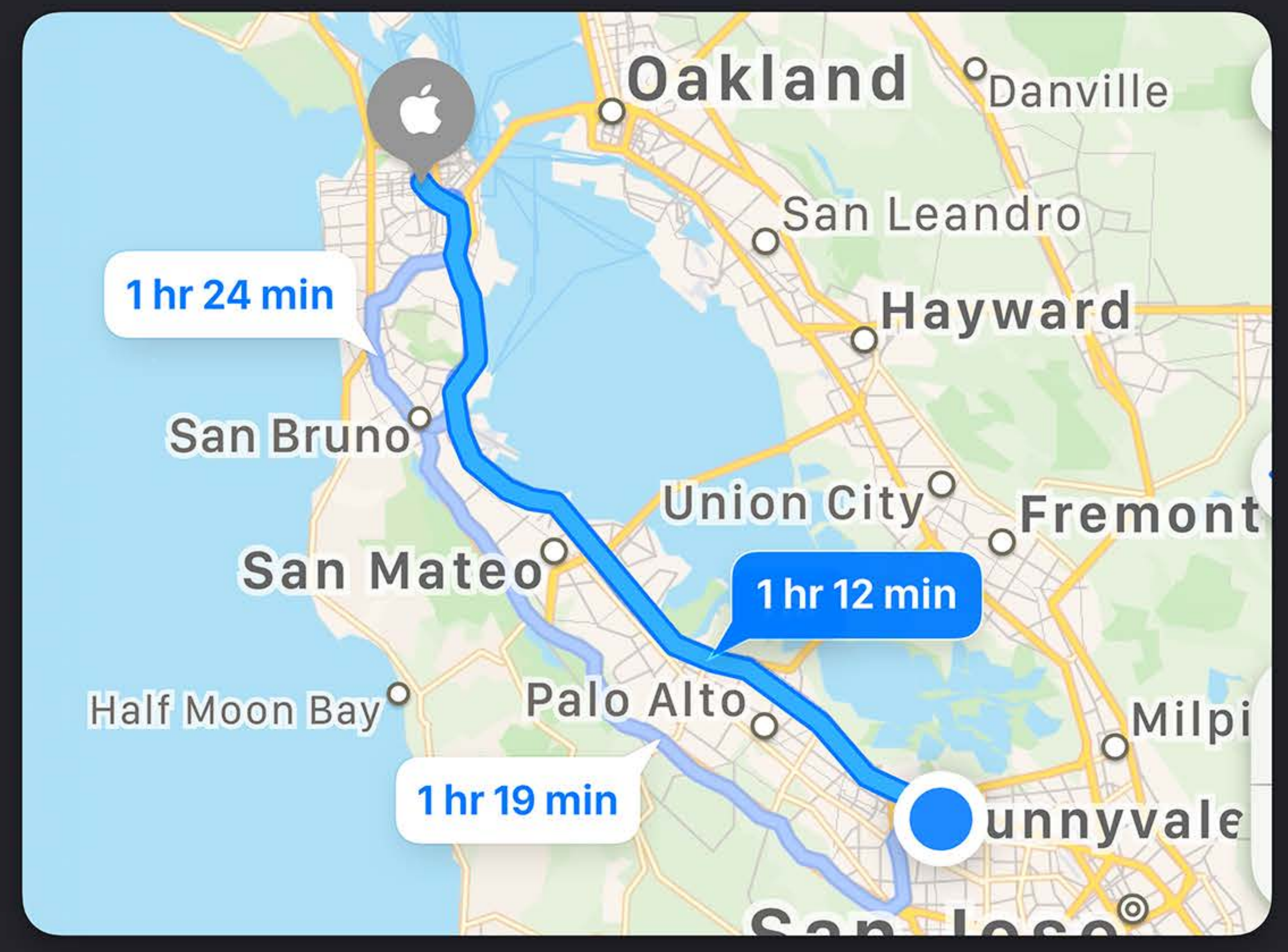
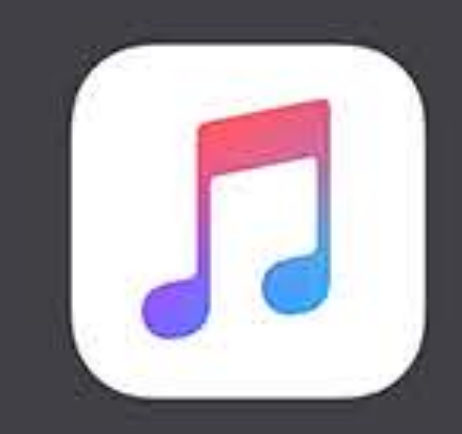
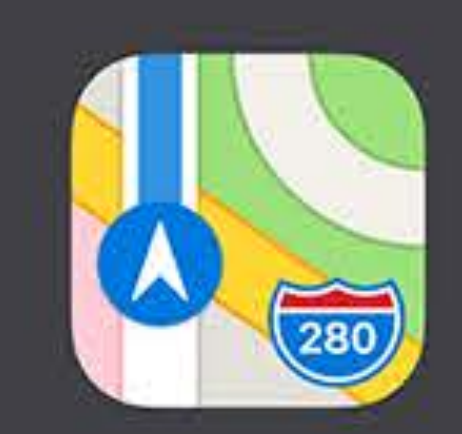



#WWDC19

Advances in CarPlay Systems

Tom Powell, Car Experience Engineering
Tanya Kancheva, Car Experience Engineering

9:41
LTE



 **1 hr 12 min**
Apple Union Square

 **Garage Door**
Open



Irregularly shaped display support

Second screen support

Dynamic screen sizes

Hey Siri

Irregularly shaped display support

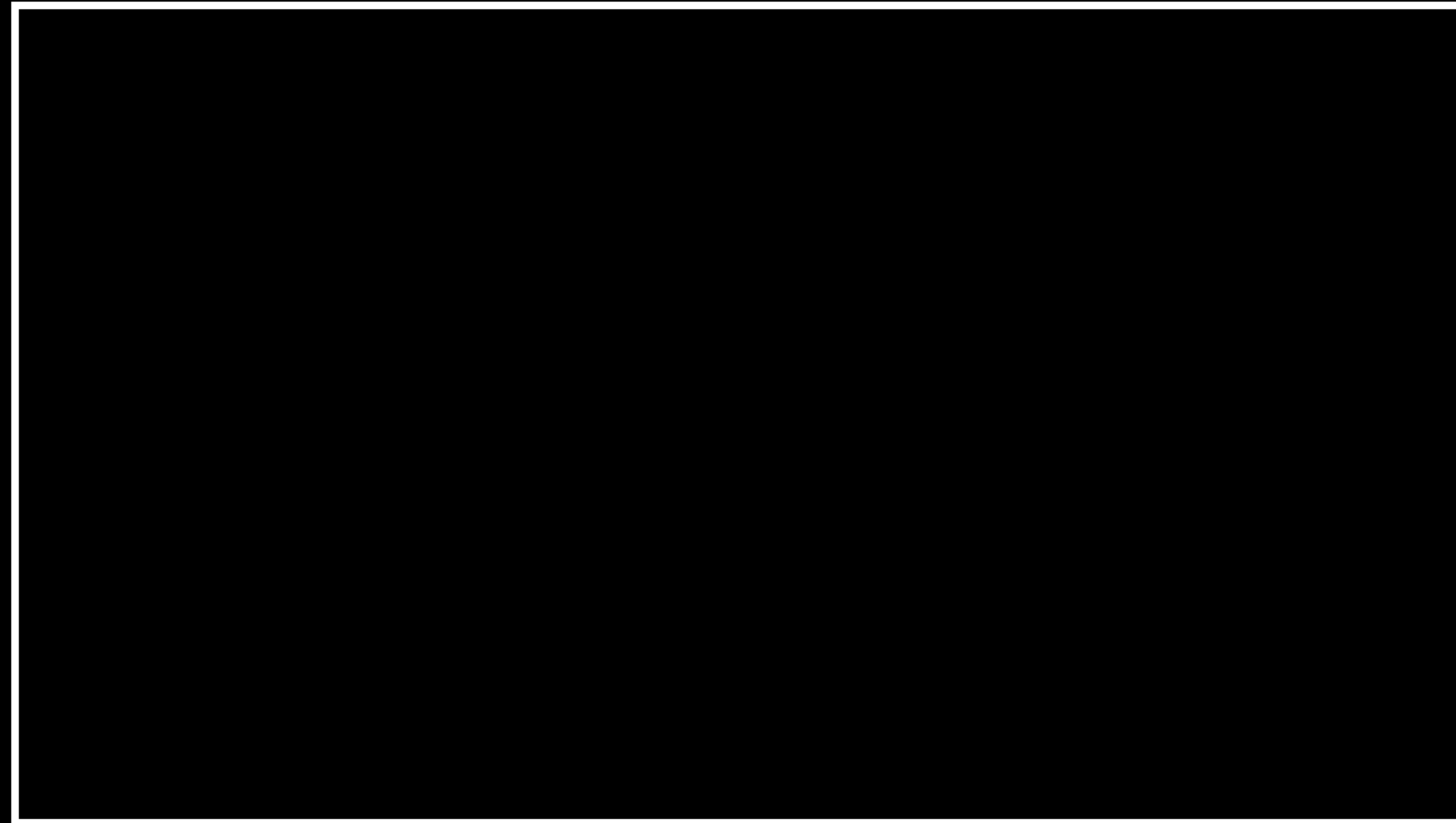
Second screen support

Dynamic screen sizes

Hey Siri

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



Car Display

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content

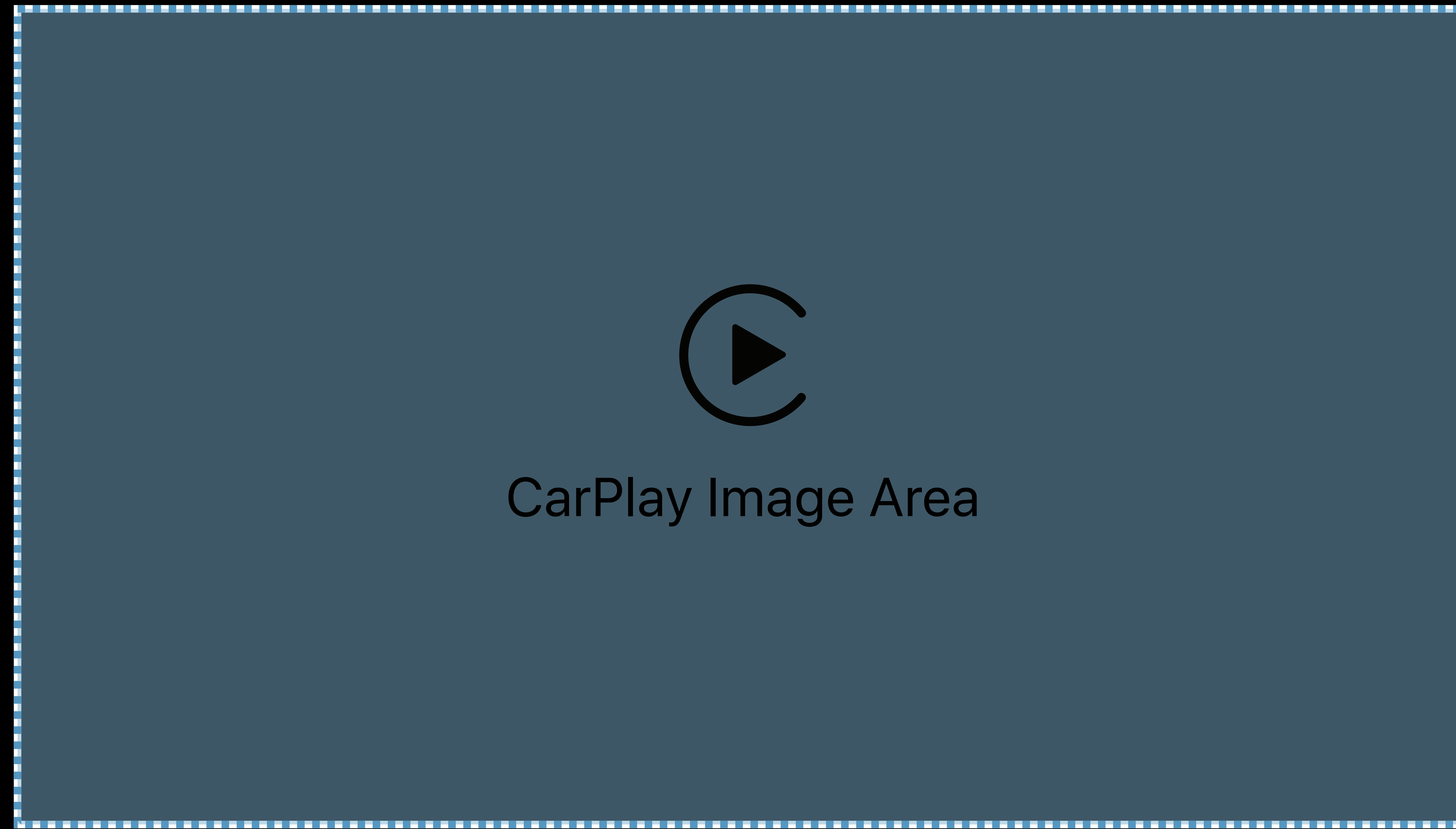
Display Area →



Car Display

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content

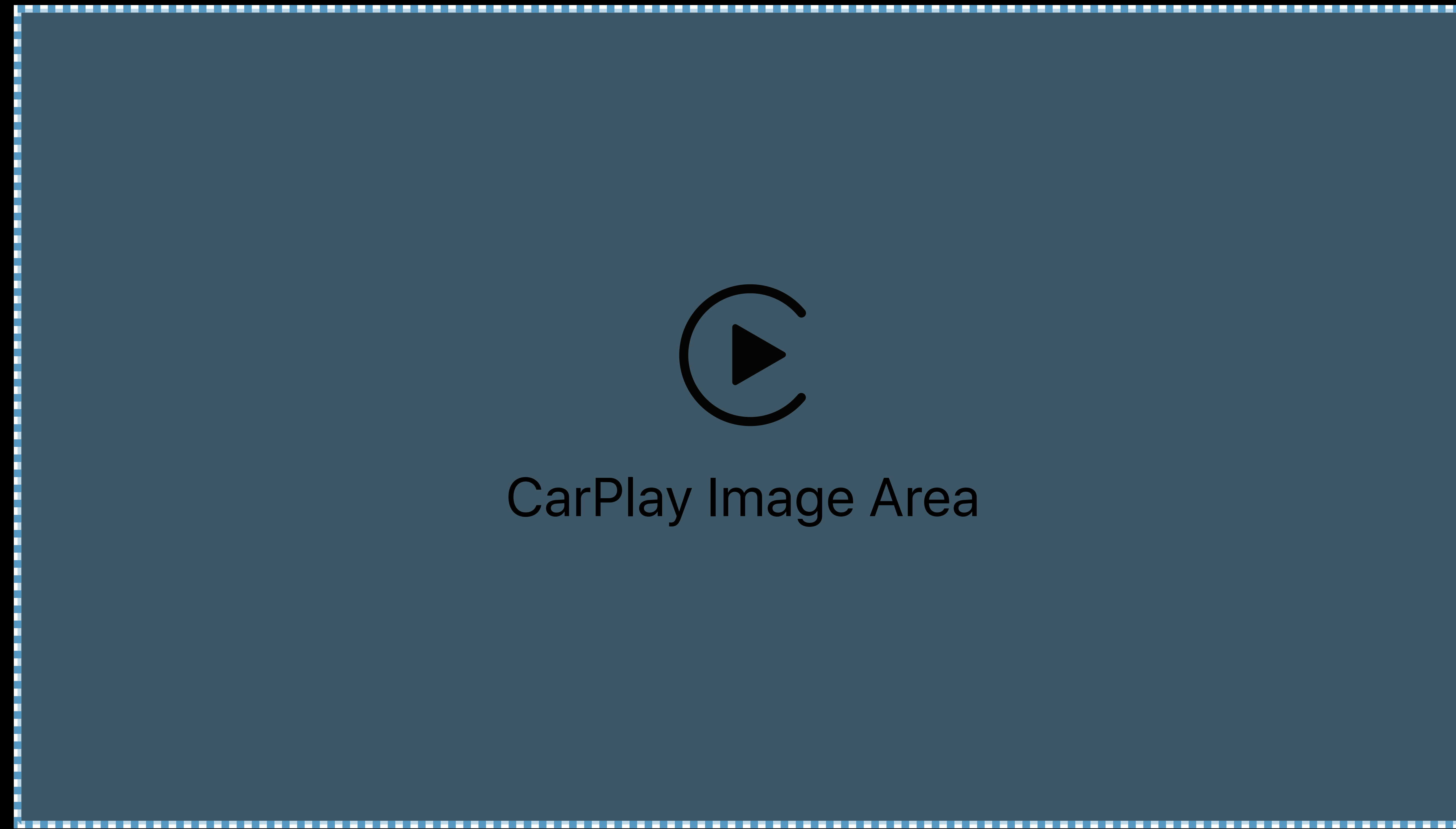


CarPlay Image Area

Car Display

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content

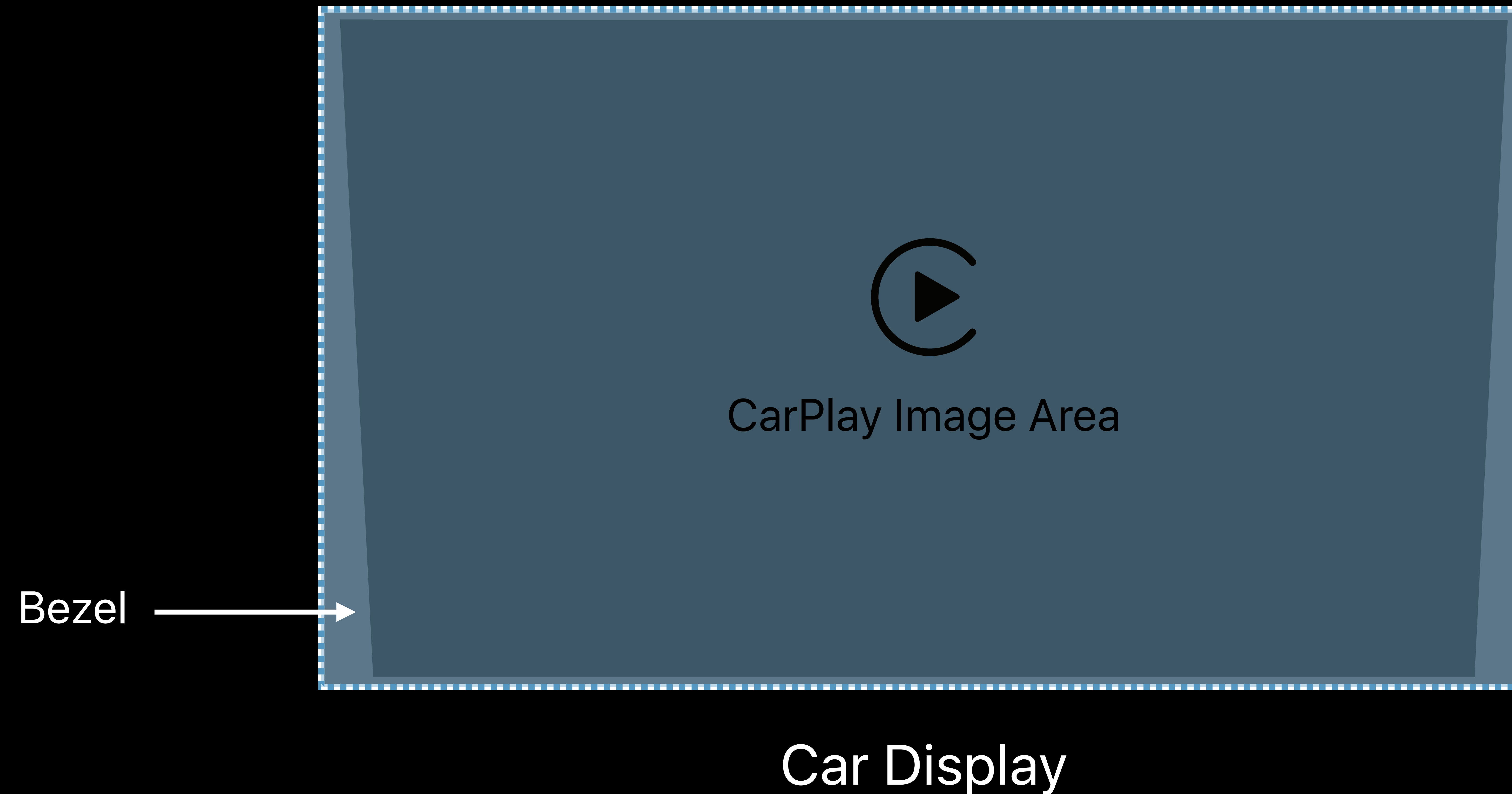


CarPlay Image Area

Car Display

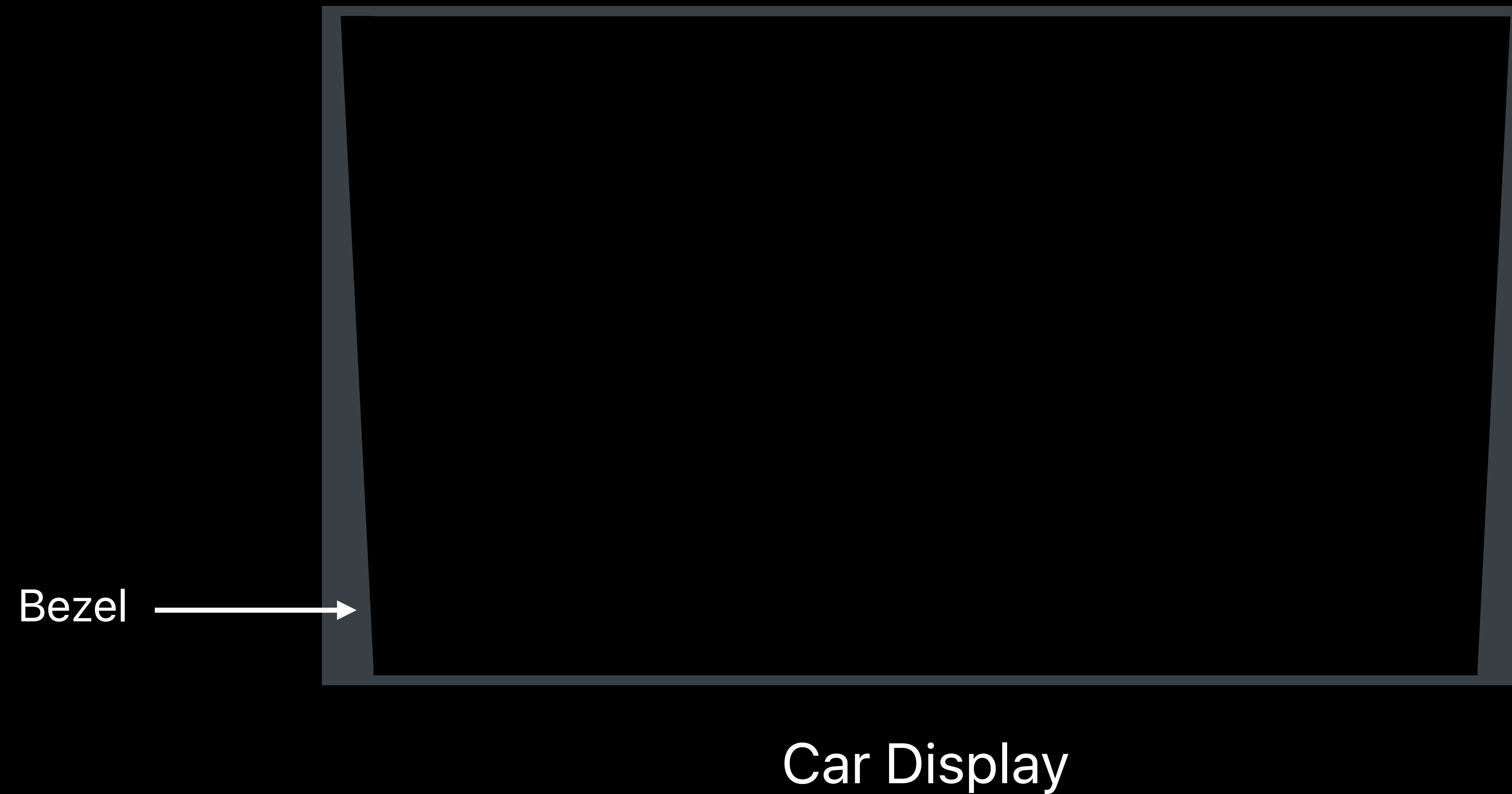
Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



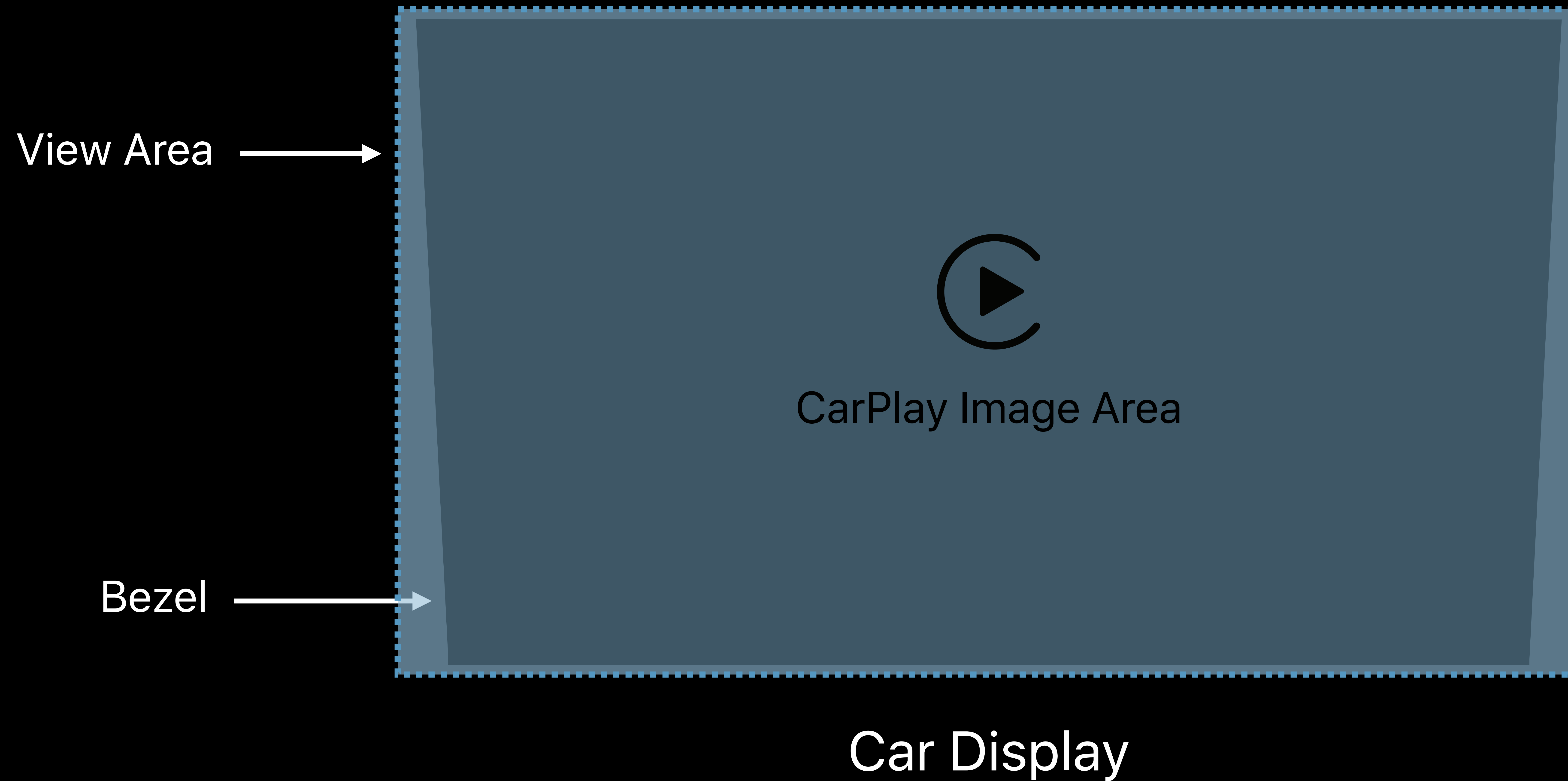
Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



