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Design and Style of a Tourist Van for Inter-City Sightseeing

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Abstract

India's tourism sector is thriving, and the demand for enriching travel experiences is growing, highlighting the urgent need for innovative sightseeing solutions that prioritize tourist needs and address critical concerns such as comfort, convenience, safety, hygiene, time efficiency, and overall enjoyment. This thesis project, MOBIII, focuses on developing a customized tourist van designed for optimal sightseeing experiences within the Indian context. The proposed tourist van promises to significantly enhance future travel experiences for millions of tourists, fostering greater exploration, connectivity, and overall quality of visits. This innovation has the potential to transform how people tour and experience India's rich cultural and historical heritage..

Keywords: Design Stylization, Transportation Design, Sightseeing Experience, Tourist-Centric Transport, Sightseeing Vans.

1. Introduction

Firstly, it is important to understand how transport systems in India function when discussing mobility in the context of tourism. When observing developing cities, they are densely packed with a crowded population and an infrastructure to go along with it. The productivity levels are high due to high work-participation. This means millions of people are travelling across the cities to reach their places of work, school, college, etc. and proceed back home. Among these are different users with different requirements and purposes heading to their destinations in various methods of transport. Thus, opting for these transport methods comes with their own set of criteria to meet and the challenges to go along. One of the problems are issues with mobility for different users. This project aims to explore the idea of ride-sharing and realizing its full potential through shared mobility. Ultimately, this project involves the research, design and development of a passenger centric mobility solution for shared rides to similar destinations and addresses critical concerns such as affordability, safety, hygiene, time efficiency, convenience, and ease of use during city commute in India.

2. Objectives

The tourist sightseeing vehicle project in India is designed to revolutionize urban tourism by offering an accessible and convenient method of commute for tourists. This initiative aims to innovate the exploration of cities, providing a clean, green, and sustainable transportation alternative. The project prioritizes eco-friendliness and modern design to minimize environmental impact while enhancing the viewing experience for tourists. By incorporating state-of-the-art amenities and real-time information displays, the vans will maximize the efficiency and enjoyment of urban sightseeing, contributing to a more sustainable and user-friendly tourism infrastructure.

Data Collection procedure

Questionnaire method using an Online Form.

3. Findings

- Amid existing mobility solutions, many cannot accommodate for people with reduced mobility such as elder persons, differently abled users, persons with hip-back pain, and persons recovering from injuries.
- Professionals who travel longer distances to work do not find time to work, especially because their commute is exhausting, time-consuming and they do not remain connected, or able to work in many modes of travel.
- Users wishing to own a car and drive their own car, are less likely to prefer using MaaS. Users that do not own a personal vehicle, and already use public transport are keener to travel in an eco-friendly way, using MaaS.
- Users who use personal vehicles would opt for public transport given they are convenient, accessible, cost-effective and time-saving. Public and Private sectors need to collaborate to efficiently provide a multi-modal mobility system for the population to commute in the city. Due to lack of data available in current day, it is hard to organize a system.
- Users do not consider autonomous vehicles to be a viable solution in India due to lack of reliability on Indian roads and lack of trust. An efficient way of utilizing the vehicles on the road and reduction of personal vehicles is necessary for the future.

4. Methodology

Designing an Intercity Sightseeing Tourist Vehicle involves various design methodologies and considerations due to the unique conditions and requirements of operating in a bustling city accommodating various users. It follows a multifaceted approach that accounts for the distinct challenges and constraints posed by intercity travel.

Conceptualization and Requirements Analysis

The first step involves defining the purpose of the tourist vehicle, which helps us understand what exactly it is that we are looking for. The next step is to analyze the requirements posed by the challenges of the defined purpose and develop initial concepts based on the same.

A. Understanding the Purpose

The Tourist Vehicle is an essential part of the urban travelling fleet. Its primary purpose revolves around the transportation of people across a metropolitan city. It is equipped with the suitable mechanisms to navigate the city's various terrains, and offers convenience to the passengers providing them with ample facilities

during the commute. The design prioritizes functionality and form, enabling it to navigate the city with ease. The Shared Mobility Van is crucial in supporting a bustling city with a massive population, delivering them across multiple points of the city.

