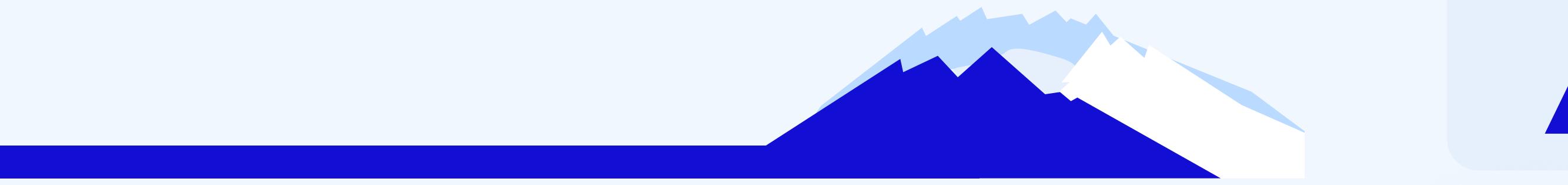


Mileworld

A travelling service system for Erdao Baihe Town
Shared autonomous electrical vehicles, an APP,
a station design for vehicle stops.

INSPIRATION

Last Spring Festival, my friends and I visited Erdao Baihe Town in Changbai Mountain, where the scenery was very beautiful, but the ancillary tourist services left a very bad impression on me. We had an afternoon in the alkaline water wetland park and played longer than expected. We went out only after six o'clock, but found that the bus had stopped running. Therefore, we could only take a taxi to the hotel. Disappointingly, there was no empty taxi for us at that time.



BACKGROUND RESEARCH

Status Of Erdao Baihe Town

- 'The First Town in Changbai Mountain with Many Tourists'

Changbai Mountain

Changbai Mountain, with its heavenly pools, waterfalls, snow sculptures, forests and so on, has been listed in the 'Guinness' World's Best Records for many times. It is also known as China's top ten famous mountains, China's five most beautiful lakes, and China's top ten most beautiful forests, and so on. In March 2024, Changbai Mountain Geopark was listed in the UNESCO World Geopark Network.

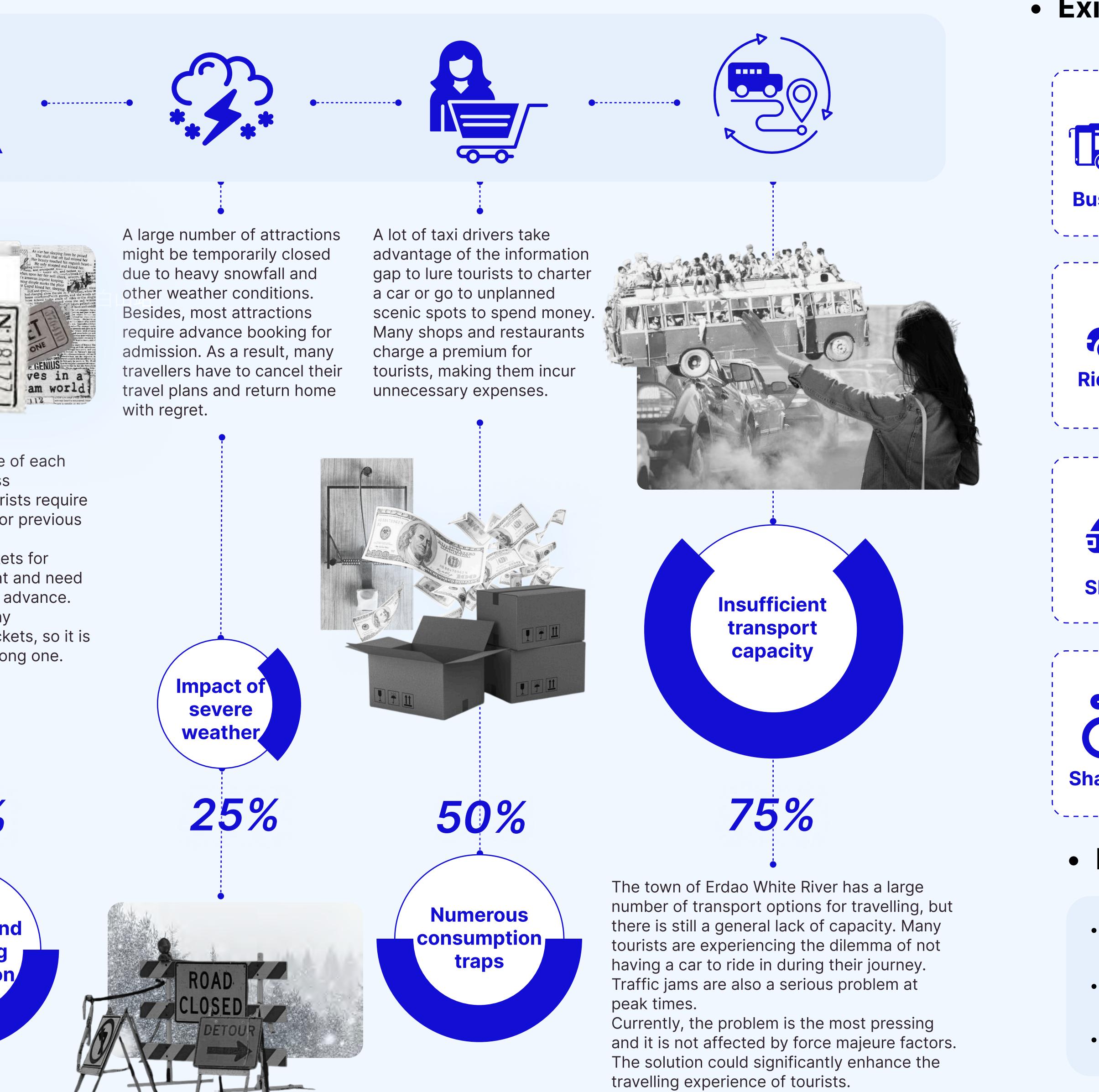
Highest peak elevation:
2749m

Number of visitors in 2024:
3067k

Erdao Baihe Town

Erdao Baihe Town belongs to Antu County, Yanbian Korean Autonomous Prefecture, Jilin Province, China. And it is located on the northern slope of the main peak of Changbai Mountain, next to the Changbai Mountain High Speed Railway Station, which is a must-visit place for travelling by high speed railway or by car to Changbai Mountain.

Traveller-Oriented Travel Issues



Tourist-Oriented Transport Issues

- Existing transport modes in Erdao Baihe Town

	Bus Line 1/2/3	Convenience	The interval is 20~30 minutes and the last Bus ends at 17:00.
	Ride-Hailing Service	Cost-Effectiveness	1 RMB / trip
	Ride-Hailing Service	Comfort Level	It's crowded most of the time.
	Shuttle Bus	Convenience	Requests from anywhere, direct to destination, but longer waits at peak times.
	Shuttle Bus	Cost-Effectiveness	Prices are not transparent.
	Shuttle Bus	Comfort Level	It's comfortable overall, but needed to carpool during rush hour.
	Shared Bicycle	Convenience	Fewer stops, less frequent and less regular
	Shared Bicycle	Cost-Effectiveness	5 RMB for 3km, 10 RMB for 5km, 45 RMB one way, 70 RMB round trip
	Shared Bicycle	Comfort Level	The vehicles are more comfortable than bus lines.
	Shared Bicycle	Convenience	Ready to use, no waiting, direct to the destination, but the elderly, the disabled and the pregnant can not take the ride.
	Shared Bicycle	Cost-Effectiveness	0.5 RMB / 30 minutes
	Shared Bicycle	Comfort Level	In Changbai Mountain, except for the summer, the temperature is low, so the cycling experience is worse.

Reflection:

- At present, the public transport capacity of Erdao Baihe Town is seriously insufficient to cope with the huge passenger flow during the peak tourist season.
- The existing methods of transport in Erdao Baihe Town have their own advantages and disadvantages. There is no method of transport for tourists that combines convenience, comfort and privacy. All tourists must give up some of their own needs.
- Since taxi services are scarce during peak hours, taxi drivers are using ambiguous pricing to gain additional benefits from tourists.

USER RESEARCH

Interview

I conducted an interview with the tourists and some relevant staff of the public transport in Erdao Baihe Town, then summarized answers into following points.

• Interviews with tourists in Erdao Baihe Town

• Questions

1. Did you use public transport when travelling in Erdao Baihe Town? If yes, which means of transport did you use?
2. What are your priority needs when travelling in Erdao Baihe Town? Does your choice of transport meet your needs well?
3. What experiences have you had when travelling in Erdao Baihe Town? What experiences have you had that were not pleasant?
4. In your existing travelling experience, what do you think are the problems of the transport system in Erdao Baihe Town? How can it be improved?

Haihong Zhang
Age: 55 Years-Old
Gender: Female

for a summer holiday for the second time
stay for a month

I usually take the bus, which basically meets my needs, but the bus times are only clear at the starting station or the passenger station. And the information I got from the locals was not correct. Therefore, I prefer to go to the starting station.

Moreover, the buses and chartered buses don't stop at every station, and the routes may not be the same as the marked ones. These really make me annoyed.

Pain Points:

- Bus arrival times are erratic, especially when in a hurry, which inconveniences them.
- Information is accurate only at the starting station, whereas information elsewhere is often inaccurate, especially by asking locals.
- The actual routes of buses do not match the labelled information. Bus stops are irregular and buses do not stop at every station.

Jialin Li
Age: 32 Years-Old
Gender: Male

for a skiing trip for the fourth time
stay for a week

The bus system is sort of adequate, but there are really quite a few problems too. For example, the town buses have an early last bus, which I missed if I didn't pay attention to the time.

