SBD

June 2025   635-25(25d)
In-Car HMI UX Evaluation & Benchmarking
Cadillac Escalade IQ

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#635

UX
EVALUATION

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In-Car HMI UX Evaluation & Benchmarking

Cadillac Escalade IQ

Welcome to the 2025 HMI benchmarking report series, where SBD's user experience experts carry out thorough UX evaluations of the features and technologies offered in the latest vehicle releases.

In this edition, our experts test the new Cadillac Escalade IQ. The team observes the struggles to meet the high expectations set by its ICE predecessors, with poor stability including five critical—significantly hurting its user experience and overall confidence. While it boasts strong perceived quality and solid ADAS features like Super Cruise, its HUD, digital HVAC controls, limited rear-seat entertainment, and feature set fall short for its price point, making competitors more compelling.

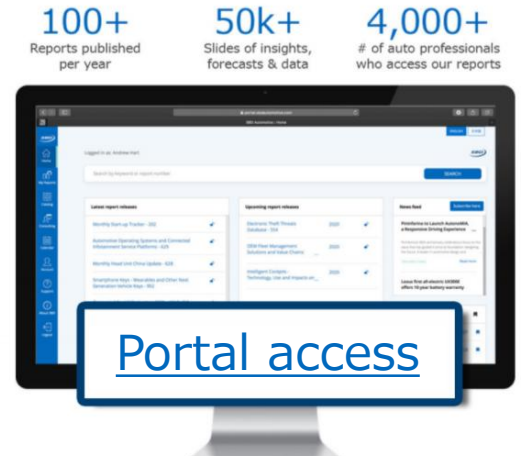| COVERAGE				FREQUENCY			PUBLICATION FORMAT				PAGES
GLOBAL	NA	CHINA	EUROPE	ANNUALLY	QUARTERLY	9 CARS PER YEAR	PDF	POWERPOINT	EXCEL	ONLINE	100+

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Scoring

> **Features and functionality:** evaluating whether the solutions provide features that customers expect, need and solve problems (or provide a wow factor).

> **Reliability/stability:** evaluating the repeated usability and whether the users can have a similar (positive) experience each time.

> **Usability:** evaluating whether the features available are easy to learn and use. This considers areas such as ergonomics, legibility, usability characteristics and how the system implements the various features.

> **Perceived quality:** evaluating the potential perception in quality of the HMI components and how this contributes to the overall customer experience.

This research is useful for

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💬 **Customer Feedback**
Provide your feedback to SBD regarding this report

Total number of pages - 111

Introduction

Report Introduction

Welcome to the 2025 HMI benchmarking report series. This report has been created to provide a fair, unbiased and objective view of the latest in-vehicle HMI solutions in the US, European, and Chinese markets. Evaluations are carried out by SBD usability experts with a deep understanding of CASE domains such as the Connected Car and ADAS & autonomy domains.

SBD supports clients throughout the development of new HMI and products from a relatively simple companion app to a more complex multi-domain infotainment solution. The methodologies used in these reports take into account many years of experience with consumer testing and custom client projects to provide a fair and, as much as possible, objective methodology.

All viewpoints and analysis within the report are aimed defining areas of concern through a data driven approach. This report aims to benchmark and score solutions whilst also being able to provide actionable recommendations to design and development teams.

Please note that due to the ever-evolving automotive technology market, SBD updates its methodology each year, but does not update scores from the previous years. Therefore, please assume a drop in scores from the previous year for both user experience (UX) and functionality.

Intuitive

Supportive

Flexibility

Consistency

Brevity

Depth

Presentation

Layer	Section	Conclusion
STRATEGY & IMPACT	Executive Summary	This report provides an in-depth look at the user experience (UX) the vehicle provides across many domains and provides an overall UX score and features and functionality score in order to benchmark vehicles against each other.
LEARNING & ACTION	System Usability	An in-depth look at factors impacting overall usability including Execution, System Performance, Legibility, Ergonomics, and System Stability.
	Features & Functionality	Breaks down the vehicle's features and functionality offering into three categories, Hygiene, Performance or Delight features.
	Perceived Quality	An evaluation of 17 different attributes that impact perceived quality of a vehicle, in which each are given a score which is calculated into the overall usability score.
CORE INSIGHTS	Analysis by domain	An in-depth analysis of each domain including the major and minor positive and concern points for Voice recognition, General system, Navigation, ADAS, Other domains.
CONTEXT	Birds Eye View	Please read the 635 25j Summary Report (available December) for consideration of the wider CX context
	Future Outlook	
	Next Steps	

