Marketing the 1999 WPI Formula SAE Racecar

by

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ABSTRACT

This project addresses the marketing component for the presentation event at the 1999 Formula SAE competition. The focus of the presentation event is to show that it is feasible to sell a thousand cars per year, i.e., it is necessary to show that there is market for the WPI Racecar. In order to demonstrate that it is necessary to perform a market analysis. The key points in the market analysis are determining the market size and competition, determining who is the customer and what his or her demands are, outlining the car's important qualities based on the customer demands, selecting locations for factory and dealerships, and finally determining the price of the car. All of the above can be done by using either real data or made up numbers for current racecar market. This work used many real figures, which were gathered from the Sports Car Club of America and an e-mail survey. It was also necessary to make a number of assumptions about current racecar market, as this particular area is not investigated well.

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1. Introduction

1.1 FSAE Competition

The main goal of the Formula Society of Automotive Engineers (SAE) competition is conceiving, designing and fabricating a small formula-style racecar to compete with other colleges in a series of static and dynamic events [1.1]. The prime event is the actual racing against other participants, in which the car's overall quality is being judged upon its performance on the track. Another important event is the cost analysis presentation, in which the car is judged upon how much money and effort was put into it by the competing team. The presentation event comes out of the cost analysis, since the sale price of the car depends directly on the manufacturing price. The final judgement on the car is given based upon how the car meets the design requirements as well as the cost and manufacturability requirements.

The main idea of the Formula SAE competition is for young engineers to gain experience in the field as well as to learn how to work as a team by carrying out this meaningful engineering project. That includes not only creating a good car, but also designing it at minimal cost within a specified budget and for a given sales market.

1.2 FSAE Racecar in SCCA Events

While no separate class exists for FSAE cars, they qualify to run in Solo II [1.2], or autocross, competitions, in which there is no wheel to wheel racing, as cars are sent out one at a time. The largest autocross club in the United States is Sports Car Club of America (SCCA) [1.2], and their definition of autocross is accepted by all other clubs. The definition [1.2] is as follows: Solo II events (also known as autocrosses) are an all-forward motion driving skill contest. Each driver is individually timed to the thousandth of a second, over a short, miniature road course clearly defined using traffic cones. Cars compete one at a time, hence the name "Solo", in a class with similar cars. An event can be held on any flat paved surface, usually a parking lot, or airport apron or runway. Solo II emphasizes driver skill and vehicle handling rather than just speed. The corners are tight, and there are a lot of them, so the driving is exciting and challenging. Solo II speeds do not exceed those normally encountered in highway drive.

Solo II was derived from the original Gymkhana competitions from 50s and 60s. Almost any regular streetcar can participate in a Solo II event. Most of the racing is usually done in second gear, and top speeds do not usually exceed 60 – 70mph, which is an average speed of an automobile on a regular highway.

Formula SAE cars fit into Modified Class A category of Solo II [1.3]. SCCA defines cars in that class as heavily modified for the purposes of competition. Some of the specifications are minimum weight of 700 lbs., minimum wheelbase of 72 in., breaks and roll bar meeting SCCA standards which are described in the SCCA rulebook. Modified Class A cars are only used

by their owners to compete in autocross events, as they have very little practical use in the real life, i.e., they are not street legal.

Originally, Formula SAE cars were not placed in any category under Solo II rules. As no separate class exists specifically for FSAE cars, all FSAE cars were put into Modified Class A category of Solo II. Unfortunately, due to limitations set by the rules of the Formula SAE competition, such as engine size, FSAE cars cannot compete successfully against other formula type cars in the A Modified class. In 1998 the fastest FSAE car, which belonged to University of Texas Arlington team, which is the winner of 8 of the past 17 FSAE competitions, finished ninth in Solo II Nationals, in which 20 FSAE cars participated that year. Hopefully, sometime in the future, there will be enough interest in different educational institutions in participating in the FSAE competition, so a separate class for FSAE cars will be established, and they will be able compete against cars with the same specifications.

This paper will be dealing with the presentation event of the competition. It will discuss the WPI Formula SAE team's plans for sales and marketing of the car, in order to do which, the racecar market of the United States will be researched. It will be done by compiling information from various autocross clubs in the country and conducting a survey among autocross racers. In this text "we" and "us" will be referring to WPI Formula SAE team.

1.3 FSAE Presentation Event: Marketing Component

FSAE Presentation Event consists of two components, which are marketing and manufacturing. The manufacturing component covers the manufacturing aspects of the car, which include factory layout, production plan, etc. [1.4]. The marketing part is mainly market research, based on which the potential market is analyzed and predictions about sales are made. The sales price of the car is determined based on manufacturing cost of the car, which is derived in the cost analysis based on money and effort put into the car by the team, overheads cost, and the suggested retail price, which is given in the rules of the competition. Also, another important aspect of the marketing part of the presentation is understanding customer demands, which is essential to making, marketing and selling the product profitably. Those are determined based on the survey and market research as well.

The marketing presentation is purely theoretical, as the car is not going to be available to general public, and the only existing prototype will stay in school. Nevertheless, the marketing event is still very important, since it shows how well the prototype is fit for the real world. The students assume that the car will be built for sale to a nonprofessional weekend autocross racer. Therefore, the car must be cheap, reliable, and easy to maintain. Just like in selling a real car, the marketability of the car will be enhanced by factors such as aesthetics, comfort and repair parts availability. The suggested retail price of the car must be maintained under $9000 and 1000 of the cars will be produced and sold per year.

It is stated in the rules, that there are only two parts in the presentation, and it has been understood that the manufacturing part is of a greater importance than marketing. It was assumed, that while the marketing part is still significant, the FSAE competition targets the participants' engineering skills, and, therefore, the judges of the competition pay more attention to the manufacturing part of the presentation. This assumption was later proved to be incorrect, which is discussed in Chapter 5. The whole presentation is ten minutes long, and it was broken into approximately three minutes for marketing, which involves no technical questions, and approximately 7 minutes for manufacturing [1.4]. In addition, a TV commercial is to be presented to the judges at that time along with the magazine article, brochure, and the webpage, all of which is made up specifically for the 1999 WPI Formula SAE Racecar.

1.4 Objectives

The objective of the marketing component of the presentation event is to conduct and analyze information on racecar market needs, and as a consequence to sell a thousand cars profitably based on that information and at a given price. Many assumptions had to be made in order to make valuable conclusions, because this particular area of the competition is not researched well.

The judges of the competition do not expect many realistic figures from the contestants [1.5], [5.1], since the task of selling a thousand cars per year is not feasible. Any assumptions and made up numbers are acceptable, as long as they appear to be more or less valid, which seems to be rather misleading. In

order to have factual information, instead of just assumed figures, information was obtained from Sports Car Club of America and a survey was conducted for this project.

2. WPI FSAE Sales Plan

2.1 Background

Effectively determining the nature of the market for the given product is understanding the customer's expectations of the product. The WPI FSAE racecar prototype was developed to build a car for sale to a working individual who enjoys nonprofessional autocross racing during his/her leisure time, i.e., weekends. The car will provide such an individual with an opportunity to autocross at an affordable price and easy maintenance, which will be achieved by establishing authorized dealerships across the nation. Other applications of the car could be sales in recreational markets (similar to jet ski and mountain bike sales), amusement parks, and using it as an educational model for young automotive and mechanical engineers. Several universities and technical schools may be interested in purchasing the car as an educational tool. In addition, the e-mail survey, which is discussed in Section 2.3, revealed that many individuals would like to rent a car just to race during a racing event, and, therefore, there is a market potential for sales to various racing clubs. The number of cars sold to clubs will depend on number of members in each particular clubs. However, at this point, the main goal is selling 1000 cars per year to individuals interested in weekend autocrossing at a cost which does not exceed $9000, while the actual manufacturing cost of the car is $6820 [1.4].

Even though a lot of information is available on the subject of professional racing, the nonprofessional racecar market is not investigated as well. The WPI FSAE racecar belongs to Solo II A Modified Class, which is a nonprofessional class. Since this class does not exist for Formula SAE, it is necessary to research the nonprofessional racecar market as a whole. In order to analyze the market carefully, a survey is necessary to obtain the knowledge of people who actually race in that class.

2.2 Sales Plan

The primary goals of the project are finding out exactly who our customer is and what his/her expectations are. The customers look for certain qualities in the car, such as easy handling, performance, parts and service availability. Having participated in the Formula SAE Competition since 1985, the WPI team has a lot of experience in the small formula-style racecar design and testing. This experience enables the WPI team to produce a better and more competitive product every year, as well as provide better after sale service and support in comparison to other teams.

The racing industry market, which includes not only automobile races, but also horse, races, dog races and motorcycle races is growing at a rapid rate. The 49 companies involved in this "thrill seekers" industry generated $4,654 billion in revenue in 1995 [2.1]. As far as strictly automotive racing, the industry more than doubled since early 1980 [2.2]. The market as a whole is looking toward manufacturers to produce new kinds of equipment for use in the expansion of the industry. The WPI FSAE racecar team hopes to capture a

niche in this market by appealing to the weekend thrill seekers and luring them towards racing. The overall growth of the sport is confirmed by tremendous increase in sales of related merchandise, for instance, sales of NASCAR-licensed goods jumped from $60 million in 1990 to $500 million in 1995 [2.3].

2.3 Survey

To gain a better understanding of the market, it is necessary to conduct a survey among people directly involved in autocrossing, particularly in Solo II class. Questions asked in the survey target certain vital qualities of a racecar and their importance to people that actually drive racecars. Analyzed responses are used to build a manufacturing quality table, discussed in the Section 2.5, which reflects how much time and effort should be put into different areas of manufacturing the car depending on both their importance to the customers and manufacturing aspects of the car

2.3.1 Target Audience

The target audience is a nonprofessional weekend autocrosser [1.1]. This person's hobby is Solo II racing, in which winning means driving a vehicle through a given course constructed from pylons in lowest time possible. We are interested in responses from racers that participate in all classes, not only Solo II, while autocross is still of primary interest.

To gain some preliminary knowledge of the audience, some facts were obtained [2.4] through the SCCA's home office [2.5] and Web site [1.3]. In order to confirm the accuracy of the survey, this information can be later compared

with some information asked in the survey to see if our audience's responses matched the SCCA averages. The facts represent the members of 1997.

- 51,000 members of SCCA.
- An average SCCA member's household income is $77,087.
- Over half of SCCA members hold professional and/or managerial occupations and 63% hold college degrees.
- The median age for an SCCA member is 40.1 years with 74% falling between the ages of 25 and 44.
- 82% of SCCA members own their own home and 65% own three or more automobiles.
- The average SCCA member spends $3,663 on parts, maintenance and after market accessories for his or her street and competition cars… representing a total market of well over $180 million annually.

2.3.2 Survey Development

Figuring out what is relevant in the survey is important. Compiling the survey requires carefully considering questions, and leaving only those that are truly important. In addition, the survey cannot be too long or too boring to read, since people will simply not want to fill it out, and, therefore, questions must be short and exact.

After a careful consideration, only those questions were included that were considered to be truly important in order to understand the customer demands. The survey that was conducted last year by the WPI FSAE team [2.4] was taken as a model for this survey. However, the last year's version was

modified quite a bit with help of Dick Parkinson and Rich Emmons [2.6], and ended up being considerably longer, as the questions in the first part were more technically involved and in the part two more marketing oriented questions were added. The questions that felt to be unnecessary were removed from the final version of the survey.

There were no demographic questions in the survey, and therefore, very little knowledge was obtained about the audience's demographics. A small additional demographics survey, which asked about participants' occupation, gender, and age, was e-mailed to those who replied to the original survey. Both the original and demographic surveys are shown in the Appendix A.

2.3.3 Survey Distribution

The survey was mailed to four mailing lists of SCCA autocross clubs in the United States. One of them was the same list as was used for the last year survey, autox@autox.team.net [2.7], which is a nationwide mailing list, consisting of approximately 900 members located in different regions of the country. Due to the diversity of subscribers on that list, we should get a more or less accurate picture of what different people want from the product. The other three randomly picked lists were rmsolo@privatei.com [2.8], the Rocky Mountain Solo Discussion List, ner@ner.org [2.9] and nersolo@ner.org [2.10], the New England Region of the Sports Car Club of America mailing list. The survey done last year showed that about 40 people from one thousand that was e-mailed replied. Assuming, that about a thousand people received the survey this year as well, the response rate even higher than the last year's, with 44 replies. Some people

included their suggestions and comments in their replies, which are enclosed as well, and will be used for the analysis, as some of them appear to have valuable information. The combination of this year's and last year's results gives us an accurate picture of the customer needs.

The additional demographics survey distributed after the original surveys came back had a little bit smaller reply rate with only 37 replies. The results of the demographics survey are discussed in the next subsection and shown in the Appendix A.

2.3.4 Evaluation of Survey Results

The results of the survey are used in the quality table, discussed in Section 2.5, which reflects how important various aspects of the car are to our potential customers. In order to make the data more readable, the information was put into tabulated form, which is shown in Appendix A along with the printouts of replies.

The evaluation of the first part of the survey is attached as A.3 in Appendix A in a form of a number of tables with replies and graphs for every question, which show the trend in replies. It showed that the most important qualities of the listed ones were (in descending order): handling, slalom performance, braking (over 20 replies for "5"). The qualities that were of lesser importance were acceleration, skidpad performance, power to weight ratio, and assembly quality. The qualities that seemed to be of even lesser importance, or not important at all were engine access, interior/safety, wrench clearance, chassis/mechanical design, innovativeness and crashworthiness. This indicates

that the parameters listed above, while still being substantial qualities of the car, are not the key factors for customers when making the decision about purchasing the car. The last question asked for the number of preferred hours spent on maintenance per event, which had the highest ranking at 1-2 hours. Last year's survey results for part 1 were similar to this survey [2.4]. Handling, power to weight ratio and the number of preferred maintenance hours responses were virtually identical.

The second part of the survey asked for short answers to given questions, which were customer needs oriented. These short answers give insight to how the target audience feels about the Formula SAE cars. Summary of the answers given in Part Two is shown in tabulated form as Table A.4 in the Appendix A. It seems that the majority of people that responded to the survey answered the questions with depth and honesty. The answers indicated that most autocrossers prefer to take their daily cars to the events, which allows them to race with low hassle, low maintenance and relatively inexpensively.

The replies clearly showed that the most important quality of any racecar for the majority of autocrossers is handling. Other significant qualities mentioned were cost, acceleration, braking, easy maintenance, and some others, which are listed in the Table A.4 in the Appendix A.

Forty eight percent of people that participated in the survey stated that they would purchase an FSAE car. The reasons given were that it is fun to drive, fast, and, even though not popular in its class, still meets the criteria of a good racecar. Forty five percent of those who replied to the survey stated that they would not purchase the car, mostly due to the car not being competitive in A

Modified class, to which it belongs. The reason the FSAE cars are not competitive is due to the earlier discussed fact that the Formula SAE rules limit certain specifications on the car, due to which the car cannot perform on the same level as other cars in the A Modified class. Other than the car not being as competitive in the class, the reasons given against purchasing the car were streetcar preference, reliability, towing and maintenance issues, which again closely matched the last year's responses to the same question.

Quite a few participants stated that they would not buy an FSAE car because they mostly race their everyday cars, but they would like to try it or possibly rent it just to race it during events.

Even though it seems that only about one half of the people who participated would consider buying the car, they seem very eager and excited about this project. This shows that while a thousand cars per year is still a very unrealistic figure, there would be quite a few potential customers. From evaluating e-mail responses, it feels as though the FSAE cars do not get much publicity and are not well known. Many people do not take student projects as seriously as they really are. Clever advertising and promotion should make the FSAE cars much more popular on the racecar market.

The additional demographics survey, which is shown as A.5 in the Appendix A, revealed that most participants would, in theory, be able to afford buying the car. 51.35% (19 people) of those who replied work in engineering/computer/science related field, 24.3% (9 people) are self employed or work in management related field. This matches the information provided by SCCA in Section 2.3.1, in which it is stated that over half of SCCA members hold

professional and/or managerial occupations and 63% hold college degrees. While there is no information on this survey's audience's college education, it may be assumed based on common sense that most of those represented in the above two groups hold college degrees. The facts discussed above are reflected in the Table A.6 in Appendix A, which shows the break up of the survey's audience by occupation. Incomes for members of both the professional and managerial groups are theoretically higher than incomes of people with no college degrees, and therefore, 75% of the survey's audience are able to afford the car. Occupations of the remaining 25% (9 people) range widely from students to graphic designers and pharmaceutical buyers. Of 37 people that replied 34 were males and 3 were females, average age for both genders being 36.5 years old.

2.4 Design for Manufacturing and Assembly

In order to comply with the FSAE rules when designing and building the racecar, the concept of Design for Manufacturing and Assembly (DFMA) can be used. This concept is becoming more popular than the traditional "we design it and you make it" [2.11] motto, which simply means that the manufacturing and assembly processes were not necessarily considered as one when designing a part, which ultimately lead to numerous problems, at which point it was unavoidable to request for design changes. Inevitably, such mismatches make the entire process rather costly, which is unfavorable for the business as a whole. To summarize the idea of DFMA shortly, it can be stated that "Design for Manufacturing means the design for case of manufacturing of the collection of

parts that will form the product after assembly and design for assembly means the design of the product for ease of assembly" [2.11]. The DFMA principles must be considered at the earliest stages of designing any process in order to avoid problems listed above.

The overall description of DFMA usage in the WPI FSAE Racecar project is fully described in [2.1]. The DFMA concepts were applied to the process in order to insure that the car is produced in a timely and cost effective manner. The main focus of the design stage was fabricating the car in such a way so that it is easy to assemble and disassemble. Other important issues considered were selecting the right processes and materials, as well as finding economic methods to simplify the production and reduce the cost of the car.

In general, the advantages of utilizing the DFMA can be summarized as follows:

- Help to simplify the design of the product.
- Reduce Cost.
- Eliminate unnecessary parts and processes.
- Improve Quality.
- Increase the interaction between design and manufacturing stages.

2.5 Manufacturing Quality Table

In order to identify the areas of the product which need improvement, it is useful to build a Quality Characteristics Table [2.12], [2.13], which is shown as Figure 2.1. The table reflects which particular aspects of the product, in this case a racecar, are of vital importance to the customers and ultimately need

more attention than other less significant areas. The table was developed based on the responses to the e-mail survey, which are discussed in Section 2.3.4. The entire process of constructing the table is described thoroughly in [2.1]. The table shows that the top customer demands are chassis/mechanical design and interior/safety, as denoted by the highlighted percentages in the far right column. It is also shown that the highest quality characteristics are slalom performance and skid-pad performance, which implies that the future design and improvement efforts must be concentrated on improving those two qualities, which is to be achieved by concentrating efforts on chassis and mechanical design of the car. Improving the interior and safety design is also of a great importance, as it is directly related to the drivers' performance on a higher level of efficiency.

	weight	braking	acceleration	slalom performance	skidpad performance	assembly quality	engine access	wrench clearance	adjustability	crashworthiness	RATE OF IMPORTANCE	1999 ENTRY	1998 ENTRY	1997 ENTRY	PLAN	IMPROVEMENT RATIO	SALES POINT	ABSOLUTE WEIGHT	DEMANDED WEIGHT
COST	9	3	3	3	3	9	3	3	3	3	2	2	3	4	3	1.50	1.0	3.0	17%
	155	52	52	52	52	155	52	52	52	52									
CHASSIS/MECH.DES	9	3	3	9	9	3	3	3	3	3	3	4	3	2	4	1.00	1.5	4.5	**26%**
	233	78	78	**233**	**233**	78	78	78	78	78									
INTERIOR/SAFETY	3	3	0	9	9	0	3	3	1	9	4	4	2	3	5	1.25	1.5	7.5	**43%**
	129	129	0	**388**	**388**	0	129	129	43	**388**									
INNOVATIVENESS	3	3	1	3	3	3	3	3	**3**	3	2	4	3	2	4	1.00	1.2	2.4	14%
	41	41	14	41	41	41	41	41	41	41									
Total	559	300	143	714	714	274	300	300	214	559	4076						TOTAL	17.4	
%	**14%**	7%	4%	**18%**	**18%**	7%	7%	7%	5%	**14%**	100%								

Figure 2.1 Quality Table [2.1]

2.6 Final Sales Plan

The e-mail survey revealed that 6 percent of all SCCA members race in A Modified Class. In 1998 there were 54,363 members in SCCA [2.14], of which 6% is 3262 members. Assuming that the competitors of the WPI Racecar are the top three schools of the 1999 Formula SAE competition, which are University of Akron, Rochester Institute of Technology and Cornell University, and that those schools will each sell a thousand cars per year, which totals to 3000 cars per year overall, we can conclude that we will definitely sell 262 cars per year to SCCA members. It can also be assumed that another 800 cars will be sold to various technical schools across the country, such as vocational high schools, technical universities and institutions, etc., and also to various racecar clubs to rent during the events. Therefore, our sales will only be limited by production capacity.

Sales Strategy - The WPI FSAE 1999 should be treated as a long-term product. The entire support structure and after sales product support needs to be developed based upon this strategy to ensure that the WPI racecar can capture and maintain a large section of the market. Because of WPI Formula SAE 1999 racecar's special market characteristics, our sales strategy includes:

- Extensive personal marketing
- Major sales initiatives during the summer months
- Focus on car performance
- Outline of car's safety features

Positioning - The consumer views our racecar as an extremely reliable and easy to service vehicle that is able to perform on a high level. Its unique technical advantages, exceptional quality and high performance can be exploited to attract potential customers. In terms of market segmentation advantages, we can use upscale consumers to arrive at a winning position here. Positioning our car as "an escape from work drudgery" in the minds of higher level executives and managers would enable us to capture a large share of that market.

We can reposition our competitors by:

- Focussing on the serviceability and performance of the WPI 1999.
- Comparing the WPI 1999 car performance to that of the competition

The resulting Selling Basis for our product, then, is to show the consumer the advantages of our car with it's qualities such as follows:

- Ease of Manufacturability
- Serviceability
- Reliability
- Versatility

Pricing - The prices for our products are determined first and foremost by manufacturing costs, suppliers, manufacturers and our ability to obtain package deals for parts that we have to outsource. It is important to know that competitive pricing is essential to our market profile. Compared to the competition, our prices are lower while the performance of our car is decidedly superior. Different seasonal aspects of our market affect our pricing to some

extent since the demand for the racecar is expected to peak during the summer months and to taper off during the winter months. We feel that our customers will be willing to pay $8500 because our competitors have set the value of their racecars at $9000.

Margin Structure - The best strategy for our sales group is expected through dealerships and direct marketing. Since the sales volume is predicted to be low during the initial stages of setup, the distribution networks and retail management strategies to market the product are unlikely to be very effective. Instead we will use predominantly direct marketing strategies and utilize distribution networks that are already in place.

Manufacturer's Representative - 5% of sales cost as commission, which is the average commission by industry standards.

Direct Sales - Direct contact with the consumer. Costs and time involved need to be minimized.

Discounts - We can take advantage of volume purchases from WPI. Once the manufacturing processes for the prototype is standardized, discounts for purchase of large volume will be availed of. We plan to review our pricing and product/service margin every 6 months for the first two years and once per year thereafter. We will discuss the necessity of a new pricing policy and check to see if market share is being lost due to a poor pricing strategy.

3. WPI FSAE Market Plan

3.1 Background

The primary goal is not only selling the car, but providing after sale service and customer support as well as expanding our market. One of the main questions is whether the cars should be sold by the manufacturer directly to customers and the manufacturer would be responsible for all after sale service and support, or whether the cars should be distributed among authorized dealers who then will deal with the customers after the sale. It is necessary to come up with a number of cars that will be sold directly versus the number of cars that will go through our authorized dealers. From studying the market the information was obtained about the geographical areas that are in demand of the product as well as about customers' willingness to purchase parts from us, which came from the survey. Based on that information, the dealerships and service centers will be set up in areas with the highest demand.

3.2 Market Plan

Researching the racecar market is essential to predict the most profitable geographic zones for selling our car. Geographical regions throughout US with most racing activity will have the highest demand for such sales and service. Dealerships and/or service centers will be set up in those areas. There will also be one region in which the factory will be set up, and therefore no dealership will

be available there, as the factory will deal with the sales and service for that particular region. The factory and dealership locations are discussed in Sections 3.5.1 and 3.5.2.

3.3 Market Study

Our primary area of interest is the United States of America. The United States will be divided into zones as defined by SCCA [1.2], rather than the standard six-region division of the country. The Sports Car Club of America divides the United States into 11 divisions, or areas, which are then divided into regions, total number 110. The SCCA divisions are shown in Figure 3.1.