In addition, the bus stop is more random, no one will take a shortcut to fly station. It's a good idea to ask the driver in advance if he or she can wait until your destination.

Pain Points:

- Bus stops are not fixed, and the phenomenon of flying stops is serious.
- The bus service ends too early, which affects visitors' activity schedules. And there's a lack of stable alternative travel options after the end of the bus.
- Inconsistent driver service levels, non-transparent information, and passengers need to spend extra effort to confirm their journeys, adding to the psychological burden.

Yilin Han
Age: 25 Years-Old
Gender: Female

for a short trip for the first time
stay for five days

I had a very unpleasant ride-hailing service experience. I met a driver who pretended he didn't know the destination I was talking about, then started chatting to me with particular enthusiasm, suggesting me change the destination to another one. After arriving at the destination, he even got off with me to make sure I was there to have fun. I believe that he must have got a kickback from the attraction, and at the same time used it to make a lot of money from me in terms of fares.

Pain Points:

- Lack of transparent pricing of services and reasonable fare expenditures.
- Unprofessional behaviour of drivers interferes with the tourist experience. Tourists are unable to visit their destinations as they wish and are forced to accept the driver's arrangements.

• Interviews with the relevant staff of the public transport in Erdao Baihe Town

• Questions

1. How is your business during the off-season? How busy are you during the peak season?
2. Do you have a preference for passengers with different needs? Why?
3. What is the difference between the tourist flow in Erdao Baihe Town during the peak season and off-season? How do you currently cope with the high traffic during the peak season?

Qingqing Yang

Age: 35 Years-Old
Gender: Female

staff of the Changbaishan Transportation Management Office

6 years on the job

Every year around the Spring Festival, the number of visitors to Changbaishan usually surges. The usual capacity is not enough to cope with such a large flow of visitors. When the capacity of hire cars and buses is insufficient, we will activate the free cruising buses to supplement them.

On board the buses, traffic law enforcement officers temporarily act as tour guides to introduce sightseeing spots and carry luggage for tourists.

Opportunity Points:

- Integrating transport and travel services helps to enhance the user experience.
- The surge in tourist arrivals during the Chinese New Year period and the lack of capacity in the existing taxi and bus systems reflect the need for flexible transport solutions during peak hours.

Jianguo Qin

Age: 55 Years-Old
Gender: Male

taxi driver in Erdao Baihe Town

3 years on the job

The business is very good, there are so many orders in town that they can't be picked up, especially during peak tourist seasons like summer holidays and Chinese New Year. However, I don't like to pick up and drop off, the plane is often delayed, sometimes have to wait for a long time. And the distance is far, send once to the airport in the town don't know how many orders have been done, it's very uneconomical.

Opportunity Points:

- During the peak season, the number of orders within towns far exceeds the capacity load, and drivers are busy with short-distance orders within towns, resulting in a high demand for efficient capacity deployment.
- Pick-up and drop-off services are associated with long waiting times, time-consuming single journeys and uneconomical revenue for drivers, leading to a reluctance to pick-up and drop-off orders. The revenue model of related services needs to be optimised.

• Conclusion

- The interviews reflected that the main pain points of tourists in response to the public transport system in Erdao Baihe Town are centred on unprofessional services, mistrust due to conflict of interest, non-transparent fees and disrupted journeys. These problems indicate that the current public transport service has serious deficiencies in terms of standardisation, transparency and user demand orientation.
- In addition, there is a serious contradiction between supply and demand for public transport services in Erdao Baihe Town during the peak tourist season. It is possible to optimise capacity deployment in the peak season, help drivers complete orders more efficiently through intelligent tools, and improve the overall experience and efficiency of the service.

DEFINE

User Persona

Hanjing Wen



21 Years-Old
Female
University Student
From Guangzhou
back from a trip with roommate

Personality: introverted and shy, can't say no
Hobbies: travelling, photography and skiing

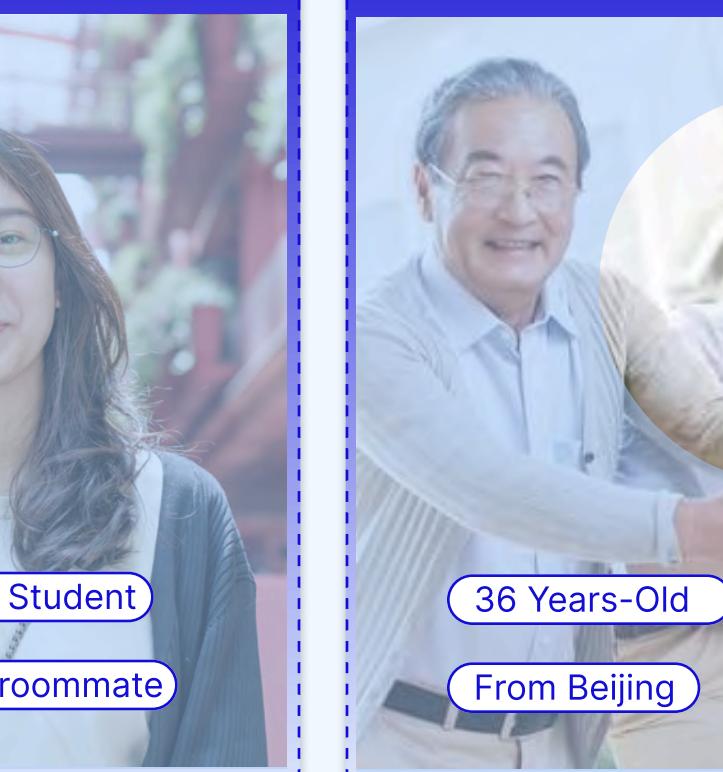
Travelling Needs :

- particularly afraid of the cold and therefore want the chosen mode of transport to provide sufficient comfort, especially if the vehicle is heated.
- fear of getting lost in unfamiliar places, and hope that the chosen mode of transport can take you directly to your destination.
- want to be able to freely discuss and exchange travel plans with their roommates during the trip without being interrupted by outside distractions.
- Prefer moderately priced transport services and do not want to be burdened by high costs of travelling.

Pain Points :

- In some cases, they were forced to carpool with other people and felt that their privacy was violated, especially as they were unable to talk freely with their fellow passengers in the car.
- Not knowing how to refuse a driver's strong recommendation, I eventually accepted a chartered bus for a whole day, but the trip was not what I expected, and thus felt that I was forced to spend money that was not worth it.
- As I am not good at bargaining, I realised after paying the fare that the price was much higher than the normal market price and felt that I was taken advantage of by the driver.

Yifeng Huang



36 Years-Old
Male
Engineer
From Beijing
plan to travel with the whole family

Personality: calm, outgoing, with a sense of responsibility
Hobbies: travelling and fishing

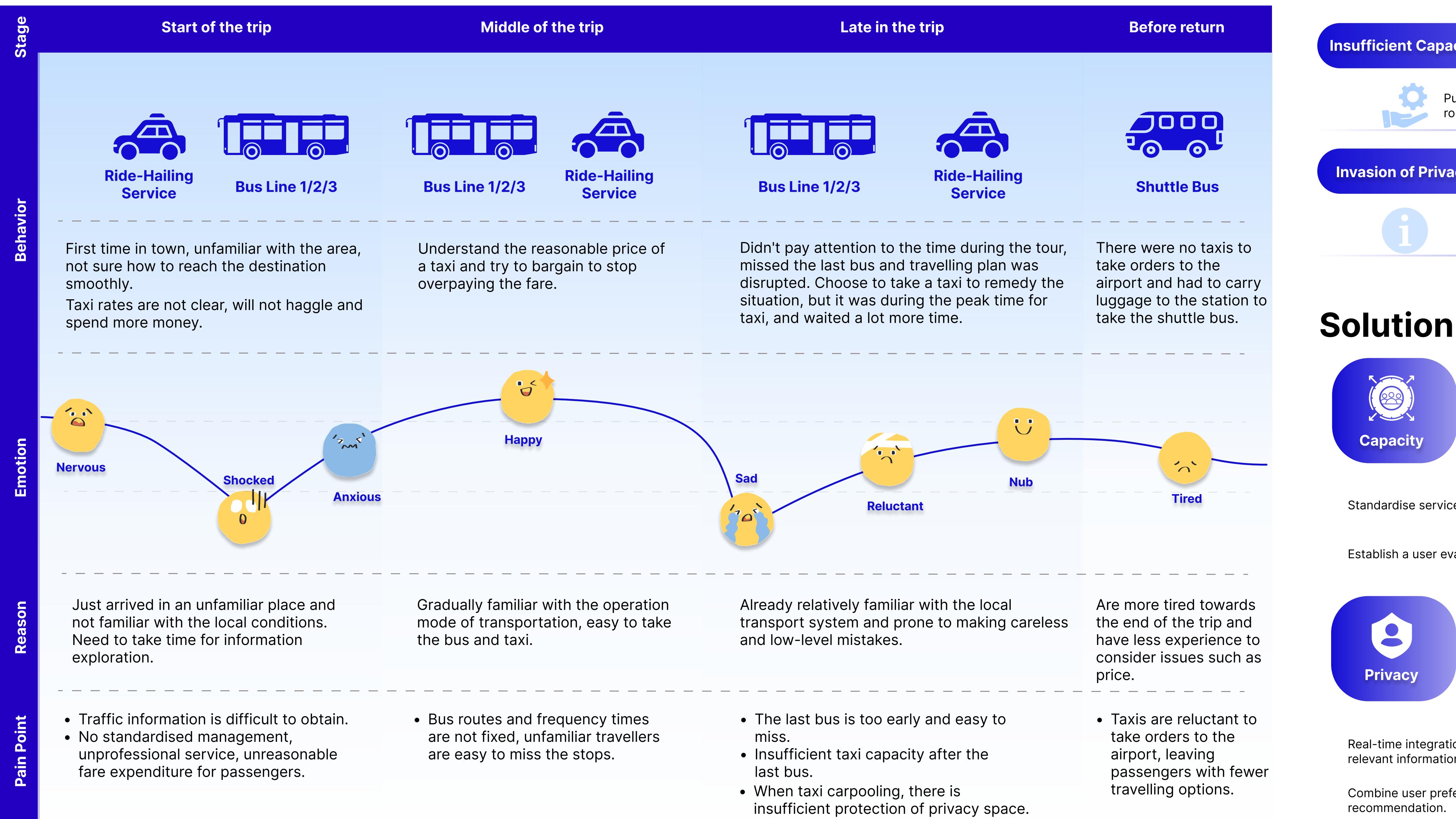
Travelling Needs :

