



Connected Vehicle Services

Speech in the Car

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Agenda

- User satisfaction data
- Improving speech interfaces in the car
- Embedded vs cloud based solutions
- CarPlay vs Android Auto
- What's expected over the years to come

J.D. Power 2015: Top Reported Problems

- 10 - **Cup holders** (2.0 PP100)
- 9 - **Media Device Ports** (2.2 PP100)
- 8 - **Automatic Transmissions** (2.4 PP100)
- 7 - **Center Console Storage** (2.4 PP100)
- 6 - **Exterior paint** (2.5 PP100)
- 5 - **Navigation systems** (2.7 PP100)
- 4 - **Excessive wind noise** (2.8 PP100)
- 3 - **Interior Materials** (3.2 PP100)
- 2 - **Bluetooth Pairing and Connectivity** (5.5 PP100)

2015 J.D. Power Initial Quality Results

The No. 1 Top Reported Problem

1: Voice-Recognition Systems (8.7 PP100, worse than 2014 which was 8.3 PP100)

Not recognizing or misinterpreting commands.



Why??



J. D. Power Speech Videos

Why is the Speech UX in the car so bad?

The Speech Button



The eyes-free hands-free concept

Speech Button Examples

Lexus



Tesla



VW



Ford



Why?

- The speech technology??
- UI design??
- Lack of usability testing??

Speech in the Car

- Humans have conversations in cars
 - Difficult to blame the acoustic environment
- “Please say a command”
 - How do most drivers respond?
- Natural prompts imply the vocabulary
 - Where would you like to go?
 - Who would you call
 - What would you like to listen to?

Audio Prompts in the Car

- “Please say a command” or a simple chime
 - Confuses new users in the car environment
 - People don’t know what to say
- Natural prompts imply the vocabulary
 - Where would you like to go?
 - Who would you call
 - What would you like to listen to?
- Yes/no confirmation prompts
 - Acceptable for confirming a request
 - Avoid “Did you say....?”

The Shift in Infotainment

CarPlay and Android Auto are vehicle agnostic which is a major shift in Infotainment HMI

