Preloaded assistants

UX guidelines

Contents

About

This document provides a high-level view of best practices for app developers designing AAOS-based assistant apps, and for car makers or OEMs who want to support those apps in their car infotainment systems.

Guiding principles

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- Integrate seamlessly with Android Automotive OS (AAOS)

- Support voice-forward experience

- Reduce complexity

- Respect privacy

Integrate seamlessly

Implement an assistant so it's integrated cohesively with the rest of AAOS. An assistant should always be ready to help. Users can invoke an assistant at any time from anywhere within the system, unlike traditional apps that must be launched.

Support voice-forward

Ensure an assistant is voice-forward, meaning users can perform most actions by voice alone. An assistant allows drivers to complete tasks without taking eyes off the road or hands off the wheel. Information presented on the car screen may augment information presented aurally, but is not distracting.

Reduce complexity

Keep task completion as simple as possible for drivers. Unfamiliar experiences can increase cognitive load, so use design patterns that are familiar both in the car and across devices.

Respect privacy

Make privacy easy to control. Attention to privacy is especially important in a car, since both drivers and passengers may change frequently. A user should always know when an assistant is listening, and easily be able to mute, temporarily disengage, or revoke assistant access.

Invoking assistants

Invoking assistants

AAOS provides three standard ways a user can invoke an assistant in a vehicle:

- Hotword
- Physical button, such as a push-to-talk (PTT) button on the steering wheel
- Soft tap-to-talk (TTT) button on the car screen

Hotwording

Hotwording allows a user to invoke an assistant by voice. Example: "Hey Google".

Car makers support listening for a hot word to invoke an assistant.

App developers allow users to disable the hot word in Settings if hotwording is supported.
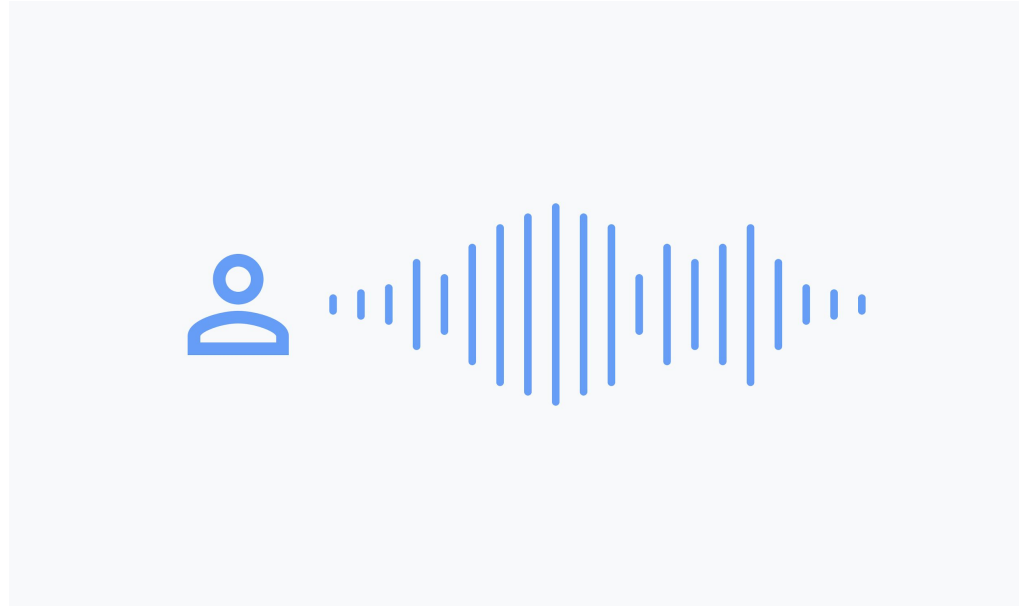
Push-to-talk (PTT)

Push-to-talk is a physical button, which, if implemented, can be pressed by the user to invoke an assistant.

Car makers:

- Launch the user-selected assistant on short press of the PTT button, or launch a default assistant if there's no user-selected assistant.

