HENRY FORD COLLEGE
Technology Investment Fund (TIF)
Application for Funding

This form and any attachments must be submitted electronically to the chairperson of the Technology Investment Committee by the published deadline date. (This application may be submitted as a document separate from the attachments.)

Please read the Outline of Approval Process and Expectations of Applicants/Project Directors on the last page, and check the box stating that you agree to the terms of the expectations.

Date of Application: 09/17/2018	**Strategic Planning Initiative ID #:** 1747
Project Name: Automotive Technology Alternative Fuel And Propulsion	**Total TIF Funds Requested:** $101,000.00
Project Director(s): Kristopher Young, Victor Gregory	**Department/Division/School:** Automotive Technology/BEPD

Summary of Project
(Please limit to one paragraph.)

This proposal will provide needed resources to allow students in ALL areas of automotive technology (engines, fuels, ignitions, alternative propultion, diesel tech, dynamometers) to share a joint interest in alternative fuel engine teardown, inspection, testing and retrofit to non-traditional applications. This project will also provide comprehensive linkage between automotive technology, enigneering, welding, manfacturing, and design programs within our college to facilitate each project. This project will also provide industry liniage with our friends and supporters over at Jacobs Engineering, who employ many of our students in safety and testing areas across southeastern lower Michigan.

Detailed Description of Project

Describe your project as specifically as possible. What do you propose to do, and why do you propose to do this?

We seek to secure several modern, contemporary fuel injected engines and use them to adapt to alternative fuel sources like bio-fuels, E85, straight methinol, compressed natural gas and even hydrogen. This retrofit will provide opportunites for automtove students to interact with students in other automotive areas to facilitate the changeover. Students will be able to use the newly installed dynamometers to test the outcomes and comparisons for each fuel type. Students will then select a sutable candidate fuel type and engine to use in projects which will involve the installation of a modern powertrain on an alternative fuel type engine in a completely non-traditonal application. One proposed non-tradtional application we are currently testing is converting the gasoline powertrain in a 1948 Ford to a totally converted current computer controlled powertrain which has been adapted for use with an alternative fuel, tested, tuned, and installed in that 48 Ford. This project will connect multiple diciplines on focused, high interest and highly conspicuous projects which will draw positive public attention to HFC, in additon to providing highly desirable linkage for students in various areas lof Automotive Technology, and ASSET. This project will also provide service and testing opportinitiesfor every

course we offer in auto tech, in additon to the joint department and industry ventures that we are seeking and cultivating.

Student Impact

How many unique students will be served each academic year (Fall through Summer) by your project? "Unique students" refers to unduplicated headcount. Provide detail (course numbers, titles, and enrollments, for example).

AUTO 101, 105, 110, 120, 131, 140, 150, 160, 181, 215, 225, 260, (all of our core courses) all with a headcount of 18 students each. Additionally, this would incorperate all levels of Welding, manufacturing, CAD/Drafting and Pre-Engineering. IF we were running this project today, we would be looking at approximately 200+ students in just the automtoive department alone, plus additional students who would participate from the other areas that will be incorporated.

Project Relevance to Technology Investment Committee Guidelines

(Address only those that apply.)

Explain how the project provides technology to multiple courses or programs.

This program provides our automtoive technology students to be able to dive into modern, high tech powertrains. It will also provide our engineering students an opportunity to take those powerplants and provide the necessary mounting, locating and design input for installation of modern powertrains into non-traditional applications, such as the 1948 Ford mentioned above. Modern powertrains require signifigant changeover to adapt into non-traditonal applications. Welding, fabricating, machining brackets, mounts, structural members and ancilary systems will require a design team to work with the engineering and installation teams to design, draw and produce completely unique and specialized parts to facilitate the installation. There will be opportunity to involve all of the technology departments to use every type of technology from CNC machining equpment to three dimenstioninal printers to produce these parts and ancilary support sytems. Every area in Automotive Technology will be engaged, as each area will participate in building of the engines, testing of the new fuel types, gear train development, steering ,modern braking and safety systems that will be required. An opportunity to develop a body repair and restoration program is also underway as renovitated vehicles will regularly come to us in a distressed state and must be rehabilitated to look as well as they run. Finally, we have great interest in this project with our industry partners at Jacobs Engineering who will provide design support for the project.

