

ÉMORA: Emotional Mobility and the Role of Emotional Connection in Urban Electric Vehicle Design

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Abstract

The introduction of electric and autonomous mobility has repositioned the car as a traditional form of transport, making it increasingly intelligent and interactive. At the same time, today's urban cars are becoming more technologically advanced, but many still focus more on the vehicle's efficiency, connectivity, and performance than on the human element inside it. This research investigates the potential of designing a small electric vehicle that takes emotional comfort and human connection as key aspects of mobility.

The so-called concept of “The Car That Cares” is the base for ÉMORA, an urban electric vehicle concept. While many vehicles focus exclusively on transporting an occupant from one place to another, this concept explores the ways in which the car can be more of a companion. The project examines the psychology of design in the exterior form, the spatial organisation of the interior, the movement of seating and digital interaction.

Soft, flowing surfaces, rounded volumes, a compact proportion and a friendly visual identity in the exterior design convey warmth and approachability. The concept of “Duality & Unity” captures the emotional connection between two occupants alongside individual personal space. Two interior themes are addressed: “Seats That Reunite”, where the seats move towards each other when the car is empty, and “Two Spaces, One Emotional Connection”, where two distinct spaces remain visually linked. A second concept, Companion Mode, is a digital addition activated when the passenger seat is vacant.

Emotional design can therefore be applied across a vehicle's spatial organisation, movement, interaction and experience, and this is the approach proposed by ÉMORA for future urban mobility.

Keywords: Emotional Design, Urban Mobility, Electric Vehicle, Automotive Interior, Human-Centred Design, Emotional Mobility, Vehicle Experience.

1. Introduction

The world of urban mobility is changing dramatically. The way people engage with a car is evolving with the introduction of new technologies such as electric propulsion systems, connected technologies, improved driver-assistance systems and digital interfaces.

As cities become more crowded, travelling is also becoming more difficult. Because of this, the automobile is becoming an important personal space where people spend a large amount of their time. Today, transportation design mainly focuses on performance, aerodynamics, packaging, safety, ergonomics, efficiency and the overall look of the vehicle. These aspects remain important, but the emotional side of travelling is not always given adequate attention in vehicle design.

In everyday city travel, people deal with traffic jams, waiting, parking problems, time pressure, noise, excessive digital information and tiredness from travelling every day. All of these factors can affect how a person feels while travelling inside a vehicle.

This raises an important design question: what if a vehicle could be a positive presence for a person's emotions during a trip? The concept of emotional mobility is the question that ÉMORA tries to answer.

The project centres on a small electric city vehicle designed not only for travelling but also to give the people inside a feeling of comfort, familiarity and companionship — an idea called “The Car That Cares.” The concept is based on Donald Norman's theory of emotional design [1]. According to Norman, people connect with products in three ways: visceral, behavioural and reflective. The visceral level concerns the first impression created by a product's appearance and feel. The behavioural level concerns how the product works and how easy it is to use. The reflective level concerns the meaning, memories and personal connection a person develops with the product.

In car design, these ideas suggest that emotional connection with a vehicle is not only about appearance. It is also about how the vehicle feels to use and what kind of memories and feelings it creates for the people inside it.

This can affect the appearance, behaviour, response and communication of a vehicle with its passengers. Traditionally, a car has mainly been seen as a useful product that provides protection and helps people travel from one place to another. Today, however, a car is becoming more like a personal space; apart from travelling, people use their cars to listen to music, talk to others, work, wait, relax and spend private time.

This shift allows transportation designers to think of a vehicle as a space for experience rather than simply a machine. Emotional design is useful here: Norman [2] explains that a product is experienced through how it looks, how it works and how people feel or think about it — the visual appearance, the manner of use, and the emotional connection developed over time.

For ÉMORA, emotional mobility is considered both physically and psychologically. The car should feel inviting, comfortable, easy to understand and familiar. This approach also changes the way the vehicle's form is designed: instead of communicating only speed, efficiency or performance, the form can also communicate warmth, softness, calmness and friendliness.

Similarly, the interior design of a vehicle can express the relationship between users and the vehicle. This research examines how these emotional ideas can be incorporated into the design process.

2. The Car That Cares — Conceptual Foundation

The project is centred on a small electric city vehicle that is designed not only for travelling but to give occupants a feeling of comfort, familiarity and companionship. This is the founding idea of “The Car That Cares,” which draws directly on Norman's [1] three-level model of emotional design — visceral, behavioural and reflective — as the conceptual base for the exterior form, interior organisation and digital interaction developed throughout this paper.

3. User and Urban Mobility

ÉMORA is designed mainly for people who travel regularly in cities. Their daily travel can include traffic jams, parking problems, long commutes, unpredictable traffic and tiredness. The user wants travelling to be easy, smooth and efficient, while also wanting comfort and personal time during the journey.