- The family consists of elderly people and children who, due to their limited physical strength, want a mode of travelling that is comfortable enough for them.
- the family consists of five members and therefore needs to choose a mode of transport that can accommodate the whole family in order to avoid the inconvenience and additional organisational costs of travelling separately.
- Safety is very important when travelling, and you want a mode of transport that not only operates reliably, but also ensures maximum safety for the whole family during the journey.

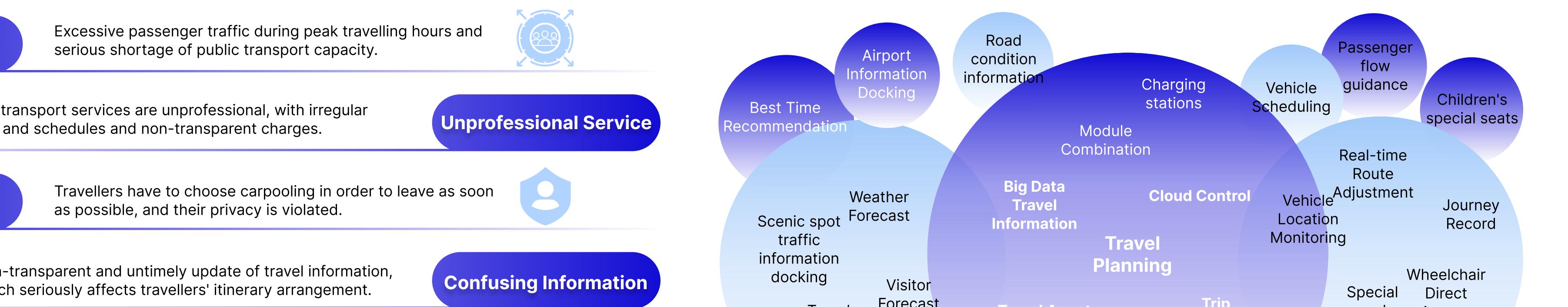
Worries :

- Children may be noisy or playful during the journey, disturbing other travelling passengers.
- As the patience of the elderly and small children is limited, if the vehicle takes a longer time to arrive, this may cause anxiety or discomfort to the family and affect the smooth running of the trip.
- concerns about the comfort level of buses. The crowdedness and seating conditions of buses may not be able to cater for the needs of the elderly and small children, leading to discomfort during the journey.

