

# RESTYLING OF SCOOTY PEP

a study of form exploration

INDUSTRIAL DESIGN  
PROJECT II

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in

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## APPROVAL SHEET

The Product Design Project- II titled " Restyling of Sooty- Pep" by Charulatha. D, 05613808 is approved as a partial fulfillment of the requirements for Post Graduate Degree in Industrial design.

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Chair Person \_\_\_\_\_

Internal Examiner \_\_\_\_\_

External Examiner \_\_\_\_\_

Date \_\_\_\_\_

## Foreword

The challenge of doing any automobile project is that its highly complex in terms of function, deeply engrossed in ergonomical issues and manufacturing processes. The second degree of complexity is deriving a form that suits the function and as well gives a new appeal to the vehicle. The thought for the function is already been driven by technology wherein any design forms could be produced today very easily.

The project was initially looked as a two wheeler that is both affordable and convenient for middle class women. After doing market study, it was found that analysis and research have been promoted by the industries to design vehicles for girls, as this segment is covering a huge profitable ground. The design solutions are yet to be produced and the focus for new identity is the prime focus.

The issue of creating a two wheeler design for girls requires a deep understanding in the way they handle things, their interest and expectation which was not catered in specific by any vehicle in the market till now. Hence, this project was take-up to understand the vehicle in terms of form, suiting to the specific target group. This project is an effort to understand the form in terms of trend and fashion and to demonstrate a meaning through which it suits the expectation of the market.

## Preface

Two wheelers are the most popular mode of transport in terms of number of vehicles. Understanding the history of vehicles is the initial set of the project. There are two main types of powered two-wheelers, the motor scooter and the motorcycle. As of 1998 there were 27.9 million powered two wheelers. The current estimate is a double of that value.

The scooter was first built in post-war Italy as a two-wheeler with small wheels (supposedly to utilize war-surplus aircraft tail wheels). It differs from the motorcycle in having the driver seated with his legs together, and is thus favored by women drivers (as sari, a common Indian dress for women, doesn't permit separation of legs).

Most scooters have smaller engines than motorcycles (between 30 cc and 250 cc with a single cylinder, though some models have twin cylinder motors). Most jurisdictions have no legal definition for "scooter". In general, 50 cc and under scooters are classified in most states and countries as a moped and are subject to reduced safety restrictions and licensing fees. Scooters above 50 cc are generally legally considered motorcycles, though some states have an in-between definition for motorized bike for scooters and motorcycles between 50 and 150 cc.

The Italian Vespa scooter was built in India under license by Bajaj Auto, and together with the Italian Lambretta scooter dominated the two-wheeler scene. Much later, the hugely successful Bajaj Chetak scooter came, but Bajaj has since lost the market to new entrants like Kinetic Motors. In the past decade, lightweight mini-scooters like the TVS Scooty and the Honda Activa have made it much easier for women to travel.



The post-war years saw the predominance of foreign motorcycles, mainly British ones like Norton, BSA, Ariel etc. In the 1960s Indian-made bikes like Royal Enfield Bullet (a 350cc British design), Jawa (a 250cc Czech design) and Rajdoot (a 175cc Polish design) predominated. After the beginning of liberalization Indian versions of popular Japanese bikes such as Suzuki, Honda, Kawasaki and Yamaha hit the roads, leading to motorcycles outstripping scooters in popularity. The overwhelmingly large number of bikes sold has engines 175cc or less.

This gave an insight of looking at scooters as a base of project development as secured ride is always the concern of any vehicle on the road and in specific, when it comes to youth.

## Acknowledgements

The project as a complete understanding was made and oriented with form as the underlying thought. Since, the subject being highly iterative it took many turnovers for which the solution is made through study partially and through arguments. The whole concept is taken form through the guidance of Prof. Athavankar and his semantics elective which supported the analysis apart from the functional point of view.

The second person I would like to thank is Prof. Anirudha Joshi for his workshop on Emotional design and that was the next step for the project ahead to handle emotions as driving force for form creation. Thanks to Mechanical department Prof. U. V. Bhandarkar for lending his new vehicle for study, to Excellent motors and services at Sakinaka, (TVS dealers) for their cooperation in the study of mechanical parts.

Special thanks to Industrial design centre professor. Chakravarthy who is also the project coordinator, Prof. Munshi for his valuable suggestions at times, to all my friends specially Sunil, Harsh from Bajaj Autos, Rupesh, Nikhil, Prashant, Neha, Edwin, Rathika, Pushkar, Meera and Arundhati for helping me at critical times. I also like to mention all the staffs at the lab specially Mr. Patel, Mr. Kini, Mr. Joshi and Mr. Pradhan for their help.

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Expression I - SPORTY

Expression II- SLEEK

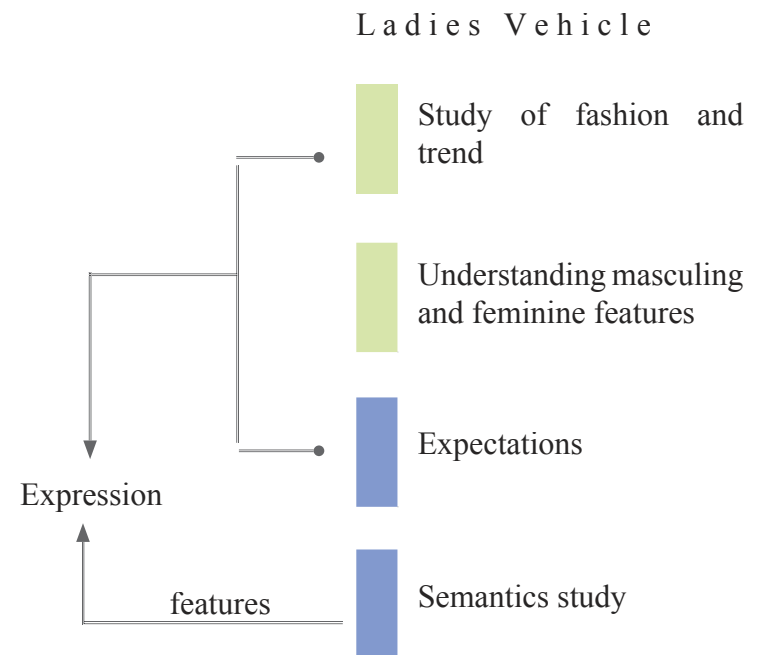
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## Abstract

The need of the industry presently is to think on new ventures of development for women segment of the society. This is taken as aim of the project to analyze the possibilities of exploration. The engineering being the prime focus of the industry, very less number of form variants are made, which in today's context needs emphasis since, the final decision of buying a vehicle matters more on the visceral effects rather than on functional factors.

Taking the visceral qualities of the vehicle alone as the main challenge the existing trend in the vehicles are studied. The styling part of the vehicle is taken for form exploration, for which a vehicle that is more common and used by various age group in the ladies segment is searched for restyling. The choice of vehicle is narrowed down to TVS Scooty which is opted for its low power, less heavy and simpler features.



The ladies vehicle being the target, the variants are made based on the study taking functional, ergonomical issues as fixed from the existing vehicle (that is TVS Scooty). The visual qualities of the vehicle are explored at various stages to understand the new trend, fashion that is to be incorporated. A comparative analysis of masculine and feminine qualities is made to demarcate and understand the degree of design freedom involved. A semantics study is also made to figure out the notions, ideas and expectations; the specific target group carries along when it comes to owning a two wheeler. All the study made is culminated in a set of design expression that is taken ahead for evolving the form.

Who is the target group?

The target group is narrowed to college going girls as the existing vehicles in terms of functional issues best fit for this target group. Their way of dressing, the weight of the vehicle, storage space etc is very close to this target group rather than housewife's or working women. As in the case of, working women and housewives, the functional and ergonomical factor has to be resolved together, where the form variations are restricted. The college going girls was found to be more challenging as the form needs to reflect the speed, as well trendy look which is again light and easy to ride.

"Our profession [of industrial design] is in no way that of the artist,  
and certainly not that of the aesthete, but rather that of the  
semanticist... Objects must give off signs, like children, animals and  
forest fires."

Philippe Starck, Industrial Designer.

## Introduction

# Two-wheeler cos count on womanpower

Darlington Jose Hector | tvv

Bangalore: A young woman whizzing past on a two-wheeler is hardly a sight for tired eyes (unlike the 1980s), for there are now scores of them on any street. But hold your horses—rather your bike in this case—before you come to the conclusion that the revolution is complete. Far from it.

You may be surprised to know that only 3% of the two-wheeler buyers in the country are women. Every year India Inc sells about 70 lakh two-wheelers and according to estimates only two lakh of those wheels are bought for/by the fairer sex. Even among scooters, which are considered to be more friendly for women, only 2.6 lakh out of the 13 lakh units belong to the fairer sex.

The low percentage has flummoxed bike manufactur-



ers who believe a far greater number ought to be riding them as India rides on a 8% GDP growth. "It's really surprising that we have not been able to open up this sector better, especially considering that women are doing well in all walks of life," says TVS Mo-

tors head of marketing Prasad Narasimhan.

The two-wheeler revolution among women was kicked off by Kinetic Honda back in the early '80s. Honda later went solo and did well with Dio and Activa, and the juggernaut seemed to continue.

But statistics often tell the hard story, and it's not rosy.

Manufacturers are convinced that they need to now come up with a variety of scooters that would cater to the demands of working women, housewives and the rest and not just college girls. Officials at Hero Honda, TVS Motors and Kinetic Engineering believe that social stigma is still a stumbling block, especially in rural areas. Two-wheeler makers feel that parents even today consider buying gold, and saving for marriage as requirements far more important than buying a two-wheeler.

Kinetic Engineering joint MD Sulajja Firodia Motwani says unless the social parameters change, the scenario would remain the same. Scooter sales are better in the southern and western regions of the country because there is greater

awareness among women in these parts, says Motwani. "As women become more assertive and independent they will buy more scooters. Probably the answer lies in introducing more gearless scooters," she says.

Andi Dua, VP (marketing) of Hero Honda, says better variety could entice women. Unlike in south east Asian countries, step-through bikes have not been a major success here. "Maybe, we need to look at 'women only' bikes to cut through the mindset," says Dua. TVS agrees on the point that bigger (more storage space for visits to the supermarket) but lighter bikes may be the need of the hour. "We need to bring in bikes which are probably bigger than the Scooty as today's college girls are tomorrow's housewives," says Narasimhan. "It's a process of slow burn."

There are two main underlying reasons for this project- firstly; it was found from the industry that out of 70lakhs vehicle only 2lakhs are brought by the women segment. The second is that the more friendly scooters in the market again face the same problem of low sales that is out of 13lakhs only 3.6lakhs were sold.

This particular article of Times of India, 2006 portrays this and it also shows that there is a huge outlet for this segment of ladies vehicle which is low powered scooters with new look. The possibilities are also found to encourage usage of two wheelers by affording the expected qualities and there by creating a market. The survey in this shows that only 3% of female population were buyers of two wheelers....

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The manufacturers are convinced to come up with a variety of scooters that cater to the demands of women. Officials at hero Honda, TVS Motors, Kinetic Engineering believe that social stigma is still a stumbling block. "Maybe, we need to look at 'Women only' bikes to cut through the mindset" says Dua. TVS agrees on the point that bigger but lighter bikes may be the need of the hour.