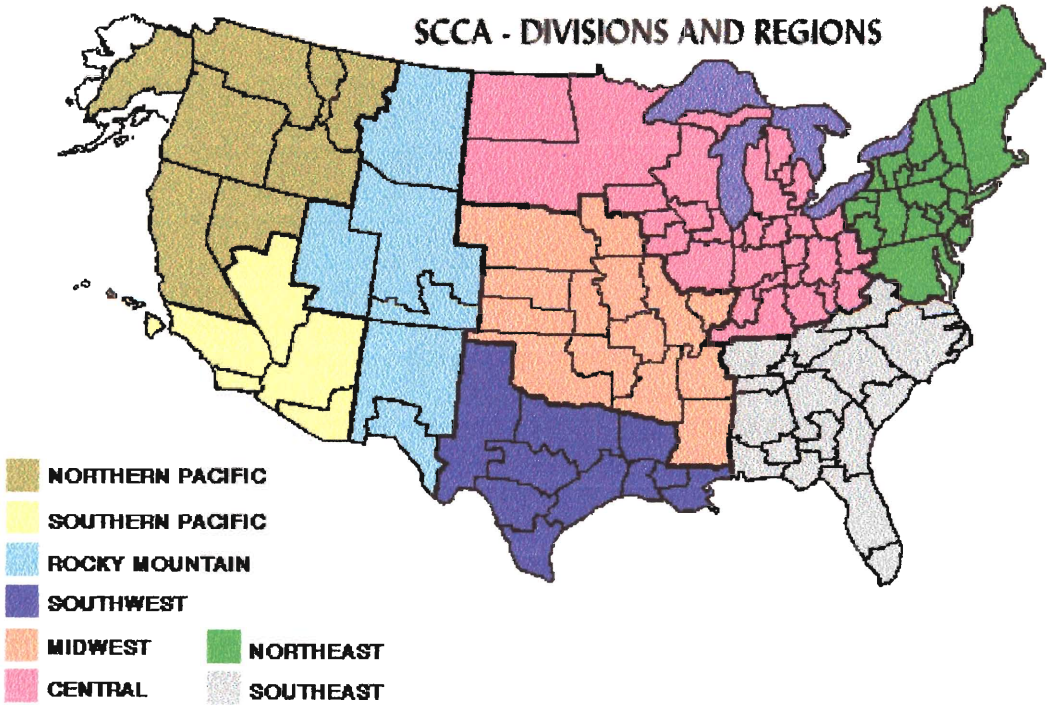

Figure 3.1 SCCA Divisions and Regions [1.2]

All areas are broken up into smaller regions, as shown in Tables B.1 through B.11 in Appendix B, which list all regions in each division in alphabetical

order and show the number of members in each region (as of March 1, 1998). This information was obtained through Dennis Dean, Vice President of Club Racing and Rally/Solo of SCCA [2.14]. These tables are summarized in Table 3.1 that reflects which areas have the greatest racing activity. Those areas will be our primary targets when determining the dealership and factory locations.

There will be authorized dealerships in some regions. The reason there will not be a dealership in every region is due to relatively low popularity of racecars that belong to A Modified Class. The location of the dealerships depends on concentration of autocross activities, i.e. places having a higher concentration of such activities must have a greater number of local dealers than places with a relatively low concentration. Based on the data from Table 3.1 and tables in Appendix B, which show the racing activity in every single region, the best geographical locations of dealerships can be determined. Table 3.1 summarizes all tables in Appendix B, to give us a clear picture of clubs sizes nationwide.

All regions are divided into 5 groups: small, with 99 members, medium, with 100-199 members, medium/large, with 200-650 members, large, with 651-2,500 members, and jumbo with 2,501 and more members. Region names are provided along with their numbers. Clearly, there are only four clubs in jumbo category and those are the primary targets when choosing the factory locations. Clubs that belong to the large category are to be considered for dealership locations. Due to low volume of sales, it is more logical to strategically place dealerships closer to places with large racing activity. Clubs that belong to small, medium and medium/large categories will be considered when choosing exact

Small 0-99	Region Number	Medium 100-199	Region Number	Medium/Large 200-650	Region Number	Large 651-2,500	Region Number	Jumbo 2.501&Over	Region Number
Alamo	49	Alabama	1	Blackhawk Valley	82	Arizona	2	California Club	19
Arctic Alaska	67	Blue Mountain	97	Buccaneer	34	Atlanta	3	Central Florida	83
Arizona Border	88	Blue Ridge	103	Central New York	5	Central Carolinas	61	New England	22
Arkansas	77	Central Illinois	4	Cincinnati	70	Chicago	7	San Francisco	33
Badlands	102	Eastern Tennessee	68	Continental Divide	109	Colorado	8		
Big Sky	38	Fort Wayne	85	Delta	9	Detroit	10		
Central Kentucky	74	Indiana Northwest	75	Des Moines Valley	76	Florida	11		
Central Louisiana	60	Kansas	15	Finger Lakes	62	Houston	32		
Central Pennsylvania	59	Kentucky	17	Glen	71	Land O'Lakes	18		
Chattanooga	94	Ozark Mountain	107	Indianapolis	13	Milwaukee	20		
Columbus Club	64	Reno	101	Kansas City	16	NeOhio	24		
Dixie	95	Rio Grande	53	Las Vegas	72	New York	23		
Great River	99	Saginaw Valley	100	Lone Star	98	Northern New Jersey	26		
Gulf Coast	12	South Bend	35	Mahoning Valley	80	Northwest	27		
Hawaii	46	South Carolina	79	Mid-South	66	Ohio Valley	29		
Iowa	14	Southern W. Virginia	47	Mohawk-Hudson	65	Oregon	96		
Lake Superior	56	Tennessee	40	NE Pennsylvania	25	St. Louis	21		
Middle Georgia	91	Utah	50	Nebraska	48	Texas	41		
Misery Bay	104			North Carolina	55	Washington DC	42		
Mississippi	73			Northeast Oklahoma	54				
Montana	105			Northwestern Ohio	28				
Northern Ohio Valley	89			Oklahoma	30				
Old Dominion	63			Philadelphia	31				
Pan American	81			San Diego	57				
Red River	78			South Jersey	84				
Salina	110			Steel Cities	39				
Snake River	106			Susquehanna	92				
South Texas Border	69			Western Michigan	6				
Southern Illinois	58			Western New York	43				
Southern Indiana	36			Western Ohio	86				
Southwest Louisiana	44			Wichita	90				
Tennessee Valley	93								
West Texas	87								
Wiregrass	45								
Yellowstone	108								

Table 3.1 SCCA Statistics Report 1/1/98

locations, as the number of members added up with the number of members of larger clubs makes up the overall target audience in a given geographic region.

3.4 Evaluation of Market Study Results

Table 3.1 summarizes information compiled in the previous section. The table divides all clubs into four categories, depending on their size. Clearly, only clubs with most members are of greatest interest. The task is to sell 1000 cars per year, and due to the fact that the product is not very popular yet, the only clubs selected as target clubs will be those with approximately 1000 or more members.

Table 3.2 shows our selected clubs in alphabetical order, divisions that they belong to and number of members in each club.

It is clear from the Table 3.2 that the three divisions with the greatest clubs are (in descending order): Northern Pacific Division/Area 9 (biggest club in San Francisco, with 4656 members), Southeastern Division/Area 3 (biggest clubs Central Florida and Florida, with 4455 members combined), and Northeast Division (biggest club in New England with 2868 members).

Table 3.2 SCCA Clubs with Approximately 1000 or More Members.

Club	Region #	Division/Area	# of Members
Arizona	2	Southern Pacific/11	955
Atlanta	3	Southeastern/3	1621
California Sports Car Club	19	Southern Pacific/11	2632
Central Florida	83	Southeastern/3	2590
Chicago	7	Central/5	1999
Colorado	8	Rocky Mountains/8	1300
Detroit	10	Central/4	2128
Florida	11	Southeastern/3	1865
Land O'Lakes	18	Central/5	1198
Milwaukee	20	Central/5	1158
New England	**22**	**Northeast/1**	**2868**
New York	23	Northeast/1	983
Northern New Jersey	26	Northeast/1	1003
Northwest	27	Northern Pacific/9	1273
Ohio Valley	29	Central/4	1118
Oregon	96	Northern Pacific/9	1161
San Francisco	**33**	**Northern Pacific/9**	**4656**
Texas	41	Southwest/7	1043
Washington DC	42	Northeast/2	2066

This information is valuable not only for setting up dealerships, but for selecting the factory location. Due to the low volume of production, it makes sense to place the factory in a busy region, so there would not be a need for a separate dealership in that area. Cars and parts are to be delivered from the factory directly to local customers. While there are more than two possible choices, California and New England are being considered as possible factory location areas. Other possible choices are Midwest and Florida, but at this point the abovementioned regions seem to be more appropriate choices due to reasons listed in Section 3.5.1.

3.5 Final Market Plan

Dealerships and factory locations must be carefully chosen in order to sell the car profitably. The next few sections are dedicated to discussing the choices of those locations.

The manufacturing price of the car including overheads (electricity, etc.) is $6820. The car is manufactured at a factory, which also serves as a dealership for those who live in the area close to the factory location. Essentially, the factory's price is lower than the dealers, since it is sells directly to customers at $8500 and the price for dealers is $8000. The dealer can raise the price as high as he or she thinks is appropriate. The dealer price can be affected by factors such as seasonal demand, popularity of the class in a particular geographic region and others. The product is distributed by the factory to dealerships all over the United States to serve people who live far away from the factory. Number of cars delivered to dealers is determined from the number of people

that race in A Modified and the number of people in the area that a particular dealership serves. The factory also supplies parts to dealers and those customers who wish to order parts directly from the manufacturer. There is a 1-800 Customer Service Hotline, via which customers can communicate with the manufacturer. The manufacturer, i.e., WPI, guarantees 24-hour delivery of spare parts by air to the customers.

3.5.1 Selecting Factory Location

Correctly selecting factory location can increase the plant's efficiency considerably, which ultimately saves a lot of money for the manufacturer. Choosing the location mainly involves minimizing the overall cost of operation and determining locations so that they can best serve customer demands. In this case, the second consideration weighs more than the first one since it saves money by not having to put a dealership into the particular area, and also attracts customer by lower than dealer's prices and guaranteed customer service.

Very often when choosing a good location for a new plant, the site is chosen simply because it is the hometown of the person beginning the business [3.1]. Both California and New England look very attractive as a potential factory location, but, even if they are equal in their qualities when considering everything, New England still seems like a more logical choice. While it may seem that choosing Worcester, MA, over San Francisco, CA, as the plant's location is based on that consideration, it is clear that this particular location is the best choice, which is shown below.

There is a number of factors which must be considered when selecting a site location qualitatively [3.1], which are listed below along with the considerations. Each one of those factors will be considered carefully to prove that Worcester, MA, is indeed the best choice for the plant's location.

Transportation Facilities - Both California and Massachusetts have well-developed highway, railroad and air transportation systems. The San Francisco International Airport is the fifth busiest in the nation, and there are several major highways intersecting in the city. Being the second largest city in Massachusetts, Worcester is close to a few major interstate highways and railroads, such as Worcester-Providence railroad. The Worcester area railroad system is one of New England's largest mainline freight interchanges. There also is an airport in Worcester, which is currently being developed into the second largest airport of Boston area [3.2].

Labor Supply - Due to relatively low volume of production, automation is not cost justified and the plant only requires 17 people for full operation, of which 13 are direct labor and the remaining 4 are indirect, and also 4 additional people for warehouse operations [2.1]. However, those 17 people required for the factory must be skilled technicians in order to produce quality product. While it is arguable that San Francisco is a good choice as far as labor due to a large number of workers from Mexico, it is still necessary to ensure that the workers have the essential skills. Worcester is one of the greatest industrial centers in

the northeastern part of the country, and, therefore, hiring employees that can satisfy the requirements is much easier than in San Francisco.

Availability of Land - When deciding between California and Massachusetts in terms of land price and availability, it is clear that Massachusetts is a much better choice. California is notorious for its expensive land, while land prices around Worcester area (although it is not true east of Worcester) are cheaper. According to [3.2] average class A Central Business District rental range per square foot is $22.63 for San Francisco, CA, and $22.50 for Boston area. No figures are given for Worcester area, but it may be assumed that the price goes down from east to west in Massachusetts.

Nearness to Markets - Both locations fit this requirement perfectly. San Francisco is officially the largest region of SCCA, and New England is the second largest. New England is also very close to other regions with high racing activities, such as New York. Canadian racers can also be considered as potential customers, as the border is only a few hours away.

Availability of Suitable Utilities - Average cost of electricity per kilowatt hour in 1990 was 8.82 cents in California and 8.83 cents in Massachusetts [3.2].

Proximity to Raw Materials – The top three principle non-fuel minerals in 1994 in California are (in order of value): 1) Cement 2) Sand and Gravel 3) Gold. In Massachusetts those minerals are: 1) Stone 2) Sand and Gravel 3) Stone.

Clearly, these minerals are not important for the given manufacturing facility, and, therefore, neither California nor Massachusetts are a good choice in terms of proximity to raw materials. A good location to pick would be, for instance, Michigan, where the top non-fuel mineral is iron ore [3.3].

Geographical and Weather Characteristics – San Francisco fits this particular factor much better than Worcester, which is notorious for being one of the coldest places with most snowfalls in New England in the winter. All year testing is available in San Francisco where the weather is consistently spring-like [3.2], while for Worcester location testing would only be possible roughly from late March to early November.

Taxes and Other Laws – Corporate income tax in California is 9.3% of taxable net income and general sales tax is 6%, in Massachusetts corporate income tax is 9.5% of taxable net income and general sales tax is 5% [3.2].

Community Attitudes - The plant can be used as an educational tool for students from colleges nearby. Being close to Boston, which is one of the largest educational centers in the world, the plant can be visited by students from various colleges in Boston, Worcester and other institutions in the area. San Francisco is a large educational center as well and can use the plant as an educational tool also.

National Security - This factor is not very important for this particular product, since the product is not military oriented at all, and therefore, makes no difference when choosing the factory location.

Proximity to the Company's Existing Plants - Worcester Polytechnic Institute is located in Worcester, MA, and since the product was originally designed and built at WPI, it is very convenient to have the factory in the area, since the operation can be supervised by the people that actually worked on the project and all technical issues that may rise can be solved right at the plant. Also, in the future, the proximity of the plant to WPI will be of help when designing, building and testing new models of the WPI Formula SAE racecar.

All of the considerations described above are used to make up Table 3.3, which summarizes all of them to give a clear picture of choosing one site over another.

Table 3.3 Sites Ranking When Choosing Factory Location

Considerations	Maximum Weight	San Francisco, CA	Worcester MA
Transportation Facilities	100	90	90
Labor Supply	100	70	90
Availability of Land	100	50	70
Nearness to Markets	100	90	90
Availability of Suitable Utilities	75	60	60
Proximity to Raw Materials	75	0	0
Geographical/Weather	50	50	40
Taxes and Other Laws	50	40	40
Community Attitudes	40	40	40
National Security	30	0	0
Proximity to the Existing	30	0	30
Total	**750**	**495**	**550**

Table 3.3 shows that our choice of Worcester, MA, over San Francisco, CA was indeed correct. While many factors seem to have equal or almost equal values, and some of them actually being better for California, such as whether considerations, two extremely important factors, which are labor supply and proximity to the existing plants, clearly show that Worcester, MA is a better choice than San Francisco, CA.

3.5.2 Selecting Dealership Locations

Table 3.2 indicates that there are 19 clubs with 1000 or more members, and, therefore, nineteen is the maximum number of dealerships that need to be considered. Some of the clubs are located not far from one another, such as New York, New England and Northern New Jersey, which allows placing one

dealerships instead of two or three in some locations. Also, considering concentration of smaller clubs around bigger ones is important, as the small clubs can add up to considerable numbers. After careful consideration, it appears that the dealerships are to be established in the locations shown in Table 3.4. Figure 3.2 shows the overall distribution of dealerships around the United States. The stars represent dealerships and the factory is shown by the factory picture and an arrow. Each dealership location is discussed below.

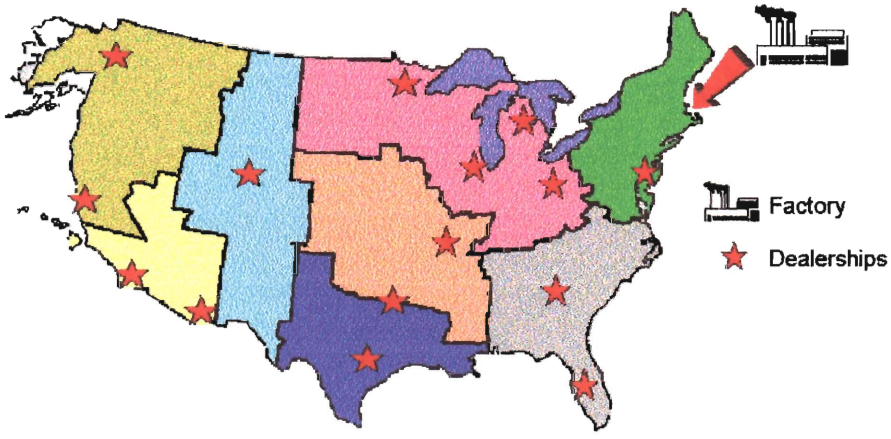

Figure 3.2 Dealership Locations

Table 3.4 Dealership Locations.

Division	Location	Members Served	# of Cars Distributed
Northeastern-Area 1&10	Worcester, MA (Factory)	6252	31
Northeastern-Area 2	Washington, DC.	5253	26
Southeastern - Area 3	Atlanta, GA	4109	21
	Orlando, FL	5177	26
Central - East, Area 4	Columbus, OH	3793	19
	Detroit, MI	3693	19
Central - West, Area 5	Chicago, IL	3840	19
	Rogers, MN	1292	6
Midwest - Area 6	Tulsa, OK	1406	6
	Saint Louis, MO	1842	9
Southwest - Area 7	Houston, TX	2746	13
Rocky Mountains - Area 8	Denver, CO	1991	9
Northern Pacific - Area 9	Portland, OR	2675	13
	San Francisco, CA	4850	23
Southern Pacific Area 11	Buttonwillow, CA	3565	17
	Avondale, AZ	1043	5
		Total	262

Another important factor when considering the dealership locations was proximity to racetracks, which was obtained from the SCCA Web page [1.2]. On figures below racetracks are indicated with stars.

Due to their size (both territory and number of members) some divisions required more than one dealership. The number of members served was calculated by adding up all clubs in a given geographic area, considering that it is possible for a customer to drive a given distance to a dealership. Due to small volume of sales, some clubs were almost ignored (number were included in the total, while it is probably not possible that the customers will drive the given distance), since additional dealerships are not cost justified. The number of cars distributed into each dealership is determined by dividing the total number of people served out of one particular dealership by the total number of people in SCCA and multiplying the result by 262, i.e., # of members / 54,363 members * 262 cars.

It is often hard to predict whether or not customers from smaller regions will want to drive far distanced to dealerships. However, those areas are included in dealership coverage areas based on pure assumptions. This data needs to be adjusted in the future based on the sales statistics from all dealerships.

The locations shown in the Table 3.4 are discussed providing region numbers to be served out of particular dealerships.

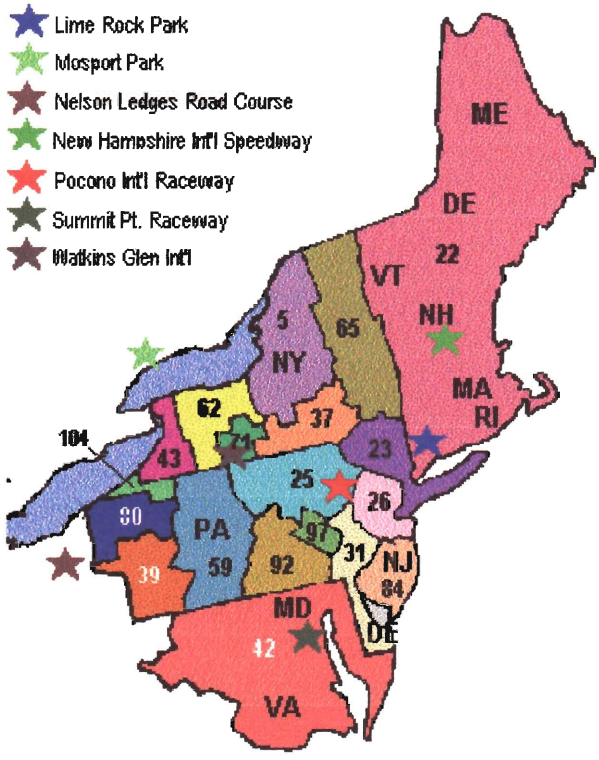

Figure 3.3 Northeastern Division - Areas 1, 2 & 10

Northeastern Division it is to be served out of Worcester, MA, where the factory is located, and, therefore, there will be no separate dealership in New England area. The area is small enough to have only one dealership, and since there is already a factory, there is no need for another dealer. Regions which are covered by the factory are 22, 23, 26, 62, 71, 65, 37. The second dealership is located in Washington DC and it will cover regions 97, 59, 80, 104, 25, 31, 39, 84, 92, 42, 5, 43.

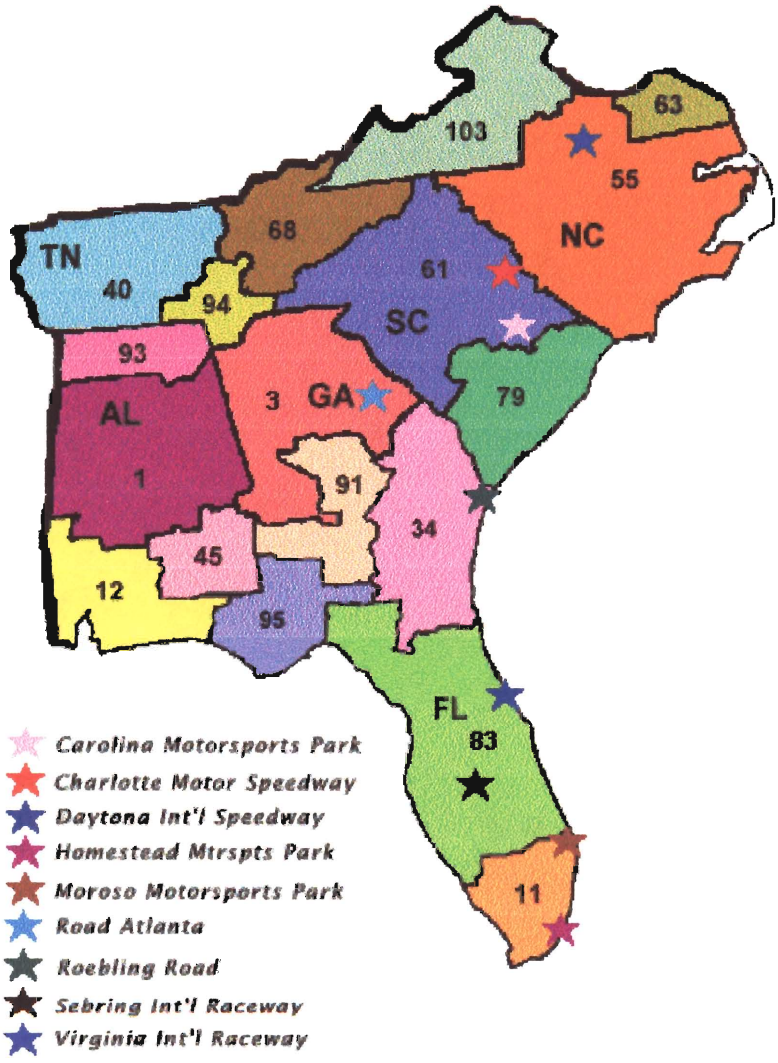

Figure 3.4 Southeastern Division - Area 3

There will be two dealerships in the Southeastern Division. One of them will be located in Orlando, FL, and will cover regions 34, 83, 95, 11, 12, 45. The second dealership, located in Atlanta, GA, will cover regions 1, 3, 103, 61, 94, 68, 91, 55, 63, 79, 40 and 93.

Central Division is divided into Central Division East - Area 4 and Central Division West - Area 5. Because the areas are located rather close to each other, it is possible that the region distribution is not accurate and that people from these two different areas will travel to a dealership outside of their local area.

Figure 3.5 Central Division East - Area 4

Columbus, OH and Detroit, MI are chosen for the dealership locations in this area. The dealership in Columbus will serve regions 74, 70, 64, 17, 24, 89, 28, 29, 51, 36, 47 and 86. The dealership in Detroit will serve regions 10, 85, 75,

13, 100, 35 and 6. It is arguable to say that customers from regions 75, 35 and 13 will travel to the Chicago location rather than to Detroit, since Chicago is considerably closer. However, those regions were still included in the total number for the Detroit location, as no information exists on that statistics yet.

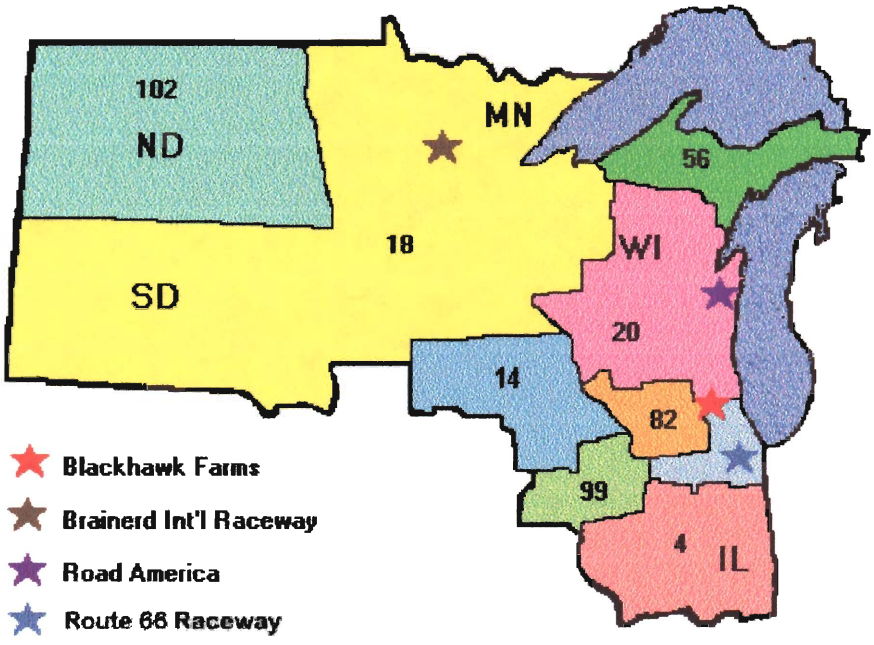

Figure 3.6 Central Division West - Area 5

There will be two dealership locations in this area. The dealerships will be placed in Chicago, IL, which will serve regions 82, 4, 7, 99, 14 and 20, and in Rogers, MN, which will serve regions 102, 56 and 18.