User Journey Map



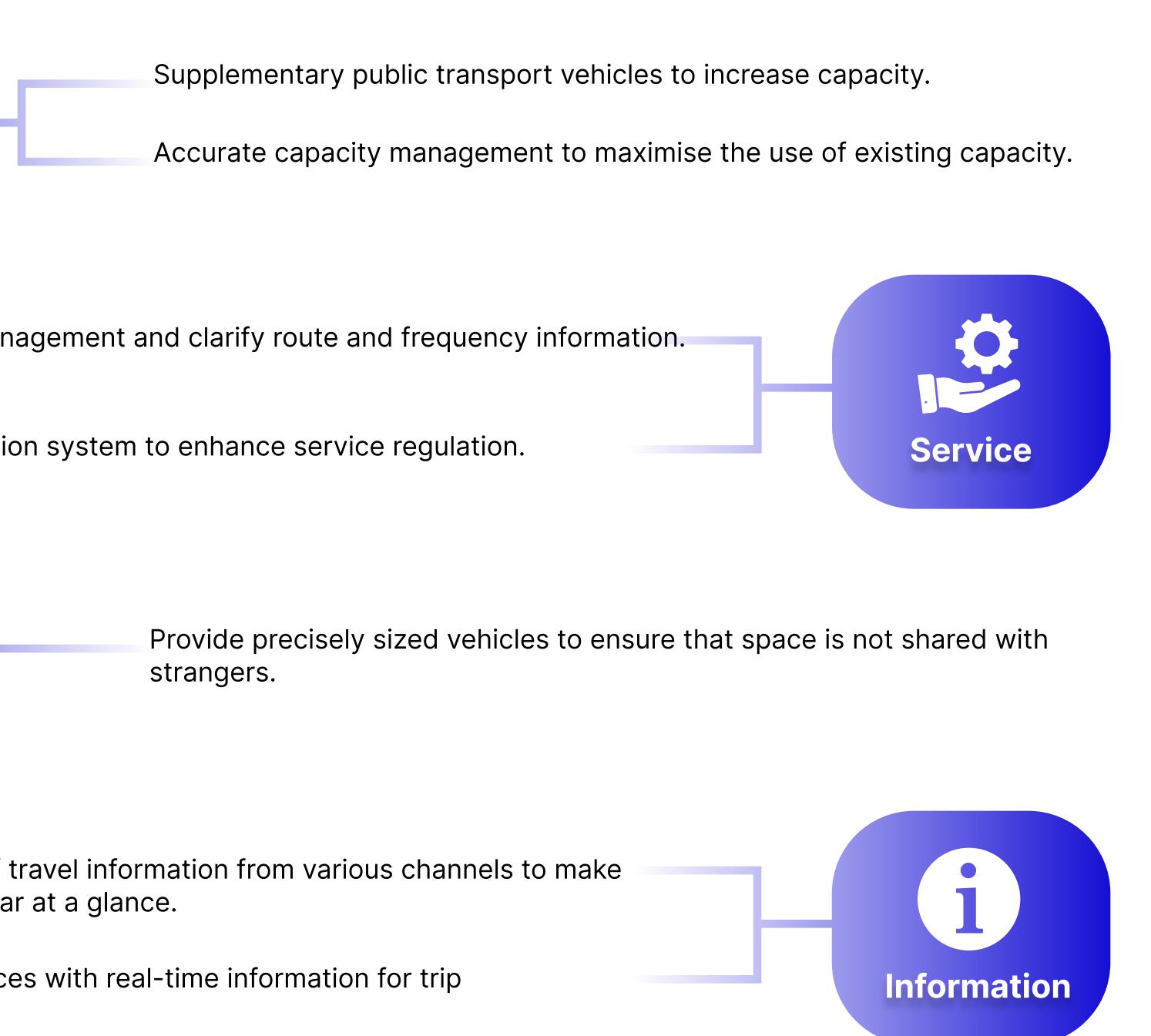
Problem Identification



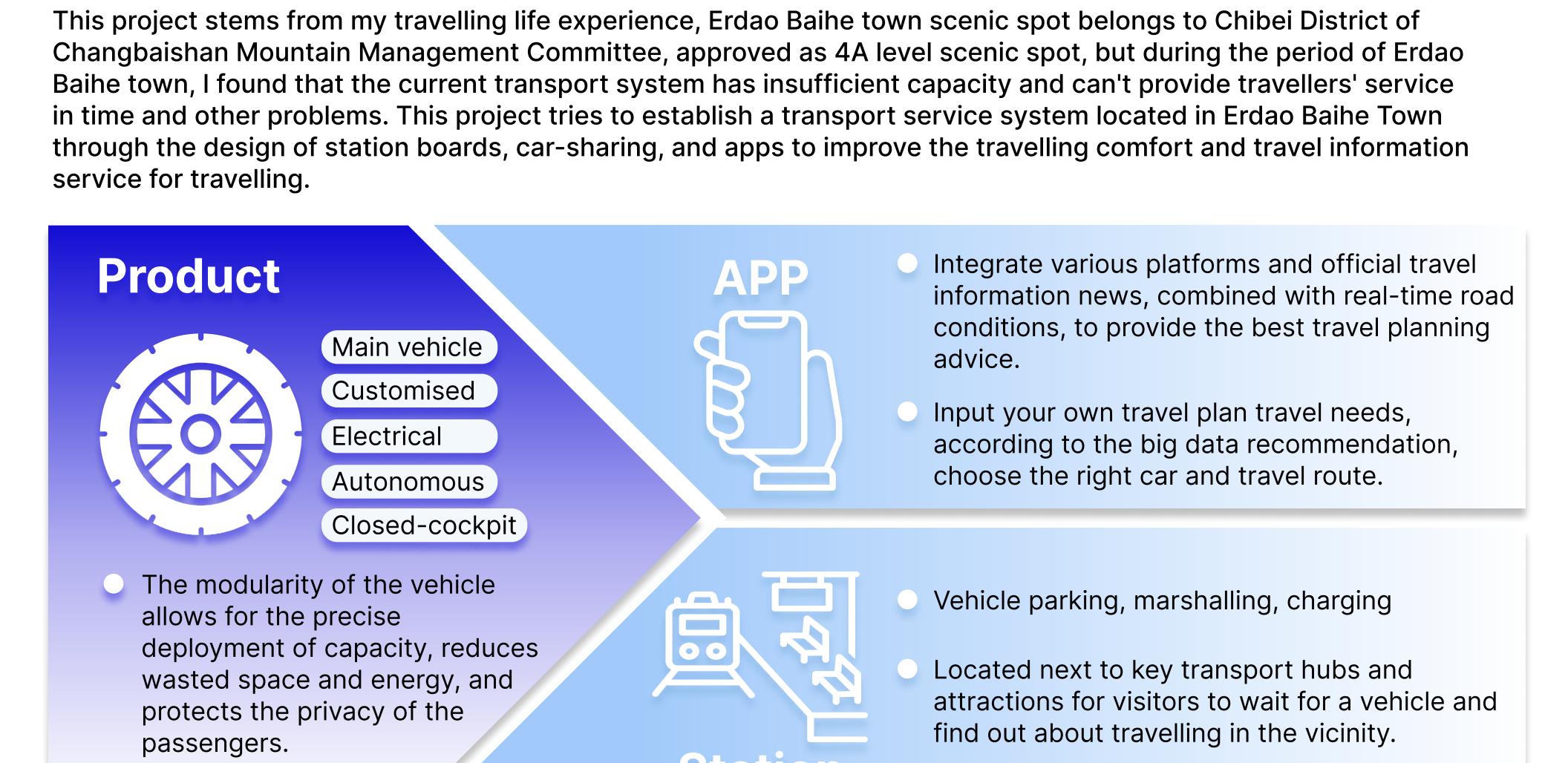
IDEATE Brainstorming



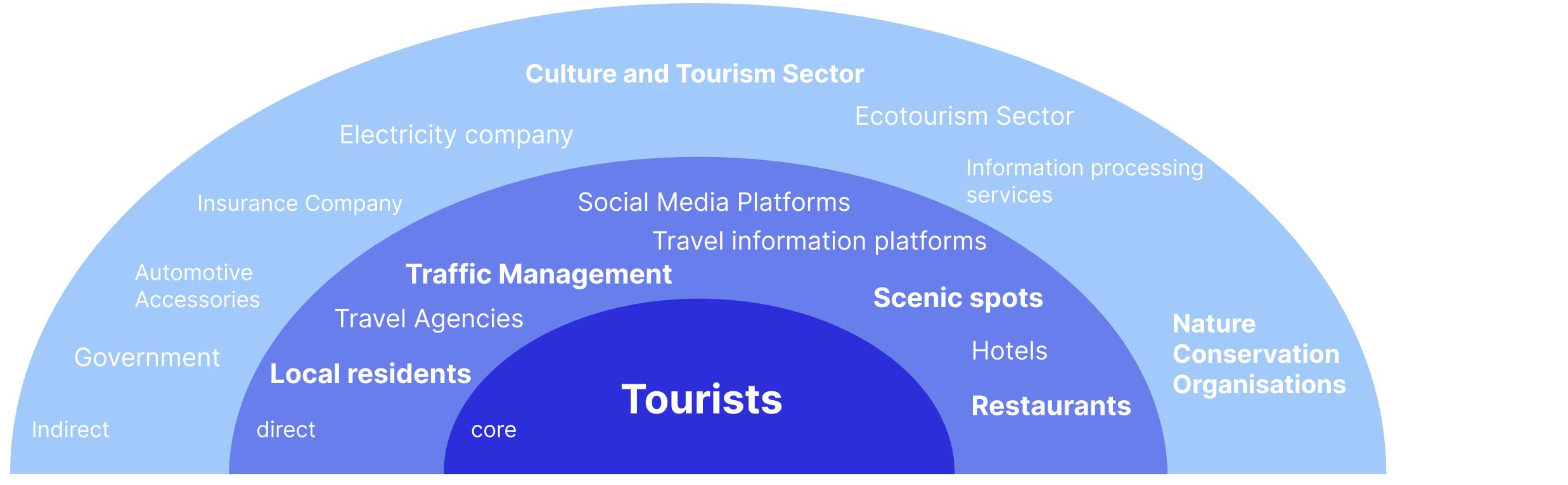
Solution Statement



DESIGN CONCEPT



STAKEHOLDER MAP

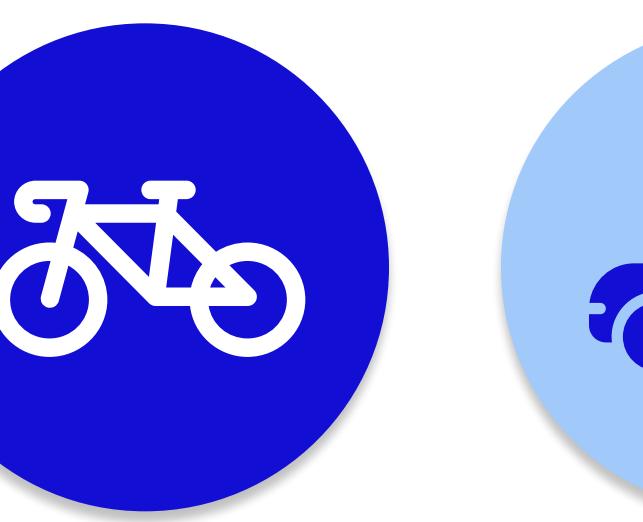


COMPETITOR ANALYSIS

Name	Product	Key Feature	Advantage	Disadvantage
T3 Travel	Online Rental Car Service Platform	<ul style="list-style-type: none"> Mobile Software Platform Online Taxi Service Online Taxi Deployment Starting price 9.5 RMB 	<ul style="list-style-type: none"> Mobile phone software to call a car, directly to the nearest boarding point. Fast speed. Relatively comfortable. 	<ul style="list-style-type: none"> Longer waiting time during peak hours. Driver service levels vary. Higher price.
Changbaishan eTravel	Phone Charter Carpooling Service Platform	<ul style="list-style-type: none"> WeChat App Platform Online Charter Service Chartered Carpooling Deployment Starting price 6 RMB 	<ul style="list-style-type: none"> Call a car by phone and go straight to the nearest boarding point. Faster speed. Better value for money. Shorter waiting time. 	<ul style="list-style-type: none"> Need to carpool with others, less privacy. Driver service is uneven.
youōn	Changbaishan Public Bicycle	<ul style="list-style-type: none"> Shared Bicycle Service APP rental / card purchase Free for 30 minutes Bicycle / Electrical Bike 	<ul style="list-style-type: none"> Cheap price. Large number of bikes available for pick up at any time without waiting. 	<ul style="list-style-type: none"> Requires additional software download/ticket card purchase. Difficult to use in bad weather. Difficult to pass on some roads. Slower speeds.
Public Transport Bus Route 1/2/3	Public Transport Vehicle	<ul style="list-style-type: none"> Public transport card ride 1 yuan for a single trip Set up multiple stops 	<ul style="list-style-type: none"> Cheap price. Fixed waiting time. 	<ul style="list-style-type: none"> More crowded during peak hours. Frequency time is not stable.
Tourist buses	Intercity public transport	<ul style="list-style-type: none"> Fixed route 5RMB/3km 	<ul style="list-style-type: none"> More comfortable seats. Speed is faster. 	<ul style="list-style-type: none"> Frequency time is not fixed. Higher price.

