

MODULAR MOBILITY
FOR **FUTURE**

MACRO TRENDS 2030



SUSTAINABILITY



URBANIZATION



WORKPLACE
FLEXIBILITY



HEALTH-CARE



OFF-ROAD
ADVENTURES



PERSONIFICATION



HMI



MULTI
TASKING

TECHNOLOGY TRENDS 2030



LEV 4 AUTONOMY

VOICE HMI

HYPERLOOP

WIRELESS
POWER

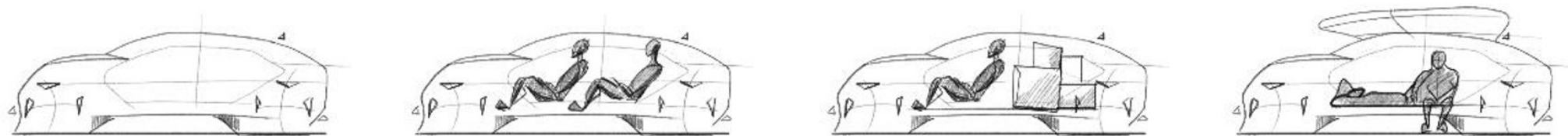
HOLOGRAPHIC
INFOTAINMENT

3D PRINTING

INTERNET OF
THINGS

NANO
TECH

OUTDOOR ➞ **CITY**
SPORT ➞ **WORK**
EXTREME ➞ **CALM**
MANUAL ➞ **AUTONOMOUS**

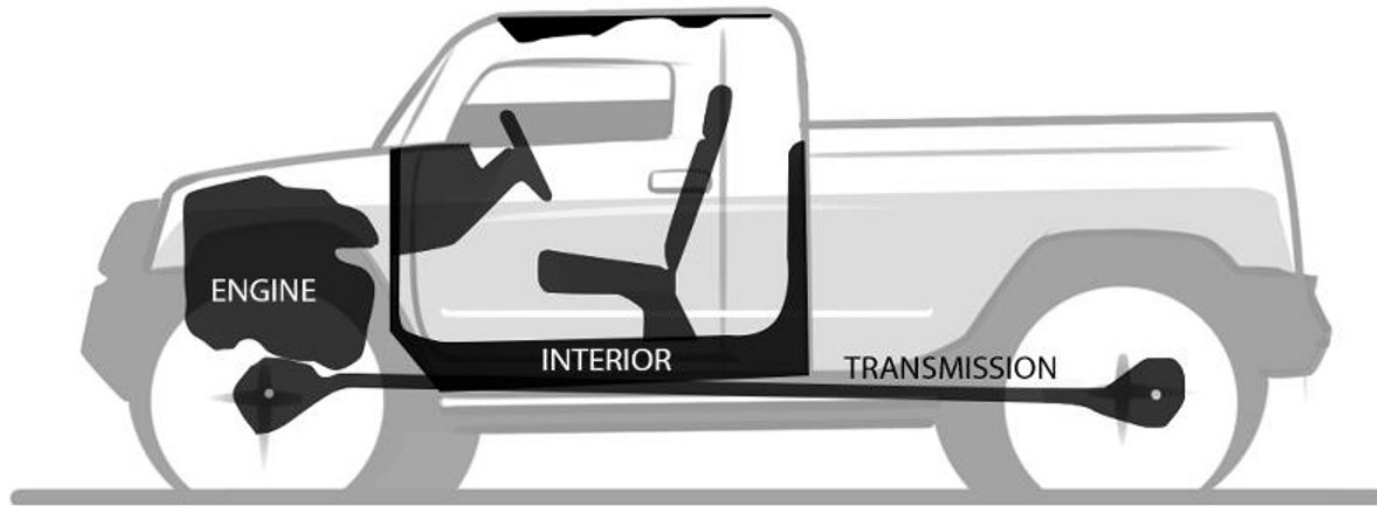


Flexible interior space will be crucial point of the year 2030

A blurred image of a highway at night, showing light trails from vehicles. The image is dark with streaks of white, yellow, and red light, suggesting motion and traffic. The text is overlaid on the right side of the image.

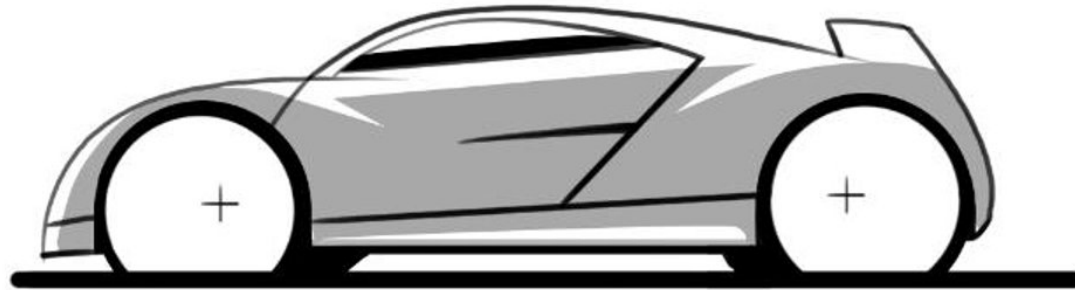
Homogeneous Vehicle Attributes

(1) Seamless interaction within sub-systems



Effortless interaction between Powertrain and controls

(2) Great experience



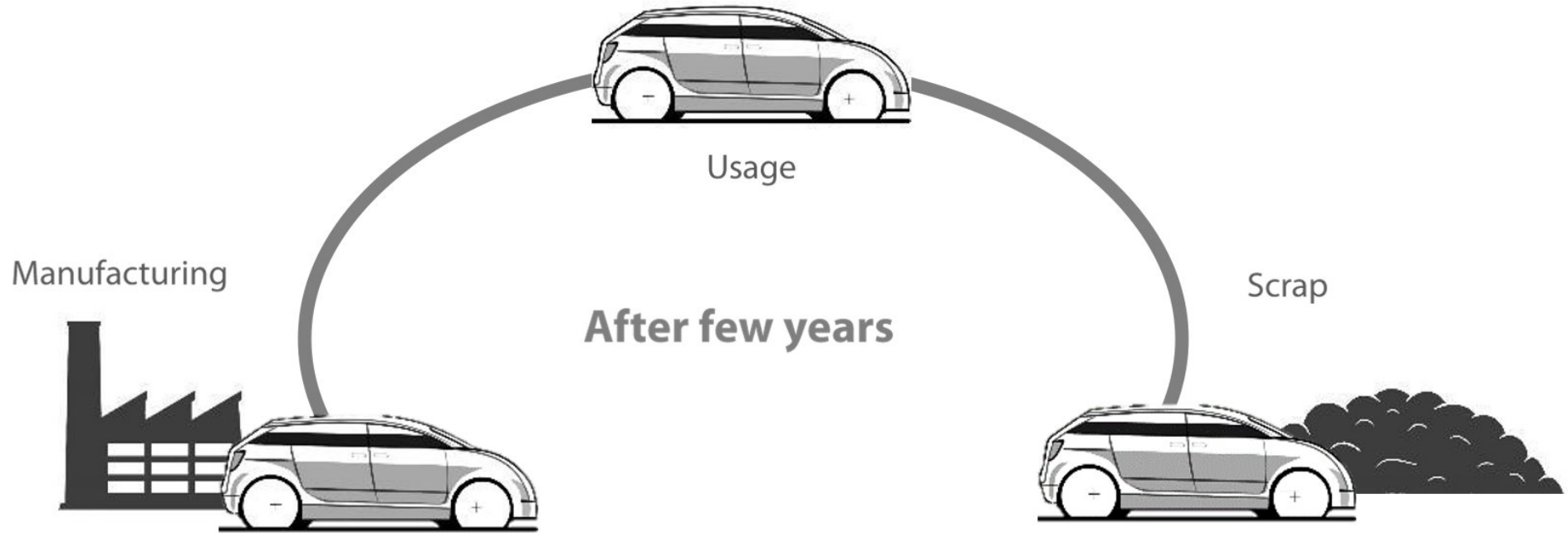
Great experience because all components are tailor made for specific vehicle

(3) Limited customization options



- Graphics and decals are the economical option to customize or personalize one's vehicle.
- Heavy customization is not at all economical.