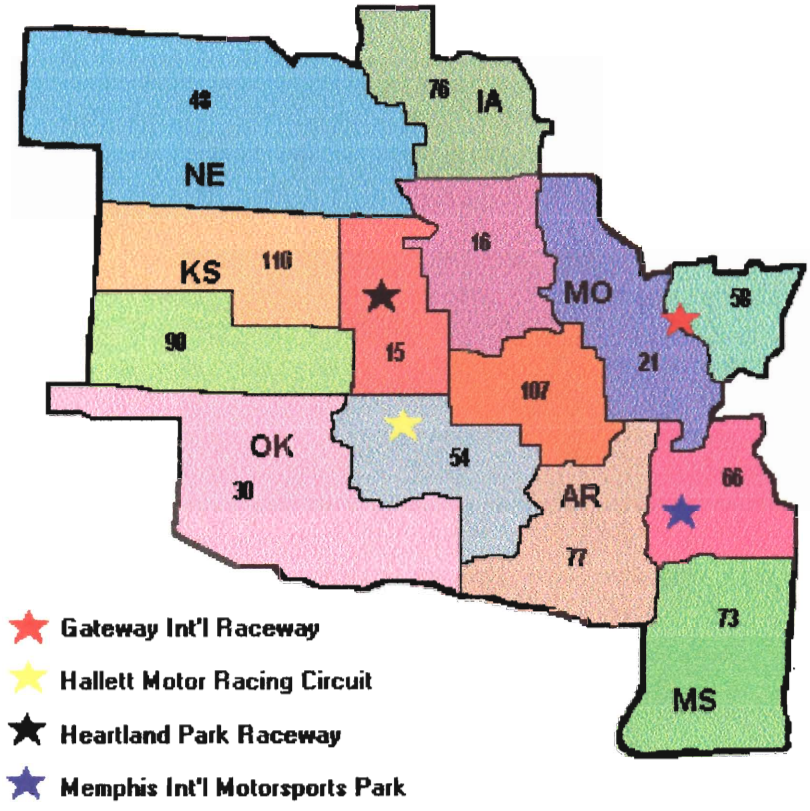

Figure 3.7 Midwest Division - Area 6

The dealerships are to be located in Tulsa, OK, which will serve regions 77, 15, 48, 54, 30, 107, 110 and 90, and in Saint Louis, MO, which will serve regions 76, 16, 66, 73, 21 and 58.

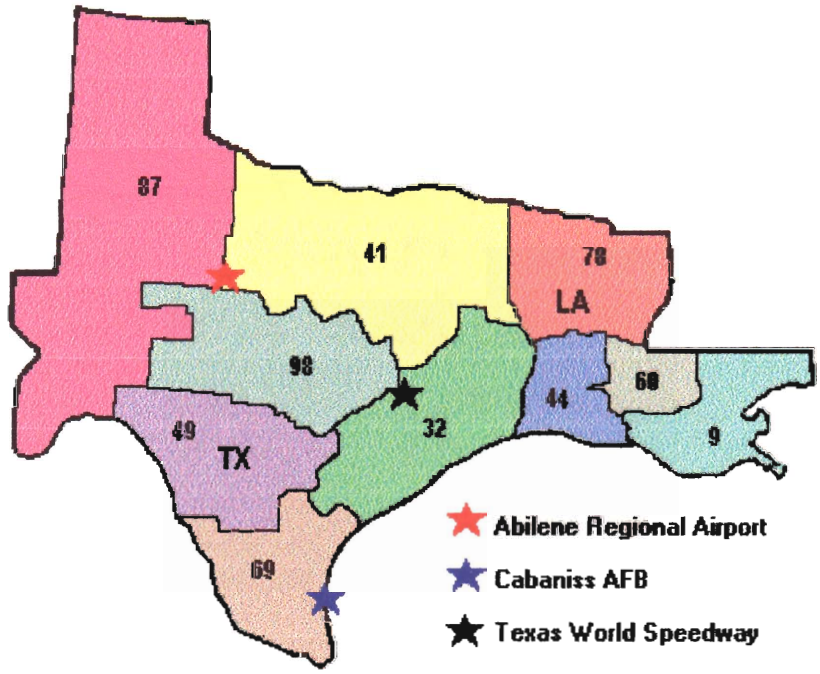

Figure 3.8 Southwestern Division - Area 7

Due to relatively low racing activity in this region, except for Texas Region (41) and Houston Region (32), there will only be one dealership in Houston, TX. It will serve all of the regions in Area 7, which are regions 60, 9, 32, 98, 78, 69, 44, 41 and 87.

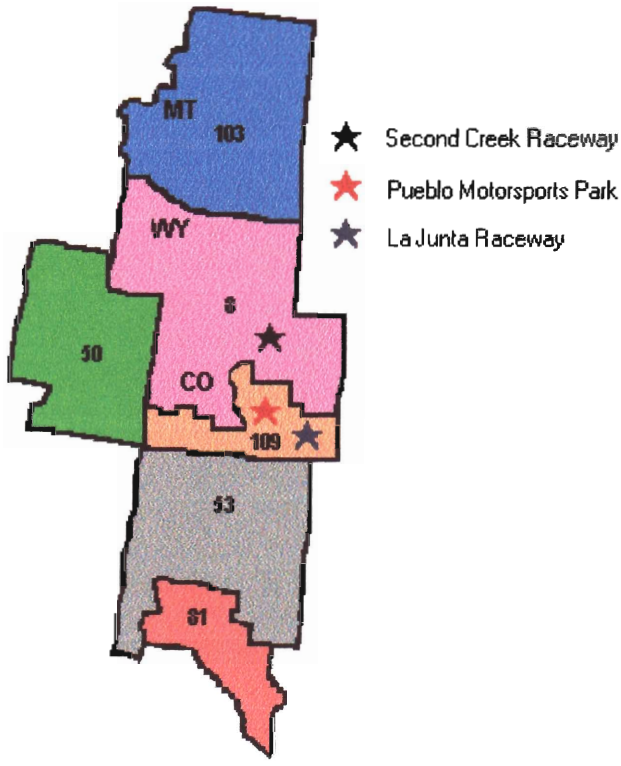

Figure 3.9 Rocky Mountains Division - Area 8

Due to relatively low racing activity in the given region, the only dealership in the Rocky Mountain Division will be located in Denver, CO, and will serve regions 8, 109, 81, 53, 50 and 108.

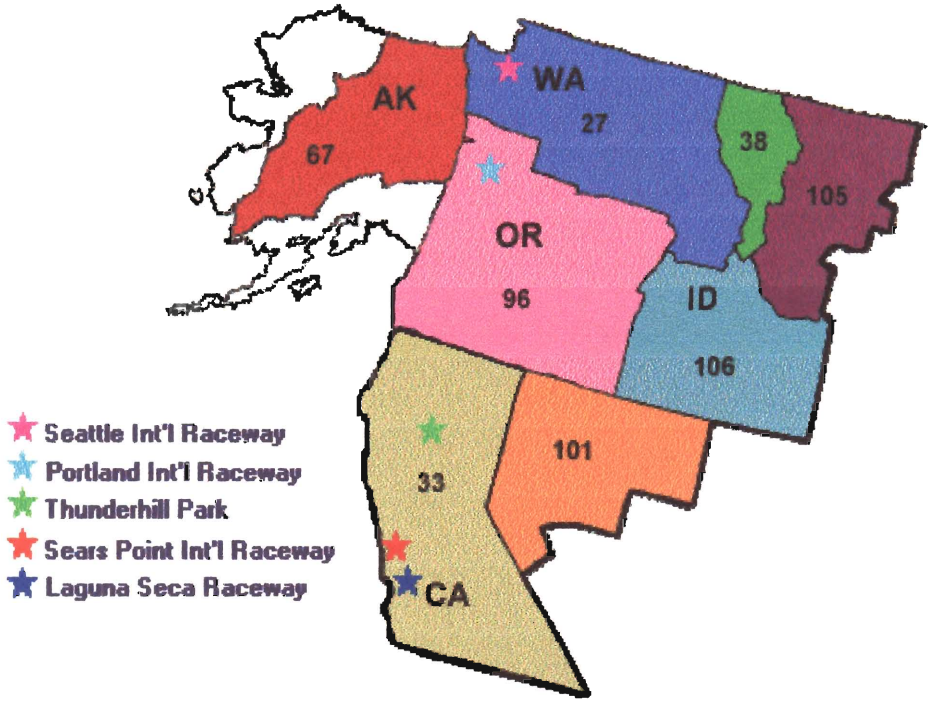

Figure 3.10 Northern Pacific Division - Area 9

Northern Pacific Division is to have two dealerships, one located in Portland, OR, and the other one in San Francisco, CA. The dealership in Portland will serve areas 67, 38, 105, 27, 96, and 106, and the dealership in San Francisco will serve areas 101 and 33.

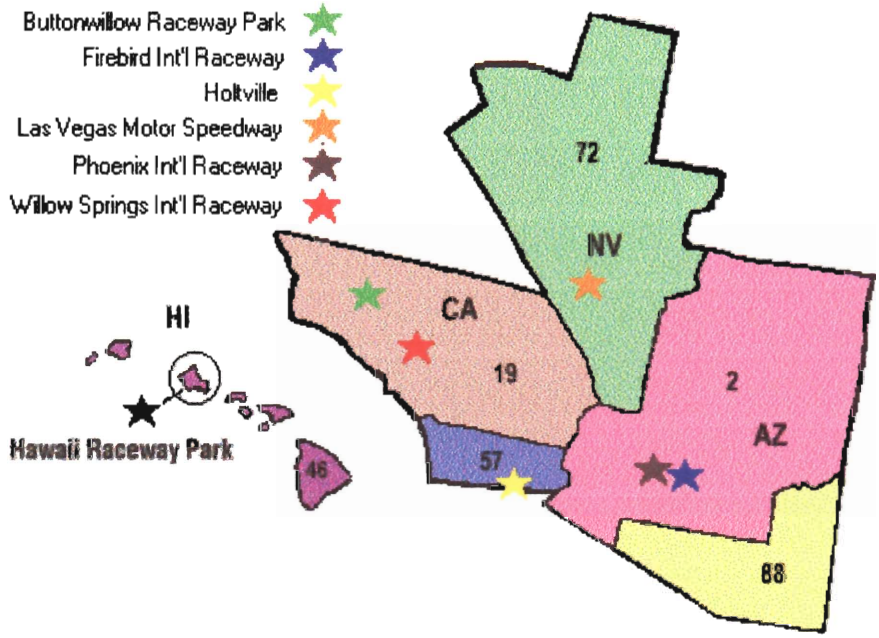

Figure 3.11 Southern Pacific Division - Area 11

The dealerships will be located in Avondale, AZ and Buttonwillow, CA. The fist dealership will serve regions 2 and 88, and the second will serve regions 19, 46, 72 and 57.

Customer Service

Our customers emphasize that service and support is one of their major concerns. They are constantly impressed with the support we provide. We intend to provide free pickup and delivery for customers in Massachusetts area. The purpose of this service is to assure customer satisfaction and loyalty, which allows us to increase sales and maintain a high profile within our local area. Warehousing allows us to book larger orders and provide faster order response. Support to manufacturers' representatives will allow them to perform efficiently as a sales force. We intend to treat the manufacturers' representatives as an extension of the WPI direct sales force, and they will be given the same support as the WPI internal sales staff. Technical support to marketing and sales functions will be strengthened. WPI staff will support pre- and post-sales situations involving the application, presentation, and demonstration of racing. WPI has a long tradition of expertise in building, testing and racing of FSAE style cars and we expect that this experience and reputation will earn us more customers as compared to our competitors.

4. Conclusion

Based on the conducted survey and market research, it is possible to sell the product, but it is unlikely to sell a thousand cars per year. The market for this particular class (A Modified) is still rather underdeveloped, and since the Formula SAE cars are not competitive in the class and do not have their own class, it is difficult to convince customers that it is indeed a good quality product. It is necessary to further explore markets other than recreational, for instance, educational market.

The customer e-mail survey revealed that potential buyers are looking for fast, fun and reliable cars. The WPI FSAE car stands out among other Formula SAE cars due to its exceptional qualities, among which are its dependability, which is guaranteed by a Honda F3 Engine, fully documented engineering analysis, fully documented extensive testing, and lifetime personalized customer support, which includes a Web site, a 1-800 Customer Service Hotline and guaranteed 24-hour spare parts delivery by air. Also, the car is offered with various customized options, such as, drive ratio, tires, adjustable pedals, seat, shocks, and three different colors. The car is being sold directly from the factory at a competitive price of $8500 and there will be financing options available in the future along with the Preferred Customer Parts Program, which allows the customer to get customized parts for the car faster and cheaper. All of the

aforementioned components combined with the WPI FSAE experience since 1985 make the WPI FSAE car a unique and competitive product.

At the presentation event seminar [5.1] it was mentioned that the one thousand cars per year figure is entirely unrealistic and should not prevent teams from doing a good presentation. The reason the authors of the Formula SAE rules came up with a thousand cars per year figure is to make students think about manufacturing and selling a thousand cars per year instead of, for example, twenty, which would have been a considerably easier task. An example of the difference between manufacturing a prototype and manufacturing a thousand cars would be that machining is used a lot to produce various components in manufacturing a prototype as opposed to the reality when casting would be used.

5. Future Recommendations

In order to stay competitive in class and excel, it is necessary to constantly improve the product. It is very important for the business to provide good after sales service and to conduct customer satisfaction surveys, which truly reflect how customers feel about the product. Issues of reducing the sales price by reducing the manufacturing cost must be addressed. Providing more customized options as well as using less customized and more generic parts will make the car more attractive to customers, as the maintenance issues will be lessened.

An assumption has been made that 800 cars will be sold to technical schools as learning aids and to SCCA clubs for rentals at races. Since no involved research was done in that area, it is necessary to have a market study done that will address that issue much deeper and determine whether that is really feasible or not.

Possible sales to amusement parks must also be looked at, as well as future expansion to international markets, which would consists of the same sales as in the United States, i.e. sales to individuals, technical schools, sports car clubs and recreational industry.

Another important research can be done in investigating possible financing options. Since the WPI FSAE car is in the same price range and is of

the same general product type as motorcycles, dirt bikes and jet skies, it is likely to have similar financing options in order to make the car more affordable.

It is necessary to address the presentation event due to the fact that this whole project is concentrated on the presentation event. The speakers at the presentation seminar [5.1] pointed out that the presentation should ideally be a mix of three major components, which are a concise review of design/technical specification and performance of the vehicle, which distinguish the WPI racecar from other teams, manufacturability of the car and market projections. The ten minutes allowed for the presentation should be equally divided between those three components. The content score would be equally divided between those three factors as well. The design review should highlight important features of the car, which are its top selling points. Basic background and some performance figures should be given without spending too much time on the specifications of the vehicle. The point of the manufacturing part is to demonstrate major points of the manufacturing process, such as time to produce one car, tooling required, simplicity of the process and its cost efficiency, amount of common parts used in the car, etc. The final part of the presentation, which is the financial or marketing part, is to show to whom the car is meant to be sold and for how much. It is not necessary to carry out a full market research, since the judges are looking for logic and reasoning rather than exact figures. Any data that resembles market research and valid conclusions drawn from that data is what judges are looking for. The difference between the manufacturing and overhead cost and the sales price is the profit, which should be demonstrated as well. It was also stated that it is better to have the lowest possible sales price, as

it makes the car more competitive on the market. The judge gave an example that it is much better to have the price of the car be around $7000 rather than around the price of $9000, which is given in the rules. The variable cost which is the cost derived in the cost analysis is not the same as manufacturing and overheads cost, which should be kept in mind when calculating profit. Just as the market research information, these figures do not have to be exact. Anything is acceptable as long as it appears to be reasonable and logical.

The judges also pointed out that the team members must show up on time for the presentation. It was also stated that it is actually better to be 10 minutes earlier in case a previous team finishes early, which allows the next team more time for setting up. At the beginning of the presentation all team members that are present must be introduced, which demonstrates the team's professionalism. A reasonable number of team members should be present to answer any possible questions that may be asked. There should be smooth transitions between different sections of the presentation. The judges are looking for a dynamic presentation that will excite people about the car and convince them to buy it, and therefore, the main presenter or presenters should be people with good speaking abilities. The use of visuals is highly encourage, as it gives judges more information about the product. It is advised to have backup slides in case there is a problem with a computer, if the presentation is done on a computer. Even though the judges are more concerned with the content of the presentation rather than the organizational side of the presentation, it is advised to be organized well in order to leave a good impression. This year the overhead projected was not brought to the presentation and the projector at the hotel

where the presentation event was held, was not working properly. Also, the VCR used to show the TV commercial was not hooked up to the monitor, which was only discovered after the TV commercial was supposed to play at the scheduled time. Those issues need to be taken care of before the presentation. This year the judges were very sympathetic to the problems that the presentation team experienced, which may not happen next year.

It was also pointed out that the slides should not contain a lot of information per slide, and it is better to have two slides with less information than one big slide. Also, it was advised not to spend too much time on any particular overhead. Usage of cue cards or any other aids is highly discouraged, as it displays the speaker as being unprofessional. The presentation should not be so complex that it cannot be done by simply looking at the slides.

This year's presentation did not have any oral part which dealt with the technical aspects of the car because it was assumed that the sales brochure that was handed out to judges in the beginning of the presentation will provide enough information. At the presentation event seminar [5.1] it was pointed out that giving out a brochure is the right way to save time during the presentation by putting information on it, such as technical aspects of the car. However, this year's handout that contained such brochure was ignored by one judge entirely, which reflected heavily on the final score given by that particular judge. In order to ensure that such incident does not occur again, it is necessary to explain to the judges exactly what the handout contains. On the other hand, the presentation reflected the other two parts in full. It is quite possible, that it actually gave more than enough information. Even though two judges were

obviously very impressed with the presentation and gave very high scores, one of the judges felt that the technical aspects of the car were not discussed at all and gave an extremely low score for content. It is recommended that for the future presentation, the 1999 WPI FSAE presentation is taken as a base and improved in such a way, so that it reflects the technical aspects of the racecar and has less technical detail on manufacturing. The marketing part can be left the way it is, as it has all necessary information.

While it is obviously extremely hard to fit all necessary information in a ten-minute presentation, it is feasible, as the judges stated at the presentation event seminar [5.1]. Taking the 1999 presentation as a base for the 2000 Formula SAE WPI Racecar Presentation and including the design review into it, as well as shortening the manufacturing part, which is fully reflected in [1.4], should allow the WPI team place higher than this year. Producing a better TV commercial as well as the handout would also be a definite plus. The TV commercial as well as all handouts and brochures must be spell checked and grammar checked. Overall, taking all the points outlined by the judges at the seminar into consideration and redoing the 1999 presentation keeping those points in mind is enough for the presentation to be nearly perfect.

There were a few discrepancies in the 1999 Formula SAE Rules [1.1] and the last newsletter that came out in May right before the competition. Those discrepancies included the exact suggested retail price of the car and whether the only people who could answer questions at the presentation were the people who actually presented. Also, during the actual presentation all three judges misunderstood that the actual presentation time was 10 minutes and 5 additional

minutes for questions. Their understanding was that there were 15 minutes given for presentation and 5 more for questioning. The teams that presented for that judges group before the WPI team got 15 minutes instead of 10 and failed to notify the judges of this error. Issues listed above should be carefully looked at, as they may cause drastic difference between the score that the team actually got and the score that the presentation really deserved.

6. References

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Appendix A. Survey Information

A.1 E-mail Survey

Hello,

My name is Maria Vassilieva. I am a junior at Worcester Polytechnic Institute in Worcester, Massachusetts. I am presently working on a Formula Style Racecar project that is sponsored by the Society of Automotive Engineers (SAE). We are to engineer, build and market this racecar for a non-professional weekend autocrosser. An autocrosser, hypothetically, will be able to purchase the racecar for $9000. The racer will be an open wheeled, open single seater, constructed out of a chrome molly space frame weighing about 500 lbs. It will be powered by a 600cc-motorcycle engine with a 20mm restrictor plate on the intake, producing just under 100hp. For those of you who are interested in seeing last year's car please venture over to our Web site at http://jjrencis.wpi.edu/fsae.

The purpose of this survey is to obtain information about what a weekend autocrosser's needs are. Please fill in and/or answer the following questions. You can just forward this e-mail back to me (you have to include the original message, which will allow you to type in your answers). :-)

Thank you in advance. See you on the track!

Maria Vassilieva (masha@wpi.edu)

Part 1

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	_5
Handling:	_1	_2	_3	_4	_5
Power to Weight Ratio:	_1	_2	_3	_4	_5
Braking:	_1	_2	_3	_4	_5
Acceleration:	_1	_2	_3	_4	_5
Slalom Performance:	_1	_2	_3	_4	_5
Skidpad Performance:	_1	_2	_3	_4	_5
Assembly Quality:	_1	_2	_3	_4	_5
Engine Access:	_1	_2	_3	_4	_5
Wrench Clearance:	_1	_2	_3	_4	_5
Adjustability:	_1	_2	_3	_4	_5
Crashworthiness:	_1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	_5
Innovativeness:	_1	_2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	_does not matter	

Part 2

Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)
What do you look for in the class for competition?
(Ex: large classes, same type of cars)
Would you be interested in racing a FSAE specified car? Why or why not?

What class do you run now? Please state 3 reasons why.
Would you want to purchase repair parts from us?

A.2 Survey Replies

Date: Sun, 21 Feb 1999 22:02:59 -0600
From: Rick Williams <redfish@premier.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_ 2	X3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	_4	X5
Braking:	_1	_2	X3	_4	_5
Acceleration:	_1	_2	X3	_4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	_3	_4	X5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	X1	_2	_3	_4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	_2	_3	X4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	X5
Innovativeness:	_1	_2	_3	X4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10		Xdoes not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling, especially transient handling, such as a slalom. Good power to weight ratio. Cost.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Large classes are nice. It's no fun to run against yourself and have no one to compare times with.

Would you be interested in racing a FSAE specified car? Why or why not?

Yes. I like formula cars and I think it would be fun to race a car designed by college students, not by some corporation.

What class do you run now? Please state 3 reasons why.

DP
I have a car that is competitive in that class. Lots of competition from essentially the same car driven by other drivers (MG Midget/AH Sprite)

Would you rather buy parts from a local dealer of from the factory directly?

Local dealer

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

I think price would be the number one factor, serviceability #2, avail. of parts #3
But competitiveness would supercede all of those.

Good luck with your project.

Date: Sun, 21 Feb 1999 22:59:04 -0600
From: Dale Botkin <dale@botkin.org>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	X4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	X3	_4	_5
Braking:	_1	_2	X3	_4	_5
Acceleration:	_1	_2	_3	X4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	_3	X4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability:	_1	_2	X3	_4	_5
Crashworthiness:	X1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	X4	_5
Innovativeness:	X1	_2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	Xdoes not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling, handling, and handling. Easy maintenance, low cost. Did I mention handling?

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Enough cars to trophy, not too many big-money racers.

Would you be interested in racing a FSAE specified car? Why or why not?

If it were affordable and competitive, yes.

What class do you run now? Please state 3 reasons why.

G Stock, because all I can afford is to run my stock Mustang. May move to ESP later.

Would you rather buy parts from a local dealer of from the factory directly?

Either.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Yes. Price, then serviceability, then parts availability, then warm fuzzies.

Thank you very much for your time :-)))

Yer welcome - want a beta tester?

Date: Mon, 22 Feb 1999 09:11:22 –06
From: Danielle Engstrom <aria@interaccess.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	X3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	X4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	X3	_4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	X3	_4	_5
Engine Access:	_1	_2	_3	X4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability:	_1	_2	_3	_4	X5
Crashworthiness:	_1	X2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	X3	_4	_5
Innovativeness:	_1	_2	_3	_4	X5

Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	_does not matter

If the above is an average over a season's time it does not matter.
If you're referring to actual getting ready for just a single event --1-2 hours.

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling, handling and handling. Fun and easy to drive is a big plus.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

It's good to have cars that are similar in terms of capability (spec-like), because then it's really up to driver's performance to place well. However, the more interesting classes (IMHO) are always the ones with the largest variety of creative vehicles. In Solo II classing, this would be the Prepared and Modified categories.

Would you be interested in racing a FSAE specified car? Why or why not?

Sure. It would be different, fun and interesting. Especially after all the different vehicles I've tried (including open-wheelers).

What class do you run now? Please state 3 reasons why.