And with this shift comes a major improvement to speech in the car

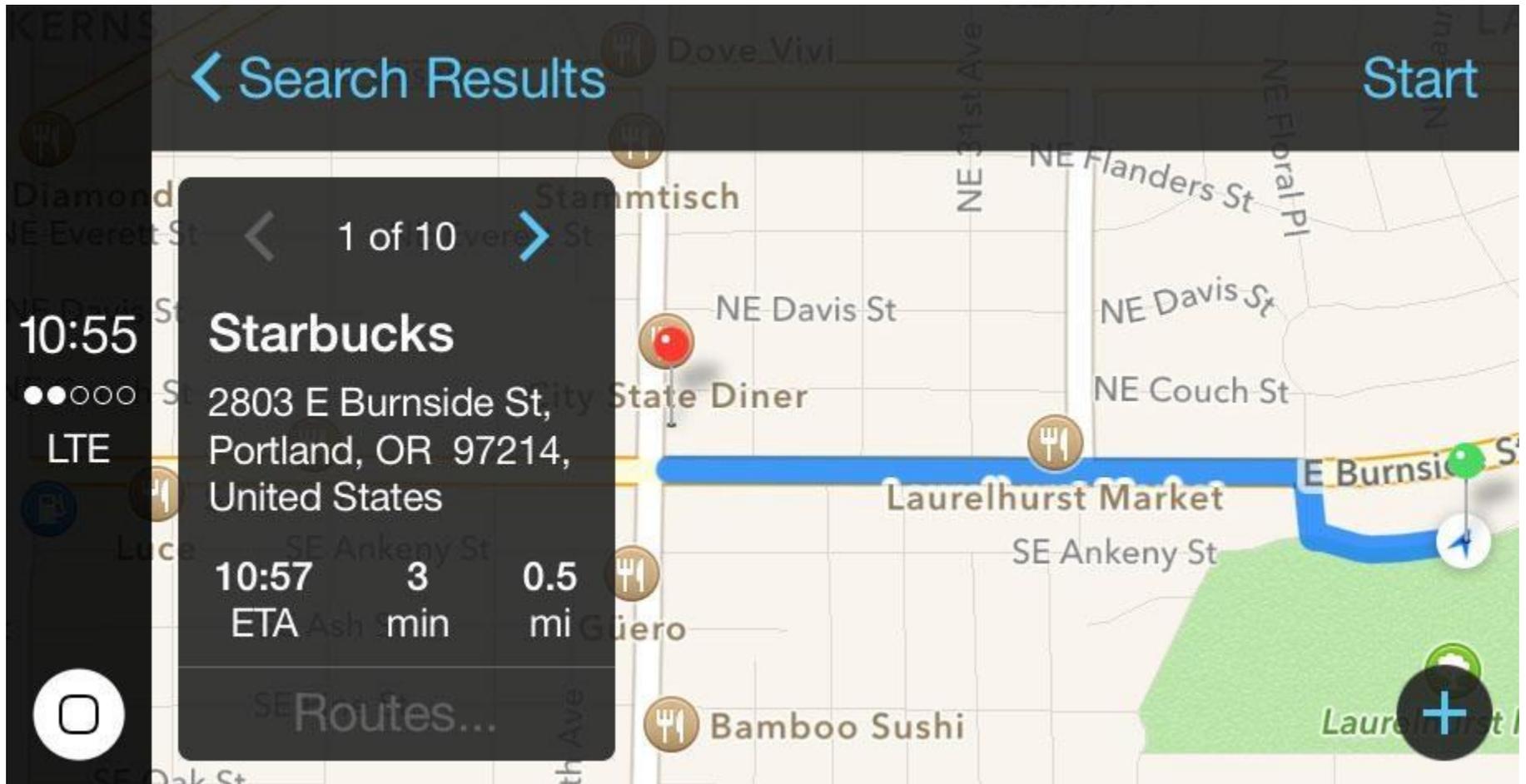
Apple CarPlay

- Uses off-board Speech and NLU
- Press and hold speech button or white button
- CarPlay shows on phone and dash screen
- Uses phone for connectivity and car for GPS
- Supports approved 3rd part apps
- Includes Siri assistant

