Feasibility Study Survey Report

Feasibility study of Electric Bi-Cycle (Velomobile) for students and faculties of VVPIET Engineering institute Solapur

(A final year project of Bachelor of Mechanical Engineering)

Submitted to:

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REPORT

Feasibility study of Electric Bi-Cycle (Velomobiles) for students and faculties of VVPIET Engineering institute Solapur.

The report is divided into the following 3 sections:

1. **Present situation:** This deals with the present situation of electric bicycles, bicycles usage and the economic, technological, environment and other issues involved in running them.

2. **Issues involved** in using of electric bicycle at college and city.

3. What are the **next steps** in furthering this project.

I. *PRESENT SITUATION:*

Following is the tabulated format of survey conducted by us during the initial stage of the project to know the exact number of two wheelers and other vehicle arriving everyday to the college

Sr. No	Students Motorcycles	Faculty Motorcycles
1	235- 4 Stroke	50- 4 Stroke
2	8- 2 Stroke	1- 2 Stroke
Total	243	50

Table no.1 Types of two wheelers

Sr. No	Brand	Quantity
1	HERO HONDA	147
2	HERO	52
3	HONDA	69
4	SUZUKI	9
5	YAMAHA	3
6	BAJAJ	9
7	TVS/KAWASAKI/OTHERS	4
	TOTAL	293

Table No.2 Company / Brands of two wheelers

Sr. No	Area	Distance in Km
1	BALIVES	14
2	SHIVAJI CHOUK	12
3	BHAIYYA CHOWK	10
4	RAILWAY STATION	9
5	MAHAPOUR NIWAS	8
6	DAFFRIN CHOWK	8
7	RANG BHAVAN	8
8	SAAT RASTA	7
9	PATRAKAR BHAVAN	6
10	VIJAPUR NAKA	5
11	ITI	4
12	ASHOK NAGAR	4
13	NEHARU NAGAR	3
14	ATTAR NAGAR	3
15	SAIFUL	3
16	DAYANAND COLLEGE	15
17	GOVERNMENT POLYTECHNIC	13
18	WIT COLLEGE	13
19	GENTYAL CHOWK	12
20	GURUNANAK CHOWK	11
21	MAHAVIR ACHOWK	11
22	MAHILA HOSPITAL	9
23	ASARA (AIRPORT)	8
24	D MART	6
25	OTHER SMALL VILLAGES AROUND CITY	10
	TOTAL	212 Km

Table No.3 Different areas of city from where vehicles are coming towards college & its respective distance

Average distance travelled by each vehicle to and fro from college is **17.5 km** per day.

Average Mileage of vehicles is **55km/liter**

Hence to travel 17.5 km per day vehicle has to use **164mililiters** of petrol.

Considering avg. of vehicle we can obtain **Rs. 27** per day as expenses of petrol.

A. **Economic Issues**:

The economical class and backgrounds of the owners of vehicle surveyed are as below

Sr. No	High Class %	Middle Class %	Lower class %
1	11	60	29

Since the average expenses per vehicle per day are Rs. 27 we got to calculate average yearly expenses. By considering the total working days in the institute we concluded that average expenses per year per vehicle are Rs.6237/-

So there is need to cut down the costs because the petroleum prices are going high and also the scarcity of these are also experienced by world.

B. **Technology Issues**:

The technological issues are the efficiency of such kind of vehicle available in market today is not so reliable there are examples of YO BIKES which is the most famous electric bike in market today but the demerits are like it has a speed limit of 40km/hr. The cost of the product is also high. Also battery maintenance is a big problem. Hence there is a need of Velomobile is raised now a days.

C. **Environmental Issues**:

Today we know that environment problems are getting bigger. The pollution of the world is taking world to its last stages. There is a crucial need to cut down the carbon emissions. Our project is a small contribution towards this.

D. **Other Issues**:

In other issues we have to consider the requirement of paddling which could be a factor of consideration for the mature people since they may feel it not so comfortable.

II. ISSUES INVOLVED IN PLYING THESE RICKSHAWS ON INDIAN ROADS:

1. **Cost of electric bicycle and its finance** : The cost may vary between Rs. 12-18000/-
2. **Certificate of road worthiness:** No need of certificate because Laws in INDIA says you don't need license for bicycle.
3. **Market testing in Solapur:** We are planning to make another survey to see how much market requirement for these kinds of products.

III. CONCLUSIONS:

1. This study has resulted in the design and development of a pedal assisted electric bicycle.

2. This bicycle can carry one passenger at estimated speeds between 40-45 km/hr on level roads. It can also climb 12% slope with speeds of 10-12 km/hr.

3. Present estimates are that bicycle will cost about Rs12-18000/each.

4. Preliminary indications are that bicycle can serve as an inner city vehicle and can help in reducing pollution in these areas.

5. This study has also pointed towards steps that need to be taken to commercially introduce electrically assisted bicycles for the Indian roads.

IV. **Reference**:

1. F. R. Whitt and D. G. Wilson, Bicycling Science, MIT Press, Cambridge, 1995.
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3. Hczalek, "GM-Sunraycer – Solar Electric Vehicle System", **IECEC 1988 Proceedings,** pp. 283-288, 1988.
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