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INTRODUCTION

Kansas State University

Kansas State University was founded in February 1863 as a land-grant institution under the Morrill Act. It has evolved into an internationally recognized comprehensive university. Kansas State University offers excellent academic programs, a lively intellectual and cultural atmosphere, and a friendly campus to its community of approximately 17,500 undergraduate and 3,500 graduate students.

The 668-acre main campus is in the northeastern Kansas community of Manhattan. Manhattan is approximately fifty miles to the west of the state's Capital of Topeka and eighty-five miles west of Kansas City. For reference purposes, a state map is provided above. The university offers more than 200 undergraduate degree programs and options, 60 master's degree programs, and 42 doctoral programs within its eight colleges: agriculture, arts and sciences, architecture and design, business administration, education, engineering, human ecology, and veterinary medicine.

K-State accomplishments have had extensive effects: astronaut space gloves and the water-purifying system used on the NASA space shuttles were developed here; two Kansas Centers of Excellence, one in manufacturing and one in value added research are located on campus; the University has national hazardous substance and atomic physics research programs; the Konza Prairie Research Natural Area is used for a National Science Foundation ecological research study on erosion and prairie mammals; and a major national center for basic cancer research is at K-State.

Paul Harvey, in a special commentary, labeled Kansas State University the "student scholar capital
of the world." This statement was made based on the number of Rhodes, Truman, Fulbright, Mellon, Goldwater, Phi Beta Kappa, Rotary International, Javits, Tilden-Snow, and Marshall scholarships awarded to K-State students over the past sixteen years.

**College of Engineering**

The College of Engineering at Kansas State University has excellent programs in every aspect of engineering. The college has an enrollment of 2,600 undergraduates and 300 graduate students. K-State offers degrees or options in almost every major field of engineering, including aerospace, agricultural, architectural, biomedical, chemical, civil, computer, construction science, electrical, engineering technology, industrial, manufacturing, mechanical, and nuclear.

Kansas State's College of Engineering is recognized nationally for the quality of both its students and faculty. Approximately half of all K-State's National Merit Scholarship finalists enroll in the college.

For six consecutive years, one or more K-State students have been selected for Washington, D.C. internships in the Engineering Program. Each year WISE selects a group of only 14 to 16 engineering students from more than 200 engineering colleges across the nation. These students work on engineering and technology public policy issues.

Ray Dempsey, a senior in industrial engineering, was selected as the 1989-90 outstanding black engineer by the National Society of Black Engineers.

K-State's College of Engineering is one of 10 colleges in the country to be cited twice by the National Society of Professional Engineers for its outstanding professional programs. The chapters of the departmental professional sectors have received national recognition. Most recently, agricultural engineering, civil engineering, and construction science have been designated as the outstanding student chapters in the nation.

**Kansas Electric Utilities Research Program**

Formed on July 15, 1981, the goal of this program is to undertake applied research and development projects that may enhance reliability and minimize the cost of electric service in Kansas. The Kansas Electric Utilities Research Program (KEURP) is a contractual joint venture between seven major electric utilities that serve the residents of the State of Kansas:

- KPL, A Western Resources Company, Topeka, Kansas
- Kansas City Power & Light Company, Kansas City, Missouri
- KG&E, A Western Resources Company, Wichita, Kansas
- WestPlains Energy, Great Bend, Kansas
- The Empire District Electric Company, Joplin, Missouri
- Midwest Energy, Inc., Hays, Kansas
- Sunflower Electric Power Corp., Hays, Kansas
The establishment of KEURP was made possible by the Kansas Corporation Commission (KCC). KCC allowed Kansas electric utilities to include research and development (R&D) costs in their operating expenses, including dues to the Electric Power Research Institute (EPRI).

Kansas' universities play a unique role in KEURP with representation on the executive, technical and advisory committees of the program. The universities receive significant direct and indirect support from KEURP through direct-funded projects as well as KEURP/EPRI co-funded projects. KEURP is working with EPRI researchers on projects to develop or expand Kansans' knowledge and expertise in the fields of high technology and economic development. KEURP is a major source of funding in the electric/hybrid vehicle demonstration program.

**ICE Corporation**

ICE Corporation is an original equipment electronics manufacturer. Seventeen employees produce solid state and microprocessor control systems for the aircraft, agriculture, and oil industries. Complete design and manufacturing facilities are located in Manhattan, Kansas. ICE continues its efforts on research, design, development, and production of AC and DC motor controller systems. Products are used in a number of different industries from assisting the disabled in achieving a higher quality of life, to advancing the state of robotics, to assisting industries in specific motorized applications.

ICE Corporation continues its work on high technology power switches. ICE designed and developed high power switches and is working with a number of companies to provide specific applications for this product. ICE is committed to assisting K-State's electric vehicle program in vehicle demonstrations, research, testing, and evaluation of product. ICE provided a letter of commitment for $2,000.00 per year for the five year contract as a cosponsor to the Department of Energy's Site Operator Users Task Force.

**Hancock Electric Motor, Inc.**

Hancock Electric Motor (HEM) is one of the largest electric motor repair facilities in the state of Kansas. The shop facilities in Lyons, Kansas, contain a welding shop (metalizing, welding, and chroming facilities), a machine shop (500 ton horizontal press, 250 ton vertical press, horizontal boring machine, and a 60-inch engine lathe), dynamic balancing, vacuum pressure impregnation system, and capabilities to rewind electric motors with 13,200 volt 10,000 horsepower ratings. AC motors, DC motors, synchronous motors and generators, pumps, traction motors, locomotive main generators, alternators, generators, semihemetic motors, and haul truck wheel motors are all within the realm of HEM's repair capability. Further impedance testing can be done with the 750KVA core loss tester. Labor rates run $40/hour with design and consulting costs at $75/hour plus expenses. HEM is committed to helping KSU in EHV demonstration, research, testing, and evaluation and has provided a letter of commitment for $2,000.00 per year for the life of DOE's
contract. HEM has recently taken steps to allow production of electric vehicles to meet growing market demands within the Midwest region.

EHV Corp

EHV Corp is a Kansas Company specializing in manufacturing infrastructure components for the electric vehicle industry. The home office of EHV Corp is located in Manhattan, Kansas. Manufacturing of electrical and mechanical parts is accomplished by other companies while EHV Corp is primarily concerned with the research and development of new products and the assembly of existing products. EHV Corp has received an economic development grant from the state of Kansas for development of its EDD-7 charging station. Further, EHV Corp has developed proposals to DOE and EPRI concerning its products. EHV Corp recently delivered its first meter for testing by a governmental laboratory. EHV Corp is hoping to establish a national demonstration program for curbside recharging within the next twelve months. This project would involve the Federal Government, Underwriters Laboratory, and major utilities in establishing curbside charging stations in major urban centers. EHV Corp has provided a letter of commitment for $10,000.00 to establish this national demonstration program.