- Invoke the projected assistant (such as CarPlay or Android Auto) on long press of the PTT button, or invoke the default assistant if no projected assistant is running.
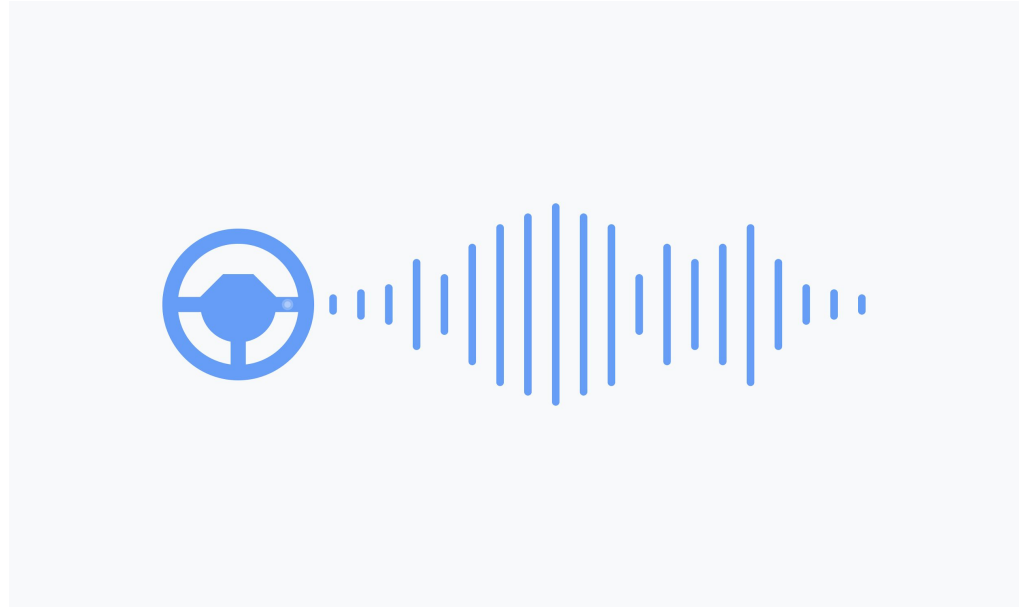
Tap-to-talk (TTT)

Tap-to-talk is a button on the car screen, which, if implemented, allows the user to invoke an assistant.

App developers provide an onscreen button to allow users to invoke an assistant if PTT is not available.
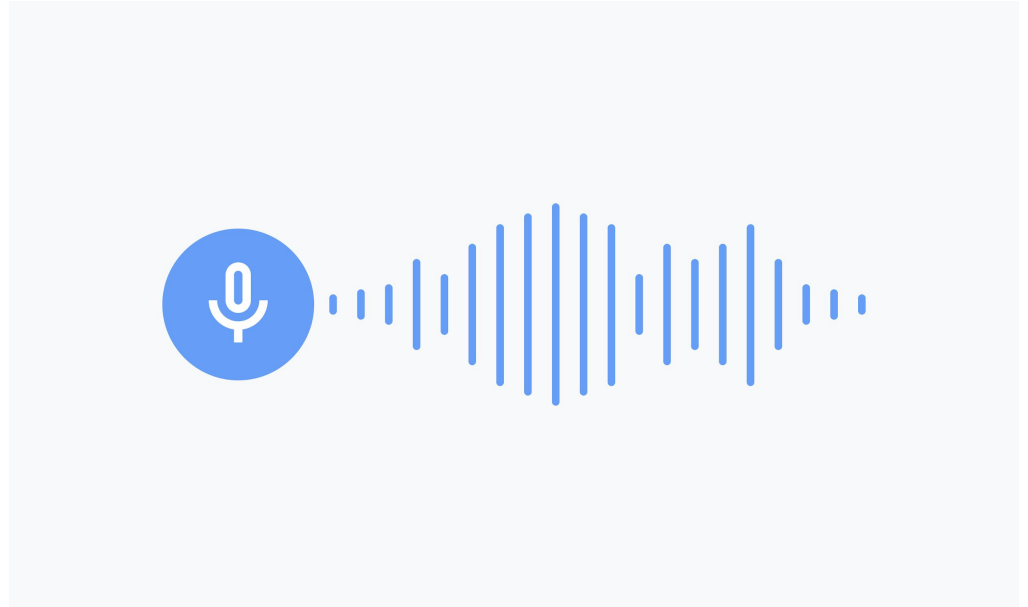
Setup

