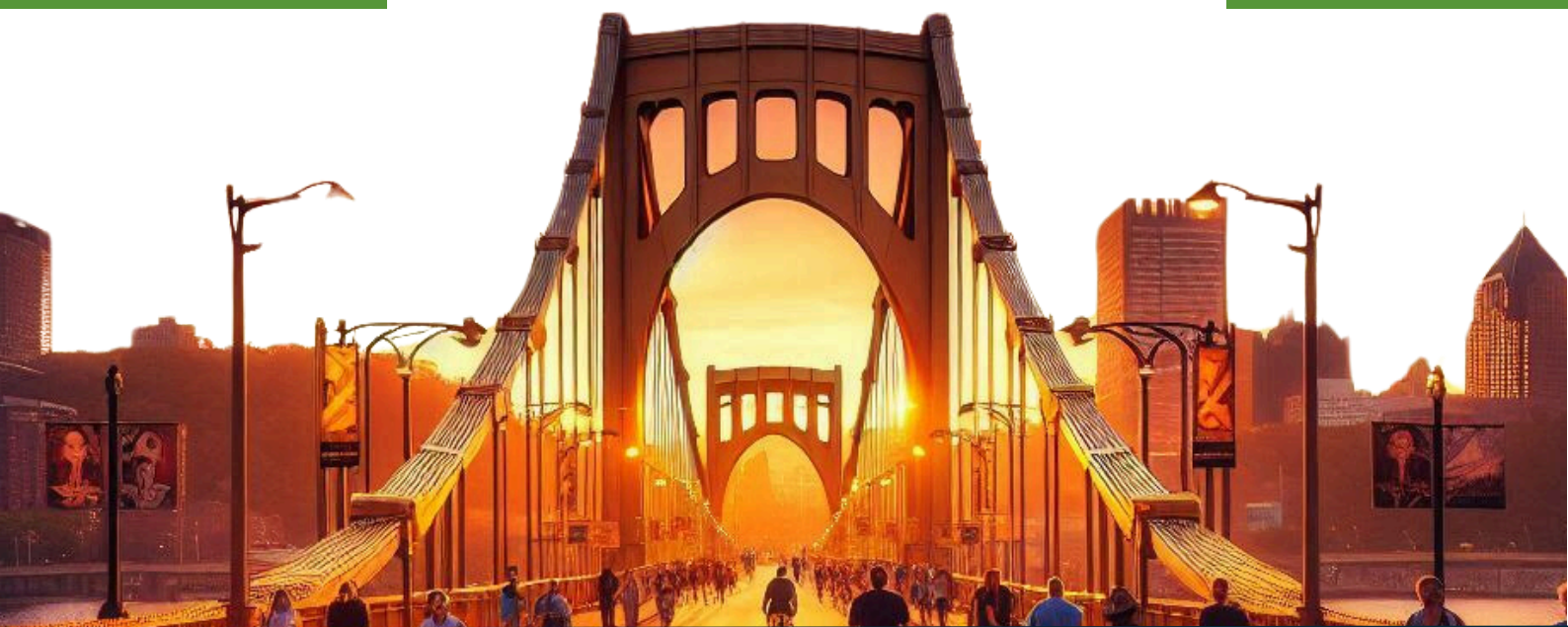




EL PUENTE NEWS

Puerto Rico Transportation Technology Transfer Center / Puerto Rico LTAP



PROMOTING STEM CAREERS IN ROADS, TRANSPORTATION, AND LOGISTICS SUMMER TRANSPORTATION INSTITUTE CAMP 2025



The 23rd edition of the **Summer Transportation Institute (STI)** was successfully completed at the Department of Civil Engineering and Surveying of the University of Puerto Rico at Mayagüez (UPRM). The STI camp was held from June 18 to July 16, 2025, sponsored by the **Puerto Rico Highways and Transportation Authority (PRHTA)** and the **Center of Excellence in Transportation and Logistics (CETL)**, and with the administrative support from the **Puerto Rico Transportation Technology Transfer Center (PR-LTAP)**. The STI initiative, aimed at high school students, seeks to spark their interest in technical careers related to engineering and transportation, focused on STEM fields (science, technology, engineering, and mathematics). At the same time, it aims to strengthen key skills for university and professional life.