Advanced Manufacturing Institute

The Advanced Manufacturing Institute (AMI) was established to promote technology transfer in the state of Kansas. AMI's goal is to develop and transfer new technology to commercial manufacturers. This Center of Excellence, located in the College of Engineering, is funded by the Kansas Technology Enterprise Corporation that derives its funding through the state lottery system. AMI strives to increase economic development through research and technology transfer in advanced areas of manufacturing technology. The institute's objectives are to help Kansas companies by working with them to expand services, design new products, and increase productivity. Special emphasis is given to the needs of smaller companies.

KPL, A Western Resources Company

Kansas Power and Light Company is part of Western Resources. Western Resources supplies electricity and natural gas to most of Kansas and portions of Missouri and Oklahoma. Although KPL provides funding to K-State's electric vehicle program through its membership in KEURP, it provides additional funding directly to K-State in support of electric vehicle programs. KPL has been involved with K-State during the last fifteen years in providing support for electric vehicles. KPL engineers are working with K-State to develop a national demonstration program to evaluate infrastructure technology for electric vehicles.
PROGRAM PLAN
Statement of Objectives

Short Term Goals (1 year)

1. Participate in the Department of Energy's Site Operator Program.
2. Evaluate Electric/Hybrid Vehicle technology through purchase of vehicles.
3. Collect user data and develop historical perspective on vehicle requirements.
4. Provide reports to DOE and KEURP on EHV data collected.

Long Term Goals (5 years)

1. Assist the nation in reversing environmental trends concerning air quality.
2. Establish Kansas State University as a national site for testing, evaluating and reporting on new technology electric and hybrid vehicle technology.
   a) Site will test vehicles through accelerated life use.
   b) Site will determine long range reliability through dedicated testing.
   c) Site will determine life cycle cost of such vehicles.
   d) Reports will be generated for fleet manager use in determining “buy decisions”.
   e) All testing will be done in "real-time" to ensure meaningful data is collected.

Kansas State University, with funding support from federal, state, public, and private companies, is participating in the Department of Energy's Electric Vehicle Site Operator Program. Through participation in this program, Kansas State is displaying, testing, and evaluating electric or hybrid vehicle technology. This participation will provide organizations the opportunity to examine the latest EHV prototypes under actual operating conditions. KSU now has two electric cars. Both are electric conversion vehicles from Soleq Corporation out of Chicago. KSU in conjunction with KEURP also initiated procurement for the purchase of four (4) Chevy S-10 pickup trucks. Since the supplier, GE-Spartan, canceled its effort concerning the production of vehicles other appropriate sources were sought. Today, K-State and the Kansas Utilities are working with Troy Design and Manufacturing (TDM), Redford, Michigan. TDM is working with Ford Motor
Company and expects to become the first certified electric vehicle Quality Vehicle Modifier (QVM). Kansas State has entered into an agreement to assist TDM in supporting the infrastructure and technical manual development for these vehicles.

The Soleq EVcorts have not been signed to illustrate to the public that it is an electric vehicle. Magnetic signs have been made for special functions to ensure sponsor support is recognized and acknowledged. As soon as TDM’s Ford Ranger electric vehicles are delivered they will be used throughout the state by utility companies that are participating with K-State's Site Operator Program.
SIGNIFICANT EVENTS/MEETINGS/PUBLICITY

PRESENTATIONS

First Quarter

August 17-23  Department of Natural Resources  Sedalia, MO
Kansas City Power & Light, assisted by two K-State students, Jill Dirksen and Rod Urbanek, transported a Soleq EVcort to Sedalia, Missouri for display at the Missouri State Fair. The Missouri Department of Natural Resources provided a variety of educational exhibits for the public. Among these displays were ways that individuals, cities, and governments can work to protect the environment in which we live. The event was well organized and the public showed significant interest in the Soleq EVcort.

Second Quarter (scheduled)

October 11  Shawnee Heights High School  Shawnee, KS
The Shawnee Heights High School’s advanced physics class visit will view K-State’s electric vehicle and be given a presentation on the activities surrounding the university EV program.

MEDIA EVENTS

First Quarter

None Scheduled

Second Quarter (scheduled)

October 11  Electric Vehicle Plant Ground Breaking  Manhattan, KS
Troy Design and Manufacturing of Redford, Michigan, is scheduled to break ground for a new multi-million dollar alternate fuel vehicle plant to be built during the next six months. Initially the plant will focus on the manufacturing of Ford Ranger electric vehicles but once production lines have been established for that product it is TDM’s plans to produce natural gas vehicles in this plant.

MEETINGS

First Quarter

July 3  TDM Corporate Overview  Redford, MI
Jim Hague, representing Kansas State University’s EV program, met with Bill
Coppola, Managing Director of Troy Design and Manufacturing’s Electric Vehicle Programs. Discussions were held concerning possible “joint efforts” in producing and supporting a state of the art electric vehicle. Professor Hague toured TDM’s manufacturing facilities. Professor Hague met with Mr. William “Bill” Roberts, President of Troy Design and Manufacturing, to discuss present and future opportunities.

July 7 - 9  
**TDM Visit to K-State, City of Manhattan**  
Manhattan, KS  
Bill Coppola, Managing Director of Troy Design and Manufacturing’s Electric Vehicle Programs met with Kansas State University’s President and Vice-Presidents to discuss opportunities. “Team approach” is defined by all parties with an agreement to move forward in an aggressive manner with the desire to have TDM build an electric vehicle plant in Manhattan, Kansas.

July 25  
**KEURP EV Planning Meeting**  
Topeka, KS  
Jim Hague met with the KEURP EV planning committee and discussed possible opportunities with Troy Design and Manufacturing siting a Alternate Fuel Test, Evaluation, and Production Center in Manhattan, Kansas. KEURP’s EV committee supported Kansas State University’s efforts. KEURP was the first agency to step forward and make a financial commitment to support the research required to make this project a reality.

August 22  
**TDM Visits Manhattan**  
Manhattan, KS  
Mr. & Mrs. William Roberts and Mr. and Mrs. Bill Coppola meet with the Manhattan Chamber of Commerce and the City of Manhattan to define the needs of TDM in building a plant in Manhattan, Kansas.