Apple CarPlay



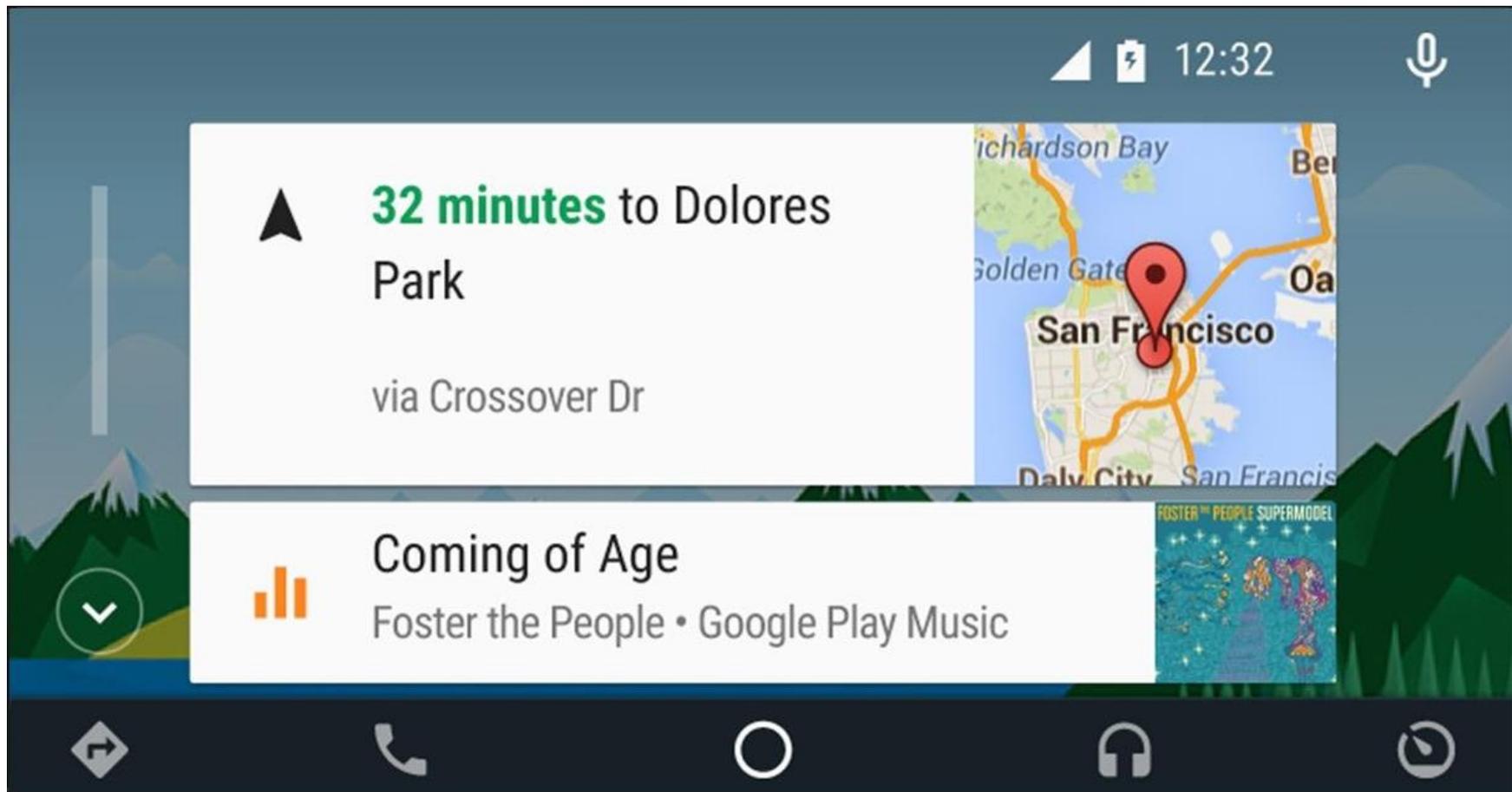
Apple CarPlay



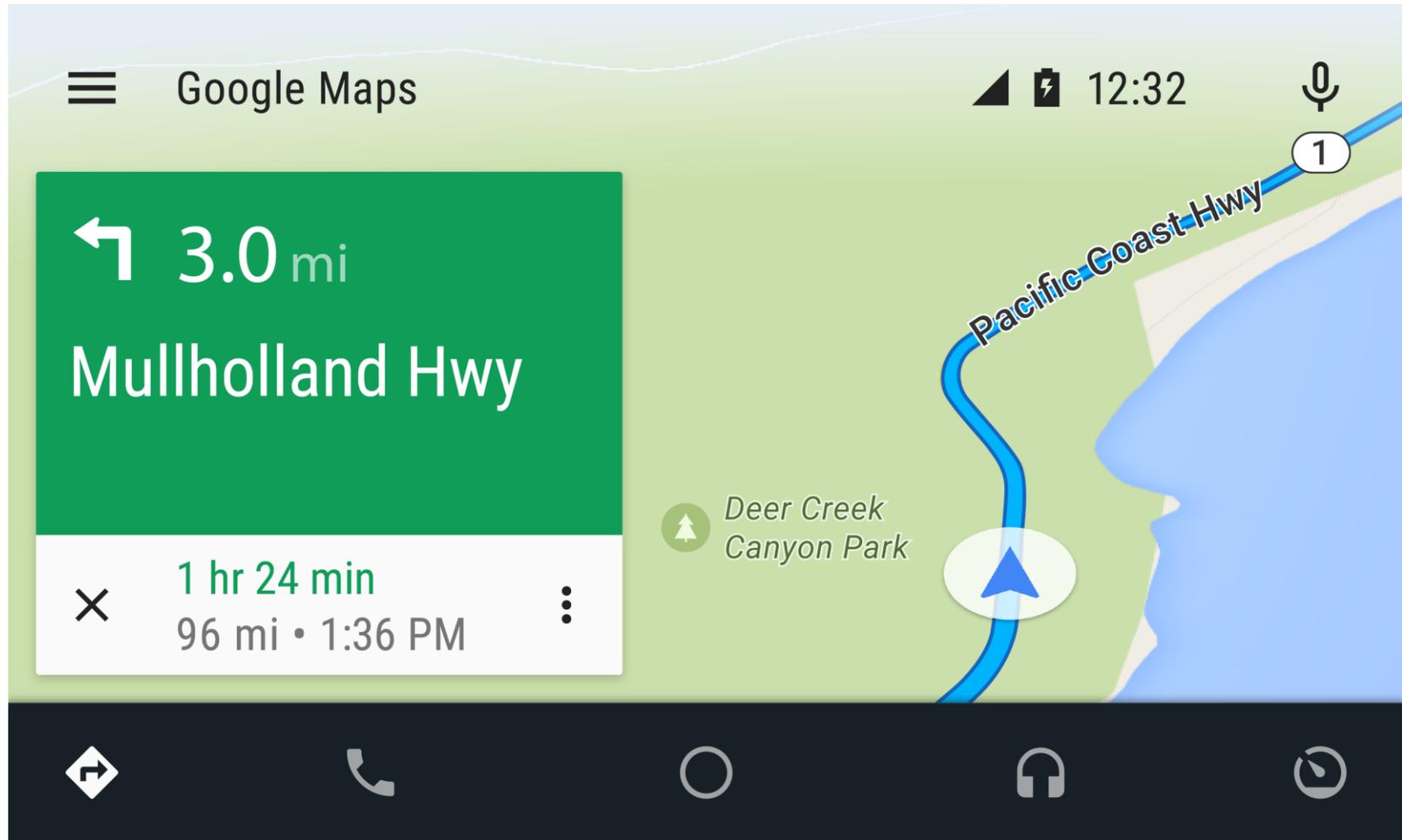
Android Auto

- Uses off-board Speech and NLU
- Tap microphone icon
- Remembers usage from other devices
- Uses phone for connectivity and car for GPS
- Supports approved 3rd part apps
- A very different look than CarPlay