Setup process

The assistant setup process:

- Is only available when the car is parked

- Introduces the assistant to users

- Discloses information the assistant accesses and asks for user consent

- Provides access to settings to personalize the assistant

- Optionally offers educational examples of tasks the user can perform
  while driving

App developers implement the assistant setup process.

For specific requirements and recommendations, refer to Resources.

Disclosures and consents

Setup displays information about mandatory 3rd party disclosure and optional User Data Controls (UDC). Typically, such information screens may provide toggles for optional features, and buttons for declining or accepting the assistant's terms of service.

Personalization

After a user completes the minimum setup required to use the assistant, the setup process can optionally invite the user to personalize the assistant for a richer experience.

Personalization can be activated during the setup process, or later, through Settings.
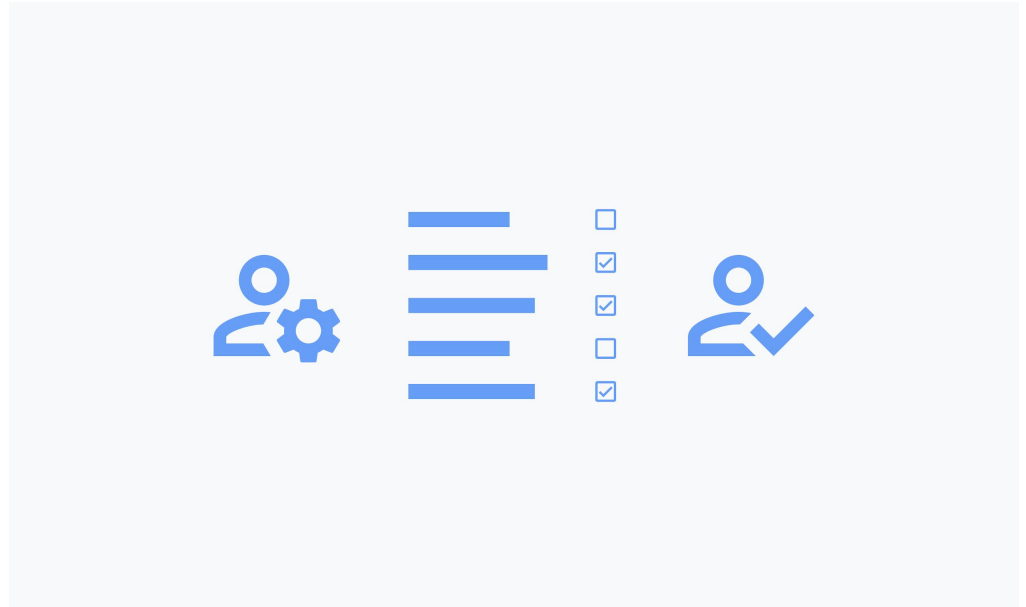
Education

Provide opportunities for the user to learn more after completing the minimum setup required to begin using the assistant.