September 6  
**TDM Notifies City of Manhattan**  
Manhattan, KS  
Troy Design and Manufacturing notify the State of Kansas, the City of Manhattan, and Kansas State University that TDM will build an electric vehicle plant in Manhattan, Kansas. Expected opening of TDM’s plant will be late first quarter 1996 or early second quarter 1996.

September 7  
**KEURP EV Advisory Meeting**  
Topeka, KS  
KEURP representatives met with KEURP’s executive committee to discuss and vote on support for the TDM Alternate Fuel Test, Evaluation, and Production Facility to be built in Manhattan, KS. The executive committee agreed to support the Kansas State University effort to bring this advanced technology opportunity to Manhattan and more importantly to the State of Kansas.

September 12  
**Kansas State University**  
Manhattan, KS  
President Jon Wefald held a press conference at Kansas State University to announce TDM’s decision to build an electric vehicle plant in Manhattan, Kansas. TDM also brought copies of the announcement that was issued through Automotive News.
Second Quarter (scheduled)

October 5  Senator Bob Dole Meeting  Washington, D.C.
Senator Bob Dole is scheduled to meet with representatives from Ford Motor Company, Troy Design and Manufacturing, and Kansas State University to discuss the new Alternate fuel technology and vehicle production facility in Manhattan, Kansas.

October 12  City of Manhattan  Manhattan, KS
The Chamber of Commerce has scheduled a series of meetings with Troy Design and Manufacturing. The opportunity to site a future natural gas production facility in Manhattan will be the topic of discussion.
Soleq EVcorts
The first EVcort, VIN 1FAPP15JXPW125411, which will be referred to by the Department of Energy's electric vehicle ID number 151, was delivered May 13, 1993. The second EVcort, VIN 3FAPP15J9PR106495, which will be referred to by the Department of Energy's electric vehicle ID number 152 on all the maintenance reports, was delivered to Kansas State University December 21, 1993.

Soleq vehicles have performed in a routine manner during this reporting period.

### CONTRACT YEAR FIVE

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TABLE 1. EVcort (151) OPERATION SUMMARY

Assuming a price of $.056/Kwh for electricity, and 25 miles per gallon for an internal combustion engine 1993 Ford Escort, the cost of operating the EVcort on electricity equates to $.853 per gallon of gasoline.

On Friday, September 22, Soleq EVcort, DOE number 151, experienced a total loss of power when the 400 ampere fuse in the front battery tray failed. Since this fuse completes the series connection for all eighteen batteries, operation of the car was impossible. It should be noted that the ampere meter located in the console regularly displays current readings of more than 450 amperes and sometimes even 500 amperes during full acceleration. These repeated conditions would cause the fuse to be subjected to currents beyond normal average ratings and could exceed peak ratings at certain points in time. Soleq was notified of the problem and two possible actions are possible: (a) adjust the vehicle’s motor controller to ensure future average currents would be limited to less than 400 amperes or (b) increase the rating of the fuse. Since the vehicle has been driven 7,000 miles with little or no limitations, it is now planned to replace the fuse with the same rated fuse and observe the conditions. This vehicle also had its two front tires replaced during this quarter. The existing “stock” tires had exposed steel belts showing when they were replaced. The Goodyear tires installed have an increased load rating and have already demonstrated better performance than the stock tires.
TABLE 2. EVcort (152) OPERATION SUMMARY

Assuming a price of $.056/Kwh for electricity, and 25 miles per gallon for an internal combustion engine 1993 Ford Escort, the cost of operating the EVcort on electricity equates to $.91 per gallon of gasoline.

NOTE: EVcort, DOE number 152 has operated without incident during this reporting period.
INFRASTRUCTURE

Charge Stations
Kansas State University continues its work with EHV Corp and KEURP in the area of infrastructure development. EHV Corp recently announced a sale of additional stock to a Venture Capital group and a Joint Venture with unspecified partners. EHV Corp is working with an automotive firm on a “new style” charge station for both public and home use. These units are expected to be Underwriters Laboratory certified. EHV Corp will offer the first produced unit to Idaho National Laboratory for testing, evaluating, and operational acceptance if the laboratory remains interested in this effort.

Recently, the Electric Vehicle Research Network (EVRN), as part of a National Electric Power Research Institute demonstration program for electric vehicles, contacted Kansas State University to request EHV Corp provide custom smart cards for the EVRN charge stations. The participants in the EV Charge station project are:

- Boston Edison Company, Boston, Massachusetts
- Centerior Energy, Cleveland, Ohio
- Duke Power, Charlotte, North Carolina
- Georgia Power, Atlanta, Georgia
- New York State Electric & Gas, Binghamton, New York
- Salt River Project, Tempe, Arizona
- Tennessee Valley Authority, Chattanooga, Tennessee

These companies are evaluating both inductive and conductive charge stations in demonstrating electric vehicle technology to the public in their region. Because K-State’s work with EHV Corp led to the first commercial charge station using advanced smart card technology (microprocessor based “chip cards”), these utility companies are also evaluating advanced billing systems that are expected to revolutionize the way Americans pay bills in the not too distant future.

Billing Systems
Kansas State University, as part of its effort to evaluate infrastructure for electric vehicles, has been looking into billing systems and how they would apply to advanced technology alternate fuel vehicles. As research progresses, information has been gathered from several countries involved with advanced billing systems and they include France and Canada. Billing systems are being evaluated on the merit of “fitting” and growing with the United States present day “credit card” system. It now appears that in the next three to five years smart card technology will replace credit cards as the card of choice. Kansas State University wants to evaluate and expand the opportunity for the use of smart card applications in the alternate fuel vehicle and utility industry. A company, IEM, Inc has been formed in Manhattan, Kansas and secured orders for the first 500 smart card readers to be used in a non electric vehicle but retail application. IEM, Inc is working with EHV Corp and its partners to ensure smart cards will be used on new charge station designs and in the new facility being built by Troy Design and Manufacturing. Additional pilot projects are being
considered to integrate smart card technology. K-State, along with its utility participants, is looking forward to implementing this advanced billing technology into the American marketplace.
PROCUREMENT OF NEW VEHICLES

**Ford Ranger EV Vehicles**
The Kansas Electric Utilities Research Program, in participation with the Department of Energy's Site Operator Program, has ordered four Ford Ranger EV vehicles from Troy Design and Manufacturing. The first vehicle is expected to be delivered around December 1, 1995 with three additional vehicles to be delivered April 1, 1996.
SUMMARY/CONCLUSION

