

VIEW 2.0

User Experience Testing Report

Version 1

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Document Overview

This document describes a test plan for conducting UX testing during the reimagining of VIEW in the 2023-2024 academic year. The goals of these tests include identifying pain points and potential design concerns, evaluating how desirable this experience is, and understanding where users get lost or confused. These goals will support any redesign or iteration of the VIEW experience to improve the efficiency, end-user satisfaction, and experience of VIEW 2.0.

Executive Summary

VIEW was first created in 2017-2018 by the Olin College Senior Capstone Program in Engineering (SCOPE) team partnering with the Volpe National Transportation Systems Center and funded by the Santos Family Foundation. VIEW presents a multitude of opportunities to improve the experience of users interacting with the VIEW ecosystem. We created a UX strategy by aligning on possible use cases of VIEW 2.0 to design specific experiences for the various needs of users:

Category 1 (power users): People who prioritize precise data from high-volume measurement, even if the system has a higher barrier of entry. Ex. Volpe, IIHS

Category 2 (fleet managers): People who want an accessible tool for low-volume measurement, such as for taking measurements of an existing fleet of vehicles. Ex. City of Boston, NTSB

Category 3 (advocates): People who access the dataset generated by VIEW but do not take measurements themselves. Ex. safety advocacy groups, reporters

Through our research, we aim to understand two main areas for improvement. First, we want to evaluate the current VIEW ecosystem created by the previous SCOPE team. This ecosystem consists of the VIEW site and the measurement process to collect the data needed for the site to calculate blind zone information. Insights gathered in this phase will support our redesign decisions to make data-driven designs. Next, we want to evaluate our redesigned experience before the completion of our project. Through both phases, we conducted evaluative research to assess and improve the VIEW ecosystem by gathering user data and insights to see how it meets user needs, how easy it is to use, and how positive user satisfaction is. Both formative and summative research methods were used to identify specific usability issues and to evaluate the overall performance and impact of VIEW.

Recruitment Plan

We will recruit participants or proxies interested in vehicle safety and represent our target user demographic of people over 21 who own or use vehicles. Other user groups we would like to have represented are researchers and vehicle safety industry professionals, government transportation offices, advocacy groups, consumer reports, and more. To test the website user experience, we will recruit proxies and participants for both general and specialized backgrounds to represent our target demographic. For the measurement process testing, we plan to recruit both vehicle safety researchers or industry professionals and everyday users.

Fall recruitment plan

We will recruit 4 students who own and drive vehicles from Olin College of Engineering to assess the website UX. The participants represent a general, nonspecialized background for our Category 2

users of VIEW. We will also talk to 3-4 researchers/industry professionals from Volpe and IIHS to understand both the website UX and measurement process testing.

Spring recruitment plan

We plan to use a combination of Lyssna's panelists and our own contacts to source US participants. For the website UX testing, we aim to recruit 8 participants from Lyssna's participant panelists. These panelists should represent a general, nonspecialized background and will not have experience or familiarity with the VIEW platform. We will also recruit 1-2 participants from City of Boston, MassDot, or Together for Safer Roads. For the measurement process testing, we will use our own user database. We aim to recruit 4-5 participants who will represent both a nonspecialized and specialized background.

Testing Plan and Timeline

Phase 1 (Fall 2023):

Research Goals:

- Understand pain points and usability issues with VIEW site and measurement experience.
- Discover areas of improvement for site navigation, content, visualizations, and impression of the site.
- Learn what is working well in the current VIEW site.
- Learn magic wand answers and changes users would like to make to the current process.

Research Questions:

- How does the site architecture meet, or fail to meet, user expectations?
- How easy is it for users to understand the blind-zone visualizations?
- What parts of the site can be improved? What can be kept the same?

Methodology:

Method(s)	Qualitative usability testing In-depth user interviews
Study design	Moderated
Participants	3-4 Category 2 users (Website UX testing) 2-3 Category 1 users (In-depth Experience interviews)
Incentives	Snacks and beverages
Length	30-minute sessions
Stimuli	Current VIEW Webapp on desktop

Timeline:

Date	Action Items
10/18-11/3	Recruit participants for testing and interviews
10/27-11/8	In-depth user interviews with power users
11/8-11/10	Conduct usability testing
11/11-11/15	Synthesize UX testing results

11/15	Present insights to Liaisons
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Key learnings:

- Homepage didn't really convey site purpose and next steps
- Site seems outdated and visuals can be improved
- Information about direct vision is useful and should be in a more prominent place
- Blind-zone visualization can be clearer
- Remove 1 ft scale in legend for visualizations
- Process to mark photos is frustrating
- Confusing to use the site
- Analysis is unreliable and slow

Phase 2 (Spring 2023):

Research Goals:

- Test and receive feedback on the redesigned VIEW website and measurement experience
- Validate hypotheses that pain points uncovered in Phase 1 have been addressed.
- Identify areas where the user navigation can be improved.
- Evaluate what information is helpful to include to optimize blind zone visualizations.

Research Questions:

- What information is confusing for users to understand?
- What is the user's overall satisfaction with the website and measurement process?
- What improvements can be made to increase user satisfaction?

Methodology:

Method(s)	Qualitative usability testing In-depth user interviews
Study design	Unmoderated (Website UX testing) Moderated (Website UX testing) Moderated (Measurement process)
Participants	6-8 Category 2 users (Website UX testing) 2-3 Category 1 users (Measurement process)
Incentives	Gift Card payments, Lyssna's payment
Length	15-45 minute sessions
Stimuli	Current VIEW Webapp on desktop or Figma mockups Vehicle

Timeline:

Date	Action Items
2/7-2/14	Create UX test plan and overview.

