REMARKS OF SENATOR BOB DOLE

"ENERGY AND THE AUTO INDUSTRY: PROBLEMS AND POTENTIAL"

DETROIT, MICHIGAN

FRIDAY, AUGUST 17, 1979

IT'S A GREAT HONOR FOR ME TO BE WITH YOU TODAY. AS ONE WHO HAS ALWAYS PREFERRED PRIVATE INITIATIVE TO PUBLIC DICTATION, THIS COMPETITION IS HIGHLY ENCOURAGING. IT DEMONSTRATES WHAT CAN BE ACCOMPLISHED WHEN GOVERNMENT, BUSINESS AND THE CAMPUS WORK TOGETHER FOR THE COMMON GOOD.

WE'LL NEED MANY MORE SUCH COLLABORATIVE EFFORTS IN THE YEARS TO COME. FOR AMERICA WILL BE TAPPING MANY NEW RESOURCES IN ITS CAMPAIGN TO WIN ENERGY SELF-SUFFICIENCY. AND ONE OF THE MOST IMPORTANT OF THOSE REOSURCES WILL BE YOUR MINDS. FOR IT IS IN THE ENTHUSIASM AND COMMITMENT OF OUR YOUNG THAT WE WILL BREAK THE BACK OF OPEC BLACKMAIL AND DECLARE A NEW AMERICAN REVOLUTION.

WE WILL REBEL AGAINST FOREIGN DOMINATION AND AGAINST DOMESTIC STAGNATION. WE WILL REJECT THOSE WHO CLAIM THAT CONSERVATION ALONE CAN GET US THROUGH THE CRISIS, AND WHO FAIL TO TELL US THE TRUTH ABOUT SO NEGATIVE A POLICY: THAT CONSERVATION ALONE WILL NOT CREATE THE NEW JOBS WE NEED, NOR EXPAND THE ECONOMY OF OLD INDUSTRIAL CITIES LIKE DETROIT.

WE WILL REJECT THOSE WHO TELL US, LIVE OFF THE FRUITS OF PAST GENERATIONS, THE FUTURE WILL TAKE CARE OF ITSELF. WE WILL USE GOVERNMENT TO ENCOURAGE DEVELOPMENT OF NEW ENERGY SOURCES, BUT WE WILL RELY ULTIMATELY UPON THE FREE MARKETPLACE TO PROVIDE US WITH THE MOST EFFICIENT--AND ECONOMICAL--ENERGY SUPPLIES.

IT WILL NOT ALWAYS BE EASY. WE WILL CONFRONT DIFFICULT CHOICES. IN USING COAL AND NUCLEAR POWER, FOR INSTANCE, WE WILL HAVE TO ACCEPT SOME TEMPORARY TRADE-OFF BETWEEN ENVIRONMENTAL AND ECONOMIC PERFECTION. BUT CAN ANYONE SERIOUSLY PREFER TO ADMIRE A PRISTINE ENVIRONMENT WHILE STANDING IN A WELFARE OR UNEMPLOYMENT LINE?

THE FUTURE CAN BE BRIGHTER THAN THAT. IT CAN WELCOME YOU INTO A DYNAMIC ECONOMY, IN WHICH GOVERNMENT EXISTS TO SERVE PEOPLE, AND NOT THE OTHER WAY AROUND.

YOU MAY OR MAY NOT AGREE WITH ALL THE SPECIFIC IDEAS I PROPOSE. BUT I HOPE YOU WILL AT LEAST CONCEDE THE NEED TO GET GOING, AND ALONG LINES THAT ENCOURAGE, NOT MERELY CONSERVATION, BUT MAXIMUM POSSIBLE PRODUCTION.

CONSERVATION AND NEW EXPLORATION

OIL AND GAS ARE FINITE RESOURCES. RECOGNIZING THAT, WE ARE NOW MOVING TOWARD THE ULTIMATE CONSERVATION PROGRAM BY DECONTROLLING THE PRICES CHARGED FOR EACH. I SUPPORT DECONTROL. I HAPPEN TO BELIEVE THAT INCENTIVE AND PROFIT ARE NOT DIRTY WORDS, AND THAT ANY EXPLORATION FOR NEW SUPPLIES IS GOING TO REQUIRE NOT ONLY CAPITAL, BUT THE WILLINGNESS ON THE PART OF PRODUCERS TO TAKE SOME RISK.

GOVERNMENT CAN ENCOURAGE SUCH EXPLORATION, WHILE AT THE SAME TIME CONTROLLING ANY SUDDEN OR EXCESSIVE "WINDFALL" PROFITS THAT RESULT FROM DECONTROL. I'VE INTRODUCED LEGISLATION THAT WOULD TAX SUCH PROFITS STEEPLY, BUT WOULD ALSO PLOWBACK SUCH REVENUE INTO THE HUNT FOR MORE OIL AND GAS.

BY CONTRAST, THE PRESIDENT WOULD TAX PRODUCERS HEAVILY TO PAY FOR HIS SYNFUELS PROGRAM IN THE 1990'S. UNFORTUNATELY, THAT LEAVES THE AMERICAN PEOPLE--NOT TO MENTION THE OIL COMPANIES--WONDERING WHERE DO WE GET THE NEEDED GAS AND OIL FOR THE DECADE OR MORE BEFORE ANY SYNFUEL PROGRAM BECOMES A VIABLE ALTERNATIVE?

PRESIDENT CARTER HAS YET TO ANSWER THAT ONE.

IN FACT, THIS ADMINISTRATION HAS REPLACED HONEST PRICES AT THE GAS PUMP WITH HIDDEN COSTS IN THE FEDERAL BUDGET. STOP AND THINK ABOUT IT: EVERY TIME WE EXPORT GRAIN OR OTHER COMMODITIES PRODUCED WITH OUR CHEAP OIL, WE, IN ESSENCE, SUBSIDIZE FOREIGN CONSUMERS.

EVERY TIME THE DEPARTMENT OF ENERGY SLAPS A NEW ORDER ON THE AMERICAN CONSUMER, OR ENFORCES AN UNWORKABLE ALLOCATION SYSTEM, OR CONFUSES EVEN THE MOST ASTUTE EXPERTS WITH ITS CONTRADICTORY PRONOUNCEMENTS, EACH ONE OF US PAYS A LITTLE MORE.

TODAY, THERE IS A SIGNIFICANT EFFORT UNDERWAY IN THIS COUNTRY TO RE-INVENT THE AUTO. WELL, I DON'T HAVE TO TELL YOU--THE AUTO ISN'T GOING TO BE REINVENTED IN ANY CONGRESSIONAL COMMITTEE ROOM. NOR IN THE WHITE HOUSE ITSELF. THE AUTO IS GOING TO BE REINVENTED BY THE PEOPLE WHO KNOW AND APPRECIATE IT BEST. BY THE VERY PEOPLE IN THIS ROOM.

EVERY TIME WE PASS ANOTHER REGULATION, OR ISSUE ANOTHER EDICT, WE ADD ON TO THE COST OF AN AUTOMOBILE. THE CURRENT PROBLEMS SUFFERED BY CHRYSLER CORPORATION ILLUSTRATE ALL TOO PAINFULLY WHAT HAPPENS WHEN WASHINGTON TRIES TO DICTATE EVERY DETAIL OF INDUSTRIAL RESPONSIBILITY.

A TROUBLED INDUSTRY

THERE ARE PROBLEMS IN THIS INDUSTRY, ONE OF THE KEY SEGMENTS OF OUR ECONOMY. FORECASTS OF AUTO SALES FOR THIS YEAR HAVE TUMBLED BY AS MUCH AS SEVEN HUNDRED THOUSAND UNITS. THE GAS CRISIS HAS CREATED SEVERE PROBLEMS FOR MANUFACTURERS ALREADY PLAGUED BY EXCESSIVE FEDERAL REGULATIONS ON FUEL STANDARDS AND EMISSIONS. ENORMOUS NEW CHALLENGES LIE AHEAD, IN RETOOLING TO MEET THE DEMAND FOR SMALLER AUTOS AND IN WARDING OFF THE MARKETING CAMPAIGNS OF FOREIGN BUILT CARS.

BUT THE FUTURE IS BY NO MEANS BLEAK. THE AUTO INDUSTRY IS NOT MOVING AWAY FROM DETROIT, NOR AMERICAN SOIL. VOLKSWAGEN IS ALREADY MANUFACTURING CARS IN PENNSYLVANIA, HONDA IS COMING TO OHIO. DETROIT WILL REMAIN THE CENTER OF A VIGOROUS AMERICAN INDUSTRY FOR AS LONG AS YOU INFUSE IT WITH NEW ENERGY AND NEW IDEAS.

AND WASHINGTON CAN HELP. I DON'T HAVE TO REMIND YOU ABOUT THE COSTS OF DOWNSIZING MODELS, NOR THE EXPENSE OF REDUCING EXHAUST EMISSION. GM ESTIMATES THE COST OF MEETING DEPARTMENT OF TRANSPORTATION FUEL EFFICIENCY STANDARDS AT 7.4 BILLION DOLLARS.

BUT THE PROBLEM IS NOT GOVERNMENT REGULATION BY ITSELF. THE PROBLEM IS THE HYDRA-HEADED REGULATORY STRUCTURE, THAT CANNOT MAKE UP ITS MIND WHETHER TO STRESS FUEL EFFICIENCY, AUTOMOBILE SAFETY OR EMISSION CONTROL. THE PROBLEM IS A LACK OF COHERENCE IN WASHINGTON'S REGULATION OF THE INDUSTRY. AND THE CONSUMER WINDS UP PAYING FOR ALL THE CONFUSION.

THE CRISIS AT CHRYSLER IS THE ULTIMATE CASE WHERE CONTRA-DICTORY AND EXPENSIVE REGULATION HAS PUSHED A GIANT MANUFACTURER TO THE BRINK. WE CAN SPEND FROM NOW TILL DOOMSDAY TRYING TO ASSESS PRECISE BLAME FOR THE PROBLEMS THE COMPANY IS SUFFERING FROM - IN MY OPINION, THERE'S PLENTY OF BLAME TO GO AROUND.

BUT NONE OF THAT IS GOING TO SAVE THE JOBS OF 130,000 MEN AND WOMEN WHO WORK FOR CHRYSLER, NOR THE QUARTER MILLION OTHERS WHOSE CAREERS DEPEND UPON RELATED INDUSTRIES.

I'VE TALKED WITH DOUG FRASER OF THE UAW AND GOVERNOR MILLIKEN OF THIS STATE. AS RANKING REPUBLICAN ON THE SENATE FINANCE COMMITTEE, I EXPECT TO PLAY A MAJOR ROLE IN DEVISING GOVERNMENT'S ULTIMATE RESPONSE TO THE CRISIS AT CHRYSLER. AND I THINK THE FIRST THING ALL OF US OUGHT TO DO IS LOWER THE TEMPERATURE OF OUR RHETORIC AND TRY AND BRING SOME ORDER TO THE CONFUSION WE NOW CONFRONT. WE NEED TO BRING COMPANY OFFICIALS, UNION MEMBERS, THE BANKS, THE SUPPLIERS AND DEALERS TOGETHER IN ONE ROOM AND DEVISE A PROGRAM OF ASSISTANCE CARRYING WITH IT THE LEAST POSSIBLE AMOUNT OF FEDERAL INTERVENTION.

LOAN GUARANTEES ARE ONE POSSIBLE SOLUTION, AS ARE REFUNDABLE TAX CREDITS WHICH COULD TAKE THE PLACE OF ANY DIRECT FINANCIAL LOAN GUARANTEES. I PREFER THE LATTER, WHICH WOULD TREAT CERTAIN CHYSLER EXPENDITURES THAT WOULD QUALIFY FOR TAX DEDUCTIONS OR TAX CREDITS, AS IF THE COMPANY HAD IN FACT, EARNED A PROFIT, THEREBY ALLOWING IT TO TAKE SUCH TAX CREDITS AGAINST FUTURE PROFITABILITY. THE COMPANY WOULD REPAY SUCH CREDITS BY OVERPAYING ITS TAXES IN FUTURE PROFITABLE YEARS.

NOW SOME WILL STAND UP AND DENOUNCE A "BAIL-OUT" OF CHRYSLER. THEY'LL SAY WE OUGHT TO LET THE COMPANY GO UNDER, AND PUT OVER ITS GRAVE A STONE WITH THE INSCRIPTION "HERE LIES CHRYSLER, KILLED BY ITS OWN MISTAKES." WELL, ALL OF THAT MAKES FOR GREAT HEADLINES - AFTER ALL, WHO'S GOING TO SHED TEARS FOR AN AUTO MANUFACTURER? BUT IT DOESN'T CONTRIBUTE TO VERY SOUND PUBLIC POLICY. AND IT SHOWS A DISTRESSING LACK OF COMPASSION FOR THE PEOPLE WHOSE LIVES DEPEND ON WHAT WE DO TO BRING CHRYSLER THROUGH ITS TEMPORARY PROBLEMS.

THE HUMAN FACTOR

A LOT OF THE COMPANY'S WORK FORCE CONSISTS OF MEN AND WOMEN 45, 55, 60 YEARS OLD. THEY CAN'T BE TRANSFERRED TO ANOTHER JOB OVERNIGHT. A LOT OF THE COMPANY'S WORK FORCE CONSISTS OF INNER-CITY RESIDENTS, MANY BLACK AND MANY AT THE MERCY OF ECONOMIC FORCES BEYOND THEIR CONTROL. DO WE DIRECT THEM TO THE NEAREST UNEMPLOYMENT OFFICE ON WELFARE LINE WITH A CLEAR CONSCIENCE? I DON'T THINK SO, NOT IF YOU CARE ABOUT PEOPLE AS INDIVIDUALS AND NOT SIMPLY NUMBERS ON A GRAPH.

