TABLE OF CONTENTS

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UX EVALUATION

In-car HMI UX Evaluations

#635

In-Car HMI UX Evaluation & Benchmarking

Lynk & Co 900

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 Lynk & Co 900. The Lynk & Co 900 brings an array of innovative features—including AR-HUD, multi-screen setups, and flexible seating—but is held back by severe system instability, lag, and underwhelming ADAS performance despite high-end hardware. While external interaction and in-cabin tech show promise, persistent flaws in navigation, connectivity, and design limit the overall user experience and demand urgent attention through OTA updates.

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

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ENGINEERS

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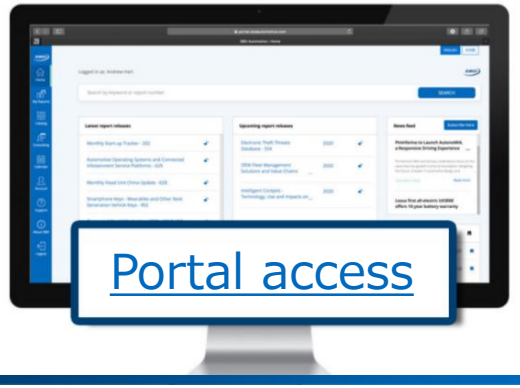

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In-Car HMI UX Evaluation & Benchmarking
Lynk & Co 900

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SBD

July 2025

635-25(25i)

In-Car HMI UX Evaluation & Benchmarking
Lynk & Co 900

Contents

635 - In-Car HMI UX Evaluation & Benchmarking – Lynk & Co 900

Customer Feedback
Provide your feedback to SBD regarding this report

Total number of pages - 104

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.

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 NIO ET9 has been evaluated in this report with testing conducted in China in May 2025. This vehicle was chosen as it is NIO's latest solution with an updated 15.6-inch touch screen infotainment display, AR-HUD, NOMI Mate, NOMI Intelligence, steer-by-wire and car-phone projection (NIO phone only).

Software version tested: Cedar 1.0.1 CN

Methodology overview

Testing is conducted by two SBD usability experts over a five-day period. Evaluations are aiming to be fair and unbiassed 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

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.

Voice of the customer

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.

Performance testing

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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GUI usability issues impacting user experience

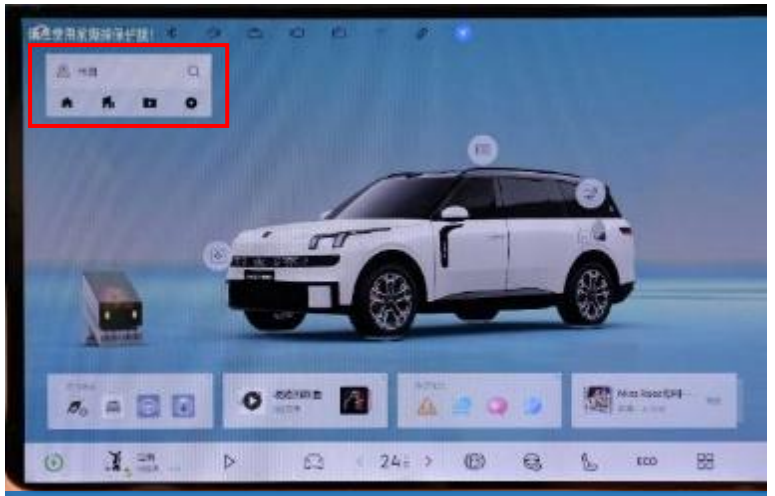
On first usage, the GUI appears appealing and easy to understand. However, testing reveals several important usability issues. The most significant relate to icon clarity, gesture guidance, and navigation input efficiency as further explained below. The clarity and comprehensibility of the UI, as well as the optimization and reduction of unnecessary steps, are aspects that volume family SUV buyers value highly.

Unclear meaning for certain icons on homepage

On the homepage of the central display, some icons are difficult to understand just from their appearance. For example, on the status bar, the icons for the virtual rearview mirror and the ceiling display control are very similar, making them hard to distinguish. On the dock bar, the icon for the environment simulation app is not easy to recognize at a glance, and it can easily be confused with functions like parking assist.