(4) Limited life-span



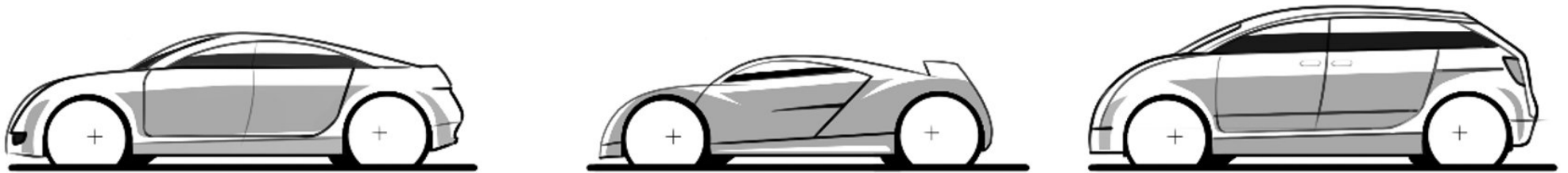
- Vehicles have limited life span after that it's efficiency get reduced
- Entire vehicle need to be scrapped just because of homogeneous system

(5) Costly to repair



- Repairing a damaged vehicle is costlier than buying new one

(6) Compromised choice



- Repairing a damaged vehicle is costlier than buying new one

Homogeneous Vehicle Attributes

(1) Seamless interaction within sub-systems

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(5) Costly to repair

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Modular system Attributes

(1) Can be customized easily

(2) Possibility of module update & reuse

(3) Easy maintenance

(4) Gives opportunity to choose

(5) User experience is depends on module

Modular system has more positive than negative

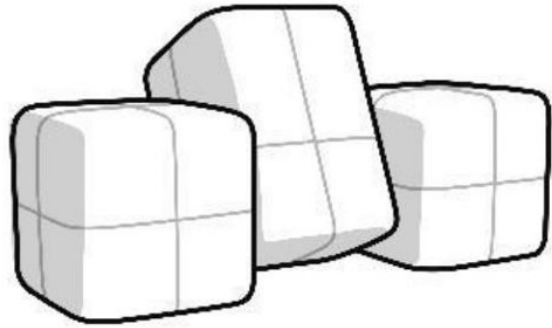
Case Example: piaggio ape



Modularity is not new concept to automobiles
Toyota introduced shared platform vehicle in 1997.

UNDERSTANDING **MODULARITY**

- What is modularity?
- Levels of modularity
- Implementation in automobile

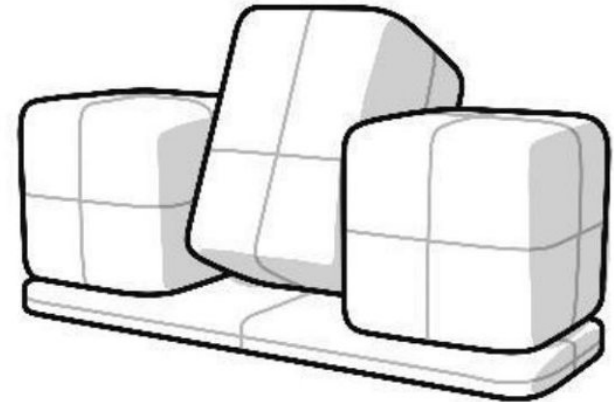


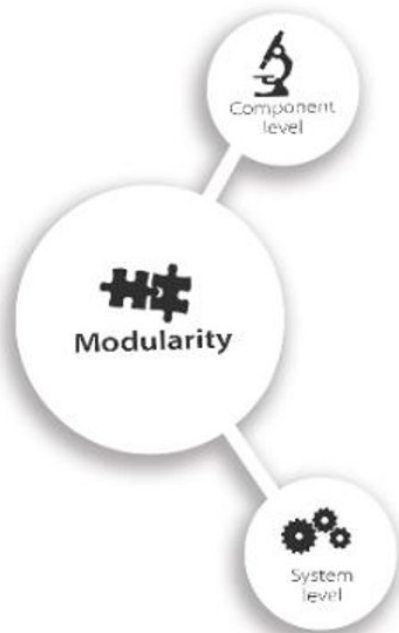
MODULE

A separable component, frequently one that is interchangeable with others, for assembly into units of differing size, complexity, or function.

MODULARITY

Employing or involving a module or modules as the basis of design or construction.





LEVELS OF MODULARITY





COMPUTER CASE STUDY

COMPUTER CASE STUDY

Aim- To understand modularity through personal computer cabinet
- To understand how variations achieved in personal computer.

Method- Study of personal computer cabinet
- Study of various accessories used in personal computer

Mother-board



Full size PC cabinet



Basic Structure

Monitor



Processor



SMPS



Basic components

RAM



HDD



Liquid cooler



SSD



Keyboard mouse



Speakers



Graphic Card



Web Camera



Add-ons

Open Platform



1X



4X



8X



16X

PCI Express

16X slot can accommodate all other cards.
performance will depend based on card not by the
motherboard slots



Component Level



Product Level



System Level

A close-up, slightly blurred photograph of a large pile of various colored LEGO bricks. The bricks are scattered and overlapping, with colors including yellow, blue, orange, green, pink, black, and white. The lighting is soft, highlighting the texture of the plastic.

LEGO BLOCK STUDY

LEGO BLOCK STUDY

Aim- To understand modularity through lego block game

- To understand possibilities challenges and opportunities if Lego model implemented in vehicle

Method- Visit the lego shop to understand lego block structure and interlocking by having some hands-on experience with legos.

- Exploration of possibilities and opportunities

OBSERVATION



Standard Block



Special purpose Blocks

Implementation in automobile

Modular platform- provides platform to accommodate various modules

E.g.. Vehicle platform

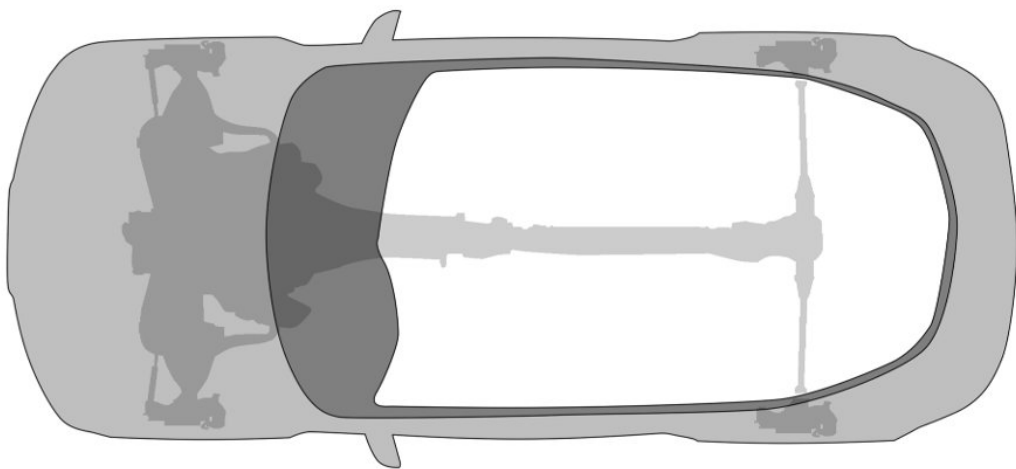
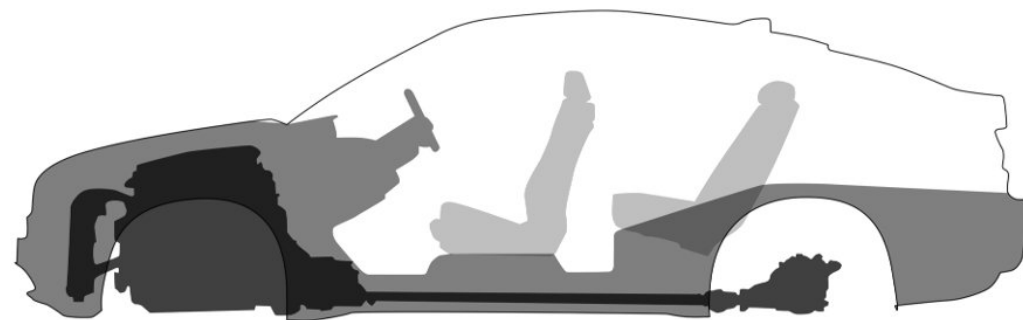
Essential module- Prime mover components to provide basic mobility to vehicle

