



# The AI Future of Automotive

## Consumers and the Conversational Car

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# Introduction

Your partner for UX Research at every stage of the product life cycle

Since 2017, Pulse Labs has been at the forefront of revolutionizing user experience research and analytics. We help clients capture real-time, context-rich user interactions across apps, web, wearables, and in-vehicle.

## FlightRecorder™

Save time and money **optimizing mobile app UX** with real-time insights from actual users of your product.

## InsightStudio™

Gain competitive intel and **unmatched UX insights** with cutting-edge primary research capabilities.

Trusted clients include:



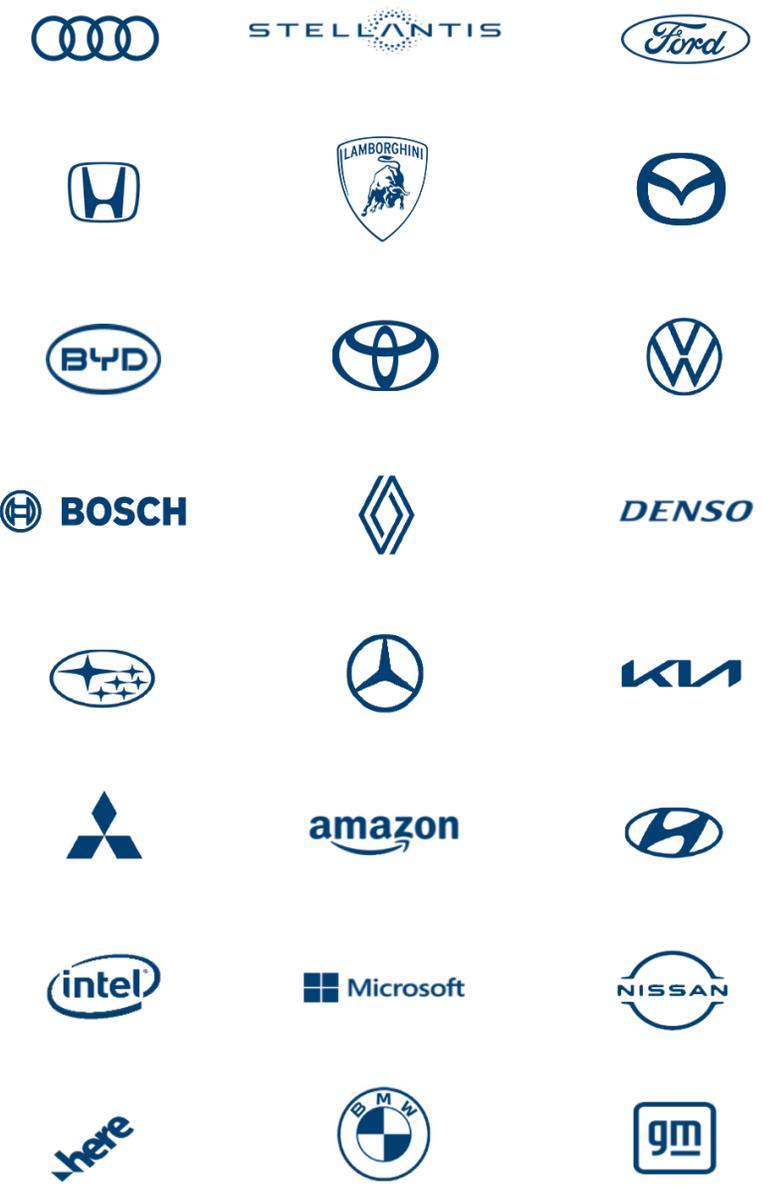
# Helping the automotive industry develop safe, secure, seamless & sustainable mobility

## Our areas of expertise



## Our regional offices

- USA
- UK
- Germany
- India
- China
- Japan



# AI enabled VPAs at CES '24 highlighted hurdles ahead

While AI took center stage at CES, it was clear that OEMs need more insight into the right use cases and delivery mechanisms for AI driven VPAs. Beyond customer satisfaction, this can pave for higher engagement across various connected services that OEMs can offer in the future.



**2018**  
Personalized  
Car



**2019**  
Shy  
Car



**2020**  
Auditory  
Car



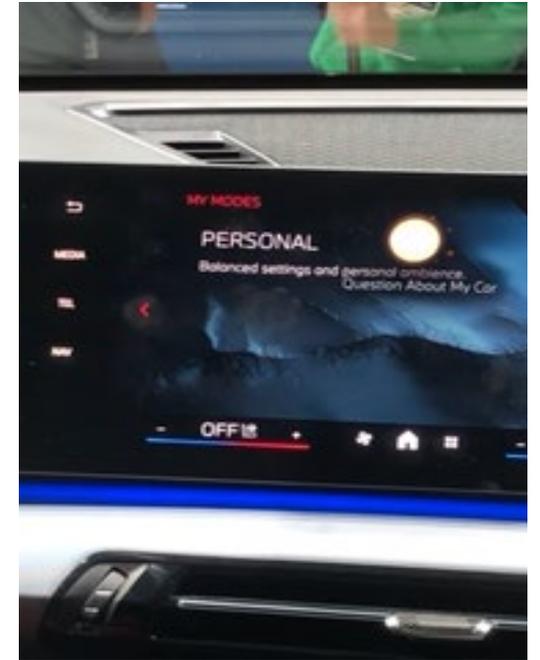
**2021**  
Augmented  
Car



**2022**  
Immersive  
Car



**2023**  
Practical  
Car



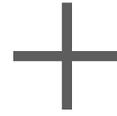
**2024**  
Conversational  
Car

The overall theme for CES 2024 was "AI for all." This trend was seen prominently throughout the automotive exhibitors.

# | We're exploring a new partnership to create richer consumer insights



Helps clients capture real-time, context-rich video user interactions across apps, web, wearables, and in-vehicle.



Helps clients understand what consumer interactions and habits mean to their automotive strategies.

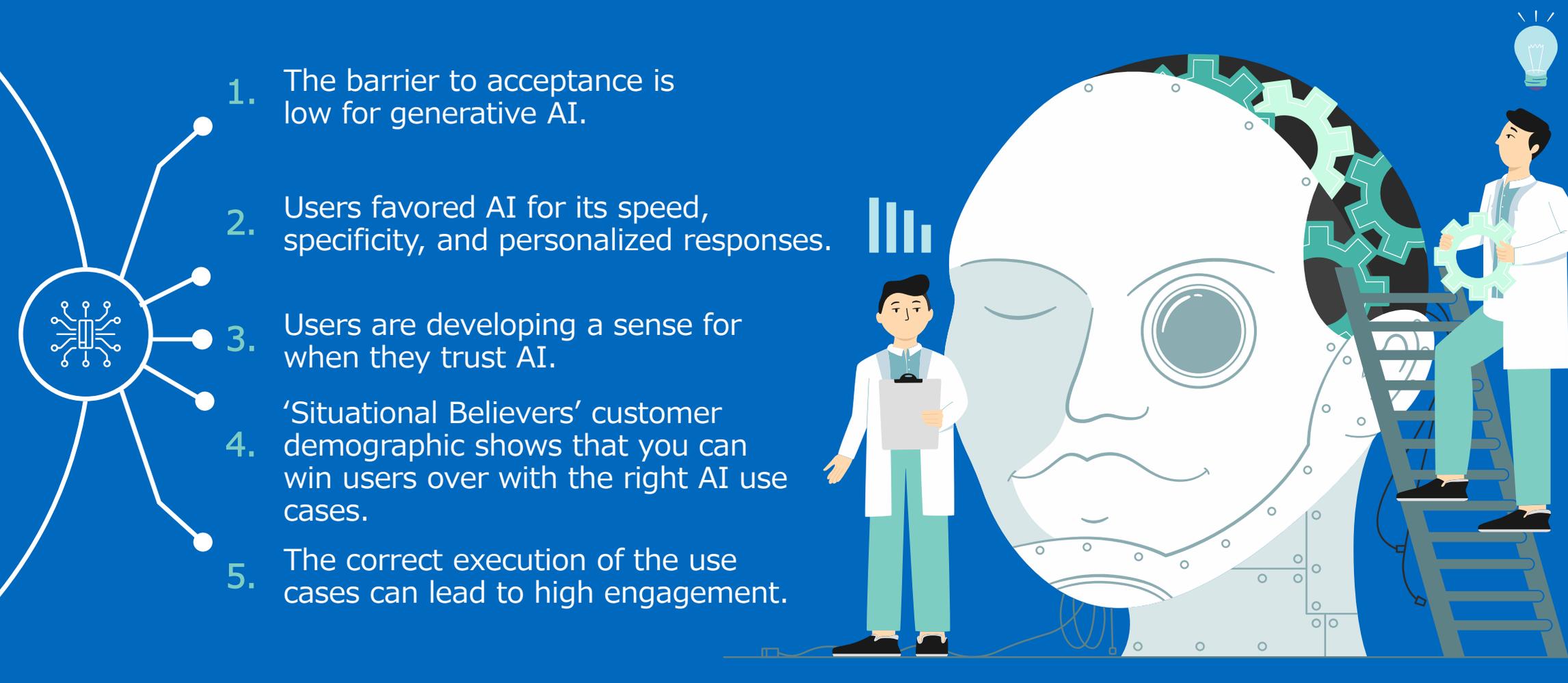
## Why what we do is unique and valuable

With the combination of SBD's auto expertise and Pulse Labs' rich video insight tools, our combined research approach will help you take advantage of cutting-edge technology, streamline your research, and make product decisions faster. Stay ahead of the curve with robust feedback from real-world drivers and scenarios.

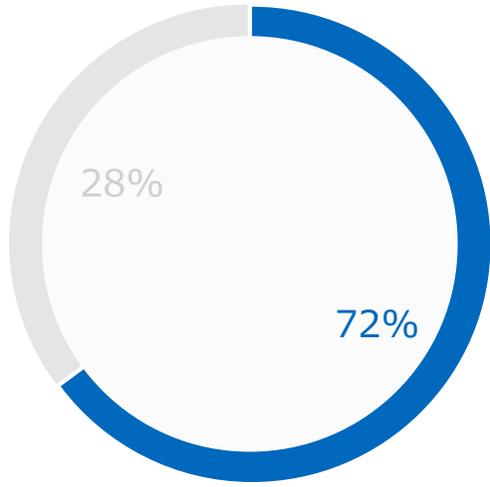
# Key findings

# Generative AI is ready for automotive applications

Barrier to customer acceptance is small if the right use cases are targeted in the right way and to the right users

- 
1. The barrier to acceptance is low for generative AI.
  2. Users favored AI for its speed, specificity, and personalized responses.
  3. Users are developing a sense for when they trust AI.
  4. 'Situational Believers' customer demographic shows that you can win users over with the right AI use cases.
  5. The correct execution of the use cases can lead to high engagement.

# 1. Barrier to acceptance



- Survey revealed that only 28% of the respondents had previously used AI for auto use cases, 72% said that, following their user experience on the tasks, they would prefer to use it.
- The AI's clarity, conciseness, and relevance were the key influencing factors behind this shift, indicating there are several cases that are ripe for AI integration.

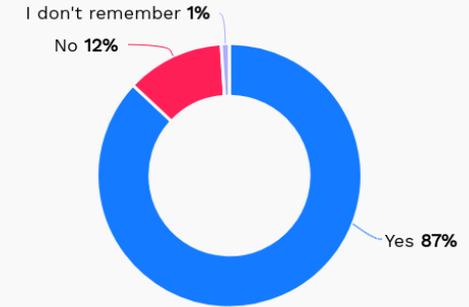
*"I preferred AI because it brought the information to me with minimal effort, it was accurate, and concise. It [...] saved me a whole lot of time and searching."*

A

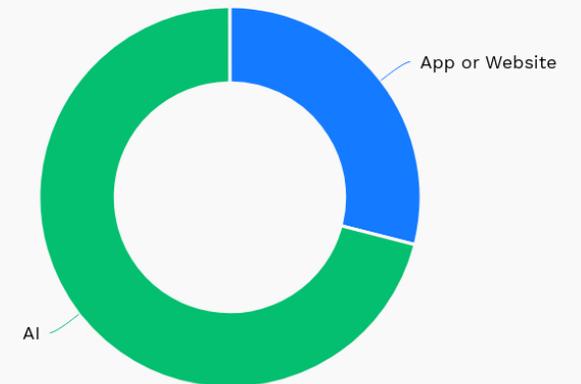
Anatasha, Millennial, Honda HR-V

## Previous App/Website Usage

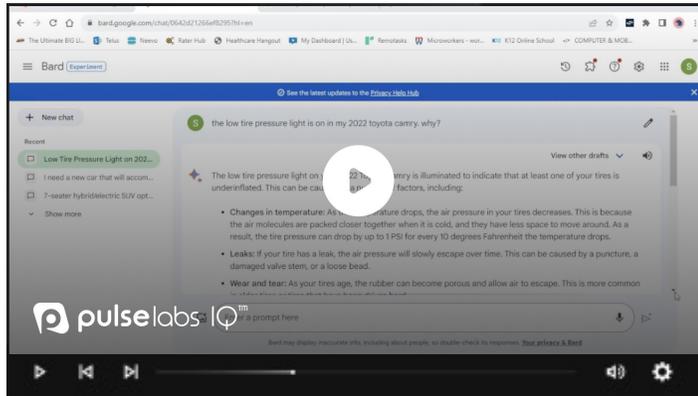
Before this study, have you ever used apps or websites for information related to vehicles?