For example, a user new to an assistant may not be aware of its features. The user might not know about different ways of invoking the assistant, or what tasks they can perform while driving.
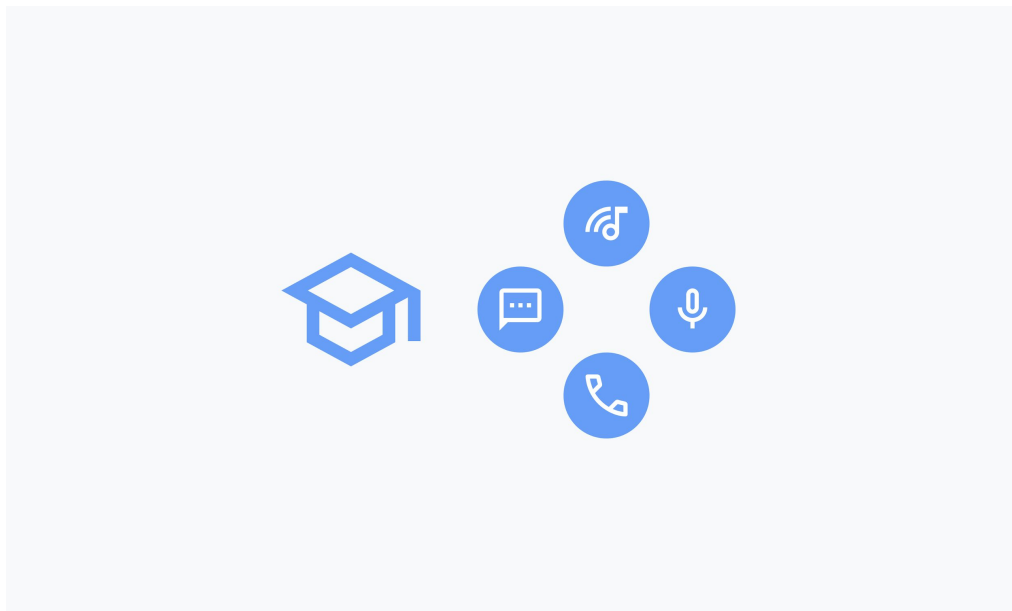
Settings

Adjusting assistant settings

Assistant settings allow users to specify or change the default in-vehicle assistant, and to customize and personalize the in-vehicle assistant.
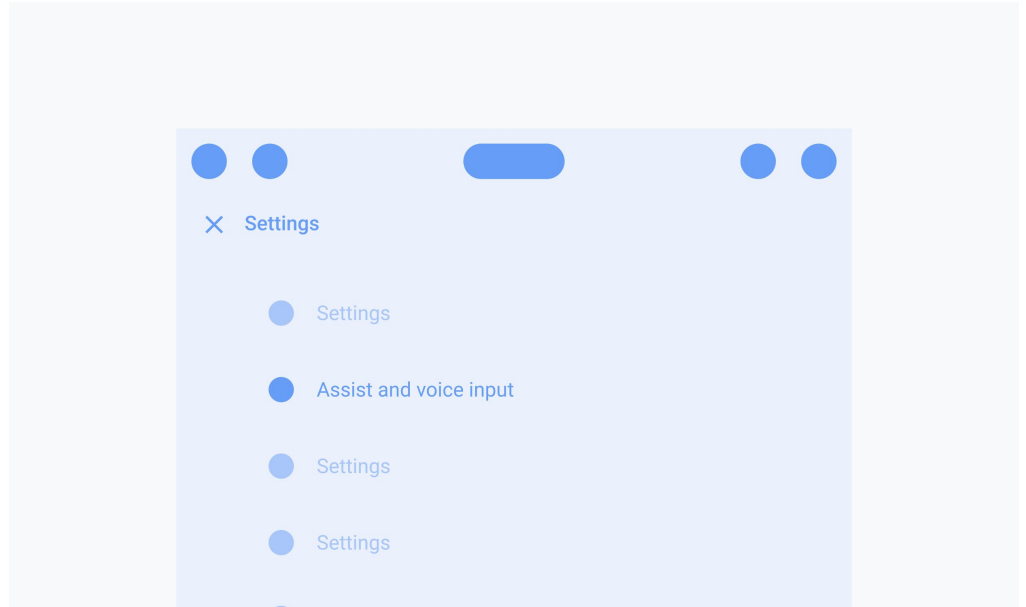
For specific requirements and recommendations, refer to Resources.

Assist & voice input

Car makers provide access to assistant settings when the car is parked.

