

What's New in Location Technologies

Clarity and control

Session 713

Brad Jensen, Software Engineer

API improvements

Authorization and usage reporting

Best practices

A Word of Warning

Experience with Core Location is assumed



CLGeocoder Improvements

NEW

CLGeocoder Improvements



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Updated to support Contacts framework

CLGeocoder Improvements



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- Geocode `CNPostalAddress`

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- Obtain a `CNPostalAddress` from a `CLPlacemark`

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Supports geocoding with a locale

CLGeocoder Improvements



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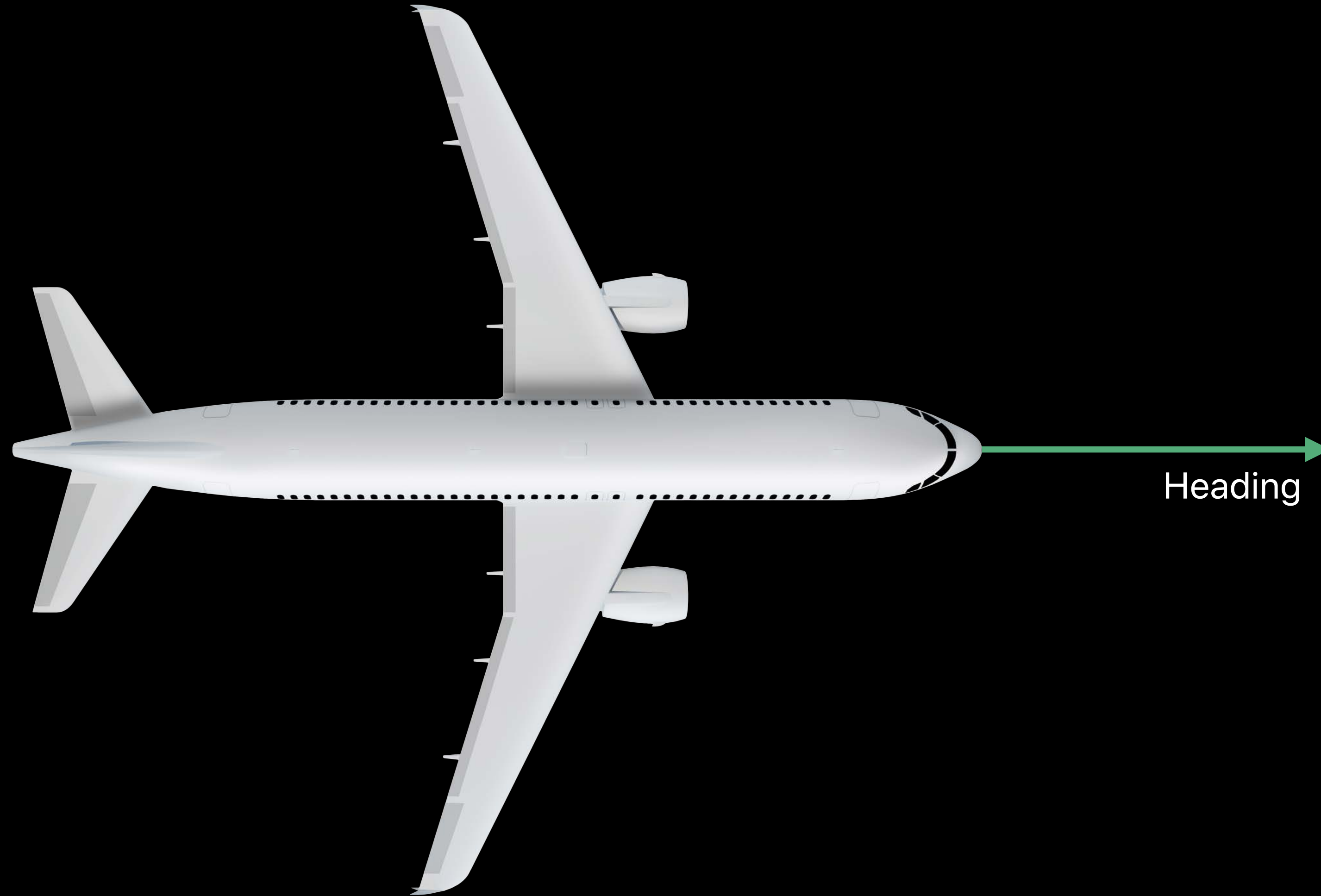
Supports geocoding with a locale