## Overall Preference



## 2. Users preferences for AI usage



*"I like that it explains the 'Why' behind my problem [...] way more helpful than googling."*

For higher-stakes tasks, or those with a higher cost impact, users preferred to obtain information from the longer-format search option offered in a conventional search engine.

### Key reasons why they prefer websites or apps:

- ✓ Accuracy
- ✓ Up-to-date information
- ✓ Task-specific tools
- ✓ Referencing to official sites
- ✓ Reliability through community vetting

*"The first task was about which vehicle suits my needs. It had a more comprehensive tool which asked many questions which made me think it was more personalized. Also, the gas mileage seemed more accurate."*

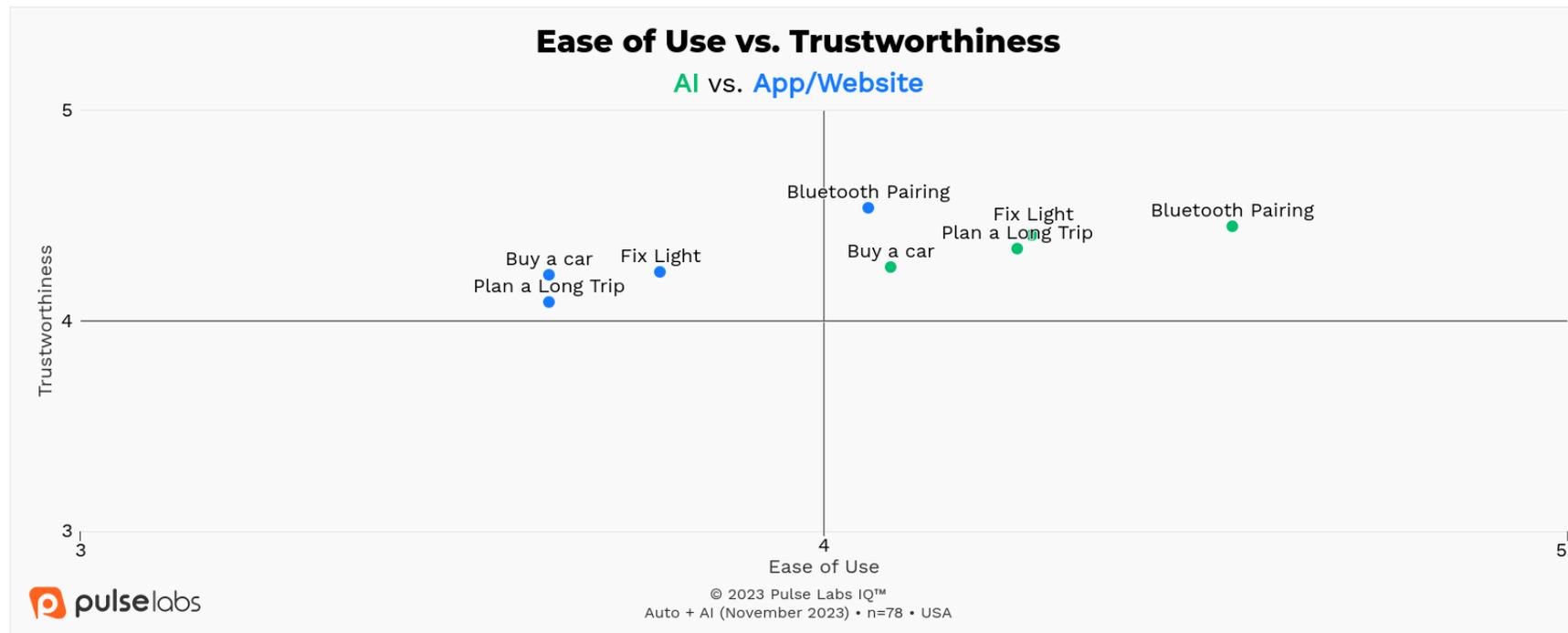
H

Hossein, Millennial,  
Toyota Camry

### 3. Users sense for when they trust AI

Participants liked the step-by-step Bluetooth pairing instructions from GPT-4 but wanted to know where the AI sourced this information from.

Respondents felt that critical information for decision making was missing from the AI responses, as well as a lack of logic.



*"The results were ok, but I expected more logic. Why should I stay 2 hours in a hotel when I plan a 3 day trip?"*

T

Thomas, Gen X+, Subaru Impreza

*"I feel like it was good overall but it didn't tell me enough about the vehicles that it was showing. I feel like it was missing important information like pricing."*

A

Alexis, Millennial, Hyundai Sonata

## 4. Unique customer clusters

### Situational Believers



Situational Believers were frequent users of Generative AI using it daily or multiple times a week. Over 70% of them were either entry level vehicle buyers or new vehicle owners, with near equal gender distribution.

### Luxury vehicle drivers

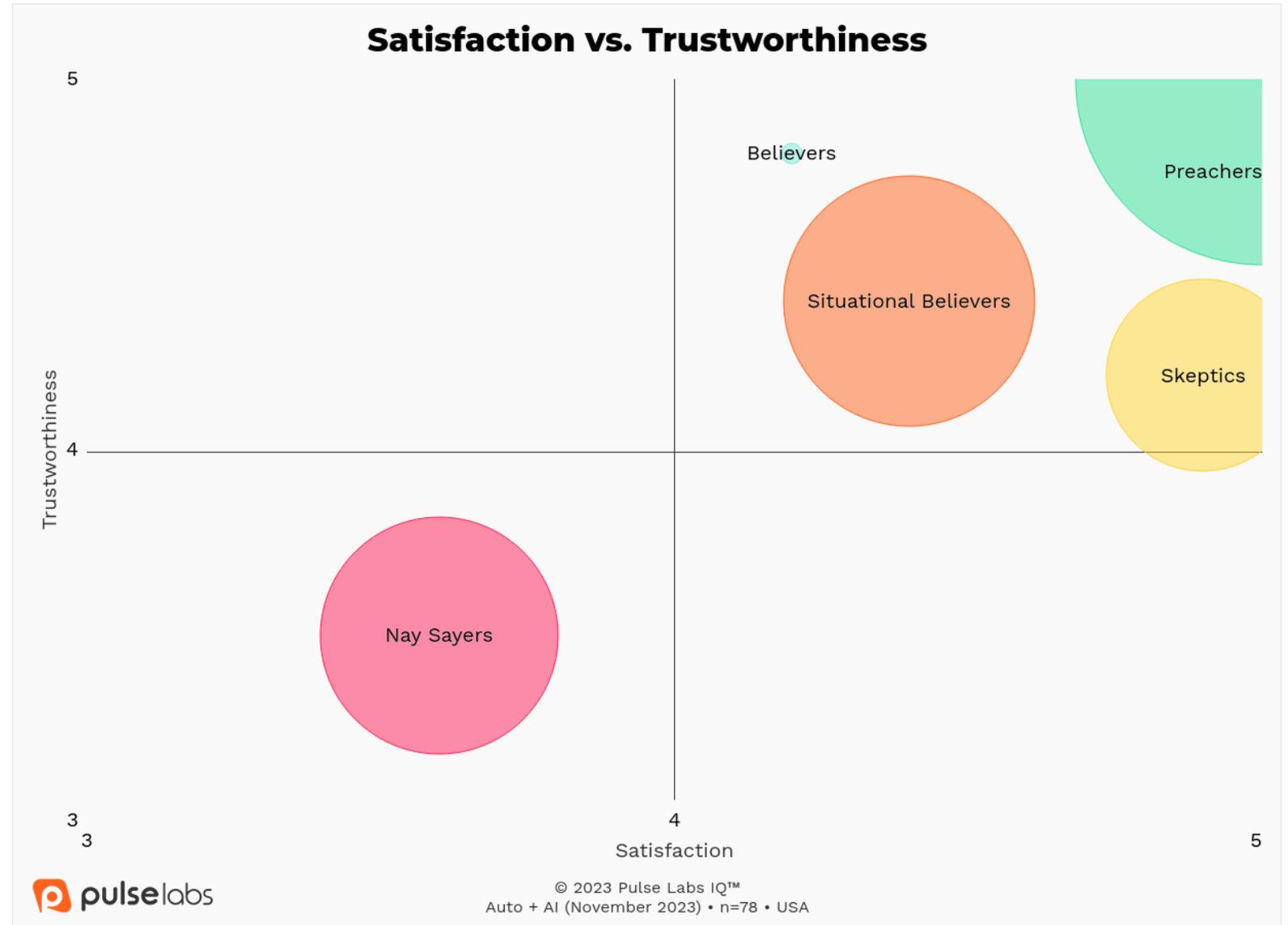


Luxury vehicle drivers, a small cohort in the survey, were more likely to be Skeptics or Nay Sayers. Here, our study showed that 50% of this group represented personas that are more hesitant to use or trust AI.

### Gen X+ and Gen Z



Gen X+ and Gen Z were the two dominant segments in both the Preacher and Nay Sayer clusters, highlighting a divided opinion on trust and satisfaction.

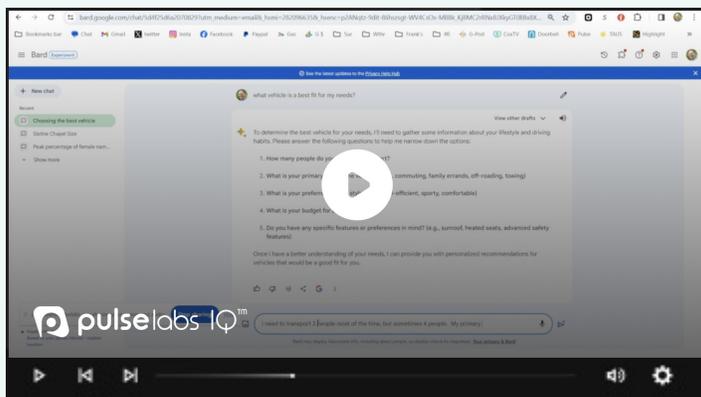


## 5. Right execution of use cases (1/2)

Ultimately, the right execution will play a pivotal role in the success of generative AI in automotive. Here, the study identified key care points for OEMs:

1

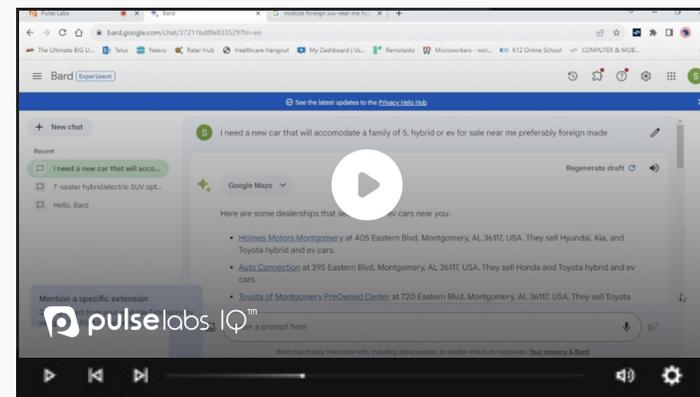
Leveraging bidirectional conversations and implementing suggestive AI tools will help less technical users extract more value from these use cases.