We just bought an A Modified car.
1. It's the class with the fewest rules, allowing as much creativity as possible.
2. The fastest, most fun class in Solo.
3. We were offered the opportunity to buy a car that we had coveted for years.

Would you rather buy parts from a local dealer of from the factory directly?

Depends on the parts and the cost -- but in general, why go through a middle-man (local dealer) if you can buy right from the factory?

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

For a daily driver or stock class car it would be all of the above. In terms of our Solo ride, none of the above apply to my husband and I.
(Or we wouldn't have an A Mod beast.)

Good luck with your project.

Danielle Engstrom

Date: Mon, 22 Feb 1999 09:18:17 -0600
From: "Meyer, Brian J" <Brian.Meyer@Wichita.BOEING.com>
To: 'Maria I Vassilieva' <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	x4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	x2	_3	_4	_5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	_2	x3	_4	_5
Preferred hours: of maintenance per each event	_1-2	x2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling is the most important characteristic. They don't give out trophies at Nationals for 'best looking' or 'best design', however, successful cars usually have those attributes. Transitional handling is more important then steady state handling.

What do you look for in the class for competition?

(Ex: large classes, same type of cars)

It's called Solo for a reason, you're the only one out there. Your biggest competitor is yourself.

Would you be interested in racing a FSAE specified car? Why or why not?

I would love to race a FSAE car, but I don't think they are capable of winning AMod, so I wouldn't buy one unless there was a special class just for cars built to the FSAE rules. I would much rather purchase a FSAE car then a shifter kart, simply because it has a suspension.

What class do you run now? Please state 3 reasons why.

CSP. 1. It's the class my daily driver falls in due to the mods I've done to it.
2. My car has the potential to be competitive in CSP.
3. I can't afford to buy a dedicated 'race only' car - yet.

Would you rather buy parts from a local dealer of from the factory directly?

Whoever gives me the best price. My local dealer charges me list price, but I've found a dealer in another state that will sell factory parts to me at wholesale prices, so I always buy from them unless I can't wait.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price certainly is, but since I do all of my own service, customer care isn't much of a consideration.

Thank you very much for your time :-)))

Good luck with your project!

I participated in the Mini-Baja competition while I was in college. We started a FSAE car, but chose to focus our efforts on the MB car since we had enjoyed pretty good success in that competition.

Believe me, the effort you put in the FSAE project is well worth it. It is valuable experience. Plus, if you are interested in a career in the automotive industry, it is probably the best thing you can do. The auto manufactures recognize this program for what it is and give preference to applicants with FSAE experience on their resume.

Brian Meyer
Senior Engineer
777 Strut Structures

Boeing Commercial Aircraft Group
Wichita, Kansas

Date: Mon, 22 Feb 1999 10:32:32 -0500
From: Shawn Mahaney <shawnekk@mail.ic.net>
To: masha@WPI.EDU
Subject: autox@autox.team.net digest #3243 Mon Feb 22 01:05:02 MST 1999

I wondered when someone was going to be motivated enough to actually get market research data. Bravo!

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	x3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	_4	x5
Assembly Quality:	_1	x2	_3	_4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	_3	x4	_5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	_2	_3	x4	_5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	x2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	x2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Trophies for cheap, tunability (adjustments), reliability

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

not sure what's being asked

Would you be interested in racing a FSAE specified car? Why or why not?

Yes - extremely fast but low-maintenance formula

What class do you run now? Please state 3 reasons why.

TES - already had the car, cheap tires, decent local competition

Would you rather buy parts from a local dealer of from the factory directly?

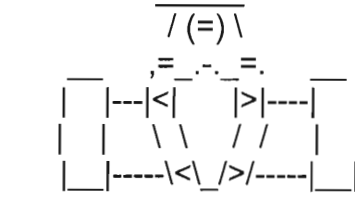
Would like options for both - i.e. direct no-hassel mail-order, or local service from knowledgeable dealer

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

not sure what's being asked

Thank you very much for your time :-)))

Shawn Mahaney
Project Engineer
EKK, Inc., Walled Lake, MI
http://ic.net/~ekk
(248)-624-9957



Exonero

Ergo

Zoom

Date: Mon, 22 Feb 1999 09:52:58 -0600 (CST)
From: James Nelson <jnelson@umr.edu>
To: masha@WPI.EDU
Subject: fsae questions

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	x3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	x4	_5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	x4	_5
Wrench Clearance:	_1	_2	_3	x4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	_2	_3	x4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	_1	_2	_3	_4	x5
Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Competitiveness in a class. FSAE cars are fun but are not competitive against Cheng in AM. I also look at who is paying money to win (Neon, BFG, etc.), and what classes over the largest competition.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Size is a factor. It is no fun to run against no one else.

Would you be interested in racing a FSAE specified car? Why or why not?

Depends. They look like fun to drive and tweak on, but many seem to encounter failures when repeatably driven hard on rough surfaces with lots of grip (ie-concrete air force bases). They also would seem to take a lot of maintenance per event, which may not be worth the time involved.

What class do you run now? Please state 3 reasons why.

DS. Fun, fast, pays money, cheap car.

Would you rather buy parts from a local dealer of from the factory directly?

I would prefer a local parts store.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price is a factor since my income limits my spending.

Thank you very much for your time :-)))

No Problem. I would like to ask for a copy of the results when you get them.

Thanks,
James Nelson
jnelson@umr.edu

16 DS Neon
78 S2 Tiga

Date: Mon, 22 Feb 1999 12:34:48 -0600
From: Thomas VandenOever <tavandy1@airmail.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: FSAE Racecar Project

Maria,
I feel I should preface this with a small introduction. I am a second year autocrosser who is very interested in SAE mod cars that show up at events here in Texas. Dr. Bob (I am unsure of his full name) and his student have created some very interesting cars.

Part 1:
Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	X_3	_4	_5
Handling:	_1	_2	_3	_4	X_5
Power to weight Ratio:	_1	_2	_3	_4	X_5
Braking:	_1	_2	_3	_4	X_5
Acceleration:	_1	_2	_3	_4	X_5
Slalom Performance:	_1	_2	_3	_4	X_5
Skidpad Performance:	_1	_2	_3	_4	X_5
Assembly Quality:	_1	_2	_3	X_4	_5
Engine Access:	_1	_2	_3	X_4	_5
Wrench Clearance:	_1	_2	_3	X_4	_5
Adjustability:	_1	_2	_3	X_4	_5
Crashworthiness:	_1	_2	_3	X_4	_5
Chassis/Mechanical Design:	_1	_2	X_3	_4	_5
Innovativeness:	_1	X _2	_3	_4	_5

Preferred hours: of maintenance per each event	X_1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

The potential of the car to be competitive while also being somewhat forgiving if the driver make small errors. I would not buy a vehicle if the danger factor outweighed the fun factor.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Classes with local/ national champion drivers with similar cars to measure my progress/ performance.

Would you be interested in racing a FSAE specified car? Why or why not?

Yes the cars produced by the FSAE teams at present have fasttimes, good predictability, and a minimum of breakdowns.

What class do you run now? Please state 3 reasons why.

E stock
1) I have a Neon which I absolutely love to drive.
2) Other Neon owners love to share info and "bench race"
3) I have National caliber drivers and instructors here in my local club.

Would you rather buy parts from a local dealer of from the factory directly?

As much as possible, I would love to be able to have the choice of where I purchased parts.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price #1
Serviceability #2
Availability of parts #3

Customer care is only an issue with single source parts then the ranking would change slightly. The availability of parts contributes highly to its serviceability.

P.S. Have you also considered the ease of transportation issues. Consideration of existing trailers and their load/ unload situations, space, cost of required

trailers etc. would greatly help my decision to purchase such an item in the future.

Tom VandenOever
1998 Solo II Rookie of the Year Texas Region SCCA
Neon Enthusiast #748

Date: Mon, 22 Feb 1999 11:31:54 -0600
From: David K Yeung <dkyeung@juno.com>
To: masha@WPI.EDU
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	X4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	_4	X5
Braking:	_1	_2	_3	X4	_5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	X4	_5
Skidpad Performance:	_1	_2	X3	_4	_5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	_2	X3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	X4	_5
Innovativeness:	_1	_2	X3	_4	_5
Preferred hours: of maintenance per each event	_1-2	X2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

minimal maintenance, spend less time working on the car, more time driving it.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

variety of cars

Would you be interested in racing a FSAE specified car? Why or why not?

no. cannot justify the investment for a car driven for 4-5 minutes on random Sundays

What class do you run now? Please state 3 reasons why.

G-stock.
1. it's where the car I have belongs
2. modifying the car would move to E-street prepared where it cannot be competitive
3. I cannot consider campaigning a non-streetable car. the investment for a part time hobby would be too great. an arrive and drive type of program could be more interesting. someone else keeps and maintains the car, I rent it to drive.

Would you rather buy parts from a local dealer of from the factory directly?

depends, how often will the local dealer not have what I need and have to order it from the factory anyway? another thing to consider in building an autocross formula car is to us consumable parts that can be commonly found at a local autoparts store. most race sites are remote. local parts stores will not have expensive/fancy race car parts.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

price is often at the top of the decision tree. for most racers serviceability and parts availability are important factors, but when a car is new, we don't think about that too much. often customer care is not a consideration until it is needed. then it is too late, other than going to another service department.

Thank you very much for your time :-)))
your welcome and good luck!!

Date: Mon, 22 Feb 1999 19:07:59 -0500
From: Matt Murray <mattm@nassau.cv.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	X_5
Handling:	_1	_2	_3	_4	X_5
Power to weight Ratio:	_1	_2	_3	_4	X_5
Braking:	_1	_2	_3	_4	X_5
Acceleration:	_1	_2	_3	_4	X_5
Slalom Performance:	_1	_2	_3	_4	X_5
Skidpad Performance:	_1	_2	_3	_4	X_5
Assembly Quality:	_1	_2	_3	_4	X_5
Engine Access:	_1	_2	X_3	_4	_5
Wrench Clearance:	_1	X_2	_3	_4	_5
Adjustability:	_1	_2	_3	_4	X_5
Crashworthiness:	_1	_2	_3	_4	X_5
Chassis/Mechanical Design:	_1	_2	_3	_4	X_5
Innovativeness:	_1	_2	_3	_4	X_5
Preferred hours: of maintenance per each event	_1-2	_2-3	_5-10	X_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling is very important as is good braking. Visual appearance is also important.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

I've been in the same general class for eight years. B Stock from '91 to '94 in an MR2 Turbo. The MR2 was moved to A Stock in 1995 where I continued in the MR2. I switched to a Porsche 968 in 1996, which is also in A Stock. I have stayed with the 968 since that time. I won A Stock in 1998 at the Tire Rack Solo II Nationals. I'm still kinda fond of the 968. :-)

Would you be interested in racing a FSAE specified car? Why or why not?

I would try it in a "fun run". However, I am still committed to A Stock.
But if you would like me to "test" the FSAE car.... :-)

What class do you run now? Please state 3 reasons why.

See above. 1) 968 2) Returning champ 3) really tough and good competition.

Would you rather buy parts from a local dealer of from the factory directly?

The factory can be cheaper. Fit and finish are usually better. If you call around, more often than you would believe, the OEM parts are cheaper.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

All of those are important to varying degrees.

Thank you very much for your time :-)))

Maria:

Will you and your fellow builders/racers attend events put on by the New England Region SCCA?
If you have any questions about NER's programs, go here:
http://www.ner.org
Matt Murray

Date: Mon, 22 Feb 1999 20:51:22 -0500
From: Don Elzinga <73652.1062@compuserve.com>
To: Blind.Copy.Receiver@compuserve.com
Subject: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	x3	_4	_5
Handling	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	_4	x5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	x3	_4	_5
Engine Access:	_1	_2	_3	x4	_5
Wrench Clearance:	_1	_2	_3	x4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	x2	_3	_4	_5

Preferred hours not of maintenance per each event matter	_1-2	x2-5	_5-10	_does

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Competitive in it's class, parts readily available for a reasonable price.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

A stable class (not one where the "car to have" changes every year), where the top cars are something that would be fun to drive. I prefer RWD cars.

Would you be interested in racing a FSAE specified car? Why or why not?

Theoretically (i.e. if there was a production run of one or more different models, and they were put in a class where they were competitive) yes. Actually, running a one-off prototype car (repair parts must be fabricated) in a class (A-Mod) where it is, as the British put it, "a bit off the boil", no.

What class do you run now? Please state 3 reasons why.

F-Stock. 1) RWD. 2) Competitve cars readily available for under $10k.
3) Car doesn't need to be trailered.

Would you rather buy parts from a local dealer of from the factory directly?

I'd rather be able to get them locally than have to order them.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

I would be willing to pay a little more for a car that's easier to work on, parts are available, customer service is good.

Thank you very much for your time :-)))

You're welcome.
Don Elzinga

Date: Mon, 22 Feb 1999 20:39:27 -0500
From: Andy Lester <alester@ix.netcom.com>
To: "'masha@WPI.EDU'" <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	x2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	x3	_4	_5
Assembly Quality:	_1	_2	x3	_4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	x2	_3	_4	_5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5
Innovativeness:	_1	x2	_3	_4	_5

Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Good handling in transitions. Good acceleration

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Good competition, whether the same or different cars

Would you be interested in racing a FSAE specified car? Why or why not?

No, I like to be able to drive my cars on the street

What class do you run now? Please state 3 reasons why.

G Stock, because 1)that's the car I have, 2)autocrossing isn't important enough to buy a different car, 3)modifying my car will put me into a class where I'll be less competitive

Would you rather buy parts from a local dealer of from the factory directly?

If prices were the same (or close), local is more convenient.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Serviceability, then availability of parts

Andy Lester
WPI '86

Date: Mon, 22 Feb 1999 20:07:00 -0600
From: Mark Noeltner <mnoeltne@ezl.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Hi Maria!

Hey!! If I take this survey do I get to drive it?? Please!! Please!!

See my answers along with your questions below. I've placed some remarks at the very end.

Mark Noeltner
'95 Probe GT
G-Stock SCCA Solo I

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	_5

I've got to split this one up as I think that they CAN be totally separate I go 5 on safety and 1 on interior. See my final comments.

Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	_4	x5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	x2	_3	_4	_5

Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	x1	_2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	x_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Performance. That is, a combination of handling, acceleration, braking, etc.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

GOOD drivers as competitors.

Would you be interested in racing a FSAE specified car? Why or why not?

A well built one, yes. I've seen them run and they look like a blast. Main problem is that, in the SCCA, they end up in a class where they are very competitive on a local/regional basis, but only marginally competitive on a national level in Solo II. In other words, you have rules for FSAE concerning engine size and weight that do not exist in SCCA Solo II A-Modified rules. So there are other custom built race cars that are better in this class. Not a lot of them, so at the local level you won't run into them very often, but get to a national level event and you'll get hosed.

What class do you run now? Please state 3 reasons why.

Stock - cost, cost, cost. I can run what I already own. No additional car needed.

Would you rather buy parts from a local dealer of from the factory directly?

Depends. If I know that the factory gives me good service and I get a break on the price by cutting out the middleman I go that way. On the other hand if the local dealer is a really fair and honest person I'll give them the business even if it does cost a little more.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

This question is really general so I'm going to answer it in the context of a custom/semi-custom dedicated autocross car. If this was for my daily driver other things come into play.

So assuming a dedicated autox car, it is performance of the car and price.

Thank you very much for your time :-)))

Now for some more in depth comments. Hopefully these will cover the stuff you asked above and tell you WHY I answered as I did.

I currently run stock class in the SCCA for reasons of cost. Basically, I don't have to own an additional car, I only have to have 4 extra wheels with race tires to be competive even at a national level. Heck, it's a blast to go out and drive even on your street tires. We go to events sometimes when we're out of town just for the fun!

In a couple of years I'm looking at going to a dedicated autox car, probably in Mod category where the FSAE cars end up. I'm currently looking at F-Mod in a Formula 500 car (small open wheel car with a 500cc snowmobile engine and a constant velocity transmission). New cars are in the same general price range as you mention (roughly $8000 to 15000 depending on brand and options). Used ones can be as low as $2000.

Anyway, now that you know a little about how I think, here is a little more detail on why I answered some of the stuff the way I did.

In looking for a dedicated autocross car for a Mod class, I could care less about the interior of the car. You're only in it for 1 minute at a time driving, maybe 5 minutes total while you get lined up and run. I can live through almost anything for that short of a time. On the other hand, I'm not into getting hurt, so safety is definitely a top priority. Solo by definition is one of the safest forms of motor sports and that has to be part of any car I run. This is why I split out the Interior/Safety question you had.

Performance needs to be the best blend that I can get given the class restrictions (in this case your FSAE restrictions). This means good slalom, good acceleration, good braking, etc. This mix HAS to be as good as the other cars in the class so that if I don't win, it's me and not the car. I don't think you can totally break out acceleration from braking from slalom, etc. like you did in your questions. As far as I'm concerned it has to be how it all comes together.

As far as your questions on engine access and wrench clearance, well... it isn't TOO important. An autocross car seldom needs to be worked on AT an event. You normally only make around 3-6 runs of 1 minute or less per driver. As long as the car can handle twelve or so 1 minute runs in a day without breaking, I'm

happy. I don't care of it's a little hard to pull the car apart between events. So, as long as there is SOME reliability don't worry about making it quick and easy to pull apart. Save that for REAL race cars that have to do LOTS of miles in a day.

As far as innovativeness and chassis design go I prefer not to buy something TOO different from other cars since new designs tend to break more often. I prefer reliability over innovativeness overall.

Ok, crash worthiness. I rated this really low since autocrossing is very safe. As long as the car is reliable enough that something doesn't break in a spectacular way and cause you to crash, you should be safe no matter what. All you can do is hit cones :-)

Maintenance: up to 1 full day of maintenance would be about the maximum I would want in an autocross car. A full track ready race car is a different story, but like I said, an autocross is roughly 12 one minute runs per event. Any more than a day of maintenance would be excessive for that.

Hope this helps in what you're doing! If you haven't already done so, please come out and compete at a local autocross. Drive whatever you normally do on the street, talk to people and see what it's all about. wpi.edu shows up as Worcester Polytechnic Institute in Mass. when I checked it. I know their are a number of clubs up that way and any one of them will be glad to help you. Visit http://www.autocross.com/ to locate the clubs and their schedules.

Date: Mon, 22 Feb 1999 22:29:08 -0600
From: washburn <washburn@dwave.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	x2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	_4	x5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	x3	_4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5
Innovativeness:	_1	_2	_3	x4	_5
Preferred hours: of maintenance per each event	_1-2	x2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Transitional handling, and predictability. Power should be good, but need not be overwhelming if the other ingrediants are there. Brakes must be killer. Maintenance is not a big issue in modern stock class cars.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Varies. Same type of car for me right now because I want a measurement against others. Soon, I will want to move into a class with a car that I like more, or where I see an opportunity to do well. Sometimes, it's just because of the car you can afford.

Would you be interested in racing a FSAE specified car? Why or why not?

Sure. Fun factor. Maintanance would be a major headache however since most of the parts are custom manufactured. Lots of people would not care though. Sometimes, I think there is too much technology put into them just for the sake of technology. Some of the best AX cars are the low tech ones. I think they would better serve their intended purpose if they were kept simple.

What class do you run now? Please state 3 reasons why.

DS. 1) Price of entry is low since Neons are the best bang for the buck and are VERY fun.
2) "Spec Class" offers me a way to compare myself against the nations best drivers since all of the cars are virtually identical.
3) Contingency money offered by Chrylser. This is a rare opportunity that can't be passed up.

Would you rather buy parts from a local dealer of from the factory directly?

Depends. Some aftermarket parts offer improved performance/durability. Sometime the factory part is the best. Cost is a factor too. Case by case decision.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Not sure I understand the question, although I think the word "of" should read "or". The price/performance story is the main factor. Availability is not a factor...if you want it bad enough, you will find one. Parts is rarely a factor in a stock car. Don't forget the "lust " factor, some cars you just gotta have!

Thank you very much for your time :-))) –

Patrick Washburn <washburn@dwave.net>
Wausau, WI Land of Cheese
95 DS Neon
Mooooooooo.

Date: Mon, 22 Feb 1999 20:26:01 -0500
From: Scott R Sawyer <reddog_es22@juno.com>
To: masha@WPI.EDU
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	x1	_2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	x3	_4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	x3	_4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	x2	_3	_4	_5
Wrench Clearance:	_1	x2	_3	_4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	_2	x3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5
Innovativeness:	_1	x2	_3	_4	_5
Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

reliability, competitiveness in class

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

comparable cars, to better compare the drivers

Would you be interested in racing a FSAE specified car? Why or why not?

Yes, it would be fun to drive a dedicated racecar.

What class do you run now? Please state 3 reasons why.

E Stock, not highly mechanically trained, competitive class locally, cars are inexpensive

Would you rather buy parts from a local dealer of from the factory directly?

local dealer, assuming they provide help that you might need

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

price/serviceability/availability

Thank you very much for your time :-)))

Date: Tue, 23 Feb 1999 15:34:29 -0500 (EST)
From: Rocky Entriken <RENTRIKEN/0003006623@MCIMAIL.COM>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Maria--

I'm a Prepared-class autocrosser, not really in the market for an A-Mod type car, but I come to this with 35 years experience in the sport. So if I WERE in the market for such a car, here is how I would answer your questions.

--Rocky Entriken

.. ..

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	X5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	_4	X5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	x1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5

Innovativeness: _1 x2 _3 _4 _5

Preferred hours: x1-2 _2-5 _5-10 _does not
of maintenance per each event matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Crisp handling and acceleration. Other factors such as power-to-weight, etc., all relate to that.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

I tend to just want a class of people out to enjoy the event, not so uptight that winning is the all-important thing. Thus, it is really the people more' than the cars. Doesn't matter to me if every car is like mine or not, as long as the classing is reasonably equitable (and basically, it is, so that is not a problem).

Would you be interested in racing a FSAE specified car? Why or why not?

Hey, sure, if someone wanted to put me in one. But I am not an innovator or a tinkerer. I just wanna get in my Prepared car and go drive it.

What class do you run now? Please state 3 reasons why.

I am in D Prepared. More than any other reason is: it was what was in my garage. I bought a 1964 Triumph Spitfire in 1966, primarily to autocross after having been to a couple of events. It is still my weapon today. In 1971 it was turned in to a G Production race car and at that time I bought a new Pinto to run G Stock. Three years later, I reacquired the Spitfire and have been driving it ever since. three reasons? 1) It is what I had. 2) I love the car. 3) I haven't terminally broke it yet/it is still reasonably competitive.

Would you rather buy parts from a local dealer of from the factory directly?

I would rather buy parts from someone I know and trust. It doesn't matter if that means factory, dealer, aftermarket supply or whatever. My loyalty goes to people in the sport more than people in my hometown (who mostly don't care what I do; people in the sport do care).

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Don't have a good answer here. I have not bought a new car to compete since 1971. In that case the overriding question was, would it be competitive in the class? Or more properly, COULD it be competitive in the class?

Thank you very much for your time :-)))

You're welcome.

Date: Tue, 23 Feb 1999 20:42:42 -0500
From: Gary Milligan <Garymannad@compuserve.com>
To: "INTERNET:Maria I Vassilieva" <masha@WPI.EDU>
Subject: Team.net--Fsae survey

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	x2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	_4	x5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	_2	x3	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	x_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Drivability, excellent transient speed, good ultimate grip.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Interesting, fun and serious competitors.

Would you be interested in racing a FSAE specified car? Why or why not?

yes. They are tunable, easy to tow, and have good overall performance.

What class do you run now? Please state 3 reasons why.

A-Mod. It challenges one technically, the cars are small and relatively easy to work on, some one else is paying the bill.

Would you rather buy parts from a local dealer of from the factory directly?

Doesn't matter. They just have to be the best part for the job.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price, cost of operation, serviceability,- in this order.

Thank you very much for your time :-)))

Lots of luck with the project!
Gary Milligan

Date: Wed, 24 Feb 1999 17:18:37 -0700
From: Aaron Miller <co23a10@ix.netcom.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Proj

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	X2	_3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	X2	_3	_4	_5
Braking:	_1	_2	_3	X4	_5
Acceleration:	_1	_2	X3	_4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	_2	_3	_4	X5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	_4	X5
Crashworthiness:	_1	X2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	X4	_5
Innovativeness:	X1	_2	_3	_4	_5

Preferred hours: of maintenance per each event	X1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Personally I run a newer car to avoid making repairs, I'd rather spend wrench time making it faster not fixing something. In autocross handling is everything, look at the results from a local event and you'll see that 132 hp miatas out run 305 hp camaros easily. My opinion is light weight is critical, simple physics tells us that it takes less force to move less mass i.e. my car at 2700lbs. and 125hp is fairly even to my brothers which weighs 3300lbs and has 210hp.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

A large class is lots more fun. more competition only makes you work harder but a good finish is much more rewarding when you are running with a competitive group. unfortunately my class is fairly small, I'd rather place 3rd battling with some fierce competitors than win by default.

Would you be interested in racing a FSAE specified car? Why or why not?

Certainly, I wish I had continued my education after High School and participated in the FSAE program. If their performance is anything like the F500 cars it would be a blast

What class do you run now? Please state 3 reasons why.

I run in H-Stock, primarily because I bought the car before I got interested in Autocross. I'd like to be in a class that allows more "tinkering" than stock but when limited by finances you must simply make the most of what you got.

Would you rather buy parts from a local dealer of from the factory directly?