ONE OF THE REASONS I'M HERE TODAY IS TO GET MORE INFORMATION ON THE INDUSTRY AND THE OPTIONS BEFORE US ON CHRYSLER. BUT WHEN I GO BACK TO WASHINGON, LET ME ASSURE YOU THAT I WILL CONTINUE TO FIGHT, ON THE FINANCE COMMITTEE AND THE FLOOR OF THE SENATE, FOR AN ECONOMY THAT IS SIMULATANEOUSLY MORE HUMANE AND MORE VIGOROUS.

THE BROADER PROBLEM OF ECONOMIC GROWTH

AND CHRYSLER IS NOT ALONE IN SUFFERING FROM EXCESS GOVERNMENT. THE BROADER PROBLEM OF ECONOMIC GROWTH IN THIS COUNTRY IS ONE OF INCENTIVE. CURRENTLY, OUR TAX LAWS TEND TO DISCOURAGE NEW INVESTMENT. WE TAX CORPORATE PROFITS AT A MAXIMUM RATE OF 40%. WE DISCOURAGE SAVINGS OR CAPITAL ACCUMULATION. WE DO ALL THIS IN THE NAME OF A MISPLACED "JUSTICE". BECAUSE FOR NEARLY A HALF CENTURY, AMERICAN GOVERNMENT HAS FOLLOWED A POLICY OF REGULATION INSTEAD OF PRODUCTIVITY. WE'VE ACCEPTED THE SPECIOUS ARGUMENT THAT MAKING EVERYTHING STANDARD MAKES IT BETTER. WE'VE AGREED THAT ECONOMIC GROWTH MIGHT DAMAGE OUR ENVIRONMENT OR PROMOTE VALUES INCONSISTENT WITH INDIVIDUAL EXPRESSION. WE'VE CONSIGNED MILLIONS OF OUR FELLOW CITIZENS TO LIVES WITHOUT HOPE, TO WAITING IN WELFARE LINES AND UNEMPLOYMENT LINES, BECAUSE PRIVATE INDUSTRY WAS DISCOURAGED FROM BRINGING THEM INTO THE MAINSTREAM OF ECONOMIC LIFE.

I WANT CHRYSLER TO SURVIVE, NOT BECAUSE I WANT CHRYSLER'S MANAGEMENT TO MAKE FATTER SALARIES AND EARN LARGER BONUSES. I WANT CHRYSLER TO SURVIVE BECAUSE I WANT JOBS FOR THOUSANDS OF INNER-CITY RESIDENTS. I WANT MEN AND WOMEN WHO CHERISH THEIR ECONOMIC INDEPENDENCE TO RETAIN THAT INDEPENDENCE. I WANT TO MAINTAIN A HEALTHY PRIVATE SECTOR SO GOVERNMENT WON'T DICTATE EVEN MORE OF OUR CONDUCT IN THE YEARS TO COME. I WANT TO REDUCE THE OCEAN OF PAPERWORK AND FEDERAL DEMANDS THAT NOW THREATEN TO SWAMP THOUSANDS OF SMALLER BUSINESSES AS WELL AS THE GIANTS LIKE CHRYSLER. LET'S FREE THE PRIVATE SECTOR - NOT FROM RESPONSIBILITY FOR A HEALTHY ENVIRONMENT AND QUALITY MERCHANDISE - BUT FROM COMPLYING WITH MEANINGLESS GOBBLEDYGOOK CONCOCTED BY BUREAUCRATS WHO HAVE NOTHING BETTER WITH WHICH TO FILL THEIR TIME. THIS ISN'T SELLING OUT TO BIG BUSINESS. IT'S STANDING UP TO SENSELESS GOVERNMENT. IT'S PROMOTING A MORE DYNAMIC ECONOMY. IT MEANS JOBS FOR YOUR GENERATION.

REMEMBER THAT, AND MAKE IT THE INSPIRATION BEHIND YOUR TECHNOLOGICAL GENIUS. REMEMBER THAT WE ARE NOT MERELY DECLARING OUR INDEPENDENCE FROM FOREIGN ENERGY PRODUCERS. WE AMERICANS IN 1979 ARE DECLARING OURSELVES ONCE MORE TO BE A PEOPLE THAT BELIEVES IN PRODUCTION INSTEAD OF REGULATION, AND ECONOMIC GROWTH INSTEAD OF A FEDERAL STRAIGHT-JACKET.

REMEMBER THAT, AND YOU WILL MAKE TODAY THE STARTING POINT FOR BETTER TOMORROWS.

REMARKS OF SENATOR BOB DOLE
THE POLITICS OF ENERGY: CRISIS OR OPPORTUNITY?
DETROIT, MICHIGAN
FRIDAY, AUGUST 17, 1979

AMERICA CAN MAKE IT. THAT'S THE MESSAGE THIS DAY HOLDS. IT'S A THEME YOU DON'T HEAR OFTEN IN THIS SUMMER OF OUR DISCONTENT, WHEN GASOLINE IS EXPENSIVE AND DOOM AND GLOOM RHETORIC-ABOUT WHAT EVERYONE CALLS "THE ENERGY CRISIS"--IS CHEAP. IN THE PAST, WHEN AMERICANS WERE FACED WITH A NATIONAL CHALLENGE, THEY RESORTED TO THEIR GENIUS FOR INVENTION AND INNOVATION. THEY COMPETED AMONG THEMSELVES TO FIND SOLUTIONS - AND THEY FOUND THEM.

AND NOW, WHEN CONFRONTED WITH SHORTAGES FOR FINITE FUELS, WE CAN DO THE SAME. THEY WILL DO THE SAME - IF GOVERNMENT ENCOURAGES THEM.

IN THE YEARS TO COME, AMERICA WILL HAVE TO TAP NEW RESOURCES IN HER CAMPAIGN TO WIN ENERGY SELF-SUFFICIENCY. ONE OF THE MOST IMPORTANT OF THESE RESOURCES WILL BE YOUR MINDS. FOR IT IS WITH THE ENTHUSIASM AND COMMITMENT OF OUR YOUNG, WITH YOUR EXPERTISE AND YOUR COMPETENCE, YOUR IMPATIENCE WITH LIMITED OBJECTIVES, THAT WE WILL BREAK THE BACK OF OPEC BLACKMAIL AND DECLARE A NEW AMERICAN REVOLUTION.

WE WILL REBEL AGAINST FOREIGN STRANGULATION AND AGAINST DOMESTIC STAGNATION. WE WILL REJECT THOSE WHO CLAIM THAT CONSERVATION ALONE CAN GET US THROUGH THE CRISIS, WITHOUT TELLING US THE TRUTH ABOUT SO NEGATIVE A POLICY: THAT CONSERVATION ALONE WILL NOT CREATE THE NEW JOBS WE NEED, NOR REVIVE THE ECONOMY OF THE COUNTRY AND OLD INDUSTRIAL CITIES LIKE DETROIT.

WE WILL REJECT THOSE WHO URGE US - LIVE OFF THE FRUITS OF PAST GENERATIONS, THE FUTURE WILL TAKE CARE OF ITSELF. INSTEAD WE WILL MOBILIZE THE SAME FORCE THAT BROUGHT YOU HERE TO ENCOURAGE DEVELOPMENT OF NEW ENERGY EFFICIENT MACHINES. IF WE ARE WISE, WE WILL RELY ULTIMATELY UPON THE FREE MARKETPLACE TO PROVIDE US WITH THE MOST EFFICIENT--AND ECONOMICAL--ENERGY SUPPLIES. THE FREE MARKET SYSTEM HAS SERVED THIS NATION SO WELL FOR 200 YEARS; THERE'S NO REASON TO THINK IT WON'T DO SO FOR ANOTHER 200 YEARS."

THE POLITICS OF ENERGY

IT WILL NOT BE EASY TO PRESERVE THE SYSTEM. WE WILL CONFRONT DIFFICULT CHOICES. IN USING COAL AND NUCLEAR POWER, FOR INSTANCE, WE WILL HAVE TO ACCEPT SOME TEMPORARY TRADE-OFFS BETWEEN THE ENVIRONMENT AND EMPLOYMENT.

CAN ANYONE DOUBT THE EFFECTS OF EXCESSIVE AND CONTRADICTORY REGULATION, NOT ONLY ON THE AUTO INDUSTRY, BUT ON MANY OTHER INDUSTRIES AND THE AMERICAN ECONOMY IN GENERAL? EVERY TIME WE SLAP ON ANOTHER REGULATION, OR ISSUE ANOTHER EDICT FROM WASHINGTON, WE BURDEN THE PRODUCTIVE ELEMENTS OF OUR ECONOMY AND STYMIE THE FREE ENTERPRISE NEEDED TO PULL US THROUGH THE CURRENT CRISIS.

THIS IS THE POLITICS OF ENERGY, MY FRIENDS. NOT POLITICS IN A PARTISAN SENSE. NO PARTY HAS A STRANGLEHOLD ON ECONOMIC VIRTUE. BUT YOU OUGHT TO BE SUSPICIOUS OF ANY POLITICIAN WHO CONFUSES ECONOMIC JUSTICE WITH AN EQUAL SHARE OF NOTHING. I KNOW I AM. AND, TO PARAPHRASE A RATHER FAMILIAR TAGLINE IN THESE PARTS - I HAVE A BETTER IDEA. IT'S CALLED PRODUCTIVITY. IT'S CALLED GROWTH.

THE TIME HAS COME FOR US TO REASSERT, ONCE AND FINALLY, OUR COMMITMENT TO ECONOMIC GROWTH AND ENERGY SELF-SUFFICIENCY. THE TWO GOALS ARE NOT INCOMPATIBLE. INDEED, THEY OUGHT TO BE INSEPARABLE.

NOW SOME POLITICAL LEADERS WOULD STRESS CONSERVATION ONLY NO ONE CAN DISAGREE WITH THAT - EACH OF YOU HAVE MADE A MAJOR CONTRIBUTION TO THAT GOAL JUST BY YOUR PRESENCE AND YOUR PARTICIPATION IN THIS COMPETITION. BUT THOSE WHO FOCUS ENTIRELY ON CONSERVATION ARE GUILTY OF THE ULTIMATE POLITICAL INSULT: A LACK OF SELF-CONFIDENCE IN AMERICA'S FUTURE. THEY WOULD HAVE US REGIMENT A SHRINKING RESOURCE, ACCEPT A FUTURE OF DIMINISHING OPPORTUNITY AND UNCERTAIN PROSPECTS FOR PEOPLE LIKE YOURSELVES. THEY WOULD ENFORCE EVERY EXISTING REGULATION, AND ENACT NEW ONES BESIDES. BECAUSE THEY BELIEVE GOVERNMENT DOES NOT EXIST TO ENCOURAGE INDIVIDUAL INCENTIVE. THEY BELIEVE GOVERNMENT EXISTS TO REGULATE AND STANDARDIZE. THEY BELIEVE THAT, IF EVERYTHING IS MADE THE SAME, IT'S BOUND TO BE BETTER.

WELL, STANDARDIZATION MAY WORK IN THE AUTO INDUSTRY,--YOU KNOW "ECONOMY OF SCALE"--BUT POLITICAL STANDARDIZATION OFFERS PRECIOUS LITTLE HOPE TO PEOPLE WISHING TO EARN THEIR WAY IN THE WORLD. IT DOES NOTHING TO BRING BLACKS AND OTHER ECONOMICALLY DISADVANTAGED AMERICANS INTO THE ECONOMIC MAINSTREAM. IT GOES ON AND ON ABOUT "THE PEOPLE" WITHOUT EVER PAUSING TO ASK THE PEOPLE THEMSELVES WHAT THEY PREFER.

IT IS THE POLITICS OF CONTROL, THE POLITICS OF PESSIMISM. IT IS THE MESSAGE THAT YESTERDAY WAS BETTER THAN TODAY, AND TOMORROW IS BOUND TO BE WORSE STILL. IT CONDEMNS MILLIONS OF THE YOUNG TO A GREY SAMENESS, AND MILLIONS OF OUR POOR TO A LIFE WITHOUT HOPE.

IT'S NOT ENOUGH TO CONTAIN A CRISIS. NOW WE MUST FOSTER NEW OPPORTUNITIES.

THE OPPORTUNITIES OF ENERGY

THE UNITED STATES IS NOT LACKING IN THE MATERIALS FOR ENERGY SELF-SUFFICIENCY. WHAT WE LACK TO DATE IS A COHERENT PROGRAM BUILT AROUND INCREASED PRODUCTION AND UNTAPPED RESOURCES. LET ME SKETCH A SCENARIO THAT DOES NOT END IN STALEMATE, THAT DOES NOT RELY ON REGULATION, THAT DOES NOT TREAT ENERGY IN CRISIS TERMS ONLY.

WE HAVE VAST DEPOSITS OF COAL; ENOUGH, TO LAST FOR HUNDREDS OF YEARS. WE HAVE BILLIONS OF BARRELS OF OIL TRAPPED IN SHALE, AWAITING ONLY THE TECHNOLOGY AND THE ECONOMIC INCENTIVE TO BE EXTRACTED.