Here, Bard develops a dialog with the user when searching for buying a new car that further helped tailor his requirement and improve accuracy of response.

2

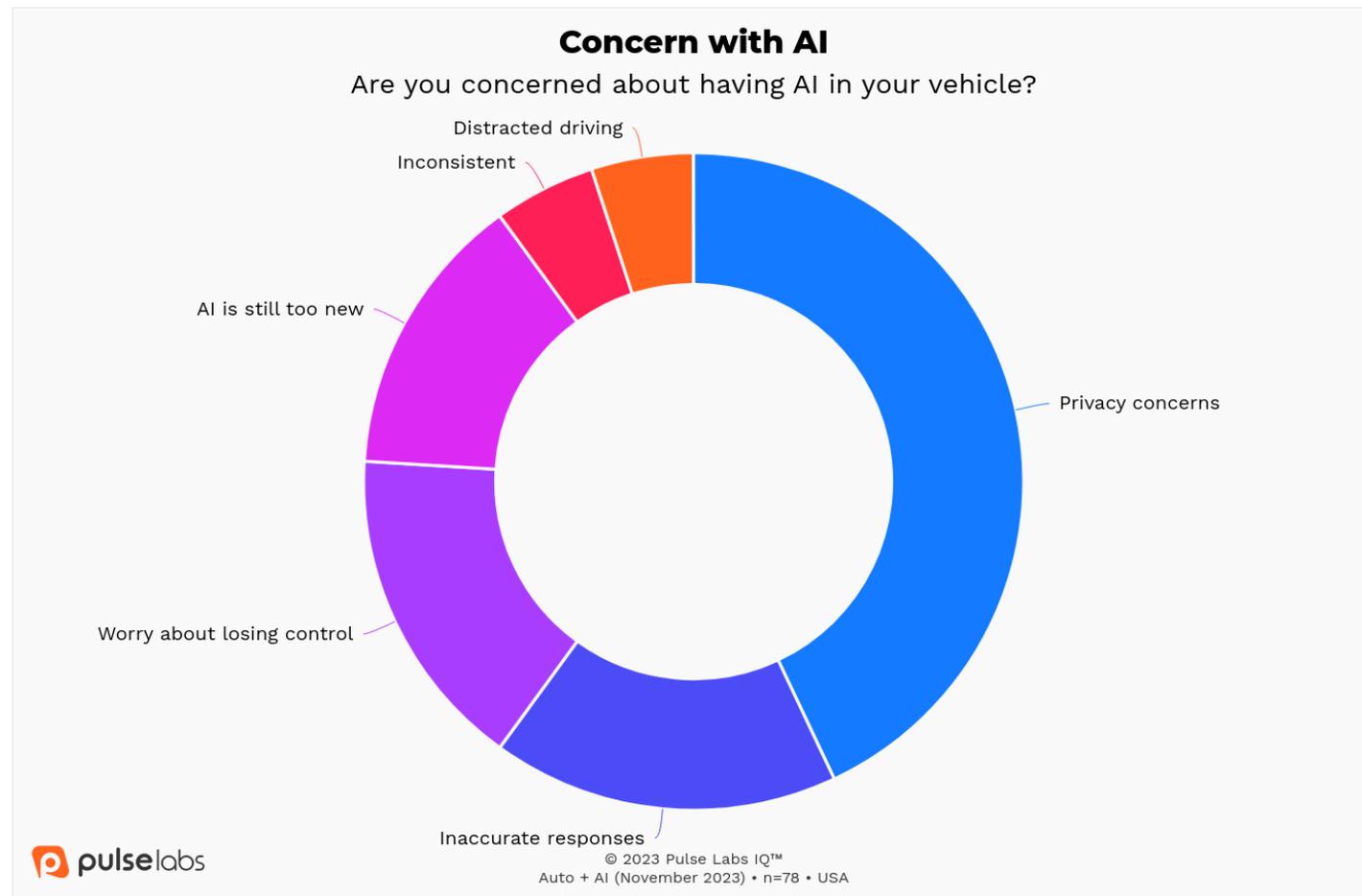
Contextually embedding audiovisual materials, alongside other relevant links and apps, similarly adds value.



Here, Bard provided better embedding of contextual metainformation – supporting its responses and aiding the customer experience.

## 5. Right execution of use cases (2/2)

Users emphasized the importance of careful and reliable AI integration, a voice-enabled AI assistant, addressing maintenance needs, prioritizing user privacy, ensuring a user-friendly interface, and focusing on reliability and safety.



Below is feedback from customers on an ideal use case execution:

### 1. Maintenance support

*"Have the owner's manual programmed into the car. And allow AI search to give intuitive answers about the car's maintenance, repairs etc."*

L

Lynn, Millennial, Mitsubishi Mirage

### 2. Journey Planning

*"I would love to have Polestar use AI in its route planning and maintenance checks as I think it would improve the overall EV experience."*

S

Simon, Gen X+, Polestar 2

# Lead the way in automotive AI applications



## Schedule your expert briefing

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- An in-depth discussion of the report findings for you and your team.
  - Help placing the consumer experience at the heart of your AI strategy.
  - Support in identifying the right use cases and experience delivery of AI for your customers.
- 

[info@sbdautomotive.com](mailto:info@sbdautomotive.com)

[insights@pulselabs.ai](mailto:insights@pulselabs.ai)

Schedule your briefing

# Research goals & methodology

# Study overview & research methodology

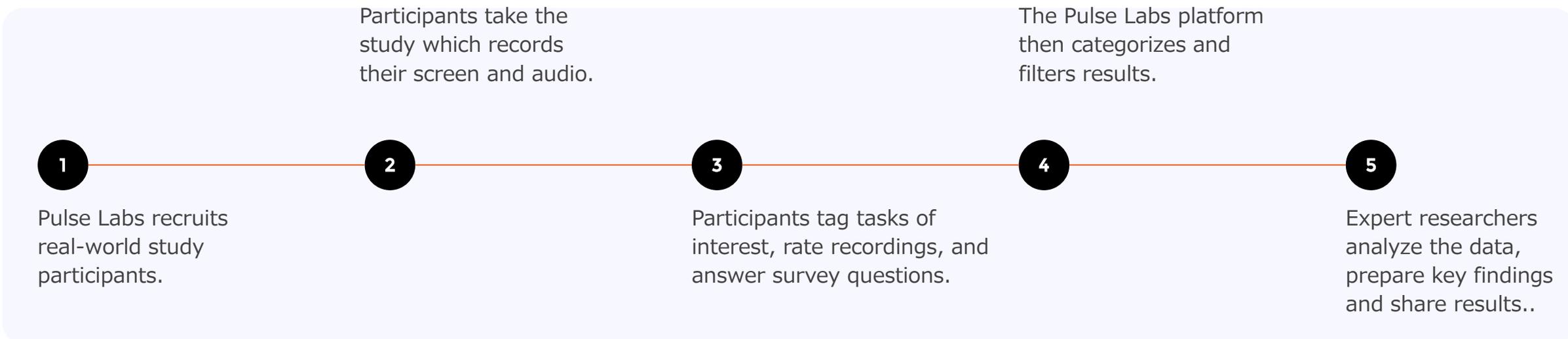
## Study overview:

- Participants were asked to complete 4 auto-related tasks using an app or website, and then attempt the same using AI.
- Users were randomly assigned to use ChatGPT or Bard for the AI version of the tasks.

## Participant tasks:

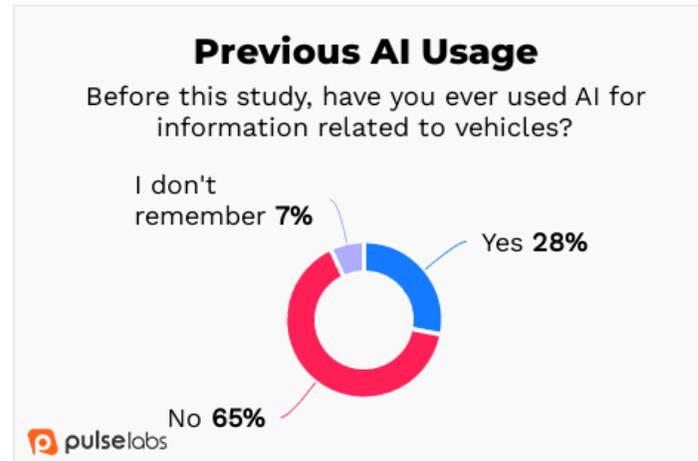
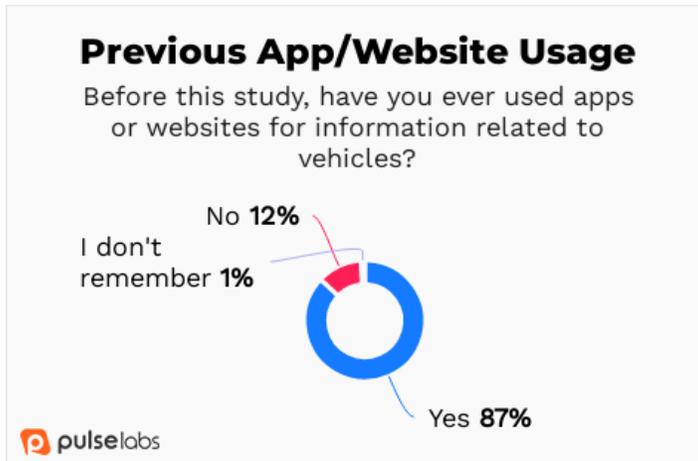
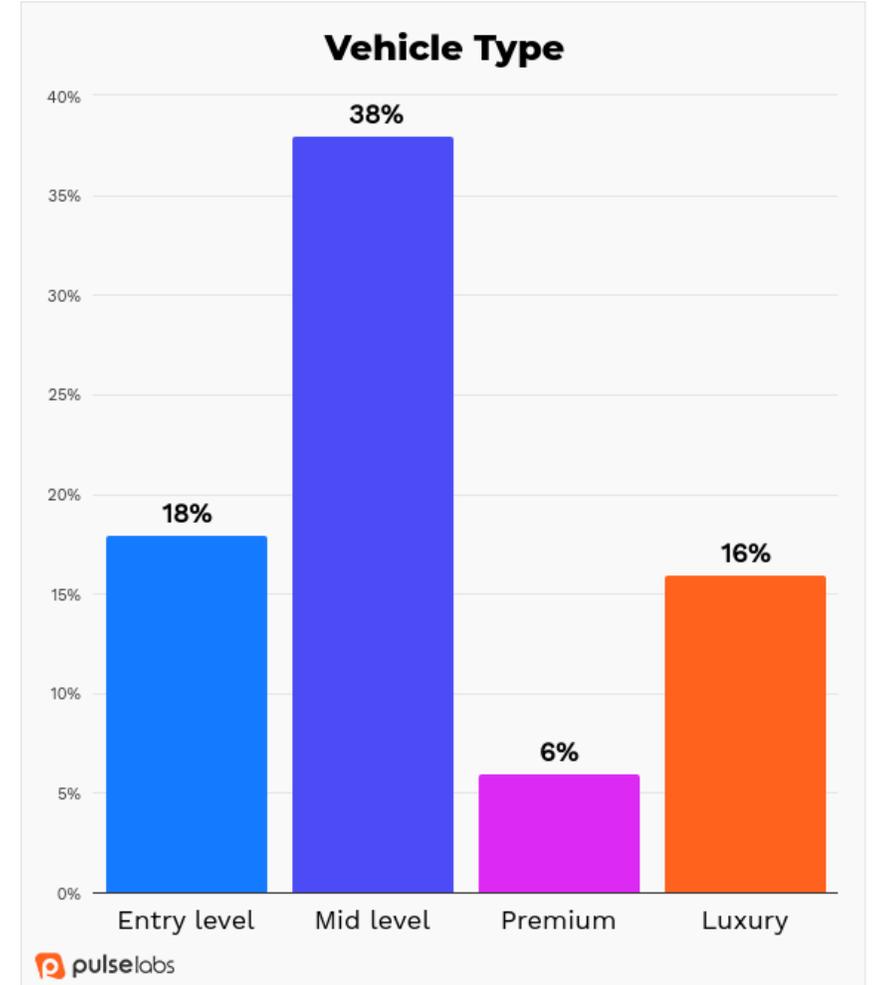
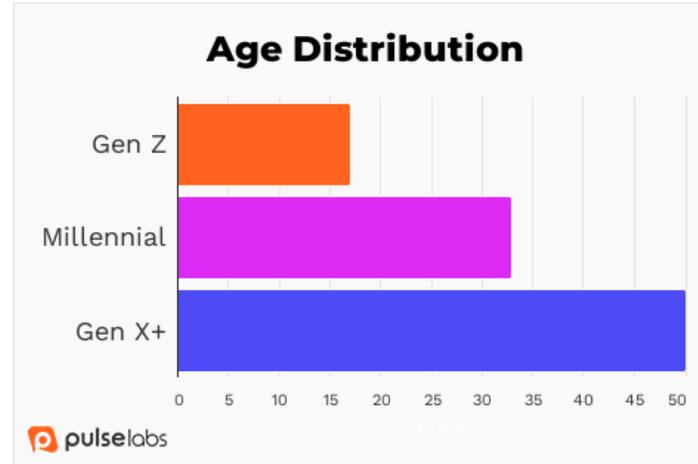
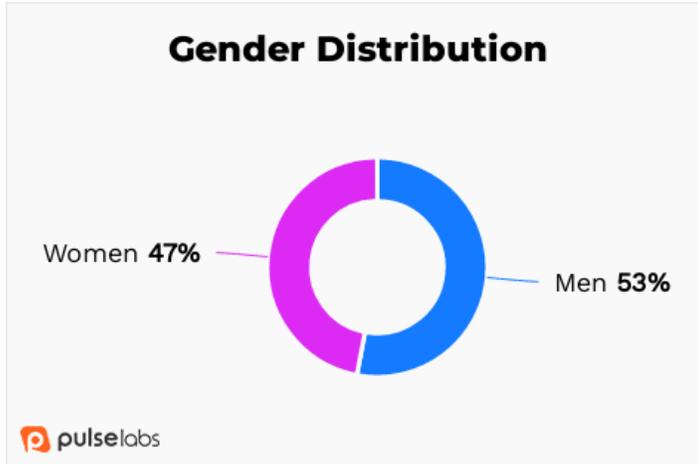
- **Buying a car:** Imagine you want to buy a new car. Try to learn what kind of vehicle would be the best fit for your needs.
- **Troubleshooting a dashboard light:** Imagine several of your dashboard lights are on (ABS, tire pressure, low oil, break, etc.). Try to find out steps to understand and fix the issue.
- **Bluetooth pairing:** Try to learn how to pair your phone via Bluetooth with the specific make and model of your vehicle.
- **Planning a long trip:** Imagine you're taking a 3-day road trip in a few weeks. Try to find out how long your route will take and where you want to stop along the way at restaurants, for fuel, and to sightsee.

