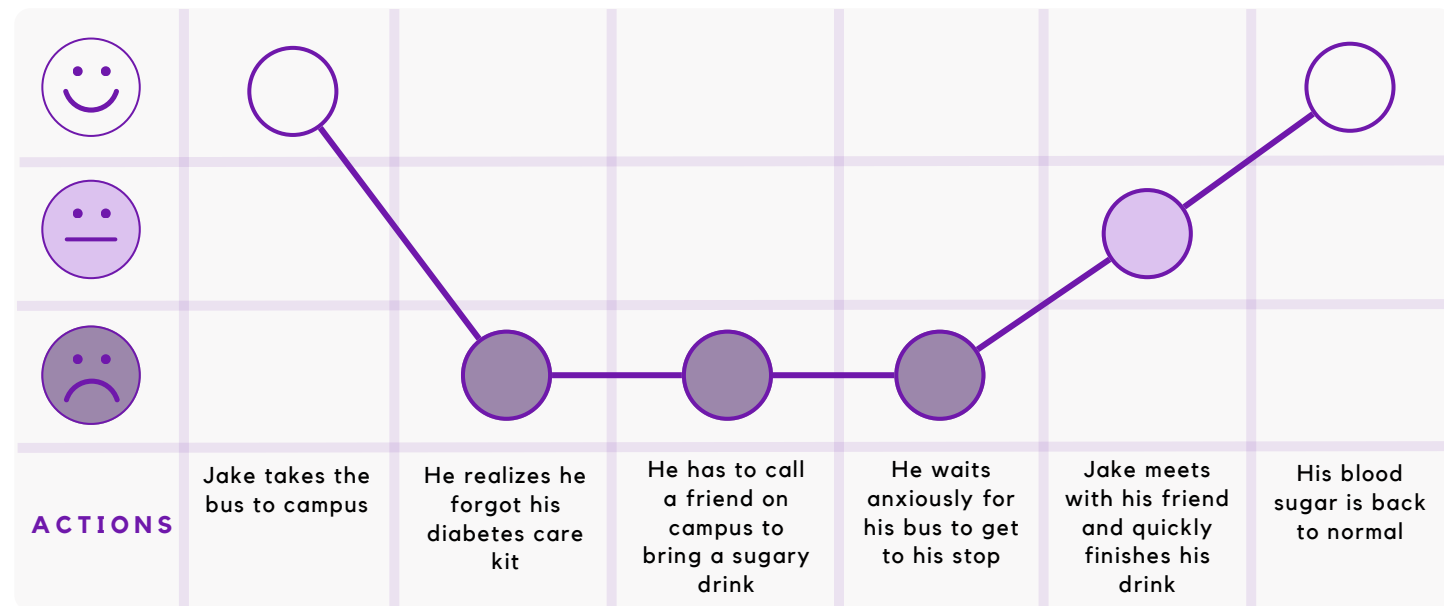


She has to call a Lyft in order to get to the theater, as there is no public transportation near her home.



Jake Facciani, a 22-year-old type 1 diabetic graciously agreed to being interviewed. He was diagnosed "late" at 16 years old, and two of his three siblings are also type 1 diabetics. When discussing driving with diabetes, he stated that he does have to double check his blood sugar because driving low is incredibly dangerous and there may not be a safe place to quickly pull over and administer insulin or eat a snack. He talked about the embarrassment he experiences in class or public transport when his blood sugar tracking app called Dexcom goes off. It alerts at full volume and causes people to turn around when it alerts in a quieter public space.

While riding on the public bus system, he was alerted that his blood sugar was low and that he did not have anything to get it up. He had to contact a friend to meet him at the bus stop with Gatorade for him to get his blood sugar back to a safe range.



## EXPERIENCES

"Traveling to Czech I had to explain through Google Translate that my insulin and gummies were to raise my blood sugar and that they were not drugs."

## FEELINGS

Wants to be understood and to educate others

Unsettled by stigma that type 1 diabetics have on type 2 diabetics

Sweaty, nauseous, and tired

## ACTIONS

Checks blood sugar and nutrition facts

Takes insulin and eats necessary foods

Pays attention to monitor and monitor app

## PAINS

Anxiety when separated from care kit

Feels embarrassed when monitor app audibly alerts

## GAINS

as access to insulin

App is good at accurately tracking his blood sugar every 15 minutes

INTERVIEW WITH JAKE FACCIANI, 22, A TYPE 1 DIABETIC

Interviewing the users made us think about public transportation or rideshare. Rideshare is becoming more prevalent and common worldwide. It personalizes the public transport experience and makes transportation more accessible if someone is nervous about using a public system like trains or busses, which can be difficult to navigate. Rideshare picks you up where is convenient for you rather than the user having to go to the system specific spots.

# CHRONIC ILLNESSES

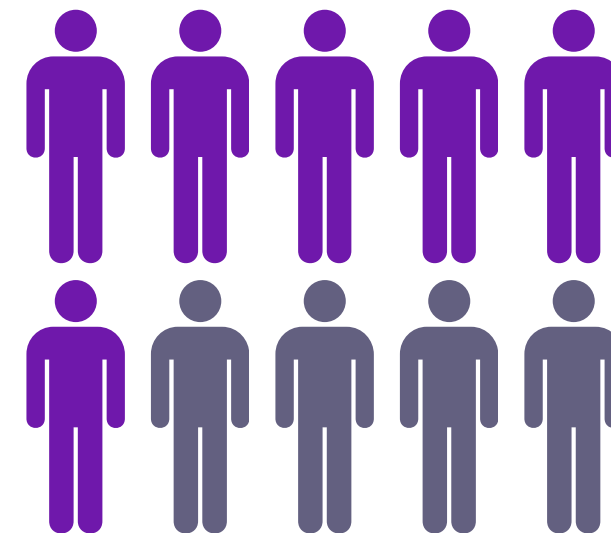
MERIEL CARNEY AND AIDAN O'DRISCOLL

Chronic diseases are defined broadly as conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both. Chronic diseases such as heart disease, cancer, and diabetes are the leading causes of death and disability in the United States.