WE HAVE THE FINANCIAL AND TECHNOLOGICAL CAPACITIES TO ACHIEVE SUBSTANTIAL ENERGY INDEPENDENCE BY 1990 - WITHOUT RESORTING TO THE PRESIDENT'S HASTY AND ILL-CONCEIVED PLAN TO SPEND $88 BILLION DOLLARS ON YET ANOTHER WASHINGTON SOLUTION TO THE ENERGY SHORTAGE - FEDERALLY PRODUCED SYNFUELS.

WE CAN INCREASE OUR SUPPLIES OF NATURAL GAS THROUGH FAIR-MINDED NEGOTIATIONS WITH MEXICO. WE CAN ACHIEVE GREATER UNITY IN HEMISPHERIC ENERGY DEVELOPMENT BY CONVENING A NORTH AMERICAN ENERGY SUMMIT.

WE CAN REQUIRE FROM THE FIFTY STATES THE SAME AIR QUALITY STANDARDS THAT THE FEDERAL GOVERNMENT ITSELF REQUIRES, AND SAVE UP TO A QUARTER MILLION BARRELS OF OIL EACH DAY.

THE PROPHETS OF DOOM TELL US THAT WE CAN TURN OUR BACK ON NUCLEAR POWER. THEY OVERLOOK OUR DEPENDENCE ON THE 66 PLANTS THAT TODAY GENERATE 13% OF ALL AMERICA'S ENERGY. THE FACT IS, WE COULDN'T TURN OUR BACKS ON NUCLEAR POWER EVEN IF WE WANTED TO.

BUT WE CAN MAKE IT SAFE. WE CAN REASSURE THOSE WHO HAVE HONEST DOUBTS.

WE CAN DO ALL THESE THINGS BY STRESSING AN ENERGY POLICY BUILT UPON MAXIMUM POSSIBLE PRODUCTION AND SAFETY. DECONTROL, WHICH I STRONGLY SUPPORT, IS A GOOD FIRST STEP. BUT IT WON'T BY ITSELF LEAD TO ALL THE ENERGY AMERICA NEEDS. WE HAVE TO MOVE BEYOND DECONTROL.

I DISAGREE WITH SUCH AN APPROACH. I THINK IT'S WRONG TO RUSH OVERNIGHT INTO MASSIVE GOVERNMENT SUBSIDIES. I THINK IT'S WRONG TO ERECT OVERNIGHT A NEW GOVERNMENT BUREAUCRACY, THE ENERGY SUPPLY CORPORATION, TO COMPETE WITH THE PRIVATE SECTOR. HOW MUCH BETTER IT WOULD BE TO STIMULATE, NOT REGULATE, PRIVATE PRODUCTION.

ENERGY AND A STRONG ECONOMY

ENERGY IS NOT THE ONLY AREA IN WHICH REVISED ECONOMIC POLICY CAN LEAD US TO BETTER TOMORROWS. IN A RECENT STUDY BY THE JOINT ECONOMIC COMMITTEE OF THE CONGRESS, WE HAD A CHANCE TO COMPARE THE RATES OF ECONOMIC GROWTH UNDER TWO SCENARIOS. THE FIRST IS THE LOW-GROWTH, GO-SLOW, SMALL IS BEAUTIFUL APPROACH OF THE REGULATORS AND THE PESSIMISTS. IT PRODUCES A DECADE WHOSE SECOND HALF SEES INFLATION AT 10%, UNEMPLOYMENT AT 7%, AND A GROWTH RATE OF JUST 1 1/2% EACH YEAR. IT'S A BLEAK PROSPECT. BUT IT WILL BECOME REALITY IF WE CONTINUE TO DEFINE THE JOB OF GOVERNMENT AS REGULATING EXISTING SUPPLIES INSTEAD OF PROMOTING NEW PRODUCTION. AND IT'S NOT JUST NUMBERS ON A GRAPH I'M TALKING ABOUT. I'M TALKING ABOUT HUMAN BEINGS, PEOPLE WHOSE HOPES FOR SELF-SUFFICIENCY AND INDEPENDENCE ARE CRUSHED BY PATERNALISTI BUREAUCRATS IN WASHINGTON.

BUT THERE IS ANOTHER SIDE TO THE COIN. THE JOINT ECONOMIC COMMITTEE ALSO FORECAST THE RESULT OF INCREASED PRODUCTIVITY, LOWERED TAXES, AND MAXIMUM ENERGY PRODUCTION. UNDER SUCH POLICY, AMERICAN ECONOMIC GROWTH COULD AVERAGE 4% A YEAR, AND BOTH INFLATION AND UNEMPLOYMENT FALL BELOW 5%.

IN THE WORDS OF THE COMMITTEE, "WE NEED TO SAVE MORE, INVEST MORE AND TRAIN MORE DISADVANTAGED AMERICANS TO ASSUME THEIR RIGHTFUL ROLES IN THE WORKPLACES OF AMERICA. WE MUST SHIFT OUR ATTENTION TO THE SUPPLY SIDE OF OUR ECONOMY."

THAT IS THE ULTIMATE CHALLENGE OF THE EIGHTIES.
IT IS THE FUNDAMENTAL QUESTION THAT LIES BENEATH ALL
THE TALK OF AN ENERGY CRISIS AND A TAXPAYER'S REVOLT.
FOR ENERGY, LIKE TAXES, CAN AFFECT PEOPLE - THEIR JOBS,
THEIR SOCIAL MOBILITY, THEIR NEIGHBORHOODS.

IT'S PEOPLE WHO ARE THE HEART OF OUR CONCERN WITH CHRYSLER
IT'S 130,000 PEOPLE, MANY BLACK, MANY ENTIRELY DEPENDENT
UPON THE COMPANY FOR THEIR LIVELIHOOD. IT'S THE 1/2
MILLION PEOPLE WHO WOULD FEEL THE RIPPLE-THROUGH EFFECTS.
I DO NOT NECESSARILY BELIEVE THAT GOVERNMENT IS THE BEST
WAY TO BRING CHRYSLER THROUGH ITS CURRENT PROBLEMS.
I SUGGEST THAT WE FIRST OF ALL CONVENE IN ONE ROOM A MEETING
OF STOCKHOLDERS, BANKERS, CREDITORS, UNION MEMBERS AND OTHERS
MOST INTIMATELY ASSOCIATED WITH THE COMPANY'S MANAGEMENT
AND PRODUCTION, TO SEE PRECISELY WHAT CAN BE DONE, SHORT OF
FEDERAL INTERVENTION. COOPERATIVE AND PRUDENT INDUSTRY
EFFORTS - LIKE GM'S PURCHASE OF SOME OF CHRYSLER'S RECEIVABLES
ARE STEPS IN THE RIGHT DIRECTION. I THINK SOLUTIONS CAN
BE FOUND THAT WILL KEEP THOUSANDS OF OLDER WORKERS ON THE
ASSEMBLY LINE AND RETAIN CHRYSLER'S POSITION IN A VIGOROUS
AMERICAN AUTO INDUSTRY. BUT THE LAST THING WE SHOULD DO IS
DESPAIR.

I INVITE YOU TO LOOK UPON THE ENERGY CRISIS AS SOMETHING MORE THAN A CRISIS. TO SEE IT AS A CHANCE TO EXPAND PRIVATE PRODUCTION, HIRE MILLIONS OF DISADVANTAGED AMERICANS AND REFORM THE RELATIONSHIP OF PUBLIC AND PRIVATE SECTORS. I WANT YOU TO SHARE YOUR OPTIMISM ABOUT THE FUTURE WITH MY COLLEAGUES IN WASHINGTON. MAKE IT THE INSPIRATION BEHIND YOUR TECHNOLOGICAL GENIUS. AND YOU WILL MAKE TODAY THE STARTING POINT FOR BETTER TOMORROWS.

United States Senate

MEMORANDUM

To: Senator
From: David

This is the background material on John Sununu's event in Detroit.

Put in Detroit speech file

S C O R E, I N C.

SCORE is a non-profit corporation with a Board of Directors, executive officers, staff, and member schools. The Board of Directors is composed of representatives from academia, industry and government. The executive officers and staff members are students and recent graduates. Each member school has a faculty SCORE representative. While every school is encouraged to join SCORE, membership is not a requirement for participation in SCORE programs.

SCORE's national offices are located at the Massachusetts Institute of Technology in Cambridge, Massachusetts and Tufts University in Medford, Massachusetts. Space and support services have been furnished by these universities, and SCORE's financial accounting system is administered through M.I.T.'s Office of Sponsored Programs and the Comptroller's Accounting Office.

A SCORE student coordinating committee is formed to organize each program. The coordinating committee for the Urban Vehicle Design Competition was located at the Massachusetts Institute of Technology; the Students Against Fires committee was at the Georgia Institute of Technology; the Energy Resource Alternatives committee was at the University of Wisconsin-Madison; the Energy Resource Alternatives II coordinating committee was at the Washington State University; and the Energy Efficient Vehicle Coordinating Committee is located at the University of Florida in Gainesville, Florida.

INTRODUCTION

The "Energy Efficient Vehicle Competition" is a unique inter-university educational program sponsored by Student Competitions on Relevant Engineering (SCORE), Inc. SCORE competitions focus on engineering research and development and require the participants to incorporate their ideas and innovations into working prototype hardware. EEVC is the fifth such program to be offered to the nation's universities and has received tremendous support both from the academic engineering community and from the professional engineering societies of IEEE, SAE, and ASME. The American Institute of Engineering Education has recently awarded SCORE the AIEE "Distinguished Service Citation" in honor of its contribution to engineering education since its inception in 1971.

In 1971, SCORE sponsored the Urban Vehicle Design Competition (UVDC). The objective was to develop a vehicle specifically for use within the urban environment with emphasis placed on reducing harmful vehicle emissions. The response was fantastic. Over 60 teams competed at the Final Test Event at the General Motors Proving Grounds. An ad hoc evaluation committee of professional engineers was very favorably impressed with the results of the program and their reports can be found in the enclosed history of SCORE vehicle programs.

The objective of the present competition is to encourage the development of an energy efficient vehicle that will meet the transportation needs of the future. The last two SCORE competitions on alternate energy resources highlighted the nature of tomorrow's transportation problems. World oil reserves are dwindling and gasoline prices are soaring as a result. New techniques must be found to squeeze more miles out of a gallon of gas and eventually to replace gasoline as the dominant fuel. A discussion of the Energy Efficient Vehicle Competition is enclosed as well as a copy of the "Rules and Guidelines" which govern the design of the competing vehicles.

SCORE was established by the academic engineering community to encourage students at the university level to develop innovative solutions to significant national engineering problems. During the past seven years, more than 4,500 students from 123 universities have participated in SCORE programs: the 1971-72 Urban Vehicle Design Competition; the 1973-1974 Students Against Fires Program; the 1974-75 Energy Resource Alternatives program; and, the 1976-77 Energy Resource Alternatives II Competition.

SCORE programs focus on significant contemporary problem areas where technology can offer a solution. Each topic selected must promote SCORE's three principal objectives:

* to encourage engineering students to develop innovative solutions to relevant engineering problems;

* to introduce project-oriented courses into university engineering curricula; and

* to increase public awareness of the problem which the program addresses.

SCORE programs are unique among intercollegiate engineering programs in that full-sized hardware systems are built and tested in competition with other schools. In translating a design from a blueprint to full-scale hardware, the student must cope with the various trade-offs, such as cost, availability of materials, and design simplicity, that the practicing engineer faces daily. This fundamental aspect of engineering is too often ignored in today's classrooms and a rapidly increasing number of educators feel it must be more strongly emphasized.

The competition format is used in SCORE programs to motivate students to respond with their very best efforts. This kind of response owes much to the fact that the students know their project will be judged by professional engineers, the press, and perhaps, most importantly, by fellow engineering students from across the nation. The time constraints imposed by the competition are representative of those that the students might encounter if

the project were undertaken in a professional context. Past SCORE competitors, now employed in industry, have found the SCORE experience to be an invaluable preparation for the real world.

ENERGY EFFICIENT VEHICLE COMPETITION

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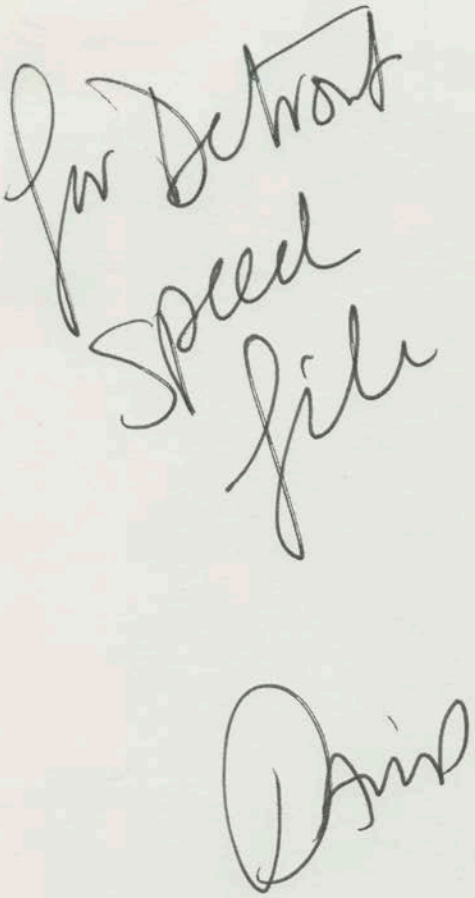
Appendix A



energy efficient vehicle competition

SPONSORED BY

SCORE

Student Competitions On Relevant Engineering, Inc.