Android Auto



Android Auto



Short video to compare CP with AA

9:35



Phone



Music



Maps



Messages



Now Playing



NEX



Audiobooks



Podcasts

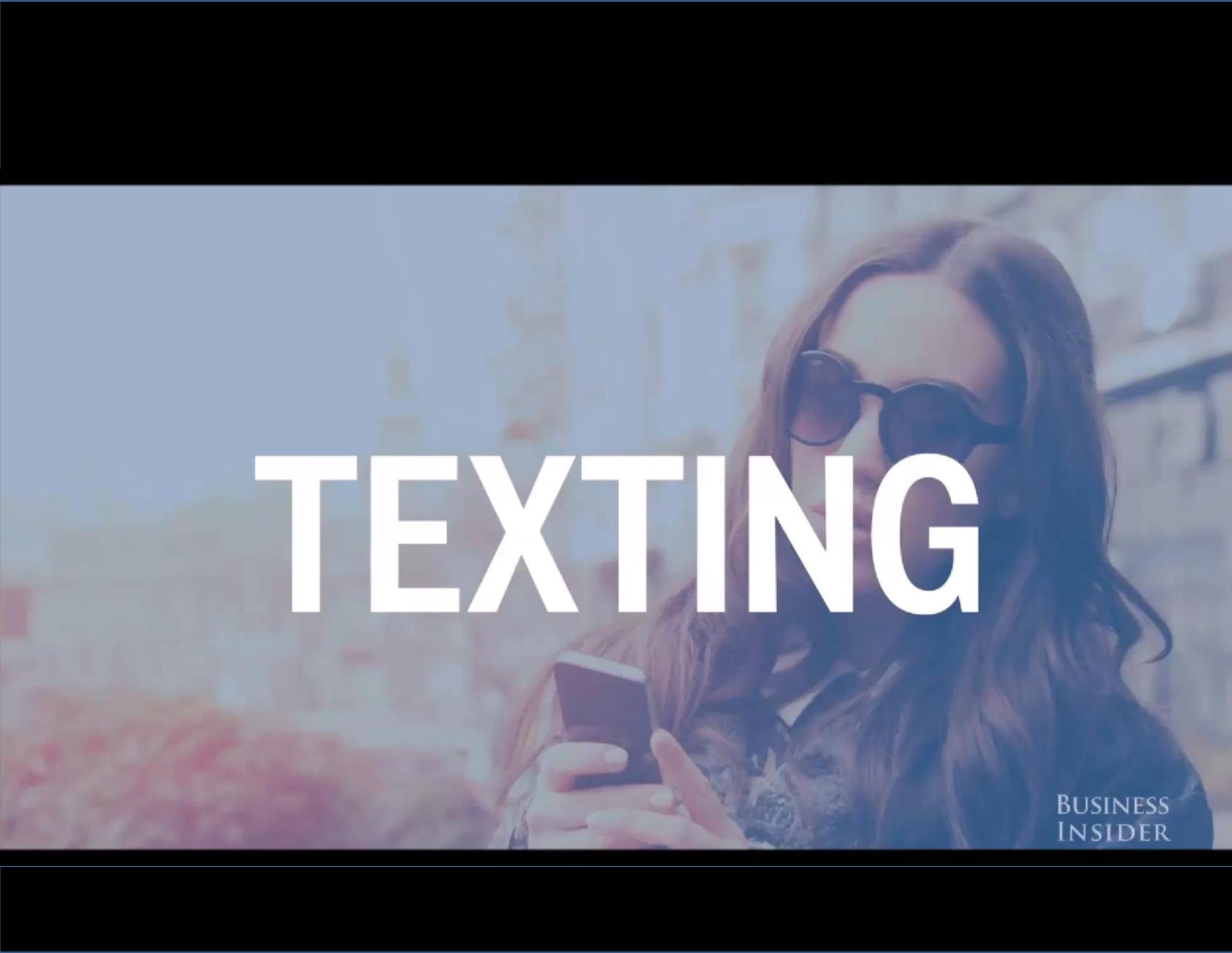


MAP



MODE



A woman with long, wavy brown hair and dark sunglasses is looking down at a smartphone she is holding in her hands. The background is a blurred outdoor setting with trees and buildings. The entire image has a blue color overlay.