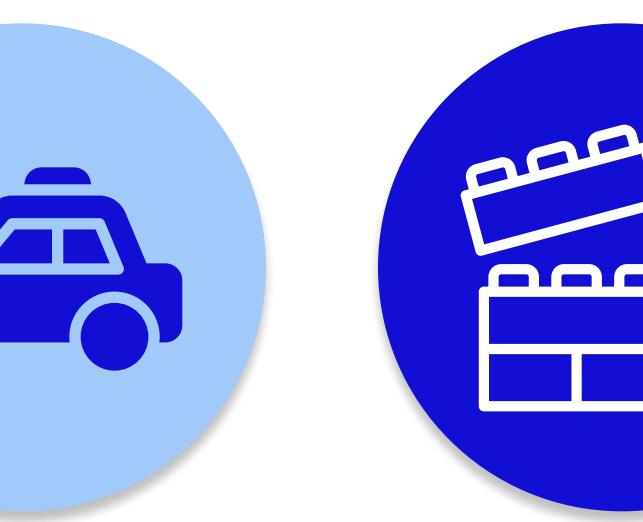
PRODUCT CONCEPT

Ideation



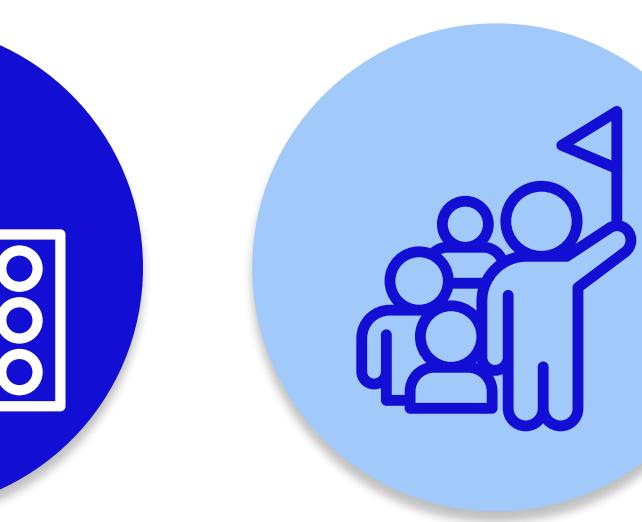
Shared Bicycle

A cost-effective means of travelling by personal public transport on the go



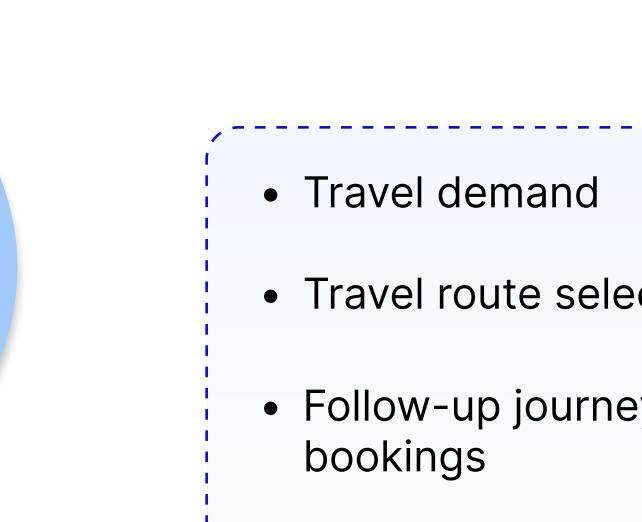
Taxi

Barrier-free, comfortable, convenient and fast journeys



Building Blocks

Modular space combination



Tour Guide

Sightseeing tours along the way

Function



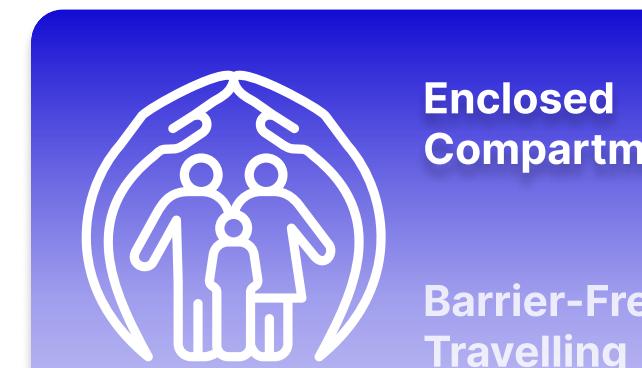
Single Occupancy Transport Units

Better Privacy
The basic unit is a single-occupancy compartment, which guarantees privacy even when travelling alone.



Multiple Travellers - Unit Combinations Precise Capacity Utilisation

No space is wasted by combining the number of modules according to the number of travellers.



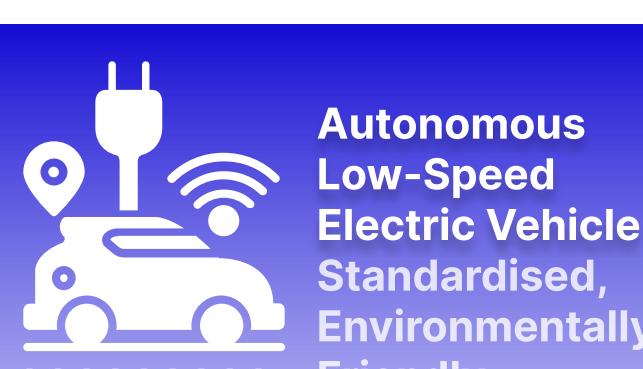
Enclosed Compartments Barrier-Free Travelling

The closed carriages are equipped with comfortable seats and air-conditioning systems, making travelling barrier-free even in bad weather.



Multimedia Interaction Enrich The Travelling Experience

Voice explanation, touch-screen interaction and multi-angle information introduction provide a better understanding of the journey plan, and the journey to the destination is equally rich and fulfilling.



Autonomous Low-Speed Electric Vehicle Standardised, Environmentally Friendly

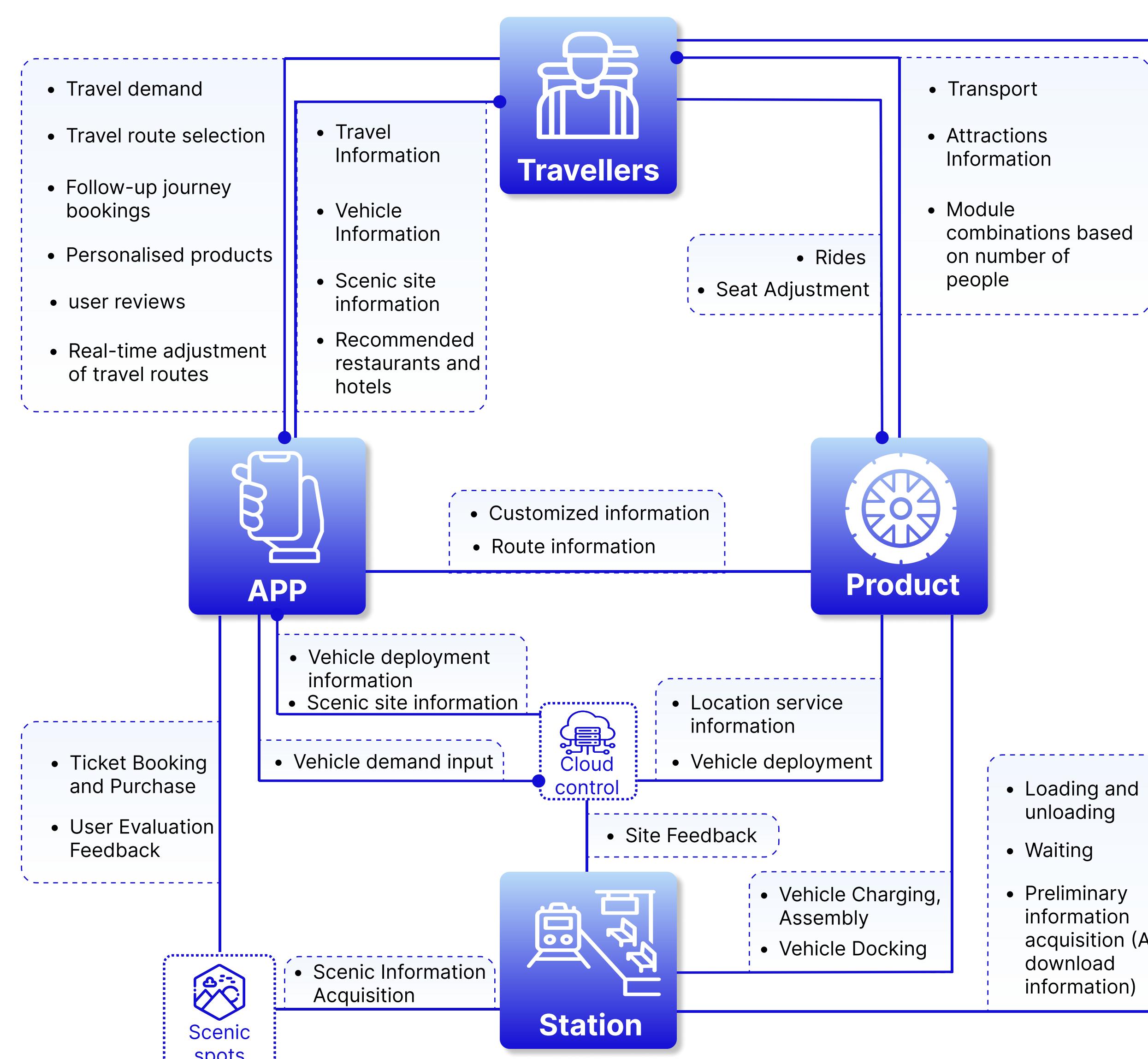
Autonomous vehicles are uniformly deployed by the cloud control system, with standardised and reliable services. The whole journey is driven by electric power, which is low-carbon and environmentally friendly.



Additional Customised Services Special Needs Fulfilment

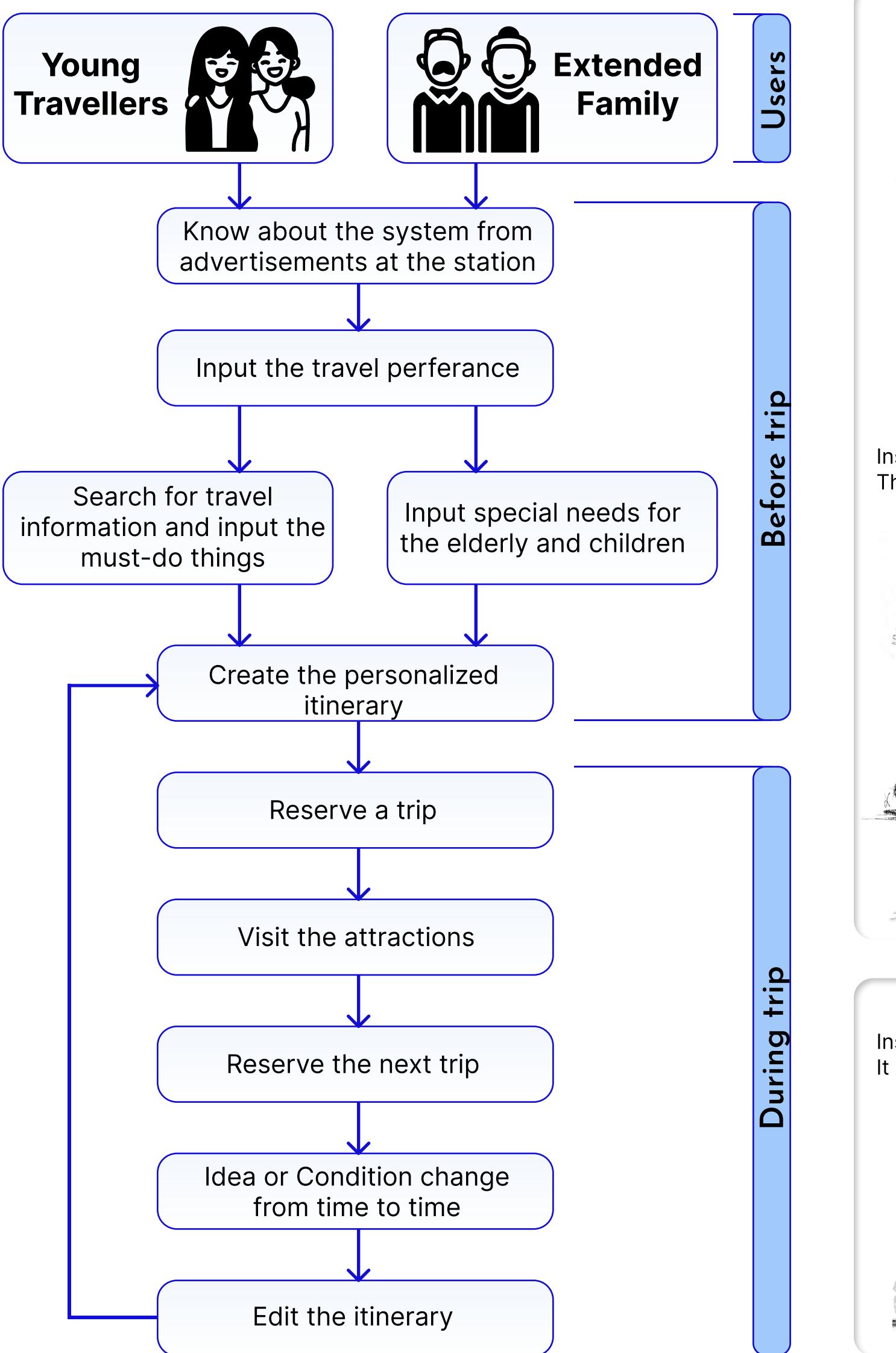
Vehicle appearance options within the permitted range to make the journey more unique. Provide additional child seats, wheelchair compartments and other services to meet the requirements of special groups.