- Overrides user preference

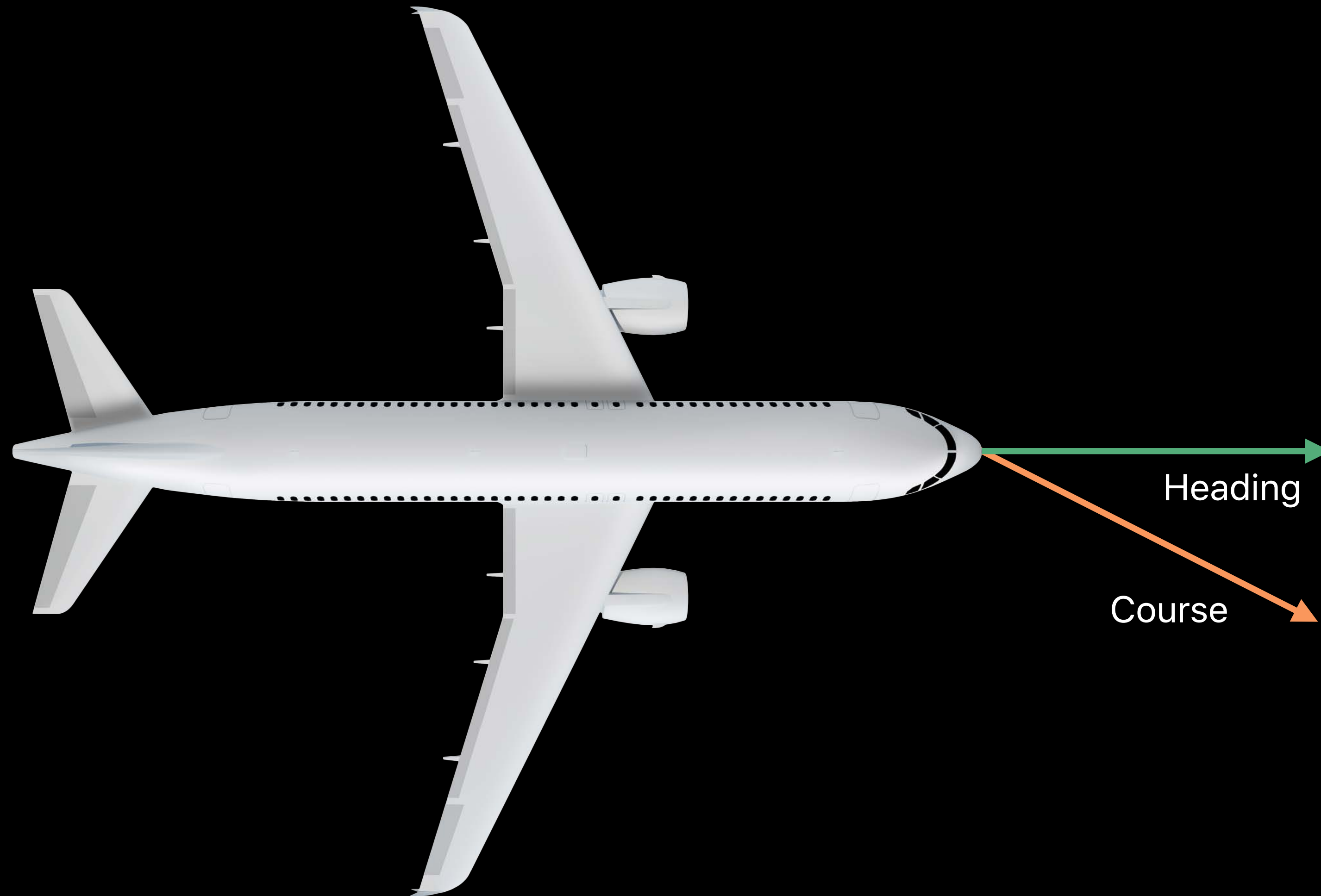
Heading vs. Course



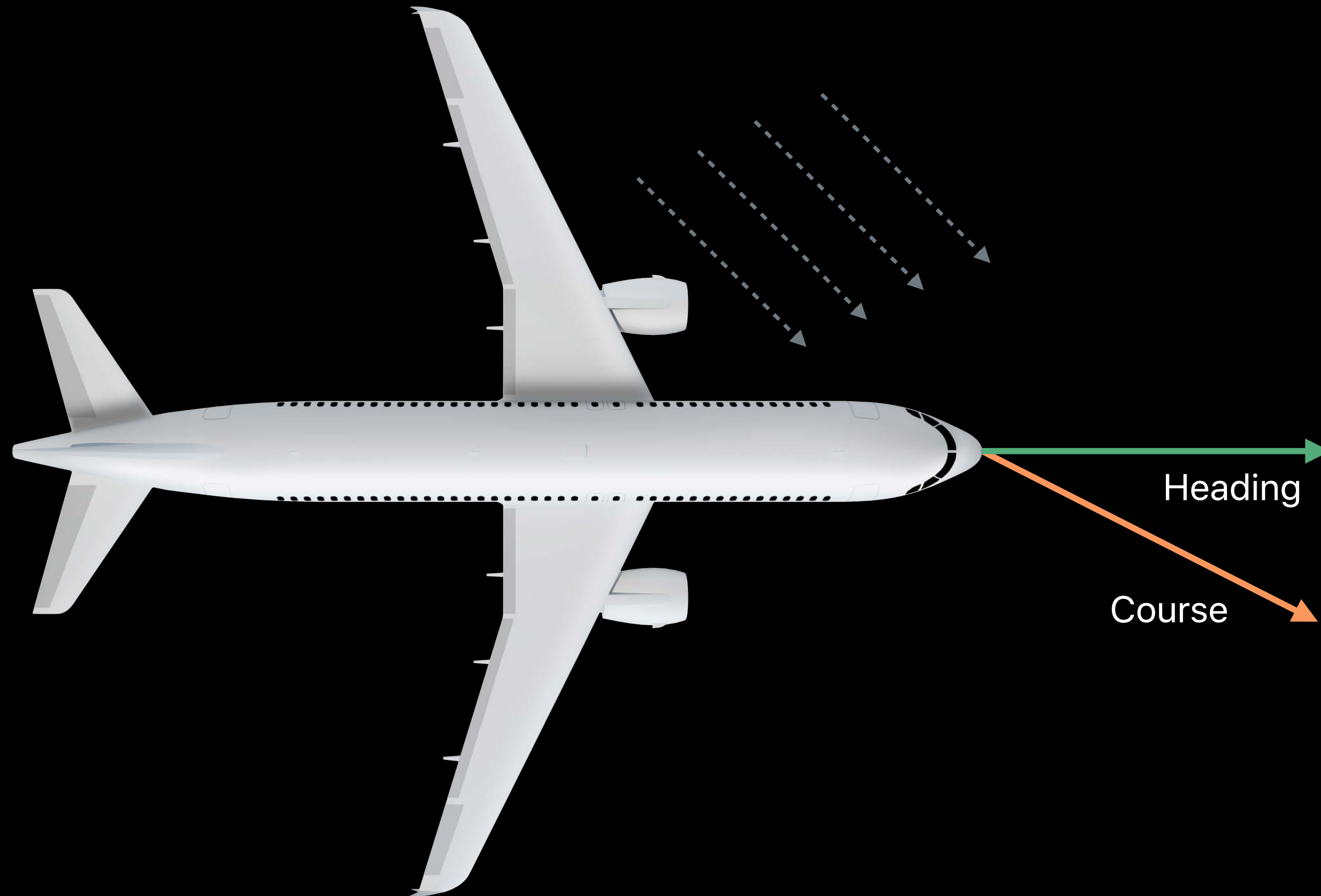
Heading vs. Course



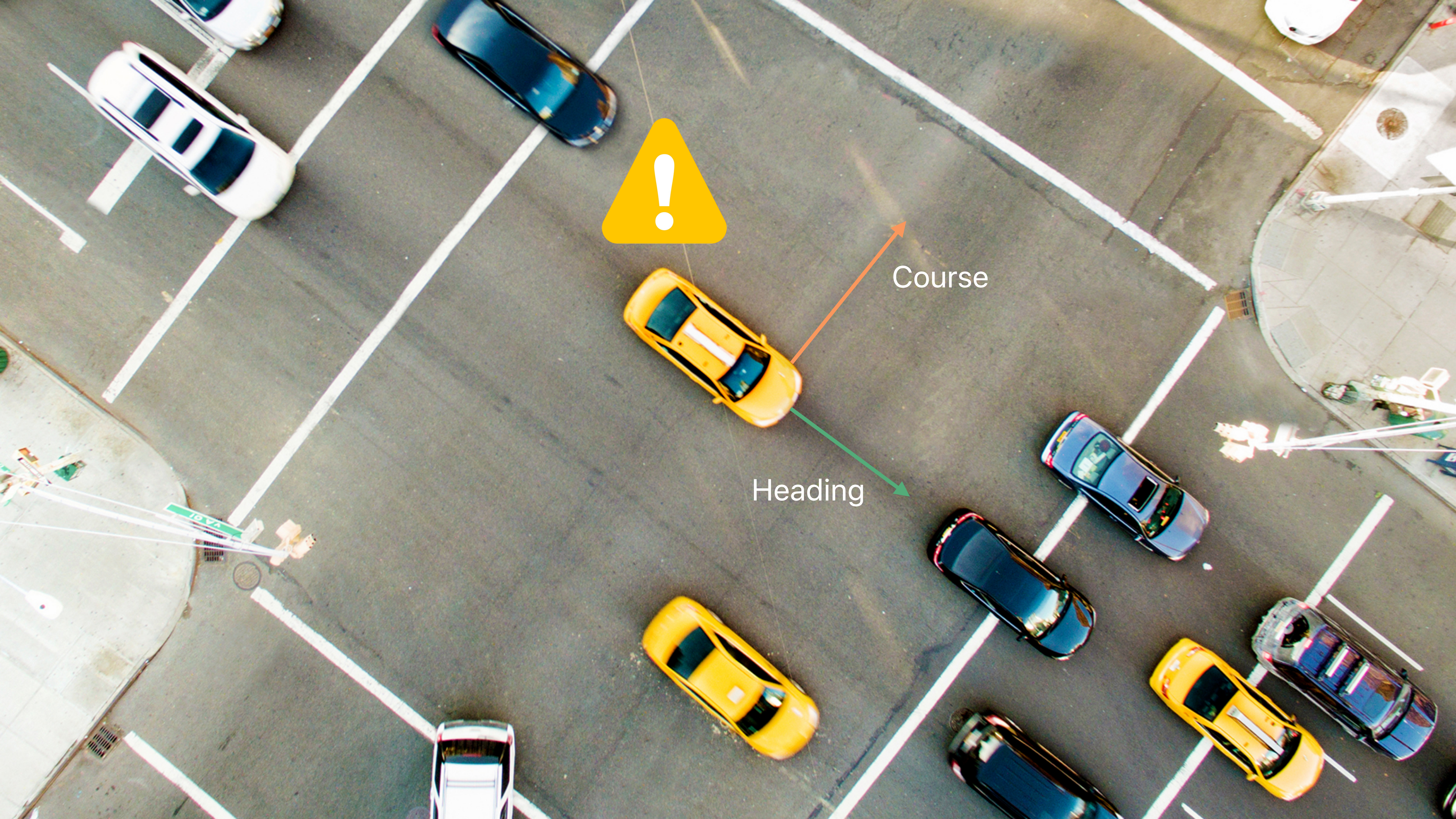
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Heading vs. Course



