

## Request for Proposals: MTI’s Caltrans Research, Technology Transfer and Workforce Development Program

**Deadline:** April 1, 2026

**Eligibility:** Any MTI Research Associate who is eligible to be hired directly by the SJSU Research Foundation. Research Associates living in the following states are eligible for direct, part-time hire: CA, WA, IL, KS, MO, AR, HI, and PA. This also includes individuals currently employed at a California State University campus eligible for Additional Employment under [Article 36 of the CSU Collective Bargaining Agreement](#). To apply for MTI Research Associate status, please review the [MTI website](#) and submit an application before March 16, 2026. Questions about eligibility should be directed to Dr. Hilary Nixon, MTI’s Deputy Executive Director at [hilary.nixon@sjsu.edu](mailto:hilary.nixon@sjsu.edu).

**Submission Requirements:** Researchers should submit a three-page summary of the proposed research plan, a two-page CV, and a budget using MTI’s required template (available to download at: <https://transweb.sjsu.edu/research/request-proposals>). The *start date* for any of the research projects should be no earlier than October 1, 2026, and no later than January 1, 2027. There is no maximum budget; researchers are asked to develop a reasonable budget based on the project timeline and scope of work.

**Research Needs:** Details for eight (8) individual research needs are listed on the following pages. Each description includes background, project problem statement, objective, proposed description of work and anticipated deliverables, and the project’s anticipated duration. A summary is shown in the table below:

Research Need #	Title	Estimated Project Duration
1	Defining Corridor Suitability for Transit Bus on Shoulder (TBOS) Operations in California	Up to two years
2	Evaluation of Rectangular Rapid Flashing Beacon Efficacy at Uncontrolled Pedestrian Crossings at On- and Off-ramps	18 months
3	Resiliency – Power Loss	12 months
4	Resiliency – Man-made Incidents	12 months
5	Resiliency Study – Cybersecurity	12 months
6	Wireless Coverage Survey for Transit Applications	6 months, completed before June 30, 2027
7	Extended Customer Experience Research	6 months, completed before June 30, 2027
8	Public Outreach Planner (POP) Tool for Caltrans Plans and Projects	Up to two years

**FAQs:** Researchers with questions about the research need details should email them to Dr. Hilary Nixon by March 16, 2026. Please clearly indicate the Research Need # and Title in your email. Answers will be provided by Caltrans and posted to the MTI website at: <https://transweb.sjsu.edu/research/request-proposals>. For administrative or budgeting questions, please direct them to Dr. Nixon, and she will respond directly to the inquiries.

## 1. Defining Corridor Suitability for Transit Bus on Shoulder (TBOS) Operations in California

**Background:** Transit ridership declined significantly during the Pandemic but is now slowly rebounding. To sustain this recovery, commuter services must remain competitive with private vehicle travel times. Transit agencies need new ways to improve service, including speeds. There is currently some practical experience with TBOS through pilot projects. What is needed is further research on TBOS and how it will help advance transit service so that it better competes with single-occupancy vehicles, thereby increasing ridership and demand for these services. Currently, there are no guidelines for implementing TBOS, which creates uncertainty for districts and partners seeking to implement it. Caltrans needs research to help it define parameters as it screens candidate corridors, reduces unknowns regarding the level of retrofitting the existing right-of-way, and improves internal coordination between functional units within Caltrans. The benefits extend beyond Caltrans to regional transit agencies, which will gain greater clarity on where TBOS investments are most feasible, thereby strengthening grant applications and funding strategies. The outcomes will also help Caltrans advance statewide mobility, safety, and sustainability goals, particularly by improving bus travel time reliability. The research would transform the TBOS pilot from a limited initiative into a scalable, data-informed program that supports multimodal integration on state highway.

**Project Problem Statement:** There is an urgent need to evaluate corridor characteristics, such as shoulder width, traffic volumes, and enforcement feasibility, and to develop a framework to support project development and permitting. This research aims to provide Caltrans, regional transit operators, and Metropolitan Planning Organizations (MPOs) with criteria to pre-identify TBOS-eligible state highway segments, thereby enhancing bus speed, reliability, and safety while complying with roadway design standards and state policy goals. This effort would supplement the Transit Bus on Shoulders Pilot Guidance being developed by the Caltrans Division of Traffic Operations. California's focus on reducing Vehicle Miles Traveled (VMT) and goal to encourage and maximize transit as a strategy to not only meet state climate, health, equity, and environmental outcomes but also to foster socially and economically vibrant, thriving, and resilient communities.

