



Rickshaw

Design Of The Exterior For A Three Passenger Auto Rickshaw

Nikhil Rane

Guide:: Prof. V. P. Bapat

Passenger Autorickshaw Manufacturers & Models in India



Bajaj Auto





Atul Auto





Goel Tempo



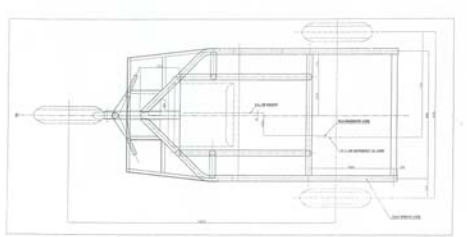
Piaggio





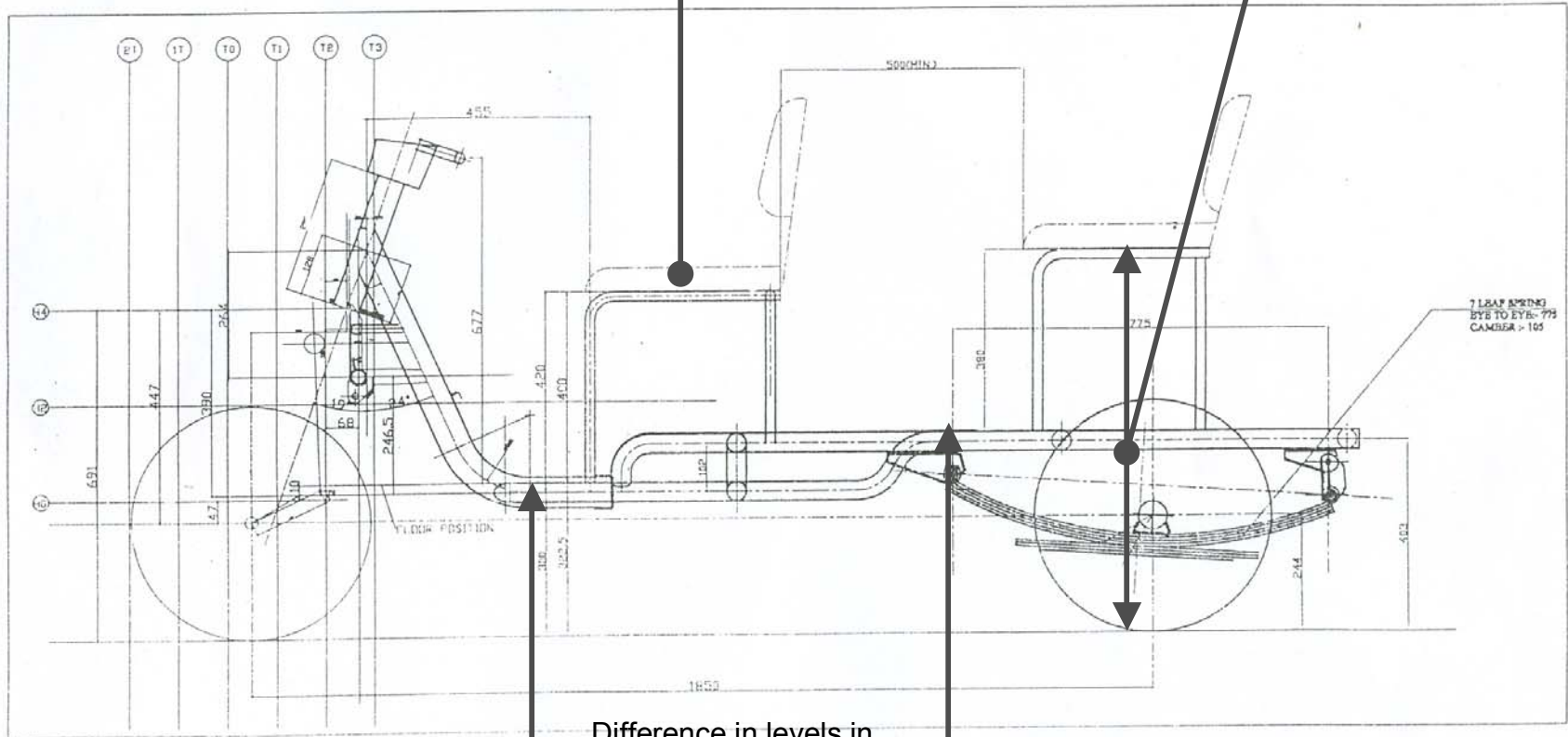
Applications

Profile View of Chassis



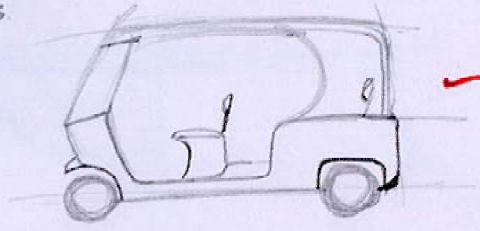
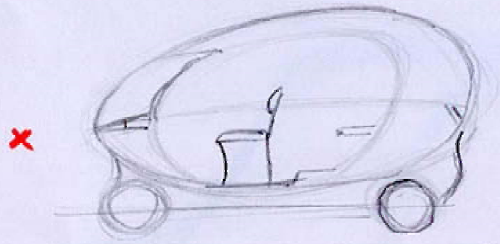
Driver Seat not suitable for all driver sizes/rigid seat

Passenger seating too high due to taller chassis

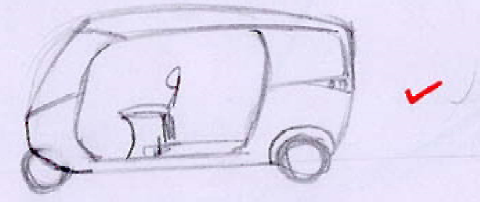
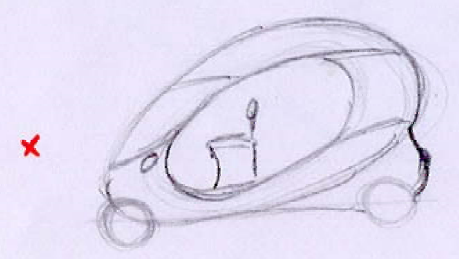
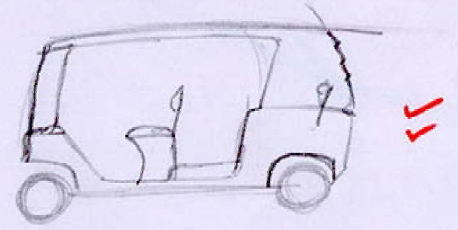
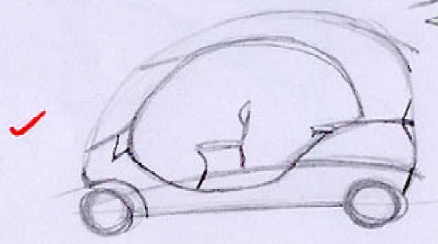