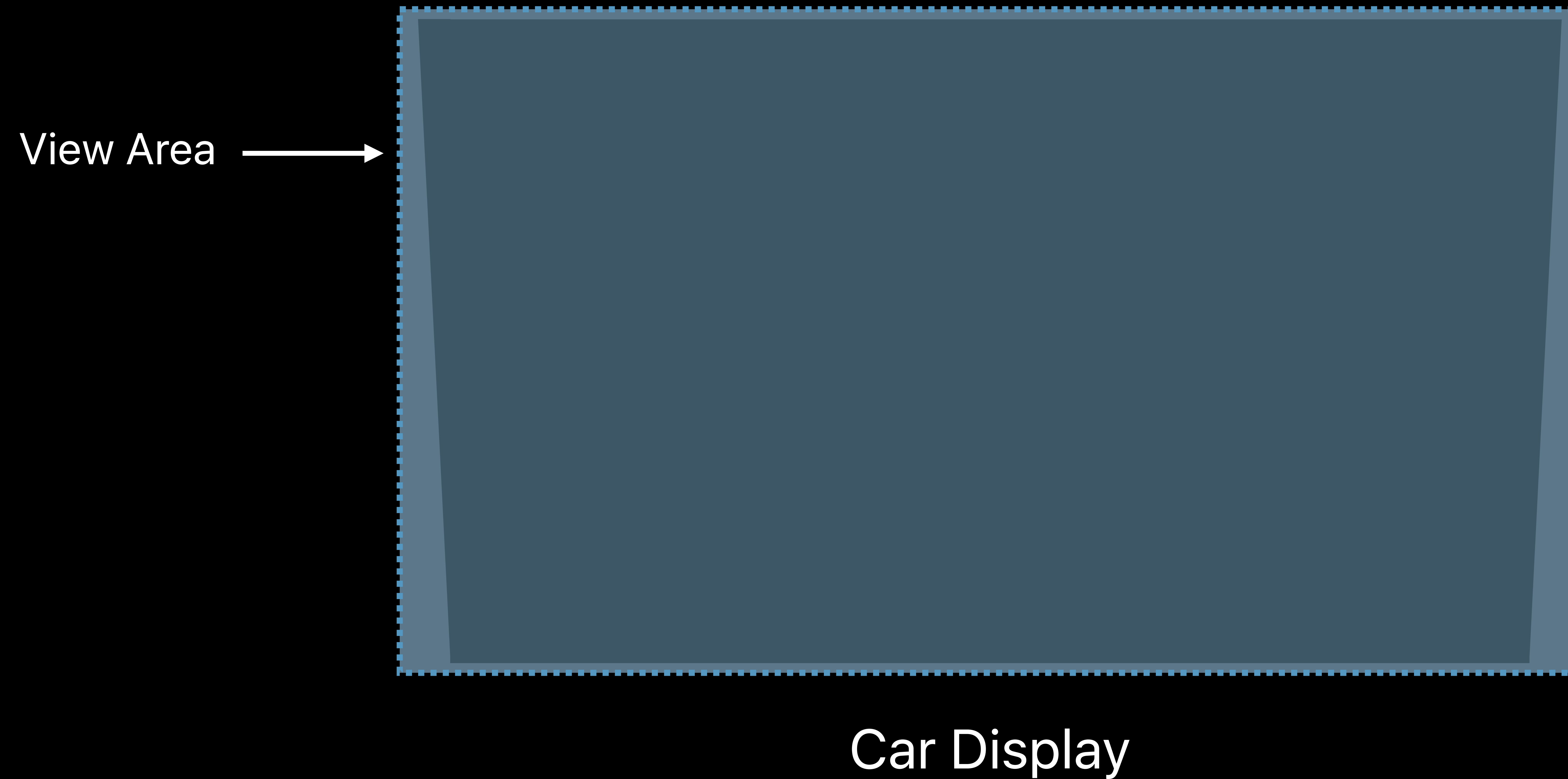
Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



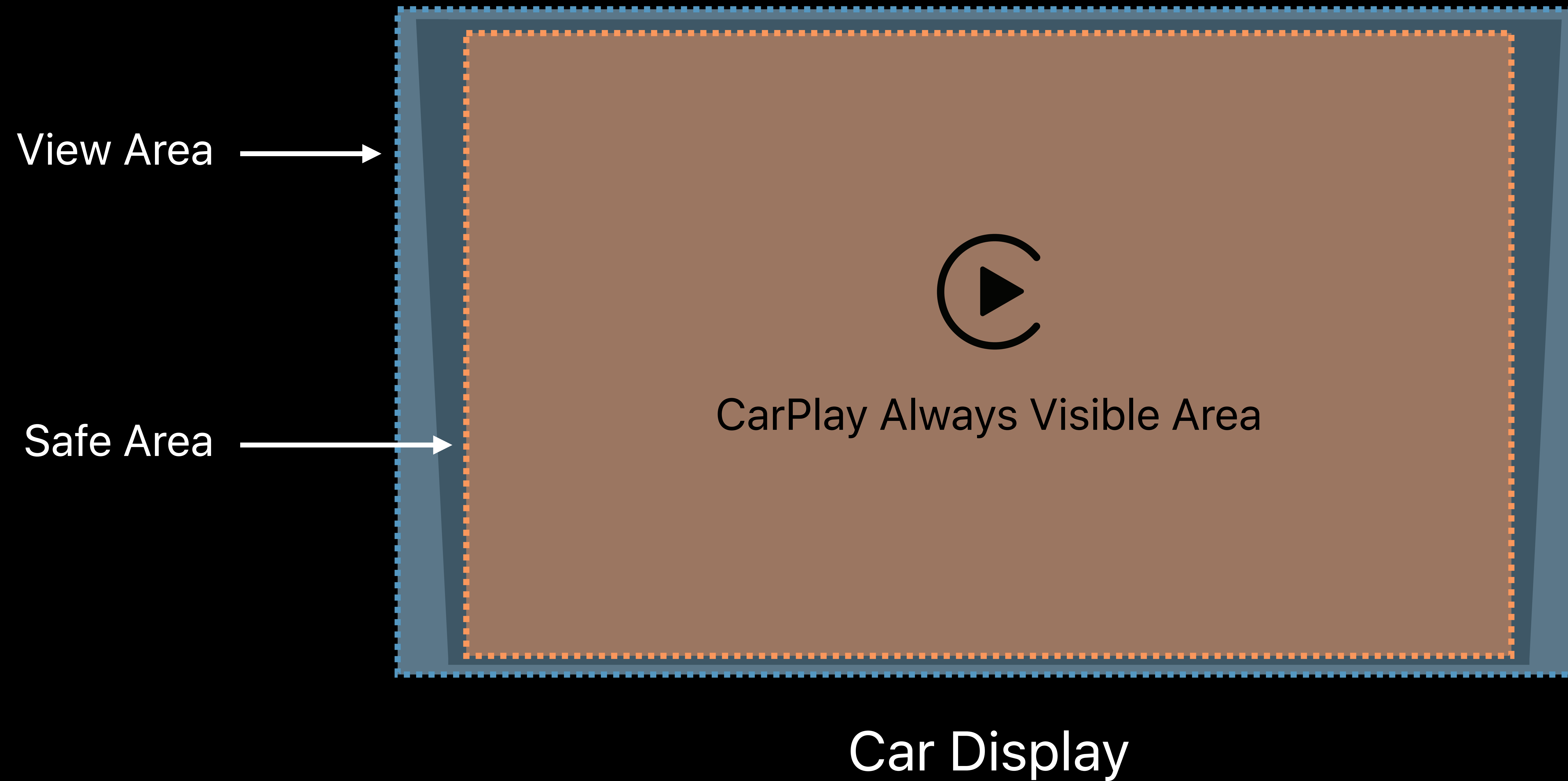
Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



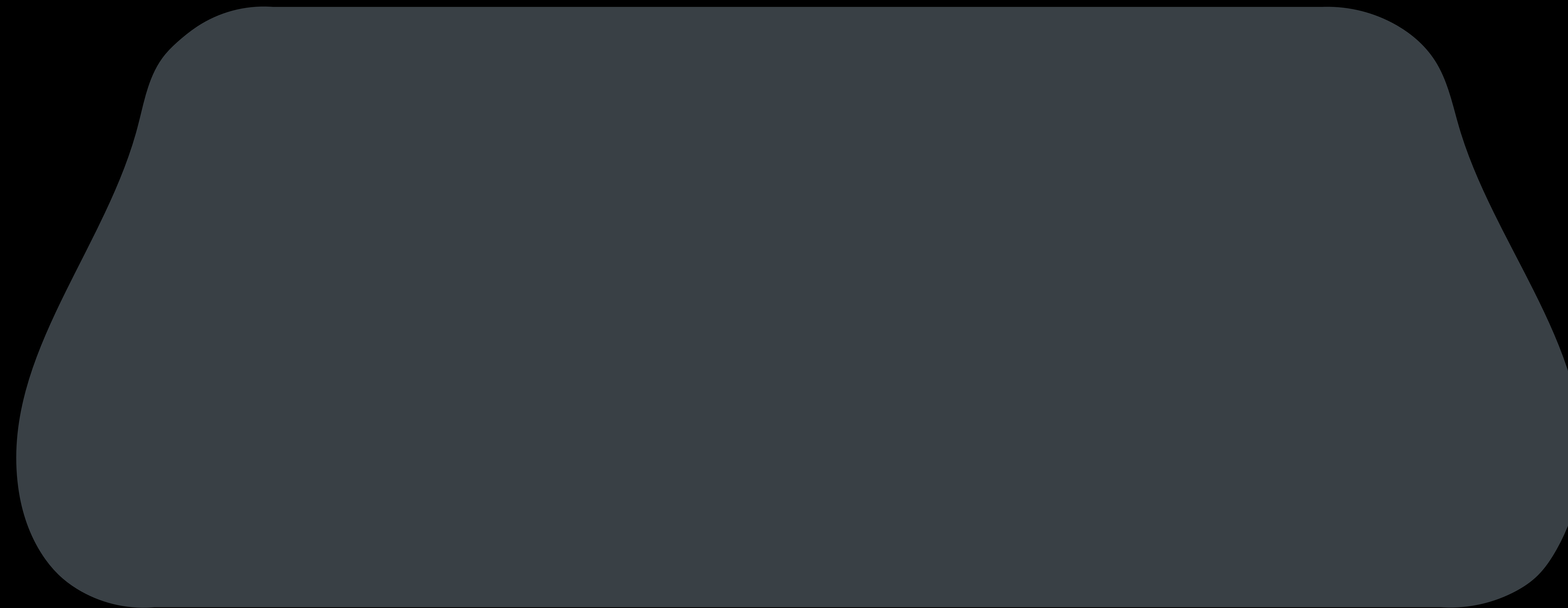
Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



Irregularly Shaped Display Support

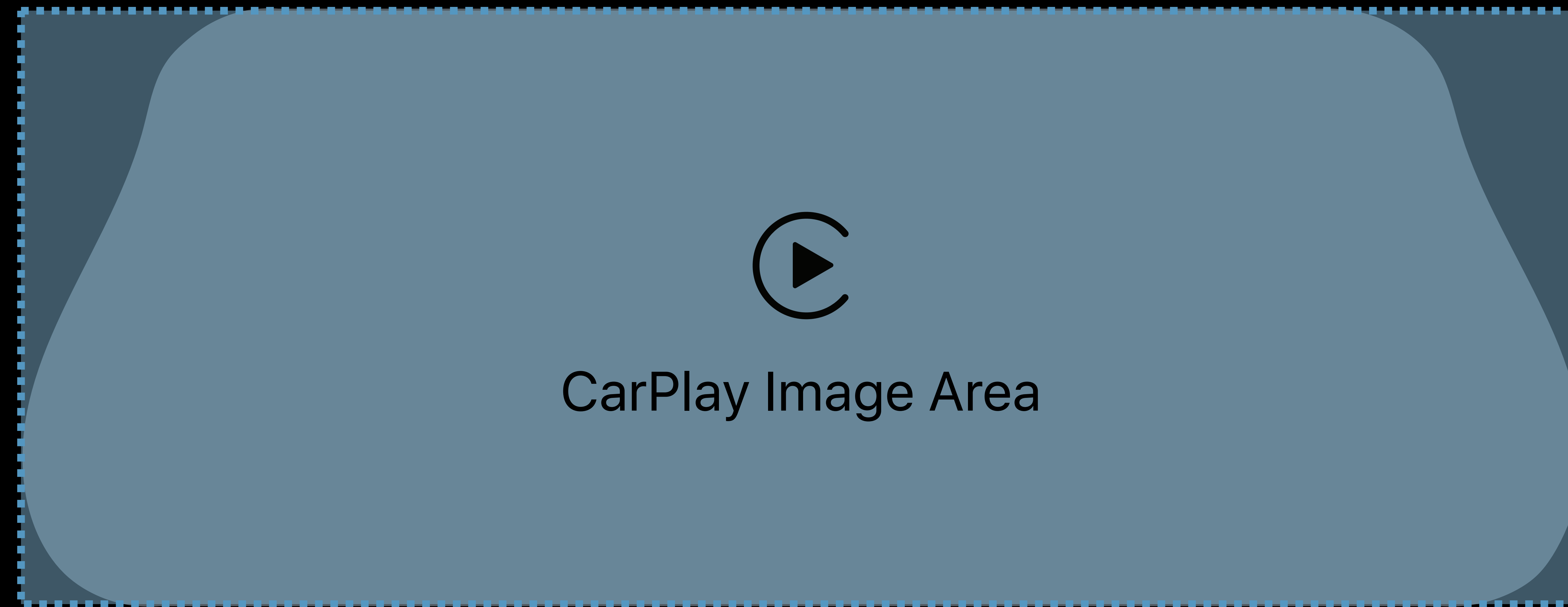
Declare areas of the screen for CarPlay to render interactive content



Car Display

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



Car Display

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



Car Display

Irregularly Shaped Display Support

Declare areas of the screen for CarPlay to render interactive content



Irregularly shaped display support

Second screen support

Dynamic screen sizes

Hey Siri

Irregularly shaped display support

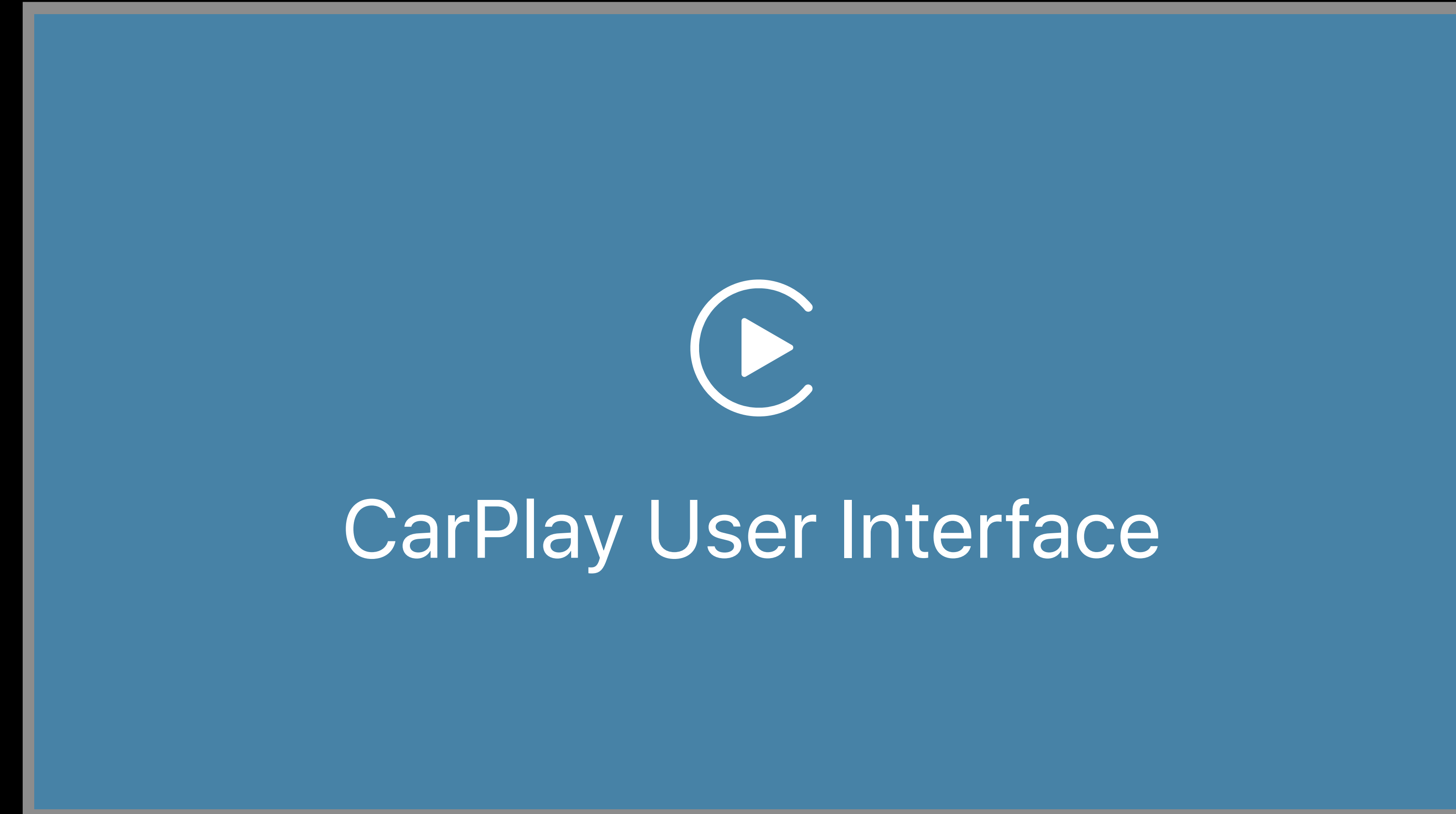
Second screen support

Dynamic screen sizes

Hey Siri

Second Screen Support

Display an additional CarPlay user interface in another screen



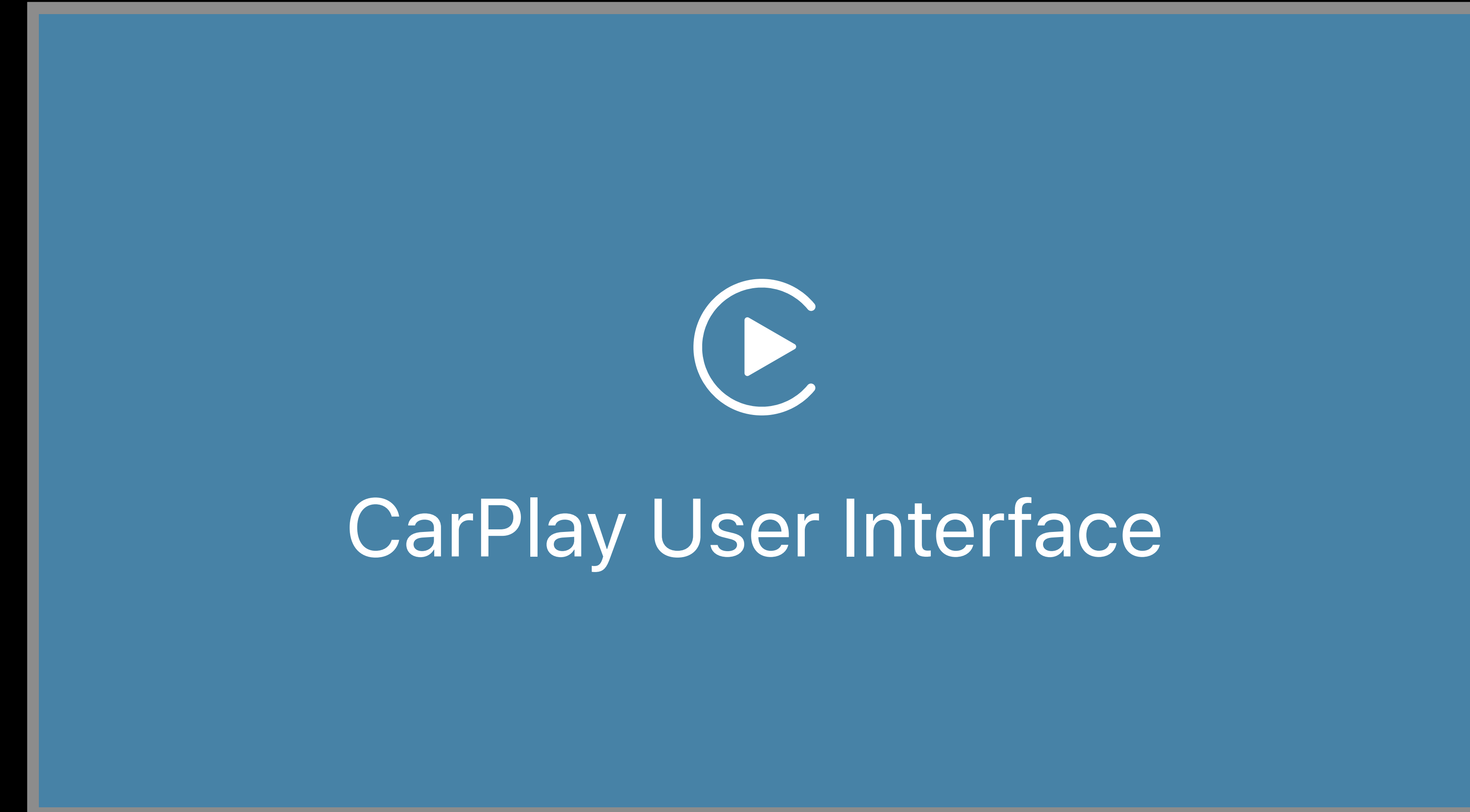
Center Console Display

Second Screen Support

Display an additional CarPlay user interface in another screen



Instrument Cluster



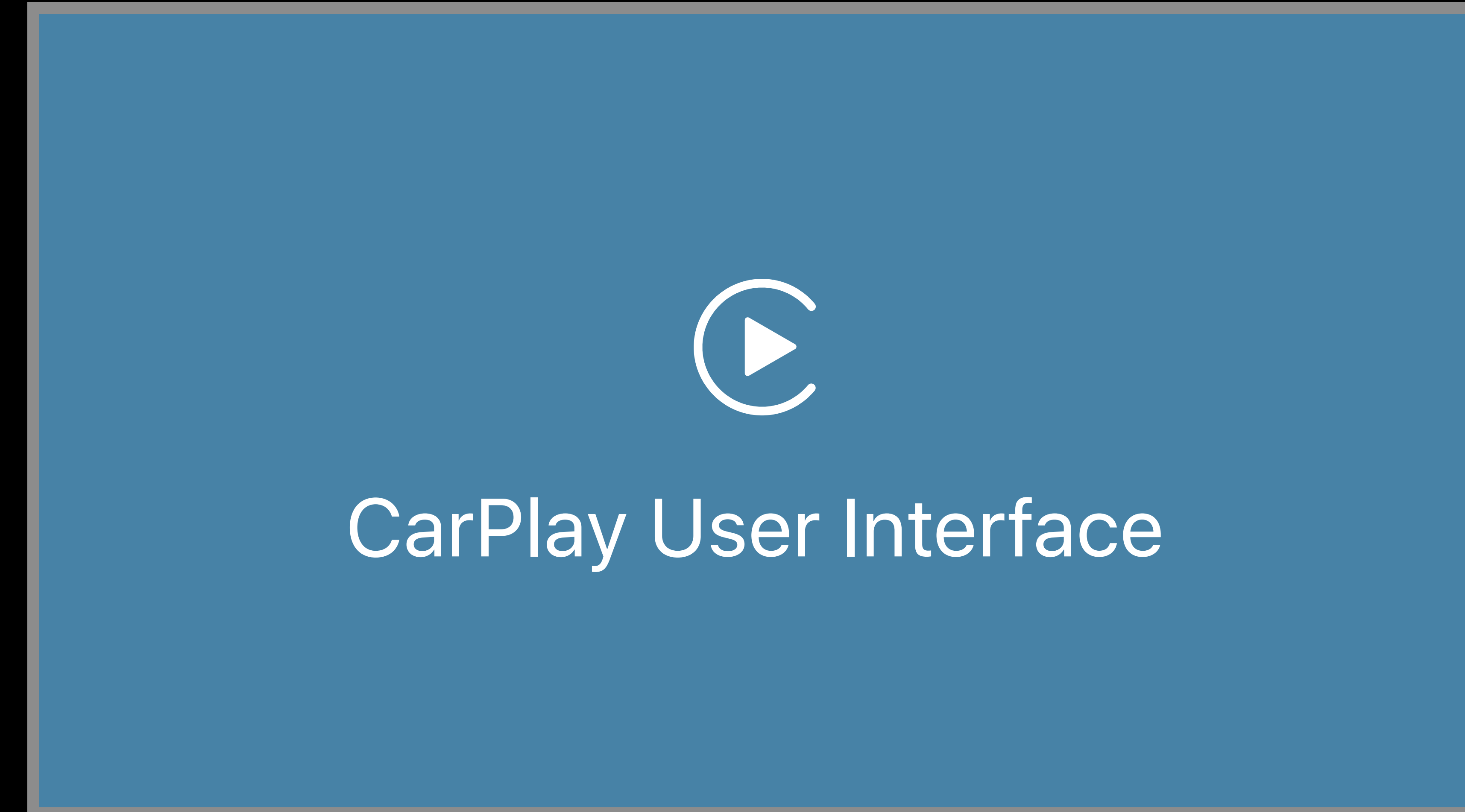
Center Console Display

Second Screen Support

Display an additional CarPlay user interface in another screen



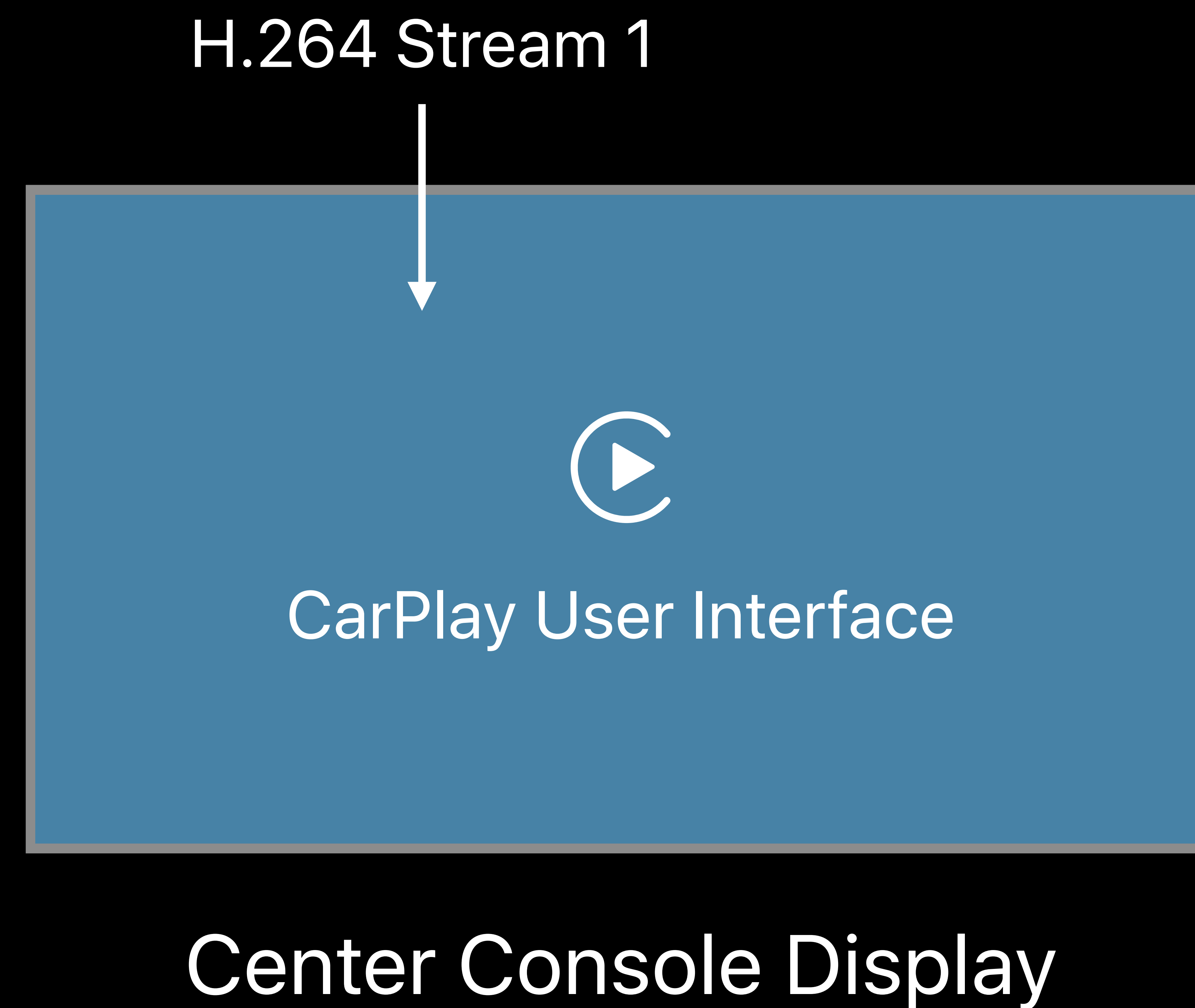
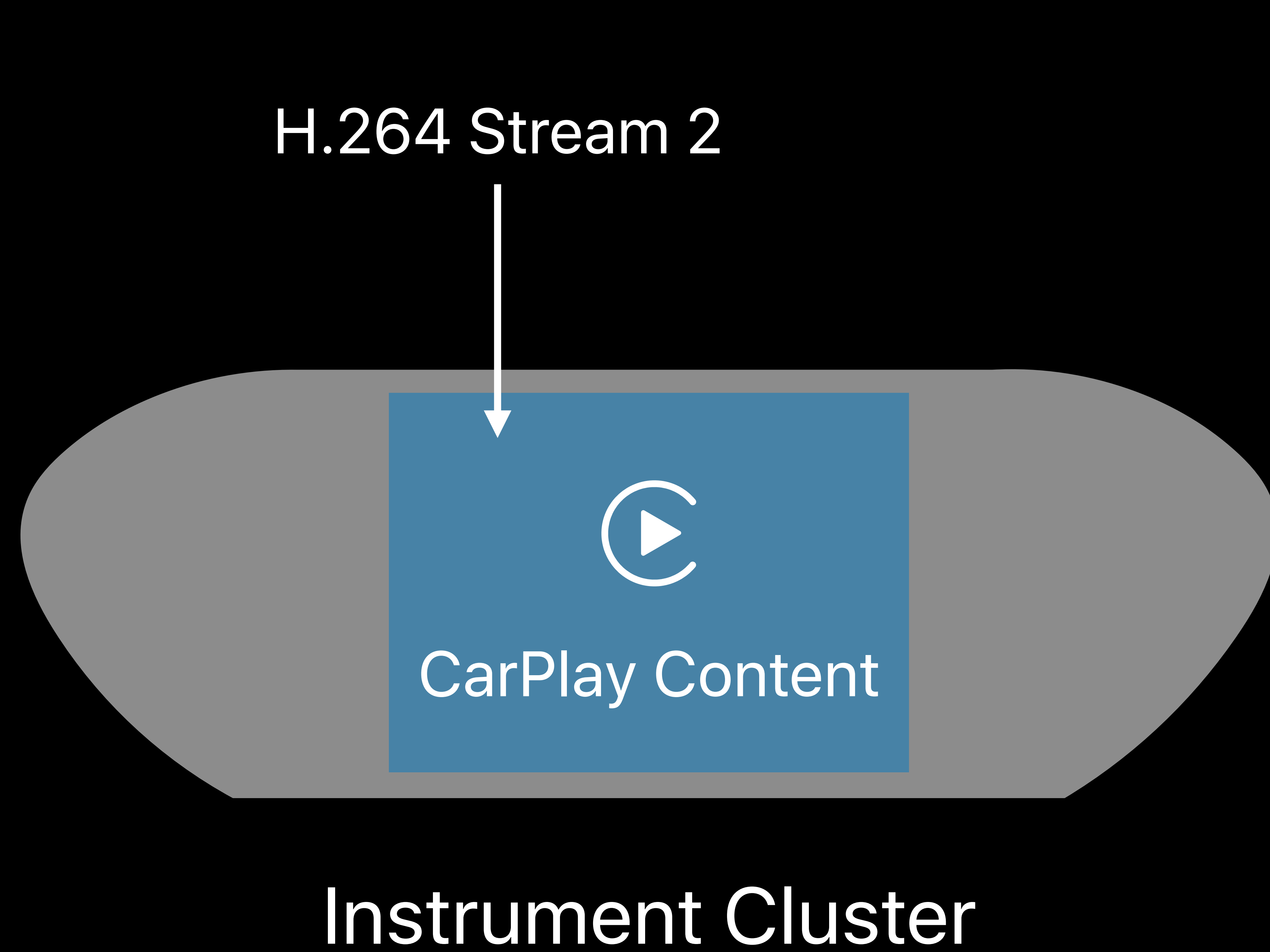
Instrument Cluster