For example, as shown here, an Assist and voice input setting allows users to:

- Specify the default assistant
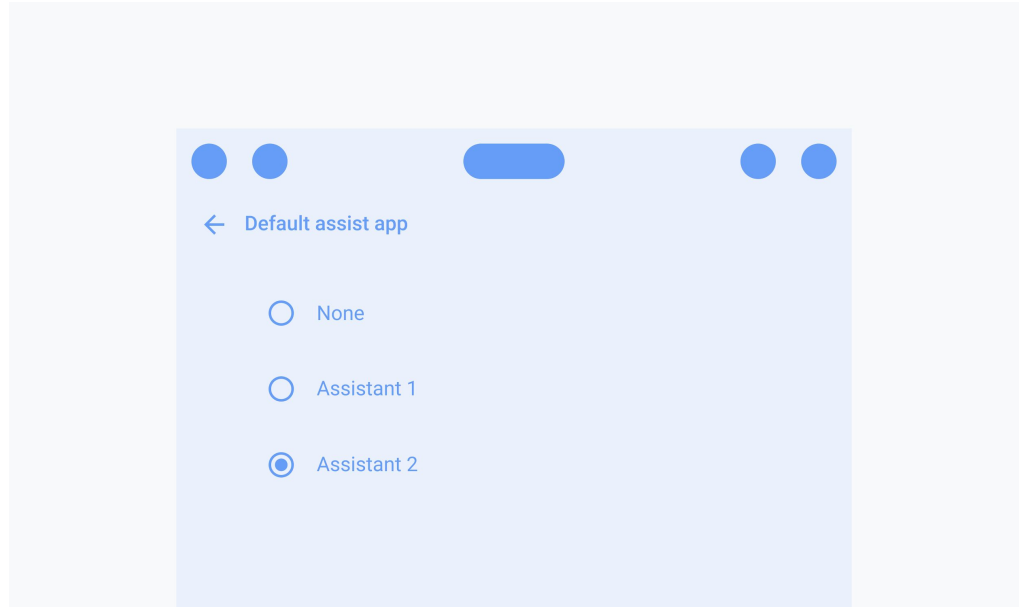- Customize assistant features

Changing assistants

If more than one assistant is available, a user can choose to set a default assistant or opt to use none of the assistants.

Car makers:

- Tell the user what information the assistant accesses.
- Prompt the user to accept the terms and conditions for the selected assistant.

Note: Speech to text functionality remains available even if no assistant is active.

