

CHAPTER ONE – ABSTRACT	04
1.1 ABSTRACT	05
1.2 AIM	06
1.3 OBJECTIVES	06
1.4 SCOPE AND LIMITATIONS	07
1.5 METHODOLOGY	08
CHAPTER TWO – INTRODUCTION	09
2.1 DIVISION OF TWO WHEELERS	10
2.2 INDIAN MARKET OF SCOOTERS	11
2.3 TECHNOLOGY THAT SHAPED STYLING	13
2.4 INTRODUCTION TO SCOOTY PEP PLUS	14
2.4.1 HISTORY	15
2.4.2 MARKET SCENARIO	16
2.4.3 BRAND IDENTITY	17
2.4.4 VEHICLE SPECIFICATIONS	18
2.4.5 MATERIAL UNDERSTANDING	19
2.4.6 HARD POINTS IN FRAME	20
2.4.7 PRODUCTION LINE	21
CHAPTER THREE – UNDERSTANDING STYLING TRENDS	22
3.1 FRONTAL EXPRESSION	24
3.2 METAPHOR	25
3.3 SURFACE BEHAVIOUR	26
3.4 EDGE STYLING	27
3.5 RETRO STYLING	28
3.6 SCULPTURAL	29

CHAPTER FOUR – UNDERSTANDING REFRESH DESIGN	30
CHAPTER FIVE – COMPARATIVE ANALYSIS	34
5.1 HEADLAMP	36
5.2 FRONT COWL	37
5.3 STANCE	38
5.4 STEP-THROUGH	40
5.5 SIDE COWL	41
5.6 FRONT FENDER	42
5.7 NOSE FEATURE	43
5.8 SEAT	44
5.9 TAIL LAMP	45
5.10 MONOGRAM / DECALS	46
CHAPTER SIX – USER STUDY & ANALYSIS	47
6.1 TARGET USER GROUP	48
6.2 QUESTIONNAIRE	50
6.3 EXISTING NUANCES TO THE USER	54
6.3.1 ACTIVITY ANALYSIS (MALE USER)	55
6.3.2 ACTIVITY ANALYSIS (FEMALE USER)	56
6.3.3 USER COMMENTS	57
6.3.4 PROBLEMS WHEN RIDING	58
6.3.5 OBSERVATIONS	59
6.3.6 IMAGE OF PERSONAL VEHICLE	60
6.3.7 HABITS	62
6.4 FEEDBACK FROM USERS	66
6.5 UNDERSTANDING EXPRESSIONS	68

CHAPTER SEVEN – CONCEPT DEVELOPMENT	72
7.1 DESIGN PROCESS	74
7.2 INTIAL FORM EXPLORATION	75
7.3 INTEGRATING EXPRESSION INTO FORM	80
7.3.1 SOFTNESS	81
7.3.2 AERODYNAMIC / SHARPNESS	87
7.3.3 MUSCULAR / ROBUST	98
7.3.4 AGGRESSIVE / FIERCE	109
CHAPTER EIGHT – CONCEPT DEVELOPMENT	117
8.1 MUSCULAR / ROBUST	119
8.2 AERODYNAMIC / SHARPNESS	131
CHAPTER NINE – CONCEPT SELECTION	144
9.1 CRITICAL ANALYSIS OF SCOOTY	145
9.2 CONCEPT SELECTION	148
CHAPTER TEN – CLAY STYLING	150
CHAPTER ELEVEN – ANNEXURE	160
11.1 USER AMENITIES	161
11.2 HARD POINTS IN FRAME	163
BIBLIOGRAPHY	164

chapter one

ABSTRACT

1.1 ABSTRACT

The two-wheeler segment being the backbone of the Indian automotive industry and having caught up with a huge population of Indian users on roads today, one identifies a need for constant development of existing models. The crowd is in constant search for something that is new and different.

Even with automotives, the user is very conscious of styling trends and every year, the two-wheeler industry has more models to offer. Scooty Pep was last styled in 2000 and a refresh design of the third degree was introduced in 2004, which included design intervention in colour panels and decals mainly, along with a few added features.

With fashion changing and styling trends taken many a leap over the seven years, Scooty Pep Plus demands a new style statement. Also, the advent of competitor industries capturing the same user group, one has identified a possibility for a refresh design.

It is time that the vehicle strives to target a larger user group and also addresses an older age group consisting of the working professionals / homemakers. These individuals are more mature and manage to balance their career with household responsibilities and the vehicle could help ease this situation.

1.2 AIM

Refresh design of the Scooty Pep plus (90 cc) for M/s TVS Motors Company - for working professionals and an older group of users aged 25 years and above.

1.3 OBJECTIVES

- Understanding the concept of refresh design in the automotive industry
- Understanding form appreciation for the specific user categories
- Appreciation of styling trends in the existing scooter industry in global market
- Refresh design of the existing vehicle
- Physical modeling in full scale in Styling clay

1.4 SCOPE & LIMITATIONS

Emphasis has been given to two major areas of the design process namely:

1. EXTERIOR STYLING DESIGN:

- Body panel design with extensive form exploration over at least 50 concepts.
- The bulk of the body had to be retained on the same chassis.
- Ergonomic changes are not suggested owing to the research put into this field behind every change, as the case is in the industry.
- User amenities and related functional issues have not been dealt with owing to the scope of the project.

2. CLAY STYLING MODEL:

Emphasis has been given on recreating the model on a 1:1 scale in industrial styling clay.

This process would span over a period of two months, owing to the fact that the critical form refinement would occur during this stage.

The model would be built over an existing vehicle as a reference guide.

JAN 15 - 31

Understanding refresh design
Form Appreciation of Users
Styling brief for target user group
User study and activity analysis
Market study and analysis
Assembly line understanding

FEB 01 - 25

Initial form conceptualization
Existing styling trends study
Analysis of the existing model of Scooty Pep plus
Integrating expression into form
Deriving concepts in two directions

MAR 01- 10

Incorporating changes from feedback of MID SEM review

Concept evaluation

MAR 10 – APR 30

Mock model in 1:1 scale for form refinement

Physical model in industrial styling clay (1:1)

Documentation of the design process

chapter two

INTRODUCTION



2.1 DIVISION OF TWO-WHEELERS

The different types of two wheelers that exist in the automotive industry are:

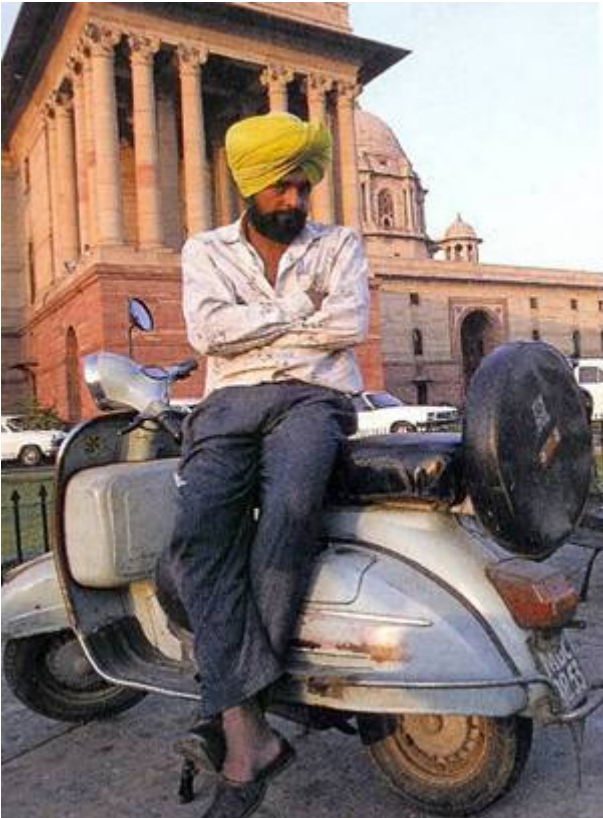
- Motorcycles
- Motor-cross bikes
- Cruisers
- Sports bikes
- Dirt bikes
- Super-bikes
- Sports touring bikes
- Moto-scooters
- Scooters
- Mini-Scooters
- Mopeds
- Electric Scooters
- Scooterettes

The most commonly accepted definition of **scooterette** is

Two-wheeled, non-geared vehicles that have wheels between 8 and 14 inches in diameter (smaller than scooters), step-through frames and typically engines that are low and close to the rear wheel

[The New Encyclopedia Britannica (1997), vol. 8, pg. 367].

Scooterettes also often incorporate full bodywork, including leg shields and generally are designed to be easier to operate than standard motorcycles or scooters. It should be noted that scooterettes may be of any engine size.

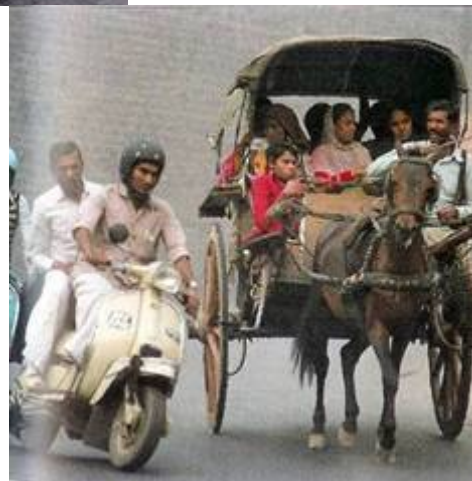


1961- Bajaj Auto Ltd. - "Chetak", " Vespa 150"

Piaggios license to manufacture in India expired and Bajaj Auto Ltd. had the opportunity to manufacture two outgoing two wheeler models of the times, the Chetak and the Vespa. They were introduced as a family vehicle. They targeted the practical crowd of India where the vehicle at home was not a mere passenger commuter but also the main support for various house errands, for instance carrying LPG stoves. They were used as source of transport for the *dhood-waala* to do his business and as a two wheeler taxi.

1971- SIL (Scooters India Ltd). - "Lambretta", (Lamby 150, Lamby Polo)

The Lambretta was also a family vehicle with typical Italian styling marketed for its high quality and technological updating.



1990- Kinetic Engineering + Honda – "Kinetic Honda"

The styling for Kinetic Honda was inspired from a "swan". This scooter was targeted at the youth and was mainly used for transport in urban areas.



1994- TVS Motor Company "Scooty "

TVS Motor Company launched ES with the idea of capturing the college crowd with a light-weight non-geared vehicle with cutting edge styling. This model was well accepted and survives till date.

Six years down the line, in 2000, the company launched Pep with a 4-stroke engine and was a trend setter with the stylized design. This model still caters to the college crowd.



2003- Honda "Activa "

With the idea of eating into the Scooter market that declined with the end of the Chetak reign from Bajaj, Honda launched the 100 cc non-geared moto-scooter, Activa. This step through design was introduced as a family vehicle with added benefits like easy maintenance, sturdy full metal body and ample stowage space, although a little retro in its styling trend.

2007- Bajaj Auto Ltd. "Kristal "

With the idea of entering the scooter market after taking a break from the segment and discontinuing previous models like the Saffire and Wave. It is aimed at 16-somethings that are entitled to get two-wheelers legally. The styling is razor sharp and edgy with sporty overtones and contemporary looks.



COPY MILLING

This is the traditional method of clay styling where master craftsmen and the automotive designers worked manually on developing clay surfaces which were then translated using rail curves manually. This process was time consuming and each model would take more than 6 months. Once the model was made, the pentograph was used for transferring the model surfaces to develop the metal body model.

CNC MILLING

This method involves the use of high-end Class- A modelling softwares to develop surface models. These models are then milled using CNC technology in Industrial clay. After a few refinements, a laser 3D scanner is used for acquiring cloud data of the model. This cloud is assimilated and corrected. The final model is then transferred to the dies used in the manufacturing process.





- HISTORY
- MARKET SCENARIO
- BRAND IDENTITY OF SCOOTY PEP PLUS
- VEHICLE SPECS
- MATERIAL UNDERSTANDING
- HARD POINTS IN FRAME
- PRODUCTION LINE



2.4.1 HISTORY:

TVS Motor Company launched ES with the idea of capturing the college crowd. This model was well accepted and survives till date.

Six years down the line, in 2000, the company launched Pep with a 4-stroke engine and was a trend setter with the stylized design.

This model still catered to the college crowd and was promoted fervently through various campaigns using Preity Zinta as the brand ambassador.

On popular demand and high market potential, the need for refresh design on the third degree (decals and amenities) was undertaken in 2004. The company also decided to introduce the 99-colour scheme for the users, providing them with a wider scope for personalisation of their own vehicle.

2.4.2 MARKET SCENARIO

To capture the niche market of college going girls Scooty ES was launched with the following design strategies. This vehicle is extremely light in weight contrary to then market scenario. It is a non-g geared two-wheeler. It has a convenient step – through and storage. it is ergonomically designed for the youth. The styling of the vehicle emphasizes lightness breaking away from notion of a “scooter”. This model created an identity for scooterette in the market

This 90cc upgraded model of Scooty ES, The Scooty PEP was introduced in the year 2000. Scooty has developed with time and created a notion of “trust” with the user group. The Scooty identity is strong in the existing market. 30% of the Scooty users are males and the rest are all females from varying age groups. This vehicle was targeted for users in the top 10 metros in India, the user study for which is carried out on a psychographic segmentation rather than the typical demographic study. Presently the model is facing stiff competition from parallel giants in the industry





2.4.3 BRAND IDENTITY

On discussion with Mr. Srinivas, Marketing manager for the Scooty Pep Brand , the following points were reviewed :-

The Scooty Pep plus is Youthful, Energetic, Fun-Loving and targeted for the age- group 18 – 25 years

Young brand ambassadors like Aishwarya Rai and Preity Zinta have been advertised to promote the trendy identity of Scooty Pep.

In terms of the design features, the cutting edge modern styling was imparted to suit the user's preferences. The treatment of decals on the vehicle also imparted a fresh, trendy appeal to suit the image of the target user group. Additional features in the Scooty Pep Plus like a mobile charging point, easy central stand and the under seat- lighting feature for the storage space was added to prove more functional than the earlier model.

Later the company launched the 99-colour scheme to give the user's a choice of personalizing their vehicle to suit their taste. In effect to this move, the "Paint your Scooty" marketing campaign was launched to introduce this scheme.

2.4.4 VEHICLE SPECIFICATIONS

Wheelbase	1230
Seat height	740
Top speed (km/hr)	74
0-60 km/h	12.2
Power (ps/rpm)	5.1 / 6500
Torque (Nm/rpm)	5.8 / 4000
Displacement	87.8
Kerb weight (kg)	95
Fuel capacity (l)	5

2.4.5 MATERIAL UNDERSTANDING

Headlamp –
POLYCARBONATE

Reflectors – ABS SILVER
PLATED

Front neck panel - ABS
CUBIC PRINTED

Grey and Silver panels -
STRUCTURAL
POLYPROPYLENE

Chassis frame - MS

Rear panel - PP – not
painted

Wheel cap – Aluminum
Alloy

Seat - Frame – PP

Foam – PU

Upholstery - REXIN

Grab handle- GAS
INJECTED NYLON

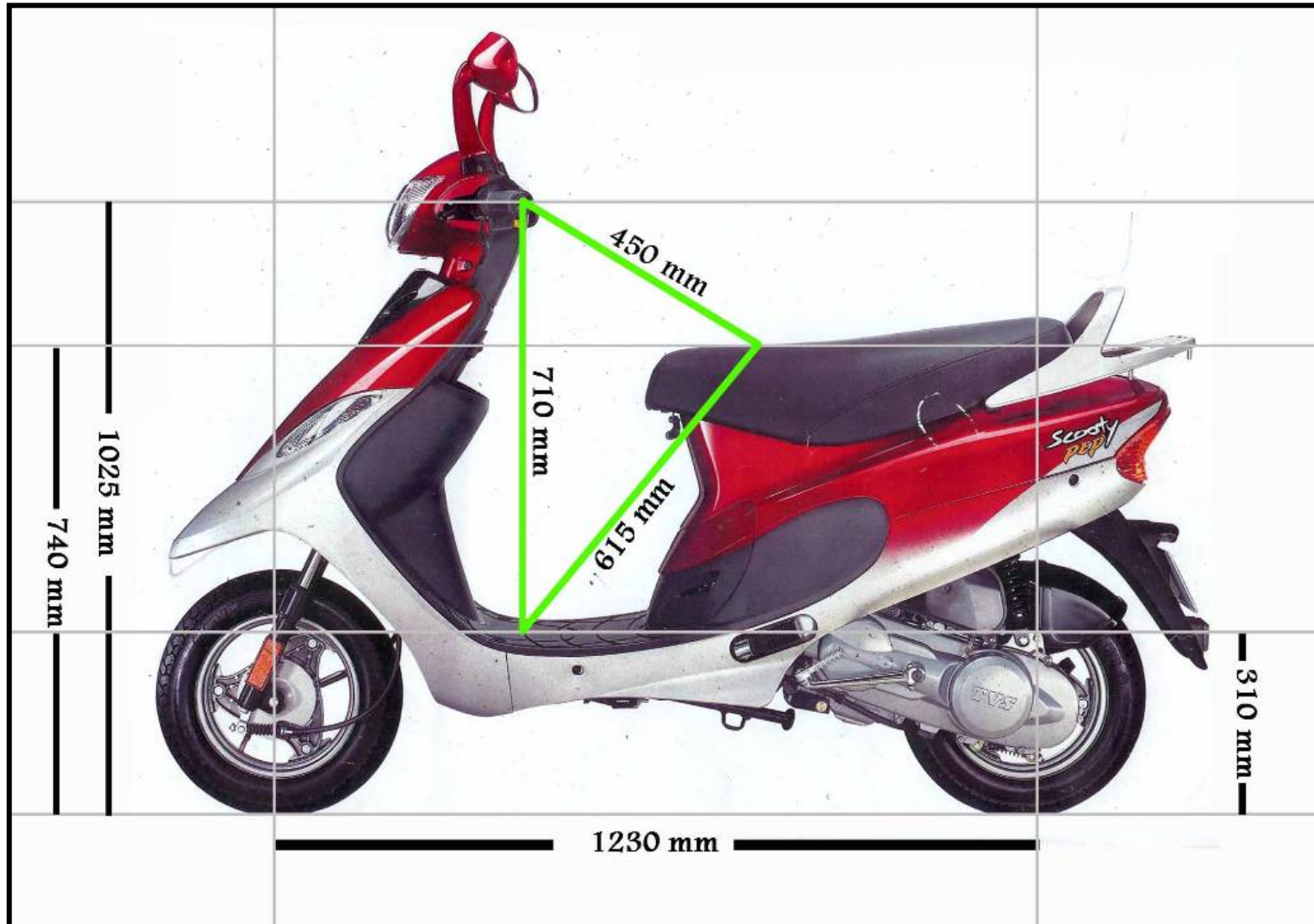
Painted Body panel - ABS

Mud-guard –
STRUCTURAL PP

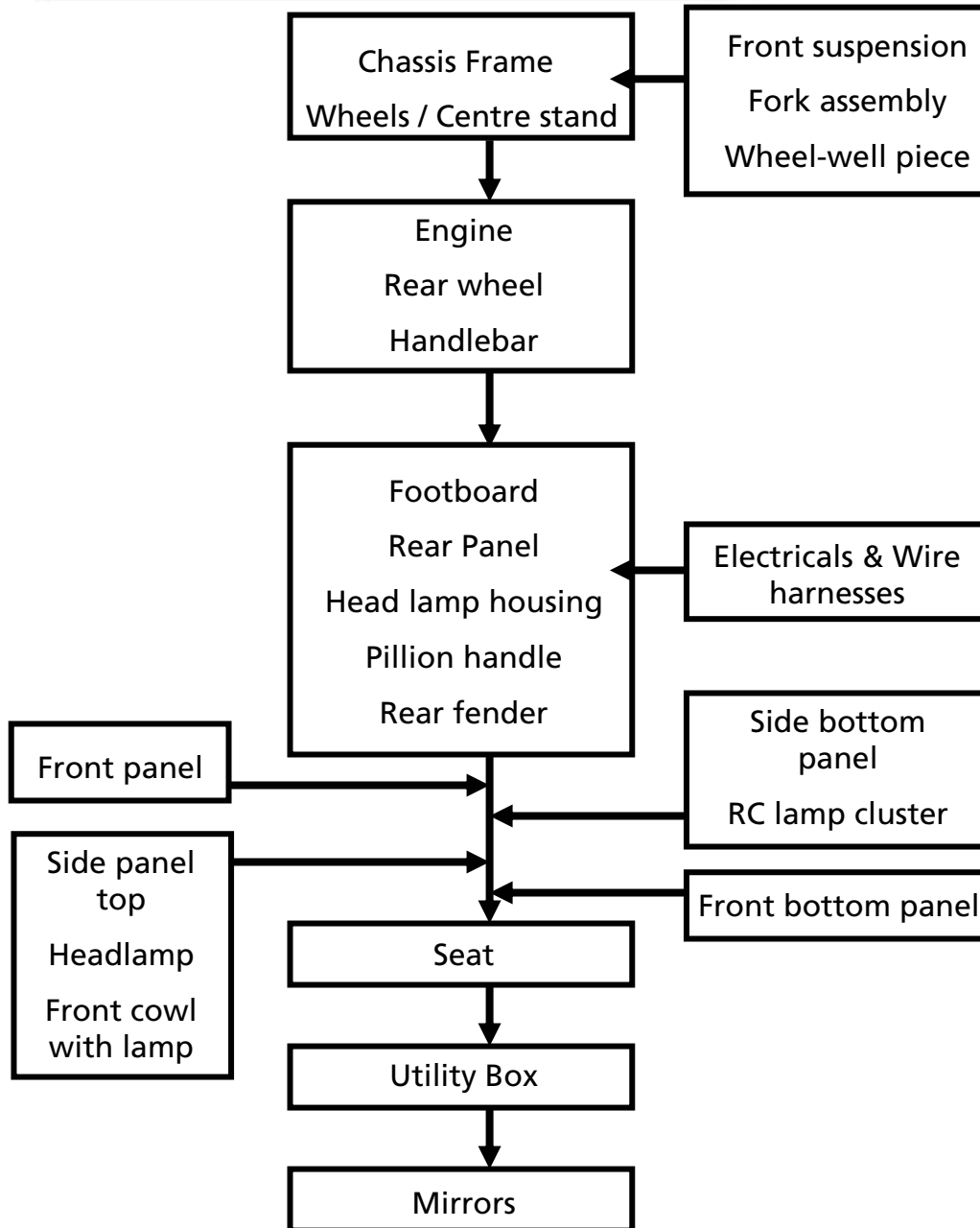
Engine housing –
ALUMINIUM DIE-CAST



2.4.6 HARD POINTS IN FRAME



The main dimensions of the vehicle have been illustrated. These are the hard points for which alterations can not be made for ergonomic reasons. Any change in the dimension of the chassis is beyond the scope of the project.



2.4.7 PRODUCTION LINE

The front suspension, fork assembly and wheel-well piece are assembled onto the chassis frame and the center-stand and wheels. After assemble, the engine, rear wheel and handle bar are fixed on, further to which, the foot board, rear panel and headlamp housing, pillion handle and rear fender are assembled. During this stage the electricals and wire harnesses are also added. Beyond this stage, all the body panels are painted and added onto this framework, once dry. The seat is then fixed with the utility box. Lastly the rear-view mirrors are put onto the headlamp unit.

chapter three

UNDERSTANDING STYLING TRENDS

STYLING TRENDS IN AUTOMOTIVE INDUSTRY

- FRONTAL EXPRESSION
- METAPHOR
- SURFACE BEHAVIOUR
- EDGE STYLING
- RETRO STYLING
- SCULPTURAL





3.1 FRONTAL EXPRESSION :

Front face has life and emotion – relates to riders

Headlamps act as EYE

Grill as MOUTH

Other supportive accessories – FACIAL FEATURES





3.2 METAPHOR :

DIRECT BIONIC (NATURAL) & INDIRECT BIONIC (ARTIFICIAL)

EG: AEROPLANE DERIVED FROM BIRD

RAYMOND LOEWY'S DESIGN INSPIRED FROM AEROPLANES

MAIN CONSIDERATIONS – COMMON CHARACTERISTICS
ELEMENTS





3.3 SURFACE BEHAVIOUR :
CURVACEOUS FORM - AERODYNAMIC
AIDED BY TECHNOLOGICAL DEVELOPMENT





3.4 EDGE STYLING :

REPLACED SMOOTH FLOWING CURVES WITH SHARP CURVES
AND WELL DEFINED EDGES

GEOMETRY HAS PREMIUM IMPORTANCE



3.5 RETRO STYLING :

STYLING TREND OF 40'S AND 50'S

INCORPORATES VISUAL FEATURES OF OLDER STYLISED VEHICLES



3.6 SCULPTURAL :

MORE IMPORTANCE TO STYLE AND LESS TO PRACTICAL CONSTRAINTS

NON-CONVENTIONAL LOOKS, MOSTLY ALL CONCEPT VEHICLES



chapter four

UNDERSTANDING REFRESH DESIGN

UNDERSTANDING OF REFRESH DESIGN

ORIGINAL VERSION



REFRESH VERSION



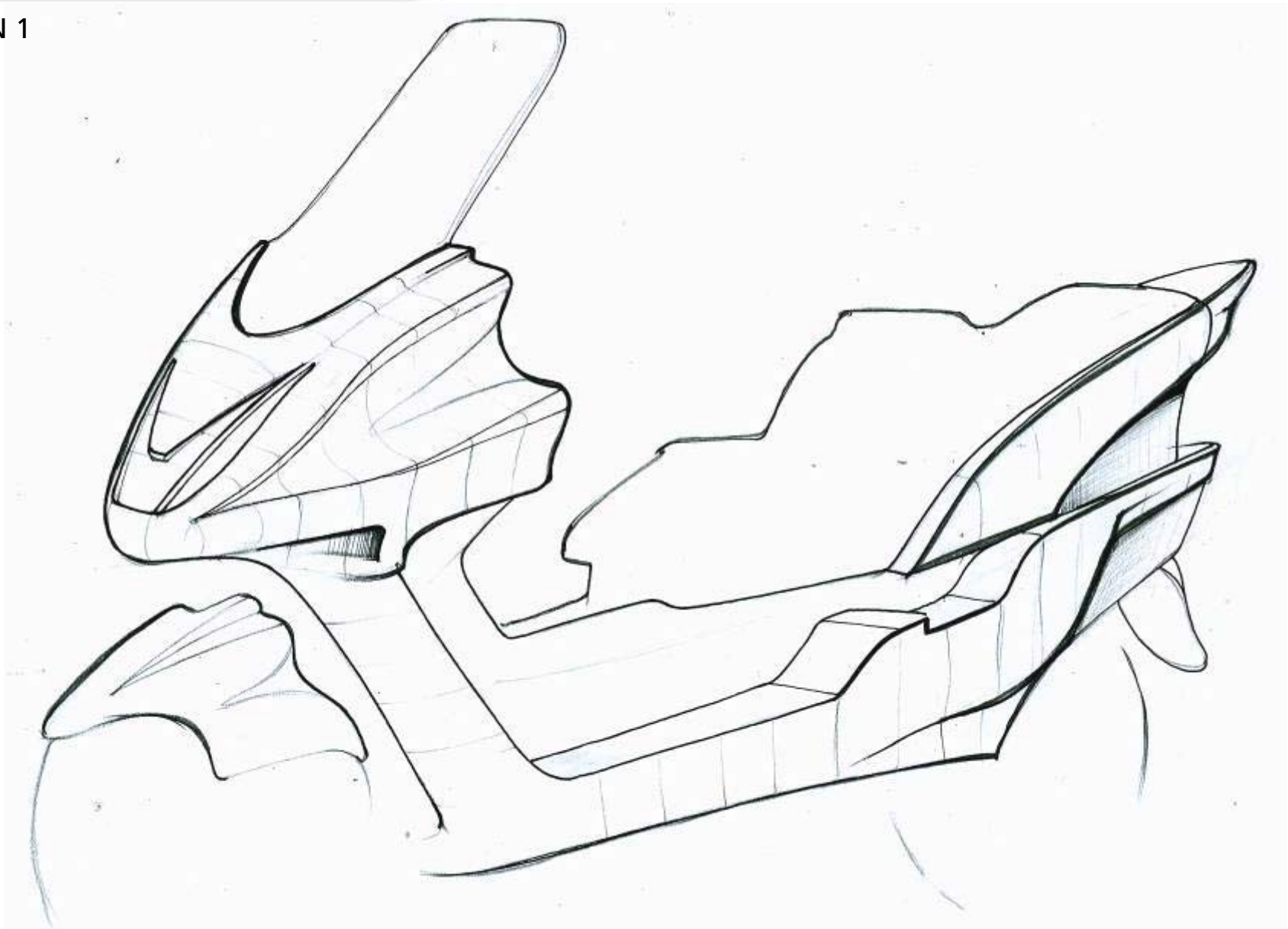
In the automotive industry, a common practice for successful models is to develop a refresh design. This is done to maintain the intrinsic qualities and identity of the model over its lifetime.

Refresh design involves minimal changes to the bulk of the mass, retaining the split lines as far as possible and keeping intact the school of thought behind its formal expression.

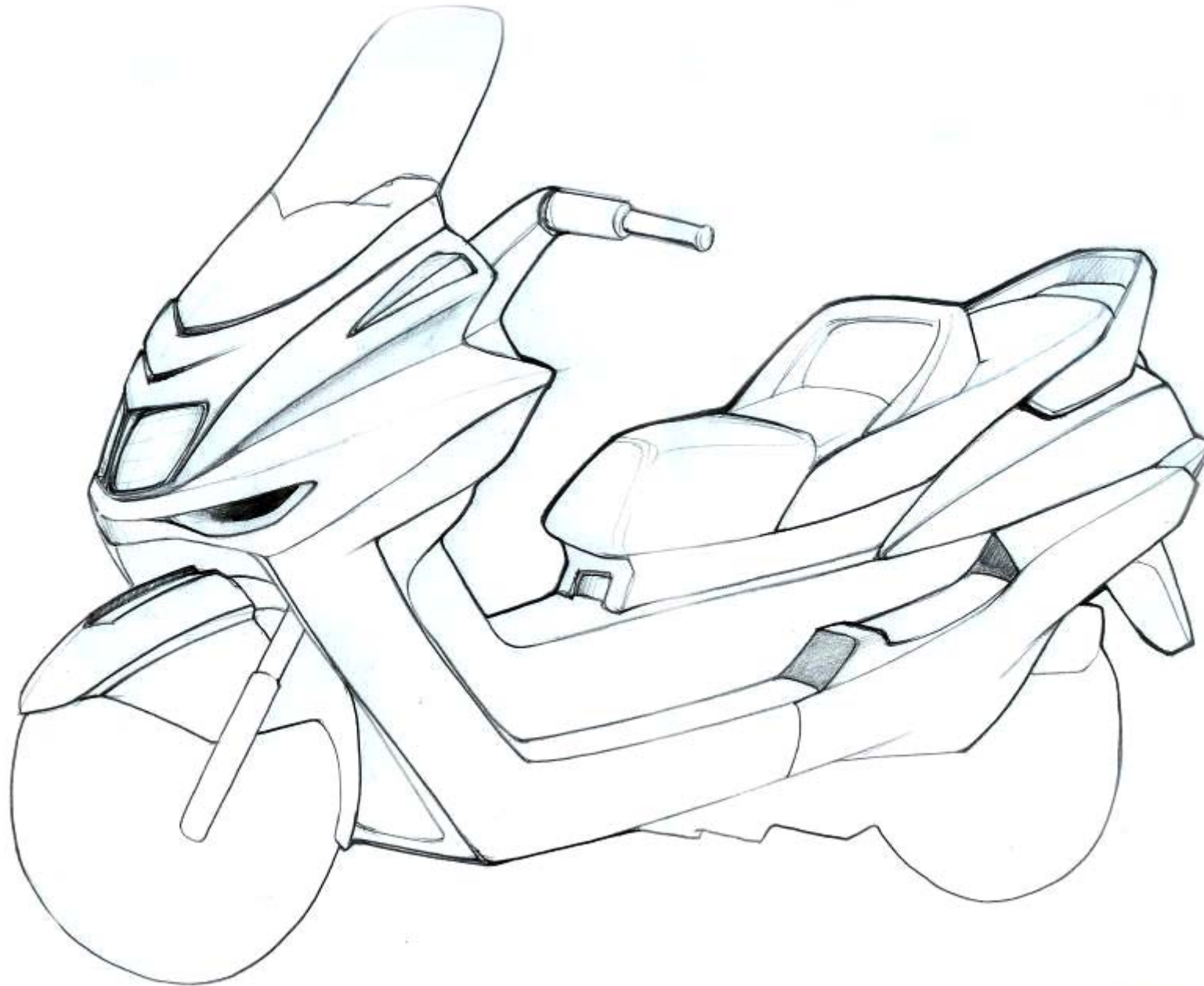
The design team gave us an opportunity to understand refresh design through the following exercise:

An earlier version of the YAMAHA Majesty was given to us to develop it to the next level of refresh design. Once the options were done, the next version that was developed by the YAMAHA design team was revealed and discussed.

OPTION 1



OPTION 2





chapter five

COMPARATIVE ANALYSIS

COMPARATIVE ANALYSIS OF OTHER SCOOTERS IN INDIAN MARKET

HONDA ACTIVA

HONDA DIO

TVS SCOOTY ES

KINETIC NOVA

HERO HONDA
PLEASURE

BAJAJ SAFFIRE

5.1 HEAD LAMP

36



Honda
ACTIVA

Box character,
head light
highlightened
and separated
Less Hard,
Passive



Bajaj
SAFFIRE

Head light in a
crescent smile

Soft, Feminine



TVS
SCOOTY ES

Indicator lights
fused with head
light in crescent
shape

Hard, Modern



Kinetic
NOVA

Box character using
concave edge lines,
makes it look larger

Central area recedes
to balance visual
mass

Bulky,
static



HONDA DIO

In front panel,
pointed to sharp
corners, but the
panel on handle
takes a soft
character

Sharp, Modern,
less aggressive



Hero-Honda
PLEASURE

Smooth panel
but the head
light breaks
away from it.

Soft, feminine



Honda **ACTIVA**

Metal panel -
minimum surface
transition

metallic Colour
makes hard edge
chest, less
prominent

Elegant,
Retro



Kinetic **NOVA**

Visual mass
reduced-silver
panel

long narrow
indicators-trendy

Curvaceous surface
- bulky

Soft, less
bulky, trendy



TVS **SCOOTY ES**

Characteristic
sharp edge &
nose, Cutouts
gives aggressive
feature, plane
surfaces and less
width makes it
look light

Modern, less
aggressive, hard



Bajaj **SAFFIRE**

Smooth and
curvaceous with
very little
treatment

Indicators - out
of proportion

Bulky, soft, less
streamline



HONDA
DIO

Graphics used
to reduce bulky
nature,
accentuated
sharp light
emphasizes
aggressive
stance, name
plate not
integrated

Bulky, static



Hero-Honda
PLEASURE

Bulky with
highly soft
edges,
indicators like
head light tries
to assume a less
soft character

Bulky, soft

5.3 STANCE

38



HONDA ACTIVA

Stable stance

Serious look

Mature expression



HONDA DIO

Crisp look

Dynamic expression

High stance



HERO HONDA PLEASURE

Low stance

Modern looks

Soft, smooth elegant styling



KINETIC NOVA

Bulky, attempt has been made to reduce the visual width with a colour break



KINETIC ZOOM

Rigid, hard looks
Static stance



TVS SCOOTY ES

Light, sleek expression
Hard, Edgy character



Honda **ACTIVA**

No storage,
surface
intersection
doesn't merge,
straight waist line



Kinetic **NOVA**

Outer and inner
panels offset hence
smooth transition.
Well integrated
storage



TVS **SCOOTY ES**

Hard edges, well
integrated
transition, no
storage, foot
board at angle
make it dynamic



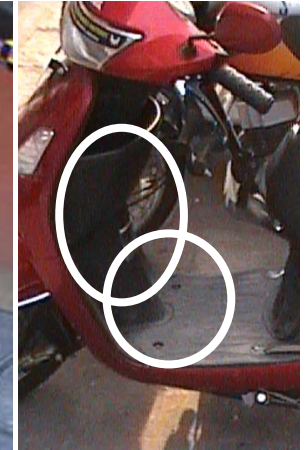
HONDA **DIO**

Contradiction
between outer and
inner panel, absence
of storage, footboard
at angle make it
dynamic



Bajaj **SAFFIRE**

Storage is not well
integrated, less
smooth transition



Hero-Honda
PLEASURE

Storage is open,
edges have
smooth transition

5.5 SIDE COWL

41



HONDA ACTIVA

Bulky, Mass made to look modern using sharp cuts



HONDA DIO

Sharp pinch on front end gives a crisp appeal

Higher stance gives a sense of lightness and dynamism



TVS SCOOTY ES

Wraps tight around the body

Less area in proportion to the grey areas reduces mass of the rear



KINETIC NOVA

Soft, curvaceous and rounded rear half



HERO HONDA PLEASURE

Smooth, modern

Minimal surface transitions making it elegant



BAJAJ SAFFIRE

Cut-outs with ridges cut the visual bulk

Steep angle of the side cowl imparts a high stance

Blunt treatment of edges makes it less sharp

5.6 FRONT FENDER

42



Honda **ACTIVA**

Fender attached to body - coherent with soft language of the whole form



HONDA **DIO**

Attached to the front panel - sharper look



TVS SCOOTY **ES**

Nose tapers down to reduce need of fender



Kinetic **NOVA**

Fender attached to the wheel and differentiated from the body with colour.



Hero-Honda **PLEASURE**

Nose is extremely shortened again, but the treatment to the bottom edge changes the character



Bajaj **SAFFIRE**

Absence of fender

5.7 NOSE FEATURE

43



Honda **ACTIVA**

The nose is short and blends with the curve of the leg shield rendering a subtle, passive character



HONDA **DIO**

The nose is bulkier with the integration of the headlamp. Ends in a point and appears robust.



TVS **SCOOTY ES**

Tapering the nose renders an aggressive look and imparts a lighter, streamlined character



Kinetic **NOVA**

Nose is extremely shortened, almost blends with the leg shield curve. The front grills cut into the visual bulk



Hero-Honda **PLEASURE**

Nose is extremely shortened again, but the treatment to the bottom edge changes the character



Bajaj **SAFFIRE**

Nose is extended more towards the front and ends in a rounded point, with the horizontal division with split colours.

5.8 SEAT

44



Honda **ACTIVA**
Warm, Less dynamic



Kinetic **NOVA**
Bulky, Feminine



TVS **SCOOTY ES**
Serious, static



HONDA **DIO**
Dynamic, Aggressive



Bajaj **SAFFIRE**
More dynamic, Feminine



Hero-Honda **PLEASURE**
Smooth, Feminine

5.9 TAIL LAMP

45



Honda **ACTIVA**

Modern, spreads over the entire width



HONDA DIO

Sharp points render a dynamic expression



Kinetic **NOVA**

Bulky, extending out of the body mass



Hero-Honda **PLEASURE**

Dynamic styling expression

Flow lines continued from the grab handle



BAJAJ SAFFIRE

Soft, feminine



Honda **ACTIVA**



HONDA **DIO**



Hero-Honda **PLEASURE**



BAJAJ **SAFFIRE**



KINETIC **ZOOM ZX**



chapter six

USER STUDY AND ANALYSIS

6.1 TARGET USER GROUP

48



The target user is the young Indian woman of age 25 years and above. This category of users would refer to the working professionals and working mothers, who strive to achieve a balance between their household chores and a career. The lifestyle of these users have moved from the households to the workplace, filled with a sense of freedom with mobility.

In terms of their priorities with riding two-wheelers, These users would insist on possessing digital connectivity, sense of "comfort" - physical + psychological assurance and also safety & security while riding.

SECONDARY USERS

Children between the age of three years to fifteen years are the secondary users of this vehicle while being dropped and picked from school mainly. Maximum number of kids that are seated on the vehicle is two. There are a lot of safety issues that creep in for these users are pillion riders. The little kids are made to stand in front for more safety. There is little storage space for all the accessories like school bags, bottles, umbrellas and tiffin boxes.





The user study conducted in Bangalore involved talking to 28 two-wheeler users which covered both the specific target user groups . The users were an equal mix of working professionals from firms and college students. The users were chosen depending on their experience of riding two-wheelers. A riding experience of at least two years was a criteria to choose the user. The study was conducted in Koramangala, Christ college, Brigade Road and Richmond town. The users hailed from various parts of India.

In the initial part of the User study a questionnaire was given to the users. The questionnaire and collective inference will be discussed in the chapter. The inference has been compiled in the following pattern

- User behaviour patterns
- Design Observations
- User comments



6.2 QUESTIONNAIRE

50

Name:

Age: 18-22 / 23-25/ 25-30/above 30

Occupation:

Mother tongue:

Family members:

How would you best describe yourself?

Fun loving

Serious

Extrovert

Introvert

Stylish

Casual

Emotional

.....

Which of these personalities would you best relate yourself to? (Please consider irrespective of age)

Preity Zinta

Shabana Azmi

Sushmita sen

Madhuri Dixit

Kareena Kapoor

Juhi Chawla

Kiran Bedi

Sania Mirza

6.2 QUESTIONNAIRE

51

If you had free time on a normally busy day what would you do?

Go on a trip
Stay indoor
Play sports
Head to the gym
Read a book
Go to the parlor
Spend time with family
Clubbing

Favorite hangout -
Favorite pass-time -
Favorite book -
Favorite movie -
Favorite personality -

Which two-wheeler do you own?

How would you best describe your vehicle?

Aggressive
Dynamic
Stylish
Sleek
Modern
Sturdy
Sporty
Light
Bulky

6.2 QUESTIONNAIRE

52

Order of preference when buying a two-wheeler – (rank from 1 to 10)

styling

price

brand identity

performance

speed

weight

safety

storage space

hi-tech features

Colour

(Any other preferences)

What products do you use? Name the brand or model of the product

Mobile phone -

Mp3 player -

Radio/walkman -

Watch -

How would you describe your fashion sense?

Casual

Trendy

Elegant

Traditional

Modern

Formal

Practical

Would you like to personalize your vehicle?