## Study process:



# Participant snapshot

78 drivers in the US who have a history of AI use, split between ChatGPT and Bard



# Key insights prior to AI and app/website experience

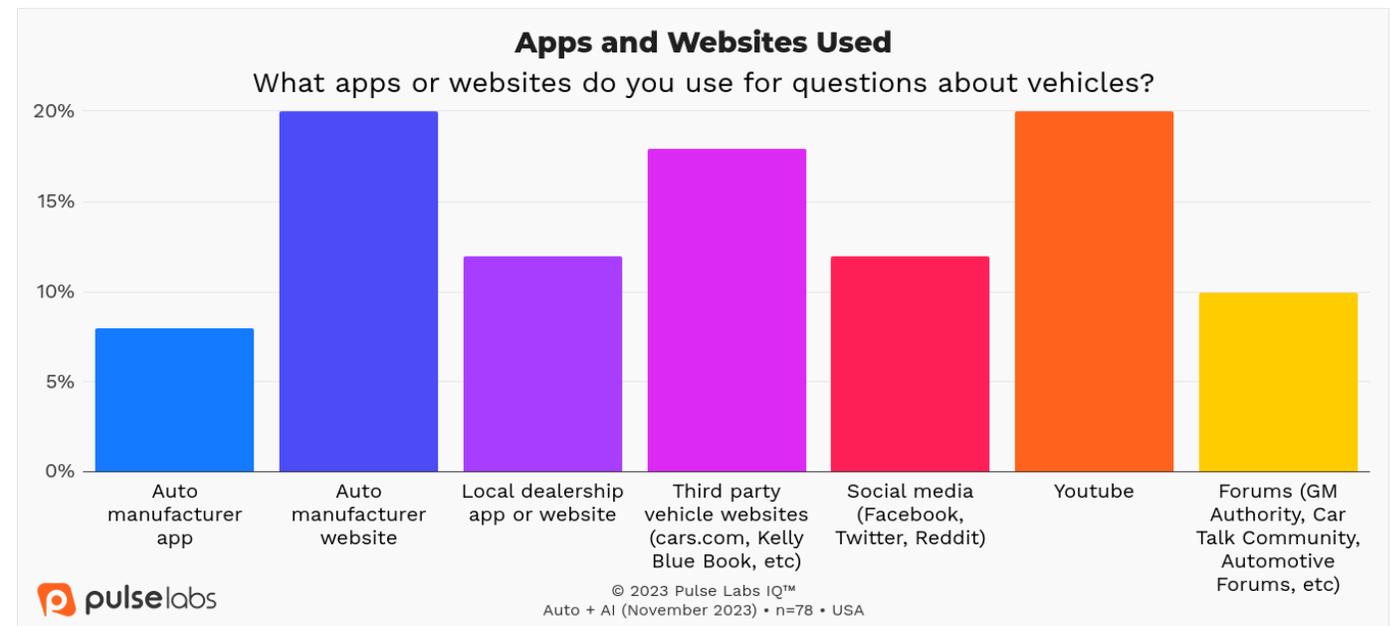
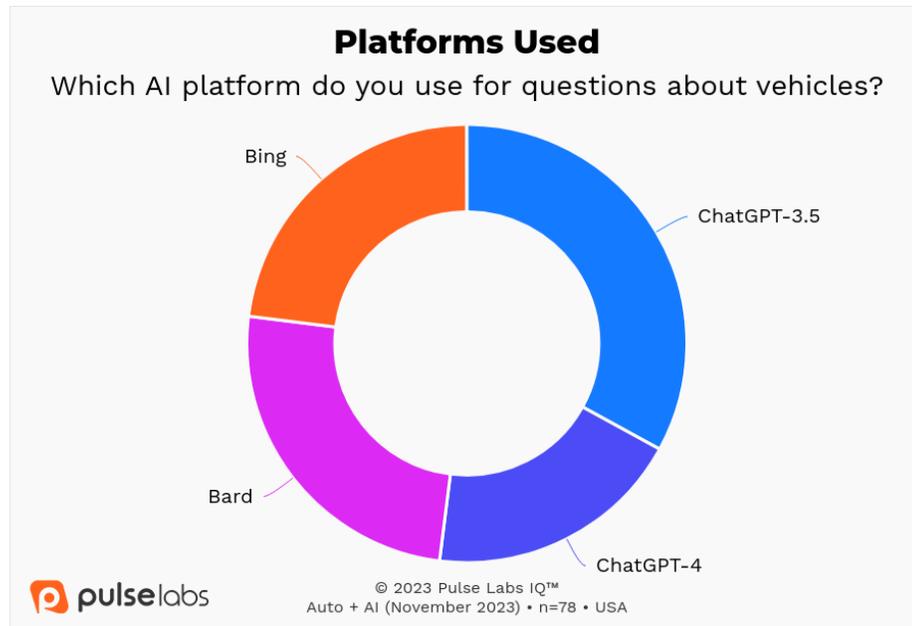
For those currently using AI for auto queries, GPT-3.5 is the most preferred:

Of those who had used AI for auto-related information, GPT-3.5 (33%) was the most widely used AI platform for these queries, followed by Bard (25%) and Bing (23%).

App/website preferences:

For users who said they used apps or websites to find auto-related information prior to this study, the leaders were:

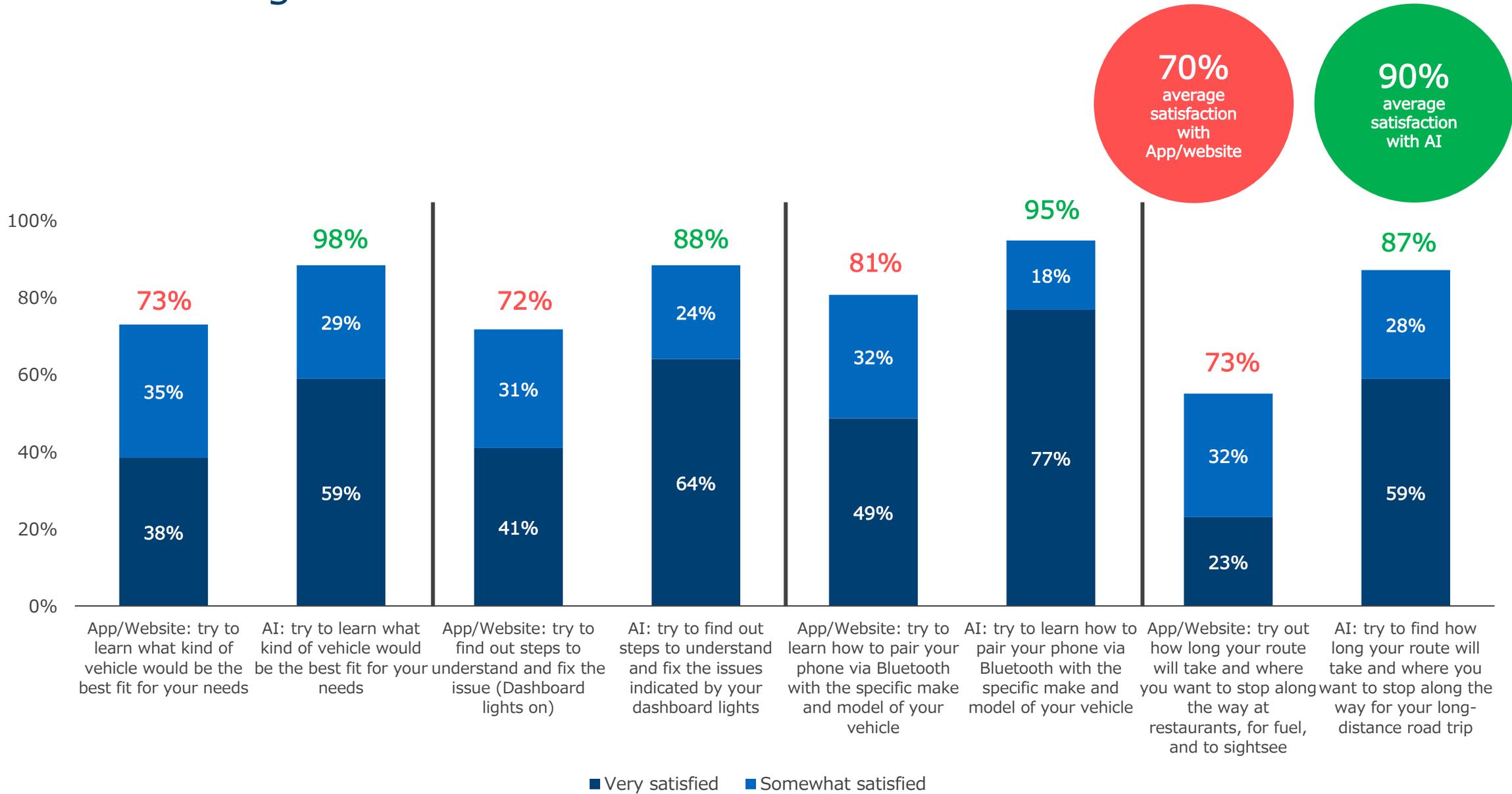
- Manufacturer websites (20%)
- YouTube (20%)
- Third-party websites like cars.com and Kelly Blue Book (18%).