**Objective:** The research proposal aims to pre-identify state-highway segments eligible for the Transit Bus on Shoulders (TBOS) program, enhancing bus speed and reliability, which contributes to safer transit operations. The research proposal aligns with the upcoming District Transit Plan, which is being developed in collaboration with other districts (with the exception of District 4), transit agencies and operators are expressing interest in utilizing state facilities, including TBOS. This research will help assess the eligibility of these suggestions in greater detail. The research will also complement the TBOS Pilot Guidance and Director's Transit Policy Implementation Plan's to provide guidance on transit facilities. By evaluating corridor characteristics (shoulder width, traffic volumes, enforcement feasibility, and crash data), this research can help mitigate risks associated with bus operations on shoulders and improve overall system safety. Additionally, the research would ensure compliance with roadway design

standards and state policy goals, ensuring that safety is an integral part of the implementation approach rather than an afterthought.

**Task Description of Work and Expected Deliverables:** In Year 1, the project would begin with a review of existing TBOS pilots, relevant state and national design standards (TCRP's A Guide for Implementing Bus on Shoulder (BOS) Systems), and applicable Caltrans guidance. The research team will use GIS-based screening methods and statewide datasets (e.g., shoulder width, AADT, transit route data) to identify and assess candidate state highway segments. Outreach will be to transit partners to validate data and refine screening criteria. In Year 2, the researchers would develop the screening framework and implementation guide, defining TBOS eligibility parameters, retrofit levels, and safety considerations. The framework will be applied to several pilot corridors to test scalability and inform statewide guidance. The research would require staff time and technical expertise, both internally and from the California Highway Patrol. The Division of Research, Innovation, and System Information (DRISI) could serve as the division lead, with the Division of Traffic Operations as the technical lead, to ensure alignment with statewide TBOS policy and guidance.

The deliverables could include:

- A statewide screening methodology and scoring system for corridor eligibility.
- A geospatial database and interactive map of potential TBOS corridors;
- Engineering and safety evaluation templates for use by Districts and regional partners;
- Recommendations for coordination and permitting procedures between Caltrans and transit operators
- Development of a corridor suitability index/data

**Duration:** Up to 2 years

## 2. Evaluation of Rectangular Rapid Flashing Beacon Efficacy at Uncontrolled Pedestrian Crossings at On- and Off-ramps

**Background:** To enhance the visibility, comfort, and safety of pedestrians crossing at freeway on ramps and off ramps, Caltrans has been installing Rectangular Rapid Flashing Beacons (RRFBs) at numerous uncontrolled crosswalks in the Bay Area. While the safety effects of RRFBs have been studied by others, these studies have primarily focused on mid-block or local roadway intersection locations, not interchanges. Interchanges present unique challenges to pedestrians. Interchanges have historically been designed to maximize motor vehicle throughput, presenting major points of conflict for pedestrians where high-speed, high-volume motor vehicles cross pedestrian paths, often at uncontrolled crossings. Freeway interchanges often have long crossing distances and often have motorists traveling at high speeds. Ramps tend to have a large truck turning radius to accommodate truck traffic, which contributes to lengthy crosswalks. These lengthy crosswalks expose pedestrians to potential conflicts with motor vehicles. Retrofitting interchanges with pedestrian and bicycle infrastructure to provide comfortable and convenient crossings that reduce collisions is a top priority at Caltrans. Caltrans District 4 has been looking at ways to retrofit interchanges for the comfort and safety of people walking and biking. RRFBs are relatively easy to incorporate into existing interchanges and can be installed as part of repaving projects. D4 has been systematically installing RRFBs at interchanges when the need and opportunity arise with SHOPP funds. Studying the efficacy, safety data, and yield rates of RRFB installations at on-ramps and off-ramps will better inform future projects.