Choice of vehicle graphics

Choice of altering colour panels

Additional vehicle accessories

6.2 QUESTIONNAIRE

Are you happy with the storage space? Yes / No
If no, please specify

How long have you been riding?

Where do you normally drive to?

Time spent riding the vehicle everyday

What do you prefer not to wear when you drive?

Who else do you drive with on the vehicle?

What do you feel about your safety when riding?

Have you developed any habits with your scooter?

What is the best two wheeler in the market? Why?

Your dream vehicle

SCOOTY PEP enthuses "Softness"

Floating lightness – which appears fragile to the user group

Feminine traits of "grace" and "flow"

Absence of any harsh corners / hard edges

QUALITIES TO ACHIEVE:

Crisper look to suit the user's image

Creating a unique identity and perhaps cultivating "Asymmetry"
– but subtly

Mature looking scooterette that offers physical lightness

Not sleek –with the personal image of the rider on the vehicle
and taking cues from the visual proportions of Indian women, it
would be advisable not to delve on a sleek model for this user
group.

Expression of safety and security should enthuse.

6.3.1 ACTIVITY ANALYSIS (Male user)

55



TASKS:

1. Wears the helmet
2. Kick starts the pedal, after putting in key
3. Grabs the vehicle by the grab handle and the handle bar
4. Lifts the vehicle off the central stand
5. Reverses vehicle from parking lot
6. Ingresses across the step through
7. Takes position of the handle bar, checks the instrument panel and accelerates
8. Rides away into traffic



TASKS:

1. Removes helmet from the storage compartment, wears the helmet, puts her bag into the storage compartment
2. Removes side stand by holding onto the handle bar and seat
3. Driver climbs in through the step-through
4. Takes position on the handle bar
5. Turns the key and checks the instrument panel
6. Presses the self-start button , while pressing the brake handle
7. Pillion rider climbs onto back seat
8. Accelerates and drives into traffic



6.3.3 USER COMMENTS

57



"It is difficult to put the vehicle on centre stand, Hence I leave the vehicle on side stand" - Lavanya

"With a co-rider it is easier to carry my other bags"
- Prasad

" Even if I wear a jacket or a rain coat, water still splashes on my dress During the monsoon season"
- Shanta

" I prefer wearing my jacket while riding"
- Sweta

" I prefer the Dio, because it helps me carry my pet dog to the vet, He rests on the floor of the step-through in front"
- Varsha

" I am not able to reach the ground easily , during long hours of traffic halt; it becomes hard to balance the vehicle"
- Apeksha

" I feel uncomfortable while riding my Spirit, because when the wheel turns to the right, the front is stil pointing straight ahead" - Anu

" I park my scooty near the laariwallah and have pani puris"
- Mary

The users were questioned about the problems they faced while driving and these were a few of the situations that they faced :

Hand bags are hung onto the handlebar and slip from it while taking a turn. This can prove to be quite cumbersome.

Female riders are very concerned about their safety while riding, especially with eve-teasing on in the increase on Indian roads.

Skidding on two-wheelers is common in the monsoons and on sandy roads.

The safety of kids is a primary concern when dropping them off to school and on the return journey, owing to lack of safety features for riders of smaller stature.

Very often, the issue of filling up petrol at the right time creeps up and is forgotten leading to un comfortable situations with stalling in traffic.

Sudden brake tantrums.

The physical weight of the vehicle turns out to be too heavy and sometimes becomes hard to handle in heavy traffic scenarios where the user has to balance the vehicle in jams.

Wearing Saris prove to be a big hindrance as they fly while riding the two wheelers. Moreover in the rain, the water splashes from the sides and the user gets thoroughly drenched inspite of wearing rain coats.

The information on the instrument panel could be more lucid.

- There is no provision to rest the mobile phone while charging.
- The user tries to personalise his/her vehicle with images/idols of their God.
- The buckle beneath the seat is used for hanging all small bags from grocery shopping.
- The bigger bags are hung around the grab handle behind the vehicle.
- Habit of holding the seat to pull it from central stand which is bad because the seat is hinged at one point only and the lock is not strong enough.
- If lost in the city, females rely on rickshaw drivers for directions and they are hesitant in this regard.
- Need for flexibility in the kind of storage – also most users prefer a lockable storage as compared to open pockets.
- When going to buy scooterettes among a gang of friends, there is an understanding of the colour for each vehicle chosen.
- Having to egress from the vehicle and put it onto central stand is painful for female users especially.
- Traffic in the city is excruciatingly painstaking and there is a need for entertainment.
- Women are aware of the tool-kit provided by some manufacturers for quick repairs.
- Kids standing in front hold onto the rear-view mirror handles for extra support.
- At night it is difficult to find the key slot.



On interviewing the users about their opinions about the existing two-wheelers in the market, one could differentiate the opinions largely based on the two age groups targeted.

HONDA DIO

The target user group from age 18 – 25 years described the vehicle as a fun vehicle, easy to ride, too steep a seat and a speedy, fast moving bike.

The older age group of users 25 years and above considered it to be well grounded, crisp looking, safe and no off- balance

HONDA ACTIVA

The younger user group considered the Activa to be smart with good styling, it may skid owing to the heavy weight, nice grips and very powerful and everyone can handle it.

The target user group of 25 years and above described this vehicle as a powerful, non-geared vehicle with good styling which enthused stability and easy maintenance, although a little too heavy.





SCOOTY PEP +

The target user group of age group 18 – 25 years are of the opinion that Scooty Pep Plus had a very good mileage. It is trendy and stylish. It is light and just right for college girls. Few of them felt the vehicle is very smooth.

The target user group of age 25 and above felt the Scooty Pep Plus looked ridiculous. Its styling being kiddish lacked crispness. It doesn't suit the image of a professional. But most of them were of the opinion that the vehicle was safe.



KINETIC HONDA

The target user group of age group 18 – 25 years thought this vehicle looks on the lines of a bull that is very sturdy and heavy. The styling of this vehicle had a very poor reflection among the young users.

The target user group of age 25 and above also felt the Kinetic Honda was very bulky. Few of them are of the opinion that the styling looks rudimentary and obsolete.



PERSONAL ACCESSORIES

The users carried few electronic accessories like mobile phones, walkman and MP3 players. But most of them abstain from using them while riding their vehicle. Certain other accessories like jacket, handbag, scarf and helmet played an important role while riding and many users carried them in their vehicle to wear them only when they are riding.

Their storage space were mainly occupied by books, grocery bags, purse, school bags, bottle, cleaning cloth, food, rain coat and tool kit.

ATTIRE

The users mostly preferred wearing clothes that were casual and comfortable in nature. They were at ease wearing jeans, Jacket, trousers, Shirts and pants. They preferred relaxed footwear like floaters, Flats and sneakers while riding.

The attire that had moderate appeal while riding two wheelers is salwar kameez.

Very few users were inclined in wearing traditional attire like sari while riding. Other least preferred attire for riding include skirts, Dupatta and high heeled footwear.



HABITS WITH VEHICLE:

The users always tie up their dupattas before riding the vehicle for want of not letting it fly off. On alighting from the vehicle, after reaching the destination, most users look into the mirror. The vehicle is treated as a social hub when they go out with friends to eateries / leisure rides.

A lot of users also talk to their vehicles. Most of them dust their seats with the cleaning cloth stowed in the utility box before riding the scooterette.

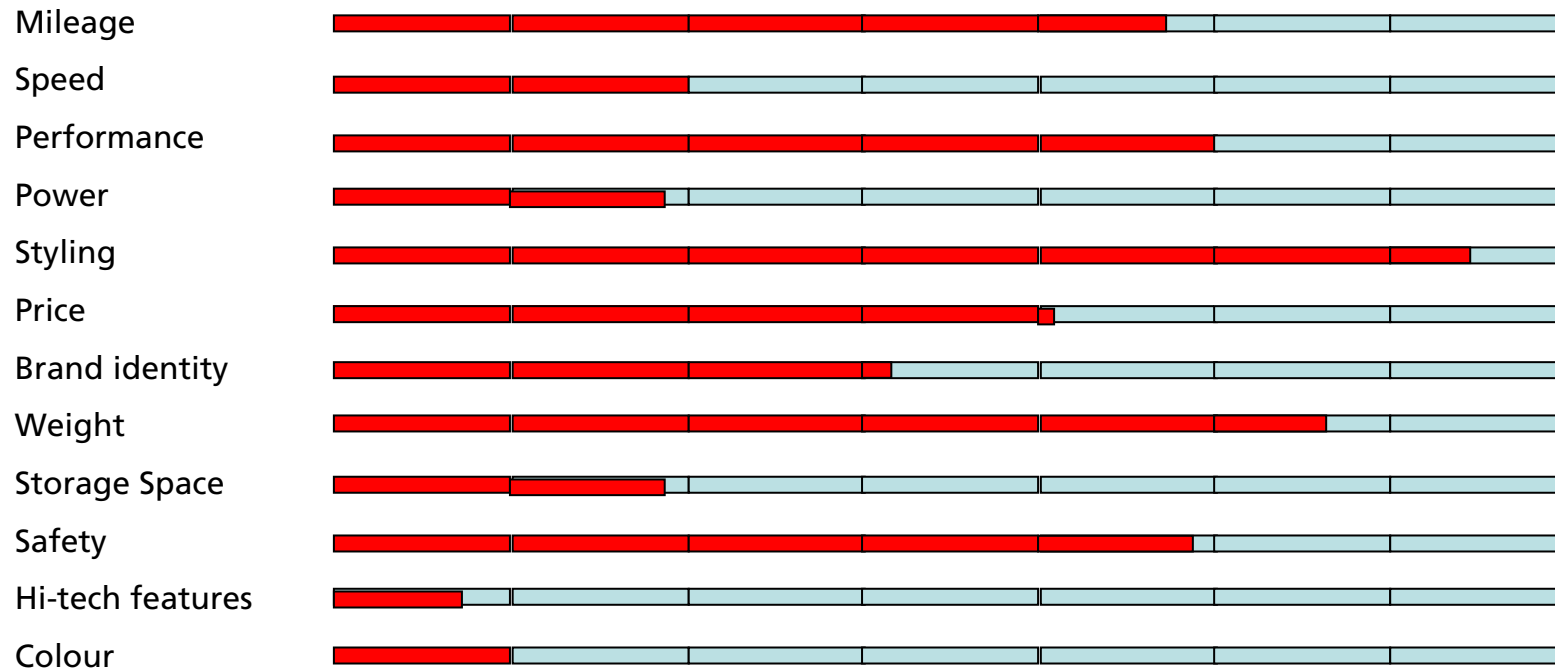
DESTINATIONS:

The different destinations driven to by the users are to College, Office, School, Groceries / Shopping malls, Theaters, Coffee pubs, Parlours or just on leisure rides.

CO-RIDERS:

Most of them ride with friends and family members, older relatives as well as young children. Sometimes, the pet is taken to the vet on the vehicle. There is also a certain emotion attached with riding on the vehicle with male friends / husbands. Riding with triple passengers is loads of fun for the younger users, especially those attending college.

PREFERENCES WHEN BUYING



- Working professionals carry laptop bags on shoulder while riding owing to the lack of storage space for lap-tops.
- Little kids sit on floor of step- through for want of safety while riding with parent to school.
- Girls are concerned about getting tanned and often cover themselves with scarves and gloves, especially in the summer season. These are easily stored in the utility box, while not riding the vehicle.
- Most users prefer wearing jacket while riding to protect them from the cold.
- There is a mental image created by the user in regards to their physical stature and the proportion of the vehicle to this image. Stocky users, for instance, felt intimidated riding the Scooty Pep owing to its sleek look, as compared to other vehicles on the road.
- The pet dog can be taken to vet on Honda Dio.
- Covering oneself with the raincoat is of little help in the monsoons, since water splashes on them anyways. The step – through vehicle does not offer much protection from the rains.
- Hand bags slip from handle when taking a turn and a hook for hanging the bags can ease this situation, as provided on the Scooty Pep Plus.
- Looking into the mirror is a frequent habit while stalled at traffic jams and also after alighting from the vehicle, on reaching the destination.



WHY ARE THE USERS UNHAPPY WITH SCOOTY STYLING?

- soft curvaceous form in the rear end
- tapered nose
- sleek look makes it feel fragile
- not crisp in its styling
- Does not enthuse safety or stability
- “barbie doll vehicle”
- Does not suit the image of an older user – too kiddish

WHAT ARE THE NUANCES DESIRED BY THE TARGET USERS?

Crisper, sharper styling with an edgy look

A vehicle that looks strong and stable

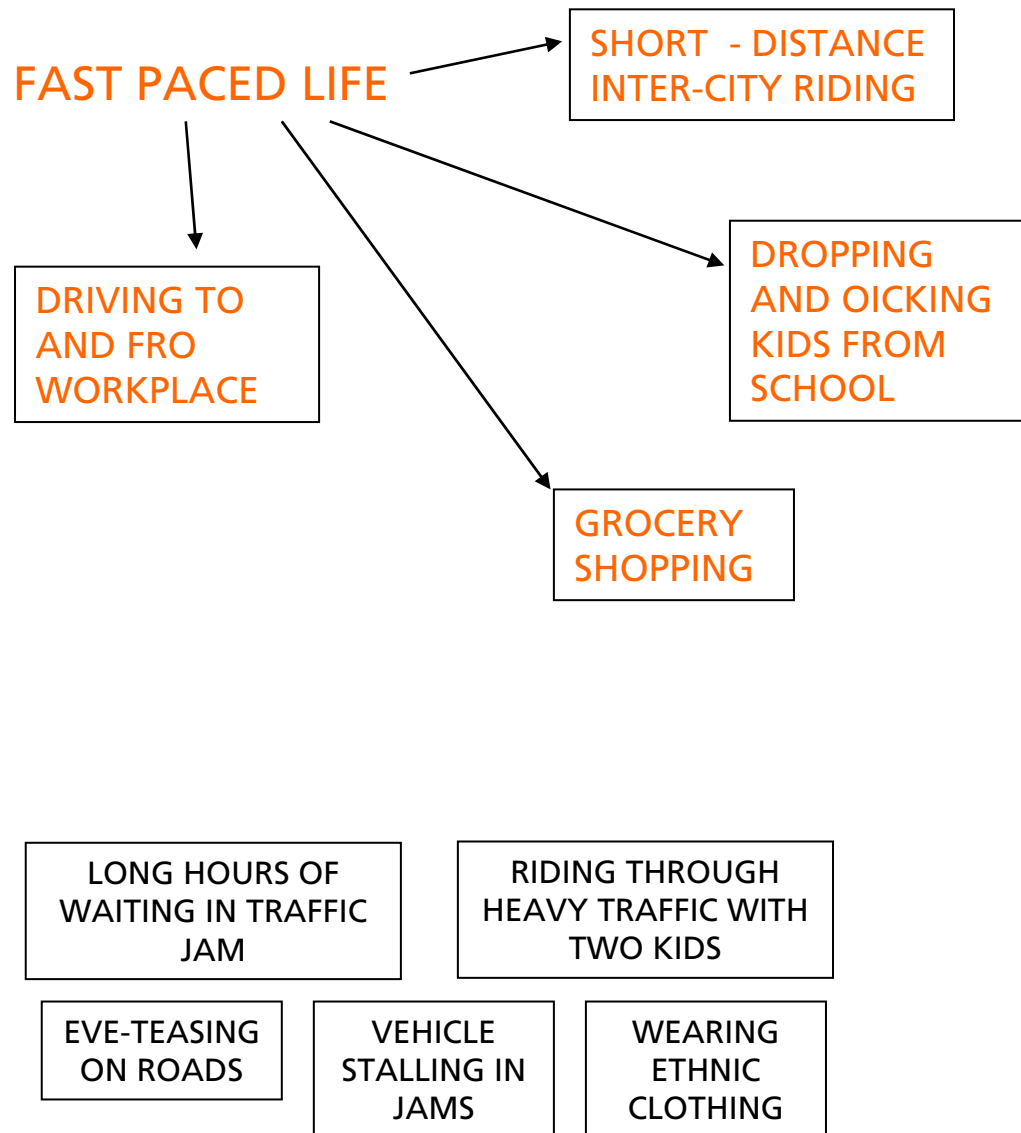
Should enthuse safety and robust looks

Prefer to be visually light

Should try to look powerful and not fragile

Aggressive / Serious or mature looks

Should suit my body build



6.4.1 inferences:

There are two main directions that the vehicle could revolve around:

- 1) Sturdy, stability, powerful and not fragile – ROBUST looks with sinewy character – MUSCULAR expressions
- 2) Crisp, aggressive, edgy character – SHARPNESS enthused with AERODYNAMIC expression

This inference led to the stage of defining the two directions in the perspective of the targeted user group to understand their definition of Muscular and Aerodynamic expressions

For this, a small exercise was carried out with the users showing a series of image cards of products and illustrations, to define the desired expressions. Each card was 4" x 4" in size and a few extra expressions were thrown in to understand their perception lucidly.

6.4.2 STYLING BRIEF:

An URBAN INSECT weaving through traffic – demands a look of swiftness, dynamism, no-frills, enthuse stability and yet should be easy to handle and light-weight

MUSCULAR EXPRESSION



1



2



3



4



5

Most users considered images 1,3 and 5 to be more muscular
2 and 4 were not chosen in almost all cases,

Further to this, a series of muscular images were showcased and ranked according to the degree of the Muscularity depicted in them. These are indicated on an image board that shows the gradation of the character from high to low. This image board was the cue to understanding the character of the expression to the fullest degree.

6.5 UNDERSTANDING EXPRESSIONS

69

MUSCULAR EXPRESSION – image board



HIGH

LOW

Characteristics of expression:

- Hard and rugged
- Faceted bulk – but not too angular
- High contrast between highlights and shadows

- Rough
- Overlapping forms - many surface transitions
- Proportions are large

AERODYNAMIC EXPRESSION



1



2



3



4



5

Most users considered images 1,2 and 4 to be more AERODYNAMIC
3 and 5 were not considered in most cases.

6.5 UNDERSTANDING EXPRESSIONS

71

AERODYNAMIC EXPRESSION – image board

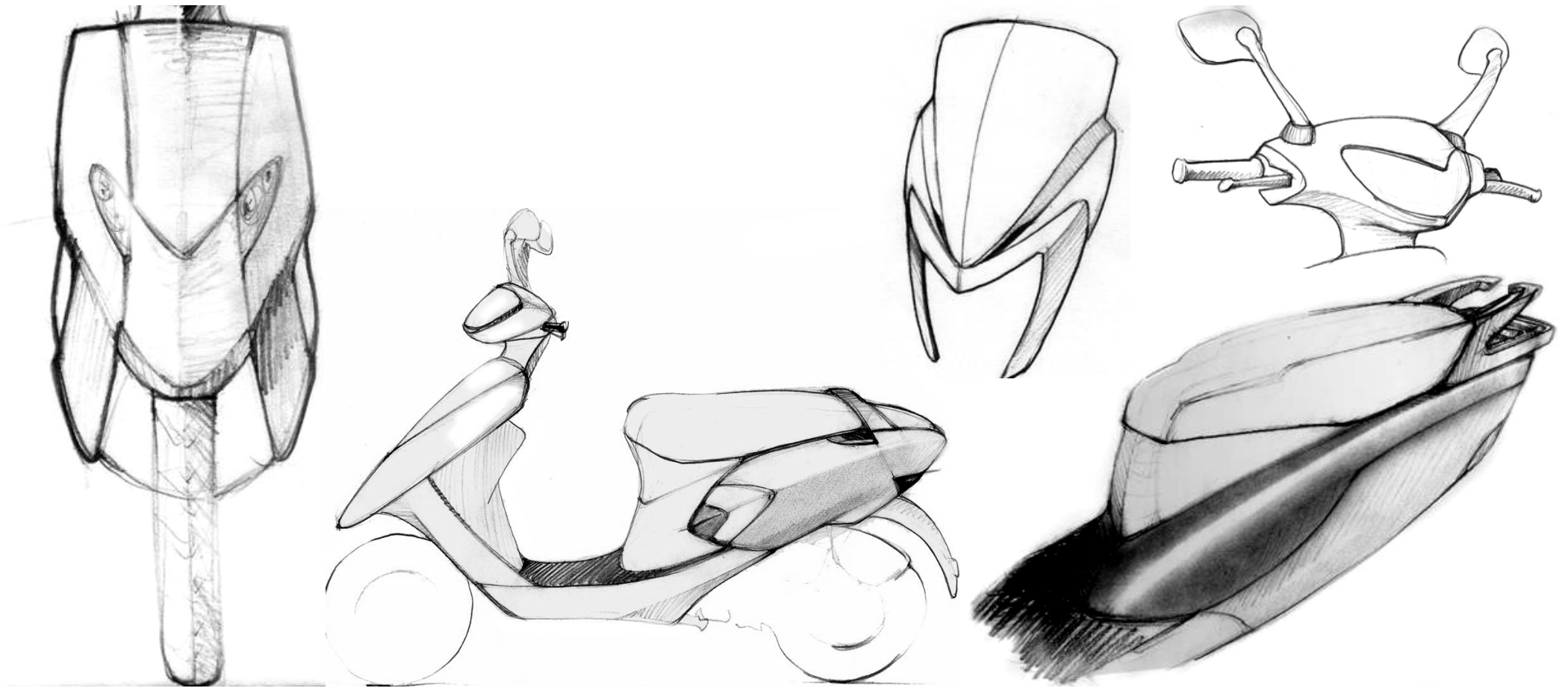


HIGH —————> LOW

Characteristics of expression:

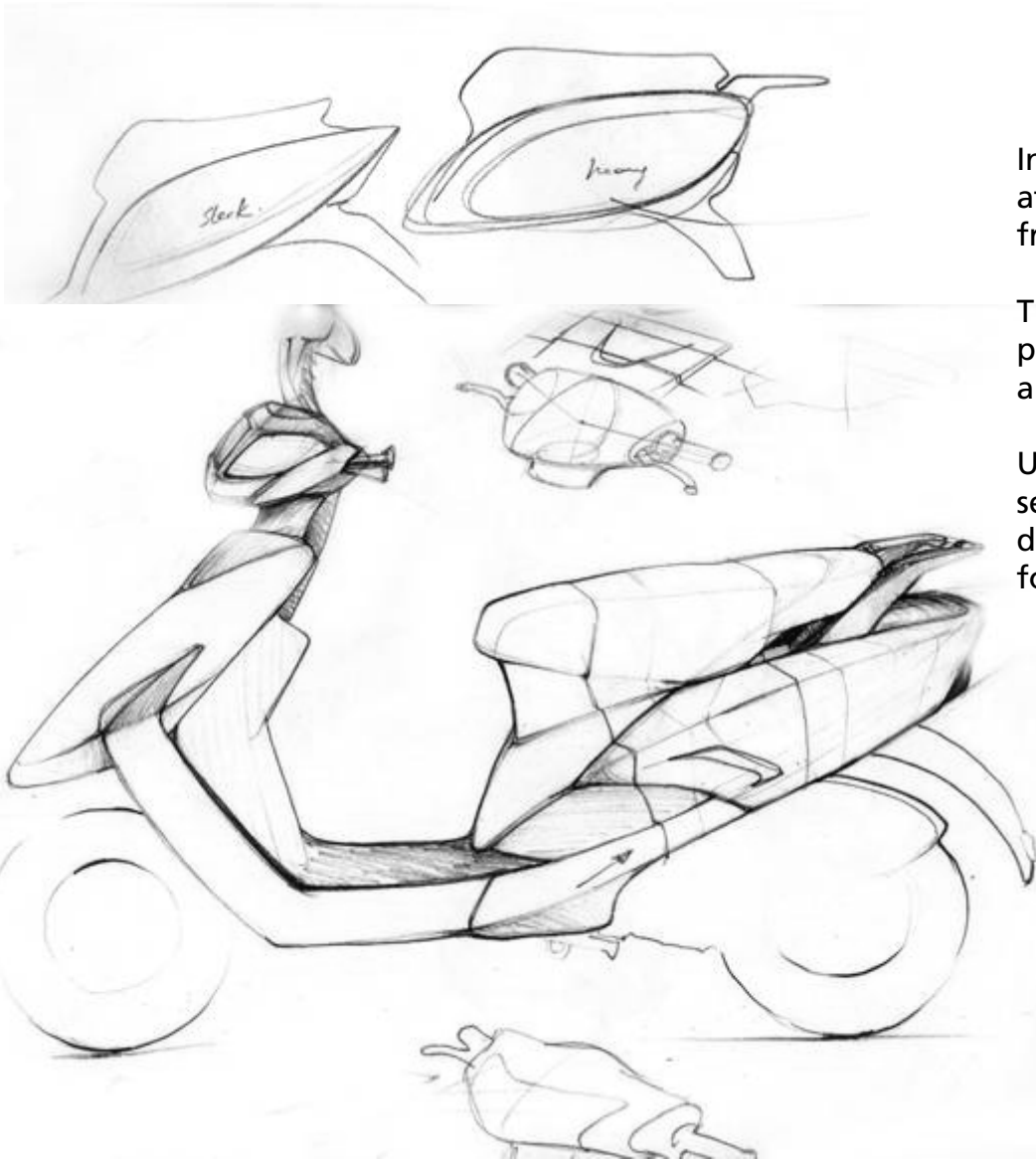
- Highly angular / SHARP - Absence of blunt edges
- Smooth surface transitions
- Ending in tapered volumes
- Visual Weight is less

- Precise details
- Highly glossy & smooth finishes – least friction
- Proportions are thinner – but not fragile



chapter seven

FORM EXPLORATION &
CONCEPTUALISATION



Initial form exploration was before user study and was an attempt to look at forms unbiased by opinions and ideas even from the users.

These explorations are strictly line diagrams which have been practiced on an overlay elevations of Scooty so that sketches are always in coherence with the proportions of Scooty.

Use of colors have been avoided for the first half of the session. Pure Black and white exploration have helped to develop sensitivity to the flow of lines that determine the form.



7.1 DESIGN PROCESS:

- Initial form sketches

In this stage, exploration in basic forms retaining the same volume of the Scooty Pep Plus was done with understanding the change in styling trends with form. Understanding the body of the vehicle and developing ideal forms on the given chassis was the main part of this was the main part of this exercise. The trend has changed from bulky, heavy rear-ends as is evident in the 60's and 70's with the *Vespa* to shifting the mass of the vehicle more towards the central area as seen in most of the present models in the market.

- b. Integrating expressions into forms

A variety of expressions were worked on, mainly divided into 4 main categories:

Soft expression

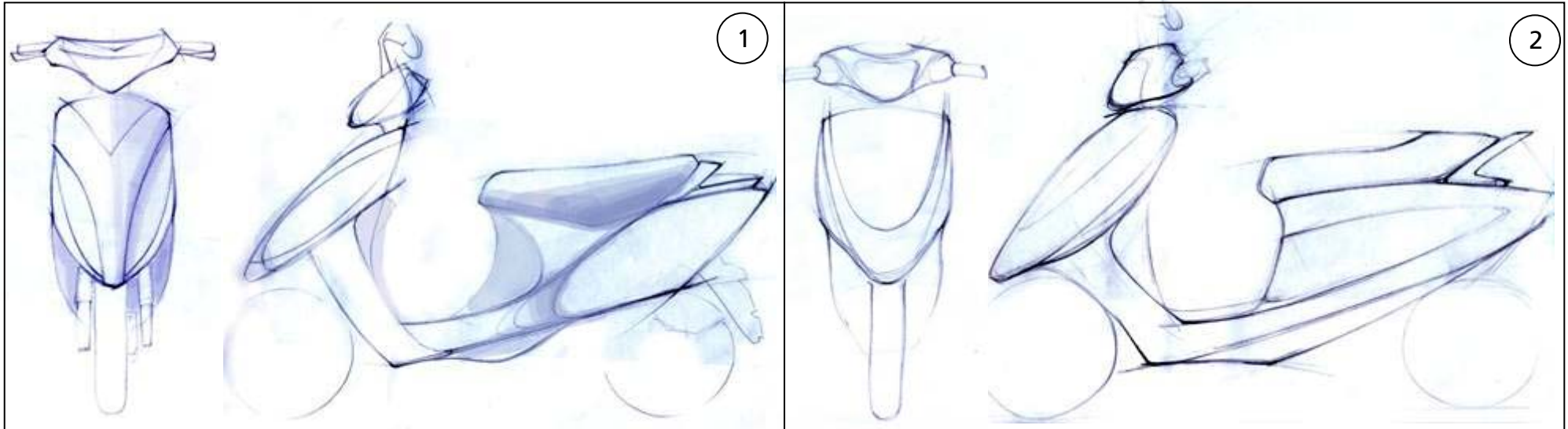
Aerodynamism / Sharpness

Muscular / Robust

Aggressive / Fierce expression

- c. Deriving concepts for 2 expressions chosen from the user feedback

7.2 INITIAL FORM EXPLORATION



- Lifting the seat to give a high stance.
- Front panel – origin of all curves emanating from nose – creates focus
- Shifting the mass to the centre – ends are tapering (higher)

- Increasing bulk in front and tapering to the end
 - Increases impression of a heavy head
 - Seat impractical

7.2 INITIAL FORM EXPLORATION

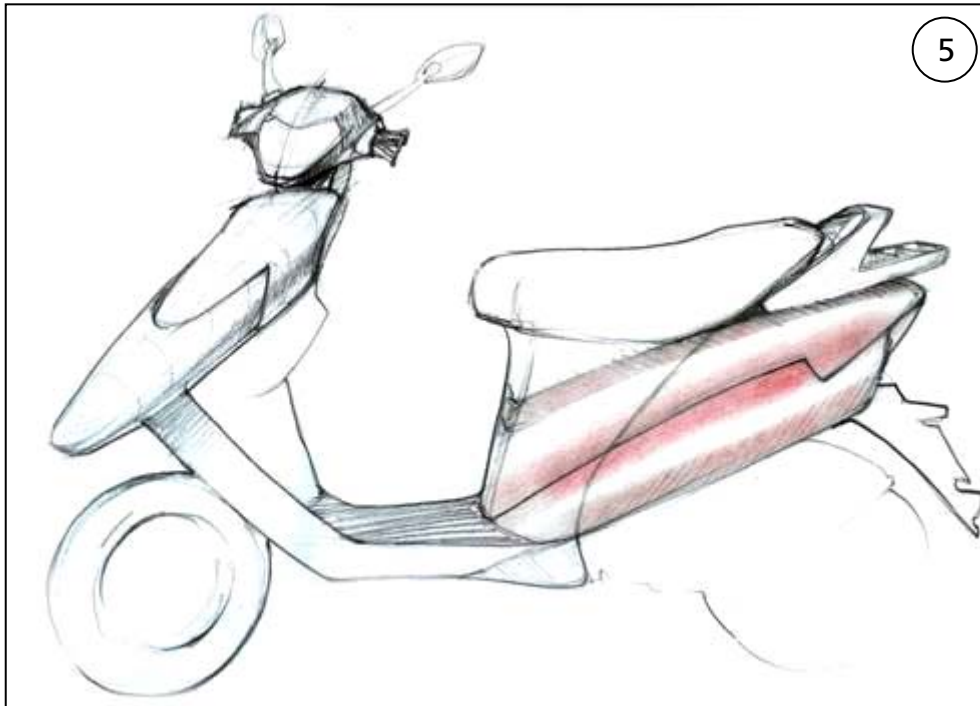


- Attempt to taper at rear end is not implied – very stocky and still retains bulk/volume
- Not coherent with the language of the rest of the vehicle



- Integrating sharper junctions
 - Varying angles – disturbing
- Proportion of the body panel to the bottom half aids in cutting visual bulk
- Front panel is a combination of convex and concave curves – incoherent

7.2 INITIAL FORM EXPLORATION

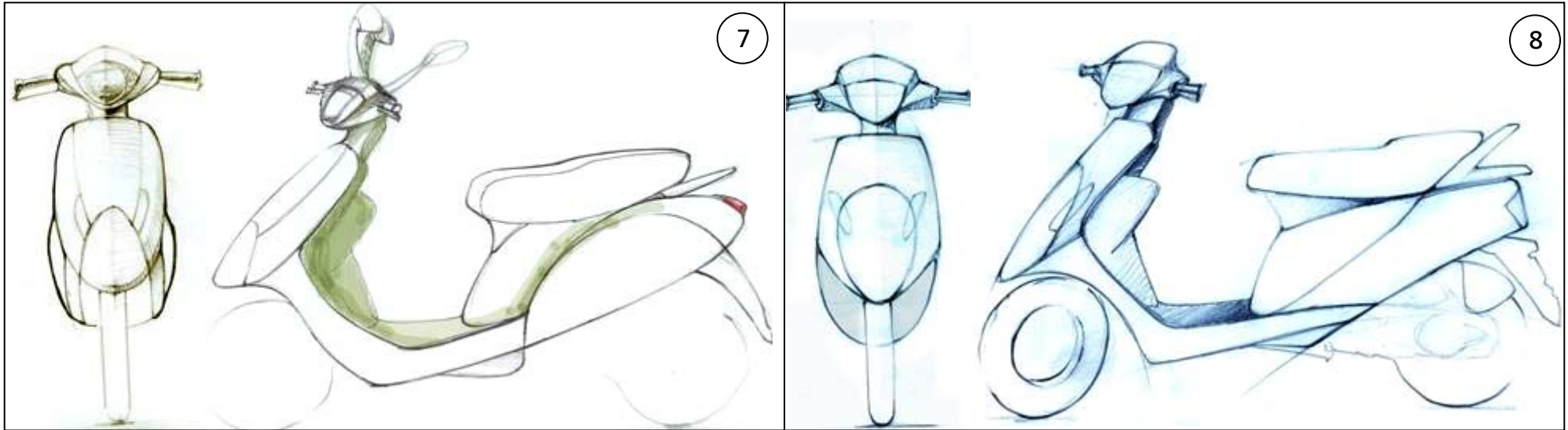


- Retaining the bulk of the scooty – but changing the split lines to vary the proportions of the body panel to bottom half- 50-50 ratio – static
- Two equal bands still read as bulky
- Jagged ends- create problem in intersection of surfaces



- Extreme bulk expressed with rear end- very retro in styling
- Language continued onto the front – breaks the identity completely of what the Scooty is like

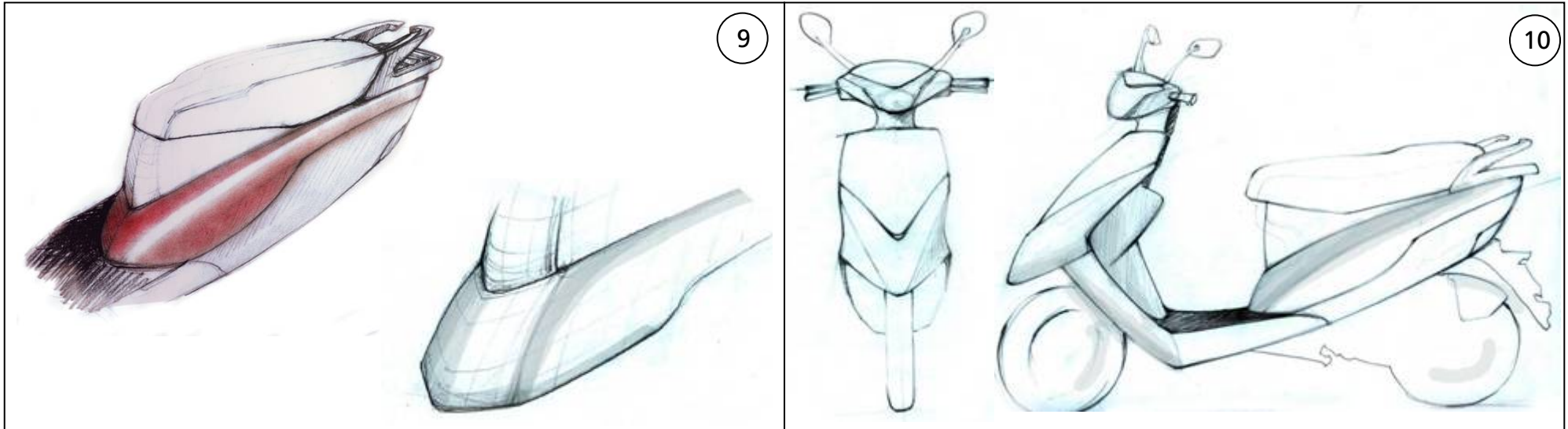
7.2 INITIAL FORM EXPLORATION



- Bulbous rear end and nose
- Rear end- inspired from Piaggios XT, rear fender also made to suit flow lines of the soft drop shaped cowl
- This effect does not reduce the bulk though
- Proportion of headlamp is too huge

- Form expresses bulk with convex curves
- Junctions between panels are crisper and hard
- Juxtaposition of crisp with bulk is not a successful attempt

7.2 INITIAL FORM EXPLORATION

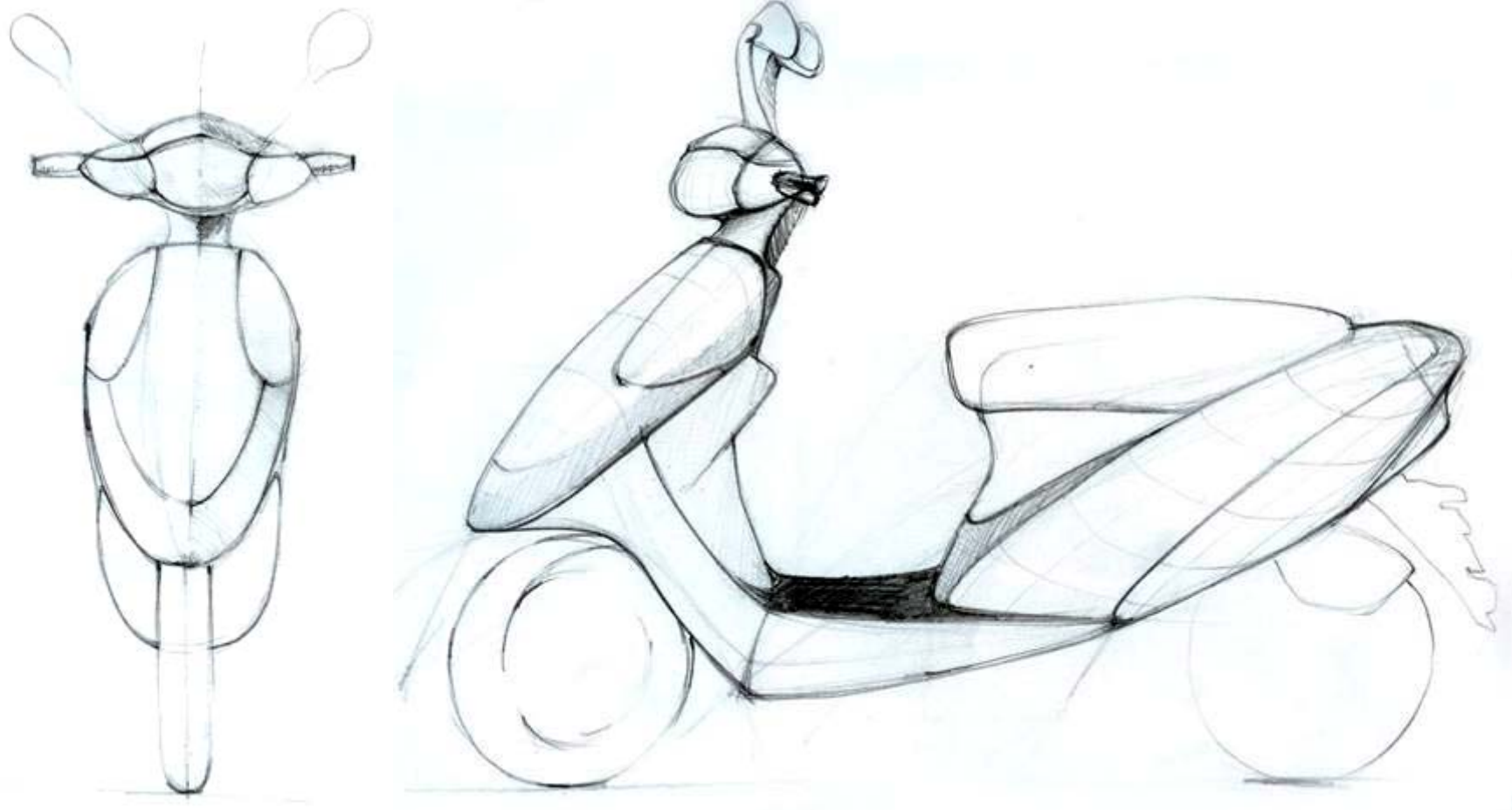


- Tucking in the mass at the jaw line gives tighter surfaces
- The degree of curvature in the body panel imparts the specific character
- Intersecting angles should be similar- too many varying angles is disturbing
- Proportion of body panel to the bottom half is critical- the cowl tapers to the rear top end
- Angle of the rear end surface imparts a 'light' look