Though in principle I like the idea of supporting local business, all things being equal I'd go for the best price. Other factors to consider in your endeavor are support after the sale and possible sponsorship opportunities.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

The greatest car is no fun when it's sitting in jackstands in the garage waiting for parts you can't get or afford. Nothing is worse than spending months preparing for a race only to have it break on raceday.

Date: Fri, 26 Feb 1999 17:06:21 -0600
From: Geremy Kornreich <GKornreich@ADVR.COM>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: RE: FSAE Racecar Proj

Maria -
I hope this info helps you.
Good luck to you guys. I actually graduated from Clark University years ago, when it was good, so WPI has good memories for me.

One issue for me and many others. Even if I had the kind of money to spend

$9K for a competition-only car, trailer, tow vehicle and storage, I would likely spend it on something street-legal if not fun or simple. Even for a maintenance-free racercar, that is a chunk of change and I could have a very fun and fast and competitive streetable racer that would have some additional utility. I currently occasionally compete a Miata. Great handling, I never win or come close (partly because of excellent local drivers in my class) but I can also take it to work if needed.

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety: Safety is a 5. Don't care about interior	_1	_2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio: 10 lbs per hp is fantastic!! 15 is okay.	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	_4	x5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	x4	_5
Wrench Clearance:	_1	_2	_3	_4	x5

Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	_2	_3	_4	x5
Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	x1	_2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	x2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Depends if you wanna win or have fun. To win, gotta be competitive in class. FOr fun, fun! Handling, some power, coolativity, etc.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Don't care

Would you be interested in racing a FSAE specified car? Why or why not?

hard to convince me it would be a good value for the money.

What class do you run now? Please state 3 reasons why.

B stock/C SP and G stock / E SP
1. Because my cars are in them.
I bought the cars to drive and occasionally autocross. I don't care about classing.
I also don't care if I win. People who want to win approach it very differently.

Would you rather buy parts from a local dealer of from the factory directly?

Local for advice and someone who cares. prices-sensitive, though.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Thank you very much for your time :-)))

Good luck.

Date: Tue, 2 Mar 1999 14:50:19 -0700
From: "Miller, Don" <MillerD2@idhw.state.id.us>
To: 'Maria I Vassilieva' <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	x5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	x3	_4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	_4	x5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	_2	_3	_4	x5
Wrench Clearance:	_1	_2	_3	_4	x5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	_2	_3	_4	x5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	_2	x3	_4	_5

Preferred hours: of maintenance per each event	_1-2	x_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling and Affordability

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Large Class with good competition

Would you be interested in racing a FSAE specified car? Why or why not?

No. I prefer full body cars.

What class do you run now? Please state 3 reasons why.

E-Mod.
1) I built a car with pieces I had at home.
2) Like the speed
3) Fairly easy to build,

Would you rather buy parts from a local dealer of from the factory directly?

I prefer to support my local economy.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price and serviceability

Thank you very much for your time :-)))

Date: Tue, 2 Mar 1999 15:54:20 -0600
From: Eric Linnhoff <eric10mm@qni.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	5	Safety above all else.
Handling:	5	Very important. You can't drive a turd fast.
Power to weight Ratio:	3	With great handling a lack of power can be overcome.
Braking:	5	Much more important than lotsa power.
Acceleration:	4	It does have to have _some_ power though.
Slalom Performance:	5	Handling is very important.
Skidpad Performance:	5	Mostly a function of setup not manufacture.
Assembly Quality:	5	I don't wanna be wrenching on it every weekend.
Engine Access:	4	Hey, if it's reliable I won't have to work on it as much.
Wrench Clearance:	4	See above.
Adjustability:	5	Greatly helps with setup.
Crashworthiness:	5	Again, safety above all else. If yer dead, ya can't race.
Chassis/Mechanical Design:	5	Quality design means fewer problems.
Innovativeness:	3	Hey, if it ain't broke.....

Preferred hours of maintenance per each event: 1-2 or less, I'd rather drive it than fix it.

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling above everything except safety. A lack of power can easily be made up by great handling. reliability is a very good thing and will be another constant in the total equation of "what's working and what's not".

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Well, I autocross a Neon in DS which is almost a spec class. I actually like the idea of spec classes as it points out who the better driver is rather than who has got the deepest pockets and prepared their car the best.

Would you be interested in racing a FSAE specified car? Why or why not?

Maybe. If the price is right. I'm fairly poor. Or is that financially challenged? I do however like the idea of racing a "daily driver" car as I feel it is far more challenging to do well while working around the many compromises that are demanded in a product manufactured for the public at large.

What class do you run now? Please state 3 reasons why.

Oh hell, I should have read ahead. I race in DS because my Neon is my daily driver. If I had the money i'd probably drive something way wacky but I personally like the challenge of trying to do well and go fast in a car that was designed for the other 99.995% of the public who don't race. It brings out the best of the driver instead of proving that one guy has the most money and can "afford" to beat me by buying better equipment. Oh yeah, and I actually do like the car.

Would you rather buy parts from a local dealer of from the factory directly?

Whoever's cheapest but I will pay a little more to get it locally. That way if there's a problem I can look an actual person in the face and tell them my story instead of doing it over a telephone.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Umm, yes to all.
Thank you very much for your time :-))) No problem. I hope that I actually helped you. ;^) See you on course. Eric Linnhoff in KC

Date: Tue, 2 Mar 1999 15:53:56 -0600
From: Leon Dupont <leond@sunshinepages.com>
To: masha@WPI.EDU
Subject: RE: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	x5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	x4	_5
Skidpad Performance:	_1	_2	x3	_4	_5
Assembly Quality:	_1	_2	x3	_4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	_2	_3	x4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	_1	_2	x3	_4	_5
Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Control under braking and during acceleration

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

close competition

Would you be interested in racing a FSAE specified car? Why or why not?

no, I prefer a stock car What class do you run now? Please state 3 reasons why.
F-Stock

1. Rear wheel drive V8's
2. Close competition
3. streetability of the car

Would you rather buy parts from a local dealer of from the factory directly?

local dealer

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

price and performance. "Bang for the Buck"

Thank you very much for your time :-)))

Date: Tue, 02 Mar 1999 16:08:18 -0500 (EST)
From: Lloyd.Wilson@Alcan.Com
To: masha@WPI.EDU
Subject: Re: FSAE Racecar Project

My responses are included below. My opinions are bias since I have only run Stock class cars regularly. My budget does not allow me to purchase a dedicated race car with tow vehicle and trailer. Also I have never seen or heard a FSAE cars being competitive in A Modified class. Why buy a race car, tow vehicle and trailer for a non-competitive car. It maybe fun but winning is even more fun.

Lloyd Wilson
100K Racing
93 Prelude VTEC
VTEC SPD

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	X2	_3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	_4	X5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	X4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	_2	X3	_4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability:	_1	_2	_3	_4	X5
Crashworthiness:	_1	X2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	X5

Innovativeness:	_1	_2	X3	_4	_5
Preferred hours: of maintenance per each event	X1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

I personal run a stock classed car. Maintenance is not a real issue due to the high quality of engineering work already performed on everyday cars. So maintenance would have to be high along with handling being very important.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Similar performance capabilities.

Would you be interested in racing a FSAE specified car? Why or why not?

Yes, but I would have to purchase a tow vehicle and trailer. Also FSAE cars are definitely not the car design to have to be competitive in A Modified Class.

What class do you run now? Please state 3 reasons why.

G Stock, (1) it is my everyday car (no extra expense of a dedicated race car), (2) the cost to be competitive is low, (3) ample supply of replacement/wear parts (no exotic special one of the kind parts)

Would you rather buy parts from a local dealer of from the factory directly?

Which ever will give me the better price for the same quality and delivery

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Performance, Price, Quality.

Thank you very much for your time :-)))

Date: Tue, 2 Mar 1999 15:59:34 -0600
From: Phil Vanner <pvanner@pclink.com>
To: 'Maria I Vassilieva' <masha@WPI.EDU>
Subject: RE: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	x1	_2	_3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	x3	4	_5
Acceleration:	_1	_2	x3	4	_5
Slalom Performance:	_1	_2	_3	X4	_5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	X3	_4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	X1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	X3	_4	_5
Innovativeness:	_1	X2	_3	_4	_5

Preferred hours: of maintenance per each event	_1-2	X2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling Small Size, simplicity

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

large classes, interesting cars, variety of cars

Would you be interested in racing a FSAE specified car? Why or why not?

Maybe

What class do you run now? Please state 3 reasons why.

DSP
It's where the British Dogs run variety Size

Would you rather buy parts from a local dealer of from the factory directly?

Hmmm, neither applies in my case, the factory went out of business 20 years ago. Aftermarket speed shops/ custom fabricators, search for NOS parts when he rules require original.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Performance 1st, Price 2nd,

Thank you very much for your time :-)))

Date: Tue, 2 Mar 1999 16:10:41 -0700
From: I.Mannix <mannix@privatei.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	x2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	_4	x5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	_4	x5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	_4	x5
Wrench Clearance:	_1	_2	_3	_4	x5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	x1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	x1	_2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	xdoes not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

If this is a $9000, Solo only car, it sounds like an AM car to me. An AM car is not going to be competitive for $9000. Simply not possible. Basically, the most critical thing you forgot (IMHO) above is whether the car is competitive - which has a lot to do with where it is classed, which of course, you have no control over.

Look at F125 for a similarish vehicle - and competitive, as they are in their OWN class. Not many people bought them, and they don't require a trailer(you can put them on the roof of a car with a rack, I've transported karts on my Audi sedan).

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Classes with varying types of cars are neat, but rareish - people don't run in droves to uncompetitive cars, and the people likely to buy an autocross specific car(IE, not a kart, not a F500, not a SoloVee) are going to buy a competitive car - a proven competitive car. FSAE cars are cool, but they get killed in AM.

Would you be interested in racing a FSAE specified car? Why or why not?

Me? I like Street Prepared, so thats why:). If it were in a class where it had a chance in hell, and I were looking for an open wheel car with lots of adjustability, sure, I'd consider one.

What class do you run now? Please state 3 reasons why.

DSP
The car I owned when I started is in DSP
The car I own, now that I'm doing it is semi-competitive in DSP
I like DSP because it rewards creativity. It is not (as much as some classes) a checkbook race.

Would you rather buy parts from a local dealer of from the factory directly?

Don't care, really. Local takes mail out of the loop, sometimes I don't have time to wait for the mail.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Not for a DSP car - most of the stuff on my car is not made "for" a DSP VW - you have to source things yourself, run around and buy various pieces of

the puzzle. I appreciate good customer service, but I appreciate the parts I need more:).

Good luck!

I.Mannix

Date: Tue, 2 Mar 1999 17:18:31 -0500
From: Phillip S. Osborne <psosborn@gte.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	x5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	x3	_4	_5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	x4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	_2	_3	x4	_5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	_2	_3	x4	_5
Preferred hours: of maintenance per each event matter	x1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance) handling, power, braking...

What do you look for in the class for competition?
(Ex: large classes, same type of cars) good quality drivers.

This can only to make YOU a better driver...

Would you be interested in racing a FSAE specified car? Why or why not?

Sure, they are fun, fast cars when properly built and maintained...

What class do you run now? Please state 3 reasons why.C Prepared...I like old muscle cars.

Would you rather buy parts from a local dealer of from the factory directly?

Factory direct whenever possible

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price and parts availability

Thank you very much for your time :-)))

Date: Tue, 2 Mar 1999 18:17:45 -0800 (PST)
From: Buddy Ahlers <buddy_ahlers@yahoo.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	X2	_3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	X4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	X4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	_3	_4	X5
Engine Access:	_1	X2	_3	_4	_5
Wrench Clearance:	_1	X2	_3	_4	_5
Adjustability:	_1	_2	X3	_4	_5
Crashworthiness:	X1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	X5
Innovativeness:	X1	_2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	X2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Good power to weight ratio, slalom, handling, beefy torque band.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Similar cars, good competition...quick cars, well prepared for specific needs of auto-xing.

Would you be interested in racing a FSAE specified car? Why or why not?

YES YES YES!!!!! Fast cars, great handling, light weight...what could be more fun? (Maybe formula 1, but...).

What class do you run now? Please state 3 reasons why.

E-Prepared. I had a car that could fit in the class, and still be relatively competitive. I like to tinker with my car, try to squeeze the most speed out of it as I can, and this class has very liberal rules I need to follow...that way I can really prep the car to help fulfill my true race car fantasies. ;-)

Would you rather buy parts from a local dealer of from the factory directly?

Order direct.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Performance possibility, then price, then availability of parts (aftermarket and factory parts), then customer care.

Thank you very much for your time

Good Luck with the project! Kick Butt!

Date: Tue, 02 Mar 1999 18:56:20 -0700
From: Joshua Hadler <jhadler@rmi.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	X4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	_4	X5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	_4	X5
Crashworthiness:	_1	_2	X3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	X4	_5
Innovativeness:	_1	_2	X3	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	Xdoes not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling potential. Autox is a handling issue. power is second to handling in almost every way when looking at autox.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Ample competitors, and a variety of vehicles.

Would you be interested in racing a FSAE specified car? Why or why not?

Hell yes! Because they look like fun. Granted, I've never actually driven one, but an open wheel car is always fun. Would it be competitive in SCCA A-Modified? No, not a prayer.

What class do you run now? Please state 3 reasons why.

CSP.

1) I like the type of preparation and technical work involved in SP development.
2) I like the type of competition in CSP
3) I bought a car that has the potential to out-handle the rest of the class. Regrettably, it is severely handicapped on power. Power isn't everything, but it sure does help.

Would you rather buy parts from a local dealer of from the factory directly?

I my case, it's a moot point. My car hasn't been in production for 25 years.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

None of the above actually. It's performance. Not just in a sports car way either. If I'm looking for a vehicle that I need to get me up and down the mountains, and through deep snow, then I'll first look for what vehicle can do that the best. - Then- I'll look at things like price and reliability. I dislike dealerships, so I don't really go into them expecting service to begin with.

Joshua Hadler '74 914 2.0 CSP/Bi - Hooligan Racing #29 - CONIVOR
'87 Quantum Syncro - aka stealth qua
jhadler@rmi.net http://rainbow.rmi.net/~jhadler/

Date: Wed, 03 Mar 1999 08:20:00 -0600
From: "m.roadster performance usa, l.l.c." <dan@mroadster.com>
To: masha@WPI.EDU
Subject: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	X4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	X4	_5
Braking:	_1	_2	_3	X4	_5
Acceleration:	_1	_2	_3	X4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	_2	_3	_4	X5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	_2	_3	X4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	X5
Innovativeness:	_1	_2	3X	_4	_5
Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	Xdoes not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling and gearing ratios ability to provide enough low-end torque.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

I look for a class that is highly competitive and can demonstrate speed
(BS)

Would you be interested in racing a FSAE specified car? Why or why not?

Absolutely. I would think it meets my criteria above with the exception of the highly competitive class. Generally, Mod classes are not highly populated. But it'd be a hoot to drive ;)

What class do you run now? Please state 3 reasons

B stock. 1. You can always count on at least 10 great drivers at each event to compete with. 2. Its really known as "Miata-spec" class, and I'm a miataholic. 3. speed and handling are always part of this class.

Would you rather buy parts from a local dealer of from the factory directly?

It depends. Our local dealer is incredible. That says a lot for a "dealership" but the service/parts department caters to the B stock crowd, miatas and racers in general. I would go to factory directly for the more expensive parts where its more likely that I could get a better price.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Not sure what it is you're asking here.

dan pedroza
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fax : (512) 2 4 9 - 0 0 0 4
this sig line brought to you today by the letters "B" and "S" and the number "99"

Date: Wed, 3 Mar 1999 07:58:24 -0800 (PST)
From: Topper Jones <gbrt@rocketmail.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	X5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	X4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	X4	_5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	_2	_3	_4	X5
Engine Access:	_1	_2	X_3	_4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	_2	_3	_4	X5
Chassis/Mechanical Design:	_1	_2	_3	_4	X5
Innovativeness:	_1	_2	_3	X4	_5
Preferred hours: of maintenance per each event	X1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

1ST is handling 2ND is that I don't want to have to work on it. I want to get in it and drive! 3RD is price.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Same type of cars and GOOD drivers.

Would you be interested in racing a FSAE specified car? Why or why not?

I would love to race an open wheel car because they're low and fast and, yes, different.

What class do you run now? Please state 3 reasons why.

B stock. 1. I own a Miata; 2. I love open top cars; 3. Cheap and fun.

Would you rather buy parts from a local dealer of from the factory directly?

Factory

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

All of the above.

Thank you very much for your time :-)))

Good luck Maria,
Topper Jones

Date: Wed, 17 Mar 1999 19:04:22 -0800
From: Kathy Wolfskill <kathyw@ff.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	x1	_2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	x4	_5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	x2	_3	_4	_5
Wrench Clearance:	_1	x2	_3	_4	_5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	x1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5
Innovativeness:	x1	_2	_3	_4	_5

Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter

Part 2:

Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

FUN! Maneuverability, handling, nimbleness

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Large class with very closely matched cars

Would you be interested in racing a FSAE specified car? Why or why not?

Probably not--I'm not mechanical and don't want to maintain anything—I want to arrive and drive something really competitive (a stock car type of person) even though I'd much prefer to DRIVE a formula car

What class do you run now? Please state 3 reasons why.

G Stock--as it turned out, I needed a daily driver for the mountains, so I got what was then known as a "dog" Talon. Turned out to the be hot car last year! So I did it on accident but loved it because
1. I arrive, change tires and drive
2. It's really competitive
3. It's pretty fun, especially for Solo Trials and faster courses (too heavy for smaller courses)

Would you rather buy parts from a local dealer of from the factory directly?

Local dealer

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

don't understand the question

Kathy Wolfskill	Voice	303-499-9181 x 115
Director of Marketing		800-357-8507
ForeFront, Inc.	Fax	303-494-5446
4710 Table Mesa Drive	E-Mail	kathyw@ff.com
Suite B	URL	http://www.ff.com
Boulder, CO 80303	CIS	74777,2132 or GO FOREFRONT

Date: Wed, 17 Mar 1999 21:06:44 -0500
From: James McElroy <jmcelroy@alum.wpi.edu>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	X3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	_4	X5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance: (as long as the car performs well on the autox course, who cares what it's skidpad numbers are?)	X1	_2	_3	_4	_5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness: (if it's a solo car, there shouldn't be anything to crash into on the course).	_1	X2	_3	_4	_5
Chassis/Mechanical Design: (again, as long as the car peforms well, I don't care that much what the design is)	X1	_2	_3	_4	_5
Innovativeness: (see above comment, but it's always nice to see an innovative design)	_1	X2	_3	_4	_5

Preferred hours: of maintenance per each event	X1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling: neutral, predictable breakaway characteristics, little body roll

Steering: quick, good turn-in response, responsive feel so you know what the tires are doing

Braking: strong, fade free, easy to modulate, ABS (if any) shouldn't kick in too early and shouldn't upset handling

Good shifter to allow quick 1-2 and 2-1 shifts (or 1-2-3-4-5-6 and 6-5-4-3-2-1 in the case of an FSAE car).

Controls: accelerator, clutch, and brakes should be progressive and easy to Modulate

Low maintenance: I want to drive my cars, not work on them

Good torque

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

A class that has a car I enjoy driving first of all. Then I look for good competition.

Would you be interested in racing a FSAE specified car? Why or why not?

Yes, *if* they were reliable. They're a blast to drive (nothing I've ever driven since come close), but I've never seen one make if through an event without breaking down.

What class do you run now? Please state 3 reasons why.

BS.
1. That's where the Miata R fits in (the car my wife and I autox full time)
2. The Miata R gives us SP-like performance in a stock class car (which means full factory warranty, no modifications to make, low maint., etc)
3. There's terrific competition

Would you rather buy parts from a local dealer of from the factory directly?

Local dealer if the price wasn't too high. In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Not sure what the question means, but I choose a car based on the merits of the car itself. Then I look around until I find good sources for parts (for those jobs I do myself) or repairs (for those jobs I don't have the tools/knowledge/time/interest to do myself).

Thank you very much for your time :-)))

You're welcome. Will you guys be coming to any events this year? Speaking from past experience, seat time, especially in an SAE car, is very important!

Good luck!

James
WPI '95, past autox club

James McElroy
NER SCCA Solo II Co-Chief of Registration
97 Miata R (BS)
(603) 465-6392 (before 9 pm)
mailto:mcelroy@nh.ultranet.com

Date: Wed, 17 Mar 1999 23:06:50 EST
From: MDreyerMTX@aol.com
To: masha@WPI.EDU
Subject: Re: FSAE Racecar Project

Maria - Good luck. I ran my first race last year in a stock car, so I may not be to ideal of a target for this survey, but you asked for it. At least you get to work on good projects in college. My senior ME project was to map a topographical surface of machined part ::ZZZZZzzzzz::
Mike

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	X5
Handling:	_1	_2	_3	X4	_5
Power to weight Ratio:	_1	_2	X3	_4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	X4	_5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	_3	X4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	_2	_3	_4	X5
Chassis/Mechanical Design:	_1	_2	_3	_4	_5
Innovativeness:	_1	X2	_3	_4	_5

Preferred hours: of maintenance per each event	X1-2	_2-5	_5-10	_does not matter

Comments: I think you might want to consider how you handle this survey. In an ideal situation I would have probably checked 5 on all (except maintenance time which would have been a 1). But in the real world, you know there are trade offs. For example, an adjustable chassis would be great, but it may have areas where the adjustability may affect the chassis stiffness and even the safety. Also, for this particular car, there are some specs that must be maintained in order to be accepted in the class (i.e. engine type). I think a more realistic approach would be to prioritize the characteristics that would be desired in a spec racer, and then use a scale of numbers where a ranking can only be used once. For example, If I were to choose between braking, acceleration, engine access, and safety, I would give safety a 1(most important), braking a 2, acceleration a 3, and engine access a 4. I would be much more patient about accessing an engine that gave me great acceleration than vice versa. You also may do better by quantifying results rather than using broad characteristics like "handling". I may think my car handles great, yet a seasoned racer may think it is lousy.

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Braking, Acceleration, Stiff Suspension, Stiff frame

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Would you be interested in racing a FSAE specified car? Why or why not?

Absolutely. However for a hobby, it can get rather expensive. If the time and money are available and you like the cornering, speed, and the adrenaline rush, I think the spec racers are the way to do it. Because of the scaled down size, the large amounts of power, and the closeness to the ground, the feeling of speed are definitely there.

What class do you run now? Please state 3 reasons why.

I am currently running stock class. Why??
1) I have a decent car for stock class that performs well with little modifications (VW GTI VR6)
2) I enjoy a well engineered and designed car and can get a lot of enjoyment for little investment
3) It's a good way to learn how to race until I figure out what I want to do in the future

Would you rather buy parts from a local dealer of from the factory directly?

Dealers typically have parts readily available because they are required to keep stock. Manufacturers typically do not want to maintain a large inventory, and thus availability is always a question. Hence, I would prefer dealers.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Serviceability and availability of parts come first. Personalized customer care SHOULD always be there. Price will fall into line if you have the first three. For example, take a look at a Bose system some time and then tell me why they can get away with charging the same higher price for their systems. Also, look at some other items that you associate with quality and you will see how a higher price (and more profits) will follow. Some examples, Oreck Vacuums, All-Clad cookware, Jeep Grand Cherokee's (with a whopping 25-50% profit margin).

Thank you very much for your time :-)))

Date: Wed, 17 Mar 1999 15:17:33
From: Jeff Loh <asp125@concentric.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	X3	_4	_5
Handling:	X1	_2	_3	_4	_5
Power to weight Ratio:	_1	X2	_3	_4	_5
Braking:	X1	_2	_3	_4	_5
Acceleration:	_1	X2	_3	_4	_5
Slalom Performance:	X1	_2	_3	_4	_5
Skidpad Performance:	_1	_2	X3	_4	_5
Assembly Quality:	_1	_2	X3	_4	_5
Engine Access:	_1	X2	_3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	X1	_2	_3	_4	_5
Crashworthiness:	_1	_2	X3	_4	_5
Chassis/Mechanical Design:	X1	_2	_3	_4	_5
Innovativeness:	_1	X2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	X2-5	_5-10	_does not matter	

Part 2:

Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Assuming the car is PURPOSE BUILT (i.e. not compromised for the street), then the main factor is handling. Specifically, an autocross car needs quick transient response. Steady state cornering G's is less important than the ability to respond to quick steering inputs and high lateral weight shifts.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Most of the fun in a class comes from close competition. It's no fun winning in a class of one. That said, I think in the past several SCCA Nationals, the F/SAE subclass (of A/Mod) represents what a "fit for purpose" design should compete in. Professor Bob Woods of Texas A&M probably has done as much for the whole SAE program as anyone.

Would you be interested in racing a FSAE specified car? Why or why not?

Too bad I finished my university days before I started autocrossing. If I had to do it over, I'd be there for sure! Still, I enjoy giving race advice and seeing the "little light bulb" go on in the student's heads. Given that most CART teams have at least one F/SAE grad on their payroll, what better way to get into professional racing? Hmm, Formula 1.... sigh.

What class do you run now? Please state 3 reasons why.