Lacking return button with no tutorial on shortcuts

The system uses edge return gestures similar to Android and has a reasonable design logic. However, it lacks quick gesture guides for first-time users, such as swiping up for the app drawer or using edge gestures. Most apps don't offer a separate back button, and the home button in the lower left corner is not always visible (e.g., during navigation, the area only shows turn-by-turn navigation and tapping it returns to navigation). Without learning these gestures, new users may find the system difficult to use.



Multiple steps to input navigation destination

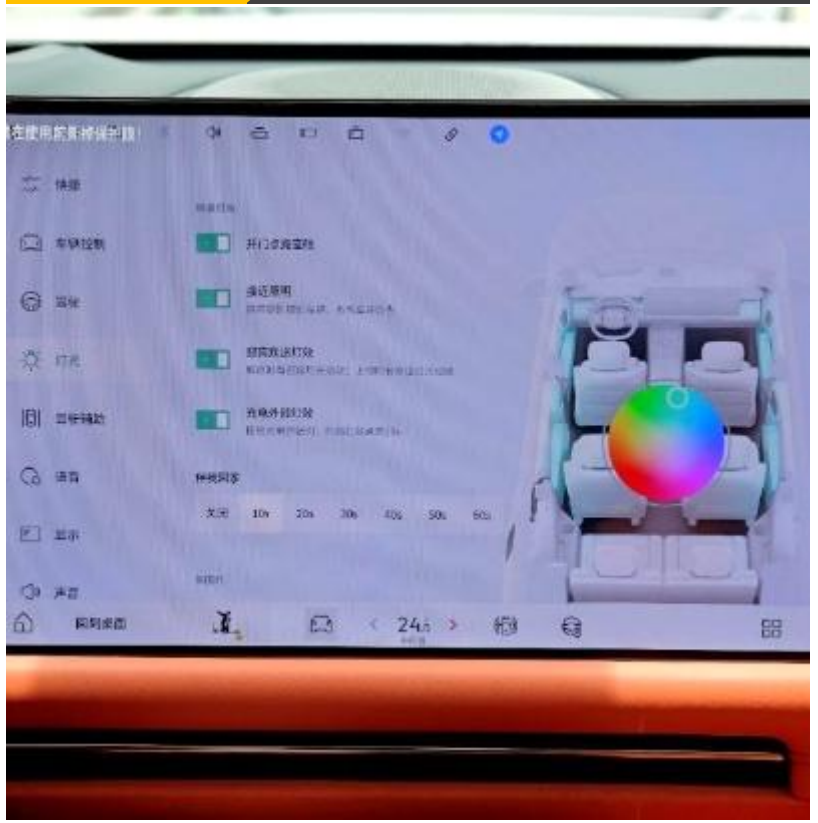
The central display homepage offers a navigation quick input box, which is a good design. However, it requires three clicks to bring up the keyboard for destination entry: first to open the navigation app, second to expand the search bar, and third to activate the input method. This process is cumbersome and undermines the intended convenience.