Taking this as the challenge in creating a new form for the ladies segment was taken forward. The project involves the greater understanding of the target group through observing, deriving and analyzing their trends, fashion and lifestyle. It also caters to their aspiration for the new vehicle. The process involves the study of understanding and thereby producing a form that sets a trend and satisfies their expectations on a vehicle in a more emotive way.



### **Issue identified:**

The issues identified from the article and the preface is that the Indian market had fewer options when it comes to two wheelers in specific to ladies. The models available don't get updated for changes in the lifestyle for longer period. There is a wide gap between the expectation of the user and the vehicle available on the market.

They infact are forced to buy with the limited models that exists in the market rather than making their own choices of owning their desired vehicle. The industry has already undertaken new ventures to support and target the ladies segment of the market. The form variations for the target group (which is a low powered scooter) was found to be a strong need of the industry.

## Scope of the project

The project is an intentional attempt to break the traditional way of looking at a ladies vehicle. The industries have started to look altogether, a different design principle to evolve form rather than making mere engineering variations in ladies vehicles. This gap of user's aspiration for vehicles and the industry is being looked for bridging which in turn makes profit to the industry.

## Why variations in form are made in vehicles?

The vehicles are always been form driven when compared to the functional issues as the users have more emotional effects in decision making.

1. The vehicle is looked upon as an extension of life in the Indian context, specially to suit their personality.  
"What you are is what you wear and drive?"
2. The form is modified to give a new appeal to the existing vehicle.
3. The variation is made to cater for a specific target group.

The form is mainly used as a language to express emotions and convey meanings. The thrust in the visceral and emotive qualities influence more than behavioral values on a product's lifecycle - which makes it sustain in the market for longer period of time.



## Focus

Exploration in form, attempting to evolve a expression or set of expressions and apply to an existing vehicle in the market and to evaluate and remodel the same in which the functional and ergonomical aspects of the vehicle are retained without major changes.

## Objective

- To derive formal expression that suits the target group and in turn reflects the fashion, trend and lifestyle.
- New form that reflects the spirit of youth ness in it.

## Target group

The junior college going girls of 18-22 years

## Choice of vehicle - TVS SCOOTY -PEP

The vehicle search for form exploration is the one that is common and one that is found more frequently used by the target group. TVS Scooty as such is a vehicle that's affordable as well found popular with college going girls. The reason is it being low speed, comparatively less heavy and easy to use. The vehicle is simple in terms of handling and effective for short distance travel.

## Understanding Existing models

The most common vehicle in the community is taken to compare the form expressions intended for, features and additions. The vehicle and the main iterations in design were looked for form and its meaning. The statements given by the company are shown here

### Activa

The highest ground clearance in its class at 145mm above ground.  
The new standard body design of Honda Activa is fashionable as well as practical.



### Kinetic

New styling and decals for a contemporary look. Low center of gravity for easy balance



## Understanding Existing models

### Blaze

With its aggressive and glamorous Italian design, generous proportions and majestic presence, the very special Blaze makes an instant celebrity of its rider.



### Dio

The slightly raised riding position, the new multi-reflector, crystal-like headlamp and indicators, and the sleek wedge-shaped design give the Dio distinctive looks.



### Wave

Aerodynamic, easy handling



## TVS- at a glance

The company was established by T.V Sundaram Iyengar in the year 1911 and was primarily into the production of mopeds. TVS Motor Company Limited, the flagship company of the USD 2.2 billion TVS Group, is the third largest two-wheeler manufacturer in India and among the top ten in the world, with an annual turnover of over USD 650 million. The company has many credit like the introduction of the first indigenous moped and a 100 cc motorcycle in collaboration with Japanese auto giant Suzuki.

## SCOOTY- engineering progression

The Scooty pep plus had received the "scooter of the year" OVERDRIVE Awards 2006. A silent cash cow for TVS Motor company remains its hot selling four stroke Scooty pep. The weight of the scooterette which sees little competition has carved for itself a niche of its own with sheer convenience to easily win over the fairer sex. Times are changing though and a number of manufacturers have announced plans to enter this segment TVS, wisely, has given the pep renewed life and the delightful runabout is now richer in features as well as a tad more sprightly.

The smiley Pep has always been trendy and still looks contemporary enough for TVS and the pep has new restyling over which there are no major alterations except a new set of graphics in the Plus. Dual-tone colours have been spruced up with a racy chequered look running the length of the scooter right to the body colour grab rail.



Scooty ES - previous model



Scooty pep- Current model

## Analysis of Scooty pep with Honda Activa

These two vehicles - TVS Scooty and Honda Activa are found to be the choice of ladies in Indian context at recent times. It was found that for more secured journey they always opt for TVs Scooty and for more fast pickup and unisexual usage within the family they prefer Honda Activa.

The TVS Scooty Pep may be the more practical choice for use by ladies, especially, if they have not been a regular two-wheeler user in the past. The low saddle height position of the Scooty Pep, the relatively lighter and the moderately powered engine may be plus points that this scooterette from TVS Motors possesses over the other. The variomatic transmission, puncture resistant tyres, side-stand alarm and the self-start options that come as standard fitment are also aids that help ladies handle the two-wheeler better.

However, the Scooty Pep is underpowered compared to the others. The Scooty Pep's 74.6cc engine generates only 4.1 bhp compared to the Honda Activa's 102cc engine generating a healthier 7 bhp of peak power. The Activa is also the more rugged, though the metal body panels may not necessarily be appealing for many buyers in this segment.

However, this is offset by the higher mileage offered by the Scooty Pep at about 45-50 kmpl compared to the Activa's 40-45 kmpl in actual road conditions. Thanks to the economy and power drive modes, the more moderately powered engine and the innovative storage options, the Scooty may be the ideal choice for ladies who are beginners. For others who are looking for long-term value and do not mind the slightly lower mileage numbers, the Honda Activa is more suitable.

The woman friendly Pep plus has received a host of features designed to make it lighter and extra convenient. The ignition key slot is now fluorescent, a helpful guide in the night. There's a Kinetic touch too - the Plus charges a cell phone just below the dashboard and lights up its lockable under-seat storage bin when opened. The new speedometer cluster is easy to decipher.

The reborn Pep has another helpful feature. It props onto its main stand with minimal effort, made possible by simply lengthening the bar the rider's foot presses on for added leverage. Smart engineering by TVS R&D has provided a spring-loaded system that prevents this bar from gouging into the ground in spite of being oversized.



## User Study

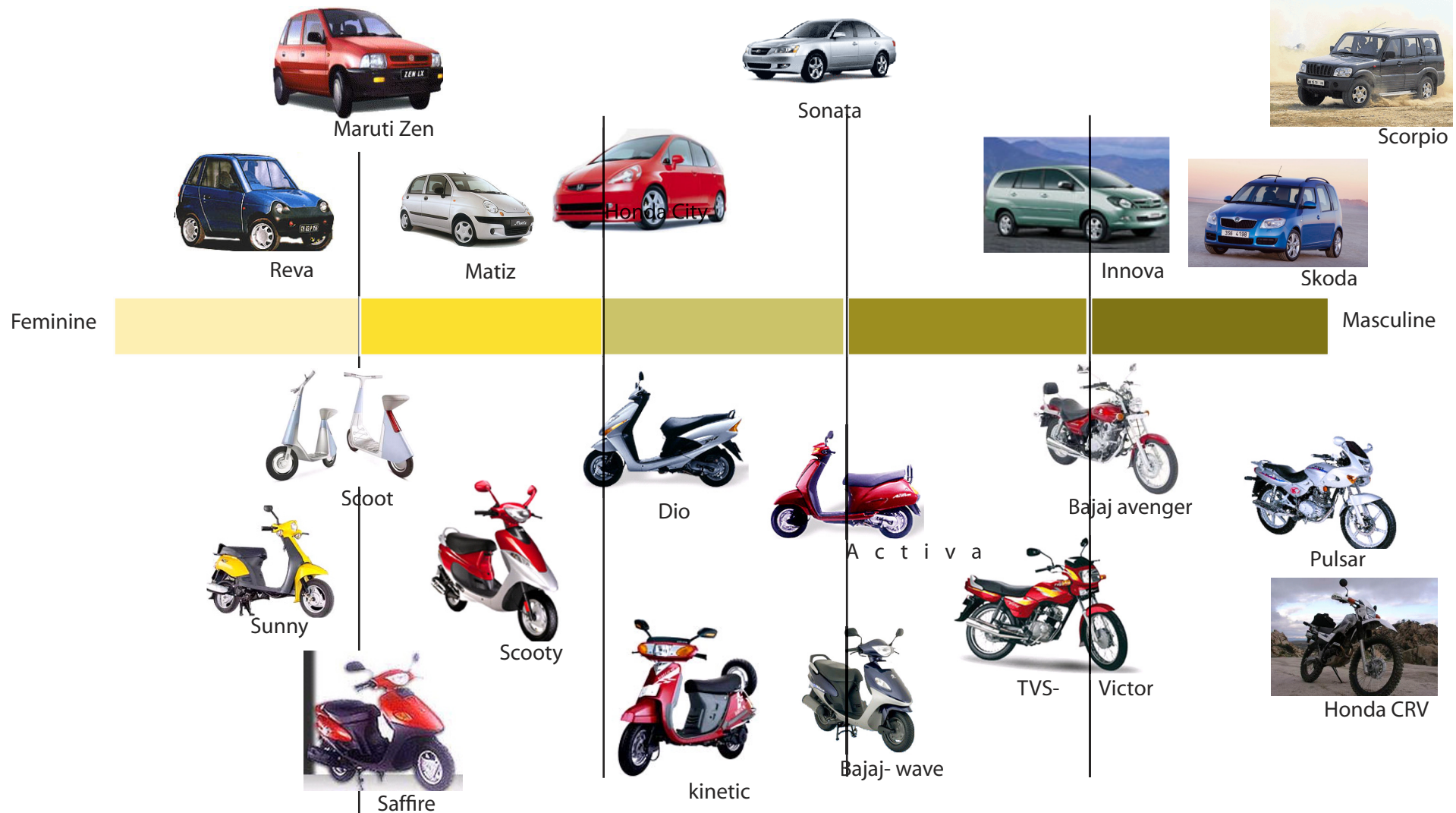
The first, user study is done to identify the vehicles that fall under feminine or masculine characteristics in terms of design elements. The second study is made through card sort method where a series of design concepts are shown as sketches and it is evaluated in terms of expression and design elements. The fashion and trend in terms of dress, color and the accessories they are proud of are discussed. The third, test is done to find the notions, manifest which exists as a mental image within the user group.

### User test I (Protocol)

The vehicles are sorted out for testing with the user to understand their expectations in a ladies vehicle. The users include college girls and a few men to understand their perspective of design solutions and expectations in a vehicle. They were also asked randomly to sort out the vehicles and cars that look more feminine or masculine. The design elements and their effects are also observed during the testing. A protocol was framed to understand the existing vehicle features which cater to reflective, behavioral or visceral values attached to it.

1. Which vehicle do you like the most and state the reason why you liked it other than its function?
2. Which vehicle you say are more feminine and which one you say more masculine and why in terms of form?
3. Which vehicle you think suits both men and women to ride and why?
4. Which vehicle do you have and you would like to have and state the reason for the same?