I have raced all classes, from Stock to Mod. Currently I run A/SP, but it's becoming too expensive to make a 911 competitive with a Lotus. The best advice a seasoned old-timer ever gave me was "stay stock or go mod". In stock, you learn to drive and prepare a car within strict parameters. In Mod, engineering comes into play. The purest form of competition comes from stock, where driving skill is 80% or more. I can't really say what reasons, but if I had to choose it would be:
1. close competition
2. tuning/engineering skills
3. learning to drive at 10/10ths

Would you rather buy parts from a local dealer of from the factory directly?

What's that old saying?.. "Never pay retail". Bargain, haggle, barter, whatever. The best thing is having sponsorship... OPM (Other People's Money) racing.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Not applicable to a PURE race car. Racecars are a hobby, passion, bad habit, or obsession. For a street car, the choice will depend on the owner's ability to hold a wrench, their time and financial resources.

Thank you very much for your time :-)))

You're welcome, just come out to the track and apply that knowledge to field testing. ;)

-Jeff Loh
SCCA Colorado Region
A/SP 911, 125cc Shifter Kart
Tire changer and chief bottle washer, Go4it Racing Team, #43 World Challenge T1 Firebird

Date: Thu, 18 Mar 1999 06:42:10 PST
From: Mike Miller <sniglet999@hotmail.com>
To: masha@WPI.EDU
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	x5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	x2	_3	_4	_5
Skidpad Performance:	_1	_2	x3	_4	_5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	x4	_5
Wrench Clearance:	_1	_2	_3	_4	x5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	_2	_3	_4	x5
Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	_1	x2	_3	_4	_5

Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Ruggedness, cheap to use in terms of parts availability.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

I purchased my cars based on their day-to-day usage, not what class they were in. (Not very appropriate for your interests...)

Would you be interested in racing a FSAE specified car? Why or why not?

Issues with towing the car to the event would prevent me from owning one..._renting_ on e at the track on the other hand might be a possibility, more so if I fit in it (I'm 6'5")

What class do you run now? Please state 3 reasons why.

SS
1) My 87 Rx7 was placed in A stock where is was stupidly non competitive,
2) vettes run Super Stock,
3) I traded the '7 for a vette.

Would you rather buy parts from a local dealer of from the factory directly?

Whoever is cheaper.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

The capabilities of the car. Personalized customer care is the wrong way to buy a car: You're talking maybe 2 hours of you life spent dealing with a sales droid and the next XX years living with the car.

Serviceability is important, but you don't have to service parts that don't break!

Date: Wed, 17 Mar 1999 20:11:51 EST
From: SoloChair@aol.com
To: masha@WPI.EDU
Subject: survey

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	x2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	_4	x5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	x4	_5
Wrench Clearance:	_1	_2	_3	x4	_5
Adjustability:	_1	_2	x3	_4	_5
Crashworthiness:	x1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5
Innovativeness:	x1	_2	_3	_4	_5

Preferred hours: of maintenance per each event	x 0-1	_1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

A car that is competitive in its class, with little maintenance and cost. Sound is also important. The sound of a screaming Ferrari is much nicer to listen to than a Neon with open exhaust. A car with a nice balance of handling, acceleration and braking is a joy to drive. One that is forgiving of mistakes yet does what you want it to do.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Different classes seem to have different types of people in them. Some classes have animals in them such as CP, other classes have terrific drivers like DS. It is always nicer to be in a class that I have friends in, but then you always seem to make friends with the people in your class anyways. I guess I pick the car to drive and not necessarily the class.

Would you be interested in racing a FSAE specified car? Why or why not?

The FSAE cars that I have seen in the past do not seem to be very reliable. If they can prove to be reliable I would consider racing one provided it was put in a competitive class. They all go to A-mod which is a tough class to compete in with only 100 horsepower.

What class do you run now? Please state 3 reasons why.

I run in DS with a Dodge Neon. Chrysler pays contingency if you win. The car is reasonably reliable with low parts costs and availability. It can be set up to handle very well if you know what you are doing.

Would you rather buy parts from a local dealer of from the factory directly?

I would rather buy from a local dealer that I can establish a relationship with.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

yes to all.

Thank you very much for your time :-)))

Good luck and let me know if you have any further questions.

Chang Ho Kim
Solo2 Chairman
NER/SCCA
autocrosser since 1990
FS, 87 Nissan 300ZX-Turbo
DS, 97 Dodge Neon ACR
ES, 85 Honda CRX Si SS, 89 Corvette
CSP, 84 Honda Civic
DS, 86 Honda Civic Si
ES, 91 Geo Storm GSI
GS, 89 Firebird V6
GS, 87 Ford Thunderbird Turbo

Date: Thu, 18 Mar 1999 08:37:47 -0700
From: Dave Dutton <dave@applemotors.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	x5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	x3	_4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	x3	_4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	_4	x5
Assembly Quality:	_1	_2	x3	_4	_5
Engine Access:	x1	_2	_3	_4	_5
Wrench Clearance:	x1	_2	_3	_4	_5
Adjustability:	x1	_2	_3	_4	_5
Crashworthiness:	x1	_2	_3	_4	_5
Chassis/Mechanical Design:	x1	_2	_3	_4	_5
Innovativeness:	x1	_2	_3	_4	_5

color bright green is very cool !

Preferred hours: of maintenance per each event	_1-2	_2-5	_5-10	x does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

quick handling, good torque, bright green color

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

another car...someone build another DP class car. Actually I am building engines for 2 more local DP autocrossers another one of them will be bright green

Would you be interested in racing a FSAE specified car? Why or why not?

No, I like the freedom that I have in prepared class

What class do you run now? Please state 3 reasons why.

I advertise for my FIAT business (Apple Motors) with my bright green DP FIAT. I got 6th in 97 and 4th in 98 and I want to win the nat'l championship in 99 I like to beat up on larger and more powerful cars with my bright green FIAT

Would you rather buy parts from a local dealer of from the factory directly?

factory

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

availability of used parts in my back lot determine what I play with

Thank you very much for your time :-)))

you are quite welcome.

Good luck with your project. see you at nat's I hope. Come over and say hello; did I say my X1/9 FIAT was bright green?
Thank you very much
Dave Dutton dave@applemotors.com

visit www.applemotors.com

Date: Thu, 18 Mar 1999 12:01:06 -0500 (EST)
From: Bob Lang <LANG@ISIS.MIT.EDU>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

Hi.
You asked, so here goes:

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	X4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	X3	_4	_5
Braking:	_1	_2	_3	X4	_5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	X4	_5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	X3	_4	_5
Engine Access:	_1	_2	X3	_4	_5
Wrench Clearance:	_1	_2	X3	_4	_5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	X2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	X4	_5
Innovativeness:	_1	X2	_3	_4	_5
Preferred hours: of maintenance per each event	_1-2	X2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling is everything. You start with the contact patch and then improve from there. So, good tires first, then better shocks and sway bars (as the rules allow, of course) and then you change the springs and stuff. You start going for max. power 'till you get the package handling.

Of course this is easier said than done!

Reliability is important, but autocross is relatively low-stress on the parts, but you obviously don't want to drive a clapped out car with parts falling off in the first place. But, ironically, my TR6 has only failed me once at probably 75 or more autocrosses, and I actually still don't know why I had that failure (I still have to do a "teardown" of the motor to see why I had a "carb fire".) But if you're car is really ready when you bring it to an event, you should be no work at an event other than putting on tires/wheels and checking air pressure (and possibly checking fluids). If your car won't do that - leave that one home and some bum a ride with someone else's car.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

I actually like some comeraderie amongst the competitors. I've been in D Street Prepared (in the New England Region SCCA) the last three years, and we share cars and that sort of thing. FWIW, DSP had the biggest Street Prepared Field _ever_ at the Solo II Nat's in '98 - 45 cars! Ironically, DSP is not the biggest class in most regions.

But if you're just starting, big fields can be a little intimidating. And they might even take away some of the "glory" factor (because in a big field, the "levels of achievement" tend to sort out pretty decisively right away - and that can be frustrating to learn that you're not the next Micheal Schumacher (or whoever you want to emulate).

I'll also point out that some Novice class participants get frustrated at really big events because they wind up not getting enough "seat time". For this reason, it's always good to find a "local venue" that has less participants so you can get 5 or 6 runs in a day... this is the "seat time" that you need.

Would you be interested in racing a FSAE specified car? Why or why not?

Yes and no. I tend to like cars based on production cars. Of course my tastes are a little strange (by SCCA standards anyway) in that I usually drive a TR6 - in

fact I'm building an AP TR6 this winter and hope to get it out this year! This is a really big deal.

However, the FSAE cars look to be really fun to drive, but I think they should run in their own class and not A or B Mod (wherever they put them) because the real A and B Mod cars are seriously fast and FSAE has little hope of "trophy'ing".

What class do you run now? Please state 3 reasons why.

DSP now - AP in the near future.

DSP - because that's where my car runs. I did not plan this. Hey, I've had the car for 25 years... what can I say. I decided from the outset that I wanted to improve the handling, and the 20+ year old springs were shot, so I wound up in Street Prepared because I had to upgrade to stiffer springs... Everything else more or less "just happened".

AP - Because that's where TR6's run when you do all the "kool stuff" to them. After 25 years, I've got a lot of parts! And I keep buying more. Cams, different differential ratios, limited slip... all the "good stuff". In both cases, I run those cars because I like TR6's. I also like the Street Prepared class because you can play with the suspension a bit to make the car handle and I like prepared class because you can tweek the motors for more power. By way of example, I'm trying to make my AP TR6 have around 175 HP. Considering that the stock configuration of that motor was around 104 HP, that's a big difference. And I know if I go insane on preparation I can get over 200 HP.

Argh argh argh.... Horsepower.....

;-)

Would you rather buy parts from a local dealer of from the factory directly?

Well, having a 25 year old car built by a manufacturer that no longer exists, I'll take my parts any way I can get 'em. FWIW, it's actually easier to get some bits for my TR6's now than it was when Triumph still existed. Go figure. And I hope that does not change in the near future.

That having been said - I'd prefer to get whatever parts I need from whatever the cheapest most reliable source is.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?
I don't give a crap about customer service. I do all my own work on my car and only farm out things that I have no prayer of doing – like balancing the crankshaft. In that case, I go with the shop that knows my application and try to work with them. If they've never heard of a TR6, they'll never see my money.

So price and availability are the big things for me. FWIW, I have a very large disdain for most service organizations. This opinion has been forged over a long time of dealing with "ninnies" at various dealers etc. And good mechanics are very hard to come by – and when I find one - I use their services exclusively. This may sound like a contradiction, but I can fill you in on the details if you care.

Thank you very much for your time :-)))

You're welcome.

Hope to see you at some SCCA events. And don't be afraid to ask questions of folks when you're there. You'll get some bullshit answers, you'll get some good answers. Once you figure out who's who, you'll know where to get your questions answered.

Gotta go work on the TR6 some more!
rml

Bob Lang	Room N42-140Q	| This space for rent.
Consultant	MIT Computer Services	|
Voice: (617)253-7438	FAX: (617)258-9535	|

Date: Thu, 18 Mar 1999 20:19:17 -0500
From: Robert Horansky <rhoransk@bellsouth.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: REPLY -- FSAE Racecar Project

HI MARIA,
IT SOUNDS LIKE YOU HAVE AN INTERESTING PROJECT. APPARENTLY YOU HAVE AN NER-SCCA ADDRESS LIST. I TOO AM A WPI ALUMNUS ('68). I AM CURRENTLY IN THE ATLANTA AREA AND A DUAL ATLANTA REGION AND NEW ENGLAND REGION SCCA MEMBER.

I HAVE BEEN INVOLVED IN SCCA RACING AND SOLO FOR 26 YEARS AS CAR OWNER, BUILDER, DRIVER, CREW, ETC, AS WELL AS AN ACTIVE RACING NATIONAL CHIEF STEWARD AND FORMER CHIEF TECH INSPECTOR FOR NER. SO, HERE IS MY OPINION:

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	X2	_3	_4	_5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	X3	_4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	_3	_4	X5
Skidpad Performance:	_1	_2	_3	_4	X5
Assembly Quality:	_1	X2	_3	_4	_5
Engine Access:	_1	_2	_3	X4	_5
Wrench Clearance:	_1	_2	_3	_4	X5
Adjustability:	_1	_2	_3	_4	X5
Crashworthiness:	X1	_2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	X5

Innovativeness: _1 X2 _3 _4 _5

Preferred hours: _1-2 X2-5 _5-10 _does not matter
of maintenance per each event

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

HANDLING AND ACCELERATION

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

LARGE CLASS OF SIMILAR CARS

Would you be interested in racing a FSAE specified car? Why or why not?

NO - PREFER A CAR THAT CAN BE MULTI-USE (SOLO AND RACE)

What class do you run now? Please state 3 reasons why.

ITS DATSUN 280Z:
1. RACE CLASS
2. SOLO I & II ELEGIBLE
3. 3. ACTIVE ATLANTA

AREA Z CLUB EVENTS (LAPPING DAYS AT ATLANTA MOTOR SPEEDWAY, ROAD ATLANTA, TALLEDEGA, ETC.)

Would you rather buy parts from a local dealer of from the factory directly?

LOCAL DEALER. EXPERIENCE WHEN I HAD A FORMULA CAR IN THE 1970'S WAS LONG DELAYS IN WAITING FOR PARTS.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

TO HAVE A POPULAR CLASS PRICE AND AVAILABILITY OF PARTS OF PARAMOUNT CONCERN.
Thank you very much for your time :-)))

Date: Thu, 18 Mar 1999 22:32:58 EST
From: RaceMyNeon@aol.com
To: masha@WPI.EDU
Subject: Re: FSAE Racecar Project

In a message dated 3/17/99 7:37:42 PM, masha@WPI.EDU writes:

Hello,
My name is Maria Vassilieva. I am a junior at Worcester Polytechnic Institute in Worcester, Massachusetts.

snippers

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	X5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio: (would be a 5 for a "race only" vehicle)	_1	_2	X3	_4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration: (I don't expect it to act like a Formula 1 car)	_1	_2	_3	X4	_5
Slalom Performance:	_1	_2	_3	X4	_5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	_3	_4	X5
Engine Access:	_1	_2	_3	X4	_5
Wrench Clearance:	_1	_2	_3	X4	_5
Adjustability: (I'm content with "what I see is what I get"...to a point)	_1	_2	X3	_4	_5
Crashworthiness: (Hopefully not needed to provide statistical data!)	_1	_2	_3	_4	X5
Chassis/Mechanical Design:	_1	_2	_3	X4	_5

Innovativeness: _1 _2 _3 _4 X5

Preferred hours: X1-2 _2-5 _5-10 _does not matter
of maintenance per each event

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Quick and precise handling. Not necessarily "nimble," but a car that will do what you expect it to do. Easy to fair maintenance. Some work expected. Won't kill me in cost of operation AND maintenance. Use common and readily available parts. A good balance in how it feels when pushed to the limits.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Same type of car I drive. I also look for someone who is trying a new part or idea. I watch, watch, watch.

Would you be interested in racing a FSAE specified car? Why or why not?

Gee - never thought of it. I'd try it.

What class do you run now? Please state 3 reasons why.

"D" stock Solo II. (Desire to prep car for Club Racing in SSC class in 2 years.) I can afford a Neon to race weekends and drive to work. I think the Neon is a fun car to drive overall. Exceptional value and enjoyment for my money.

Would you rather buy parts from a local dealer of from the factory directly?

Dealer can be overpriced or sleazy at times. Factory may not always discount and can't always provide service or repair. So if a local dealer has a good reputation I'd do business w/ them. I had to educate my local dealer on the type of car I was interested in (Neon ACR) Overall - slight preference to local dealer, as I can yell at them at the least.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

I'd have to say it's a combination off ALL of these that can make a deal a deal. Good service is worth paying a bit more in price, a good price can offset a wait of a few months, etc. etc., but that order is reasonably true: price, service (which

may be closely linked to customer car -i.e. does the dealer stand by their product, availability

Eddie Savage RaceMyNeon@AOL.com
(who works up the street from you in downtown Worcester)
1995 Plymouth Neon SportCoupe/Nitro-Yellow Green Neon Enthusiasts#1004
1998 Plymouth Neon ACR sedan/Bright Platinum Neon Enthusiasts#1614
Member SCCA - New England Region
North Brookfield, Massachusetts

Date: Fri, 19 Mar 1999 09:20:16 EST
From: RacerXII@aol.com
To: masha@WPI.EDU
Subject: Questioniare

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	x2	_3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	x3	_4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	_4	x5
Slalom Performance:	_1	_2	_3	x4	_5
Skidpad Performance:	_1	x2	_3	_4	_5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	_2	x3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	_4	x5
Crashworthiness:	_1	_2	x3	_4	_5
Chassis/Mechanical Design:	_1	_2	x3	_4	_5
Innovativeness:	_1	_2	_3	x4	_5
Preferred hours: of maintenance per each event	x_1-2	_2-5	_5-10	_does not matter	

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

handling
adjustablility

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

similar cars
explicit rules

Would you be interested in racing a FSAE specified car? Why or why not?

no, no time

What class do you run now? Please state 3 reasons why.

AS, its a road course car, not an autocrosser. Its wheel to wheel

Would you rather buy parts from a local dealer of from the factory directly?

local dealer

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

1. track record (is it a consistently competitive chassis)
2. price
3. serviceable

Thank you very much for your time :-)))

your welcome

Date: Tue, 23 Mar 1999 15:57:19 -0500
From: Bob Carolan-fac <Bob_Carolan-fac@ncdsnet.net>
To: masha@WPI.EDU
Subject: reply

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	x5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	x3	_4	_5
Braking:	_1	_2	_3	_4	x5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	_3	x4	_5
Assembly Quality:	_1	_2	_3	_4	x5
Engine Access:	_1	_2	_3	_4	x5
Wrench Clearance:	_1	_2	_3	_4	x5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	x4	_5
Innovativeness:	_1	_2	x3	_4	_5

Preferred hours: of maintenance per each event	x1-2	_2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Yes, those

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

The ideal class is one in which there are no other cars that are inately superior.

Would you be interested in racing a FSAE specified car? Why or why not?

No, I use my daily driver and don't want to have to tow but if I did then I would look for a used car like a F440 or a kart or an obsolete F Ford.

What class do you run now? Please state 3 reasons why.

ESP Mustang 302 v8
Fulfills a wide variety of needs.
Lots of power, convenience

Would you rather buy parts from a local dealer of from the factory directly?

Not sure.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Price and relative competitiveness

Thank you very much for your time :-)))

Date: Wed, 24 Mar 1999 20:50:21 -0500
From: Kathleen Barnes <KJBarnes@compuserve.com>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: FSAE Racecar Project

Maria:
I have been doing autocrosses for over 25 years. I may have a different perspective. I have also worked with the Solo events board to oversee the National program

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	X1	_2	_3	_4	_5
Handling:	X1	_2	_3	_4	_5
Power to weight Ratio:	_1	_2	X3	_4	_5
Braking:	_1	_2	_3	X4	_5
Acceleration:	_1	X2	_3	_4	_5
Slalom Performance:	_1	_2	_3	X4	_5
Skidpad Performance:	_1	_2	_3	X4	_5
Assembly Quality:	_1	_2	X3	_4	_5

this is hugely important for stock class competitors - others tinker

Engine Access:	_1	_2	X3	_4	_5

important to not stock class drivers

Wrench Clearance:	_1	_2	X3	_4	_5

not important to stock, very important to others

Adjustability:	X1	_2	_3	_4	_5
Crashworthiness:	X1	_2	_3	_4	_5

this is because I also run hill climbs - should not be a factor in Solo II (autocross)

Chassis/Mechanical Design:	X1	_2	_3	_4	_5

its what makes it all work

Innovativeness: _1 _2 X3 _4 _5
I'm a sheep

Preferred hours: X1-2 _2-5 _5-10 _does not matter
of maintenance per each event

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling - nearly equal to what is competing on a national level

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Quality of competition, depth of field at a national level

Would you be interested in racing a FSAE specified car? Why or why not?

No - I hate to work on cars. If it was just drive - yes, but I think that FSAE should be limited to people who work with the program - not hot shot walk ones. There are many people in New England Region who would help you if you would like.

What class do you run now? Please state 3 reasons why.

E Prepared Ladies

1) Ladies because it is SCCA's title IX sports program,
2) EP because the car is fast, handles and does take talent to drive
3) There is excellent National competition in the class with out the car of the year syndrome.

Would you rather buy parts from a local dealer of from the factory directly?

I would love to buy from the factory but the local dealer is good.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?
Price, availability of service

Thank you very much for your time :-)))

You are welcome. Please come find me at the first event - white Honda Civic #25, white van, white trailer, black dog

Date: Sun, 28 Mar 1999 22:03:51 -0500
From: Anne and Greg Vincent <gfv27@concentric.net>
To: Maria I Vassilieva <masha@WPI.EDU>
Subject: Re: FSAE Racecar Project

I hope you can still use my delayed response. I have been autocrossing since 1984 and I currently drive a Formula Ford (open wheel, single seat, 1600cc engine making just over 100HP). Please feel free to contact me with questions. If I don't know the answer I can probably find someone who does.

Greg Vincent
CM 27
84 Van Diemen FF

Part 1:

Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	x3	_4	_5
Handling:	_1	_2	_3	_4	x5
Power to weight Ratio:	_1	_2	_3	x4	_5
Braking:	_1	_2	_3	x4	_5
Acceleration:	_1	_2	_3	x4	_5
Slalom Performance:	_1	_2	_3	_4	x5
Skidpad Performance:	_1	_2	x3	_4	_5
Assembly Quality:	_1	_2	_3	x4	_5
Engine Access:	_1	x2	_3	_4	_5
Wrench Clearance:	_1	_2	x3	_4	_5
Adjustability:	_1	_2	_3	x4	_5
Crashworthiness:	_1	x2	_3	_4	_5
Chassis/Mechanical Design:	_1	_2	_3	_4	x5
Innovativeness:	_1	x2	_3	_4	_5

Preferred hours: x1-2 _2-5 _5-10 _does not
of maintenance per each event matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

You want a car that handles extremely well at low to moderate speeds (30-70mph) and that is very reliable. From that I have seen of SAE cars in the past this last point is often overlooked. There are some simple things (like safety wire on critical suspension bolts) that can significantly decrease the chance of the car falling apart. These area's have not been addressed on the SAE cars I've seen. Easy adjustability is another key feature. It is very unlikely that the car will be perfect right out of the box. You want to be able to easily adjust camber and toe at all four corners. You should be able to make these adjustments without disassembling any part of the suspension. You should also design the car with lots of Ackerman in the steering geometry. This will make the car turn well, especially in tight radius turns. In order for the car to handle well you also need a stiff chassis to attach everything to. If the car flexes a lot you will never be able to get the handling right. Good acceleration is important. When designing and tuning the engine you should aim for a broad torque band rather than absolute horsepower. This will make the car more driveable. Also, since you lose time on every shift a broad torque band will result in quicker times. Good brakes are also essential so that you can slow the car in the shortest possible distance as you approach critical turns. Driver comfort is not usually an issue since you don't spend much time in the car but it is important to pad surfaces that the driver may contact during cornering, acceleration, and braking. It is surprising how much a car can beat up the driver when this is not done.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Large classes are nice but the best class is one in which you enjoy driving the car and have strong competition.

Would you be interested in racing a FSAE specified car? Why or why not?

I wouldn't mind a fun run or two but I would prefer to stick to my CMod car. The SAE cars are really not competitive in their class in SCCA. Not surprising since they run in the AMod class which consists of cars with lots of horsepower, big wings, and light weight.
What class do you run now? Please state 3 reasons why.

Cmod. The car is very fast, challenging to drive, and economical to maintain.

One more reason is the class has stable rules that make it possible to run the same car competitively for a very long time.

Would you rather buy parts from a local dealer of from the factory directly?

No real preference here. I use mail order a lot since many of the parts for my car are specialized. Of course there is nothing like walking into your local parts store to get what you need.

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

Not sure what you mean by this question. Most autocrossers work on their own cars or take their car to a mechanic that specializes in autocross setup. I don't think that customer care would be much of a factor in a purchase. Availability of parts (mail order or local) would be an issue. Few people want to own a car that requires fabrication of most replacement parts.

Thank you very much for your time :-)))

Date: Thu, 01 Apr 1999 09:40:30 -0500
From: Corey Wilson-Wirth <cwilson-wirth@molec-geodesics.com>
To: masha@WPI.EDU
Subject: [Fwd: FSAE Racecar Project]
Parts/Attachments:

Maria--

Being an ex-FSAE participant (Georgia Tech '90-'94), I'll see what I can do to help you out. Hopefully, I'm not getting back to you too late. Best of luck to your team next month. Here's the survey:

Part 1:
Put an "x" mark next to the appropriate number according to how important it is to you. Highest ranking 5 to the lowest ranking 1:

Interior/Safety:	_1	_2	_3	_4	X5
Handling:	_1	_2	_3	_4	X5
Power to weight Ratio:	_1	_2	_3	X4	_5
Braking:	_1	_2	_3	_4	X5
Acceleration:	_1	_2	_3	_4	X5
Slalom Performance:	_1	_2	X3	_4	_5
Skidpad Performance:	_1	_2	X3	_4	_5
Assembly Quality:	_1	_2	_3	X4	_5
Engine Access:	_1	_2	_3	X4	_5
Wrench Clearance:	_1	_2	_3	_4	X5
Adjustability:	_1	_2	_3	X4	_5
Crashworthiness:	_1	_2	_3	_4	X5
Chassis/Mechanical Design:	_1	_2	X3	_4	_5
Innovativeness:	_1	_2	X3	_4	_5

Preferred hours: of maintenance per each event	_1-2	X2-5	_5-10	_does not matter

Part 2: Please answer the following questions:

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Handling, ability to brake, and ability to accelerate to me are the most important. Maintenance and accessibility are also important, because if you can't get it to the track, you're definitely not going to win. But if you have to give up 5-10 minutes to have a superior performing car, then so be it. Now, if we are talking 45-60 minutes, then forget it. People might buy the car once, but they'll never come back because they were too frustrated with the car.