2/14-2/28	Create Figma prototype and test on Lyssna for website experience testing
2/28-3/4	Conduct unmoderated website testing
2/21-3/6	Recruit participants for measurement experience testing.
2/28-3/1	Synthesize website UX testing results
3/29	Conduct measurement experience testing
3/28-4/10	Synthesize measurement experience testing
3/8	Redesign experience based in testing insights

Key learnings:

- The site purpose was more clearly identifiable than the previous landing page.
- Opportunity to be even more descriptive with the visualizations and why blindzone safety is so important.
-

Appendix

Phase 1 Website User Experience Script

Introduction

Hello! My name is Claire and I'm going to walk you through today's session. As I mentioned in the informed consent, I'm on Olin College U.S DOT Volpe Center / Santos Family Foundation SCOPE team at Olin College, and we are working on improving the VIEW blind-zone measurement tool to help better inform people of blind spots of vehicles. Feel free to grab a muffin and iced tea.

I want to begin by saying your feedback is valuable to us, and there are no right or wrong answers. We're looking for honest feedback, and we were not part of the team that developed this so we will not get offended.

We have a formal consent narrative written up, but wanted to ask you for your permission if we can zoom record the screen during the session. It will only be used within our team for internal purposes. When collecting information, we will use pseudonyms to keep participants' identities anonymous.

For this session, we will have you complete a series of tasks on the VIEW site and hear your thoughts.

Before we begin, do you have any additional questions?

Task description

1. Is it ok if we screen record your screen?
2. Open [VIEW](https://blindzonecalculator.herokuapp.com/) (<https://blindzonecalculator.herokuapp.com/>)
1. You should be on the home page. Spend a few minutes exploring the page. Make sure to voice your thoughts out loud.
2. What do you think the purpose of this site is? What information do you believe you can find?
3. What do you expect the 'Visualize' Tab to contain? What information would be useful, and presented in what way?
4. Please go to the 'Visualize' Tab. Is this what you expected to see?
5. Look for the 2010 HONDA CR-V that was added on September 13th. Navigate to the visualization for it.
6. Spend a few minutes viewing the visualizations and navigating the page. Please make sure to say your thoughts out loud.
7. What, if anything, is helpful?
8. What, if anything, is unhelpful?
9. Feel free to explore any of the other tabs or other parts of the site.

Wrap up

10. If you had a magic wand, how would you change the experience of using the VIEW Webapp?
11. What are your overall impressions of this process?
12. What, if anything, was helpful?
13. What, if anything, was unhelpful?
14. Are there any additional comments you would like to add?

Thank you for your time and invaluable insights. It's been truly helpful. If you have any questions or additional feedback, feel free to share. Your input is central to our work.

Phase 1 Measurement Experience Interview Questions

Preparation

- Ask users to collect any photos they have of the measurement process (the space, tools, themselves, etc.)

Questions

- If you can remember, how many times have you taken measurements and of how many vehicles?
- When was the last time they took measurements and used the VIEW app?
- What was it for?
- What tools do you use?
- Can you walk me through the process from start to finish of taking the measurements and uploading it to VIEW? How long does it take?

- How does the space look like? (if they don't explain in previous question)
- How accurate are the outputs of the measurement?
- (if they have photos) Show photos and ask them to describe each photo in detail.

Wrap-up

- If you had a magic wand, what would you change about the experience?
- What was the most confusing or unhelpful thing about the experience?
- What is helpful about the experience?
- Are there other people you know that have taken vehicle measurements that may be willing to be interviewed?

Phase 1 Insights

Website User Experience

- Homepage didn't really convey site purpose and next steps
 - o "I first thought this was an information site for a smartphone app until I went to FAQs"
 - o "My first thought when I saw the home page is a free smartphone-based tool, but where's the tool, how do I use it, I'm on a desktop website"
 - o "To be honest, I don't really understand what's happening"
 - o "I knew there was an app, but I didn't see the app anywhere"
- Site seems outdated and visuals can be improved
 - o "Carousel seems like it was created 10 years ago with the font and everything"
 - o "Overall, the site feels amateurish. It's confusing that there's an app and a table. Feels like it should be 2 separate things"
 - o "I would love to make this site a lot more beautiful"
 - o "This feel likes, oh, I feel like this was made in 2005 by the US government"
- Information about direct vision is useful and should be in a more prominent place
 - o "I didn't know what a blind zone is, the word I've heard more is blindspot"
 - o "I didn't know those (indirect vs direct vision) were two different things"
 - o (In response to 'What is direct vision')
 - "This makes me care a lot more about what's happening now. I would love to know this fact before starting to deep dive into it"
 - "There you go, that I would've liked to know beforehand"
- Blind-zone visualization can be clearer
 - o "Extends out by two elementary school children" is not super clear
 - o "I don't really understand this"
 - o "Oh, here are the heights, I could have used that earlier"
 - o "Maybe having this be like some indicator of an elementary school student like a kid with a backpack. This feels like a miniature adult right now"
- Remove 1 ft scale in legend for visualizations
 - o "1ft scale in legend is confusing, is it just a symbol in the legend?"
 - o "1 foot scale in passenger side blindzone isn't super helpful, I thought it was part of the car. A scale above or below the people will be significantly helpful"

The Design Process

- Define the problem
 - Understand the context
 - Research the problem
 - Identify the stakeholders
 - Define the scope
 - Clarify the requirements
 - Identify the user needs
 - Define the functional requirements
 - Define the non-functional requirements
- Generate ideas
 - Brainstorming
 - Individual brainstorming
 - Group brainstorming
 - Sketching
 - Hand-drawn sketches
 - Digital sketches
 - Prototyping
 - Low-fidelity prototypes
 - High-fidelity prototypes
- Evaluate and refine
 - Usability testing
 - Formative testing
 - Summative testing
 - Feedback
 - User feedback
 - Stakeholder feedback
 - Iteration
 - Refining the design
 - Revising the requirements
- Implement and launch
 - Development
 - Front-end development
 - Back-end development
 - Deployment
 - Staging environment
 - Production environment
 - Monitoring
 - Performance monitoring
 - Usage monitoring

Other concepts shown in the mind map include:

- User research
 - Interviews
 - Surveys
 - Focus groups
 - Contextual inquiry
- Ideation
 - Brainstorming techniques
 - Sketching techniques
 - Prototyping techniques
- Evaluation
 - Usability testing techniques
 - Feedback techniques
 - Iteration techniques
- Implementation
 - Development techniques
 - Deployment techniques
 - Monitoring techniques