## USER STUDY -I



An image board was formed out of their own choice of vehicle in random and there are no pictures or names of the vehicles are revealed. These are the vehicles that they remember and categorize as feminine or masculine from their features. The names revealed are not restricted in terms of two wheeler or four wheeler but the images are plotted against a scale between feminine to masculine elements.

## USER STUDY

5. What are the priorities and decisions you make to buy a vehicle assuming that money is not the constraint?
6. Which vehicle you think suits male and which one suits female in terms of appearance and describe why?

### SOLUTIONS (USER STUDY - I)

The solutions were marked across the scale from more feminine on left end to more masculine on the other end. According to the study it was found that small, compact vehicles like Reva, Scoot, Sunny comes under more feminine category also because of their performance of low power driven. whereas on the other end Scorpio, Pulsar were listed to masculine both because of rugged surface treatment, majestic look, more power driven etc.,

### USER TEST - II (cardsort method and verbal)

The second testing is focused on the user group to understand the expression linked with the design elements showing conceptual sketches. They are tested by card sort method wherein the elements of design are marked across one or more expression listed. This test also includes verbal reasoning for the sketches shown together a protocol for identifying fashion and trend among girls of this age group.

#### Protocol

1. Which of the following expression do you think suits the conceptual sketches? Write the number across the expressions and state why you chose?  
Angry, Soft, Light, Hard, Swift, Smooth, Fast, Harsh, Small, Light, Heavy, Flight, Float, Flow, Speed, Slow, Float, Sporty, Funny, Cheerful, Pleasing ,Or any other expressions.



Fashion



Trend

2. Which kind of things you would wish to carry for college? Or features that you like in the same.

- Bag-----
- Wallet---
- Dress----
- Accessories---
- Vehicle-----
- Neck chain, ear rings etc-----

3. What do you think about fashion?

4. What expression you expect from a ladies vehicle?

5. Which ladies vehicle you like and why?

#### SOLUTIONS (USER TEST- II)

The concept sketches are prioritized and the expressions are short listed as the one they would most relate to a ladies vehicle are light, comfortable, sleek, speedy and sporty. The fashion according to their terms is more in a way that looks different then traditional. It should stand out in the midst of other products and the vehicle should have such qualities altogether setting up a new trend in the society.

The products and accessories that they carry are much different interms of material like the leather purse with weave detail, the nail enamel that was white and it is colored only on the tips, using pencil to tieup the hair etc.,

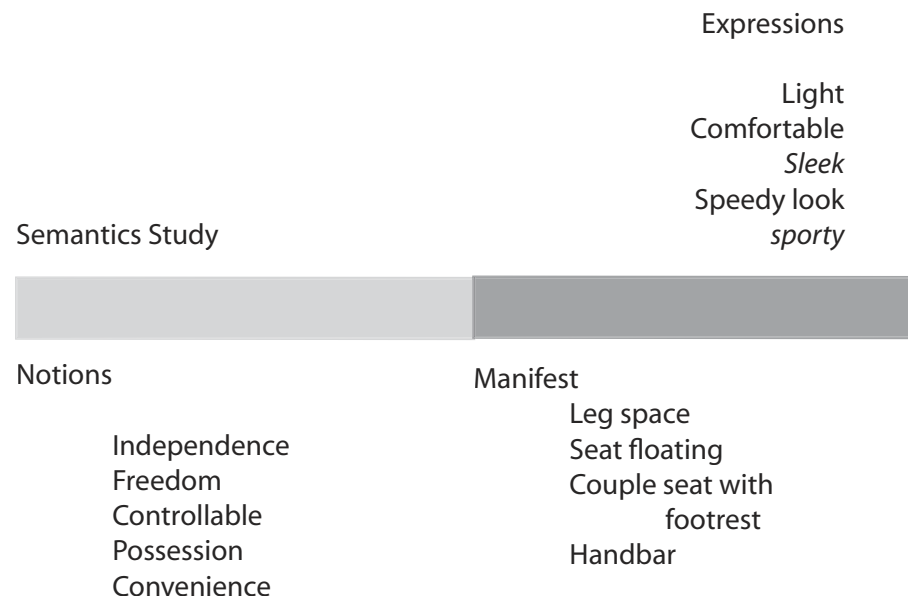
## SEMANTICS

### USER TEST -III (verbal)

This study was done with the target group to understand the semantics of the vehicle- the notions (meanings) and manifest (physical attribute that comes to mind) attached to a ladies vehicle.

The questions are asked verbally and they are- what do they think a vehicle means to them in terms of values and reflective senses and why? Which physical attributes come to their mind when you say as a ladies vehicle? etc. The expectations of the target group were also prioritized with the expressions short listed in the previous test.

The expression that is chosen is sleek and sporty as these two expressions have much different design characteristics which are almost opposite. The sporty expression has much different characteristics like speed, movement, defined elements, usage of colors in specific- red, blue, black etc., while the sleek has its own characteristics like light, minimal, clear lines, lower elements and colors like white, grey, yellow or metallic white etc.,



## PRODUCT BRIEF

The project is Restyling of Scooty Pep with form exploration as basis and deriving a set of expression for the target group chosen.

## Objectives

- The project aims at Restyling of Scooty Pep with functional and dimensional issues being unaltered.
- The target group looked upon was college going girls of 18- 22 years.
- The design aims at moving ahead of the expectation of a conventional vehicle in terms of visceral qualities.
- The project aims at relooking the requirements of college going girls in terms of fashion and trend in the society.
- The expressions taken for form exploration after the user study is sporty ness and sleekness where in two different forms independently were arrived at for the same target group.
- The expressions are tested with design solutions and the feedback is included to refine the design with the target group.
- To identify design elements that could be borrowed from existing products of similar expressions to give altogether a new form.
- To come up with recommendations and suggestions to add increase the emotional values attached with the vehicle.

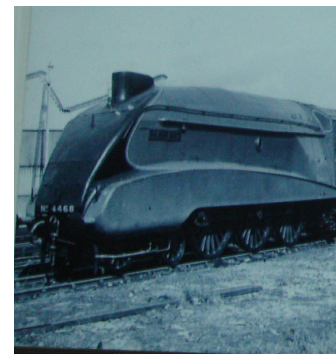




### Source of inspiration

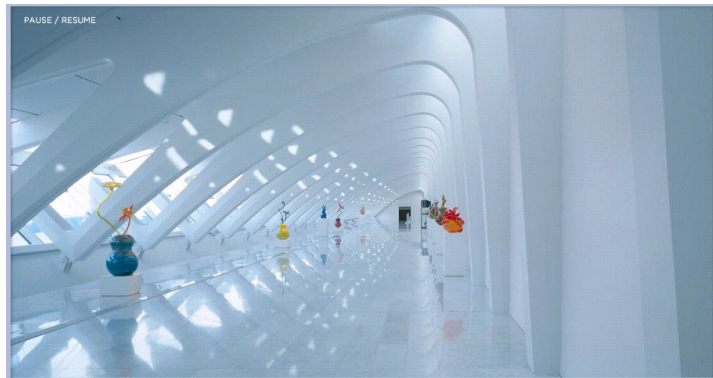
The form of vespa is the first made scooter in the world which has borrowed design clues from other means of transport like locomotives and aeroplane. Enter Corradino D'Ascanio, Piaggio's is an ingenious aeronautical engineer who designed, constructed and flew the first modern helicopter. D'Ascanio set out to design a simple, sturdy, and economical vehicle that was also comfortable and elegant.

D'Ascanio, who could not stand motorcycles and so dreamed up a revolutionary new vehicle. Drawing from the latest aeronautical technology, he imagined a vehicle built on a "monocoque" (French for "single shell") or unibody steel chassis. Furthermore, the front fork, like a plane's landing gear, allowed for easy wheel changing. The result was an aircraft-inspired design that to this day remains forward-thinking and unique among all other two-wheeled vehicles.



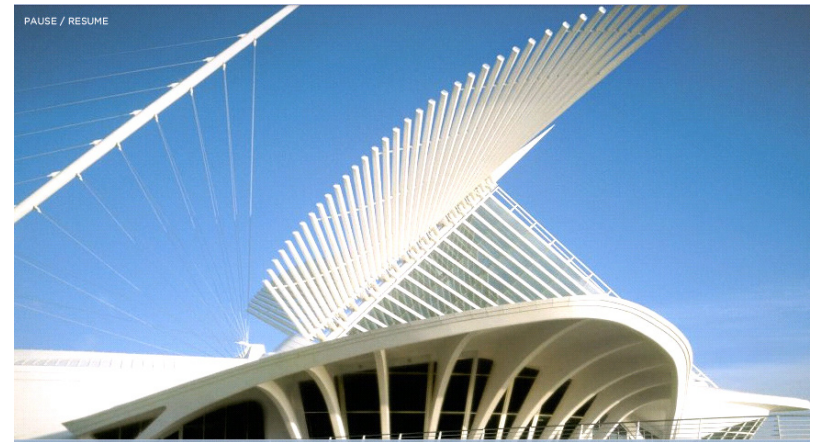


Santiago Calatrava, Milwaukee, Wisconsin, USA  
Spectacular kinetic structure  
Brise soleil with louvers that open and close like that of a bird.



## Source of inspiration

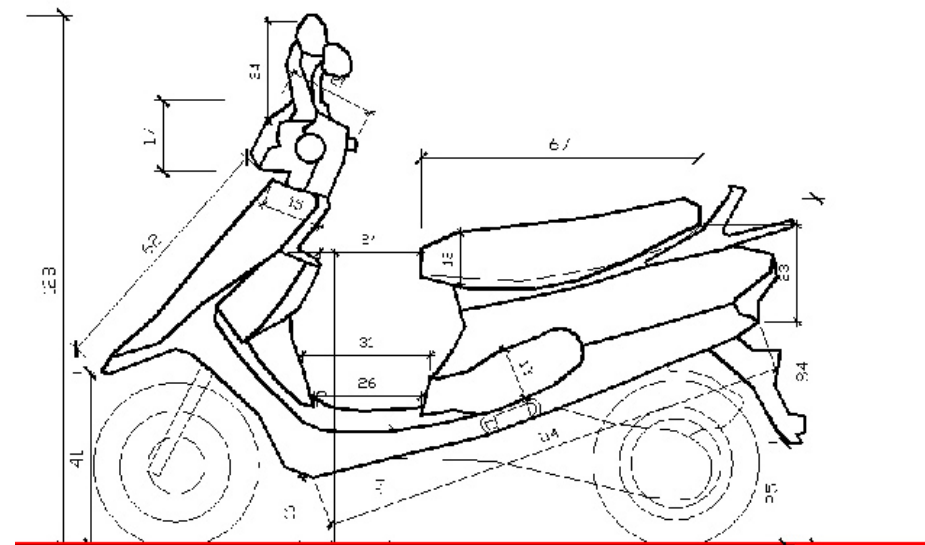
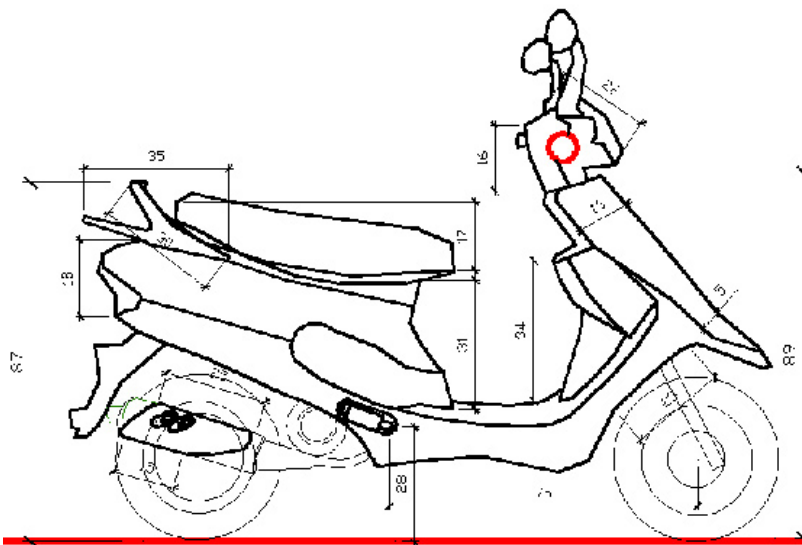
The museum addition was conceived of as a work of art in which more works of art reside. Built right on the edge of Lake Michigan, the building's form calls to mind images of boats and birds, and easily complements the natural setting in which it is placed. The structure is resolved with interesting movement of the louvers creating a dramatic effect in the urban setting. The form is more expressive and the emotional qualities suggest clues for its moving parts by its tensile members and strings. The play of scale again matches the interior with human whereas in the exterior competes with the nature and the lake.