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Personally, I would prefer a medium size class... you know, enough people to have some good healthy competition, but not too many people to force you to wait 5 hours to run between events. I'd prefer a class with a healthy amount of modifications allowable (because I'm an engineer and I get into that stuff). However, with the more open rules, you inevitably cater to a class of folks with deeper pockets (speed costs, how fast can you afford to go) which will limit your customer base.

Would you be interested in racing a FSAE specified car? Why or why not?

Hell yes. It was a blast when I did it before, and I'd love to do it again. Looking for drivers??? (somehow, there never seems to be a shortage of drivers)

What class do you run now? Please state 3 reasons why.

I'm currently not running in a class (or participating in any auto-x races). I'm crewing for a guy with a G-Production Fiat in Club Racing and am helping a guy build a GT-3 car to Club race as well. Oh yeah, my three reasons: because I can't afford to shell out the bucks for my own car, because I'm an engineer and I like the technical side, and because it's a blast.

Would you rather buy parts from a local dealer of from the factory directly?

Local dealer because you can build a reputation with them and/or get a local sponsorship if you're good, and because it would probably stimulate some competition among dealers and keep the prices reasonable (although by going through a dealer, you have already bumped the pricing up)

In consideration of buying a car is it price/serviceability/availability of parts/personalized customer care?

If I understand the question correctly, if I were to buy a car, my primary concerns would be price and serviceability. Availability of parts would be a hassle, but that is a headache you run into when you are away from the track. Same with personalize c. c. Price is definitely important because racing is expensive and the cash always flows one way.... away. Serviceability is important because, again, if you can't get it running at the track, you'll have a real hard time winning.

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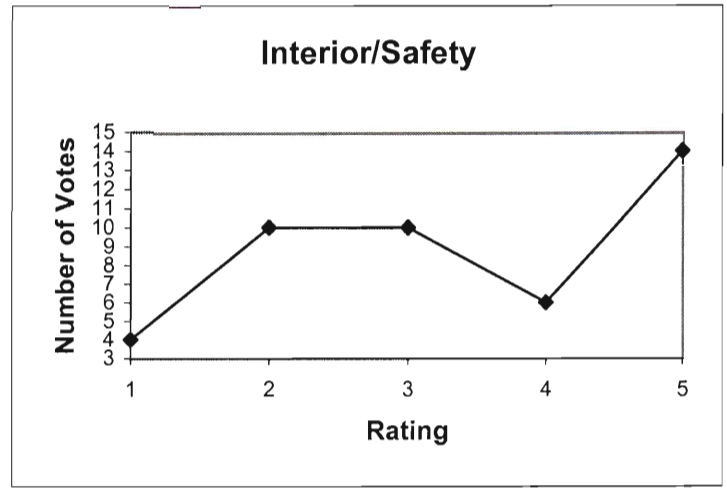
A.3 Survey Results Evaluation, Part 1: Multiple Choice Answers.

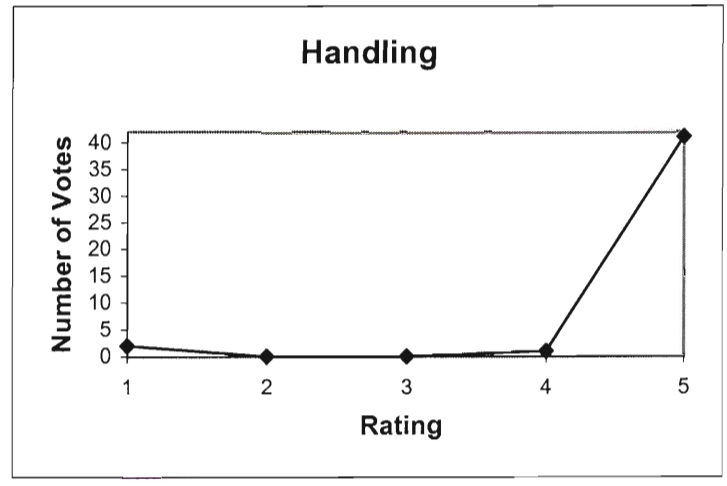
Interior/Safety

Rating	Number of Votes	Percentage
1	4	9.1%
2	10	22.7%
3	10	22.7%
4	6	13.6%
5	14	31.8%



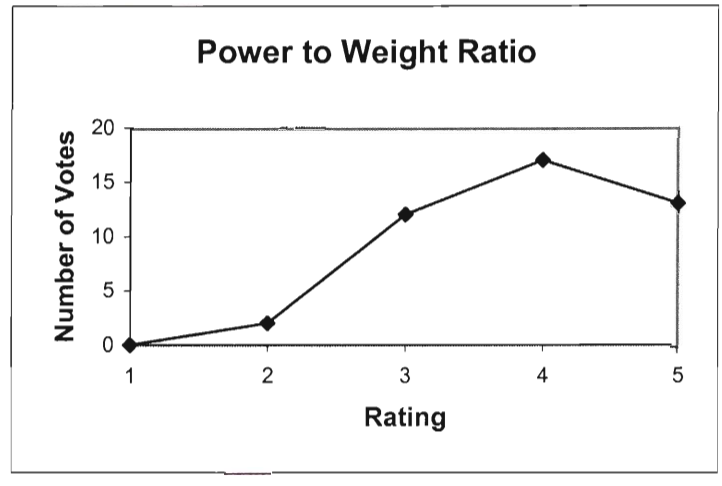
Handling

Rating	Number of Votes	Percentage
1	2	4.5%
2	0	0.0%
3	0	0.0%
4	1	2.3%
5	41	93.2%



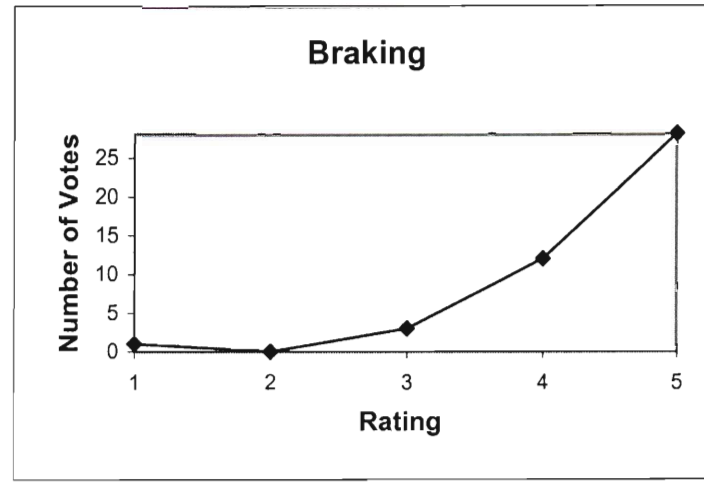
Power to Weight Ratio

Rating	Number of Votes	Percentage
1	0	0.0%
2	2	4.5%
3	12	27.3%
4	17	38.6%
5	13	29.5%



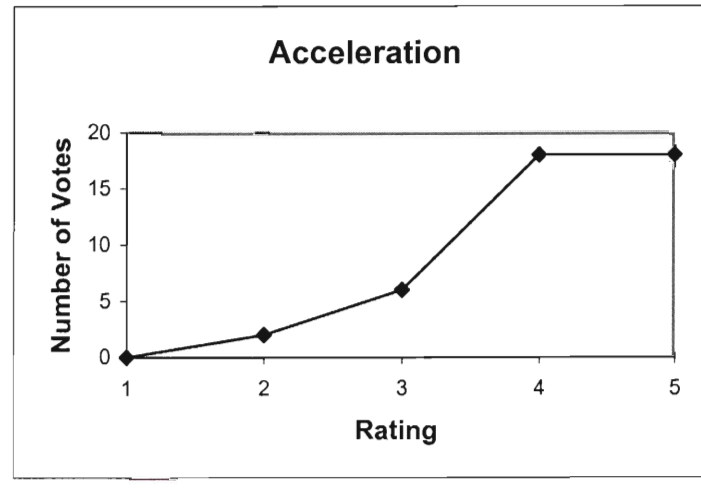
Braking

Rating	Number of Votes	Percentage
1	1	2.3%
2	0	0.0%
3	3	6.8%
4	12	27.3%
5	28	63.6%



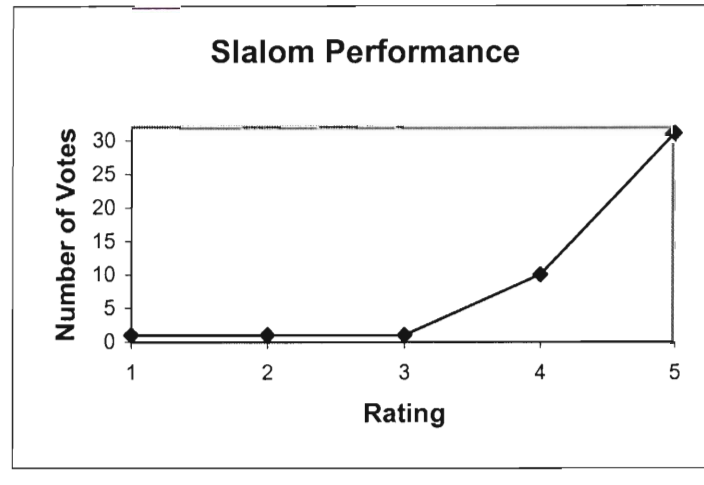
Acceleration

Rating	Number of Votes	Percentage
1	0	0.0%
2	2	4.5%
3	6	13.6%
4	18	40.9%
5	18	40.9%



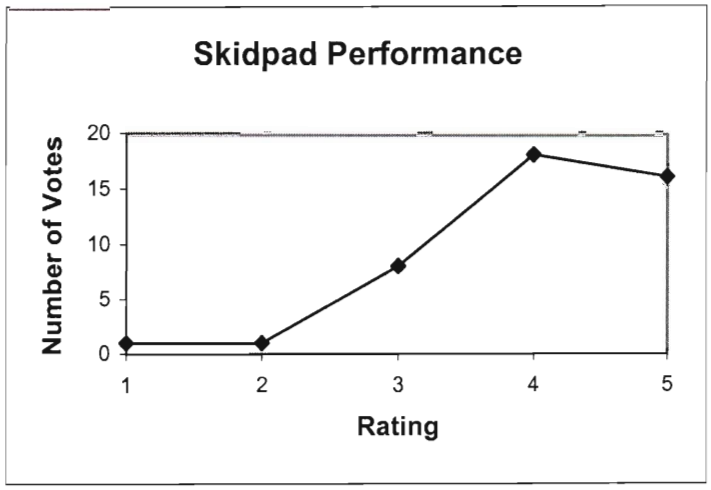
Slalom Performance

Rating	Number of Votes	Percentage
1	1	2.3%
2	1	2.3%
3	1	2.3%
4	10	22.7%
5	31	70.5%



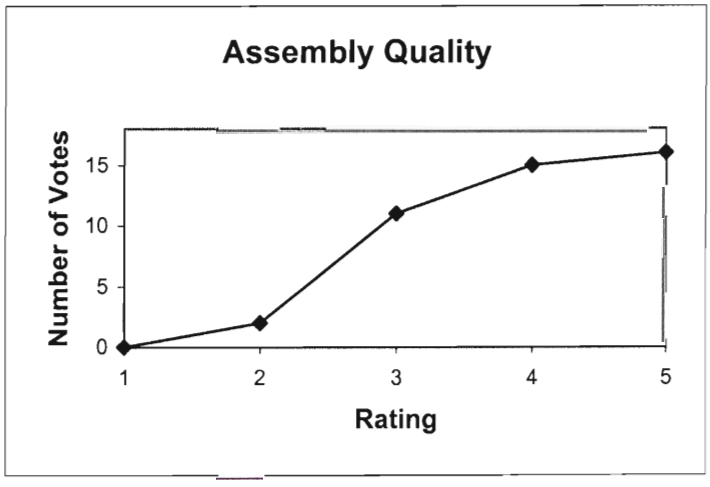
Skidpad Performance

Rating	Number of Votes	Percentage
1	1	2.3%
2	1	2.3%
3	8	18.2%
4	18	40.9%
5	16	36.4%



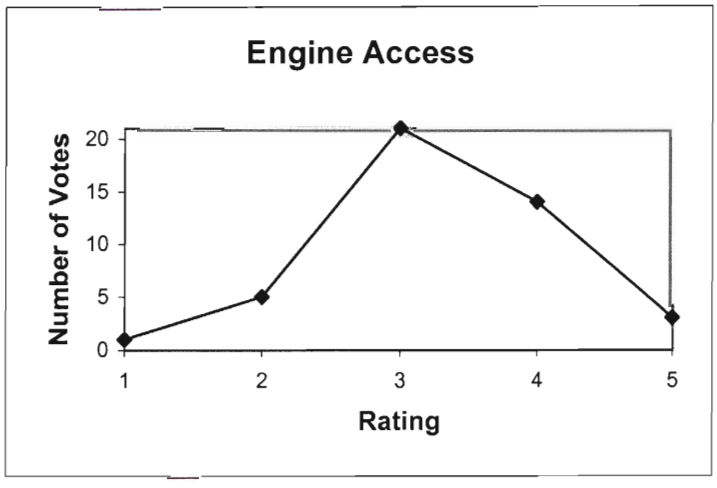
Assembly Quality

Rating	Number of Votes	Percentage
1	0	0.0%
2	2	4.5%
3	11	25.0%
4	15	34.1%
5	16	36.4%



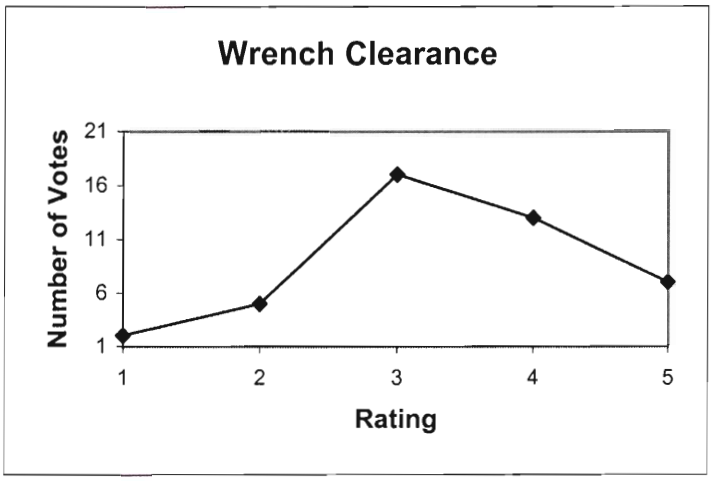
Engine Access

Rating	Number of Votes	Percentage
1	1	2.3%
2	5	11.4%
3	21	47.7%
4	14	31.8%
5	3	6.8%



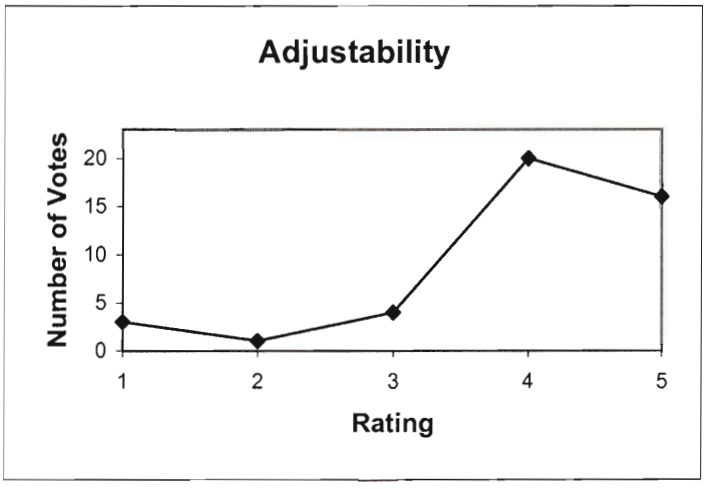
Wrench Clearance

Rating	Number of Votes	Percentage
1	2	4.5%
2	5	11.4%
3	17	38.6%
4	13	29.5%
5	7	15.9%



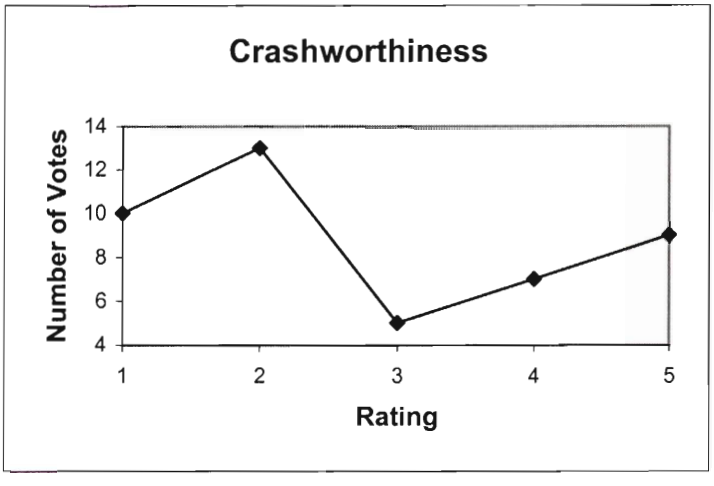
Adjustability

Rating	Number of Votes	Percentage
1	3	6.8%
2	1	2.3%
3	4	9.1%
4	20	45.5%
5	16	36.4%



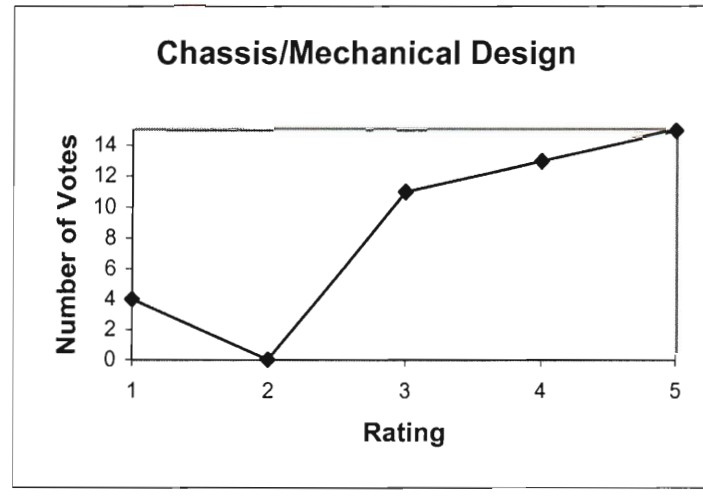
Crashworthiness

Rating	Number of Votes	Percentage
1	10	22.7%
2	13	29.5%
3	5	11.4%
4	7	15.9%
5	9	20.5%



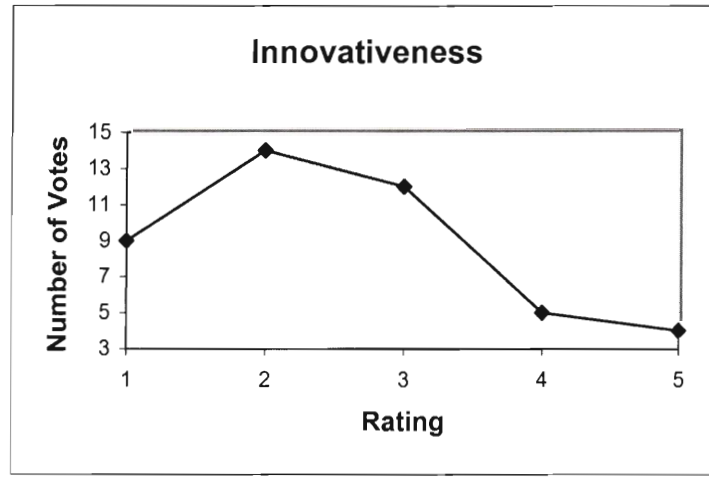
Chassis/Mech. Design

Rating	Number of Votes	Percentage
1	4	9.1%
2	0	0.0%
3	11	25.0%
4	13	29.5%
5	15	34.1%



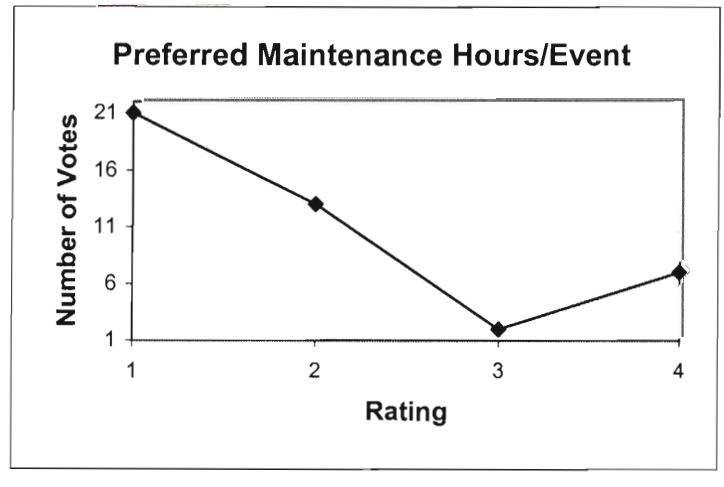
Innovativeness

Rating	Number of Votes	Percentage
1	9	20.5%
2	14	31.8%
3	12	27.3%
4	5	11.4%
5	4	9.1%



Preferred Maintenance Hours/Event

Rating	Number of Votes	Percentage
1	21	47.7%
2	13	29.5%
3	2	4.5%
4	7	15.9%



A.4 Survey Results Evaluation, Part 2: Short Answers.

What characteristics do you look for in an autocross car?
(Ex: handling, easy maintenance)

Characteristics	No. of Replies
Handling	33
Cost	9
Acceleration	9
Braking	9
Easy Maintenance	8
Competitiveness	7
Power to Weight Ratio	7
Reliability (Dependability)	5
Adjustability (Tunability)	4
Fun	3
Torque	3
Frame	2
Predictability	2
Size (Weight)	2
Good Shifting	2
Steering	2
Visual Appearance (Color)	2
Driver Comfort, Parts Availability Safety, Simplicity, Gear Ratios Slalom Performance, Suspension Ruggedness	1

What do you look for in the class for competition?
(Ex: large classes, same type of cars)

Characteristics	No. of Replies
Competition/Driver's Skills	18
Same Type of Cars	15
Large Classes	8
Variety of Cars	6
No Difference/Not Sure	3
Driving Skills	2
Fun	2
Interesting Cars, Speed, Local Competitions, N/A (races everyday car, no class preference)	1

Would you be interested in racing a FSAE specified car? Why or why not?

Choice	No. of Replies	Why/Why Not	No. of Replies
Yes	21	Fun	7
		Fast	5
		Not a popular class, still meets criteria (dedicated racecar)	3
		Good Overall Performance	2
		Affordable, Competitive Easy Towing, Great Handling, Light Weight Low, Low Maintenance Minimum Number of Breakdowns, Predictable Tunable	1
No	20	FSAE cars are not competitive against other cars in A Modified Class, should have their own class	6
		Street Car Preference	6
		Maint. Issues (Custom Parts)	3
		Cannot justify the investment	2
		Prepared Class Car Preference	2
		Reliability Issues	2
		Towing Issues	2
		Multi-Use Car Preference Price Stock Car Preference	1
Would try	5	-	-
Maybe	3	-	-
Would rent	1	-	-

What class do you run now? Please state three reasons why.

Class	No. of Replies
Stock	28
Street Prepared	7
Prepared	5
Modified	4

Reasons	No. of Replies
Owns a car in a given class	28
Cost	15
Competition/Driver's Skills	14
Fun	7
Likes to work on the car	6
Low Maintenance	6
Likes the car	5
Specs on the car (handling, RWD, V8, power, etc.)	5
Fast	4
No Transportation Issues	1

Would you rather buy parts from a local dealer or from the factory directly?

Parts/Service Distributor	No. of Replies
Local dealer	18
Factory	6
Either/Depends	17
Cannot answer	3

Customer's choice depends on:	No. of Replies
Price	9
Availability of Parts	5
Wants to have a Choice	2
After Sales Support	1

In consideration of buying a car is it price/serviceability/availability of parts or personalized customer care?

Characteristic	No. of Replies
Price	32
Availability of Parts	25
Serviceability	20
Personalized Customer Care	12
Performance	8
Not sure what is being asked	6
Competitiveness	4

A.5 Additional Demographics E-mail Survey.

Hello, everybody

This is Maria Vassilieva from Worcester Polytechnic Institute again, I sent an email survey about our FSAE car to various mailing lists some time ago, and this email is going to those who replied. First of all, I would like to thank you all for filling out my survey. I got a lot of valuable information from it, as well as a lot of suggestions how to improve our car, which was extremely helpful. We just discovered that we were missing the information on demographics of people that replied, and it is important for the survey, so can you guys please let me know your occupation, age and gender? This is very small comparing to that huge survey, and the information won't be given to anybody, I will record the info and delete your emails for privacy reasons.