STI students, mentors, and directors during one of the technical visits to road projects.

Over the course of the four-week camp, **20 students** from various schools across Puerto Rico, including Walks Webs, Colegio La Milagrosa, Academia Inmaculada Concepción, Segundo Ruiz Belvis, Santa Ana Bilingual Academy, Froebel Bilingual School, ESCAED, Carib Christian School, Puerto Rico Christian School, Lola Rodríguez Tió, Academia San Agustín and Espíritu Santo, and the Ernesto Ramos Antonini Free School of Music, participated in an intensive program. The camp ran Monday through Friday and included academic activities, hands-on practical workshops, technical visits, and personal and professional development workshops. The program combined activities on the UPR Mayagüez campus with a week dedicated to visits to transportation systems and projects in the San Juan Metropolitan Area, from July 7 to 11.

The camp activities promote:

- The exploration of professional fields in engineering, transportation, and logistics.
- Interest in mathematics, science, and technology as key tools for professional development.
- The development of skills useful for completing a university degree.
- Exposure to employment opportunities in the industry.
- The strengthening of teamwork and experiential learning, as well as the development of communication and critical thinking skills.

The program content covered a wide variety of engaging topics in science, engineering, and technology, such as:

- Technological innovations in the transportation sector.
- Roadway design and safety.
- Intermodal transportation of people and goods.
- Applicable laws and regulations.
- The relationship between transportation and the environment.
- Resilience and durability of transportation systems in coastal communities.
- Ethics and human relations.
- Career outlooks in the industry.



Technical Visit at La Boquilla Reserve in Mayagüez About Coastal Resilience with the CREATE Group



Visit to the Traffic Management Center on the PR-52 Highway with Metropistas Personnel



STI students receive a visit from Dr. Agustín Rullán, UPRM Chancellor, and Dr. Cristina Pomales, Dean of Engineering

The camp was led by **Dr. Didier M. Valdés Díaz** and **Dr. Ivette Cruzado Vélez**, professors in the Department of Civil Engineering and Surveying at UPRM. Participants were supported by a team of mentors made up of civil engineering graduate students **Álvaro Solano**, **Carol Perelló**, **Alonso Velásquez**, **Claudia Carrasquilla**, **José Monterrosa**, and **Camila Arenas**, who guided and assisted the students throughout the entire experience.

The STI program was supported by two US-DOT University Transportation Centers (UTCs) at UPRM: **DuReTransp (Durable and Resilient Transportation Infrastructure Center)** and **CREATE (Coastal Research and Transportation Education)**, as well as by agencies such as the **Puerto Rico Highways and Transportation Authority (PRHTA)**, **Federal Highway Administration (FHWA)**, the **Integrated Transportation Authority (ATI)**, **Metropistas**, **Puerto Rico Ports Authority**, **Aerostar**, **ACI-Herzog (Tren Urbano)**, the **Metropolitan Bus Authority (AMA)**, the **Luis Muñoz Marín International Airport**, **Aircraft Rescue and Fire Fighting (ARFF)**, among other key institutions in the sector.

Professors from UPRM and experts in various engineering fields, coming from these agencies and organizations, delivered twelve lectures to the STI participants during the camp. STI is grateful to all these professionals who generously gave their valuable time to share their knowledge and experiences for the benefit and learning of the participating students.



During the camp, students participated in a variety of activities, including:

- **Lectures and talks** with industry experts.
- **Technical projects:** Students built a bridge using balsa wood to understand how structural design influences the distribution and management of loads. The students designed and tested solar-powered cars, exploring how solar energy can be used as a clean and efficient propulsion source. They also constructed water-propelled rockets (using water and compressed air), experimenting with fundamental physics principles.
- **Comprehensive research project.**
- **Personal and professional development workshops.**
- **University tours**, including a walk-through various areas of the UPRM campus.
- **Sports activities at UPRM and recreational outings in San Juan.**



- **Multimodal Tour Activity in the San Juan Metropolitan Area**

During the visit to the San Juan Metropolitan Area, the STI participants engaged in an experience where they used various modes of transportation on a technical tour between the municipalities of Caguas and San Juan. The group departed from Caguas and took the ATI express bus system Route E20/E30, from the Caguas Terminal to the Cupey Station of the Tren Urbano. From there, they traveled on the Tren Urbano from Cupey to the San Francisco Station. Next, they travel on the highway system toward Cataño, where they used the ATI ferry system to cross the San Juan Bay to reach Old San Juan.