AUGUST, 1979

TABLE OF CONTENTS

INTRODUCTION

The "Energy Efficient Vehicle Competition" is a unique inter-university educational program sponsored by Student Competitions on Relevant Engineering (SCORE), Inc. SCORE competitions focus on engineering research and development and require the participants to incorporate their ideas and innovations into working prototype hardware. EEVC is the fifth such program to be offered to the nation's universities and has received tremendous support both from the academic engineering community and from the professional engineering societies of IEEE, SAE, and ASME. The American Institute of Engineering Education has recently awarded SCORE the AIEE "Distinguished Service Citation" in honor of its contribution to engineering education since its inception in 1971.

In 1971, SCORE sponsored the Urban Vehicle Design Competition (UVDC). The objective was to develop a vehicle specifically for use within the urban environment with emphasis placed on reducing harmful vehicle emissions. The response was fantastic. Over 60 teams competed at the Final Test Event at the General Motors Proving Grounds. An ad hoc evaluation committee of professional engineers was very favorably impressed with the results of the program and their reports can be found in the enclosed history of SCORE vehicle programs.

The objective of the present competition is to encourage the development of an energy efficient vehicle that will meet the transportation needs of the future. The last two SCORE competitions on alternate energy resources highlighted the nature of tomorrow's transportation problems. World oil reserves are dwindling and gasoline prices are soaring as a result. New techniques must be found to squeeze more miles out of a gallon of gas and eventually to replace gasoline as the dominant fuel. A discussion of the Energy Efficient Vehicle Competition is enclosed as well as a copy of the "Rules and Guidelines" which govern the design of the competing vehicles.

SCORE was established by the academic engineering community to encourage students at the university level to develop innovative solutions to significant national engineering problems. During the past seven years, more than 4,500 students from 123 universities have participated in SCORE programs: the 1971-72 Urban Vehicle Design Competition; the 1973-1974 Students Against Fires Program; the 1974-75 Energy Resource Alternatives program; and, the 1976-77 Energy Resource Alternatives II Competition.

SCORE programs focus on significant contemporary problem areas where technology can offer a solution. Each topic selected must promote SCORE's three principal objectives:

* to encourage engineering students to develop innovative solutions to relevant engineering problems;

* to introduce project-oriented courses into university engineering curricula; and

* to increase public awareness of the problem which the program addresses.

SCORE programs are unique among intercollegiate engineering programs in that full-sized hardware systems are built and tested in competition with other schools. In translating a design from a blueprint to full-scale hardware, the student must cope with the various trade-offs, such as cost, availability of materials, and design simplicity, that the practicing engineer faces daily. This fundamental aspect of engineering is too often ignored in today's classrooms and a rapidly increasing number of educators feel it must be more strongly emphasized.

The competition format is used in SCORE programs to motivate students to respond with their very best efforts. This kind of response owes much to the fact that the students know their project will be judged by professional engineers, the press, and perhaps, most importantly, by fellow engineering students from across the nation. The time constraints imposed by the competition are representative of those that the students might encounter if

the project were undertaken in a professional context. Past SCORE competitors, now employed in industry, have found the SCORE experience to be an invaluable preparation for the real world.

THE ENERGY EFFICIENT VEHICLE COMPETITION

SCORE takes pleasure in announcing the "Energy Efficient Vehicle (EEV) Competition" for 1978-79. The EEV Competition is an inter-university educational program which focuses on engineering research and is pursued in a competitive format. As participants in the EEV program, engineering students will work with faculty advisors to design, build, and test innovative prototype vehicles.

These vehicles will be designed to serve as inter-city transportation for a single-car family of the future. To meet this goal, a vehicle must be capable of transporting a minimum of two passengers and their accompanying impedimenta over a typical commuter circuit which may include highway travel. To improve overall efficiency without sacrificing capacity and speed will require a careful evaluation of powerplant performance, aerodynamics, and power transmission.

Innovation in the design and construction of these vehicles is strongly emphasized. Totally new system designs or innovative use and modifications of commercially available hardware are encouraged. Scoring of the competition will be based on four unequally weighed areas: vehicle efficiency, innovation, performance, and marketability.

It is in the hardware construction phase that many students get their first intensive exposure to hands-on engineering. In translating their own design from paper to hardware, the students try to bring the hardware as close to their original specifications as possible. Modifications, debugging, and testing become an important part of the construction phase activities, along with regularly scheduled progress reports to SCORE.

Details of the EEV "Rules and Guidelines" which contain the scoring criteria and vehicle specifications may be found in Appendix E of this proposal. For more information on SCORE and past vehicle programs, see Appendix D.

PROGRAM ORGANIZATION

The EEV program is composed of a design phase, a hardware construction phase, two symposia, and a final test event.

During the design phase, currently underway, the student teams study the specifications outlined in the EEV rules and develop a design for the vehicle systems they would like to build and enter in the competition. In so doing, the teams are expected to seek technical advice from companies and other organizations in their community as well as from faculty members (in addition to their regular faculty advisor) at their university. The team's design proposal is presented to SCORE in the form of a professional-quality design proposal which includes a technical, economic, and marketing analysis of the vehicle design as well as a project budget. An evaluation board consisting of professionals from industry and government makes a technical evaluation of the proposals placing particular emphasis on innovation and practicality. Based on these evaluations, SCORE awards development grants to the teams to partially finance the construction costs of the systems. SCORE also provides some travel funds to assist the teams in attending the first EEV symposium and the final test event. These various grants are made to the university in the team's name and are accompanied by a Memorandum of Agreement detailing how the grant funds are to be used and administered.

SYMPOSIA

Each of the two phases of the EEV program includes a SCORE-sponsored national symposium. The first symposium was held on April 29, 1978 at Kansas State University as a general information session where representatives from industry, government, and academia discussed engineering design innovation and the state-of-the-art of automotive technology. This meeting was a tremendous success and attracted over 100 participants from 34 universities across the United States and Canada. An agenda of Symposium I has been included in Appendix C.

The second EEV symposium is designed as a workshop to give team members the opportunity to discuss their particular

projects with engineering experts in the automotive field. On January 11, 1979, the competing teams met at the University of Michigan, in Ann Arbor. During this two day event, they were able to obtain answers to specific technical questions and iron out some of the design and construction problems they had encountered. Final revisions of the Rules and Guidelines were also worked out at this meeting

Both symposia included business sessions in which such matters as rules, team finances, and preparations for the Final Test Event were dicussed.

The EEVC competition will climax during the week of August 13 - 17, 1979 with the Final Test Event at the General Motors Proving Ground in Milford, Michigan. Each team will transport its vehicle to the competition site for a week of rigorous testing and evaluation. Final testing for the EEVC program will include driving cycle efficiency tests, test track performance evaluation, and several subjective evaluations. SCORE's previous programs, the 1972 Urban Vehicle Design Competition, the 1974 Students Against Fires Competition, the 1975 Energy Resource Alternatives Competition, and the 1976 Energy Resource Alternatives II Competition, held their respective final testings at the General Motors Proving Ground, the Ansul Company's Fire Technology Center in Marinette, Wisconsin, the Sandia Laboratories in Albuquerque, New Mexico, and the U.S. Energy Research and Development Administration facility in Richland, Washington.

During the final testing, the EEVC team members will give oral presentations to panels of judges. Innovation, economics, and marketability are among the topics presented on each entry. The judges also review the project final technical reports submitted by the teams. The judging panels will be composed of research and practicing engineers from industry, government, academia, and other professions in the transportation field.

The EEVC teams will recieve an overall competition score

and each will be eligible for awards in several categories. Trophies and plaques are awarded which symbolize the student's engineering achievements and bring recognition to the winning team's schools.

SCORE Final Test Events are well publicised by the national media. In addition, SCORE conducts a public communications effort during the program to help the individual teams recieve local media coverage.

ENERGY EFFICIENT VEHICLE COMPETITION

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University of Florida

Thomas Terry
Environmental Activities Staff
General Motors Technical Center

S C O R E, I N C.

SCORE is a non-profit corporation with a Board of Directors, executive officers, staff, and member schools. The Board of Directors is composed of representatives from academia, industry and government. The executive officers and staff members are students and recent graduates. Each member school has a faculty SCORE representative. While every school is encouraged to join SCORE, membership is not a requirement for participation in SCORE programs.

SCORE's national offices are located at the Massachusetts Institute of Technology in Cambridge, Massachusetts and Tufts University in Medford, Massachusetts. Space and support services have been furnished by these universities, and SCORE's financial accounting system is administered through M.I.T.'s Office of Sponsored Programs and the Comptroller's Accounting Office.

A SCORE student coordinating committee is formed to organize each program. The coordinating committee for the Urban Vehicle Design Competition was located at the Massachusetts Institute of Technology; the Students Against Fires committee was at the Georgia Institute of Technology; the Energy Resource Alternatives committee was at the University of Wisconsin-Madison; the Energy Resource Alternatives II coordinating committee was at the Washington State University; and the Energy Efficient Vehicle Coordinating Committee is located at the University of Florida in Gainesville, Florida.

ENERGY EFFICIENT VEHICLE COMPETITION

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United States Department of Energy

ENERGY EFFICIENT VEHICLE COMPETITION

Symposium I

Agenda

energy efficient vehicle competition

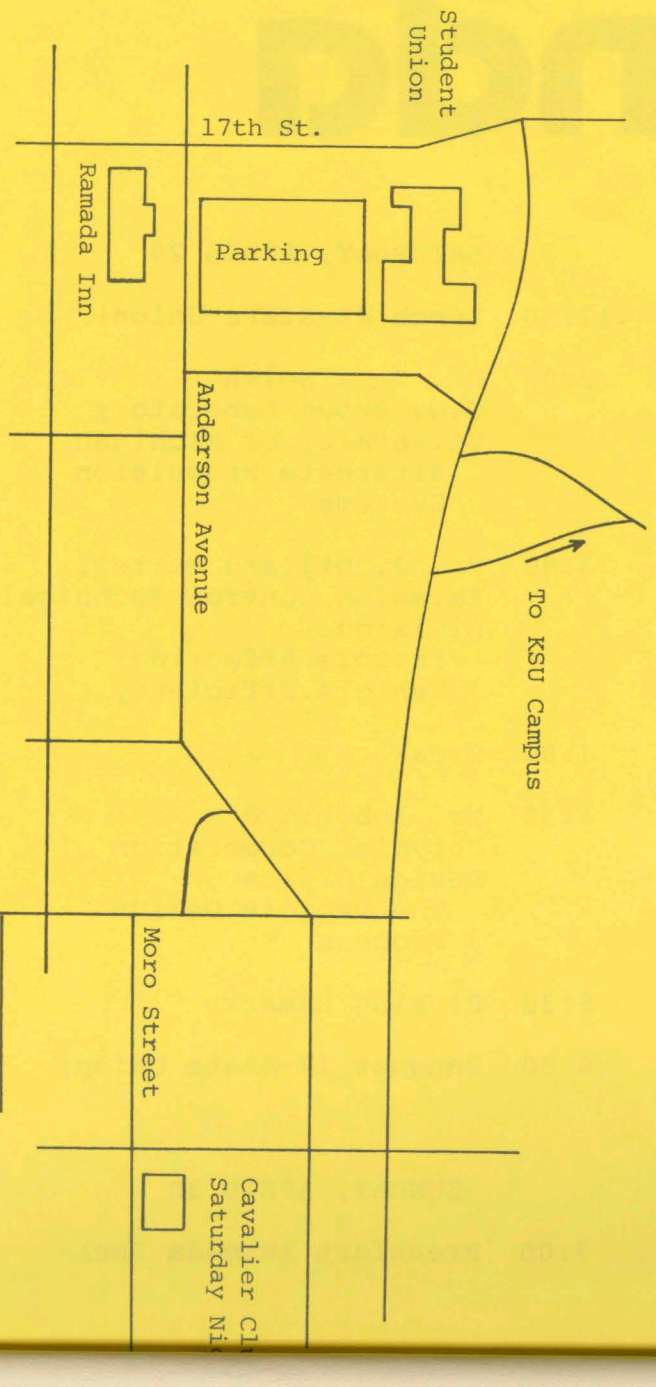
WELCOME

TO

SYMPOSIUM I

April 29, 1978

Kansas State University



ACKNOWLEDGEMENTS

We are grateful to Kansas State University for the use of its outstanding facilities and would like to thank the KSU staff for their help and advice in the preparation of Symposium 1. Special thanks are extended to symposium coordinators, Dr. Hugh S. Walker and Lee McQueen, for the time and effort they have expended in the organization of the symposium.

We would also like to thank our distinquished speakers for accepting an invitation to speak to our teams and share with them their knowledge and experience.

agenda

FRIDAY, APRIL 28

5:00-9:00 Dinner at Ramada Inn

SATURDAY, APRIL 29

7:00 Breakfast & Meeting of Participants (Ramada Inn)

8:30 Donald E. Rathbone
Dean of Engineering
Kansas State University

8:40 Ms. Mindy Hayet
Coordinating Committee

9:00 Mr. Walter Dippold
Department of Energy
Hybrid & Electric Vehicles

10:00 Coffee Break

10:30 Mr. Thomas Terry
General Motors Corporation
Safety Design Considerations

11:30 Mr. R. W. Hurn
Bartlesville Energy Research Laboratory
Alternate Fuels

SATURDAY, APRIL 29

12:30 Lunch (K-State Union)

2:00 Dr. Gene Smith
G.G. Brown Laboratory
University of Michigan
Alternate Propulsion Systems

3:00 Mr. J. Dillard Murrell
Emission Control Technical Division
Factors Affecting Vehicle Efficiency

4:00 Break

4:30 Mr. Rob Lloyd
Chrysler Corporation
Design Office
The Vehicle Design Process

5:30 Closing Remarks

6:30 Banquet (K-State Union)

SUNDAY, APRIL 30

7:00 Breakfast (Ramada Inn)

The EEVC is a student-run, nationwide engineering competition directed towards the design and construction of practical energy efficient vehicles. Throughout the course of the competition, the students will have the opportunity to gain practical "hands-on" engineering experience while developing and implementing their approach to the problem.

