

CATALYST

iCUBE's AGENTS  OF CHANGE **2020 EDITION**

**INNOVATIVE
AQUARIUM
PROJECT** 
GOES VIRAL P.14

Trailblazing
**OPIOID EDUCATION
SUCCESS!** P.10

 **OLLIE**
Reaches **ONE MILLION** P.26



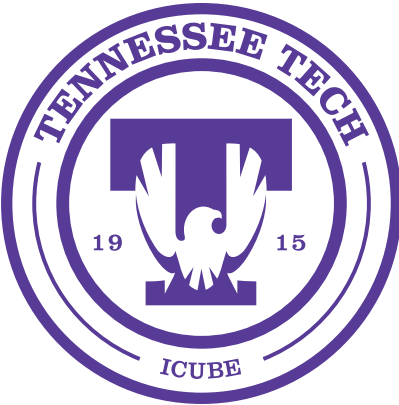
**OCCUPANT PROTECTION
CENTER** *Built at Tennessee Tech* P.19



CATALYST

TABLE OF CONTENTS

- INTRODUCTION..... 4
- HIGHLIGHTS 5
- FOR CAMPUS 6
- COLLEGE OF BUSINESS 7
- SCHOOL OF ART CRAFT & DESIGN 8
- iCUBE 9
- NEW PROJECTS 10
- TWEETING EEL SHOCKS THE WORLD 14
- CONTINUING PROJECTS 22
- OLLIE OTTER 26
- THE FUTURE 31





INTRODUCTION

iCube has had many successes this year, including new project acquisitions, the continuation of several campaigns, and widespread recognition of successful past projects. We've added new team members, provided a new group of student interns with opportunities to work on a diverse range of projects, and continued to use innovative strategies to solve traditional problems. With our focus to create and collaborate with interdisciplinary teams of students and faculty, we continued to generate creative solutions for working remotely throughout the Covid-19 pandemic this last quarter, and have continued to imagine, inspire and innovate throughout this fiscal year.

HIGHLIGHTS

- We received an NSC Appreciation Award for our work to create a National Digital Checkform for all child passenger safety technicians across the country.
- Our work over the years with traffic and child passenger safety has led to us taking on the Occupant Protection Center in order to heighten its success and encourage new stakeholders to join the efforts of child passenger safety across the state.
- The tweeting Eel at the Tennessee Aquarium, @EelectricMiguel, was recognized by news outlets both nationally and internationally (starting with The Associated Press and picked up by agencies including ABC, MSN, and NBC News, NPR, and the BBC) for powering a Christmas tree, with several shoutouts to our interdisciplinary iCube team and Tennessee Tech for creating the system that made it possible to convert his electric shocks to tweets and, more recently, lights on a Christmas tree.
- Our Ollie Otter Booster Seat and Seat Belt Safety Program reached a major milestone of one million high fives, which means one million kids have heard the life-saving messages of the program to always buckle up and “Under 4’9”, It’s Booster Time!” and given Ollie a high five after his presentation at their school.





FOR CAMPUS

Our team has continued to contribute to Tennessee Tech's campus through teaching classes, providing internship opportunities with real-world project work, collaborating on projects with various colleges and groups, and looking to the future with hopes of providing more opportunities for students to learn about innovative technologies alongside their current coursework. Along with our monetary contributions to the university with each project in our grant-funded office, we are eager to work with other departments and colleges in order to support Tennessee Tech's culture of collaboration and community on campus.



COLLEGE OF BUSINESS

TEACHING

Four members of the iCube team taught classes this year for the College of Business: Principles of Marketing, Business Communications, Advertising, and a Special Topics: Digital Marketing class, which was the first of its kind on campus. Our team is able to provide diverse learning experiences from working in iCube on real-world projects for state leaders, organizations, and nonprofits spanning a wide range of topics including health, traffic safety, and conservation.