In 2009, 7 out of 10 deaths in the U.S. were due to chronic diseases. Heart disease, cancer and stroke account for more than half of all deaths each year. About half of all adults have a chronic condition, and approximately 8 percent of children ages 5 to 17 were reported by their parents to have limited activities due to at least one chronic disease or disability (*About Chronic Diseases*).

There is a lot of correlation between chronic illnesses and low vision. Physical health contributes to the health of your eyes. Some chronic illnesses that effect your vision include diabetes, hypertension, Lyme disease, autoimmune conditions, and liver disease. "People who suffer from diabetes...may be at risk of a condition known as diabetic retinopathy...which can result in serious vision loss and even blindness," (Broberg Eye Care). The leading causes of blindness and low vision in the USA are primarily age-related eye diseases such as cataracts, diabetic retinopathy, and glaucoma.

**6 IN 10**  
ADULTS IN THE USA HAVE  
A CHRONIC ILLNESS



(Ekoue)

Nearly 60% of adult Americans have at least one chronic disease. About 40% of American adults have multiple chronic conditions and evidence is growing that one chronic illness has a negative impact on the risk of developing others (Hoffman).

More and more people are living with not just one chronic illness, such as diabetes, heart disease or depression, but with two or more conditions. Almost a third of the population is now living with multiple chronic conditions (Gerteis, Jessie, et al.).

**2 IN 5**  
ADULTS IN THE USA HAVE TWO OR  
MORE CHRONIC ILLNESSES



(Ekoue)

# PROCESS

## RESEARCH SIMILARITIES

## KEY DESIGN FACTORS

## PROBLEM STATEMENT

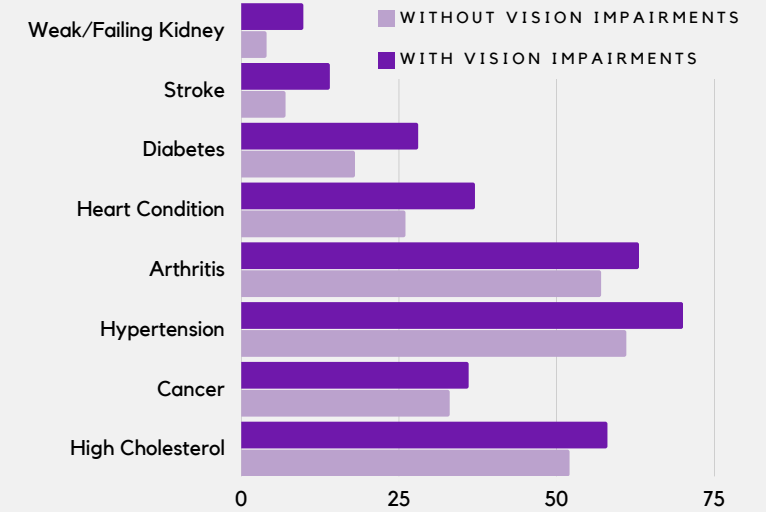
## INITIAL IDEAS

## REFINEMENT

## FINAL CONCEPT

### Research Similarities

In our Research Teams of two, the class wrote out areas of interest from our research and findings. We began to discuss the similarities between chronic illness and vision impairment, as well as the similarities between pain points we had noticed in our user interviews. With research, we learned that there is a high prevalence of people with chronic conditions and vision impairment, making this a good user market. We discussed pain points from our users about public transport, rideshare, and having to get rides from friends or family members. From this, we decided to focus on a way to make rideshare more accessible due to its availability amongst various companies and apps.



PREVALENCE OF CHRONIC CONDITIONS AMONG PEOPLE WITH AND WITHOUT VISION IMPAIRMENTS, AGED 65+ YEARS

### Problem Statement

After deciding upon rideshare or personal vehicles as the main focus of our project, we looked for ways to narrow our problem statement. We realized that many rideshare drivers don't purchase their vehicle for the specific purpose of offering rides. This motivated us to pursue the design of aftermarket products to make existing cars more accessible. The add-on capabilities of these products could also cater more to those whose vision is declining or mobility is becoming more limited. These factors led us to our problem statement of:

How can we create **assistive technology accessories** to aid those with visual impairments or chronic illnesses in rideshare or personal vehicles?