- **Technical Visits in the San Juan Metropolitan Area**

Highway Construction Project on PR-52 in Cayey

STI participants received a technical lecture about the engineering process of stabilizing the mountain slope that collapsed, that is currently blocking the northbound direction of Freeway PR-52. The participants visited the area of the landslide, where they observed a demonstration of the nail anchors being used to stabilize the slope and the earthwork required to complete the stabilization.



Visit to the slope construction and repair project on PR-52 Highway



Tour of the AMA Bus Maintenance Shops with its President, Luis González Rosario

Metropolitan Bus Authority (AMA)

During this visit, the STI students were welcomed by the AMA President, Luis González Rosario. The group visited the administrative offices, explored the bus repair and maintenance shops, the fuel station, and the bus washing system. Additionally, the STI group learned about the “Llame y Viaje” paratransit program and visited the AMA Communications and Control Center, where they observed how bus daily operations are coordinated and supported.

Luis Muñoz Marín International Airport (LMM)

During this visit, STI students attended a technical presentation about the operations at the LMM Airport by Aerostar in a conference room, visited the JetBlue's Control Center, and learned about air security protocols through a session with officers from the Transportation Security Administration (TSA).



Visit to the Aircraft Rescue and Fire Fighting (ARFF) at LMM International Airport

Aircraft Rescue and Fire Fighting (ARFF)

STI students also participated in demonstrations of the protective equipment used for aircraft rescue and fire control at the LMM Airport. The students had also access to observe up close the operation and features of the specialized firefighting vehicles at the airport.

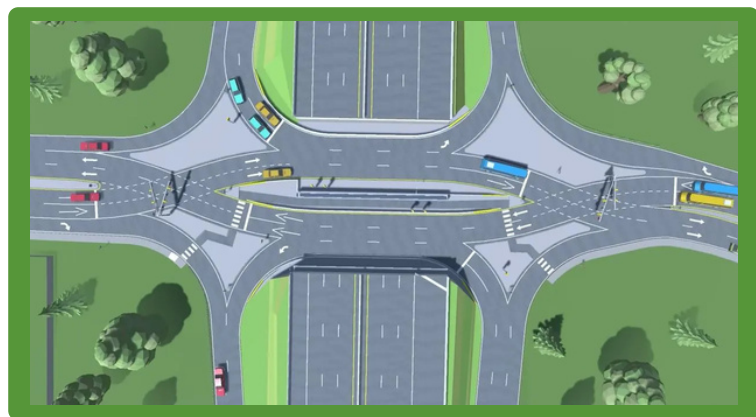
Tren Urbano

STI students attended a technical presentation in the conference room of the Tren Urbano Administration Building at Martínez Nadal, where they learned about the operation of the heavy rail system. Afterwards, they visited the Operations Control Center and the Maintenance Shops of the train cars. The STI group also had the opportunity of using the train to visit different rail stations and experience the system in operation with the guidance and direction from ACI-Herzog personnel.