B. Requirements List

The Intercity Sightseeing Tourist Van has a wide range of requirements that need to be fulfilled to achieve its purpose of shared transport amidst a metropolitan city, they are as follows:

- Range – Ideally the range should be at least 400 kms between a fuel cycle given the repetitive nature of transport in a city. Energy-efficient systems and materials to minimize environmental impact is predominant.
- Passenger Capacity – Spacious interior with comfortable seating to accommodate multiple (at least 6-8) passengers.
- Navigation – Autonomous driving capabilities for improved efficiency and reduced human error
- Comprehensive safety features including airbags, seat belts, and anti-lock braking systems (ABS)
- Regulatory Compliance - Adherence to local, state, and federal transportation regulations and safety standards.
- Convenience - Onboard entertainment options such as Wi-Fi, screens, and charging ports for electronic devices.
- Safety - Comprehensive safety features including airbags, seat belts, and anti-lock braking systems (ABS).

C. Prototype Development

Prototype development for An Intercity Sightseeing Tourist Vehicle involved a systematic process that combines brainstorming, mapping insights to requirements, and translating these findings into initial ideations. After initial sketches on paper, they were taken over to a 3D canvas such as Autodesk Fusion and Blender 3D for more detailed visualization of the design. The process is shown below:

Theme Board for Concept Generation

Figure 1 - Theme Board for Concept Generation

Theme boards were generated keeping in mind the surroundings of a metropolitan city, and the culture and diversity visible in the passengers. A sleek, modern and futuristic van with a modular structure and neutral colors was the direction. By integrating these themes into the design process, the van can evolve into a vehicle that not only meets transportation needs but also enhances the urban landscape, offering an aesthetically pleasing, innovative, environmentally conscious, and user-friendly solution to mobility challenges.

Inspiration Board for Concept Generation

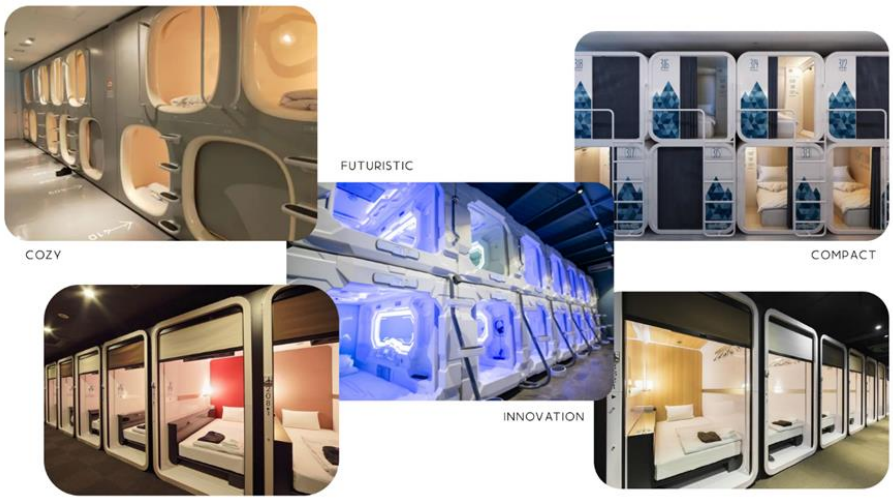

Figure 2 - Japanese Sleep Capsules & Pods

The inspiration for the structure was chosen from Japanese sleeping capsules since they are similar in essence to providing the function of comfort and privacy in a compact space while being available in many different themes. As seen in above images, they are also quite colorful and variety of designs and themes can be seen, this was chosen as an inspiration in the development of the intercity sightseeing Tourist Van.