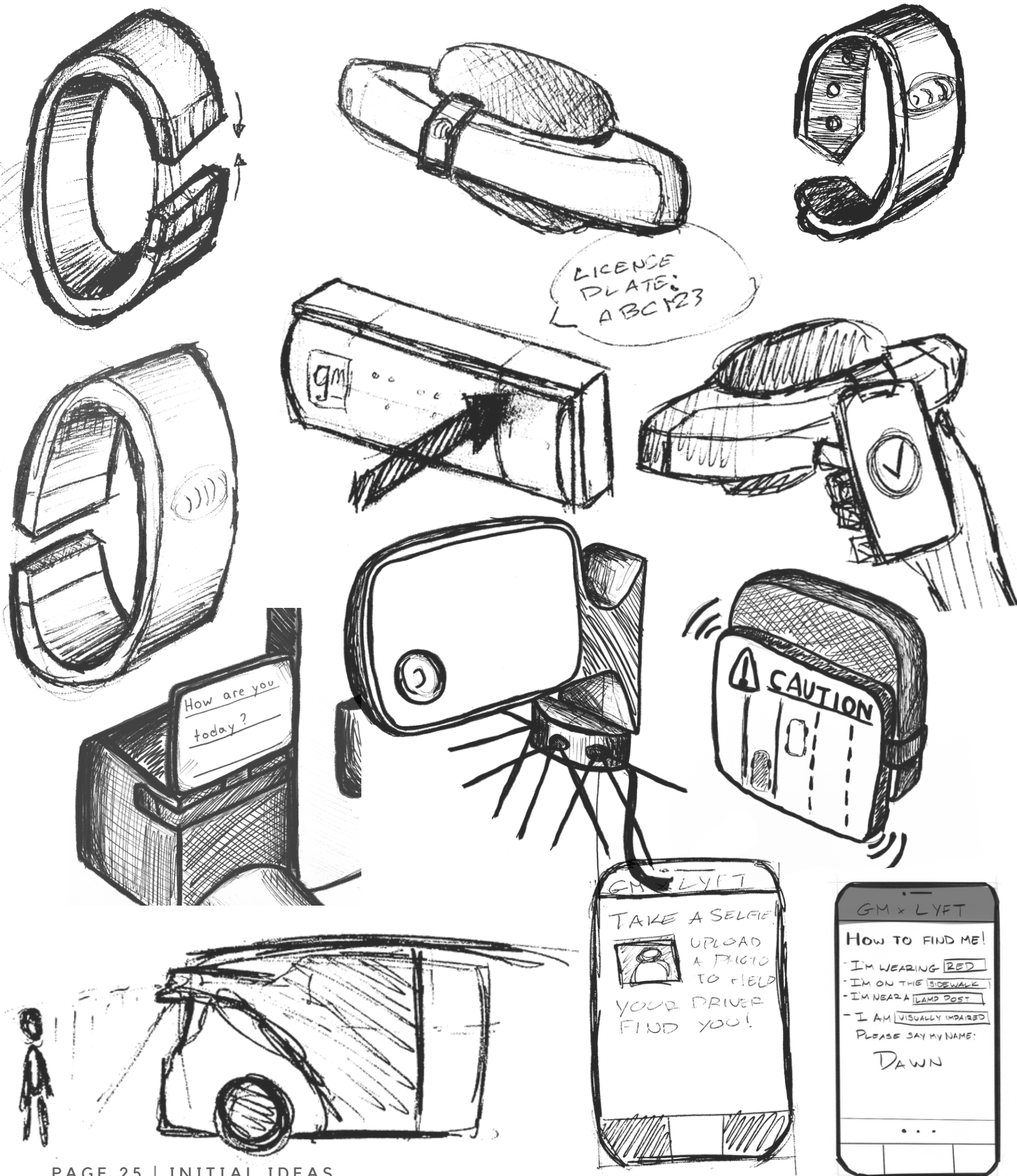
### Key Design Factors

**Safety, Convenience, and Independence** were our three key design factors that led us as a group to ideate products that would improve the users and drivers rideshare experience and travels. These three combined create for a comfortable and secure ride that every user and driver deserve.

Safety was the most important and leading design factor that we focused on as a group. All of our products and ideation included a way to make the rideshare experience either safer for the passenger, driver, or both!

Convenience and independence were also major themes because many users with disabilities or impairments are not given the assistive technology or resources to have a pleasant and enjoyable ride that they should have.

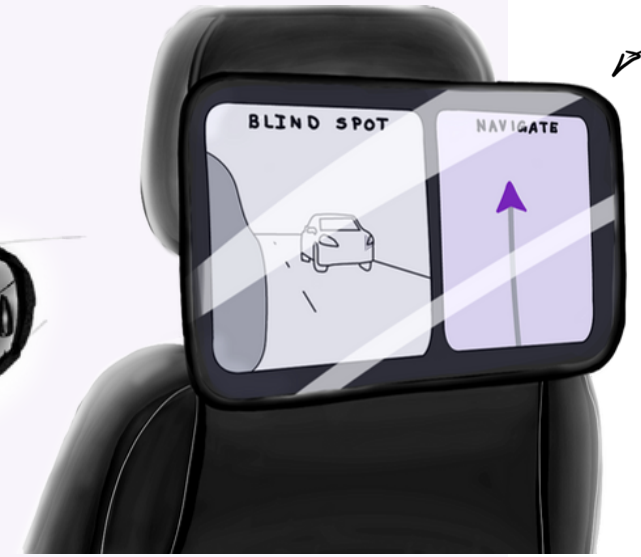
# INITIAL IDEAS



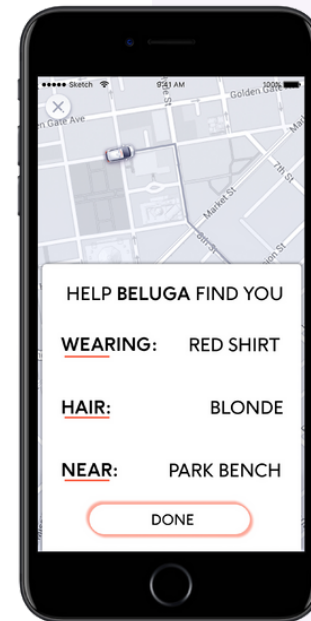
RFID DOOR HANDLE BAND



PASSENGER DISPLAY



INPUT PASSENGER INFO SCREEN



PASSENGER INFO DRIVER DISPLAY

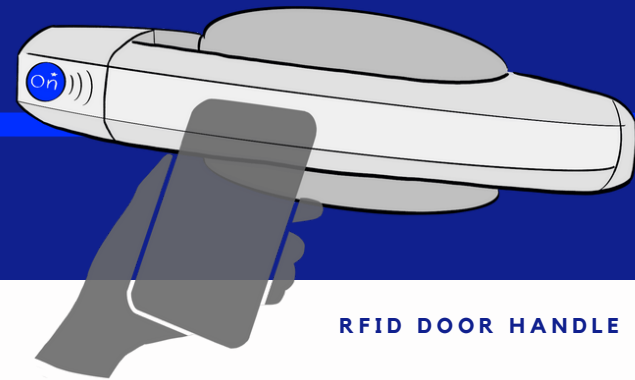
## HOW CAN THESE IDEAS GROW AND EVOLVE WITH GM?