← **Default assist app**
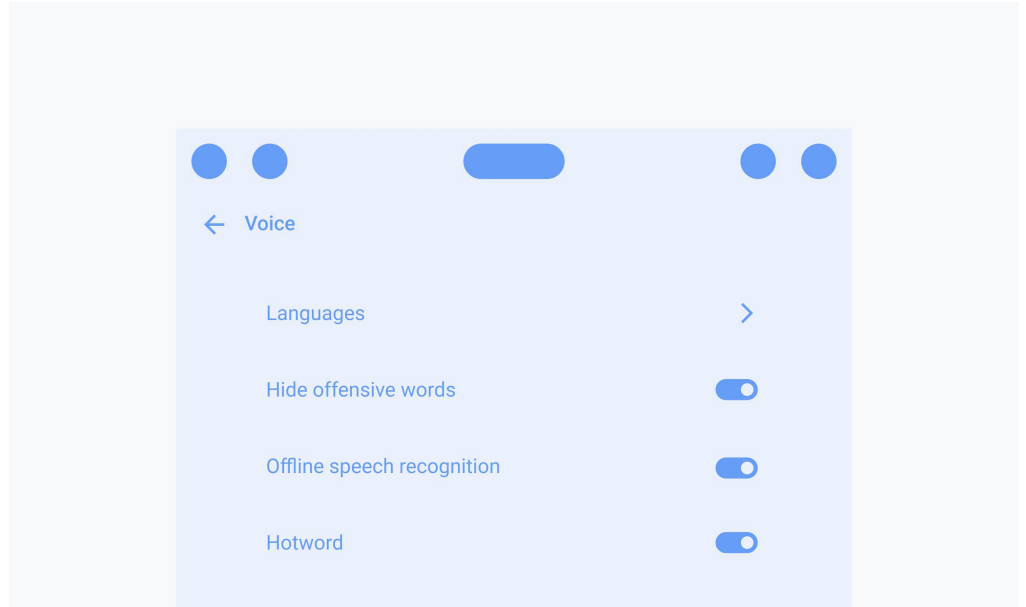
○ None

○ Assistant 1

◉ Assistant 2

Customization

Voice settings allow users to customize aspects of the assistant.

App developers allow users to:

- Turn off hotword functionality
- Specify the assistant language
- Hide offensive words
- Personalize assistant features
- Manage privacy

Error handling

Dealing with errors

Assistant errors have a range of causes, including not being able to interpret a user's response, invalid or unsupported requests, and system failures.

When an error occurs, a user appreciates graceful and robust error-handling.

An assistant that anticipates error conditions and provides guidance, should errors occur, instills user confidence in the assistant.

Error type	Examples of underlying cause
Recogntion errors	**No input:** • The Assistant hasn't detected the user's response • The user hasn't responded within the "timeout" period **No Match:** •The Assistant can't understand the user •Assistant can't interpret the user's response in context **False Accept:** • The Assistant misunderstands the user, but proceeds in spite of that
Speaker identification errors	• The user wasn't successfully identified by voice (when needed for a personalized feature) • A user was misidentified as another user
Contextual errors	• The user's input was successfully interpreted, but is insufficient or impossible to act on
System errors	• The systems that the Assistant depends on for information can't complete the task or fails due to technical reasons

Basic error-handling strategy

App developers:

- Play an audible error prompt to alert the user.
- Inform the user when a request isn't completed.
- Provide information directly related to solving the problem.
- Provide short, specific instructions to solve the problem, or examples of what the user can say to resolve the problem.
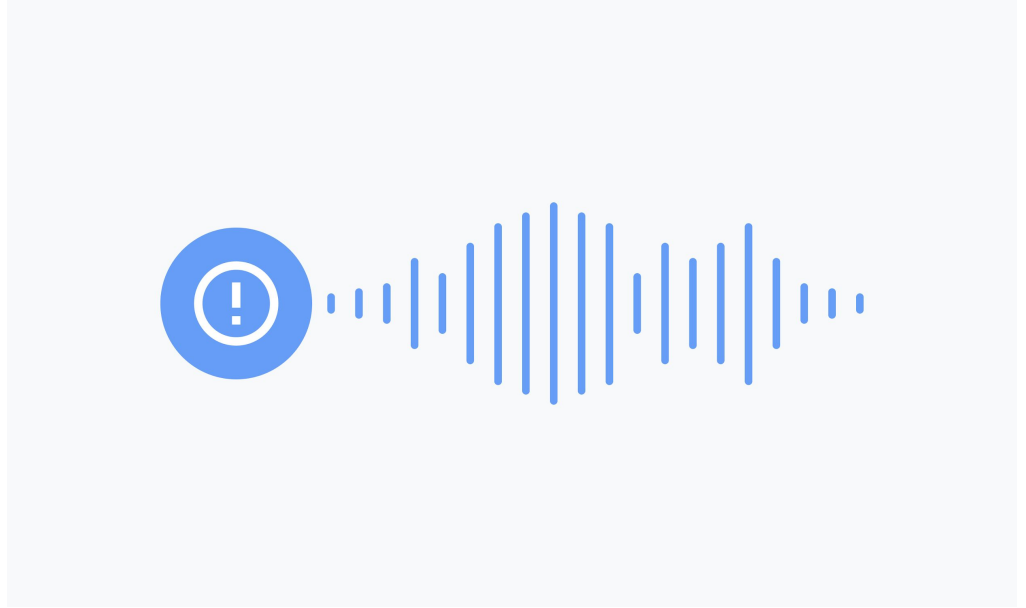
Using toasts and dialogs

Onscreen error handling can make use of toasts and dialogs as appropriate.