Report series & test vehicle

This report series offers insights, analysis, and perspectives based on a well-defined testing methodology. SBD Automotive has been conducting UX and HMI testing for automakers since 2012, initially focusing on connected vehicle solutions across global markets. Over time, our methodology and approach have evolved in response to industry advancements and client feedback.

The 2025 series marks our fourth major update, featuring the following enhancements:

- Inclusion of safety considerations and risk assessments

- Integration of AI testing

- Streamlined HMI heuristic evaluations

- Updated voice, static, and dynamic use cases

- Improved legibility to align with ISO guidelines

- Introduction of emotion evaluation to perceived quality evaluations

- Restructured ADAS testing to reflect current industry trends

- Simplified report structure

The Cadillac Escalade IQ (Sport 2 trim) has been evaluated in this report with testing conducted in the USA in April 2025. This vehicle was chosen as it is Cadillac's latest EV solution with an updated 55-inch curved touch screen infotainment display plus a display in the lower center console, Google Built-in, and Super Cruise (SAE L2+).

Software version tested: GM N24-249059 & GM N25-2494560

Methodology overview

Testing is conducted by two SBD usability experts over a five-day period. Evaluations are aiming to be fair and unbiased covering the vehicle's infotainment and ADAS HMI solutions. The key components of the methodology are outlined below.

First impressions	Preliminary assessments of key aspects such as build quality, reach, wow factor, and ergonomics
Use cases	Testing of static and dynamic use cases, including acceptability ratings and detailed analysis
Voice recognition	Voice recognition evaluations, focusing on command structure, recognition accuracy, flexibility, localization
Heuristics	General UX guideline assessments, considering factors like error prevention, consistency, and user control
Execution	Analysis of visual elements (GUI, display, map, etc.), responsiveness, and system reliability
Ergonomics	Evaluation of ergonomic factors such as reach, gaze and visibility, strain, and fatigue
Performance	Quantitative testing of practical use cases, including route calculation and rear-view camera delay
ADAS	Assessment of driving assistance features considering Levels 0/1/2/2+/3 (e.g. PD, BSM, RCTA, SAPA/FAPA)
HUD	Evaluation of feature set, HUD quality, and performance under various conditions
Legibility	Assessment of display quality, including contrast, character count, and viewing angle
UX laws	Verification against common UX principles and alignment with in-vehicle usage

SBD's usability & HMI consulting support

Since 2012, SBD has been conducting HMI evaluations for both publicly available research reports and bespoke client studies. Our team of domain experts and seasoned industry professionals ensures that all research findings are data-driven and objective. While this report focuses on expert evaluation methods, our bespoke studies encompass a wide range of topics and HMI use cases. SBD has carried out testing across the globe covering a wide variety of topics and domains; from both in-vehicle and external evaluations.

Expert evaluations

Voice of the customer

Performance testing

Evaluations carried out by SBD experts with global UX testing experience. Example projects:

HMI best practice guidance: summary results of past system failures, creation of common HMI guidelines and rules, and an overview of technology trends

Prototype bench unit evaluation: Onsite assessments conducted through targeted expert testing to identify key issues, provide recommendations, and rank them by importance based on their impact on overall UX.

Evaluations carried out by end consumers with either 'hands-on' or remote testing. Example projects:

Full HMI UX evaluations: A hybrid approach combining expert and consumer perspectives, utilizing both blind and targeted testing methods, exploratory testing, use case analysis, and assessments of emotional engagement.

ADAS Real World Consumer Testing: Designed to understand consumer expectations of partially automated systems, with a focus on real-world usage and perceptions.