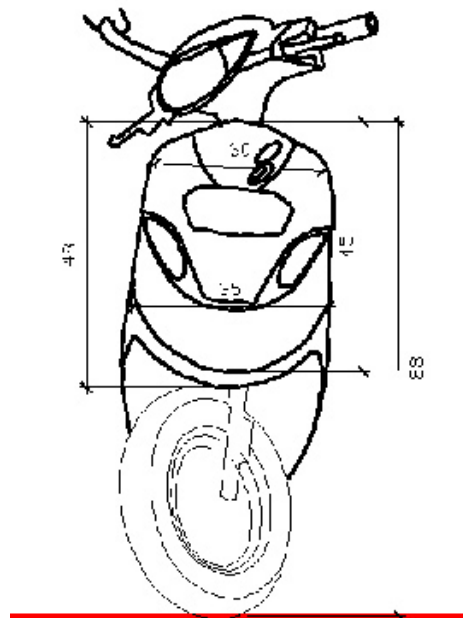
## Design Restriction

The Scooty Pep and the Scooty Es model has the same chasis, except minor changes in the in between supports. The fuel tank capacity is increased and there by reducing the size of the storage space available. The outer skin is upgraded for a new look in the Pep with molded storage in the leg room. The dimensions of the chasis is maintained for restyling which is a structural support for the parts and inturn a constraint for design as the change of chasis runs the vehicle cost high.

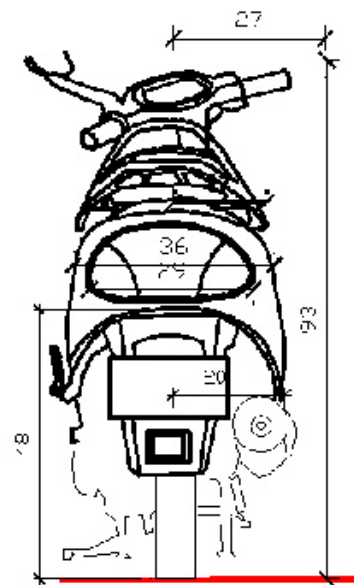


Side Elevation

## SCOOTY PEP -specifications



Front Elevation

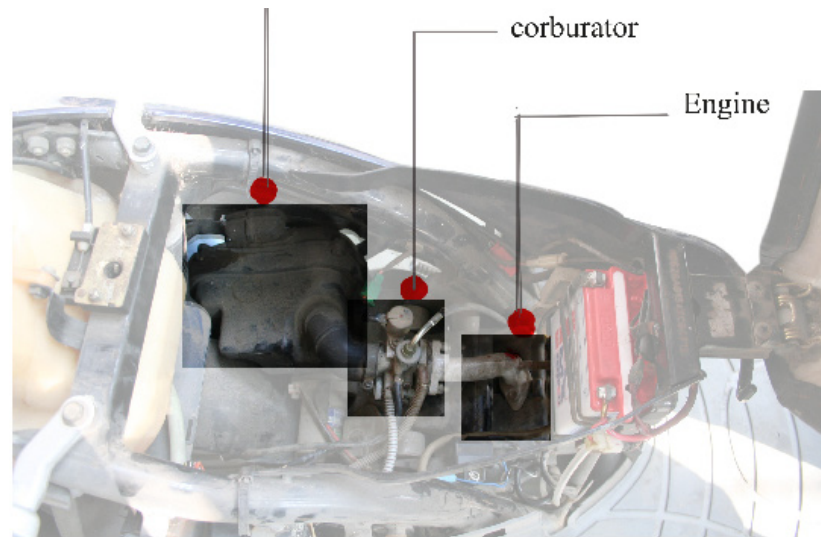


Rear Elevation

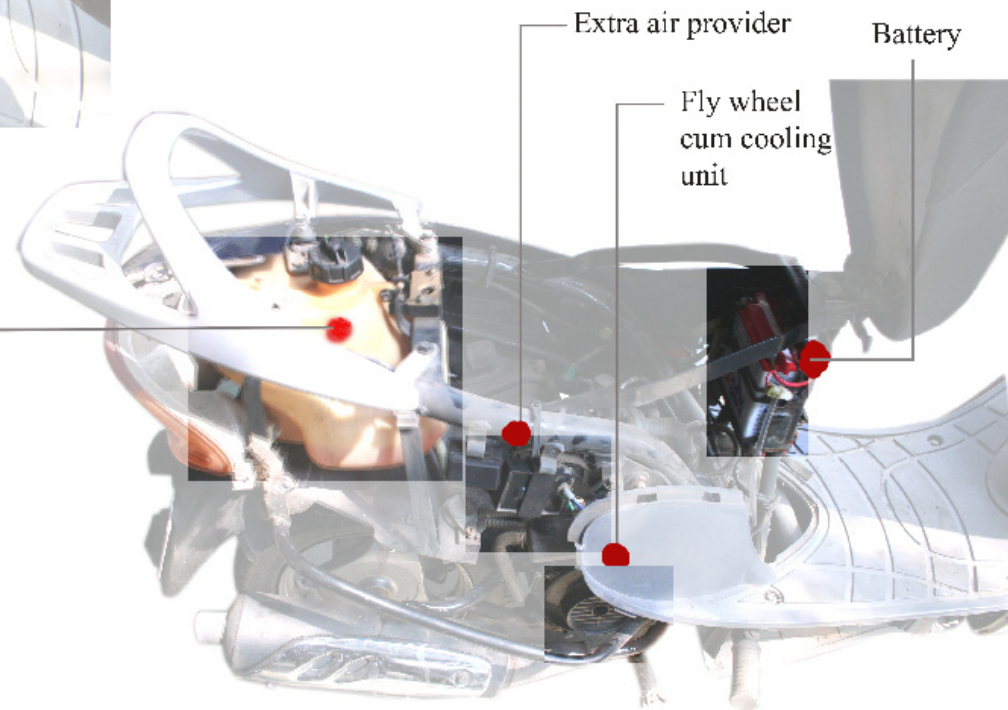
|                      |                                       |
|----------------------|---------------------------------------|
| Engine               | 4 Stroke, Single Cylinder, Air Cooled |
| Cubic Capacity       | 74.6cc                                |
| Max. Power           | 3.0 KW @ 6500 rpm                     |
| Gear Box             | Continous Variomatic                  |
| Ignition             | CDI                                   |
| Front Brakes         | 110mm Drum                            |
| Rear Brakes          | 110 mm Drum                           |
| Front Tyre           | 3.00 X 10                             |
| Rear Tyre            | 3.00 X 10                             |
| Wheelbase            | 1230mm                                |
| Ground Clearance     | 135mm                                 |
| Dry Weight           | 85 Kg                                 |
| Tank Capacity        | 5 Litres                              |
| Price On Road Mumbai | Rs. 35470                             |
| Colours              | Black, Blue, Red, Silver, Green       |

## Design Constraints

The chassis and the mechanical parts are restored the same as that of the existing vehicle. The hard core points like the engine, gear wheel, fuel tank etc are retained in the same position wherein the space between the chassis below the seat line is used for new styling of the vehicle.



Fuel tank





Front  
Elevation



chasis position



CHASIS

Design Constraint

The height and width of the chasis is fixed and taken as a constraint for design. the height of the footrest and the slope line of the seat is again retained as that of the existing vehicle.



Side Elevation



Back  
Elevation



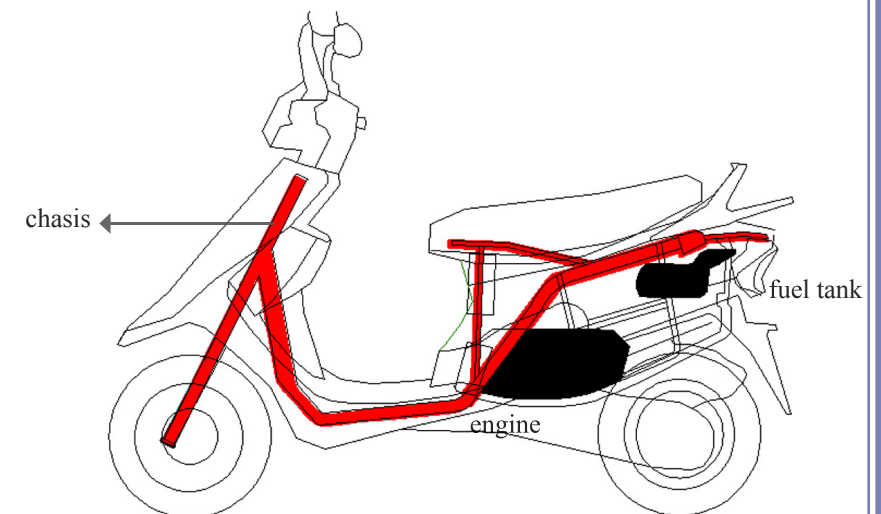
## Design possibilities



|                       |                             |              |        |
|-----------------------|-----------------------------|--------------|--------|
|                       |                             |              |        |
| Front handle          | space between seat and body | leg space    | chasis |
| Front and back lights |                             | body profile | locker |
| Fascia                | mudguard                    | seat profile |        |

The possibilities and opportunities in the existing vehicle has been plotted against the table above which shows the potential for exploration on left end and hard points that should be retained the same way on to the right end.

Basically, the front of the vehicle comprising of the handle and the Speedometer, head lights etc., is the place where the maximum liberty of modification is possible.



## Masculine characteristics in design

The design features of male products are indicated by hard and angular lines.. The products are communicated by strong lines that look heavy in terms of detail. The emphasis on the edges is defined boldly to represent the dominance in character. The design of their products lacks flowy patterns and ornamentation. The overall appeal is majestic in terms of form and design.



Design elements are

Angular

Hard and rugged

Rough

The proportions are large

The weight is more



## Feminine characteristics in design

The design features of female products are indicated by soft and smooth lines. The products are communicated by curvy lines that look slender in terms of detail. The emphasis on the edges is defined thin to represent the subtleness in form. The design of their products is flowy with patterns and ornamentation. The overall appeal is tender and associated with colors like purple, pink, blue etc.