It is the purpose of the Symposium I to present ideas and information which will be valuable to the students in the design phase of their projects.

SCORE EEV Coordinating Committee
Room 210, Mechanical Engrg. Bldg.
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(904) 392-0809

SCORE National Office
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Massachusetts Inst. of Technology
Cambridge, MA 02139
(617) 253-6833

S C O R E

Vehicle Programs

"A History"

Appendix D

SCORE

Vehicle Programs

« A History »

March, 1978

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Gainesville, FL 32611
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Student Competitions on Relevant Engineering, Inc. (SCORE) is a student-run, non-profit corporation whose members are U. S. and Canadian engineering colleges. SCORE was organized in May of 1971, as stated in the Corporate By-Laws, to "engage in, assist, and contribute to the support of student inter-university events and projects which advance education and engineering."

The SCORE concept developed from the experience gained in two inter-collegiate engineering competitions and the growing need for a project-oriented approach to engineering education.

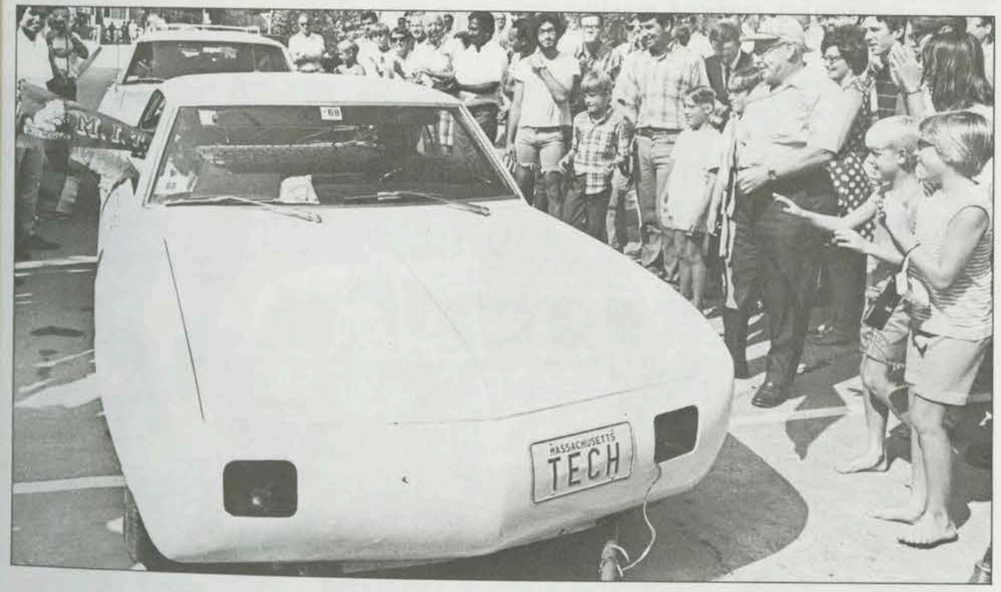
The Great Electric Car Race - 1968

In 1968, a student at the California Institute of Technology (Caltech) challenged the Massachusetts Institute of Technology (MIT) to a cross-country electric-powered vehicle race. The Caltech student had converted his Volkswagen bus to electric propulsion during the previous year and conceived of the race as a means to promote electric vehicles as a smog-free transportation alternative. The challenge was accepted by a team of MIT undergraduate students, mainly from the engineering school, with an engineering professor as a faculty advisor.

To prepare his entry for the race, the Caltech student also assembled a team of undergraduate and graduate engineering students. With financial backing from a local newspaper, the Caltech team installed a new motor and batteries in the VW bus, along with a standard but "proven" student-built control system.

The MIT team decided to base their electric vehicle on a Chevrolet Corvair which was subsequently donated. Exotic nickel-cadmium batteries were also donated which were charged by a sophisticated student-designed and built controller. Extensive alterations were made to the Corvair body to adapt the automobile to electric power.

Since the two vehicles would have to be recharged every sixty miles or so



MIT's "Tech I" crosses the Great Electric Car Race finish line in Pasadena, California on September 1, 1968. (Photo courtesy of MIT Historical Collections)

along the race route, a cross-country network of charging stations was set up for the race by electric utility companies.

The race got underway on August 26, 1968 with the Caltech car heading for MIT in Cambridge, Massachusetts, and the MIT car bound for Caltech in Pasadena, California, both cars traveling over the same route. Each vehicle suffered from a variety of mechanical and electrical problems, including burnt-out motors which had to be replaced, and were at times recharged from a portable unit or towed, incurring penalty points. The MIT Corvair crossed the finish line in Pasadena 7½ days after the start, with Caltech pulling into Cambridge 40½ hours later. After the assessment of penalties, Caltech was declared the winner with a corrected time of 210 hours, 30 minutes less than MIT's.

The Great Electric Car Race, as this contest was called, generated a great deal of national publicity with many reporters equating it to the classic Peking-to-Paris automobile race of 1907. Unfortunately, where the latter race had helped establish the automobile as a feasible and practical means of transportation, the difficulties encountered by the vehicles in the Great Electric Car Race showed that practical electric propulsion was still years down the road. Yet the national attention helped alert the public to the fact that alternatives to the internal combustion engine were being explored by the engineering community.

The Great Electric Car Race also proved to be an extraordinary educational experience, particularly for the undergraduate students involved. For them, engineering education had been based on theory and design, generally restricted to the blackboard and homework assignments. Being able to build a working prototype electric vehicle gave them a taste of "real world" engineering, forcing them to confront the various trade-offs (such as cost, reliability, and availability of materials) that the practicing engineer faces daily. As noted at the end of the race by the MIT faculty advisor, Professor Richard Thornton, "In one week, these students have learned the equivalent of reliability engineering that might otherwise have taken them years to acquire. They see clearly that shortcuts taken in the laboratory can cost hours of problems in the field."

The Caltech challenger arrives in Cambridge, Massachusetts 40½ hours later but is declared the winner on the basis of its point score. (Photo courtesy of MIT Historical Collections)

The following year, a sequel to the Great Electric Car Race was organized by faculty members at MIT and Caltech. Christened the Clean Air Car Race (CACR), this automotive competition was open to all forms of low-pollution vehicles. While entries could be designed and built by any group of individuals, including teams from commercial companies, only college students could drive them in the race.

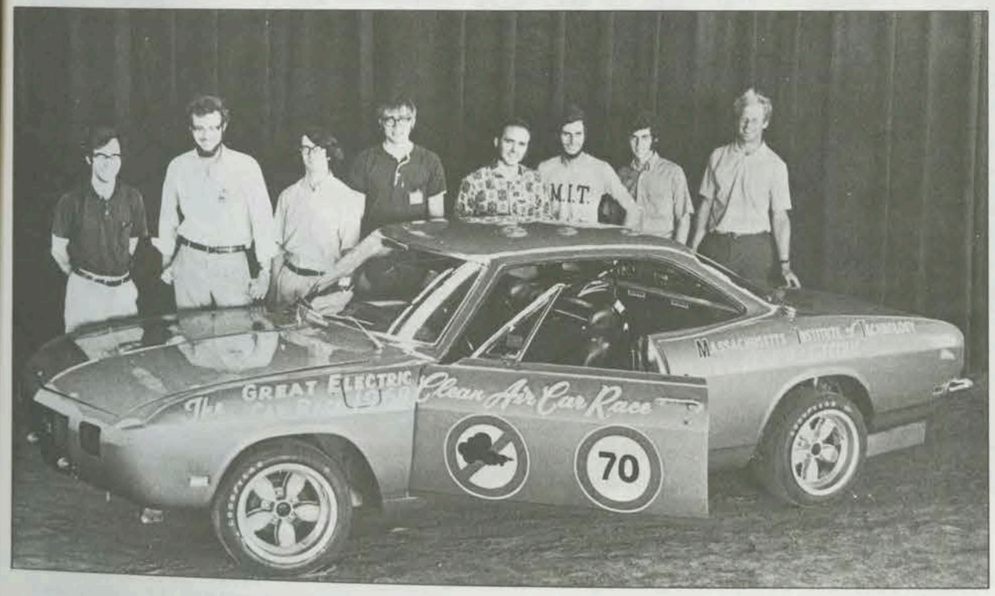
The faculty coordinators initially expected fifteen to twenty CACR entries. When over fifteen teams had entered by mid-January, 1970, with the actual cross-country race still seven months away, the faculty coordinators could no longer effectively handle the administrative load required to organize the competition. This responsibility was turned over to a student coordinating committee, composed of students from MIT and Caltech, with a faculty advisor.

The CACR coordinating committee assumed all duties necessary to plan and carry out the competition program. It developed and administered the race rules, vehicle testing procedures and scoring system, directed the logistics of the cross-country travel of the CACR participants, handled all communications with the entrant teams, raised and allocated funds, and conducted a public communications campaign to arouse the public's interest in the problem of automotive air pollution and the possible solutions demonstrated by the CACR vehicles.

The entrant vehicles were divided into five competition categories according to their power plants: internal combustion engines; pure battery-powered vehicles (electrics); hybrid-electrics; power plants using either liquified natural gas or liquified petroleum gas for fuel; and turbines using a Brayton cycle of operation.

The Clean Air Car Race program was divided into three parts: vehicle performance and emission testing at MIT; the cross-country rally from Cambridge to Pasadena; and a final emissions testing at Caltech.

The pre-race activity at MIT took place during the week of August 17, 1970. The CACR vehicles were tested and evaluated for hot-start exhaust emmissions, acceleration, braking, noise, road handling and maneuverability. Two days were also devoted to seminars in which the entrant teams presented technical papers on



One MIT team completely rebuilt Tech I as a hybrid electric for the Clean Air Car Race. (Photo courtesy of MIT Historical Collections)

their vehicle power plants. In addition, there were public showings of the CACR vehicles, a parade through Boston, and evening meetings of the team captains with the coordinating committee.

Forty-three vehicles qualified for the race, having passed the rigorous week-long testing program.

The cross-country rally got underway at 3 a.m. on August 24, when the first vehicles left MIT bound for California. The 3600 mile race route was divided into seven legs with the following destinations: Toronto; Detroit; Champaign, Illinois; Oklahoma City; Odessa, Texas; Tucson; and Pasadena. Cold-start exhaust emissions testing was performed in Detroit, and vehicle fuel consumption was measured over the two-day, 1071-mile run from Ann Arbor, Michigan to Oklahoma City.

Thirty-six vehicles, eighty-five per cent of the starting field, completed the week-long transcontinental journey to Pasadena. While at Caltech, the vehicles underwent a final hot-start emissions test. The results of this test were combined with the earlier MIT hot-start test to provide a deterioration factor for overall vehicular emissions. Teams were also given a chance to discuss complaints or protests with the coordinating committee, and at the same time penalties for rule infractions were levied. Other committee activities included the final tabulation of race scores.

A final awards banquet was held on the evening of September 2 for all CACR participants. Trophies were presented to the five class winners and the overall winner. The overall winner was selected by an impartial board of judges composed of representatives from academia, state and federal government, and a professional engineering society. A final seminar was held the next day in which the judging panel discussed their reasons for choosing the Wayne State University internal combustion engine-powered vehicle as the overall winner.

Starting early in the morning of August 24, 1970, the forty-three Clean Air Car Race vehicles left the starting line at the rate of one every three minutes. Shown here is one of the five Worcester Polytechnic Institute CACR entries. (Photo courtesy of MIT Historical Collections)

The Clean Air Car Race proved to be highly significant in several respects. For one, it was the first national intercollegiate engineering competition conducted by students. Other engineering competitions for students had been either sponsored nationally under the auspices of one of the professional engineering societies, or regionally by a university. CACR was the first time a program of this magnitude had been undertaken by the students themselves. It was also the first national intercollegiate engineering design competition to require that full-scale hardware be built and tested. Previous national competitions had called for either proper designs or small-scale models.

As was the case with the Great Electric Car Race, the impact of CACR on the participants and the general public was considerable. The educational benefits of translating a paper design to actual hardware was demonstrated again on a much larger scale. The media's coverage of the cross-country rally was extensive and helped to inform the public of the various technical approaches being considered to reduce automotive exhaust emmissions. The Clean Air Car Race had an impact in Washington as well where the results were read into the Congressional Record.

Establishment of SCORE

Encouraged by the success of the program, CACR members began planning another competition in early 1971. Building on their background in motor vehicle research, they decided the new competition should tackle the problem of designing a motor vehicle particularly suited to the urban environment. A successor committee composed of engineering students from five universities was formed at MIT to coordinate the Urban Vehicle Design Competition (UVDC), as the new program was called. In order to assess potential interest in UVDC, a questionnaire was mailed to 200 deans of engineering. Encouraged by 100 favorable responses, the new committee began to actively promote UVDC.