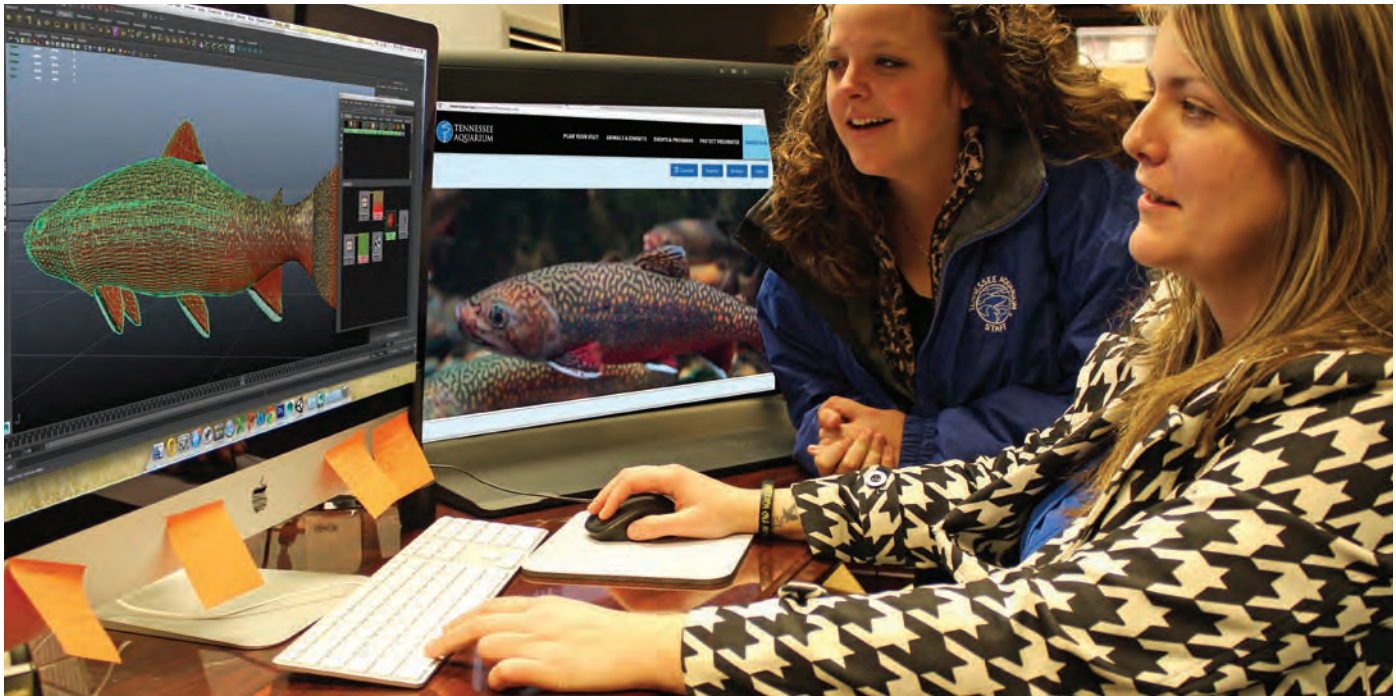
GRAMMORNOT

iCube completed an app for Donna Smith of the College of Business this year called GrammOrNot, providing quizzes for three areas in the COB Online Writing Tutorial: Misused Words, Apostrophes, and Concise Writing. The app was programmed using Unity, a software we also used for VR project development, and the artwork was provided by three artists at Tennessee Tech, including

two interns and one full-time team member at iCube. The app is available on both Apple and Google Play Stores and is used to supplement the curriculum for multiple classes in the COB.

ONLINE PRESENCE

As part of the College of Business, iCube has been working to update the COB website within the new guidelines provided by campus this year. This has included reorganizing content and utilizing social media to streamline various aspects of the site to provide information for students, both current and potential, as well as streamlining the marketing of COB programs and Tennessee Tech as a whole. By forming an Online Presence Taskforce, iCube has helped increase Instagram, Facebook, and Twitter followers by 25% in a single semester. iCube also led several social media campaigns including Wings Up Wednesdays, Zoom Background Challenges, Online Spirit Week, Faculty Friday 2 Truths and a Lie, and Testimonial Tuesdays along with Alumni Spotlights to feature those who have already graduated and their success gained from the COB.