System Map

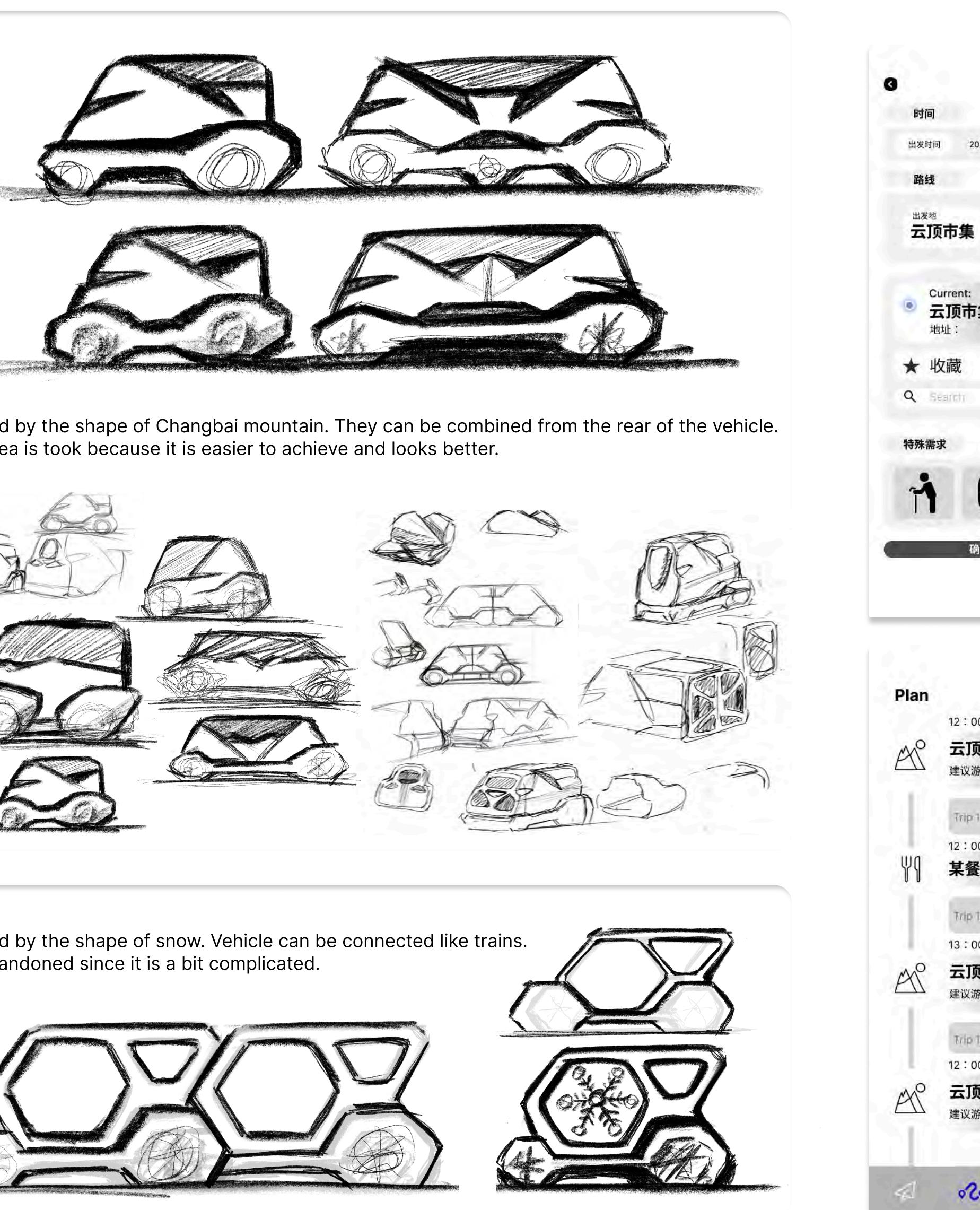


DEVELOPMENT

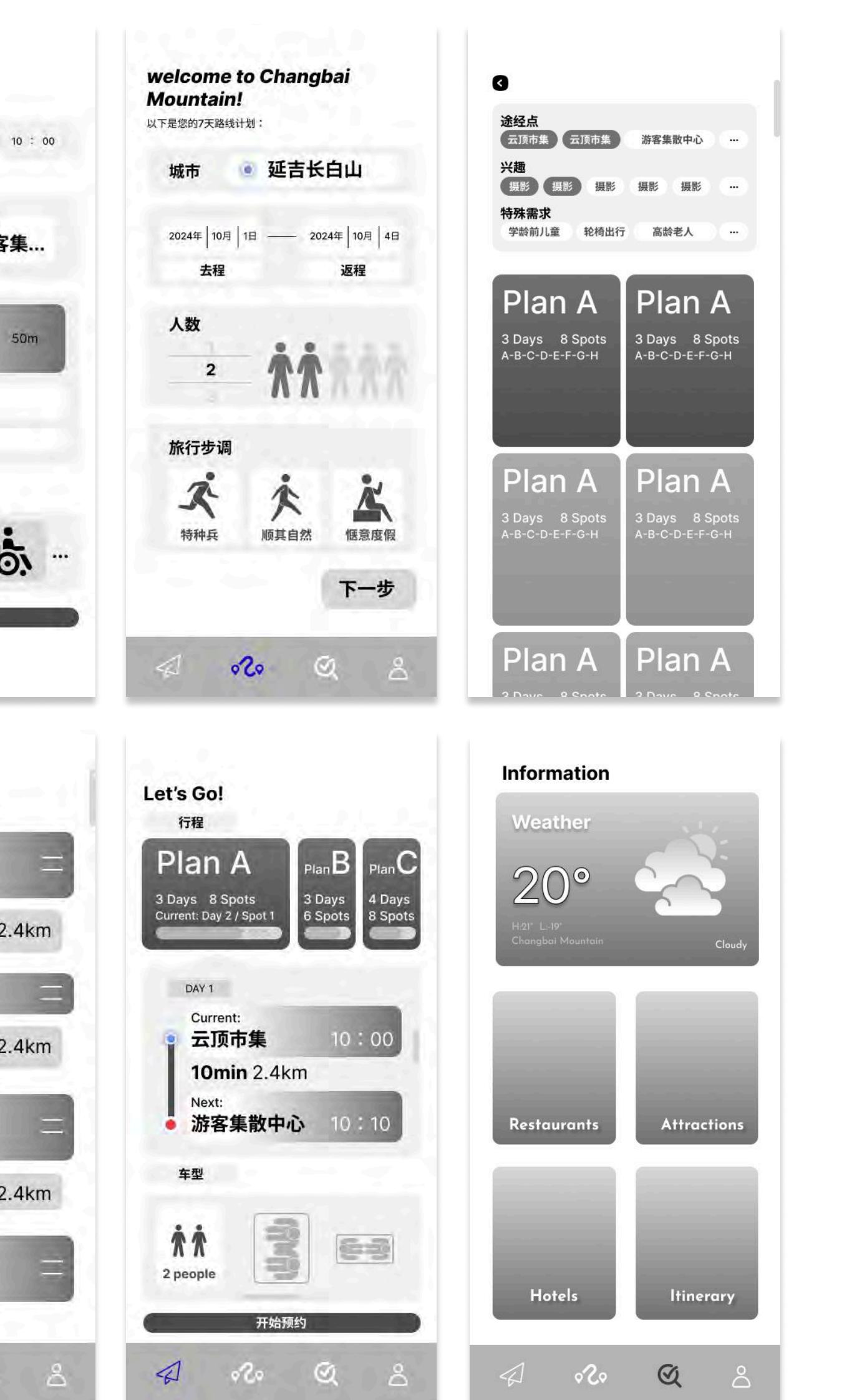
User Flow



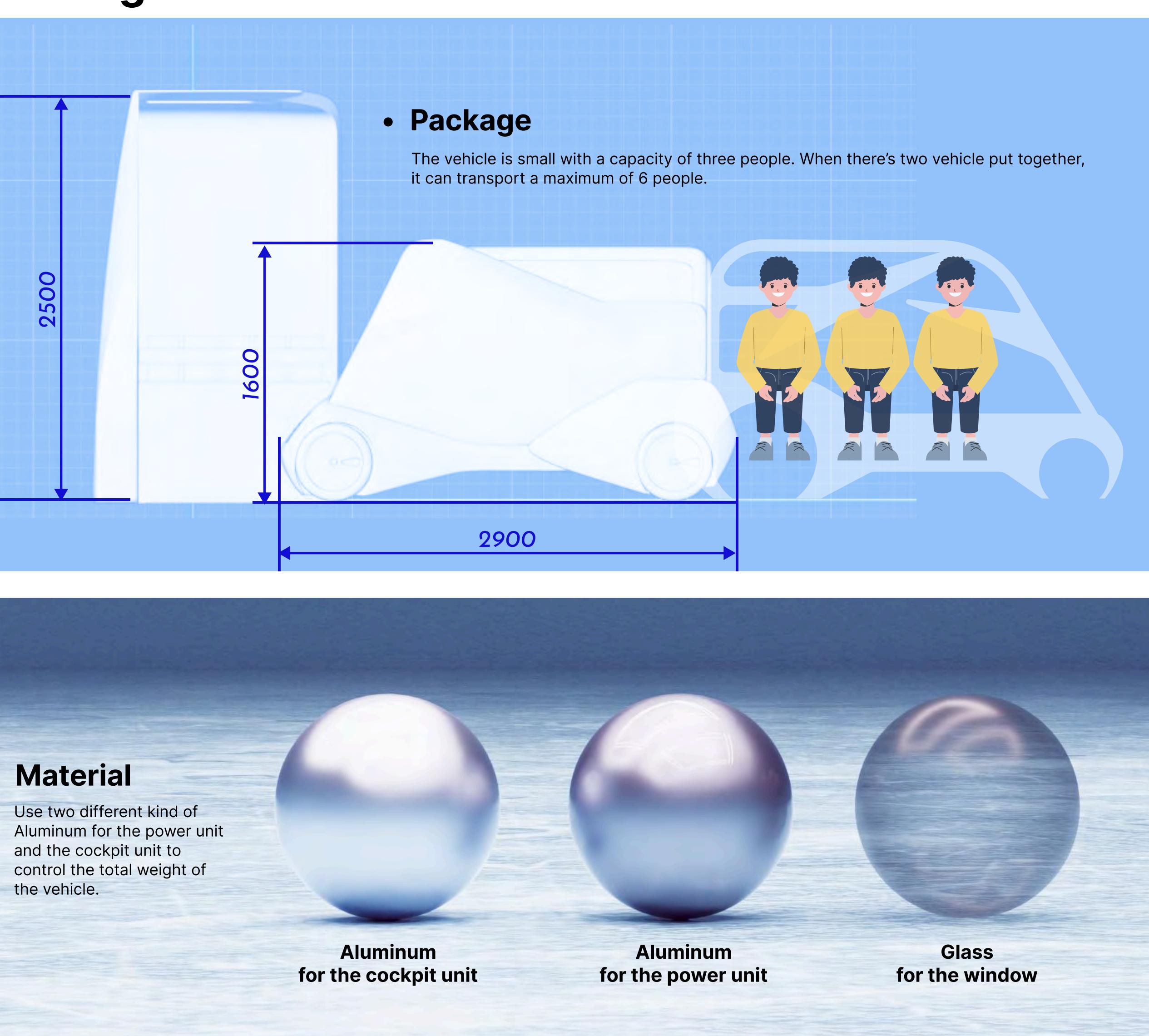
Sketch



Prototype



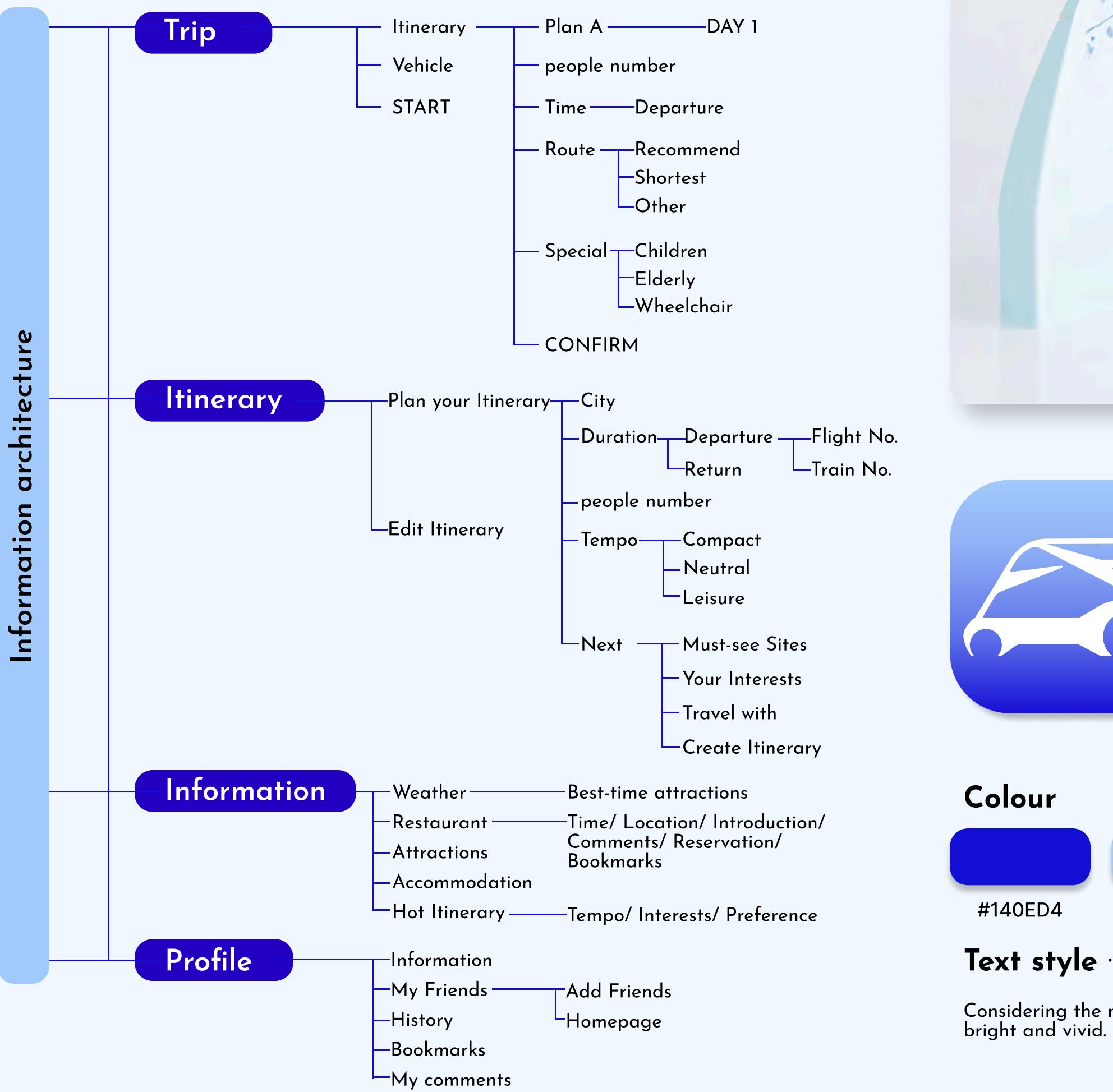
Modeling



OUTCOME

APP & Station

1. Search information	2. Plan Itinerary
The APP provides various travel information, which helps tourists know better about the resort town.	According to the information provided and the personalized needs from the tourists, the APP create some itineraries.
3. Reserve trip	4. Board vehicle
Reserve the vehicle to travel to the attractions planned.	Vehicle arrives as reservation, and tourists can board the vehicle to enjoy their trips.