E.g. Powertrain, controls, Interior

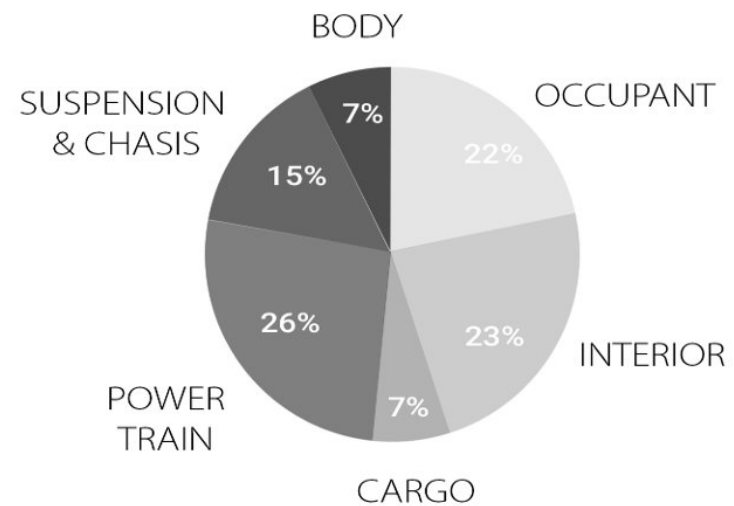
Accessory module- Enhance usability of vehicle

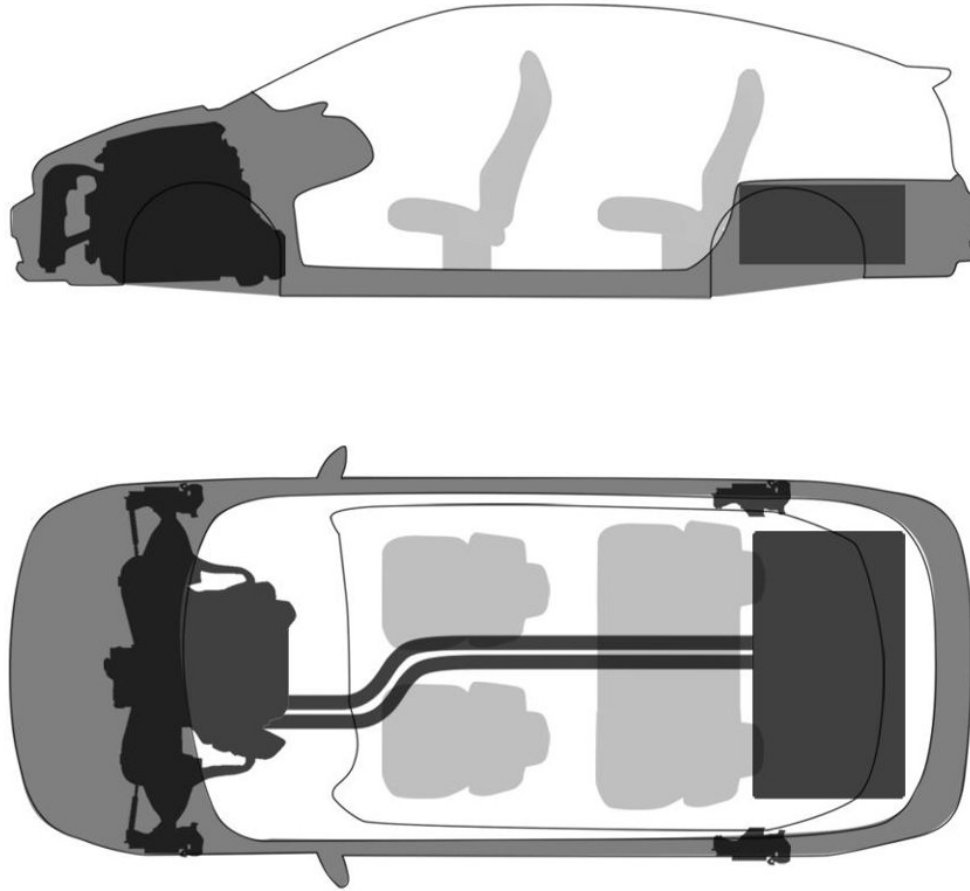
E.g. Music system, sensors etc.

VEHICLE VOLUME STUDY

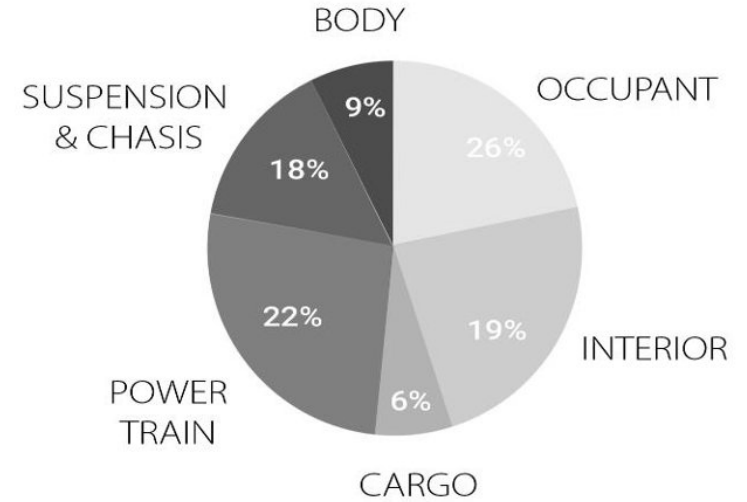


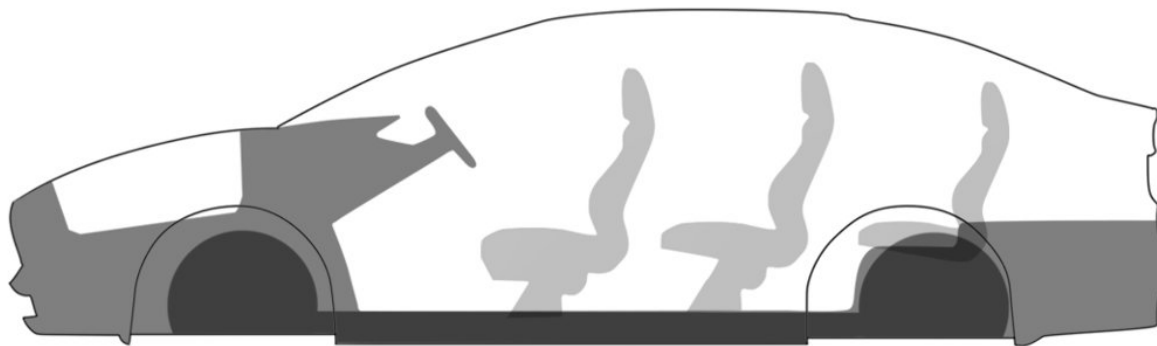
BMW X6



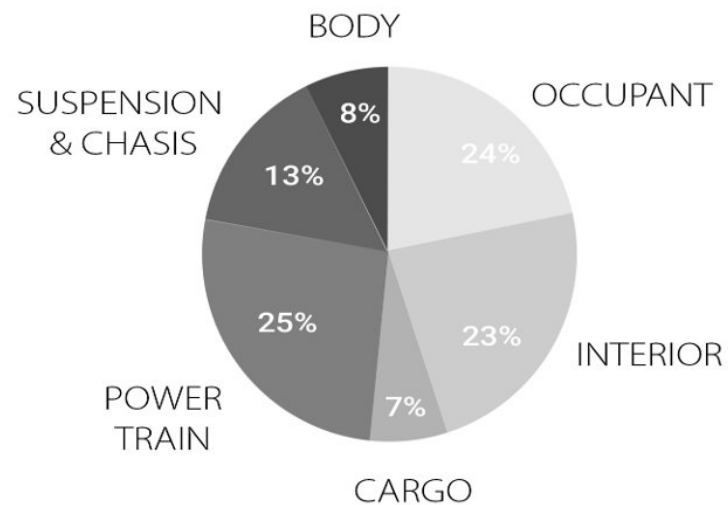
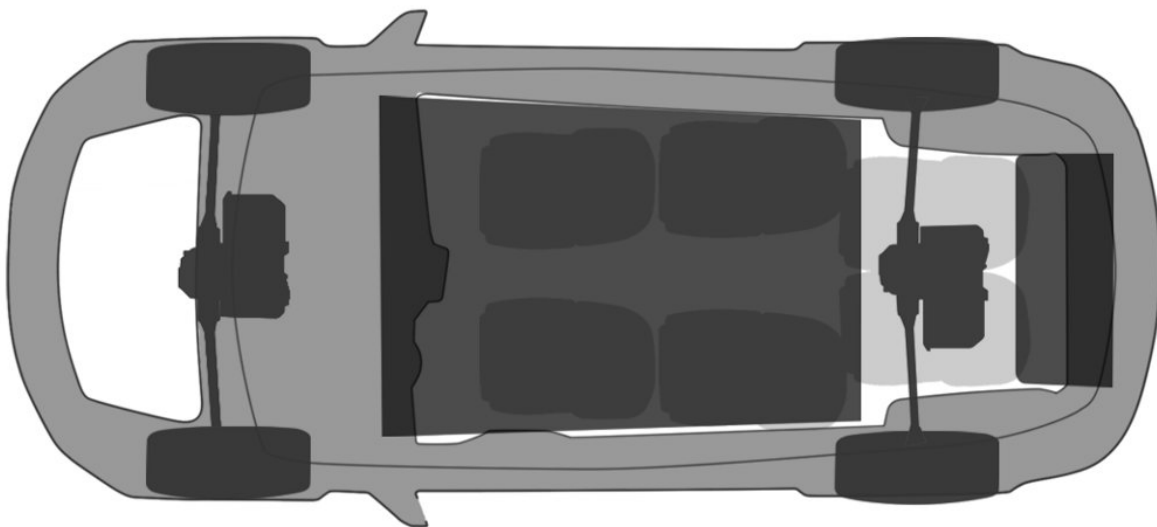