SCHOOL OF ART, CRAFT & DESIGN

ART PARTNERSHIP

We started looking for students in the Tech's art department interested in 3D modeling in 2015. The next year, we began incorporating students interested in graphic design as well, which led to a more formal partnership with the art department in 2017. Students began completing their required independent study hours with us and were able to complete projects for clients such as the Tennessee Department of Health, THSO, and other organizations across the state. At

the end of each semester, students provide a portfolio presentation of what they have completed while working with us to the art department. This partnership provides us with access to talented designers and art students who are able to gain experience and expand their portfolio to include work on our campaigns, and helps alleviate some of the burden for the art department looking for independent study placements. This partnership is continuing to grow and evolve into a more formal assessment of students' skills before working with us to ensure their success while completing their independent study hours, as well as portfolio guidelines so that we can better prepare the students for their final presentations.



STUDENT HIGHLIGHT

Laura Beth Hellerstedt, a fine arts major with a design concentration, helped create the graphics for the THSO Thanksgiving microsite and contributed greatly to the Turtle Exhibit project we completed with the Tennessee Aquarium by redrawing all of the turtles provided to us and then digitized them in Adobe Illustrator to make it compatible with the programming of the coloring book portion of the exhibit.



iCUBE

CERTIFICATE PROGRAM

iCube has been working to develop a Certificate Program that aims to launch Spring semester 2021. This 15-credit-hour program, currently titled the Creative Design & Project Development Certificate, includes 3 credit hours for project design and communication, 3 credit hours of an art or programming course, and 6 credit hours of iCube labs for Introduction to Project Design, Digital Art Production, and Programming, culminating in a 3-credit-hour Capstone project catered to each student's abilities. Our goal is to provide students with the opportunity to learn about each stage of development for projects using immersive technologies, such as VR and other current technology

trends. We hope this program will be accessible and useful for all interested students on campus.

VR PROGRAMMING TEAM

This year, we have had many students eager to work on our VR development team. These students support our demonstration areas for tours by ensuring our equipment and programs are ready to experience by visitors to our space. Throughout the semesters we have worked on updating projects that are no longer compatible with the new VR technologies, as well as a project designed by iCube that allows players to experience arcade games to show how difficult it is to perform tasks while under the influence of alcohol or drugs. We hope to complete this game and have it ready for implementation in Fall 2020.



STUDENT HIGHLIGHT

Dallas Jackson and **Jamison Boyd**, both juniors and computer science majors, led the student development team while working directly with iCube leaders and contributed greatly to various VR projects and updates throughout the year.



NEW PROJECTS

We have tackled several new problems using innovative solutions for leaders throughout the state this year. These projects come from previous work we have done directly with some of these clients, or with new clients after seeing what we have done with organizations similar to their own. Our office strives to exceed expectations in each project we complete, and the work we have done and our relationships we have built contribute greatly to the sustainability of our office as we complete new projects each year.



CAREGIVER WEBSITE AND 360 VIDEO

iCube launched TNRecharge.com for the Tennessee Respite Coalition, a site aimed at helping the public understand what a caregiver is and how respite care can help ease some of the burden of caring for a loved one who can no longer care for themselves. The site provides a quiz and a 360-degree video we created of a day in the life of a caregiver to help visitors self-identify and acknowledge their role and access to respite resources in the state through the Tennessee Respite Coalition.

BANKCAREERS.ORG

This year, iCube worked with the Tennessee Bankers Association at the request of Tennessee Tech's College of Business (COB) to develop a way for banks to bring young talent into the banking industry. iCube has worked with representatives from ETSU, MTSU, UT Martin, and Tennessee Tech's COB to launch BankCareers.org, a platform for banks to post positions college students can find through the site with universities across the state acting as the bridge that connects young talent with local opportunities.

iCube has also created a social media campaign, @BankOnThatTN, to target college-aged students who have never considered a career in banking and expose them to the possibilities the industry has to offer.

2BBETR

iCube has been working with various organizations to combat the opioid crisis over the past few years, and this year we partnered with the TN Office of the Inspector General to create an app targeting middle and high school students. We created 2BBETR, a webapp for adolescents with a quiz that allows them to make choices throughout a typical school day to determine their pattern for decision making. The webapp places them in one of five categories that the Institute of Public Health determined are reasons adolescents use and abuse drugs: To Do Better, To Feel Better, To Fit In, To Experiment, or To Feel Good. The webapp encourages students to be aware of their tendencies for making decisions to empower them with self-awareness in possible scenarios involving the choice to use drugs.