Category 3

Nov Website User Testing Themes and Takeaways

Quick updates

Longer updates

Minor updates to site functionality and usability

Utilizing relevant links on page content

Search functionality on visualizations

Search bar for dataset to allow make and model

Navigation bar updates

Updates to Visualize page

Make FAQ content more visible and not at bottom

Indicator when VRU is updated

Clearer/more appropriate word choice

'ID' column name and details link on visualization table

'Visualize' column name to indicate dataset

Visibility of system status

Loading animation while the table loads

Indicator that VRU is updated on visualizations

Update VRU visualization and figure notes to make clearer

Remove 1 ft scale in legend for visualizations

'Extends by ___ VRU' isn't super clear

Add heights of VRU on page

Current site seems outdated and visuals can be improved

Update visuals and images (including visualizations)

Download measurement instructions instead of linking

Redesign homepage

Make crowd-sourced data more prominent

Put Direct Vision information in a more visible place

Remove "smartphone based tool"

Make clearer who this website is for

Provide more context to visuals

Add ways to compare visuals

Personalize height of passenger for blind zone calculation

Connect visuals to each other

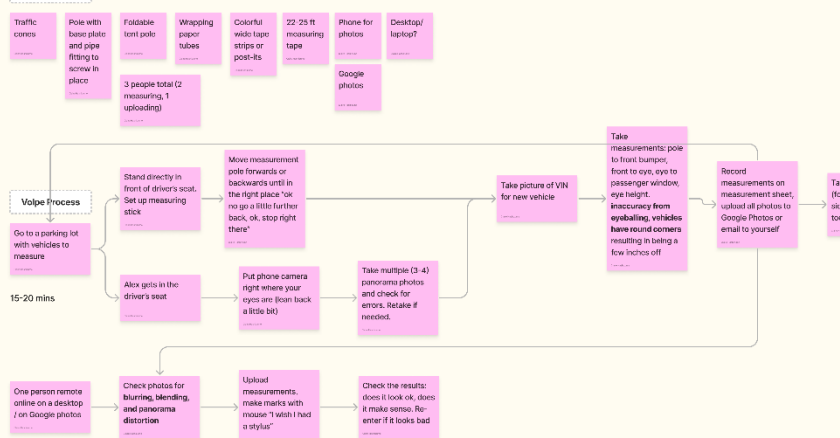
Measurement Experience

- Process to mark photos is frustrating
 - o Drawing lines is subjective and takes time without a touchscreen since the mouse is clunky.
 - o There is a lack of forward-backward navigation and visibility of what step users are on
 - o It is difficult to understand how to mark things: where to start and stop annotation, what surface to mark
 - o There is no option to erase annotations instead of clearing
- Confusing to use the site
 - o "Some of these users are not engineers", and the site should support those users
 - o Three researchers failed to use the site correctly the first time.
 - o Wording is confusing
- Analysis is unreliable and slow
 - o Different phones produced different blind-zone results

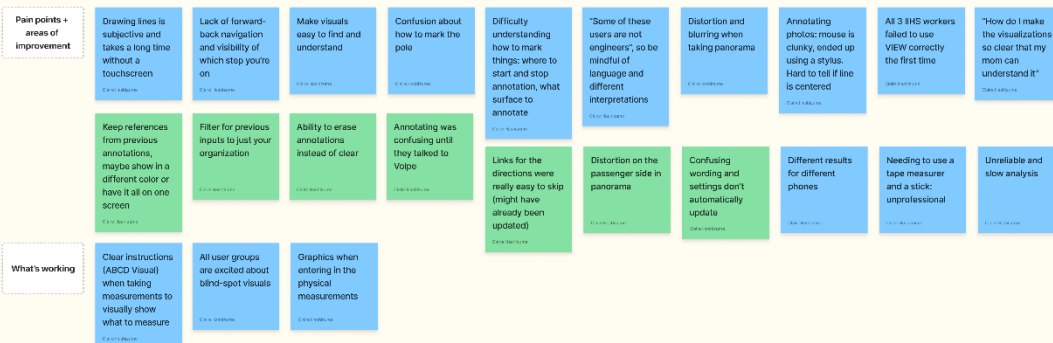
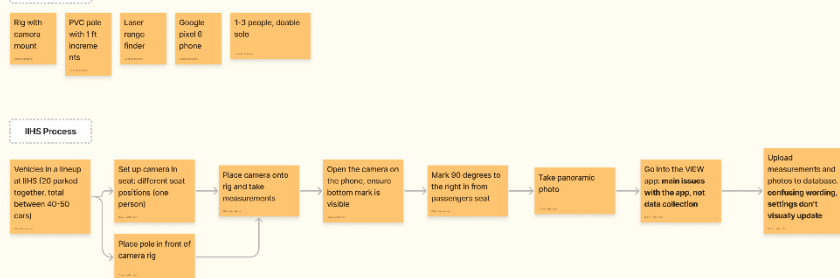
Power User Interviews