Design elements are

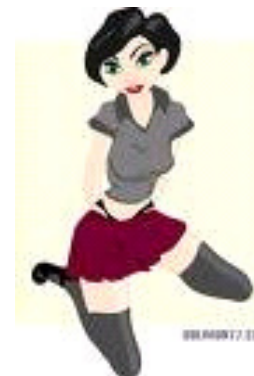
organic

Soft and smooth

Expressive

The proportions are small

The weight is less



## Expression and its characteristics

### Sleek ness- design clues

The design involves clear lines that are extremely thin in terms of form and proportion. The feel of the product is made light through the details. No ornamentation is found. The elements are less and more precise in terms of details. The graphics are not bold or big. The colors used are very subtle and mild. The surface treatment is usually flat with slight curvature.



watch



mp3 player



palmtop



computer monitor



## Expression and its characteristics

### Spoty ness- design clues

The design involves clear lines that are curved and flowing. There is a sense of movement exhibited through the form. No angular elements are used. There are floating elements to indicate speed and movement. The display of icons and graphics are big, bold and clear. No ornamentation or extra elements are found. Neat and clear lines of definition are made.



i-pod



shoe



watch

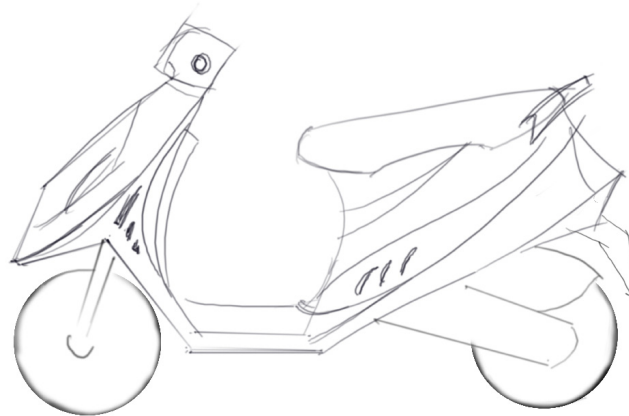
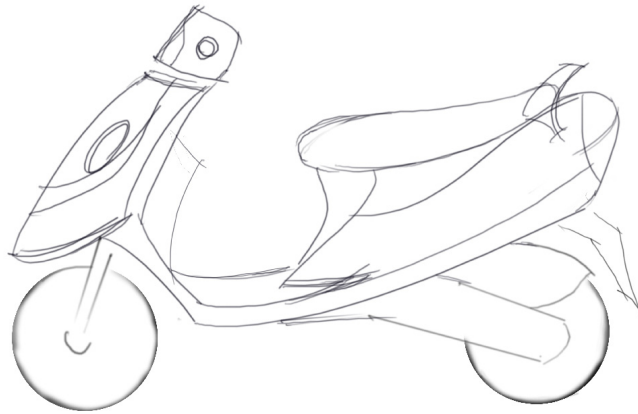


concept art

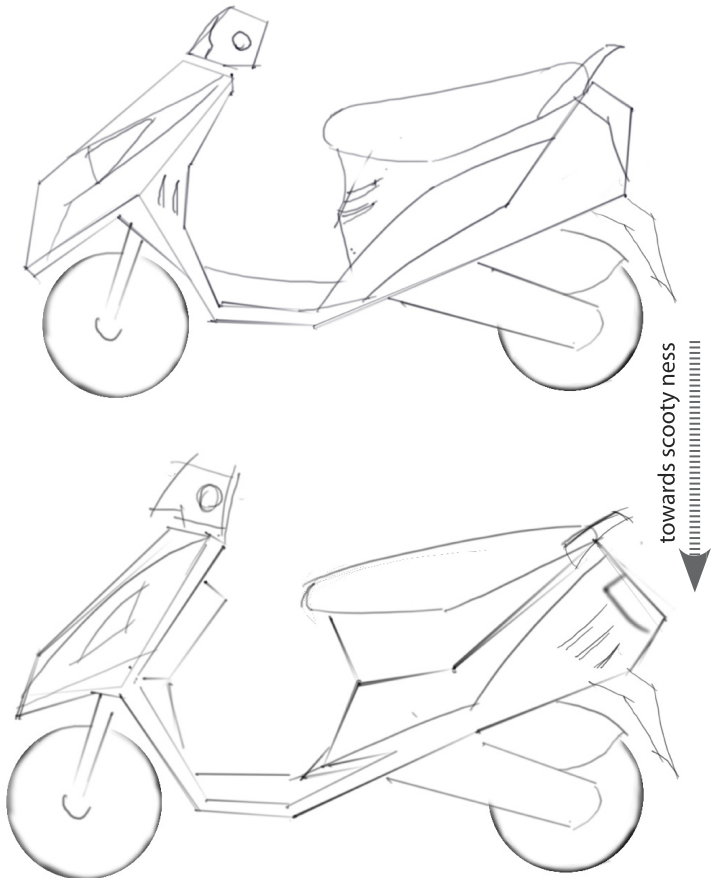
IDEATION and METAPHORS  
Expression I

SPORTY NESS

## SPORTY ness



The form variation are looked in terms of constraints with possibility of exploration in the fascia and on the side surfaces.

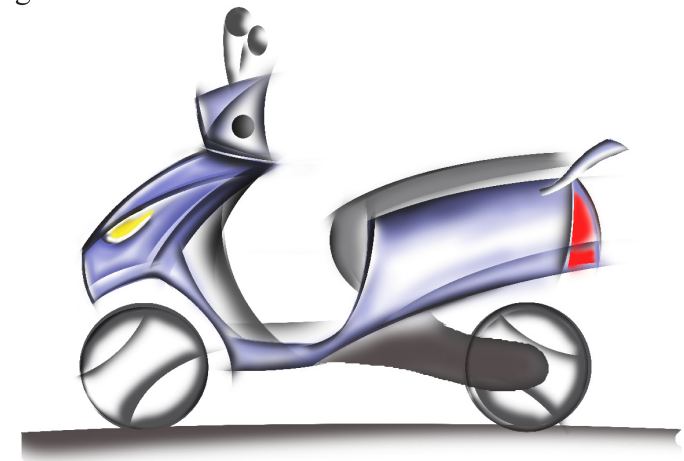


The sporty ness of the vehicle is achieved using various design elements like splitting the mass of the body through surfaces, increasing the gap between the rear wheel and the body, using diagonal lines indicating the movement and speed.

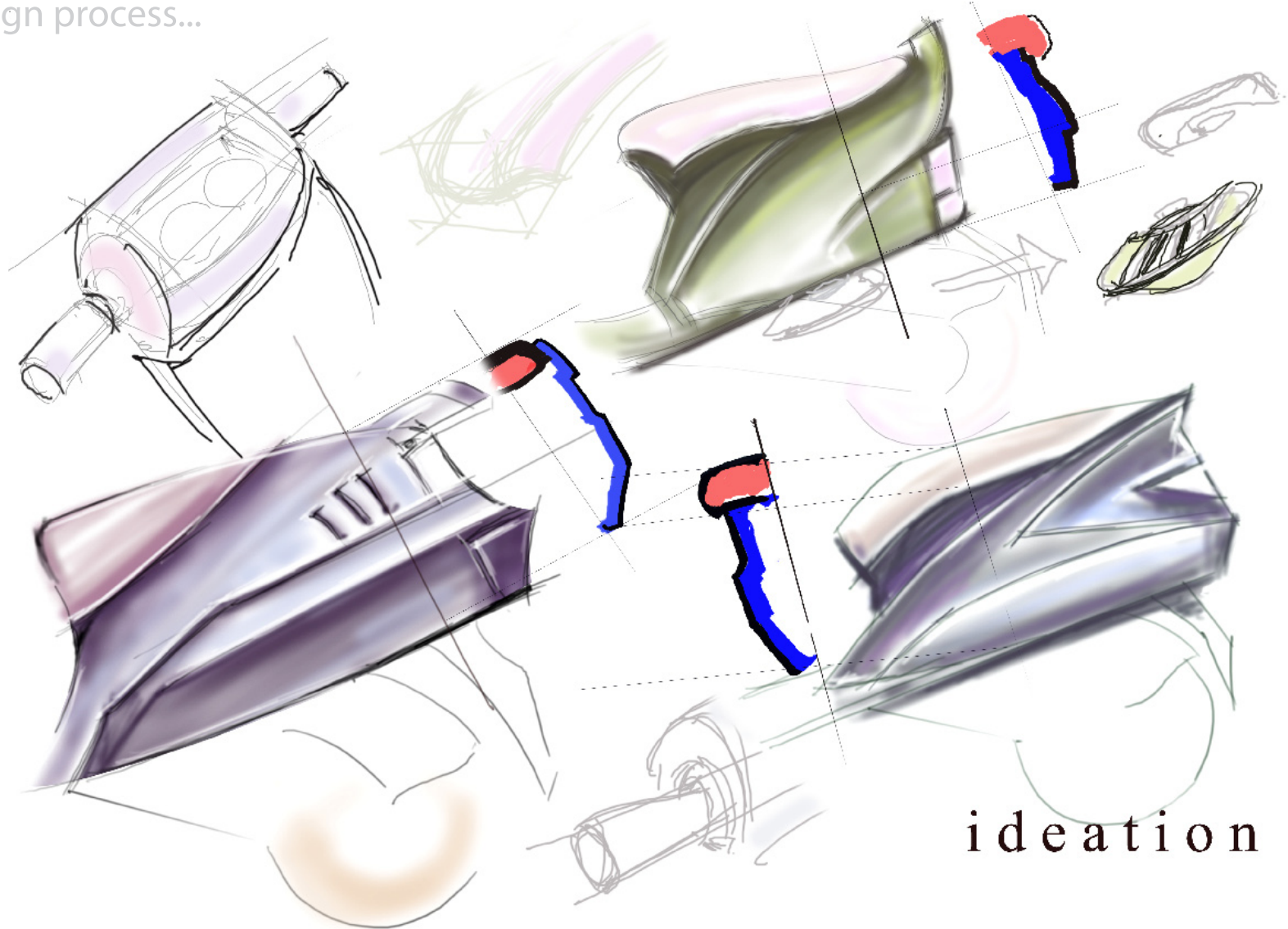
## SPORTY ness



The bird is taken as a metaphor for deriving the design principles. The speed, floating nature of the bird is captured by lines and surfaces that are used to create surface definitions and combinations to achieve the sporty ness of the vehicle. The degree of Scooty ness in the vehicle along with metaphorical implication positions the vehicle close or far from the existing model.



design process...



ideation

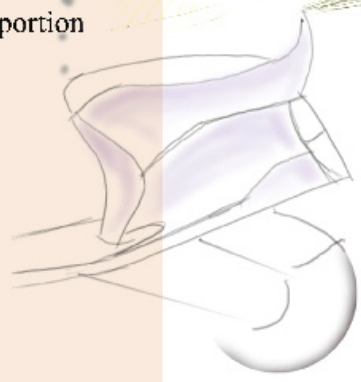


sCOOty NESS of the vehicle

Variation....Surface



Variation....Proportion



More

elements-  
vertical play



interlocking



Frank O' Gehry style  
as a metaphor

twisting



elements borrowed



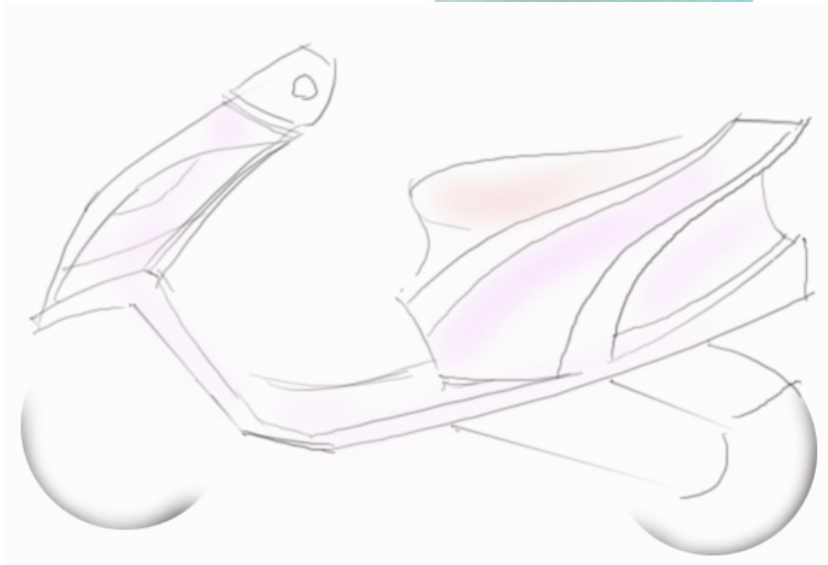
Bird Metaphor

design process...