**Project Problem Statement:** While the efficacy of RRFBs has been studied at local roads, RRFB at interchanges have a unique set of characteristics that have not been studied. Crossing on and off-ramps can be challenging for people walking and biking. In general, bicycle and pedestrian research on off-ramps and on-ramps is lacking. Most data on bike and pedestrian safety efficacy and design guidance, and pedestrian safety recommendations are concentrated in the context of local roads and conventional highways, despite the unique safety challenges of interchanges. Interchanges often have high volumes and high motor vehicle speeds, which have a greater potential for severe pedestrian collisions. A preliminary investigation of pedestrian collisions by D4 Caltrans staff showed that, from 2020-2024, there were 22 reported pedestrian fatalities in District 4 at interchanges, according to the Transportation Injury Mapping System (TIMS). In addition to the fatalities, there were 177 injury collisions at interchanges, indicating that interchanges could benefit from pedestrian safety countermeasures. This research aims to study the safety data and yield rates of motorists to pedestrians at uncontrolled on-ramp/off-ramp locations with RRFBs at existing locations to inform future projects. Researching the efficacy of pedestrian infrastructure improvements at on-ramp/off-ramp locations has the potential to inform Caltrans District staff on how to effectively increase safety at locations that are often overlooked.

**Objective:** Safety is a top priority at Caltrans, and reducing pedestrian collisions is an important goal at the Office of Transit and Active Transportation. This research will publish safety data in an area where data is lacking and would better inform Caltrans projects. Currently, District 4

has been incorporating more and more Rectangular Rapid Flashing Beacons (RRFBs) at uncontrolled on-ramp/off-ramp locations as part of SHOPP projects. This research would better inform whether these safety improvements are effective or if more pedestrian safety improvements are needed.

***Task Description of Work and Expected Deliverables:*** The research will analyze the before and after collisions data at existing RRFB locations at on-ramps/off-ramps to determine the efficacy and potential safety benefits. Caltrans D4 staff have identified 46 locations in the Bay Area where an RRFB was installed at an uncontrolled on-ramp or off-ramp crossing before 2023. The research will analyze at least three years of before- and after-collision data. More RRFB locations may be identified in other Caltrans Districts if other District staff have data on RRFB locations. The research could also look at the effect these pedestrian improvements have on bicycle collisions. The research would also look at driver pedestrian yielding rates for on-ramp RRFB locations vs. similar non-RRFB locations.

***Duration:*** 18 months

### 3. Resiliency – Power Loss

(Research needs 3, 4 and 5 are related. Proposals can be submitted by the same team for all three, but that is not a requirement.)

**Background:** The Division of Transportation Planning is interested in understanding the impact that non-environmental stressors can have on California’s transportation infrastructure, including power outages, cyber threats, and other man-made incidents. The 2025 power outage that affected Portugal and Spain highlights the need to understand how energy disruptions can affect transportation systems. Understanding the interdependence between energy and transportation systems is important for planning for future emergencies.

**Project Problem Statement:** The purpose of this project is to understand how power loss impacts California’s transportation system, including the identification of Caltrans’ assets that are vulnerable to power loss, how vulnerability changes depending on the duration of the incident, and the identification of mitigations that can be implemented to address these concerns. Caltrans would like to understand what coordination should occur with energy providers during power outages.

**Objective:** This research would support the Office of Air Quality Conformity and Resiliency Planning’s efforts to incorporate mitigation strategies specific to power loss into resiliency planning. The goal of this work is to develop a stronger understanding of the areas in which State transportation facilities are vulnerable and the measures that can be taken, whether through physical changes to infrastructure or policy and operational improvements, to make the State transportation system more resilient.

#### **Task Description of Work and Expected Deliverables:**

##### Task 1 – Vulnerability Assessment and Resiliency Mitigation Development

Deliverable 1.1 (Report) - Create a document that outlines identified threats and vulnerabilities of Caltrans assets to power loss.

Deliverable 1.2 (Report) – Create a document that outlines recommended mitigation strategies to address vulnerabilities identified in Deliverable 1.1.