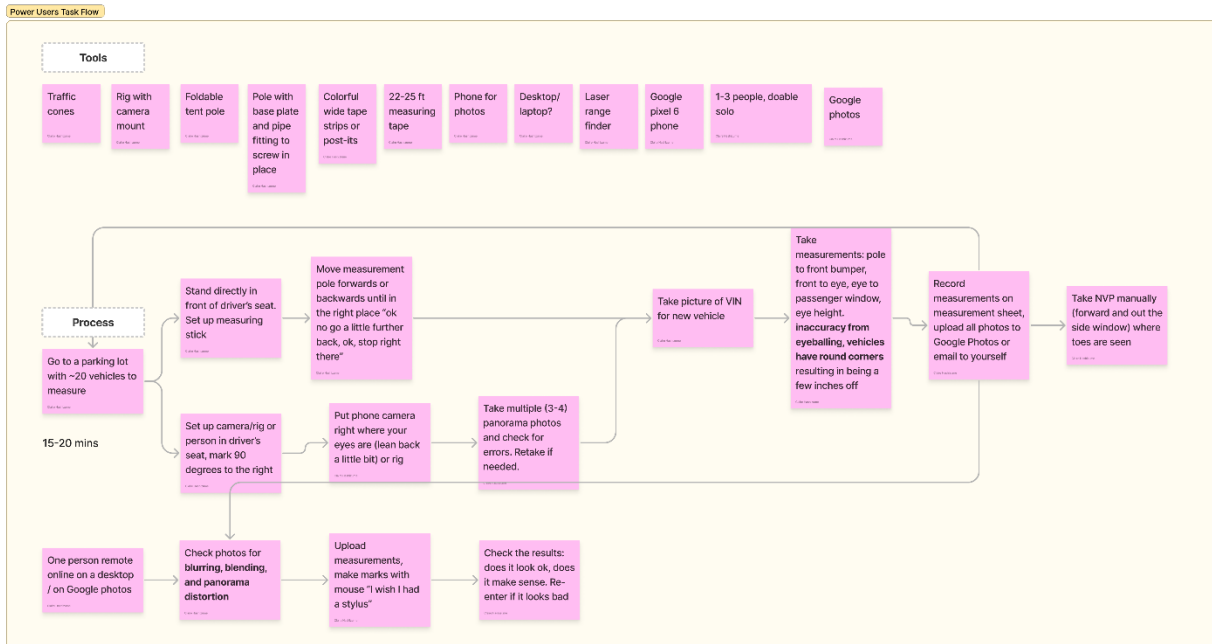
Volvo Tools

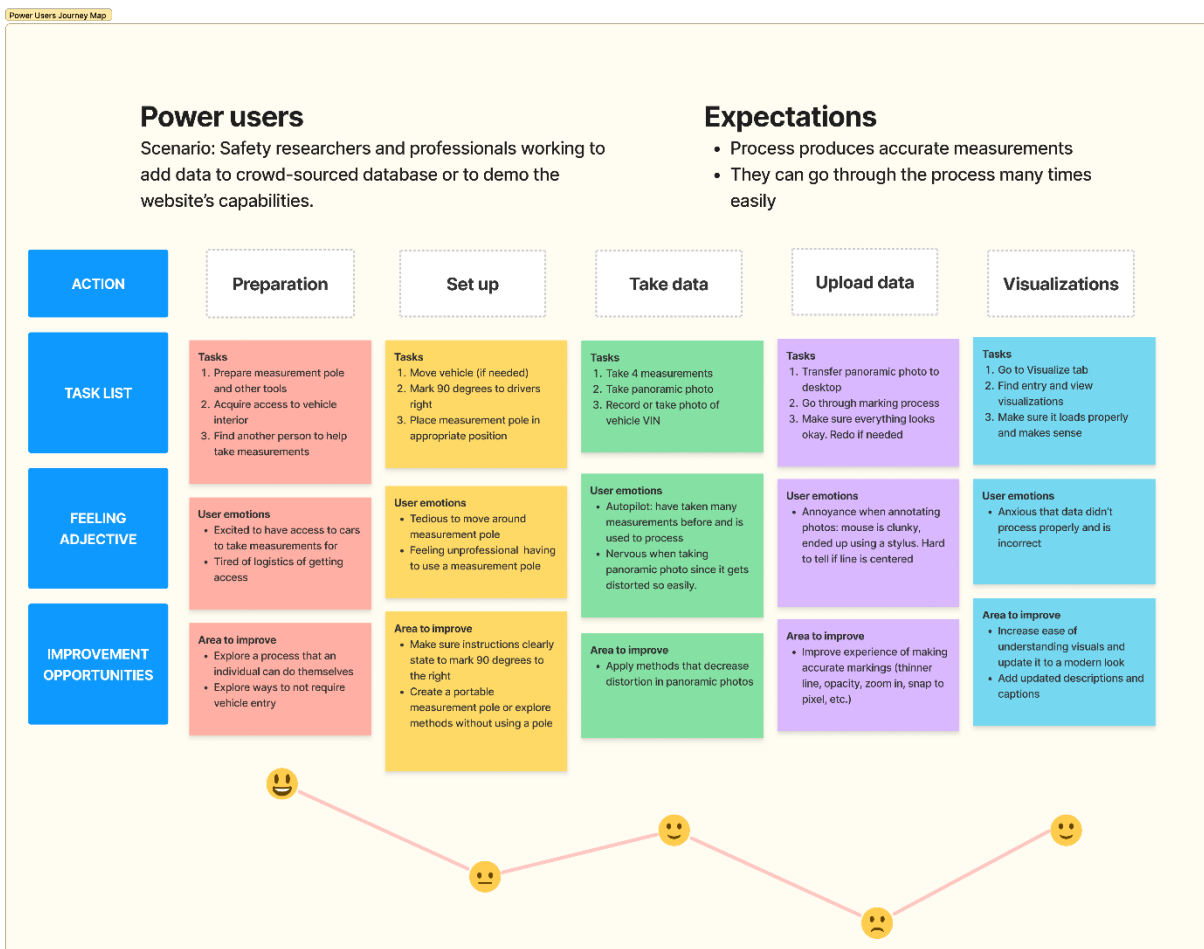


IHS Tools



Measurement Experience Journey Flows





Phase 2 Website Redesign Script and Questions

Introduction

Hello! For my Senior Capstone project, I am working on improving a blind zone measurement tool and site called VIEW.

For the test, you will view a couple screens from the website and answer some questions. I want to begin by saying your feedback is valuable to us and there are no right or wrong answers, so please share as much as possible. You may scroll up and down to view the entire page, but please do not click on anything unless instructed to.

Context

Today, you will be visiting the VIEW Blind-zone calculator site. There are several types of people who will be using this site: drivers looking to purchase a new car, advocates creating policy for safer roads, vehicle fleet managers that own several vehicles, professional researchers, and more. Please answer the questions based on what these types of people may think.