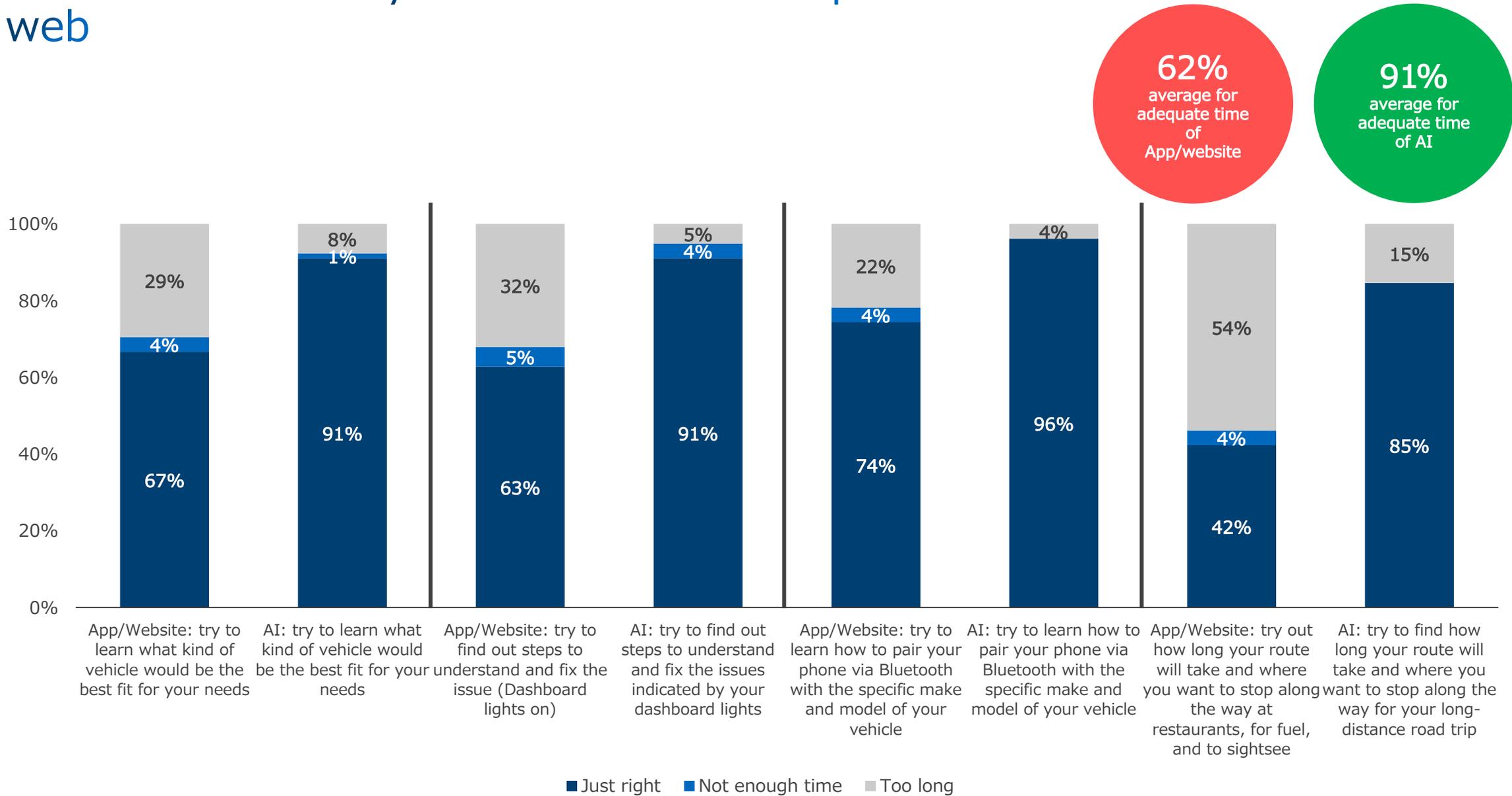
# Appendix

# Further quantitative insights

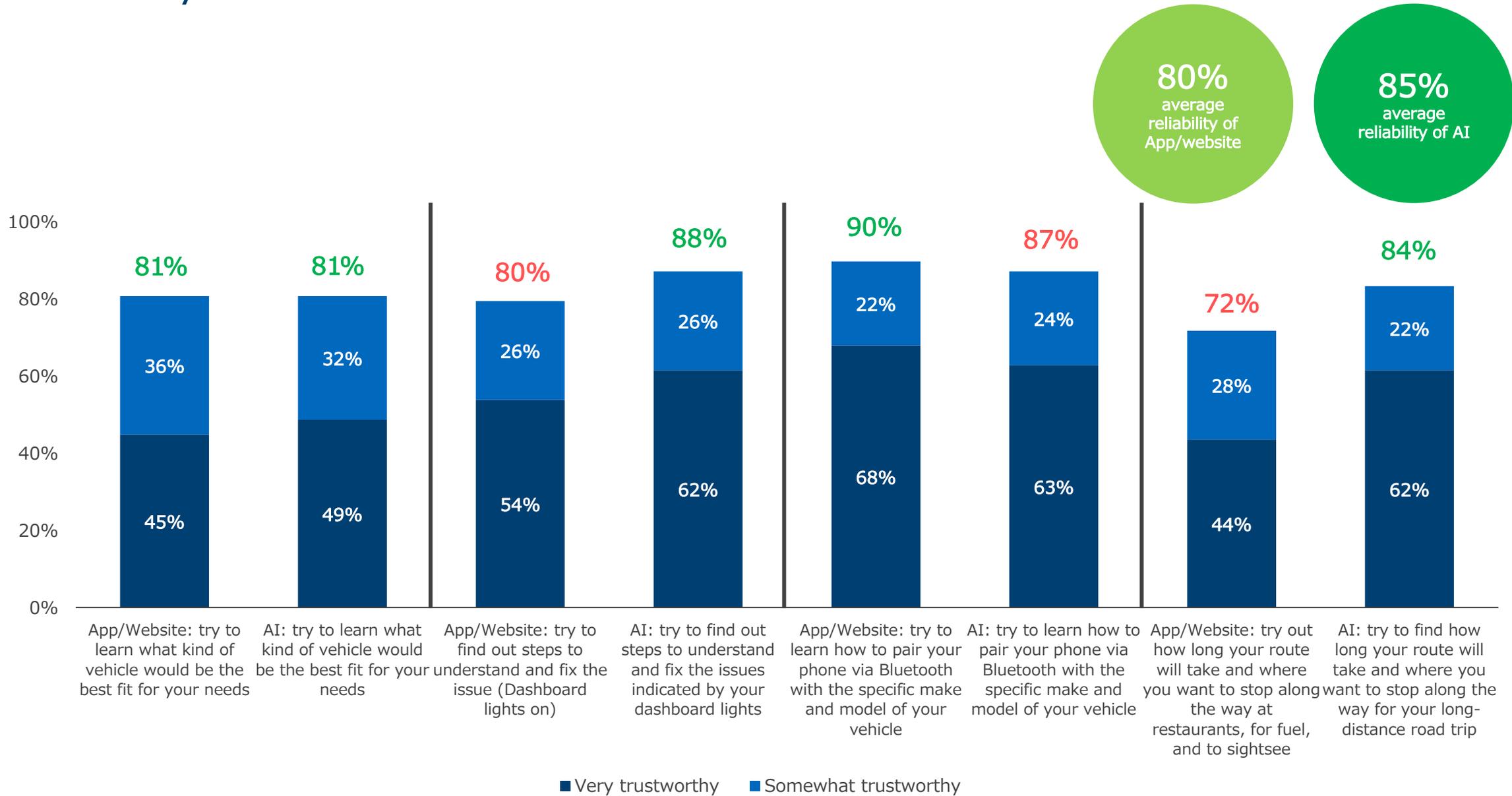
# AI creates higher task-based satisfaction vs web



# Time taken to carry out tasks with AI is preferable vs web

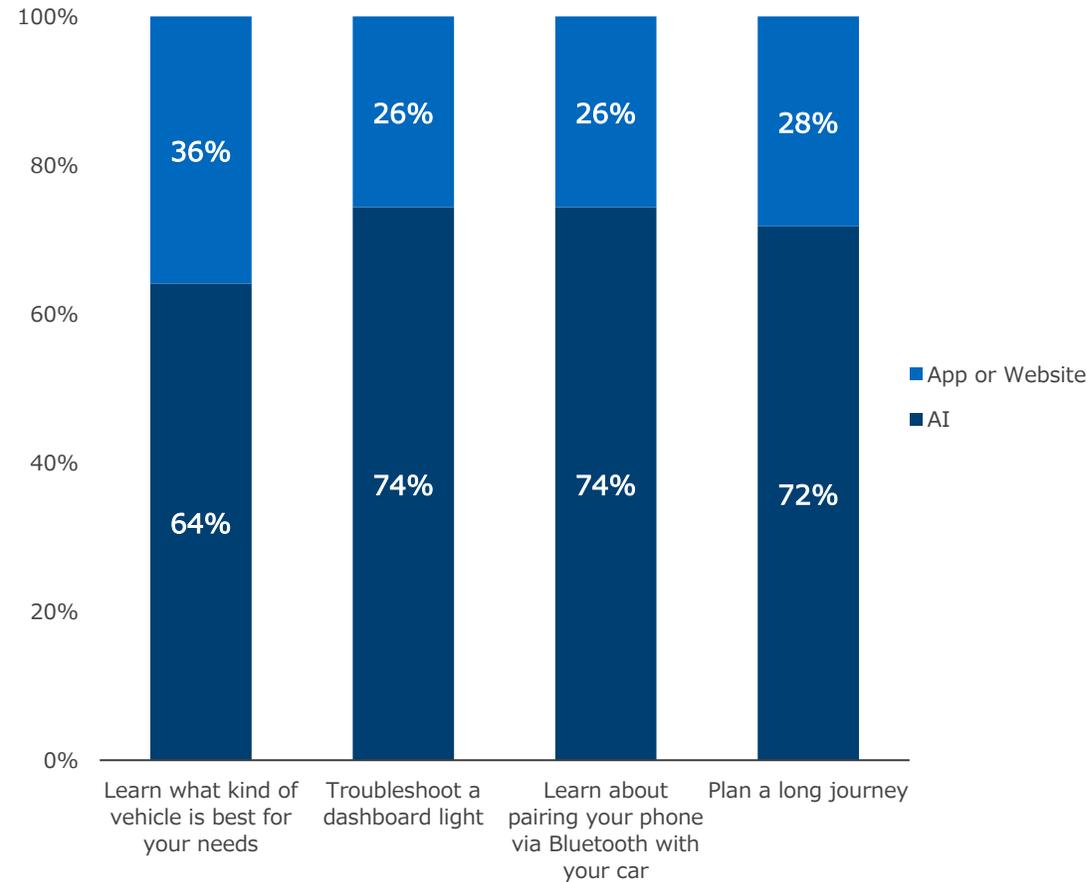


# Reliability of information is similar between AI & web



# AI is preferred method for task completion, especially for Gen-X

Preference for task completion (AI vs web)



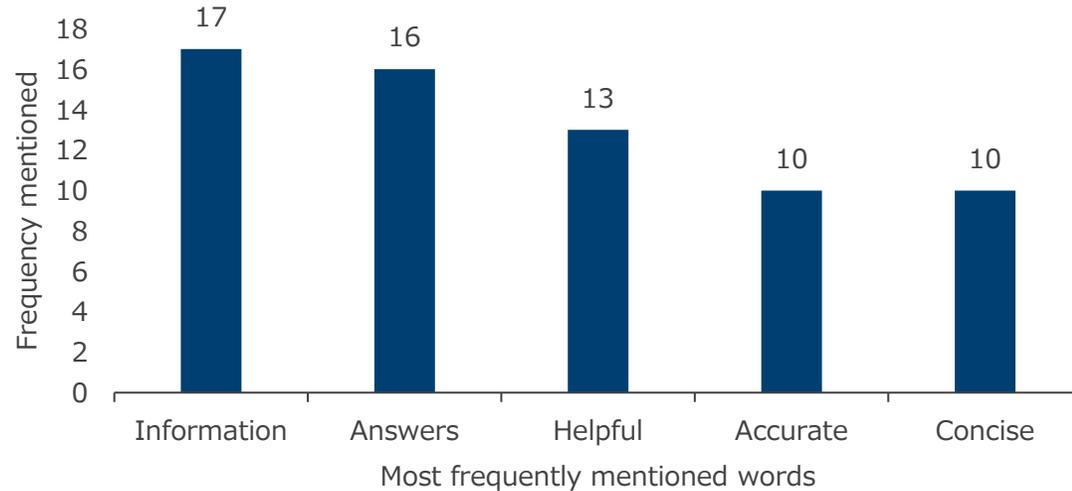
Summary of responses based on demographics