INTRODUCING

# RIDESAFE

The RideSafe system timeline is designed with the consideration of future technological innovations. To incorporate accessibility into upcoming General Motors vehicles, the features of the initial stage, The Now, are anticipated to be ready for the market in approximately two to three years. Following The Now, The Next aims to expand the availability of accessible capabilities to other models and brands in collaboration with Lyft in a timeframe of three to five years. Lastly, The Future has the goal of improving the accessibility within Cruise in approximately seven years.

## NOW



RFID DOOR HANDLE

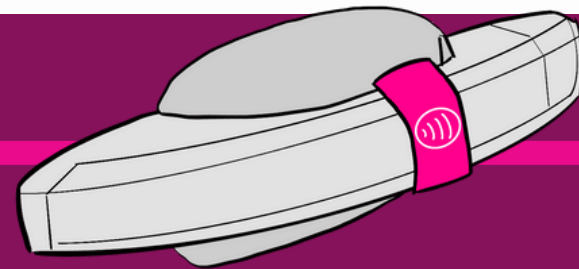


PASSENGER INTERFACE

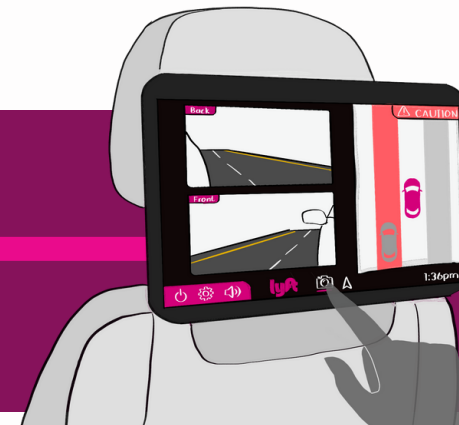


ONSTAR DRIVER INTERFACE

## NEXT



RFID DOOR HANDLE BAND



LYFT PASSENGER INTERFACE



LYFT DRIVER INTERFACE

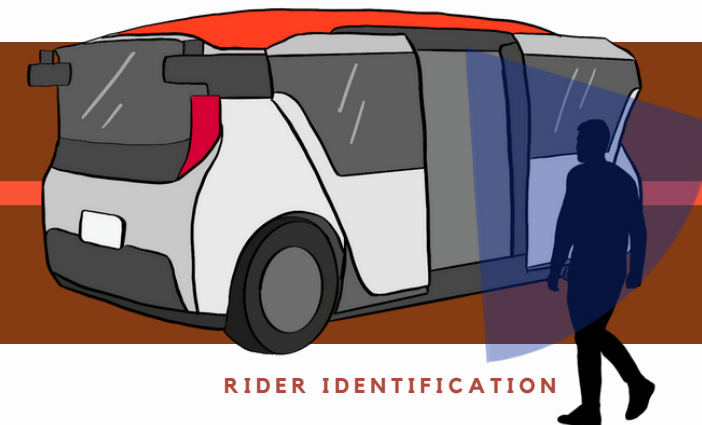
## FUTURE



UNLOCKING PAD



CRUISE PASSENGER INTERFACE



RIDER IDENTIFICATION



# OUR TEAM



MERIEL CARNEY

I focused primarily on researching the similarities between chronic illness and vision impairment, and Cruise Origin and their current accessibility features. I worked on the integrated door handle in the Cruise Origin. I created statistic images and photoshopped some of the supplementary images. I also starred in and edited the video demonstrating the rideshare experience with RideSafe.



STEFAN MEINERT

Each member of the group tried to work a little on everything, but we still had individual areas of focus. I primarily focused on initial vision impairment research, an immersive research experience, driver/passenger identification interfaces and wireframes, photoshopping of supplementary images, and some graphic design.



ISABELLE PATRICK

While I worked on many different elements of this project, some of my main contributions include the design of the RFID Car Door Handle and its iterations, page layouts, and graphics such as those describing the Ride-Safe timeline. Additionally, I played a key role in organizing our designs in to their categories and deciding upon how to clearly convey our concepts.

While each aspect of the project was worked on by all group members, every participant lead different elements of the process.

We decided that working jointly while each member lead different parts was an efficient way for our team to work given that our products all overlap and have a timeline to follow.

GABRIELA COLON-MELENDZ

Although I worked on most aspects of the project my focus was on the display concepts. This included the passenger and driver displays in the personal vehicles as well as the Cruise origin display. I worked on the ideation for them as well as the renders and wireframes.



AIDAN O'DRISCOLL

I primarily focused on the Now section of our timeline and assisted with the others areas of the project including research, ideation, refinement of designs, and intended business model approach. I also helped put together our animation video and live-action storyboard.



MICHAEL SILVERMAN

We split and worked on all aspects of the the project and reviewed each other's work. I specifically looked a lot into the initial research for the chronic illness I page as well as worked on much of the photoshop work and graphics for this book and our video. I also looked into the infotainment system in current GM vehicles and how to integrate the features we wanted into it.





# REFLECTING

As a team, we wanted these products to increase user safety, convenience, and independence during rideshare transportation. We discussed how rideshare is being more widely and commonly used worldwide, and that it is a great option for transportation for disabled persons since it personalizes the public transport experience.

In the future or if given more time, we would have loved to make physical prototypes like the additive door handle band. We would also work on making more thorough wireframes for the digital interfaces so we could go more in depth of the development of the user interface and gain user feedback for them.

## MERIEL CARNEY

Our concept fulfills the goals of making rideshare more safe, convenient, and independent for all users, not just users with a disability. If I had more time, next time I would make physical prototypes of the additive accessories and make a preliminary app for the user's rideshare.

## STEFAN MEINERT

I am very content with the results of this project. Working with a large company like GM was eye opening and an invaluable experience. I really enjoyed the opportunity to do speculative design, with such open criteria, we really had so much room to dream and ideate, and the time to polish our ideas.

## ISABELLE PATRICK

Overall, I am very satisfied with the results of this project. I think that many of our concepts could feasibly be integrated into existing rideshare programs. In particular, I really enjoyed developing the door handle designs and believe that they have opportunity to benefit rideshare users beyond those who are visually impaired or experience chronic illness.

