



AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY



2018 NISSAN PATHFINDER SL



INFOTAINMENT SYSTEM* DEMAND RATING

Very High Demand



The 2018 Nissan Pathfinder SL's NissanConnect infotainment system* placed very high demand** on drivers in the study. While the system reacts quickly and allows drivers to promptly place calls and change the audio, the navigation and text messaging functions generated very high cognitive (mental) demand for extended periods of time.

Standard and Optional Features in the 2018 Nissan Pathfinder SL

	S	SV	SL	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 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, tune the radio or program navigation, all while driving.

STRENGTHS

- Motion restrictions prevent drivers from scrolling through contact books and dialing numbers while driving.

WEAKNESSES

- The center stack contains many buttons, which can complicate interactions.
- Voice recognition tasks require very high cognitive (mental) demand, likely due to inflexible commands and low interpretation accuracy.
- The system's displays are cluttered, driving visual (eyes-off-road) demand up for all tasks.

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

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

INFOTAINMENT SYSTEM

The 2018 Nissan Pathfinder NissanConnect In-Vehicle Infotainment System offers the following features:

CALLING AND DIALING



The 2018 Nissan Pathfinder SL allows drivers to place calls to contacts and dial numbers via the center stack interface, steering wheel controls and voice commands. A maximum of five devices can be paired to the NissanConnect system while the vehicle is in motion or stationary. Drivers must select “Connect Device” in the phone menu, located on the main screen, or enter the Bluetooth settings via the settings menu. The majority of the pairing process occurs via the phone, with no confirmation from the system that pairing has been successful. Drivers can start the pairing process via voice commands but must complete it on the touch screen. While driving, drivers can only initiate the pairing process using the center stack.

The center stack allows phone functions to be accessed through a manual phone button and a corresponding menu option on the touch screen. When the vehicle is in motion, the dial pad and full contact book are both inaccessible, and phone functions are limited to placing calls via a customizable favorite contacts menu. Although these tasks took only 20 seconds* to complete, high cognitive (mental) and visual (eyes-off-road) demand were generated when placing calls from the favorites list.

Drivers were able to dial numbers or place calls to contacts in approximately 17 seconds*; however, the layered interaction design and specific commands placed very high cognitive demand on drivers. Restrictions in language, such as the difference between saying “Call” for contacts and “Dial” for numbers, requires additional attention from drivers to avoid mistakes and successfully place calls.

TEXT MESSAGING



Drivers can use the center stack interface, steering wheel buttons and voice commands to have messages read aloud from the connected phone’s inbox and reply using predefined text message options.

After a message is selected from the inbox via the center stack interface, message details are immediately read aloud, including the name of the contact followed by the content of the text. Drivers are unable to compose new text messages and are limited to the 15 response options provided by the system. Only the first five message presets are available as reply options while the vehicle is in motion, and “Driving, can’t text” is the first reply option listed.

The voice commands required six steps in order to respond to text messages, bringing the interaction time to nearly 36 seconds* on average. Command prompts were displayed on the center stack touch screen during interactions, leading to high visual demand as well. Responding to text messages using voice commands placed very high overall demand on drivers due to the unintuitive and lengthy multi-step process.

Sending text message replies via the center stack generated high levels of demand overall. While drivers had to complete fewer steps in order to reply to a message than via voice commands, interaction times still averaged 24 seconds*, with high levels of cognitive and visual demand.

AUDIO ENTERTAINMENT



Drivers can access audio entertainment via voice commands, the touch screen and the steering wheel controls. The steering wheel uses a toggle button to allow drivers to alternate among audio sources, cycle through preset radio stations, seek available stations in the area, and change songs when a media device is connected and in use.

+ 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 vehicle

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

The center stack interface, consisting of a touch screen, manual buttons, and a rotary wheel, yields full access to audio entertainment functions. Drivers were able to complete audio tasks in an average of 18 seconds⁺, but were met with very high levels of cognitive demand as the center stack offers an excessive amount of options to complete the same task.