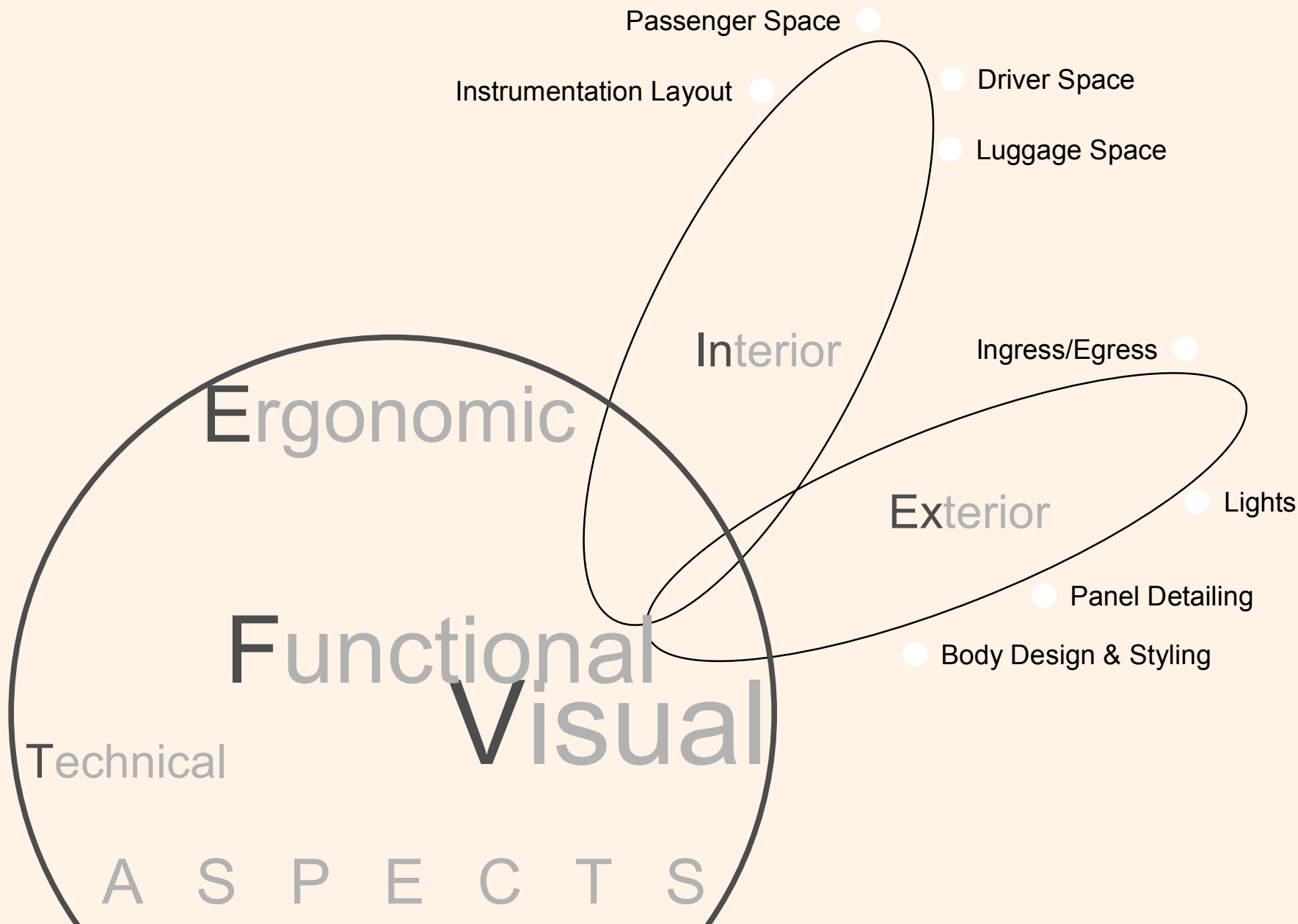
Difference in levels in driver and passenger floor height

BODYSTYLES



Softer
←
Cube
→





Design for manufacture: Sheet metal body + Soft top

Maximum passenger space

A small van like body

Features of higher end vehicles

Personalization

Detachable components

Understanding the **Users**, i.e.

Driver (talk to..... try being one)

Passenger/s (Talk to.....Travel)

Owner

Service mechanics

Autorickshaw model selected for Observation : Bajaj RE 2S/4S/CNG



integration weakens at the **sides**,

Both structurally and visually

Driver says ' I need side **half height side doors**.....like a jeep

Passenger adds ' I need more safety on side for **children and luggage** against brushing vehicles, rain water splashing.....

Insights & Ideas

Design retractable door beams

Integrate through more organic colour bands
from rear to front

Wrap cabin with safety bands all around

Rexin doors with MS rod frames for
passengers



Sagging canopy problem hampers look and causes leaks during rains



Metal hood faces rust problem and dents

Tubes for canopy are visually weak

They do not offer any occupant safety also as they are collapsible

Insights & Ideas

Design roll over cage

Larger diameter tubes for canopy

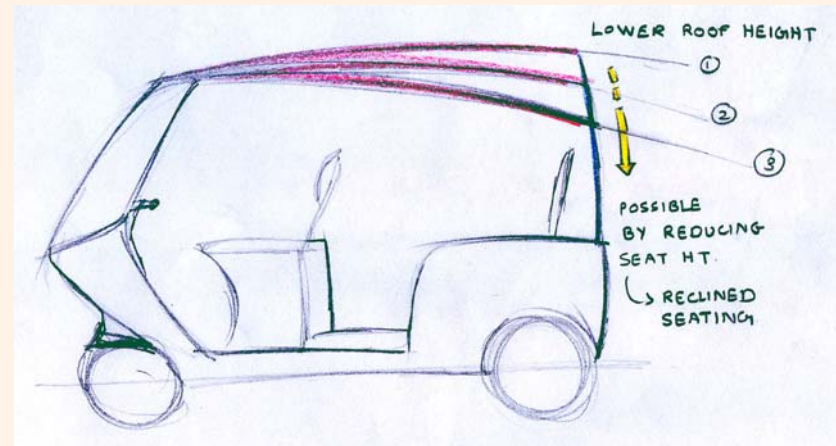
Expose tubular members as elements of strength



Rickshaw is **too high**.....can't the height be reduced

All rickshaw in the market today are taller than most cars, yet they cannot accommodate most percentiles comfortably

Insights & Ideas



Is the result of

- The Project Scope and Product Brief
- Interaction with
 Company engineers, designers and marketing
 personnel
- Auto rickshaw owners/ drivers, passengers
- People using bus, taxi and two wheelers as
 transport
- Existing product study
 Product Survey
 Product Analysis

Functional Requirements

- Comfortable seating for three passengers
 (involves visual comfort, openings, access to
 surroundings)
- Ingress/ Egress space and location for passenger and
 luggage
- Safety - better lighting, larger windscreen
 area and stronger canopy structure
- Adapting vehicle for tropical climate
- Weather protection in the form of canopy, door
 attachment and accessories
- Modularity in Construction for assembly and
 disassembly for service, transport, etc
- Explore possibilities for various applications on one
 platform