## GABRIELA COLON-MELENDZ

I am very pleased with our final concept and timeline. I found it exciting that we decided on a GM Ridesafe system rather than a singular product because it allowed us the opportunity to expand on how products and ideas could age with the company.

## AIDAN O'DRISCOLL

I was very excited to hear that we would be doing work with GM at the beginning of the semester. This has been my first experience doing a project with a major company and I'm proud of how my team worked together and overcame the challenges presented to us. I believe we produced a successful project. If I could change something it would be extending the timeframe we had to ideate and flesh out our designs.

## MICHAEL SILVERMAN

I was delighted when told we'd be working on this prompt with GM. This was an amazing experience to work with a large company and integrate our work with theirs both literally and figuratively. I loved working with the idea of adding our own taste to an existing product to better help a specific audience.

Thank you to our professors, Ben Kirkland and Martha Sullivan, along with Gregory Borbon and those from General Motors who guided us through this project. Your direction helped us make informed decisions to pursue the cause of improving accessibility in rideshare.

We would also like to thank Glen Gagnon, Chivon Fitch, Reilly Becker, and Kristine Taylor for aiding us in the research phase of our project. By conducting interviews, we were able to receive insights that closely related to our chosen topic. This information informed our design decisions when addressing accessibility.

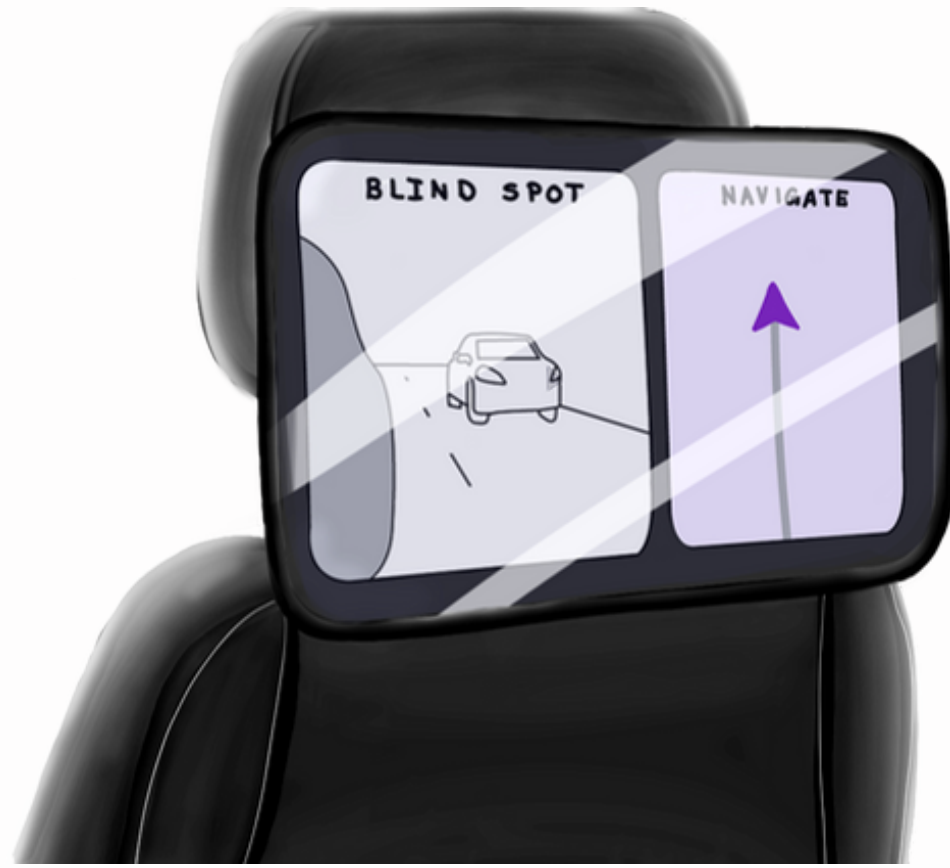
Lastly, we would like to thank all of those who participated in our research interviews. We appreciate your vulnerability and willingness to educate us about your experiences with chronic illness and/or vision impairment.