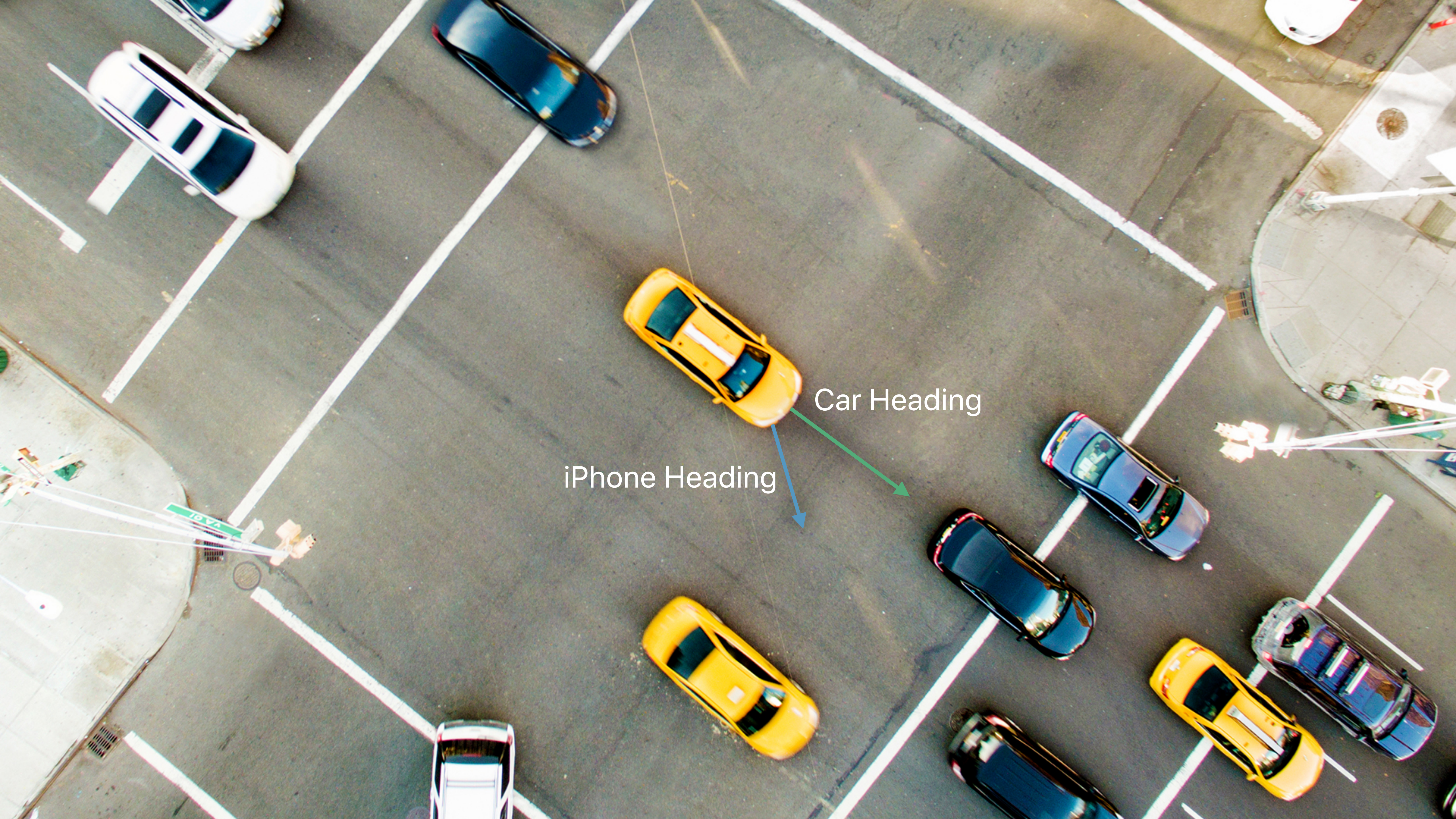




Course

Heading





Car Heading

iPhone Heading

Heading and Course

Better together

Heading and Course

Better together

Better heading estimates

Heading and Course

Better together

Better heading estimates

Fully automatic

Heading and Course

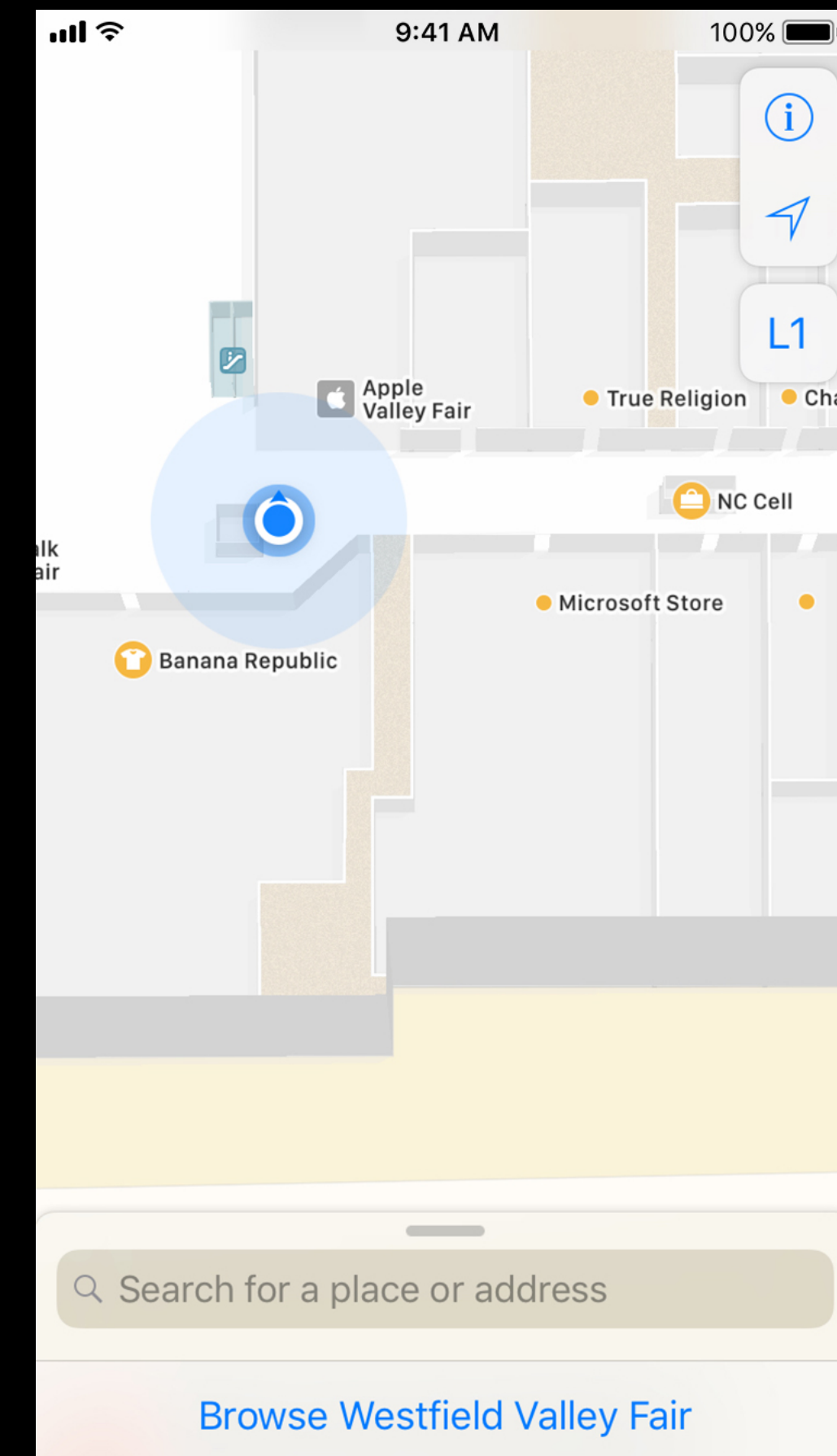
Better together

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Fully automatic

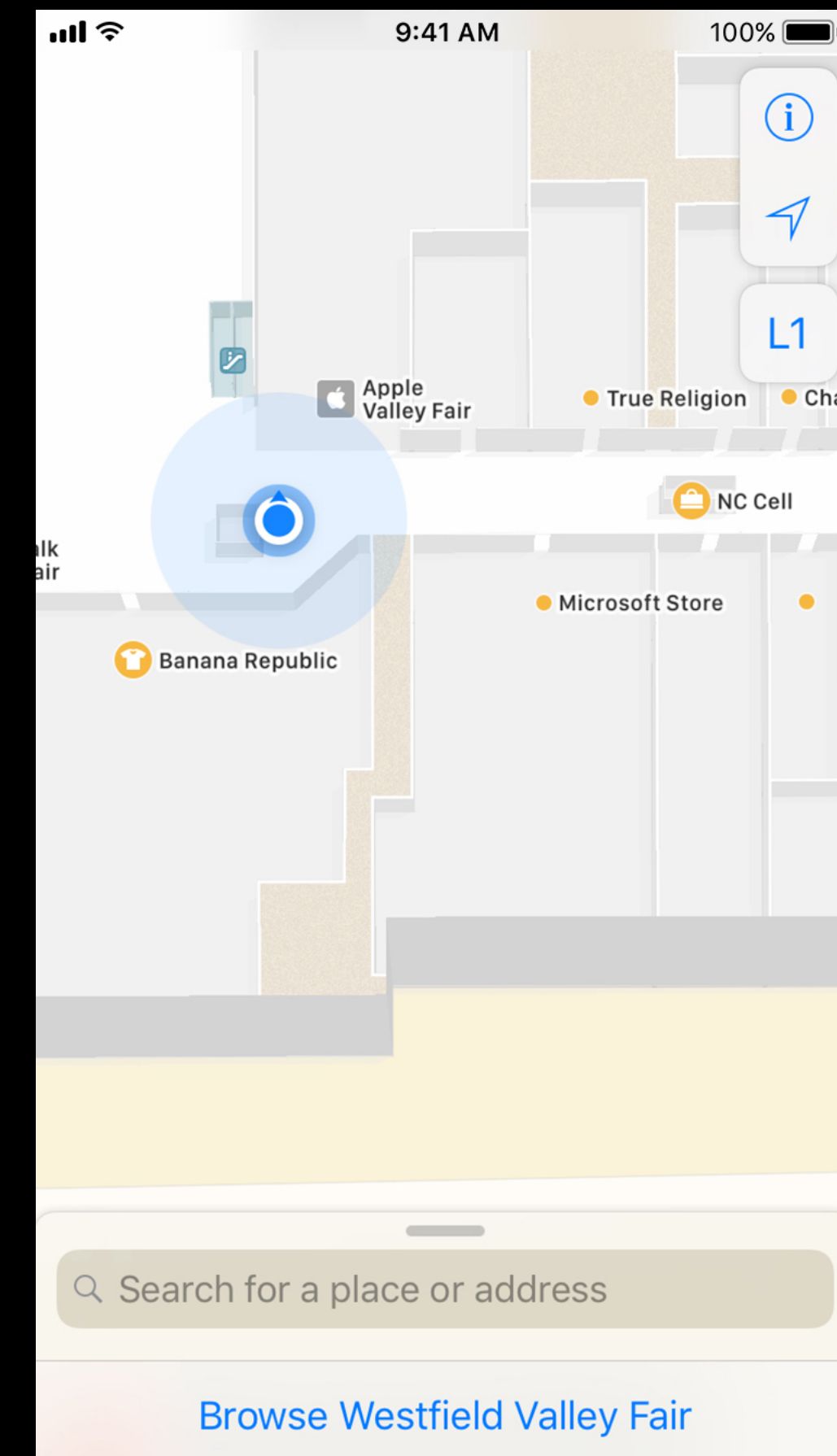
Use `CMDeviceMotion` for raw heading

Indoor Positioning Improvements



Indoor Positioning Improvements

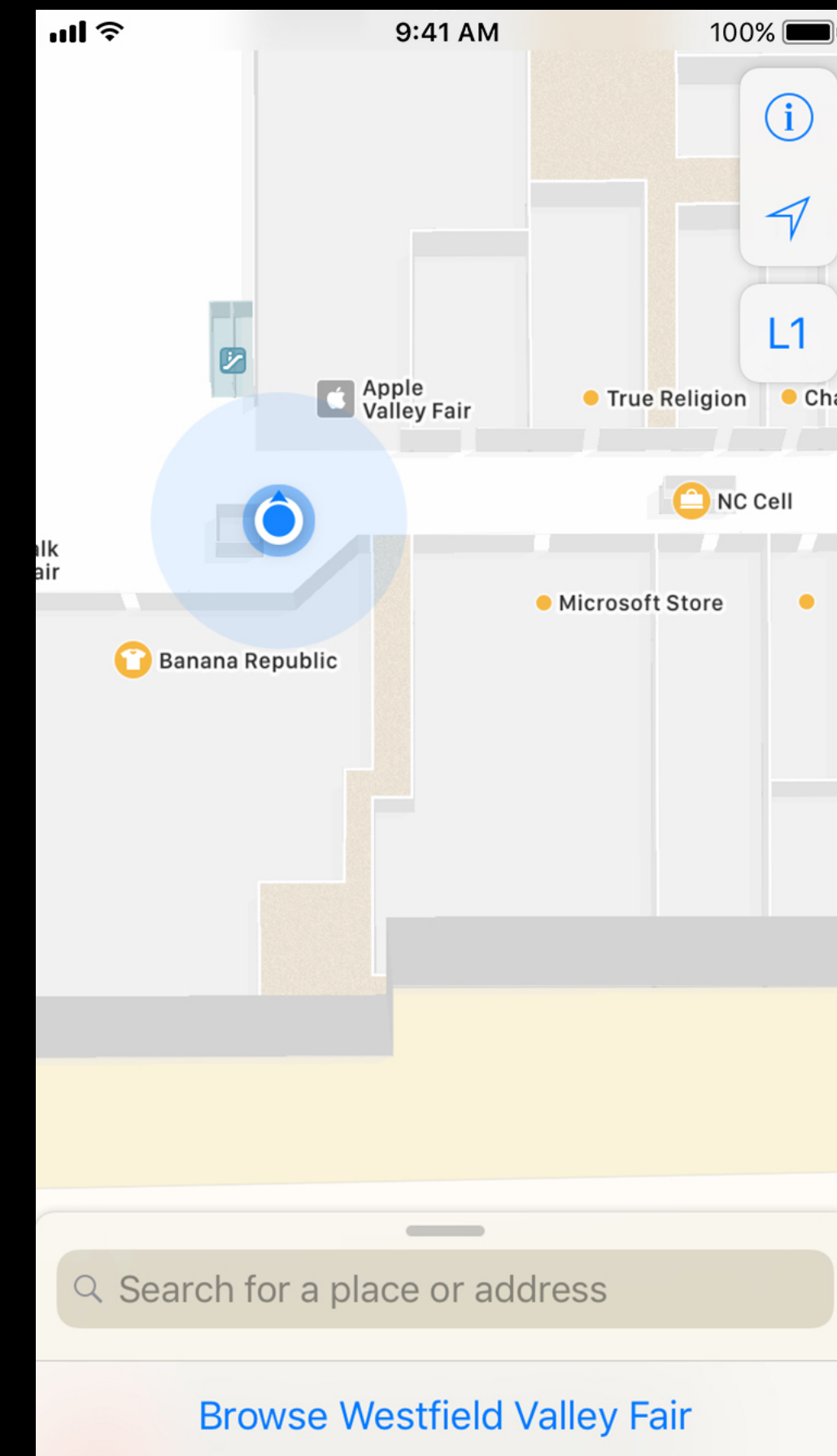
Accuracy



Indoor Positioning Improvements

Accuracy

Responsiveness

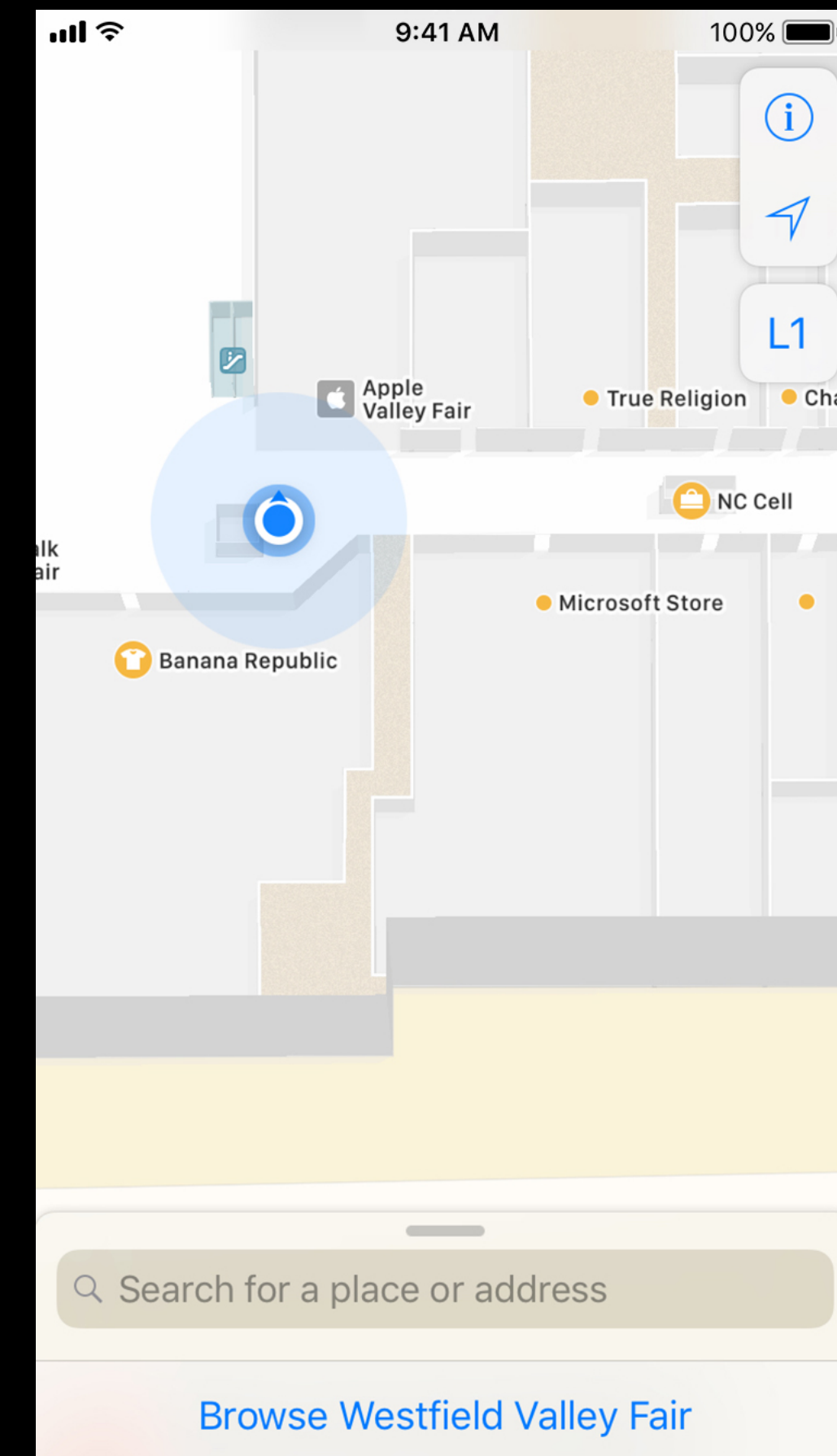


Indoor Positioning Improvements

Accuracy

Responsiveness

Availability



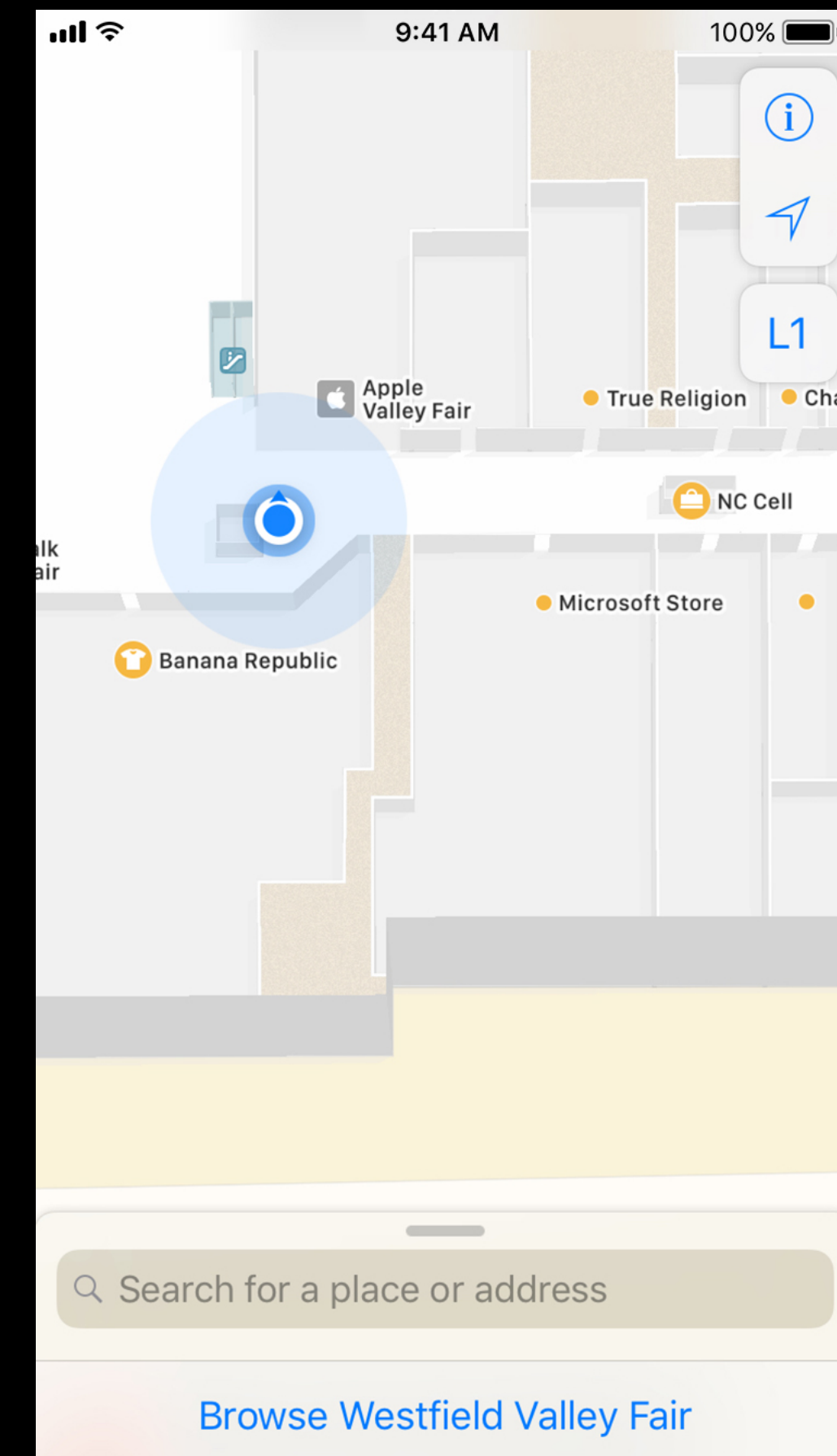
Indoor Positioning Improvements

Accuracy

Responsiveness

Availability

Interoperability



Continuous Background Location

Now available on watchOS



NEW

Continuous Background Location

Now available on watchOS



NEW

Continuous location extends to background

Continuous Background Location

Now available on watchOS



NEW

Continuous location extends to background

Previously available through HealthKit

Continuous Background Location

Now available on watchOS



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Previously available through HealthKit

Good for navigation and fitness apps

Continuous Background Location

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NEW

Continuous location extends to background

Previously available through HealthKit

Good for navigation and fitness apps

Workout apps must adopt

Continuous Background Location

Now available on watchOS



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Continuous location extends to background