Center Console Display

Second Screen Support

Display an additional CarPlay user interface in another screen



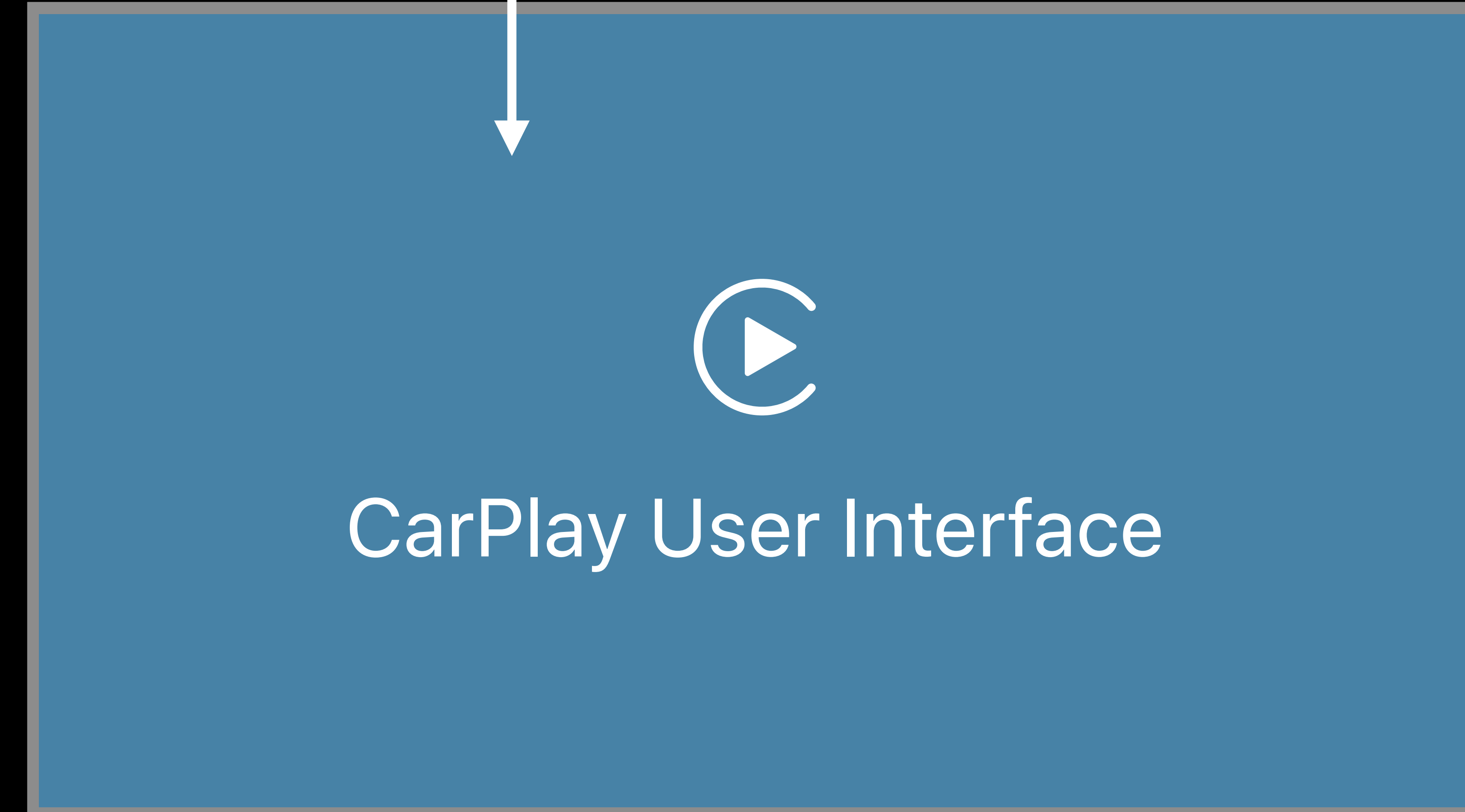
Second Screen Support

Display an additional CarPlay user interface in another screen



Instrument Cluster

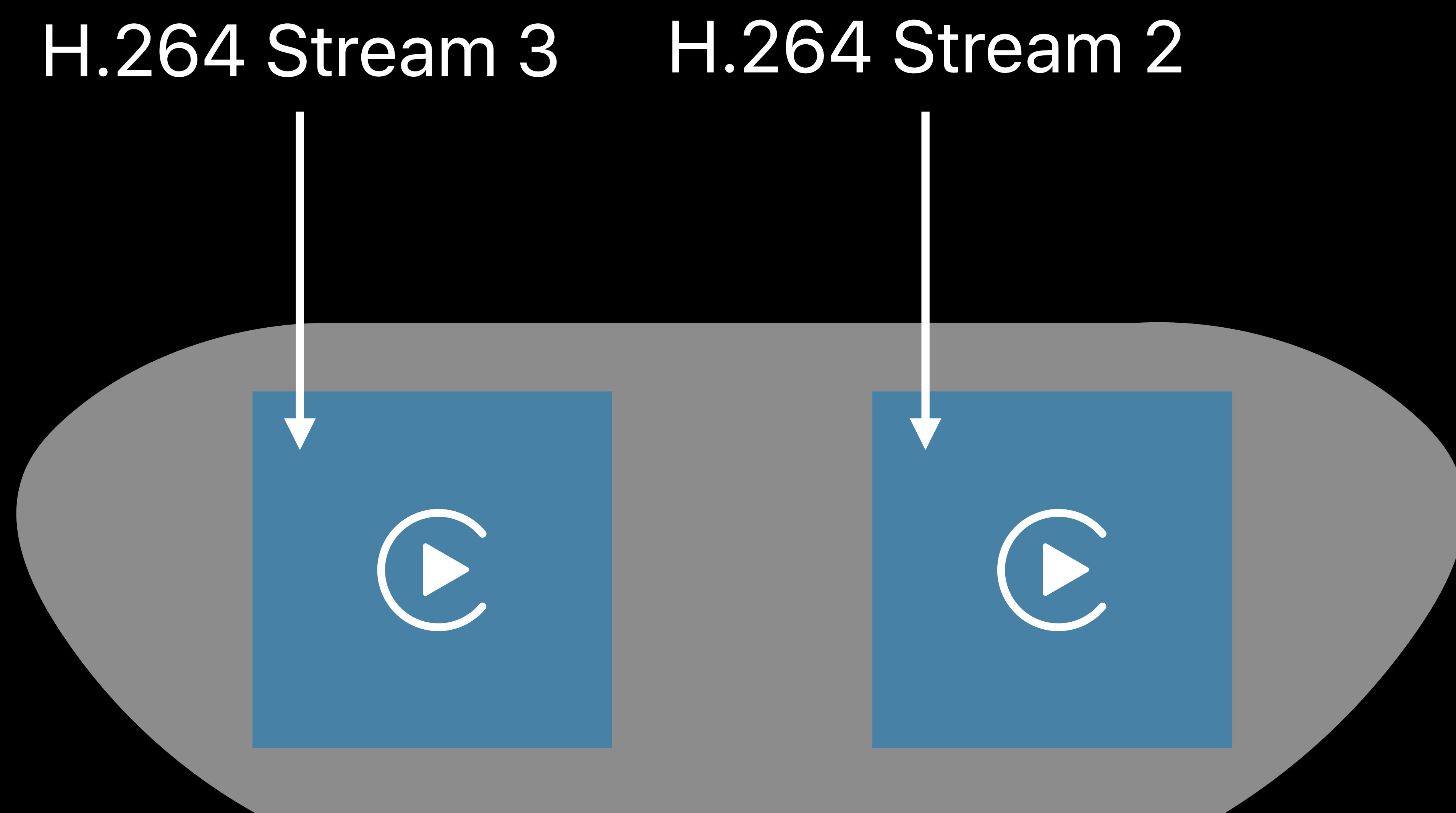
H.264 Stream 1



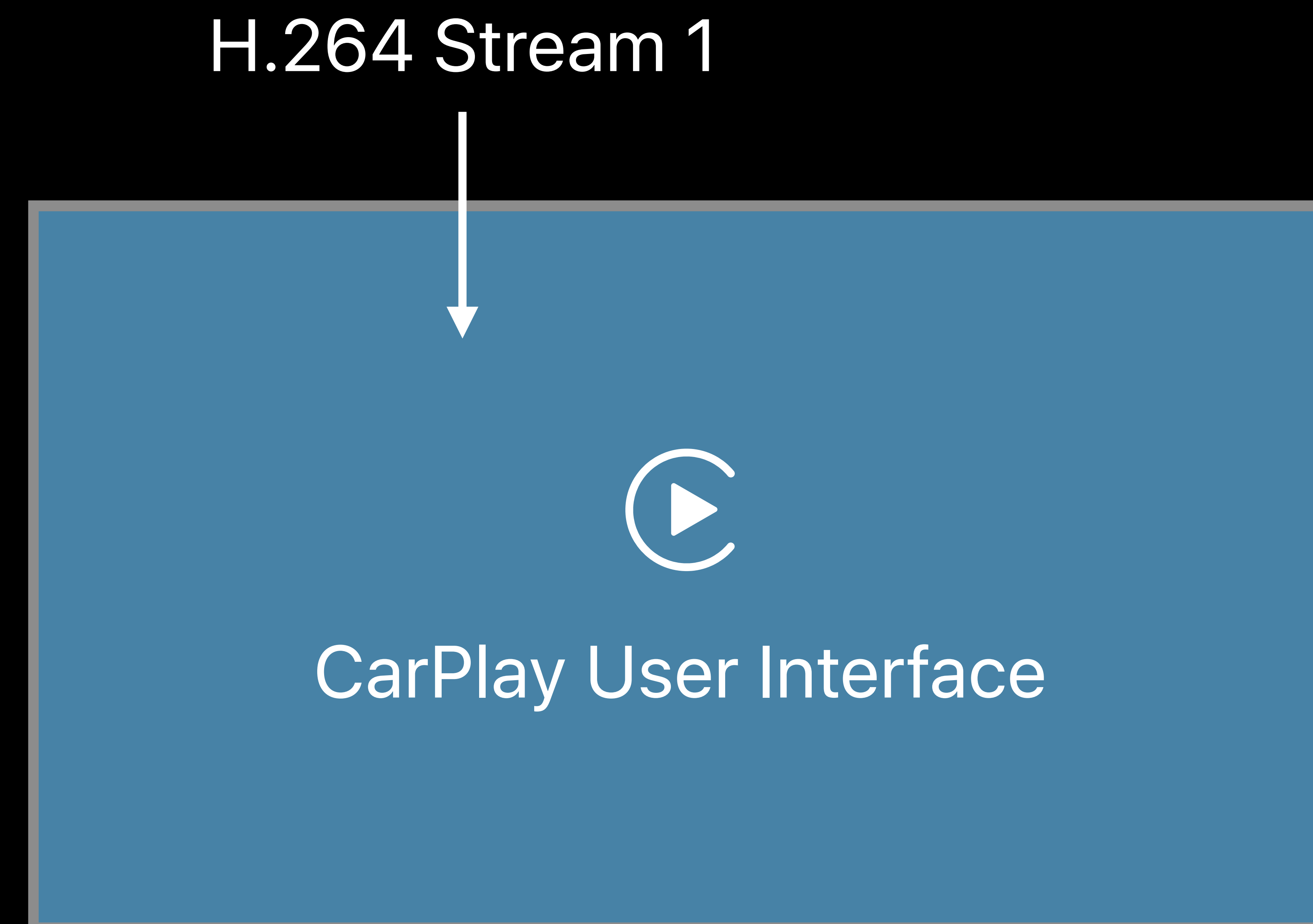
Center Console Display

Second Screen Support

Display an additional CarPlay user interface in another screen



Instrument Cluster



Center Console Display

Second Screen Support

Second Screen Support

Maneuver instructions provided by Apple Maps

Second Screen Support

Maneuver instructions provided by Apple Maps

Map provided by Apple Maps

Second Screen Support

Maneuver instructions provided by Apple Maps

Map provided by Apple Maps

Independent night mode per H.264 stream

Second Screen Support

Maneuver instructions provided by Apple Maps

Map provided by Apple Maps

Independent night mode per H.264 stream

Vehicle controls what type of content is drawn into each H.264 stream

Second Screen Support

Maneuver instructions provided by Apple Maps

Map provided by Apple Maps

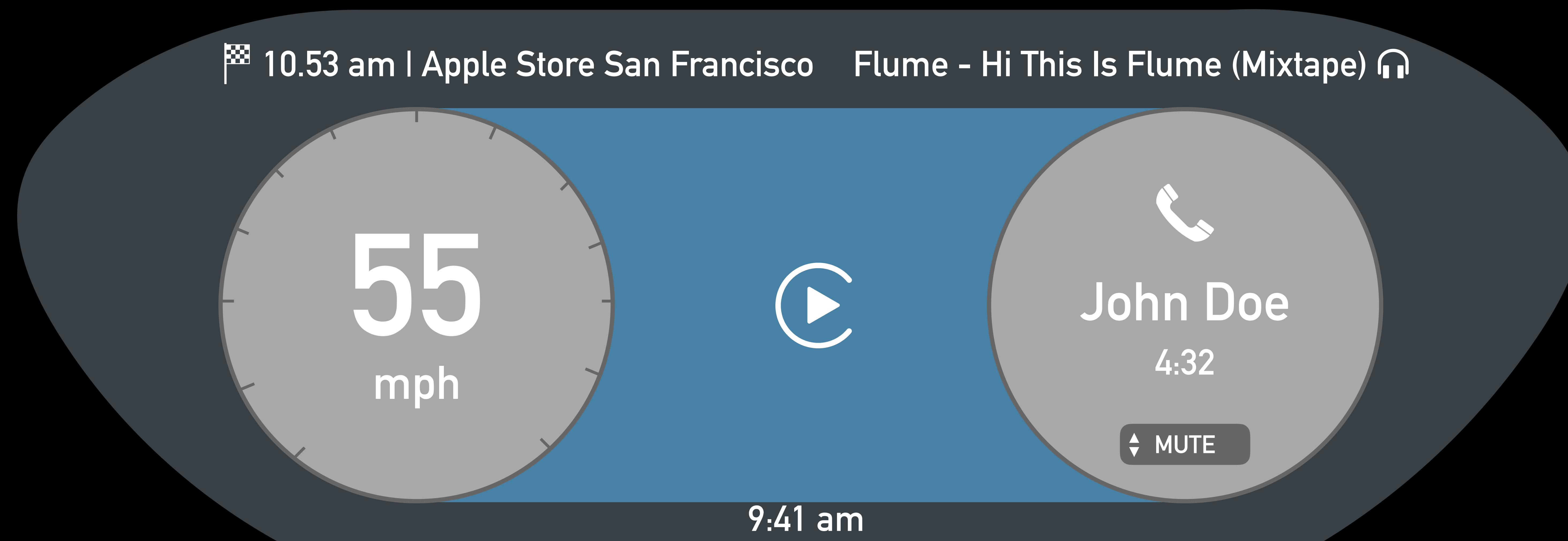
Independent night mode per H.264 stream

Vehicle controls what type of content is drawn into each H.264 stream

Heads-up displays continue to use metadata (iAP2 Route Guidance)

Second Screen Support

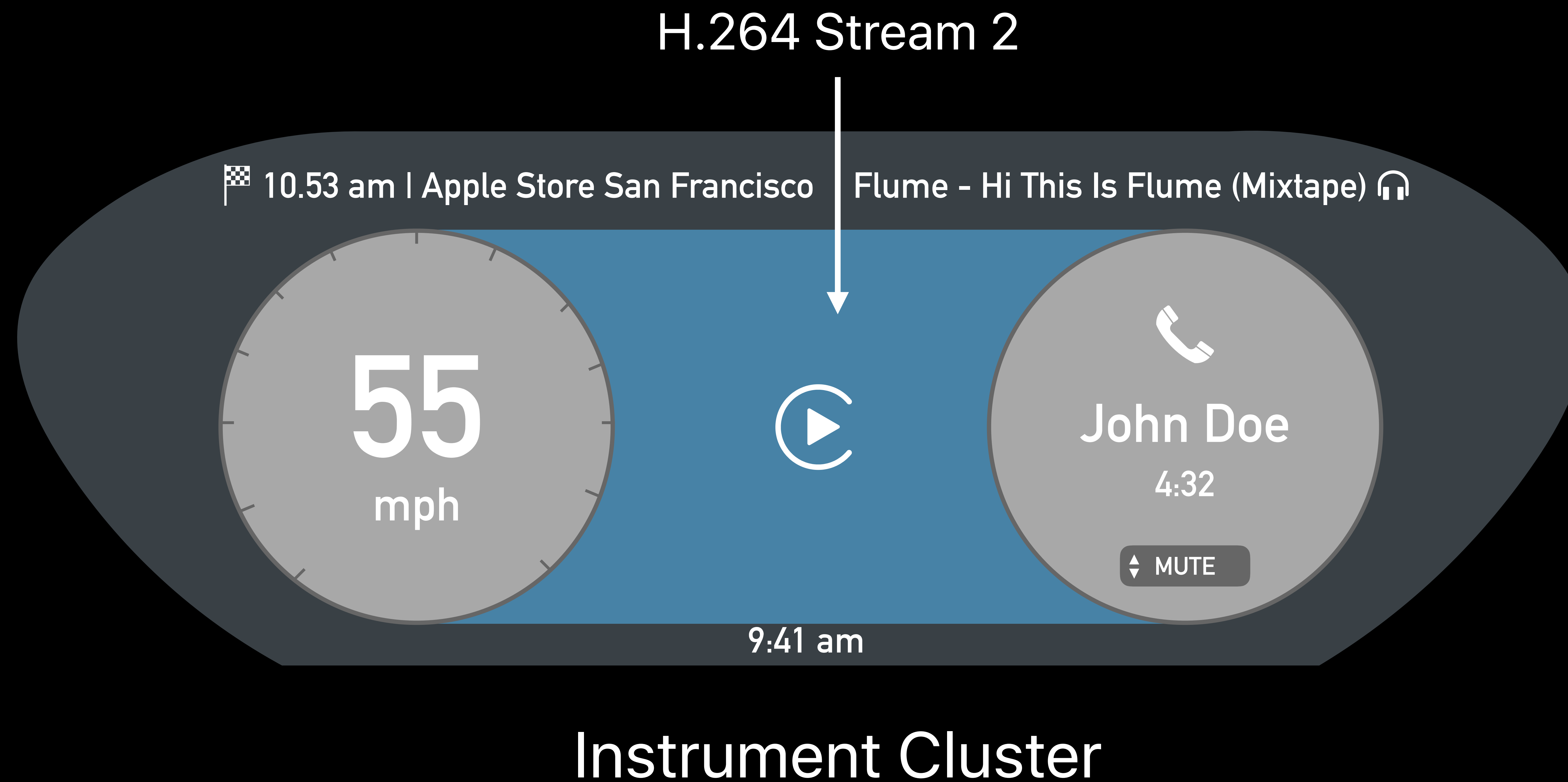
Display an additional CarPlay user interface in another screen



