Center for Pedestrian and Bicyclist Safety (CPBS)

Year 2 Strategic Plan (2024-2025)

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Lead Institution
University of New Mexico (UNM)

Partner Institutions
San Diego State University (SDSU)
University of California, Berkeley (UCB)
University of Tennessee, Knoxville (UTK)
University of Wisconsin-Milwaukee (UWM)

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1. Introduction

The Center for Pedestrian and Bicyclist Safety (CPBS) is a Tier-1 University Transportation Center (UTC) supported by the United States Department of Transportation (USDOT) through the Bipartisan Infrastructure Law (BIL).

CPBS's goal is to eliminate pedestrian and bicyclist fatalities and serious injuries. We take USDOT Secretary Pete Buttigieg's statement as our guiding principle: "Zero is the only acceptable number of deaths and serious injuries on our roadways." CPBS will play a critical role in realizing this target for the most vulnerable road users.

CPBS will explore the recent increase in pedestrian and bicyclist fatalities and injuries, identify transformative solutions, and disseminate that knowledge through education, technology transfer, and workforce development.

A key goal of the CPBS Year 2 Strategic Plan is to determine the direction of CPBS's research. For this Strategic Plan, we identify broad research priorities. Project specifics will subsequently be determined during the Problem Statement and Project Charter steps. Education, technology transfer, and workforce development efforts – which will coincide with CPBS's research – are detailed in Section 3.

2. Research

Year 2 projects will build upon Year 1 projects and are guided by the CPBS proposal (see the **Appendix** for priorities from previous years). During Year 2, CPBS will continue to define pedestrian and bicyclist safety problems and identify solutions. In terms of continuing to define pedestrian and bicyclist safety problems, research might seek to holistically identify the who, where, and when of pedestrian and bicyclist safety issues. Solutions that may be explored include novel road designs, new vehicle or roadway technologies, policy strategies, data techniques, or other topics that align with the Safe Systems approach. We envision that as we move through the life of CPBS and make progress in holistically defining the problem, projects will transition to focus more exclusively on identifying solutions.

CPBS will also seek to pursue both fundamental and applied research. We want to ensure that CPBS research will be implemented by agencies, thereby making it transformative. The research team will therefore integrate specific technology transfer efforts into every project. Since CPBS members come from a wide geographic range, CPBS research should apply broadly in urban and rural contexts and across the socio-economic spectrum, making it transformative on a wide scale.

It is also possible for projects that are not solely examining pedestrian and bicyclist safety to be selected. For instance, research linking pedestrian and bicyclist safety to wider transportation goals – such as how enabling walking and bicycling might help reach environmental, equity, and public health goals – may be worthy CPBS investments. Putting the importance of vulnerable road user safety into a wider context and therefore justifying continued investment in pedestrian and bicyclist safety is critically important.

All CPBS directors met and compiled the following list of Year 2 research priorities (**Table 1**). Note that research priorities are relatively evenly distributed across the different USDOT RD&T research objectives.

Table 1. Research Priorities for Year 2 CPBS Projects

Research Priority	USDOT RD&T Research Objective	Topic Examples
Exposure	Safety Data	Estimating exposure in low-count locations; midblock pedestrian exposure; leveraging new technologies
Surrogate Safety	Safety Data	Bicycle level of traffic stress (BLTS); pedestrian level of traffic stress (PLTS); perceived safety; capturing conflicts
Geographic/Demographic/Temporal Shifts	Safety Design	Urban/suburban/rural shifts in crashes; role of planning-level built environment
Roadways	Safety Design	Arterial design strategies; VRU crashes on freeways; safety at night and enhancing street lighting
Behavior	Safety Culture/Behavior	Alcohol/drug involvement; hit & run crashes; involvement of unhoused populations
Transit Access	Safety Culture/Behavior	Safe access to transit stops; interaction of pedestrian/bicyclist facilities and transit infrastructure
Tribal and Rural Safety	Safety Culture/Behavior	Data needs; prioritizing interventions; how to assist smaller communities with project implementation
E-bikes & Micromobility	Human-Technology Interaction	Providing appropriate infrastructure; safety for private versus shared micromobility; safety at night
Vehicle Design	Human-Technology Interaction	Safety outcomes by vehicle height and weight; electric vehicles; effectiveness of crash avoidance technologies

It is not imperative that all projects align with the above research priorities. While advisory committee members will note those problem statements that address the above research priorities during the peer review process, projects that do not directly address one of the research priorities may still be chosen if they are otherwise highly ranked.