TOYOTA PRIUS

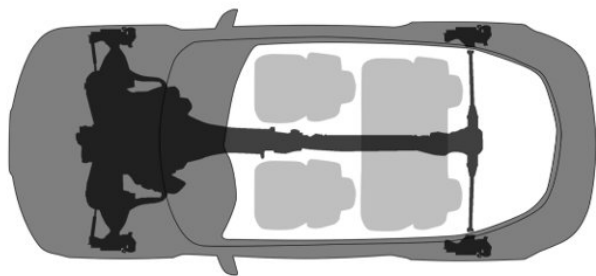
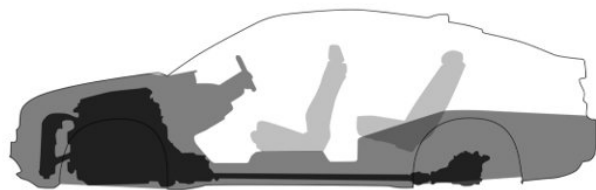




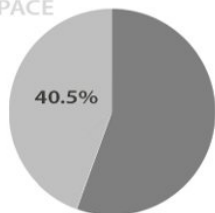
TESLA MODEL X



BMW X6

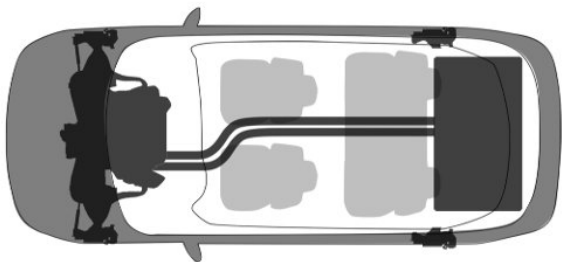
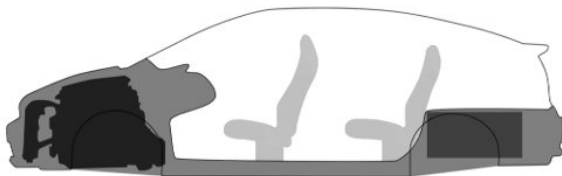


USABLE
SPACE

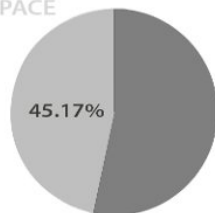


NON-USABLE
SPACE

TOYOTA PRIUS

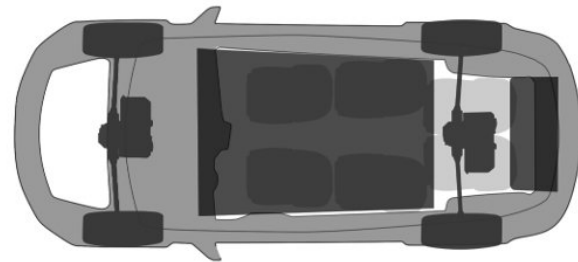


USABLE
SPACE

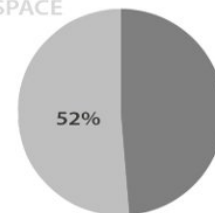


NON-USABLE
SPACE

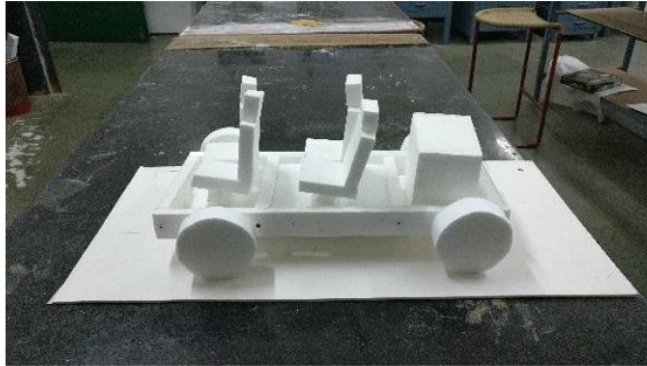
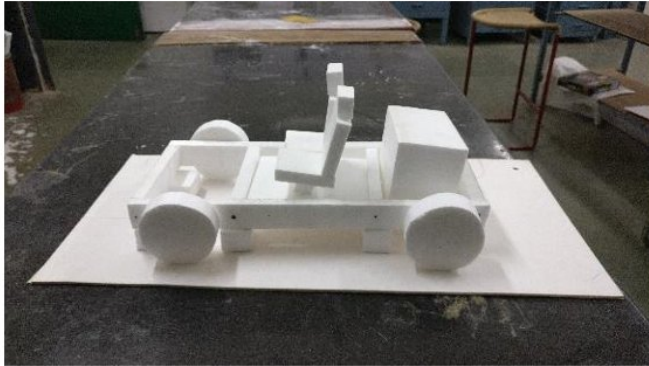
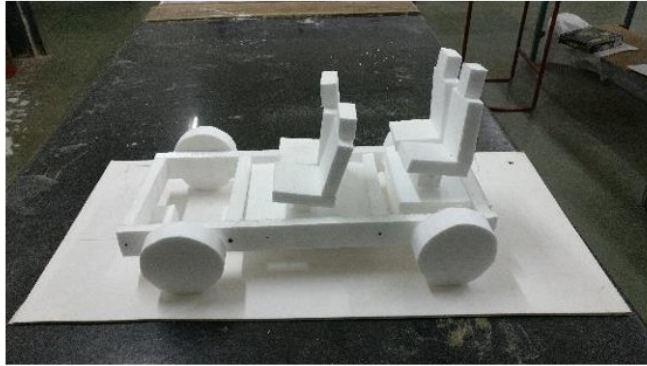
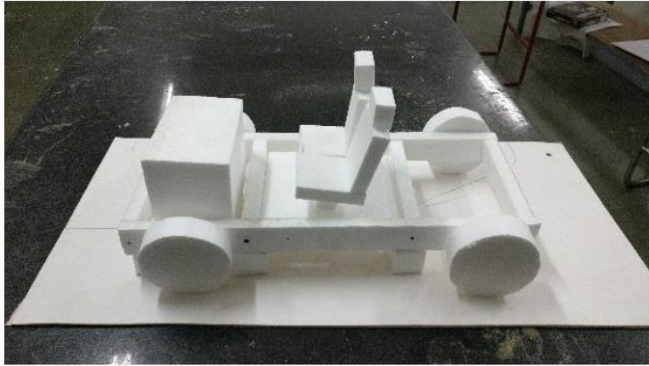
TESLA MODEL X



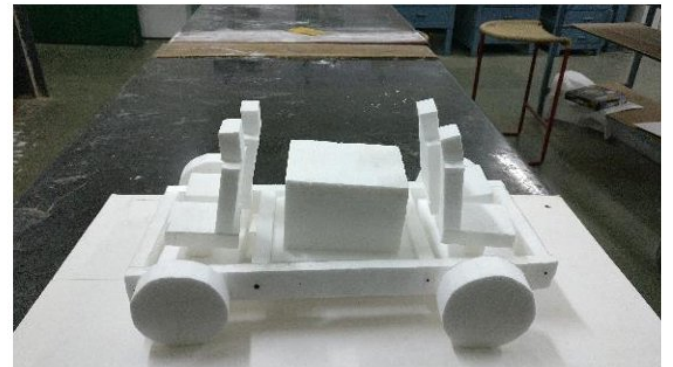
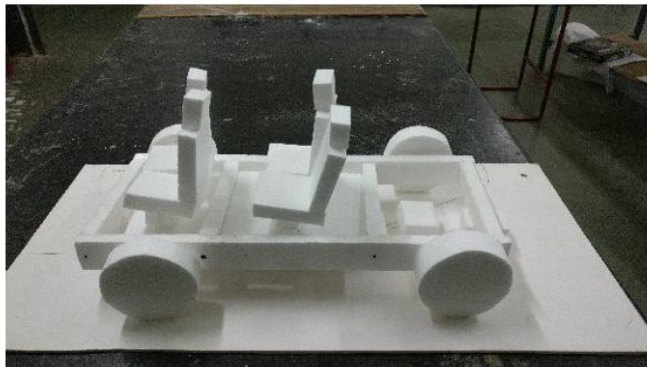
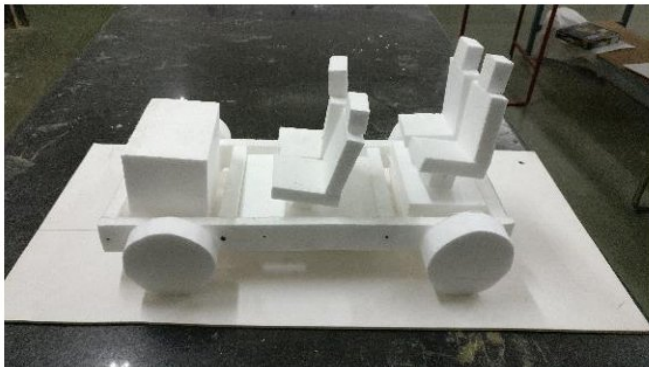
USABLE
SPACE

