# *Thank you for your commitment to green initiatives at the University of Illinois. One of the ongoing requirements listed in the terms of the funding agreement for your project is the submission of semesterly reports with key information about your project. In addition to this form, please provide additional financial documentation and/or progress photos if available.*

# *Please be as accurate as possible in describing the project (including possible setbacks or challenges in meeting the initial goals of the project). Not fully meeting your project's goals will not disqualify you from making future funding requests as long as your reports are as complete and accurate as possible. If you have any questions, please contact the Student Sustainability Committee, at* *sustainability-committee@illinois.edu**.*

**Project Name:** Illini EV Concept: EV3

**Date of Report Submission:** 1/31/22

**Project Purpose:**

Illini EV Concept proposes creating EV3, the first student built autonomous and energy

efficient vehicle in the US. The project will allow students from different majors to get

invaluable industry experience in cutting edge technology. In the scope of the project our

team is also proposing collecting and recycling old electronics, batteries and PCBs from RSOs

on campus to minimize the environmental harm from student-run projects. We are also

planning on holding quarterly online video educational sessions to raise awareness of using

clean energy, building energy efficient electric cars and development of autonomous vehicles.

**Detailed Accounting of Expenditures to Date:**

Additional spreadsheet is attached to email.

**Project Progress to Date:**

With university facilities opening back up this semester, our team started having in-person meetings, which are crucial for the success and development of many of our projects. After a couple of virtual semesters, EV2 was not in the greatest of shape. The Mechanical Subteam started painting EV2 to make the carbon to make the car more presentable in preparation for the competition. The Software subteam experienced the largest boom in membership, mostly with Freshman and Sophomores interested in learning about Computer Vision and creating an autonomous vehicle. Projects were distributed across the whole autonomous-stack, ranging from lane detection, object detection, controls, and communication. We had some new project areas this semester too: Spatial Perception, Jetson Interface, and ROS. All of these projects have been crucial for our progress towards autonomy. Our current goal for the Spring semester is to have the car automatically break when detecting pedestrians, and slowly to build off those features. Our meetings have been spread between the new SCD and the ECE OpenLab for more hardware-related meetings. Electrical team further researched ways of improving the efficiency of the car using more common hardware components which completely solved the issues caused by the silicon shortage. As a result we created a state of the art Battery Management System that will prolong the life of the battery cells, hence will make it more sustainable in the future, allowing us to run with the same battery pack for years to come.

**Student Involvement, Outreach, & Promotion:**

In addition to the work of the team's own members, EV Concept has been preparing to contact multiple local education facilities for community outreach. A new subteam has been formed of 5 members that are filling a range of roles from internal consulting to media to outreach. Now that we have the numbers and money to support their needs, we plan on beginning our outreach by connecting with the University High School towards the northern end of campus. We intend to teach at some level about sustainability and ways for the students to practice it in a way that is tailored to them. In addition, as Grainger is such a renowned institution, we could take the opportunity to show students what it is like to be an engineering student at UIUC.

We currently plan to have a booth at EOH as well, where we will display the work we have done

Our team is fortunate to have spaces in many of the top collaborative spaces on campus. Our General and Software meetings have been held at the newly-opened Siebel Center for Design (SCD), which has provided us with an engaging and collaborative environment. The Software team has especially been taking advantage of the movable tables and displays, which has promoted a lot of cross-collaboration between projects. The Electrical subteam has been meeting in OpenLab, which provides all the hardware and tools necessary for their projects. Mechanical has been meeting at the Engineering Student Project Laboratory (ESPL), which is the home of many of the other car-teams. This has proved to be very beneficial, because there are always students there in-case anyone has any questions or needs advice on something.

The majority of new members joining the Software subteam this semester have been Freshman or Sophomores. At this stage of their education, most of them have only been exposed to a couple of introductory programming courses. According to member feedback, one of the biggest draws of this subteam was the opportunity to work on software projects that are conceptually at an upper-undergraduate to graduate level, specifically Autonomous Systems. Specifically, the Lane & Objection detection projects spent last semester learning how to train, implement, and deploy Deep Learning models. The numerous project and subteam leads have been preparing resources, creating tutorials, and motivating these students to learn about these upper-level topics. The same applies to the Embedded Systems branch of Software, which starts off members with very simple projects, with a lot of room for learning and progression. Overall, the Software subteam’s rapid growth over the past year has connected dozens of students together and inspired them to create their own projects.