Explain how the project introduces student access to technology where it has not been available.

In many cases, our school provides wonderful and bennificial experiences in many technology areas. This project provides the key lingage between design, testing, mechanical and fabrication areas that we currently do not have. Automotive students get to interact and experience working with an engineering and design team where students have not had that interaction previously. Design, fabrication, and engineering students get to put their hands on a tangable, "real world" project that will give these students the ability to turn what they have learned into real-world applications, with tangable outcomes. This is an opportunity for our technology students to work on a project that will mirror the type of colaboration that exists in the industries they seek to participate in using a medium that all of these students can really take pride in and employ their diciplines in an arena of open collaboration and cooperation.

Explain how the project promotes innovation.

Projects which involve (1) placing a brand new, contemporary, fuel injected, computer controlled powertrain that (2) has been converted to run on any fuel except straight gasoline, (3) after being painstakingly tested to assure that the fuel being used is the most efficient, and (4) then converting that engine to run on the fuel, test that system, then (5) installed into a vehicle like a 1948 Ford, whose (6) designers could never have immagined would have such a powertrain going in that vehicle, could not do anything except incubate innovation.

Explain how the project promotes curricular revision.

The program would requrie a regular and immersive interaction between departments that, as mirrored in industry, support one another. It would allow all of the automotive, engineering, technological diciplines to come together collaboratively and will allow instructors to particiate in a meaningful immersion of curriculum from other areas of instruction. This project will provide, for instance, an automotive technology instructor to learn how to include engineering principals in their automotive courses and vice-versa. We seek to also encourage students to particiate electively in these other areas of instruction in persuit of a well rounded education. This will also possibly inspire students to persue additonal degree work in areas that complement industry needs, and fill the demand for multi-diciplinary skill sets in manfucacturing, engineering, trades and automotive fields.

Explain how the project supports areas that have established themselves as leaders using technology.

This project, because it requires abstract and creative thinking, demands that top performers in their field rise to the challenge of melding "new with old." This program challenges any field of thought or instruction to rise to meet the challenges of other fields, in similar diciplines, and assimilate their knoweldge into a unique and unfamilar project. It takes the theroetical and puts it into motion to make it operational and by having to overcome the inevitable problems that particular technicial areas will be faced with, relying on other instructional diciplines with a skill set that students may not currently be familiar with or know about.

Are you pursuing additional funding sources? If so, what are they?

Yes, it was part of the schools operational plan cycle. We will attempt to secure funding through this process, but the cost is too great to be high enough on the list be expand this program to meet the desired outcome.

Project Budget

What will be purchased? (Include model numbers, if appropriate.) What is the cost? Include amounts that are committed from funds other than the Technology Investment Fund, and indicate the source of those other funds.

Contemporary Ford and General Motors engines. These would include modern Coyote, LS1 engines as well as Eco-Boost Engines. Fuel system components including fittings, high pressure fittings and hoses made of matereials that resist failure from alternative fuels like alcohol and E85. Drivetrain computers and required wiring harnsses requried to link engines, transmissions to those computers. Programming equpment to make fuel curve and igntion profile changes for each fuel type. No other funds are currently being allocated.

Where will funds for future maintenance needs, consumables, and such come from?

Department budgets and future operational plan proposals.

Forward any support for your budget (quotes, for example) to the chairperson of the Technology Investment Committee, and indicate here what has been forwarded.

Due to the nature of this investemnt, and the quickly changing technology as well as external factors (avalablity etc), cost can vary depending on those factors.

Rank your needs so that the Technology Investment Committee will have guidance should only partial funding be available to recommend.