App developers:

- When possible, let the user know what went wrong and how to complete the request with clear CTAs (avoid dead ends).
- Balance being helpful, informative, concise, and conversational.
- Display a persistent error dialog only if the user's input or acknowledgment is crucial.
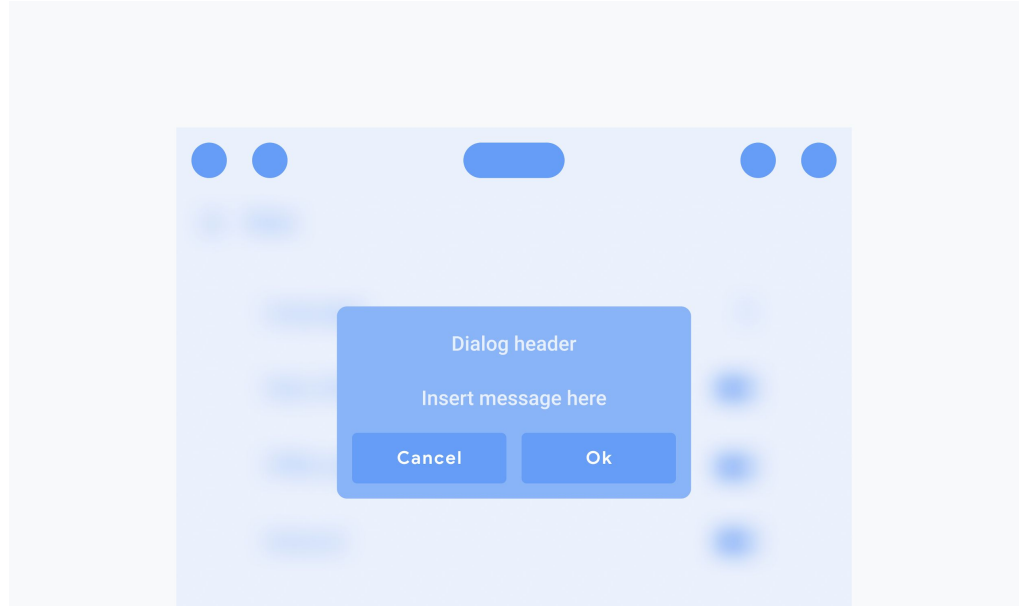
Design guidelines

Designing for automotive

The guidelines in this section highlight areas of focus that make the experience more cohesive between OEM and assistant branding.

For specific requirements and recommendations, refer to Resources.

Displaying assistants

App developers:

- Handle most requests through voice interaction with minimal UI.

- Display supplemental content and contextual action in the app window only when necessary.