## Form exploration with clay and foam

The forms derived for sporty expression is short listed and explored as three dimensional models from which this the final design is chosen for further refinement.

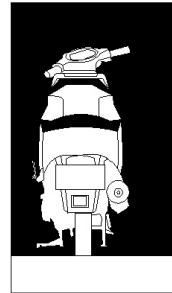
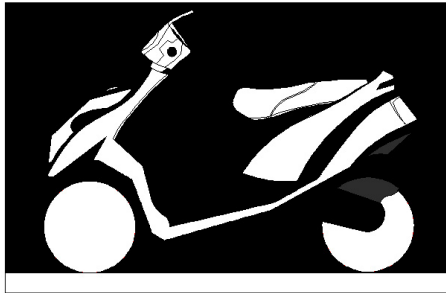
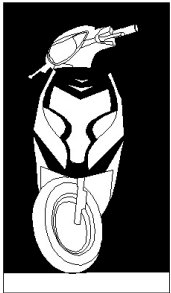


FORM CHOSEN FOR SPORTY NESS

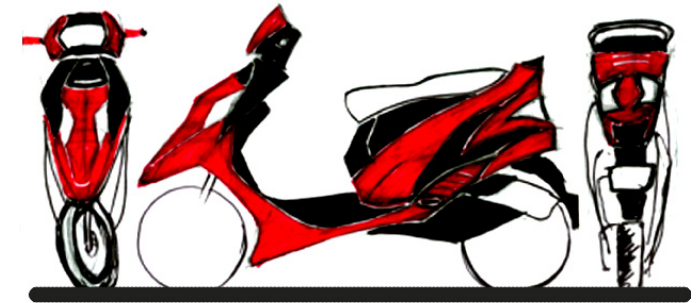


design process...

SPORTY ness



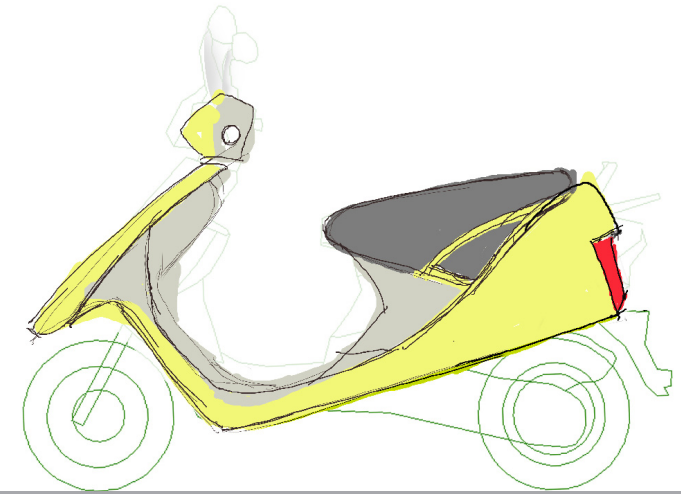
This design concept that had major number of manifests like maintaining the foot rest, retaining the gap between the handle and the body is chosen for refinement. The design element is found to break away from the Scooty ness (with bird as metaphor) is taken for further refinement. The front and side elevation of the vehicle is analyzed for combination of one or more surfaces to achieve flow as well continuity of masses. This is checked and corrected against a background- foreground study to refine the distribution of masses.



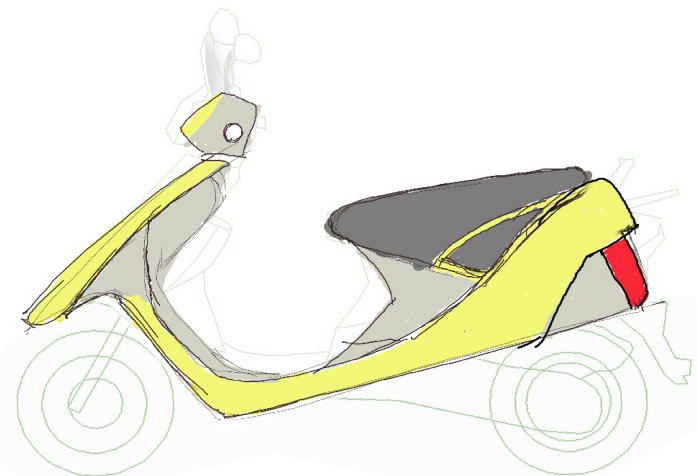
IDEATION and METAPHORS  
Expression II

SLEEK NESS

## SLEEK ness



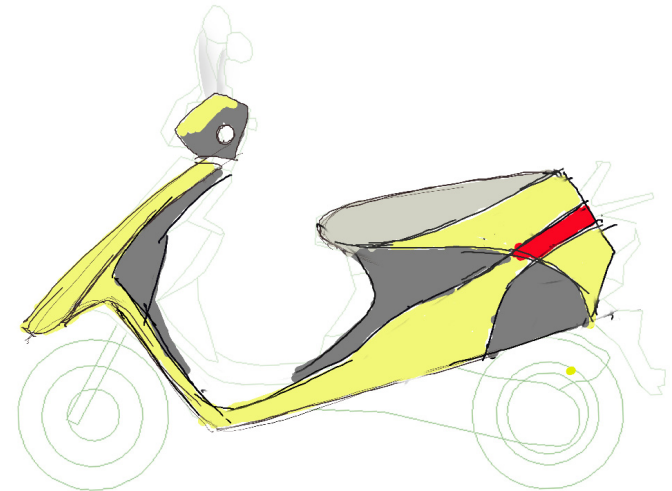
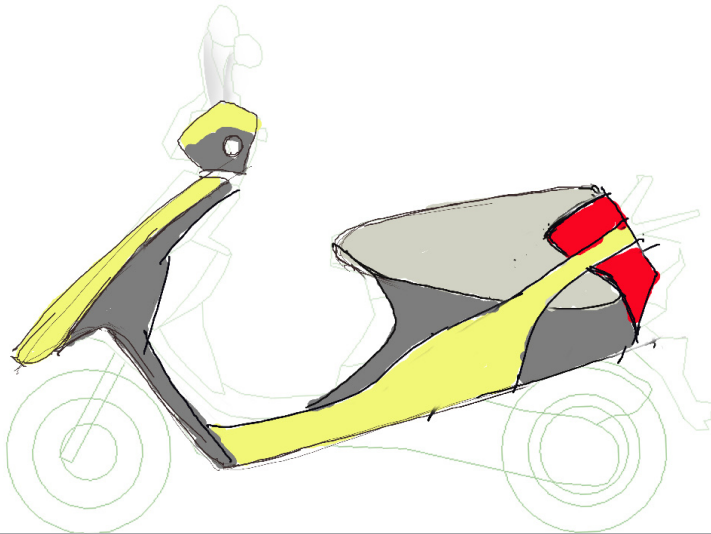
The second expression of sleek ness is achieved over the vehicle with design features like neat surfaces, more clear lines on surfaces, reducing the bulkiness of the vehicle through variation in proportions, making the vehicle look much closer to the ground etc. The color chosen is also very subtle interims of expression and the details were not emphasized much in the body.



design process...

SLEEK ness

The sleekness of the vehicle is visually modified through its surface distribution. The change in the flow of lines that move around the body is varied to make the vehicle look light and less heavy by proportion. The elements like seat and lights were again taken as tools for making variations in the form of the vehicle.



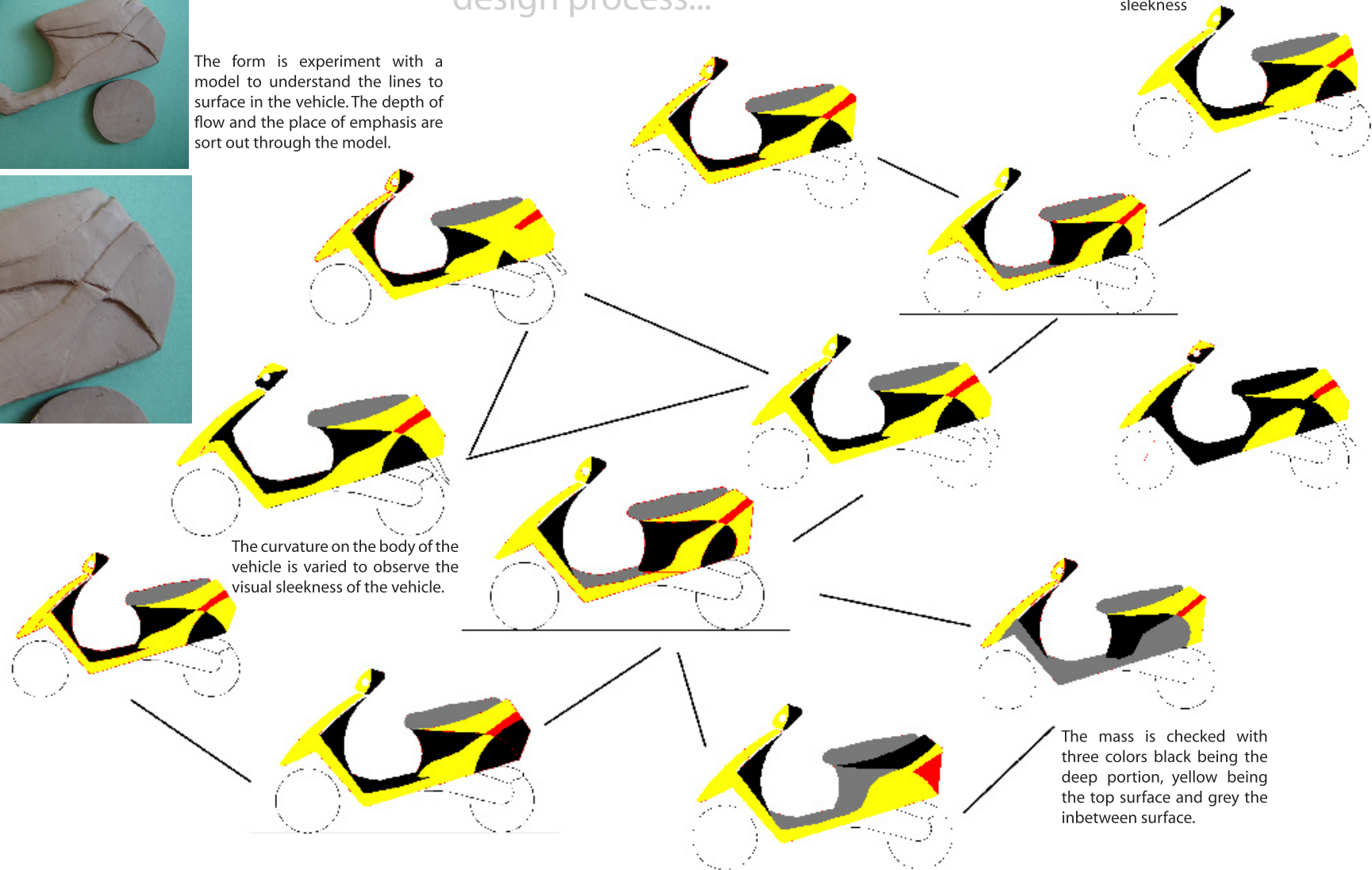


The form is experiment with a model to understand the lines to surface in the vehicle. The depth of flow and the place of emphasis are sort out through the model.