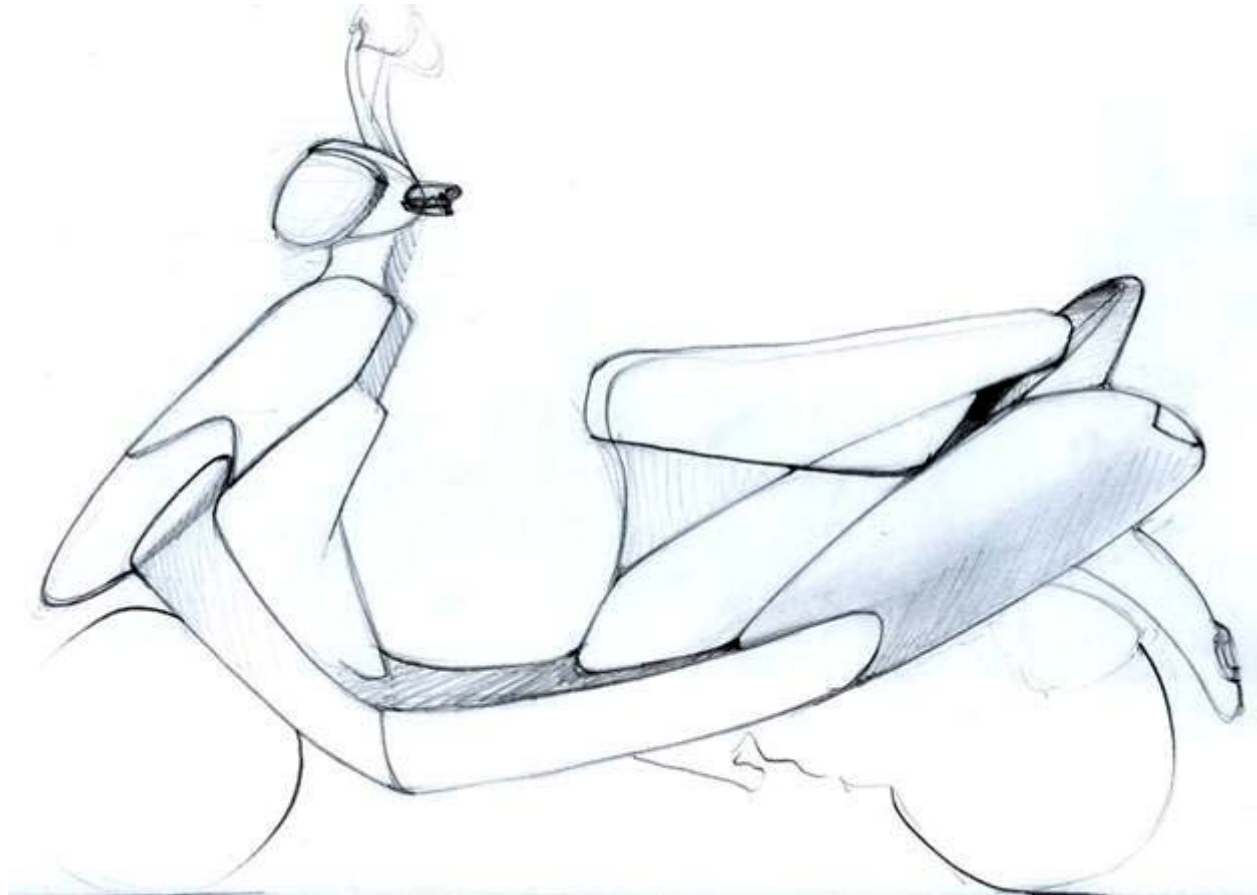
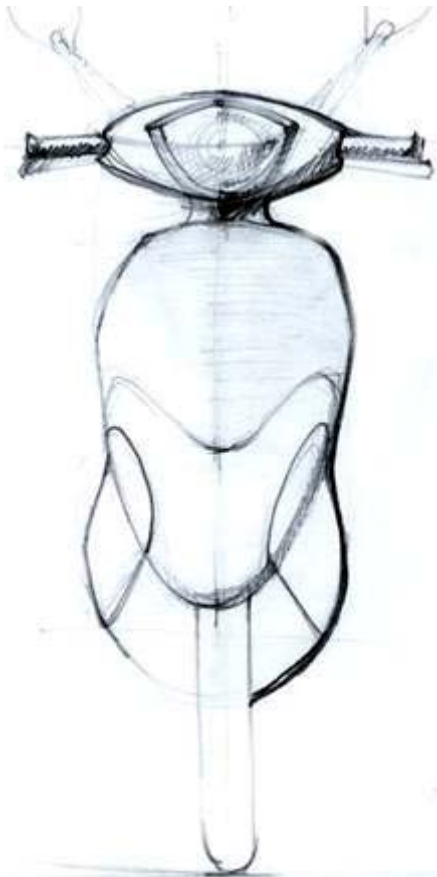
7.3 INTEGRATING EXPRESSION INTO FORM

A variety of expressions were worked on, mainly divided into 4 main categories:

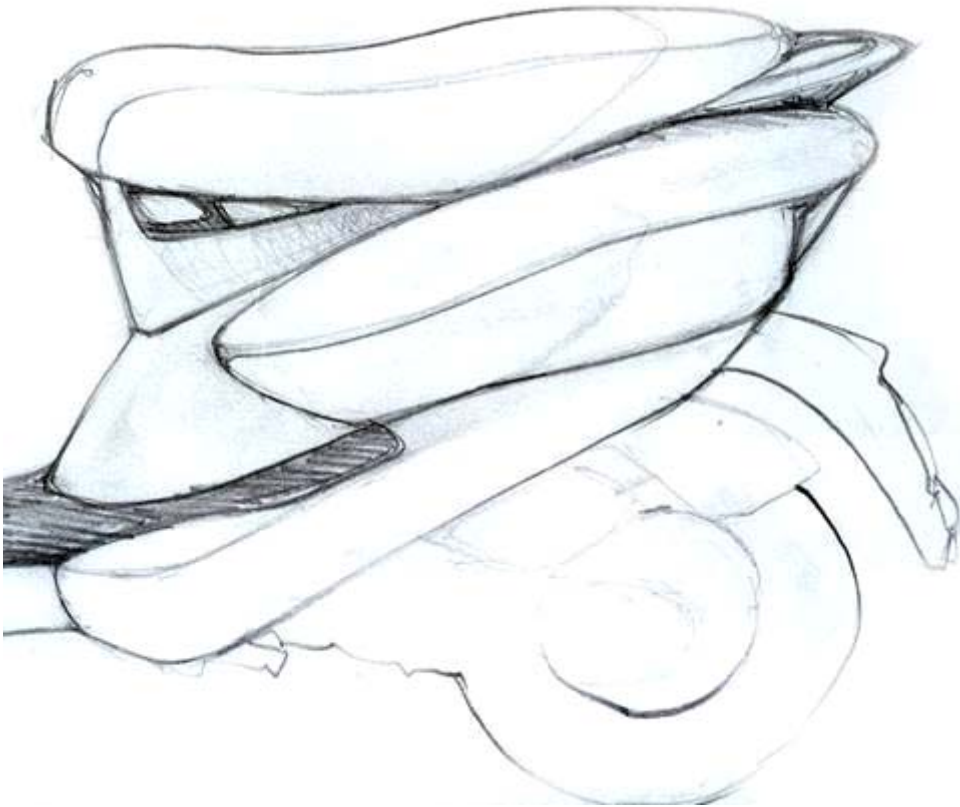
- Soft expression
- Aerodynamism / Swiftness
- Muscular / Robust
- Aggressive / Fierce expression



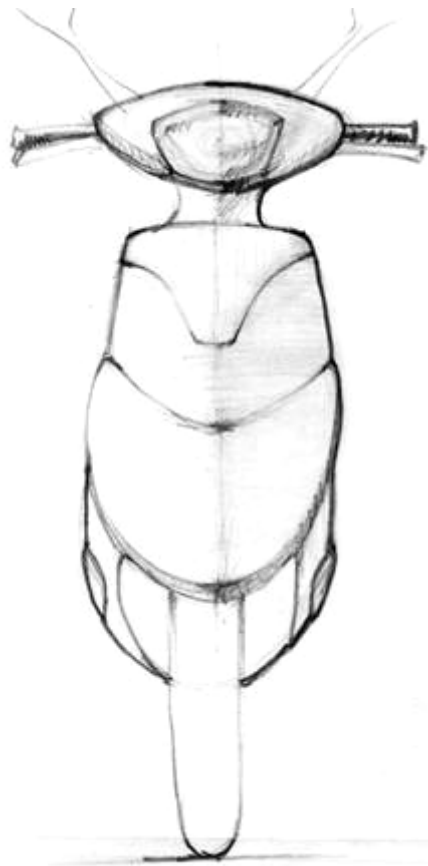
- Convex flow lines
- Tracing continuity in flow lines
- Absence of harsh breaks – more monolithic surfaces in body cowl.



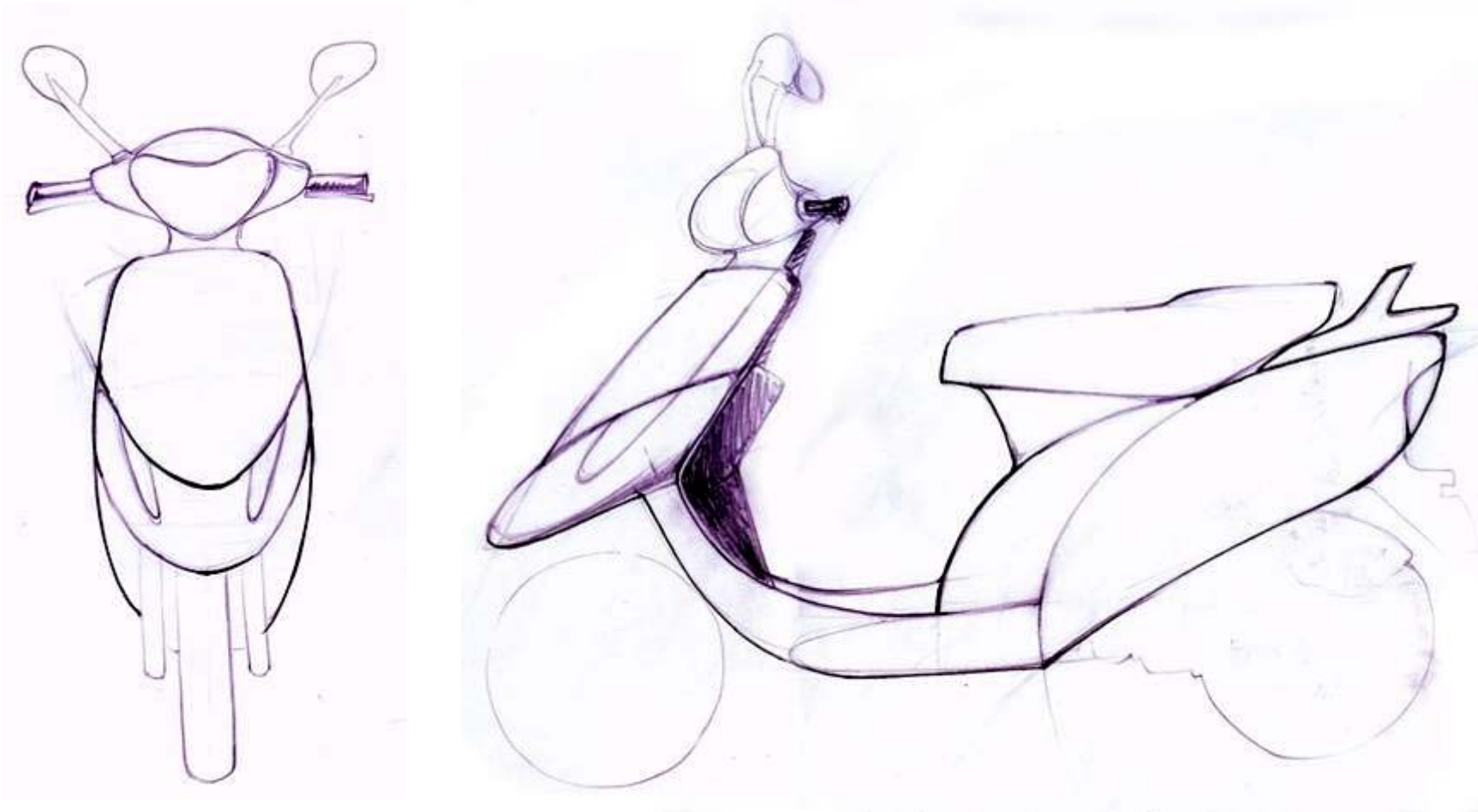
- Rear section is characterized by soft lines, with dropped shaped cowls in the body shell, though too bulky
- Headlamp is one bulbous unit, tapering softly to either side of the handle bar
- Front panel appears highly effeminate and curvaceous
- Intersections between panels are less harsh and this is avoided by creating protruded volumes



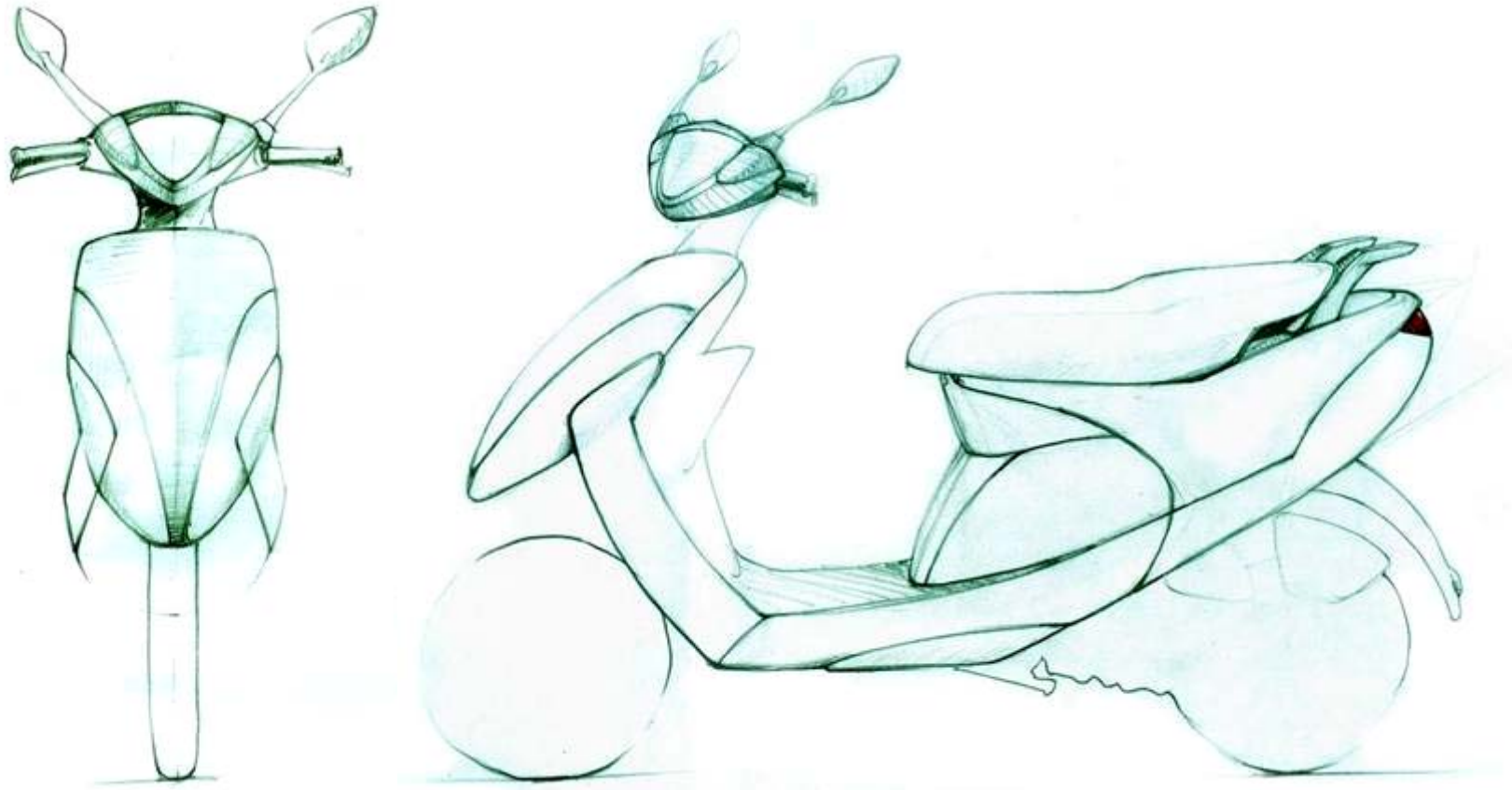
- Protruded volumes in the elements at the rear end enhance the feeling of softness.



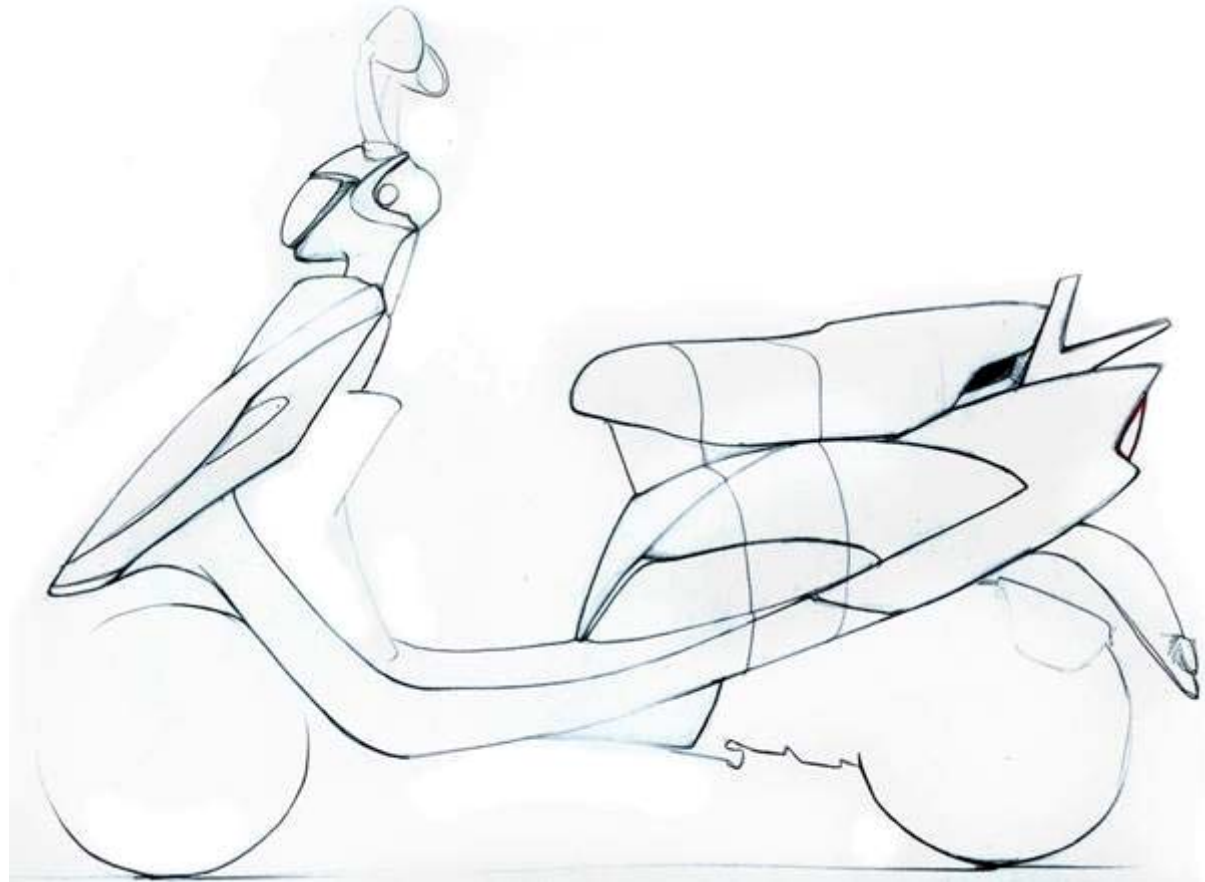
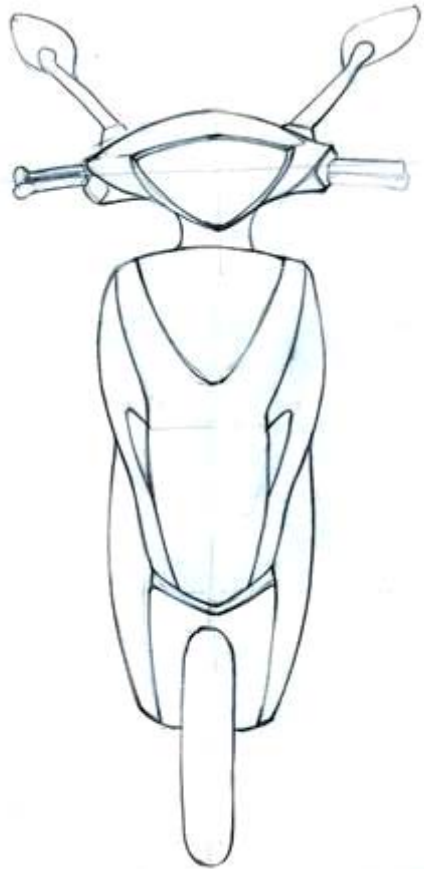
- Softness in front panel, increases in volume towards lower end – visual weight
- Imparts notion of being well-grounded / stability in stance.



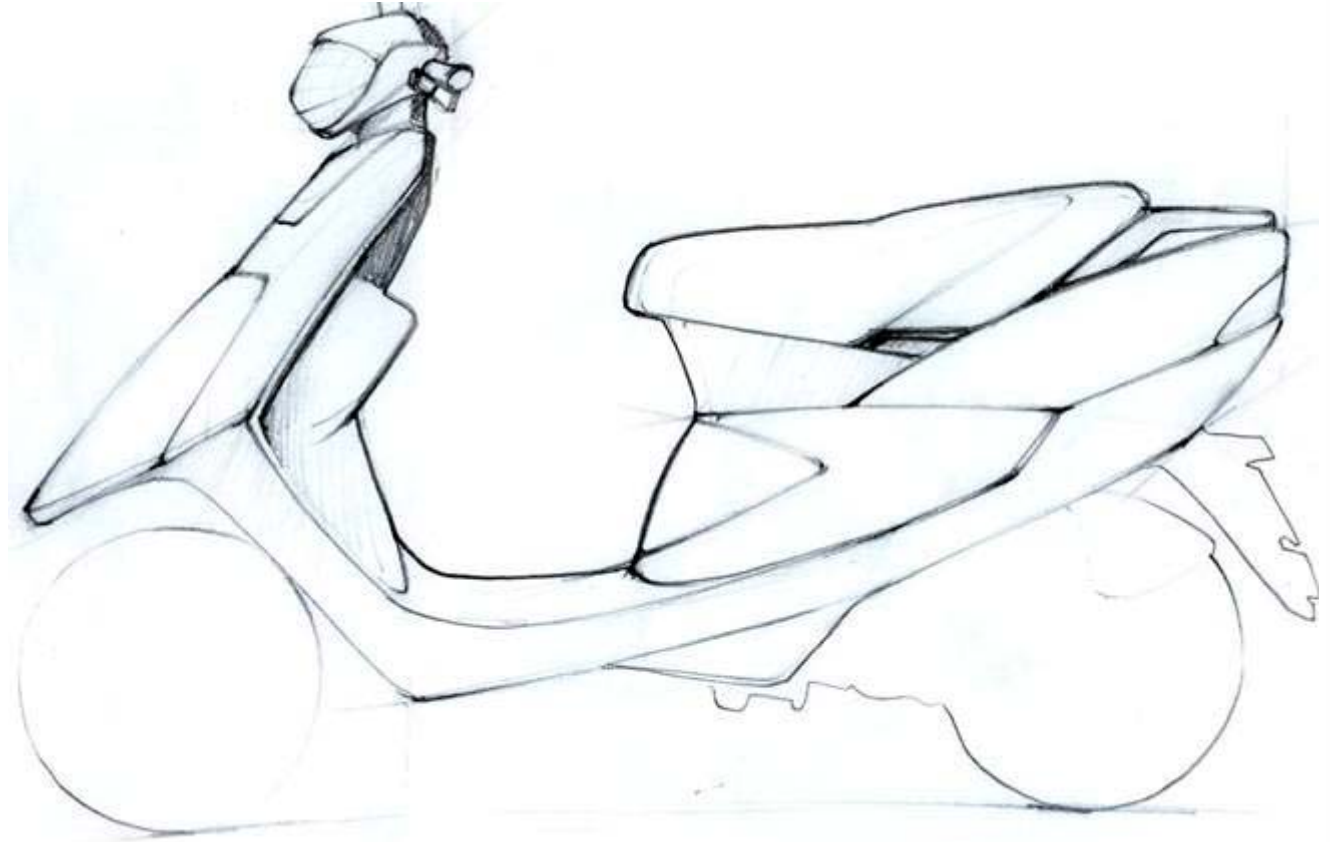
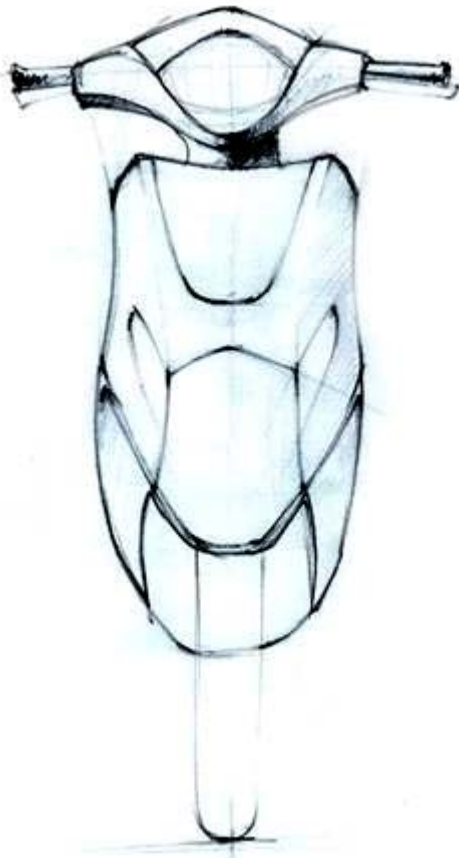
- Overlapping volumes protruding out in progression
- Rear end – single color – expressed bulk
- Transition from step through to body panel - incoherent.



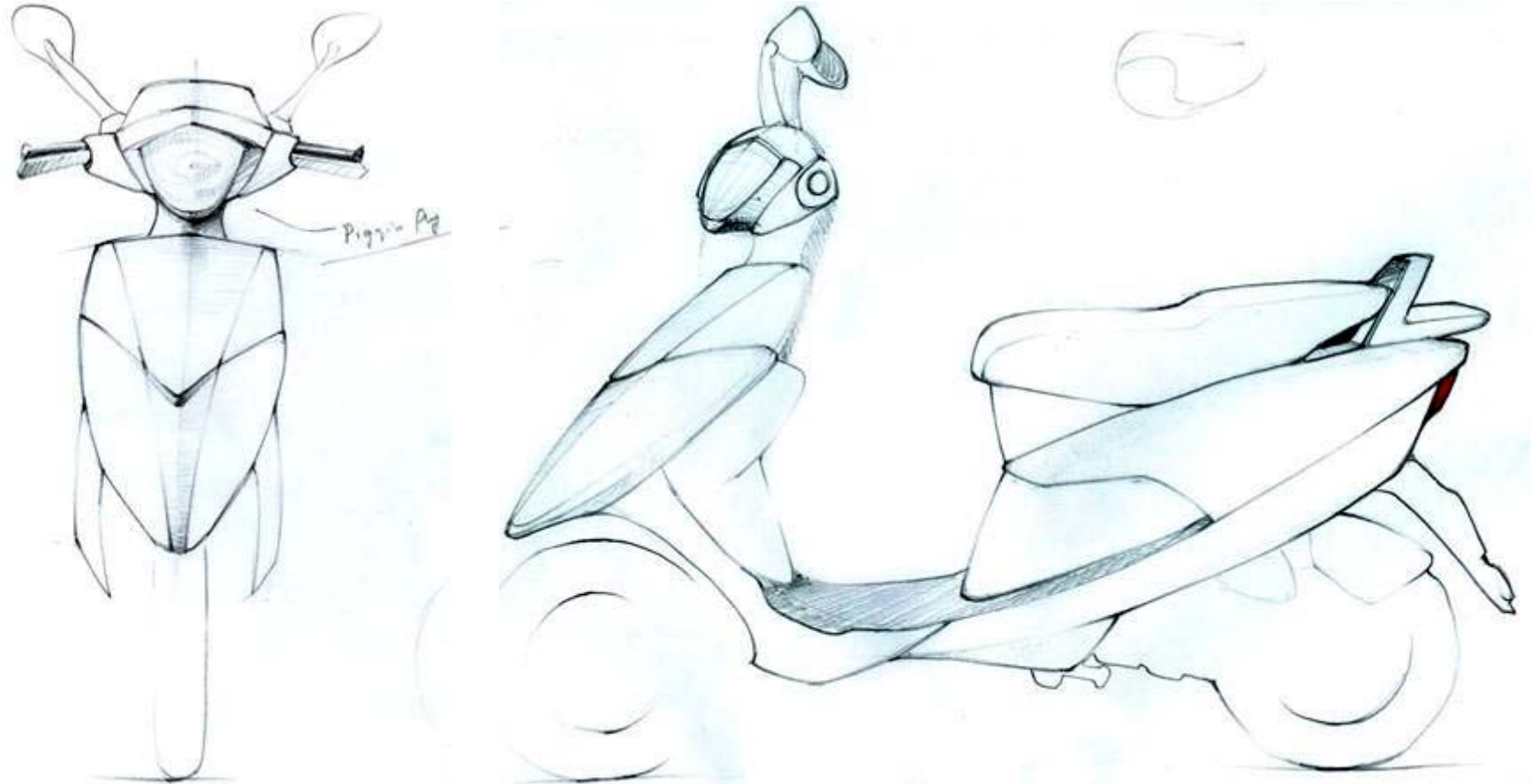
- Soft bulbous rear with slight crispness expressed in edges
- Front cowl – overbearing chest
- Animated looks in headlamp.



- Chin tucked in tight, with tapered nose
- Rear end raised & tapered
- Convex and concave curves in the same flow line to be avoided
- Headlamp can do more justice.



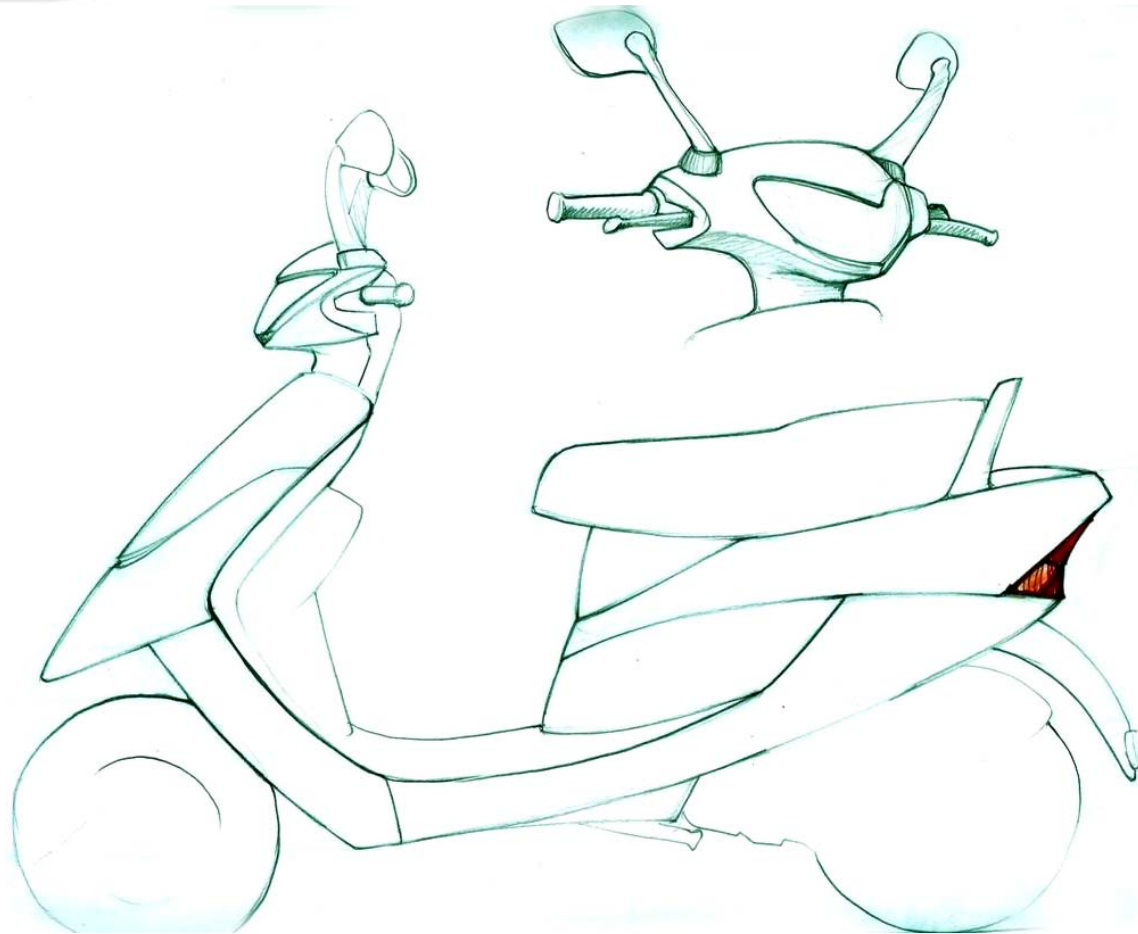
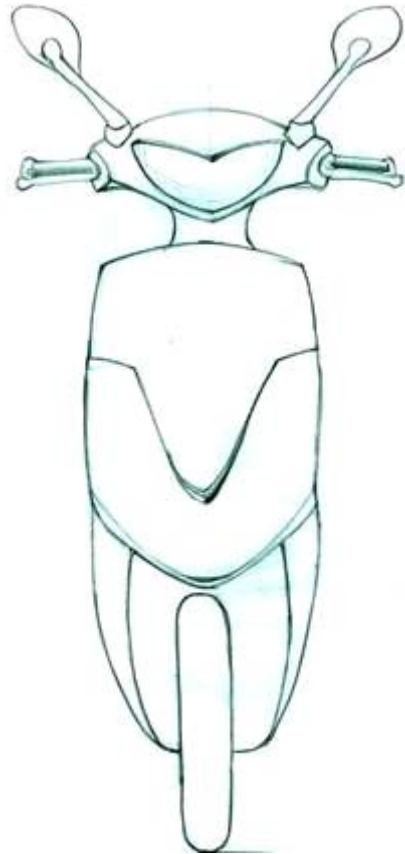
- Tighter surfaces in rear end intersecting at sharp acute angles – racy / dynamic look.
- Shoulder pulled back
- Bulk of the belly is cut by color breaks
- Tapered nose line continues till jaw line



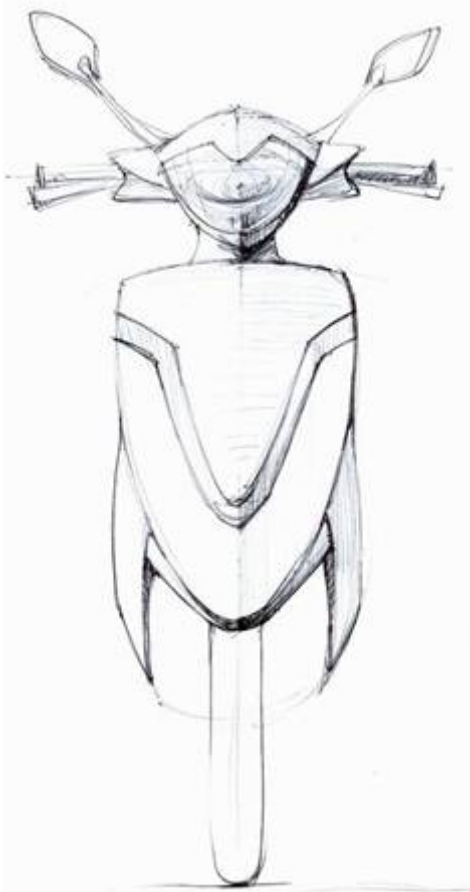
- Shoulder pulled back
- Front cowl made of faceted edges by convex curves
- Overhang of tail end could be more dynamic – too soft for expression



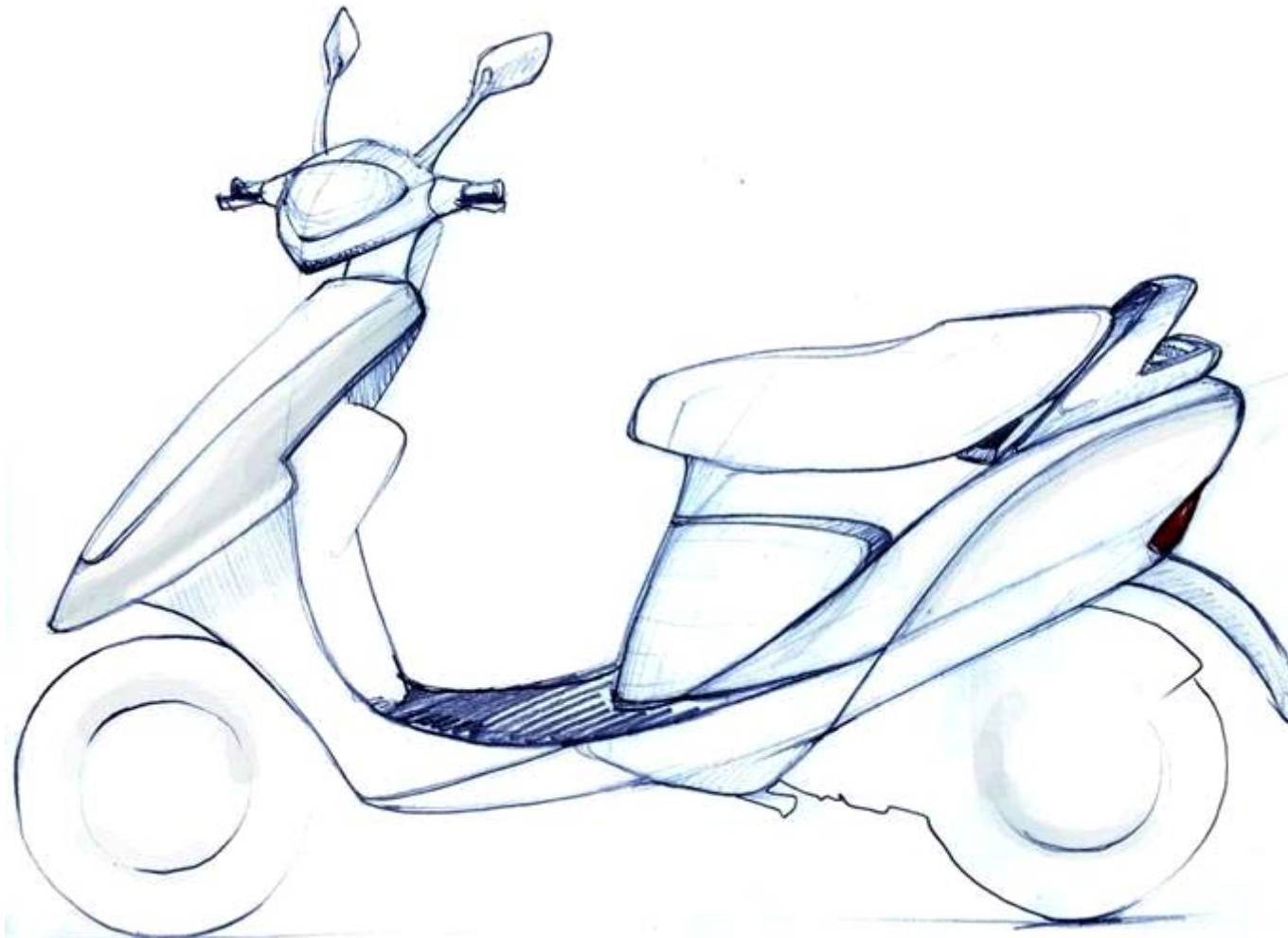
- Acute angles determine the degree of expression
- Cut-outs enhance the racy look
- Proportion of the jaw line is critical



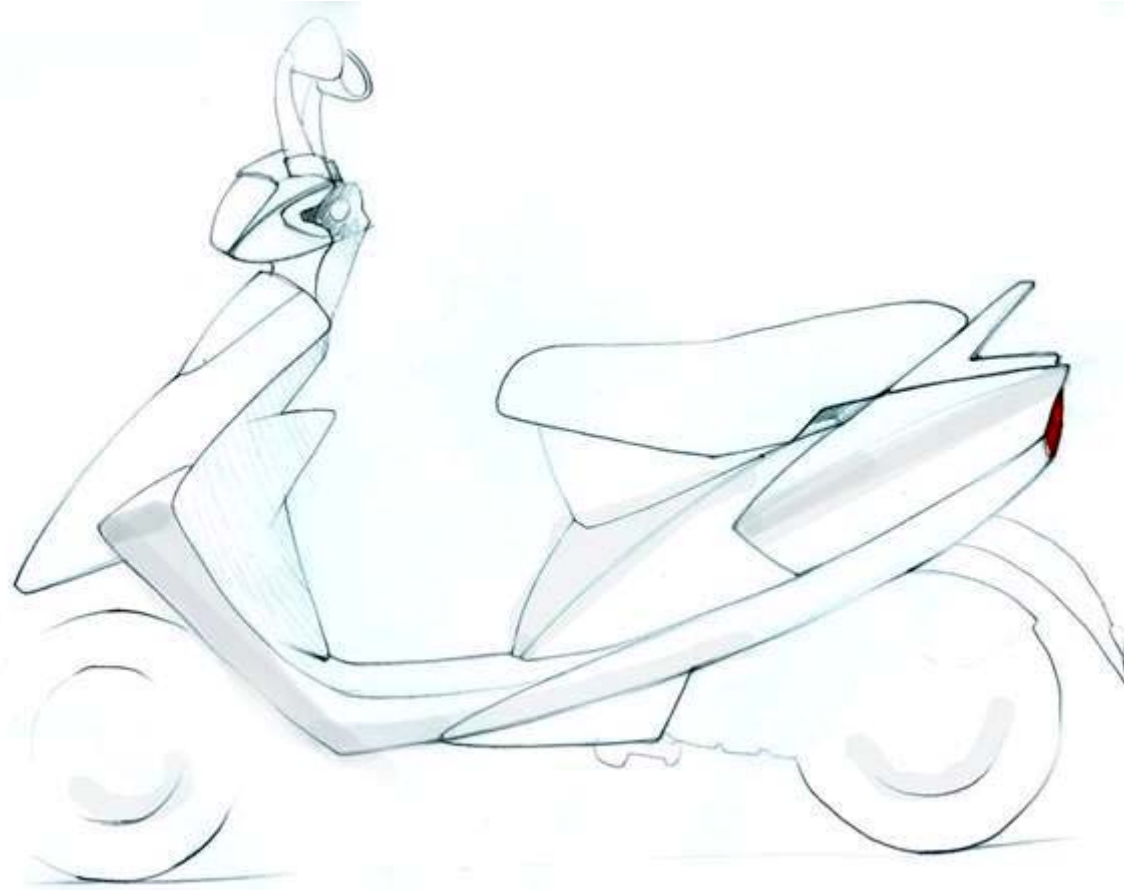
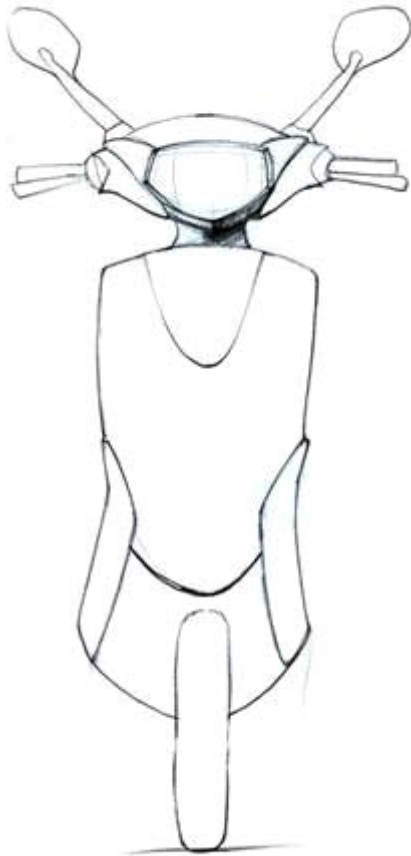
- Flow lines are coincident at one point
- Non-parallel lines are visually busy
- Ends of form coincide in sharp acute angles – rendering a dangerous look