3. Education, Technology Transfer, and Workforce Development Efforts

CPBS's education, technology transfer, and workforce development initiatives may be either inter-institutional/center-wide (e.g., CPBS's newsletter and social media accounts) or specific to individual institutions (e.g., a study abroad course offered at an individual university). We detail progress made during Year 1 and goals for Year 2 and beyond in the sections below.

3.1. Education

The baseline for CPBS's education program is the integration of CPBS research into each university's coursework. This was initiated immediately in Year 1 and will continue in Year 2 and beyond.

UNM

UNM successfully established and administered a study abroad course in Year 1. The two-week study abroad course took place in the Netherlands (Amsterdam, Rotterdam, and Utrecht) and focused on multimodal transportation systems. During Year 2, UNM will begin planning to run the course again in summer 2025 and will explore options for collaboration with partner universities.

UNM successfully integrated CPBS research into the UNM Summer Transportation Institute (STI) in Year 1. The UNM STI is a program hosted at UNM for students in 9th through 12th grade to encourage them to get into the transportation field. The program is free for New Mexico residents and has been run for 20 years. The program typically has 25 students attend annually. During Year 2, UNM will expand their STI involvement by offering more sessions during the summer and by collaborating with local middle schools and high schools during the school year.

UNM began discussions regarding the establishment of a dual degree program between civil engineering and community/regional planning during Year 1 but was not able to formalize the relationship during Year 1. UNM did establish their first cross-listed transportation engineering/planning course during Year 1. UNM hopes to continue discussions between the pertinent departments during Year 2 and to formalize the program by Year 3. UNM will seek to integrate colloquiums and other activities into the dual degree program in Year 3.

UNM successfully pursued its educational goal of investing in undergraduate students during Year 1 and will continue to do so during Year 2. With minimal investment, several promising undergraduate students were attracted to the transportation industry during Year 1.

UNM successfully implemented CPBS research into CE 382 (Transportation Engineering) and CE 482/582 (Traffic and Highway Engineering) during Year 1 and will continue to integrate research into their coursework during Year 2.

SDSU

SDSU will work to fund graduate students in their thesis research (and other CPBS research) in Year 2 and in all subsequent years. SDSU will create a program for undergraduates on financial aid to ensure that promising young students are excited to get into the transportation field.

Special focus will be given to students at the SDSU Imperial Valley Campus, whose minority population is over 90%. At SDSU IV we will hold special education and outreach events focusing on CPBS activities to get students interested in transportation research and careers.

UCB

UCB developed and delivered courses that integrate CPBS concepts, including the Spring CE C265 Traffic Safety and Injury Control course, and the Fall PH 285 Injury Prevention and Control Course. UCB worked with the Transportation Program in Civil and Environmental Engineering to increase course enrollment to 16 for CE C265, the highest enrollment to date.

UCB will continue to engage students through student-directed activities and professional opportunities, including a CPBS Pedestrian and Bicyclist Safety Fellowship for graduate students from a diverse selection of academic programs on the Berkeley campus, including electrical engineering and computer science; history; civil and environmental engineering; public health; public policy; the school of information; and city and regional planning. This would provide graduate students with the opportunity to generate high quality research advancing the CPBS mission to eliminate pedestrian and bicyclist fatalities and serious injuries.

UTK

UTK introduced Pedestrian and Bicycle Safety content for CE 559 Transportation Safety. This class includes advanced modeling approaches for different modal safety outcomes. Non-motorized safety content will be refined in this course in subsequent offerings. At the undergraduate level, CPBS content was introduced more explicitly in the senior-level design class and lab sequence, CE 455/456 specifically focusing on added content road safety audits for pedestrian safety and vision zero content.

UTK students in year one were engaged primarily through the civil and environmental engineering department. The UTK team collaborates with faculty in EECS that focus on road safety. In year two, the team would be focused more solely on engaging graduate and undergraduate students on active research projects. In year one, the UTK team engaged with Knoxville Police Department's Safety City program, tasked at educating elementary-aged children on road safety, particularly bicycle and pedestrian safety. Year 2 work will continue this effort with evaluation of their program that may lead to added benefits to educational and safety outcomes for K-5 students.

UWM

UWM will redesign its transportation dual degree program in Civil Engineering and Urban Planning to attract additional students into transportation courses. This will include removing an engineering thesis requirement, exploring reduced urban planning course requirements, and developing new marketing materials by Year 2. Enrollment in the program has dropped over the last 10 years, and this effort will help lead to educating more students about pedestrian and bicyclist safety.