## SLEEK ness design process...

The back edge is modified through varying angle and thereby checked more sleekness



Morphing of forms through surfaces

Concepts and Final Design  
Expression I

SPORTY NESS



## SPORTY ness

Final Design  
Expression -I

The final expression for sporty ness is derived with bird as a metaphor. The elements of design that is used are:

**Proportion-** The proportion of the Scooty is maintained in the footrest portion whereas in the body parts and in the front fascia the Scootyness is lowered by dissolving the mass at the back and adding rugged forms in the front.

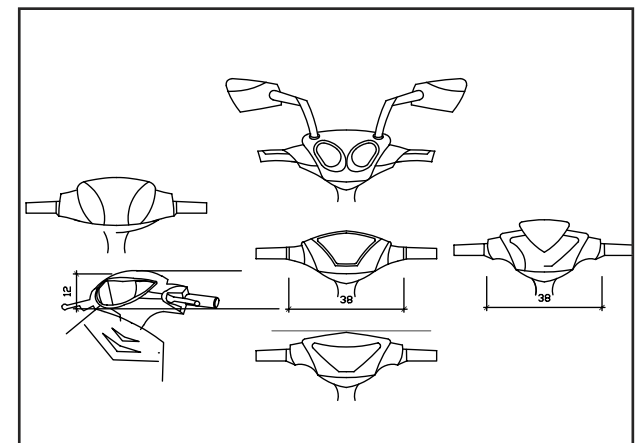
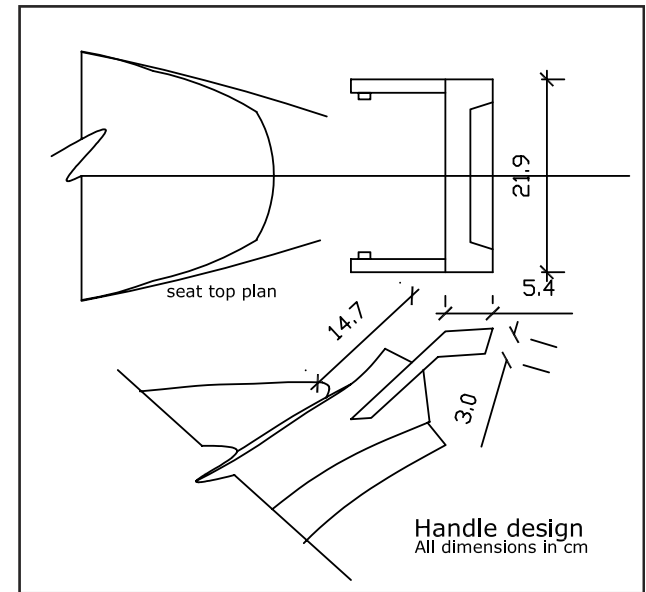
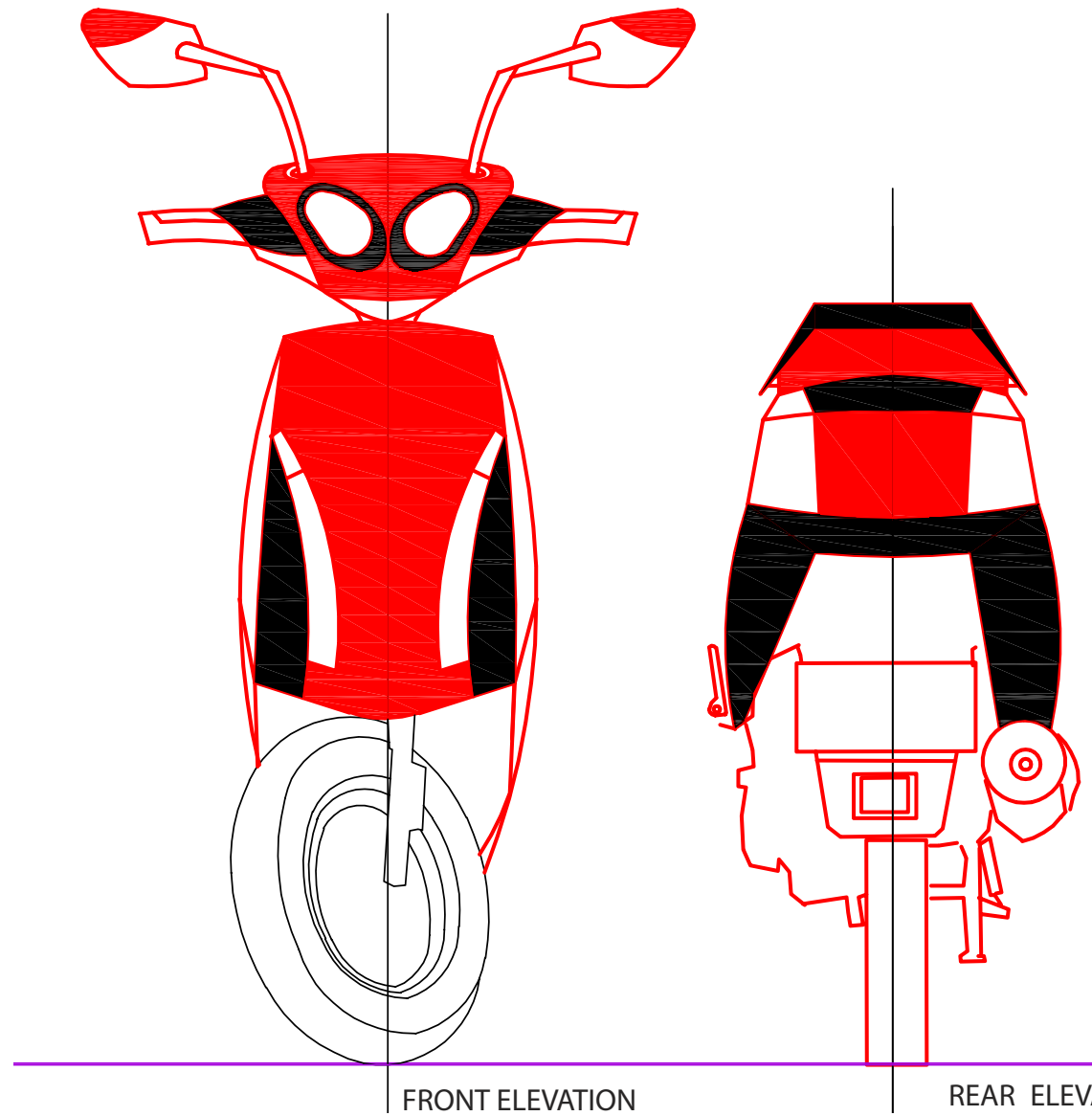
**Form-** The form is made flow and the body is divided into one or more surfaces to reduce the mass of the body in a synchronized way.

**Surface-** The line in the surfaces is made to float on the body and they are interlocked and subdued at places to give a sporty appeal.

**Color-** The color chosen is red and black to project the vehicle sporty and the colors are altered to produce a coordinated look for the expression.





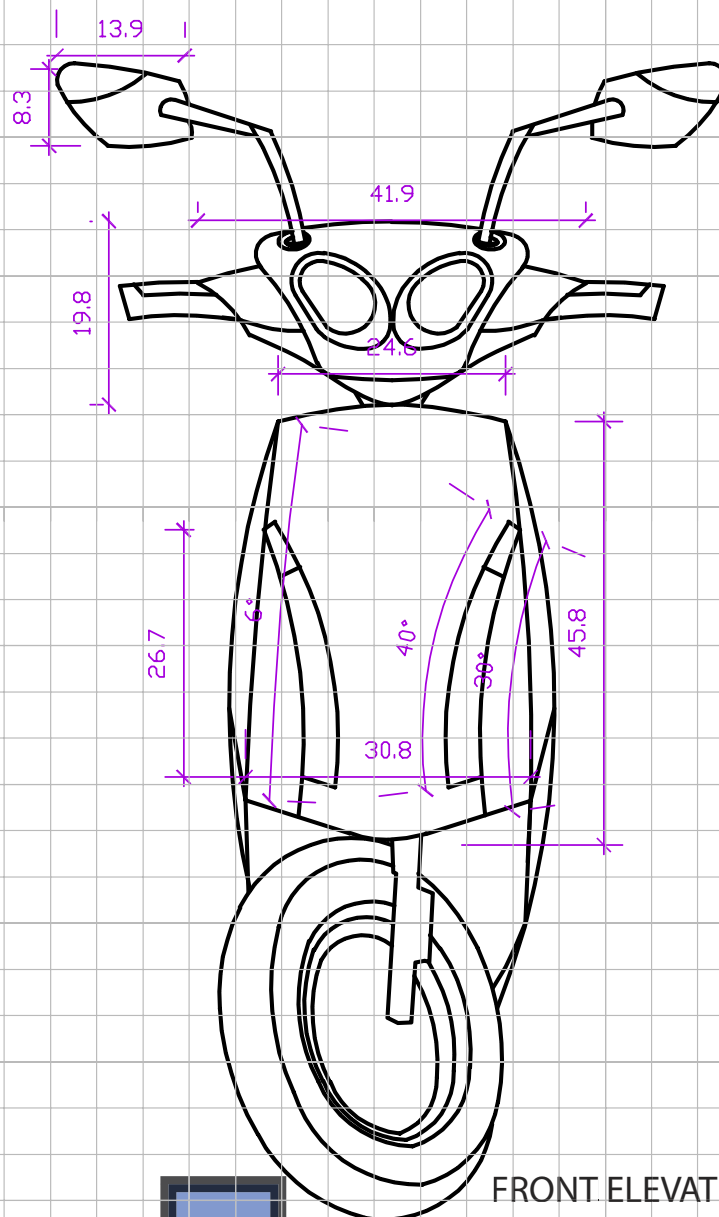


FINAL DESIGN AND DETAIL

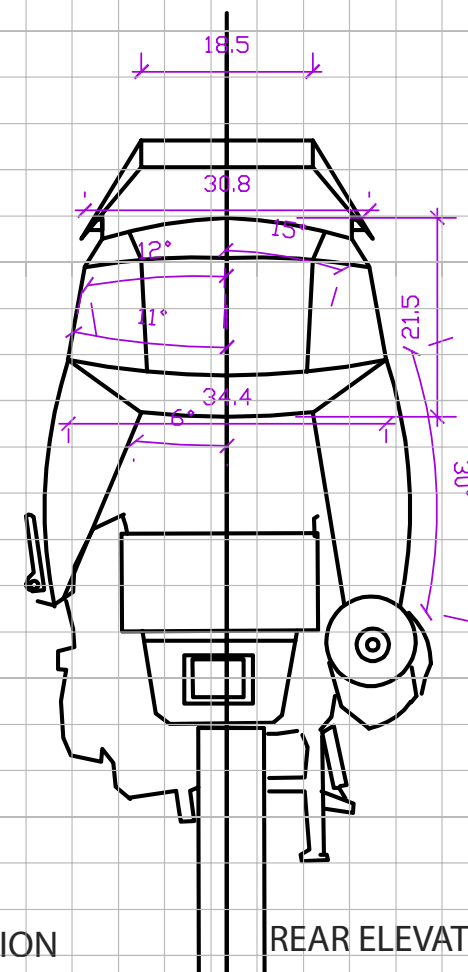
[illegible]

A technical line drawing of a motorcycle from a side profile view, overlaid on a grid. The drawing includes numerous dimension lines with numerical values indicating measurements in centimeters. Key dimensions include a total length of 62.2, a wheel diameter of 34.4, a seat height of 79.6, and a rear wheel diameter of 40.0. The text "SIDE ELEVATION" is written at the bottom right. A small blue square is located at the bottom center of the page.