At the same time, a group of engineering deans from universities that had participated in CACR and who recognized the need for such hardware oriented programs was moving to create a permanent "parent" organization to sponsor UVDC and future CACR-like intercollegiate engineering competitions. Working together, the deans and members of the CACR/UVDC committee designed an organization to take advantage of the strengths and avoid the weaknesses evident in the CACR organization.

The new organization, to be called Student Competitions on Relevant Engineering, Inc. (SCORE), would be staffed by students and recent graduates. CACR had shown that they were capable of handling such administrative responsibilities, and that they brought a high level of enthusiasm and imagination to the job. A Board of Directors composed of engineering deans (later expanded to include representatives from industry and government) would be concerned with SCORE's long-range goals and would not become involved in the day-to-day activities.

The national fund-raising for the competition would be conducted by SCORE. Funds solicited from corporations, foundations, and the government would provide development grants for the teams and support the operating costs of the programs. The decision to centralize the national fund-raising in SCORE was made in response to a problem that arose during CACR. In addition to finding local sponsors, the CACR teams were all approaching the same federal agencies, large corporations and foundations for grants. Many of these national organizations were interested in funding the teams, but their granting systems were not designed to make numerous small awards. They suggested that the national fund-raising for future competitions be centralized so that they could make one large grant to the competition's organizer and it, in turn, could make the individual team grants.

The grants SCORE would provide to the competing teams would be used to support the purchase of expendable equipment, materials and supplies needed to construct an entry. SCORE team grants would be seed-money awards intended to provide major but not complete project funding. One of the educational benefits for the team members would be learning how to raise donations of funds, equipment and supplies from local sponsors.

SCORE was legally established in Massachusetts in May, 1971, as a non-profit, tax-exempt corporation. The members of the corporation are U. S. and Canadian engineering colleges.

Each member school has a designated SCORE representative from the faculty who is the SCORE contact and who represents the school at the SCORE annual meeting. While every engineering school is encouraged to join SCORE, membership is not a requirement for participation in SCORE competitions.

The Urban Vehicle Design Competition 1971-1972

The Urban Vehicle Design Competition (UVDC), organized as the sequel to the Clean Air Car Race, was the first intercollegiate engineering program sponsored by SCORE. Where CACR had allowed any type of vehicle utilizing a low-emmission powerplant, UVDC focused on small, quiet, safety-oriented automobiles that were also fuel-efficient and low-polluting.

A comprehensive set of rules and guidelines were written by the UVDC coordinating committee based on the rules developed for CACR. The UVDC rules gave design specifications for the entrant vehicles (outlining minimum performance characteristics and requiring certain features such as headlights, windshield wipers, seat belts, etc.), designated the different vehicle competition classes (based as in CACR on the type of power plant), detailed certain required reports and gave a timetable for their submission, and presented a scoring system for the final testing program.

The rules also defined who could enter the competition, and gave guidelines for team sponsorship and advertising. To prevent a re-occurance of the relatively small amount of commercialism that caused some problems in CACR and to firmly establish the educational nature of the program, only student teams (with a faculty advisor) from accredited educational institutions were allowed to enter UVDC. Companies and other organizations were encouraged to sponsor individual teams in a manner that fostered the educational objectives of the program, and to promote their sponsorship in as discreet a fashion as possible.

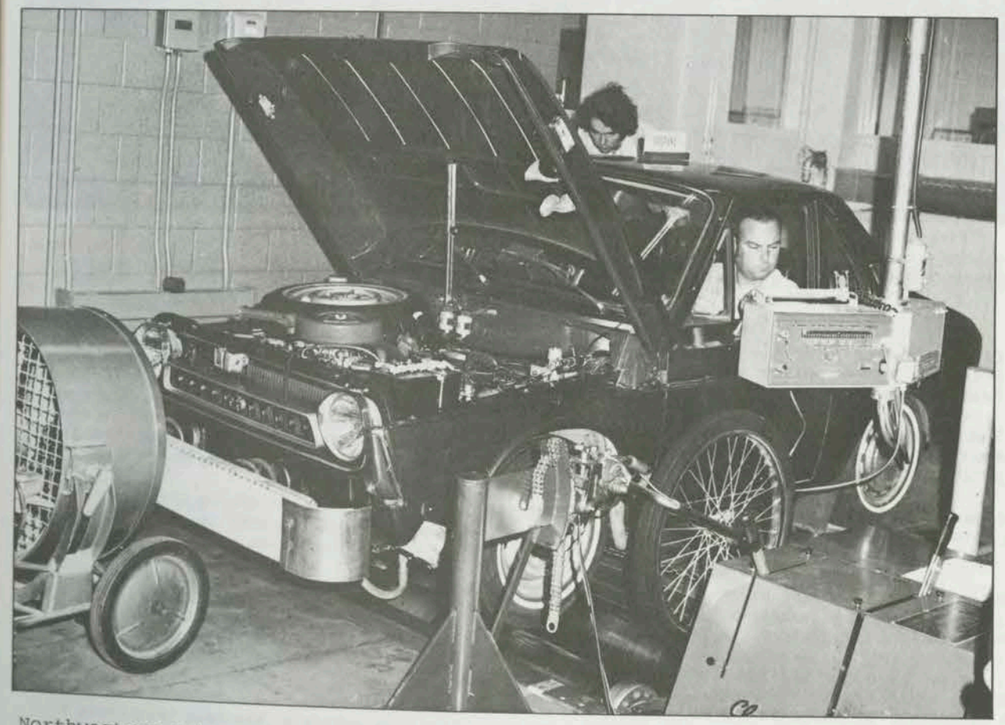
The organization of the UVDC program was also a refinement of CACR. UVDC was organized as a two-year competition with a design phase, a hardware construction phase, and a final testing program.

In the design phase, the UVDC teams studied the hardware specifications outlined in the rules and developed a design for their urban vehicle. In doing so, the teams were expected to seek technical advice from companies and other organizations in their community as well as from faculty members at their university. Totally new designs for the vehicle and its sub-systems or innovative modifications of commercially available hardware were encouraged. The results of this work were presented to the coordinating committee in a professional-quality design proposal which included a technical and economic analysis of the vehicle design, and a project budget and funding request. After evaluating the design proposals, the coordinating committee recommended the award of SCORE grants to help the teams finance the actual construction of their vehicles during the construction phase of the competition.

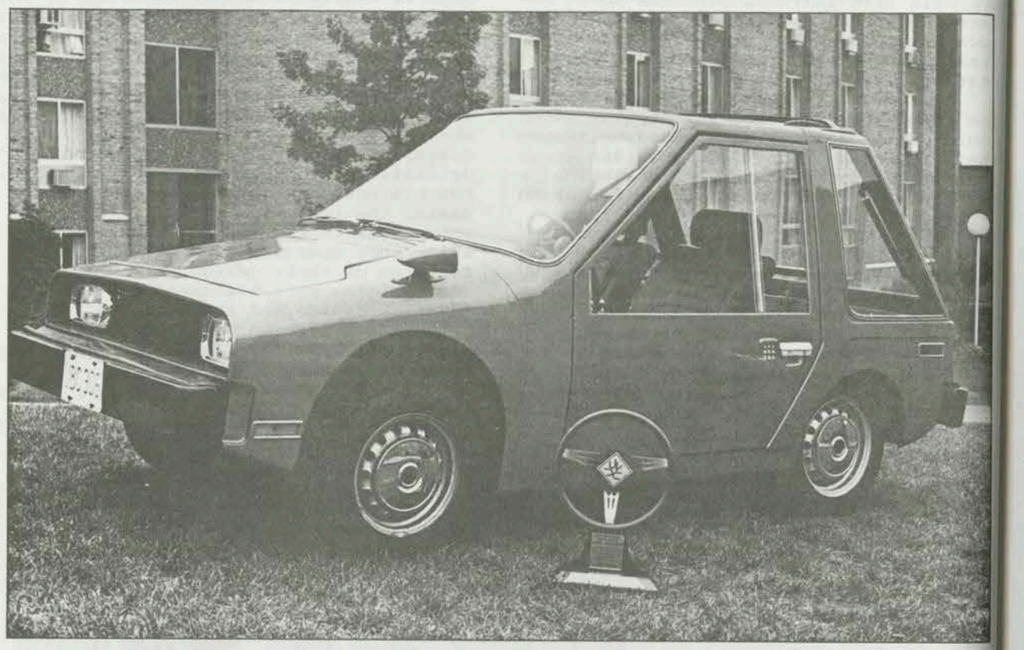
Both the design and the construction phases of the UVDC program included a symposium to assist the teams in the development of their vehicles. The first (design phase) symposium was held at the University of Toronto. Here, speakers from industry, the government and academia presented background information for the students to consider in their design work by examining the technological and social aspects of urban transportation. The second (construction phase) symposium was held in May, 1972 at Catholic University in Washington, D. C. This meeting was designed around workshop sessions on vehicle sub-systems which were directed by leaders from industry and the government. Here, team members had the opportunity to direct specific questions to the experts on design and construction problems that they had thus far encountered. Both symposia also included business meetings run by the committee to discuss such matters as the rules, team finances, and preparations for final testing.

The teams were required to keep the coordinating committee informed of their progress through the submission of two progress reports during the course of the competition. A comprehensive team final report was also due at the end of the program.

The Urban Vehicle Design Competition concluded with the final test event held the week of August 6, 1972. Sixty-six teams from sixty-two U. S. and Canadian colleges participated in the final testing at the General Motors Proving Grounds in Milford, Michigan. The vehicles were technically tested and evaluated (using the Proving Grounds test equipment and General Motors personnel and other leading automotive experts) for their exhaust emmissions, acceleration, braking, handling, noise, five-mile-per-hour crash resistance, energy efficiency, and space utilization. The vehicles were also subjectively evaluated in the areas of safety features, mass-production cost, and drivability by panels of experts. For the cost and safety features tests, the team members made presentations to the judging panels in which they discussed the salient features of their design. Finally, the vehicles were evaluated for innovative design and the degree of student fabrication of their powerplant, drivetrain, emission controls, suspension, frame, body,



Northwestern University's LPG-powered Subaru undergoing the Federal Mass Emissions Test at the UVDC final test event held at the General Motors Proving Grounds.



The University of British Columbia vehicle, built from the ground up, took the UVDC Grand Award by achieving high safety, driveability and innovation scores.

five-mile-per-hour bumpers, and interior and exterior safety features.

The total score received by each entry was achieved by summing the products of the score received in each test by that test's weighting factor, and multiplying this summation by the vehicle's overall innovation and student fabrication coefficient. The University of British Columbia received the highest total score and won the UVDC Grand Award.

REPORT OF
THE AD HOC EVALUATION COMMITTEE
OF THE COMMISSION ON EDUCATION
NATIONAL ACADEMY OF ENGINEERING
COVERING THE
URBAN VEHICLE DESIGN COMPETITION

Phillip Myers, Chairman
Allen L. Cudworth
Michael Ference
Leonard Reiffel
William E. Siri
James F. Young

August 11, 1972

UVDC EVALUATION COMMITTEE

As the UVDC progressed toward the August 1972 date of final examination, the officers and directors of SCORE studied the problem of how to provide an objective evaluation and interpretation of the overall results of the competition. Based on experience with publicity from the Clean Air Car Race, it was clear that the significance of the UVDC should be presented to the public as objectively as possible. It was concluded that an evaluation committee of eminent citizens with a broad spectrum of backgrounds and appointed by the National Academy of Engineering would meet this objective. Accordingly, an Evaluation Committee was appointed by the President of NAE, as a Committee of the NAE Commission on Education.

The invitation to serve on this Evaluation Committee carried the following charge:

> "The principal function of the Evaluation Committee will be to evaluate and provide a statement on the significance of the achievements, and to place in proper perspective, relative to existing systems, the performance levels achieved by the students."

At its first meeting, the UVDC Evaluation Committee elected Phillip Myers of the University of Wisconsin as its chairman. Professor Myers is past president of the Society of Automotive Engineers. Members are: Allen L. Cudworth, Vice President and Director of the Research Center, Liberty Mutual Insurance Company; Michael Ference, Vice President-Scientific Research Staff (retired), Ford Motor Company; Leonard Reiffel, Board Chairman, Instructional Dynamics, Inc., and science adviser, Columbia Broadcasting System; William E. Siri, past president and current officer of the Sierra Club, Donner Laboratory, University of California; and James F. Young, vice president-Technical Resources, General Electric Company.

1972 UVDC IN PERSPECTIVE

A final examination, held in the merciless glare of spotlights, cameras, other students and the press, has been going on at the General Motors Proving Ground for the past week. This final examination culminates a year and one-half of intensive effort on the part of thousands of student engineers to design and fabricate 91 small, limited-performance, urban vehicles having minimum noise and exhaust emissions and maximum safety and urban utility.

The A+'s earned in the course, as determined by this open final examination, will be handed out at the final banquet tonight (August 11) by Secretary of Transportation, John Volpe. Some of the top contenders are present.

Two things have impressed the Evaluation Committee as they observed this public examination. The first is the enthusiasm, dedication, ingenuity, innovativeness, engineering know-how and "ability to make things work" displayed by the student representatives at this final exam. About 500 of the several thousand student designers, together with 80 faculty members, were present this week to participate in the test of 66 vehicles. Although some vehicles performed better than others there were really no "failures", for the entire purpose of this Urban Vehicle Design Competition was to initiate student engineers into the intricacies and headaches of designing, for a particular deadline, a system that will work!--and these student engineers did find these headaches--an electrical contactor unexpectedly shorted out by Monday's rain--several 24-hour

work sessions to meet deadlines--followed by a dead-to-the-world snooze on a blanket on a hard concrete floor.