TEXTING

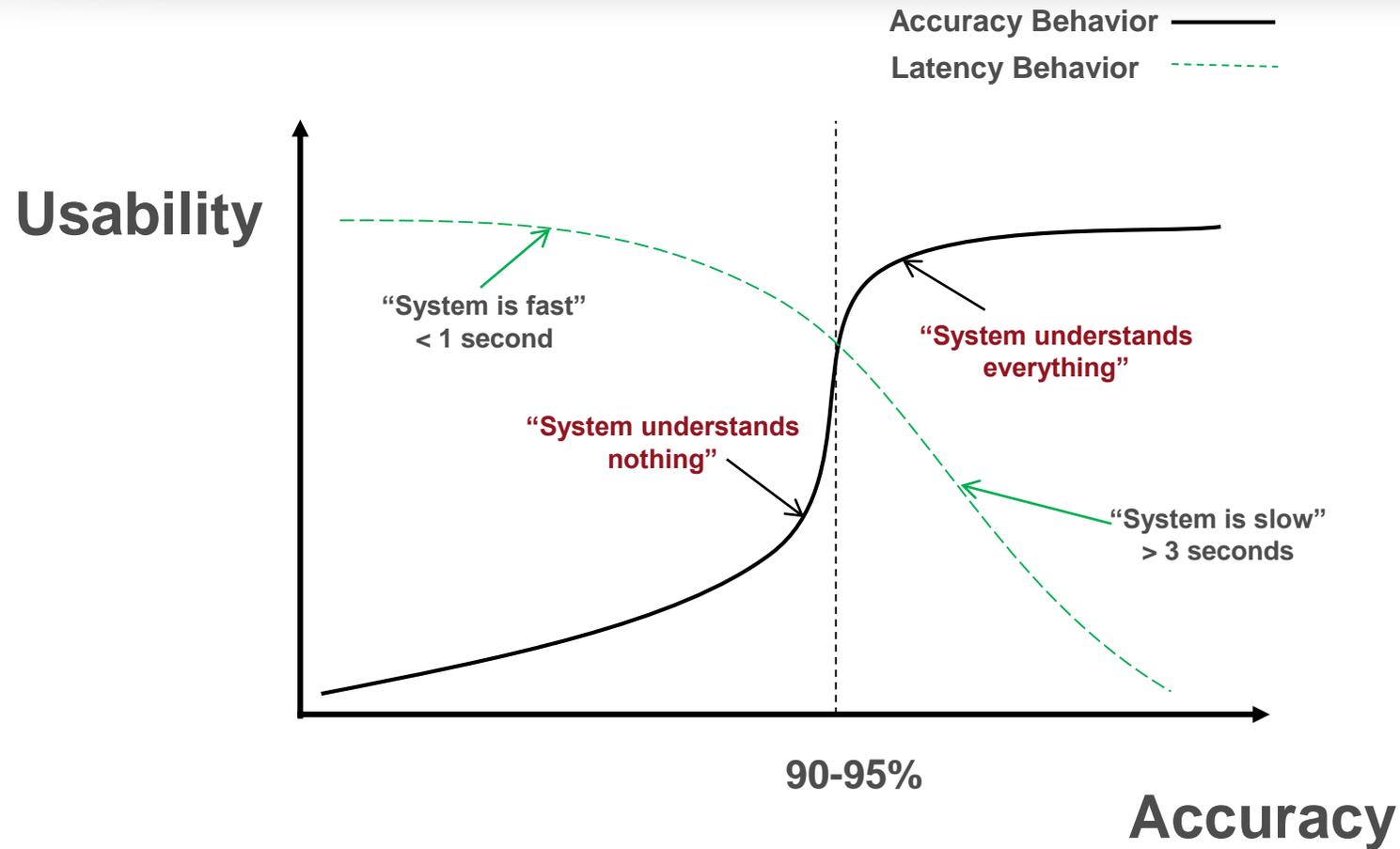
BUSINESS
INSIDER

Conclusions

- Speech in the car needs more usability focus
- CarPlay and Android Auto will win
- The embedded solutions have disadvantages

Thank You

Accuracy and Latency



Accuracy and Latency are Both Critical

Usability and Grammar Size