##### Task 2 – Internal and External Collaboration

Deliverable 2.1 (Meetings) - The researcher shall host at least 3 Internal meetings with Caltrans staff, including Caltrans Maintenance, Emergency Services, Traffic Operations, and Transportation Planning, to identify assets that should be included in the study, the existing District protocols for power loss incidents, any gaps to these protocols, and how Districts work with regional energy partners during outages.

Deliverable 2.2 (Workshop) – The researcher shall host a stakeholder workshop with Caltrans staff, CalOES, energy partners, as well as stakeholders identified by Caltrans staff. The purpose of this meeting is to gather stakeholder feedback on the findings of Deliverable 1.1 and recommendations from Deliverable 1.2, understand how energy

partners communicate with external parties during power outages, and identify opportunities for collaboration.

### Task 3 – Final Report

Deliverable 3.1 (Report) - The researcher shall develop a final report consolidating all findings in Deliverable 1.1 and 1.2 and the stakeholder meetings from Deliverables 2.1 and 2.2. The report shall include a summary of actions taken, recommendations based on information acquired throughout the development of the project, and any other relevant frameworks developed or introduced throughout the project.

**Duration:** 12 months

#### 4. Resiliency – Man-made Incidents

(Research needs 3, 4 and 5 are related. Proposals can be submitted by the same team for all three, but that is not a requirement.)

**Background:** The Division of Transportation Planning is interested in understanding the impact that non-environmental stressors can have on California’s transportation infrastructure, including power outages, cyber threats, and other man-made emergencies. For this research, man-made emergency incidents include vessel strikes (accidental or intentional), blasts, and actions that cause substantial physical damage to transportation infrastructure.

**Project Problem Statement:** The purpose of this project is to understand how man-made emergency incidents can impact transportation infrastructure. We want to understand what mitigations exist to make transportation infrastructure resilient to these incidents, including design specifications, security around structures that limit access to the piece of infrastructure, and ways to study the impacts of blasts.

**Objective:** The goal of this work is to develop a stronger understanding of areas in which State transportation facilities are vulnerable, and any measures that can be taken, either through physical changes to infrastructure or through policy and operational improvements, that will make the State transportation system more resilient.

#### **Task Description of Work and Expected Deliverables:**

##### Task 1 – Vulnerability Assessment and Resiliency Mitigation Development

Deliverable 1.1 (Report) - Create a document that outlines identified threats and vulnerabilities of Caltrans assets to man-made emergency incidents including vessel strikes (accidental or intentional), blasts, and actions that cause substantial physical damage. The document shall include consideration of physical measures that can be taken to limit access to structural components, design features that make transportation infrastructure more resilient to physical damage, and policy changes that can support this effort.

Deliverable 1.2 (Report) – Create a document that outlines recommended mitigation strategies to address vulnerabilities identified in Deliverable 1.1, including the items referenced in Deliverable 1.1, input from Caltrans Traffic Operations, Design, Emergency Services, and Engineering Services representatives from the District and Headquarters to understand specific concerns and implementation of mitigations.

##### Task 2 – Internal and External Collaboration

Deliverable 2.1 (Meetings) - The researcher shall host at least 3 Internal meetings with Caltrans staff, including Caltrans Design and Engineering Services, Emergency Services, and Transportation Planning, to identify how existing design addresses vulnerabilities to blasts, and any gaps in research.

Deliverable 2.2 (Workshop) – The researcher shall host a stakeholder workshop with Caltrans staff, Caltrans Office of Emergency Services, and Department of Homeland

Security partners, as well as stakeholders identified by Caltrans staff. The purpose of this meeting is to understand what features make Caltrans infrastructure vulnerable to made-emergency incidents.

### Task 3 – Final Report

Deliverable 3.1 (Report) - The researcher shall develop a final report consolidating all findings in Deliverable 1.1 and 1.2 and the stakeholder meetings from Deliverables 2.1 and 2.2. The report shall include a summary of actions taken, recommendations based on information acquired throughout the development of the project, and any other relevant frameworks developed or introduced throughout the project.

**Duration:** 12 months

## 5. Resiliency Study – Cybersecurity

(Research needs 3, 4 and 5 are related. Proposals can be submitted by the same team for all three, but that is not a requirement.)