Evaluations carried out with dedicated test equipment to evaluate system performance. Example projects:

ADAS performance testing: Testing on proving grounds with prototype solution to evaluate vs upcoming regulations.

EV range performance & CX: Multiple market evaluations of EV range estimates and how the information is presented to the end user (both accuracy and depth of information).

Example slides from the report

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Stability issue evidence (3/13)

5. Auto lane change when other cars were too close

The system attempted to carry out an automatic lane change when another car was too close for comfort. This occurred on a highway and raised serious safety concerns.

Frequency	Low
Severity	Critical

No image

6. Question to VPA was ignored

Google Assistant ignored the prompt even though it showed it was listening. The VPA made an audible noise but didn't respond with any answer, action or clarification question.
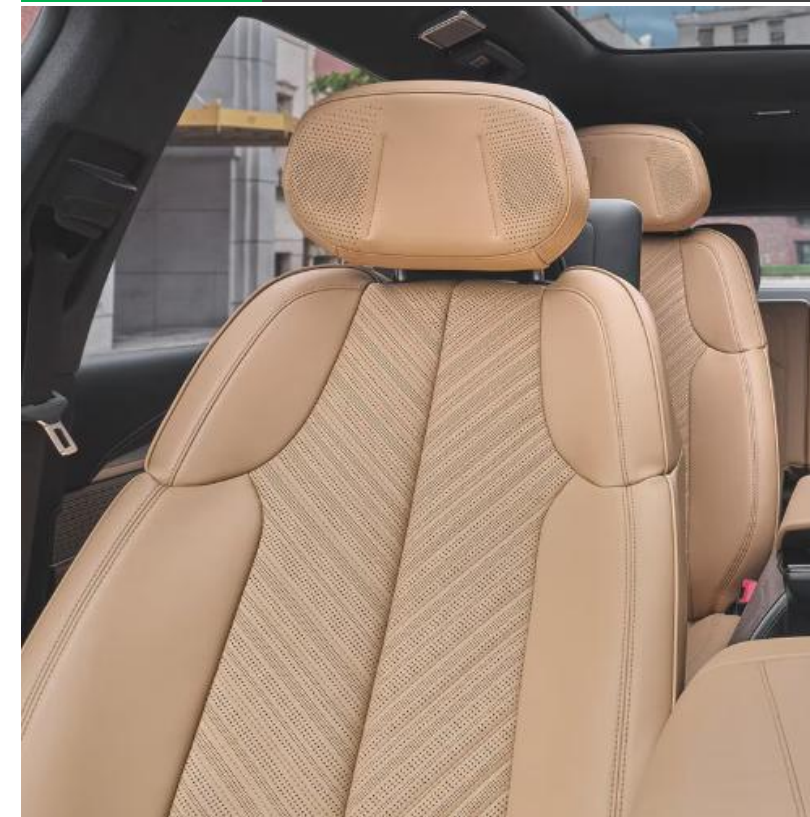
Frequency	Medium
Severity	Major

Ambient lighting, passenger display & headrest speakers are delight

| Delight | Highly customizable ambient lighting |

| Delight | Passenger display |

| Delight | Speakers in headrest |

The ambient lighting is highly customizable. It includes the ability to choose brightness and color, save custom styles, choose from preset styles or link the ambient lighting to the drive mode. Additionally, the ambient lighting is customizable for three different zones (door panels, dash and floor area), which gives an even higher level of personalization.

The passenger display offers functions such as Youtube, Hulu, browsing through the web or checking the vehicle status. While more functions were expected, the possibility to enjoy these few entertainment options is still enhancing the overall experience in the vehicle.

The Cadillac Escalade IQ has speakers implemented in the headrest of the front and rear seats. They are part of the AKG Audio System which provides a premium sound experience. An advantages of headrest speakers is that one passenger can listen to music or watch a movie without disturbing others too much.