STUDENT HIGHLIGHT

Alyssa Meadows, a sophomore and computer science major, was a primary contributor to the programming of the webapp, along with being the student representative at iCube weekly meetings and completing work on other projects throughout the office.



TURTLE EXHIBIT

Over the years, iCube has partnered with the Tennessee Aquarium on projects including the Tennessee Aquarium Visitor's App, the Tweeting Eel (@electricmiguel), the Secret Reef App, and a VR simulation on environmental conservation. This year, the Tennessee Aquarium asked iCube to help with the remodeling of their turtle exhibit.

We created a set of educational games for visitors to learn about four different varieties of turtles, change the look of each turtle with an interactive coloring book, and a habitat game to show what it takes to be a "Turtle Hero" by making positive choices at home that can save turtle ecosystems.



STUDENT HIGHLIGHT

Ryan Philips, a senior computer science major, used his programming skills to work with iCube team members and develop the turtle coloring book feature of the interactive media we provided for the Tennessee Aquarium's new turtle exhibit.



STUDENT HIGHLIGHTS

Flavia Gjishiti, a fine arts major with a design concentration, painted each turtle digitally to provide a 'fade out' effect from the realistic turtle to a colorless version for visitors to recolor on their own.



DIGITAL OLLIE RESOURCE KIT

Ollie Otter wasn't able to visit schools when COVID-19 shut them down at the end of the year, but we created activities for kids to complete at home to spread the message of booster seat and seat belt safety even during the crisis. Activities and accommodation for each were grouped for each day of the week into the five key points of Ollie's presentation: workzone safety, HandsFreeTN, always buckle up, belts to bones, and

"Under 4'9, It's Booster Time!" The activity sheets are available at ollieotter.org, and visitors are encouraged to post pictures and videos of their kids completing the activities while using #OllieAtHome.

TWEETING EEL SHOCKS THE WORLD!

Hundreds of news outlets across the globe cover iCube Project.

“*Tennessee Tech teamed engineering and business students to give the eel a voice*” center director Kevin Liska previously said in an aquarium statement.

– Kevin Liska, iCube Executive Director

HEADLINES

In the News Electric eel shocks top media sources and dozens more



“An electric eel named Miguel Wattson is powering lights on a Christmas tree at the Tennessee Aquarium”



“Electric eel powers Tennessee Aquarium’s Christmas lights”



“Noel: Electric Eel Lights Up Christmas Tree In Tennessee”

The Washington Times

“Shocked? Electric eel powers aquarium’s Christmas lights”

HEADLINES *In the News*

Electric eel shocks top media sources and dozens more



“Electric Eel Lights Up Aquarium’s Christmas Tree And Tweets About It”



“This Electric Eel Is Shocking Around the Christmas Tree”



“Shocked? Electric Eel Powers Aquarium’s Christmas Lights”



“Shocked? Electric Eel Powers Aquarium’s Christmas Lights”



“Electric eel powers aquarium’s Christmas lights”



“Electric eel’s shocks light up aquarium’s Christmas tree”



“Electric Eel Lights Christmas Tree at Tennessee Aquarium”



“Electric eel ‘Miguel Wattson’ lights up Christmas tree at Tennessee Aquarium”

The Bismarck
Tribune

“Electric eel powers lights on Christmas tree at Tennessee Aquarium”


A U S T R A L I A

“Electric eel sting delivers 860 volts of juice in massive jolt, study finds”

自由時報
Liberty Times Net

“This aquarium is so cool that the electric eel “generates electricity” to light up the Christmas tree video is here!”

