AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY

Standard and Optional Features in the 2017 Toyota Camry

○ Optional ● Standard	LE	XLE	SE	XSE
Android Auto				
Apple CarPlay				
Mobile App Support		○	○	○
Text Messaging	●	●	●	●
Navigation	○	●	○	●
Touch Screen	●	●	●	●
Gesture Control				
Heads-Up Display				
Voice Commands	●	●	●	●
Console Control				

Additional trim levels available

INFOTAINMENT SYSTEM* DEMAND RATING

Moderate Demand

The Toyota Camry SE with Entune™ infotainment system demonstrated overall moderate demand on drivers in the on-road study when placing phone calls, sending text messages and tuning the audio system.

ABOUT THE STUDY

Researchers evaluated 30 new 2017 vehicles' infotainment systems* to measure overall demand** placed on a driver when using voice command, touch screen and other interactive technologies to make a call, send a text message, tune the radio or program navigation, all while driving down the road.

STRENGTHS

- Voice recognition system understands common voice commands with high accuracy.
- Users can easily navigate through phone menus by using the well-labeled buttons and icons.

WEAKNESSES

- Noticeable lag time demonstrated in both voice and touch screen, which may frustrate users or extend the time needed to complete tasks.
- It can be difficult to accurately press buttons on the touch screen due to the low sensitivity of the screen and small size of the buttons grouped too close together.

* Infotainment System: Vehicle system that combines entertainment and information content
**Overall demand measured: visual (eyes-off road), cognitive (mental) and time-on-task

VEHICLE OVERVIEW: CONTROLS AND DISPLAYS

VOICE COMMANDS

STEERING WHEEL COMMANDS

INSTRUMENT CLUSTER

CENTER STACK

INFOTAINMENT SYSTEM

The Entune™ In-Vehicle Infotainment System offers the following features:

CALLING AND DIALING

The Toyota Camry SE with Entune™ infotainment system offers calling and dialing functions accessible via the center stack and voice commands, with limited steering wheel functionality. After initiating the Bluetooth pairing process on the touch screen while the vehicle is stopped, users can follow the on-screen instructions to easily complete the pairing. As a safety measure, the touch screen can only be used to place calls to preselected favorite contacts, as the phonebook and dial pad are inaccessible while the vehicle is in motion.

The Camry's phone system generates an overall moderate demand. When using voice commands, drivers were unable to complete tasks quickly, although they were able to keep their eyes on the road. The system accepts common voice commands. Should a user require additional help, examples are displayed on the touch screen.

When using the center stack to place calls, drivers were subjected to very high levels of cognitive (mental) demand, but for a short period of time. Locking out access to the phonebook and dial pad may reduce the length of time and number of steps required to select a contact. Researchers^ noted the crowded touch-screen phone interface, though they commended the simple and easy-to-navigate menu structure with its clearly-labeled buttons.

TEXT MESSAGING

Text messaging functions are available while driving with little restriction via voice commands and the center stack. Using the touch screen, drivers can have messages in their inbox read aloud and can also send replies choosing one of 15 predefined messages. Using voice commands, drivers can send new messages to a stored contact or a phone number. While the car is in motion, restrictions prevent the user from viewing a message on the touch screen, but the user can still scroll through the list of responses to choose a reply. While the vehicle is stopped, the predefined messages can be customized.

The on-road study found sending a text message generated overall high levels of demand. When using the touch screen, drivers were able to quickly send messages, though at the expense of high visual (eyes-off-road) and cognitive (mental) demand. This is not surprising as the messaging menu houses a grid of tiny buttons that may be difficult to accurately select while driving. Drivers may have to scroll through several menu pages of small text before finding the desired predefined message to send.

The voice command system allowed users to keep their eyes on the road but at the cost of an excessive interaction time and high cognitive (mental) demand. This could be due to the slow response and processing time of the system, or the extensive number of steps required. It took drivers on average 43 seconds◆ to send a text message. The voice system accepts a wide range of commands and verbally guides the user through the entire process.

^ Researchers with expertise about how humans interact with technology evaluated the usability of the infotainment system in stationary vehicles.

◆ Compared to a recommended maximum of 24 seconds.

AUDIO ENTERTAINMENT

The audio entertainment system includes: AM, XM, and FM radio; CD; USB; Bluetooth; and auxiliary audio via the touch screen and accompanying center stack buttons. A few audio options are available via steering wheel buttons, but the voice command system does not support audio commands. Audio information is displayed on the touch screen when any audio menu is loaded. If any other menu is currently loaded, any audio-related changes are conveniently displayed in a temporary dropdown ribbon along the top of the screen.

Overall, the Camry's audio entertainment system generated moderate demand. Drivers were subjected to very high visual (eyes-off-road) demand while interacting with the touch screen and accompanying buttons for an average of 14 seconds◆. The screen size may not be not ideal for the layout of the menu, which uses skinny horizontal buttons instead of easier-to-select squares. However, drivers were able to quickly make selections with few button presses.

◆ Compared to a recommended maximum of 24 seconds.

VEHICLE CONTROLS AND DISPLAYS

VOICE COMMANDS

The Toyota Camry's highly accurate voice command system provides access to phone and text messaging options. Upon pressing the clearly labeled button on the right side of the steering wheel, the natural-sounding voice guides the user through a series of prompts that tailors the system to the user's voice for higher interpretation accuracy. Unlike most other systems tested, a substantial lag occurs when the system is activated, which frequently led to the user speaking before the system was ready for a command. Furthermore, the system fails to promptly inform the user of the system's current status in real time, such as whether it is listening for or processing commands.

INSTRUMENT CLUSTER

The instrument cluster, located behind the steering wheel, features familiar gauges on either side of a 4.2-inch LCD full-color display. Vehicle information and settings can be accessed by using steering wheel controls.

STEERING WHEEL CONTROLS

The steering wheel has a total of 17 buttons to control audio and phone functions on the center stack touch screen and to access information on the instrument cluster display.

CENTER STACK

The center stack houses a 6.1-inch full-color touch screen surrounded by six large buttons and two smaller dials. It gives access to audio entertainment, phone functions and text messaging. Below the screen are two dials and nine buttons for climate control.

VEHICLE SALES SUMMARY

The Toyota Camry is the fourth best-selling vehicle in the U.S. market, with 388,618 vehicles sold in 2016[1].

[1] Source: Automotive News at autonews.com; Wall Street Journal at wsj.com – data updated to 2/25/2017.