To date, much of the same electric vehicle technology has been in the market place for the past three years. National attention and Government agencies tend to focus on mandates and policy rather than on assisting key segments of the market to develop quality products. The Site Operator Task Force was circumvented in its efforts to work with manufacturers when EV America, consisting of some of the same membership as the Site Operator Task Force, decided to focus efforts on testing and certifying vehicles for purchase. Clearly, Kansas State University's Program Manager does not believe this should be the role of the utilities or the Department of Energy in working to bring advanced technology vehicles to the market. In fact, as all participants in the President's Federal Fleet Conversion Task Force recognized, it is the proper role of automobile manufacturers to produce or certify other manufacturers to produce "niche market" vehicles. Kansas State University, the State of Kansas, and Kansas Legislators maintain their position of "fuel neutrality" and in assisting the automobile industry to bring out viable automobile technology. This theme is in consonance with the President's Federal Fleet Conversion Task Force's recommendation to have the Big Three certify manufacturers through the Quality Vehicle Modifier (QVM) process.

The market is waiting for QVM's or the Big Three to develop and offer for sale "sound technology" vehicles at a reasonable price. When this occurs, the market will "pull" the technology into it. Automobile manufacturers will then see market growth and therefore will be willing to dedicate more resources to producing additional products. The approach now being promoted by government and some non-profit organizations is to "push" the technology into the market requiring large sums of money to set up "high risk segmented sites" to test advance vehicle technology for its feasibility. In the past year, the Department of Energy has participated in the expenditure of large sums of money to test limited production vehicles. In fact, many of the vehicles being tested have no potential for large scale production without the infusion of large sums of additional cash. The automobile industry recognizes that it takes a minimum of $3,000,000 to bring a vehicle from concept to "one off" production and it takes an additional commitment of $70,000,000 to $100,000,000 to actually bring a single vehicle model into full scale production. It may be easy for some to attack the American automobile industry for lack of alternate fuel vehicle product but, it is very difficult to find anyone outside the car industry willing to "put up" the kind of cash it would take to bring a viable alternate fuel vehicle to the market. Instead of "fighting" the existing process, the non-profit organizations and government should analyze how they can partner with the automobile industry to ensure "program success."

The State of Kansas, the City of Manhattan, and Kansas State University will continue to promote programs and activities that have the highest likelihood of success at the minimum cost. Hopefully, as our partnership demonstrates success, some of the opposing forces will combine with our team to work towards a long term viable personal transportation system solution.
ADDENDUM
ARTICLES FROM

THE MANHATTAN
MERCURY
&
THE KANSAS STATE
COLLEGIAN
City to hear proposal for cutting-edge company

Electric-engine firm would be located in city’s industrial park

Todd Manning and Joe Bathke
Staff Writers

The Economic Development Opportunity Fund Advisory Board and the City Commission have each scheduled special meetings this week to review a proposal that, according to two sources, would bring a company that installs electrical engines in trucks to the Manhattan industrial park.

The proposal appears to fall directly in line with the city’s goal for the economic development fund that was established this year. The out-of-state company would provide 50 jobs its first year in an emerging high-technology industry and work closely with Kansas State University, the sources said.

Randy Martin, president of the Manhattan Chamber of Commerce, would not reveal the nature of the company or its name. He did say, however, that representatives from the company have visited Manhattan several times and added: "The hint I would give you is watch the automotive news."

Mayor Edith Stunkel, when reached at her home, refused to provide details of the special meetings.

The special Economic Development Opportunity Fund Advisory Board meeting is scheduled for 9:30 a.m. Wednesday in the Riley County Commission Room at 110 Courthouse Plaza. The special City Commission session is scheduled for later that evening at 7 at the Riley County Seniors’ Service Center, 412 Leavenworth.

The city announced the meetings in a memo released to media organizations and others Saturday. A press conference also is scheduled for Wednesday morning.

Martin said the purpose of the commission meeting Wednesday would be to vote on recommendations that emerge from the advisory board meeting that morning. Among the items the city commission may take up at its meeting are proposals for industrial revenue bonds, land purchase, tax abatements and revenue from a half-cent city sales tax for economic development, Martin said.

Sources involved in area economic development said the trucks, manufactured by a well-known national car builder, would arrive in Manhattan absent their regular fossil fuel-powered engines, but otherwise complete. The company would then install the engines and market the trucks to cities such as Los Angeles where efforts to scale back automobile emissions through the use of alternative energy sources are increasing.

Martin said the company would work closely with officials at Kansas State University. The company was lured to Manhattan by a KSU faculty member, he said.

"I think the community is going to find it very exciting," he said, referring to the company as a "clean industry, (bringing) high-paying jobs tied in with K-State."

Martin said the chamber had been pursuing the company for some time, and that chamber officials have been working closely with commissioners throughout the process.

Martin indicated that financing from the economic development opportunity fund is crucial to the proposal. He also said two city commissioners have met with company representatives, while one commissioner declined.

Some commissioners last year complained that the chamber withheld or didn’t provide them with enough information on a proposal to build a small airplane assembly plant near the Manhattan Municipal Airport.
Stage set for $10 million plant

Michigan-based company would install electric engines in Ford Rangers; 100 new jobs in two years; proposal to come before city; magazine announces company's arrival

Todd Manning
and Joe Bathke
Staff Writers

A Redford, Mich., company will announce plans Wednesday to build a $10 million electric vehicle plant in Manhattan that will employ 100 workers over two years, according to Automotive News magazine.

TDM (Troy Design and Manufacturing Co.) will produce electric Ford Ranger XL pickups, powered by a 100-hp AC electric drivetrain with conventional lead-acid batteries, Automotive News reported today. The trucks can be recharged on a 240-volt line in three hours and have a driving range of 55 miles.

The Manhattan plant also will house an engineering center to design electric powertrains and components. The center, the magazine reported, will support TDM's efforts to design an electric five-passenger sedan.

Jim Hague, a Kansas State University associate professor of engineering, who is closely involved in the project, said he expected the 40,000- to 60,000-square-foot plant to open in the first three months of 1996.

The Economic Development Opportunity Fund Advisory Board and the City Commission both have called special meetings for the project for Wednesday. Jerry Petty, director of community development, said a press conference will be held at 8 a.m. Wednesday at the K-State Union concerning the meetings. The press conference is expected to provide details of the project.