**Background:** The security and resilience of transportation infrastructure are critical to the functioning of California’s economy, public safety, and State and national security. As transportation systems become increasingly reliant on digital technologies and interconnected networks, they face growing risks from cybersecurity threats. These threats include not only logical attacks targeting information systems, operational technologies, and communications networks, but also physical threats that can compromise infrastructure assets, disrupt services, or serve as entry points for cyber-intrusion. Caltrans must proactively assess vulnerabilities and enhance preparedness to address both conventional and emerging threats. Recent events across the United States have demonstrated that cyberattacks on transportation systems—ranging from ransomware incidents on State Departments of Transportation to attacks on connected Traffic Management System (TMS) elements can result in significant operational, financial, and safety impacts. Moreover, physical breaches of operational technologies that Caltrans uses to monitor and manage transportation systems can lead to degradation of service on transportation facilities as well as cascading failures or data integrity issues. With transportation systems becoming increasingly connected, many vulnerabilities have the potential to be amplified to become disruptions that affect Californians at larger scales. Caltrans has already been proactive in seeking to identify and address potential vulnerabilities to the existing Traffic Operations Systems Network (TOSNet) and continues to do so in preparation for a wide variety of threats that would otherwise impact the mobility of Californians and the industries critical to the defense and resilience of our state. In response to these challenges, Caltrans seeks the expertise of a qualified researcher familiar with potential stressors or actors that threaten the sustained operation of California’s transportation system to assist in identifying, evaluating, and prioritizing cybersecurity threats to operational technologies that are critical to the transportation network, and identifying potential mitigations to address identified vulnerabilities.

**Project Problem Statement:** The purpose of this project is to develop cyber-resiliency strategies for critical transportation infrastructure in California. This study will focus on identifying physical and logical cybersecurity threats to Caltrans operational technologies that are critical to state transportation systems and to develop mitigations to address these threats. The researcher will identify potential threats to Caltrans’ operational technologies and associated assets (examples listed below), and facilities that are critical to the efficient and sustainable operation of the State transportation system and develop recommended mitigations that address vulnerabilities and strengthen the state’s preparedness against these threats. The study will focus on Caltrans assets and infrastructure.

- Central systems
- Closed Circuit Television (CCTV)
- Changeable message signs (CMS)
- Freeway Ramp Meters
- Transportation Census Systems (TCS)

- Traffic Monitoring Detection Stations (TMDS)
- Traffic Signals
- Cellular Routers
- Highway Advisory Radio (HAR)
- Road Weather Information Systems (RWIS)
- Extinguishable or Variable Message Signs Management Systems (EMS or VMS)
- Transportation Management Systems (TMS)
- Traffic Management Centers (TMCs)
- Vehicle to Infrastructure (V2I) Communication systems
- Others

**Objective:** This research would support Caltrans' efforts to incorporate mitigation strategies specific to cyber threats to operational technology into resiliency planning. This effort will support the development of a comprehensive threat assessment that includes both physical and logical vulnerabilities to assets and facilities that support these technologies and provides actionable recommendations for risk mitigation, response planning, and future investment. The goal of this work is to develop a stronger understanding of areas in which State transportation facilities are vulnerable, and any measures that can be taken, either through physical changes to infrastructures or through policy and operational improvements that will make the State transportation system more resilient.

***Task Description of Work and Expected Deliverables:***

Task 1 – Vulnerability Assessment and Resiliency Mitigation Development

Deliverable 1.1 (Report) - Create a document that outlines identified threats and vulnerabilities to the cybersecurity of critical transportation infrastructure in California. The researcher shall identify and assess threats and vulnerabilities to existing traffic-related infrastructure, with specific consideration of how modernization and connectivity will impact these critical transportation assets. The assessment must account for risks associated with making these assets “smart” and continuously connected to the networks, ensuring that future security challenges tied to the next generation of these always-on devices are thoroughly evaluated.

Deliverable 1.2 (Report) – Create a document that outlines recommended mitigation strategies to address vulnerabilities identified in Deliverable 1.1.