Form

- **Visual and material Integration** of rickshaw body
- Endowing the vehicle with a **strong and distinct identity** in its category
- Enhancing the **unique experience** of a rickshaw ride
- Use **existing chassis and powerplant characteristics** to advantage in form generation
- Project increased passenger cabin space and comfort as a visual element to attain **an inviting look** for prospective customers

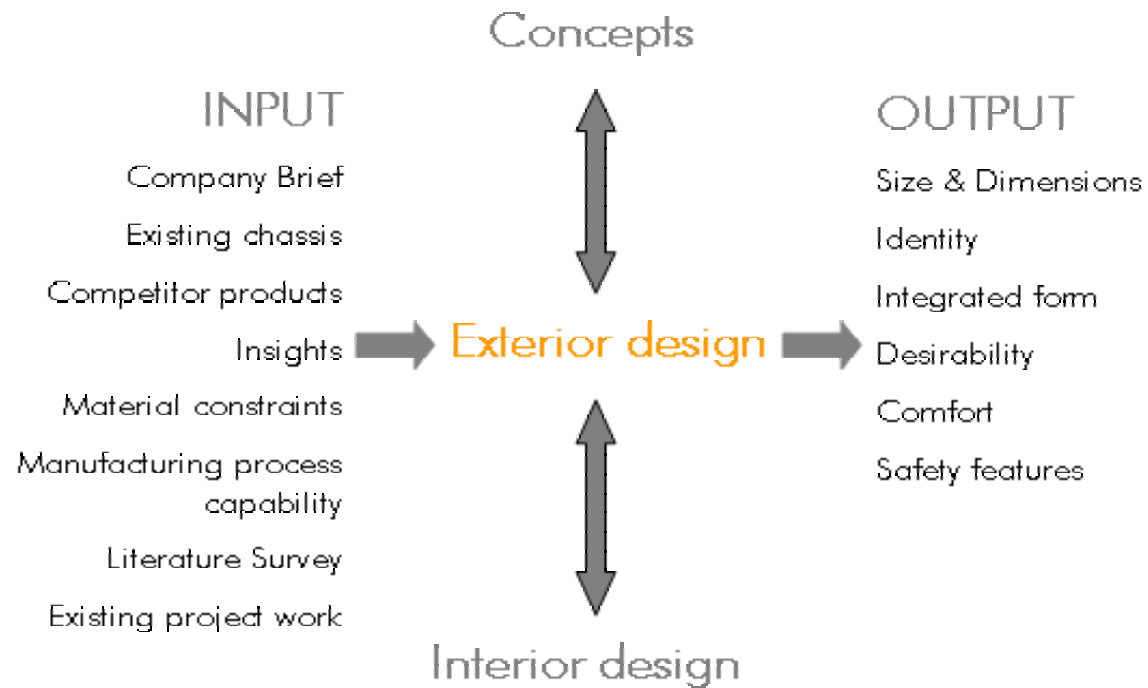
Size Aspects

- **“Compact Exteriors, Spacious Interiors”**

Use of anthropometric dimensions data book

Constraints/Opportunities

- Use of sheet metal and soft, flexible materials for body design
- Existing chassis and engine setup
- Manufacturing capability and capacity

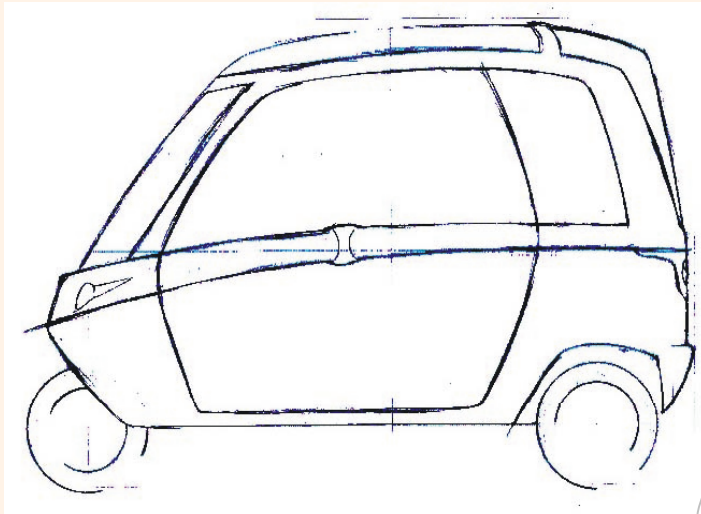


Ergonomic Analysis

This involved a combined activity with the interior design.

- Use of full scale 5th % and 95th % male mannequins
for analysis of seating posture, control reach driver visibility through windscreen and longitudinal legroom
- Use of data book for Indian Anthropometric Data
- Use of information from previous project reports on the subject
- Use of digitized mannequins for analysis using 2D CAD data

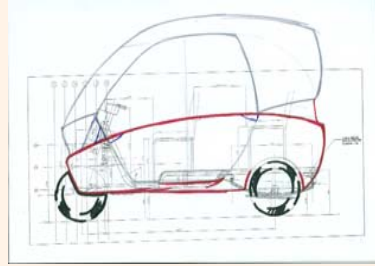
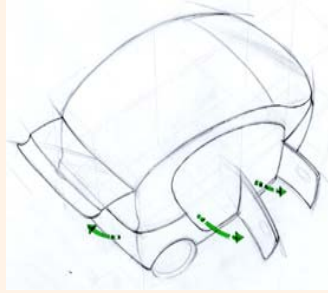
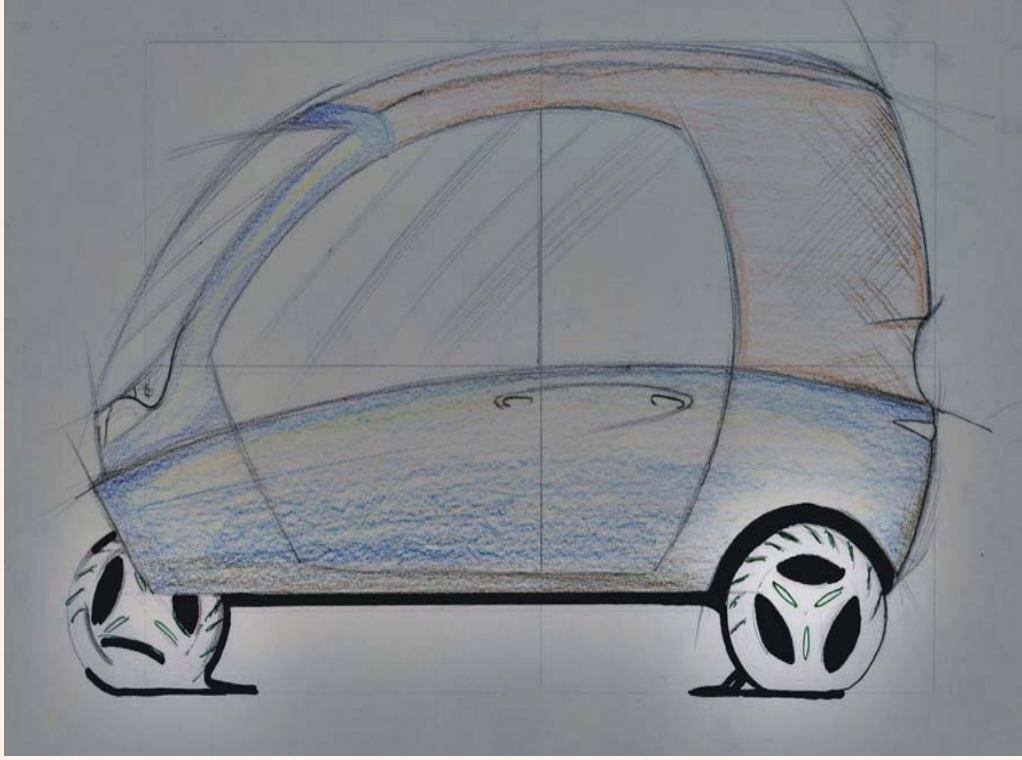
The male mannequins were chosen as nearly 100% of the auto rickshaw drivers are male and the 5th and 95th % male size gives the two extremities in size.