Questions

1. Take a few minutes to look at the page displayed. **[Show photo of the VIEW homepage]**

- a. What is the site's purpose?
 - b. What actions can you take on this site?
 - c. Scroll to the top of this page. What do you expect to see if you go to *Vehicle Database*?
 - d. What do you expect to see if you go to *Add Vehicle*?
 - e. What, if anything, is confusing or hard to understand?
 - f. What additional information, if any, would you like to know from this page?
2. Say that you wanted to find the blind zone information for a Honda Odyssey. Here is the vehicle page. **[Start prototype of visualization flow]**

- a. What is the difference between selecting the 'Preschool Child' vs 'Wheelchair user' for the visualizations?
- b. Please go to the visualizations for a preschool child. If you get stuck, move on to the next step.
 - i. I was able to complete this step correctly.
 - ii. I'm unsure if I completed this step.
 - iii. I could not complete this step.
- c. If you became stuck, please select the circle next to Preschool child. The “Generate Visualizations” button should now be dark blue. Please click it.

You should now see the “Visualization Results with Preschoolers” section of the page. Go ahead and spend a couple minutes looking at the information being shown.

When you are ready, please describe the diagrams and information being shown.

- d. On a scale of 1 to 5 from “I understand nothing” to “I understand everything”, how would you rate your understanding of the blind zones with preschool children for the Honda Odyssey?
 - i. 1- I understand nothing
 - ii. 5- I understand everything
 - e. Why did you rate your understanding in that way?
 - f. If you wanted to view visualizations for a wheelchair user, what steps would you take?
3. Wrap up
- a. If you had a magic wand, how would you change the pages you’ve seen?
 - b. Thinking about the users described at the beginning, how does the site support or not support what they are looking for?
Users include drivers looking to purchase a new car, advocates creating policy for safer roads, vehicle fleet managers that own several vehicles, professional researchers, and more.
4. Thank you

Thank you for your time and invaluable insights. It's been truly helpful. If you have any questions or additional feedback, feel free to share. Your input is central to our work.

Phase 2 Website Redesign Stimuli

- [Visualizations prototype link](#)
- Landing page screengrab

VIEW Blindzone Calculator
Home
Vehicle Database
FAQ
Add Vehicle

SAFER VEHICLES, SAFER STREETS

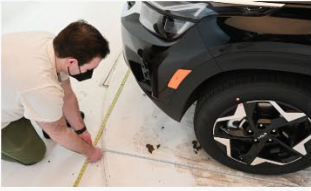
See the hidden dangers of your vehicle with our blindzone visualizer

Add Vehicle

About VIEW

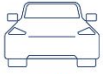
A free blindzone measurement tool

VIEW is a measurement tool and crowd-sourced database with visualizations of blindzones for many types of vehicles. It uses LiDAR technology and seat measurements to calculate what space around the vehicle is visible from the driver's eyepoint.




Who It Helps

VIEW is designed to help all kinds of people



Vehicle Buyers

Discover blindzones to help make purchase decisions.



Fleet Managers

Measure and address blindzones in vehicles on the road.



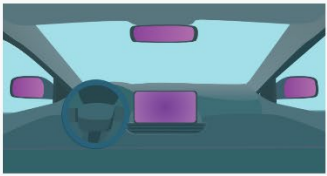
Organizations

Access blindzone information to raise awareness.

Why This Matters

Research shows that drivers respond 0.7 seconds faster to hazards seen through direct vision than indirect vision. In addition, according to a study conducted at the University of Leeds, drivers react up to 50% faster to hazards in their direct vision compared to indirect vision.

Learn More



Indirect Vision

What a driver can see with the aid of devices such as mirrors and cameras.

Blindzone

Where visibility is blocked by solid components of the vehicle.

Direct Vision


What a driver can see directly with their own eyes.

Who We Are

About Us

We are a group of safety researchers and professionals focused on addressing the rising number of pedestrian and bicyclist fatalities.

In partnership with Federal and non-Federal stakeholders, we aim to quantify and understand the safety impacts of large blindzones and to inform [Safe System Approach](#) solutions to save lives.



Curious to learn more?

Find answers to frequently asked questions about the work we do, vehicle blindzones, and how to use the site.

FAQs

Contact Us:
blindzoneapp@dot.gov

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Landing page screengrab.

Phase 2 Unmoderated Participant Profiles

	Test Duration (mins)	Age	Gender	Education	Annual household income	Employment Status	Industry	Daily hours online	Technical proficiency
1	20.5	48	F	College graduate	Over \$100,000 / year	Full-time employed	Science, Technology, Engineering & Mathematics	>6	Intermediate
2	10.5	44	F	Some college	\$70,001-100,000 / year	Unemployed, seeking employment	Transportation, Distribution & Logistics	>6	Intermediate
3	11.3	37	M	College graduate	Over \$100,000 / year	Full-time employed	Transportation, Distribution & Logistics	>6	Advanced
4	12.1	44	M	High school graduate	\$10,001-\$40,000 / year	Part-time employed	Science, Technology, Engineering & Mathematics	>6	Advanced
5	4.9	36	M	College graduate	\$40,001-\$70,000 / year	Full-time employed	Transportation, Distribution & Logistics	4-6	Advanced
6	24.3	29	M	Post graduate degree	\$40,001-\$70,000 / year	Self-employed	Science, Technology, Engineering & Mathematics	>6	Advanced

Phase 2 Unmoderated Test Responses

Today, you will be visiting the VIEW Blind-zone calculator site. There are several types of people who will be using this site: drivers looking to purchase a new car, advocates creating policy for safer roads, vehicle fleet managers that own several vehicles, professional researchers, and more. Please answer the questions based on what these types of people may think. "

- 1. Take a few minutes to look at the page displayed. [Show photo of the VIEW homepage] What is the site's purpose?**
 - To point out dangers of the blind-zone
 - The site's purpose seems to be to educate users on blind zones and the blind zone measurement tool.
 - This website shows the blind zone of your vehicle so you can see and understand how safe or unsafe your vehicle is.
 - Looks like a site for a tool to measure the blind zones of your vehicle for safer driving.
 - To show you how much of a blind spot a car features.
 - this site that helps drivers avoid car accidents and drive safely
- 2. What actions can you take on this site?**