Task	AI			App or website			Statistical significance (p-value)
	Gen X+	GenZ	Millennial	Gen X+	GenZ	Millennial	
Learn what kind of vehicle is best for your needs	77%	46%	54%	23%	54%	46%	0.06
Troubleshoot a dashboard light	77%	69%	73%	23%	31%	27%	0.85
Learn about pairing your phone via Bluetooth with your car	72%	85%	73%	28%	15%	27%	0.65
Plan a long journey	82%	77%	54%	18%	23%	46%	0.04
Sample size	39	13	26	39	13	26	

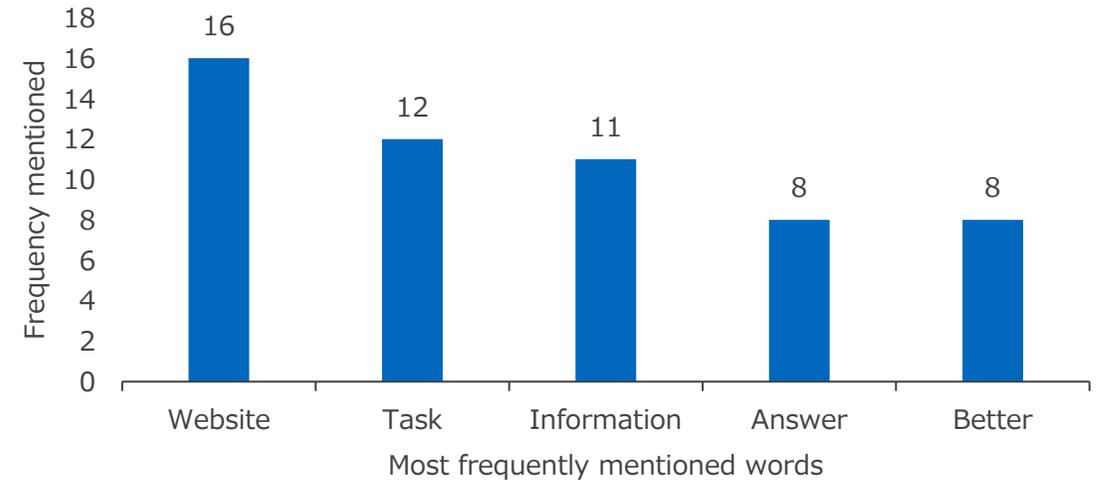
• Chi-Squared test of independence used to highlight statistical significance. Values of <0.05 are considered to be statistically significant, meaning significant differences have been observed between demographics

# Text analysis of AI vs web preferences for task completion

Text analysis of responses in favour of AI



Text analysis of responses in favour of Web



## Example Quotes

"AI wins across the board. The websites take much longer to gather the same information as ChatGPT shows you in seconds. I would take ChatGPT in every single information search I conducted."

"I preferred the AI for the troubleshoot dashboard light & pairing my phone via Bluetooth with my care because I feel ChatGPT gave the most compact list of results that I understood clearly."

"It was quick to pull up and it provide a very clear list of how to solve the issues without having to go into websites."

"Because it was quick, easy, and right to the point. You did not need to search around all over the place for what you needed."

"The information was more concise, I could have a conversation if there were any lingering questions versus going to another source and the answers were more personalized to my needs."

"I chose learning what kind of vehicle best suits your needs because I can see the picture of the vehicle on the internet whereas chat is just that chat, no pictures"

"The tasks like troubleshooting a specific vehicle, I don't think AI is up to date enough to help me troubleshoot my new vehicle."

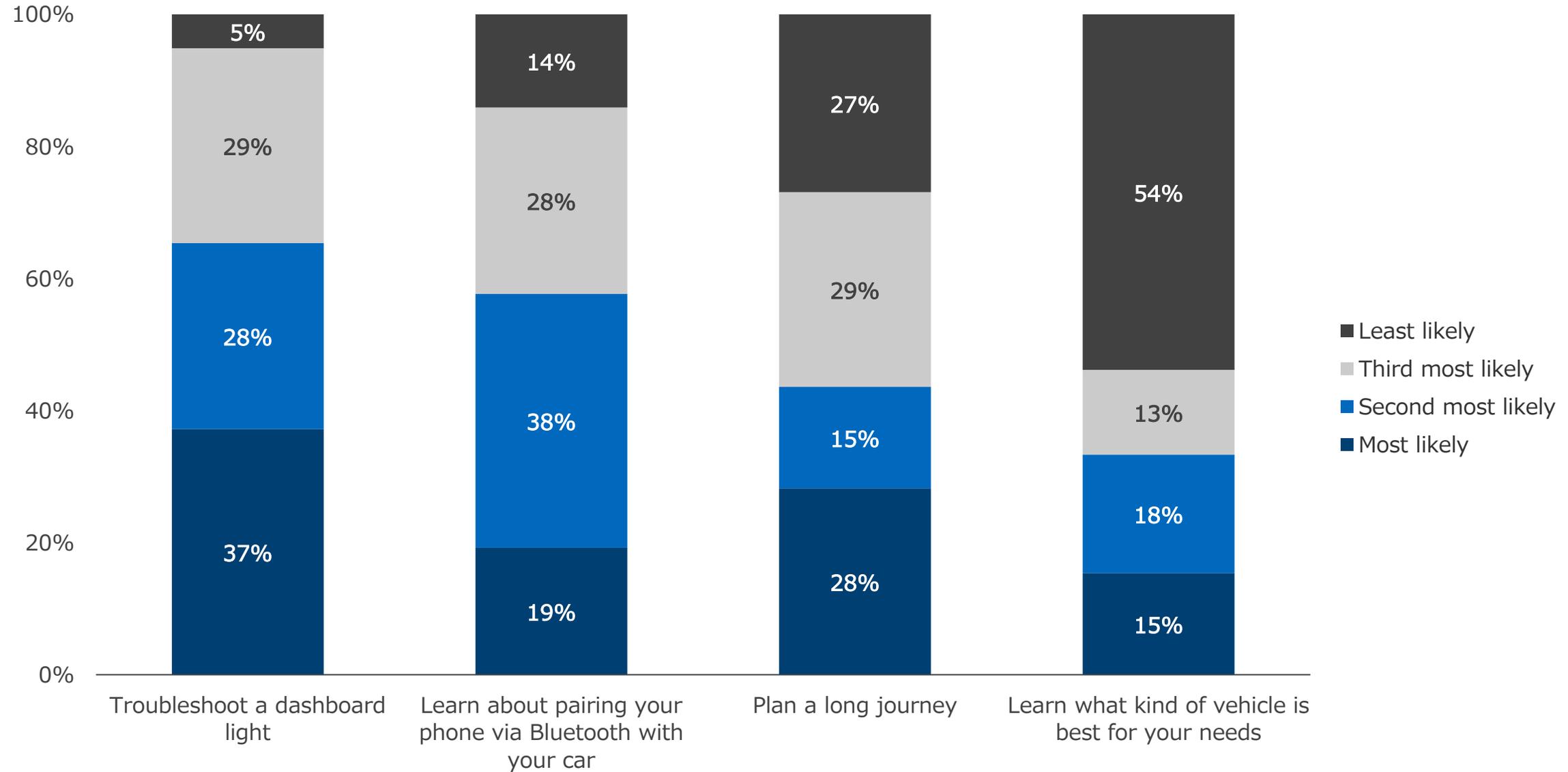
"I preferred the website because it was official website so I knew that the information I was receiving was correct."

"For the task that I prefer a website I feel like it works best because I want more control over those tasks. This task also requires more filters so I feel like doing it myself would just be faster."

"The website had pictures, videos, and more in depth information."

"How to's are still easier to watch in Youtube so I would prefer this way over written steps."

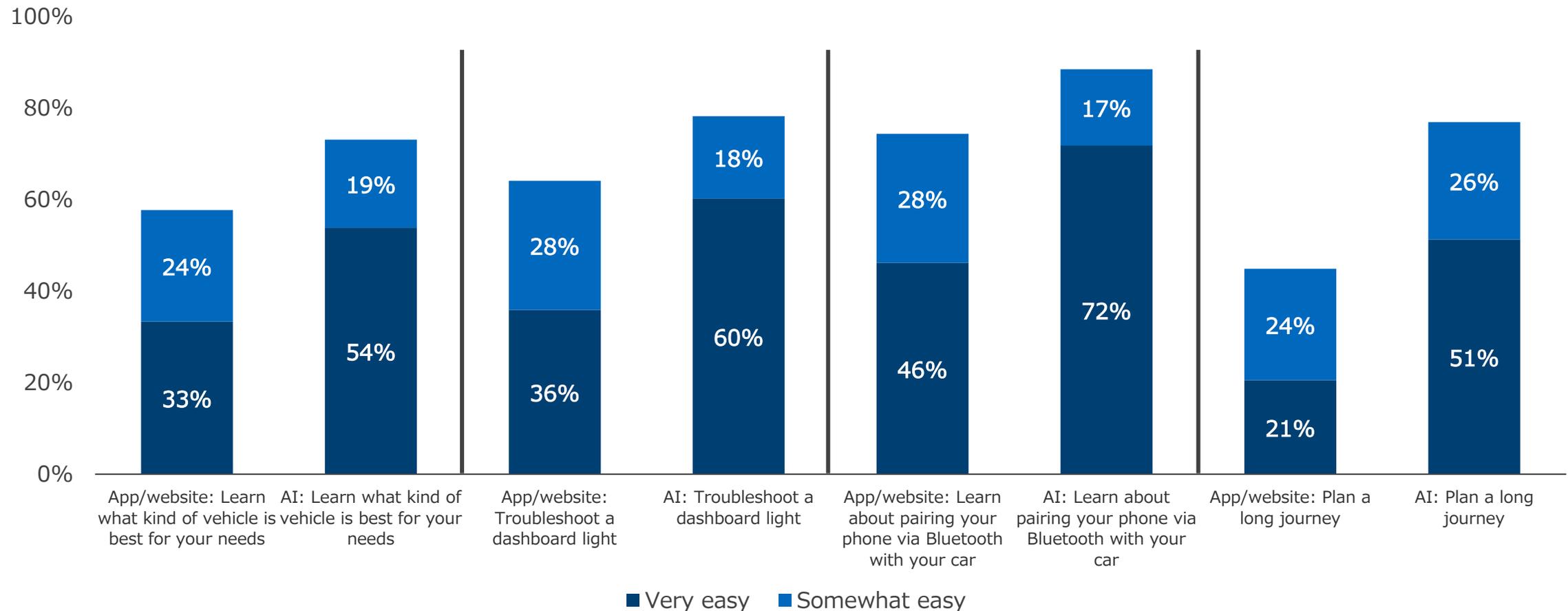
# Troubleshooting use cases most appealing for AI