Task 2 – Stakeholder Collaboration and Final Workshop

Deliverable 2.1 (Meetings) - The researcher shall host at least 3 Internal meetings with Caltrans staff to share findings, recommendations, and gather feedback on the study's progress.

Deliverable 2.2 (Workshop) – The researchers shall host a stakeholder workshop with Caltrans staff, the Governor's Office of Land-use and Climate Innovation (LCI), as well as stakeholders identified by Caltrans staff. The purpose of this meeting is to gather feedback from stakeholders on the findings of Deliverable 1.1 and recommendations from Deliverable 1.2.

Task 3 – Final Report

Deliverable 3.1 (Report) - The researcher shall develop a final report consolidating all findings in Deliverable 1.1 and 1.2 and the stakeholder meetings from Deliverables 2.1 and 2.2. The report shall include a summary of actions taken, recommendations based on information acquired throughout the development of the project, and any other relevant frameworks developed or introduced throughout the project.

**Duration:** 12 months

## 6. Wireless Coverage Survey for Transit Applications

**Background:** Currently, transit planners and related professionals are unable to make data-driven decisions that depend on real-world wireless coverage and network performance measurements along transit routes statewide. The FCC Mobile LTE Coverage Map publishes mobile coverage areas from four of the nation's largest mobile carriers. This map is generated from computer-simulated data provided by wireless carriers to the FCC, using radio propagation modeling software that indicates where customers can expect to receive service, but not necessarily where service exists in the real world. Actual customer experience may vary due to cell site capacity, terrain, and other environmental factors. While there are mobile coverage maps based on actual field measurements for some areas of the state, they do not encompass all transit routes due to the prohibitive costs in planning and conducting drive surveys to measure, collect, and post-process that data, let alone in near real-time. Also, due to the high cost of conducting traditional mobile surveys, available measured data are likely several years old, which can create an inaccurate understanding of the wireless coverage in an area and ultimately lead to poor decision-making. Is there a way to provide transit professionals with reliable and up-to-date wireless coverage and network performance data statewide to improve their planning and decision-making?

**Project Problem Statement:** Caltrans is testing a highly automated measurement system that enables transit vehicles to measure wireless coverage and network performance in the background, without any intervention from transit service providers. Caltrans seeks analysis of the data collected in each transit service area identified by the Caltrans project team. Caltrans wishes to know, specifically, but not limited to, if the data collected by the measurement system is sufficient to support publication of the GTFS-rt feeds, cEMV payment transactions, agency dispatch-operator communications, and passenger internet access via the agency's onboard WiFi/cellular system.

**Objective:** Real-time transit services such as vehicle tracking, vehicle arrival time prediction, mobile payments, and agency dispatch-operator communications rely on cellular networks to connect edge devices to the internet. Therefore, access to reliable and up-to-date cellular coverage and network performance metrics along transit routes statewide would enable our office to identify issues early on, proactively plan, make better decisions, and provide higher-quality recommendations to its clients.

**Task Description of Work and Expected Deliverables:** This work will examine the data collected by a precursor research study to evaluate, among other things, wireless availability and capacity to support near real-time publication of the GTFS-rt feeds to digital signage at transit stops, cEMV payment transactions, dispatch-operator communications, and passenger internet access via the agency's onboard WiFi/cellular system. The expected deliverable would be the data results as well as a report summarizing the findings.

**Duration:** 6 months, completed before June 30, 2027

## 7. Extended Customer Experience Research

**Background:** While transit signage in California is generally available, it is neither standardized nor tested for statewide usability or use. Globally, transit customers depend on Google and Apple maps, as well as other applications regionally, to obtain trip-planning information via the General Transit Feed Specification (GTFS) on cell phones. Neither Google nor Apple produces information outside of the form factor of mobile phones.

**Project Problem Statement:** Caltrans seeks extended customer research in rural areas to determine whether consumers would view information on digital signage at bus stops, and, if so, which data would help them make travel decisions in real time. Further, Caltrans seeks to understand what the minimum viable bus stop is: a pole in the road with signage, an improved bus stop with a dedicated pad for a shelter, seating, etc.