During Year 2, UWM will integrate new pedestrian and bicyclist safety content into its undergraduate level Urban Planning (UP 140 and UP 141) and Civil Engineering (CE 490 and CE 590) courses.

UWM shared information about CPBS UTC with the general public through local media in Year 1. This covered some of the initial pedestrian and bicyclist safety topics that would be explored in Milwaukee. During Year 2, UWM will educate the general public by sharing CPBS UTC research results and products with local and national media. UWM researchers already have good connections with local media outlets since traffic safety is a major issue in Milwaukee.

3.2. Technology Transfer

CPBS's center-wide technology transfer efforts that were accomplished during Year 1 include the establishment of a website and designing marketing/branding materials. UNM also set up a CPBS social media account on LinkedIn which all CPBS institutions can utilize to disseminate their work. UNM established a CPBS newsletter during Year 1, although staff turnover limited the number of issues that were sent out. CPBS plans to have a full-time program manager for Year 2 and with the assistance of that position will endeavor to send out a monthly newsletter and have two social media posts per week throughout Year 2. The goal of the CPBS website/social media/newsletter is to 1) promote CPBS efforts and 2) promote other efforts toward pedestrian and bicyclist safety more broadly. We will not try to act as a repository of resources as that would be too time-intensive to keep such an effort updated.

CPBS also seeks to establish a webinar series during Year 2. This series will be organized by the CPBS program manager who will begin employment soon.

In addition to the above center-wide technology transfer efforts, each research project should have specific technology transfer activities. We will structure the projects on 18-month cycles that will include a 12-month Research Phase and a 6-month Implementation Phase. The Research Phase will consist of the actual research and the Implementation Phase will allow for the research to be organized into technology transfer deliverables. Plans for technology transfer will factor into the project selection process during the problem statement step.

Because we want to ensure that our research is implemented (and therefore transformative), project-specific technology transfer should primarily take the form of policy changes, patents, or being able to show that agencies are implementing tools or metrics that CPBS has developed. Secondary technology transfer might take the form of journal publications or conference presentations which, while still important, might not necessarily be considered transformative.

CPBS successfully supported travel for students presenting at the Annual TRB Conference in Washington DC and other conferences during Year 1. CPBS will continue to support travel to conferences to disseminate our work during Year 2.

SDSU

SDSU will establish an Active Transportation Research Technology Transfer Laboratory that will work to create web-based tools and apps based on the work of CPBS consortium members to help inform active transportation research and decisions. We will soon be making available new content from our Year 1 research activities.

UCB

UCB has ITS which has a center called Tech Transfer which is devoted specifically to technology transfer. UCB will leverage ITS to develop courses and workshops.

UTK

UTK has a strong working relationship with road safety staff in Tennessee cities and state agencies, including State DOT and DOSHS. We will continue to regularly brief staff and practitioners on outcomes from research and will continue to do so under this grant.

UTK will continue to work with the Knoxville Police Department that operates Safety City with the goal of improving, documenting, and replicating best practices for child safety education.

UWM

UWM will contribute to Year 1 CPBS technology transfer efforts by sharing pedestrian and bicyclist safety research products and results through its annual Institute for Physical Infrastructure and Transportation (IPIT) Southeastern Wisconsin Transportation Symposium in October 2024. The IPIT Symposium typically attracts more than 150 transportation practitioners from the private and public sectors.

During Year 1, UWM participated in project- and program-level committees for the Wisconsin Department of Transportation and other local agencies. These include the serving on WisDOT Wisconsin Non-Drivers Advisory Committee (WINDAC) and Milwaukee County Complete Communities Safety Working Group, as well as seeking input for research topics from the City of Milwaukee Vision Zero Community Action Committee. In the future, these collaborations will provide platforms for UWM researchers to share new research results and tools that will come from CPBS. During Year 2, UWM plans to conduct research that will benefit WisDOT, the City of Milwaukee, and other local agencies directly. UWM will seek CPBS matching funds from these agencies.

During Year 1, UWM established the foundation for a data clearinghouse for Wisconsin pedestrian and bicyclist exposure data. This clearinghouse includes manual and automated pedestrian and bicycle counts and model-based pedestrian and bicyclist volume estimates. Initially, the database will house data from Wisconsin, but it could be expanded in future years to include other states.

UWM presented initial Year 1 work on its Pedestrian Level of Traffic Stress (PLTS) project to the pedestrian and bicycle working group at FHWA Headquarters in December 2023 and shared initial ideas informally with other professionals at the Transportation Research Board Annual Meeting in January 2024.