Thank you very much

Maria Vassilieva

WPI

Class of '00

A.6 Demographics of the Survey Audience.

Occupation	Age	Gender
Pharmaceutical Buyer	30	male
Aerospace Engineer	32	male
Business Owner	28	male
Computer Related	36	male
Mechanic/Shop Owner	49	male
Writer	35	male
Landscape Architect	29	male
Mechanical Engineer	29	male
Computer Related	42	male
Computer Related	42	male
Network Engineer	38	male
Computer Systems Engineer	38	male
Marketing Director, Software Co.	42	female
Educator K-12	58	male
Engineer	30	male
Self-Employed Home Builder	42	male
Engineer/Analyst	38	male
Heating and A/C Installer	23	male
Computer Technician	43	male
Human Factors Engineer	27	male
Engineer	28	male
Construction Project Manager	36	male
Account Manager, Internet Dev.	29	male
Engineer	37	male
Sales	34	male
Journalist	58	male
Graphic Designer	44	female
Air Force Officer / Engineer	35	male
Sports Writer	25	male
Administrative Manager	47	female
Student	21	male
Mechanical Engineer	27	male
Scientist	31	male
Aerospace Engineer	31	male
Nuclear Engineer	38	male
Contractor/Businessman	45	male
VP Data Center Operations	53	male

Occupation	Number of people
Engineer/Engineering Related	13
Computer Related	6
Management Related	5
Self-Employed/Business Owner	4
Writer/Journalist	3
Misc: Pharmaceutical Buyer, Educator K-12, Heating and A/C Installer, Sales, Graphic Designer Student	6

	No. of Replies	Average Age
Males	34	35.8
Females	3	44
Males & Females	37	36.5

Appendix B. Divisions

Table B.1 Northeast Division (bright green on Figure 3.1), Area 1.

Region Name	Region #	# of Members
New England	22	2868
New York	23	983
Northern New Jersey	26	1003

Table B.2 Northeast Division (bright green on Figure 3.1), Area 2.

Region Name	Region #	# of Members
Blue Mountain	97	162
Central Pennsylvania	59	70
Mahoning Valley	80	220
Misery Bay	104	80
Northeastern Pennsylvania	25	283
Philadelphia	31	619
Steel Cities	39	470
South Jersey	84	206
Susquehanna	92	307
Washington, D.C	42	2066

Table B.3 Northeast Division (bright green on Figure 3.1), Area 10.

Region Name	Region #	# of Members
Central New York	5	326
Finger Lakes	62	606
Glen	71	422
Mohawk-Hudson	65	331
Southern New York	37	39
Western New York	43	444

Table B.4 Central Division (pink on Figure 3.1), West, Area 5.

Region Name	Region #	# of Members
Badlands	102	27
Blackhawk Valley	82	375
Central Illinois	4	132
Chicago	7	1999
Great River	99	85
Iowa	14	91
Lake Superior	56	67
Land O'Lakes	18	1198
Milwaukee	20	1158

Table B.5 Central Division (pink on Figure 3.1), East, Area 4.

Region Name	Region #	# of Members
Central Kentucky	74	88
Cincinnati	70	478
Columbus Sports Car Club	64	64
Detroit	10	2128
Fort Wayne	85	153
Indiana Northwest	75	109
Indianapolis	13	656
Kentucky	17	170
NE Ohio	24	888
Northern Ohio Valley	89	16
Northwestern Ohio	28	351
Ohio Valley	29	1118
River Cities	51	34
Saginaw Valley	100	132
South Bend	35	191
Southern Indiana	36	75
Southern West Virginia	47	115
Western Michigan	6	324
Western Ohio	86	396

Table B.6 Southeastern Division (gray on Figure 3.1), Area 3.

Region Name	Region #	# of Members
Alabama	1	162
Atlanta	3	1621
Blue Ridge	103	140
Buccaneer	34	509
Central Carolinas	61	781
Central Florida	83	2590
Chattanooga	94	56
Dixie	95	97
Eastern Tennessee	68	189
Florida	11	1865
Gulf Coast	12	89
Middle Georgia	91	51
North Carolina	55	565
Old Dominion	63	89
South Carolina	79	189
Tennessee	40	203
Tennessee Valley	93	63
Wiregrass	45	27

Table B.7 Midwest Division (orange on Figure 3.1), Area 6.

Region Name	Region #	# of Members
Arkansas	77	77
Des Moines Valley	76	269
Kansas	15	187
Kansas City	16	495
Mid-South	66	269
Mississippi	73	49
Nebraska	48	260
Northeast Oklahoma	54	237
Oklahoma	30	270
Ozark Mountain	107	100
Saint Louis	21	693
Salina	110	52
Southern Illinois	58	67
Wichita	90	223

Table B.8 Rocky Mountains Division (cyan on Figure 3.1), Area 8.

Region Name	Region #	# of Members
Colorado	8	1300
Continental Divide	109	242
Pan American	81	69
Rio Grande	53	165
Utah	50	138
Yellowstone	108	77

Table B.9 Northern Pacific Division (green on Figure 3.1), Area 9.

Region Name	Region #	# of Members
Arctic – Alaska	67	87
Big Sky	38	35
Montana	105	41
Northwest	27	1273
Oregon	96	1161
Reno	101	194
San Francisco	33	4656
Snake River	106	78

Table B.10 Southern Pacific Division (yellow on Figure 3.1), Area 11.

Region Name	Region #	# of Members
Arizona	2	955
Arizona Border	88	88
California Sports Car Club	19	2632
Hawaii	46	100
Las Vegas	72	252
San Diego	57	581

Table B.11 Southwest Division (blue on Figure 3.1), Area 7.

Region Name	Region #	# of Members
Central Louisiana	60	43
Delta	9	209
Houston	32	900
Lone Star	98	240
Red River	78	65
South Texas Border	69	94
Southwest Louisiana	44	56
Texas	41	1043
West Texas	87	96

Appendix C. Presentation Event

C.1 Marketing Presentation

The judges' sheets that are enclosed as C.2 in this appendix show scores that the 1999 WPI Formula SAE Racecar team received at the Presentation Event. Two of three judges obviously were pleased with the presentation and gave rather high scores of 46 and 44. The third judge felt that there were not enough technical details presented, which resulted in a score of 34, which is drastically different from the other two scores. The comments written on the sheet as well as the points outlined in Section 5 should be taken into consideration when preparing for the 2000 WPI Formula SAE Presentation Event.

C.2 Judges' Sheets from the 1999 WPI Formula SAE Presentation Event

SCHOOL Worchester Poly CAR NUMBER #600

PRESENTATION JUDGING

Score the following categories on the basis of 0-10 points each according to the following scale (any number or fraction along this scale may be used).

0.0	=	inadequate or no attempt
2.5	=	attempted but below expectation
5	=	average or expected
7.5	=	above average but still lacking
10	=	excellent, perfectly meets intent

10 — **CONTENT:** Were the concepts presented appropriate and adequate to explain how the car meets the intent of the customer? Were enough technical details presented without being boring?

9 — **ORGANIZATION:** Were the concepts presented in a logical order progressing from basic concept and showing how the engineering accomplished the concept? Was it clear to the audience what was to be presented and what was coming next? Were distinct introduction and overviews as well as summary and conclusions given?

9 — **VISUAL AIDS:** Were visual aids used or clear visual references made to the car? Were the illustrations visible for all of the audience?

9 — **DELIVERY:** Did the presenter speak in a clear voice? Did the presenter show enthusiasm and promote confidence in the technical aspects? Did he maintain eye contact?

9 — **QUESTIONS:** Did the answer illustrate that the team fully understood the question? Is there doubt that the team understood the answer? Did the team promote complete confidence in their response to the questions?

46 — **TOTAL = PRESENTATION POINTS (50 points maximum)**

COMMENTS: Very Excellent presentation

SCHOOL WORCESTER P/I CAR NUMBER 600

PRESENTATION JUDGING D

Score the following categories on the basis of 0-10 points each according to the following scale (any number or fraction along this scale may be used).

0.0	=	inadequate or no attempt
2.5	=	attempted but below expectation
5	=	average or expected
7.5	=	above average but still lacking
10	=	excellent, perfectly meets intent

8 EIGHT **CONTENT:** Were the concepts presented appropriate and adequate to explain how the car meets the intent of the customer? Were enough technical details presented without being boring?

9 NINE **ORGANIZATION:** Were the concepts presented in a logical order progressing from basic concept and showing how the engineering accomplished the concept? Was it clear to the audience what was to be presented and what was coming next? Were distinct introduction and overviews as well as summary and conclusions given?

8 EIGHT **VISUAL AIDS:** Were visual aids used or clear visual references made to the car? Were the illustrations visible for all of the audience?

9 NINE **DELIVERY:** Did the presenter speak in a clear voice? Did the presenter show enthusiasm and promote confidence in the technical aspects? Did he maintain eye contact?

8 EIGHT **QUESTIONS:** Did the answer illustrate that the team fully understood the question? Is there doubt that the team understood the answer? Did the team promote complete confidence in their response to the questions?

41 **TOTAL = PRESENTATION POINTS (50 points maximum)**

COMMENTS: VERY WELL PREPARED, FOCUS WAS ON MARKETING & MANUFACTURING & PROFIT
EXCELLENT JOB

SCHOOL Worcester Polytechnic Inst. CAR NUMBER 600

GROUP D

PRESENTATION JUDGING

Score the following categories on the basis of 0-10 points each according to the following scale (any number or fraction along this scale may be used).

0.0	=	inadequate or no attempt
2.5	=	attempted but below expectation
5	=	average or expected
7.5	=	above average but still lacking
10	=	excellent, perfectly meets intent

3 **CONTENT:** Were the concepts presented appropriate and adequate to explain how the car meets the intent of the customer? Were enough technical details presented without being boring?

8 **ORGANIZATION:** Were the concepts presented in a logical order progressing from basic concept and showing how the engineering accomplished the concept? Was it clear to the audience what was to be presented and what was coming next? Were distinct introduction and overviews as well as summary and conclusions given?

8 **VISUAL AIDS:** Were visual aids used or clear visual references made to the car? Were the illustrations visible for all of the audience?

7 **DELIVERY:** Did the presenter speak in a clear voice? Did the presenter show enthusiasm and promote confidence in the technical aspects? Did he maintain eye contact?

8 **QUESTIONS:** Did the answer illustrate that the team fully understood the question? Is there doubt that the team understood the answer? Did the team promote complete confidence in their response to the questions?

34 **TOTAL = PRESENTATION POINTS (50 points maximum)**

COMMENTS: You've obviously gotten the message on the need for mfg. and profitability info in the presentation but you've gone too far! What about the car? You need to cover the market, the car and its selling features, brief mfg info and cost analysis with potential profitability. You sure knew your stuff, I feel you didn't cover the appropropriate material. Handout was a bit overwhelming. A simple leaflet w/ some pertinent technical facts would be enough

A-6

1999 FORMULA SAE

Team Statistics for Presentation Event

EDS

			Standard Deviation for Judge Team 1				6.418		
			Standard Deviation for Judge Team 2				7.989		
			Standard Deviation for Judge Team 3				5.926		
			Standard Deviation for Judge Team 4				8.996		
			Standard Deviation for Judge Team 5				11.896		
			Standard Deviation for Judge Team 6				7.704		
			Average Standard Deviation for all Judge Teams				8.15		
			Maximum Normalized Score for all Teams				50.41		
Place	Car No.	Team	Judge Team #	Score #1	Score #2	Score #3	Average Score	Normalized Score	Calculated Score
1	5	Rochester Institute of Technology	5	46	46	48	46.67	50.41	75.00
2	44	University of Alberta	4	49	48.5	45	47.50	48.34	71.93
3	52	Rensselaer Polytechnic Institute	5	42	42	43	42.33	46.07	68.55
4	12	Texas A&M University	3	47	50	46	47.67	45.44	67.61
5	11	University of Washington	5	39	41	42	40.67	44.41	66.07
5	27	Cornell University	5	42	41	39	40.67	44.41	66.07
5	63	University of Cincinnati	5	40	39	43	40.67	44.41	66.07
8	9	Ohio State University	3	47	50	42	46.33	44.10	65.62
8	113	Michigan Technological University	3	47	47	45	46.33	44.10	65.62
10	116	Cal Poly San Luis Obispo	6	45	46	38	43.00	42.55	63.31
11	600	Worcester Polytechnic Institute	4	46	44	34	41.33	42.17	62.75
12	102	Michigan State University	6	42	42	43.5	42.50	42.05	62.56
13	54	University of Missouri, Columbia	4	39	36	47	40.67	41.51	61.76
14	70	University of Michigan, Ann Arbor	3	45	45	40	43.33	41.10	61.16
15	46	University of Wisconsin, Madison	2	40	43	40	41.00	40.83	60.76
16	30	Lawrence Technological University	1	45	40	40	41.67	39.93	59.41
17	39	Union College	2	37	39.5	42	39.50	39.33	58.52
18	76	Bradley University	2	36	38	43.5	39.17	39.00	58.03
19	13	Georgia Institute of Technology	3	45	38	39	40.67	38.44	57.19
20	151	Dartmouth College	4	35	39	38	37.33	38.17	56.80
21	3	University of Akron	4	41	39.5	31	37.17	38.01	56.55
21	50	Clarkson University	4	43.5	32	36	37.17	38.01	56.55
23	196	United States Air Force Academy	1	41.5	37	40	39.50	37.76	56.19
24	117	University of Wyoming	2	43	33	37	37.67	37.50	55.80
25	43	University of Minnesota, Twin Cities	3	39	43	37	39.67	37.44	55.70
26	492	Colorado School of Mines	5	31	35	34	33.33	37.07	55.16
27	98	McGill University	6	38	38	36	37.33	36.88	54.88

5/21/99

11:39 AM

DAIMLERCHRYSLER

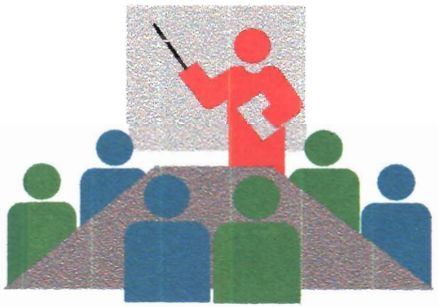
GM

Ford

C.4 1999 WPI Formula SAE Presentation Event marketing slides

Market Analysis

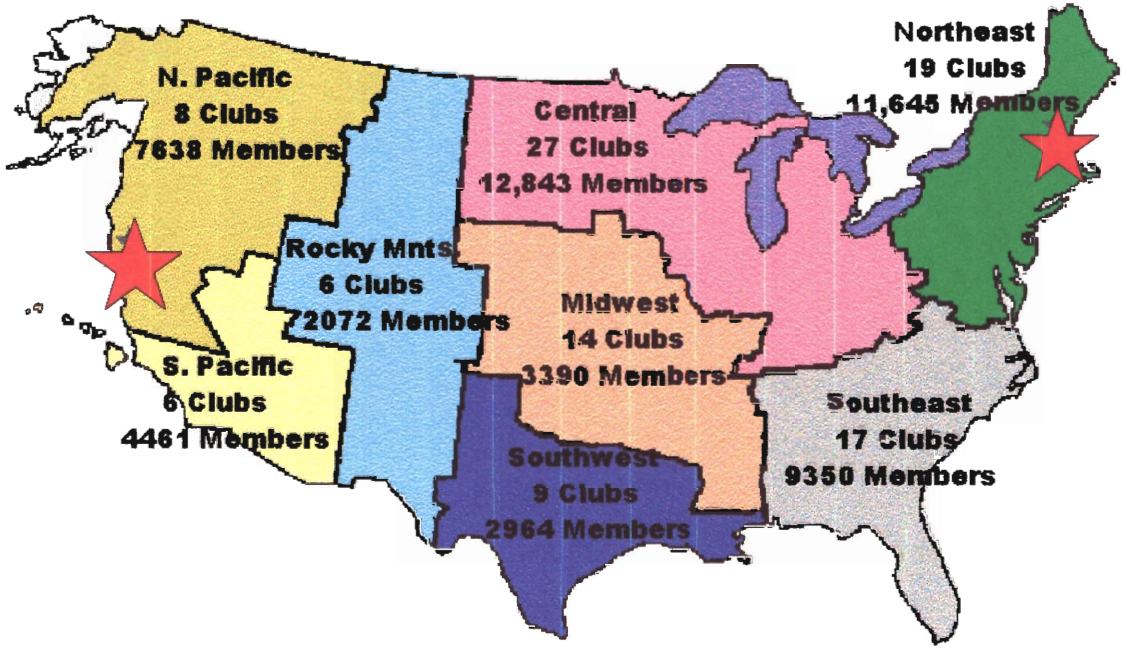
Goals:



- Market Size
  - Customer Base Size
  - Competition
- Customer / Customer's Demands
- Important Features
- Factory / Dealerships Locations
- Price Vs. Cost

Market Size

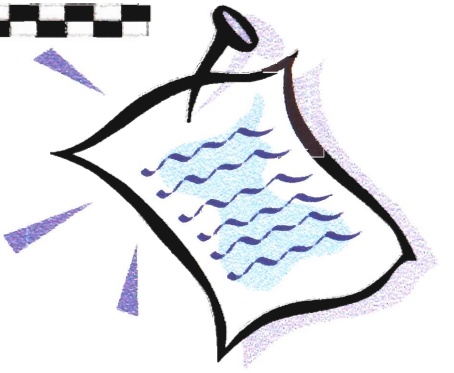
Sports Car Club of America (SCCA)



1998 Statistics

- 54,363 Members
- 110 Clubs
- SF is Largest
- NE is Second

Market Size



Competition:

- Survey Results:
  - 6% - 3262 Members of SCCA in A Modified
- FSAE Top Three Schools - 3000 cars/year
- Sales Guaranteed by Quality and Will be Limited Only by Production Capacity
  - 262 Members of SCCA (lowest possible)
  - 800 cars - SCCA Clubs, Technical Schools

Who Is Our Customer?

Demographics of Customer Group:

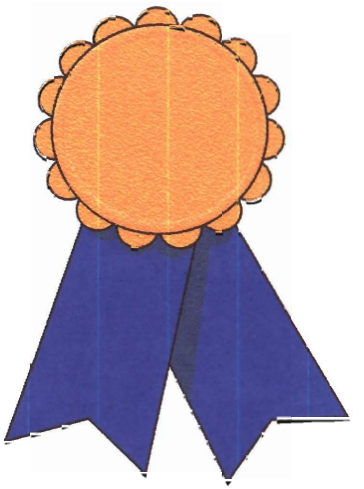
- Occupation
  - Engineering/Computer/Networking Related - 53%
  - Miscellaneous - 25%
  - Self-Employed/Management Related - 22%
- Average Household Income **$ 77,087**
- 82% own their own home
- Average Age - 36 years old
- Males - 92%; Females - 8%

What Does Our Customer Want?

- Fast
- Fun
- Reliable

1. Handling
2. Acceleration
3. Braking
4. Power to Weight Ratio
5. Slalom Performance

Important Features

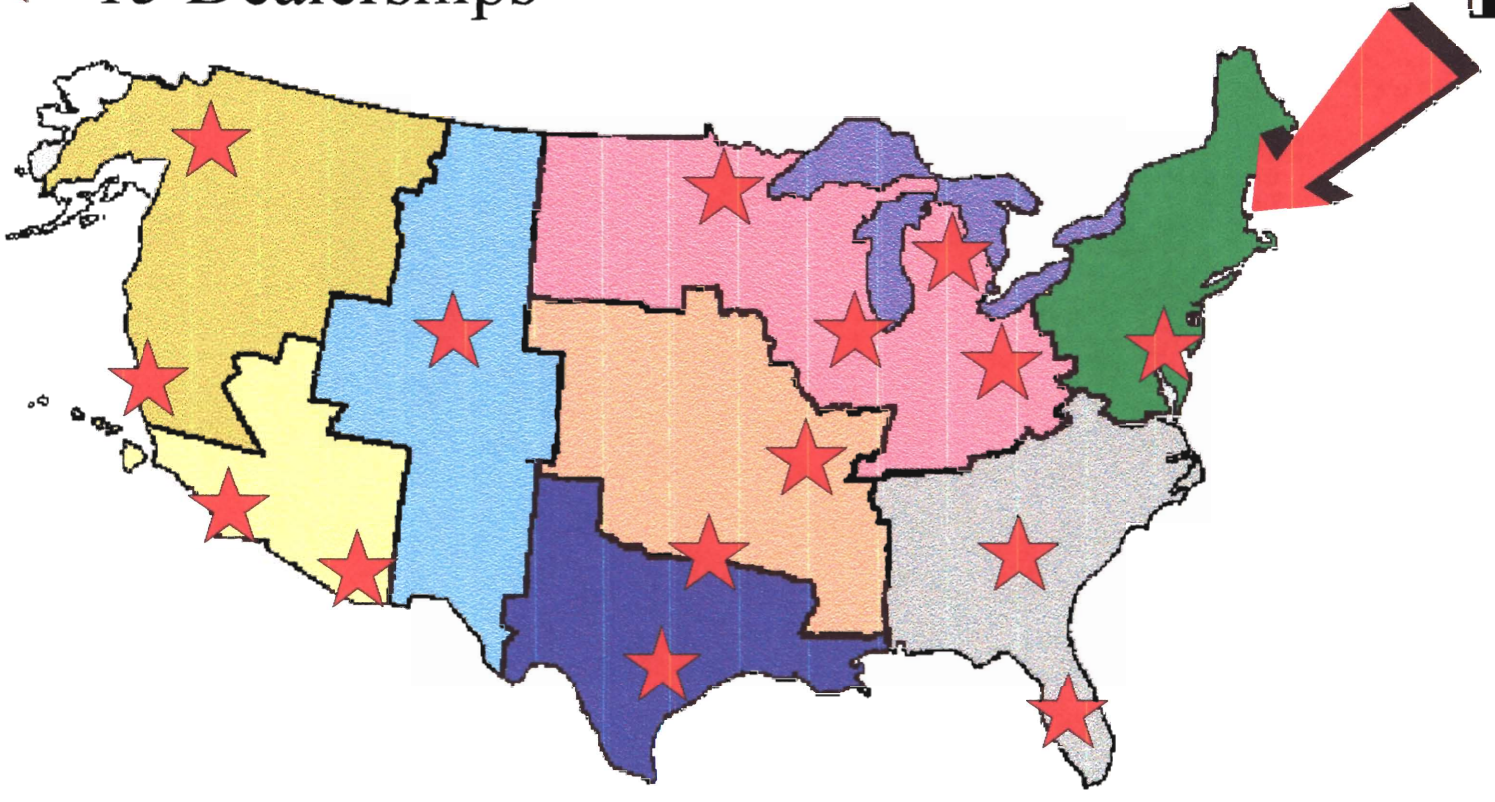


- Quality
  - FSAE Experience Since 1985
- Dependability
  - Honda F3 600cc Engine
  - Fully Documented Engineering Analysis
  - Fully Documented Testing
- Customer Service
  - 24 Hr. Delivery by Air
  - 1-800 Customer Hotline
- Customized Options
  - Drive Ratio, Seat, etc.

Factory / Dealerships Locations

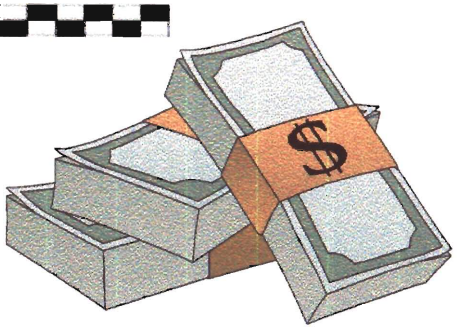
Factory/Dealership - Worcester, MA

15 Dealerships



Price Vs. Cost

Affordability:

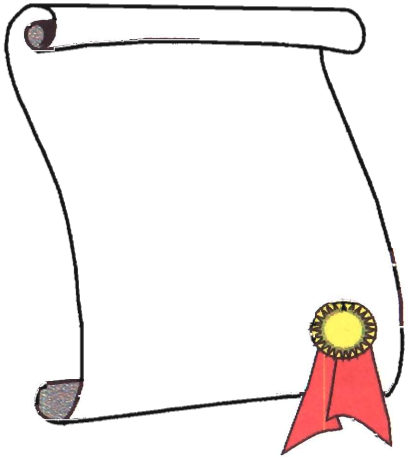


Suggested Retail Price	$9000
Manufacturing Cost	$6820
Direct Sales from the Factory	$8500
Sales to Dealers	$8000

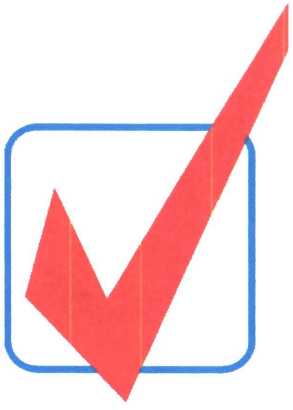
What Makes our Car Unique?

Do Not Rely On Past - Innovate to Excel:

- Customer Satisfaction Surveys
- Continuous Improvement
  - Safety
  - Cost
  - Performance
- Research Sales in Other Areas
  - Spare Parts Sales
  - Selling Car as a Kit
  - International Market



Market Campaign



- TV Commercial
- Magazine Article
- Brochure
- Sales Plan
- Web Page
- Direct Calling
- Telephone
- Newspapers
- Radio
- 1-800 Numbers