The second thing that impressed the Evaluation Committee was the cooperation and assistance given to the students, by industry, foundations, Government, and universities. Testing was facilitated when General Motors made their sophisticated Proving Ground facilities available.

The Urban Vehicle Design Competition was a competition among students to demonstrate their ideas in an experimental vehicle. It was not a competition between student engineers and indust engineers to design a vehicle suitable for mass production. Comparing student vehicles with industry designed vehicles is impossible because they have vastly differing objectives and requirements.

As the Evaluation Committee has reviewed and studied this competition it became convinced o the following:

I. The Competition was highly successful in its primary objective of contributing significantly to the education of student engineers. For example--

   A. The students were most enthusiastic and highly motivated. As one student put it, "Cars are getting exciting again because of environmental problems." Long hours, seemingly insurmountable difficulties, and inclement weather were inconsequential in comparison to their desire to get the job done.

   B. Their experience in the Design Competition contributed significantly to their engineering education. For example--

      (1) The Competition taught the importance and ways of bridging the gap that exists between the drawing board and a working design and improved their skills in closing this gap.

      (2) The Competition provided first-hand experience in project management.

      (3) The Competition impressed upon the students the fact that there are inevitably trade-offs in any practical engineering design many of which are now imposed by the new demands of society.

      (4) The Competition taught the necessity of bringing together the diverse interdisciplinary groups necessary to the success of the Design.

II. There were several innovative ideas as a result of the Competition. Such as--

   A. A hydraulic energy absorbing bumper using small glass beads as a working fluid and return positioning with a spring.

   B. An individual-tailored drunk driver/anti-theft system.

   C. 90 degree steering geometry for ease in parking.

III. There were many interesting combinations of industry-developed components and material, which may or may not have commercial application. It would be impractical to mention all, but to list a few:

   A. A Wankel engine, thermal reactor and catalytic muffler to produce low exhaust emission

   B. A variety of energy sources including natural gas, propane and ammonia.

   C. An urban taxi providing ready access, high visibility and integration of safety system

   D. Interesting beer can and popcorn bumpers.

   E. A diagnostic system for brake and fuel systems.

   F. Strong and attractive body shells constructed of various types of laminated plastics.

IV. The student design did not take into account the total needs of an urban vehicle. While la of time and resources can be pleaded as a mitigating circumstance this fact is emphasized b

   A. The fact that most vehicles were laboratory models constructed to express an idea or ideas rather than a total system.

   B. The failure in some cases to take into account the total picture--for example, a car w dangerously sharp internal and external corners and projections, but a bumper that wit stood a 5-mile per hour crash, or a bumper that withstood a 5-mile per hour crash but would be extremely dangerous to the occupants of another vehicle on side impact.

   C. The sometimes failure of human engineering--for example: Poor entrance accessibility, inability to accommodate extremely small or large people, inability to control vehicle a rough road, etc.

ENERGY EFFICIENT VEHICLE COMPETITION

"Rules and Guidelines"

Appendix E

energy efficient vehicle competition

Rules and Guidelines

February 1978

SCORE

STUDENT COMPETITIONS ON RELEVANT ENGINEERING, INC.

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I. OBJECTIVES OF THE ENERGY EFFICIENT VEHICLE (EEV) COMPETITIO

A. To give engineering students the opportunity to use the education in a practical application and gain technical experience by improving upon the automotive vehicles of today.

B. To educate the student and the general public with regard to the energy demands of today's transportation ar to stimulate the development of innovative concepts in automotive fuel economy.

C. To produce a passenger vehicle which will effectively utilize the energy resources available today and in the foreseeable future.

II. THE EEV COORDINATING COMMITTEE

A. The University of Florida at Gainesville has accepted t responsibility of coordinating the EEV Competition.

B. The student Coordinating Committee will be assisted by Advisory Board composed of representatives from those sectors of government, industry, university, and busine most concerned with automotive engineering.

C. The Committee will have final jurisdiction on all aspec of the competition.

D. All judging panels will be chosen by the Committee. Suggestions of qualified persons are welcome.

E. All questions concerning the competition should be forwarded to the Committee.

F. All special requests and individual policy decisions mu be approved in writing and signed by at least two membe of the Committee.

III. TEAMS

A. All team members must be full or part-time students (9 credit hours) currently enrolled in a degree-seeking pr gram at an accredited educational institution.

1. This includes:

a. Colleges, universities, institutes, and high schools.

b. Undergraduate students (and graduate students

III. A. 1. b. who began in the project as undergraduates and chose to continue after graduation).

c. Co-op students who study full-time (or equivalent) for at least 6 months of the academic year and work the remainder of the year.

d. Graduating team members who do not continue school as a registered student may continue to work on the project up to one term following change of status.

2. All teams must submit a statement from a dean or department head of their school certifying that the team members meet the above qualifications, in this format:

Student	Status	Nature of Outside or Co-Op Work
Jones, John	part-time senior	draftsman
Smith, Bob	full-time senior	none
Grant, Ted	co-op freshman	marketing

These statements must be submitted and updated at the following times:

a. As soon as possible after entering.

b. October 15, 1978.

c. March 15, 1979.

d. July 1, 1979.

IV. TECHNICAL PAPERS AND REPORTS

Five reports are required of each team, as follows:

Design Proposal, 3 Progress Reports, Final Report.

Initial seed-money will be based on individual merit of the project as determined by the Design Proposal.

Design Proposal (Due April 29, 1978)

a. abstract
b. system description
c. illustrations:
   1. artist rendering
   2. engineering drawings
d. vehicle operation
e. prototype construction estimate

(See Attached Outline for Details)

IV. TECHNICAL PAPERS AND REPORTS

Progress Reports (Due July 1, 1978, October 15, 1978, March 15, 1979)

Each team must submit two (2) copies of a progress report o the above dates. Outlines for these reports will be furnis

All major changes in concepts or hardware must be noted by the Coordinating Committee to determine possible change in seed-money priority.

Final Report (Due July 1, 1979)

Complete technical, descriptive report of vehicle design a construction. Outline will be furnished.

NOTE: All report outlines will be furnished to competing teams at least one month prior to scheduled deadline

All teams must have one or more faculty advisors specif cally in a technical background who will be reponsible for assuring the team's adherence to these rules. The name and address of the faculty advisor should be submitted to the E Coordinating Committee. Graduate students acting in this capacity must be given and retain full responsibility (incl ing budgetary) for the team's project.

Teams must register under the name of an educational in tution. The form letter certifying that the team is affili with an educational institution must accompany the entry fo In the case of a university, college, or institute, the for letter should be signed by the president, dean of engineeri or a department head of the school. In the case of a high school, the forms should be signed by the principal.

V. SPONSOR PARTICIPATION GUIDELINES

Entrant teams may solicit financial, technical, and other assistance from corporations, consultants, universities, governments and their agencies, and other organizations and individuals (hereafter called "sponsors") according to the following guidelines:

A. A "sponsor" shall be defined as all divisions and subsi aries of one parent organization. No exception to this interpretation will be permitted unless expressly appro in writing by the Committee.

V. B. Sponsor Guidelines

1. Teams may accept from sponsors any part, subsystem, system, design, or idea (hereafter called components) to be used in their entry, subject to the following constraints:

   a. No sponsor-supplied, commercially available, or non-student designed component will be eligible for a design award.

   b. Sponsor-designed components for which design details and specifications cannot be supplied and which are delivered to the team prior to general commercial availability on a one-of-a-kind basis will be barred from the competition. (The intent here is to stimulate student design.)

   c. Innovative combinations or modifications of existing components will be eligible for design awards.

2. In order to determine the role of the sponsor, all teams must submit the analysis of the sponsor participation in the following format (to be included in the "cost" appendix of their final report):

Sponsor	Donation	Retail Value
ABC Company	Disc Brake Unit	$ 200.00
XYZ Foundation	Cash	2,000.00
F & G Consulting Firm	Advice	100.00
H. Hughes	Cash	300.00
M. E. Department	Shop Space	250.00
Prof. Friend	Advice	Free

The Committee and their appointed representatives reserve the right to inspect all components, technical drawings, and design work on an entry to evaluate the amount of sponsor participation. The decision of the Committee on this matter is final.

C. Except for items specified in Paragraph B(1), sponsors may act only in an advisory capacity concerning the design of any component or system of entry.

D. Advertising of sponsorship of a component or a system shall be limited to the following:

   1. A maximum of two decals, stickers, or the like, not to exceed 6" in any dimension (length or width) per sponsor.

V. D. 2. A maximum of two lettered phrases not to exceed 3" in height or 18" in length per sponsor.

3. Any other form of ad, a maximum of two per sponsor, not to exceed a 6" square area.

No sponsor shall make use of more than one of the above choices.

E. Advertising of industrial sponsorship or the use of supplied components via any other media must be reviewe and approved by the EEV Coordinating Committee in writi prior to such distribution or presentation, unless ment of such sponsorship or support takes place during a spe fic interview that is clearly in the interest of the entrant school and the Energy Efficient Vehicle Competi

F. Promotion of related components by sponsors is expressl prohibited on entrant campuses.

G. Any infringement of these rules subjects the team to possible disqualification from the competition.

VI. VEHICLE CONSTRAINTS

All entrant vehicles must adhere to the following constrain

A. Vehicle must be driveable by one person.

B. Must have fully enclosed passenger compartment with a rollbar or equivalent protection and a minimum capacity of two persons. Tandem arrangements will not be allowe

C. Must satisfy all current inspection and registration re quirements of the State of Michigan (possible site of final testing).

D. Must be equipped with operational headlights, windshiel wipers, heater, defroster, tail lights, back-up lights, turn signals, brake lights, and seat belts or equivalen passenger restraint systems. Some form of functional spare tire and changing tools must be stored in the veh

E. Must have front and rear bumpers located between 16" an 20" high measured from the level ground on which the vehicle is resting.

F. Must have minimum range of 50 miles at 45 mph.

G. All passengers must be safely protected from hazards involved with the system's operation.

VI. H. Must be able to decelerate from 45 mph to 0 in a maximum of 121 feet.

I. Vehicle tire pressure must not exceed manufacturer's maximum standards. Tire pressure may not be varied for individual tests.

VII. SCORING

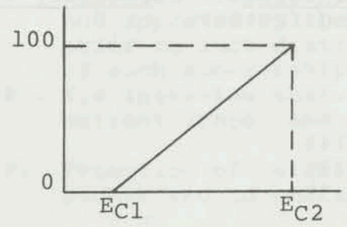
Categories	Individual % of Total (weighing factor)	Category % of Total
Energy Efficiency		40%
1. Dynamometer	14%	
2. Highway Test	21%	
3. Space Utilization	5%	
Safety		17%
1. Braking	7%	
2. Subjective Safety Eval.	8%	
3. 5 mph Bumper Test	2%	
Driving Response Test		12%
1. Handling	7%	
2. Acceleration	5%	
Driveability and Overall Design		11%
Endurance Run		10%
Emissions		5%
Cost to Consumer		5%
	TOTAL	100%

Maximum possible score for each test is 100 points.

VIII. SCORING CRITERIA AND TEST METHODS

Energy Efficiency

1. The Dynamometer Test will be run on each vehicle with a load corresponding to the vehicle's maximum passenger capacity. Since the vehicle dynamometer time will be used to best advantage by measuring both emissions and efficiency simultaneously, the standard combined (city/highway) cycle will be utilized. Only the city portion data will be used for this efficiency test, so that the results will represent the vehicle's "city" energy efficiency performance.



E_{C1} = Average of lowest 5% city efficienc

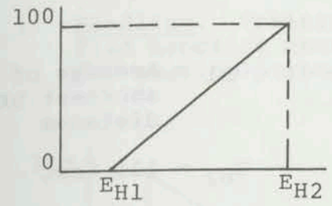
E_{C2} = Average of highes 5% city efficienc

2. The Highway Test will be run on a course selected by th Committee to simulate highway driving. The driver and one observer will be required to complete at least 50 m at an average speed of 45 mph for this test. In order gain a more accurate measurement of test performance, a entries will be encouraged to complete an additional 50 miles (100 miles total), or as much as the vehicle's ra allows (over the required 50 miles). Vehicle speed dur this test must not drop below 40 mph at any time follow initial acceleration. The observer's functions will be insure that a minimum speed of 40 mph is maintained, an that the driver follows conventional highway driving pr tices, e.g. normal acceleration to speed, no coasting, The vehicle will be fueled and/or charged immediately p to and directly following this test, and energy consump thereby obtained. The results of the dynamometer and h way tests will be adjusted for various vehicle passenge capacities according to the following schedule:

Adjusted Value = Measured Value x S_f

where:		
	2 passengers	Sf = .7
	3 passengers	Sf = .85
	4 passengers	Sf = 1.0
	5 passengers	Sf = 1.1
	6 passengers	Sf = 1.2

NOTE: We are developing a system for evaluating energy efficiency so that all vehicles including those usin non-heat engine and non-petroleum based fuels will b evaluated on an equitable basis. Details on this procedure will be sent at a later date.