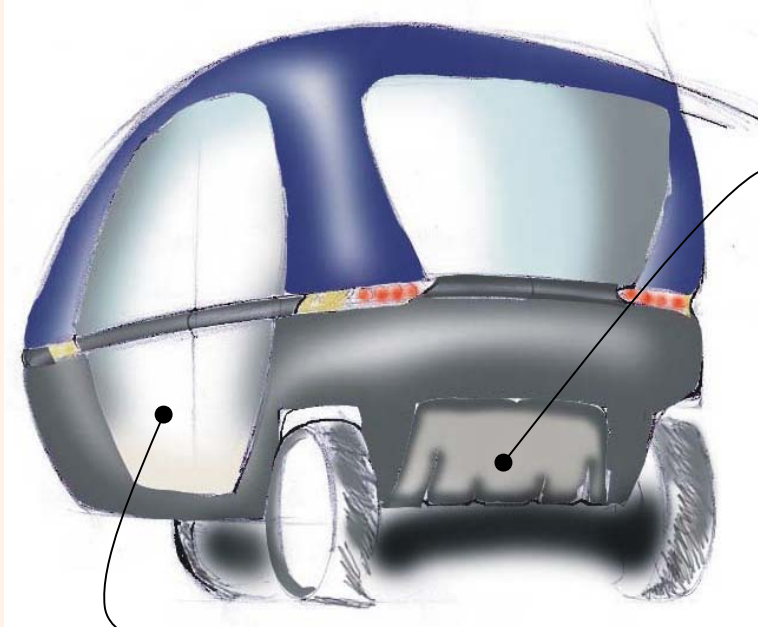
Soft top in Rexin 'soft grey'

Connecting bands
&
Transparent openings
made from PVC
sheets





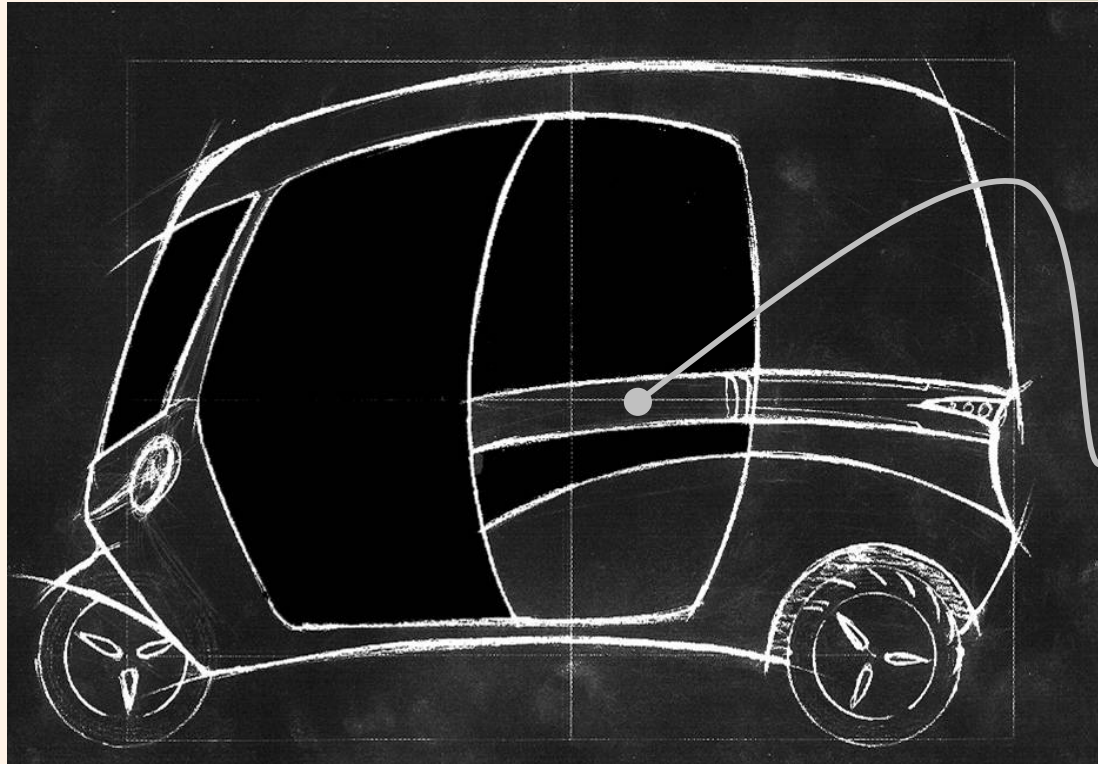
Concept 2



Removable doors with moulded door beams

Dirt tray to protect underbelly
.....doubles up as luggage
access door





The door is used not just as a protection against elements but is

An integral part of body design

Has a play of body coloured and transparent elements

Slides open for ingress/egress on gentle body patterns

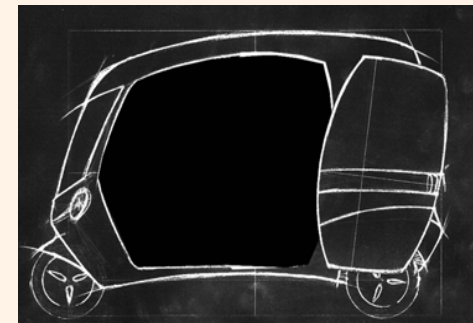
Thus rendering it more than a mundane entity

.....through design

Gentle curves...