"Representatives from the company, K-State, the Chamber (of Commerce) and, I believe, city leadership will be there," he said.

Sources close to the project have said the economic development board will consider an application from TDM and K-State to assist in funding construction of the plant in the present Manhattan industrial park. The request will then go before the commission along with proposals for industrial revenue bonds, and purchase and tax abatements.

The economic development fund, which receives revenues from a citywide half-cent sales tax, was created last year during a failed bid for a Cessna small airplane assembly plant.

Automotive News reported that the plant expects to sell 1,700 electric Rangers in the first two years of production.

TDM Co. will market the trucks to utilities, local, state and federal agencies, said Bill Coppola, managing director of TDM's electric vehicle operations.

TDM Co. has specialized in converting gas-powered vehicles over to natural gas and has received an exclusive contract from Ford to convert F-series pickups. The work will be done at a small facility near Ford's Kansas City, Mo., plant.

The plant will put Manhattan at the forefront of electric vehicle manufacturing, company officials say.

"We didn't just hop off the banana boat and decide to come to Manhattan," Coppola said.

In fact, Coppola said, the company looked at several locations before settling on Manhattan. One of the deciding factors was the expertise in electric trucks that can be found at K-State, he said.

"Not only did K-State have the means, but they also had the expertise in developing alternative fuels," Coppola said.

Coppola said other universities had been courting the plant, but they couldn't back up their claims with hard evidence; K-State could.

"K-State wasn't just blowing smoke and saying 'Yeah, we want to be involved,'" Coppola said.

The company was lured to Manhattan through the work of Hague. Hague is president of EH2 Corp., which developed a curbside charge point meter in 1993 that dispenses electrical energy for charging electric vehicles. Hague has been active in researching alternative fuel vehicle development through grants from the U.S. Department of Energy for the last five years.

Hague said this morning he came to know executives through his work and tried to sell them on Manhattan when he found out the company was looking for a location for the electrical truck plant.

"I tried very hard to have them come into town and meet KSU President Jon Wefald and his staff," Hague said. "Senior management at TDM was very impressed with Pres. Wefald and with K-State, and the chamber did an excellent job of presenting the city. I think that's what cemented TDM's decision."

The book on Troy Design

Here are some details about Manhattan's newest manufacturing company:

* Troy Design and Manufacturing is headquartered in Redford, Mich., and was founded in 1981.
* TDM Co. modified all Cadillacs sold in Japan last year.
* TDM Co. produces almost every Sears and Montgomery Ward service van used in the country.
* TDM Co. is the largest producer of natural-gas powered vehicles in the U.S.
* General Motors' 1998 model of the S-10 pickup was designed by TDM Co.
City, K-State prepare for TDM-day

Financial package for Michigan-based company to include $4 million in industrial revenue bonds, tax abatement and funding from eco devo fund, city officials say; details Wednesday

Todd Manling
Staff Writer

In exchange for building a $10 million electric-vehicle plant in Manhattan, TDM Co. of Redford, Mich., has requested a property tax abatement, a grant and loan from the city's economic development fund and up to $4 million in industrial revenue bonds.

Jerry Wood, city finance director, said this morning that the request from TDM (Troy Design and Manufacturing) Co. will come before the City Commission in a special meeting at 7 p.m. Wednesday. The session follows a meeting of the Economic Development Opportunity Fund Advisory Board that morning in which TDM Co. is expected to request a property tax abatement among other incentives.

"I read in their application to the Economic Development Opportunity Fund that they have some $5 million in hand or so to cover the rest of the cost for the plant," Wood said. "There are some other revenue sources they have in mind from the state, and a property tax abatement."

Jerry Petty, director of community development, confirmed that the application includes a property-tax abatement as well as financing through the economic development fund. Petty is acting as city manager in the absence of Acting City Manager Ron Fehr, who is attending a city manager conference in Denver.

No information on the length of the tax abatement or the amount of the grant and low-interest loan was available.

City officials and TDM Co. have withheld most information on TDM's incentives request pending a press conference scheduled for 8 a.m. Wednesday morning at the Kansas State University Union. TDM Co. has said it will formally announce the press conference its intention to build the electric-vehicle plant in the Manhattan industrial park.

"Tomorrow morning will be the meat and potatoes part of it," Petty said.

Lured to Manhattan through the electric-vehicle research and work of K-State engineering professor Jim Hague, the plant would produce electric Ford Ranger XL pickups, powered by a 100-hp AC electric drivetrain with conventional lead-acid batteries. Bill Coppola of TDM Co. said the plant would employ 100 workers within two years.

The Manhattan plant also would house an engineering center to design electric powertrains and components. The trucks would be marketed to utilities and government agencies in areas, such as Los Angeles and Mexico City, where air quality conditions have prompted a push toward alternative fuel vehicles.

According to Coppola, seven Midwest utilities are backing the electric truck program with money and "buy" orders.

Despite the optimism Hague and Coppola have expressed about the plant, Coppola said Monday that the approval of the incentives could decide whether it is built in Manhattan.

"It plays a significant role because TDM could have built this job in its existing capacity," Coppola said. "But as I see it, the city and K-State bring a lot to the table—K-State's knowledge of electric drivetrains and the city's work ethic."

The nine-member Economic Development Opportunity Fund Advisory Board makes recommendations to the City Commission on economic development-related items such as tax abatements and allocating money in the form of grants or low-interest loans from a city half-cent sales tax.

The sales tax is expected to collect about $2 million a year and expire after four years. Manhattan voters approved it in November as the city vied for a Cessna small airplane assembly plant. Cessna later chose to build the plant in Independence.

Industrial revenues are issued on behalf of cities to assist local companies in construction or expansion. A city's role in issuing the bonds can get a private company a lower interest rate.

But although a city issues the bonds, it is not held responsible for repaying them in the event the company defaults.
TDM 'transparent' partner in automaking

Todd Manning
Staff Writer

Until a few days ago, Manhattan residents trying to decipher the words behind TDM Co.'s initials probably would not be able to give you an answer.

And they wouldn't be alone, said Bill Coppola, managing director of Troy Design and Manufacturing's electric vehicle operations. TDM Co., which has proposed building a $10 million electric vehicle plant in Manhattan, may as well be invisible to the general public, he said.

"You wouldn't know us from a hill of beans," Coppola said. "Our participation in the development of vehicles is transparent to the consumer. It says Ford or Chrysler or Pontiac."