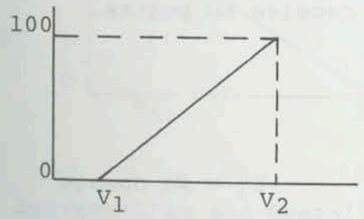


E_{H1} = Average lowest 5% highway efficiency

E_{H2} = Average highest 5% highway efficiency

3. Space Utilization. Any and all allotted passenger space will be excluded from this test. Those areas considered to be storage space must be protected from any detrimental environmental conditions such as weather, extreme vibration, engine heat or shock. Capacity will be determined by filling the space with cubes of volumes: 1/2 ft^3, 1 ft^3, 2 ft^3, and 4 ft^3. Volumetric weighing values will be assigned to the cubes as follows:

1/2 ft^3 . . . 1	1 ft^3 . . . 3
2 ft^3 . . . 7	4 ft^3 . . 15

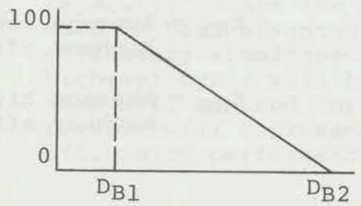


V_1 = Average lowest 5% volumetric weighing factor

V_2 = Average highest 5% volumetric weighing factor

Safety

1. Braking Test. Vehicles will be required to perform a 45-0 mph "panic" stop. The distance required will be measured and used as the scoring criteria. Control will be included as part of the test as drivers will be required to brake between two parallel rows of cones, set apart a distance corresponding to an average lane width. The vehicle will be disqualified if any cones are knocked over or displaced. Two trials will be allowed.

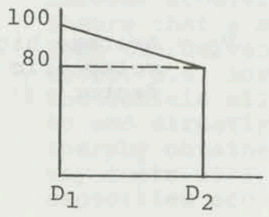


D_{B1} = Average of 5% shortest braking distance

D_{B2} = 121 feet

2. Subjective Safety Evaluation. A safety score will be awarded by a panel of experts from inside and outside the automotive manufacturing industry. The panel will base their decision on examination of the vehicle and i plans, interviews with the student design team, and non- destructive testing. Guidelines for awarding points wi be provided by the Committee.

3. Optional 5 mph Bumper Test. The front and rear of the vehicle will impact a collision barrier at a height of 16 to 20 inches above level ground. The score will be determined by the extent of the damage (repair cost) sustained by the body or structure of the vehicle. Dama greater than $50.00 will receive no points.

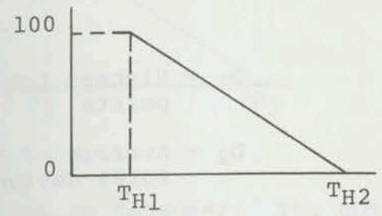


D_1 = No damage

D_2 = $50.00 damage

Driving Response Test

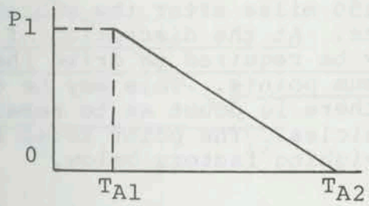
1. Handling. Vehicles will make two runs through a specified handling course, with the fastest time to be used for scoring purposes.



T_{H1} = Average of 5% shortest handling times

T_{H2} = Average of 5% longest handling times

2. Acceleration. Times for 0-50 mph and 25-55 mph accelerations will be measured with the 0-50 time counting 60% of total, the 25-55 time counting the remaining 40% towards a total possible score of 100 points.



P_1 = Maximum points assigned to test

T_{A1} = Average of 5% shortest acceleration times

T_{A2} = Average of 5% longest acceleration times

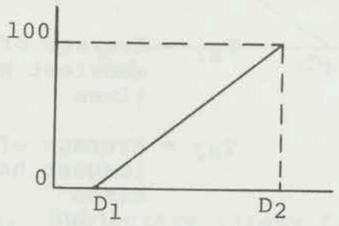
Driveability and Overall Design (professional test drivers used)

This group will contain both objective and subjective tests. Each item will be rated 0 to 6, except the overall vehicle rating which will be 0 to 16. The test is divided into the following sections:

1. Ingress and egress
2. Visibility
3. Accessibility of controls
4. Spare wheel and jack location
5. Control and convenience responsiveness
6. Ease of control
7. Noise
8. Ease of maintenance
9. Ease of starting
10. Ease of operation of passenger restraint system

11. Instrument arrangement
12. Seating comfort
13. Directional stability
14. Ride
15. Overall vehicle rating

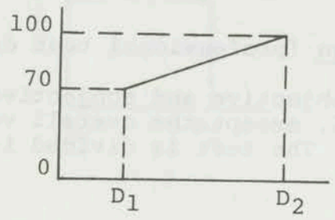
Maximum Score: 100 Poin



D_1 = Highest total desig points

D_2 = Average of 5% lowes total design points

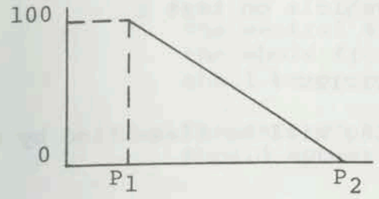
Endurance Run. Each vehicle will be required to travel a minimum of 100 miles at an average speed of 45 mph to be eligible for endurance points. Maximum points will be awar for a demonstrated capability of 250 miles at an average sp of 55 mph. This capability may be demonstrated by showing fuel reserve of at least 150 miles after the vehicle has actually traveled 100 miles. At the discretion of the Committee, the vehicle may be required to drive the entire 250 miles to receive maximum points. This may be done, for instance, in cases where there is doubt as to remaining ene reserve, i.e. electric vehicles. The point total will be weighed as shown by the weighing factors below.



D_1 = 100 miles

D_2 = 250 miles

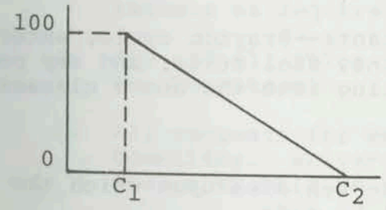
Emissions Test. Emissions as measured from the exhaust of the vehicle must not exceed 1980 Federal Emission Requiremen for NO_x, CO, and unburned hydrocarbons. Vehicles exceeding these standards will receive no points for the emissions te The scoring will be effected by adding the emissions from t vehicle exhaust to standardized values for federally regulat pollutants due to applicable fuel or energy production to y a total emissions value.



P_1 = Average of 5% lowest adjusted emissions

P_2 = Average of 5% largest adjusted emissions

Cost to Consumer. The consumer's cost, f.o.b. the factory, will be estimated by a panel of production experts based on identical costs for labor and materials for 100,000 units. Maximum points will be awarded to a vehicle costing less than the cost of the lowest priced American manufactured four passenger vehicle at the time of the competition.



C_1 = Cost of lowest price American-made 4 passenger car

C_2 = Average cost of 5% highest priced entries

Student Innovation Multiplier. This scoring multiplier is an attempt to evaluate the amount of student design, innovation, or modification present in the vehicle. Student modification of commercial systems must improve performance over that claimed by the manufacturer to receive credit as student innovations. Each team will be judged by the competing teams and the results averaged. The point assignments, by increments of 0.1 for each category, will be as follows:

1.	Power plant	.4	3b.	Safety, ext.	.1
2.	Drive train	.3	4.	Suspension	.1
3a.	Safety, int.	.1	5	Overall design	.2

Determination of Score. An entrant vehicle's total score will be determined as follows:

$$\text{SCORE} = M\ (w_1\ s_1 + \ldots . \ w_{12}\ s_{12}) = M\ \Sigma\ w_i\ s_i$$

Where: M = SI Multiplier

w_i = weight assigned to each scoring area

s_i = score obtained by vehicle on test i

IX. VEHICLES PERMITTED IN THE COMPETITION

Every vehicle at the final testing will be classified by cla or category.

A. Entry classes

Class I: Internal combustion engine (ICE), including those vehicles using diesel, gasoline, kerosene, natural gas, and other liquid, gaseous and fluidized fuels.

Class II: Hybrid--a combination of two or more onboard energy conversion/storage techniques (e.g. ICE engine--generator and batteries).

Class III: Pure electric.

Class IV: Exotic power plants--Brayton cycle, external combustion engine, fuel cells, and any power plants not fitting into the above classes.

B. Categories

1. Entrant vehicles: those vehicles upon which the test will be made.

2. Support vehicles: those vehicles that are present fo the support of entrant vehicles.

3. SCORE vehicles: those vehicles operated by SCORE personnel or their representatives.

C. All vehicles must adhere to the following rules:

1. Industrial participation and advertisement guidelines as established in Rules V , Sections D, E, F, and G.

2. Each vehicle must be listed on an official list of team vehicles to be submitted prior to the competition.

D. All EEV areas will be defined by the Committee, which may exclude any vehicle or person from a test area or other EEV areas.

IX. E. Vehicle Lettering. Must be displayed as follows:

1. On both sides of the vehicle an area 9 inches square must be reserved for entrant numbers to be affixed.

2. The central area of both sides of the vehicle (e.g. the whole front door area by present-day designs) shall be reserved in its entirety for the Committee.

3. The name of the affiliated educational institution should appear on the rear portion of the vehicle.

X. PROTEST WAIVERS AND VEHICLE REPAIRS

A. All requests for vehicle retest must be made in writing to the Committee immediately after the test is completed. Each protest will be judged on its individual merit. Each team is limited to a maximum of three requests for the entire competition and to one retest request on any one test. The Committee will have the final word in these matters.

B. The Committee may, on its own initiative, order as many retests as required to obtain accurate results.

C. Any and all rules interpretation will be done solely by the Committee.

D. All requests for waivers should be given directly to the Committee. Waivers will be granted if the Committee rules that they will be in the best interest of the competition.

E. Vehicles may not be repaired during the competition without first notifying the Committee as to the nature of the repairs.

F. The Committee will assess penalty points for repairs if they consider the repairs an unfair enhancement of the entrant vehicle.

G. The infraction of any of these rules will result in disqualification or other appropriate action. All such decisions will be made by the Committee.

APPENDIX I

Definitions:

Passenger Capacity. Passenger capacity shall be defined as the total number of places within the vehicle assigned as seats for the vehicle's driver and passengers, each of which must: (1) provide adequate leg, hip, elbow, shoulder, and headroom for comfortable seating and ease of movement; (2) be equipped with a passenger restraint system which meets or exceeds all pertinent 1980 U.S. Federal Standards.

APPENDIX II

S I CONVERSIONS

16"	40.64 cm
20"	50.80 cm
121 ft.	36.88 m
50 miles	80.45 km
100 miles	160.9 km
250 miles	402.25 km
5 mph	8.05 km/h
25 mph	40.22 km/h
40 mph	64.36 km/h
45 mph	72.40 km/h
50 mph	80.45 km/h
55 mph	88.5 km/h
1/2 ft^3	.01416 m^3
1 ft^3	.02932 m^3
2 ft^3	.05663 m^3
4 ft^3	.1133 m^3

CALENDAR OF EVENTS

April 29, 1978	April 29, 1978	July 1, 1978	October 15, 1978
Design Proposal Due	Symposium I	Progress Report 1 Due	Progress Report 2 Due Team Update Due
November 1, 1978	January , 1979	March 15, 1979	July 1, 1979
Deadlines for Late Entries	Symposium II	Progress Report 3 Due Team Update 2 Due	Final Reports Due Team Update 3 Due

August, 1979

FINAL TEST EVENT

ENERGY EFFICIENT VEHICLE COMPETITION

TEAM ENTRY FORM

SECTION I Affiliation

Name of Institution _____

Name of Authorizing Official _____
(President, Dean of Engineering, Dept. Head)

Signature of Authorizing Official _____ Date _____

SECTION II Faculty Advisor(s)

Name(s) _____

Position(s) _____

Address(es) _____

SECTION III Team Roster

Name of Student	Year In School	Major	Area(s) of Project Participation	Home Town and Newspaper

SECTION IV Project Idea

TEAM PARTICIPATION LOG

University: _____

Team No.: ____

Name	Address	Tel. #	Major	Dates of Participation Begin Date	End Date	Area of Responsibility

ENERGY EFFICIENT VEHICLE COMPETITION

DESIGN PROPOSAL OUTLINE

I. Abstract

Give a brief overview of the nature and design objectives of the vehicle that you plan to build. The information contained within these few paragraphs should be structured so as to be suitable for use in our newsletters and press releases.

II. System Descriptions

This section should contain a general qualitative description of the vehicle. Give an in-depth summary of the proposed design including separate descriptions of the following systems and related components:

1. Interior and exterior design
2. Power plant
3. Drive train
4. Frame and suspension
5. Safety--interior and exterior
6. Emission controls
7. Other noteworthy systems or subsystems

NOTE: Be sure to include descriptions of all innovations in your design in this section.

III. Illustrations

A. Artists renderings (if available). Renderings are a very efficient means of conveying your ideas. Experience has shown that they also make very effective tools in the solicitation of funding.

B. Engineering drawings. Engineering drawings are necessary in the evaluation of your design proposal. Although no rigid specifications are set forth, an effective presentation will require enough drawings to completely describe your vehicle. Included should be dimensioned drawings (including cutaways) of the interior and exterior of the vehicle showing the locations of all major systems, subsystems, and innovative components.

IV. Vehicle Operation

A. Routine operation. This section should contain a description of routine driving procedures (e.g. vehicle range,

special driving cycles or procedures, fueling procedures, etc.)

IV. B. Vehicle Maintenance. Include a description of maintenance procedures along with a projected routine maintenance schedule.

V. Prototype Construction Estimate

This section should contain a realistic detailed estimate of the production cost of your prototype. Following the estimate, include a list of any donations of materials and/or funds that have been promised or received.