... a move towards a more soothing feeling

...simplicity



Concept 4



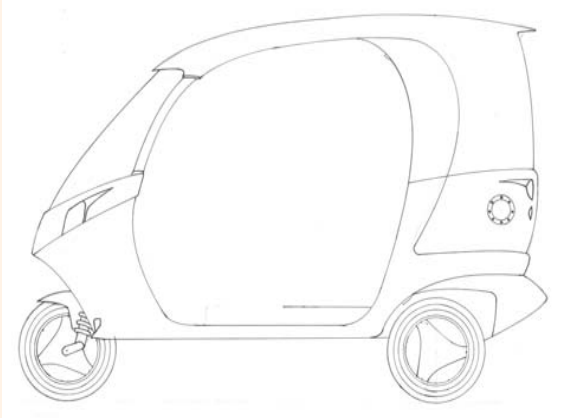
Cabriolet type rear hood

Larger (approx 13")
wheels for better ride to
complement body style

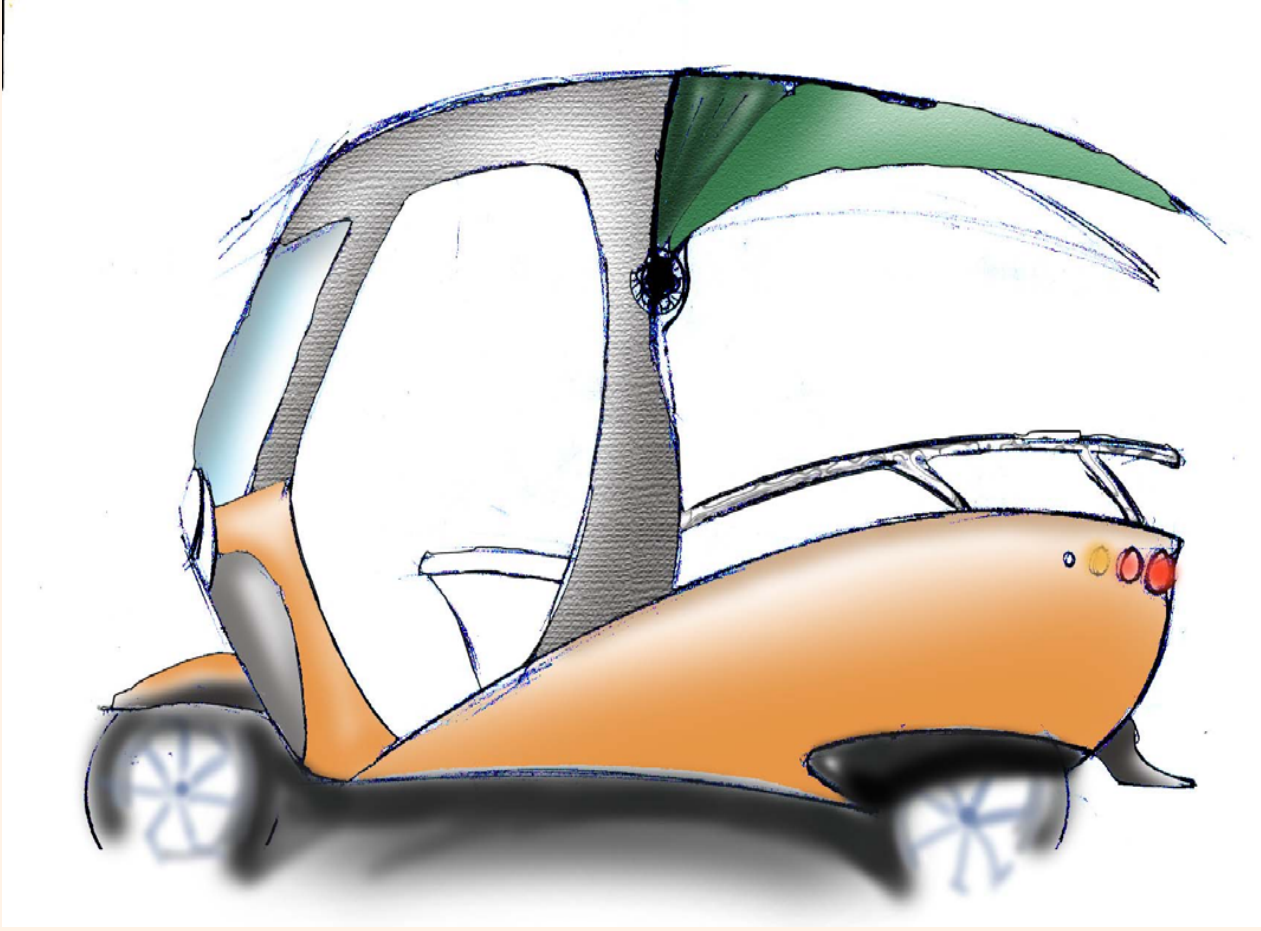
Air dams to cool front
mounted engine



Concept 5

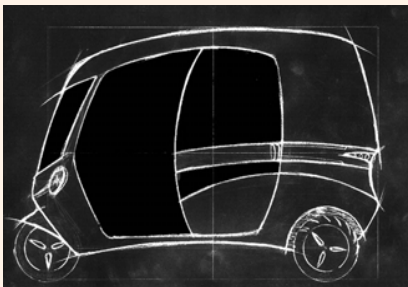
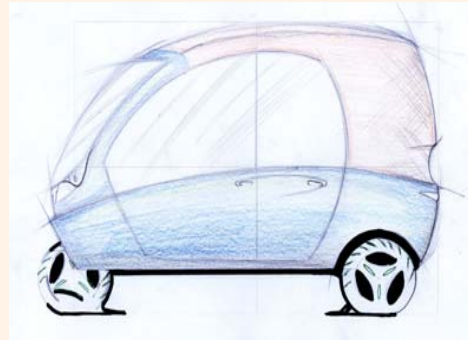


