City of
FRESNO
DEPARTMENT OF TRANSPORTATION
Fresno Area Express Handy Ride

DATE: September 24, 2025

TO: GEORGEANNE A. WHITE, City Manager
Office of the Mayor and City Manager

FROM: GREGORY A. BARFIELD, M.A., Director
Department of Transportation

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Department of Transportation

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Department of Transportation

SUBJECT: FORMAL UNIQUELY QUALIFIED SERVICE CONTRACT WITH CALIFORNIA STATE UNIVERSITY, FRESNO INTELLIGENT DESIGN VISUALIZATION LAB THROUGH THE CALIFORNIA STATE UNIVERSITY, FRESNO FOUNDATION FOR THE FAX INNOVATIVE SHADE STRUCTURES DESIGN SETS AND DIGITAL TWIN PROJECT

EXECUTIVE SUMMARY

The Department of Transportation Fresno Area Express (FAX), requests approval from the Office of the City Manager to suspend the competitive bid process and to award a contract to the California State University (CSU), Fresno's Intelligent Design Visualization Lab (IDVL), through the California State University Fresno Foundation. Their unique qualifications would be utilized to guide architectural and interior design students, identifying high-need areas for innovative shade structures at bus stops throughout the FAX service area, and the creation of Finalized Innovative Shade Structures Design Sets and FAX Facilities Digital Twin Project.

BACKGROUND

Transit agencies across the nation attempting to address extreme heat concerns for its customers have struggled to find adequate bus shelters solutions.

During a visit to Arizona in May of 2024, Director Gregory Barfield observed unique shade structures. Once he returned, he directed FAX Planning Manager Drew Wilson to investigate further. FAX met with its current amenities' provider, Tolar, to explore options. However, their offerings were limited, oversized for a neighborhood bus stop which highlighted the need to explore more innovative solutions.

Next, Planning Manager Wilson contacted the City of Tucson to learn more about the shelters and the partnership model used to develop them who had just completed a bus stop design project with students and faculty from the University of Arizona that was recently highlighted in a transit trade magazine.

Inspired by this model, Director Barfield directed staff to reach out to the Fresno State Transportation Institute (FSTI). The Institute is a collaboration between the 15 cities within Fresno County, College of Social Sciences, Lyles College of Engineering and the Craig School of Business established to collaborate with other researchers on advanced transportation technologies, multi-modal and transit systems and global transportation issues. After several meetings and in-depth discussions, it became clear that CSU Fresno was well-positioned to deliver the type of creative, community-centered design FAX was seeking.

The Fresno State Transportation Institute put together a team from the Fresno's Intelligent Design Visualization Lab (IDVL) of the College of Social Science, and the Lyles School of Engineer to fund a research grant to provide extensive field research and stakeholder engagement to further study the need for developing a solution.

Three IDVL and three architectural students were hired by the University as interns led by faculty members Holly Sowles and Uris Giron of the IDVL, beginning the Summer of 2024 with the grant funds received.

During the summer of 2024, students and staff conducted field surveys and interviews with FAX riders, bus drivers, Assets and Facilities staff, Planners, and Capital Development team members to determine the issues to address related to shade, as well as to better understand the needs and concerns, including the ADA needs. This feedback, as well as personal experience from riding buses and visiting stops, was used to develop the initial alternative shade structure designs. In addition to providing shade, goals included the use of sustainable materials for durability and cost-efficiency, as well as meeting all building codes while ensuring ADA compliance.

Collection for data included data on FAX, its ridership, priorities, and concerns extreme heat including ongoing extreme heat research underway by the Fresno COG to address regional extreme heat concerns in various communities and neighborhoods in Fresno County.

Internally, students, and the faculty team met weekly with FAX staff from Planning, Capital Development, Operations, and Community Engagement to confirm data points collected and make needed adjustments in approach as needed from Summer 2024 to the end of the 2025 Spring semester.

With all the needed research, data, and knowledge the students and faculty then moved forward with the formal designs of 10-15 models that were produced to address various conditions and factors of heat based on location, heat index of the neighborhoods at the

high sun point of the day that would be ADA accessible even if the sidewalk size was that of a typical 6 foot width or smaller.

Design charrettes were held, allowing FAX staff to provide feedback on potential designs. The final charrette was a City Hall event in February 2025, entitled "Exploring Innovative Bus Stop Shade Solutions". CSU Fresno students and staff presented their 10-15 designs and discussed the potential benefits if implemented. Attendees were then invited to interact with informational posters, 3D printed models of the bus stop design concepts, and a VR experience for each design. A vote was held, and a total of four designs were then chosen to be considered for the next project phase.