Previously available through HealthKit

Good for navigation and fitness apps

Workout apps must adopt

Three easy steps

Continuous Background Location

Now available on watchOS

NEW

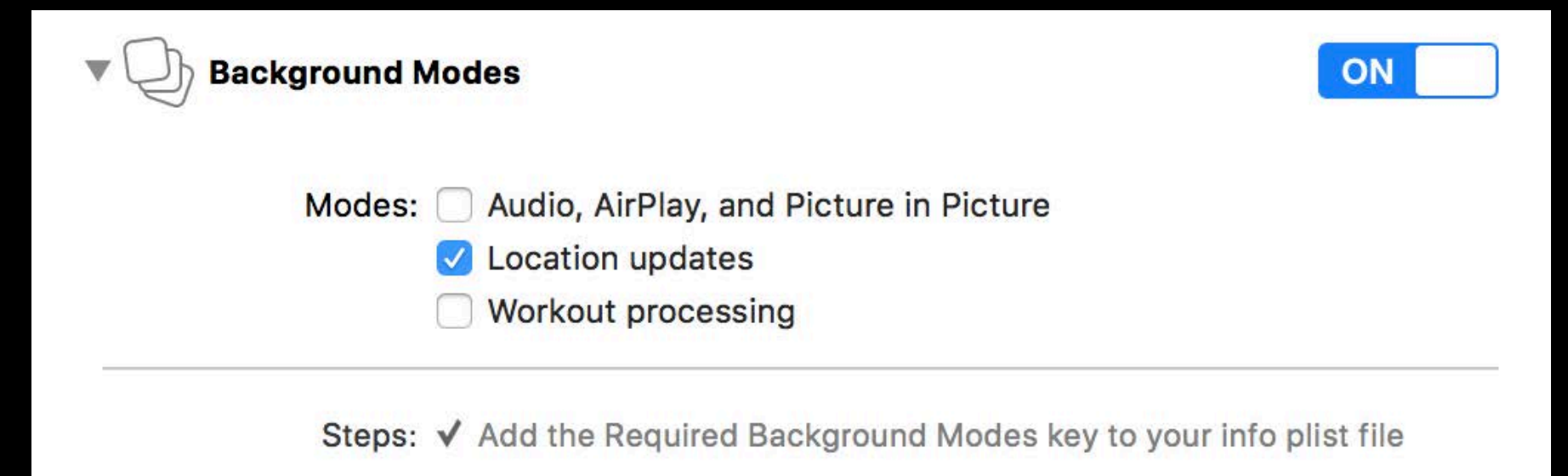
Continuous location extends to background

Previously available through HealthKit

Good for navigation and fitness apps

Workout apps must adopt

Three easy steps



Continuous Background Location

Now available on watchOS

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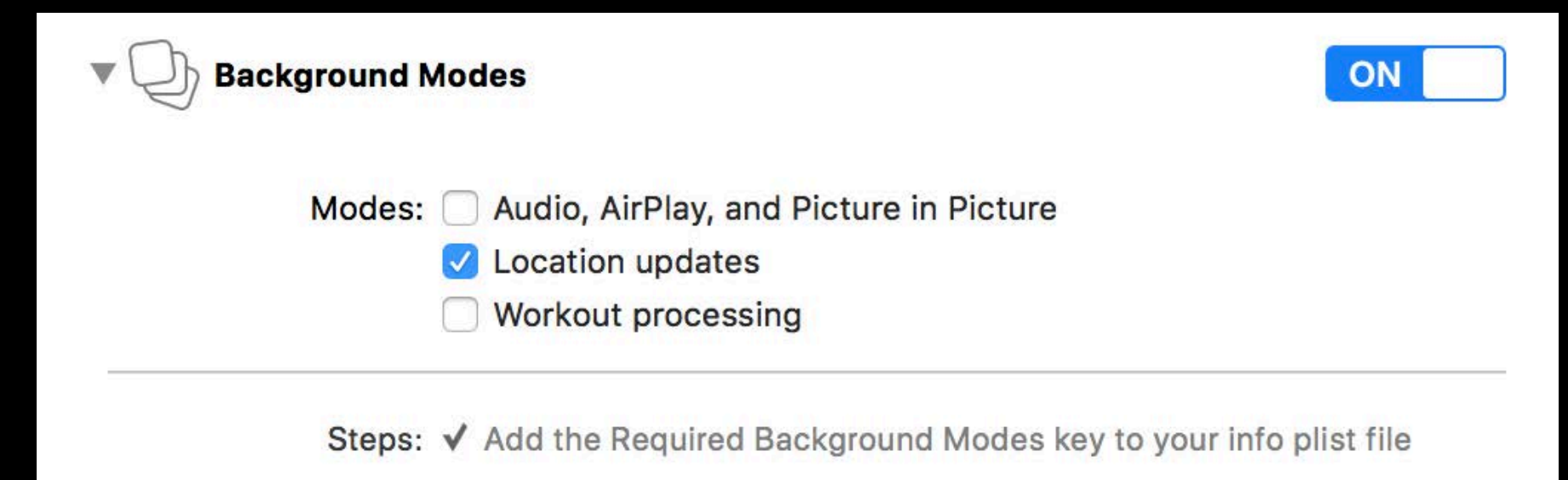
Continuous location extends to background

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Good for navigation and fitness apps

Workout apps must adopt

Three easy steps



```
locationManager.allowsBackgroundLocationUpdates = true
```

Continuous Background Location

Now available on watchOS

NEW

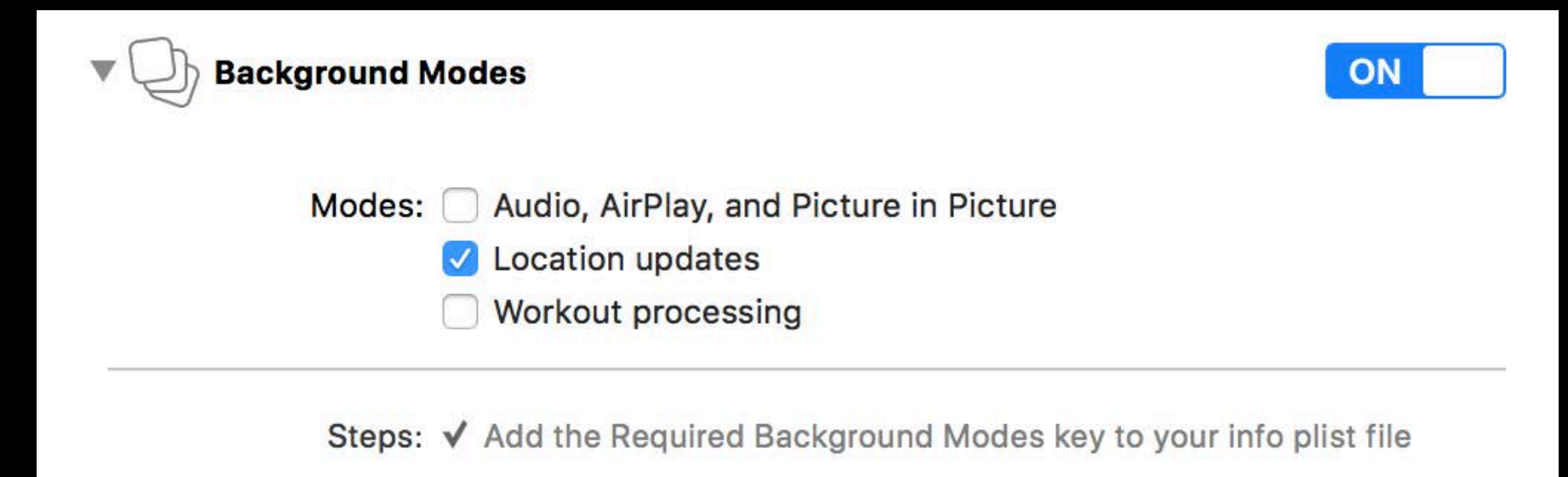
Continuous location extends to background

Previously available through HealthKit

Good for navigation and fitness apps

Workout apps must adopt

Three easy steps



```
locationManager.allowsBackgroundLocationUpdates = true  
locationManager.startUpdatingLocation() // While in the foreground!!
```

Best Practices for Workout Apps

Best Practices for Workout Apps

Use `HKWorkoutSession`

Best Practices for Workout Apps

Use `HKWorkoutSession`

Use `CMPedometer` for pedestrian distance

Authorization and Usage Reporting

Authorization Modes







Review

Authorization Modes

Review

Always authorization

- Access any time the app is running
- Background monitoring APIs

Service	Available with Always
Region Monitoring	
Significant Location Change Monitoring	
Visit Monitoring	
Standard Location	
Continuous Background Location	
Ranging	

Authorization Modes










Review

Always authorization

- Access any time the app is running
- Background monitoring APIs

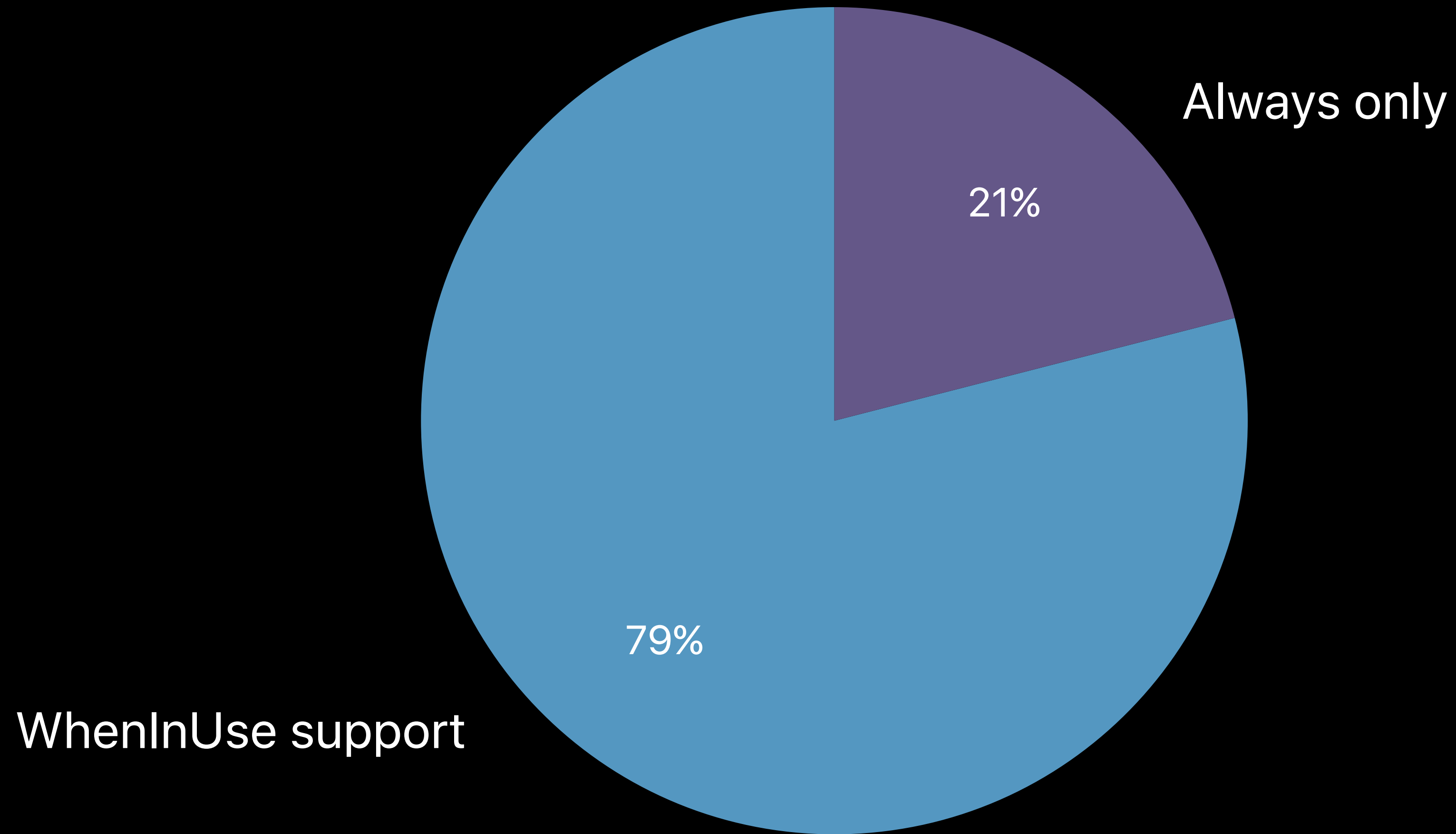
WhenInUse authorization

- Access only when "in use"
- Improved user control

Service	Available with Always	Available with WhenInUse
Region Monitoring		
Significant Location Change Monitoring		
Visit Monitoring		
Standard Location		
Continuous Background Location		
Ranging		

Authorization Modes

Percentage Breakdown



Motivations for Requiring Always

Motivations for Requiring Always

Developer confusion

Motivations for Requiring Always

Developer confusion

Pursuit of magical experiences

Always Authorization in iOS 11

Always Authorization in iOS 11

WhenInUse support is required

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- Legacy apps included

Always Authorization in iOS 11

WhenInUse support is required

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`CLLocationWhenInUseUsageDescription`