**THE RIDESAFE TEAM  
WOULD LIKE TO OFFER  
OUR *THANKS* TO  
THOSE WHO MADE  
THIS PROJECT  
POSSIBLE**

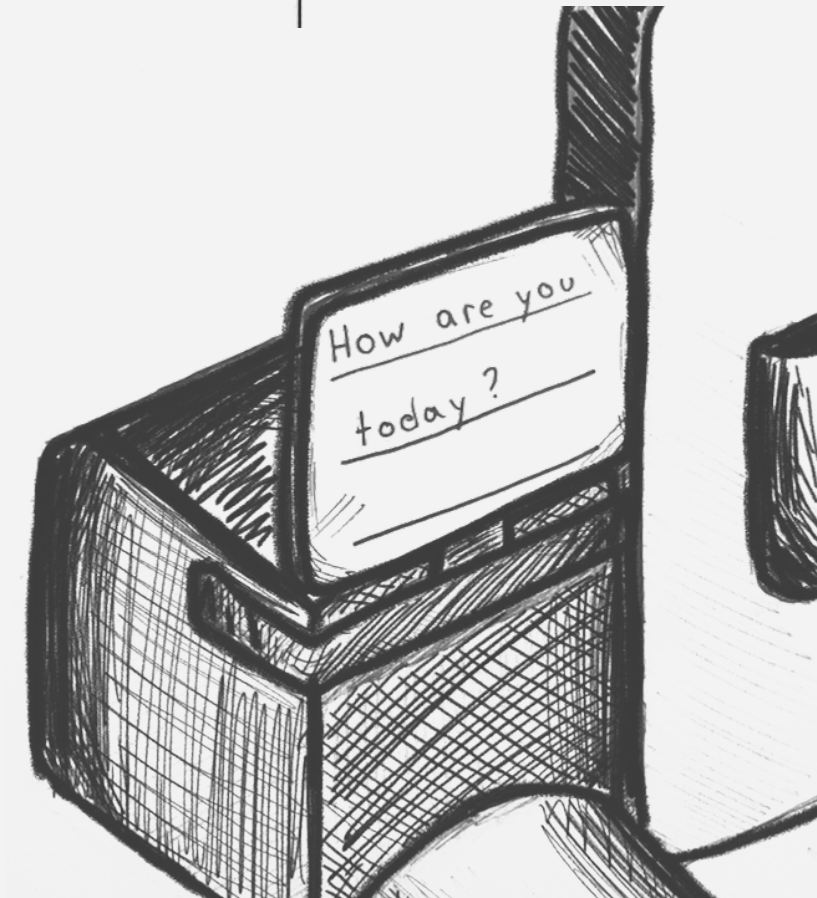
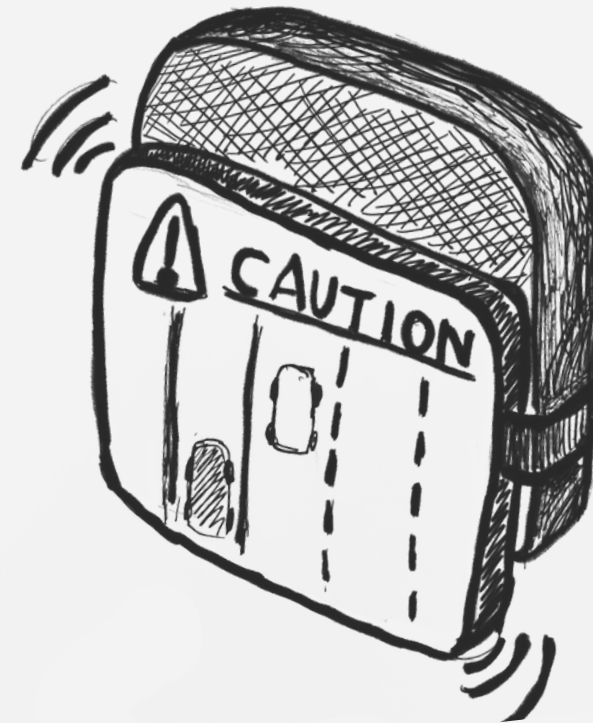
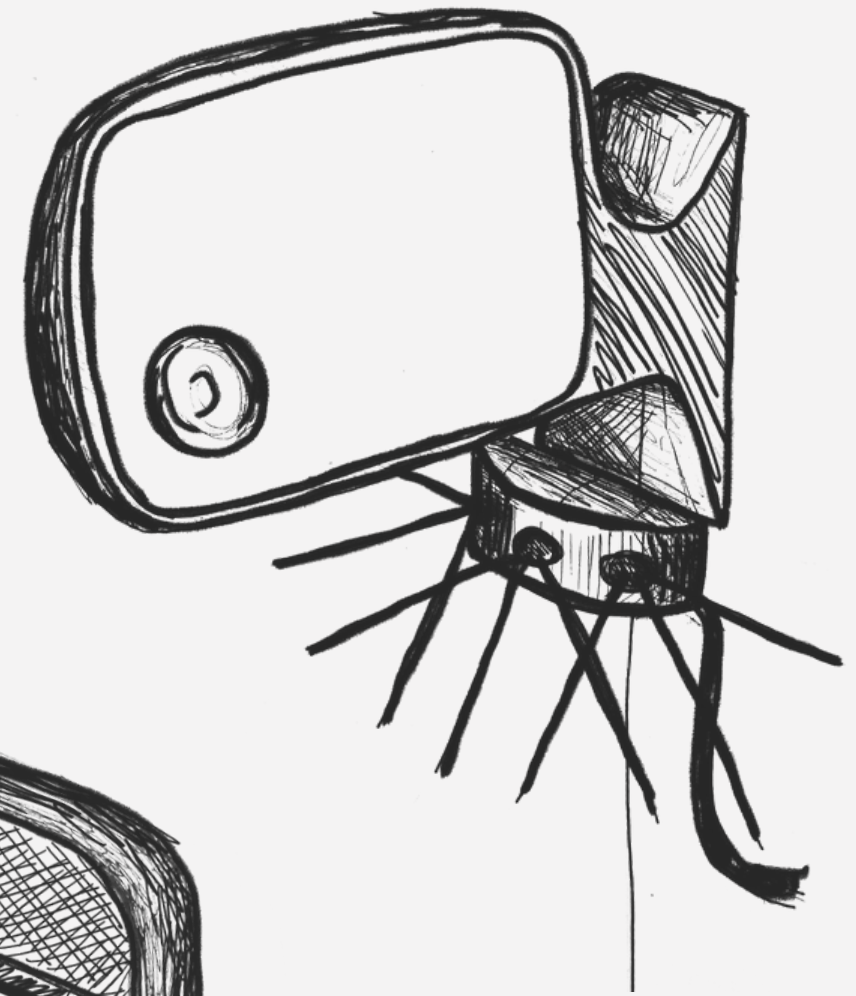