The design of the alternative shade structures inspired the development of the Digital Twin, a digital replica that models the real-world conditions of stops in our service area. The intent of the Digital Twin is that environments can be replicated to real-life renderings, giving FAX more accessible data, such as dimensions, and real-time temperature data. This will reduce the time needed in the future to conduct studies such as heat analysis.

This will support mayoral priority to enhancing customer satisfaction by providing needed bus shelters for all bus stops within our service area. To achieve this goal, we require the finalization of the Innovative Shade Structures Design Sets to receive permits and fabricate the shade structures. As well as the performance of temperature research to produce the necessary data needed in order to create a digital replica that models the real-world conditions of stops in our service area, known as a Digital Twin. The finalization of the Innovative Shade Structures Design Sets, temperature research, and Digital Twin will be developed by architectural and interior design students, using the Intelligent Design Visualization Lab (IDVL) of California State University, Fresno (CSU Fresno), and will intend to improve transit equity and rider comfort through simulation analysis of the area's environmental and socio-economic conditions.

The award of this contract to finalization of the Innovative Shade Structures Design Sets, perform necessary temperature research, and create the Digital Twin will ultimately provide increased comfort and convenience to FAX passengers, allowing them to travel safely despite weather conditions throughout the FAX system. Further, the added shade infrastructure may also increase access to and use of the transit system, particularly by those riders most vulnerable to the negative effects of harsh heat and sun exposure. Finally, the tool will provide the potential to decrease bus stop maintenance expenses by recommending more effective materials and efficient universal designs for future bus shelters.

The proposed agreement allows for consultant-level work to be produced by local High School, College and Vocational students, giving them hands-on, real-world experience as they also possess equivalent knowledge and educational hours. This presents the opportunity to significantly offer innovative perspectives, while strengthening ties between the City and a local educational institute to address a community need. Additionally, CSU Fresno's IDVL has already invested considerable resources in the project's preliminary phases. The agreement provides the opportunity to establish a collaborative framework that will expand relationships with additional local institutes through a guidance and

resource network. This collaborative group will oversee the engineering and fabrication of shade structure prototypes during Spring 2026, with installation of prototypes to be placed at 50 bus stops throughout the service area scheduled for Summer 2026. Partner institutions proposed include the Fresno Unified School District's Career and Technical Education Program, Fresno County Office of Education's Career and Technical Education Program, State Center Community College District's Advanced Manufacturing Program, various Apprenticeship Programs, Manufacturing Alliances, and CSU Fresno's IDVL. The IDVL of CSU Fresno has already been a partner in developing alternative shade structures, making them uniquely qualified to be awarded this agreement for the Digital Twin.

ADDITIONAL FACTORS TO CONSIDERED

The proposed agreement utilizes an academic model, where students produce consultant-level work under faculty supervision.

Additionally, CSU Fresno's IDVL has already invested considerable resources in the project's preliminary phases funded by the FSTI grant. This includes field surveys, interviews with riders and drivers, multiple design charrettes, and a presentation at City Hall in February 2025, which resulted in four viable shade structure designs that will be used for the creation of the final design sets.

The agreement also offers unique value by integrating academic research capabilities and providing access to cutting-edge digital modeling technologies. It establishes ongoing partnerships with multiple educational institutions that will support future phases of prototype development and installation. This next phase covers not only the Innovative Shade Structures Design Sets and a Digital Twin deliverable but also the overarching collaborative framework and institutional relationships that will enhance the City's transit infrastructure initiatives beyond this specific project and could lead to a product that could be marketed to others in an environment that does not have anything to offer.

RECOMMENDATION

The Department of Transportation Fresno Area Express (FAX), requests the concurrence of the City Manager that, due to the unique knowledge and qualifications of the staff and students of CSU Fresno's Intelligent Design Visualization Lab (IDVL) , to be authorized to suspend the competitive bid process and award the formal contract for the creation of Finalized Innovative Shade Structures Design Sets and the development of the Digital Twin. The CSU Fresno's Intelligent Design Visualization Lab is uniquely qualified to perform services related to a FAX Facilities Digital Twin; approval to suspend the competitive bid process to award a contract to California State University, Fresno Intelligent Design Visualization Lab, based on their unique qualifications to guide architectural and interior design students to Finalize Innovative Shade Structures Design Sets for permit and fabrication. As well as performing temperature research to produce the necessary data needed in order to conduct the FAX Facilities Digital Twin Project to identify high-need areas for innovative shade structures at bus stops throughout the FAX service area.

For all the reasons above, I find that CSU Fresno IDVL is uniquely qualified to perform the services required.

✓ Approved _____ Denied

Georgeanne A. White, City Manager

9/24/25
Date