La Razón
DE MEXICO
S P A I N

“Electric eel surprises by turning on Christmas tree lights”

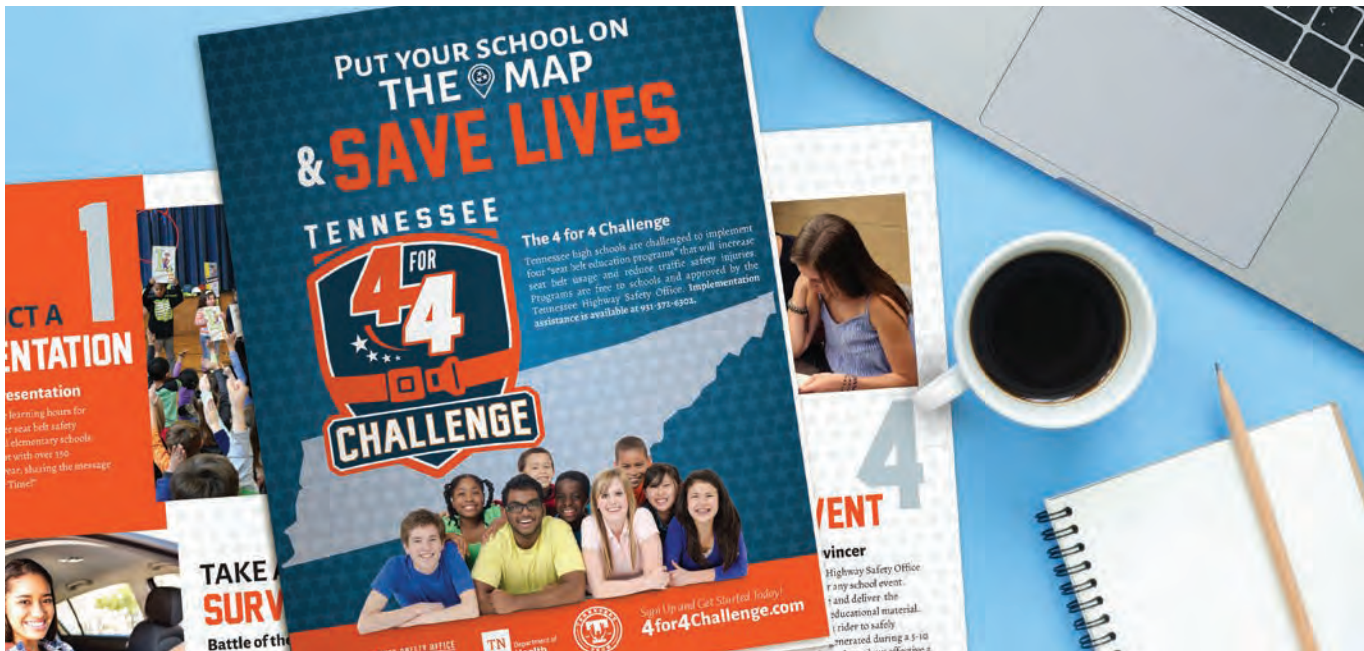


iCUBE TWEETING EEL PROJECT

The Tennessee Aquarium asked us to come up with something cool for their new electric eel display that would be interactive and engaging even when visitors left the aquarium to go home. Another zoo had created an exhibit where a honey badger would post selfies on Instagram when it stood in a certain part of its cage, and they really liked that concept. We thought it would be fun to come up with a way for the electric eel to power its own social media, and ultimately decided to let him run his own twitter account.

At first our idea was to stick two multimeters in the tank and measure electrical current between them—but because the electricity from the eel disbanded in all directions, the power reading on one end of the tank would read very differently from the other end, depending on the eel’s position. An electrical engineering student we had at the time, Josh Leverette, noted that sound would travel very consistently through water. He helped to write an equation and calibrate it so that we could convert decibels to voltage. From there, we took two microphones, inserted them in the tank, and connected the input to the raspberry pi. The pi would then listen for electrical pops from the eel and, using this equation, calculate the voltage emitted.

If the voltage rose above a certain threshold the pi would look to an externally hosted database of possible tweets, choose one, send it out on Twitter, and move to the next line for next time. We also instilled a cool down period because the amperage from the eel was very high. This would prevent the eel from sending out hundreds of tweets a minute. We put a cap on his tweets per minute.



4 FOR 4 CHALLENGE

The Tennessee 4 For 4 Challenge is a unique partnership with the Tennessee Department of Health and other iCube traffic safety stakeholders. Tennessee high schools are challenged to implement four seat belt education programs to increase seat belt usage and reduce traffic safety injuries in young adults. These programs are free to schools, available through our ReduceTNCrashes.org initiative, and have been approved by the Tennessee Highway Safety Office.