ÉMORA does not treat the journey as an empty space between two locations; rather, it considers the journey as part of the user's daily life. Daily travel can include traffic jams, parking problems, long travel times, unpredictable traffic and mental tiredness. For ÉMORA, the journey is considered an important part of the user's everyday life, and the vehicle is designed to make this daily travel experience more comfortable and meaningful.

The issues of urban transport also carry broader implications for health and wellbeing. The World Health Organization [4] has highlighted the connections between transport, the built environment, physical activity, pollution, road traffic crashes and access to social and economic opportunities. This underscores the importance of considering mobility as a component of life rather than only as a transportation challenge.

4. Purpose and Goals

The main aim of the project is to explore the integration of emotional connection into the design of a small electric urban vehicle. The goals are:

1. To analyse emotional design as a strategy for transport development.
2. To develop an exterior personality that is welcoming and inviting.
3. To design an interior that balances personal space with a communal experience.
4. To explore movement and transformation as means of expression.
5. To use digital engagement as a way to create a sense of companionship.
6. To create a small urban car that is functional and emotionally healthy.

5. Design Approach

The design methodology was developed across multiple stages. The first stage focused on understanding the target user and setting the emotional arc of the project, leading to the identification of warm, gentle, eco-friendly, intelligent and friendly as guiding attributes. The second stage focused on exterior form development: different proportions, outlines, surface treatments and aesthetic directions were explored to find a form that communicates friendliness while retaining a futuristic identity as an electric vehicle.

The third stage explored the interior. Rather than beginning from conventional seating arrangements and dashboard layout, the study examined human posture, occupant relationship and the emotional dimension of space, leading to the broader idea of Duality & Unity. The final stage connected interaction to tangible design, exploring how seat movement and digital projection could create a feeling of presence and companionship.

6. Exterior Design Evolution

The exterior of ÉMORA embraces rounded volumes and soft, flowing surfaces. The car does not rely on an aggressive or overly mechanical vocabulary, but on a compact and friendly one. Proportions are adjusted to suit densely populated urban environments: short overhangs, a compact profile, a glass-heavy cabin and large wheels suggest a small but capable city car. The side surfaces are sculpted, adding visual dynamism without unwanted complexity. The overall shape remains futuristic while maintaining a human scale. A number of materials and finishes were explored to reinforce the emotional persona of the vehicle, since the exterior is the first emotional surface of the car.

7. Interior Design Evolution

The car needs to appear friendly, calm and welcoming before the user enters it. This visual and sensory response corresponds to the visceral component of emotional design — the properties that evoke an initial emotional response to a product. The exterior therefore provides the foundation for ÉMORA's broader aim: a small electric vehicle designed to move people while making mobility more 'human.'

The interior is the primary place in which the relationship between the vehicle and its users translates ÉMORA's emotional intent. The core idea is "Duality & Cohesion," based on a simple premise: two people sit in a two-seater car, each with their own feelings, tastes, actions and boundaries.

The interior is therefore designed to allow free expression of individual personality rather than full uniformity, while still creating a sense of identity and community. The design explores spatial harmony between two people, so that each passenger retains personal space while sharing the same emotional environment. The abstract conception of the yin-yang principle — two forces that are distinct yet connected — was used as a reference, manifested through spatial partitions, curved shapes and overlapping forms rather than as a literal symbol. The result is an interior that fosters both individuality and togetherness.

8. Concept 1: The Gesture of Unity — Seats That Embrace

The main interior idea, "The Gesture of Unity," proposes that a physical mechanism can elicit emotion. It was inspired by an abstract gesture of two forms moving nearer to each other, suggesting the dynamics of the seats' movement. The seats fold inwards toward each other when passengers exit the vehicle, giving the impression of an embrace; the interior becomes an empty space, and the car's attitude changes.

This motion transforms furniture into an expression of emotion. When in use, the seats face the occupant to support them during travel; when the car is empty, the seats assume a different configuration that visually represents "reunion" and "connection." The idea is that a car can hold different moods depending on whether it is occupied. The distance between the seats becomes significant — not 'wasted space' but emotional space, a window into the relationship between two people.

This viewpoint expands the role of car mechanisms. Mechanisms typically serve practical functions such as adjustment, folding, storage or access; in ÉMORA, the movement itself becomes a means of communication. This illustrates how emotional design can operate at a behavioural level — Norman's [1] behavioural dimension relates to the experience of interacting with a product and the effectiveness and satisfaction of its operation. The movement of the seats therefore carries both a functional and an emotional role in shaping the user's perception of the vehicle.