Instrument Cluster

Second Screen Support

Display an additional CarPlay user interface in another screen



Second Screen Support

Display an additional CarPlay user interface in another screen



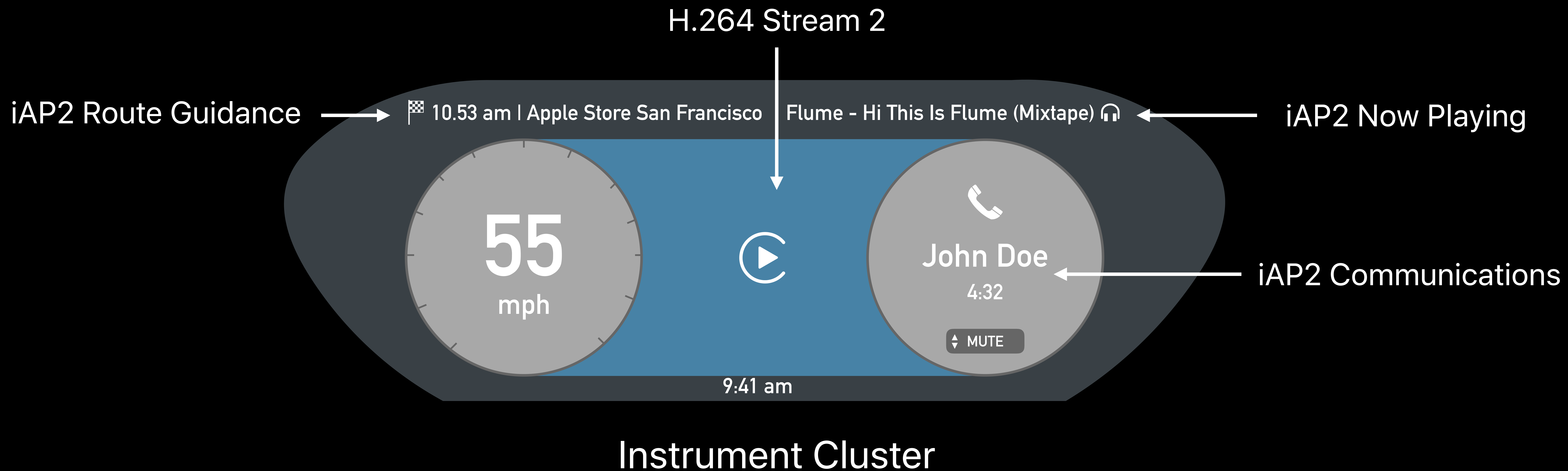
Second Screen Support

Display an additional CarPlay user interface in another screen



Second Screen Support

Display an additional CarPlay user interface in another screen



Second Screen Support

Display an additional CarPlay user interface in another screen



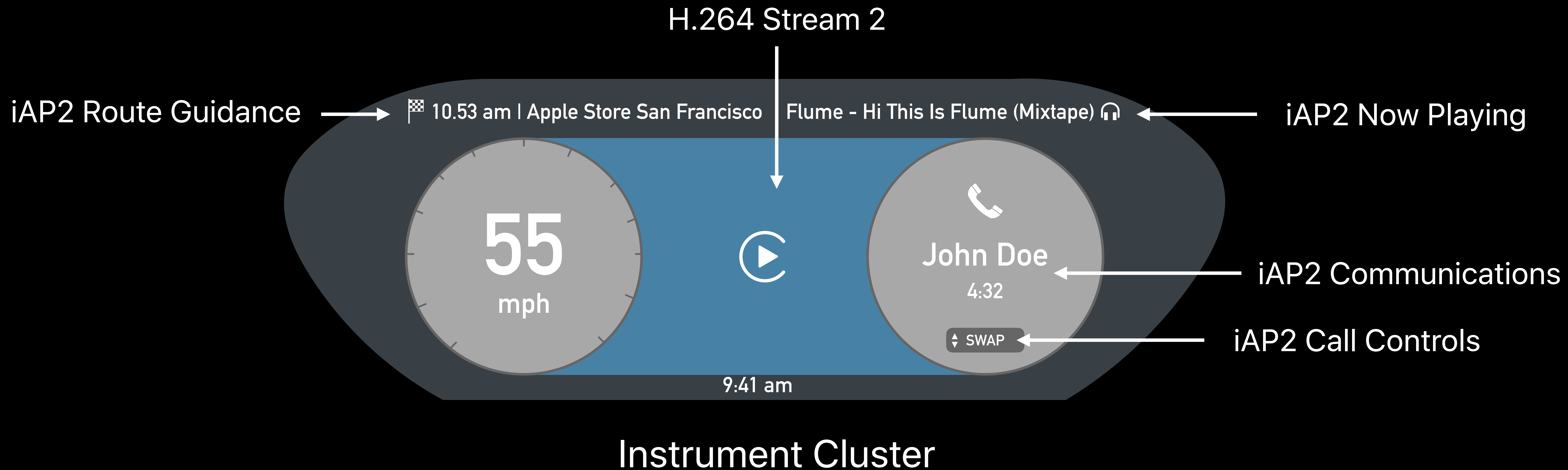
Second Screen Support

Display an additional CarPlay user interface in another screen



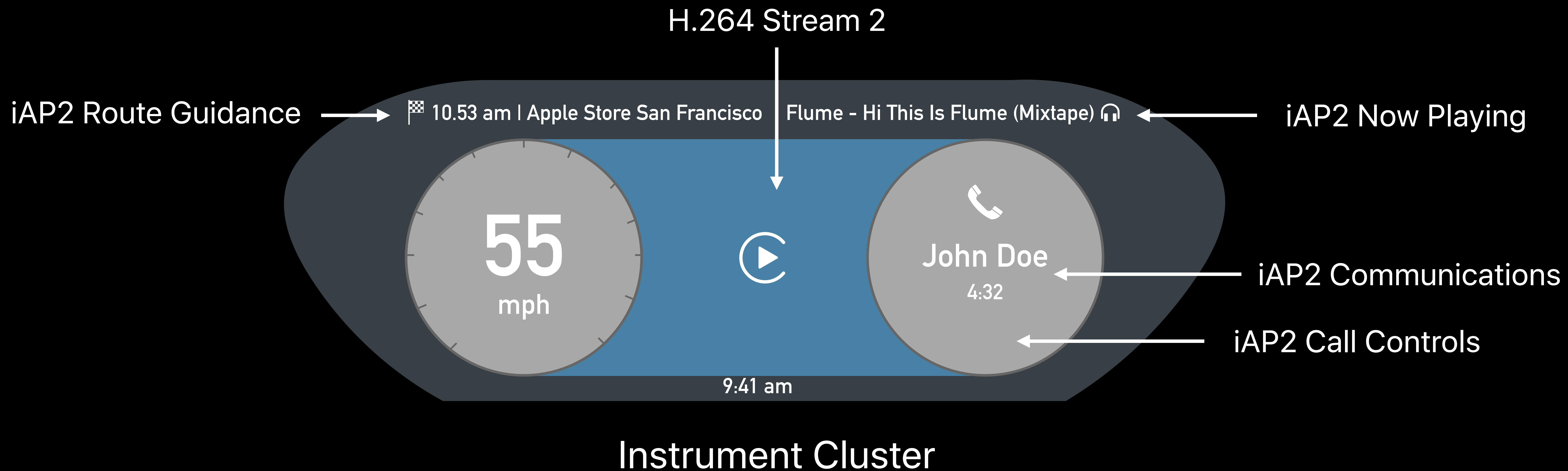
Second Screen Support

Display an additional CarPlay user interface in another screen



Second Screen Support

Display an additional CarPlay user interface in another screen



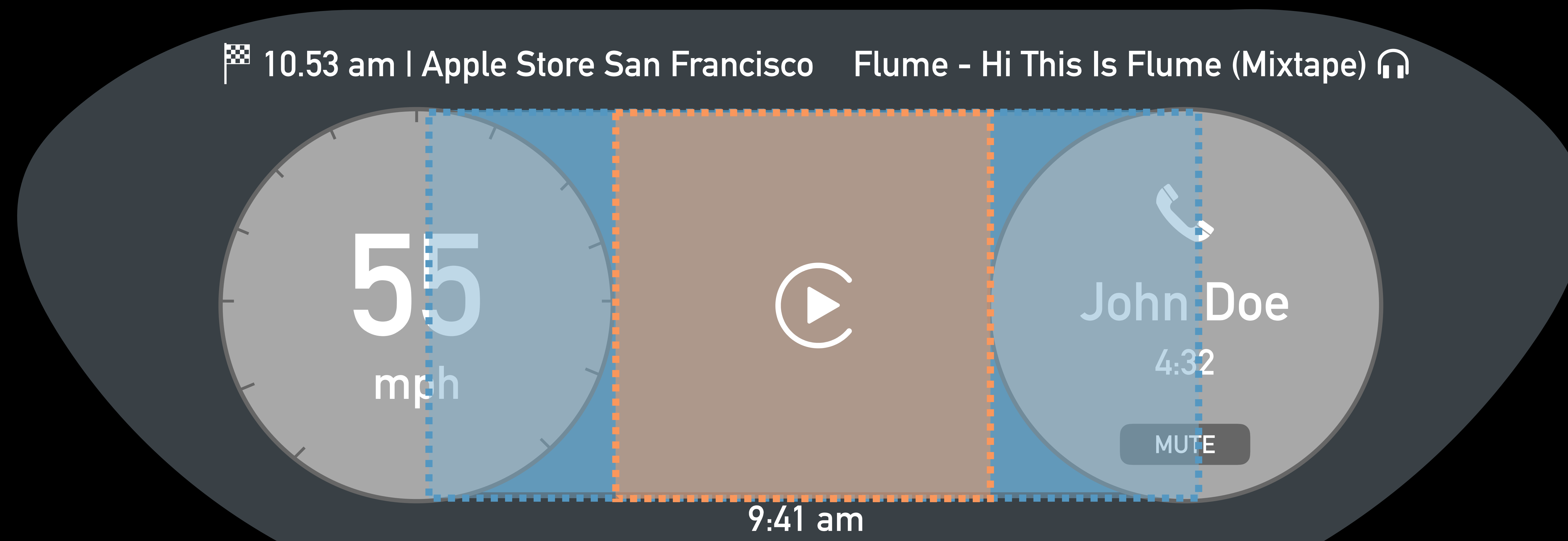
Second Screen Support

Display an additional CarPlay user interface in another screen



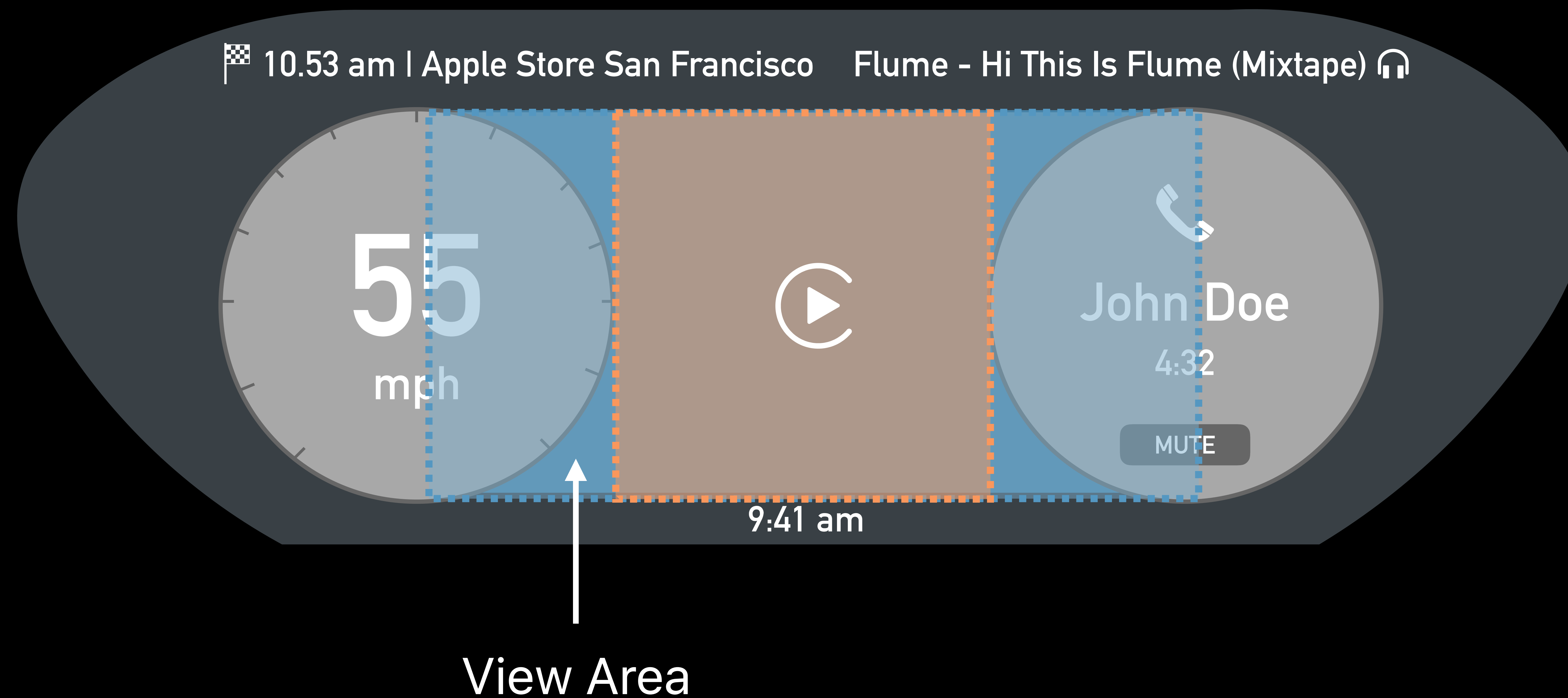
Second Screen Support

Display an additional CarPlay user interface in another screen



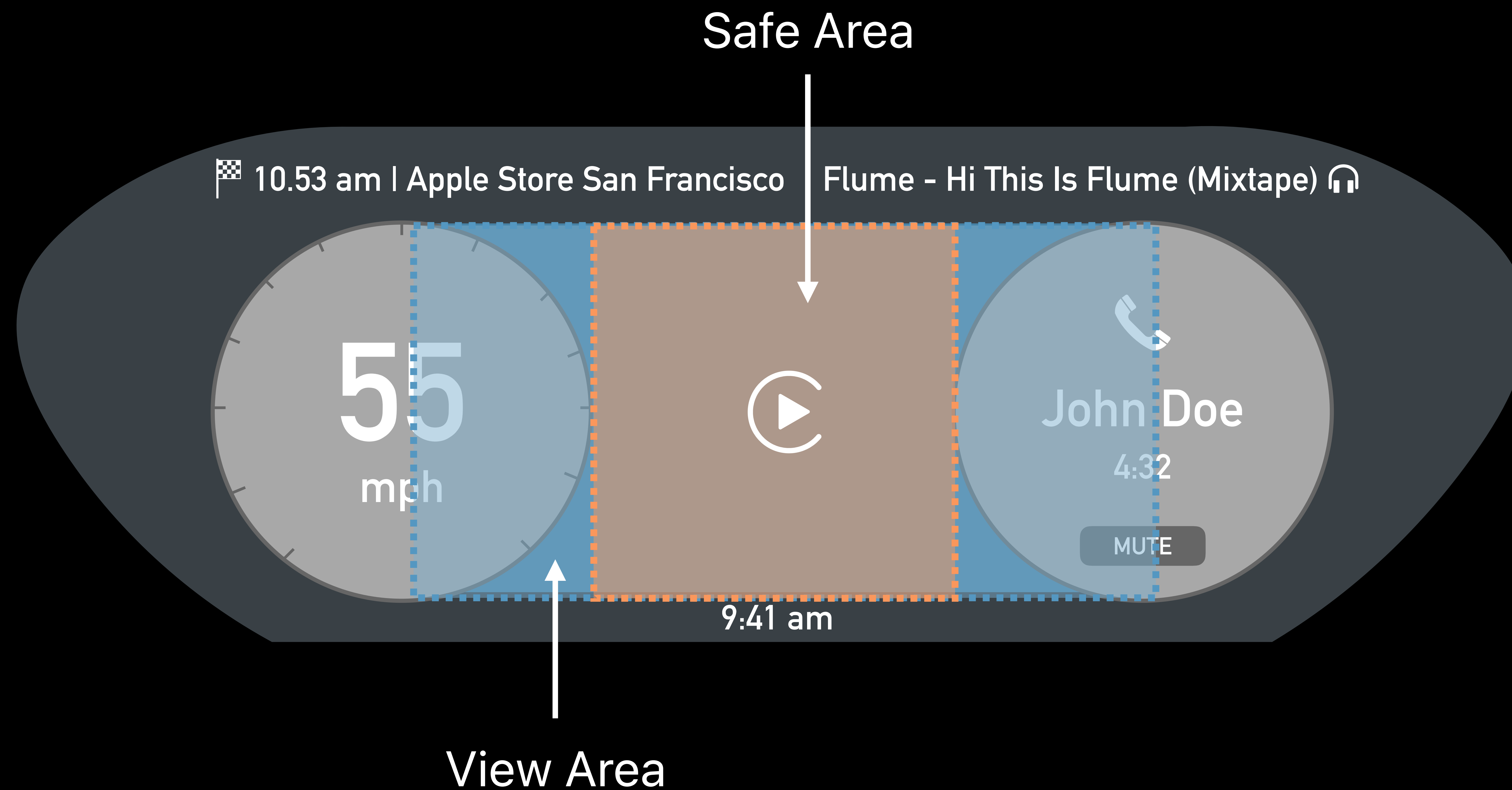
Second Screen Support

Display an additional CarPlay user interface in another screen



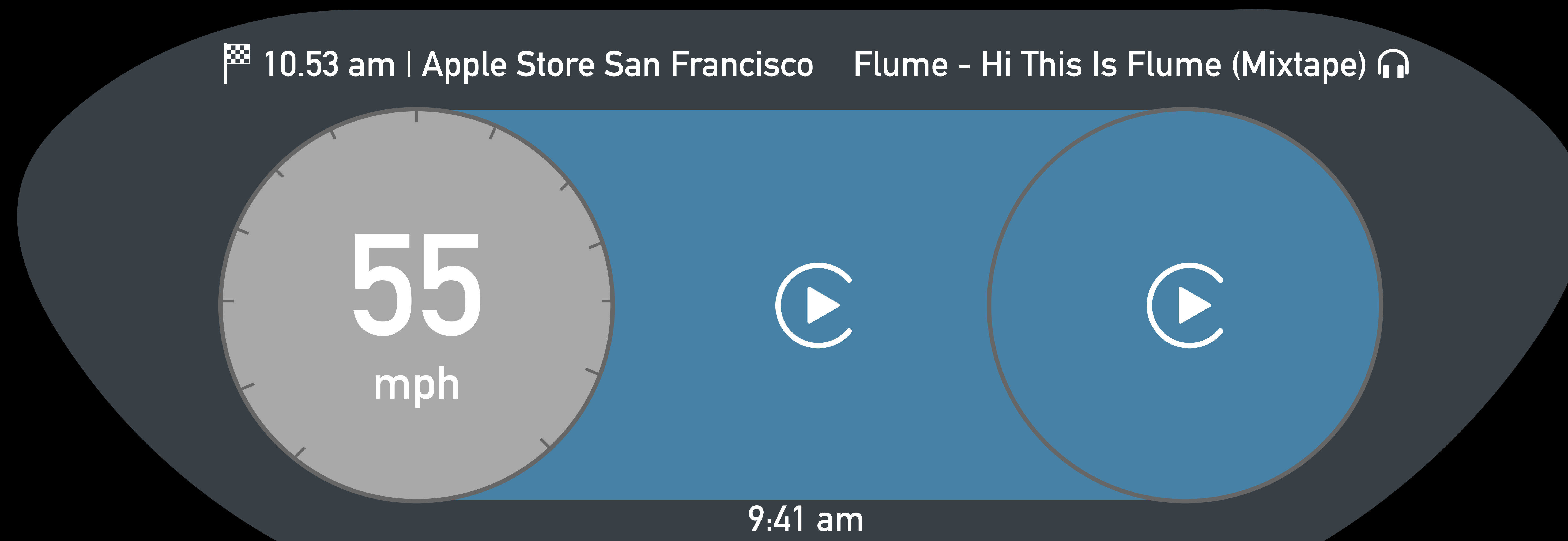
Second Screen Support

Display an additional CarPlay user interface in another screen



Second Screen Support

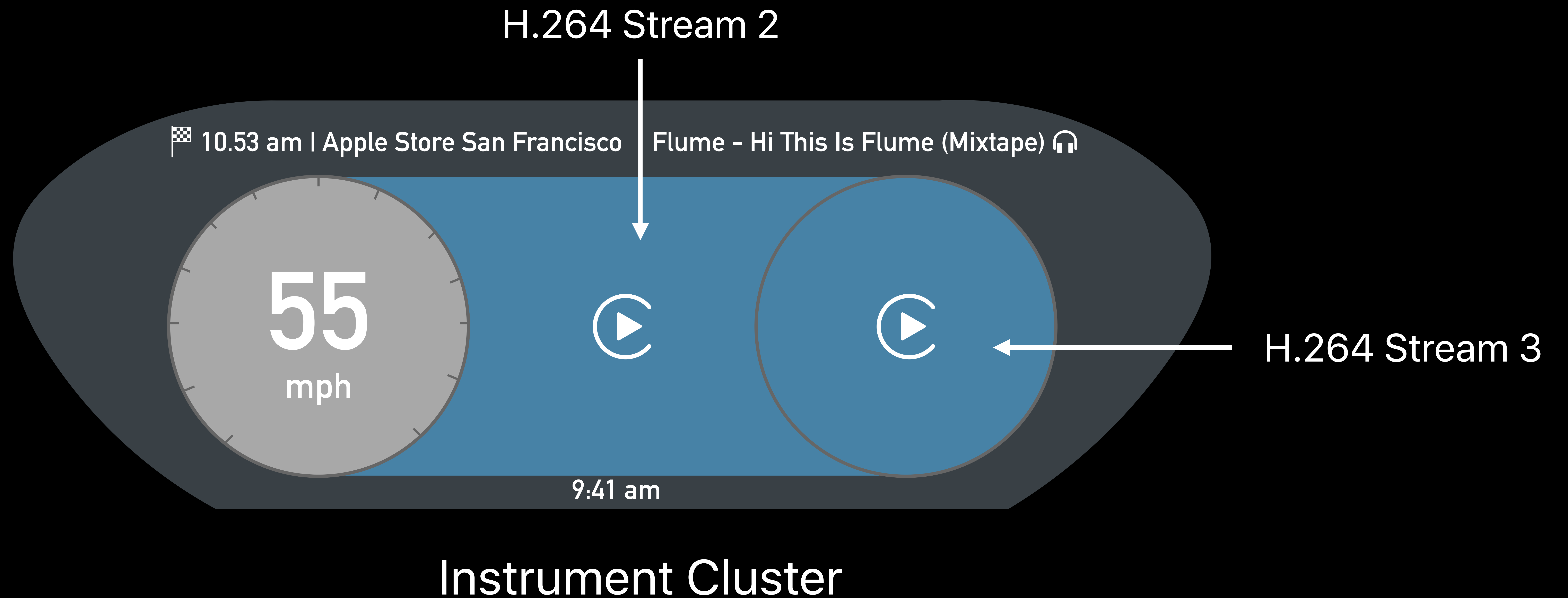
Display an additional CarPlay user interface in another screen



Instrument Cluster

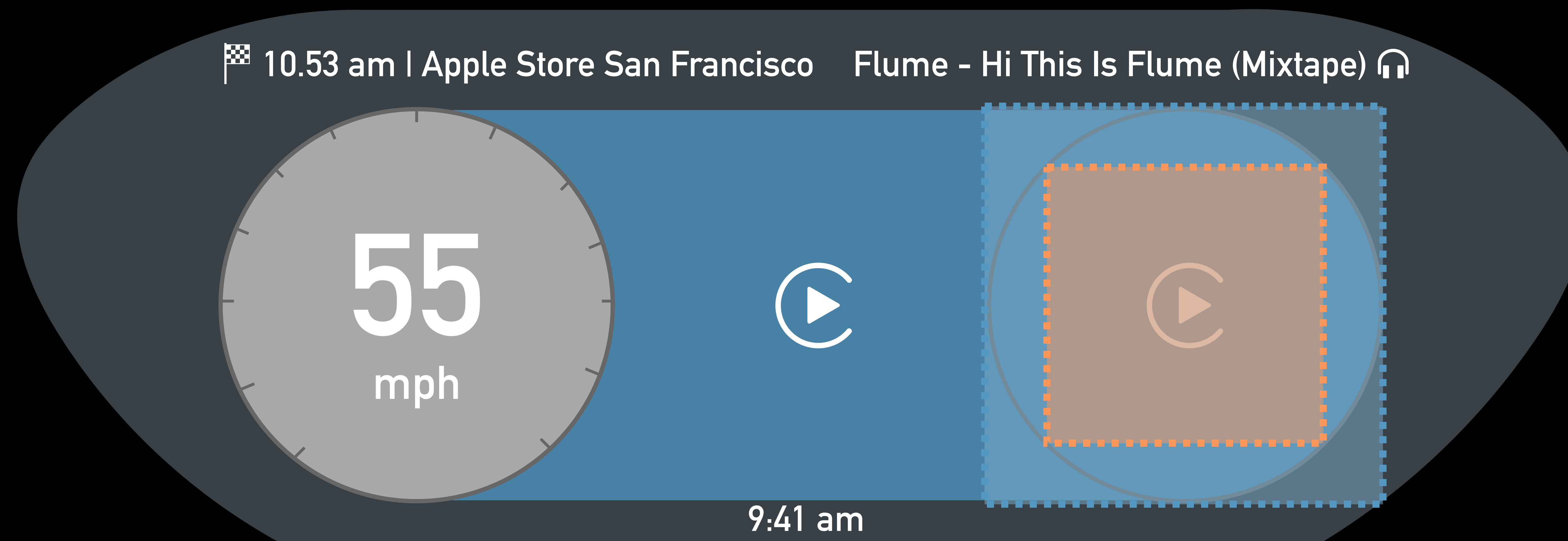
Second Screen Support

Display an additional CarPlay user interface in another screen



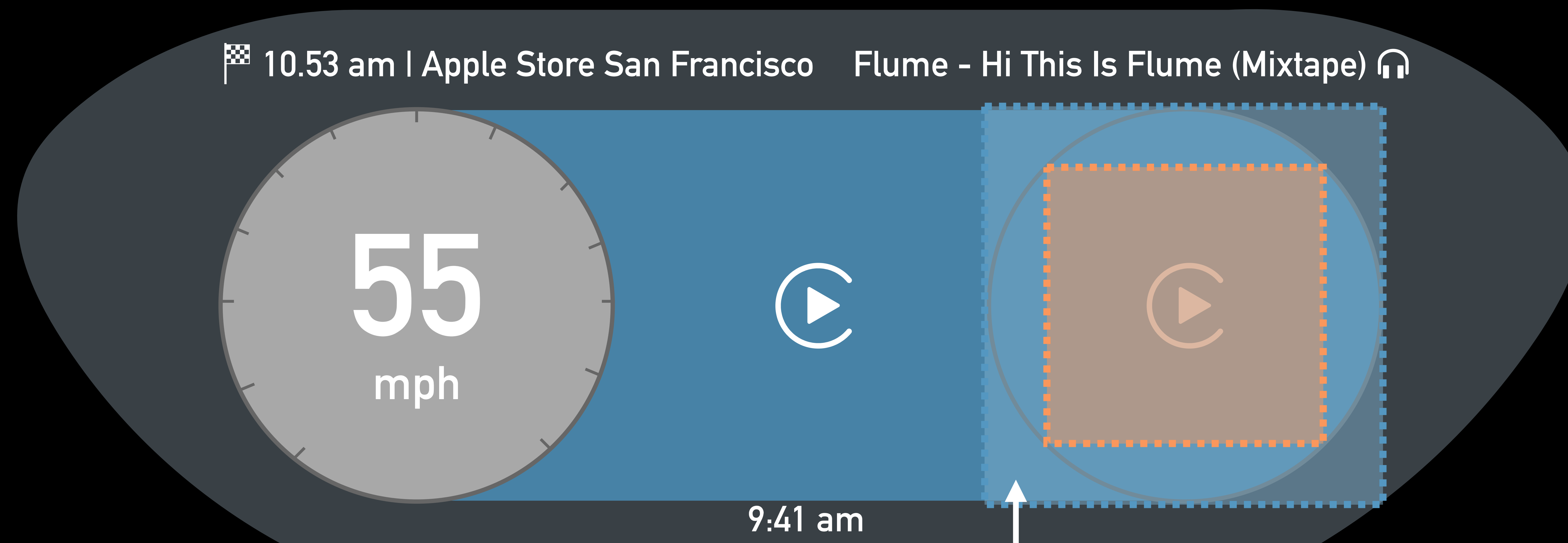
Second Screen Support

Display an additional CarPlay user interface in another screen



Second Screen Support

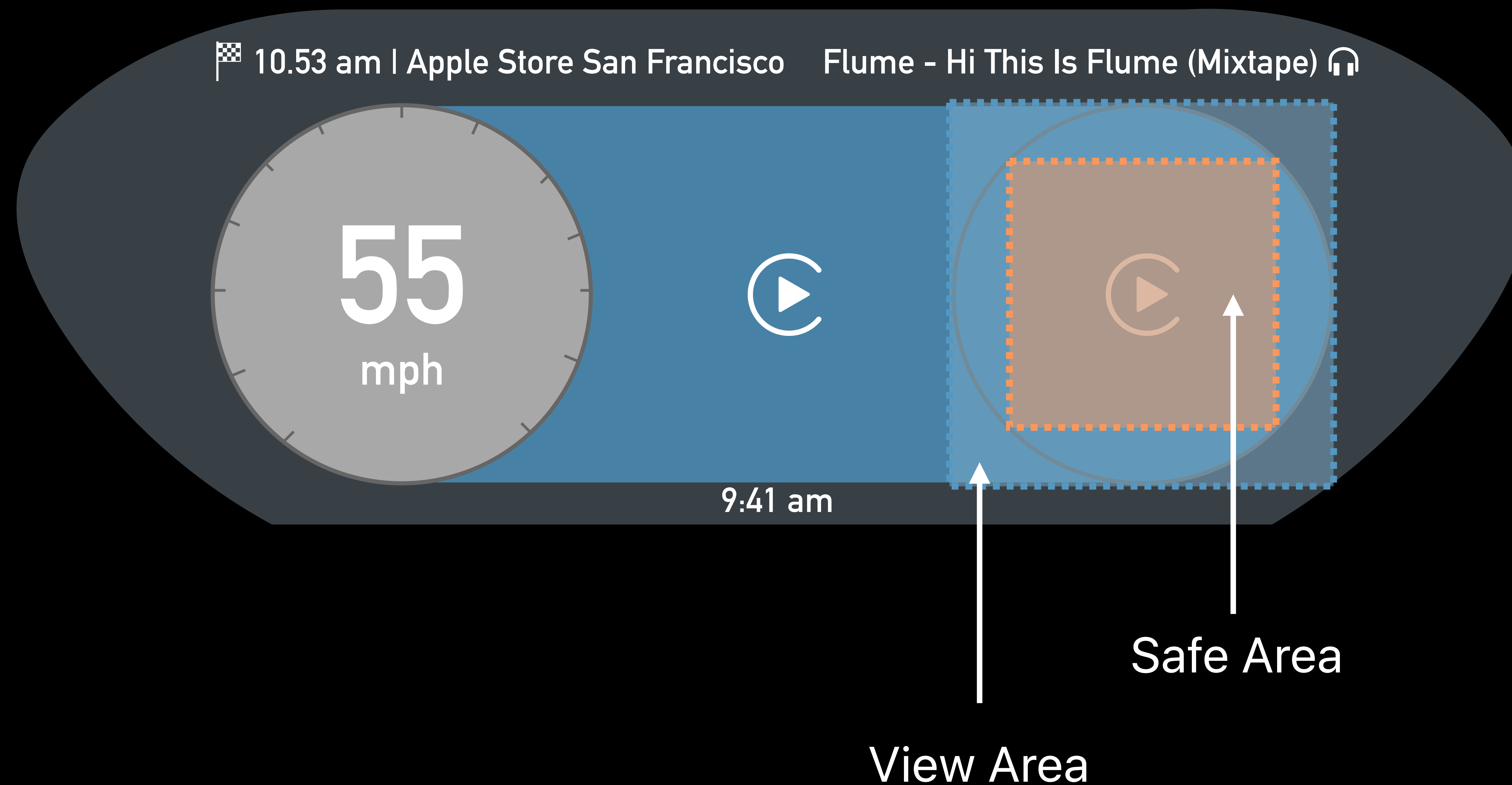
Display an additional CarPlay user interface in another screen



View Area

Second Screen Support

Display an additional CarPlay user interface in another screen



Irregularly shaped display support

Second screen support

Dynamic screen sizes

Hey Siri

Irregularly shaped display support

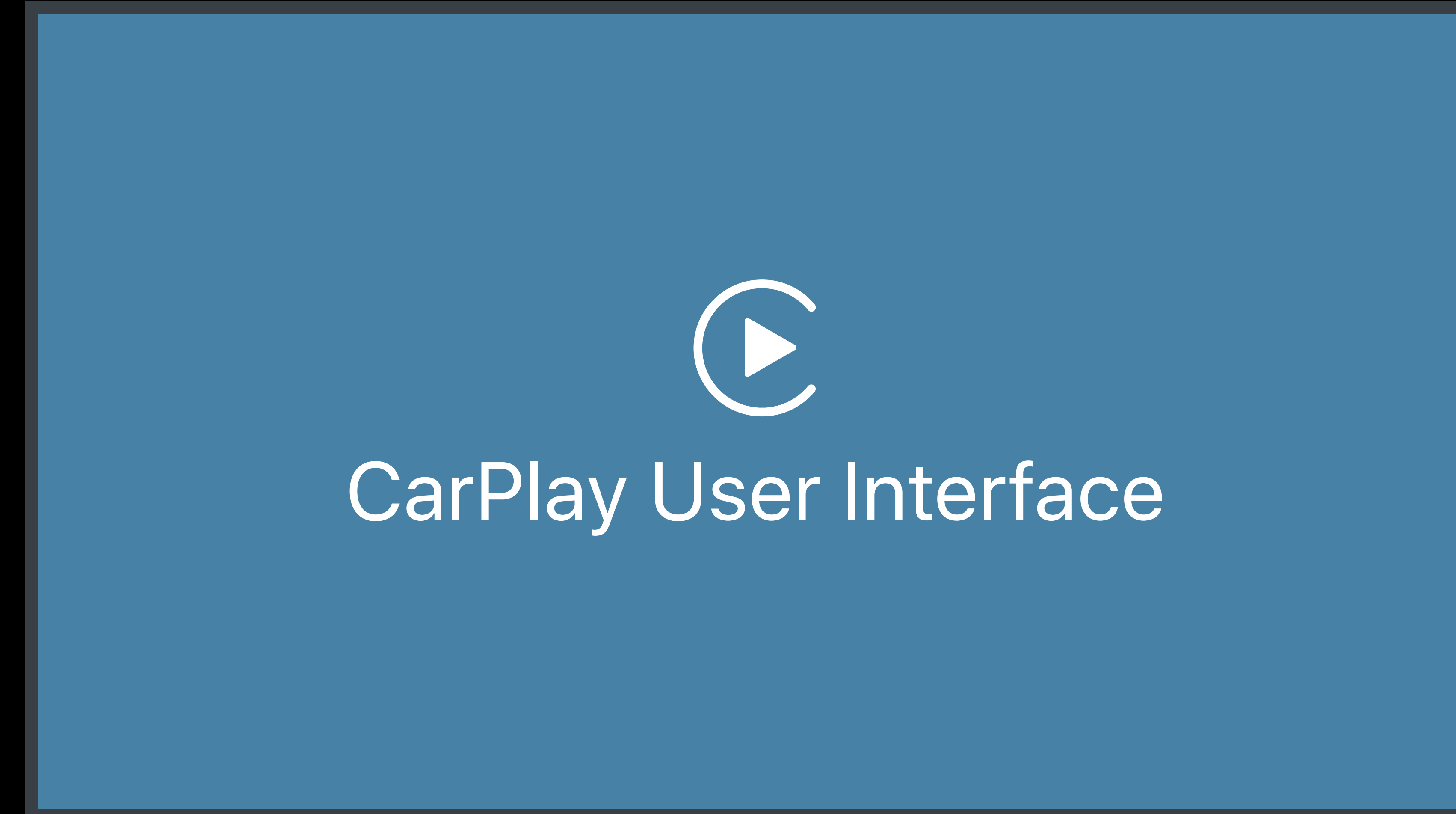
Second screen support

Dynamic screen sizes

Hey Siri

Dynamic Screen Sizes

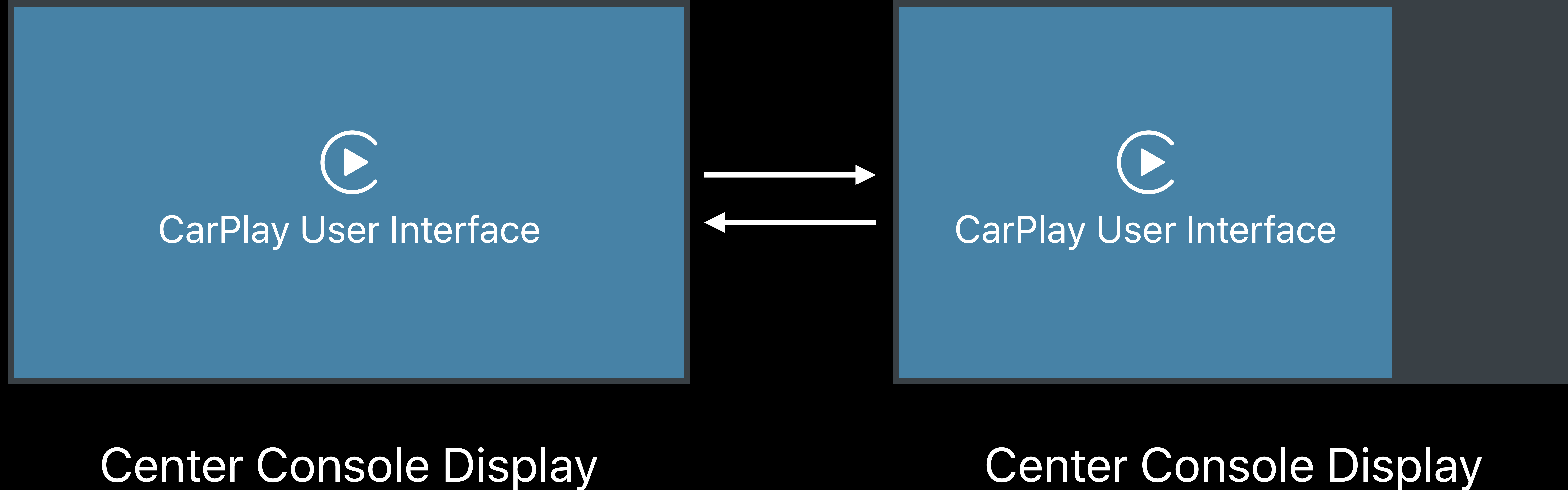
Dynamically change the size of the CarPlay user interface