- Swift lines with edgy character
- Rear end is raised and tightly wrapped around the body
- Arms are recessed under the Jaw line to enhance sleekness



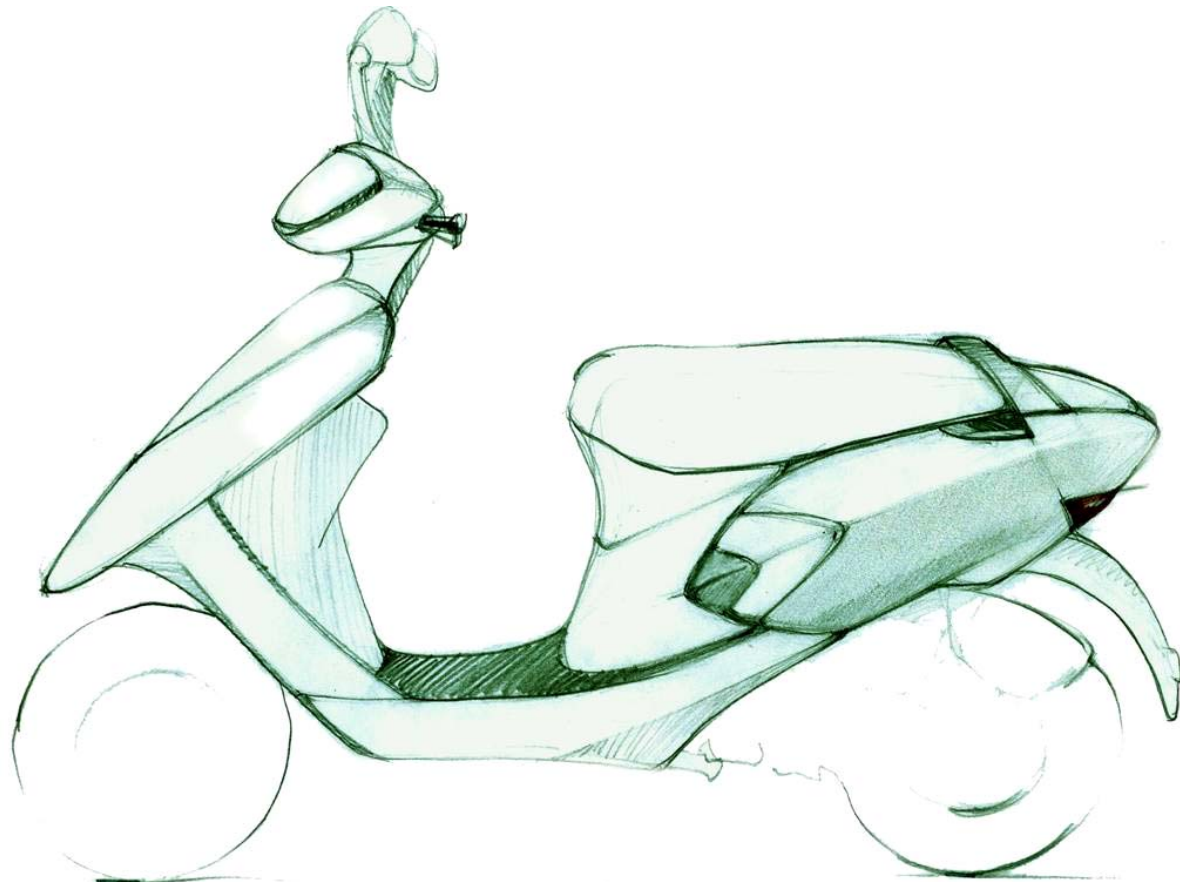
- Curves indicate flow of wind along the body surface
- Headlamp and front cowl promote the racy stance
- Curves are convex and taper to the top to enhance the swift look



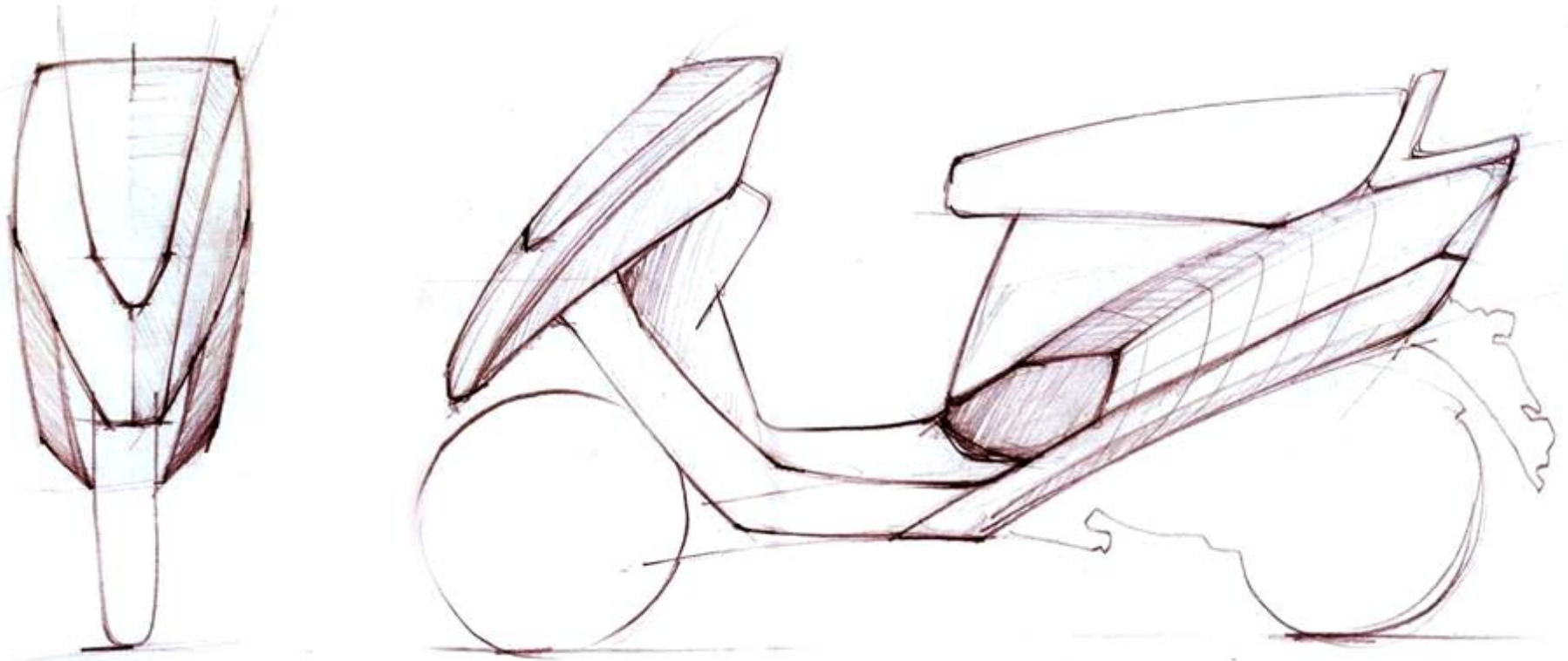
- Acute angles - piercing racy expression
- Aerodynamic expressions in individual elements , but a whole, too broken



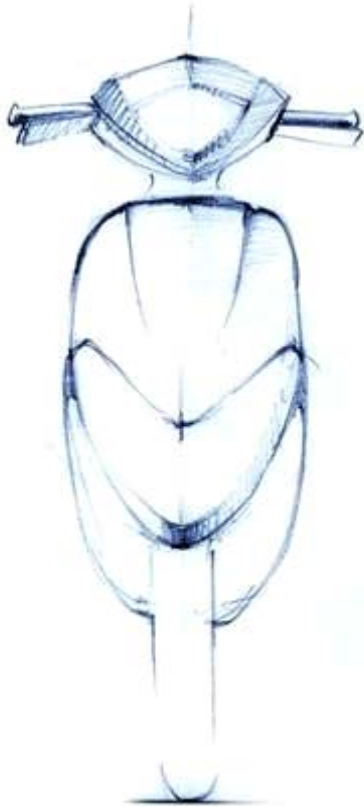
- Cutouts enhance quality of swiftness
- Waistline determines change in surface behaviour tapering all the way to the top rear end – this is enhanced by highlights along this edge
- Headlamp – too bulky



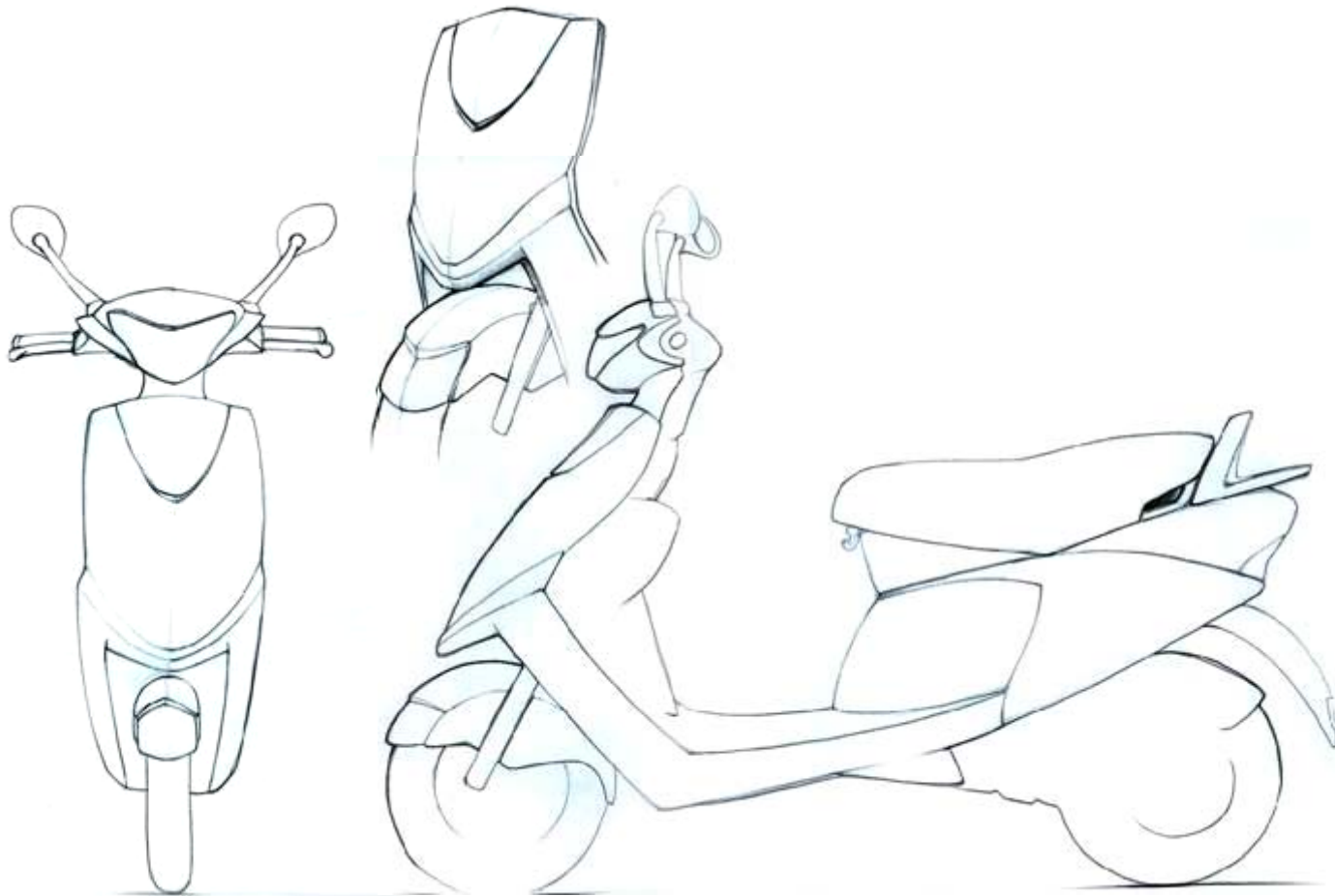
- Form is neatly wrapped around body with a sense of crispness introduced into the edges
- Rear end tapers to a point and is cutting bulk
- Cutout is too large in proportion
- Streamlined curves on front cowl
- Seat with grey area still occupies a large visual mass



- Pushed back shoulders with harsh edges following a convex path
- Surfaces intersect at acute angles
- Seat angle sloped down too much
- Split line in step through not feasible – tapered corners



- Muscle expressed with extended apex in body cowl – triangulation of surfaces
- Jaw merged with nose and given more definition to look sinewy



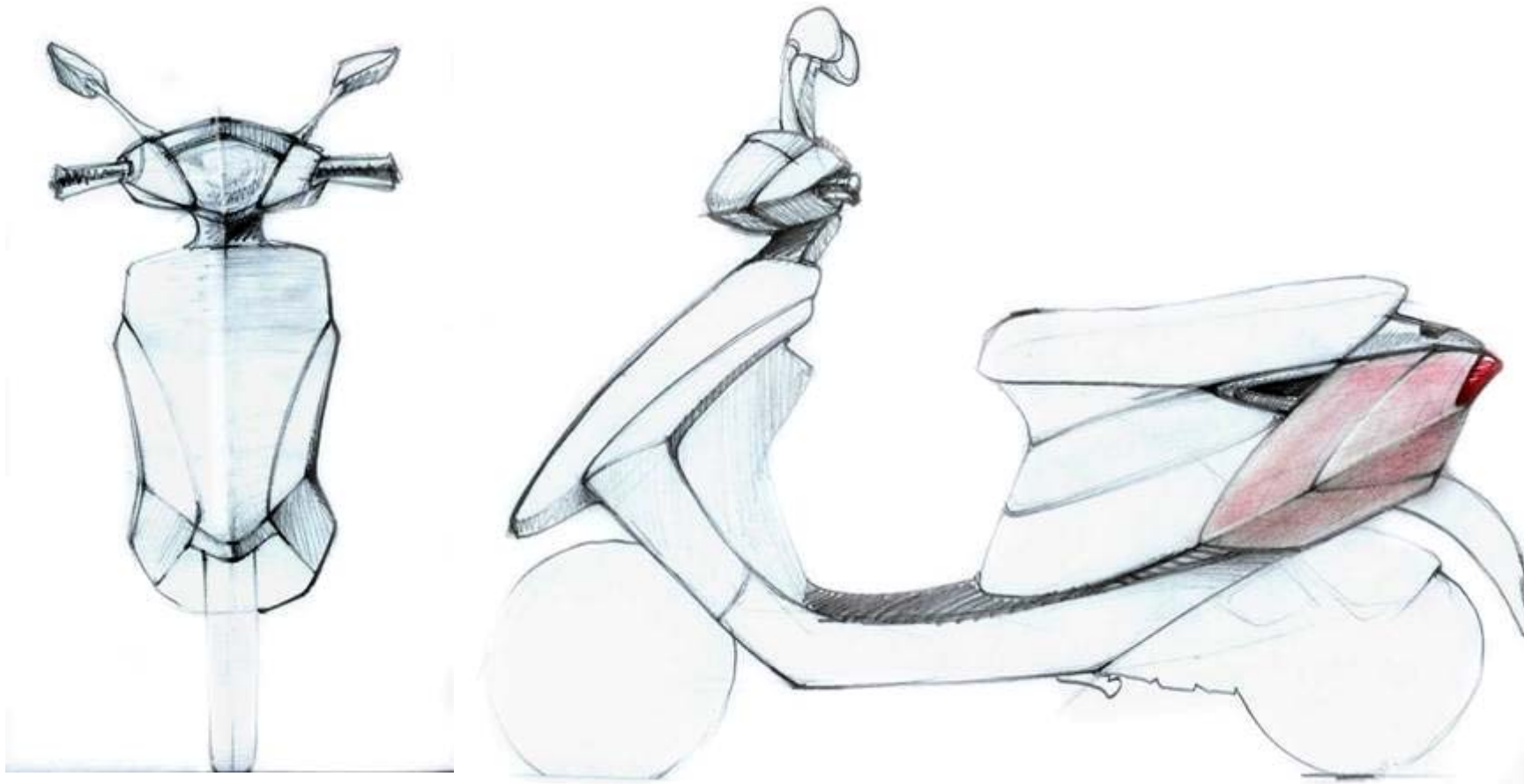
- Decision to reduce the nose and introduce a fender element – more macho, brawny
- Nose should avoid being too tapered in this case
- Complete change in split lines renders a unique identity – however, bulk of grey area renders a pregnant look



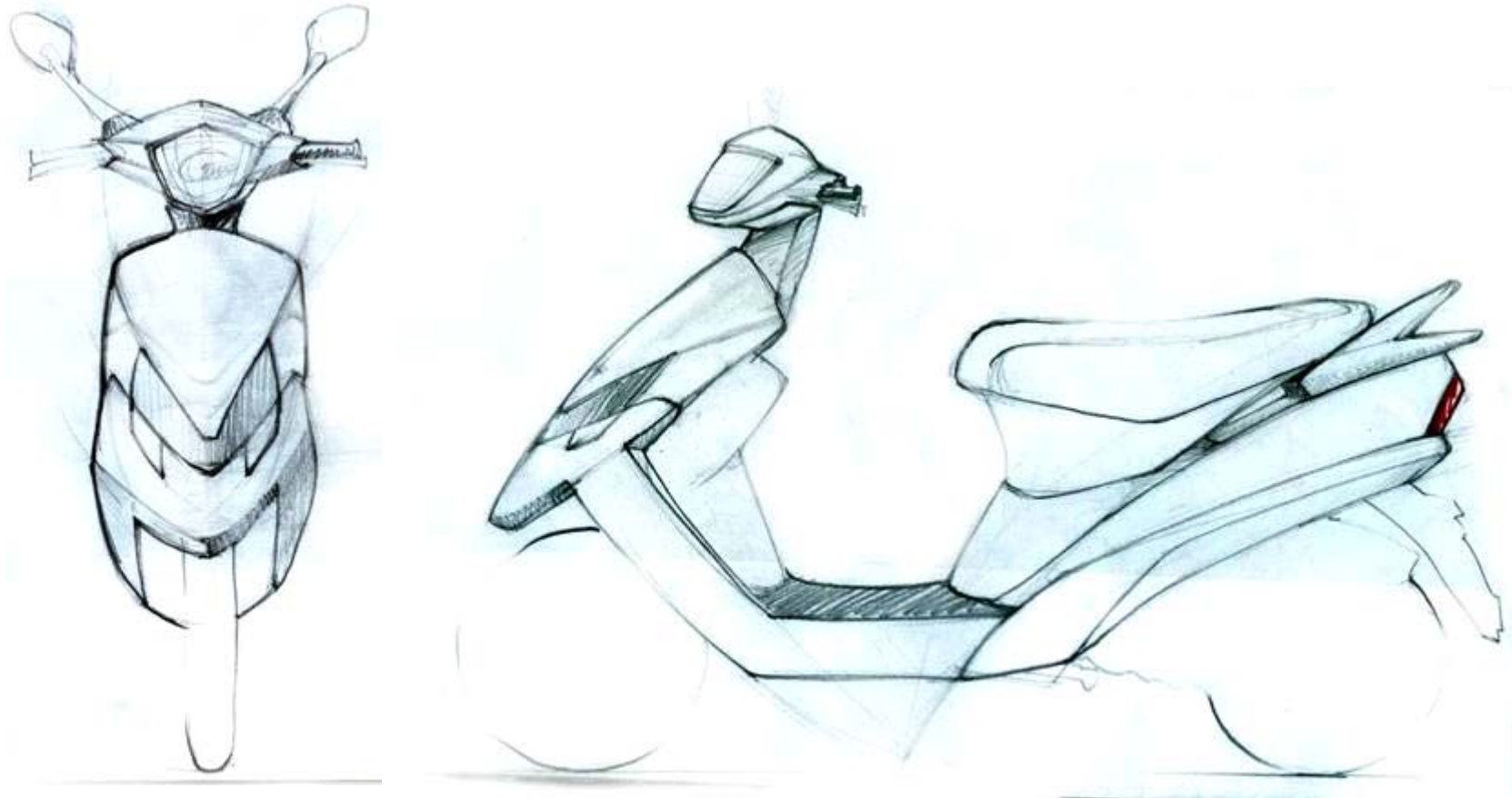
- Relatively sporty character given a more muscular and sinewy frontal face
- Nose however is broken from the jaw feature and tapers down to evade the ideal expression



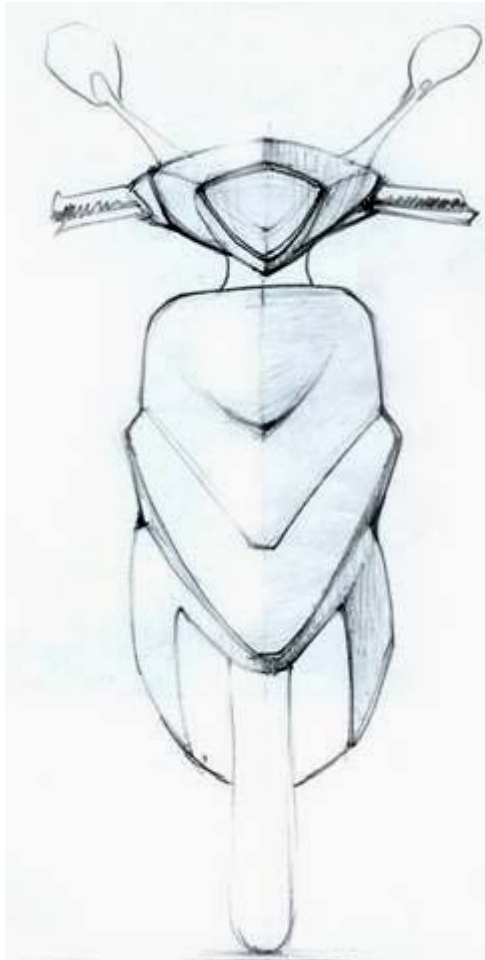
- Pushed back shoulders with harsh edges following a convex path
- Surfaces intersect at acute angles
- Seat angle sloped down too much
- Split line in step through not feasible – tapered corners



- Sinewy sharp featured body cowl
- Proportion of grey area is too big
- Reduction in grab handle to co-relate to tapered end
- Hence an additional grab pocket integrated under the seat
- Jaw features extended into side arms and tapers up to the shoulder



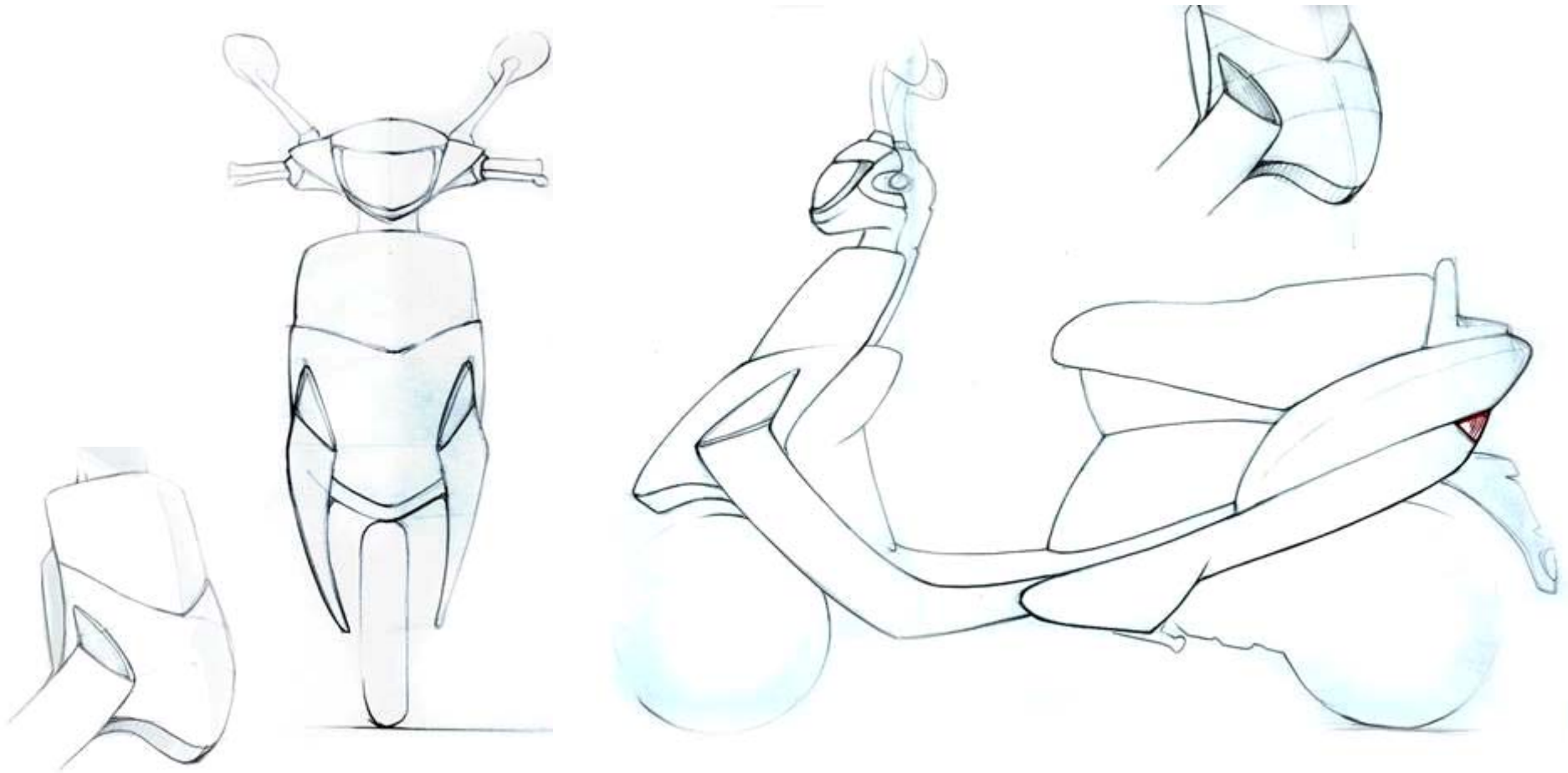
- Frontal expression has too many tapered intersections
- Faceted surfaces in rear end to express body
- Armoured warrior
- Break in surfaces expressed in headlamp unit also



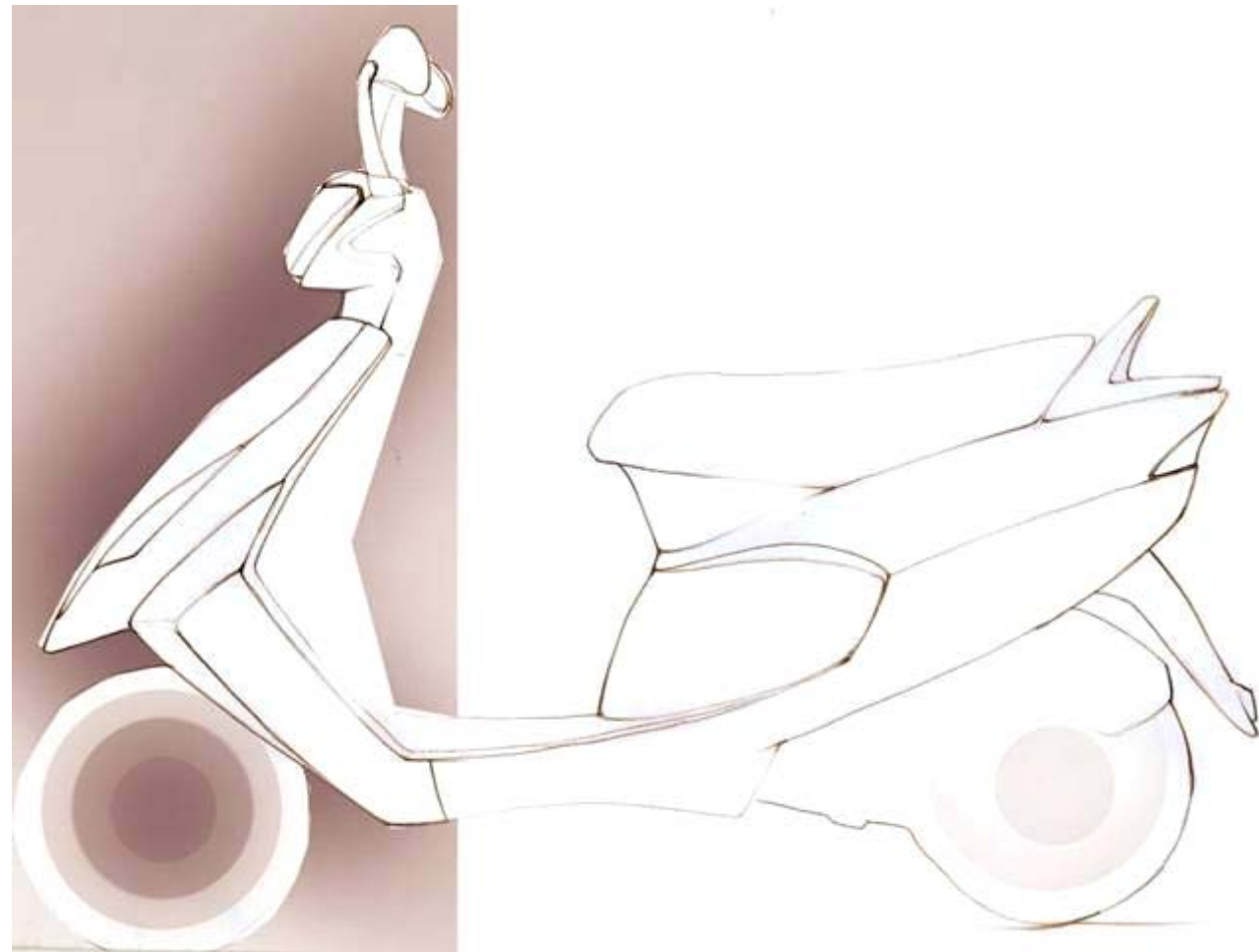
- Variation in jaw feature to understand what degree of continuity should be achieved
- Headlamp – acrylic faceted and extended out of housing for a more faceted look



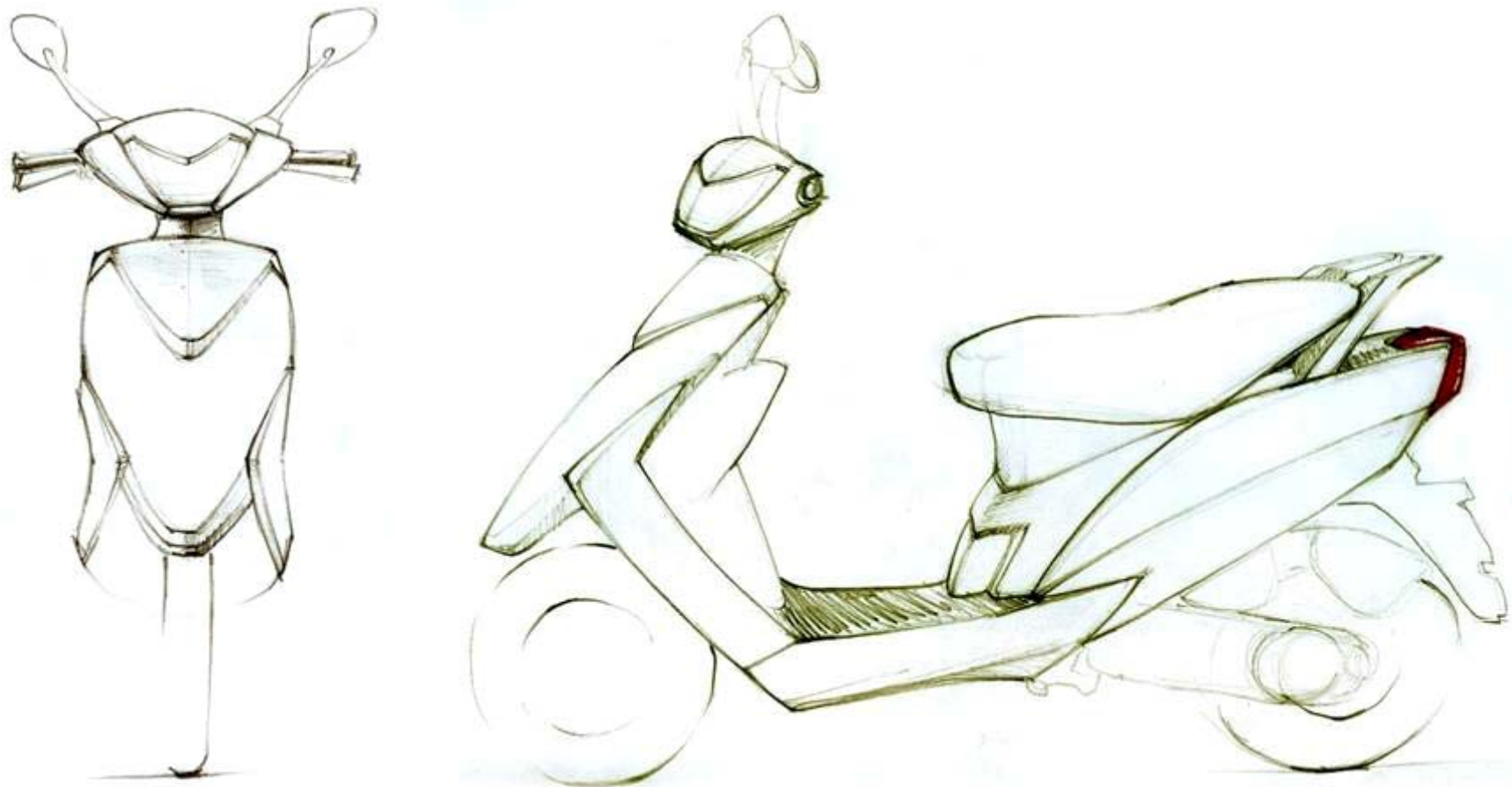
- Nose shortened – with drooping fender to give more build into expression of robustness
- Equal proportion of two panels render a look of stability



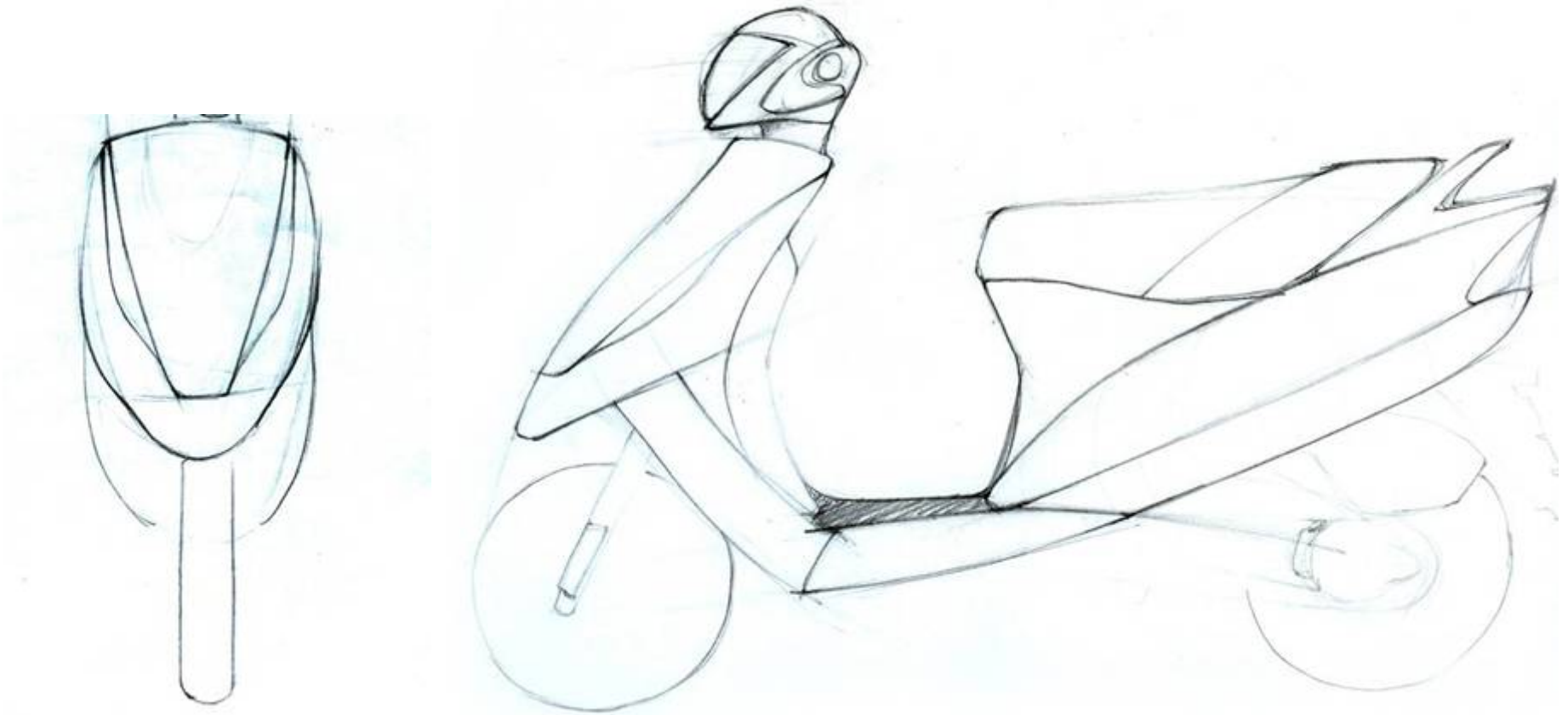
- Overlapping elements within body – too sculptural
- Side indicators integrated into arm feature
- Rear still appears too bulky



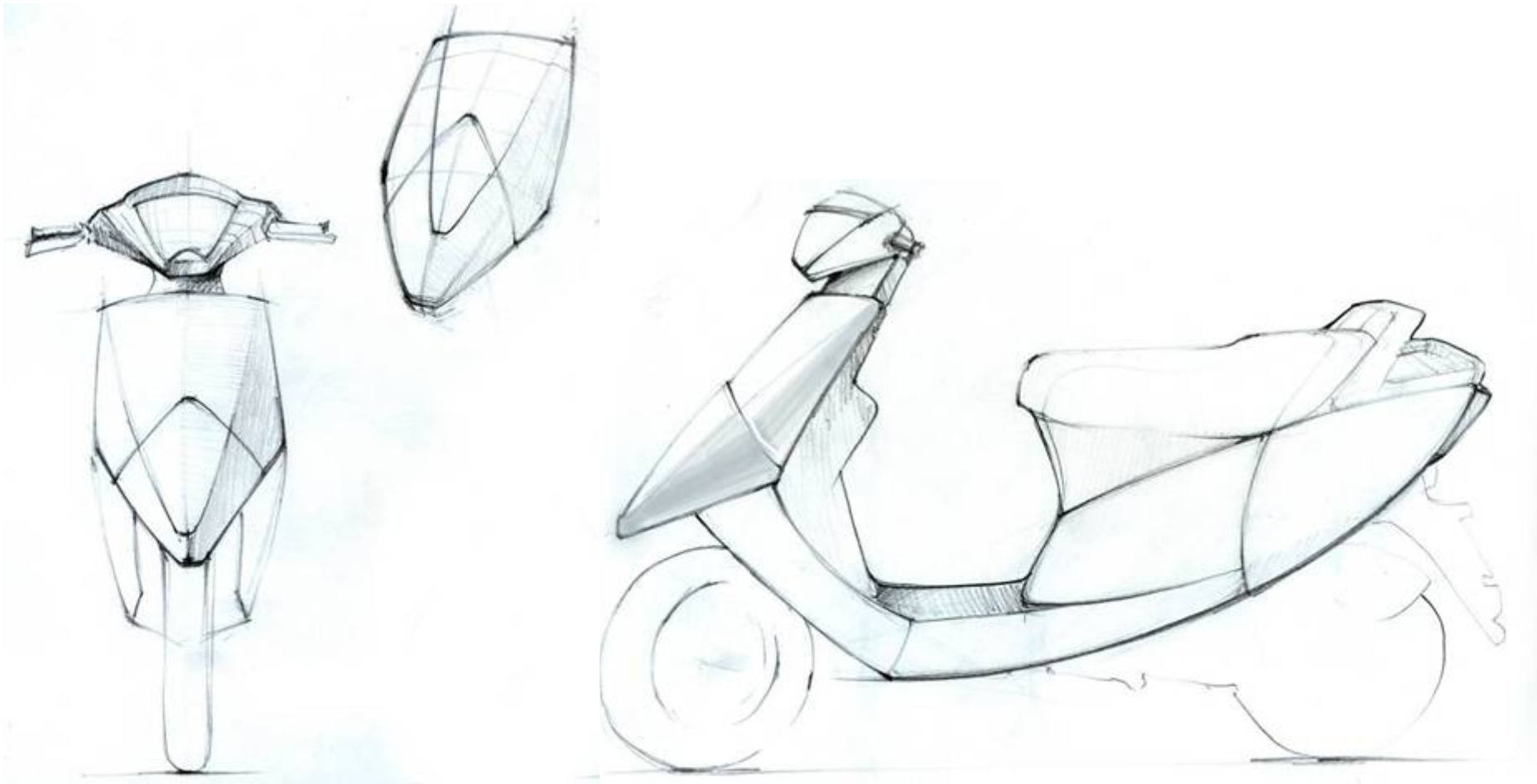
- Pointed nose with frontal expression gives a piercing aggressive character
- Body shell is larger and more aggressive
- Arms are given more bulk at apex but prove to appear out of proportion