8.1 Ergonomic Considerations

The idea is emotional, but the interior still needs to be grounded in human factors and ergonomics. Seat position, passenger posture, reach, visibility, ease of entry and exit, and seat adjustment all affect how comfortable and usable an interior is. Research on vehicle interiors shows that variation in human body size and seating position is an important consideration in interior design [3], and this becomes even more critical when developing new seating mechanisms.

The proposed emotional movement in "Seats That Embrace" would require further testing to ensure it functions safely, including studies of body size and proportion, movement testing, structural development, integration of safety restraints and formal safety testing. At this stage, the idea remains a design exploration rather than a fully developed engineering mechanism.

9. Concept 2: Dual Domains, Singular Emotional Connection

The second interior idea, “Dual Domains, Singular Emotional Connection,” removes the fixed centre partition that typically separates two passengers. Instead, it creates two distinct spaces that remain visually connected, giving each passenger a sense of privacy while keeping the shapes and surfaces between the spaces smooth and continuous, so the interior does not feel divided.

This creates a balance between privacy and togetherness, again drawing on the yin-yang principle, where two opposite sides remain part of one whole. The two sides of the interior can differ in look and spatial character while remaining connected through continuous curves and shared surfaces.

This approach is particularly useful in a small two-seater car, where limited space can otherwise make passengers feel closed in. Rather than treating the limited space as a constraint, the design uses it to bring passengers closer, turning the interior into a shared space rather than two separate seats. The flowing curves also remove the visual weight of a conventional centre console or physical barrier, helping the eye move smoothly across the interior and making the whole space feel more open and connected.

10. Companion Mode: Digital Emotional Engagement

A digital interaction concept, Companion Mode, complements the tangible interior design. It activates when the passenger seat is unoccupied: the space behind the driver's seat can be filled with a flexible projection or digital visual entity that creates a sense of a ‘virtual’ companion. The intent is not to imitate or substitute for a real person, but to explore how digital technology can create a hint of presence during solitary journeys.

The digital companion can communicate through ambient light, projection, voice, tailored information or other HMI actions, adapting to the user's journey and delivering information in a calm and unobtrusive manner. This extends the emotional intent of the project into the digital layer of the car. Crucially, the technology is meant to be supportive rather than distracting — informing the user without overwhelming them with alerts or entertainment, and creating a conscious, responsive atmosphere rather than a demanding one. Companion Mode therefore represents a form of emotional intelligence in future mobility, combining physical design, spatial dynamics and digital interaction.

11. Emotional Design as a Shaping Tool

A central finding of the project is that emotional design need not be an extra layer added after a vehicle's design has been finalised; instead, emotion can act as a formative tool. For ÉMORA, the emotional aim shapes the vehicle across several dimensions:

- Proportion: compact and inviting, rather than daunting.
- Surface: smooth and soft, rather than sharp.
- Lighting: warm and welcoming, rather than only practical.
- Interior space: open and connected, rather than divided into separate sections.
- Mechanism: interior movement used to express and create emotion.
- Interactions: digital features designed to make passengers feel more connected and present.
- Materials and finish: warm, comfortable materials supporting the overall feel of the interior.
- Overall personality: modern, friendly and approachable.

The car is not only about emotion; it must still function well as a vehicle. However, the emotional narrative is carried through its design, space, movement and interaction, connecting with Norman's [1] idea that appearance, behaviour and reflection work together to shape the overall experience of a product. Emotion

is therefore not added as decoration but is embedded in ÉMORA's colours, forms, space and overall experience.

12. Results

The development of ÉMORA has produced several key findings. First, emotional engagement can be treated as an acceptable design objective in transportation aesthetics. Vehicles are often compared using measurable factors such as efficiency, performance, safety, space and ease of use, but the emotions of the person inside the vehicle can also strongly affect how they remember and feel about it.

Second, the research shows that vehicle interiors can generate strong emotional responses, since the interior is the main area where users spend time and interact with the vehicle; spatial arrangement, seating, lighting, materials and interaction design can all significantly affect how a user feels.

Third, the project shows that mechanisms themselves can create emotion. “Seats That Reunite” demonstrates how a functional movement can also carry emotional meaning, becoming part of the vehicle's character rather than remaining a purely technical feature.

Fourth, the project shows that personal space and togetherness can coexist. “Two Spaces, One Emotional Connection” gives each person their own space while keeping them connected to the overall interior.

Finally, digital features can also enhance the emotional experience of travelling. Companion Mode explores how human–machine interaction and projection can create a sense of connection even without physical contact. Together, these findings support ÉMORA's central idea: that urban mobility should be efficient and practical, but also comfortable, enjoyable and emotionally pleasant.