Center Console Display

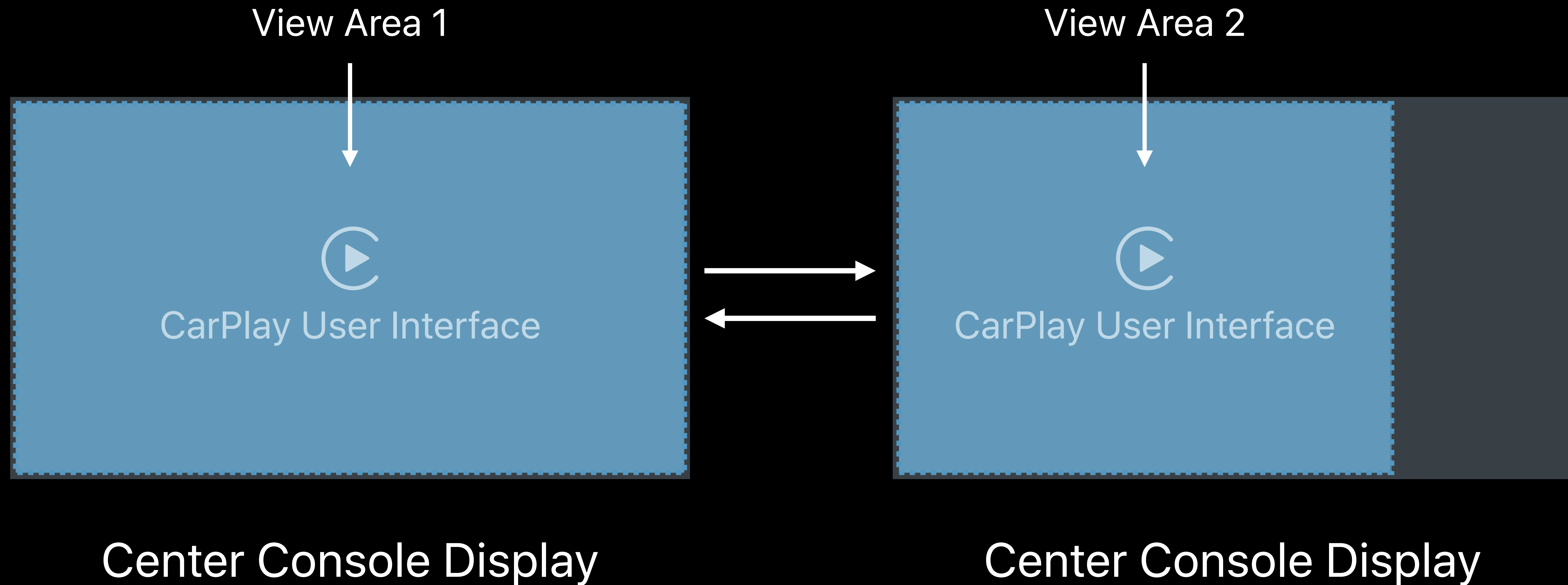
Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



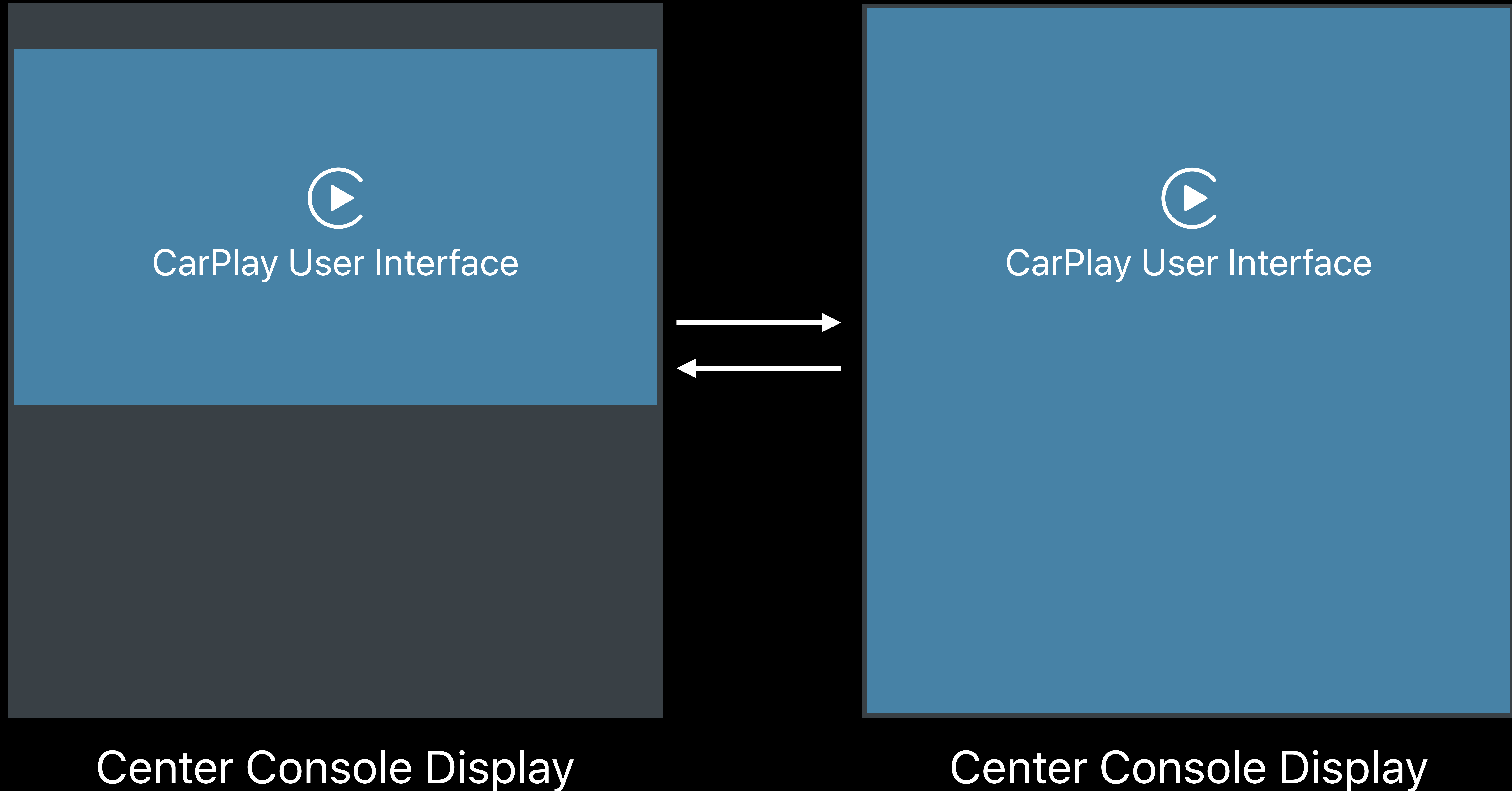
Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



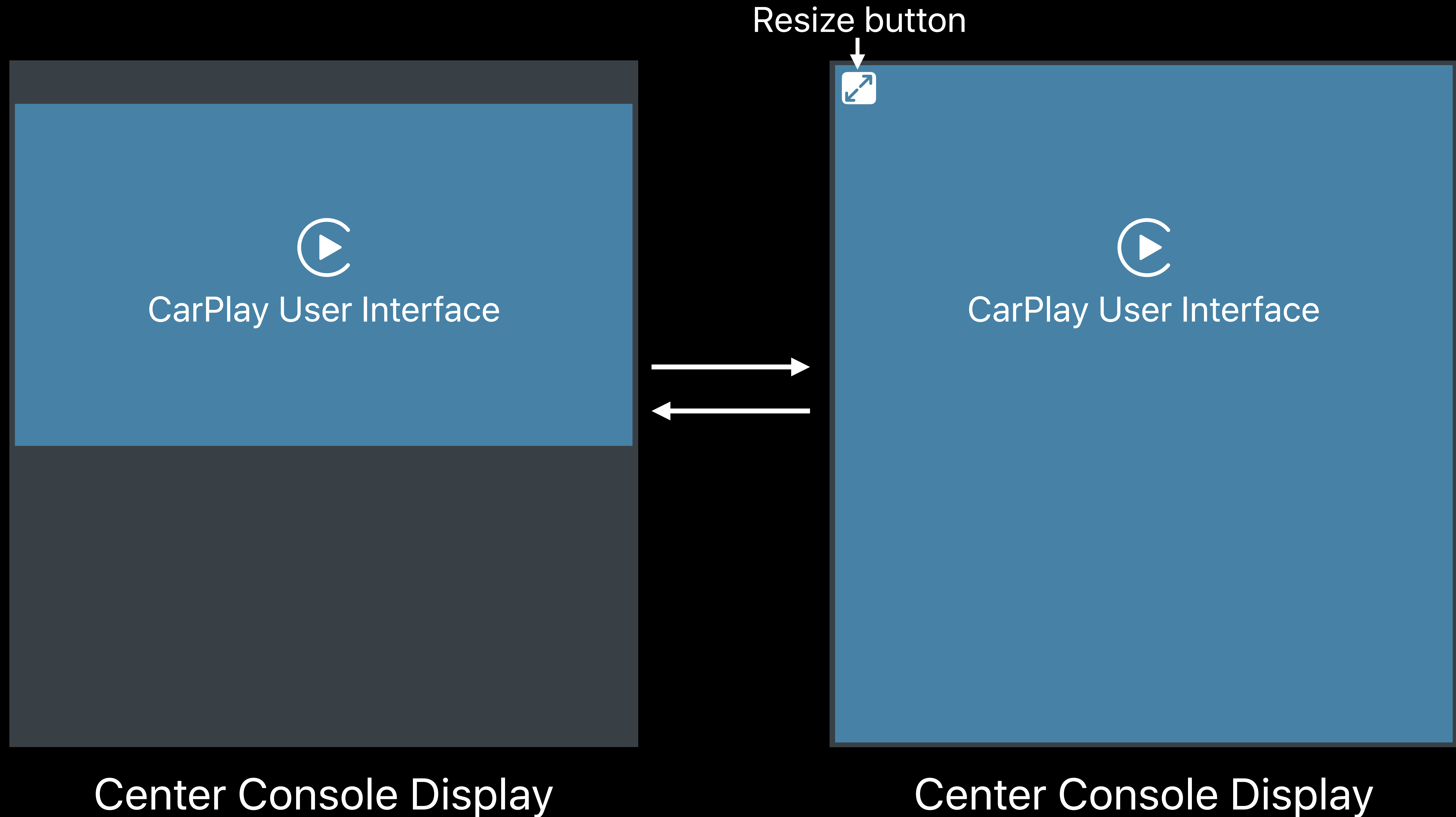
Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



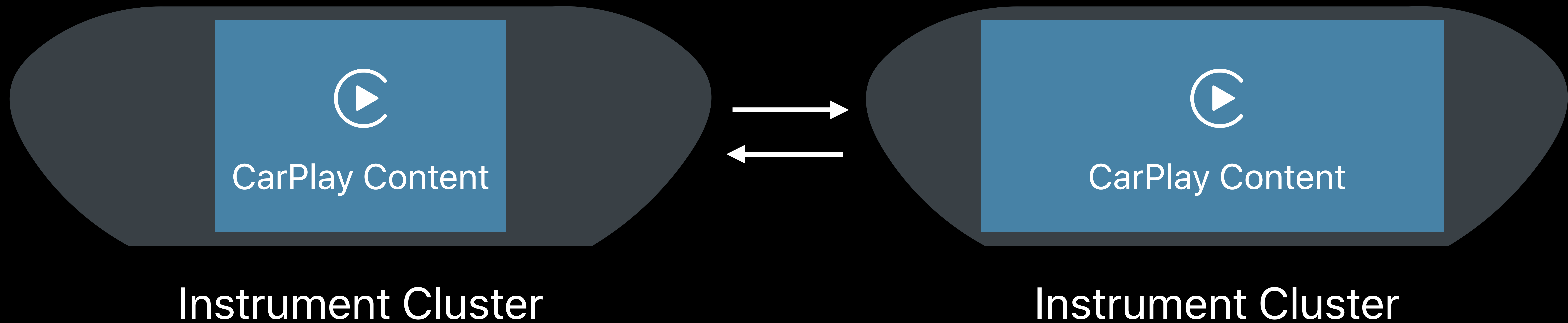
Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



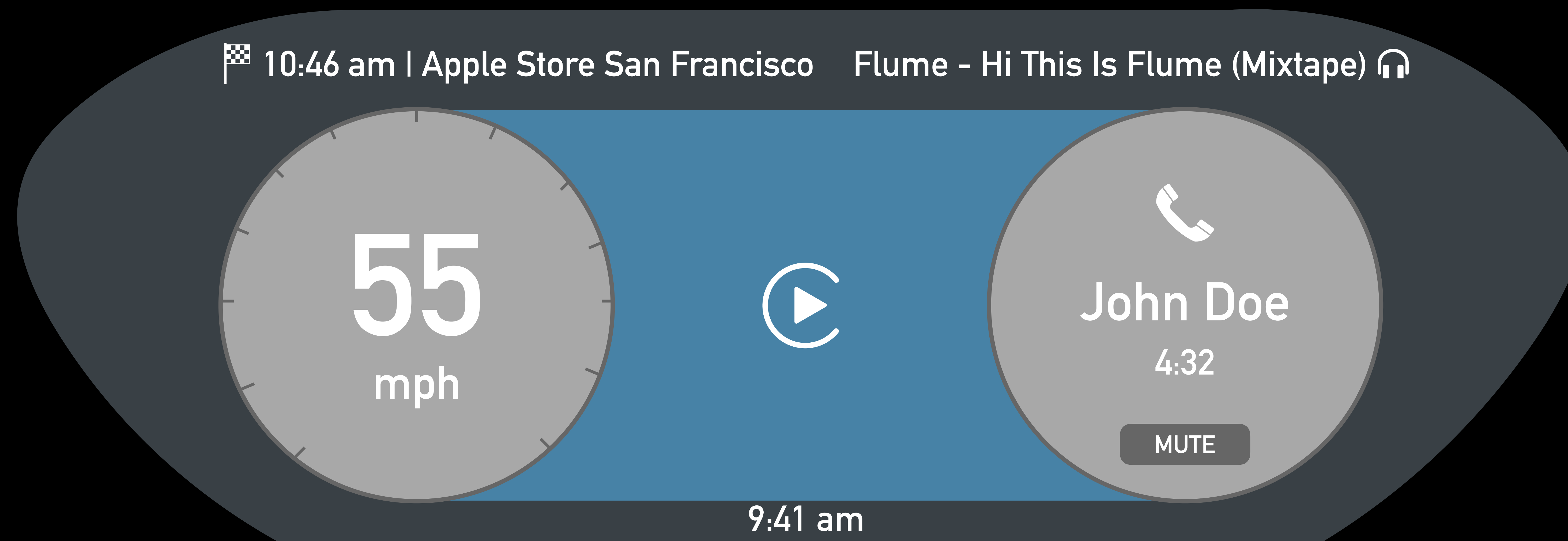
Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



Dynamic Screen Sizes

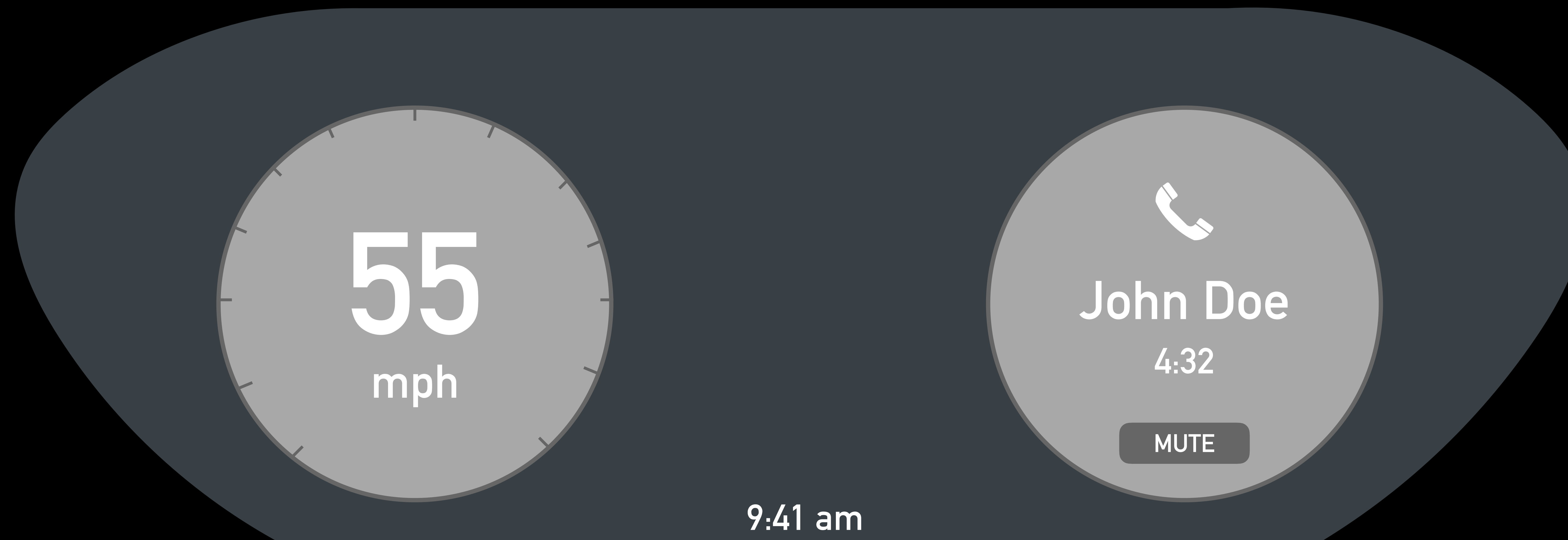
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

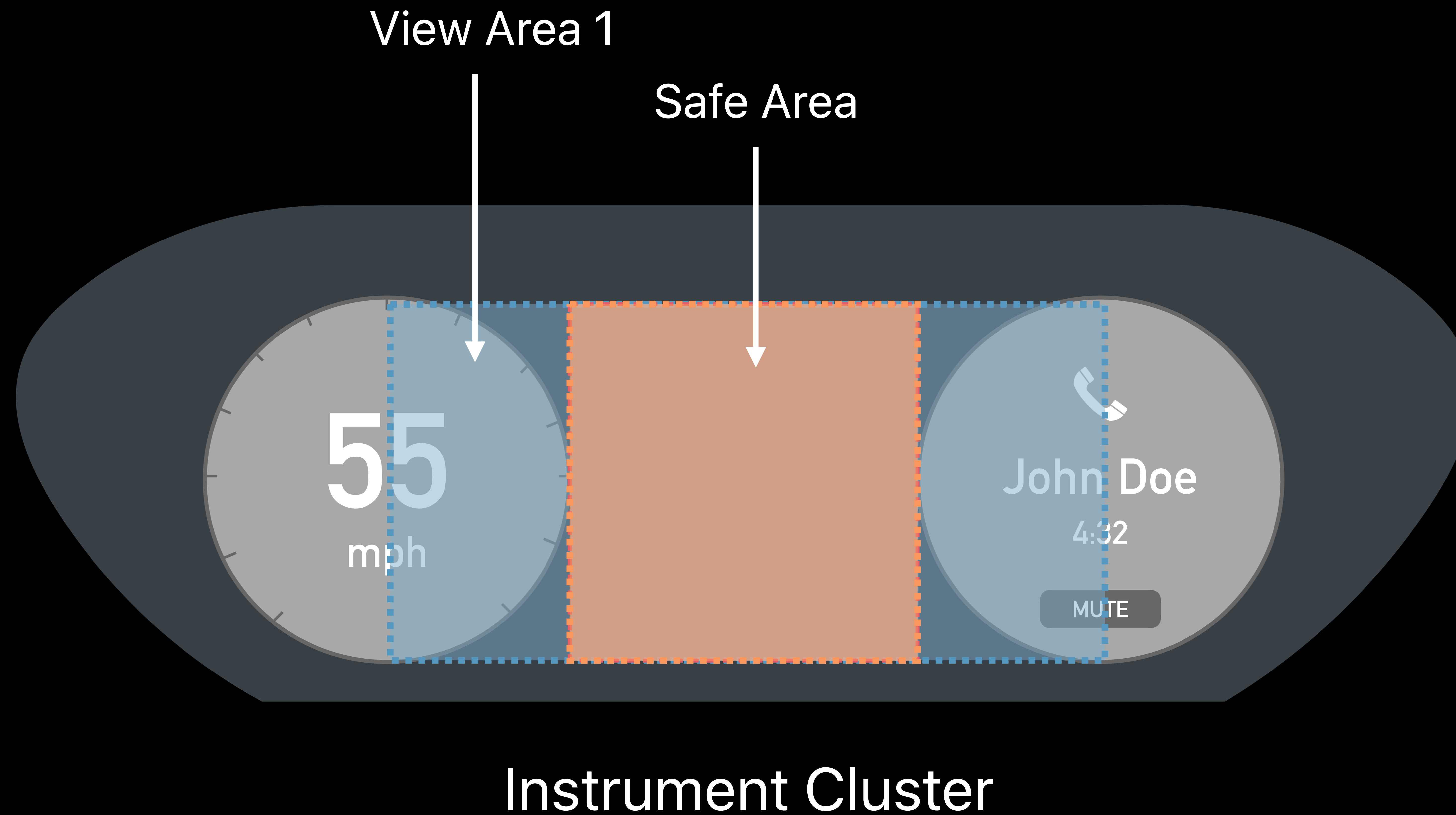
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



Dynamic Screen Sizes

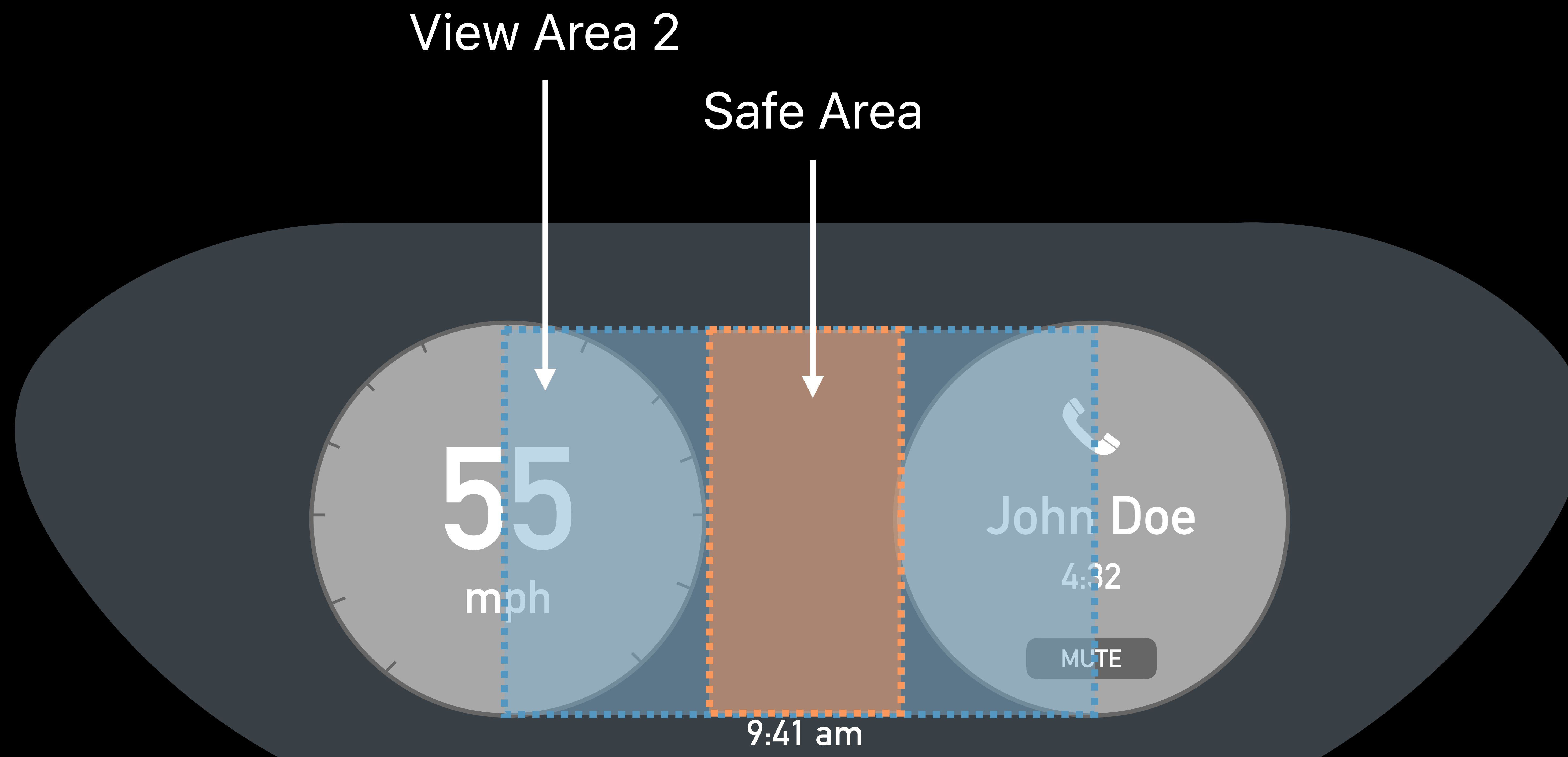
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

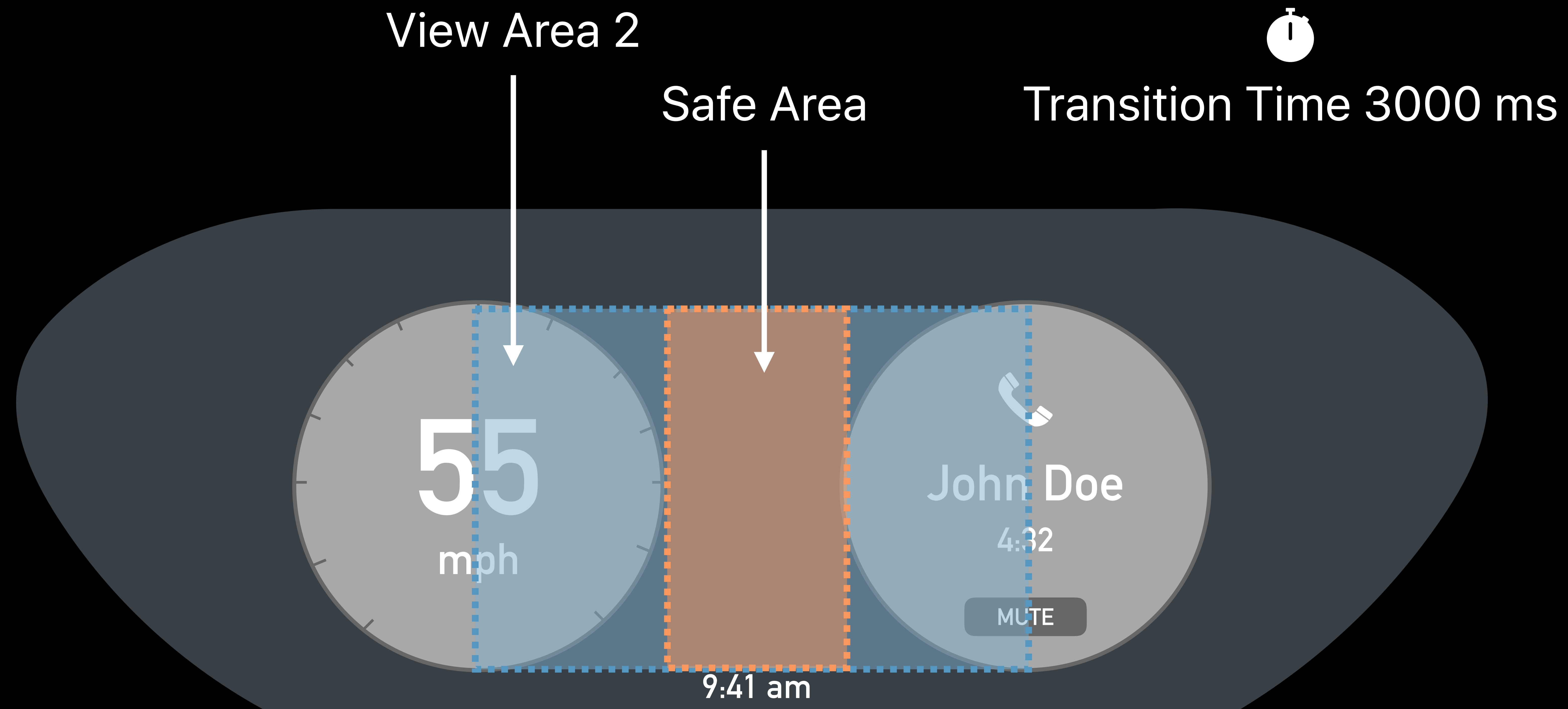
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