CHALLENGE 1: CONDUCT A PRESENTATION

Students earn service learning hours for conducting Ollie Otter booster seat and seat belt safety presentations at local elementary schools. Ollie volunteers across the state assist with over 350 presentations each year, spreading the message of "Under 4'9", It's Booster Time!"

CHALLENGE 2: TAKE A SURVEY

High schools implement the Battle of the Belt program and compete with rival schools to increase seat belt use. Schools conduct a student-led seat belt education

program and survey seat belt usage improvements through three unannounced seat belt checks. Awards are given for creative program implementation and improved seat belt use rates.

CHALLENGE 3: SIGN A PLEDGE

Schools implement the national Checkpoints™ program that gives parents instruction and structure to establish a Parent-Teen Driving Agreement, which helps set safety expectations as teens gradually increase driving complexity and gain more responsibilities. The resulting driving pledge has proven to reduce teen crashes and violations.

CHALLENGE 4: HOST AN EVENT

Schools request a Seat Belt Convincer from THSO for any school event. Partners will schedule and deliver the Convincer along with educational materials. The Convincer allows a rider to safely experience the force generated during a 5-10 MPH crash, demonstrating how effective a seat belt can be in keeping a person seated and reducing movement during a crash.



OCCUPANT PROTECTION CENTER

The Tennessee Occupant Protection Center offers access to a program of strategies to improve the safety of passenger vehicle occupants. Child safety becomes compromised when the child restraint is not correctly installed into a motor vehicle. Other dangers are presented when the child is not buckled into the restraint correctly and/or the safety seat used is not age and size appropriate. Studies show that at least 80% or more of child restraints are not used correctly. To help reduce misuse of safety seats, groups across the country offer safety seat check-up inspection or fitting stations. At these stations,

technicians offer hands-on training about the proper use and installation of child restraints and advise parents and caregivers as to what is age and size appropriate for their child passengers. The center supports the Tennessee Highway Safety Office in hands-on guidance for over 240 nationally certified child passenger safety technicians in Tennessee. Other Center activities include implementing the Ollie Otter program, supporting occupant protection safety marketing and media campaigns and promoting innovative traffic safety programs in Tennessee high schools..



TDOA TRAINING

iCube developed online training for Tennessee Soil Conservation Districts across the state. The training featured custom graphics and content and was the nation's first comprehensive training launched statewide for over 400 board members of a state's organization. Modules included Financial Management Processes of the Soil Conservation District; Statutory Mission, Goals, and Objectives; Board Relationships with USDA; and other Board member activities. Programmers and designers from the iCube team worked together to develop

and implement this training from the Tennessee Department of Agriculture.

CHILD PASSENGER SAFETY TECHNICIAN

Child Passenger Safety Technician certificate is available statewide through the Occupant Protection Center at Tennessee Tech's iCube. Technicians and instructors are required to successfully complete the recertification process before current certification expires. The center facilitates statewide training and provides resources for the statewide network of technicians.



TDOT TRAINING

iCube worked with the training division at the Tennessee Department of Transportation to develop and implement several online learning modules for the state. These modules were among the first custom components for the TDOT Learning Network Curriculum and included topics such as OSHA Safety in the Workzone, Protect the Queue and Safety Primer for New Employees. iCube team members developed unified branding across all modules, edited and recreated content, and programmed the training and related quizzes using Articulate software.





TENNESSEE
LIFESAVERS

CONTINUING PROJECTS

Ongoing projects are the core source of sustainability in our office, and have led to new projects in various fields over the years. While several of these larger projects have been an integral part of iCube for many years, some recently developed projects have been gaining momentum.



TENNESSEE TRAFFIC SAFETY RESOURCE SERVICE

We have been assisting the Tennessee Highway Safety Office with educating the public on safe driving practices and behavior changes while on the roadways since 2012. We provide free resources for agencies and departments to use across the state to educate the public on the mission and assist with handling, organizing, and storing 90+ training courses of 2000+ students every year to help document and maintain the database for certifications of the courses across the state. iCube team members and interns also assist with developing new materials for marketing across the state for education and enforcement campaigns, along with the annual state Lifesavers Conference.