13. Reflection

The overall message of the ÉMORA concept is to reframe the function of the vehicle. As cars become more electric and automated, mechanical parts may become less central, and the interior can become a more comfortable space for sitting, relaxing and spending time, while digital interfaces become more important in helping the vehicle communicate with its occupants.

This gives transportation designers an opportunity to reconsider what a car can be: more than a means of moving from one place to another, it can be a personal space, a place shared with someone, a space to relax, or a space for digital features — making emotional comfort an important part of the interior.

The concept also challenges the assumption that small city cars must always be minimal and purely functional. Even a small car can offer a rich experience, introducing the idea of emotional luxury: luxury need not mean a large car, expensive materials or extensive features. In a small electric car, comfort, personal space, calm and good interaction can themselves feel luxurious.

In this way, ÉMORA shifts the conventional relationship from Human → Vehicle → Destination to Human ↔ Vehicle ↔ Experience. In the first, the car is mainly a tool for reaching a destination; in the second, the car becomes part of the journey and the experience itself. Emotional design, however, should not replace the basic functions of a vehicle — safety, ergonomics, usability, accessibility, strength and manufacturability remain essential, and the emotional dimension is intended to work alongside them.

14. Design Importance

The central concept behind ÉMORA's design is “The Car That Cares.” The project assumes that future vehicles will be able to express care through subtle physical and digital actions, manifested through a

welcoming exterior, a cosy interior, an appropriate layout, adaptive illumination, intuitive interactions, supportive digital actions, and mechanisms that respond appropriately to the presence of the user.

This does not imply that a car can actually feel human emotions; rather, it creates cues and behaviours that users can interpret as caring, familiar or calming. The concept therefore engages with the emotional dialogue of transportation design, asking a different question from the one usually posed — not only “What should the vehicle look like?” but “How should the vehicle evoke feelings in a person?” — a question that reshapes the design process itself.

15. Constraints and Future Opportunities for Improvement

ÉMORA is a conceptual design inquiry, and several aspects require further investigation before the concept could be developed into a viable production model.

The first is the anthropometric and ergonomic dimension of the design: testing with people of different body sizes is needed to determine correct seat position, range of seat movement, ease of entry and exit, and comfortable sitting positions.

The second is the mechanism and structure of the seats. The folding and inward movement must be smooth, reliable and safe, requiring proper engineering and testing, with particular attention to seat belts, airbags, restraints, seat structure and crash-safety standards for a movable seat system.

Because the car is compact, further study is needed on battery placement, wiring, visibility, entry and exit, storage and overall passenger comfort. For Companion Mode, additional research is required in human-machine interaction, projection, privacy, sensors and voice recognition, ensuring the system does not distract the driver while creating an emotional connection.

Most importantly, the emotional response to the concept should be tested with real users, since different people can interpret the same shape or movement differently depending on personal experience, culture, expectations and preferences. Future work could test the concept through physical prototypes, VR environments, interactive seat models, HMI mock-ups and user testing, to assess whether people experience the intended feelings of comfort, connection, warmth and companionship.

16. Conclusion

In ÉMORA, emotion becomes a central part of designing a new type of urban electric vehicle. The core premise is that vehicles are becoming smarter and more advanced, but intelligence alone is not sufficient to create an emotional connection with the user.

People spend considerable time inside their vehicles, particularly during busy or stressful journeys, so a car is not only a means of travelling from one place to another — it can also become a private, comfortable space in which to relax, spend time and feel connected. ÉMORA explores this idea by making the vehicle more than a machine: through its seating, space, movement, lighting, materials and digital interaction, the concept aims to create a more comfortable and emotional experience for the user.

At the same time, the emotional dimension should not come at the cost of basic vehicle function — the car still needs to be safe, comfortable, practical and easy to use. The aim of ÉMORA is to show that even a small electric city car can provide not only mobility but also a better emotional experience.

The exterior design is simple and balanced, with an easily understood form and a compact size that makes the vehicle feel friendly and welcoming. The idea of Duality & Unity is explored in the interior through the movement and interaction of the two passengers: Seats That Reunite gives a mechanical movement emotional meaning, while Two Spaces, One Emotional Connection balances personal space with

togetherness. Companion Mode extends this idea into the digital domain by creating a sense of virtual presence.

The project demonstrates that emotional design is not limited to how a vehicle looks; it can also shape proportions, interior space, materials, lighting, mechanisms, interactions and digital features. Through ÉMORA, the project aims to shift transportation design away from simply carrying people from one place to another, toward developing a vehicle that also understands and supports the user's experience.

Future urban mobility will require vehicles that are efficient, connected, safe and sustainable, while also feeling more human, comfortable and user-centred. ÉMORA treats emotional mobility not as a replacement for technology but as an additional layer within it, where technology and human experience work together to create a more meaningful journey.

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