GRID 5X5 cm

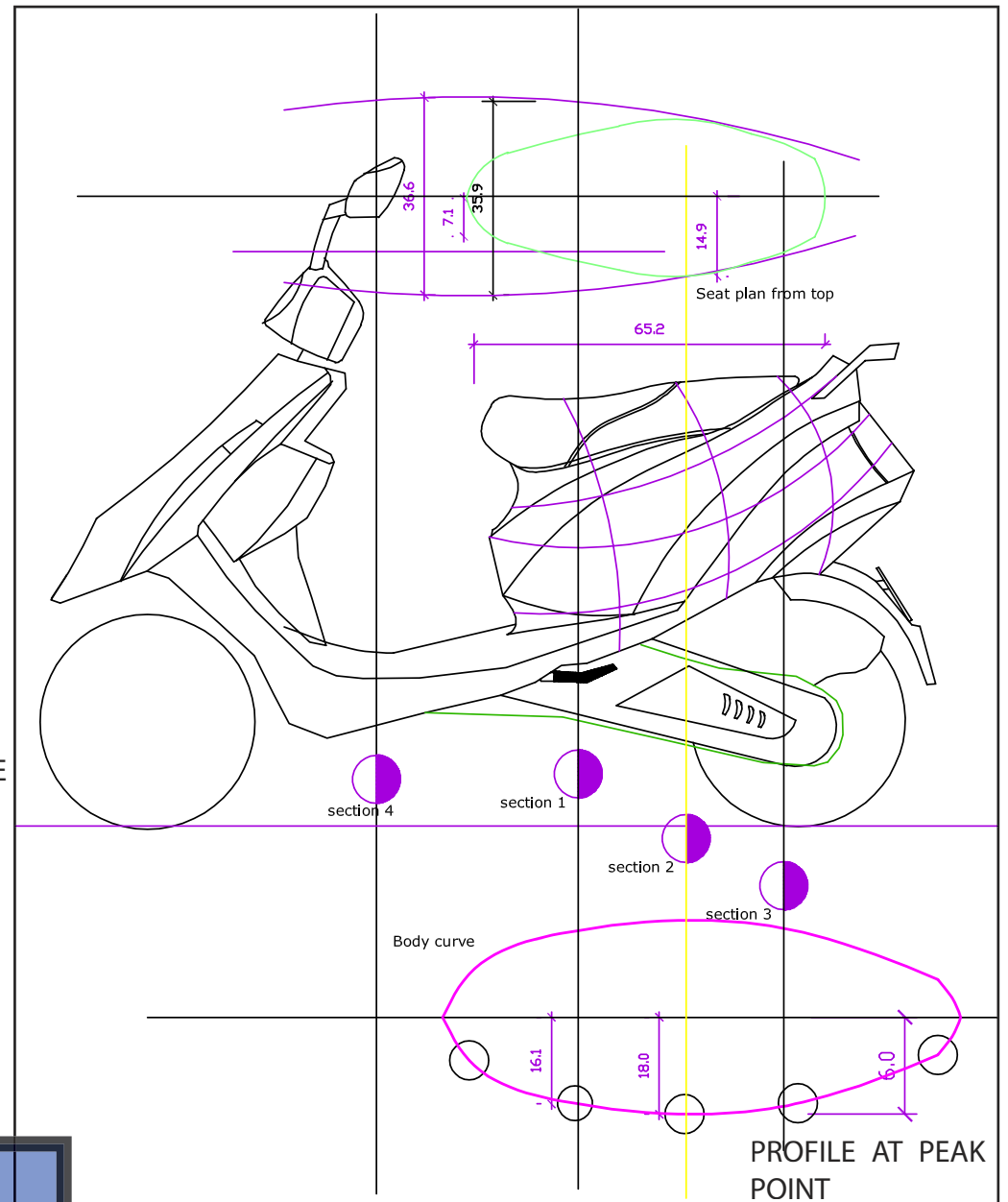


FRONT ELEVATION

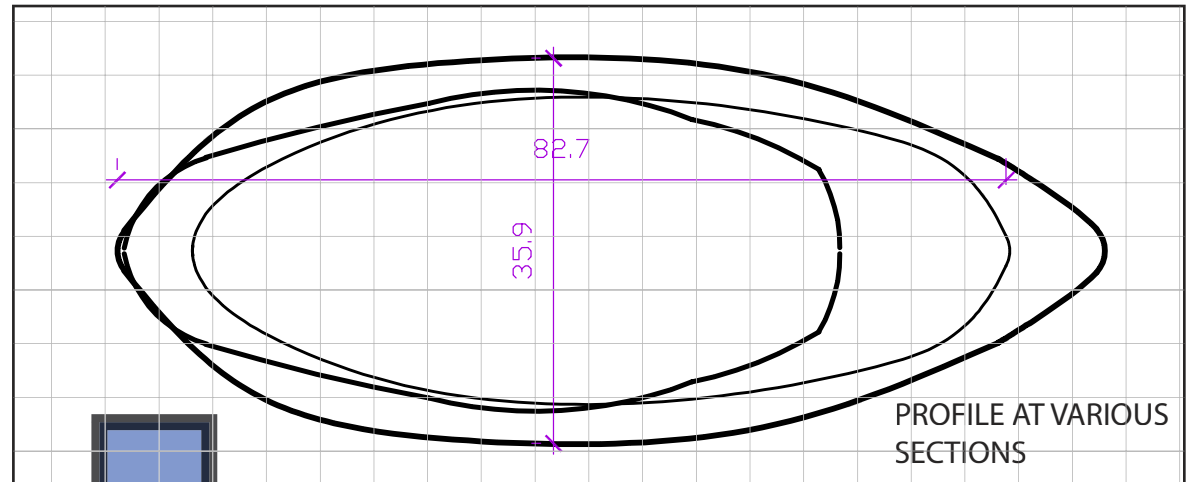
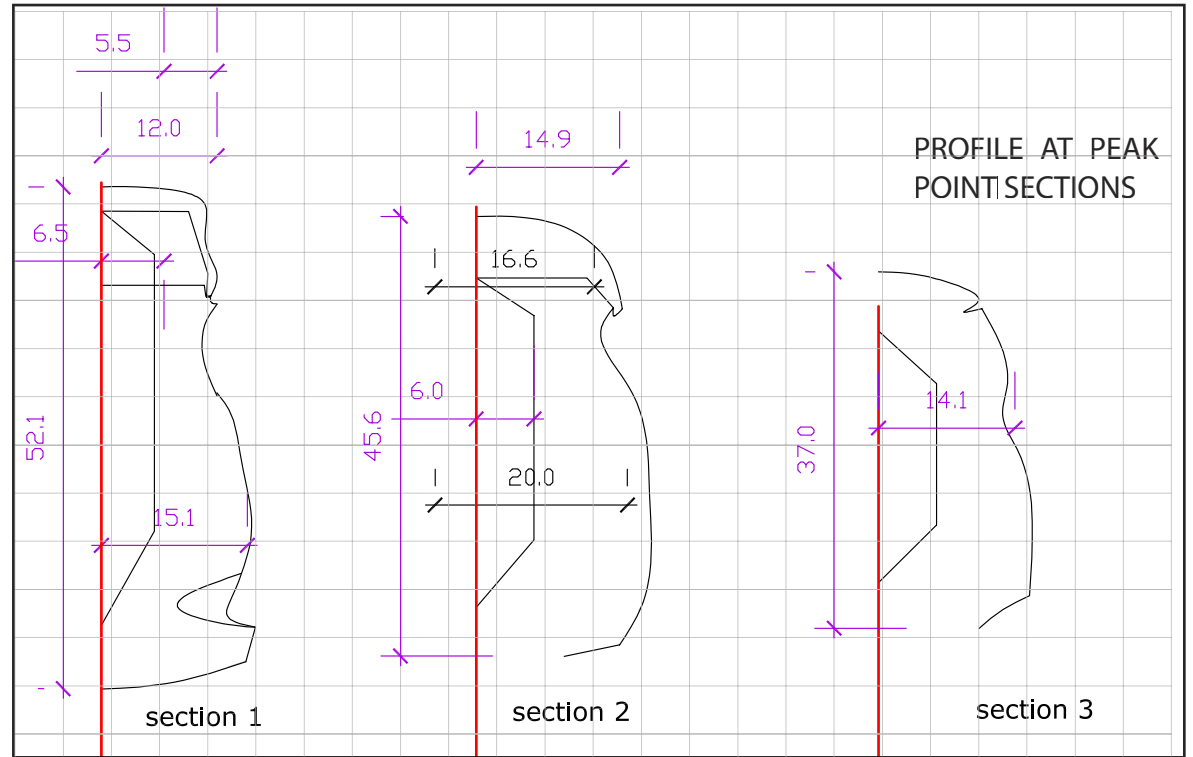


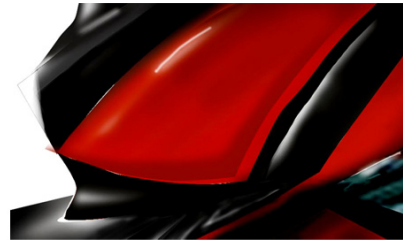
REAR ELEVATION

## BODY PROFILE OF THE VEHICLE

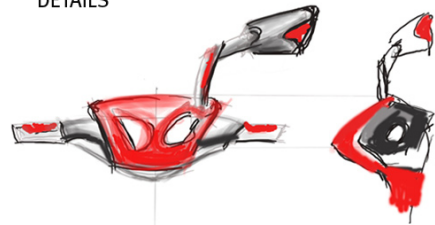








DETAILS



## MODEL

The final sporty expression is made in 1:5 scale with industrial clay and finished with a silver film over the top.







MODEL OUT OF INDUSTRIAL CLAY



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