**Objective:** Senate Bill 960, Complete Streets and Transit Priority Facilities, signed into law by California Governor Gavin Newsom in 2024, mandates Caltrans to adopt a transit policy to guide the implementation of transit priority facilities and transit stops on the State Highway System. Effective statewide investment and guidance by Caltrans requires robust customer research. This customer experience research study focused in rural areas is to help the State of California surface the right problems and ensure that the minimum viable product requirements in that environment are identified in the timeframe needed.

**Task Description of Work and Expected Deliverables:** This research will conduct well-considered interviews, surveys, and empirical observations of riders at bus stops in rural areas that represent all archetypal rider groups in those underserved areas (e.g., served by transit agencies that receive FTA 5311 grants). This research will also seek input from additional stakeholders, including ADA, other rider advocacy groups, transit agency and operator representatives, and other subject-matter experts, for consideration in developing the MVP requirements. The research should yield a statistically valid corpus of data that can be relied upon to determine minimum viable bus stop requirements in rural environments. Interview recordings, survey results, raw data, and a report summarizing the findings shall be included. Architectural drawings or artist renderings showing examples of minimum-viable bus stops in these environments are welcome but not required.

**Duration:** 6 months, completed before June 30, 2027

## 8. Public Outreach Planner (POP) Tool for Caltrans Plans and Projects

**Background:** Given the complexity and diversity of Caltrans projects, a structured and scalable approach to planning public engagement is essential. Both Idaho and Utah DOTs have successfully implemented Public Outreach Planner (POP) tools that help determine the timing, level, and scope of public involvement based on project characteristics. These tools streamline decision-making, support resource estimation, and promote consistency across projects. Inspired by these models, Caltrans seeks to explore the development of a similar tool that would complement—not replace—our existing resources, such as the Public Engagement Plan Template and Guide. The goal is to create a simple, user-friendly interface that supports project managers in identifying appropriate engagement levels and planning for staffing, budget, and outreach tools. This would enhance internal coordination, improve transparency, and ensure more effective and equitable engagement planning across the department. This is a much-needed tool for multiple divisions in the Department.

**Project Problem Statement:** While considerable information exists from research and practice on methods of public engagement, factors that influence engagement methods, and timing of outreach, there is a need for a tool that provides information and guidance to Caltrans staff as they pursue planning and project-related work. Underpinning this need is a lack of standardized practice and feedback, as well as inconsistent uptake of best practices and available tools.

**Objective:** The proposed research will explore and design a Public Outreach Planner (POP) tool tailored for Caltrans. Drawing inspiration from successful implementations in Idaho and Utah, this tool would provide a structured, user-friendly interface to help project managers assess and plan for public engagement needs based on project characteristics, complexity, and community context.

**Task Description of Work and Expected Deliverables:** The research will aim to:

- Evaluate existing POP tools used by peer agencies to identify best practices, strengths, and limitations.
- Design a prototype tool that:
  - Filters with existing Caltrans-specific engagement criteria
  - Integrates seamlessly with existing Caltrans resources, such as the Public Engagement Plan Template and Guide
  - Has a simple, intuitive interface for planning and project development teams to determine appropriate engagement levels, and estimating resource needs
- Test and refine the tool through pilot applications on a range of project types and scales.
- Ultimately, this research will support Caltrans in enhancing the consistency, transparency, and effectiveness of public engagement planning.

- The primary product of this research will be a Public Outreach Planning (POP) tool designed specifically for Caltrans. This tool will support project managers in determining the appropriate level, timing, and scope of public engagement for transportation projects, based on project characteristics, community context, and potential impacts.

The tool will:

- Align with existing Caltrans resources, including the Public Engagement Plan Template and Guide, to enhance—not duplicate—current practices.
- Provide a simple, user-friendly interface that guides users through a structured decision-making process using project-specific inputs.
- Generate engagement activity recommendations related to the spectrum of engagement based on criteria such as project complexity, location, demographics, and potential for public interest or controversy.
- Offer resource planning support, including estimated staffing needs, budget ranges, and suggested engagement tools and techniques aligned with the recommended level of outreach.

By streamlining engagement coordination and aligning it with Caltrans' existing frameworks, the tool will help ensure more consistent, equitable, and effective public involvement across the department.

**Duration:** Up to two years