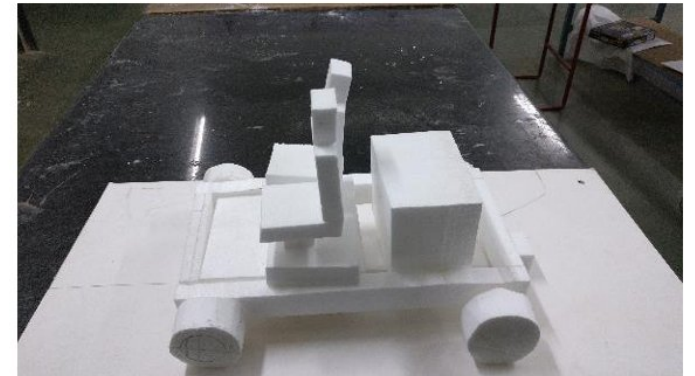
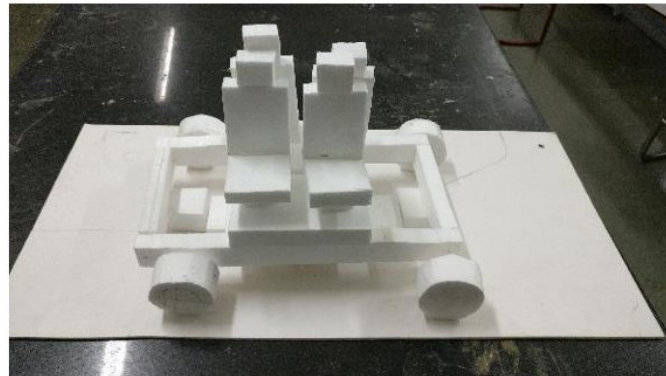
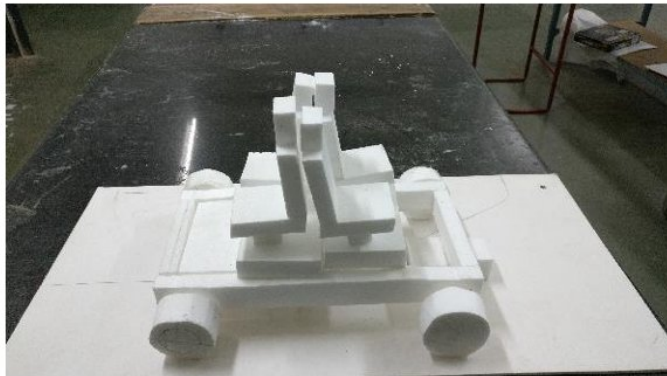
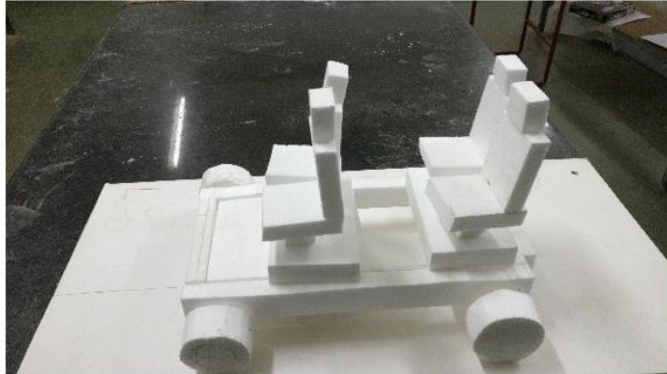
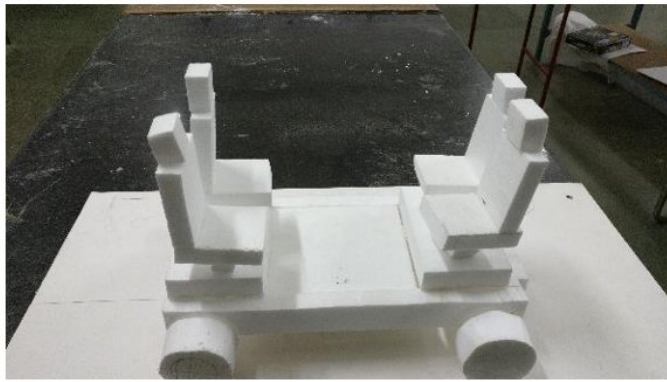


NON-USABLE
SPACE



VEHICLE CONFIGURATION





VEHICLE CONFIGURATION

DESIGN BRIEF

To conceptualize Modular mobility for year 2030

Vehicle should able to evolve or adapt with user need

- Any user should able to upgrade own vehicle with utmost ease

Vehicle should function as an Urban commutor

- Minimum seating capacity of 2 people.
- Having all basic features required in year 2030.



CONSUMER PROFILE

GEN Y 1981-1995

Gen Y will be significant market force in 2030

Conventional - make decisions based on value for money

Age 35-49 years old

Life-stages - Family formation, Family maturation

Characteristics

Tech-savvy

Innovative

Creative

Confident

Sociable

Flexible

CONCEPT 1

An aerial night view of a city, likely Los Angeles, with a bright comet streaking across the sky. The city lights are visible, and the comet's tail is prominent. The text "MODULAR MOBILITY FOR YEAR 2030" is overlaid in the center.

MODULAR MOBILITY FOR YEAR 2030

CONCEPT 2

An aerial photograph of a dense urban landscape at dusk. The sky is filled with dark, heavy clouds, with a bright orange and yellow glow from the setting sun visible in the center. The city below is a mix of high-rise buildings and lower residential structures, mostly in shades of grey and blue. The text 'MODULAR MOBILITY' is written in a large, bold, white sans-serif font, and 'FOR YEAR 2030' is written below it in a smaller, white sans-serif font. The text is centered horizontally and partially overlaps the city and the sky.

MODULAR MOBILITY

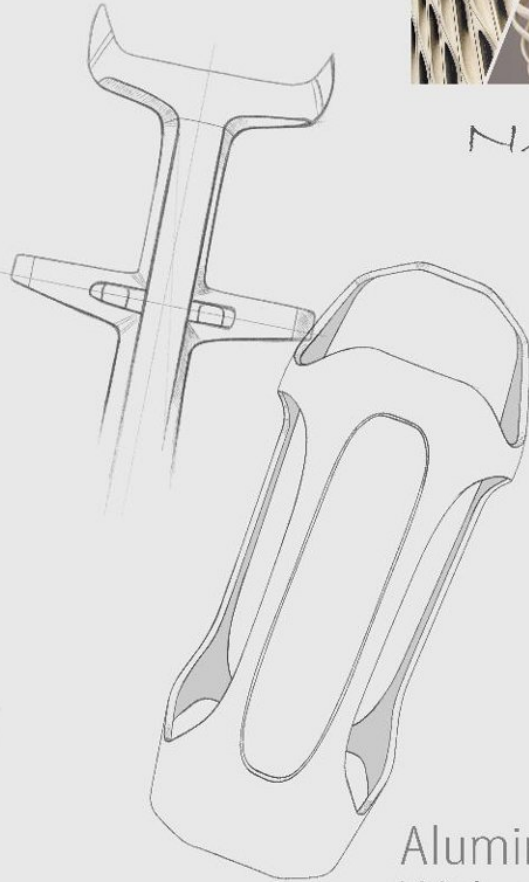
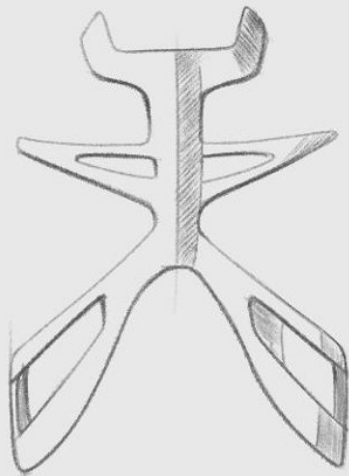
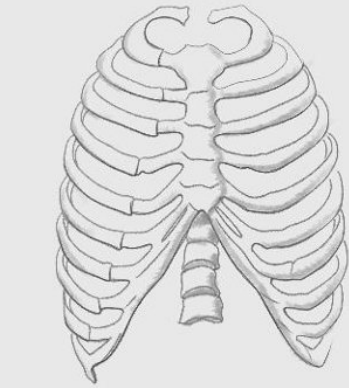
FOR YEAR 2030

