



AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY



2017 NISSAN MAXIMA SV



INFOTAINMENT SYSTEM* DEMAND RATING

High Demand



The 2017 Nissan Maxima SV, equipped with the NissanConnect® infotainment system, placed high demand on drivers when using it for placing calls, sending a text message, tuning audio entertainment and programming navigation.

Standard and Optional Features in the 2017 Nissan Maxima

	S	SV	SL	SR	SR Midnight	Platinum
○ Optional						
● Standard						
Android Auto						
Apple CarPlay	●	●	●	●	●	●
Mobile App Support	●	●	●	●	●	●
Text Messaging	●	●	●	●	●	●
Navigation	●	●	●	●	●	●
Touch Screen	●	●	●	●	●	●
Gesture Control						
Heads-Up Display						
Voice Commands	●	●	●	●	●	●
Console Control	●	●	●	●	●	●

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

- Calling and dialing voice commands were easily understood by the system.
- Certain phone functions are not accessible while the vehicle is in motion, reducing potential for distraction to some users.

WEAKNESSES

- Voice commands to control audio entertainment are rigid and unnatural.
- The rotary wheel interface proved to have multiple functions that some drivers had trouble remembering.

* 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



CENTER CONSOLE

INFOTAINMENT SYSTEM

The NissanConnect In-Vehicle Infotainment System offers the following features:

CALLING AND DIALING



Drivers can pair a phone with the infotainment system using the center stack touch screen while the vehicle is stopped. Once a phone is paired, the system allows drivers to both call contacts and dial phone numbers. Drivers can access all phone-related functions using voice commands, the touch screen or the rotary dial. Certain phone functions are not accessible while the vehicle is in motion. For instance, drivers cannot view the phone's entire phonebook – only the quick-dial favorite contacts.

Drivers using voice commands to place a phone call in the on-road study were met with moderate demand overall. Drivers were able to place calls quickly, but with very high cognitive (mental) and high visual (eyes-off-road) demand. While voice commands were intuitive and accurately interpreted by the system, researchers[^] noticed the system only accepted 'office' or 'mobile' to differentiate between contacts with more than one number.

Using the touch screen to access phone functions placed moderate demand on drivers. Drivers were able to complete a task quickly but experienced high visual (eyes-off-road) and cognitive (mental) demand. The touch screen responds quickly to inputs, and drivers are only able to access five quick-dial contacts while the vehicle is in motion.

The console control placed moderate demand overall on drivers, according to the on-road study. The unique rotary wheel allowed drivers to make selections quickly, but with very high cognitive (mental) and high visual (eyes-off-road) demand. It is likely that the interface and its multifunctional capabilities require higher mental focus while drivers attempt to remember all the ways it can function.

Overall, the Nissan Maxima's infotainment system for calling and dialing placed moderate demand on drivers.

TEXT MESSAGING



With a phone paired via Bluetooth, drivers can view, listen to and respond to text messages by choosing from seven predetermined replies.

Using voice commands to access text messaging functions placed very high demand on drivers in the on-road study. While drivers were able to keep interactions short, they experienced very high cognitive (mental) demand, and high visual (eyes-off-road) demand. While voice commands are intuitive and the system processes them with high accuracy, sending text messages takes drivers through five different menus, an overall cumbersome process.

When drivers in the on-road study used the center stack touch screen to access text messaging, they were met with high demand. While drivers were able to send one of the seven predetermined texts quickly, they still experienced very high visual (eyes-off-road) and cognitive (mental) demand.

Using the center console control, drivers in the on-road study experienced high demand. While task times were short, interactions imposed very high cognitive (mental) and high visual (eyes-off-road) demand on drivers. The process to send a reply using the rotary wheel is identical to that of the touch-screen path.

The text messaging functions in the Nissan Maxima, while limited to just seven predetermined replies, placed very high demand on drivers.

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

INFOTAINMENT SYSTEM

AUDIO ENTERTAINMENT



The Maxima's audio entertainment system offers: AM, FM and XM radio; Bluetooth; CD player; USB port; and auxiliary input. Drivers can pair two separate phones using Bluetooth, one for phone-related and one for media-related functions. Drivers can access audio via voice commands, center stack touch screen, steering wheel buttons and the rotary wheel.