**THANK YOU**

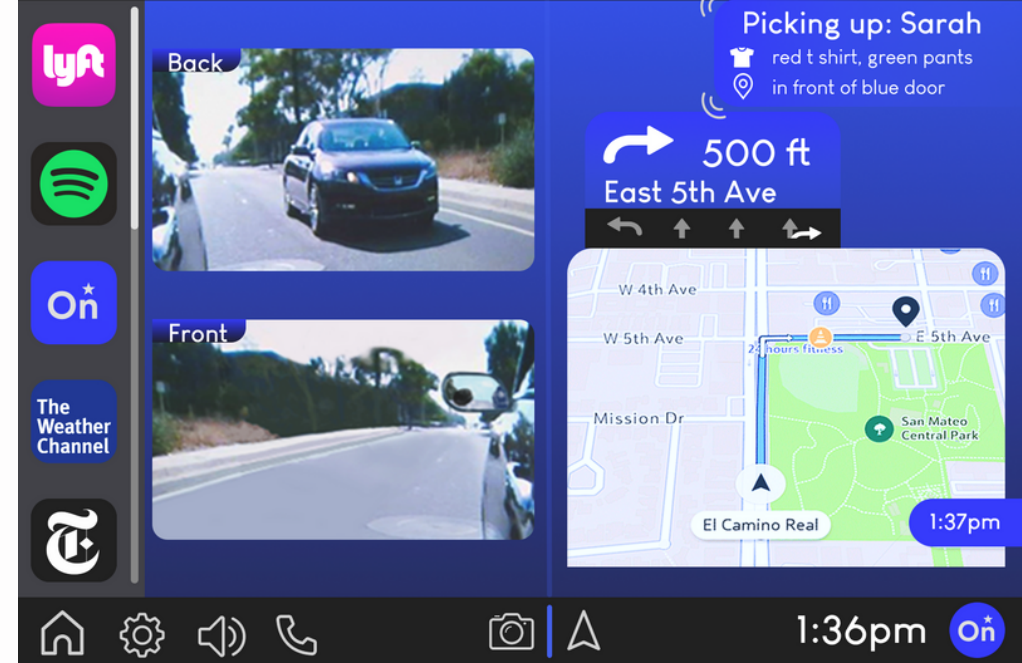
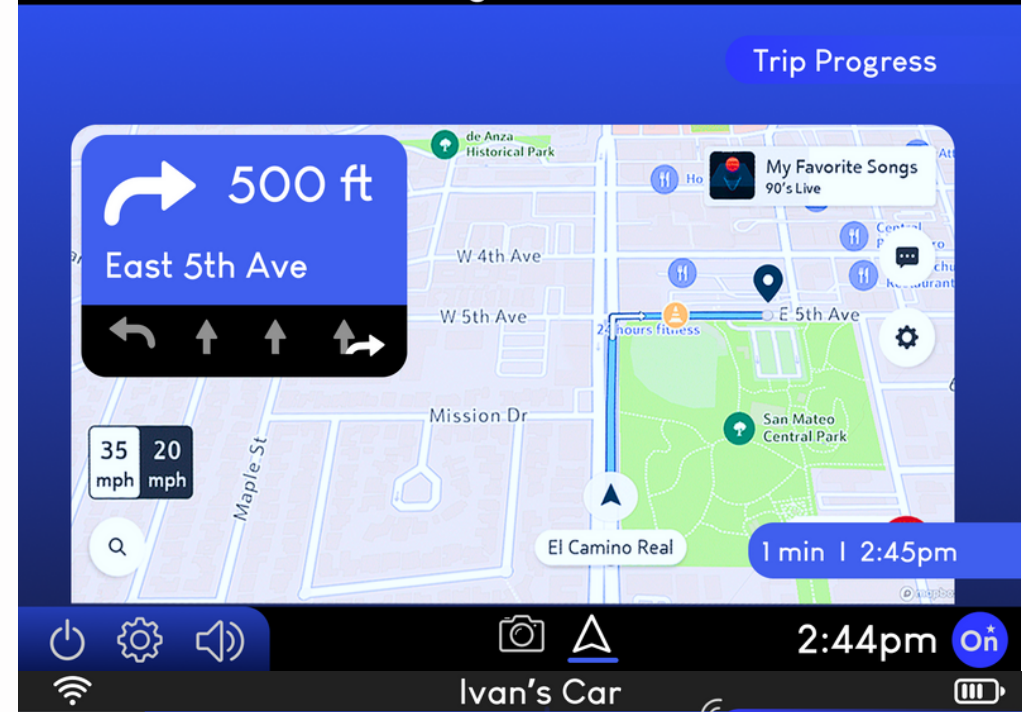
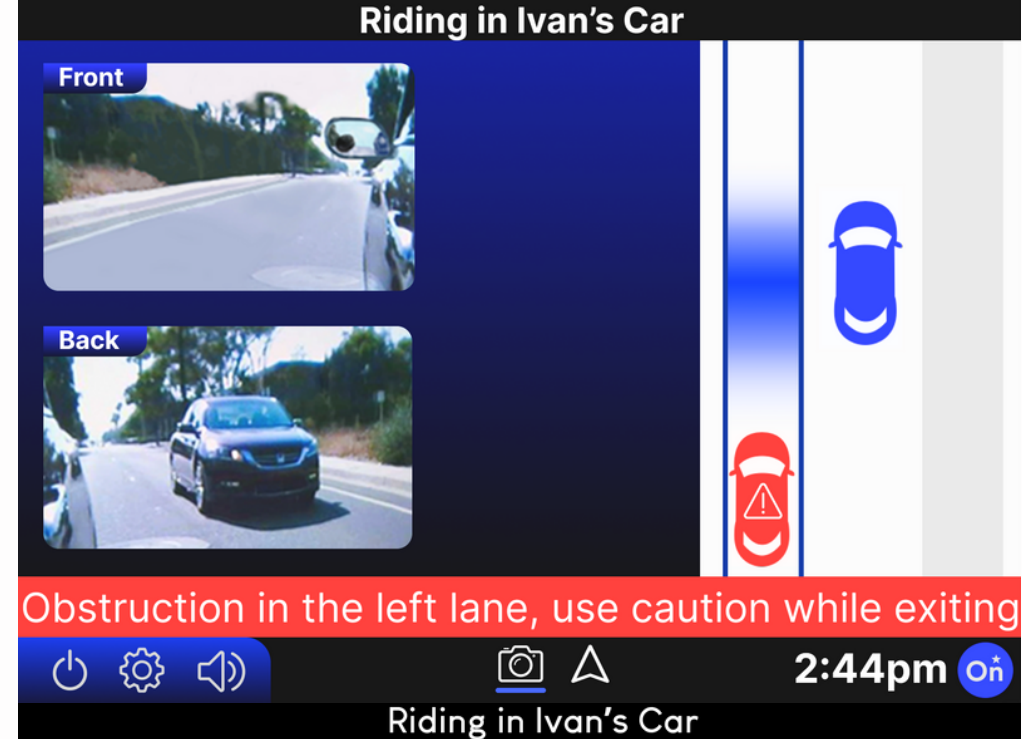