CONCEPT 3

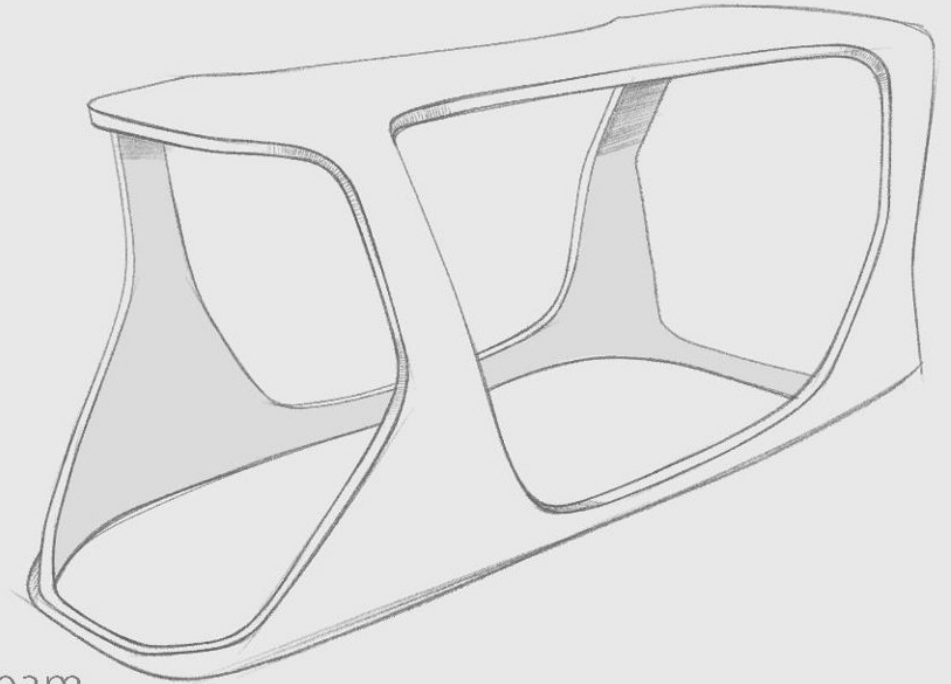


MODULAR MOBILITY FOR YEAR 2030

CONCEPT 4



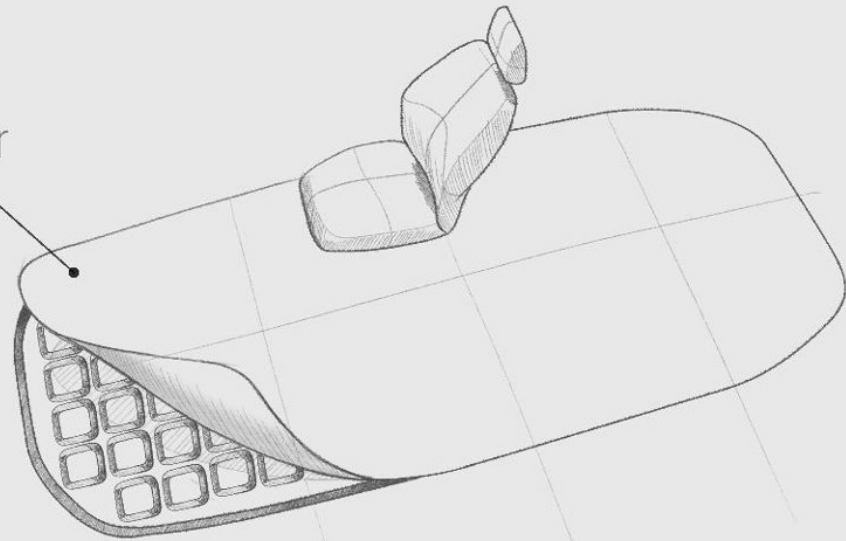
NATURE + TECHNOLOGY



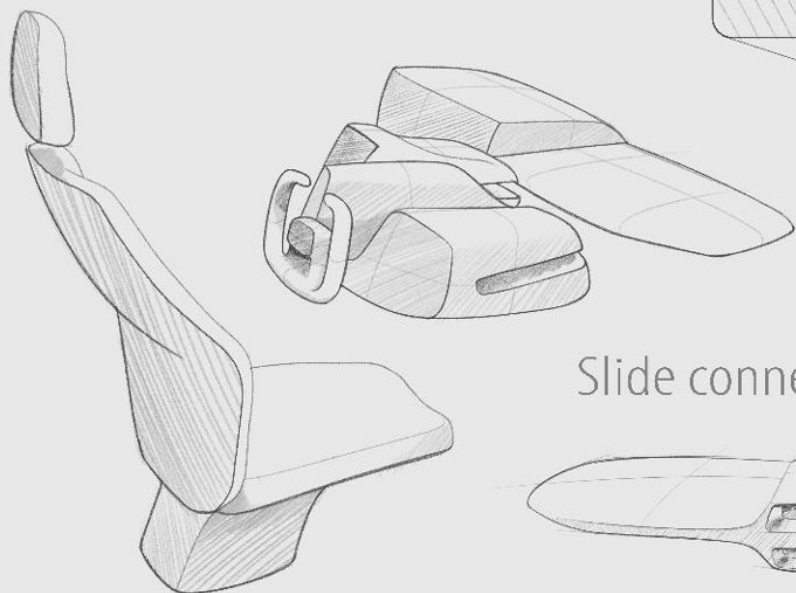
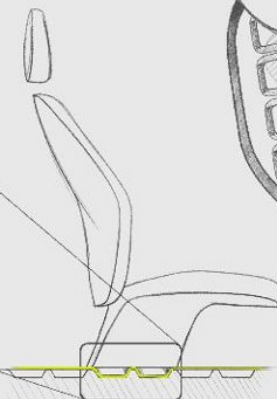
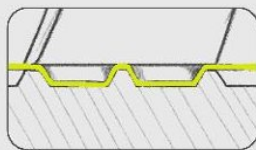
Aluminum foam
With graphene coating