Full audio entertainment functionality is available via the voice command system. Drivers wanting to change the radio could do so using one command; however, when making selections from a media device, the accuracy of the system declined, as commands for this source are more rigid. Audio entertainment tasks took an average of 17 seconds⁺, but required high levels of cognitive demand.

A help dialogue specific to NissanConnect audio commands is available to assist in audio entertainment-related voice interactions.

TURN-BY-TURN NAVIGATION SYSTEM



Navigation is accessible via the steering wheel, center stack interface, and voice command system, allowing drivers to navigate to nearby places and points of interest. Drivers can select from general categories, including restaurants, gas stations, hotels, ATMs, rest areas, freeway entrances, emergency facilities and a general “other” category. The map screen is the default menu on the center stack display, featuring nonconventional color choices such as teal buildings against a gray background. Overall, navigating using the NissanConnect generated very high demand.

Center stack interactions required high overall demand and tasks took approximately 24 seconds⁺ to complete. The extensive menu options and multi-step design of the navigation menu generated high visual (eyes-off-road) and cognitive (mental) demand for drivers. While the vehicle is in motion, drivers are given the option to access the destination menu, the route menu and the navigate-to-home functions. If the destination menu is selected, 13 categories, each containing its own list of options, is displayed in a tile menu structure across two pages. While the vehicle is in motion, address input is allowed and the subcategories listed in the “other” category are not available via the center stack.

If a driver has already loaded the navigation menu through the center stack interface, the steering wheel offers quick options to navigate to nearby places or select a location from a category. Current navigation routes can be canceled quickly via the steering wheel controls.

Navigation tasks using voice commands lead to high demand overall, and took an average of 39 seconds⁺ to complete. Once the driver accesses navigation via voice commands, the menu allows drivers to select either nearby categories or specific points of interest. While the system is accurate at interpreting categories, once a destination has been set, it does not indicate that navigation has begun or confirm route selection. Researchers[^] noted that while the voice system provides command prompts on the center stack screen, interactions tend to be overly verbose, increasing interaction time.

⁺ 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 vehicle

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VEHICLE CONTROLS AND DISPLAYS

VOICE COMMANDS

The 2018 Nissan Pathfinder SL's voice command system can be activated and deactivated via a button on the steering wheel, or the voice button in the center console. It gives access to calling and dialing, text messaging, audio entertainment and navigation. A synthetic female voice gives commands; voice command selections also appear on the center stack via the touch screen. The "Enter" toggle switch on the steering wheel can also be used to scroll and make selections.

INSTRUMENT CLUSTER

The instrument cluster located behind the steering wheel features a small LCD display, flanked by two large circular gauges that house the tachometer, speedometer and fuel gauges. The LCD screen provides information about the outside temperature, the current drivetrain and the current gear; the bottom menu ribbon provides the odometer, Advanced Driver Assistance System information and miles-until-empty readings. Buttons on the left side of the steering wheel provide access to settings, trip information, tire pressure, audio, navigation and warnings.

STEERING WHEEL CONTROLS

The steering wheel contains 11 buttons that control the LCD display in the instrument cluster. Seven buttons on the left access infotainment. Separate individual buttons access audio source options, activate voice commands, and answer or hang up phone calls. In addition, a set of menu navigation controls allow drivers to interact with the LCD screen in the instrument cluster. Four steering wheel controls on the right-side yield access to cruise control functions.

CENTER STACK

The center stack is equipped with an 8-inch full-color touch screen accessed via a rotary wheel mounted underneath and 39 buttons that surround it, clustered into two sections. The touch screen and associated buttons provide drivers with access to HVAC functions, audio entertainment, applications, navigation, map screen, status, info, settings, phone functions, brightness control, and fuel information.

VEHICLE SALES SUMMARY

The 2018 Nissan Pathfinder SL is the 73rd bestselling vehicle in the United States, with 67,550 vehicles sold during 2018¹.

¹ Source: Auto sales data and statistics at goodcarbadcar.net – data updated to 1/04/2019.

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