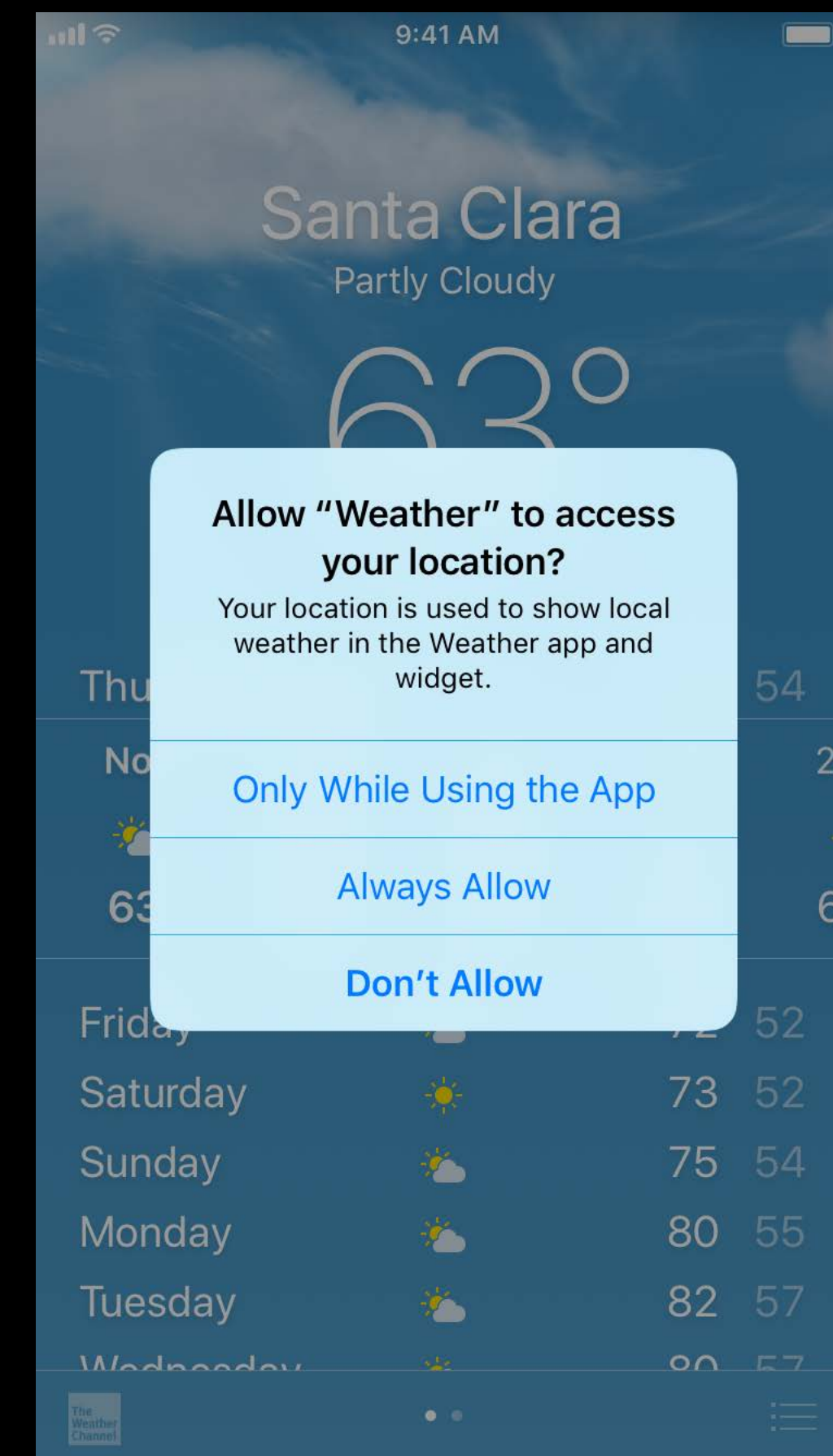
Always Authorization in iOS 11

WhenInUse support is required

- Legacy apps included

`CLLocationWhenInUseUsageDescription`

Prompts for Always include WhenInUse option



Always Authorization in iOS 11

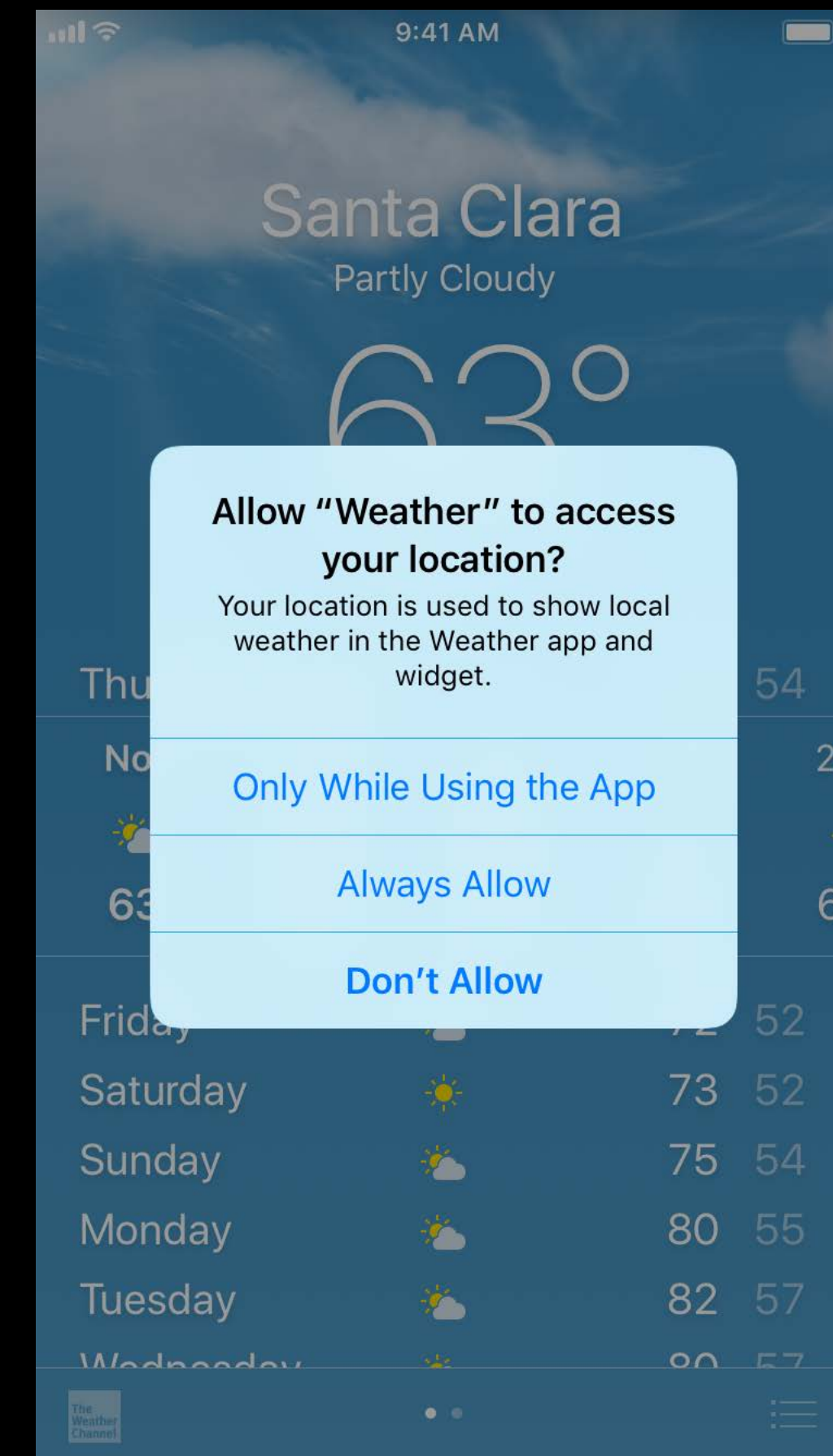
WhenInUse support is required

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`CLLocationWhenInUseUsageDescription`

Prompts for Always include WhenInUse option

`CLLocationAlwaysAndWhenInUseUsageDescription`



Always Authorization in iOS 11

WhenInUse support is required

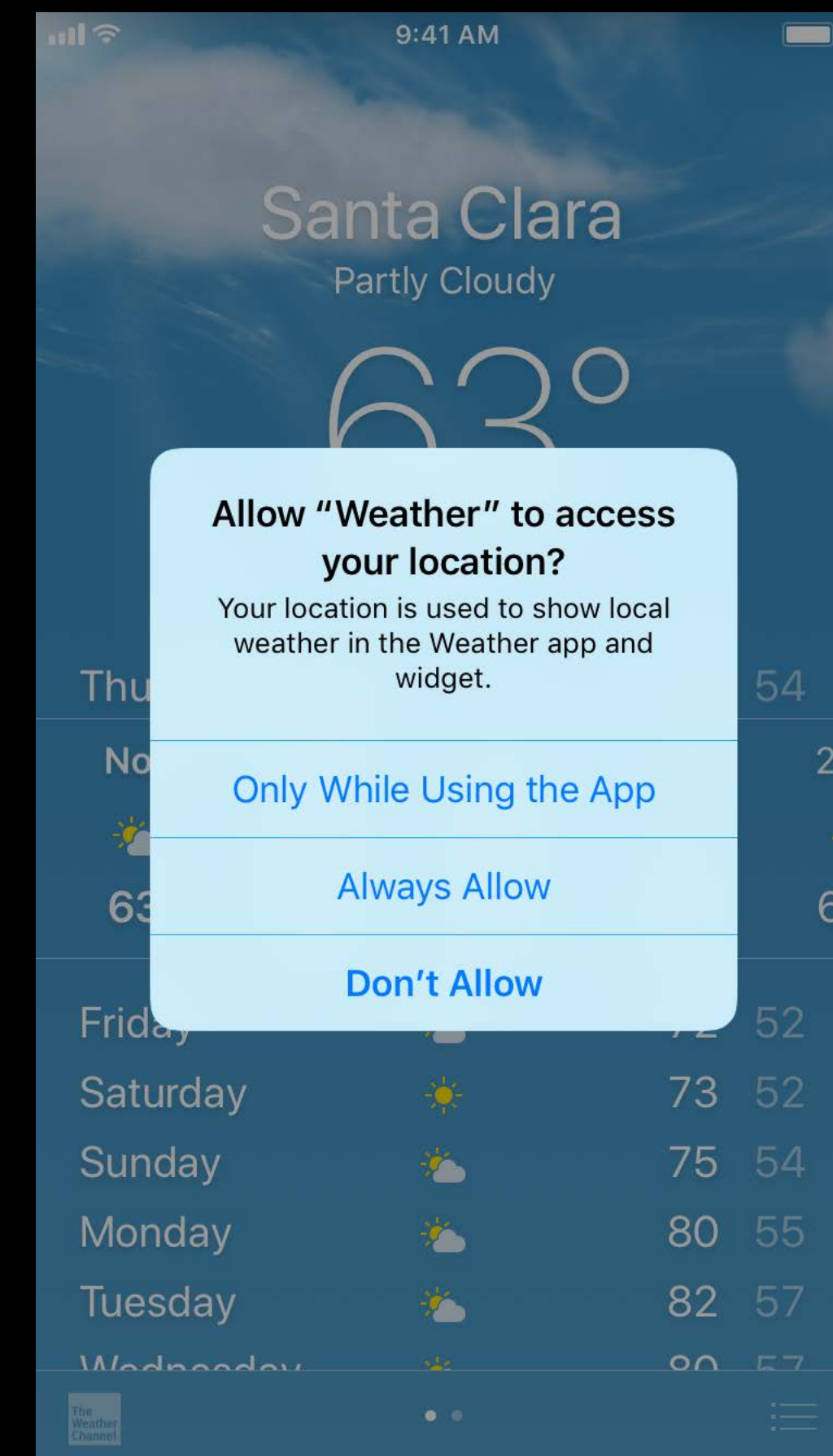
- Legacy apps included

`CLLocationWhenInUseUsageDescription`

Prompts for Always include WhenInUse option

`CLLocationAlwaysAndWhenInUseUsageDescription`

- Always-using apps must adopt



Supporting Always Authorization

Best practices

Supporting Always Authorization

Best practices

Support older iOS builds and provide all keys

`NSLocationWhenInUseUsageDescription`

`NSLocationAlwaysAndWhenInUseUsageDescription`

`NSLocationAlwaysUsageDescription`

Supporting Always Authorization

Best practices

Support older iOS builds and provide all keys

`NSLocationWhenInUseUsageDescription`

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`NSLocationAlwaysUsageDescription`