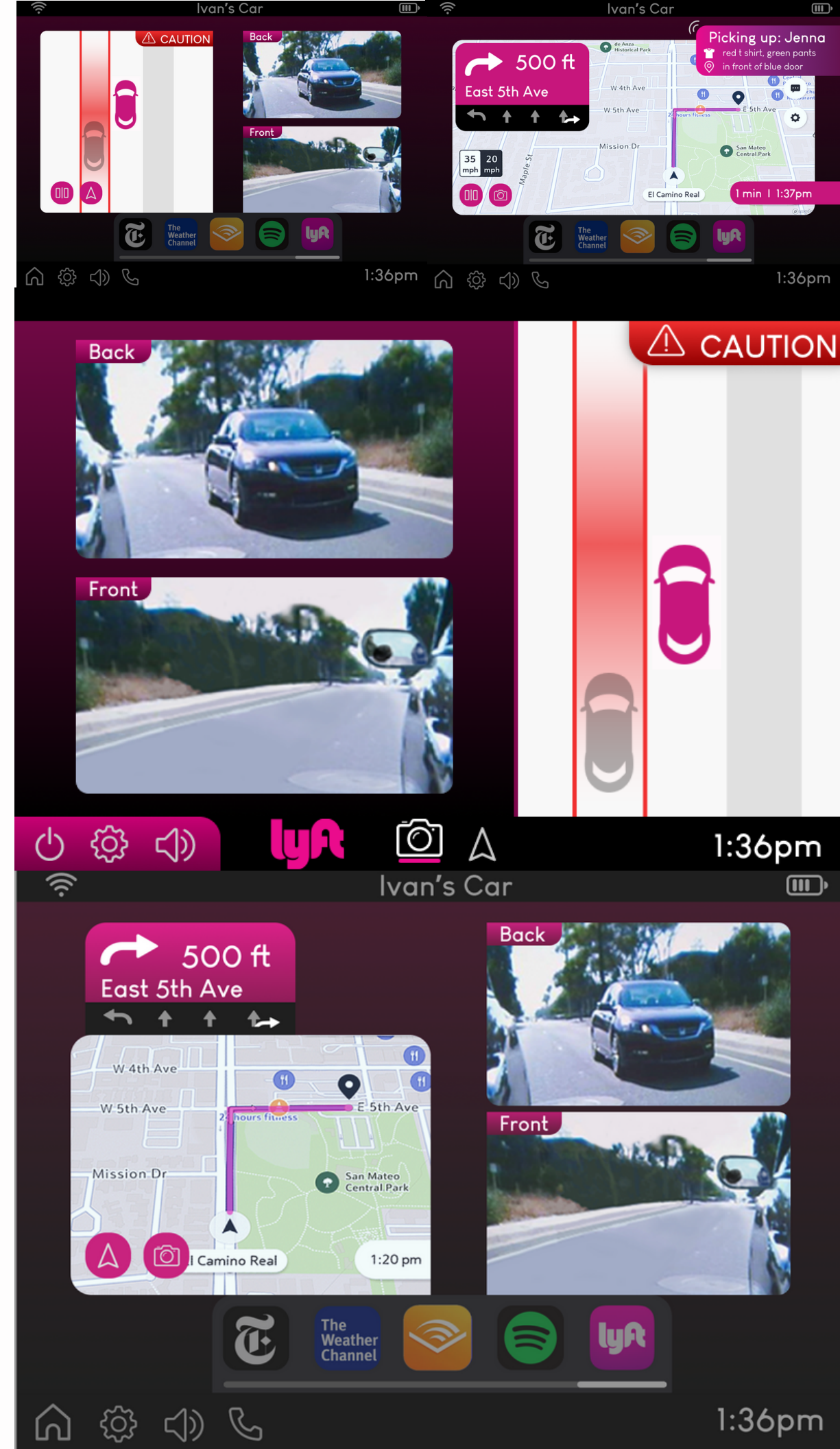
# MY CONTRIBUTIONS

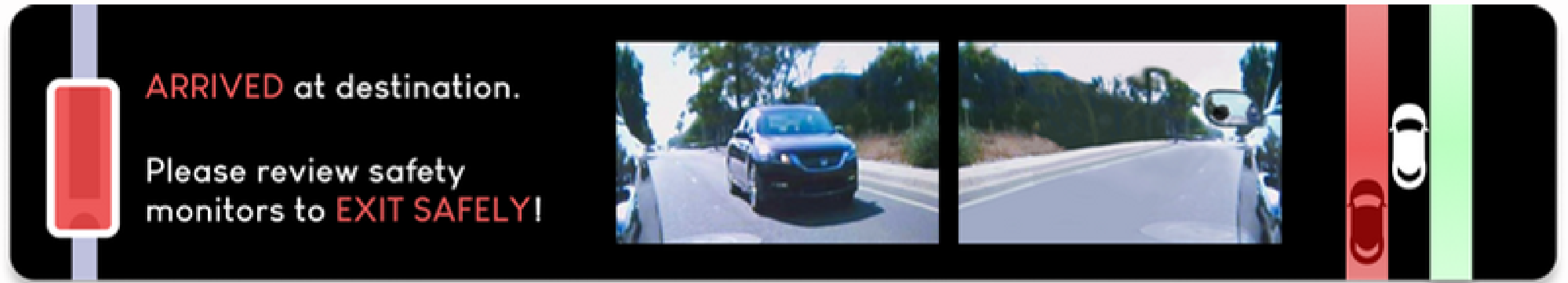


# NOW/ON STAR



# NEXT/LYFT





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