Perceived Quality: Visual

Level 1	Visual
SBD viewpoint	**Harmony/alignment:** Aesthetics are consistent throughout, but overall visual of the shiny black controls does not align with the brand identity. **Geometric:** The shape of most of the HMI Components matches their function. **Spatial harmony:** Most controls are spaced appropriately, but some screens appear cluttered and the reach to them it can impact usability. Touch areas are also not always clearly defined. **Branding:** There are touches of branding throughout the entire car that help give the impression that the design was really thought out and helps improve perceived quality. **Output HMI:** The light bar on the steering wheel communicates to the driver when using Super Cruise and is well implemented. The exterior lights are a form of output HMI as well and are used to communicate for different use cases, e.g. light sequence for locking/unlocking/approaching and front lights indicate the charge level during charging. **Interior lighting:** Highly customizable ambient lighting is implemented. A lot of buttons and panels are well lit making them easier to see.

Ambient lighting on door panel

Controls on door panel are well lit

Level 2 scoring					
Harmony/ alignment	Geometric	Spatial harmony	Branding	Output HMI	Interior lighting
Good +	Excellent -	Good +	Excellent +	Excellent +	Excellent +

Poor integration of keyboard

| Major negative	Separate keyboard can cause frustration

For typing in or searching information, the user has to use the keyboard on the lower central display. The results then appear on the upper central display. This operating model cannot be changed to just using one screen and includes all use cases for when the user needs to type:

• Searching for a location in navigation system

• Searching for information in owner's manual

• Searching in list of contacts

• Setting up a user profile (typing in information such as user name, password, email address, home address)

While it is generally more convenient for the user to have the keyboard closer to the armrest, the division of where to type and where the typed in letters appear creates an awkward use – the user needs to look up and down to see if the typed letters were correct or if suitable suggestions of a search appear. Mistakes might be noticed too late and therefore many letters need to be corrected or typed in again. Overall, the separation of the keyboard most likely lowers speed of task completion significantly, can cause frustration and decrease the user experience. One way to fix this is showing the typed letters and search results above the keyboard on the lower central display. This can be integrated with the next OTA update.

Another issue is that the search field needs to be clicked twice to show the keyboard. This presents no clear added value and causes a longer task completion time. SBD recommends to have the keyboard show up right away when the search field is clicked. This can be integrated via an OTA update as well.

This issue is also noted in Navigation Analysis.
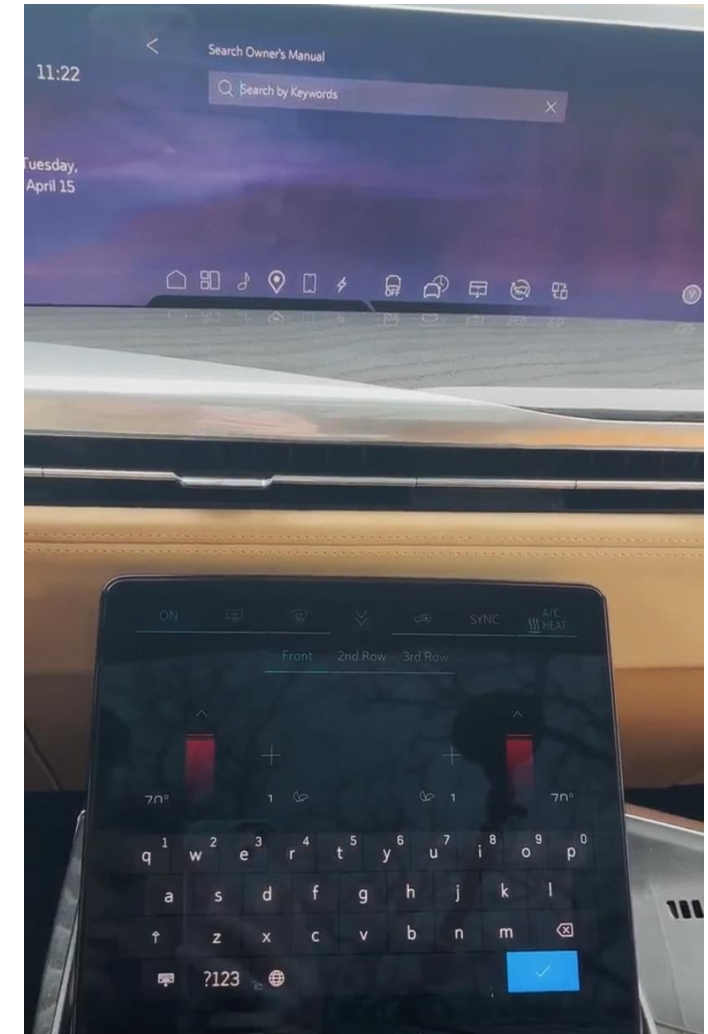
Automatic plotting and calculation of charging stops

Minor positive	Ability to learn the system

Using Google Maps, EV route calculations are supported by automatic planning of charging stops.