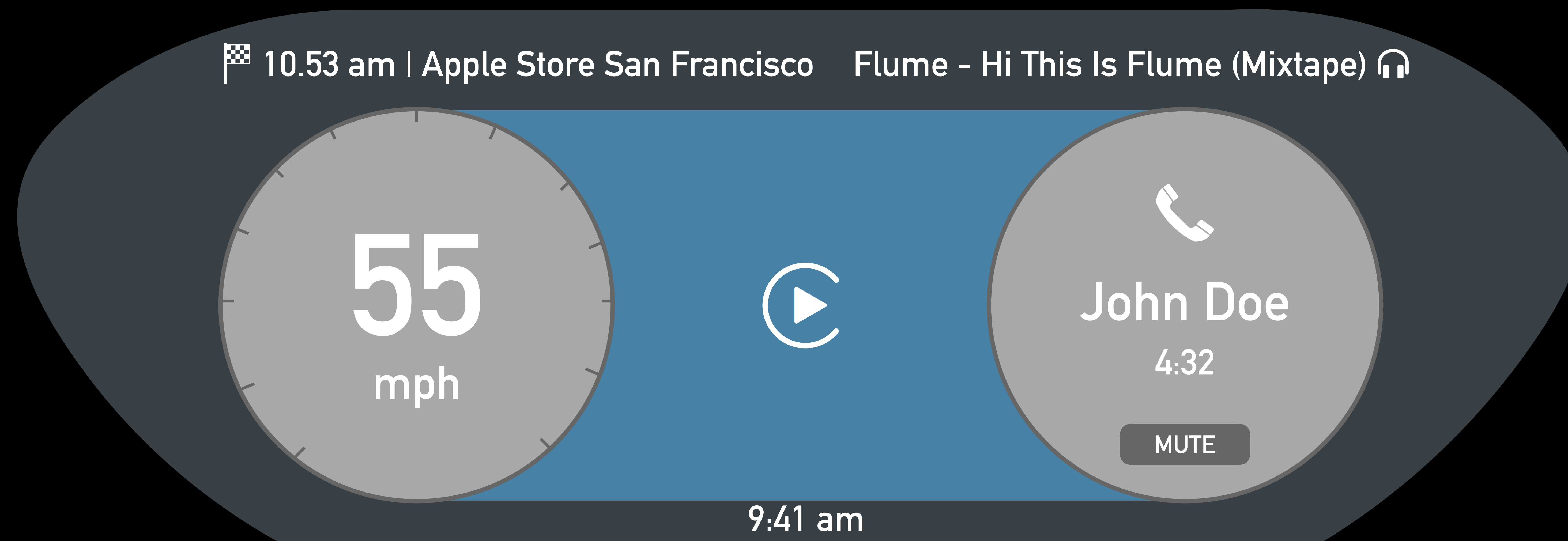
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

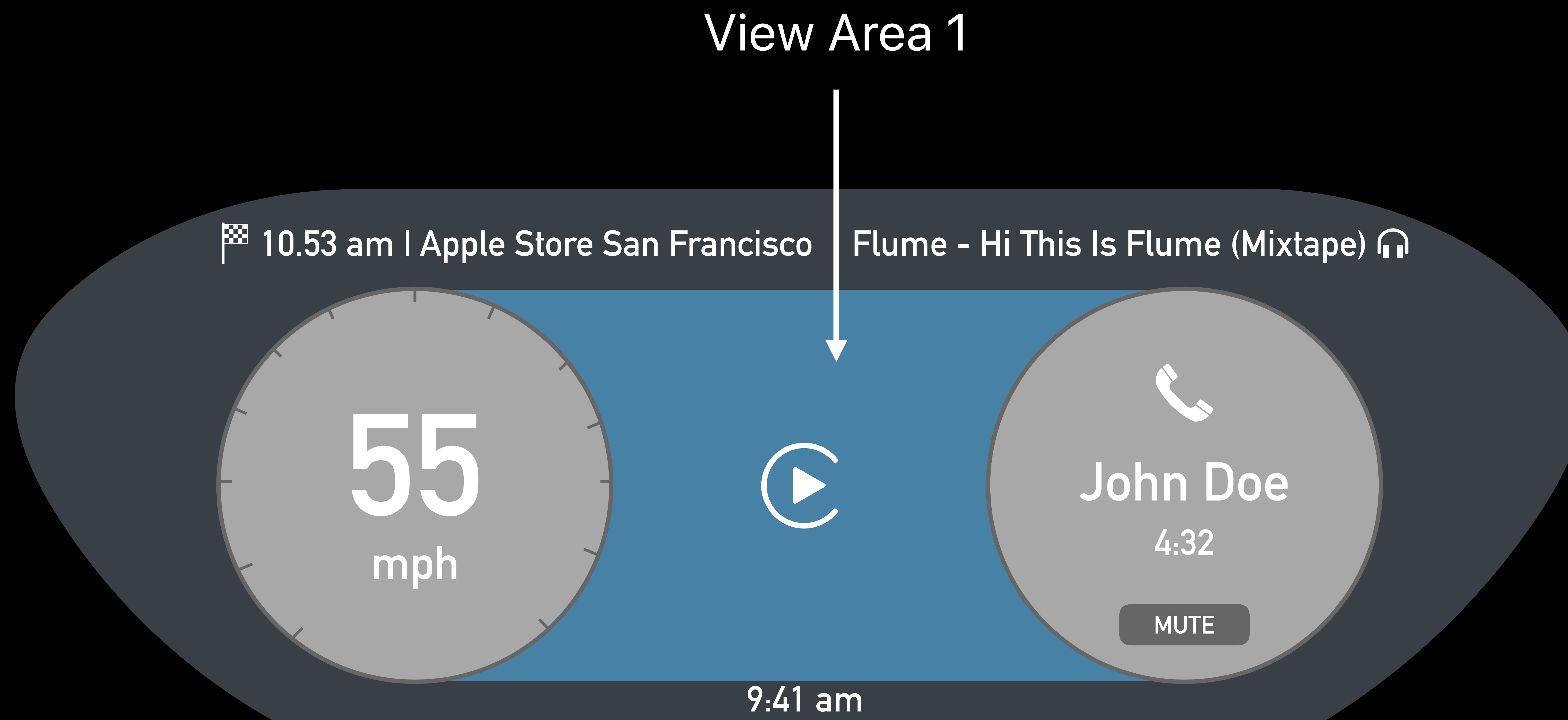
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

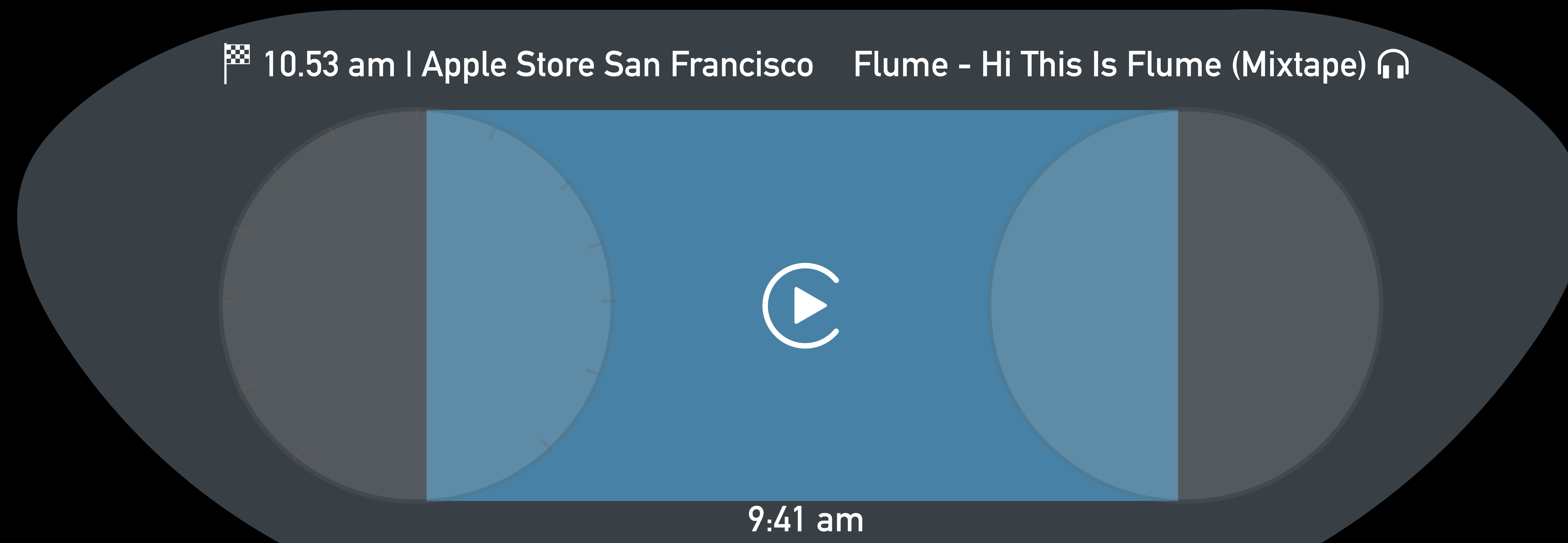
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

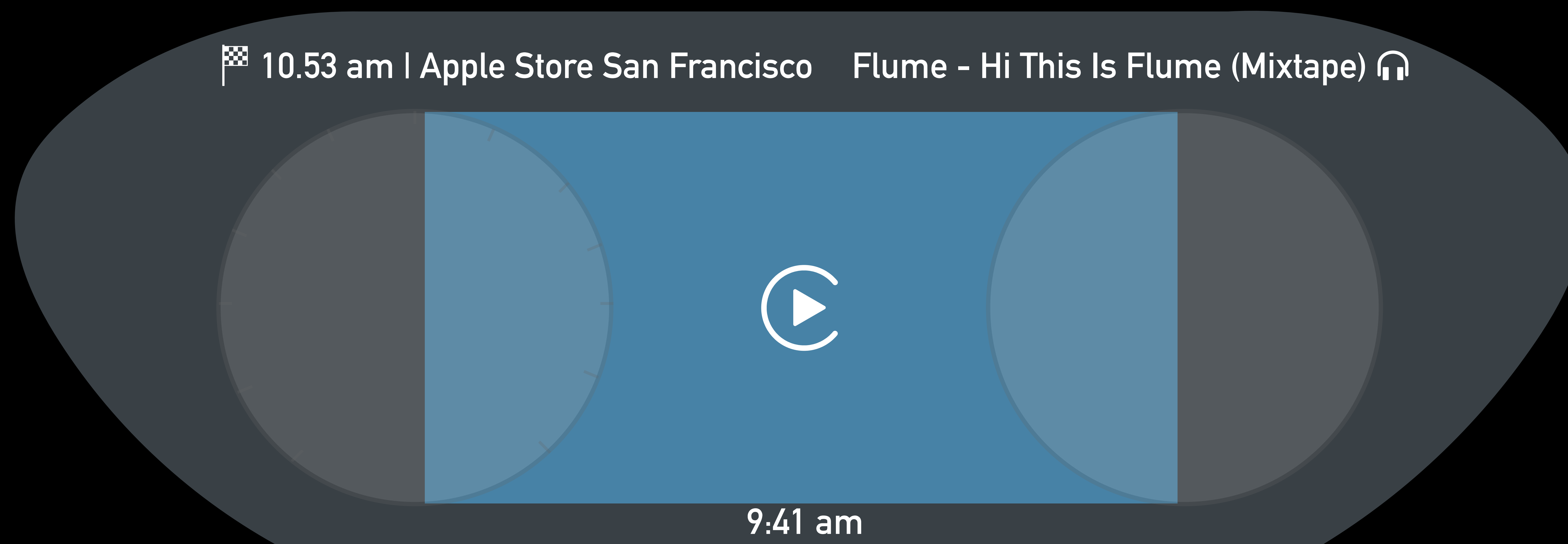


Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

View Area 1 to View Area 2 Transition

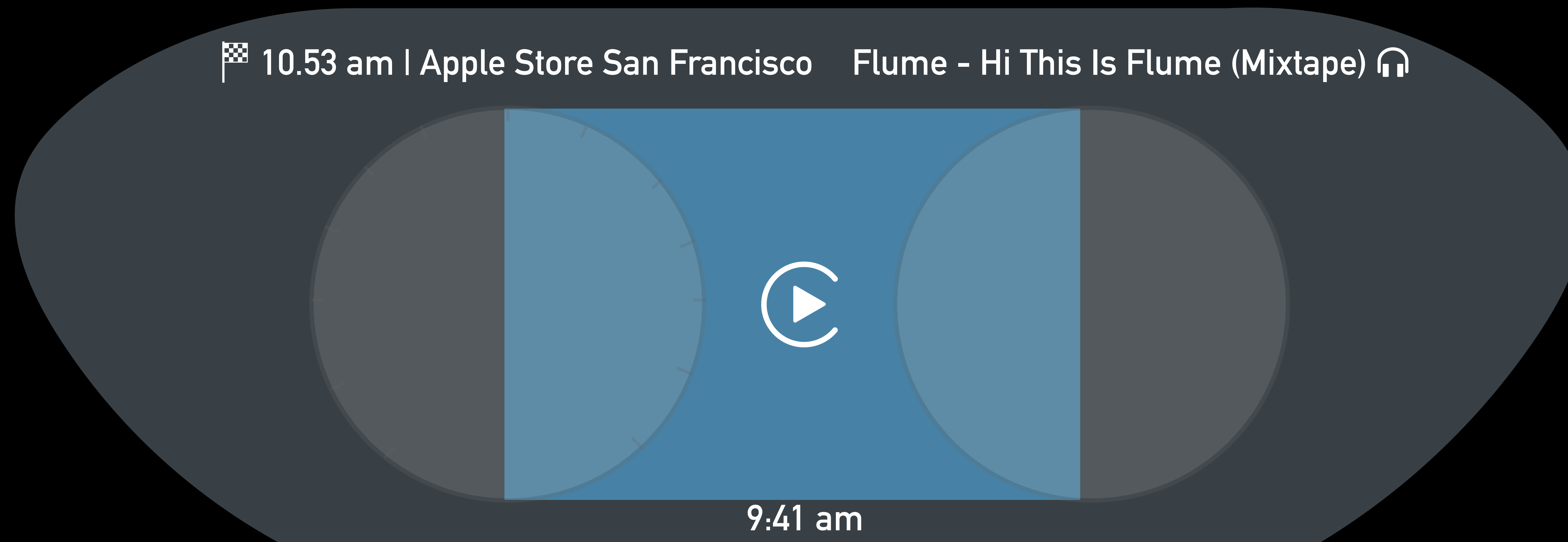


Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

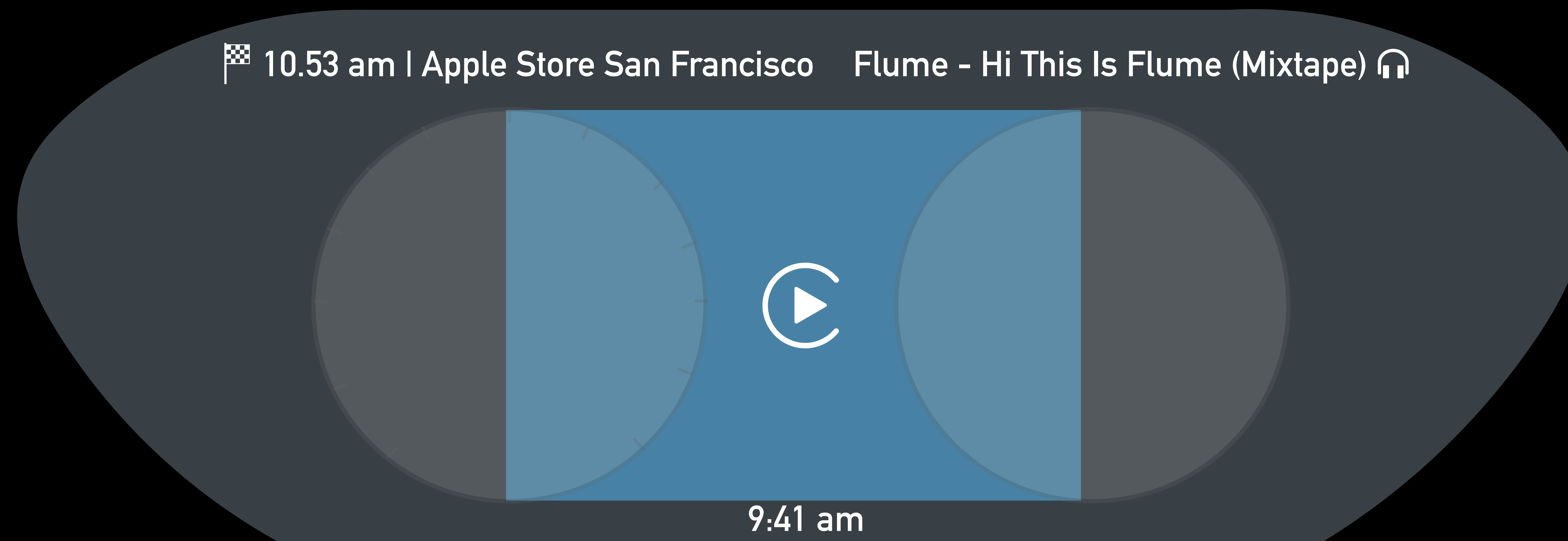
View Area 1 to View Area 2 Transition



Instrument Cluster

Dynamic Screen Sizes

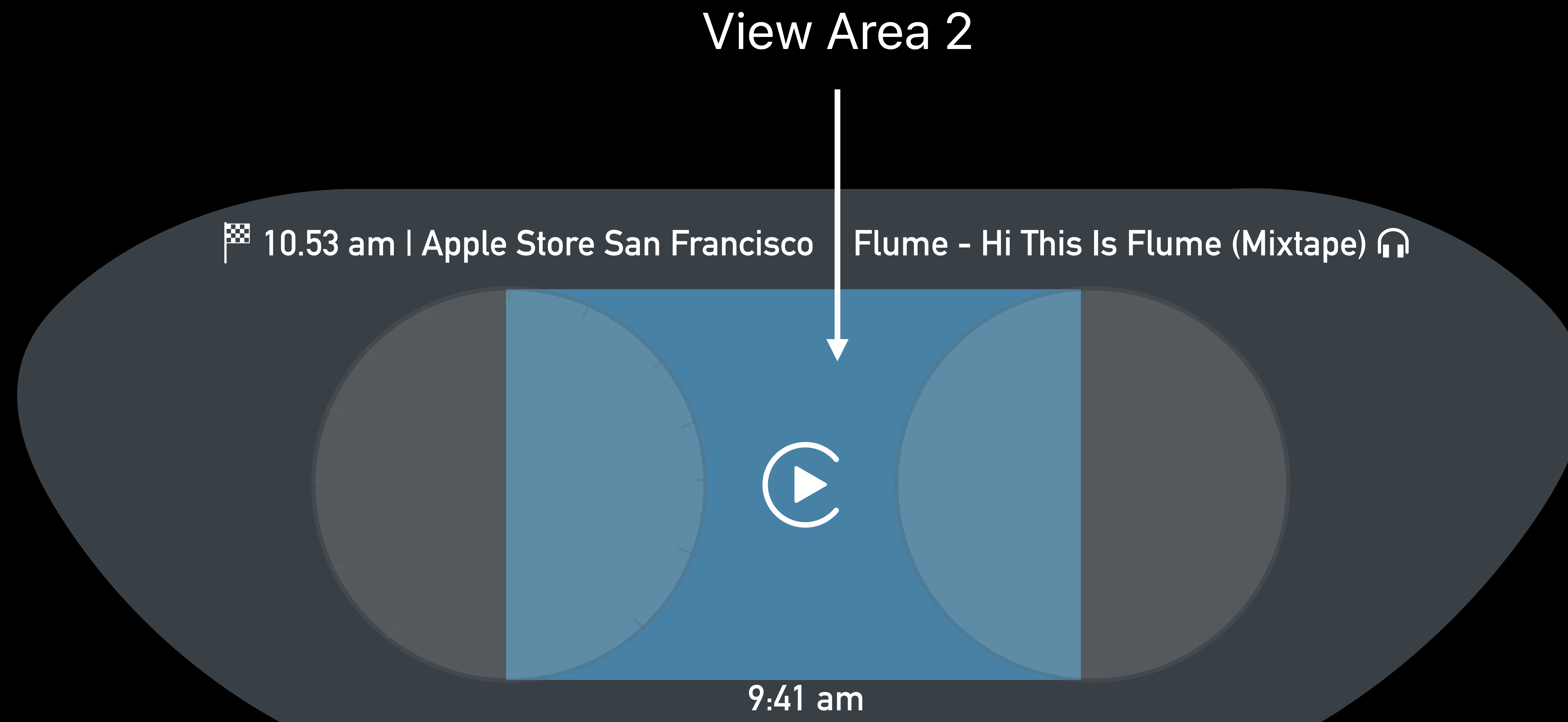
Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface



Instrument Cluster

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

Available for center console and instrument cluster displays

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

Available for center console and instrument cluster displays

CarPlay-provided button on center console allows user to trigger resize

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

Available for center console and instrument cluster displays

CarPlay-provided button on center console allows user to trigger resize

Specify duration of the transition

Dynamic Screen Sizes

Dynamically change the size of the CarPlay user interface

Available for center console and instrument cluster displays

CarPlay-provided button on center console allows user to trigger resize

Specify duration of the transition

Synchronize visual transitions between native and CarPlay UI

Irregularly shaped display support

Second screen support

Dynamic screen sizes

Hey Siri

Irregularly shaped display support

Second screen support

Dynamic screen sizes

Hey Siri

Hey Siri

Hey Siri

Invoke Siri by simply using your voice

Hey Siri

Invoke Siri by simply using your voice

Siri activates instantaneously when using a button press

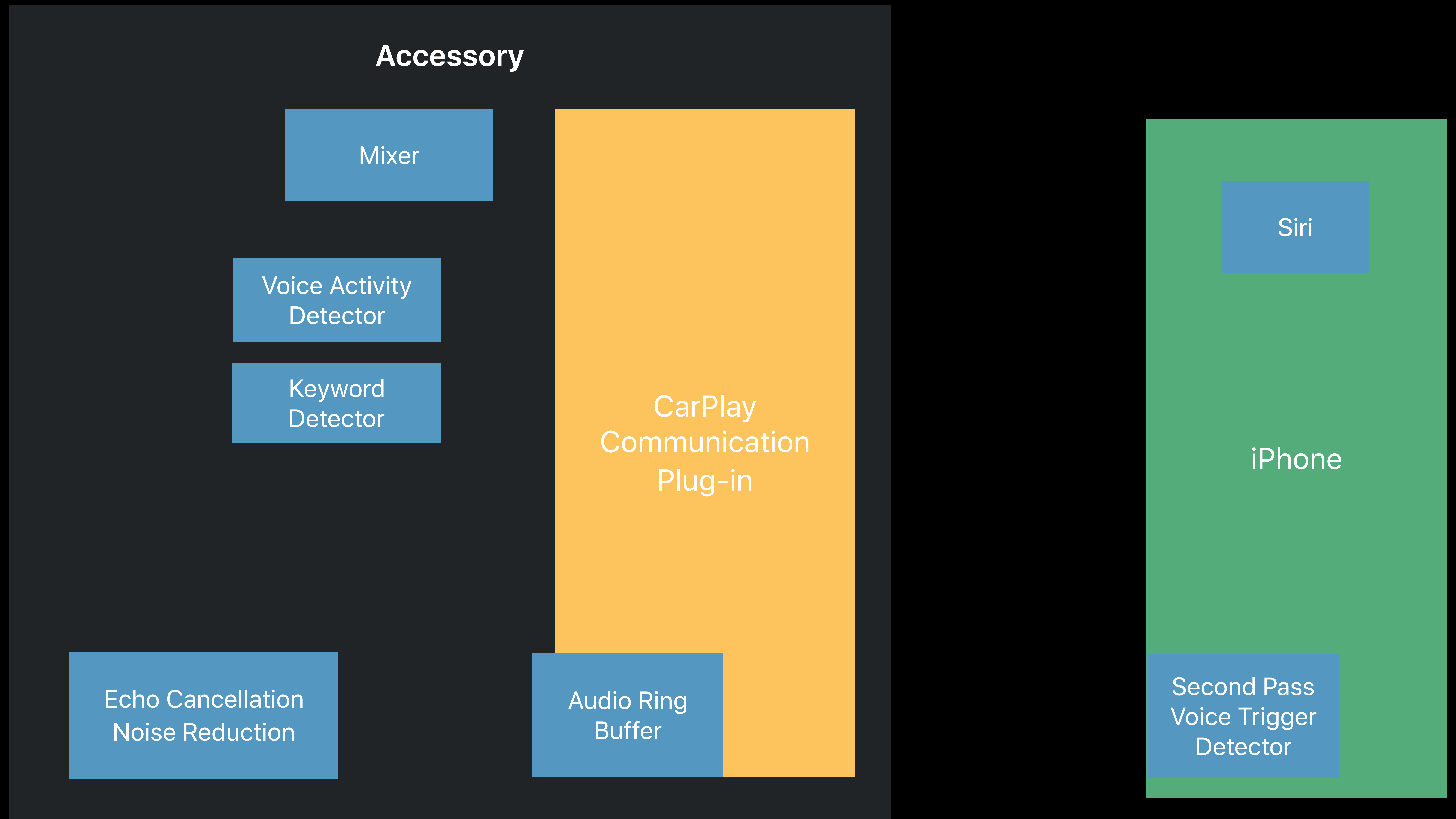
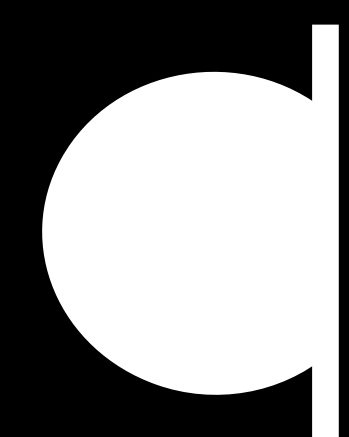
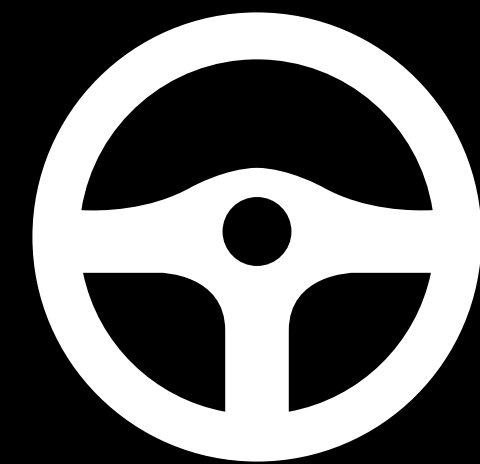
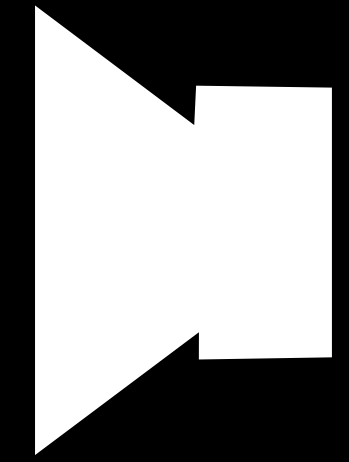
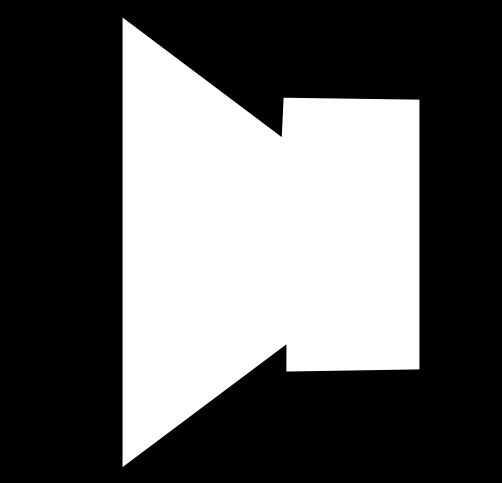
Hey Siri