- Find out about the blind zone dangers on your vehicle and learn about the blind zone measurement tool called View.
 - You can add a vehicle, view the database, and view frequently asked questions.
 - I can add my vehicle and get a good understanding of its blind zone.
 - Add your vehicle type, learn more about blind zones, view the database, and view frequently asked questions.
 - You can add a vehicle so that you can check what its blind zones are.
 - It's not yet clear whether I can buy some equipment that helps me or this is just a training site
- 3. Scroll to the top of this page. What do you expect to see if you go to *Vehicle Database*?**
- the blind zone dangers of your particular vehicle
 - I would expect to see a database of different types of cars and their blind zones.
 - see variety of vehicles along with their blind zone data and search for the vehicle that match my interest.
 - A list of vehicle models and their blind zone info. Including how to improve visibility.
 - a master database of all the vehicles you can pick from.
 - how this system will be installed. or which cars need it more
- 4. What do you expect to see if you go to *Add Vehicle*?**
- Your vehicle information
 - I would expect to see info on my vehicle's blind zones.
 - I would be able to add the vehicle that is not in the database and see its blind zone.
 - Ability to select or search for your vehicle type.
 - It would load a new page for you to add a vehicle from.
 - if I click add vehicle I will see a form to fill out. to order installation of this equipment
- 5. What, if anything, is confusing or hard to understand?**
- Nothing stands out immediately that explains what it is and does. You have to be willing to read the whole page before it is clear.
 - Not much, though I'm not sure if I would have to pay for any aspect of the service--I'm guessing not, since it is crowdsourced, but not sure...
 - Nothing.
 - The database area could be better described. Something like, "find your vehicle model" might help.
 - nothing.
 - I couldn't immediately understand what it was. Is it possible to install this yourself, or do you need to take it to a service center? Is this suitable for all cars? website design is like dmv, a little boring.
- 6. What additional information, if any, would you like to know from this page?**
- More descriptive tag lines, specific and to the point
 - Not sure
 - NA
 - More images showing technology used might help. Like a rear view camera pic on the display on dash.
 - nothing
 - how to get a. How to install this, can I do it myself, how easy this is

Say that you wanted to find the blind zone information for a Honda Odyssey. Here is the vehicle page.
[Start prototype of visualization flow]

7. What is the difference between selecting the 'Preschool Child' vs 'Wheelchair user' for the visualizations?

- ☐ the section of the car it shows
- ☐ The main difference would be the preschool child height is 28 inches and the wheelchair user height is 39 inches.
- ☐ It is the height difference.
- ☐ 11 inches of visibility.
- ☐ 11 inches.
- ☐ that's right, a child is much smaller than a wheelchair

8. Please go to the visualizations for a preschool child. If you get stuck, move on to the next step.

- ☐ I could not complete this step.
- ☐ I was able to complete this step correctly.
- ☐ I was able to complete this step correctly.
- ☐ I was able to complete this step correctly.
- ☐ I was able to complete this step correctly.
- ☐ I was able to complete this step correctly.

If you became stuck, please select the circle next to Preschool child. The “Generate Visualizations” button should now be dark blue. Please click it.

You should now see the “Visualization Results with Preschoolers” section of the page. Go ahead and spend a couple minutes looking at the information being shown.

9. When you are ready, please describe the diagrams and information being shown.

- ☐ This isn't working correctly for me
- ☐ The info shows different POV's and where the blind spots are if a preschool child/children were in the area and where you would not be able to see them from the vehicle.
- ☐ It shows the blind spot for a preschooler based on their height.
- ☐ This info is very clear. The visualizations of your blind spots couldn't be done any better. It's very easy to understand.
- ☐ I believe it is showing me where on the car you would have the blind zone. anything that is colored is what you wouldn't be able to see them from.
- ☐ it does not work

10. On a scale of 1 to 5 from “I understand nothing” to “I understand everything”, how would you rate your understanding of the blind zones with preschool children for the Honda Odyssey?

- ☐ 2
- ☐ 4
- ☐ 5
- ☐ 5
- ☐ 2
- ☐ 1

11. Why did you rate your understanding in that way?

- ☐ I either didn't understand the directions, or the page didn't load correctly

- I understand most of it, but am less sure about the first image of the overhead view--for me that image is less clear about what is/isn't a blind zone.
- Because I can clearly understand what is being shown and understanding them are quite easy.
- I think these images convey everything you need to know perfectly.
- The scan image is a bit confusing because it doesn't explain what exactly you are looking at.
- I clicked on everything and the visualization didn't work

12. If you wanted to view visualizations for a wheelchair user, what steps would you take?

- Select wheelchair user, generate visualizations
- I would click on the "wheelchair user" button at the top of the page and "generate visualizations" again
- All I really needed to do was ot choose wheelchair user from the previous page.
- I would click the wheelchair user radio button at the top and hit generate visualizations.
- You would click wheelchair user instead of preschool child.
- I would just click on the wheelchair user or the picture

Wrap up

13. If you had a magic wand, how would you change the pages you've seen?

- I don't think I would
- I think maybe just make the overhead view a bit more clear and be consistent with coloring for blind zones vs. direct/indirect vision...
- I think it looks perfect enough and there is no need to change anything. It was quite easy to navigate and understand the information on the website.
- I think the car model visualizations are perfect. The main page should show a demonstration of those so people clearly understand what the tool does before selecting their model.
- I would have a better description for the image that is shown when you click a option for the blind zone.
- the page looks good. but instead of all the names, I would just leave pictures with the names under them so that you can click on the picture and get a visualization

14. Thinking about the users described at the beginning, how does the site support or not support what they are looking for?

Users include drivers looking to purchase a new car, advocates creating policy for safer roads, vehicle fleet managers that own several vehicles, professional researchers, and more.