- When calculating a long route that exceeds the current range of the vehicle, charge point location stops are added automatically, quickly and without any recalculation. This compares favorably with legacy solutions that either take a long time or calculate the route twice.

- Stops were appropriately chosen during testing and appeared to optimize battery state to provide the minimum charging duration.

The thought of being unable to find suitable charging stops contributes to range anxiety. An effective solution, such as the one provided by Google Maps, mitigates for this and gives drivers the reassurance that they can reach their destination effortlessly and as efficiently as possible.
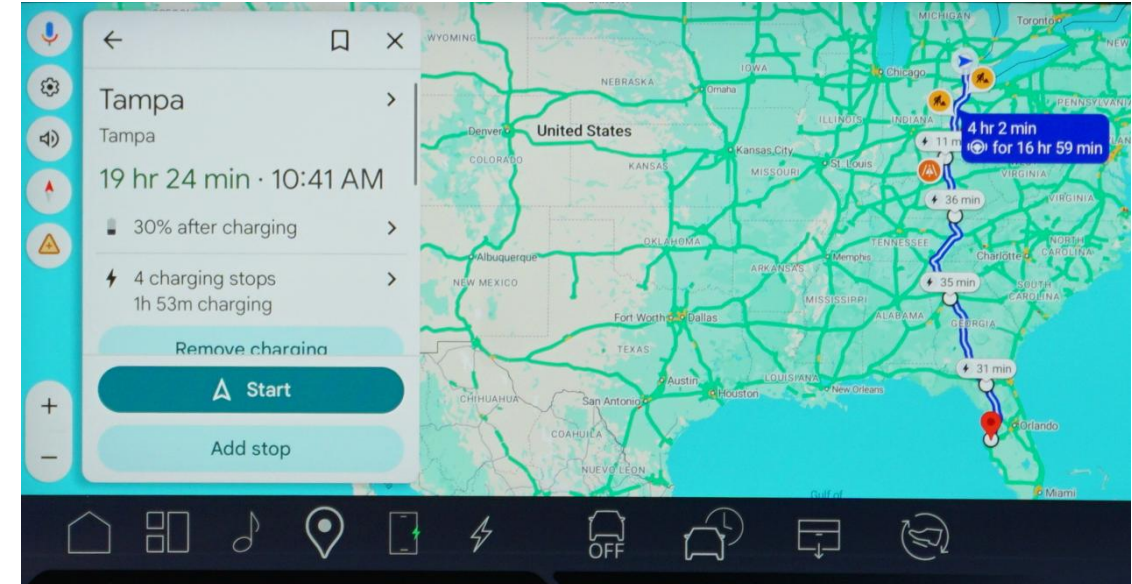
Charging stops are automatically added to the route

Good output HMI for Super Cruise

Major positive	Supportive output HMI

The Escalade IQ offers Super Cruise, which is SAE L2+, assisted driving (AD) hands off, and it's implemented well.

- There's a light bar on the steering wheel that changes between blue, green and red to help indicate status of Super Cruise.

- There's also a specific ADAS view option in the instrument cluster that enables detailed information relating to ADAS.

- The ADAS icons are always visible and intuitive on any of the instrument cluster screens and in the HUD.

The light bar feature is a standout feedback HMI offering and helps improve confidence in the ADAS and encourage usage of the system.

Supportive light bar on the steering wheel and visuals in the cluster

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Contact SBD Automotive

Do you have any questions?

If you have any questions or feedback about this research report or SBD Automotive's consulting services, you can email us at info@sbdautomotive.com or discuss with your local account manager below.

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