Sketches

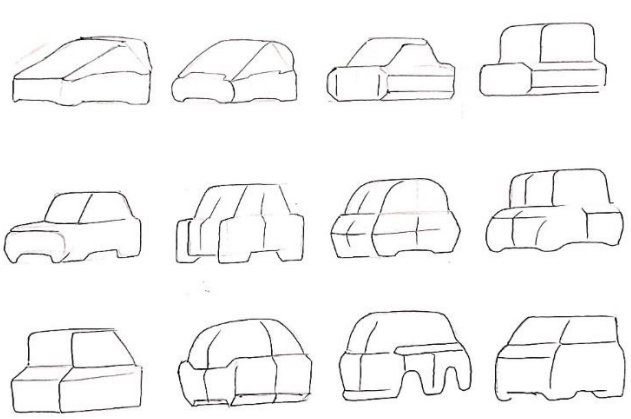

Figure 3 – Doodles A

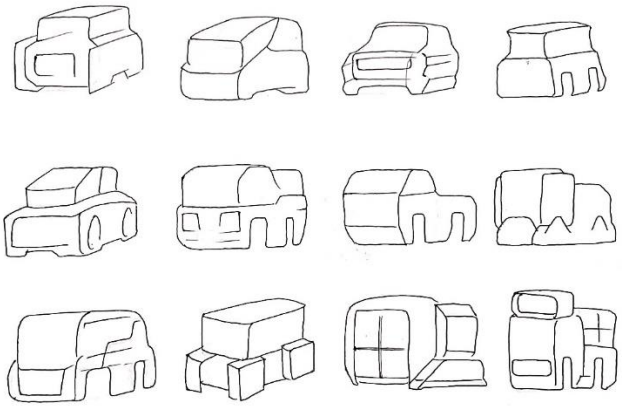

Figure 4 – Doodles B

The above figures show the initial approach in doodling simple forms and later moving on to more detailed forms as shown in the following page.

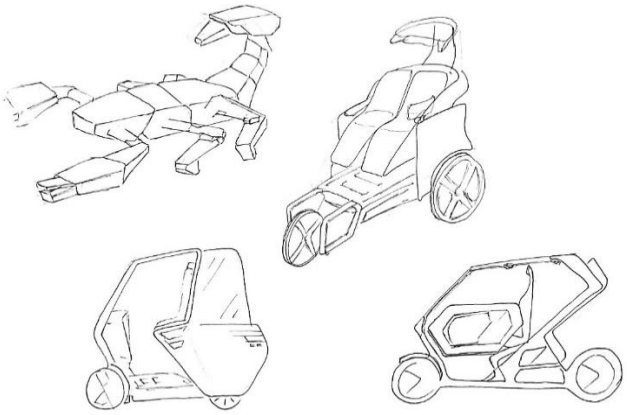

Figure 4 – Explorations A

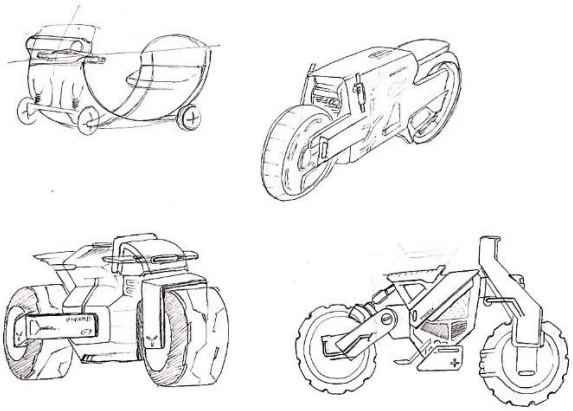

Figure 5 – Explorations B

The above figures display the sketches explored in similar mobility options as to not be constrained by a single direction.

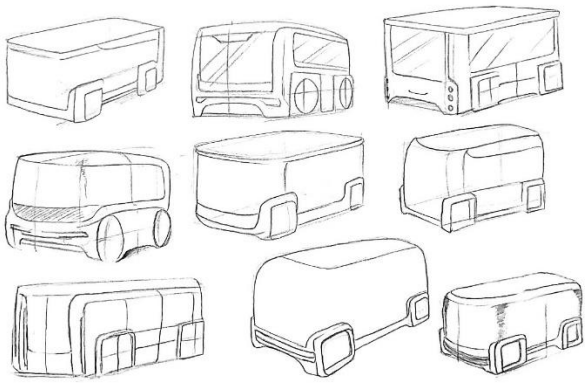

Figure 7 – Approved Ideation

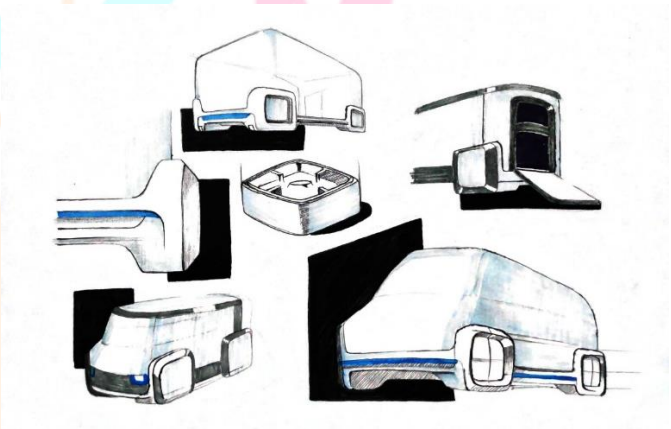

Figure 8 – Concept Sketch

The figures above display the approved ideation/direction for the concept. Figure 8 displays the further rendered and stylized sketch as the Finalized Concept.