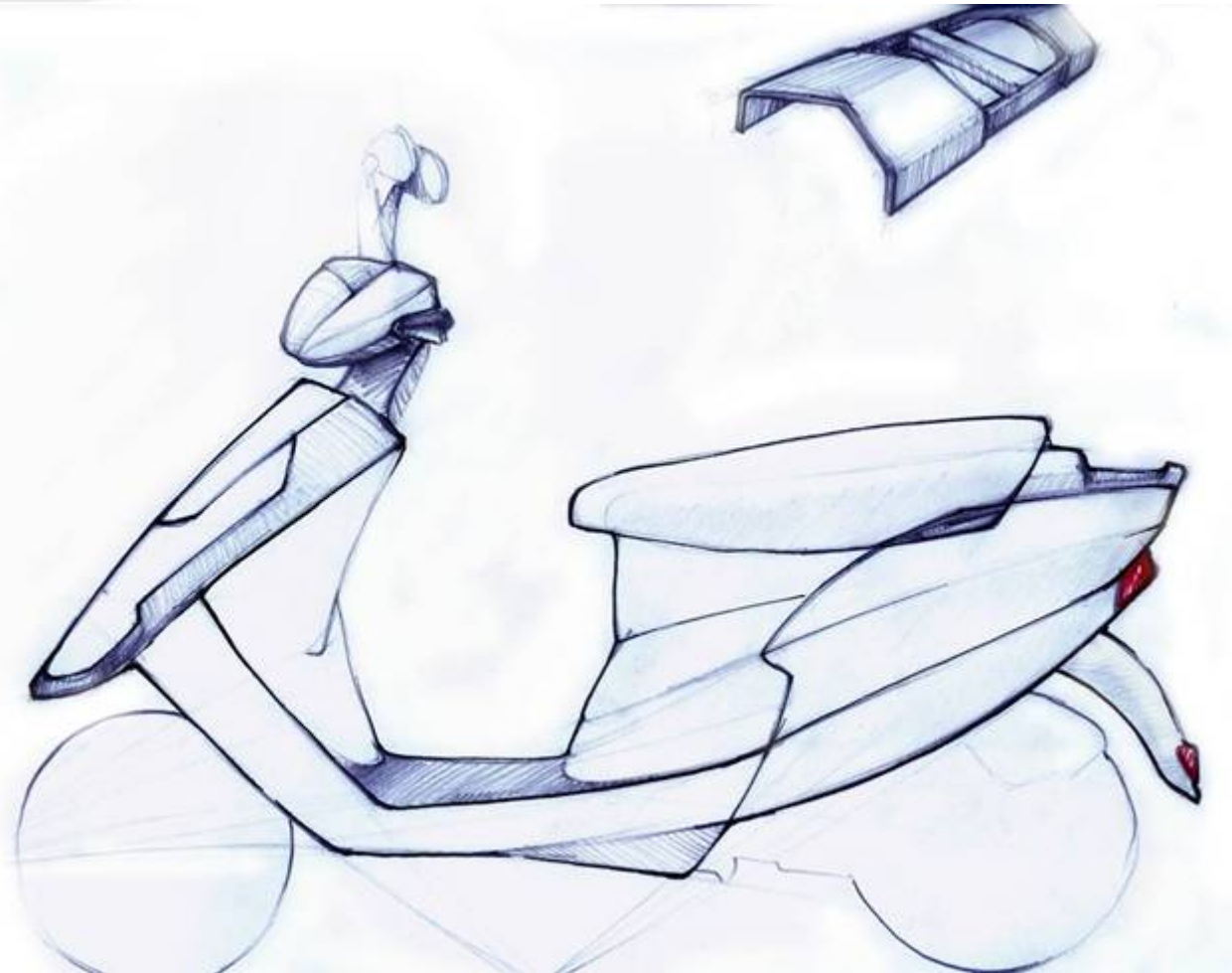
- Break in chest surface with cut out appears muscular
- Arms are tapered in front to appear more dynamic
- Sharp triangulated intersections not feasible
- Single color at rear end will have to be broken visually by use of decals
- Headlamp ends at broader chin and not at a point – more robust expression



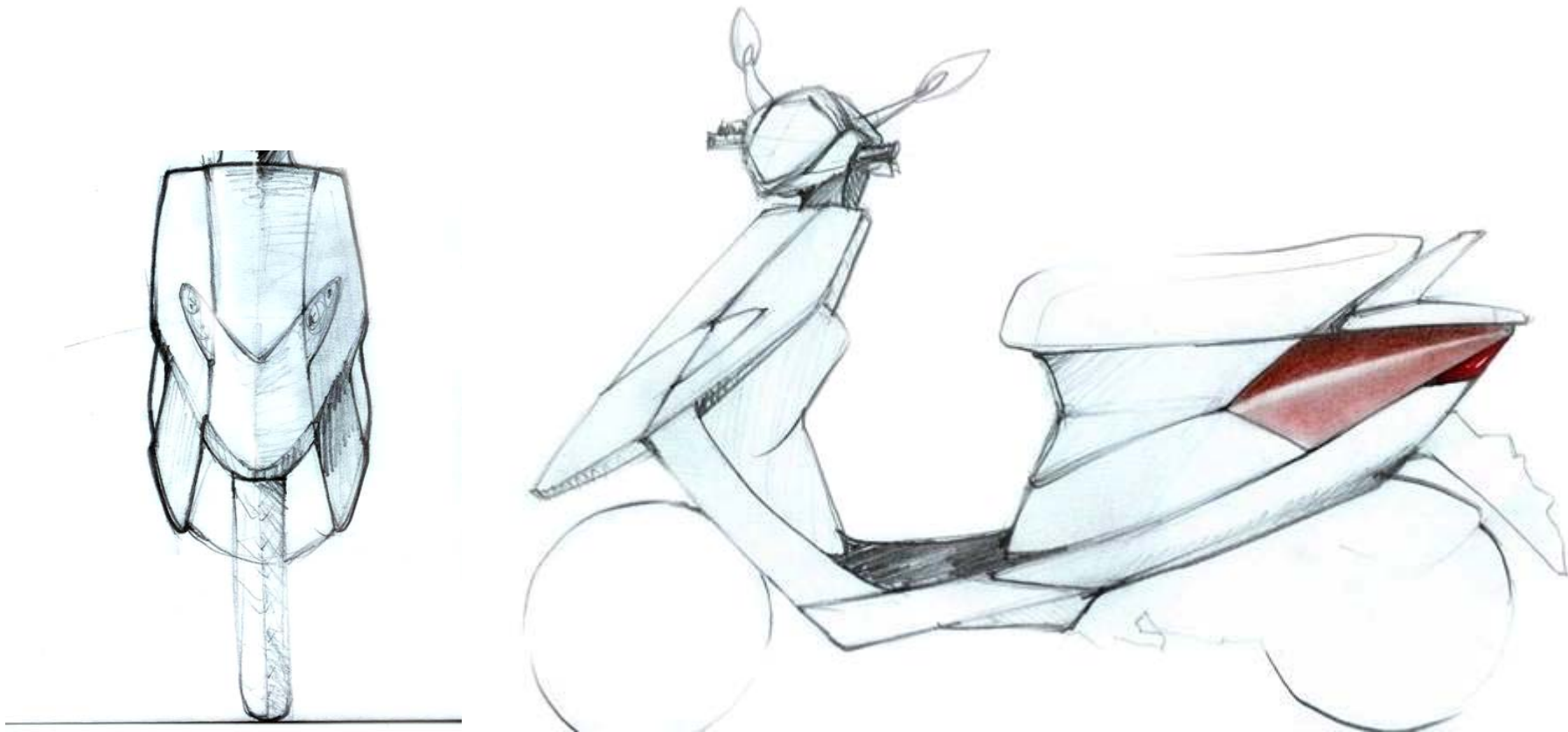
- Aggressive look expressed in indicators dipping in jaw towards nose inspired from a serpent
- Stance of the neck and the headlamp also indicate charging stance
- Dip in body cowl flow lines – too spread out over a large length



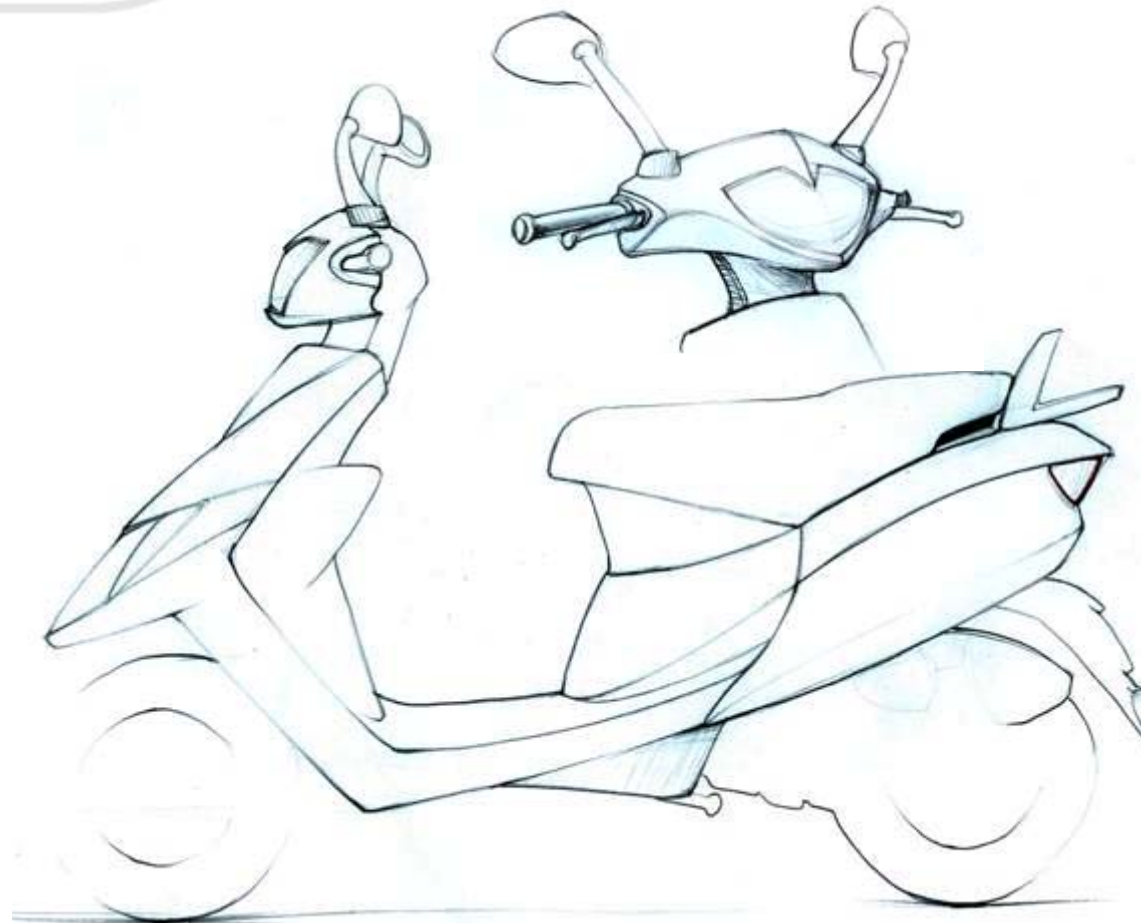
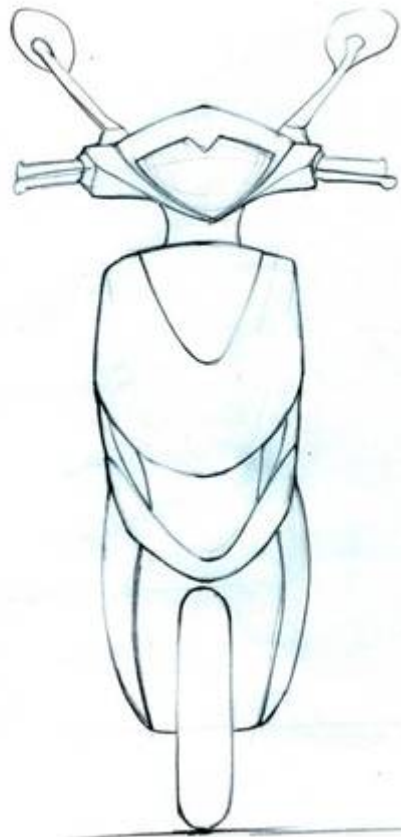
- Hard nose with boxy chin to impart charging stance
- Reduction in front width – more piercing – too extended over the front wheel
- Rear end too soft and in contradiction to expression



- Front cowl – division of split lines - fierce look
- Thin edges make it look fragile
- Grab handle reduced form
- Tapered body cowl with greater convex dips for more forthright / bold stance



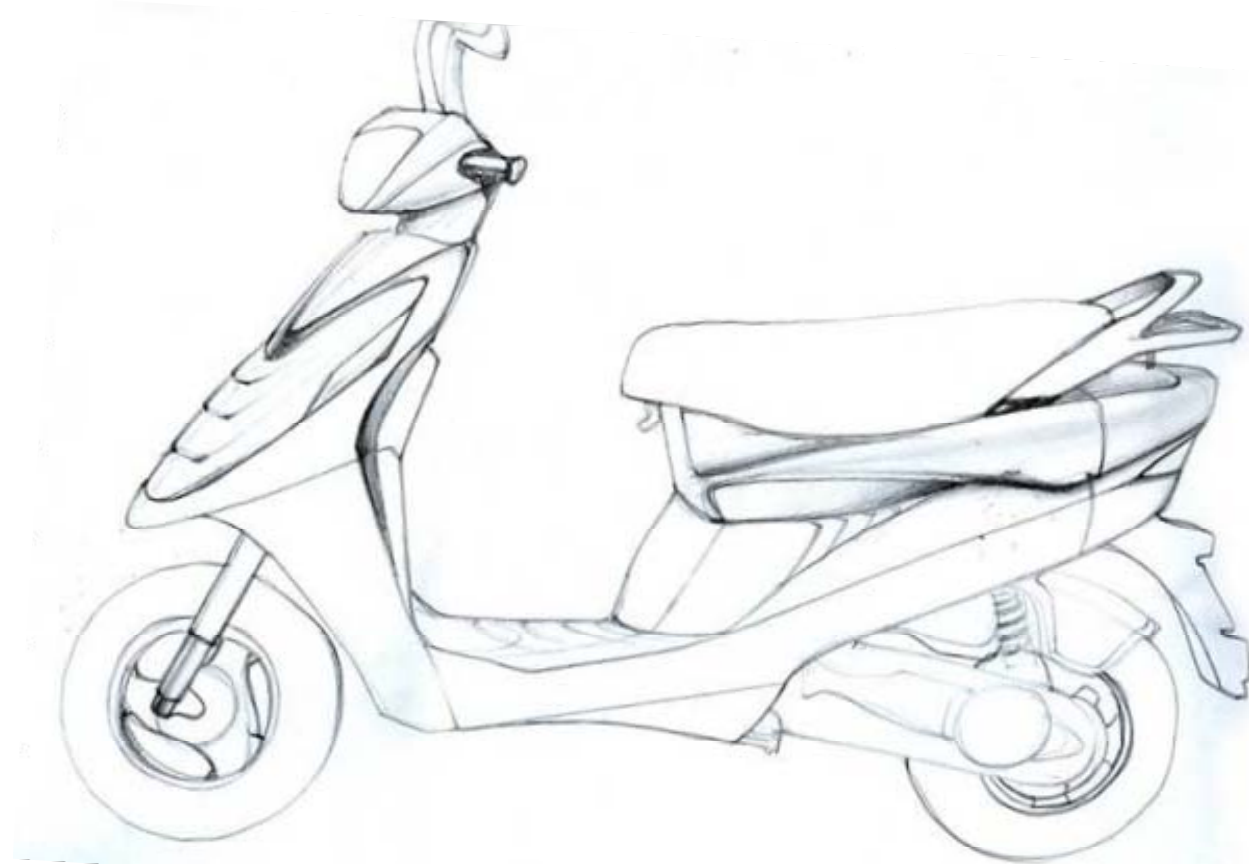
- Aggressive stance with highly tapered nose and wears an armored warrior look
- Charging stance with angles implied in front cowl
- Bold headlamp feature with harsh facets for forthright look
- Sharpness in body cowls renders piercing dangerous expression
- Seat – too dormant



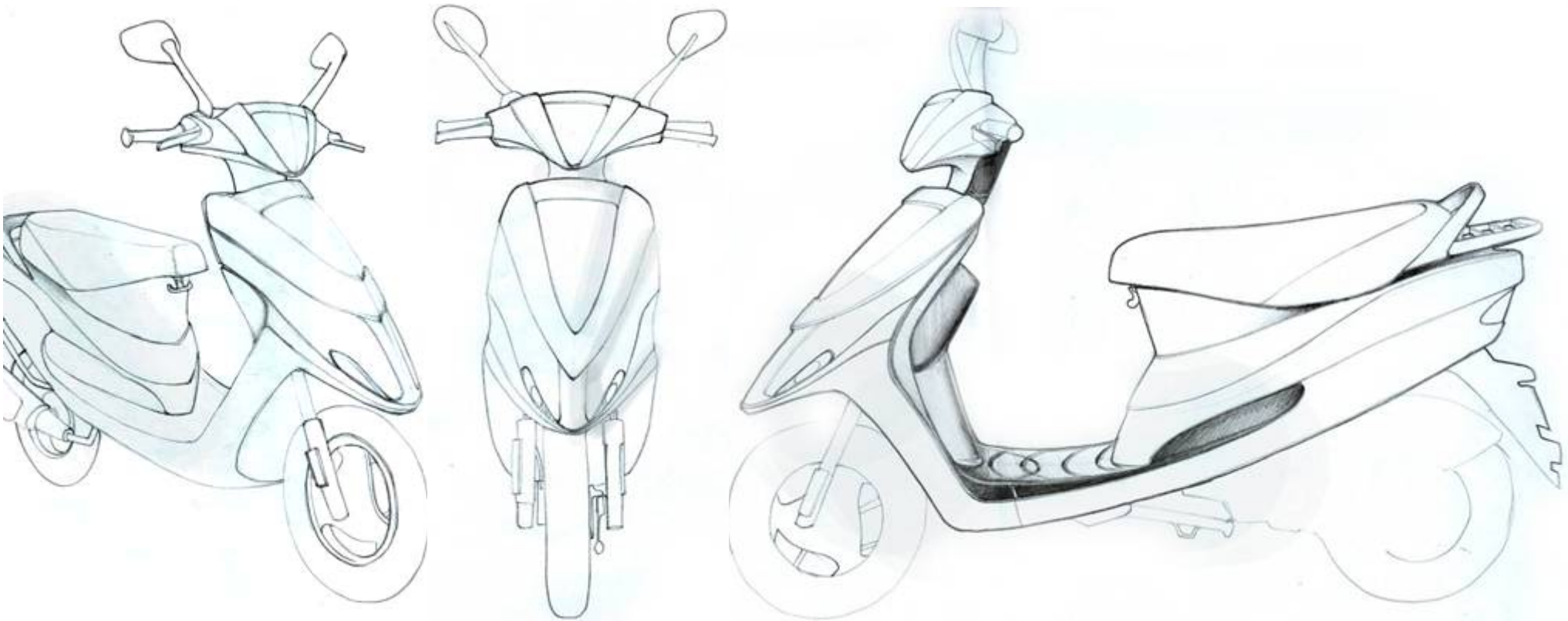
- Indicators tucked under the front panel to look like a staring brow
- Roman warrior helmet
- Nose – too rounded at apex
- Rear end tucked under the side cowl giving the tail lamp a niche
- Division of front cowl into neck gives a guarded look



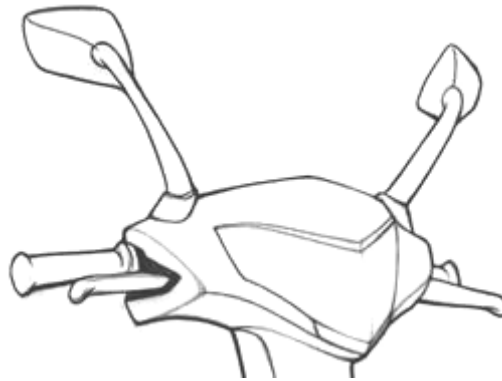
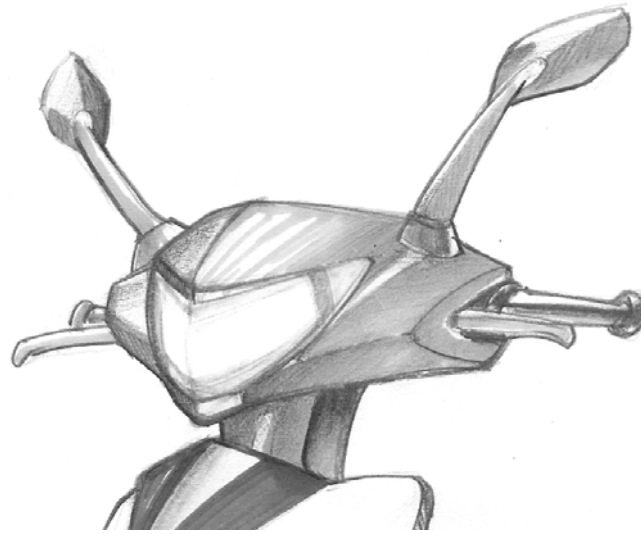
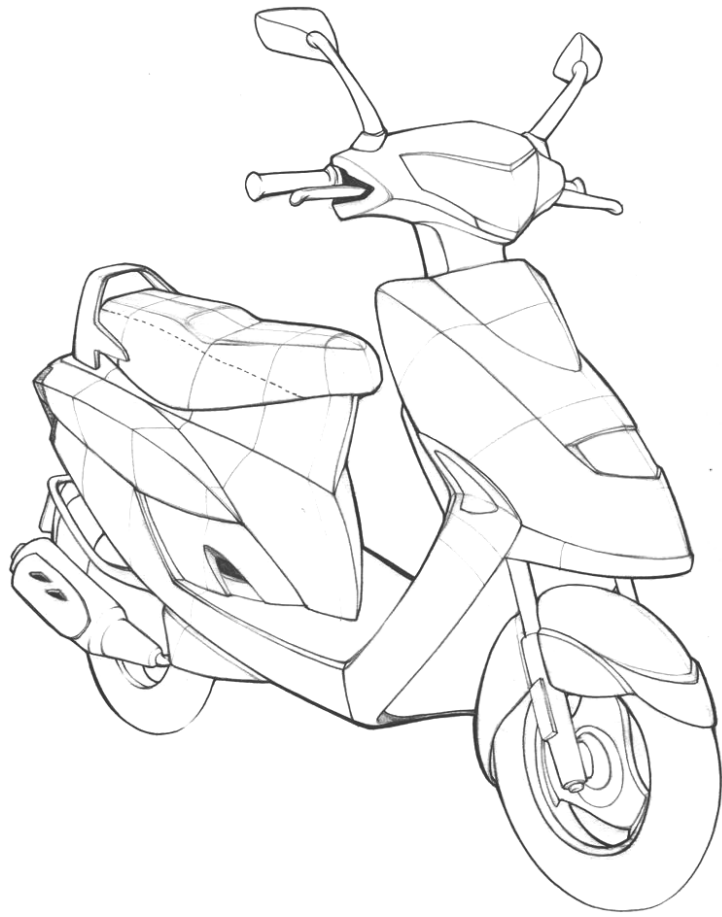
- Faceted front cowl – inspired from battle armours – shields
- Cut-outs – fierce
- Tapered nose – swooping fender – aggressive



- Cut outs in front grill and body cowl express fierceness and dangerous expression
- Upward pointing indicators are the key to fierce look
- Numerous surface transitions appears too sculptural



- Eyes in front fierce and very close to the nose
- Impractical owing to legislation that the distance of separation between the two lamps is minimum 240mm



chapter eight

CONCEPT DEVELOPMENT

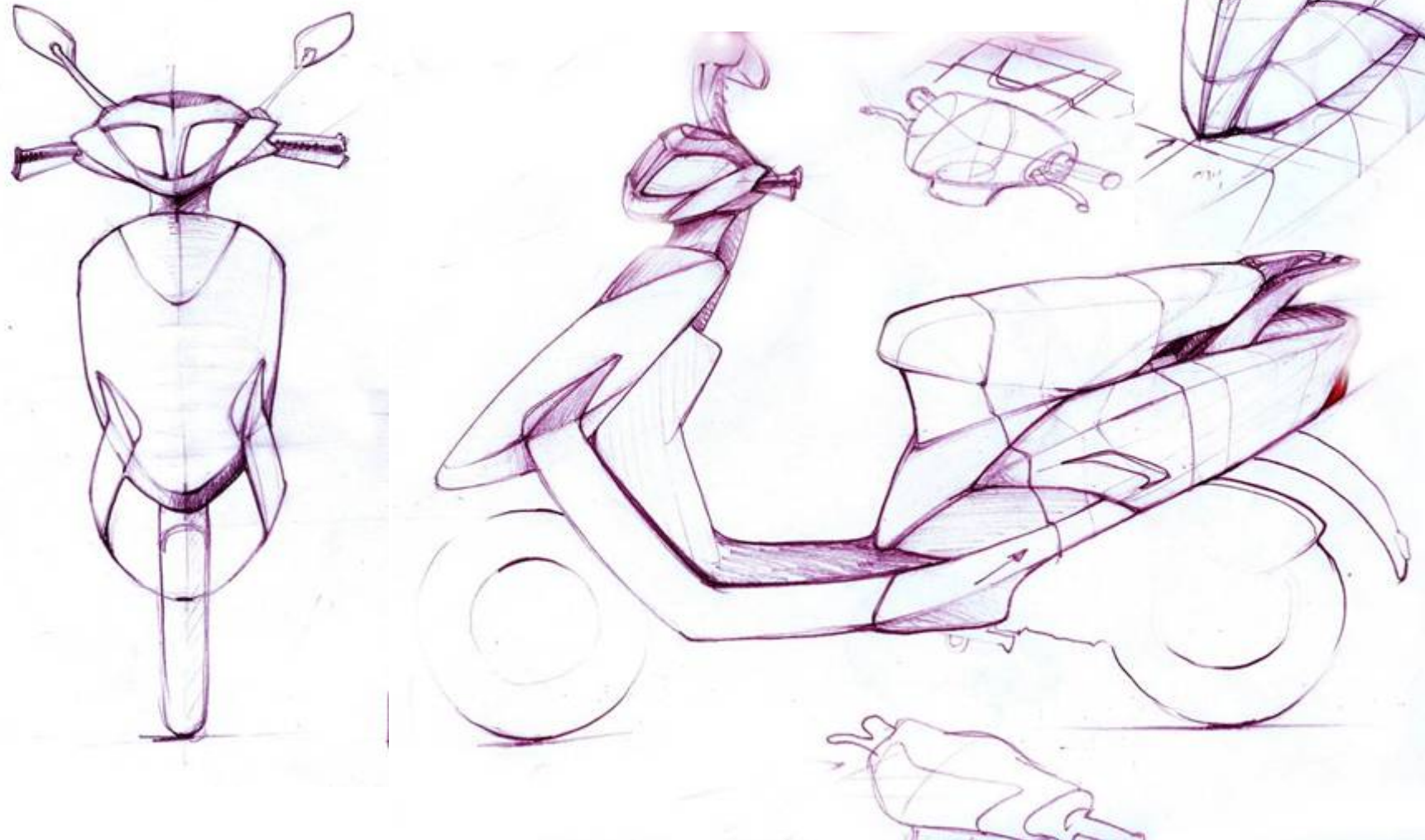
Two specific directions were chosen for further concept development with a base design as a cue for further refinement in surface styling, edge detailing, flow lines, convex nature of curves as well as graphic details like cut-outs, colour splits, indicator positions etc.

These stages also involved part by part exploration to get a better understanding of detailing and coherence in form was established by putting it together in the final picture.

Marker renderings were chosen as a quick medium at a later stage to explore the possibilities with form and expression.

Surface contours were drawn to develop a clear understanding of the form behavior.

8.1 MUSCULAR / ROBUST EXPRESSION



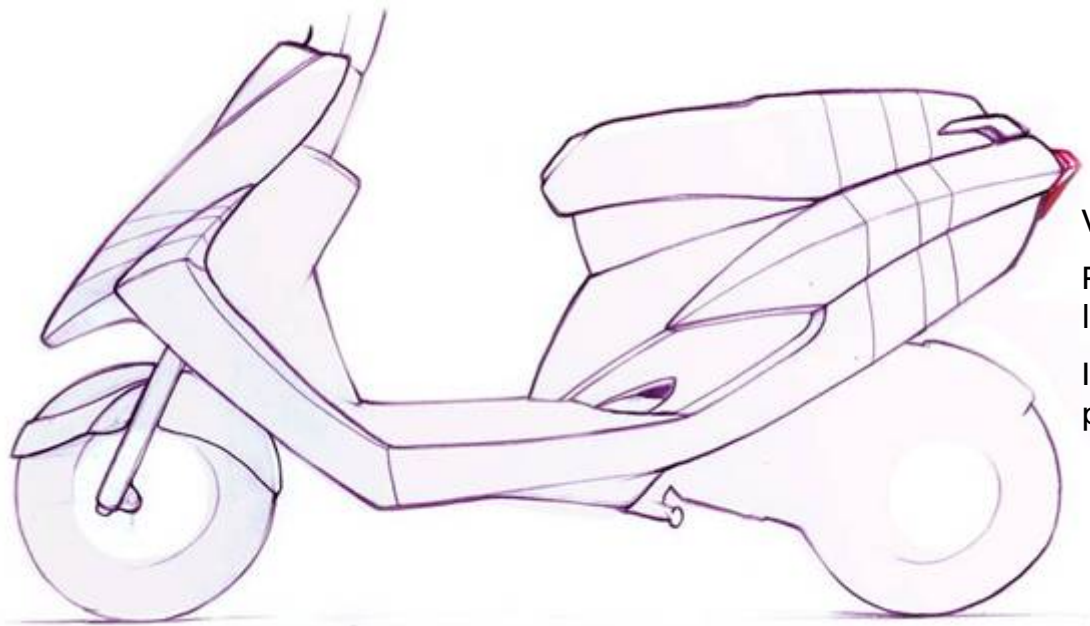
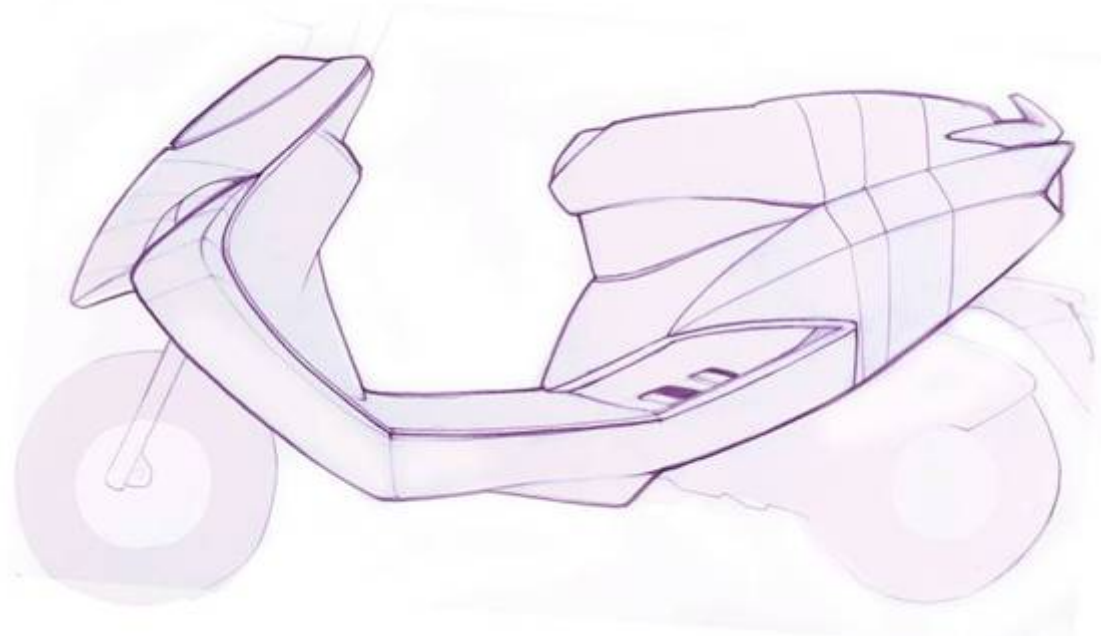
- Chosen concept to work on for further development
- Muscular expressions can also be made to look crisper

8.1 MUSCULAR / ROBUST EXPRESSION

Front cowl looks too short / stunted

Positioning of the indicators is critical to break the visual mass – in this case it cuts the highlight too.

Lifting the rear end gives it a higher stance



Variations in the cut out for graphic details

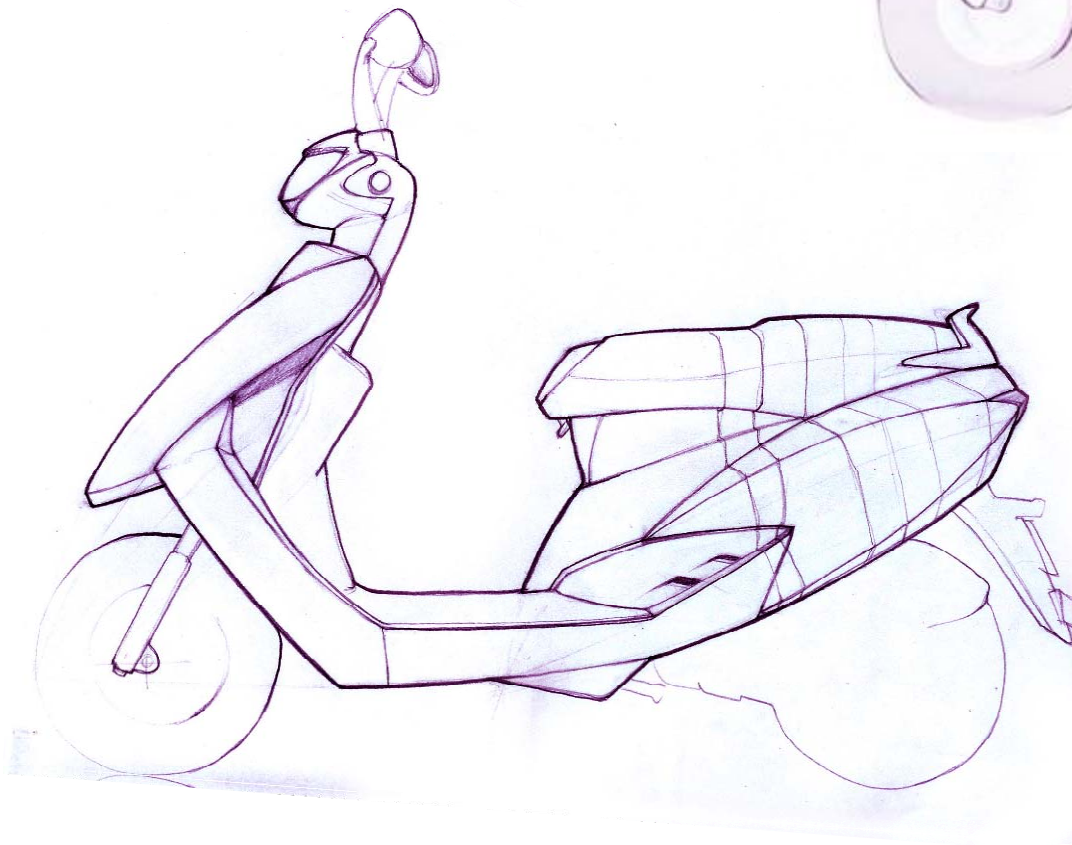
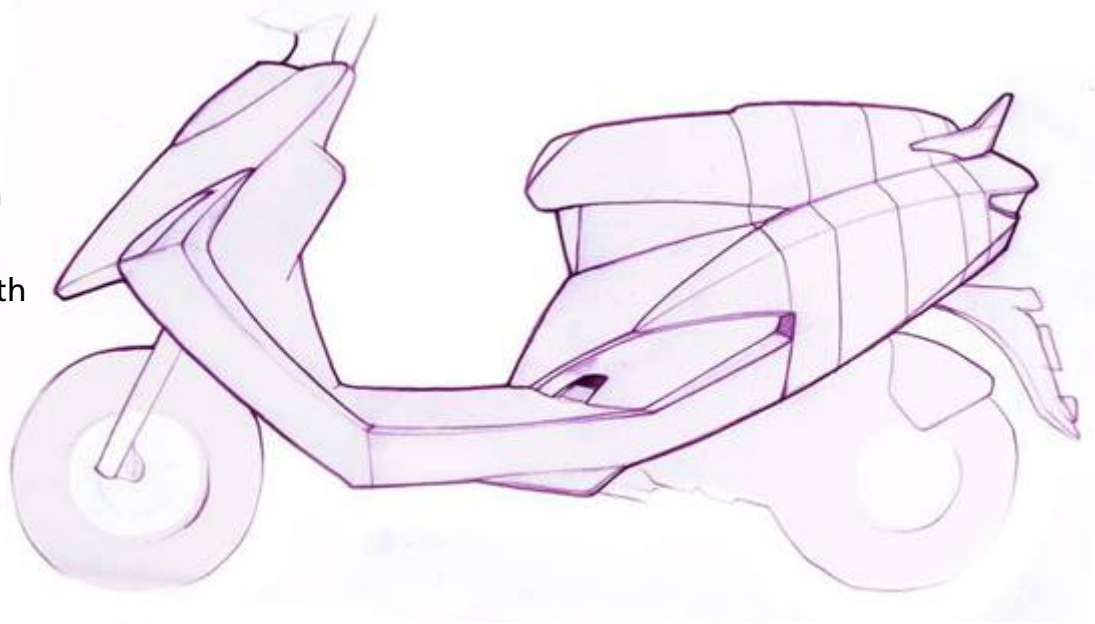
Pillion handles are minimal and independent to make it look stronger and contained within the form

Introduction of the fender can bring out many possibilities

8.1 MUSCULAR / ROBUST EXPRESSION

Shortening the nose to give it a charging stance with a strength or robust nature in expressions

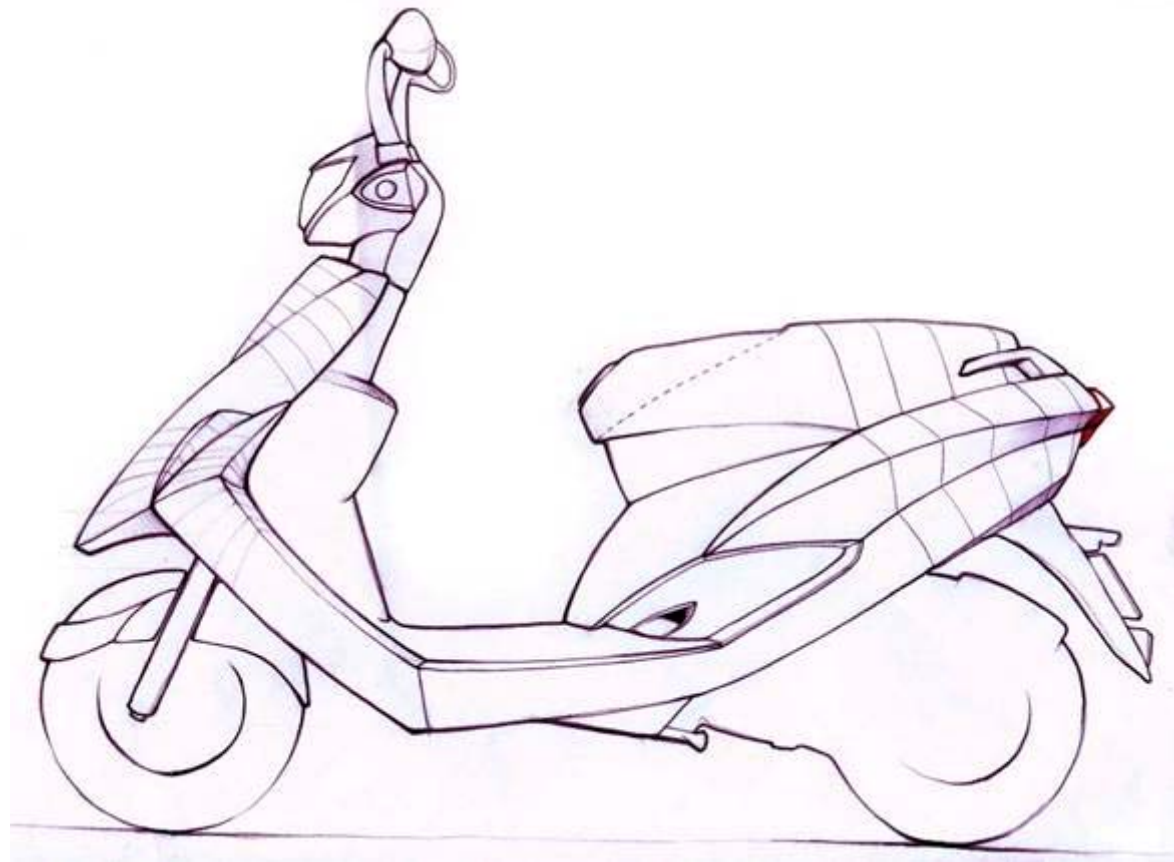
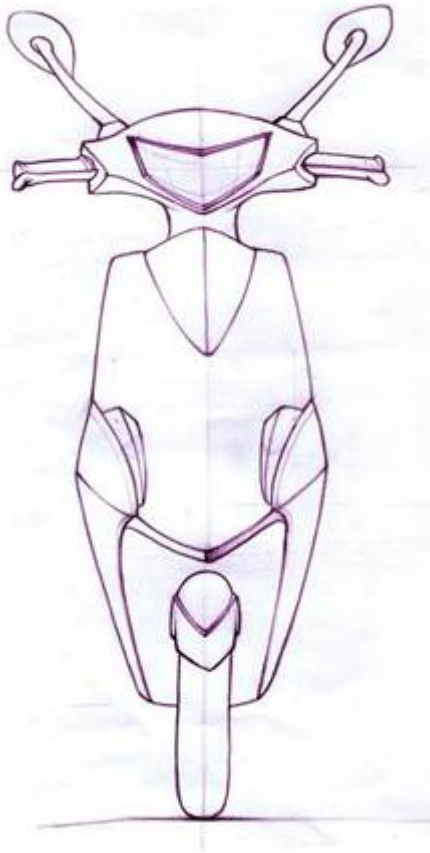
The arms would need to cater to the norms of the width of the existing vehicle.