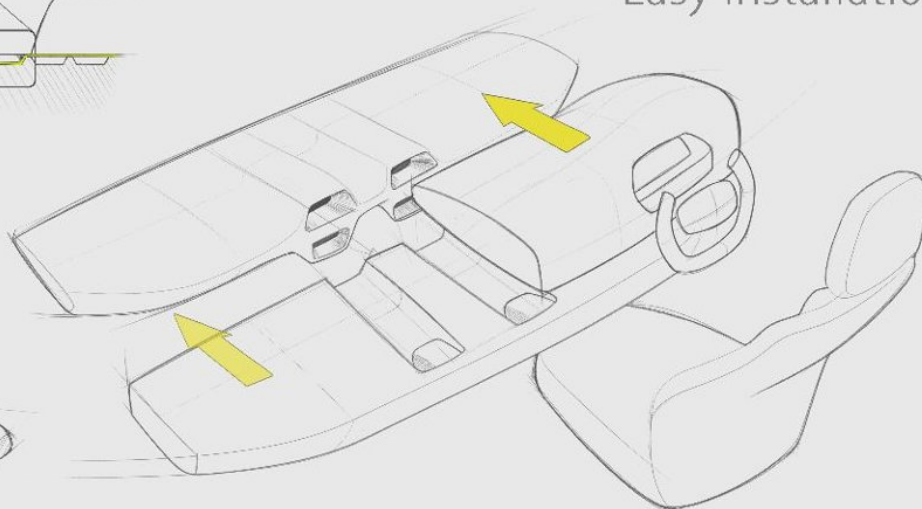
Shape memory polymer



Easy installation



Slide connection dashboard



CONCEPT 5

NEW
MODIFY
SELL

STARK INDUSTRIES

3.15m

LG

DEVELOPER
TERMINAL

STARK INDUSTRIES

STARK INDUSTRIES

STARK INDUSTRIES

STARK INDUSTRIES

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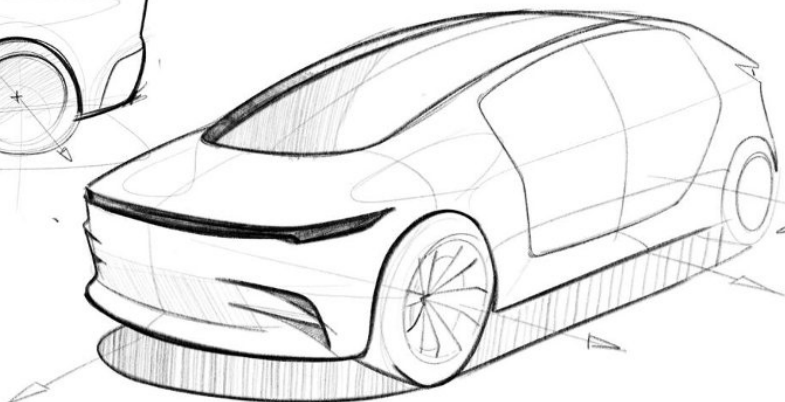
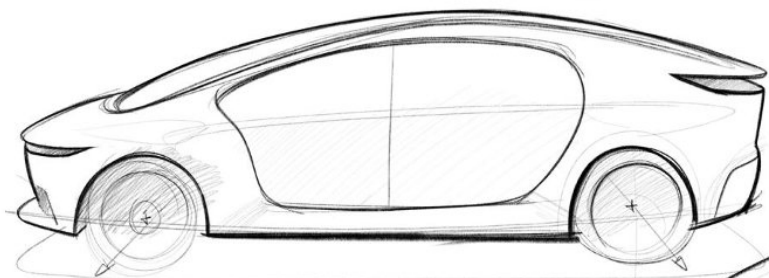
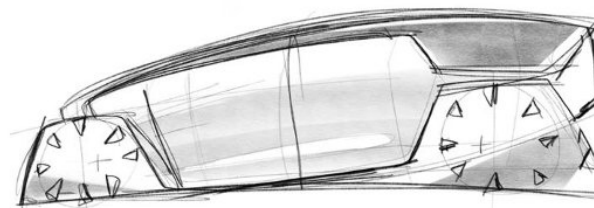
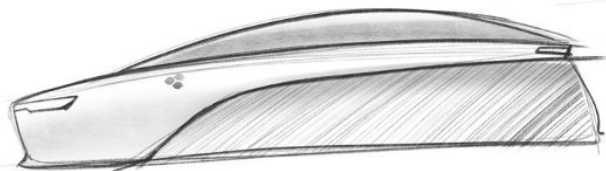
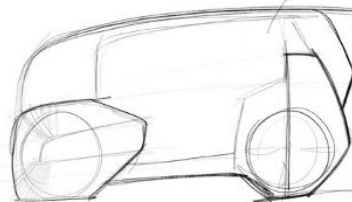
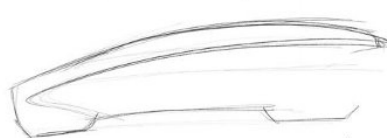
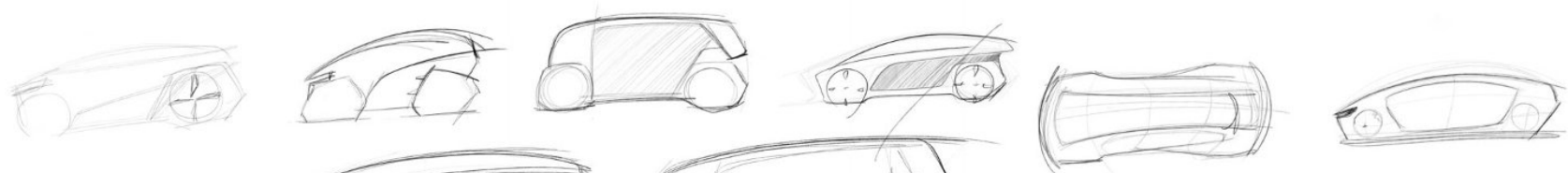
STARK INDUSTRIES

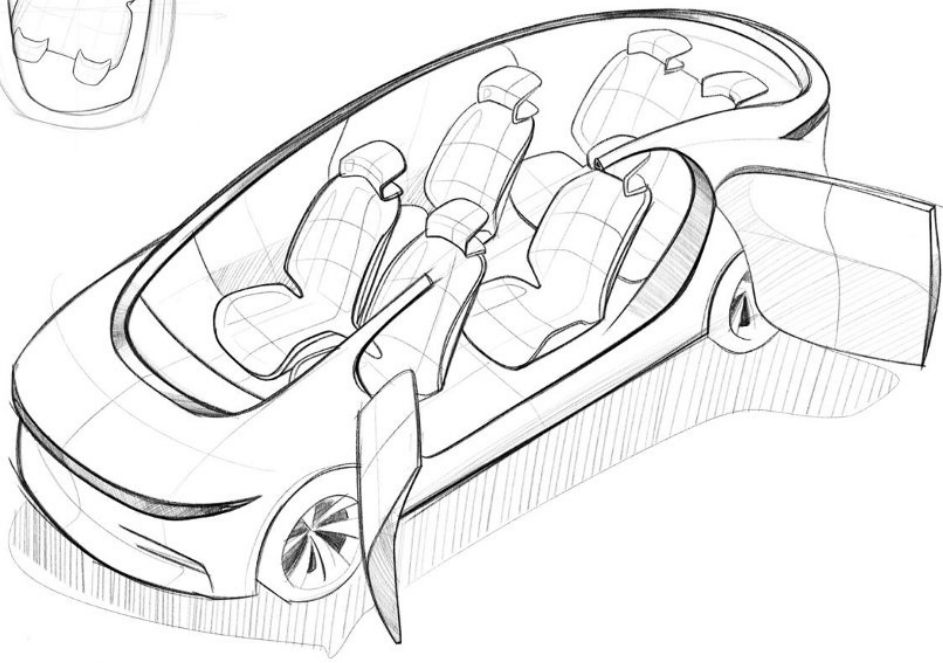
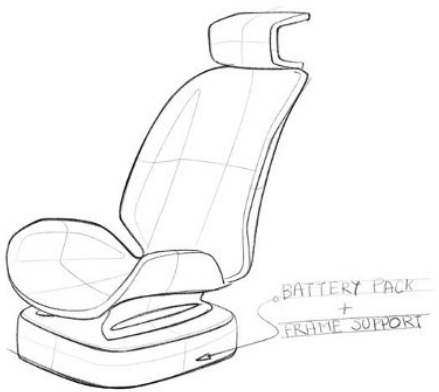
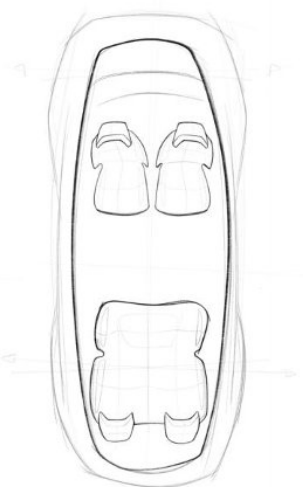
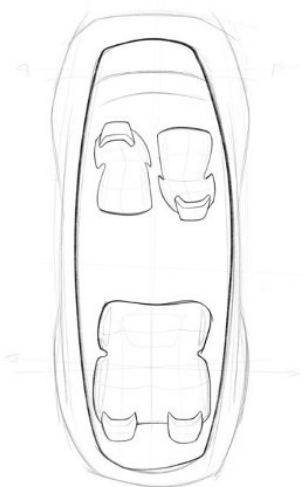
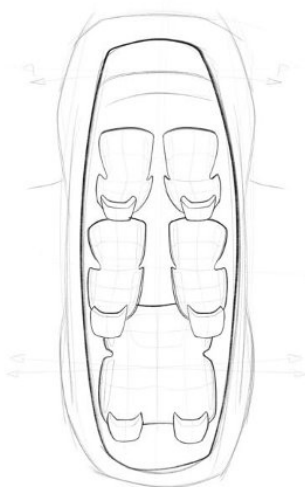
COMMANDERING SYSTEM