Based in Redford, Mich., a suburb of Detroit, TDM Co. has 12 divisions, each with its own area of expertise mainly in the automotive industry. The company employs 2,318 people and is privately owned by Richard Janes and William Roberts, a former executive with General Motors.

TDM Co. also has facilities in Ontario, Calif., Wilmington, Del., and Ohio.

Among its projects, TDM Co. works with auto manufacturers to modify vehicles either for export or, in the case of the Manhattan plant, to use alternative power sources.

For instance, Ford Motor Co. recently awarded TDM Co. an exclusive contract to convert Ford F-series pickups to natural gas fuel. TDM Co. plans to use a small facility near Ford's Kansas City, Mo., plant to continue its work.

But the day of the electric vehicle is coming, and when it does, Coppola said, TDM Co. plans to be there.

"People need to understand this is a long-term vision," Coppola said. "TDM expects to take a lead role in this and Manhattan then could become an export center."

The Manhattan plant, upon opening, would produce Ford Ranger XL pickups, exactly like the ones found at any local Ford car lot, with the exception that they will be powered by a 100 hp electric drivetrain. The electric Rangers have a driving range of about 55 miles and can be recharged on a 240-volt line in about three hours.

TDM Co. also is developing a five-passenger sedan with a driving range of 100 miles, which could go into production at the Manhattan plant. The plant would employ about 50 workers in its first year and about 100 its second.

Coppola said TDM Co. expects to sell about 1,700 of the trucks in its first two years of production to utilities and government agencies both in and outside the U.S.

"The United States isn't the only country that's concerned about exhaust emissions and Los Angeles isn't the only city," he said. In Mexico City, residents must limit their driving to six days a week because of high amounts of air pollution and delivery vehicles for several companies recently have switched over to natural gas and electric power, he said.

Other countries and cities where alternative fuels are in demand include Santiago, Japan, Malaysia and Singapore, Coppola said.

TDM Co. expects to sell each truck for $26,000 — tax incentives would cut the price by about $6,000 — compared to the $11,000 starting price for a gas-powered Ranger XL.

Besides jobs for Manhattan residents, Coppola and Don Rathbone, dean of the Kansas State University College of Engineering, said the project would provide K-State students with a first hand opportunity to work on cutting edge technology. The opportunities wouldn't end when the students graduate, Coppola said.

"We intend on coming to (Manhattan) and providing career opportunities that minimizes the transient aspect of K-State students, where they graduate and leave to find jobs elsewhere," he said.
The ‘great’ professor deserves some credit

Beth Bohn
Staff Writer

In a few years Jim Hague's preferred form of transportation may not be such an oddity in Manhattan and in the nation's major metropolitan areas.

Hague, who daily drives a Ford Escort station wagon that has been converted to run on electricity, is on the verge of seeing some of his electric-vehicle research bring a multimillion-dollar payback in economic development for Manhattan.

It all started five years ago when Hague helped K-State land a $1.25 million grant from the U.S. Department of Energy and the private sector for research and development of electric-powered vehicles. The grant made K-State one of 13 test sites in the nation for electric vehicle technology and enhanced Hague's reputation in the field. In 1993 the professor was named to President Clinton's Federal Fleet Conversion Task Force.

Hague's research and contacts were credited as major reasons for today's official announcement that TDM, a Michigan-based company, plans to build a $10 million plant in Manhattan to produce electric-powered Ford Ranger pickup trucks. The deal would create more than 50 jobs in the first year of production, with more jobs promised as production expands.

That K-State and Hague were key factors in TDM's decision to locate in Manhattan was made clear at this morning's news conference by TDM executive Bill Coppola.

"The most key ingredient to this whole thing was Kansas State University," he said. "When you're dealing with this level of technology, when you're dealing with changing all the rules, you have to embrace with a learning institution to ensure that you roll out an infrastructure that will bring success.

Coppola said that infrastructure is people, "The electric vehicle industry is going to be people," he said. "What we need are trained personnel that understand electric vehicles."

What TDM will be looking for from K-State will be ways to improve the distances electric vehicles can travel before needing recharging; enhancing the technology; and improving efficiency of the vehicle, Coppola said.

He also said TDM is considering aligning itself with other post-secondary institutions but that K-State's depth in electric vehicle research made it the company's first choice.

"K-State is a significant part of our program," he said. "It will continue to be."

Hague's efforts to connect TDM officials with business leaders in Manhattan earned him a new title from KSU President Jon Wefald, who introduced the professor at a news conference this morning as "the great professor Hague."

Hague is quick to credit others — including Don Rathbone, dean of KSU's College of Engineering, and Wefald — for helping to bring TDM to Manhattan and for making his research work possible.

The company's arrival, he says, only means good things for K-State and its electric vehicle research program. He said the program is rising to the top much the way the K-State football program has.

"Our electric vehicle program has been lumbering along for five years, competing at a national level with people who have more money, as much talent and maybe more resources than we do," he said. "But we have remained committed."

Hague added: "I think... winners attract winners. The opportunity to work with somebody like TDM, the opportunity to put this plant in our town, I think will not only bring good-paying jobs, but I think will bring other people and companies that have related technologies to Manhattan."

Even talk of congressional cutbacks in research funding does not dampen Hague's outlook for K-State research, including in alternative fuels for vehicles.

Although a proposal backed by two of Kansas' congressmen, Reps. Todd Tiahrt and Sam Brownback, would eliminate the Department of Energy — and possibly DOE funding of Hague's electric vehicle research, which was $200,000 in 1994 — the professor is confident other federal funding sources could be secured because of the need for alternative fuels.

"With TDM being in our community, you're going to see an opportunity not only for technology to flow through that plant," Hague said, "but as the taxpayers demand from Congress — as we're hearing about cutting budgets and focusing research — we will have in our community the genesis for one of the major industries in this country to apply research that we do at the university every day."

Hague said that TDM and K-State will work closely together.

"I think you're seeing the genesis of a partnership that's going to be demanded by the taxpayers in order to more effectively use the dollars we have available to apply technology into the marketplace," he said.

That partnership, Hague added, will be an incentive for students interested in engineering to attend K-State.

"We have an opportunity for these young minds — who graduated first in their class from Kansas high schools, who are Rhodes Scholars, Truman Scholars — to put that energy and talent to work in an industry (automobile manufacturing) that is demanding a significant change," he said.
City to vote on proposal tonight; plant would be first of its kind in the country

Todd Manning
Staff Writer

If the City Commission tonight follows the lead of its economic development advisory board, the first electric vehicle plant in the country will open in Manhattan by Feb. 15.