3D Modeling

Phase I - The first iteration of the 3D model was done during the ideation stage and was explorative in nature and in order to visualize the sketches on paper to a more realistic form. It was done to observe the scale, volume, and how it interacted with the surroundings in its current form.

The first model had two sliding doors on the side, a custom seating arrangement imagining it being shared between multiple passengers and a running led information panel around the outer body. These features led to further discussion and exploration, signifying the first developmental phase of the project.

The design was inspired by the simplistic nature of campus autonomous buses and their minimal yet functional build structure.

Figure 9 - Front Profile of Tourist Van (WIP)

Figure 11 - The Passenger Seat (WIP)

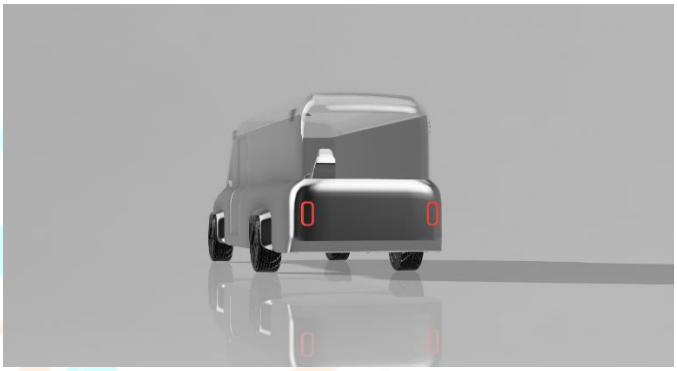

Figure 12 - Rear Profile of Tourist Van (WIP)

As displayed in the above figure 9, the final iteration of the tourist van relies on sleek yet elegant seams and lines to fulfill its structure and design, although still in the developmental stage, the van's details of the full glass cabin can be seen in the view along with the swiveling side door in later figures displayed below.

As displayed in the above figure 10, the van's slots of rotatable seats can be seen in the image, the rotation allows the viewers to sit in both front-facing and side-facing views according to their travel and sightseeing needs. The seats also slide back on a rail of its base to provide the users with more convenience.

Final Design - This iteration included all the learnings from the previous concepts, considering all the previous pros and cons and functionality. All panels were reworked. Few more features were added to the existing design from the Iteration II. The final design of the Tourist Van represents an interesting leap in the way people travel and explore new cities. This vehicle is meticulously crafted to address the unique challenges posed by the busy metro cities with a demanding crowd while maximizing functionality, efficiency, and convenience.

Rapid Prototyping

Phase II - The rapid prototyping process was carried out using the approved 3D model and was materialized in the form of a printed model, at 250 microns in a milk white shade, in order to understand the functions, and limitations of the current and final iteration. The respective images are attached below.

Figure 13 - Front

Figure 14 - Rear

Figure 15 –Front Interiors

Figure 16 – Rear Interiors

7. Future Scope

- A comparable study may be achieved via usage of specific techniques i.e. descriptive study method.
- A descriptive study can be conducted on effects of automating transport solutions and future.
- This examine may be replicated the use of a massive pattern to validate the findings and make generalization.

8. Conclusion

Designing the tourist van has been a rewarding project aimed at enhancing urban tourism with innovative transportation solutions. The primary goal was to create a vehicle that ensures comfort, safety, and convenience for city tourists. Challenges included working with realistic dimensions, user proportions, urban transport logistics, and balancing aesthetics with practicality. The project envisions a fleet of smart, eco-friendly tourist vans equipped with state-of-the-art navigation systems, real-time information displays, and amenities to enhance the travel experience, making urban tourism more accessible and enjoyable. Limitations include the need for continuous updates due to rapid technological advancements, urban infrastructure constraints, and varying regulatory environments. However, this project represents a step towards a future of interconnected and sustainable metropolitan transport, showcasing the potential to transform urban tourism through innovative design.

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