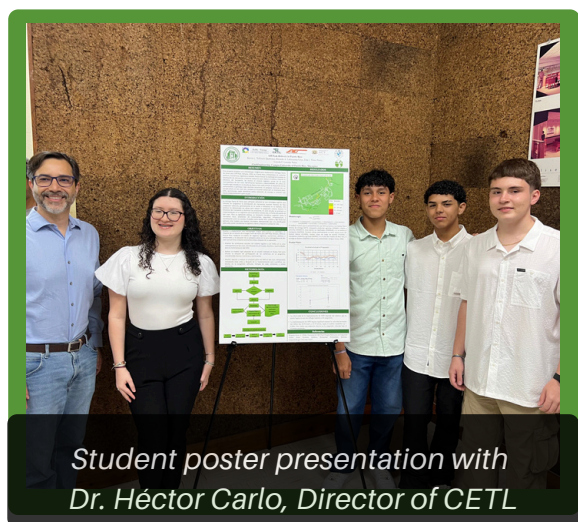
Visit and Tour of Tren Urbano Stations

Ports Authority – During this visit, the STI students toured the administrative offices and met with the Executive Director, Lic. Norberto Negrón. They also explored the port operational facilities, including the Crowley areas, the Luis Ayala Colón firm, and the Dry Dock, where they learned about the current operations and ongoing expansion projects of the port facilities.



Diverging Diamond Interchange (DDI) between Expressway PR-30 and PR-189 in Gurabo – Students took a walk through the first diverging diamond interchange in Puerto Rico, completed in 2024, used the pedestrian crosswalks, and observed how this innovative intersection design improves traffic flow and reduces traffic conflicts compared to conventional intersections.

Traffic Management Center (TMC) – PR-52 – During the visit, students observed the daily operations at the TMC and were informed about how highway traffic is monitored through cameras installed along the freeway corridors. They participated in demonstrations and talks on incident management protocols and the coordination of roadside assistance vehicles operated by Metropistas.



The closing ceremony of the STI camp took place on July 16, 2025, and had the participation of **Dr. Agustín Rullán, UPRM Chancellor**; **Dr. Cristina Pomales, Dean of the College of Engineering**; **Dr. Ivette Cruzado, Associate Director of the Department of Civil Engineering and Surveying**; and **Dr. Héctor Carlo, Director of the CETL**. UPRM Faculty and administrative personnel, as well as the parents of the STI students, joined in celebrating the achievements accomplished by the students throughout the 2025 STI Camp activities.

During the closing ceremony, the students presented the posters of their final research projects, which demonstrated the fruits of their hard work and the knowledge acquired throughout the STI camp. Each presentation reflected the dedication, learning, and growth experienced during this enriching experience. Participants also received recognition for their performance, commitment, and active participation, marking the close of an educational and transformative experience that will undoubtedly leave a significant mark on their academic, professional, and personal development.



Final presentation of STI students' research projects during the closing of the camp to parents and visitors



Why is it necessary to attract more young people to highways, transportation and logistic related careers in STEM areas?

1. **Generational renewal** – Many transportation professionals are nearing retirement. It is vital to cultivate a new generation equipped with technical knowledge and innovative vision.
2. **Global challenges require STEM solutions** – The transportation industry needs young people skilled in technology, engineering, and data analysis to tackle challenges such as automation, sustainability, and urban resilience. Issues like climate change, urban congestion, and sustainable mobility demand scientific and technological approaches. Young people have the potential to lead these transformations.
3. **Lack of representation in certain communities** – In Puerto Rico, the transportation sector offers a pathway to professional development and social mobility, especially when linked with technical and university-level education. Programs like STI help diversify the field by providing opportunities for students from diverse groups to access high-impact, well-paying careers.
4. **Economic and social development** – Efficient transportation drives economic growth. Training local professionals strengthens infrastructure and improves the quality of life in their communities. New generations can design more inclusive solutions, such as multimodal systems, smart infrastructure, and accessibility-focused policies.
5. **Early inspiration leads to long-term commitment** – Exposing young people to real-world experiences—such as simulations, technical visits to agencies and real projects, and hands-on projects—sparks an interest that can evolve into university studies and professional careers. Through the STI Camp, gaining access to topics like sustainable and resilient transportation, fleet electrification, smart logistics, and autonomous vehicles can inspire STEM-trained youth to become part of the solutions.

To learn more about the activities, conferences, and resources we offer at the Puerto Rico Transportation Technology Transfer Center, we invite you to visit our website at www.prltap.org or scan the QR code with your mobile device. You can also stay informed by signing up for our mailing list or following us on social media: Facebook, LinkedIn, and Instagram.