- need more support for bigger work vehicles for vehicle fleet managers
- It supports them in being able to see what blind zones there are for their vehicles which could in turn help increase safety with education and possibly, vehicle re-designs...
- I think this website clearly supports all the necessary information and support a subscriber i looking for.
- I think it helps everyone to understand what areas they should be watching out for when driving.
- It provides good information, but I feel like it could better explain what the image is showing you when it shows it.

- It's difficult to answer this question. because most people don't think about blind spots when they buy a car

Phase 2 Moderated Interview Responses

Hello! For my Senior Capstone project, I am working on improving a blind zone measurement tool and site called VIEW.

I'll show you a couple of screens from the website and answer some questions. I want to begin by saying your feedback is valuable to us and there are no right or wrong answers, so please share as much as possible.

Would it be okay to record this call? No identifying information will be shared outside of my team, and the zoom recording will just be for personal use to go through afterwards.

Today, you will be visiting the VIEW Blind-zone calculator site. There are several types of people who will be using this site: drivers looking to purchase a new car, advocates creating policy for safer roads, vehicle fleet managers that own several vehicles, professional researchers, and more.

Introductions

1. What is your role in vehicle safety?

- Helped begin city of boston looking into direct vision for city vehicles (large trucks, school buses, firetrucks) in the public health lens at BPHC. Partnership for healthy cities (bloomberg) to work on policy change within city to increase active mobility
- Area that there was interest for was direct vision, she project managed that grant.
- Project managed grant for direct vision working with volpe, measured 30+ vehicles for the City of Boston with Alex
- So they can see where the vehicles fell within direct vision landscape to help create 5 star rating system, did analysis of vehicles, looked at what was out there to see if there were better or worse (comparing diff types of school buses) to see what makes a difference
- Passion project as a cyclist and pedestrian who uses city streets everyday.
- Now that she has an awareness of vehicle's lack of direct vision, she's a lot more aware as a cyclist of where or where they can't see her.

2. How familiar are you with the VIEW tool?

- Familiar with the process. Alex used the tool.

3. Here is the landing page. Take a few minutes to look at the page displayed. [Show photo of the VIEW homepage] What is the site's purpose?

- What actions can you take on this site?**
 - Looks mostly like education, something that might need to be more in your face is the 'add vehicle' going into what that means- see your hidden dangers, i almost wonder if you want to start with what it is and why. Right now, looking at it, do i go to add vehicle to put my own in, what does that mean, if the goal of the site is to collect data, it might be important to put that a little more in your face. Like starting with the visuals of the blindzone and really showing people that, for this car, did you know you can't see a child? "something that makes me care in a way". Especially if

I'm just your average person who has a car and/or wants a car. Or, if you're designing it for people who have more of an understanding of what the goals are, then it makes sense.

- I might put more of the stark graphics in your face to be like "this is why you would want to measure your vehicle"
- I think I'd want to click add vehicle to see what that means. I know that the vehicle database would probably pull up the vehicles that are already measured, because I've already been on that a lot. I think it's good to have on the top there. I think I'd be able to add my own vehicle, but other than that, it would just be for me to learn a little bit more.
- I saw the three categories of vehicles, fleet, organization, I would assume I would click one of those based on who I am and why I'm on this site.
- As someone who works closely with direct vision, I'd want to be able to look up a vehicle in the database or see if it's there and maybe use that to make a case of ADAs or whatever it is. Or using it an advocacy like public health advocacy, showing the reasons why we might consider vehicles with more direct vision.

4. Scroll to the top of this page. What do you expect to see if you go to *Vehicle Database*?

a. What do you expect to see if you go to *Add Vehicle*?

- 'Add Vehicle button' - what are your expectations for the next page? "Well, I would kind of wonder since I know this is an app, so if I'm on my phone, I would expect it to pull up directions on how to use the app and lead me to start using the app. If on desktop, I would wonder is this for me if I've already measured a vehicle, is this where I go into cause I already have the measurements? Or is it going to show me how to download the app and what to do from there.

b. What, if anything, is confusing or hard to understand?

- I do see that the crashed car is there, how did that happen? I would say just for add vehicle, what does that even mean? I wouldn't know just from looking at it here.
- Use cases: maybe difference between fleet manager and organization, which one do I choose if I'm a fleet manager that's part of an organization? What is access blindzone information and raise awareness, is that going to lead me to a database? A bit clearer on why I should choose fleet manager over organization?

c. What additional information, if any, would you like to know from this page?

5. Say that you wanted to find the blind zone information for a Honda Odyssey. Here is the vehicle page. [Start prototype of visualization flow]

- a. "So this i would choose which of these people to visualize the car above with the blindzone? Oh that's neat"
- b. "no i think this is great"
- c. "I almost wonder if you want to move the blindzone visualizations to the top. When we were first here, I was like 'is this a ghost car? What is this? I see that it's a picture of the car'"
- d. "Maybe to demonstrate what do i do with this car? Or even a sample at the top of a visualization to say what the goal is. If you had an example of 'here's a preschool with a honda odyssey' like select one to change or select your car or VRU to visualize whatever you want"

- e. What is the difference between selecting the 'Preschool Child' vs 'Wheelchair user' for the visualizations?
- f. Please go to the visualizations for a preschool child. If you get stuck, move on to the next step.

If you became stuck, please select the circle next to Preschool child. The “Generate Visualizations” button should now be dark blue. Please click it.

You should now see the “Visualization Results with Preschoolers” section of the page. Go ahead and spend a couple minutes looking at the information being shown.