Variations in the cut out for graphic details

Seat profile altered to make it look muscular – however the slope provided is not feasible.

8.1 MUSCULAR / ROBUST EXPRESSION



Pinch in the waistline to enhance muscle

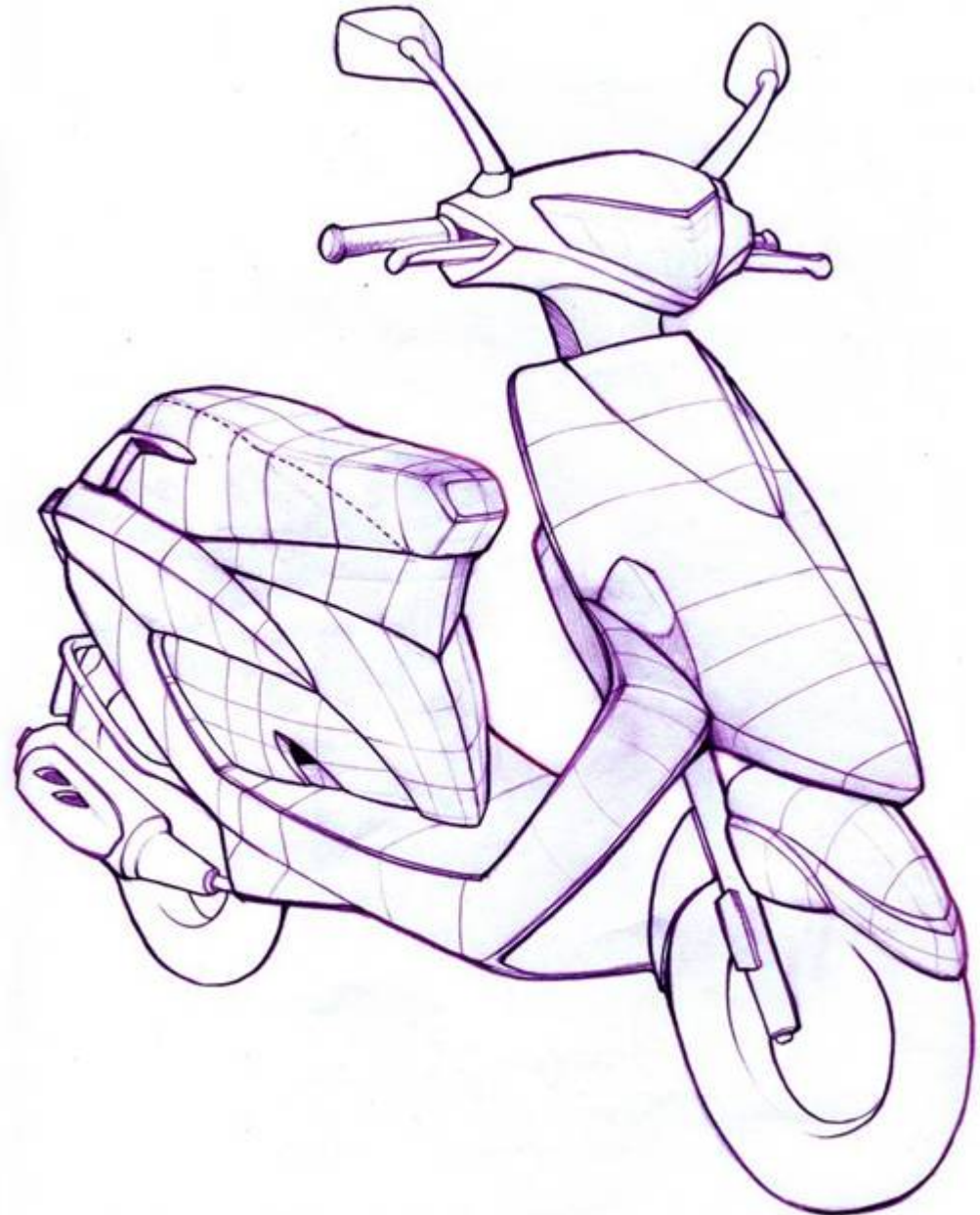
Strong arms on either side to enhance sinewy expression

8.1 MUSCULAR / ROBUST EXPRESSION

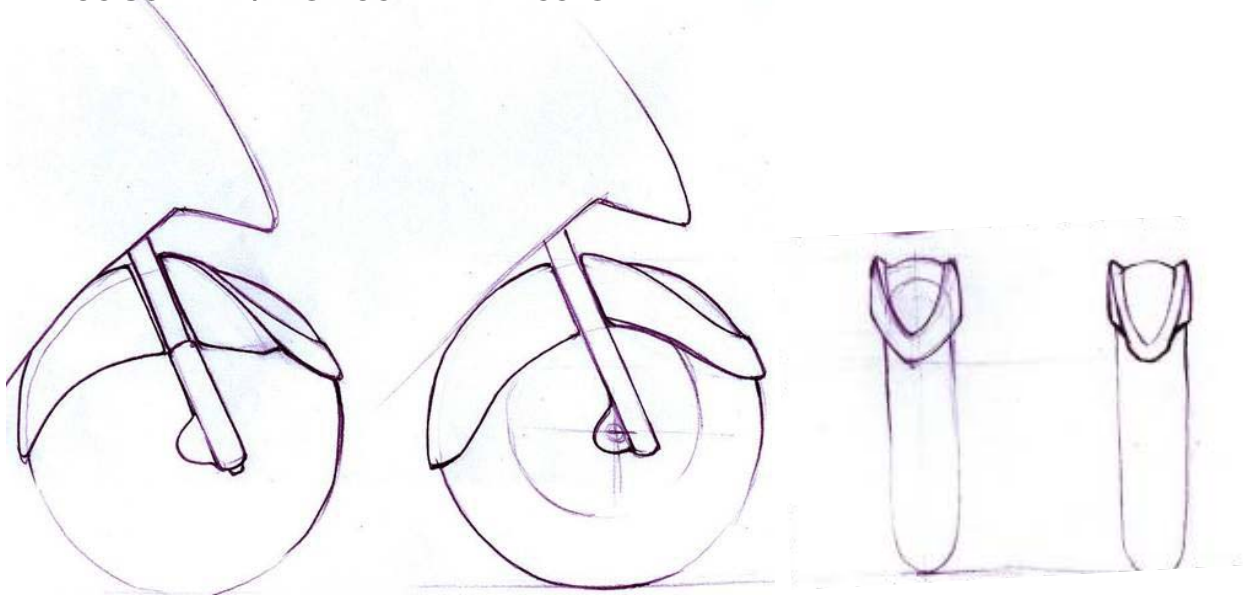


Inspired from muscular arms and claws of a crab

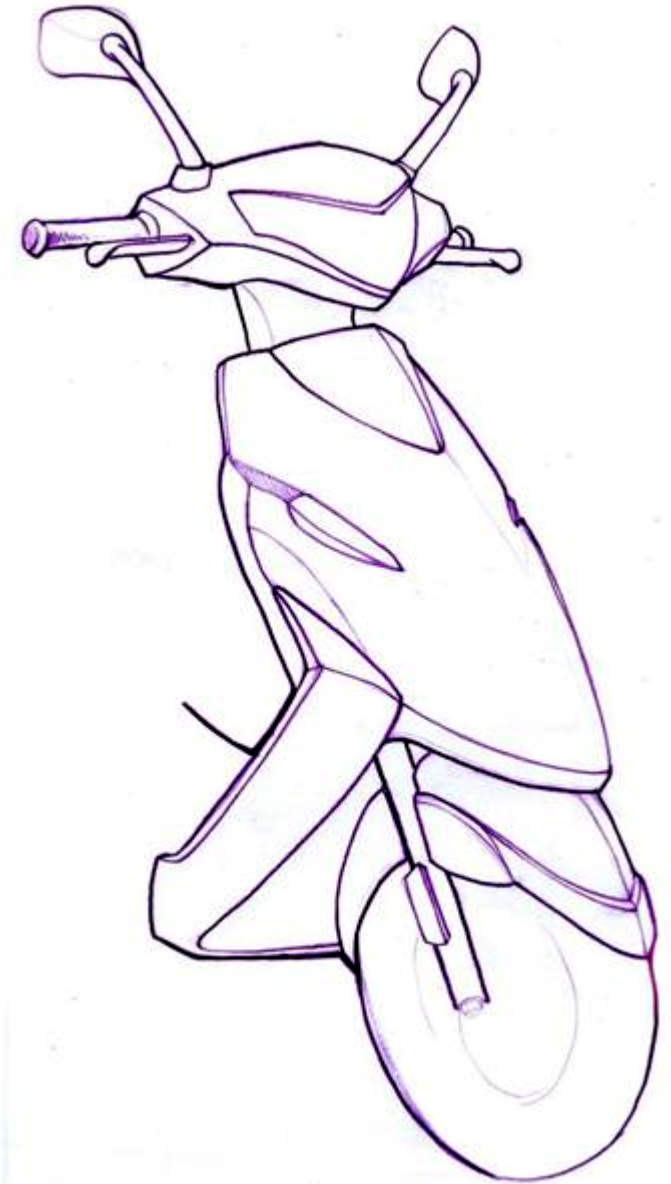
Side indicators are not coherent with the language of the front cowl



8.1 MUSCULAR / ROBUST EXPRESSION

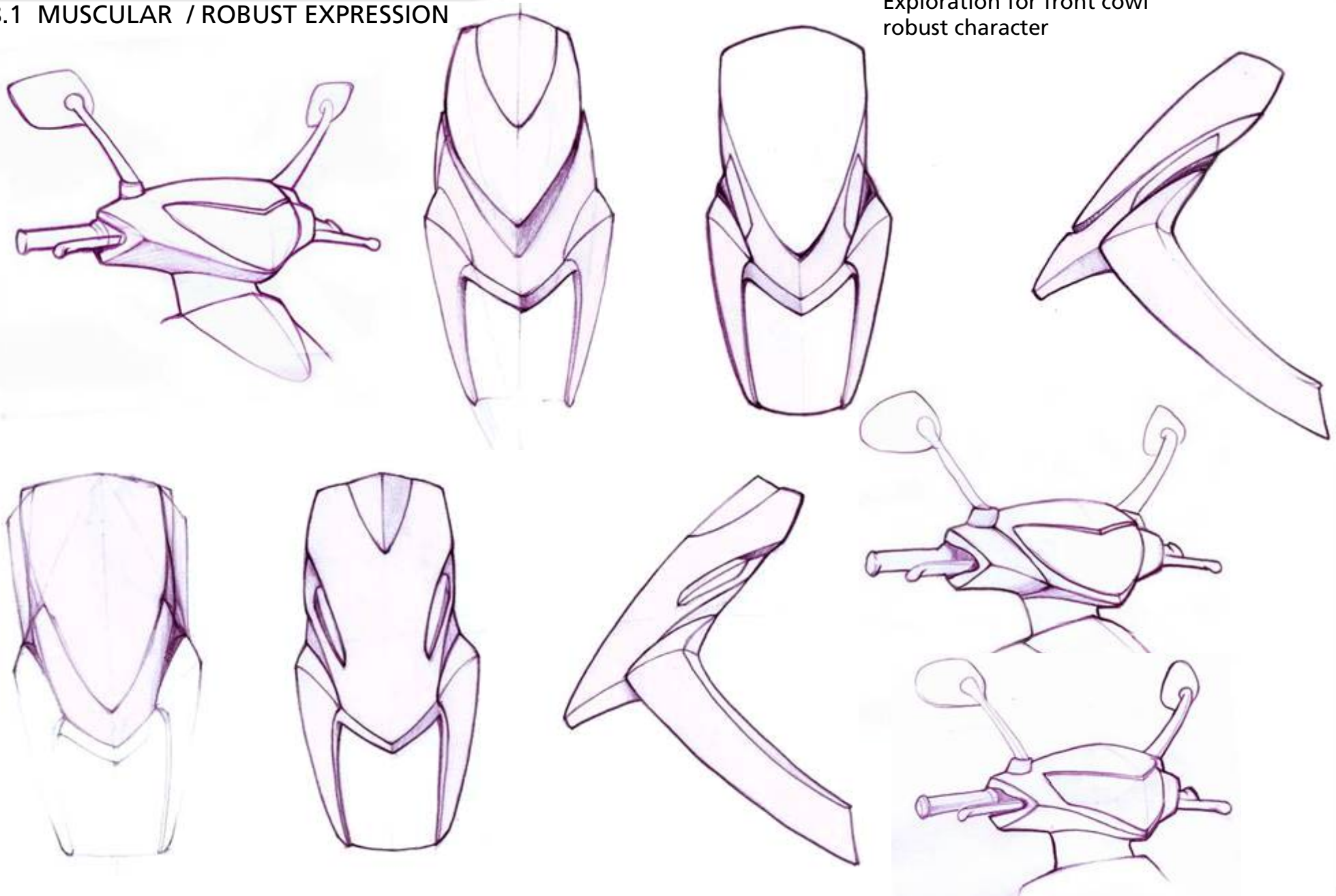


Exploration for fender element
to look robust / strong / non-
fragile

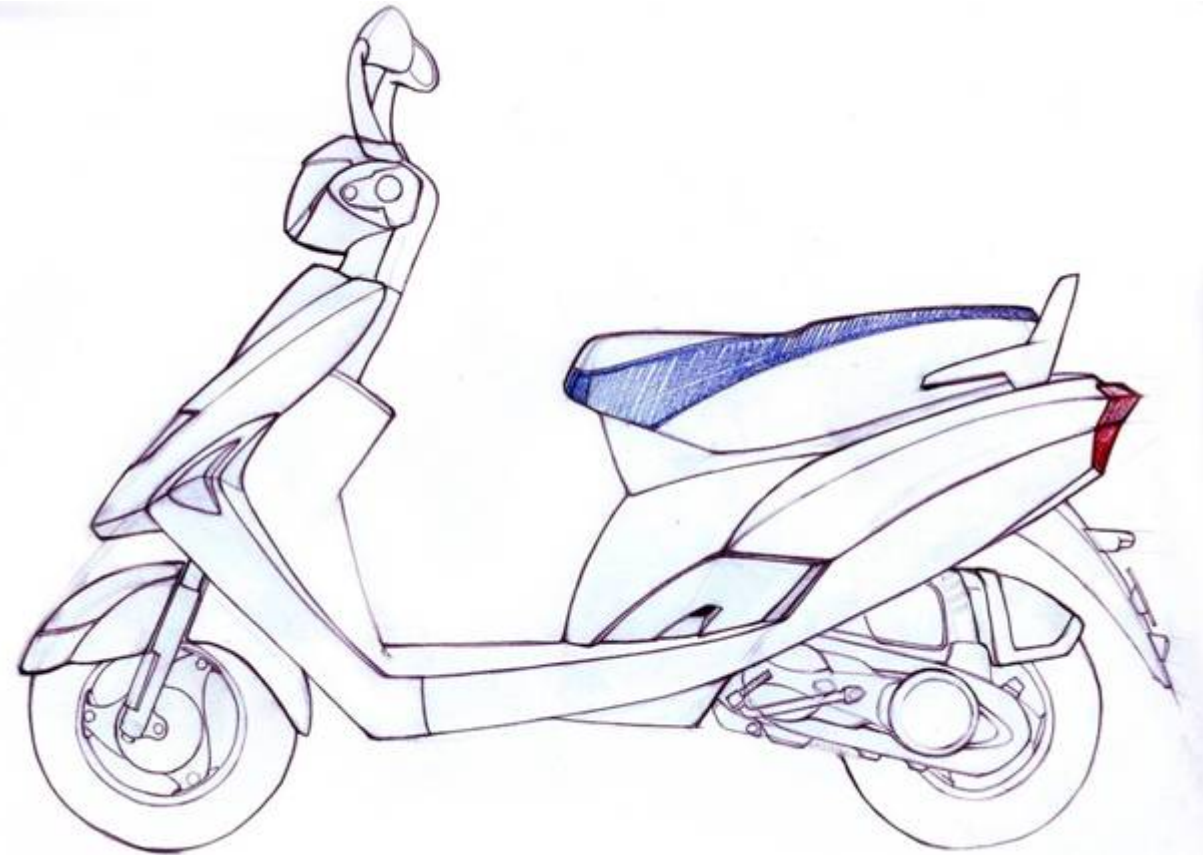
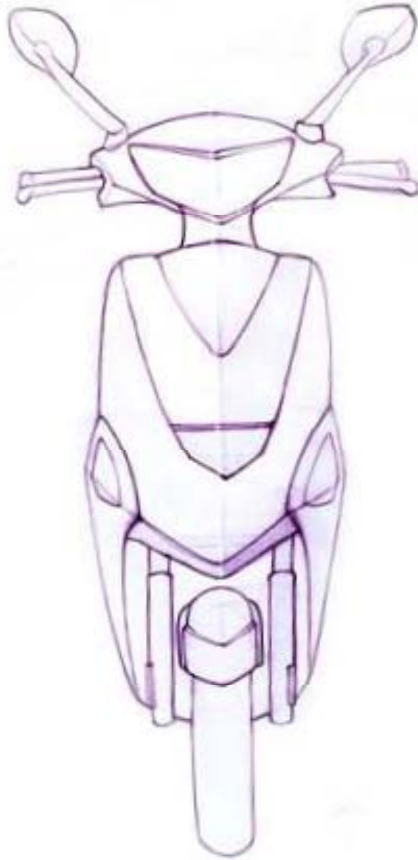


8.1 MUSCULAR / ROBUST EXPRESSION

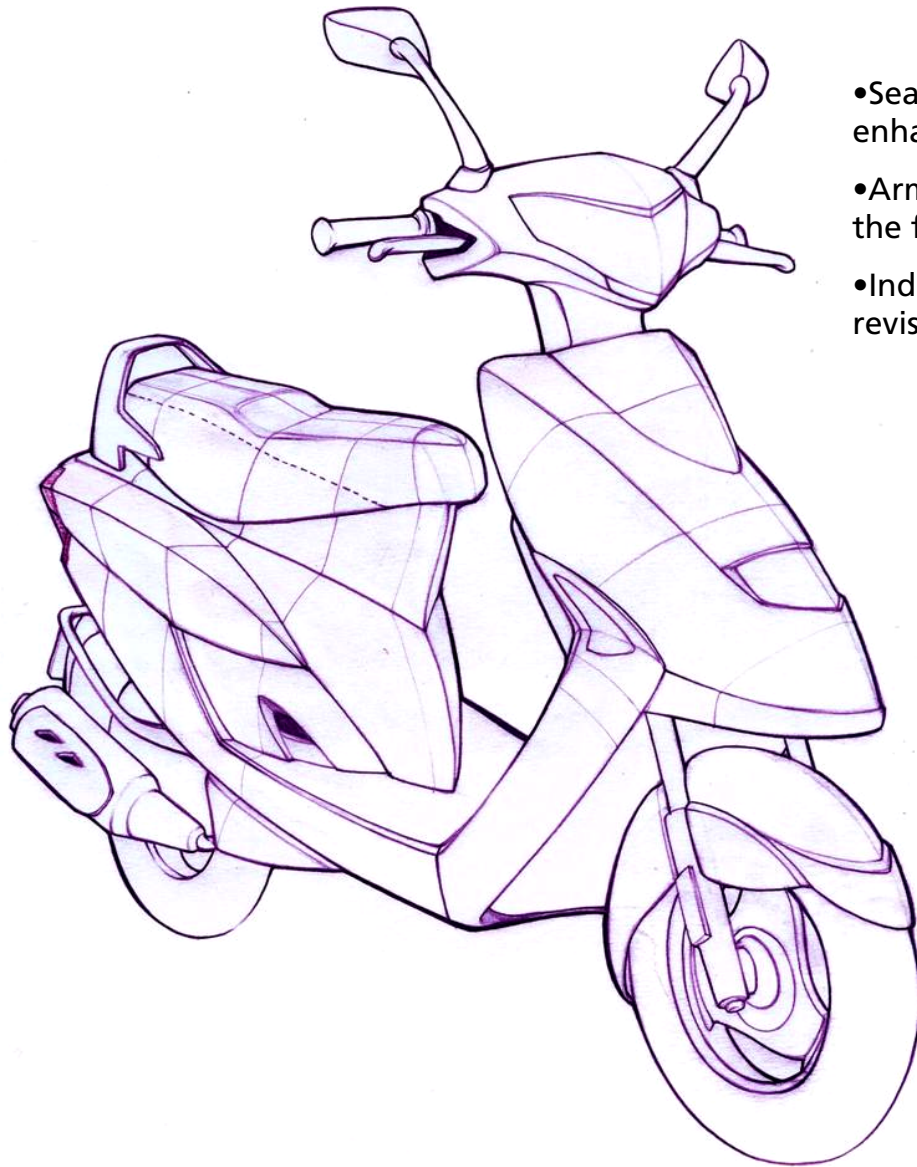
Exploration for front cowl
robust character



8.1 MUSCULAR / ROBUST EXPRESSION



8.1 MUSCULAR / ROBUST EXPRESSION

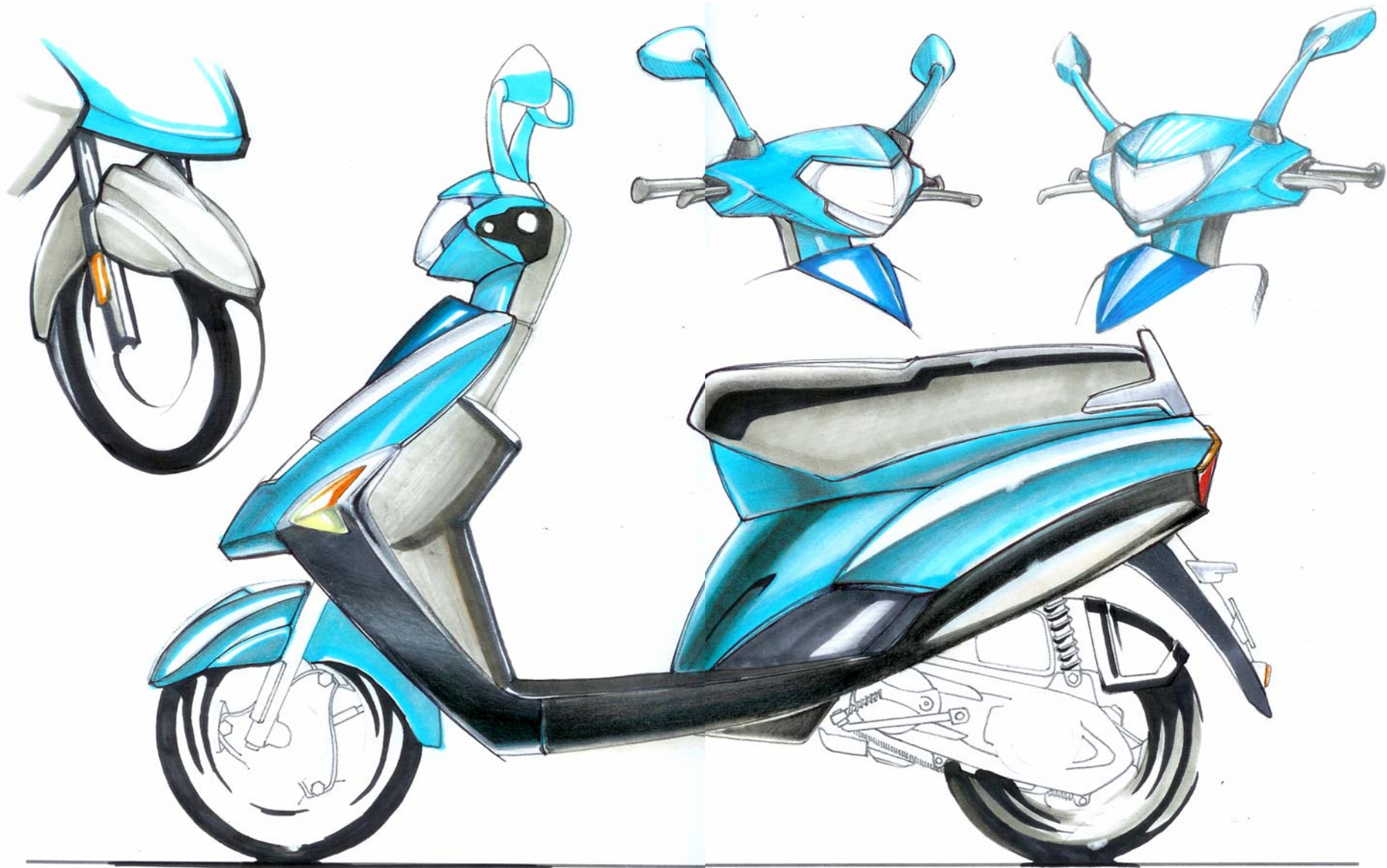


- Seat levels must change to enhance dynamism
- Arms enhance the strength in the form
- Indicator positions could be revised



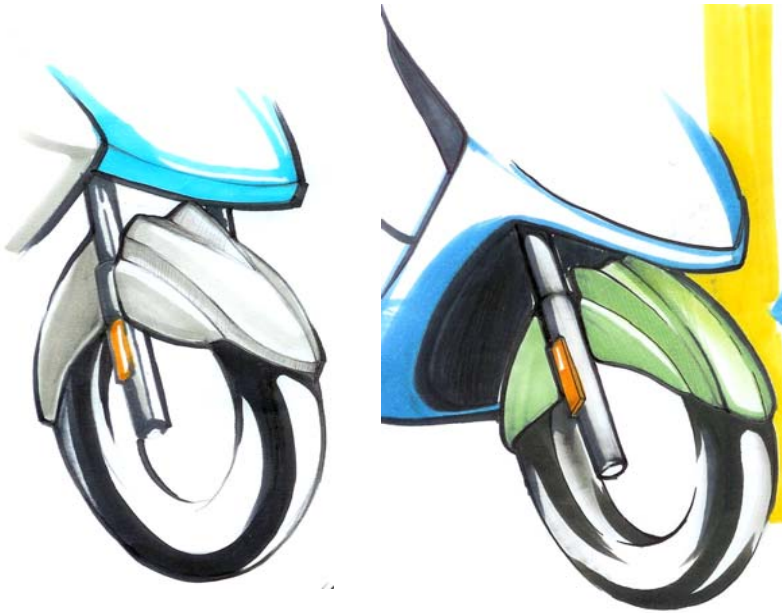
- Solid pillion handle to go with the similar expression and a bulky rear ; however stance is too static

8.1 MUSCULAR / ROBUST EXPRESSION

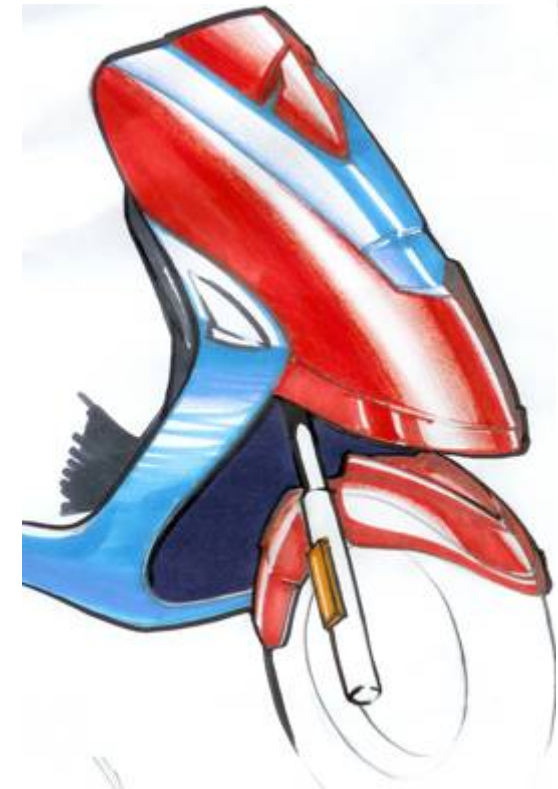


Proportions of muscle in panel is critical; aggressive headlamp explorations to look strong / charging character

8.1 MUSCULAR / ROBUST EXPRESSION



Explorations for fender element

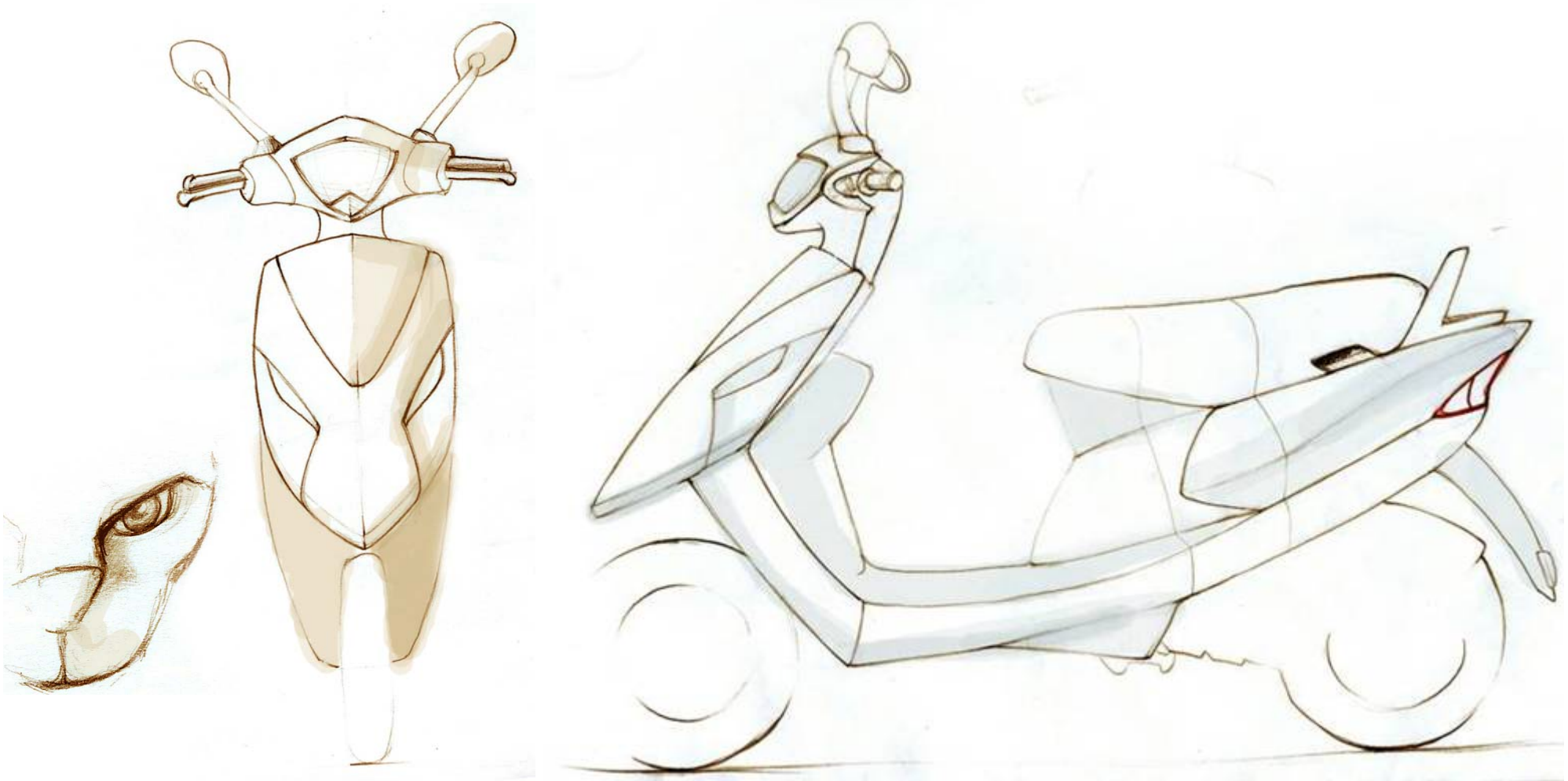


8.1 MUSCULAR / ROBUST EXPRESSION



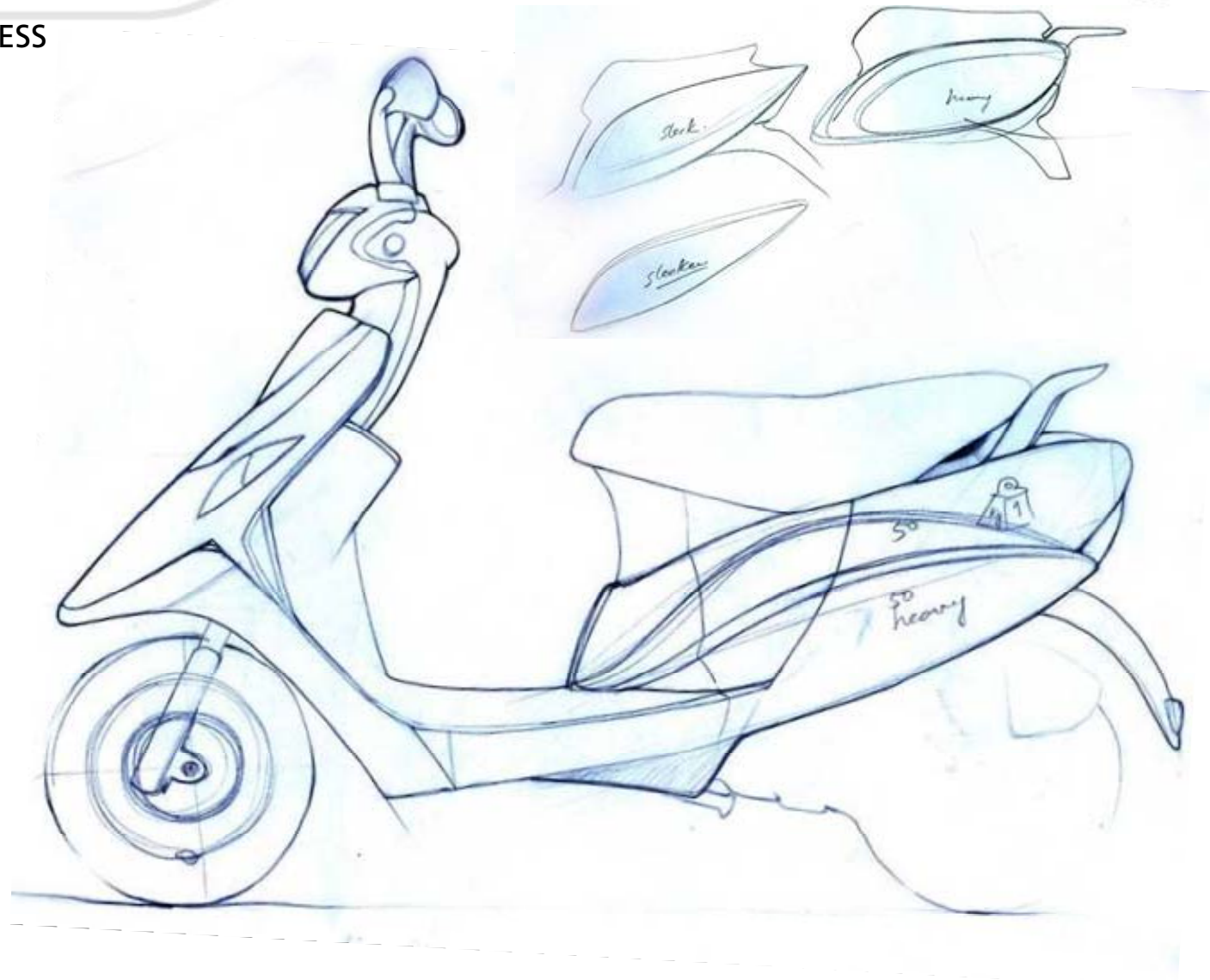
Final concept chosen for this direction

8.2 AERODYNAMIC / SHARPNESS



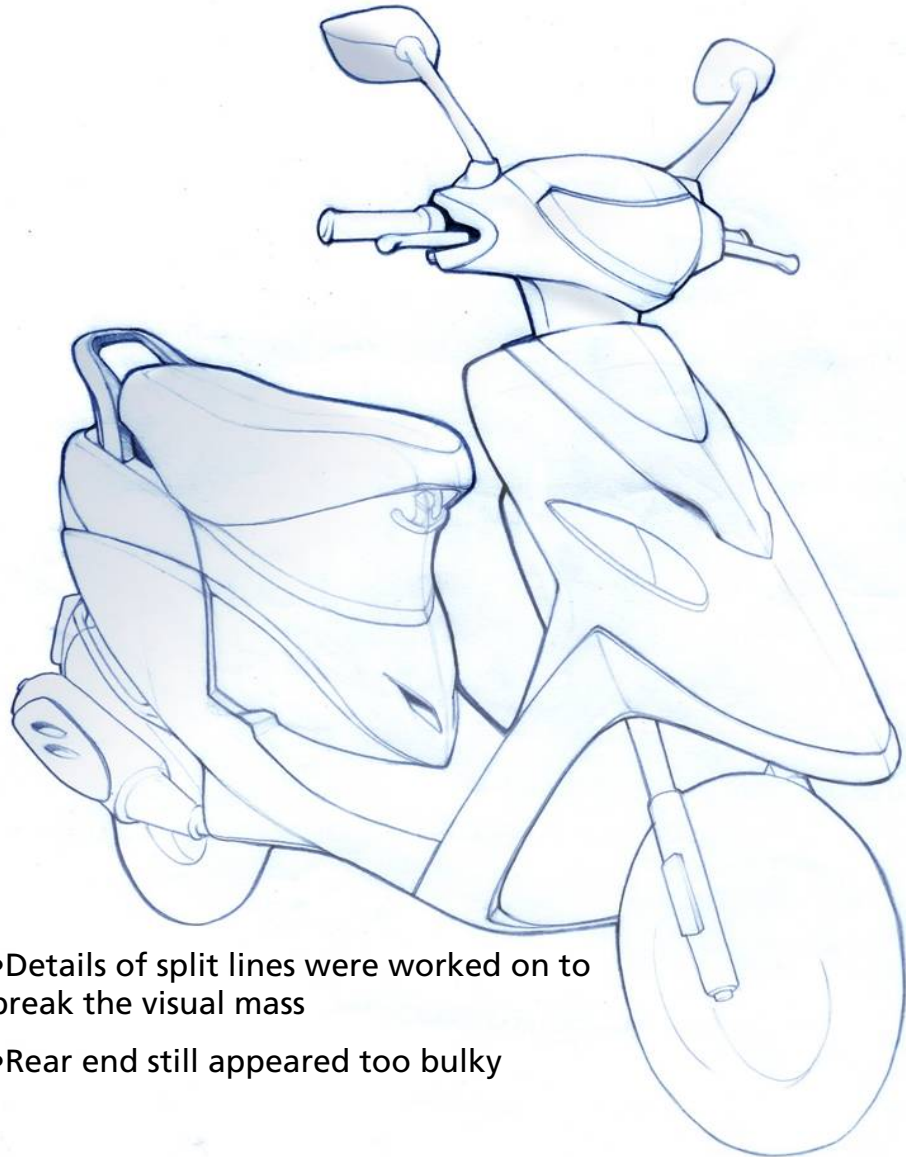
- Chosen concept to work on for further development
- Essence of aggressiveness taken into the sharpness expression

8.2 AERODYNAMIC / SHARPNESS



- Deciding on the visual weight expressed in the rear end
- Side indicators must improve – not coherent