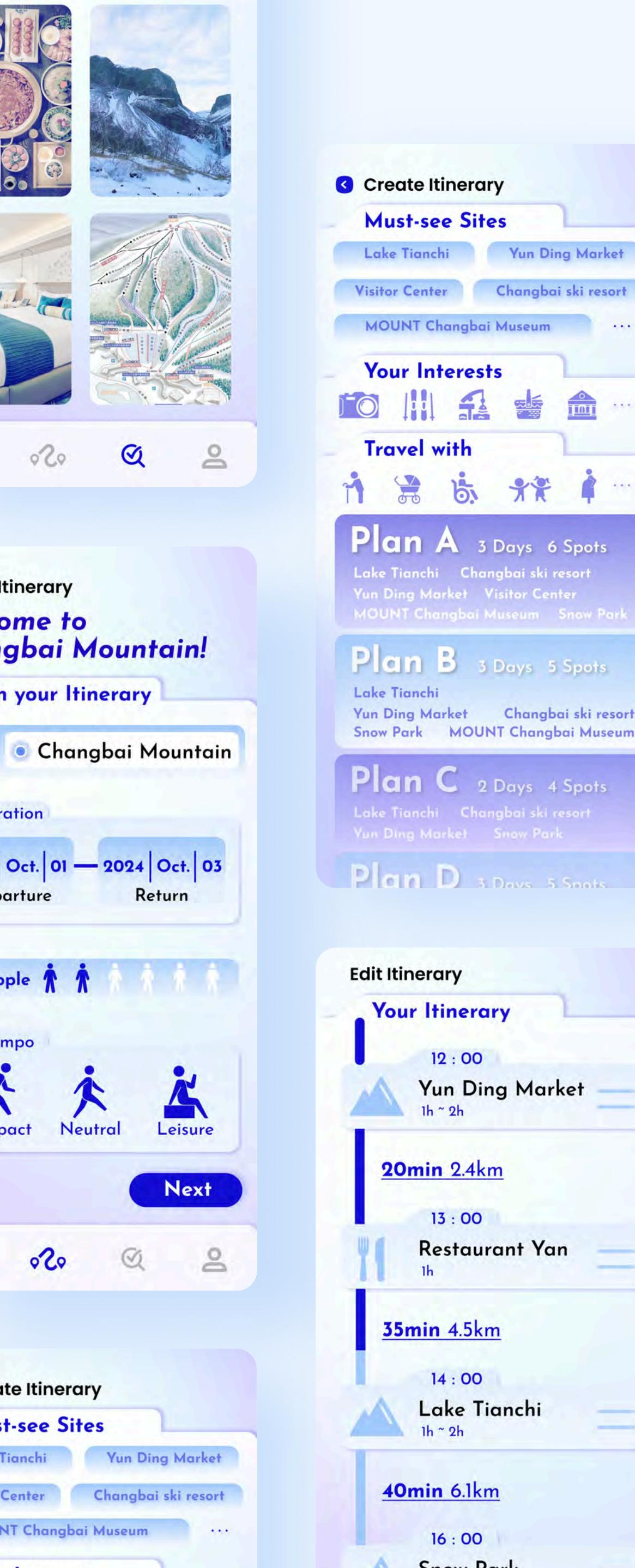
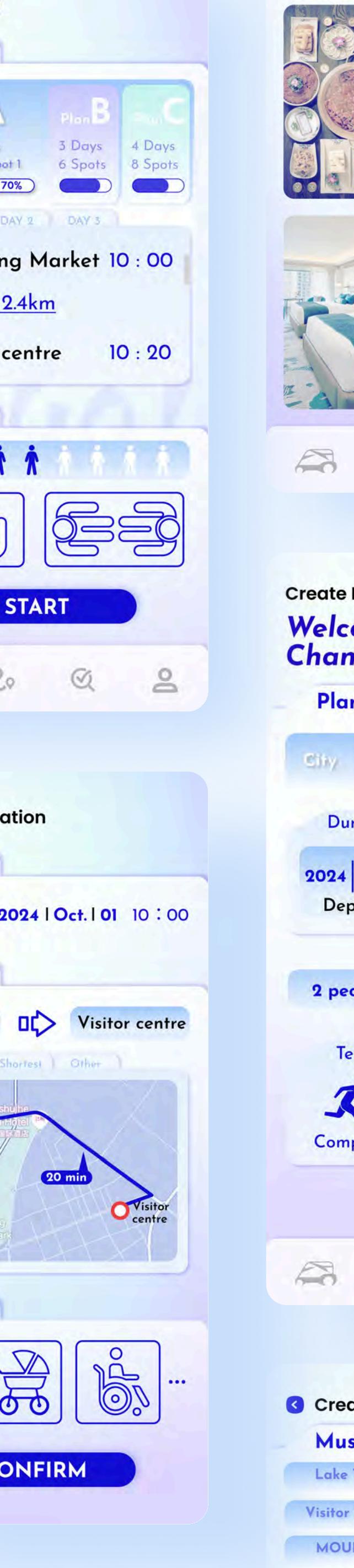
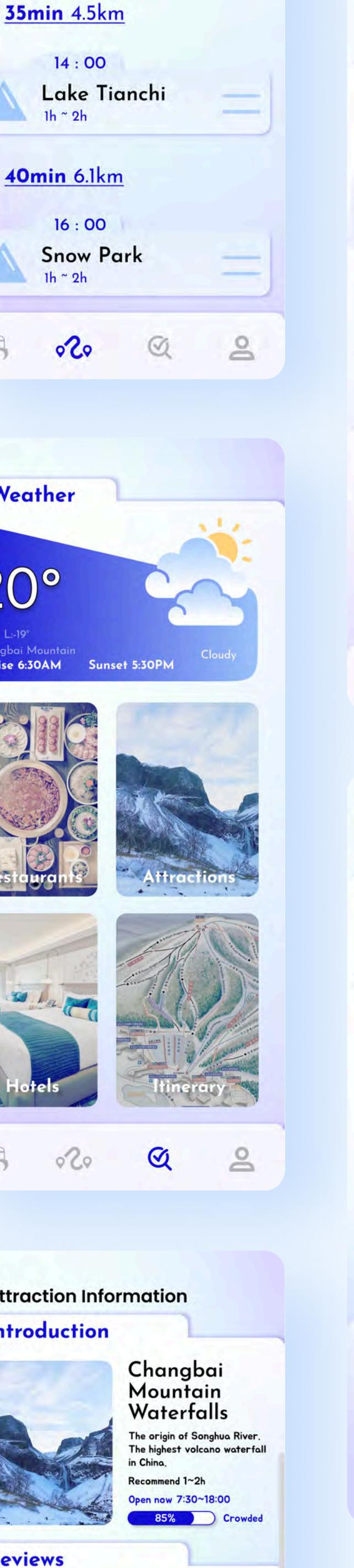
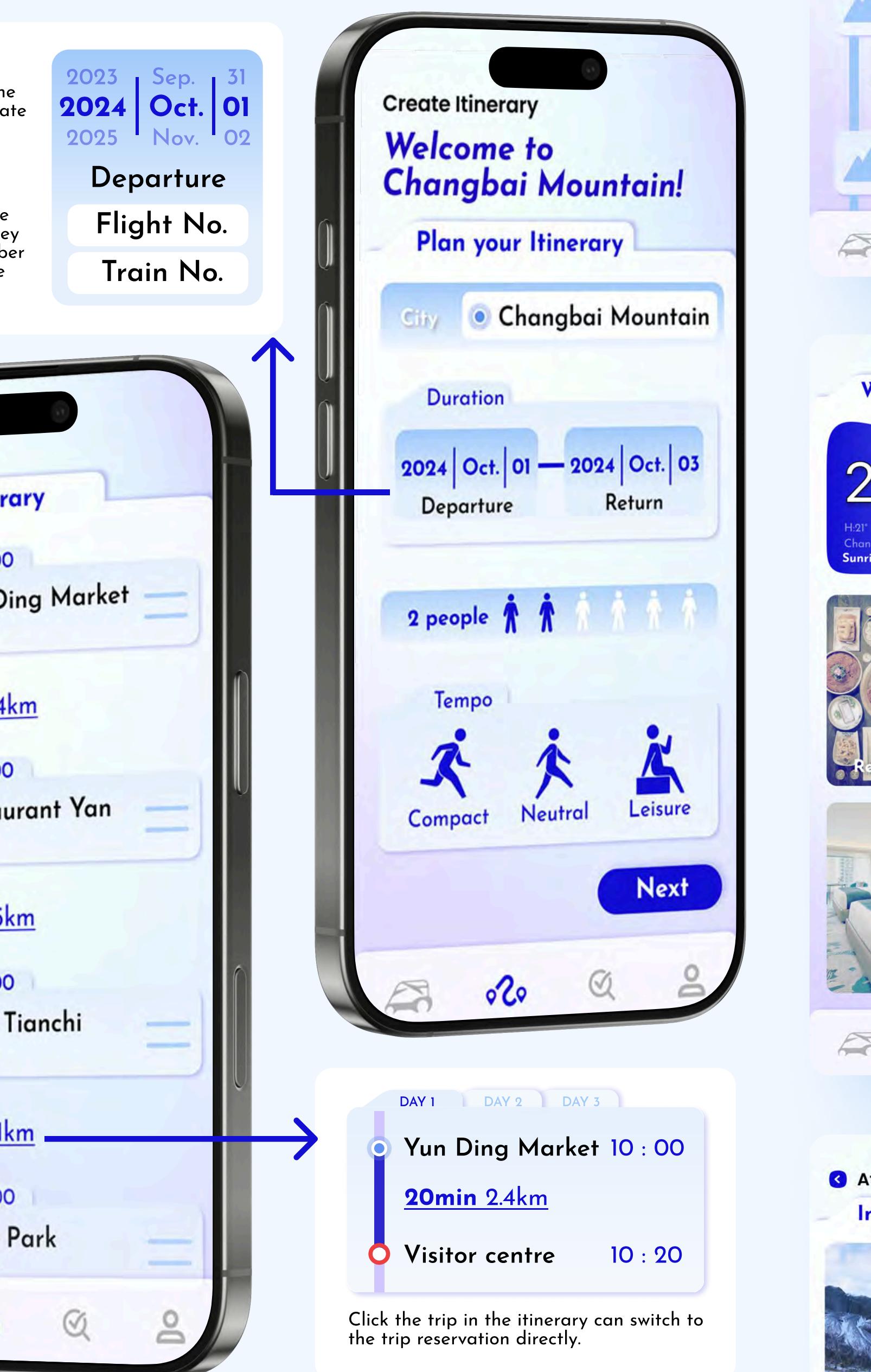
Colour

#140ED4 #A2CAF8 #FFFFFF #C8F6EF

Text style

Considering the mood of travel, the colour and the text style are both bright and vivid. The colour is also inspired by the snow mountain.

Josefin Sans



OUTCOME

Product - Vehicle