- Avoid displaying the assistant over system UI, such as system navigation, HVAC, or status bar.
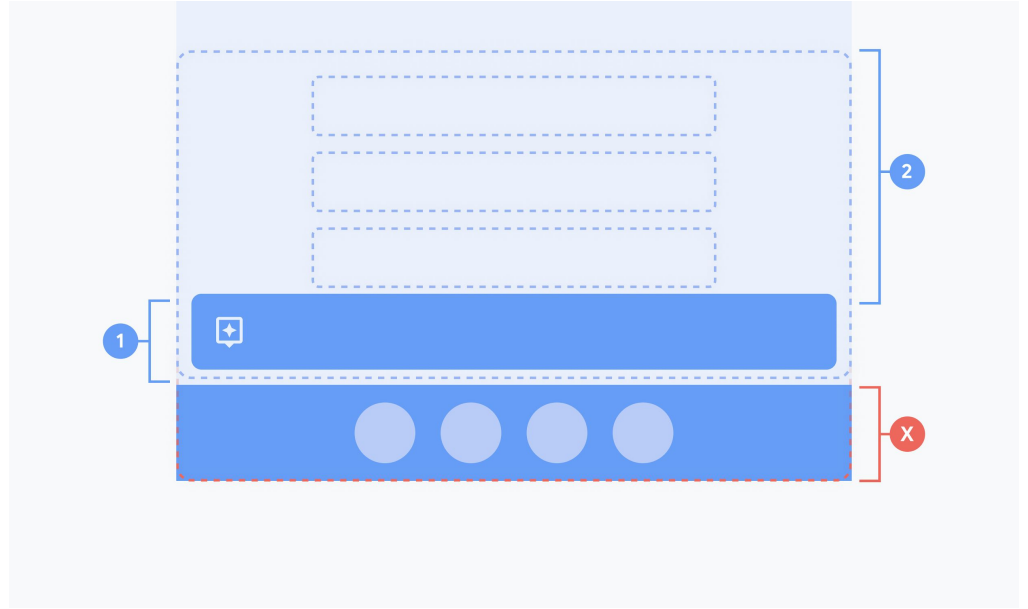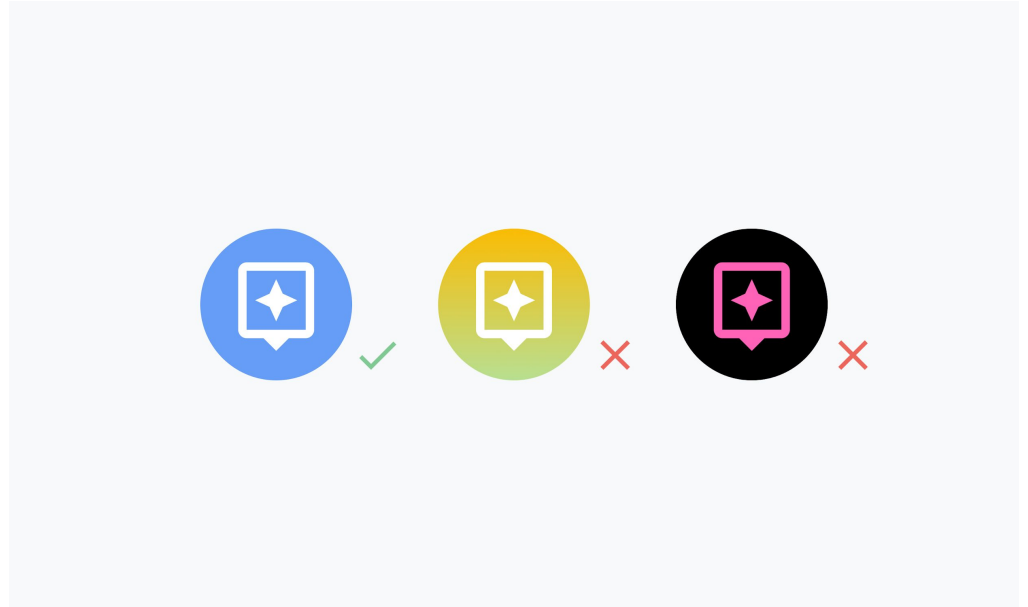
Branding

Ensure users are always aware of which assistant they are interacting with.

Car makers:

- Show assistant attribution when invoked and/or displaying content.

Immersive actions

Immersive actions are assistant tasks that allow or require the user to complete an action on the car screen. They supplement verbal response, and also provide additional details such as text and source attribution.

App developers:

- Provide a way for users to dismiss the assistant

- Ensure content of actions match the assistant's verbal response

Ensuring privacy

Car makers display a visual indicator to alert the user that an assistant is active and listening.

App developers provide controls for easily muting or temporarily disengaging the assistant, or revoking assistant access.

Resources

Resources

Compatibility Definition Document (CDD)

Lists Google's definitive requirement and recommendations for automotive device implementations.

AAOS Voice-interaction integration guide

Provides technical guidance for car makers, OEMs, and system app developers who develop preloaded voice interaction services (voice assistants) for AAOS.

Android Automotive OS design guidelines

Offers design guidance for app developers building apps that run on cars with AAOS built in.

Thank you