# AI is considered easier to carry out tasks than web

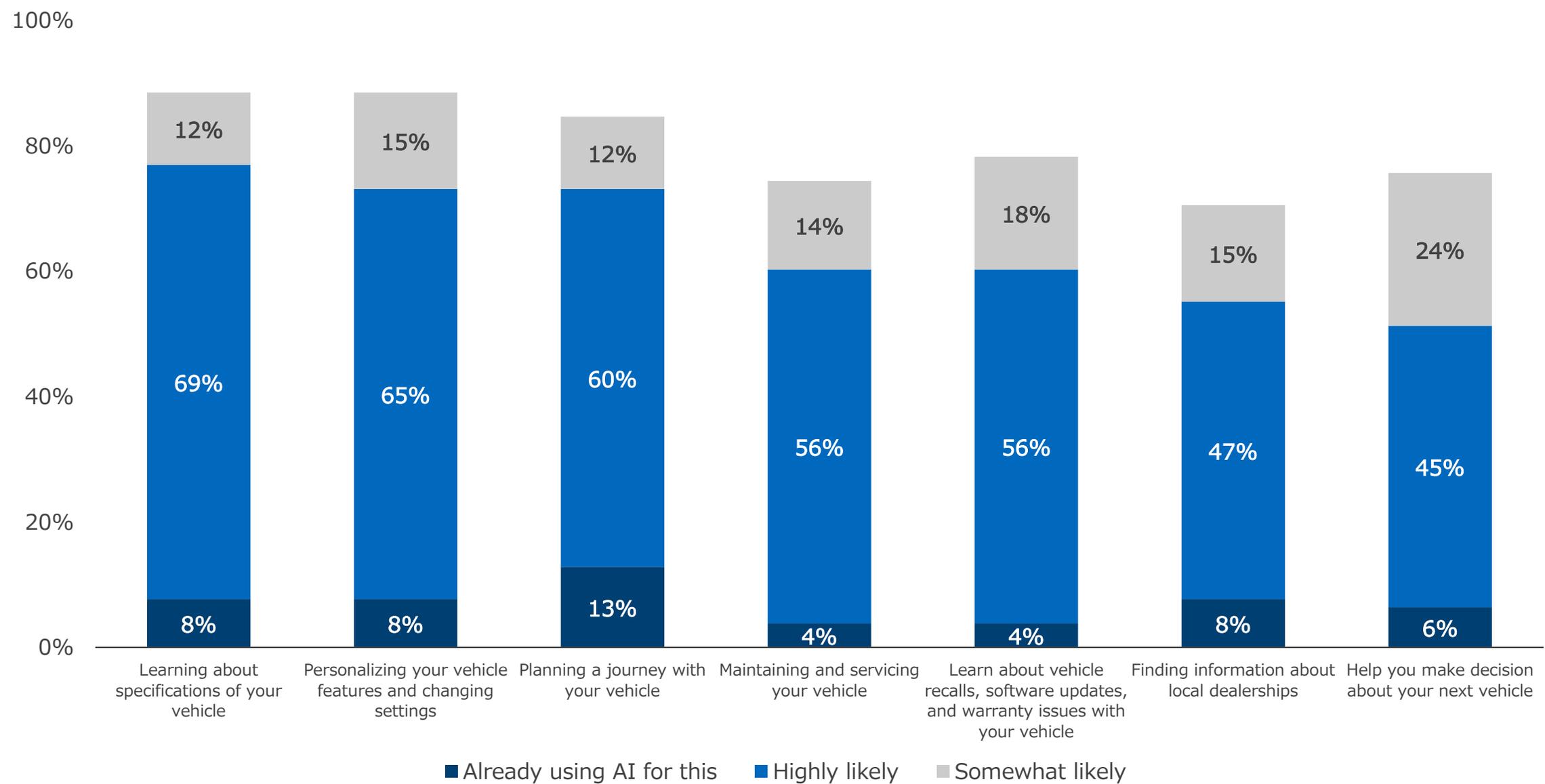
60%  
average for ease of finding information App/website

79%  
average for ease of finding information AI

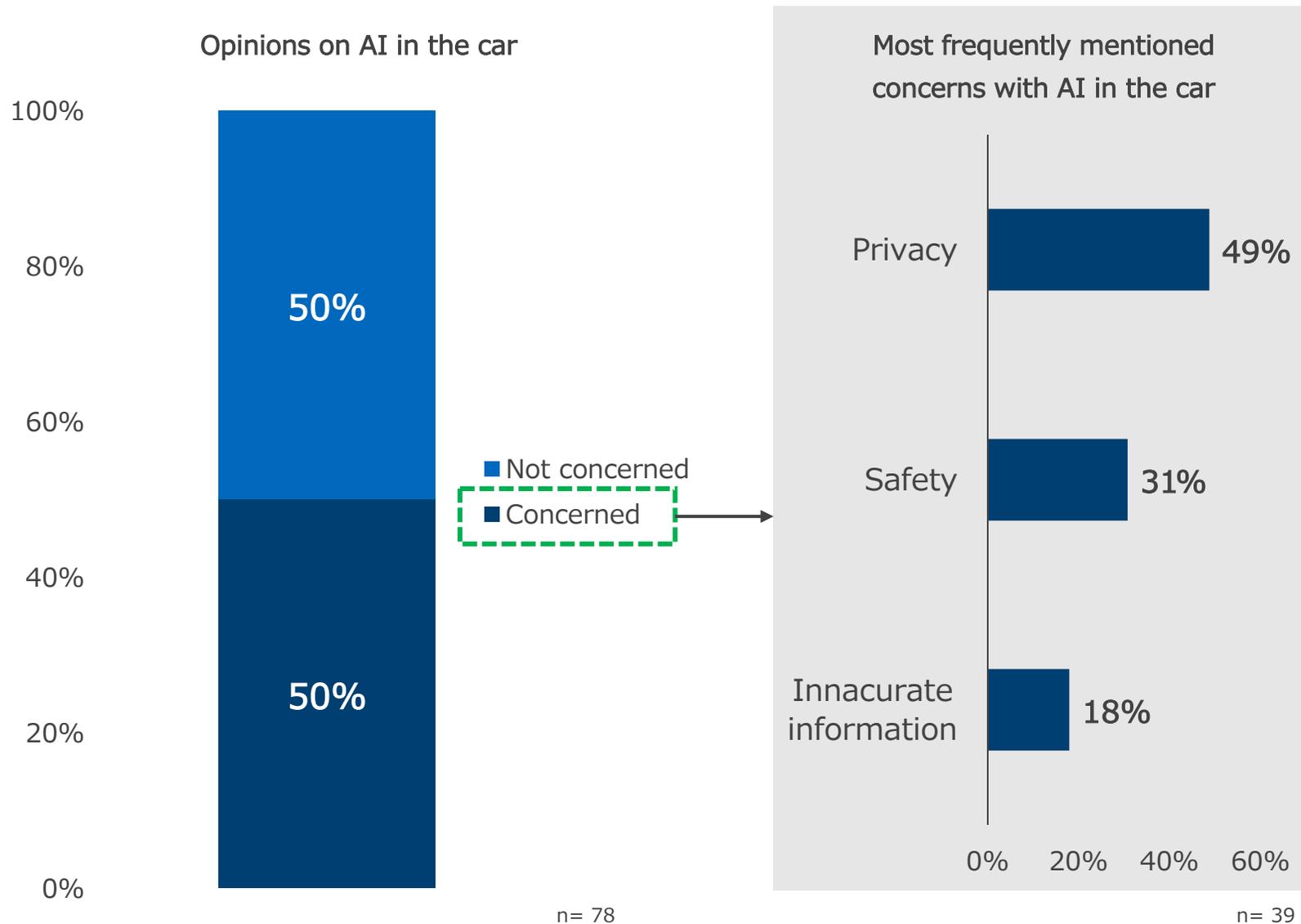


Very easy Somewhat easy

# Intention to use AI is high as a result of positive experiences



# Implementation of AI in the car is divisive for consumers



## Example Quotes

"More privacy breaches. AI would be able to see our search history and behavior which is a little unnerving."

"By getting too much information about me and my family and storing it to use later."

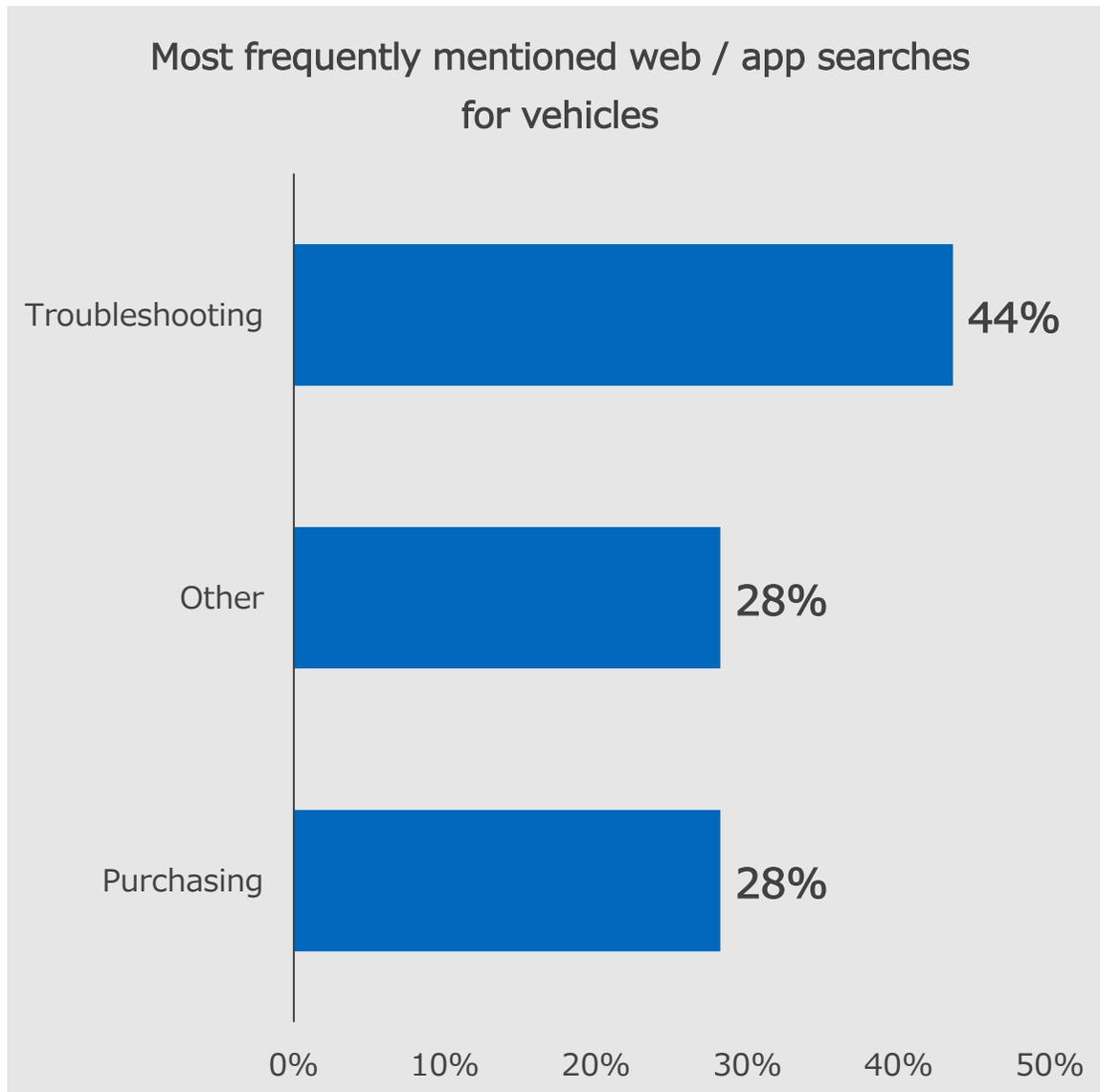
"I do not have many concerns other than if the AI is "always on" and recording conversations that do not relate to queries being presented. What does the AI do with that information and should I be concerned about privacy?"

"I don't want AI in my vehicle as it's just another distraction and could potentially mislead me."

"I worry that it can override my decisions or report me to authorities for thing I didn't do."

"I would love to have it. However, some inaccurate responses could have consequences while driving safety factors need to be insured."

# Vehicle troubleshooting is most common search requirement



## Example Quotes

"I usually search in Google when something is wrong with my car. I'll see if other people are having the same issues as me."

"if I had a blinker issue what does it mean, cost of car tires, cost of fixing a car window, cost of repairing leather seating."

"If there is an issue with one of our vehicles, we have used websites to help us trouble shoot the problem."