Help the user choose

Supporting Always Authorization

Best practices

Support older iOS builds and provide all keys

`NSLocationWhenInUseUsageDescription`

`NSLocationAlwaysAndWhenInUseUsageDescription`

`NSLocationAlwaysUsageDescription`

Help the user choose

- Explain what each authorization mode enables

Requesting Authorization

Best practices

Requesting Authorization

Best practices

Ask for authorization when you need it

Requesting Authorization

Best practices

Ask for authorization when you need it

Request `WhenInUse` first

Requesting Authorization

Best practices

Ask for authorization when you need it

Request WhenInUse first

- Always features are an addition to WhenInUse experience

Requesting Authorization

Best practices

Ask for authorization when you need it

Request `WhenInUse` first

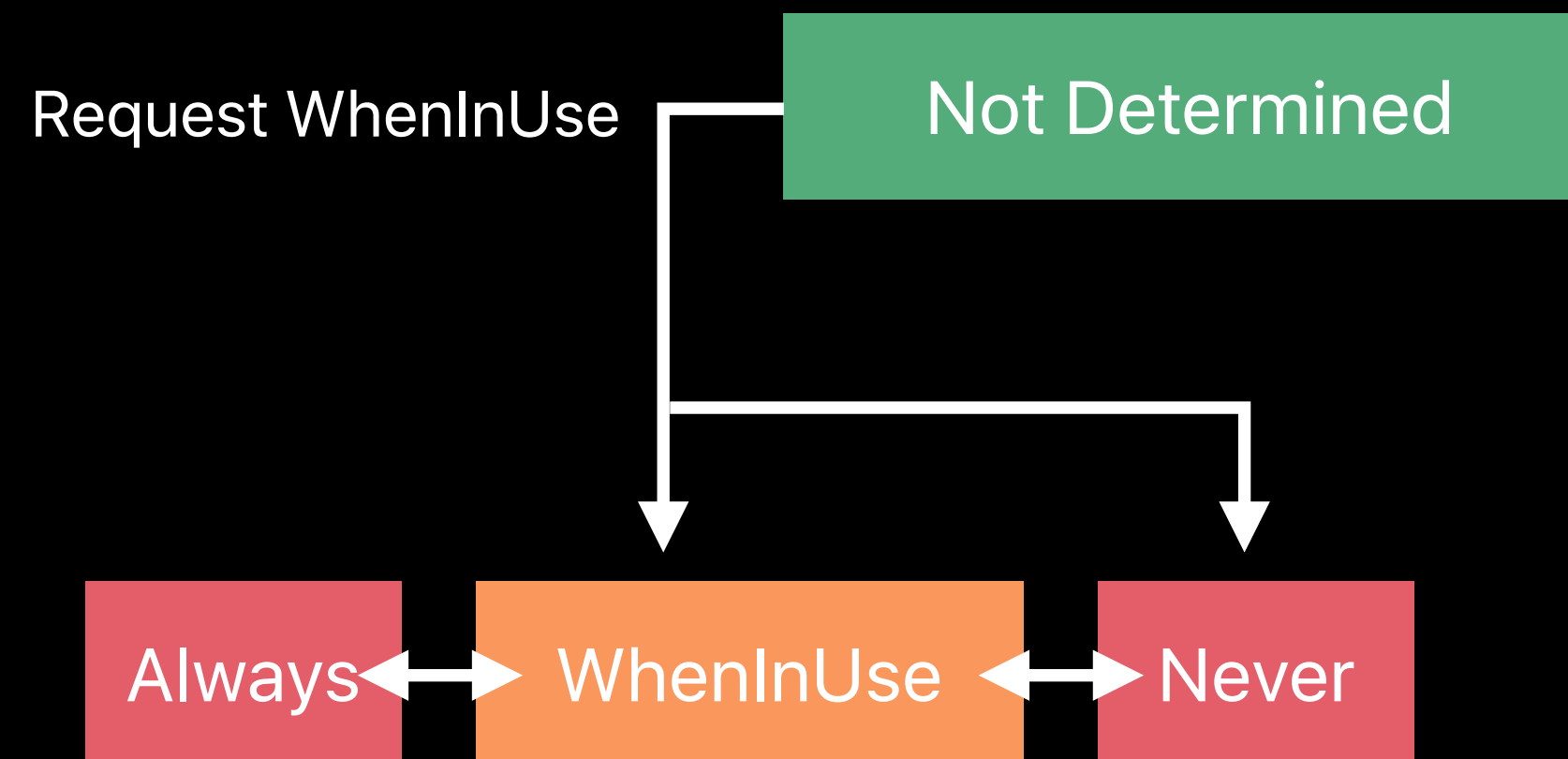
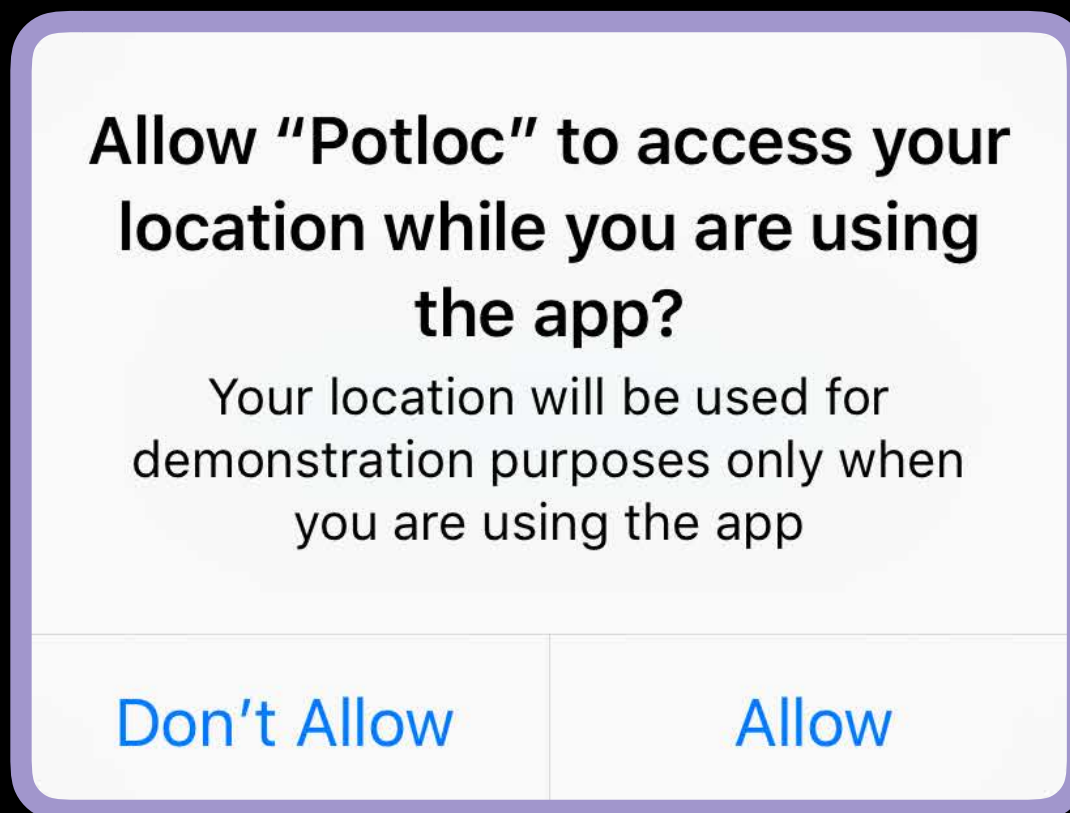
- Always features are an addition to `WhenInUse` experience
- Transition from `WhenInUse` to `Always` later

From WhenInUse to Always

From WhenInUse to Always

Not Determined

From WhenInUse to Always



`CLLocationWhenInUseUsageDescription`

From WhenInUse to Always

Allow "Potloc" to access your location while you are using the app?

Your location will be used for demonstration purposes only when you are using the app

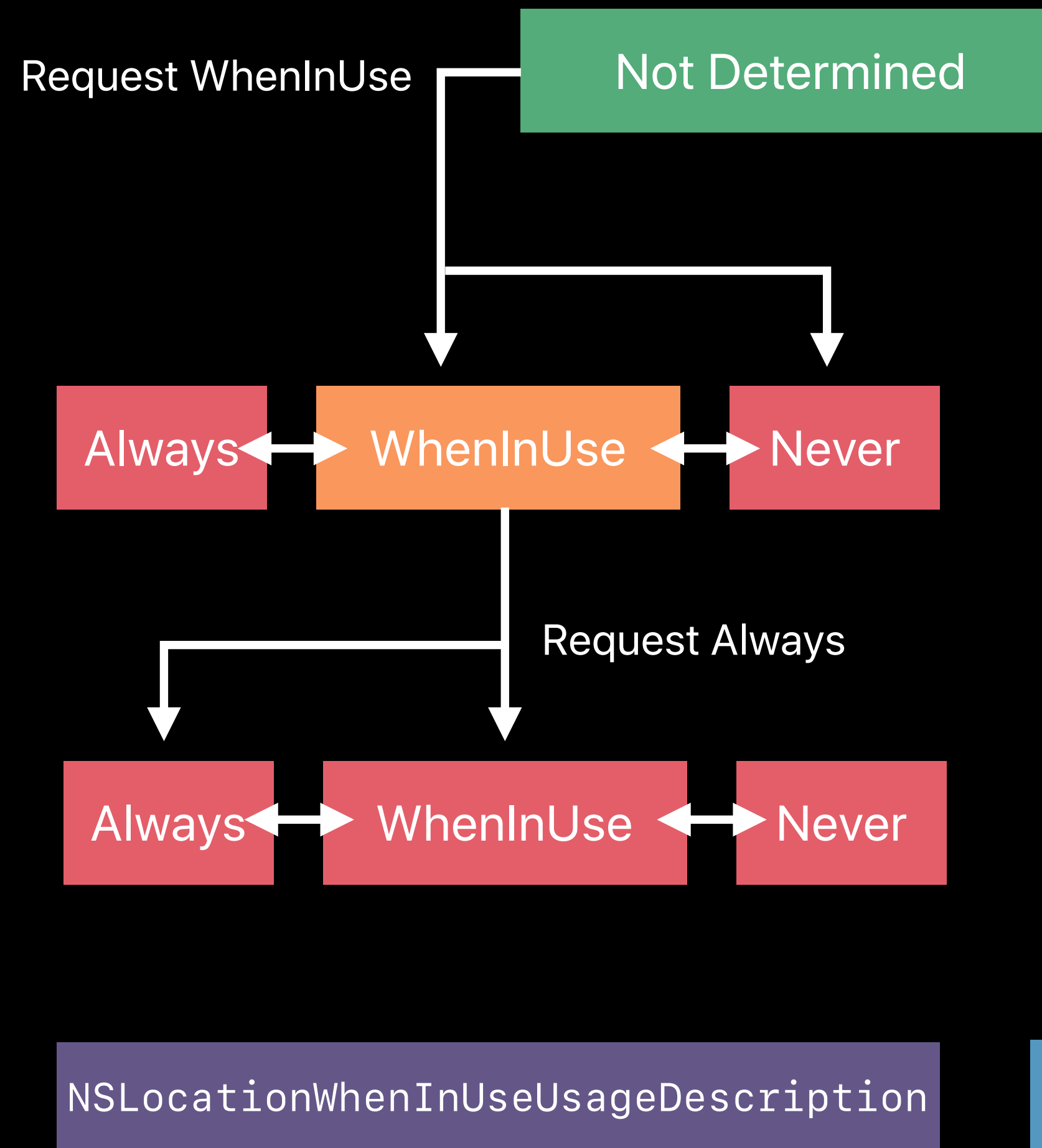
[Don't Allow](#) [Allow](#)

Allow "Potloc" to also access your location even when you are not using the app?

Your location will be used for demonstration purposes.

[Only While Using the App](#)

[Always Allow](#)



From WhenInUse to Always

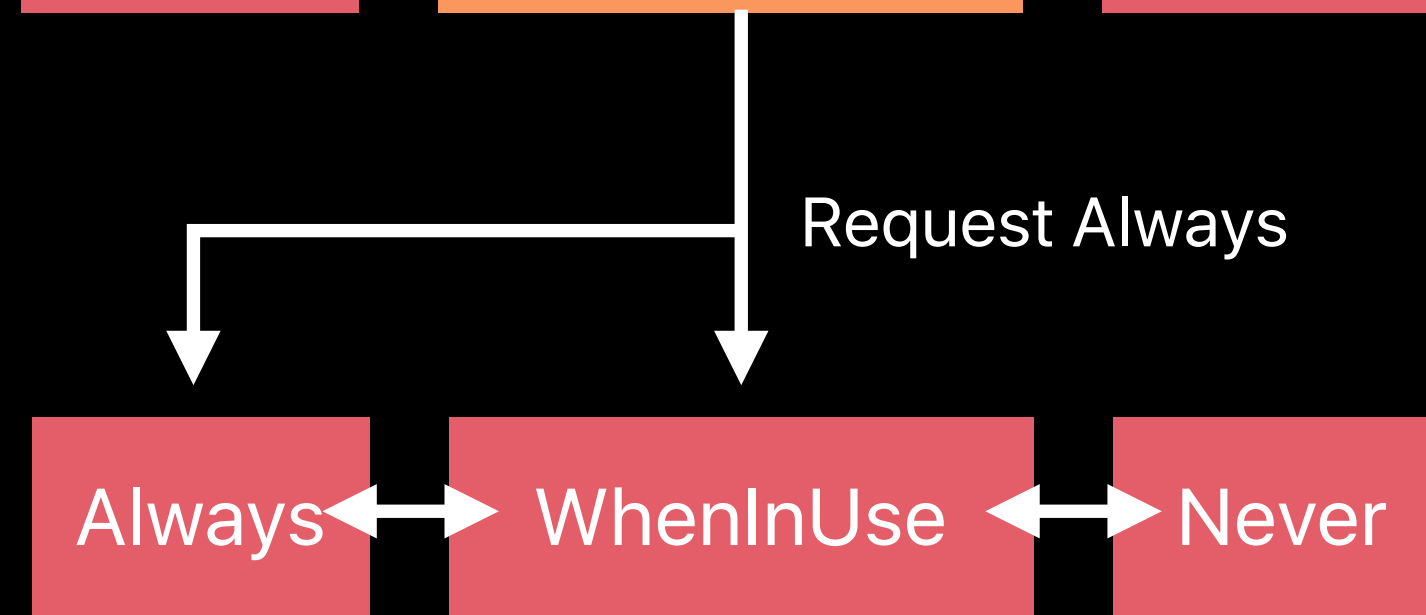
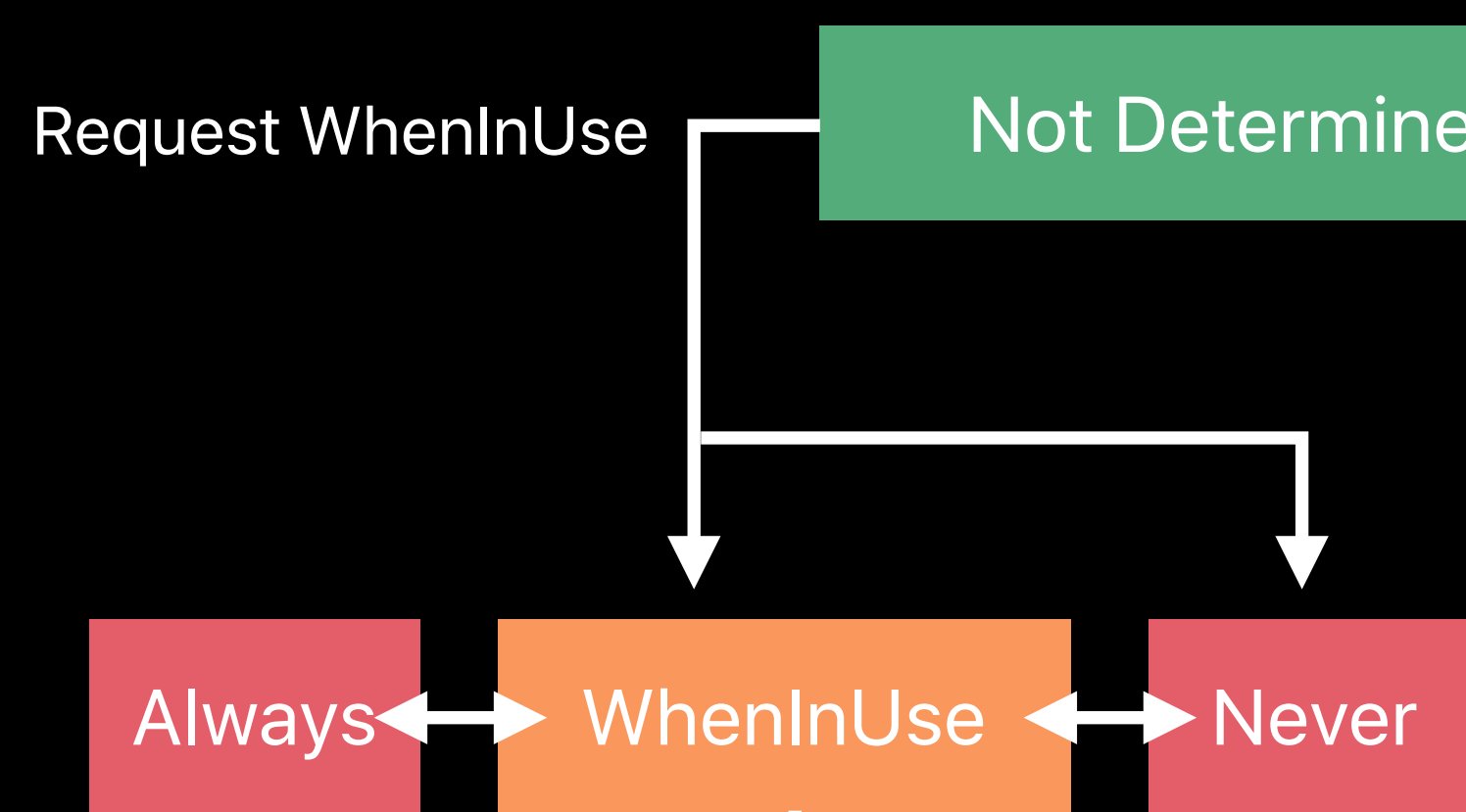
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Only While Using the App