Feature linkage enhances the immersive cockpit experience

Performance | **Flyme Link - Phone Connectivity**

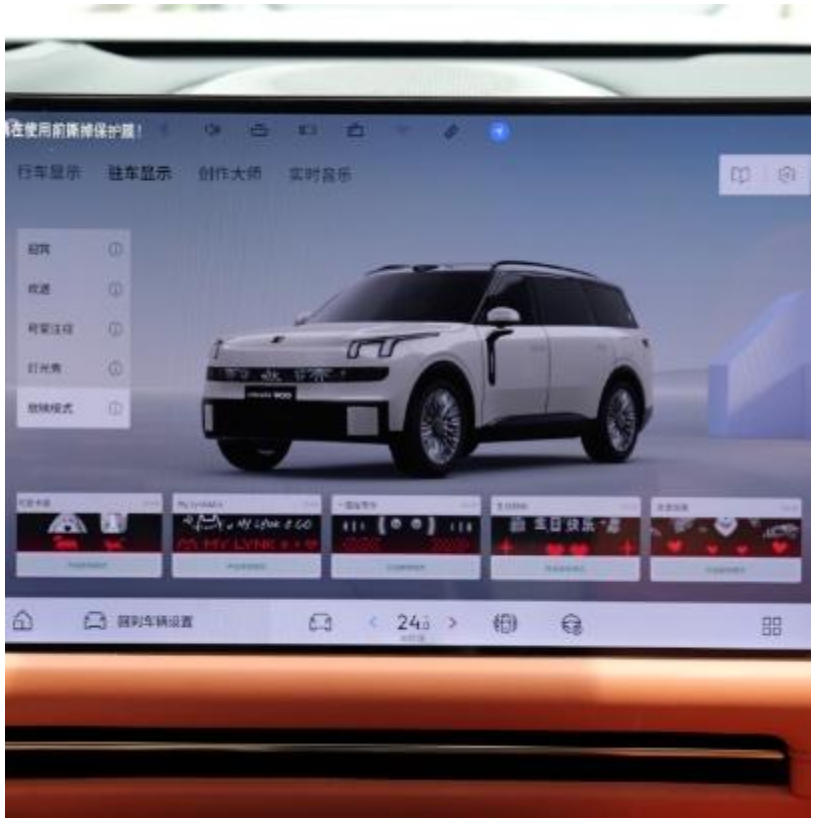
Users can connect with Meizu smartphones via Flyme Link. Once connected, the vehicle's display can show a list of applications from the phone. When opening an app like Bilibili, users can also freely control the split-screen display ratio in full-screen mode.

Performance | **Ambient lighting**



The Lynk & Co 900 offers a rich variety of ambient lighting themes and color settings. Additionally, the ambient lighting will synchronize with the turn signals when L2+ PD is active, indicating the system's intentions.

Delight | **Exterior interactive displays**



The vehicle features a front interactive display, and the taillights also support custom interactive content. Users can select driving and parking displays from the settings interface, which supports custom drawing boards and the display of music lyrics and melodies. If the gaze function of the front interactive display is enabled, the animated character on the display will move along with people outside the vehicle.

Perceived Quality: Tactile

Level 1	**Tactile**
SBD viewpoint	**Stiffness & looseness:** Some of the buttons, especially those on the steering wheel, exhibit noticeable wobble and have a pronounced plastic feel. **Force feedback:** Most buttons, including those on the steering wheel controls, display weak force feedback with insufficient damping. **Material quality:** The leather feels inexpensive, with minimal soft padding present. Some plastic and rubber surfaces come across as low-grade and poorly finished. The choice of materials and their tactile properties are not in line with what would be expected for a vehicle in this price range. **Material harmony:** There is a strong emphasis on orange-colored leather across most panels, with plastic components designed to mimic a similar tactile experience. **Geometric & Positioning:** The placement of the center console buttons and interior mechanical door latches is not adequate, leading to awkward reachability issues.

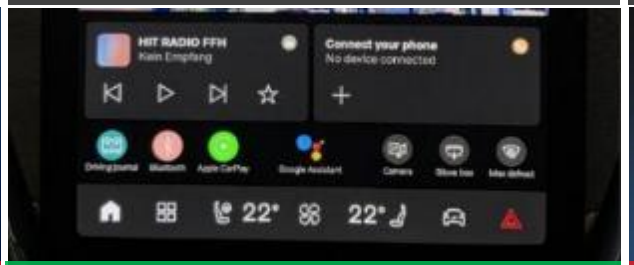
Level 2 scoring				
Stiffness & looseness	Force feedback	Material quality	Material harmony	Geometric & positioning
Poor +	Poor +	Poor +	Fair +	Poor +

Level of integration: C

Whilst not a primary consideration, the level of integration of voice interface solutions is something being focused on more by OEMs.

Only one IoT (Google Assistant) is integrated, and the system can fulfil content-based integration use cases such as setting calendar schedules, checking news, and weather information etc.

The voice recognition system demonstrates an **average** level of integration. The system scores a **C** for this section of the assessment.