8.2 AERODYNAMIC / SHARPNESS

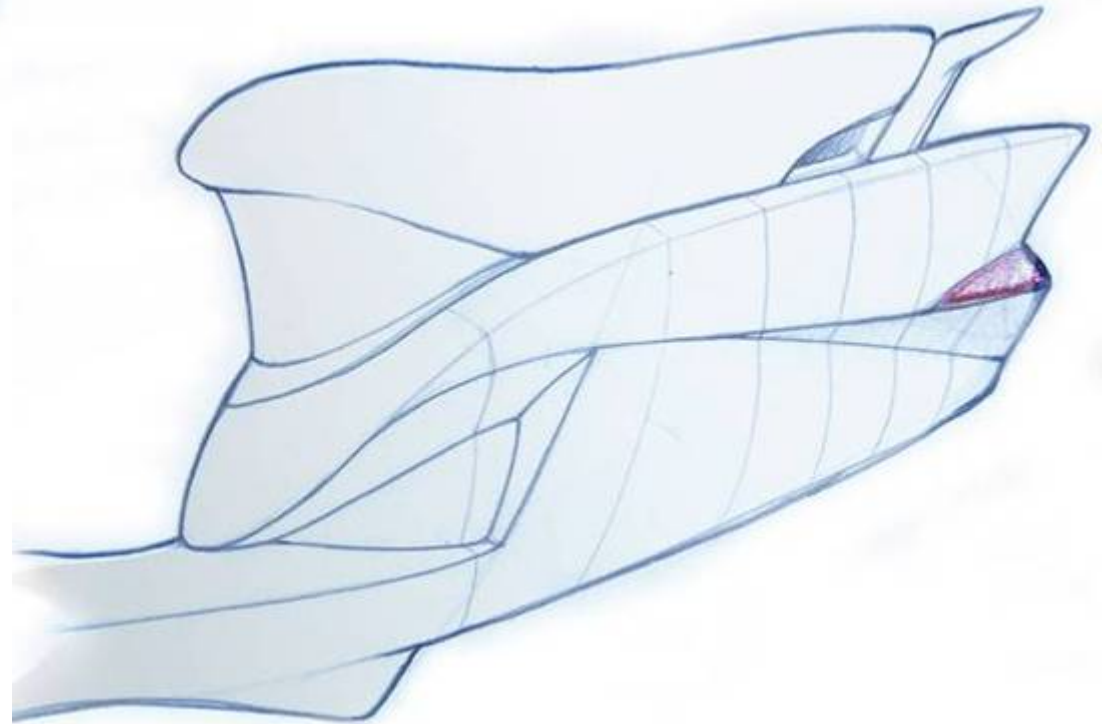
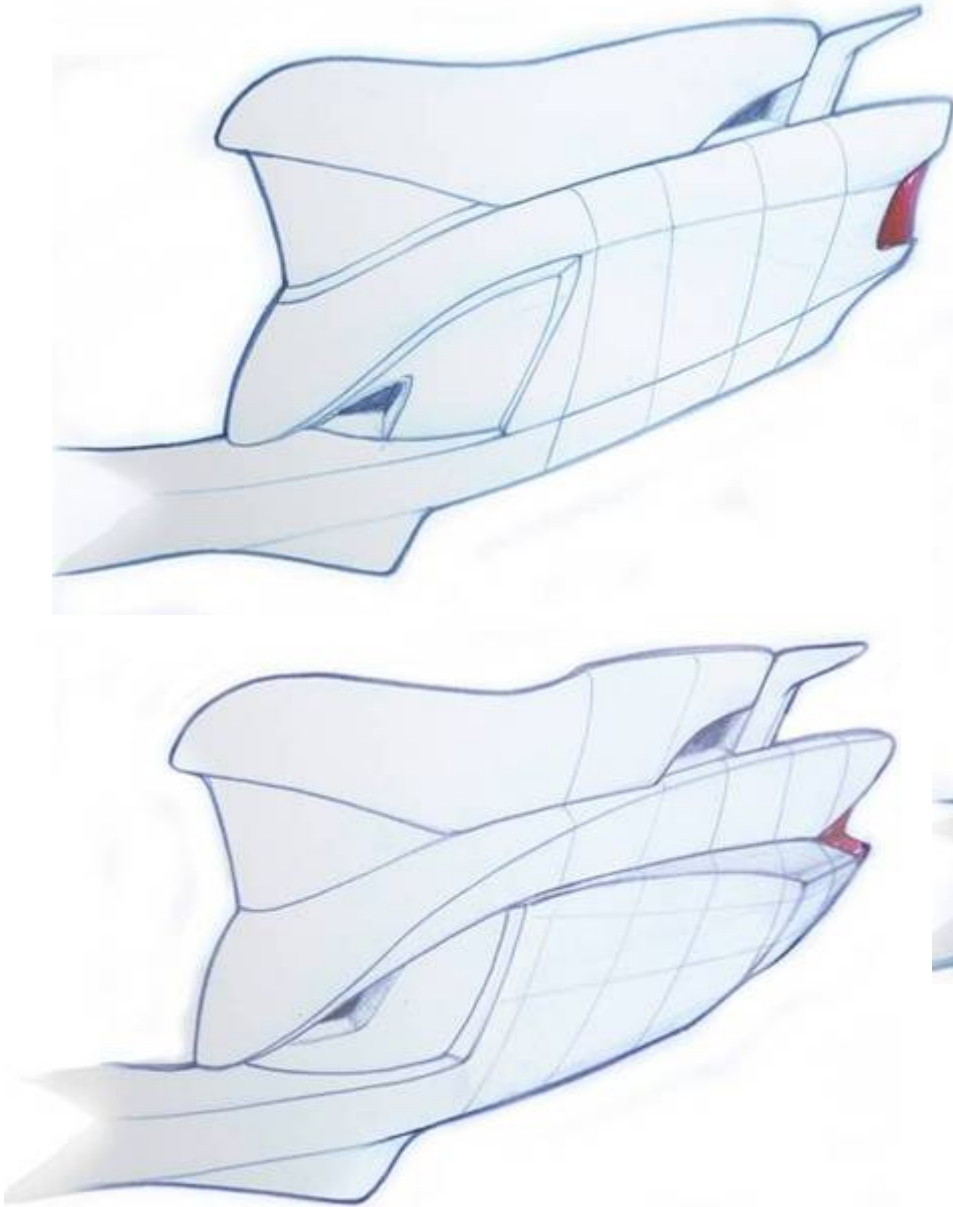


- Details of split lines were worked on to break the visual mass
- Rear end still appeared too bulky

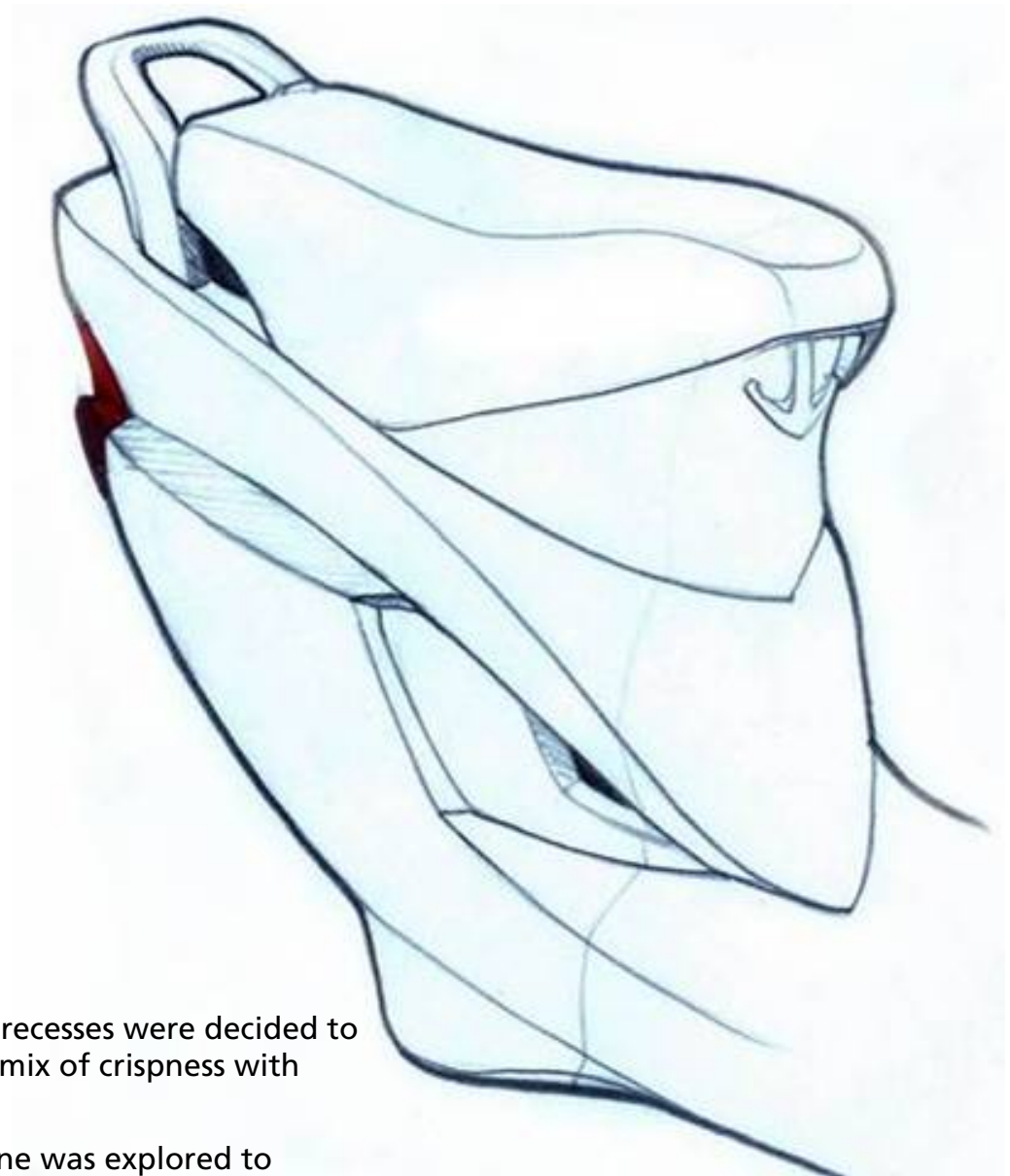
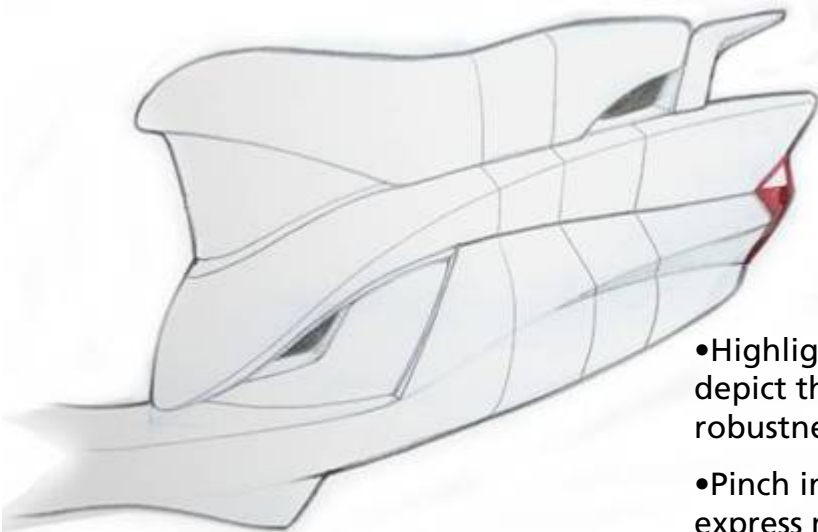
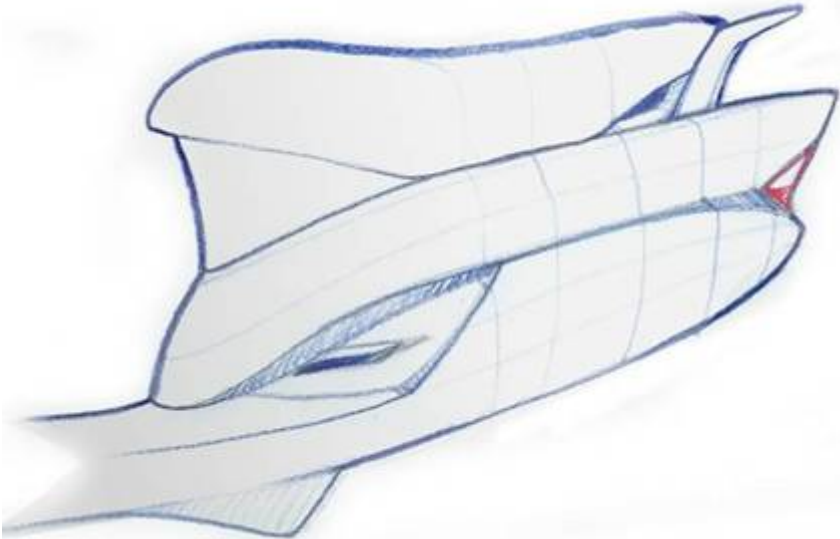


8.2 AERODYNAMIC / SHARPNESS

- Developments in the rear end and side cowl to pull out muscles
- Proportions of each panel were very critical

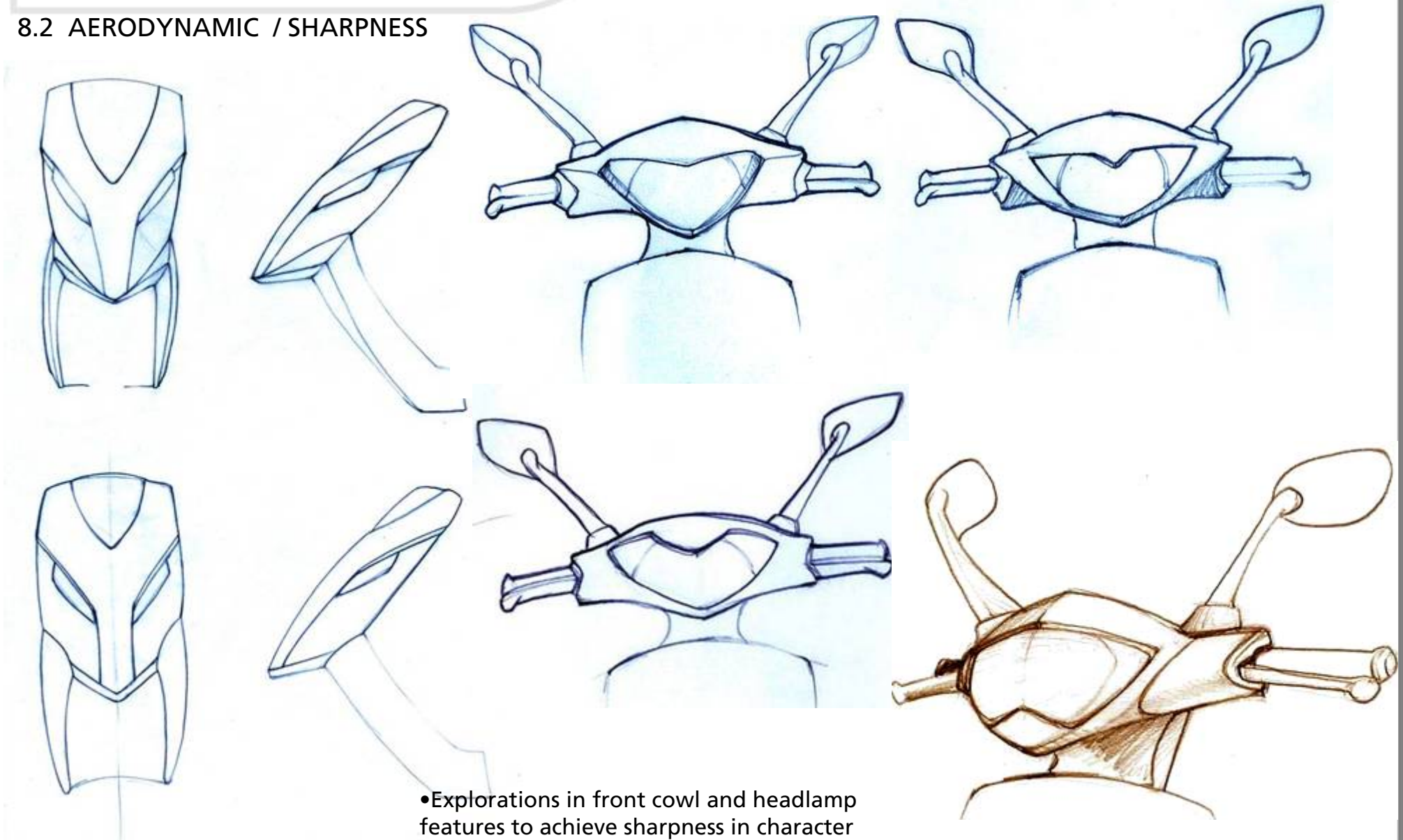


8.2 AERODYNAMIC / SHARPNESS

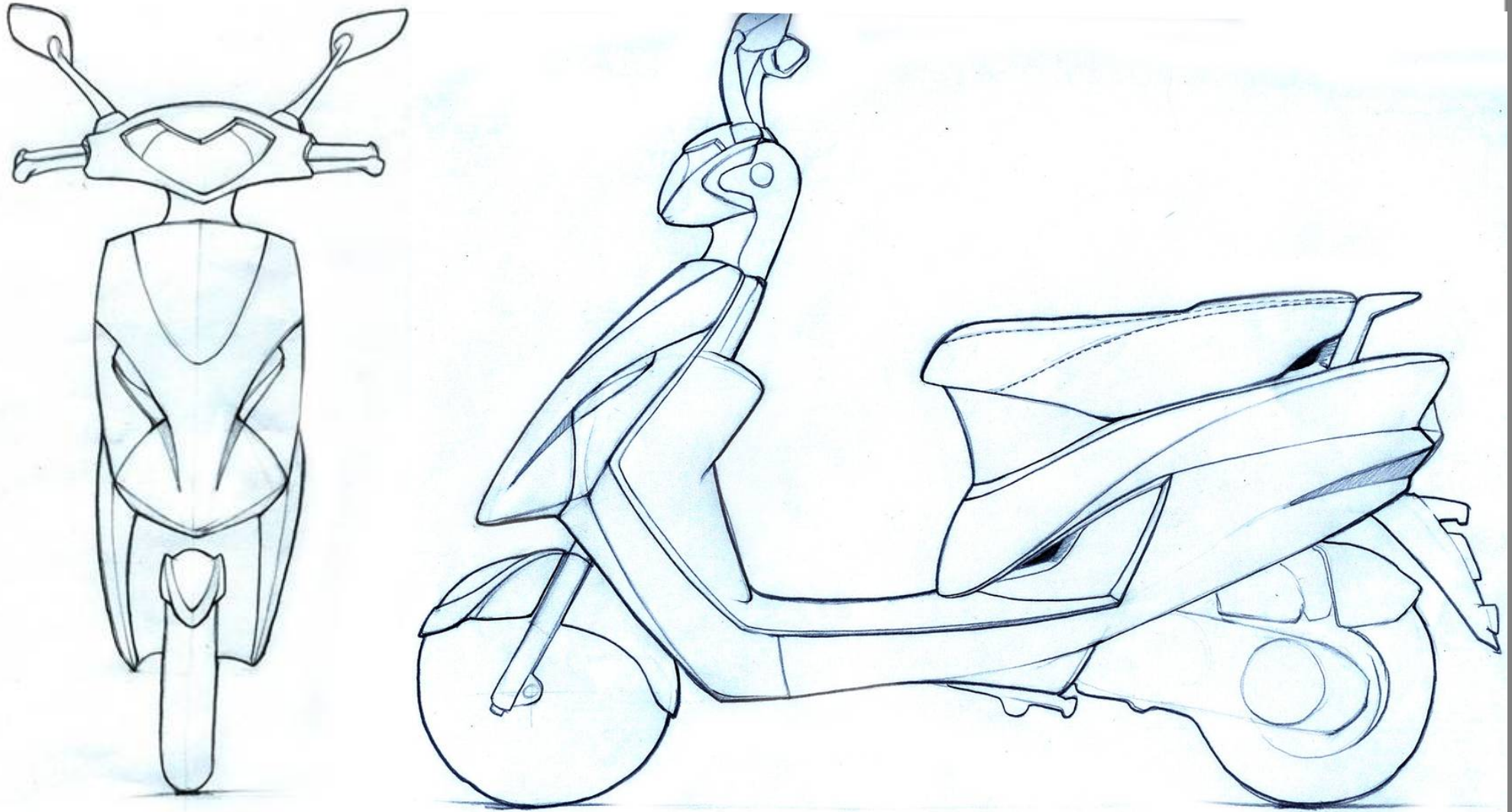


- Highlights and recesses were decided to depict the right mix of crispness with robustness
- Pinch in waistline was explored to express muscle

8.2 AERODYNAMIC / SHARPNESS

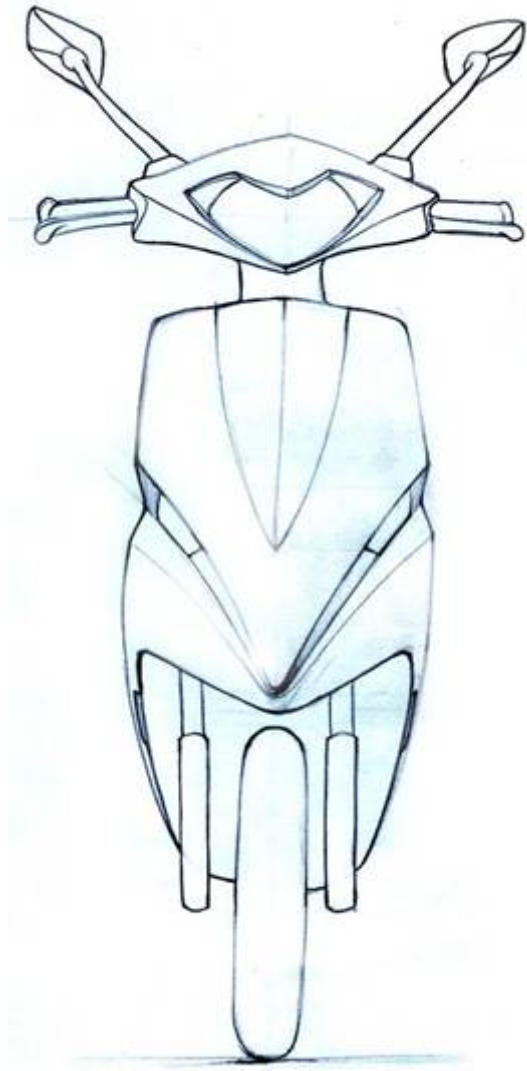


8.2 AERODYNAMIC / SHARPNESS



- Front cowl appears too bulky, the jaw line is visually disturbing
- Degree of convex curves should be critical

8.2 AERODYNAMIC / SHARPNESS



- Front cowl appears too narrow, the jaw line is visually disturbing
- Degree of convex curves should be critical
- Large swooping curves in side cowl – not feasible
- Detailing in front cowl panels is crude

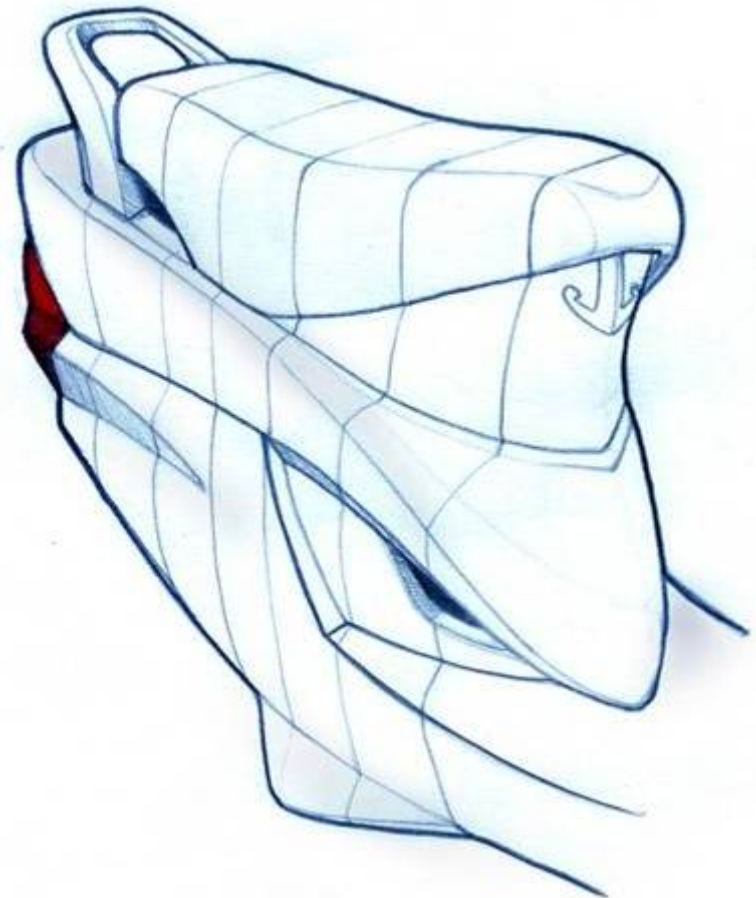
8.2 AERODYNAMIC / SHARPNESS



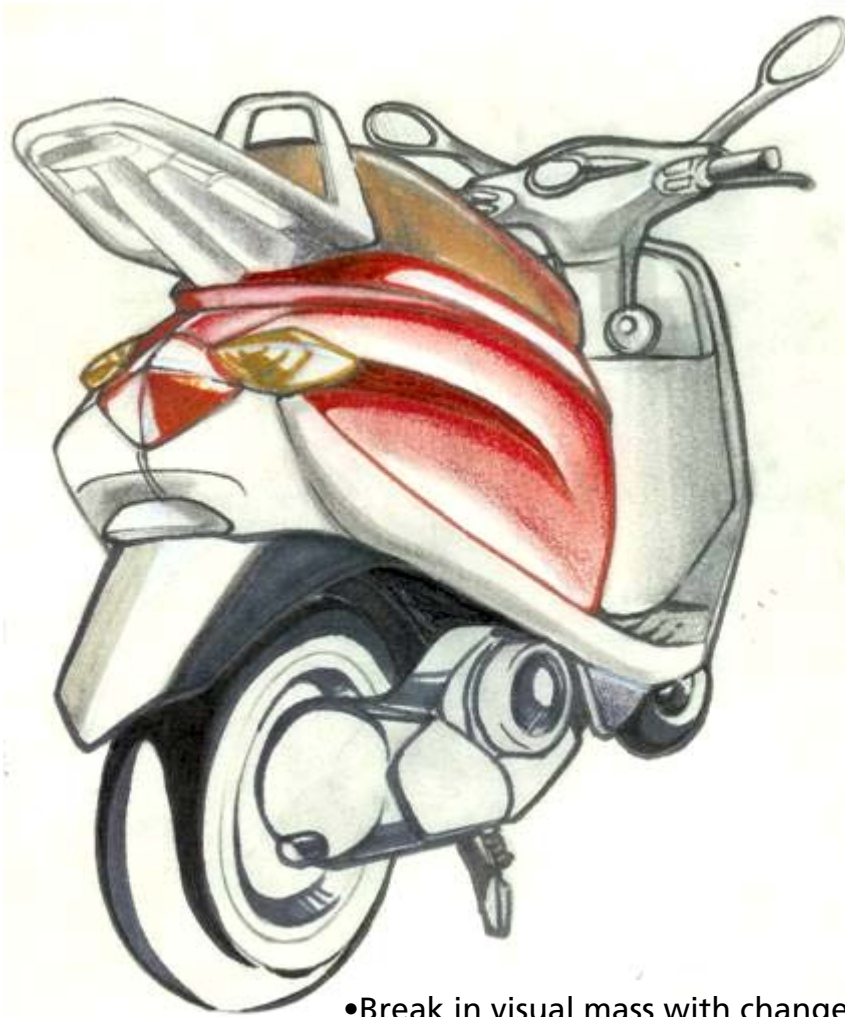
- Side indicators are successful in aggressive expressions
- Front cowl looks stubby owing to negative split lines



- Rear end lifted to give higher stance
- This led to a change in the length of the vehicle making it longer

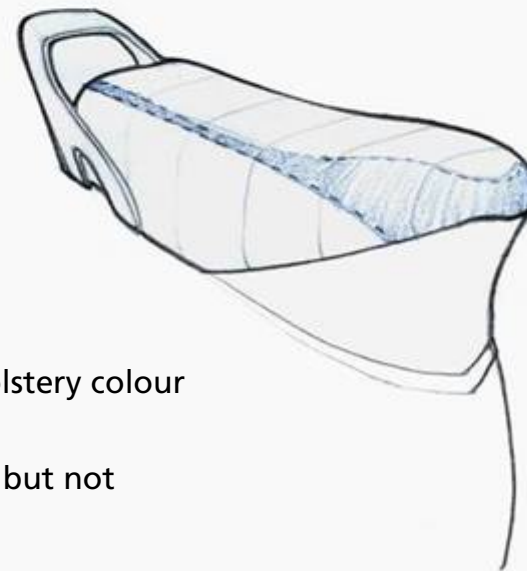
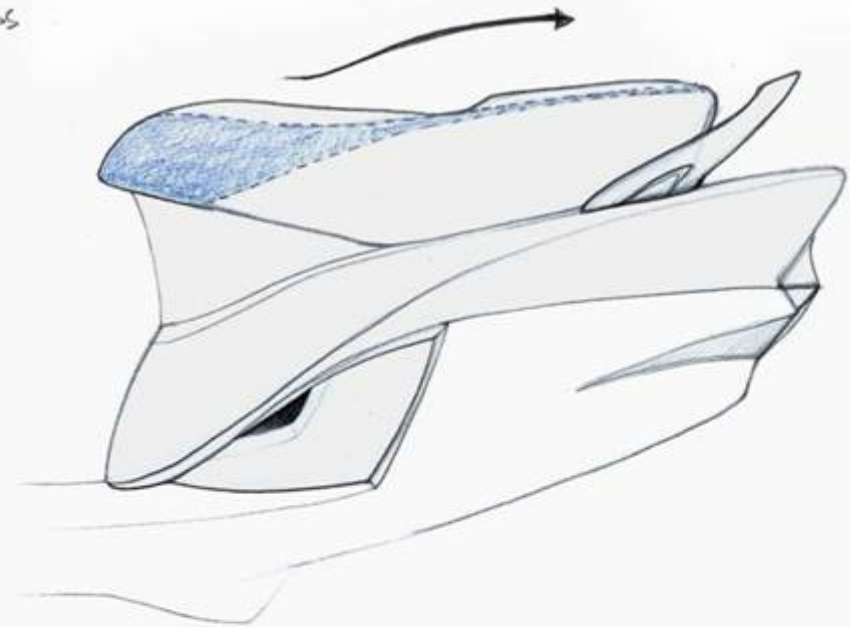


8.2 AERODYNAMIC / SHARPNESS

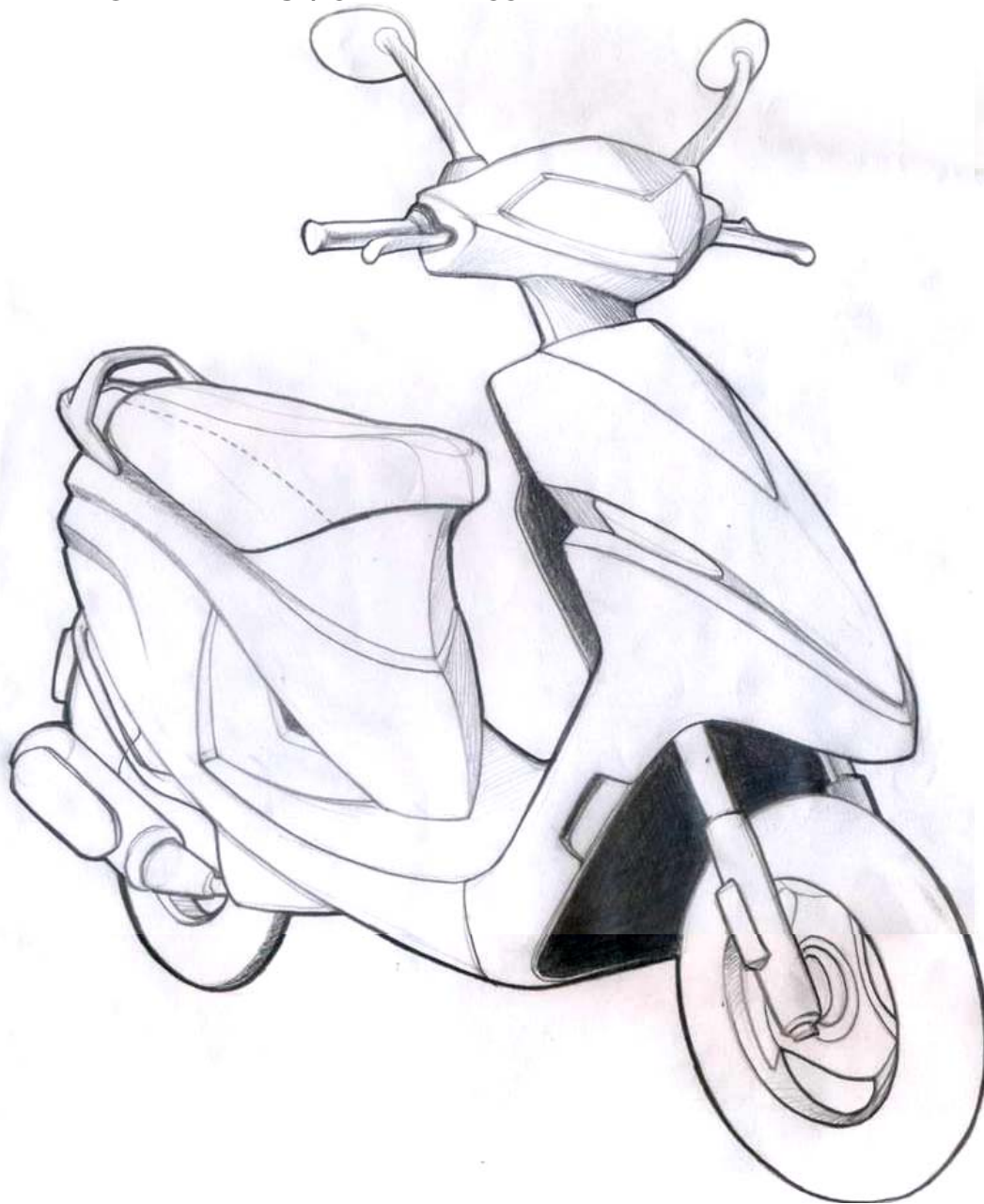


- Break in visual mass with change in upholstery colour in seat
- The rear indicators are pointed elements but not coherent with bulky rear

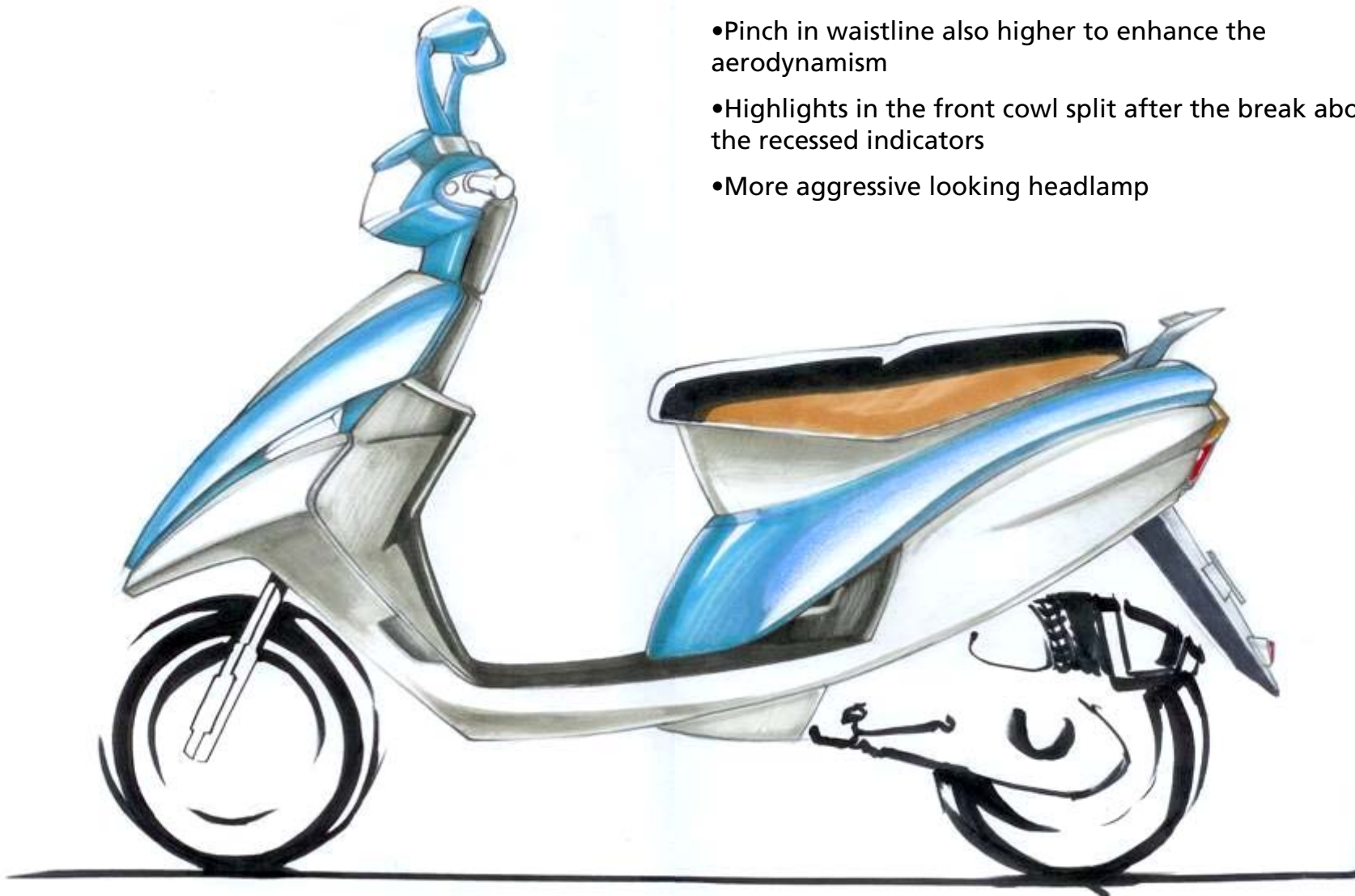
BREAK IN
SEAT MASS
↓
FOLLOWS
SIMILAR FLOW
LINES
↓
DISTRACTS
FROM NEGATIVE
DIRECTION
FLOW LINES



8.2 AERODYNAMIC / SHARPNESS



8.2 AERODYNAMIC / SHARPNESS



- Rear end lifted to give higher stance
- Pinch in waistline also higher to enhance the aerodynamism
- Highlights in the front cowl split after the break above the recessed indicators
- More aggressive looking headlamp

8.2 AERODYNAMIC / SHARPNESS



Final concept chosen for this direction



chapter nine

CONCEPT SELECTION



Out of the two concepts one had to be selected for the final proposal. For this a critical appraisal of the form of Scooty was done to evaluate which of the two was better in terms of a **REFRESH DESIGN**.

9.1 CRITICAL APPRAISAL OF SCOOTY

- Feminine looks with soft quality of surface which makes it very bulbous and curvaceous; although the present trend as per user demand towards a crisper look
- Tapered nose and the neck element are the characteristic features of the Scooty stance
- Colors and decals are a part of the trendy nature of Scooty Pep
- The width (430mm) renders a quality of lightness and sleekness to the vehicle



Typical **colour splits** in front cowl to break visual monotony.

A very characteristic **highlight** in front partly obstructed by indicator

Too many **surface transitions** causing break in visual continuity



Happy looking headlamp unit

Better **detailing with the water-tight joints** could have avoided the evident surface breaks

Thick supports for the **mirrors** impart a heavy look



Recessed **shoulder** gives a characteristic stance.

Step through is longer than most vehicles and curvaceous



The **tapered nose** reduces the bulk of the body.

The flow lines of the nose are **incoherent** with the rest of the styling flow lines.

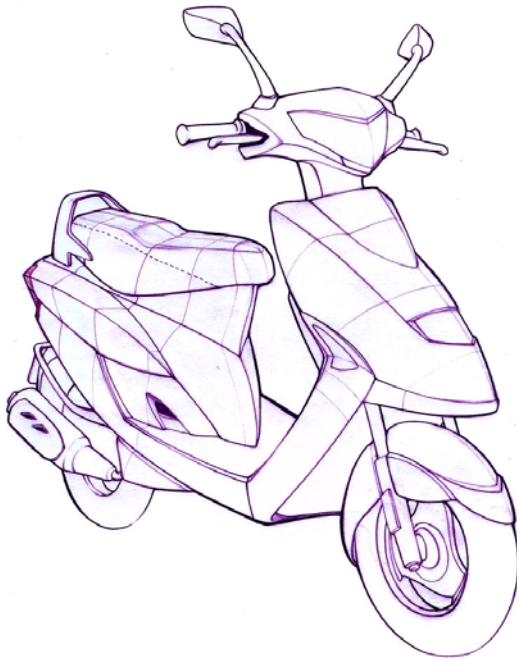
Nose is so positioned that the driver hardly sees the wheel turning.



Rear half appears too **bulky** for the front half.

The tail lamp is a derivative of flow lines of the rear and is very **curvaceous** and gels with the **language of the rear end**

Bulkiness of the **seat** is complementing the bulk of the rear half of Scooty. This enhances mass at rear.