Engines would be ranked first. Hook up equipment (fuel system parts and powertrain control equipment). Wiring harnesses and software.

Project Location and Equipment Security

Describe specifically where items to be purchased will be located or installed. Forward to the chairperson of the Technology Investment Committee room-layout diagrams if appropriate.

We will purchase our items from a source which can also provide technicial support and assistance to our students. We have used a local business such as Fastime to provide parts and support. Fastime is a unique supplier because in addition to providing parts and components, they have engaged our school to offer support. They also provide engine testing and can participate on a meaningful basis with our students. They also employ a full machine shop which gives us a unique access to data, knoweldge and support for every fascet of this program.

Indicate the status of any necessary approvals for using the space in which items will be located or installed.

There are none needed.

Who, specifically, will do the installation?

The installation will be performed completely by students with the oversight of instructors. There is no skilled trades necessary for this project. It is 100% student oriented.

How will equipment purchases be secured?

They will be locked in secured areas that we have requested key card access be installed in these areas.

Have you discussed with the Executive Director of Facilities Services to determine what, if any, infrastructure modifications are required to support this project such as electrical upgrades, locks, etc.? What has been determined?

Yes. The modifications will be completed by the end of the week of September 17th. Modifications incude water and power as well as the hook up of the newly purchased dynamometer in our automtoive technology department.

Have you discussed with the Director of Network and IT Infrastructure to determine what, if any, software and/or network infrastructure modifications are required to support this project? What has been determined?

Yes. We have always worked closly with our IT department to privide computer support. The requested testing stands are all computer driven and HFC has very recently installed the necessary wireless access points which will allow us to link to the software developer, who will look at our data and offer support.

Evaluation

How, specifically, will you determine the success or shortcomings of your project?

This project involves so many diciplines that our success will be gauged on how well these entities work together.

TIF Funding: Outline of Approval Process and Expectations of Applicants/Project Directors

1. Your project must be consistent with the description of the purpose of the Technology Investment Fund (See II.D.210 in the Faculty Organization Handbook.) and must have been submitted as part of your division's operational plan. Assuming that your project has not been funded otherwise (from general College funds or through Perkins funding, for example), you may complete and submit the application for TIF funding by the announced deadline.

2. A meeting will be scheduled for you to present your project to the Technology Investment Committee. You will be asked to give a short presentation and to take questions from Committee members about your project. The Committee will then meet to determine whether to recommend funding for your project. Please remember that even projects with great apparent merit may not be recommended for funding due to limited funds or other factors.

3. The recommendations of the Technology Investment Committee are forwarded to the President for consideration. Should your project be recommended by the Committee for funding and should the President concur with that recommendation, the funding request is placed before the Board of Trustees for consideration.

4. If your funding request is to be brought before the Board, the Technology Investment Committee Chair will notify you of the date of the Board meeting at which your request will be discussed. You or someone familiar with your project should plan to attend that meeting to answer any questions Board members may have.

5. The Board of Trustees will not actually vote whether to allocate funds for your project until the meeting following the meeting at which your project is discussed. The Board generally does not ask further questions about projects during the meeting in which it takes the vote. The Technology Investment Committee Chair will notify you of the outcome of the Board's vote.

6. Assuming that the Board votes to allocate funds to your project, you will work with the Office of Financial Services and Auxiliary Services and with Purchasing to use your funding to complete your project. (A copy of your proposal will be forwarded to the Purchasing Director.) You are responsible for coordinating the work to be done to complete your project including any tasks required during the Spring and Summer semesters.

7. During the third full semester (Fall or Winter semester) following the semester during which your funding is awarded, you will be asked to provide a written report evaluating your project and to present this report to the Technology Investment Committee.

☒ I (We) have read the TIF Outline of Approval Process and Expectations of Applicants/Project Directors and do agree with the terms of the expectations.

Name(s): Victor Gregory, Kristopher Young, Ashley Smith, David Tillman

Date: 09-20-2018