- 6. When you are ready, please describe the diagrams and information being shown.**
- 7. On a scale of 1 to 5 from “I understand nothing” to “I understand everything”, how would you rate your understanding of the blind zones with preschool children for the Honda Odyssey?**
 - a. 3.5- one thing that I always struggle with this is i see the dots are preschoolers that are hidden. And i see the blindzone is grey. So why aren't the children filling out that whole grey space. Is it because I can see part of the child? That's what I always wonder with these graphics. Is the grey zone just the ground they cannot see?
 - b. Saying “From the ground up” or something similar
- 8. Why did you rate your understanding in that way?**
- 9. If you wanted to view visualizations for a wheelchair user, what steps would you take?**

Wrap up

- 10. If you had a magic wand, how would you change the pages you've seen?**
 - a. I almost want the selections to be side by side. Having the of VRU with image on one side and visual on the other. I don't know if there's space for that, but that way you can toggle between those two and see it change by toggling between the two. I feel like there's kind of a lot of blank space to the left, so you can put it next to the options above.
 - b. Would be interesting to make multichoice squares instead of circles so you can have wheelchair user and an adult and see like, wow, you can see an adult in all these places and you can't see a wheelchair user in any of them. Maybe there's a color that overlaps them. I think it would be fun to be able to see them together in a way. You can make a big statement with that
- 11. Thinking about the users described at the beginning, how does the site support or not support what they are looking for?**

Users include drivers looking to purchase a new car, advocates creating policy for safer roads, vehicle fleet managers that own several vehicles, professional researchers, and more.

- a. I think for your average person who doesn't understand what the blindzone is and why it's important- that's why i recommended putting what it is and an example of the view at the top to throw it in your face at first. I might just be like, this is just for someone who is interested in this. But making someone interested. I also understand Volpe doesn't want to be biased- they're promoting safety, so throw that safety piece in your face. This is why people should care.

- b. If you were to hover your mouse over vehicle database, I'd almost want something to tell me what it is. For example, a library of vehicles that have been measured, but that just might be a bit more descriptive as someone coming in who has no idea what this is.
- c. Even if you have that for add vehicle, maybe that's where you have info about where it takes you.
- d. I think, you mentioned coming to the site as an advocate, maybe there should be something for VRUS for 'where am I in the blindzone?' when I pass this big truck, how do i know they can see me or not. Where am I blind. You can kind of figure that out as a cyclist, but maybe one of the use cases is for VRUs and having a frame like that. You don't want to victim blame of couse, but it's educational.

12. Do you have any questions remaining for me?

Phase 2 Journey Maps

User Journey Map *Taking Vehicle Measurements and LiDAR Scan*

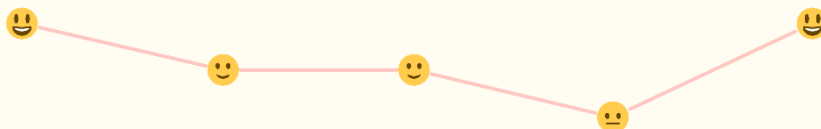
Fleet Managers and Consumers

Scenario: People taking measurements of vehicles they own or manage to view blind zone information about their own vehicle(s).

Expectations

- Blind zone information is easy to understand.
- Process is easy to replicate using nonspecialized material.

ACTION	Awareness	Find + Read instructions	Take measurements	Upload data	Visualizations
TASK LIST	<ol style="list-style-type: none"> Hears about VIEW through outside sources or industry partners (for first time users) 	<ol style="list-style-type: none"> Opens landing page Explore landing page and site purpose Go to Add Vehicle button in nav bar or on home page Sees process overview Locate instructions page and PDF (Optional) Print PDF Read instructions 	<ol style="list-style-type: none"> Locate and collect materials Go to vehicle Look at printed instructions or instructions page Mark vehicle with tape and take 4 measurements Use Pro phone to take LiDAR scan Record or take photo of vehicle VIN 	<ol style="list-style-type: none"> Email LiDAR file. Go to vehicle entry page Add vehicle information Remove windshield Click Submit 	<ol style="list-style-type: none"> Wait for visualizations to load View the 3 blind zone images Save images
THOUGHTS	"Sharon at MassDOT was talking about this site!"	<p>"I wonder if I have all the tools I need to take measurements"</p> <p>"This makes a lot of sense. I hope I can take accurate data"</p> <p>"How can I take measurements with just 1 person?"</p>	"I don't have tape, I hope these sticky notes will do"	<p>"I hope I got enough of the windshield for it to work"</p> <p>"What year is my vehicle?"</p>	<p>"Oh wow, I didn't realize the blind zone was so large for my car"</p> <p>"I wonder how this compares to my other car"</p>
DEVICE		Type anything, @mention anyone 			



User Journey Map *Taking Vehicle Measurements and LiDAR Scan*

Power users

Scenario: Industry researchers and professionals working to add vehicle blind zone data to the crowd-sourced database to add information for others to see or to demo the site capabilities.

Expectations

- Produce accurate visualizations and blind zone information
- A reliable tool that functions without mistakes or glitches.

ACTION	Awareness	Find instructions	Take data	Upload data	Visualizations
TASK LIST	1. Hears about VIEW through outside sources or industry partners (for first time users) OR 1. Visits VIEW site that's already in history or bookmarked (frequent users)	1. Opens landing page 2. Go to Add Vehicle button in nav bar or on home page 3. Locate instructions page and PDF 4. (Optional) Print PDF	1. Collect materials 2. Go to vehicle 3. Mark vehicle with tape and take 4 measurements 4. Use Pro phone to take LiDAR scan 5. Record or take photo of vehicle VIN 6. Repeat steps 2-5 for several vehicles	1. Email LiDAR file(s). 2. Go to vehicle entry page 3. Add vehicle information 4. Remove windshield 5. Click Submit 6. Repeat steps 1-4 for all vehicles.	1. Wait for visualizations to load 2. View the 3 blind zone images 3. Save images if wanted.
THOUGHTS	"I'm interested to try this tool I heard about it at the transportation conference. I wonder how accurate it is" "Where in my bookmarks is this site? I remember I was just here a couple weeks ago"	"I've done this before, but I just need a refresher on the 4th measurement"	"Here's the bin with all the materials I need from last week" "I think I got all the measurements, let me check just in case"	"Shoot, which vehicle was this scan for?" "Removing the windshield gets easier everytime"	"This seems like good images to send to Together for Safer Roads" "I wonder how this compare to other vehicles"
DEVICE		Type anything, @mention anyone 			



Redesigned User Task Flow