LIFESAVERS CONFERENCE

iCube is responsible for the technical, marketing, website, and social media aspects of the conference both before and during the event, supporting THSO staff to ensure the event runs smoothly. The annual conference for the state includes a pre-conference for child passenger safety technicians, training and certifications for drug recognition experts, and informational panels for attendees, including topics on traffic and pedestrian safety, effective campaigns, enforcement, teen and elderly drivers, legislation changes, and the latest technology available. This year, the conference had over 600 attendees, nearly 30 vendors and 20 sessions



NATIONAL DIGITAL CARSEAT CHECKFORM

In a dramatic shift toward uniformity and collaboration among states, several organizations, including iCube, were tasked by the National Safety Council and NHTSA to develop a new platform to better document specific misuse with child restraints and create a complete picture of national CPS data. To meet this goal, iCube has developed an online platform with a dashboard for technicians to store their car seat checks digitally, providing real-time access to national data and information. Previously, there have been applications for iOS, Android, and Amazon created for similar use, but

limitations in internet and data connections proved problematic in the field. iCube's recently developed platform will be the first widely-used app for child passenger safety, complete with a standardized check form to be used across all states, and a single database containing all forms and related car seat data. This collected data will then be used to better inform the engineering of car seats and vehicles based on the common misuses being shown in the data, as well as to generate targeted education messages to make car installation procedures easier on parents and, subsequently, safer for kids.



TRAFFIC SAFETY MEDIA

Since 2018, the iCube has managed the public service paid media campaigns on behalf of the Tennessee Highway Safety Office. This includes creative direction, media buying and campaign management. We use a broad range of tactics including social media, digital, broadcast radio, streaming audio, broadcast and cable television, and out-of-home to communicate safety messages. These safety messages include drunk driving prevention, seat belt safety, motorcycle safety awareness, distracted driving prevention, and pedestrian safety. During the first year, we saved THSO over \$500,000 while increasing paid media impressions by over 160%. This year, we have generated over 88 million impressions and



over 19,000 television and radio spots, as well as directing over 300,000 unique visitors to HandsFreeTN.com, which educates the public on Public Chapter No. 412, prohibiting handheld cell phone use while driving.

▶ CONTINUING PROJECTS





OLLIE OTTER

Since 2007, The Ollie Otter Seat Belt and Booster Seat Education Program began with a vision for public and private partners to save lives on Tennessee roadways. The Ollie Otter Program has become a nationally recognized, award-winning program, supported by educators, safety professionals, safety and healthcare workers. In March 2020, the Ollie Otter Program had reached one million children across all 95 counties in Tennessee. Through public education, student engagement and outreach events, the Ollie Otter Program teaches the importance of booster seats, seat belt use and roadside safety.



STUDENT HIGHLIGHTS

Macie Waldroup, a civil and environmental engineering major, "Interning with Ollie Otter and the Tennessee Roadbuilders Association has opened doors for me both academically and professionally."



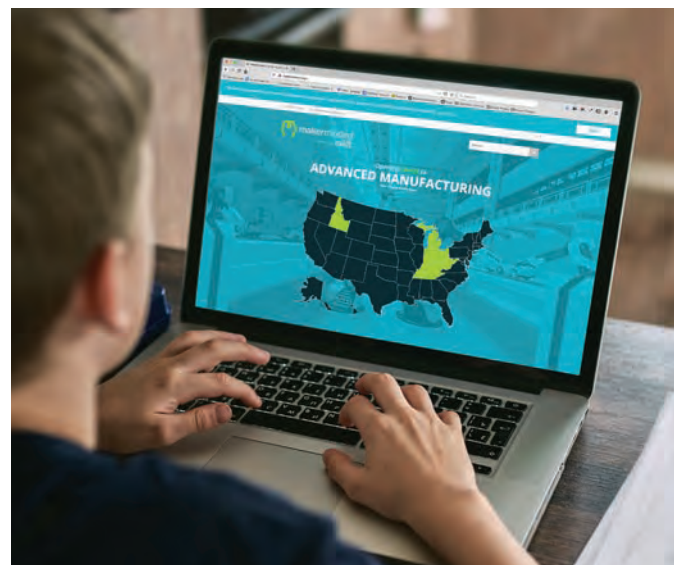
REDUCETNCRASHES

iCube created ReduceTNCrashes.com in 2013 for the THSO with the goal of increasing traffic safety activities for teens. The website serves as a portal for traffic safety activities available throughout the state and incentivises schools to complete these programs to earn points and Gold Level status. The custom platform designed for this program served as the inspiration for both MakerMinded and TNTogether. This year, Dana White, a graduating senior from David Crockett High School, received a \$3,000 Reduce TN scholarship through the first year of our partnership with AAA, and three high schools reached Gold Level status.