Always Allow



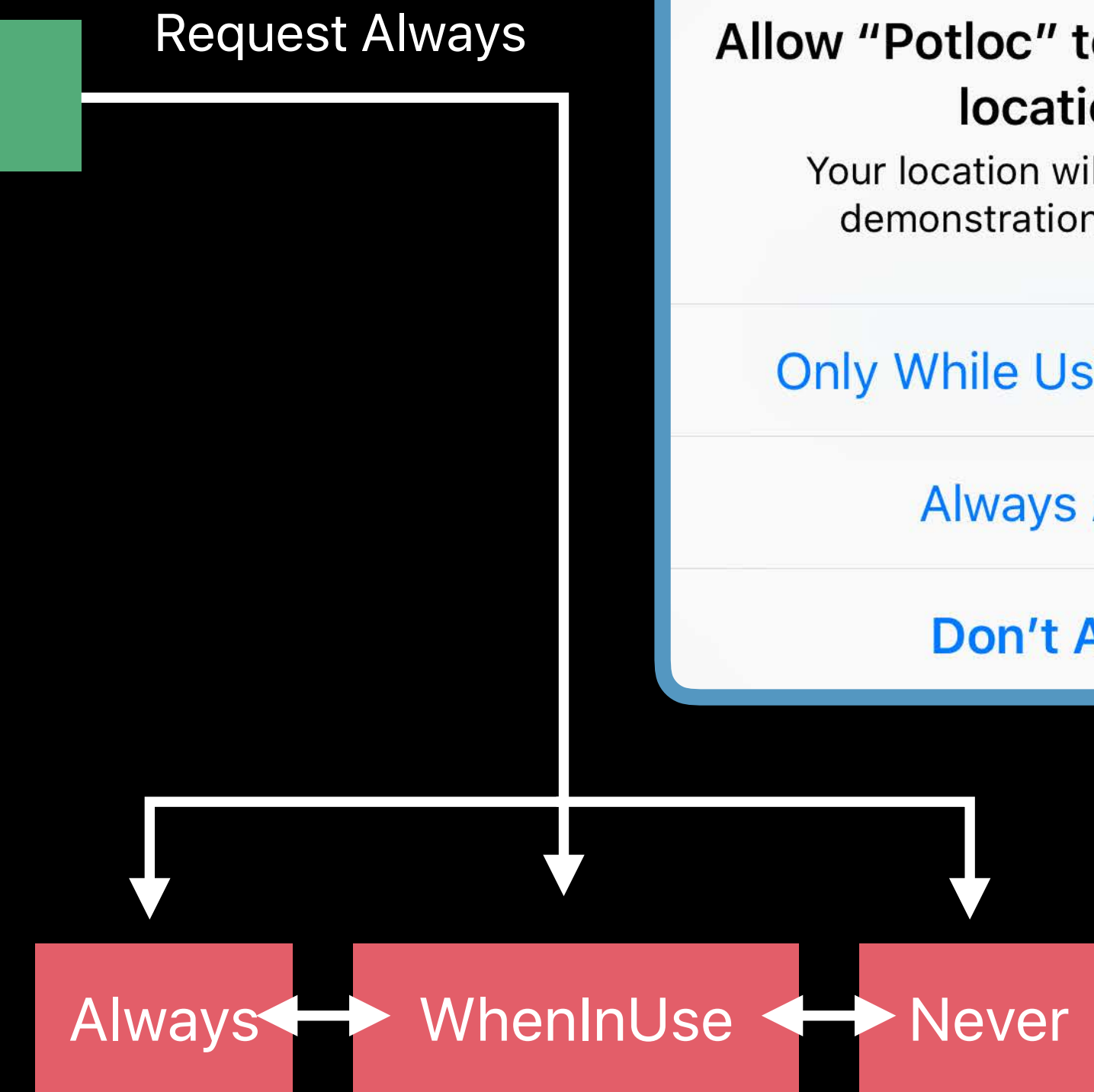
CLLocationWhenInUseUsageDescription

Allow "Potloc" to access your location?
Your location will be used for demonstration purposes.


Only While Using the App

Always Allow

Don't Allow



CLLocationAlwaysAndWhenInUseUsageDescription



Allow "Maps" to access your location while you are using the app?

Your current location will be displayed on the map and used for directions, nearby search results, and

Location Usage Indication

iOS 10

Location Usage Indication

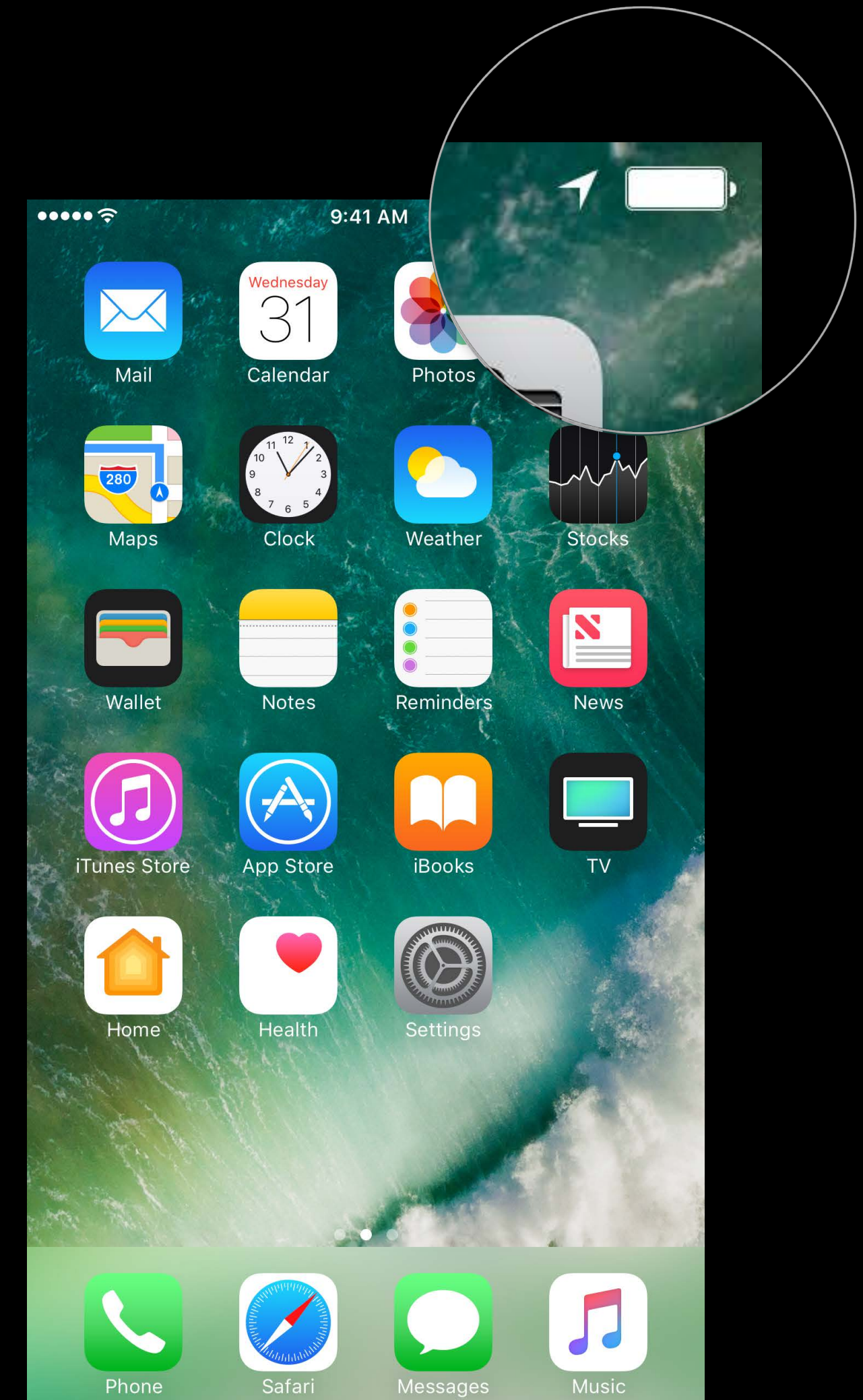
iOS 10

Based on requested service

Location Usage Indication

iOS 10

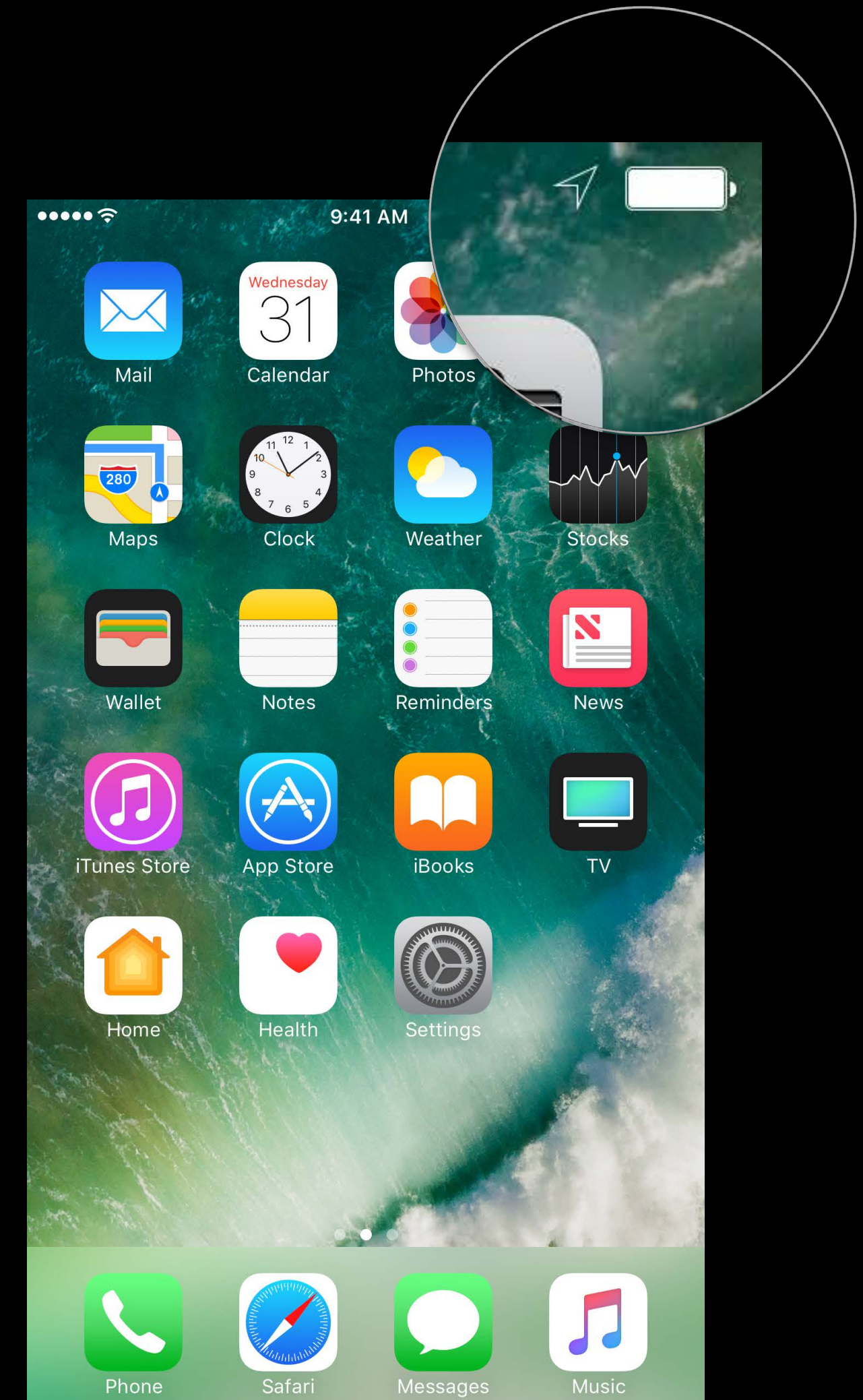
Based on requested service



Location Usage Indication

iOS 10

Based on requested service



Location Usage Indication

iOS 10

Based on requested service

WhenInUse required for blue status bar



Location Usage Indication

iOS 10

Based on requested service

WhenInUse required for blue status bar

Room for improvement



Location Usage Indication

iOS 10

Based on requested service

WhenInUse required for blue status bar

Room for improvement

- Over-represented some services



Location Usage Indication

iOS 10

Based on requested service

WhenInUse required for blue status bar

Room for improvement

- Over-represented some services
- Blue bar inconsistency



Location Usage Indication

iOS 10

Based on requested service

WhenInUse required for blue status bar

Room for improvement

- Over-represented some services
- Blue bar inconsistency
- Users could get the wrong impression