The Economic Development Opportunity Board approved a request from Troy Design and Manufacturing this morning to give the company $550,000, loan it another $418,000 for 10 years at no interest and issue $4 million in industrial revenue bonds. The funds, along with a 10-year property tax abatement, will assist TDM Co. in construction of a $10 million plant on a 10.41-acre site in the Manhattan industrial park.

The board's vote was unanimous.

The advisory board's approval recommendation will go before a special meeting of the City Commission at 7 tonight at the Riley County Seniors' Service Center, 412 Leavenworth St.

The first of its kind, the electric vehicle plant will produce 2,000 electric Ranger XL pickups under an agreement with Ford Motor Co., said Bill Coppola, managing director of TDM electric vehicle operations. Under the agreement, the plant must be built by Feb. 15 and the first electric Ranger will roll off the line 45 days later—by March 30.

TDM officially announced the plant in a press conference this morning at Kansas State University, which has a partnership with the company in the researching and designing of the electric vehicles. KSU President Jon Wefald said the plant will place Manhattan at the forefront of an emerging new technology.

"I believe that we are going through a major shift," added Jim Hague, an electrical engineering professor involved in the TDM Co. plant. "I believe that we are the Wright brothers."

But at least one economic development advisory board member wasn't as sure the new electric vehicle technology will fly.

Sonny Ballard said he felt under great pressure from K-State administrators to approve the project and questioned whether at 10.41 acres the plant site was large enough to handle future expansions. He also questioned the technology itself.

"I think the longevity of electrical cars is not very good," Ballard said. "I think we've got to look past the sales pitch. We're making a decision for the community."

The man with his horse and buggy had the same thought when the first horseless carriage appeared on the road, responded Coppola. What followed was a 2½-hour tour of the possibilities presented by present electric car technology and the geometric rate at which the field is advancing.

"I think we're at the beginning stages of what could be a significant industry," said Don Rathbone, dean of the KSU College of Engineering.

While Rathbone and Coppola said they did not support federal mandates on the use of electric vehicles, Rathbone said that more than 100 cities in the U.S. have pollution levels higher than allowed under federal clean air standards. Electric vehicles, he said, are the only cars that meet the zero emissions requirements.

"I remember in 1972 when I was in Philadelphia and I could only get gas on alternate days, and that scared me to death," said board member Shirley Baker. "I think that as a nation the day might come when we can't get gas."

By noon, even Ballard was at
Continued

least partially won over, saying "I think if you can change my mind, you can change anybody's. But I still personally wouldn't buy your car."

If the technological opportunity didn't change Ballard's mind, it was the research opportunities, federal grants and employee salaries that would come with the plant that did, he said.

According to Coppola, the plant will create 52 to 67 jobs its first year—with a total payroll of more than $2.2 million—and more than 138 within six years.

Production line workers would have an average annual salary of $45,000 and designers at $60,000, Coppola said. The better the company does, the higher the pay.

The 40,000-square-foot plant would be built in the northeast section of the industrial park on property presently owned by the city — 8.58 acres—and Steel & Pipe—1.83 acres.

Dennis Mullin, an officer with Steel & Pipe Supply and a member of the economic development advisory board, stepped down from the discussion for conflict of interest. Advisory board member Bob Therien, KSU vice president, declined to step down, but abstained from the vote.

The recommendation from the economic development also carries so called "clawbacks" that if TDM doesn't reach its minimum employment levels — 50 in 1996, 70 in 1997, 90 in 1998, 110 in 1999 and 138 in the year 2000—the percentage difference, if over 20 percent, will result in TDM having to pay the same percentage in property taxes.

> CITY COMMISSION

City approves incentive package for plant

Carl Cornelison  
staff reporter

City commissioners, unanimously and with little debate approved an incentive package for an electric-vehicle plant that is to open in Manhattan.

Troy Design and Manufacturing Co., based in Redford, Mich., will receive $350,000 for job incentives, a $418,000 revolving loan for the next 10 years at no interest and $4 million in industrial revenue bonds from the Manhattan Economic Development Fund.

The Economic Development Fund was created with money from a half-cent sales tax, which was approved by voters in the November 1994 election.

TDM will also have a 10-year, 100-percent tax abatement.

Under TDM's contract with the city, there will be minimum employment levels of 50 in 1996, 70 in 1997, 90 in 1998 and 138 in 2000.

If TDM does not perform at the required numbers then it will be responsible for an initial 20-percent property tax, plus 1 percent for each employee it did not hire for that year.

For example, if TDM only hires 48 employees in 1996, it will pay 22 percent in property tax.

The plant will produce 2,000 electric Ford Ranger XVs; pickups under an agreement with Ford Motor Company.

TDM has already chosen a contractor, but it also needs local contractors to assist in construction of the plant.

The $10-million plant will open its doors no later than Feb. 15 and must have its first truck manufactured by March 31.

"We are well down the road with the development of the vehicle," said Bill Coppola, managing director of electric vehicle development at TDM.

The Ford Ranger will not be the only vehicle manufactured in the Manhattan plant. Cars, trucks and vans will also be manufactured, Coppola said.

"I don't want the Ford EV to eclipse the business effort we are spawning in Manhattan," Coppola said.

Coppola said there are many other places TDM could set up a plant, but the plant wants to build in Manhattan.

"The work ethic and fabric of the community is consistent with what we're looking for," Coppola said. "The people here are who we want to partner with."
The package of integrated components is made of the battery containment packs, harnesses, wires, a gear reduction box and the electric powertrain.

"Each package of integrated components is made up of $15,000 of unique technology of TDM content," Copolla said. "This package is so simple it literally drops right into the truck and is secured by a few bolts."

Copolla said K-State was an important factor for TDM wanting to locate in Manhattan.

The key ingredient was a partnership involving K-State, TDM, Western Resources and other utility companies, which would be able to provide a $1-million package for research support.

"If we didn't put that package together, TDM would have went elsewhere," K-State President Jon Wefald said in a press conference at the K-State Student Union Wednesday morning.

In order to get that package together and provide the other necessary elements to bring TDM to Manhattan, a team approach was used.

The team consisted of K-State, the Manhattan Chamber of Commerce, Western Resources, the Kansas Technological Enterprise Corporation and the Kansas Electric Utilities Research Program.

"We did a team full-court press to convince them that this little town in the middle of America would be the best place for TDM," Wefald said.