Concept 6



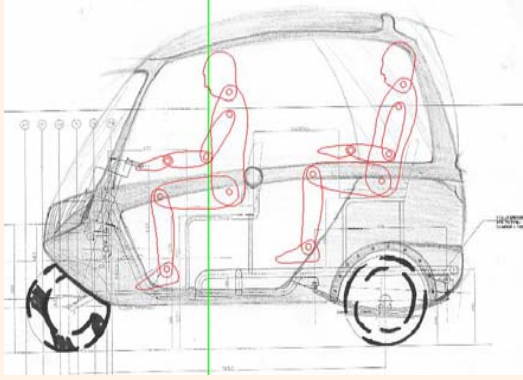
Concept 7

Concepts

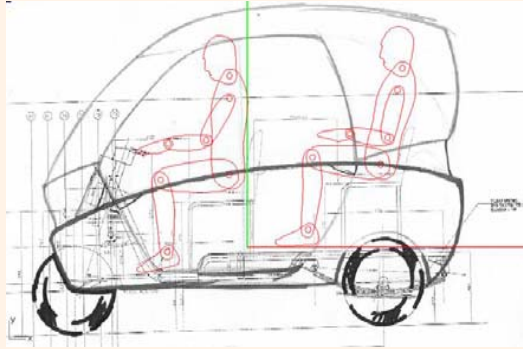


Chosen concept

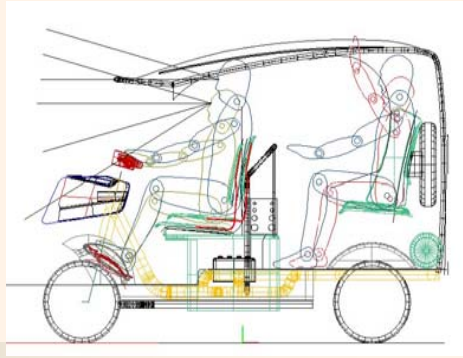




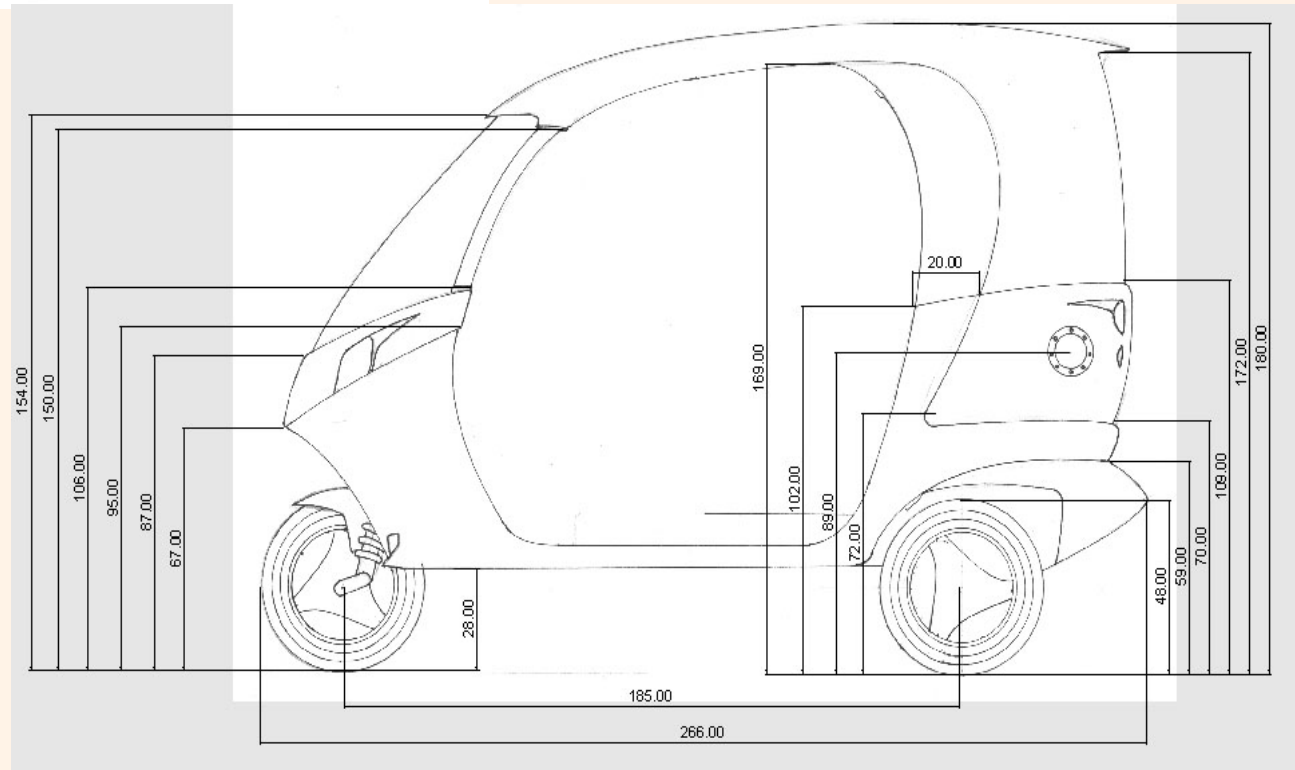
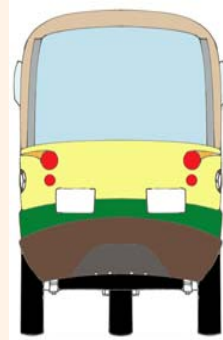
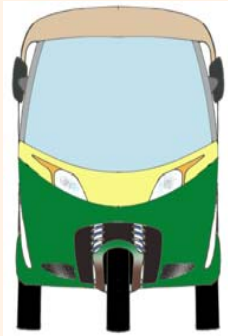
Concept 1

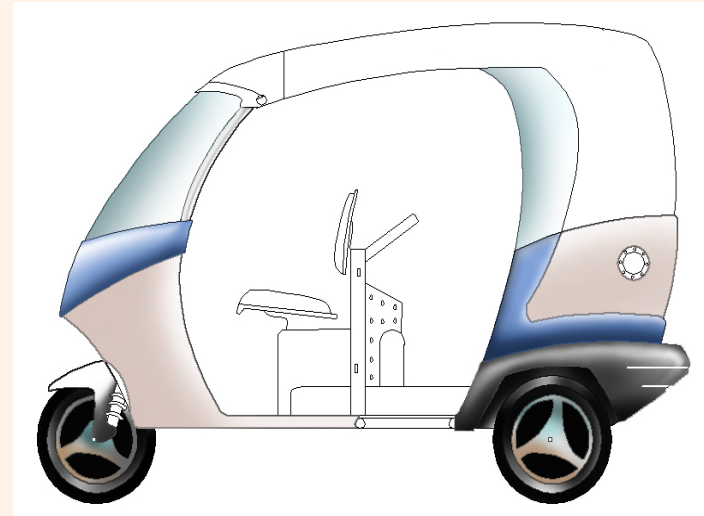
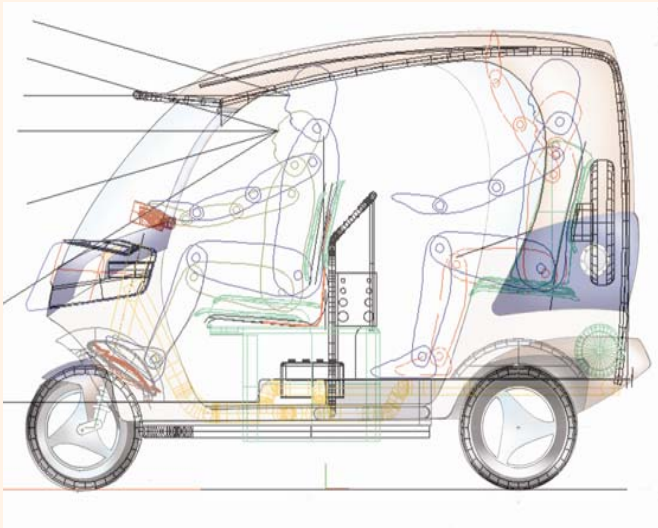
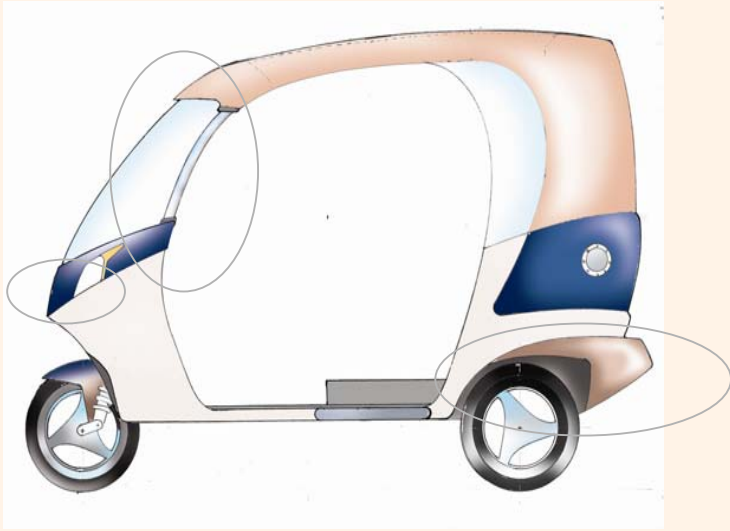