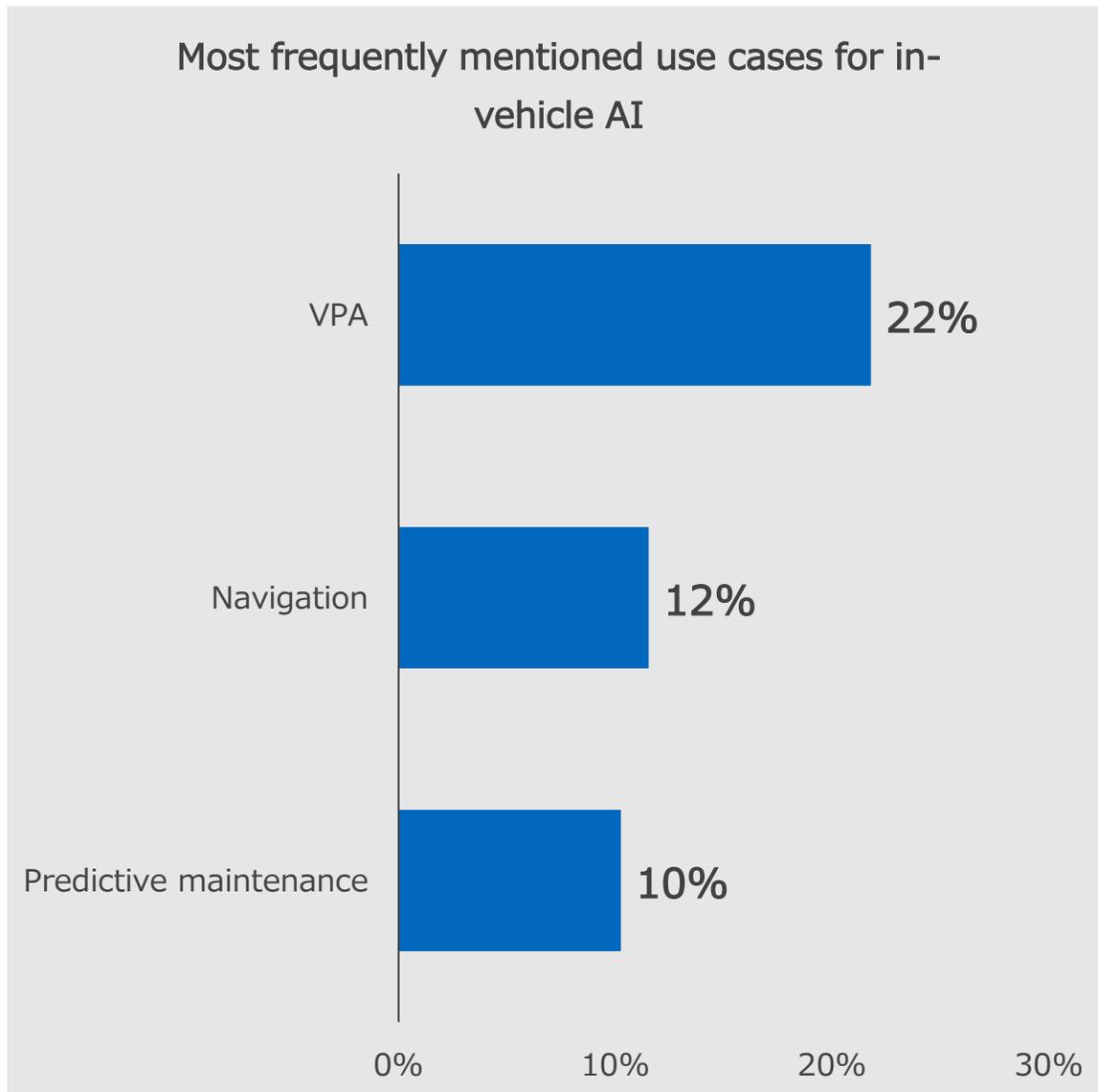
"Logistical information such as charge time, fuel mileage, maintenance intervals. I also look up how to use specific things like changing the time, changing wiper blades.."

"I tend to search about vehicle health and maintenance. I have also looked up issues with the technology inside of my car."

"I check reviews on the items or how well it has performed in tests, get information about the mileage and what is included in each trim line."

"why is certain indicator light on?"  
"how do I adjust the certain settings?"

# AI integration in VPAs is seen as the most valuable use case



## Example Quotes

"I want to be able to ask any basic vehicle questions, similar to how Google Assistant is, but would love more thorough responses. Also would really love for images to come into play, if possible. I know in a vehicle this can be difficult, but if there's a way it would really help."

"I would tell them to leverage AI in all aspects, especially in-car. The voice assistant should be AI based with ability to search neural networks to help understand common language, dialects, and translations for all situations."

"I would love to have Polestar use AI in it's route planning and maintenance checks as I think it would improve the overall EV experience."

"Use it most for troubleshooting immediately and route planning."

"Integrated into a personal assistant and possibly vehicle diagnostic software which would make things a little bit more straightforward to the user."

"I think they should leverage AI for maintenance. If the car is connected to the internet it could provide information about when services will be due."

"Use AI to make cars with better safety and performance. Monitor and predict maintenance of the vehicle. Keep people safe at all costs."

# Further qualitative insights

# 1. Buying a car



Insight	Meta Data	Video Link
<p>A user finds the AI response to be too generic to make any decision around buying.</p> <p>Prompt: Want to buy a used hatchback with manual transmission</p>	<p>Jillian, Millennial, Subaru Forester</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1iedpGg7AuGpJ6_RUeXP6CK6q_t7azVEG/view?usp=drive_link">https://drive.google.com/file/d/1iedpGg7AuGpJ6_RUeXP6CK6q_t7azVEG/view?usp=drive_link</a></p>
<p>User liked the options provided by GPT but found them too few and lacking in depth. They also wanted to see visuals.</p> <p>Prompt: Best vehicle for 6 people that is also fun to drive</p>	<p>Khuzaima, Gen Z, Nissan Rogue</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1nSbUvRgDmt4lgEuN2rqjRmYACCPkhhf/view?usp=drive_link">https://drive.google.com/file/d/1nSbUvRgDmt4lgEuN2rqjRmYACCPkhhf/view?usp=drive_link</a></p>
<p>User was told that the information provided did not have the latest models of vehicles, and they would need to cross check.</p> <p>Prompt: What are the top hatchbacks of 2023 with good mileage</p>	<p>Jessica, Millennial, Hyundai Veloster</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1vUNYnwrEa3c8_1QcHplFQh0SNJCPXGdy/view?usp=drive_link">https://drive.google.com/file/d/1vUNYnwrEa3c8_1QcHplFQh0SNJCPXGdy/view?usp=drive_link</a></p>
<p>User finds that there is too much cognitive overload with websites, but Bard's response is easier to consume.</p> <p>Prompt: I need a car that will accommodate a family of 5, hybrid or EV, near me, preferably foreign</p>	<p>Sara, Gen X, Toyota Camry</p> <p>Platform Assigned: Bard</p>	<p><a href="https://drive.google.com/file/d/1ESNg2SpFupX_vyWDWBM_pnJAqSOuLvHW/view?usp=drive_link">https://drive.google.com/file/d/1ESNg2SpFupX_vyWDWBM_pnJAqSOuLvHW/view?usp=drive_link</a></p>

## 2. Troubleshooting a dashboard light



Insight	Meta Data	Video Link
<p>User appreciates that GPT gives step-by-step instructions and they can have follow-up queries on technical terms</p> <p>Prompt: What to do when my check engine light is on</p>	<p>Stephanie, Gen X, Chevy Equinox</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1eKKnYQv_hbIgKblE-VuxRnibJtYZehviI/view?usp=drive_link">https://drive.google.com/file/d/1eKKnYQv_hbIgKblE-VuxRnibJtYZehviI/view?usp=drive_link</a></p>
<p>User found website responses to be too complicated to wade through, liked the written instructions</p> <p>Prompt: Reset instructions for Kia Sportage</p>	<p>Mark, Gen X, Kia Sportage</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/12rnzpz0GwugrNwGKtLCbiI9L9kiIiPcM/view?usp=drive_link">https://drive.google.com/file/d/12rnzpz0GwugrNwGKtLCbiI9L9kiIiPcM/view?usp=drive_link</a></p>
<p>User found that Bard was able to explain why a problem was there and also offered solutions</p> <p>Prompt: My engine lights are on, why</p>	<p>Sarah, Gen X, Toyota Camry</p> <p>Platform Assigned: Bard</p>	<p><a href="https://drive.google.com/file/d/1YWoLfyXR8SP1MMufXvZJ7d4O1LiP5Rcp/view?usp=drive_link">https://drive.google.com/file/d/1YWoLfyXR8SP1MMufXvZJ7d4O1LiP5Rcp/view?usp=drive_link</a></p>
<p>User liked that they were provided with images along with the instructions making it intuitive</p> <p>Prompt: How to fix dashboard lights, low pressure on Kia Forte</p>	<p>Stephanie, Gen Z, Nissan Sentra</p> <p>Platform Assigned: Bard</p>	<p><a href="https://drive.google.com/file/d/1VZAtoV6N5ZA4ncYbqGB9ZPVpHleBG3B1/view?usp=drive_link">https://drive.google.com/file/d/1VZAtoV6N5ZA4ncYbqGB9ZPVpHleBG3B1/view?usp=drive_link</a></p>

### 3. Bluetooth pairing



Insight	Meta Data	Video Link
<p>User experiences hallucinations for the task</p> <p>Prompt: How do I pair my bluetooth to my Subaru WRX</p>	<p>Jillian, Millennial, Subaru WRX</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1xpaea0o-oHJhiCM0b9oaDZnU9Cu-JHS1/view?usp=drive_link">https://drive.google.com/file/d/1xpaea0o-oHJhiCM0b9oaDZnU9Cu-JHS1/view?usp=drive_link</a></p>
<p>User appreciated the step-by-step instructions, would like the source to be cited and clickable</p> <p>Prompt: How do I pair my iPhone 14 with BMW 330i va bluetooth</p>	<p>Nicholas, Gen X, BMW 330i</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1Un7-pr7EbOTr6ffcZFHtVw8fQm2cmfe5/view?usp=drive_link">https://drive.google.com/file/d/1Un7-pr7EbOTr6ffcZFHtVw8fQm2cmfe5/view?usp=drive_link</a></p>
<p>User appreciated that Bard was able to predict potential issues and address them proactively. However, they would like images along with step-by-step instructions</p> <p>Prompt: How to pair my iPhone with my Toyota Camry</p>	<p>Hossein, Millennial, Toyota Camry</p> <p>Platform Assigned: Bard</p>	<p><a href="https://drive.google.com/file/d/1sQu5iz0en-UouiCwUZO3CDNUBgq8raF/view?usp=drive_link">https://drive.google.com/file/d/1sQu5iz0en-UouiCwUZO3CDNUBgq8raF/view?usp=drive_link</a></p>
<p>A well detailed out response was appreciated and the ability to follow-up/ clarify and consider other drafts</p> <p>Prompt: How to pair phone with Volkswagen Tiguan</p>	<p>Sharon, Gen X, Volkswagen Tiguan</p> <p>Platform Assigned: Bard</p>	<p><a href="https://drive.google.com/file/d/1ZI2JLkn1TEOudi5kDVwRhk6kAVMJxS2Q/view?usp=drive_link">https://drive.google.com/file/d/1ZI2JLkn1TEOudi5kDVwRhk6kAVMJxS2Q/view?usp=drive_link</a></p>

## 4. Planning a long trip



Insight	Meta Data	Video Link
<p>User appreciated that he was provided with multiple routes with all details. In contrast website search was all over the place</p> <p>Prompt: Plan trip from Detroit with multiple stops for gas, food and sightseeing</p>	<p>Mark, Gen X, Kia Sportage</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1jrYzdIetxgxg8nk3Hm_UUw5Zc7IHaIV/view?usp=drive_link">https://drive.google.com/file/d/1jrYzdIetxgxg8nk3Hm_UUw5Zc7IHaIV/view?usp=drive_link</a></p>
<p>User noted that the ETA for the trip seemed inaccurate</p> <p>Prompt: How long will the trip take</p>	<p>Jessica, Millennial, Hyundai Veloster</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1lc4YOyW_FJva_-22I51Z7rTJFNKimO1j/view?usp=drive_link">https://drive.google.com/file/d/1lc4YOyW_FJva_-22I51Z7rTJFNKimO1j/view?usp=drive_link</a></p>
<p>User was impressed with the offbeat suggestions from GPT, had to go back to web to see images</p> <p>Prompt: Plan stops along my route</p>	<p>Stephanie, Gen X, Chevy Equinox</p> <p>Platform Assigned: GPT-4</p>	<p><a href="https://drive.google.com/file/d/1k2u3_rdtSzPJyIob7LlaTwSDDrvfsEA/view?usp=drive_link">https://drive.google.com/file/d/1k2u3_rdtSzPJyIob7LlaTwSDDrvfsEA/view?usp=drive_link</a></p>
<p>User liked to have the maps extension and the detailed itinerary</p> <p>Prompt: I am planning a three-day trip, can you plan my sightseeing</p>	<p>Abhinav, Millennial, Tesla X</p> <p>Platform Assigned: Bard</p>	<p><a href="https://drive.google.com/file/d/1E8fAe9kFpMtFPaZI-tp-x2xHo8Ae8x9R/view?usp=drive_link">https://drive.google.com/file/d/1E8fAe9kFpMtFPaZI-tp-x2xHo8Ae8x9R/view?usp=drive_link</a></p>

# Thanks

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