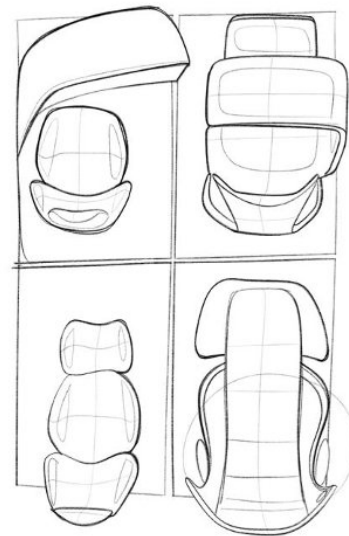
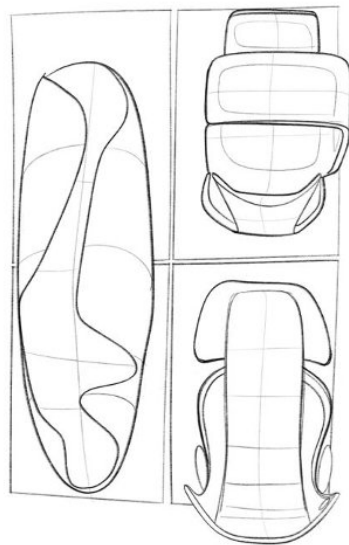
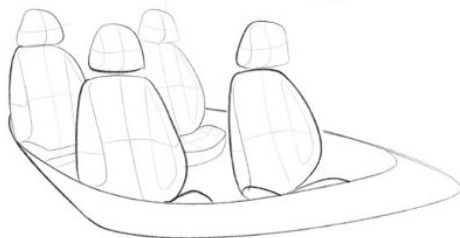
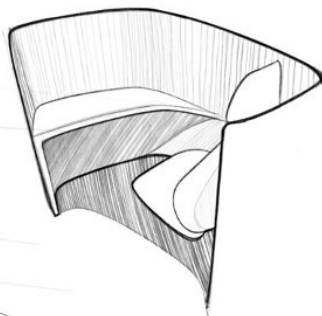
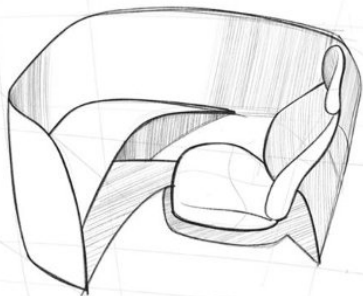
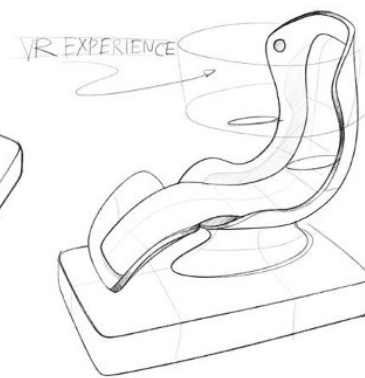
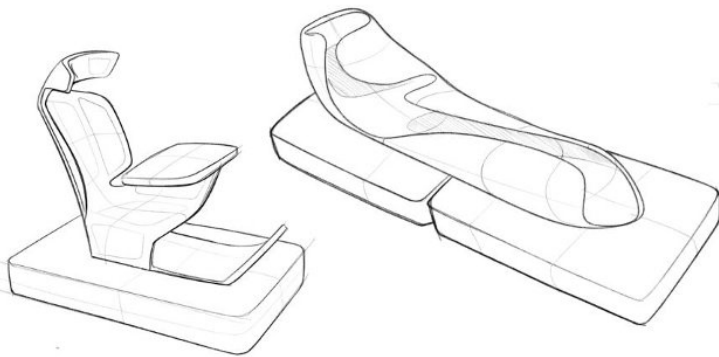
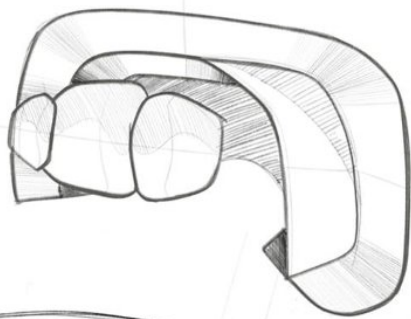
LG



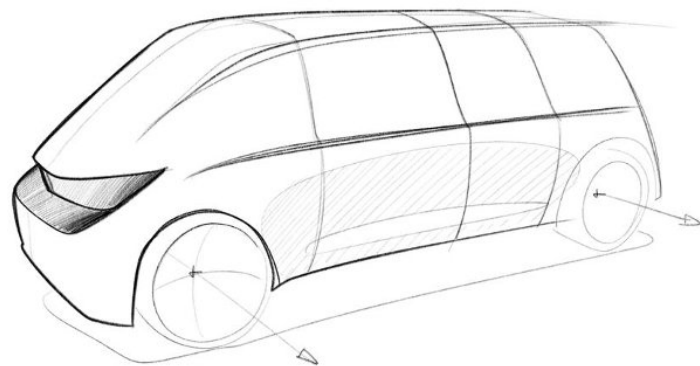
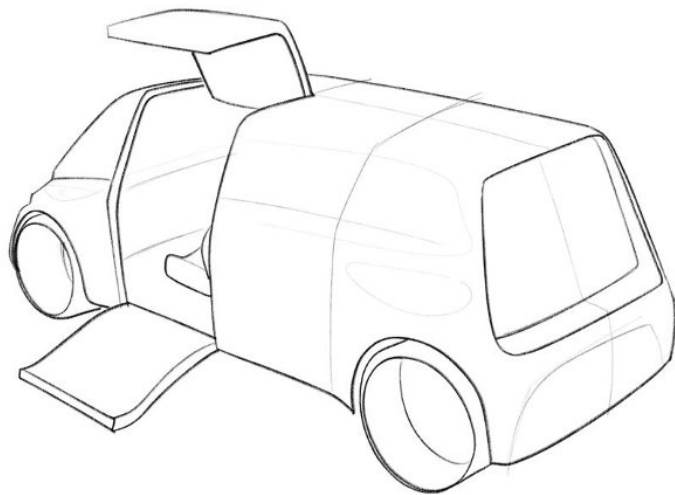
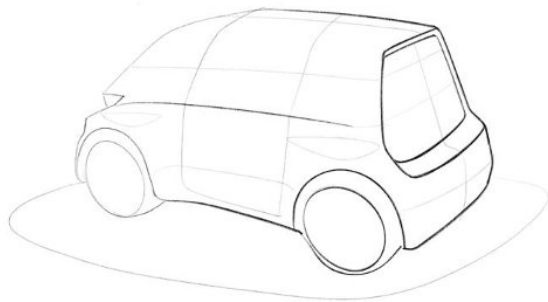
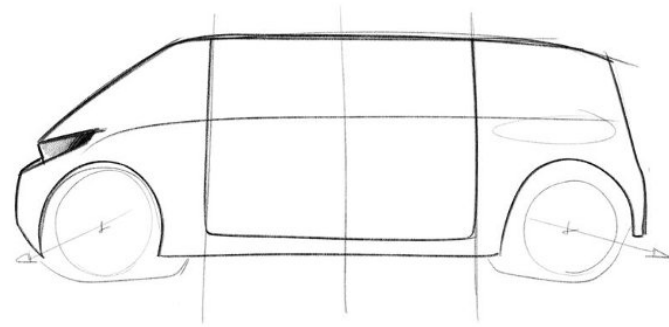
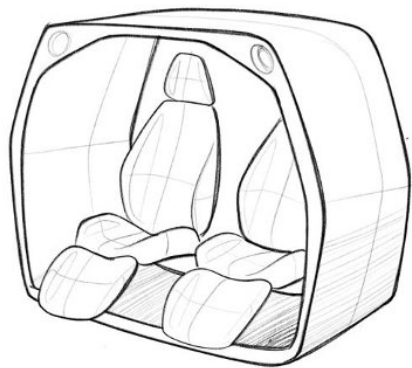
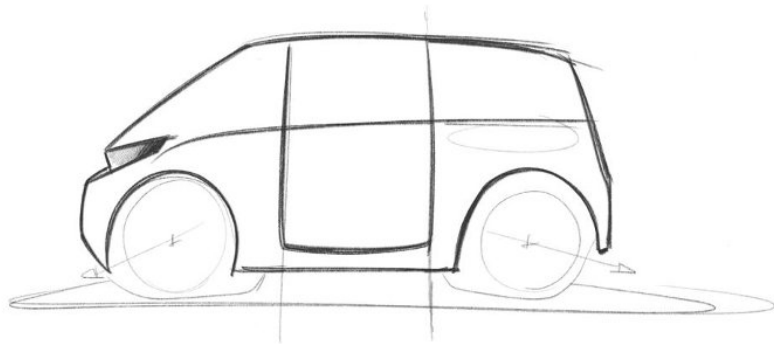
CONCEPT 6







CONCEPT 7



**CONCEPT
REFINEMENT**