Drivers in the on-road study experienced moderate demand overall when using voice commands to access audio entertainment. While drivers were able to change radio stations quickly, they were met with very high cognitive (mental) demand. Drivers may be frustrated by the audio entertainment voice commands that were rigid and unnatural, leaving little room for error when changing radio frequencies and selecting media.

Drivers using the center stack touch screen for audio entertainment in the on-road study were also met with moderate demand overall. Drivers were able to make audio selections quickly, but with very high visual (eyes-off-road) and high cognitive (mental) demand. Menu structures for media selection can take drivers into multiple submenus, which may cause them to take their eyes off the road for too long while searching for a selection.

The center console rotary wheel, when used to access the audio entertainment in the Nissan Maxima, placed high demand on drivers. While drivers were able to tune the radio and make media selections quickly, such tasks imposed very high visual (eyes-off-road) and cognitive (mental) demand. While the rotary wheel was able to navigate audio menus efficiently, drivers were still required to look at the screen at length to make the correct audio selection.

Audio entertainment in the Nissan Maxima placed overall moderate demand on drivers, no matter how they attempted to control the system.

TURN-BY-TURN NAVIGATION SYSTEM



The system offers turn-by-turn navigation, providing visual directions to a destination on the center stack touch screen with accompanying voice prompts. Additional navigation data is shown on the cluster display behind the steering wheel. Drivers can access navigation control via voice commands, touch screen or the rotary wheel. Multiple options are inaccessible while driving and drivers are only allowed to search points of interest while the vehicle is in motion.

Drivers using voice commands for the navigation system in the on-road study were met with high demand. Task times took 29 seconds* and required high cognitive (mental) demand, as drivers have a vast number of categories to sort through.

Touch-screen access to the navigation system placed very high demand on drivers. Task times were, again, very drawn out and imposed very high cognitive (mental) and high visual (eyes-off-road) demand on drivers. The navigation system is slow at loading selections and has a large number of options drivers can scroll through.

Using the center console's rotary wheel to make navigation selections also placed very high demand on drivers. It took drivers an average of 33 seconds* to make a selection, and interactions also resulted in very high demands. Some of the rotary wheel's functions are not immediately noticeable or obvious to drivers, who must search to find the desired selection or outcome.

Overall, navigation in the Nissan Maxima placed very high demand on drivers.

* Compared to a recommended maximum of 24 seconds

VEHICLE CONTROLS AND DISPLAYS

VOICE COMMANDS



The Maxima has a voice command system that lets drivers place phone calls, adjust audio and use turn-by-turn navigation to reach a destination. To give a voice command, drivers must press the clearly labeled voice control button on the steering wheel.

INSTRUMENT CLUSTER



The instrument cluster, located behind the steering wheel, has a 7-inch display showing vehicle information, settings, warnings, turn-by-turn navigation and audio entertainment information. Familiar gauges are located on either side of the display.

STEERING WHEEL CONTROLS



The steering wheel comes equipped with 10 dedicated buttons that control audio entertainment, cruise control, voice recognition and phone as well as the cluster display.

CENTER STACK



Central to the center stack is an 8-inch touch screen surrounded by four physical buttons. Drivers can press the physical buttons to access audio entertainment, phone controls and turn-by-turn navigation. The touch screen gives access to the same features through the main menu. It also includes customizable widgets, such as a current weather menu tile.

CENTER CONSOLE



The Maxima's center console offers a set of physical buttons and dials to control the vehicle's interior climate. It includes a digital display that reflects the current temperature and fan settings. It also includes a rotary wheel, located between the driver and passenger seats, which links to the infotainment system through the touch screen. The rotary wheel can be rotated or shifted in different directions and is accompanied by three buttons. Rotary controls give access to all of the same functions as the touch screen.

VEHICLE SALES SUMMARY

The 2017 Nissan Maxima is the 81st best-selling vehicle in the United States, with 30,753 vehicles sold between June 2015 and June 2016¹.

¹ Source: Automotive News at autonews.com; Wall Street Journal at wsj.com - data updated to 11/25/2016