MAKERMINDED

In 2015, iCube launched MakerMinded.com with LIFT (Lightweight Innovations for Tomorrow), a lightweight manufacturing company in Detroit, Michigan. The aim of the program is to get more students interested in advanced manufacturing and other STEM-related careers. By providing

students with an online repository of the STEM activities happening across the country, MakerMinded awards schools for completing activities by giving them points on a live scoreboard to encourage competition between middle and high schools throughout each active state. This year, MakerMinded was active in 6 states: Tennessee, Kentucky, Ohio, Michigan, Indiana, and Idaho.





TN TOGETHER

iCube created an opioid educational campaign for the Tennessee Department of Health in 2017, focused on educating the public to decrease stigmas and increase the power of individuals and communities to fight the epidemic across the state. Over the past three years, this campaign has become TNTogether.com, an online repository for finding resources from the Tennessee Departments of Health and Mental Health and Substance Abuse Services and activities that are happening throughout the state for individuals families, communities, and organizations to complete and help combat the crisis.

This year, the iCube team has redesigned the website to make it even easier to navigate and quickly find available resources in an effort to make the site even more accessible and useful to the public. iCube is now also responsible for TNTogether's social media, which led to a significant increase of followers in the first three months after acquiring the responsibility from the state departments in December of this year. Currently, the site has over 133 activities for individuals, coalitions, communities and professionals to complete, and over 143 submitted success stories of individuals, groups, and organizations who have completed one or more of these activities.



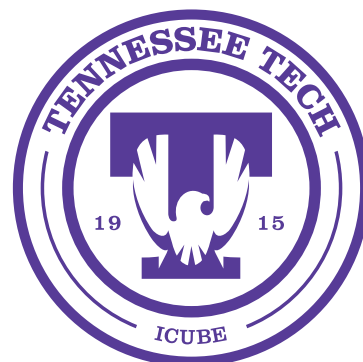
iCUBE

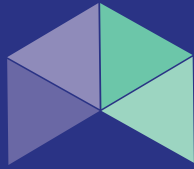
THE FUTURE

As we move forward, we are proud of the work we have completed and excited about the new opportunities heading our way. Our team is filled with creative talent and innovative mindsets, and we are always ready to collaborate on cutting-edge solutions to prevalent issues.

We evaluate and modify our best practices to remain a pioneer in the field of merging business technology and innovation with traffic safety, public health, conservation, and many other areas, while providing Tennessee Tech students with opportunities to get involved. As the nature of content delivery and technological capability continues to evolve, our innovative students are a highly valuable resource.

iCube will continue to attract the brightest minds, invite eager students to join new projects, and build interdisciplinary teams of passionate leaders who solve complex problems through education, training, public policy campaigns, marketing, and virtual reality for local, statewide, and national initiatives. We will continue to Imagine, Inspire and Innovate, and look forward to the new and continuing projects ahead.





CATALYST

iCUBE's AGENTS OF CHANGE



Tennessee Tech does not condone and will not tolerate discrimination against any individual on the basis of race, religion, color, creed, sex, age, national origin, genetic information, disability, veteran status, and any other basis protected by federal and state civil rights law. Tennessee Tech complies with Title IX and prohibits discrimination on the basis of sex in education programs and activities, admissions or employment. Inquiries regarding non-discrimination and affirmative action may be referred to the Director of Affirmative Action, Derryberry Hall 156, Box 5132, Cookeville, TN 38505-0001, 931-372-3069, equity@tntech.edu. Inquiries regarding Title IX may be referred to Tennessee Tech's Title IX Coordinator, Derryberry Hall 256, 931-372-3112, titleix@tntech.edu, or to the U.S. Department of Education Office of Civil Rights, 800-421-8339, OCR@ed.gov. Publication #CBUSR035-PRNT-21