



AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY



2017 BUICK ENCLAVE LEATHER



INFOTAINMENT SYSTEM* DEMAND RATING

Very High Demand



The 2017 Buick Enclave Leather's IntelliLink infotainment system* placed very high demand on drivers in the study. Center stack functions required very high demand due to the small buttons and the nonintuitive design of the system. Using the voice command structure to send text messages proved particularly demanding.

Standard and Optional Features in the 2017 Buick Enclave

- Optional
- Standard

	FWD 4dr Convenience	FWD 4dr Leather	FWD 4dr Premium
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.

ABOUT THE STUDY

Researchers evaluated 40 new 2017/2018 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, program audio entertainment or program navigation, all while driving down the road.

STRENGTHS

- While the vehicle is in motion, drivers cannot send new messages using the touch screen or view messages.
- Voice command interactions use intuitive language with calling/dialing and audio entertainment features.

WEAKNESSES

- Small touch-screen buttons are difficult to select, making drivers prone to erroneous selections when driving.
- Calling and dialing functions placed overall high demand on users, taking them an average of 24 seconds[‡].

* Infotainment System: Vehicle system that combines entertainment and information content.

** Overall demand measured: visual (eyes-off road) cognitive (mental) and time-on-task.

‡ Compared to a recommended maximum of 24 seconds.

VEHICLE OVERVIEW: CONTROLS AND DISPLAYS



VOICE COMMANDS



STEERING WHEEL COMMANDS



INSTRUMENT CLUSTER



CENTER STACK

INFOTAINMENT SYSTEM

The IntelliLink In-Vehicle Infotainment System* offers the following features:

CALLING AND DIALING



The 2017 Buick Enclave Leather allows drivers to place calls to contacts and dial numbers using voice commands or the center stack touch screen. The steering wheel contains call pickup and hang-up buttons for convenience. Either voice commands or the touch screen can be used to initiate the phone pairing process when the vehicle is stationary. While the vehicle is in motion, drivers can use either mode of interaction to access the phone book or access a dial pad to manually input phone numbers.

Calling and dialing functions placed overall high demand on users, taking them an average of 24 seconds[‡] to complete tasks using both the center stack touch screen and the voice command system. Researchers[‡] noted the phone button on the home touch screen is large and well-labeled, making it easy to identify. This did not, however, negate the very high visual (eyes-off-road) demand placed on users, which likely was driven by the small size of the dial pad. Similarly, the phone functions (i.e., dial, contacts, call list and pair devices) that are accessible along the bottom edge of the screen were difficult to accurately press. An unfamiliar organization of contacts in the phone book and multiple pathways for accessing favorites may have contributed to the very high cognitive (mental) demand placed on users by the center stack.

The voice command system for calling and dialing received a moderate overall demand rating despite requiring high levels of demand for both cognitive and visual attention. Fast voice-processing speed, easy-to-use commands and the system's ability to accurately interpret contact names consistently provided drivers with an easier interaction when using voice commands. However, the system still drew attention away from the driving task for an average length of 24 seconds[‡].

TEXT MESSAGING



With a phone paired, the Buick Enclave's IntelliLink infotainment system* allows users to send and receive text messages via the voice command system when the car is in motion. The voice command system can be used to listen and reply to messages or send new ones to contacts. Users are presented with 15 pre-defined messages to choose from when using the voice commands or when using the touch screen if the car is parked. While the vehicle is in motion, drivers cannot send new messages using the touch screen or view message text, but can have the message content read aloud.

Using text message functions while driving placed overall very high demand on drivers.

Sending new messages to contacts using the vehicle's voice command system generated very high demand, pulling the driver's visual and cognitive attention away from the road for an average of 37 seconds[‡] per interaction. A task cannot be completed solely using voice commands as the system forces the driver to interact with the touch screen to select a message. The resulting text messaging menu is visually cluttered due to a vast number of buttons with few or no visual distinctions. This forces the driver to visually and manually engage with the screen when making selections and completing a task.

When listening to messages in the inbox, the touch screen presents drivers with time stamp information and a grid of text message options. For example, users can delete and forward messages while driving. In addition, the voice readout is verbose, providing the driver with date and time information in addition to the message content. The lengthy message readout may have produced the high cognitive demand.

* Infotainment System: Vehicle system that combines entertainment and information content.

[‡] Compared to a recommended maximum of 24 seconds.

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

AUDIO ENTERTAINMENT



The audio entertainment system in the Enclave includes: FM, AM and XM radio; Bluetooth audio, USB and auxiliary connectivity; and third-party apps installed on the user's phone, such as Pandora or Stitcher. These sources can all be accessed while the vehicle is in motion using voice commands, the center stack touch screen and steering wheel buttons.

High demand was required of users to interact with the audio entertainment functions in the Buick Enclave. In particular, the center stack registered with very high demand, a contrast to the voice command system's moderate rating. Similar to the phone functions, researchers[‡] found the target buttons for audio entertainment functions are small and difficult to select, especially while the vehicle is in motion. Operating the system via touch screen required very high visual and cognitive demand due to its implementation of presets, small text and slow processing speed.

Using the voice command system generated overall moderate levels of demand. The command structure and prompt list displayed on the touch screen may have contributed to high levels of cognitive and visual demand. These were slightly mitigated by a short average task duration of 16 seconds[◊].

[◊] Compared to a recommended maximum of 24 seconds.

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

VEHICLE CONTROLS AND DISPLAYS

VOICE COMMANDS



The 2017 Buick Enclave Leather comes equipped with a natural-sounding voice command system that allows drivers to access phone functions, audio entertainment, text messaging and extensive help menus. The voice command system is activated by pressing the designated steering wheel voice button. Available commands are listed on the center stack touch screen, although auditory instructions frequently do not match visual aids.

INSTRUMENT CLUSTER



The Enclave's instrument cluster, located behind the steering wheel, features a small monochromatic LCD display placed above five standard gauges, such as the speedometer and tachometer. Users can access trip information, Park Assist settings, vehicle information and status indicators from this display by pressing the four touch-sensitive buttons flush with the center stack below the touch screen.

STEERING WHEEL CONTROLS



The Enclave's steering wheel contains 12 buttons: Five on the left side provide access to cruise control and seven on the right side give access to the voice command system and limited audio entertainment functions. The buttons are large and spaced out, which may pose difficulties to users with smaller hands. The buttons are grouped according to function and labeled with intuitive and standard icons.

CENTER STACK



The center stack is equipped with a 6.5-inch full color touch screen, two dials and seven touch-sensitive buttons flush with the center stack. The main menu uses a grid layout with large tiles for three different pages of submenus. Users can access audio entertainment, text messaging, phone functions, various third-party and native apps, and settings.

The vehicle's HVAC system is accessible using 15 buttons located below the touch screen. Common functions, such as adjusting temperature and fan speed, can be quickly selected due to the use of standard icons and color coding.

VEHICLE SALES SUMMARY

The 2017 Buick Enclave is the 99th bestselling vehicle in the United States, with 48,564 sold during 2017.⁵

⁵Source: *Automotive News* at autonews.com; *The Wall Street Journal* at wsj.com — data updated to December 2017.