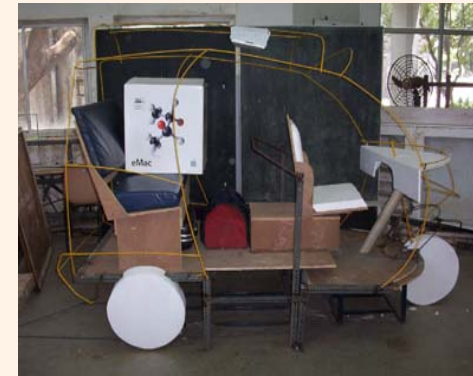
Concept 2



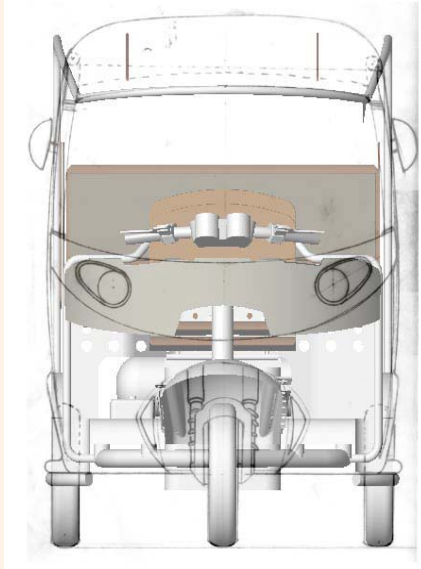
Concept 6



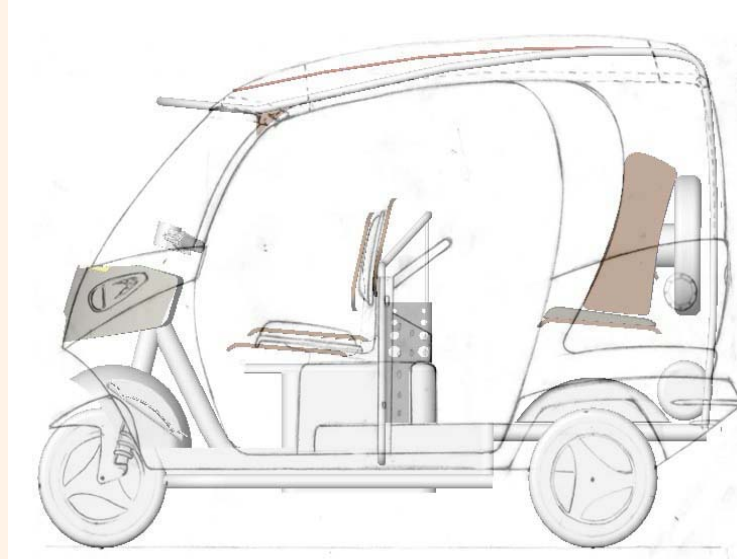




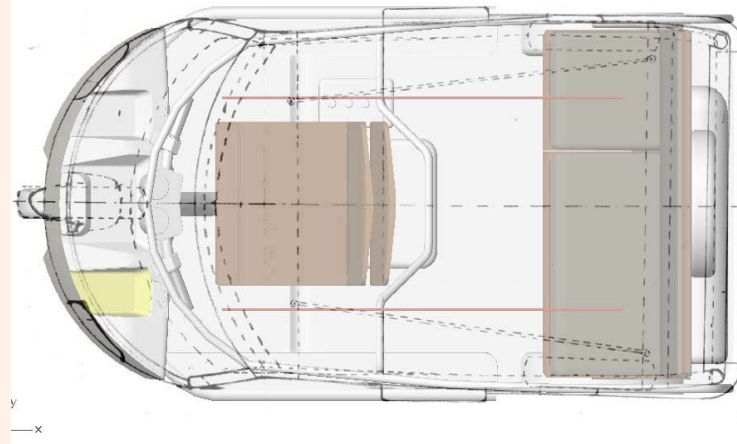
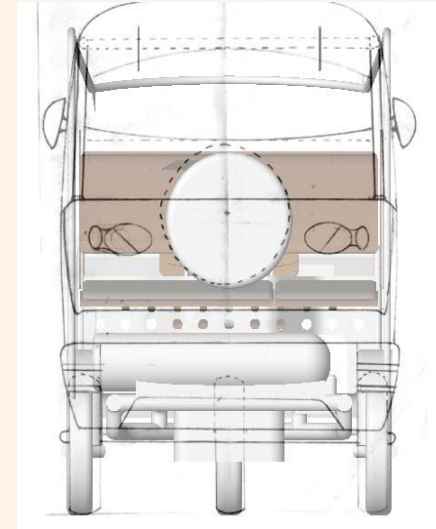
Front view