Invoke Siri by simply using your voice

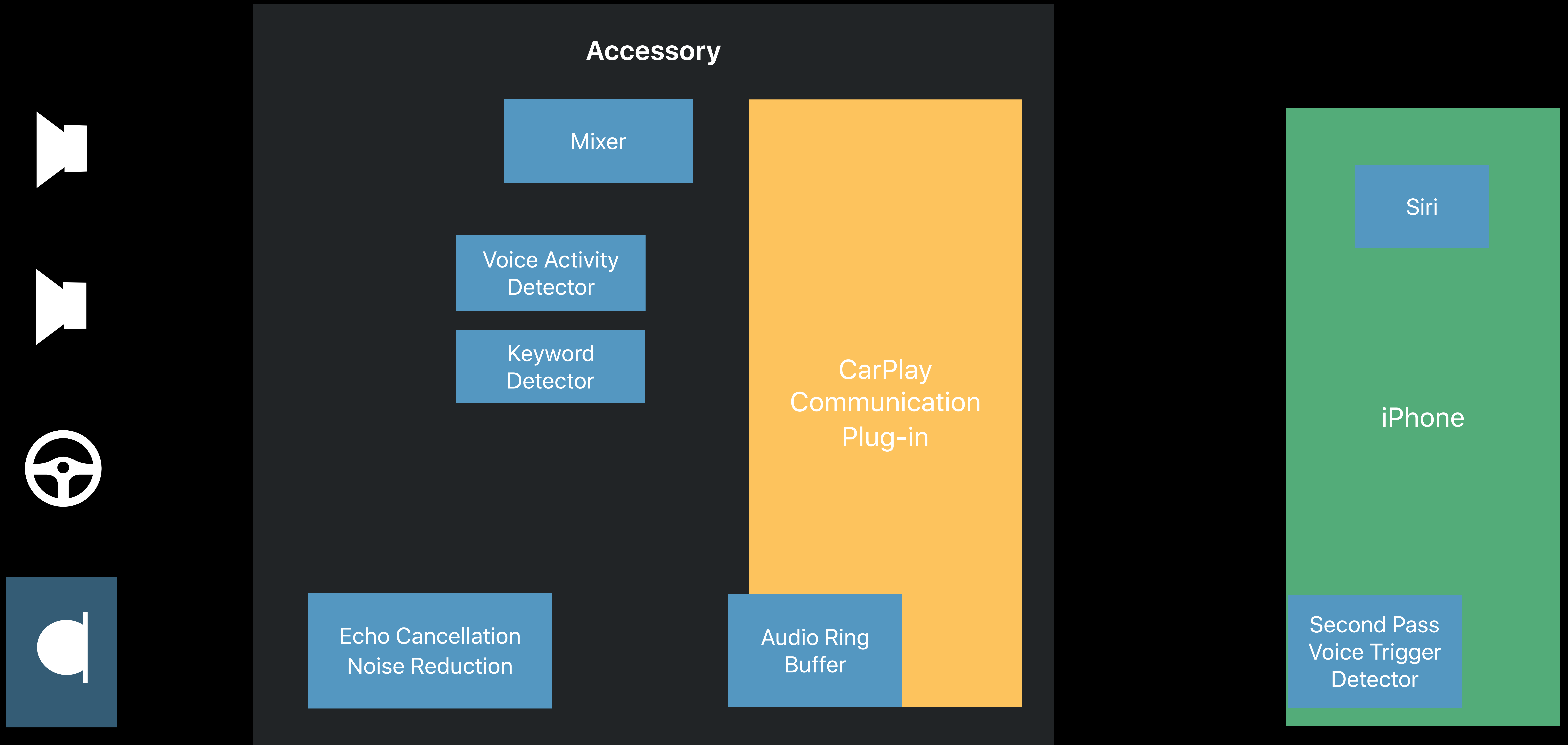
Siri activates instantaneously when using a button press