In-car HMI	IoT	Car features	Multiple VPA
			
Yes and effective	**No integration**	**Yes and effective**	**No integration**
• The VPA can be activated either via voice, the avatar in the home page of the central display or steering wheel control • The VPA supports multiple voice tone settings, customizable wake-up words, dialect recognition, and voiceprint recognition capabilities.	• No IoT integration available	• Most system settings and vehicle controls can be controlled via voice.	• No multiple VPA integration available

Physical buttons for quick activation of common functions

Minor positive | **Improve the convenience of common functions**

The Lynk & Co 900 features physical buttons for common functions on both the steering wheel and the center console. This improves the efficiency of operating without looking while driving, thereby reducing driver distraction compared to screen-based controls.

The center console features four HVAC shortcut control buttons and a central knob. The four HVAC buttons allow quick control over A/C on/off, front defogging, cabin air recirculation, and auto climate mode. The central knob primarily manages multimedia, with rotation adjusting volume, and a press initiating pause or play. Additionally, this central knob has a built-in ambient light, enhancing consistency with the overall cabin lighting.

The steering wheel buttons are divided into left and right sides:

- The left side primarily controls ADAS functions, including adjusting following distance, cruise speed, and activating or canceling AD features. There's a customizable button in the upper-left corner of this side. Its customizable options include the panoramic view, trunk release, automatic parking, exterior speaker, media source switching, and the streaming rearview mirror.
- The right side is mainly for multimedia-related function control. On the far right, there are buttons to switch the content displayed on the rightmost section of the instrument cluster and to activate the voice assistant.

Overall, the physical buttons within this vehicle's cockpit are practical, capable of meeting many common needs during driving. While the cockpit adheres to a minimalist design, the retention of a few physical buttons improves interaction efficiency without cluttering the cabin. However, the number of customizable buttons is limited, with only one on the steering wheel. Adding one or two more customizable buttons would increase user flexibility for quick operations.

Physical buttons on the center console

Physical buttons on the steering wheel

Navigation offers guidance on the expanded lanes at intersections

Minor positives

Minimizes the risk of drivers choosing the incorrect lane

In the navigation information window, any extended lanes that appear when the road widens at an intersection are specifically marked. As shown in the image on the right, there's an indicator line below the extended lane to show that it's not an original lane but a newly extended one.

When the users approach a roundabout, the upper-left corner of the navigation information window will display a roundabout icon along with the number of the exit they need to take to leave the roundabout.

This enhances the driver's efficiency in understanding the road ahead and lane distribution, which reduces the risk of them taking the wrong lane or missing a roundabout exit.

Lane guidance for widening roads at intersections

Driver monitoring is limited, and voice prompts are sparse

Major negatives

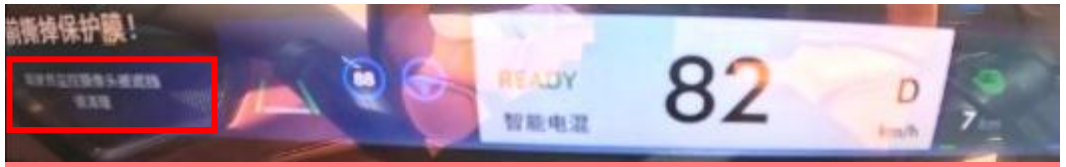
Limited DMS and voice prompts under AD L2+

Detailed mode provided for ADAS voice prompt setting, but content minimal

The system lacks intention prompts for ADAS actions. Additionally, the Driver Monitoring System (DMS) does not detect key fatigue behaviors.

- DMS only detects driver's gaze direction (e.g. looking away from the road) and camera obstruction, with no detection of other drowsiness or distracted behaviors such as yawning or rubbing eyes.
- Voice prompts offer detailed and simplified modes, but even the detailed mode only provides engagement and exit announcements, with no reporting on AD L2+ system behaviors or intentions while active. System actions are only shown as small text prompts on the central display and instrument cluster.
- Alerts are sparse and fail to comprehensively warn about risky or inattentive driving behaviors.

DMS only tracks gaze and camera obstruction, with sparse voice prompts omitting ADAS intentions. This increases the likelihood of drivers becoming less focused when using L2+ systems, posing a safety risk.



DMS has attention alerts and camera obstruction alerts, but lacks detection of other drowsiness behaviors

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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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