CONCEPT 1
MUSCULAR / ROBUSTNESS



• POSITIVE FEATURES:

- Retaining the same number of **panels and colour splits**
- Giving a **higher stance**
- Modified the **seat** to provide a dynamic stance
- **Shortened the nose** to make it look strong
- **Tight convex curves** to make it look aggressive
- Providing a **crisp look** to the styling design

• DRAWBACKS:

- Addition of the **fender breaks the identity** of the Scooty, although it gives it a robust character
- The **pillion handle** appears to **stubby**
- The grey appears too little in proportion, making the **rear end bulky**



CONCEPT 2
AERODYNAMIC / SHARPNESS



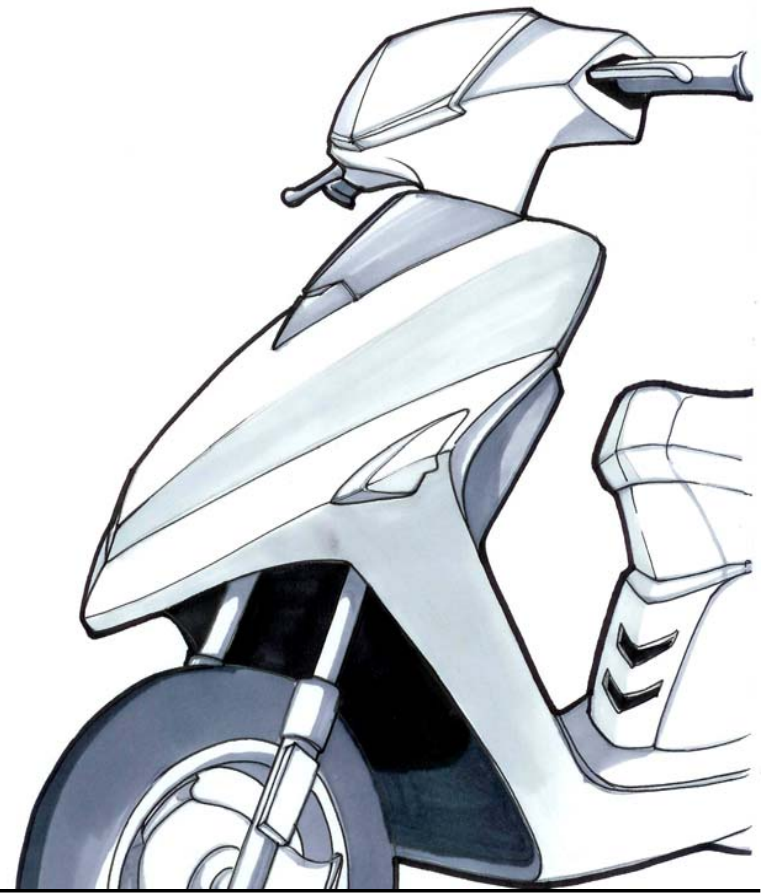
• POSITIVE FEATURES:

- Retaining the same number of **panels and colour splits**
- **Aggressive** looking headlamp
- Flow lines are **coherent**

• DRAWBACKS:

- Styling is too close to the existing model – **not evolved enough**
- **Rear** still appears **bulky**
- No change in the **seat** makes it look **static**
- Large swooping surfaces that require a **visual break**
- Form still appears to be **sleek** like the existing model

CONCEPT 1 was selected and was taken ahead for further refinement after this stage, owing to better styling cues suited for the refresh design brief. However, a decision was taken to drop the fender element as this would break from the identity of the Scooty Pep Plus.



chapter ten

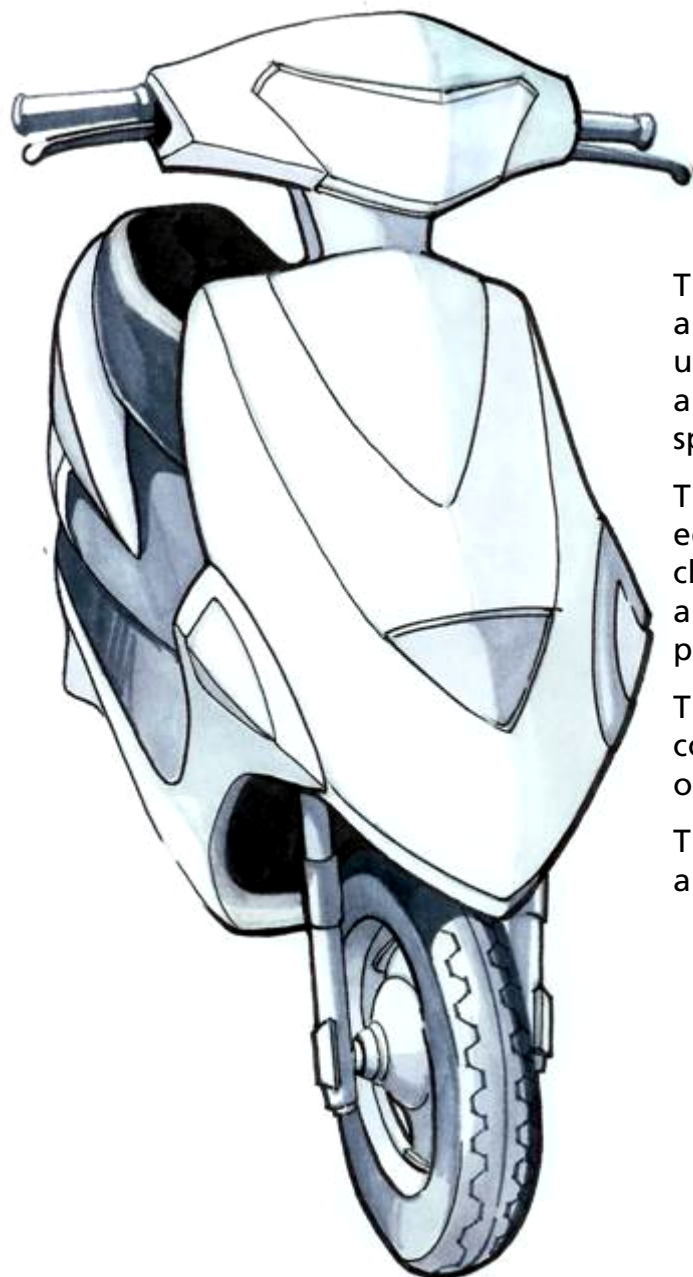
CLAY STYLING

Having decided on the final concept, the process of clay styling helped in evolving refined forms for the final concept with the help of three-dimensional visualisation. Moreover with the addition process involved in making the model. Changes were rather easy to render to check for the appropriate surfaces with many iterations.

For each section of the vehicle atleast three to four iterations were experimented on in styling clay before settling on the final design.

The use of rail curves helped to determine the tightness of the convex curves and changing proportion of one panel to the next were also facilitated.

The following section records the changes that occurred in each stage of clay styling in the form of sketches, owing to restrictions with photo documentation. However, this process had far more immense learning with the back and forth process of creating in 3D and then re-iterating the changes in sketches.

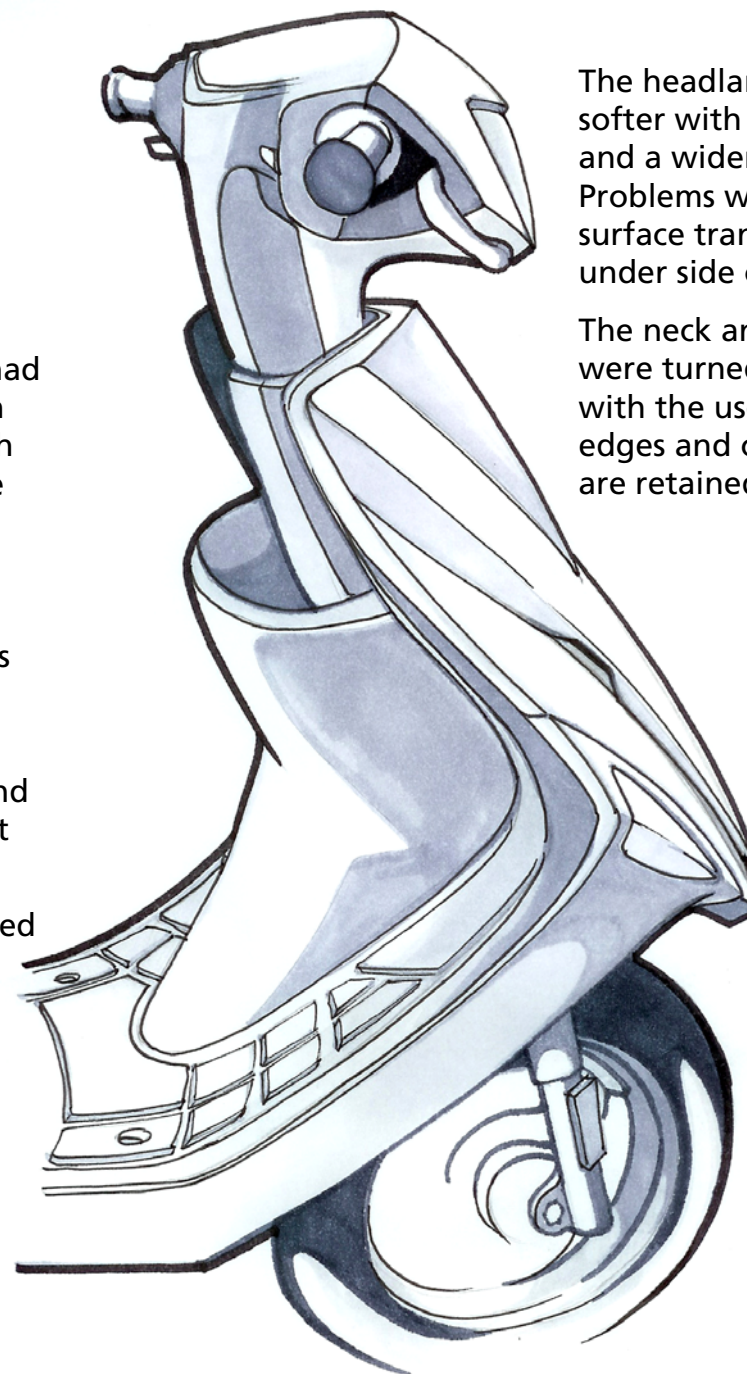


The initial concept had a slightly wider than usual front cowl with arms enveloping the split front panel.

The headlamp was edgy with a defined chin and 6mm ridges along the eared-profile.

The neck was soft and contradicted the rest of the language.

The expressions lacked a sense of crispness



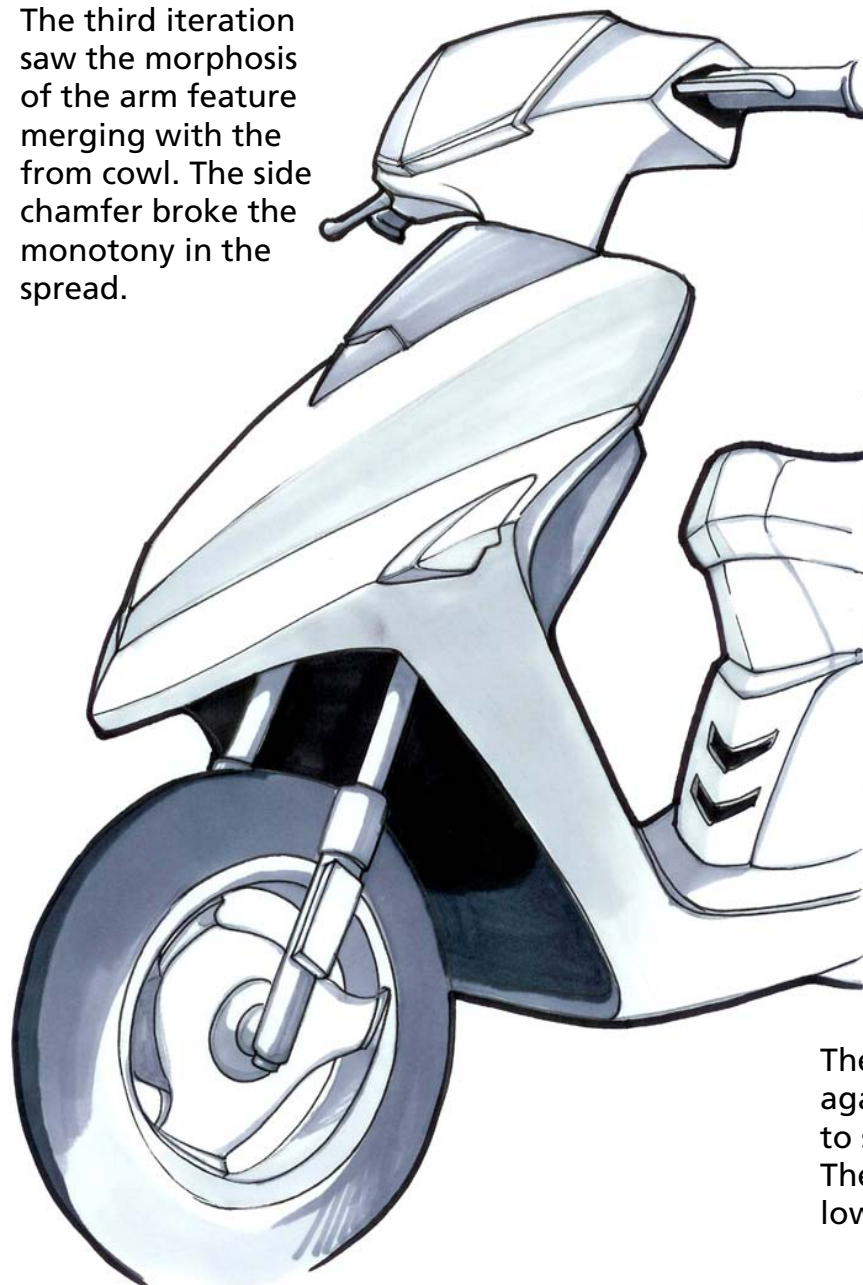
The headlamp was made softer with larger radii and a wider head. Problems were faced in surface transition of under side of headlamp

The neck and front cowl were turned sharper with the use of harsh edges and cut outs. Arms are retained.

CLAY STYLING

153

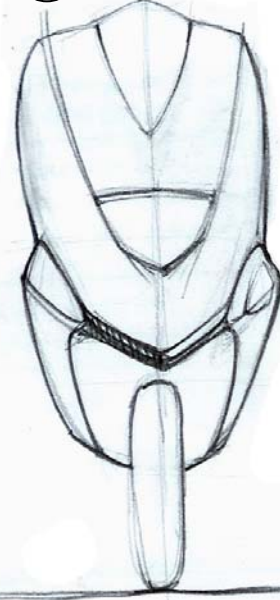
The third iteration saw the morphosis of the arm feature merging with the front cowl. The side chamfer broke the monotony in the spread.



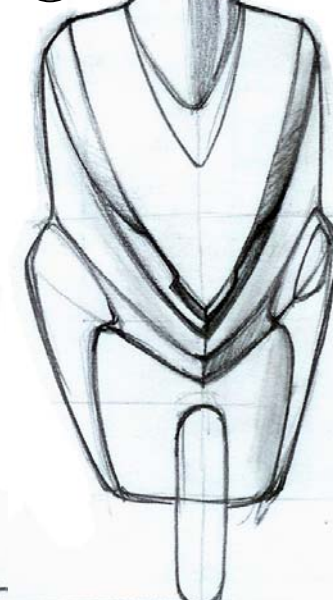
1



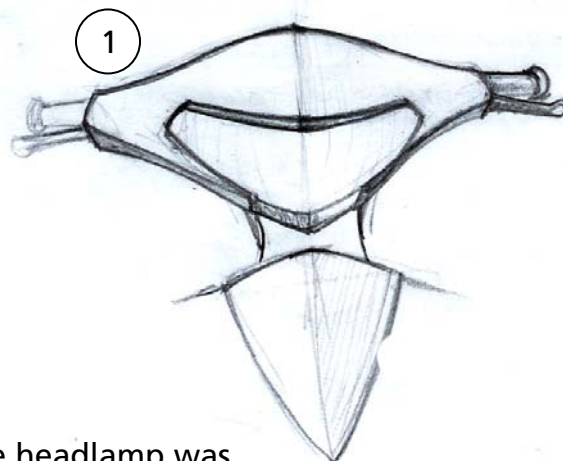
2



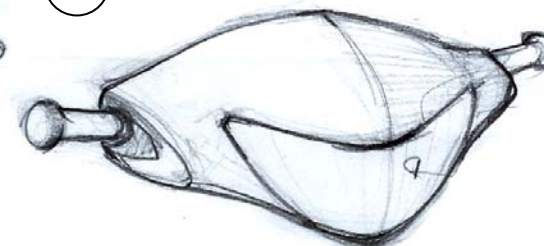
3



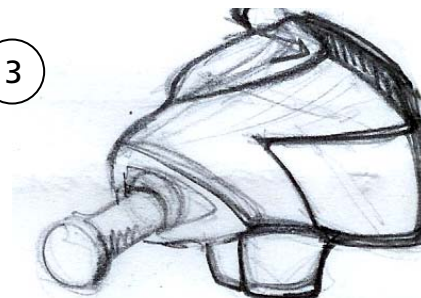
1



2



3



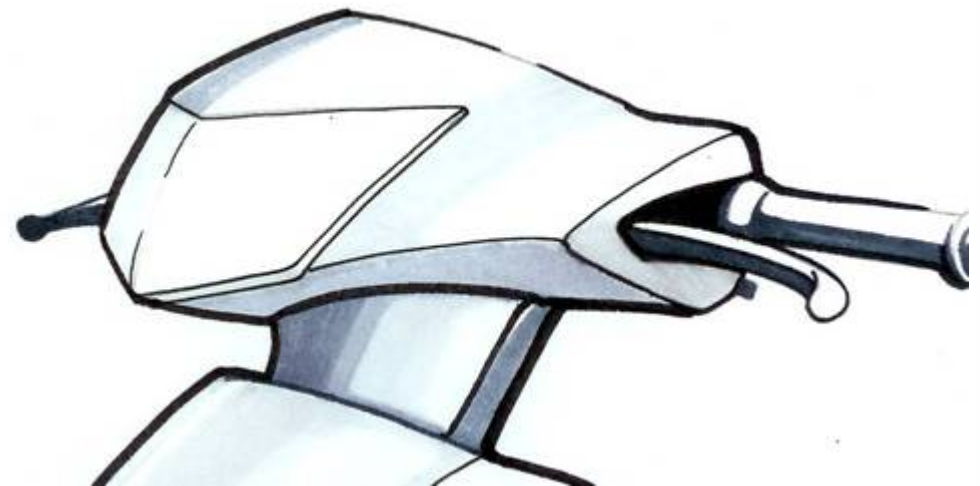
The headlamp was again made sharper to suit the front cowl. The top surface was lowered.

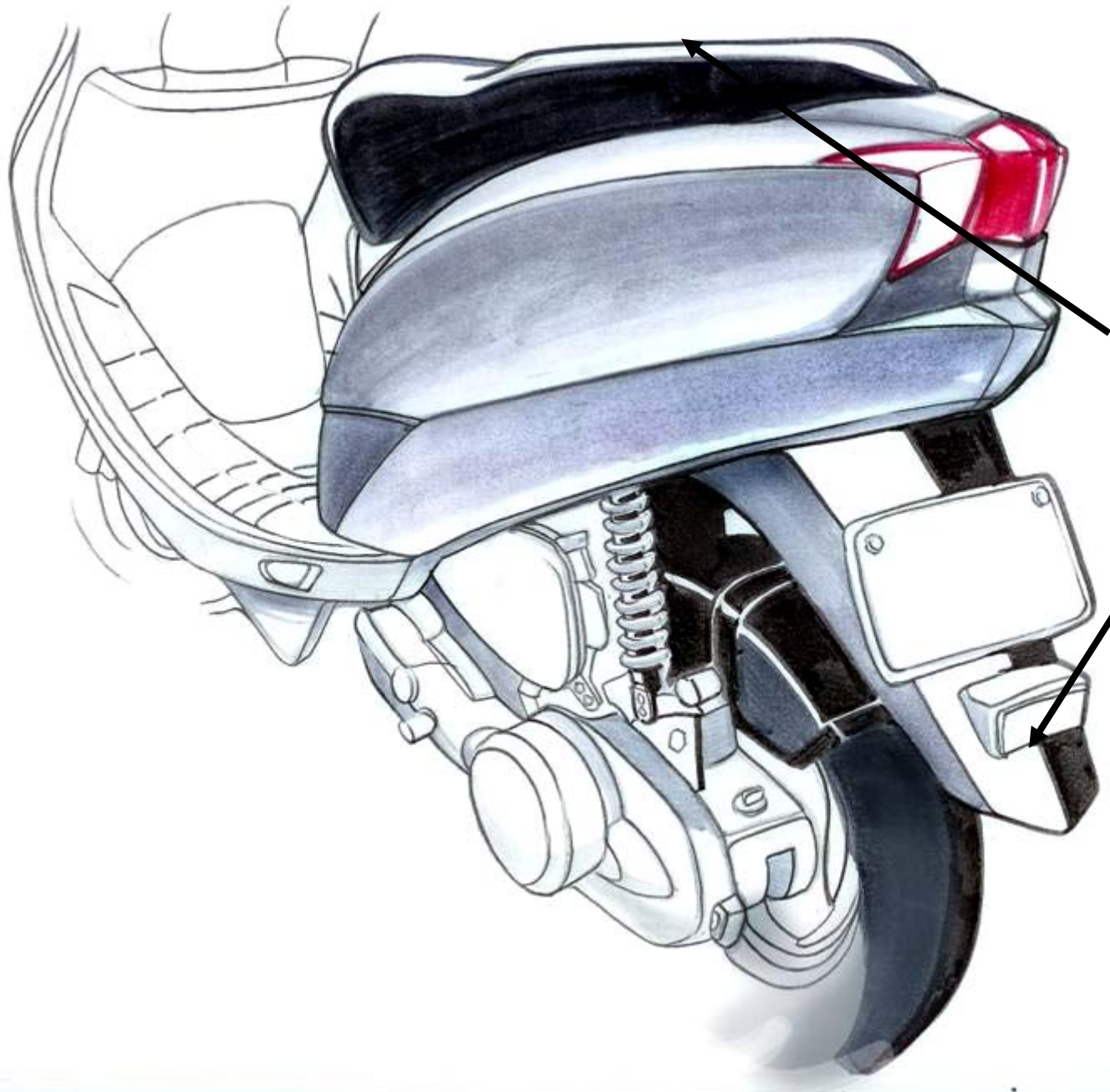


The fourth refinement involved repositioning the side indicators as well as simplification of the cut out position to look like extensions of the indicator cut outs.

The headlamp was simplified with a defined break in the bottom defining line to imitate sharpness.

The neck was given a finer radius to achieve crispness in form.

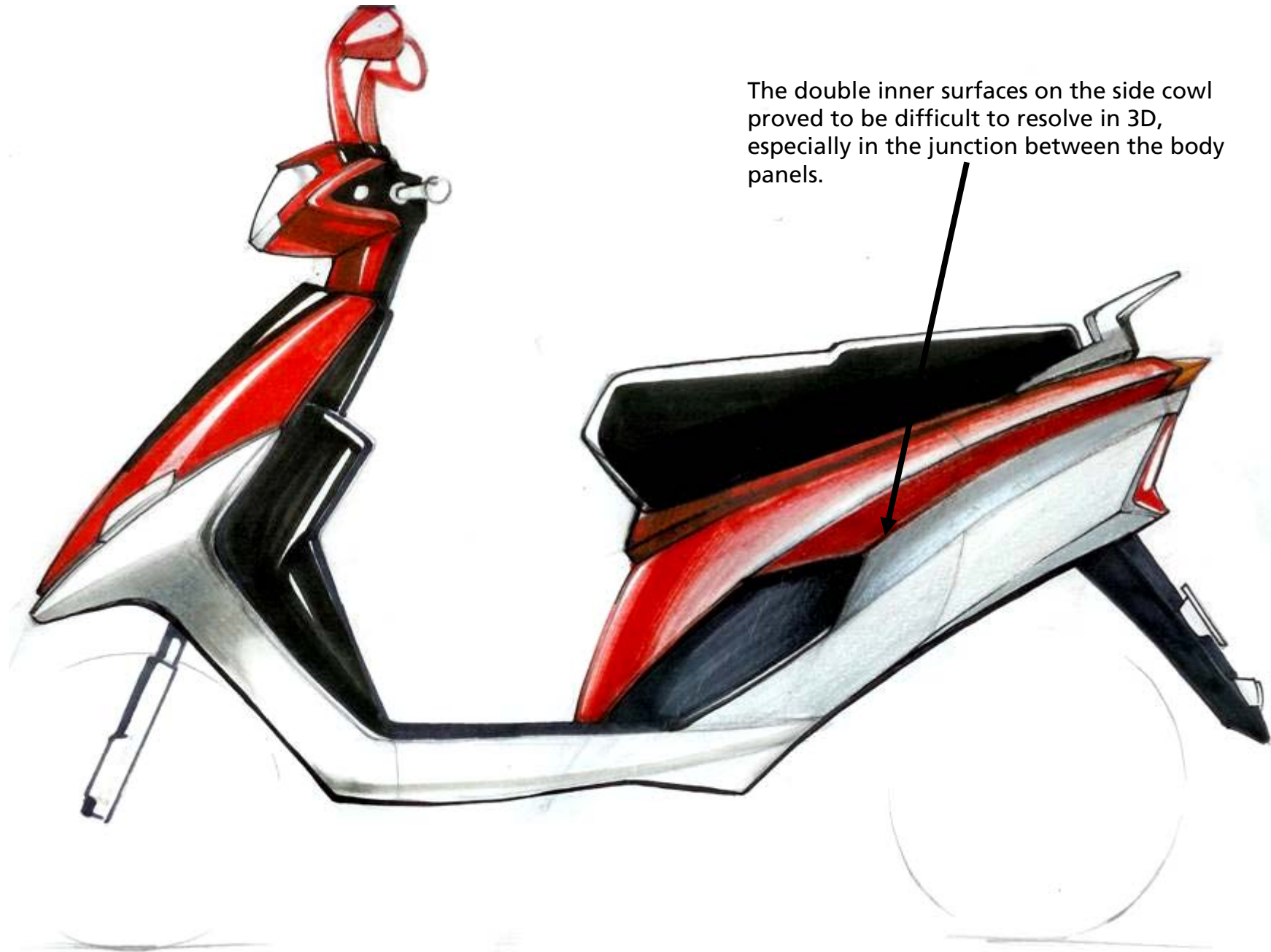


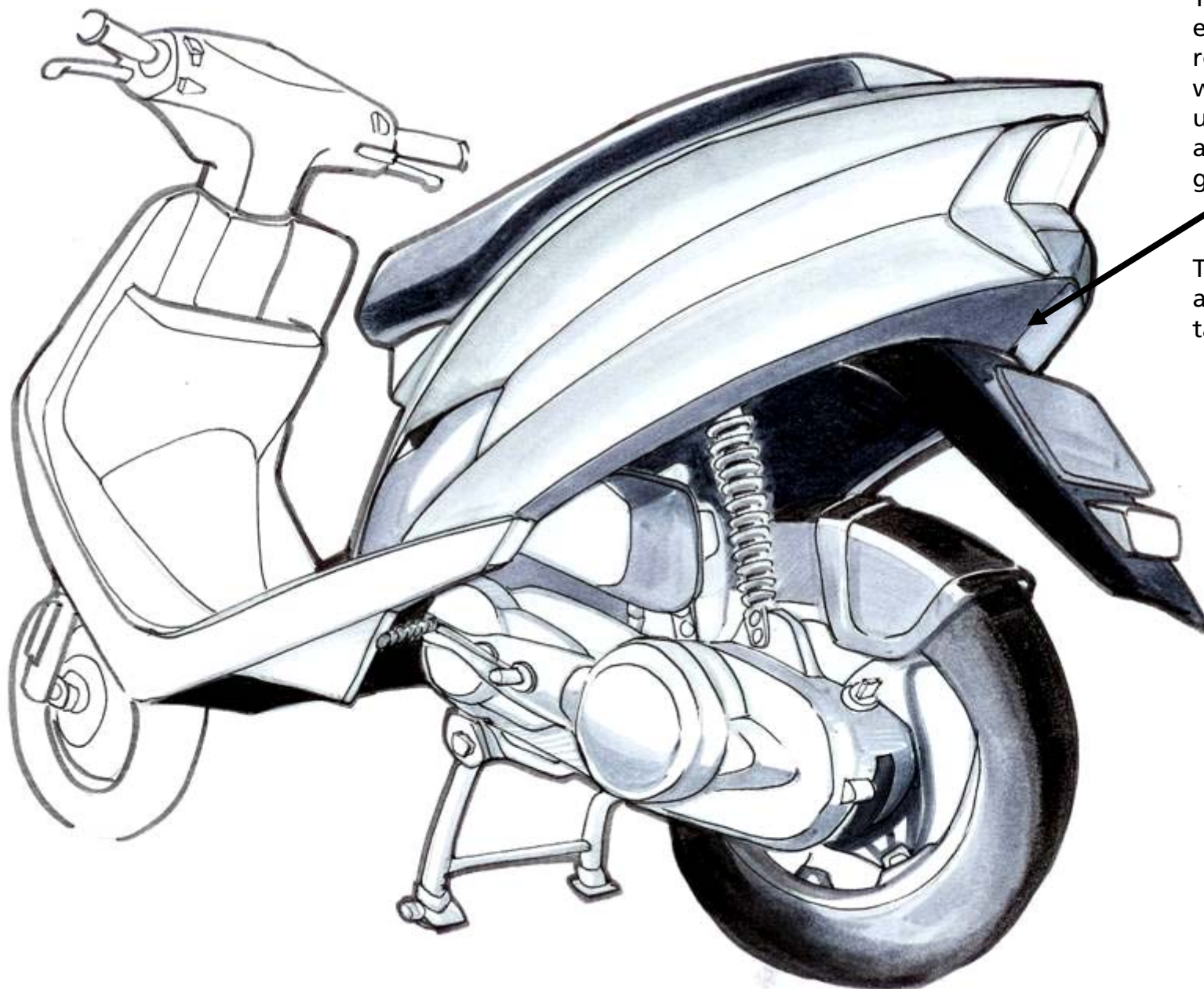


The side cowl was initially sweeping over extremely huge lengths and was required to break. The rear end looks too heavy in contrast to the front end.

The seat height were altered to break away from the static look.

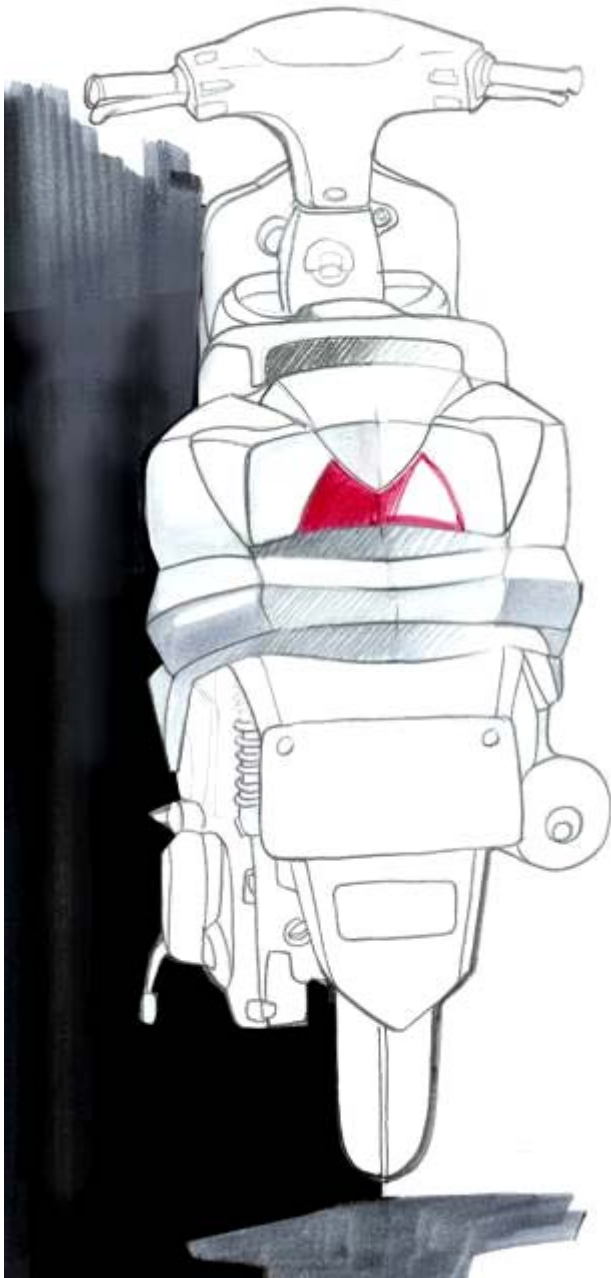
The fender was also made to look sharper and provide an edgy character to the rear end.





The upper muscle was enhanced to prove to be robust. However, this visual weight was cut down by the use of tight convex curves and lifting the rear end to give it a higher stance.

The rear end was also altered to suite the front tapering language.

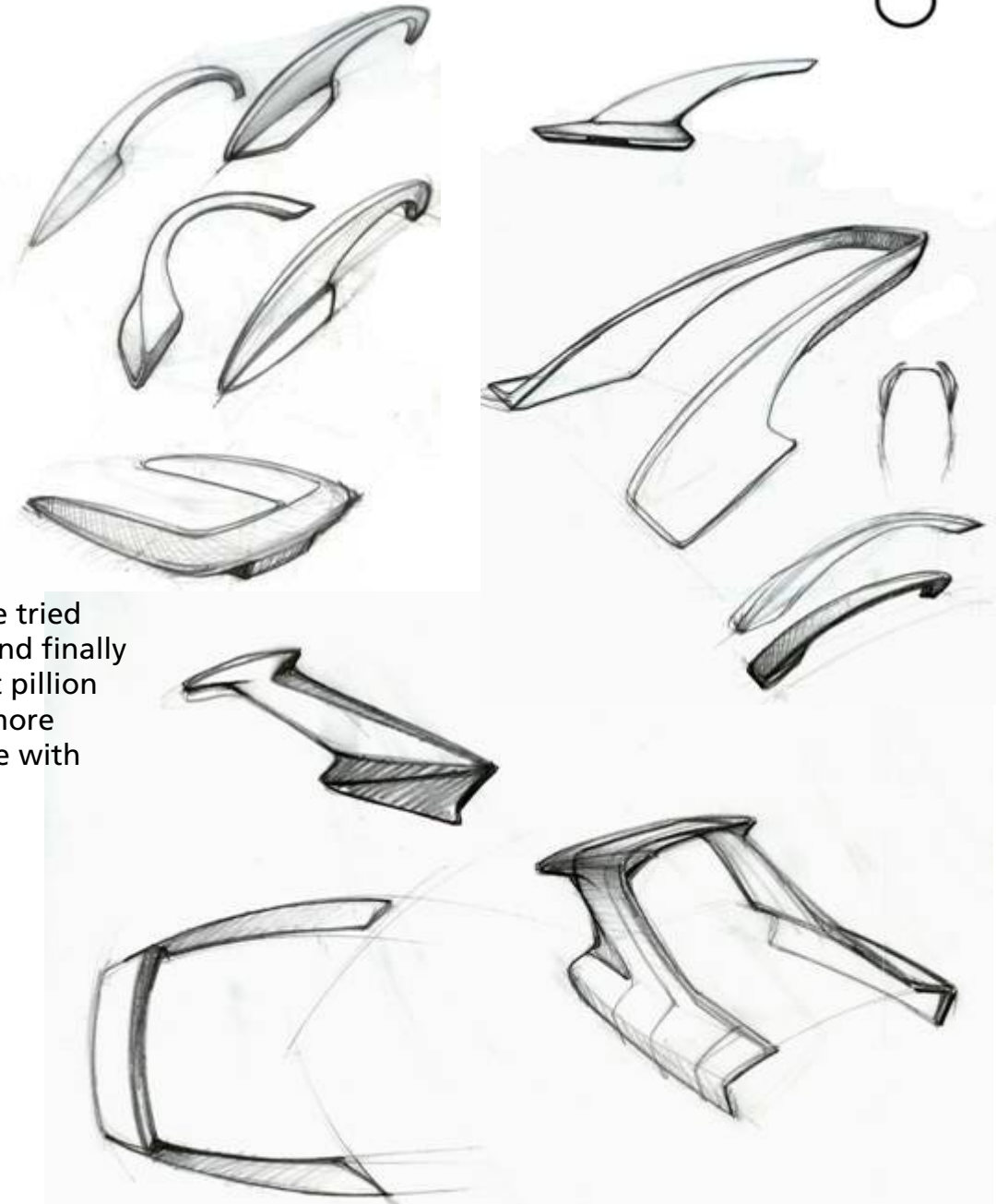


The tail lamp wraps neatly around the form and flushed with the surface.

The key hole for the seat had to be provided for and was decided on top of the rear end.



Different options were tried out for the Grab rail and finally the decision for a Split pillion handle proved to be more successful in coherence with the robust look





chapter eleven

ANNEXURE

These are the areas that could be addressed for further design intervention with the user amenities in the Scooty pep Plus:

STORAGE SPACE

- CLOSED STORAGE COMPARTMENTS LIKE GLOVE BOXES IS REQUIRED
- LAPTOP BAG STORAGE
- STORAGE SPACE FOR SCHOOL KIDS ACCESSORIES
- BOTTLE HOLDER FOR DRINKS
- STORAGE SPACE FOR MOBILE PHONE WHILE CHARGING
- GAS-SPRING HNGES INTEGRATED IN SEAT & STORAGE SPACE BELOW FOR HELMET AND JACKET

INSTRUMENT PANEL & REAR PANEL

- INTEGRATING THE FUEL-INJECTION POINT IN THE REAR PANEL
- ALARM FOR "TROUBLED RIDER"
- LCD DISPLAY INDICATING TIME
- FM/ MP3 PLAYER INTEGRATED - REMOVABLE UNIT
- AUTO-RELEASE PILLION RIDER FOOTREST
- SOLAR – SENSITIVE INSTRUMENT PANEL
- USE OF TELEMETRIC DEVICES (GPS)
- ADJUSTABLE HEAD- LAMP UNIT
- CAN SET REMINDERS FOR SERVICING AT TVS STATIONS
- SHOULD INDICATE WHERE FAILURE IN VEHICLE OCCURS
- ALARM FOR RUNNING OUT OF FUEL

SAFETY

- GRAB HANDLES FOR LITTLE KIDS IN REAR PANEL
- FLIP-SEAT IN FRONT
- SAFETY STRAPS FOR PILLION RIDERS
- ANTI-SCRATCH GUARDS ADDED ON EITHER SIDE
- RUBBERISED GRAB HANDLES, HANDLE GRIPS AND UNPAINTED LEVERS
- STEP-THROUGH FLOOR WILL BE MADE FLAT – ERGONOMIC COMFORT & KIDS SAFETY
- RECESSES ON SEAT EDGES TO ALLOW KIDS TO HOLD ONTO SIDES

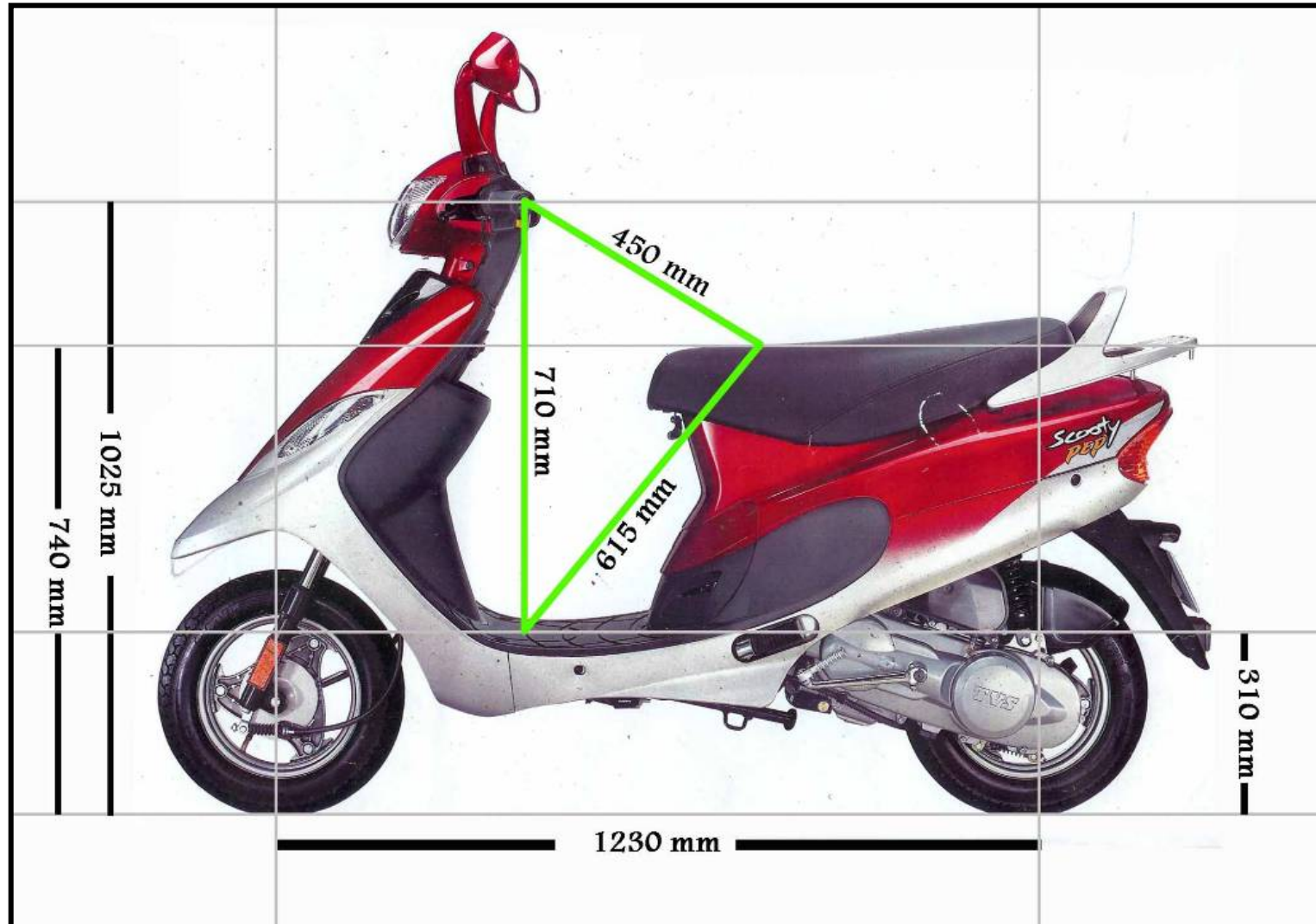
TO SUIT ETHNIC WEAR

- SARI-GUARDS ON EITHER SIDE TO AVOID SPLASHING OF WATER FROM ROADS TO SOME EXTENT
- TRIMMING THE FLOOR BOARD TO CREATE A NICHE WHERE THE LEGS CAN ACCESS THE ROAD SURFACE EASY
- STEP-UP IN REAR HALF OF FLOORBOARD – LEGS PLACED CLOSE TO BODY
- CHANGE IN PILLION RIDER'S SEAT SURFACE – AVOID SLIPPING WITH SARI / SKIRT
- WATER-PROOF SHEET THAT STRETCHES OVER SEAT IN MONSOONS

ADDITIONAL ELEMENTS

- NUMBER PLATE INTEGRATED IN FRONT COWL
- NUMBER PLATE LIGHT INDICATOR MOVED INTO BOTTOM REAR PANEL
- USE OF LED'S FOR TAIL LAMP
- EXTRA GRAB POCKET CLOSER TO THE FRONT FOR SHIFTING OFF CENTRE STAND
- VELCRO STRAP PROVIDED FOR HANGING ADDITIONAL BAGS
- EASILY REPLACEABLY FRONT NECK PANEL FOR CHANGE
- DECALS TO SUIT REGIONAL TASTES

HARD POINTS IN FRAME



PERIODICALS:

AUTO & DESIGN – September 2004 – Issue 148

AUTO & DESIGN - February 2003 – Issue 135

BIKE – Volume 2 issue 007 – Feb 2007

OVERDRIVE – July 2005 Issue

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COLANI - Luigi Colani, Phillipe Pernodet, Bruce Mehly - Dis voir publishers, January 2001.