Continue listening to music while interacting with Siri

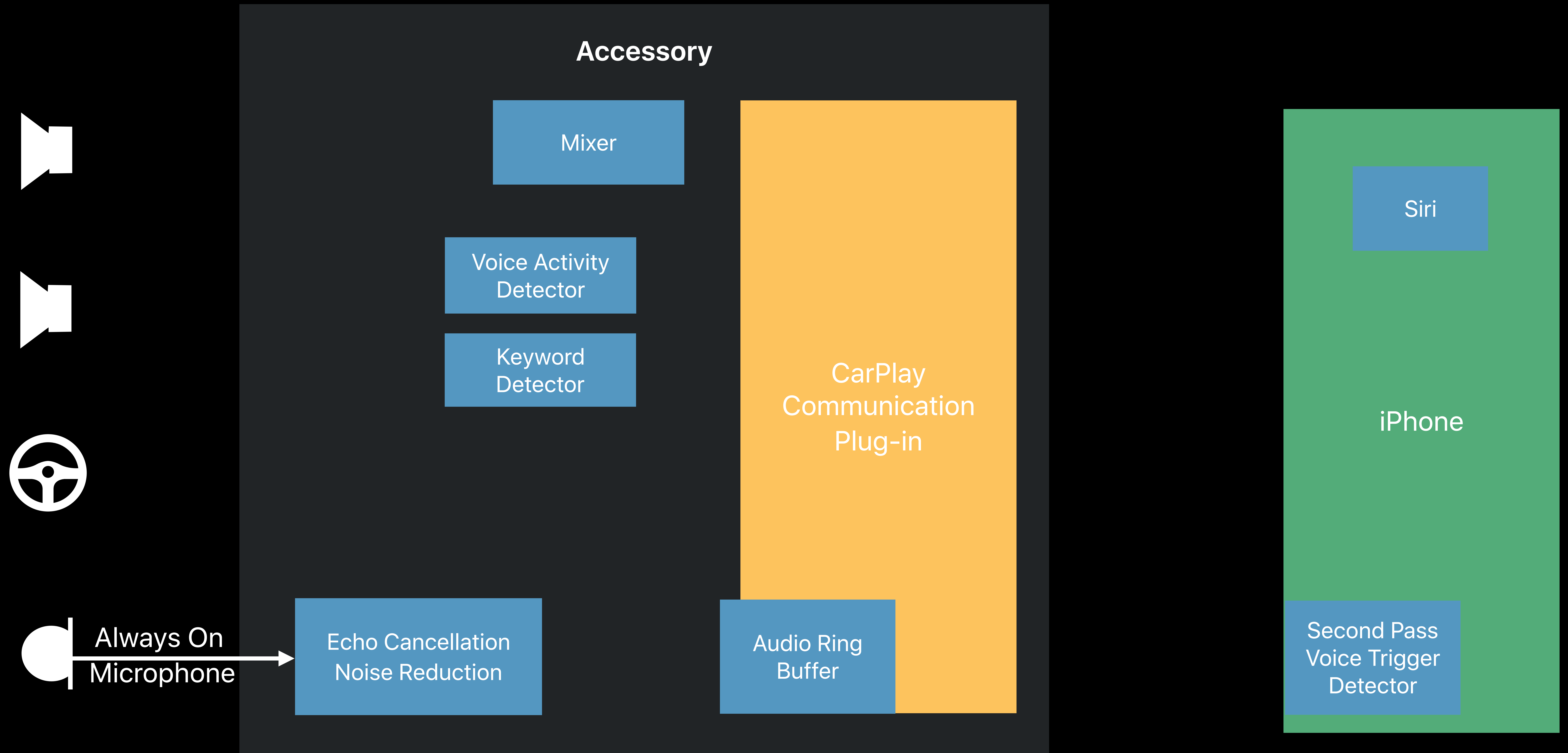
System Overview



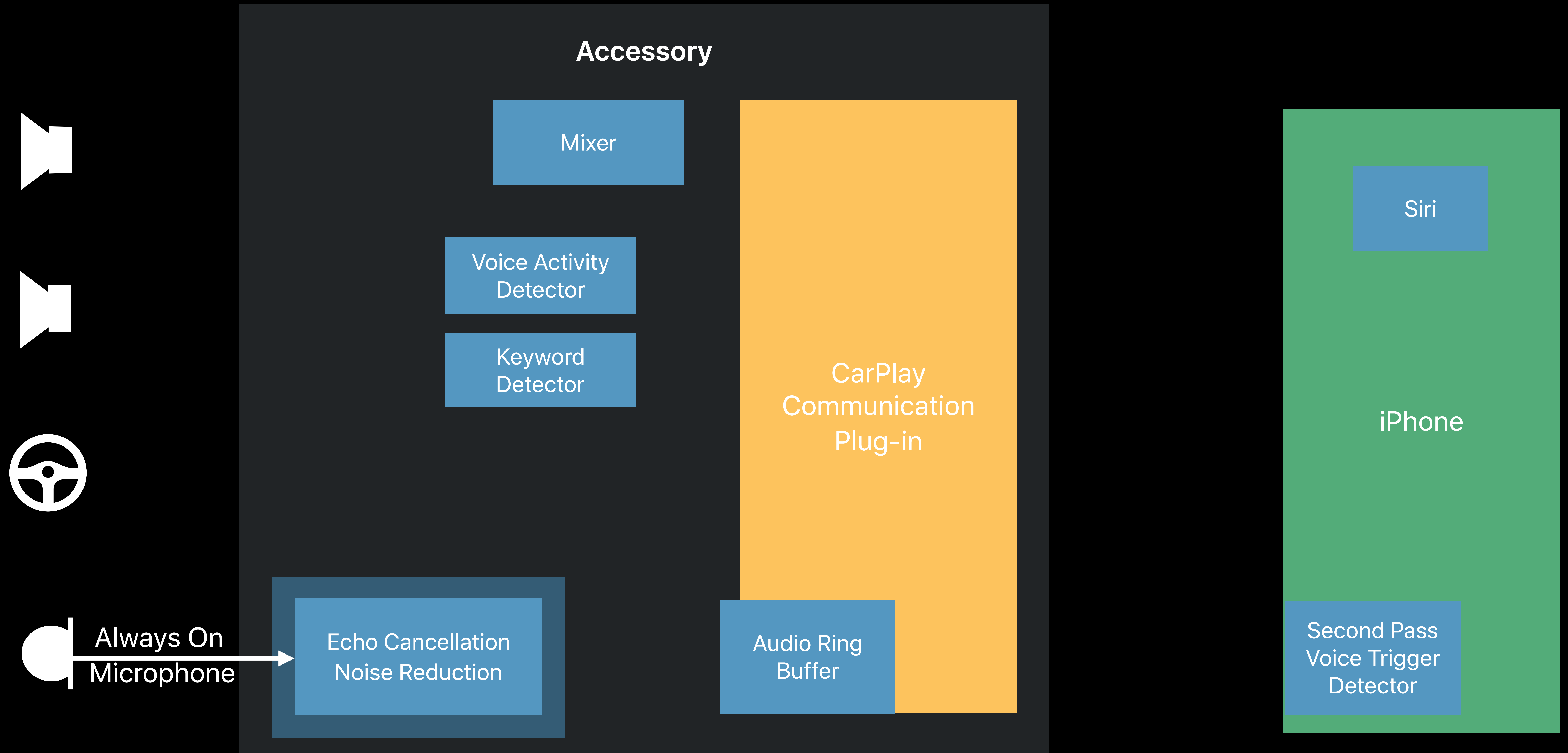
System Overview



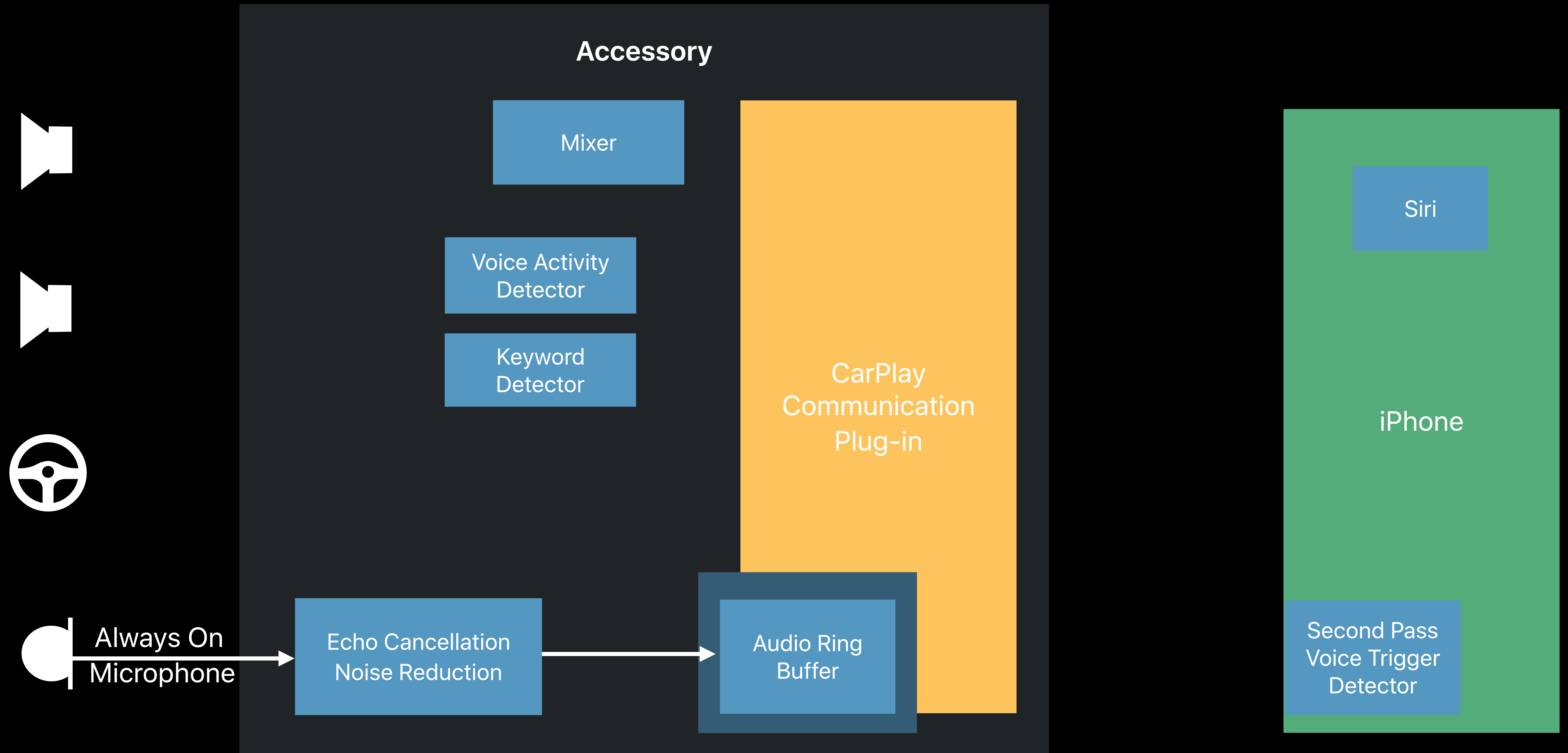
System Overview



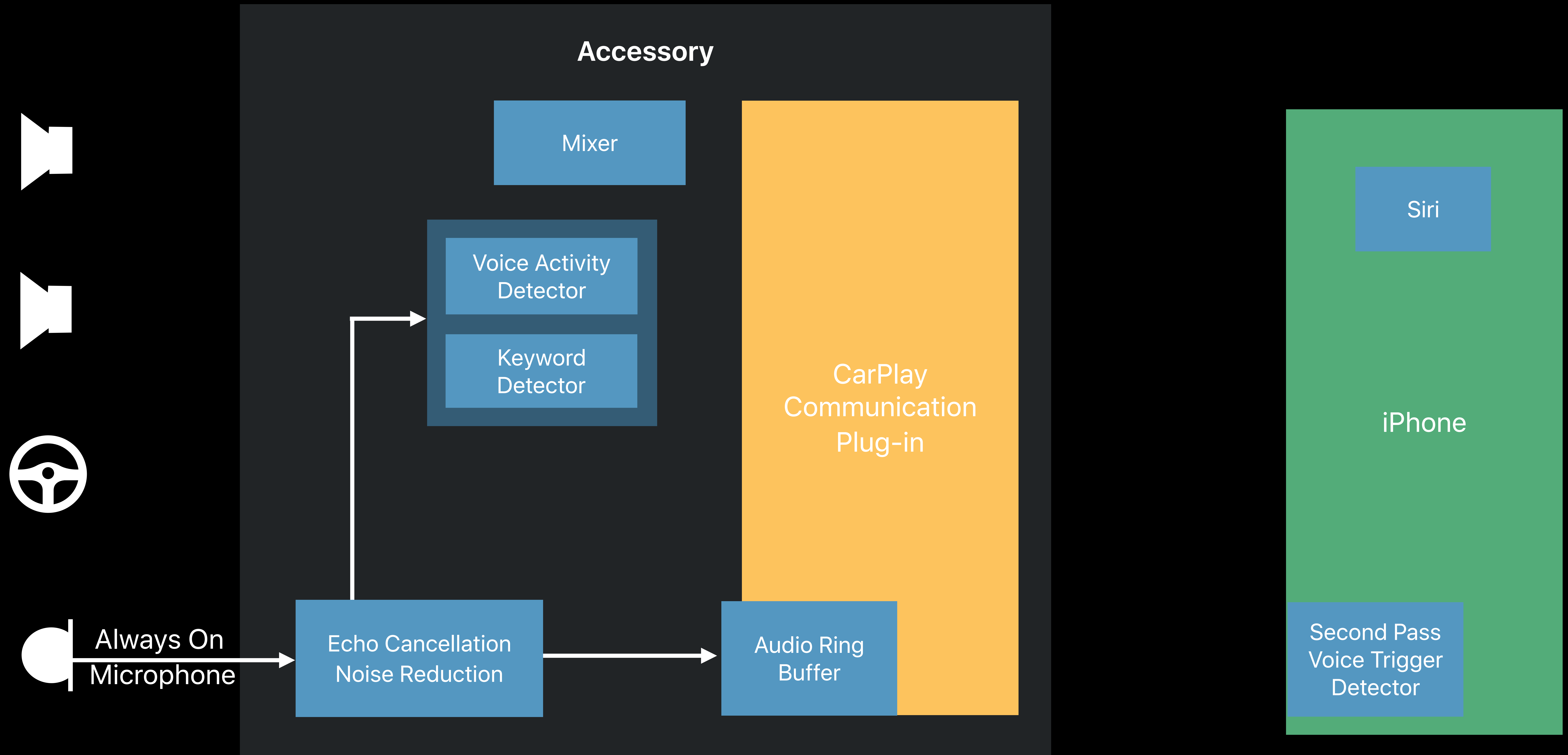
System Overview



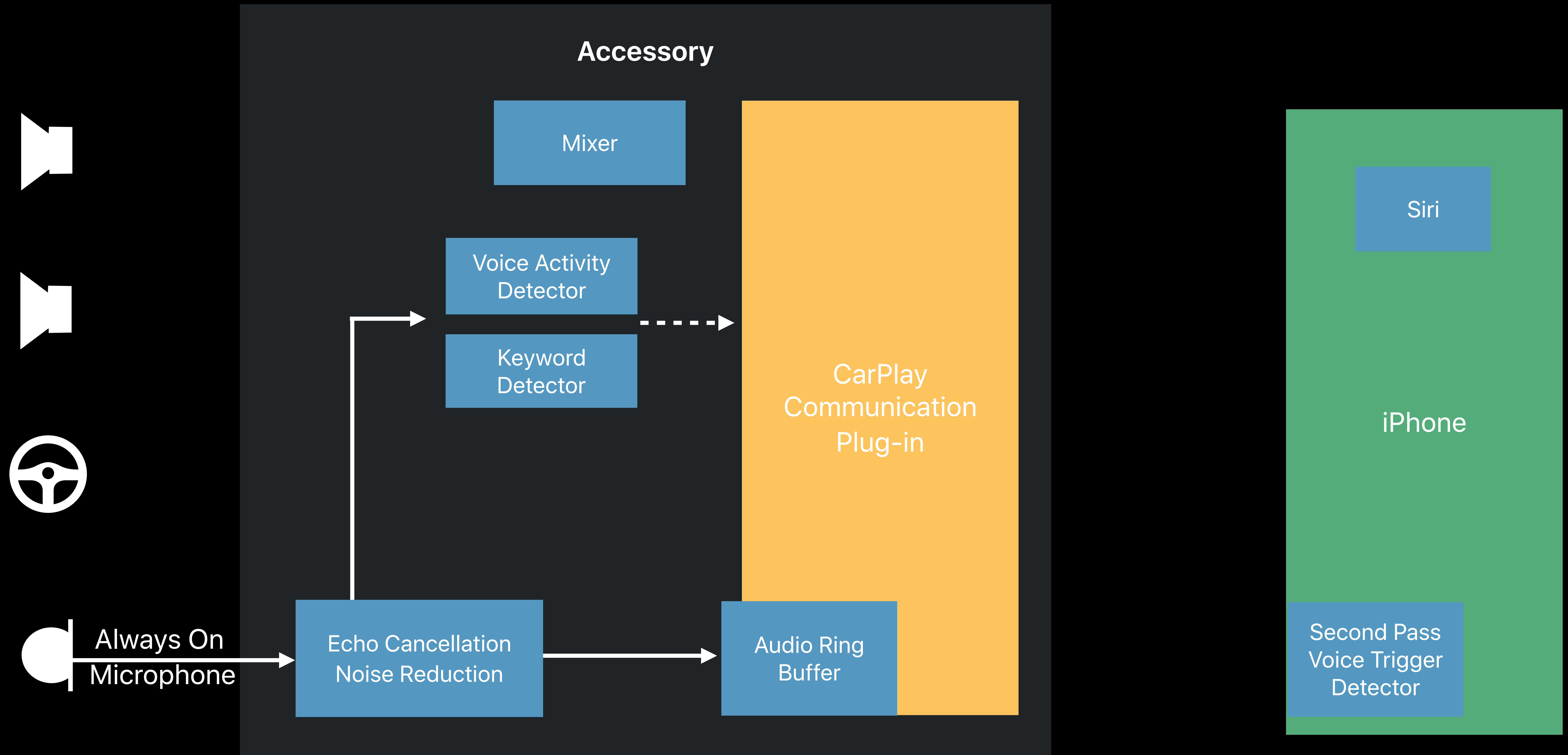
System Overview



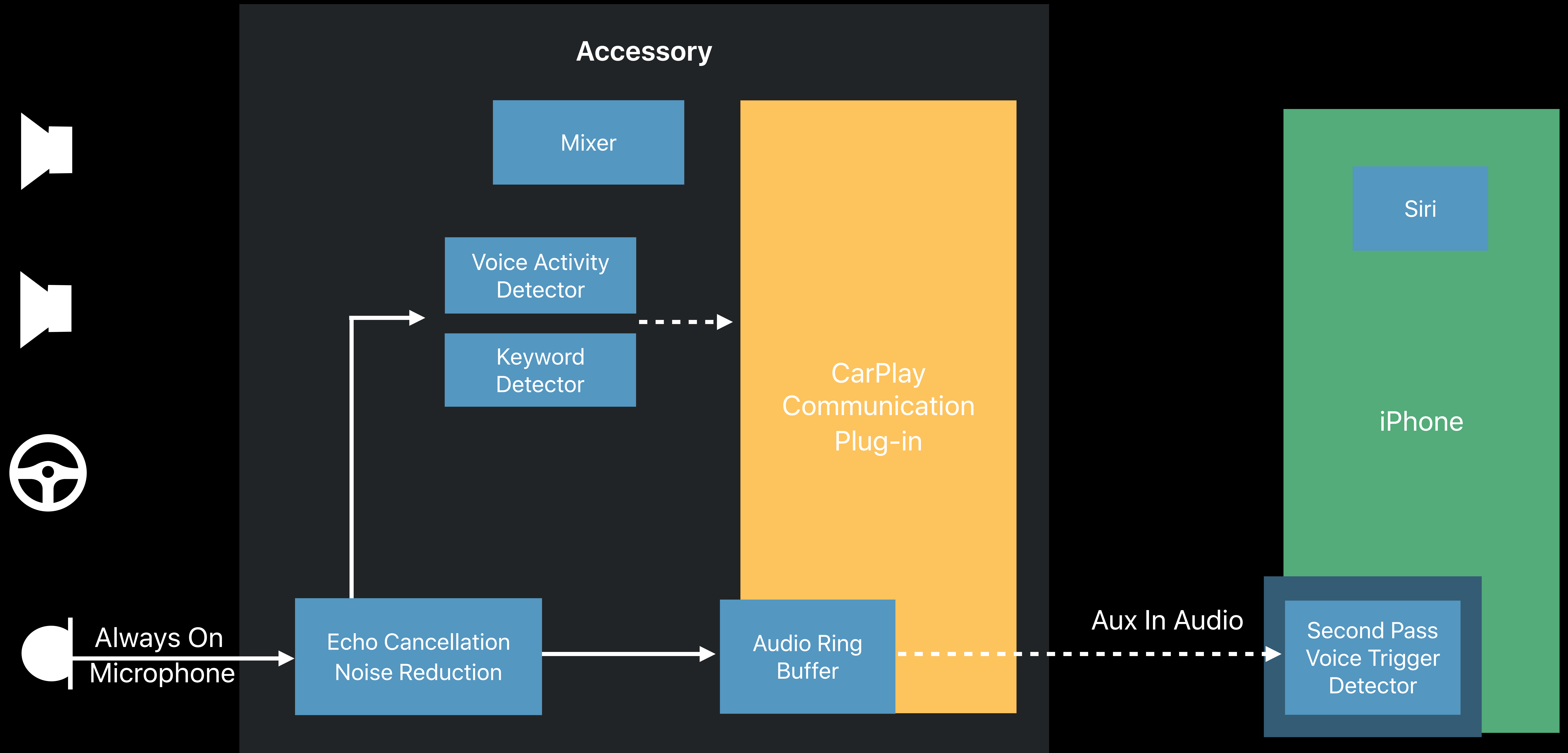
System Overview



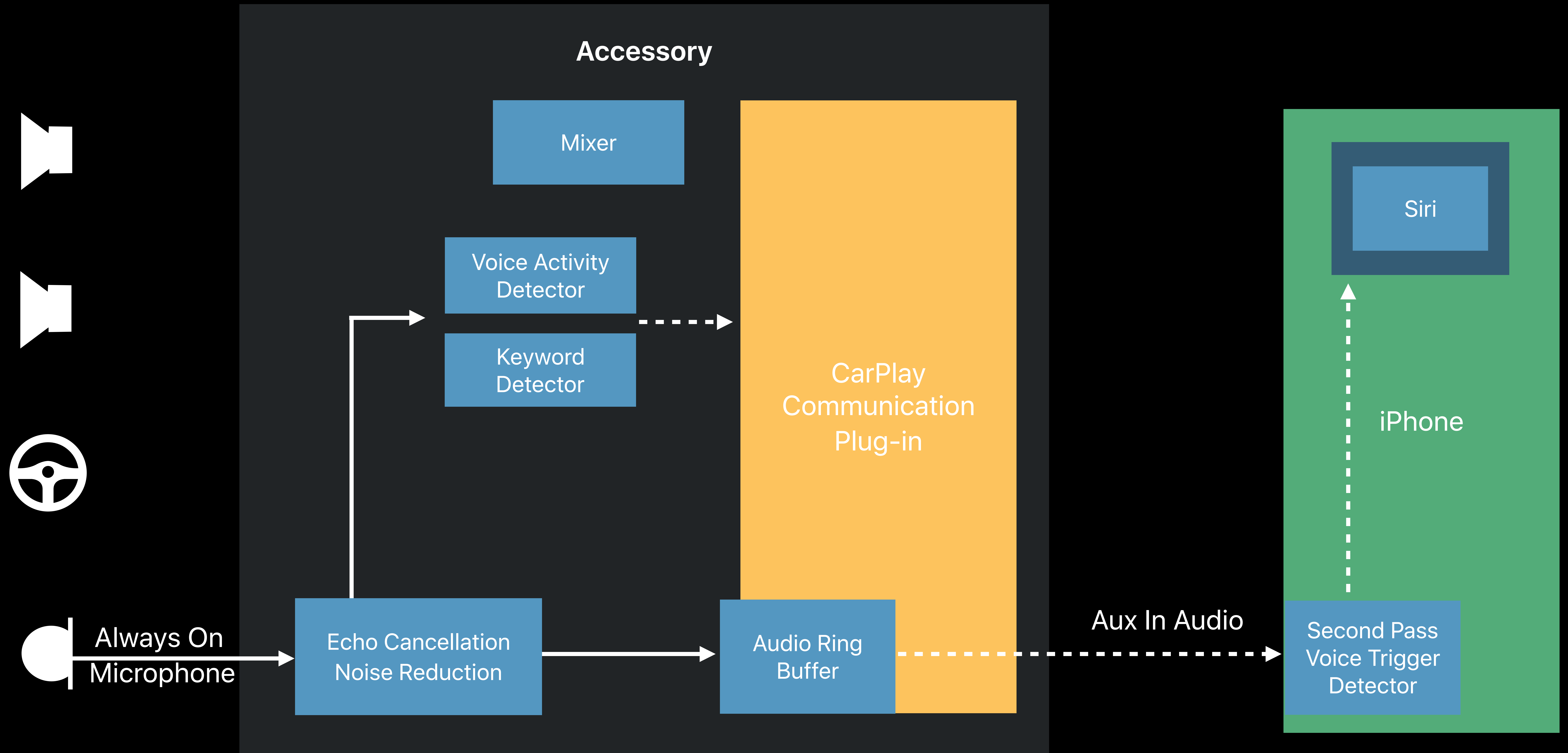
System Overview



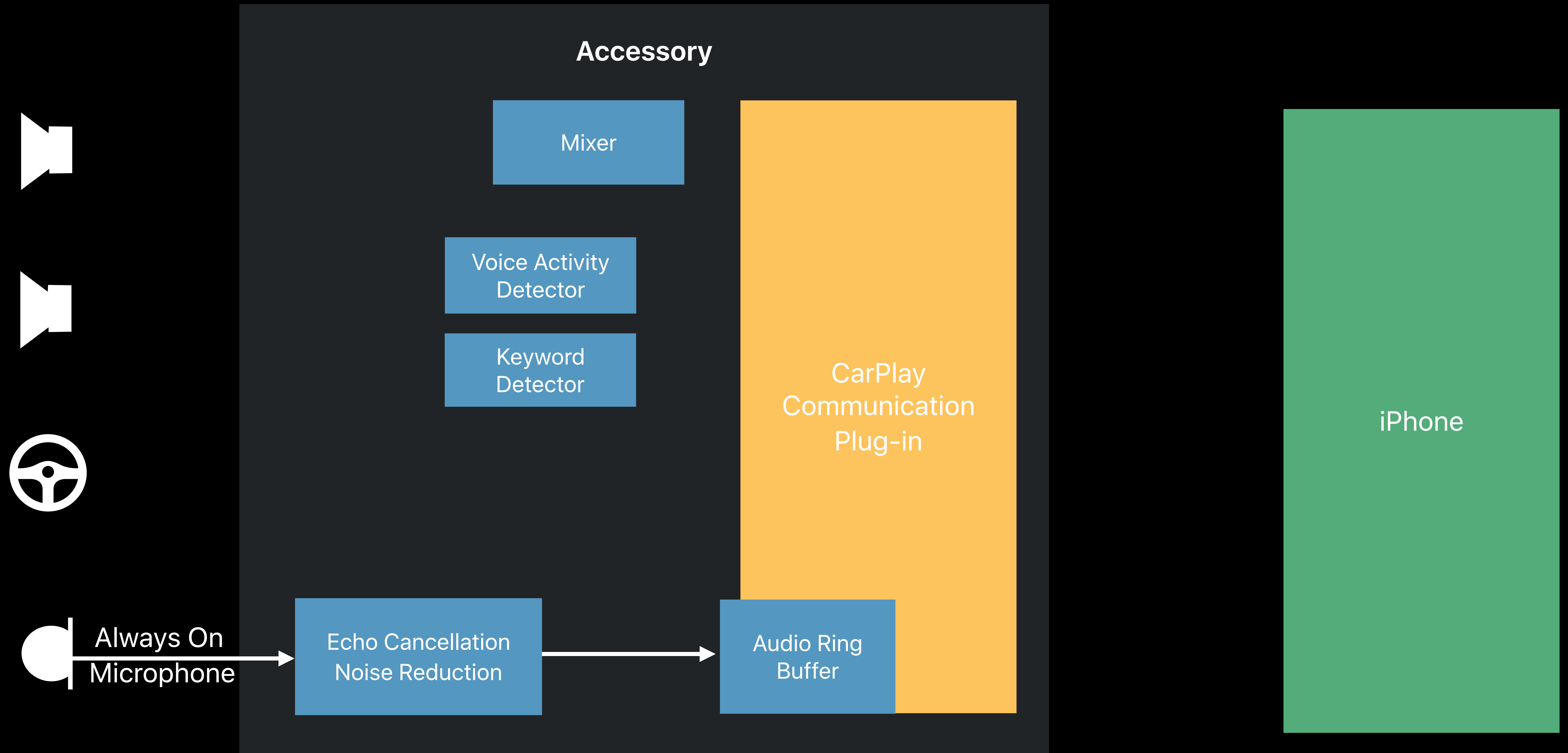
System Overview



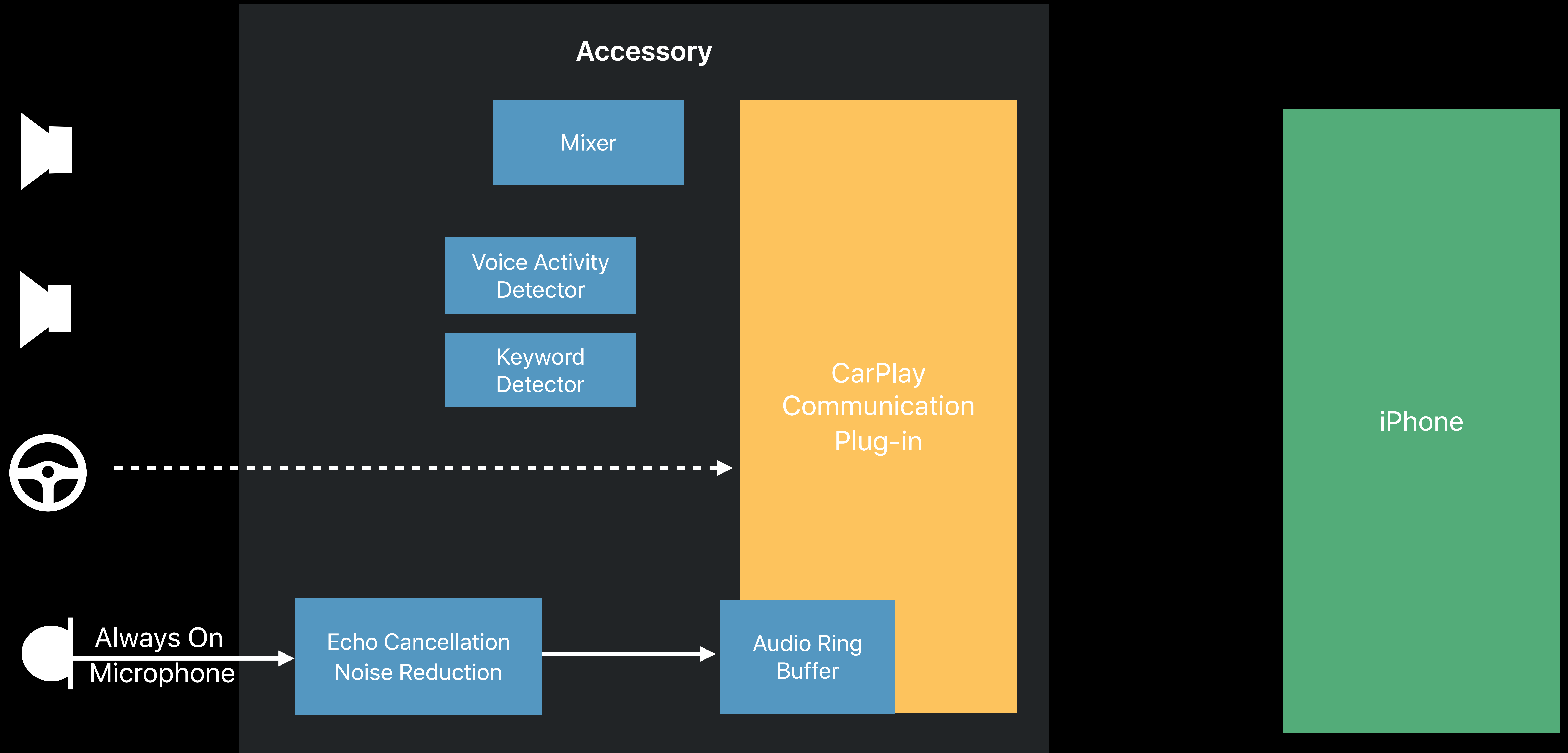
System Overview



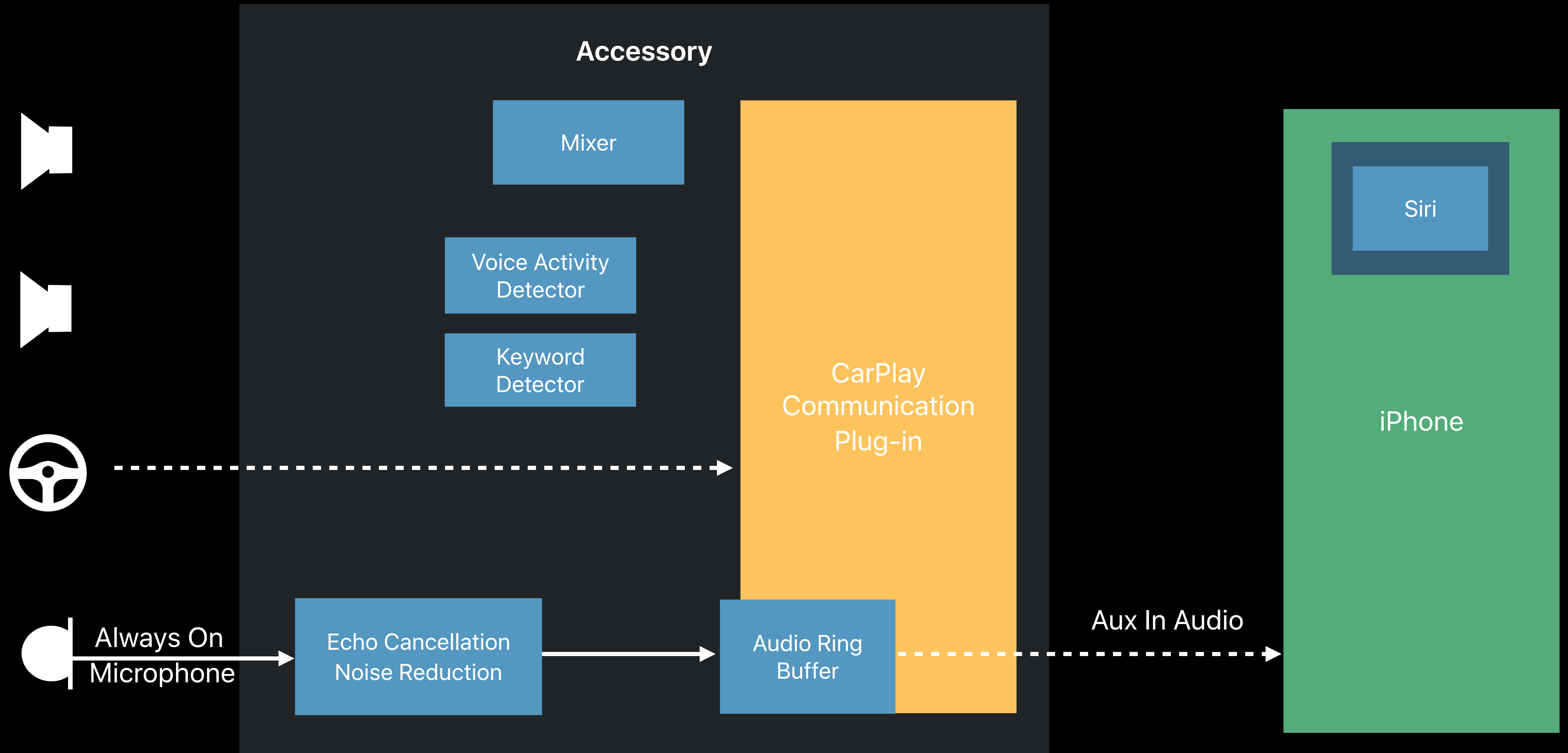
System Overview



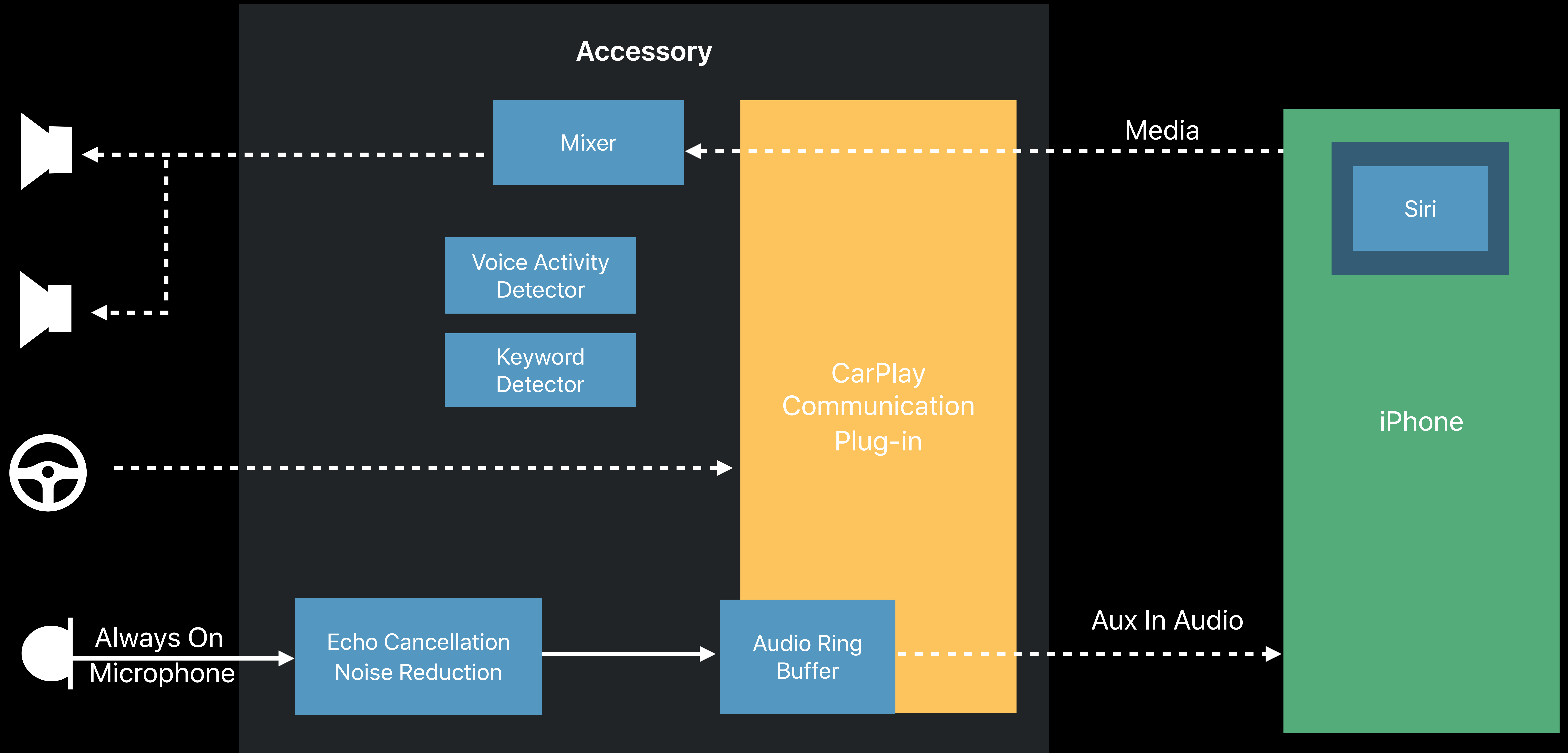
System Overview



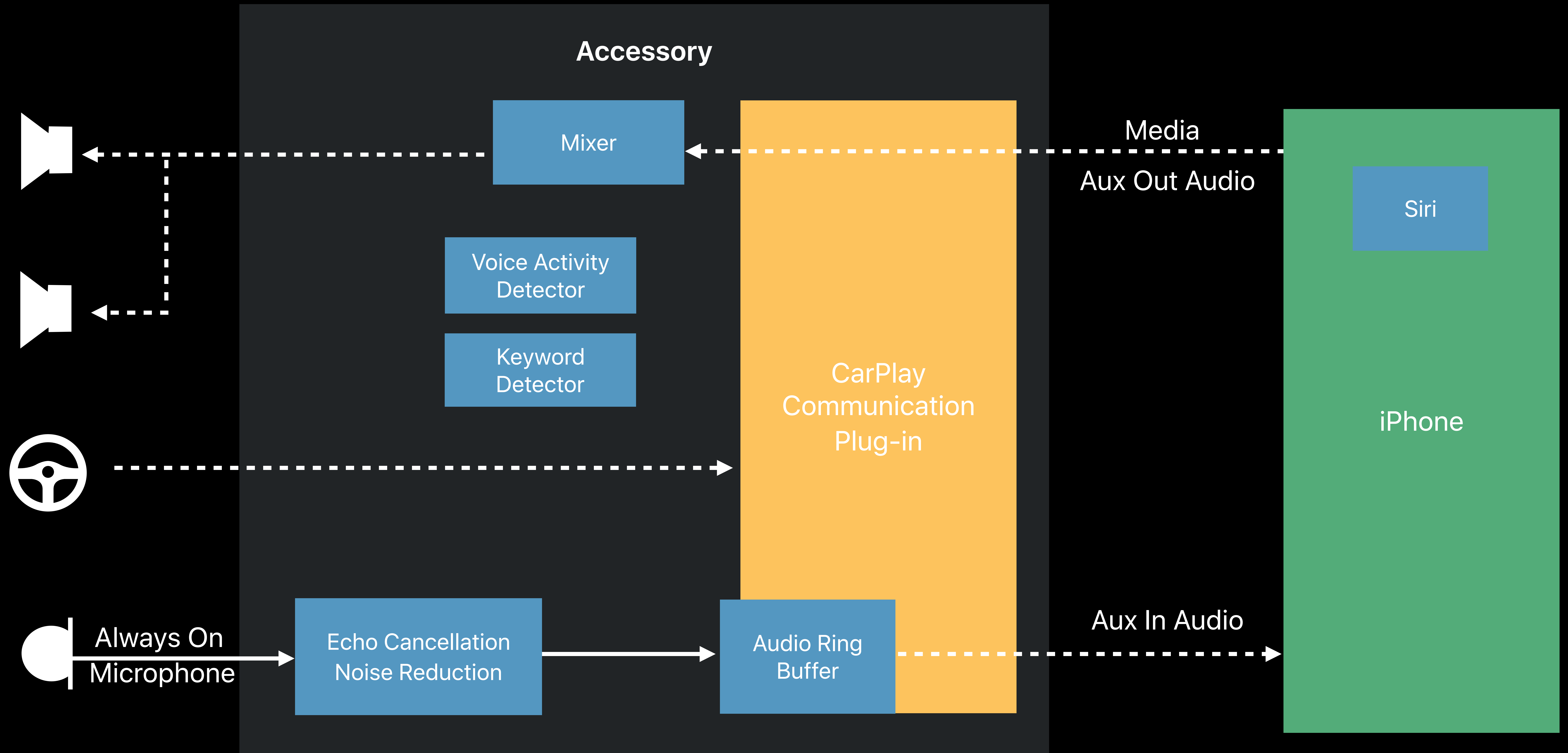
System Overview



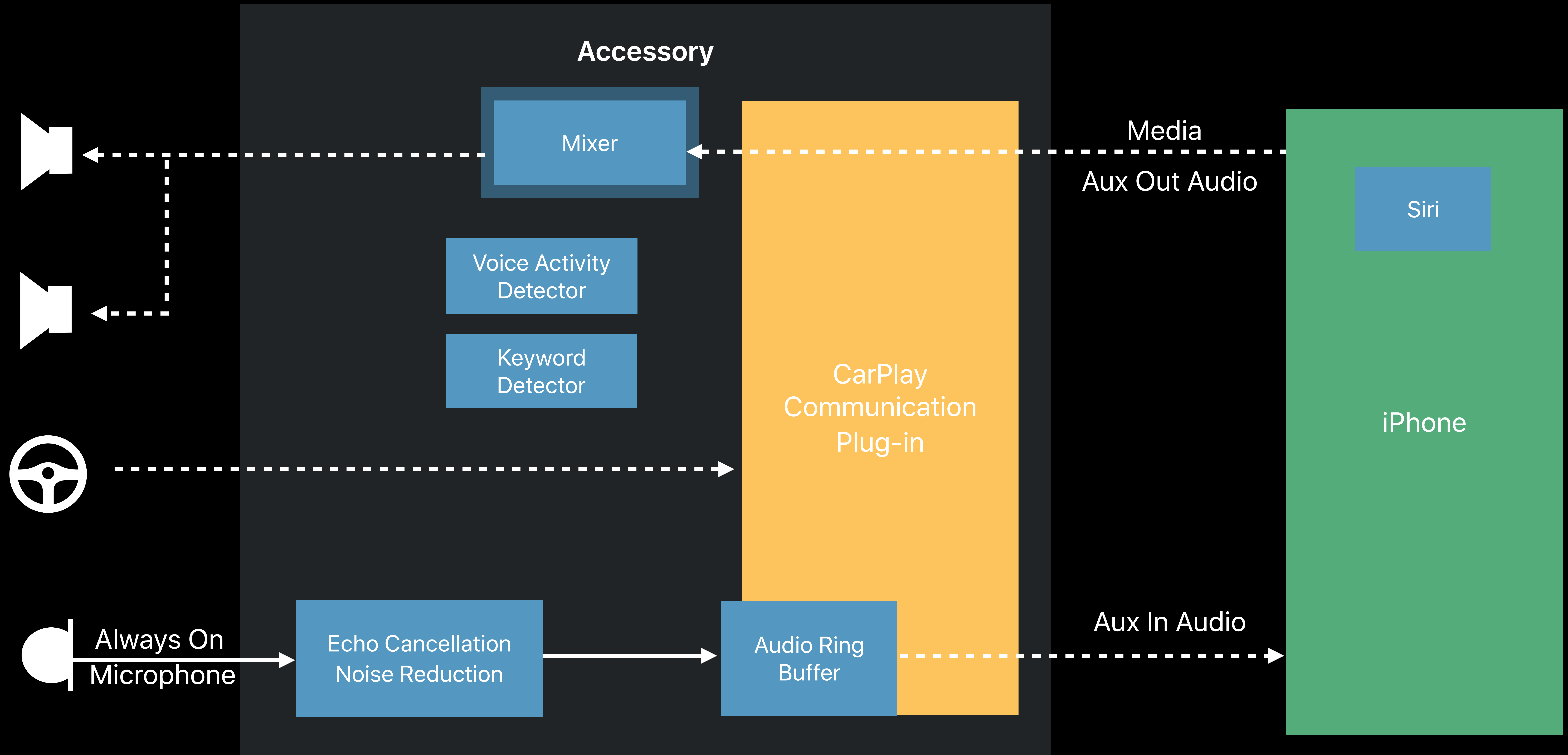
System Overview



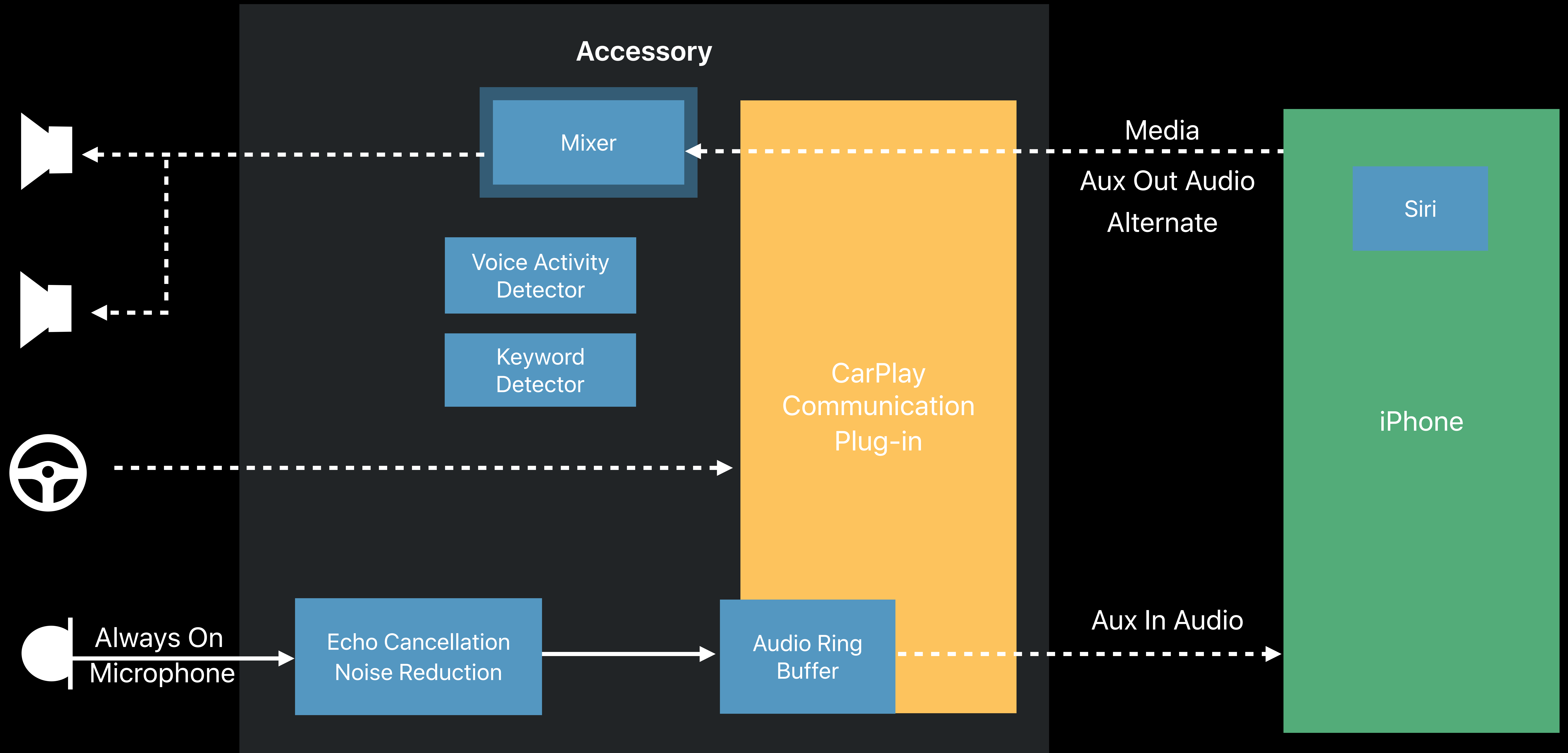
System Overview



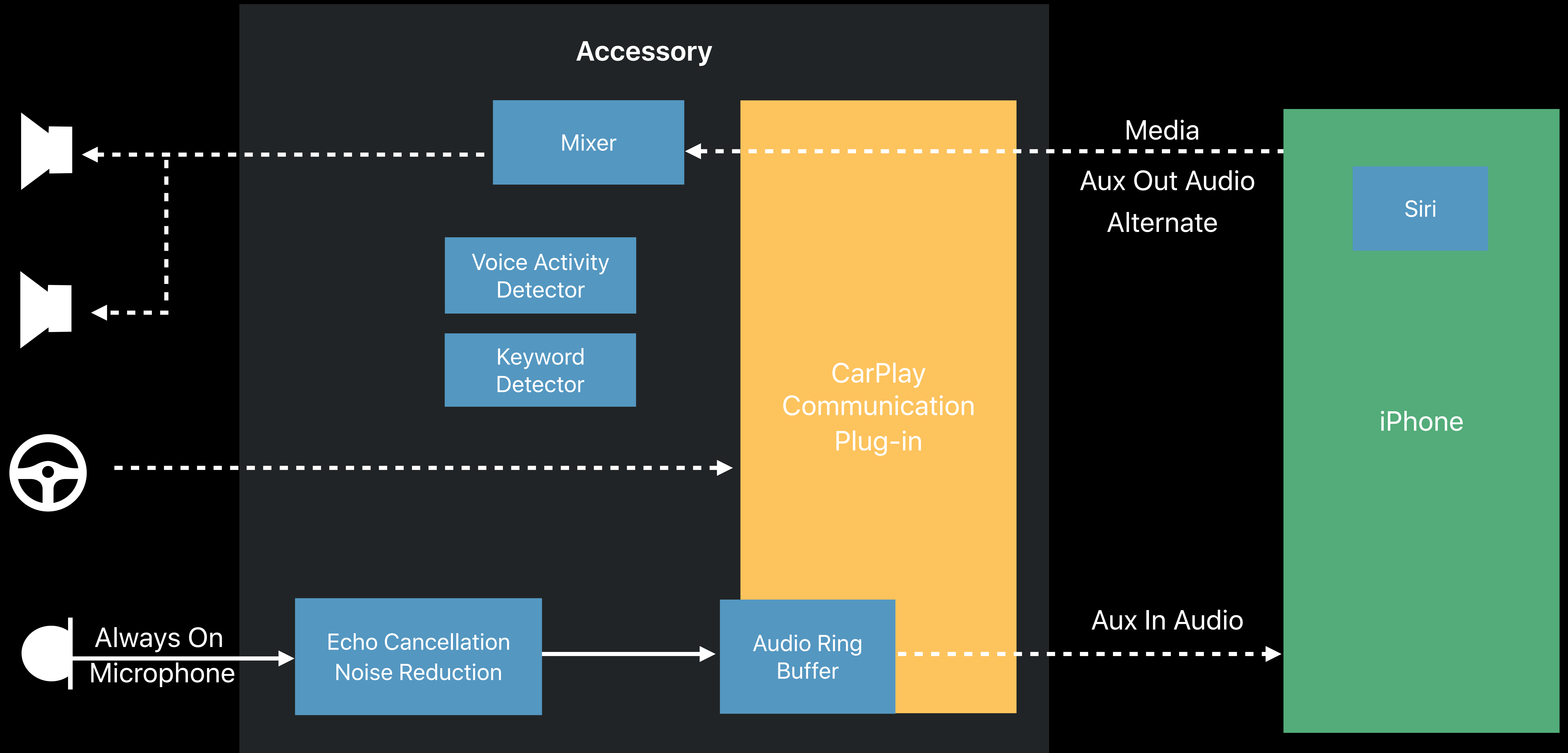
System Overview



System Overview



System Overview



Vehicle System Requirements

Vehicle System Requirements

Always on microphone input stream processed within the vehicle

Vehicle System Requirements

Always on microphone input stream processed within the vehicle

Continuous echo cancellation and noise reduction

Vehicle System Requirements

Always on microphone input stream processed within the vehicle

Continuous echo cancellation and noise reduction

Voice activity detector

Vehicle System Requirements

Always on microphone input stream processed within the vehicle

Continuous echo cancellation and noise reduction

Voice activity detector

Keyword detector

Vehicle System Requirements

Always on microphone input stream processed within the vehicle

Continuous echo cancellation and noise reduction

Voice activity detector

Keyword detector

Audio mixer for Siri audio, media playback, and navigation prompts

More Information

developer.apple.com/wwdc19/252