Location Usage Indicators

New behavior

Location Usage Indicators

New behavior

New arrow policy

Location Usage Indicators

New behavior

New arrow policy

- Hollow arrow when requesting

Location Usage Indicators

New behavior

New arrow policy

- Hollow arrow when requesting
- Solid arrow when receiving

Location Usage Indicators

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Blue status bar for Always apps

Location Usage Indicators

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- Solid arrow when receiving

Blue status bar for Always apps

Matches user expectations

Location Usage Indicators

New behavior

New arrow policy

- Hollow arrow when requesting
- Solid arrow when receiving

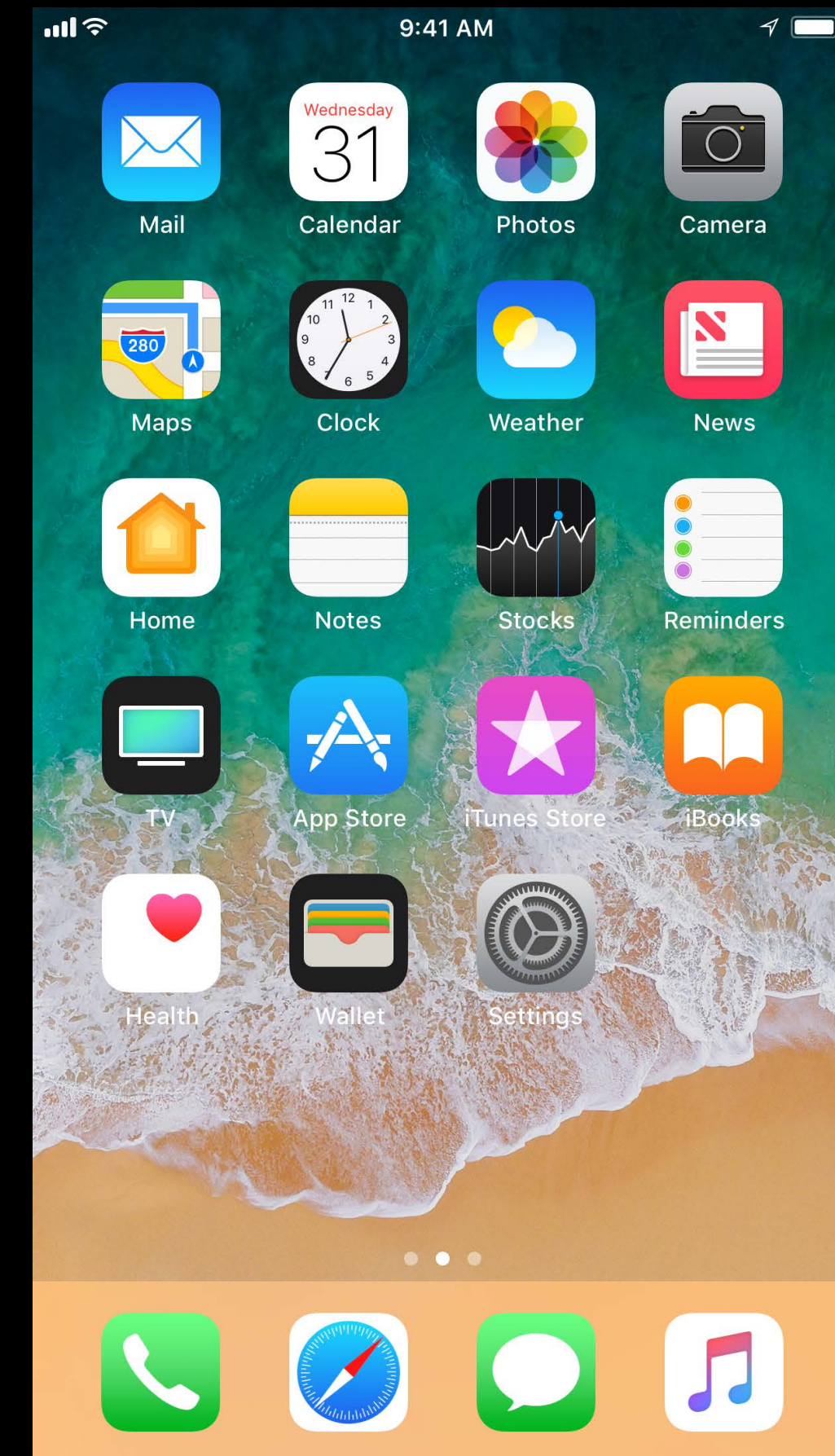
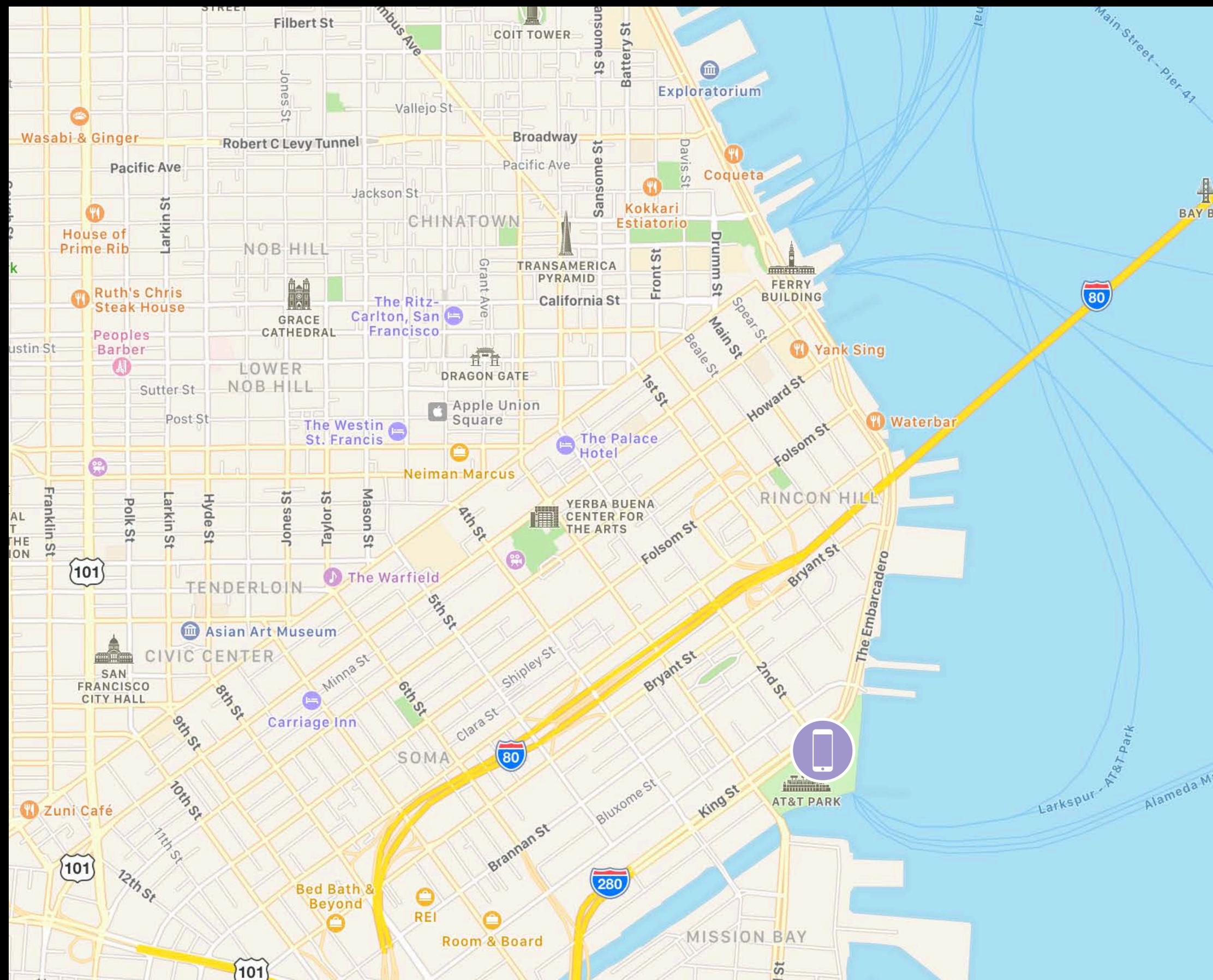
Blue status bar for Always apps

Matches user expectations

Better for developers

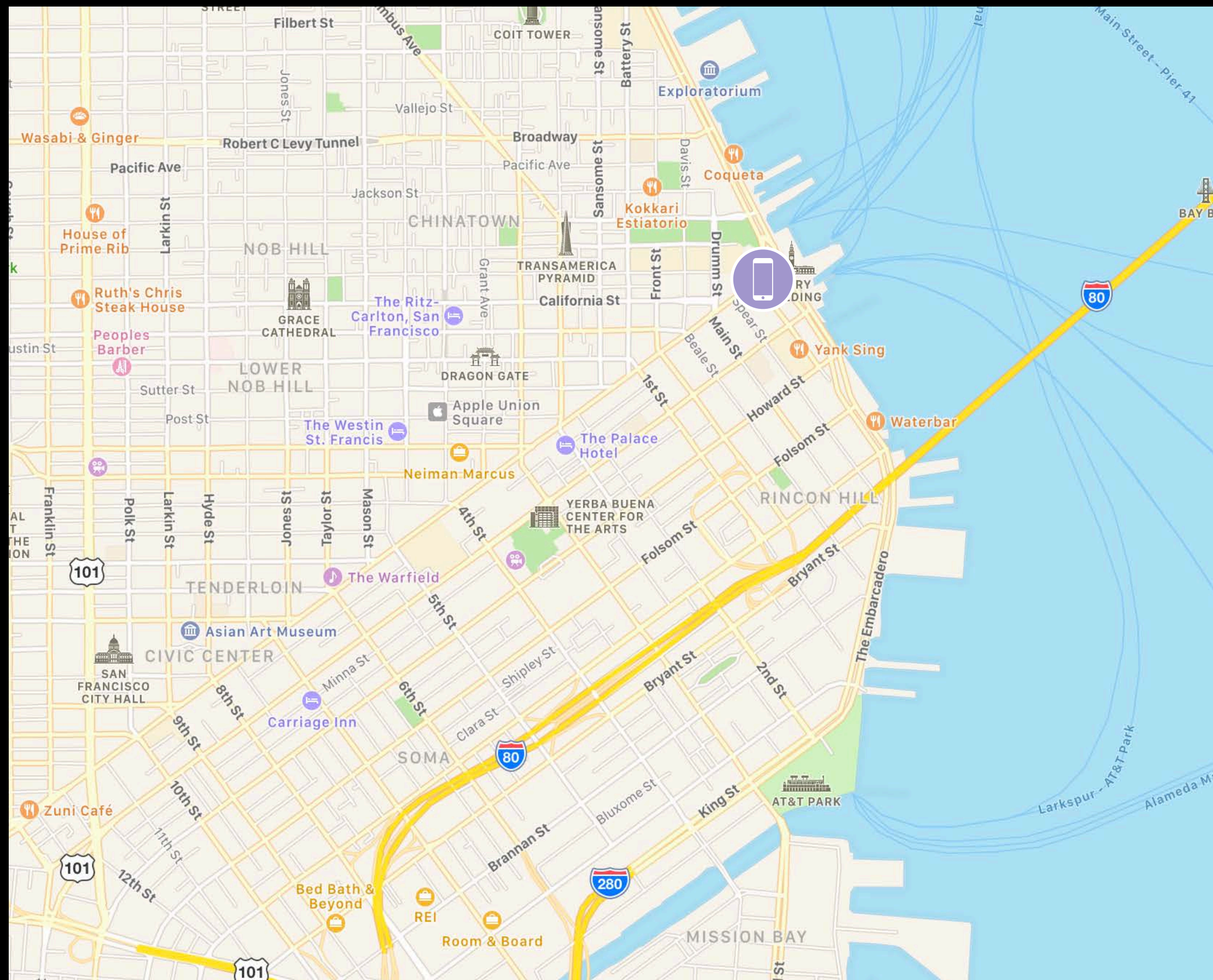
Arrow Icon

Example



Arrow Icon

Example



Summary

Users have more control

Communicate with the user

Build a WhenInUse-first experience

More Information

<https://developer.apple.com/wwdc17/713>

Related Sessions

Privacy and Your Apps

WWDC 2017

Creating Immersive Apps with Core Motion

WWDC 2017

Labs

Location and Mapping Technologies Lab

Technology Lab C

Thur 4:10PM–6:00PM

Location and Mapping Technologies Lab

Technology Lab K

Fri 10:00AM–12:00PM