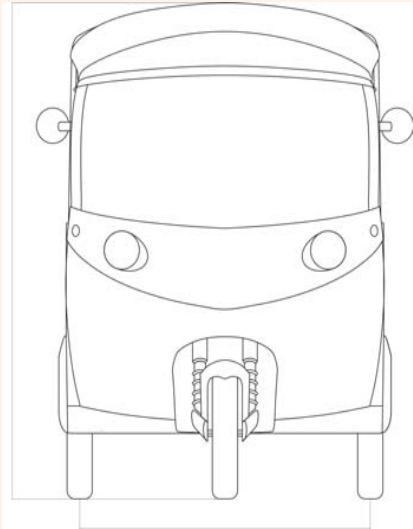
Side Profile



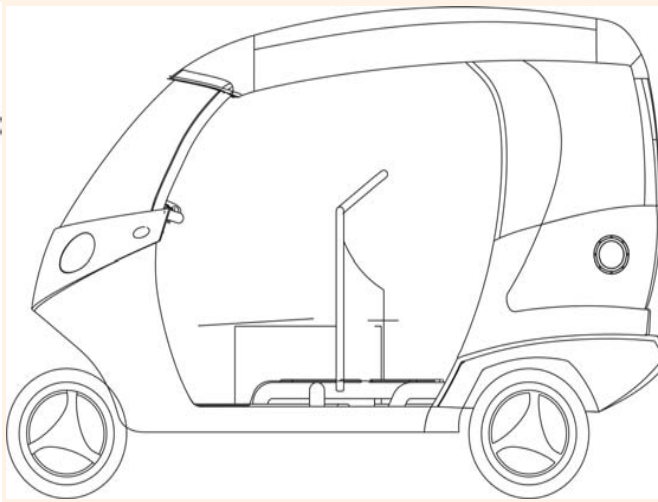
Rear View



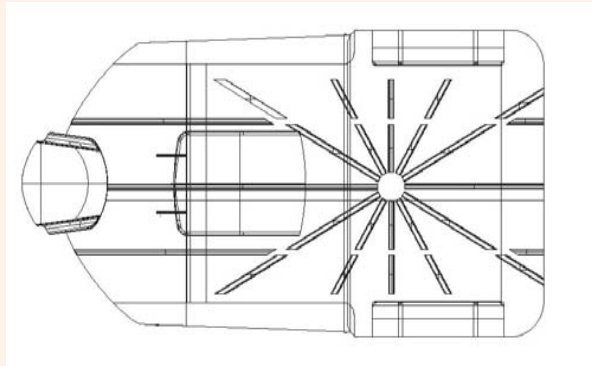
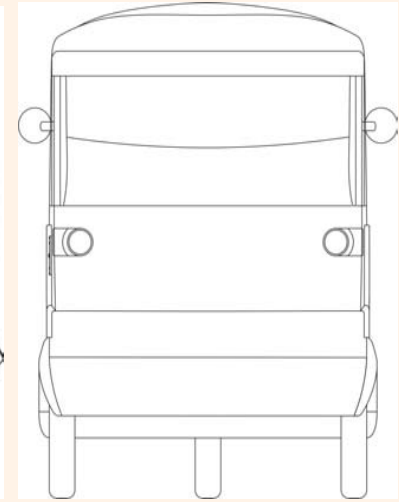
Front view



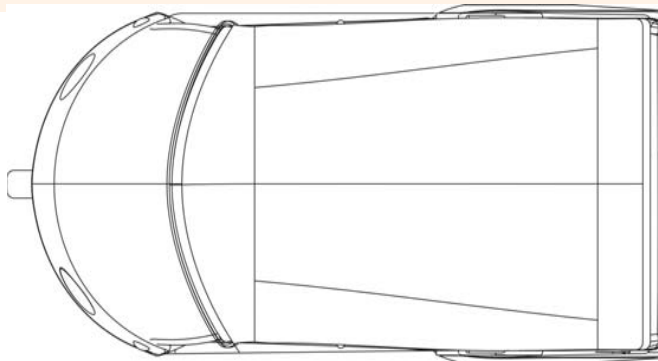
Side Profile



Rear View



Floor plan



Top view

Windshield held
by top and bottom
members

Transparent side
openings for better
side visibility



Twin headlights
with clear lens
headlamps

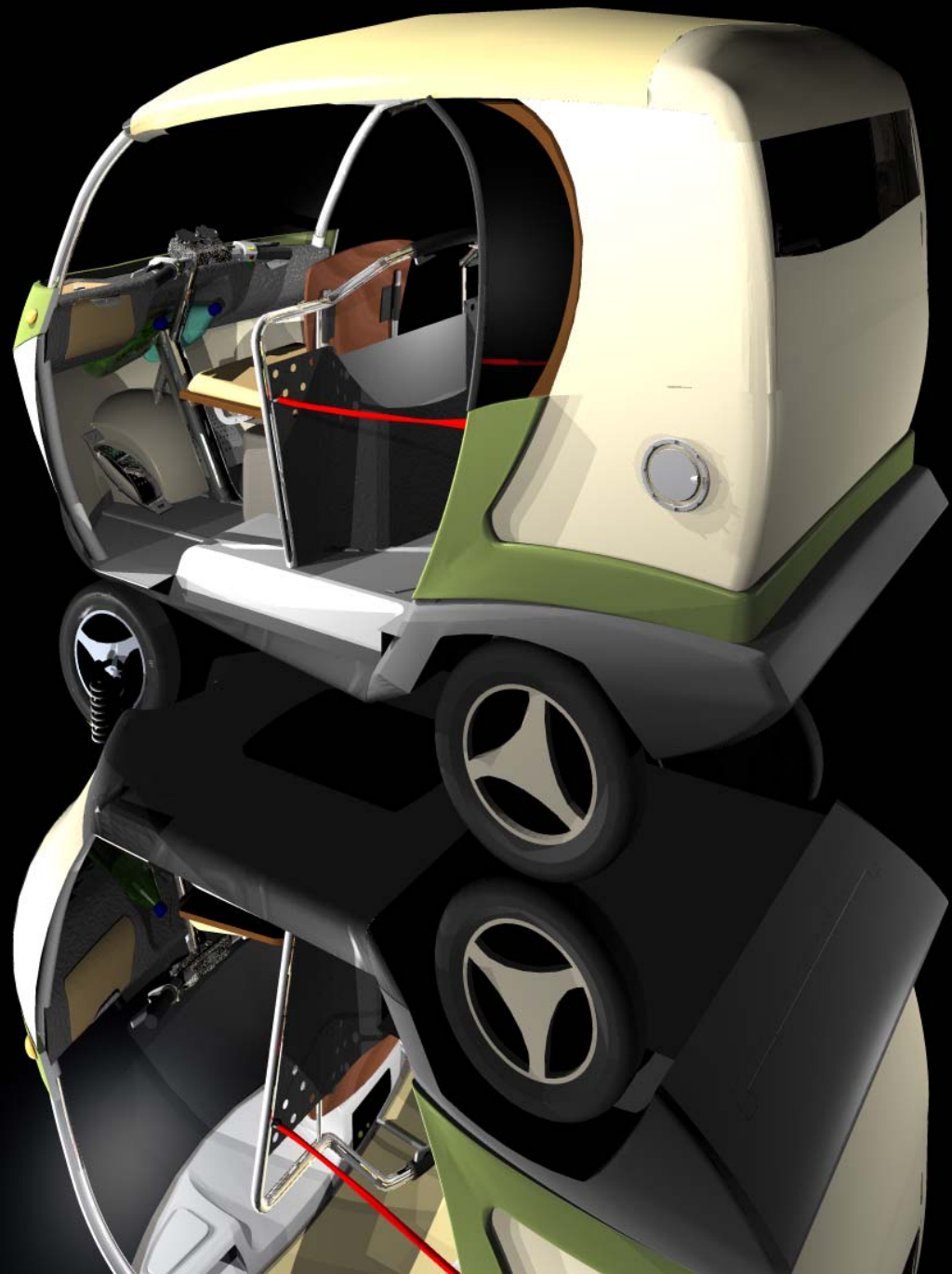
The colours chosen are Olive Greens in warmer shades
With the larger panel colours in Ivory White and tans

Dual coloured front
Mudguard













Thank You