Wefald also said this effort was strongly supported by Gov. Bill Graves and Rep. Ken Glasscock, R-Manhattan.

Perhaps the most influential person in bringing TDM to Manhattan was Jim Hague, associate professor of architectural engineering and construction, Wefald said.

"Hague served two years as the national chairman of a Department of Energy task force, whose primary mission was to develop a plan for the market development of alternative fuel vehicles nationwide."

K-State has been part of the Department of Energy's Electrical Vehicle Program for four years.

Hague said TDM will come to Manhattan to take advantage of the resource provided by both the community and K-State.

"We're going to take advantage of TDM," Hague said. "We're going to see a genius of a partnership between TDM, the community and the University."

Troy, city agree to terms of $1 million deal

Todd Manning
Staff Writer

Officials of the city and Troy Design and Manufacturing agreed Wednesday on a $1 million deal that will locate an electric vehicle plant in the city's industrial park.

City commissioners, meeting in a special session and with little debate, voted 5-0 to give TDM Co. $225,000, a 10-year property tax abatement and a 10-year, $418,000 no interest loan. Also included in the package is the city's issuance of $4 million in industrial revenue bonds that TDM Co. will repay.

The electric vehicle plant will be the first of its kind in the country, and will be operational by early next year.

Following the vote, Bill Copolla, managing director of Troy Design and Manufacturing's electric vehicle operations, handed Mayor Edith Stunkel a check for a down-payment on 10.41 acres in the northeast section of the Manhattan industrial park. The $8,000 check also included money for options to purchase property on either side of the new TDM Co. site.

Under an agreement with Ford Motor Co., TDM Co. must have its $10 million plant open by Feb. 15. The first Ford Ranger XL, powered by a conventional lead-acid battery, will roll off the line 45 days later, Copolla said.

The facility — expected to employ 100 workers in two years and more than 150 in four — will consist of a research and design center at the front of the building and a production plant and training center in the back. Ford, which will service the electric trucks, plans to send its technicians to the Manhattan plant to learn how to repair and maintain

The facility — expected to employ 100 workers in two years and more than 150 in four — will consist of a research and design center at the front of the building and a production plant and training center in the back. Ford, which will service the electric trucks, plans to send its technicians to the Manhattan plant to learn how to repair and maintain
the electric Rangers, Coppola said.

"I don't want the Ford Ranger production to eclipse the business effort we are starting in Manhattan," he said.

TDM Co. plans to introduce the manufacture of natural gas and "hybrid" vehicles to the plant within the next few years, Coppola said. Hybrid vehicles can run on either gasoline or natural gas.

A five-passenger electric sedan also may be built at the plant.

TDM Co. is one of two companies working on electric vehicles. A company called Solectria Corp. in Wilmington, Mass., is working with the Massachusetts Institute of Technology to start mass producing four-seater Sunrise electric cars by 1998.

By that year, regulations taking effect in three states — Massachusetts, New York and California — will require the sale of vehicles that produce no emissions. Coppola said TDM Co. was offered $6 million in cash to build the plant in Amarillo, Texas. Kansas City, Mo., upon learning of the company's plans to locate near K-State, offered to "meet or beat" any offer from Manhattan, he said.

"We're paying to come to Manhattan because of the technology and research available through Kansas State(University) and the work ethic of this community," he said. "The feeling is the community wants (the plant). They have a burning desire."

A number of factors weighed in Manhattan's favor, perhaps most important being TDM Co.'s relationship with Jim Hague. An associate professor in engineering, Hague is former chairman of a U.S. Department of Energy alternative-fuel task force and helped K-State land a $1.25 million grant for the research and development of electric vehicles.

Approached by TDM Co. and Hague about building the electric vehicle plant in Manhattan, K-State officials put together $1 million for research support funded by Western Resources and other area utilities, the state and the university. The state also gave TDM Co. a $250,000 grant to train new employees.

The incentives packages from the city is funded by a citywide half-cent sales tax for economic development. TDM Co. still is awaiting approval of another state grant to finance extending a railroad spur to the 10.41-acre site, said Randy Martin, president of the Chamber of Commerce.

The plant, Coppola said, will employ 52 to 67 workers in its first year and at least 138 in four years. Total payroll for the first year, with an average salary of $45,000 a year for production line workers and $60,000 a year for designers, will range from $2.2 million to $3.3 million, he said.

TDM Co. has agreed to purchase the industrial park site for $8,000 an acre. The site is owned by the city — 8.58 acres — and Steel & Pipe Supply — 1.83 acres.
City figures to recoup costs in eight years

The cost-benefit analysis developed by the League of Kansas Municipalities is required anytime a city or county proposes granting a company a property tax abatement, said Curt Wood, city finance director. The analysis compares the difference in tax revenues between granting and not granting a property tax abatement and measures the resulting impact not only on the city, but also on all other area taxing bodies, including the county and school district.

Of all area taxing bodies, it will take Pottawatomie County the longest to see the benefits of the plant equal its costs — 10 years. The land for the plant is located entirely in Pottawatomie County. USD 383 would recoup its losses in property taxes in eight years, the same as the city.

Todd Manning
Staff Writer

It will take the city eight years to recoup the costs of bringing the country's first electric car production plant to Manhattan, according to a cost-benefit analysis required by the state.

The analysis estimates that an incentive package of $550,000 in cash, a 10-year property tax abatement worth $415,540, and other costs, such as running sewer lines to new homes TDM employees will buy, will cost the city a total of $1.2 million over the next 10 years.

During the same time period, however, the city will make $1.5 million in revenues from construction, sales taxes from TDM operations and taxes on TDM employee salaries and the salaries of spin-off businesses the electric vehicle plant will create, the analysis shows.

Revenues from spin-off businesses created by the electric vehicle plant are estimated at $92,672 and are a significant portion of the city's payback. Spin-off businesses are companies that locate or are created primarily to serve another company.

Bill Coppola, managing director of TDM's electric vehicle operations, said the company expects that for every 100 jobs it creates, 78 will be created outside the company.

Typical products that TDM Co. purchases from other local businesses include seat belts, headlights, rearview mirrors and autobody styling parts such as ground effects and trim.
Prepared by:
James R. Hague
Director, Electric Vehicle Program

Rod Urbanek
Service Technician

Jenifer Hague
Student Assistant

Jill Dirksen
Student Assistant

Kansas State University
219 D Seaton Hall
Manhattan, Kansas 66506
Phone (913) 532-5617
Fax (913) 532-5661