During Year 2, UWM will explore adding pedestrian and bicycle safety content into its professional engineer licensing maintenance program.

3.3. Workforce Development

CPBS reached out to the Institute of Transportation Engineers (ITE) regarding their Road Safety Professional (RSP) transportation professional certification program during Year 1. CPBS seeks to ensure that the RSP pedestrian and bicyclist materials are up to date and will collaborate with RSP during Year 2 to see whether an update is warranted.

UNM

UNM's Year 1 workforce development strategy focused on leveraging the existing infrastructure of the New Mexico Local Technical Assistance Program (NMLTAP), which is housed in the Civil, Construction & Environmental Engineering Department at UNM. The goal is to organize CPBS research into deliverables that will be disseminated through NMLTAP to communities throughout New Mexico (with a strong focus on rural and tribal communities). UNM was successful in building a CPBS/NMLTAP connection during Year 1, although there were administrative issues with NMLTAP for which NMLTAP was not technically active for much of CPBS's Year 1, which precluded many of the planned collaborations. NMLTAP anticipates renewing their contracts soon and CPBS will then continue to collaborate during Year 2.

UNM was successful in investing in undergraduate students during Year 1. Several promising undergraduate students were attracted to the transportation field because of CPBS support. Some of these students already plan to continue with graduate studies, showing that the early investment will have positive long-term impacts. UNM will continue to support undergraduate students during Year 2.

UNM successfully participated in the Transportation Research Board (TRB) Minority Student Fellows Program and a local competition of the Dwight David Eisenhower Transportation Fellowship Program during Year 1. UNM has historically supported two or three students annually through the TRB Minority Student Fellows Program, which involves mentoring the students through a research paper, submitting to the TRB Annual Meeting, and attending the TRB Annual Meeting. UNM runs a local competition of the Dwight David Eisenhower Transportation Fellowship Program which usually has five or six students participate. These programs are excellent ways to encourage promising students to enter the transportation field. UNM will continue to support these programs and students during Year 2 of CPBS.

SDSU

SDSU will lead the development of a pedestrian and bicyclist street safety design course for professional workforces nationwide, and especially all CPBS regions. Dr. Appleyard from SDSU will also give talks to professionals, advocates, and member of the public on CPBS research activities and how to design safer streets for pedestrians and bicyclists, both in person and online.

UCB

UCB is working to develop a module about their bicycle simulator research for the youth STEM summer programs organized by the College of Engineering.

UCB is planning to work with K-12 educators to develop transportation-focused curriculum for a climate literacy program in a local school district.

UTK

UTK will work with the Center for Transportation Research (CTR), who hosts the statewide LTAP program (Tennessee Technical Assistance Program – TTAP). The TTAP program offers dozens of training courses annually. Work from CPBS will be integrated into TTAP materials as appropriate. We will also engage with the education and workforce development programs associated with local non-profits and advocacy (e.g., Two Bikes).

UWM

UWM hired four graduate students in Year 1 to assist with CPBS research projects. UWM plans to increase the number of students it hires to at least six in Year 2 and subsequent years. Through this experience, these students will be well-equipped to enter the transportation field and provide their employers with the latest knowledge and innovations related to pedestrian and bicyclist safety.

Appendix 1
Research Focus Areas and Priorities from the CPBS Proposal and Previous Years

Table A1. All Proposed Research Focus Areas from the CPBS Proposal

Research Objective	Research Focus Areas		
Safety Data	Enhanced Crash Reporting	Fatalities Expected per Time Saved	Surrogate Safety Data
	CMFs & Systemic Safety Analyses	Exposure in Low-Count Locations	
Safety Design	Arterials	Freeways	Speed Management
	Nighttime Safety Treatments	Urban Form & Demographic Shift	
Safety Culture & Behavior	Behavioral Error vs. Violation	Safe Systems & Vision Zero	Complete Streets
	International Examples	Tribal and Rural Safety	Funding Safety
Human-Technology Interaction	E-bikes & Micromobility	Vehicle Design	Distraction & In-Vehicle Devices
	Infrastructure Quality	CAVs	

Table A2. Research Priorities for Year 1 CPBS Projects

Priority Rank *(1=highest priority)*	**Research Priority**	**USDOT RD&T Research Objective**
1	Urban Form & Demographic Shift	Safety Design
2	Speed Management	Safety Design
3	Arterials	Safety Design
4	Vehicle Design	Human-Technology Interaction
5	Funding Safety	Safety Culture/Behavior
6	Tribal and Rural Safety	Safety Culture/Behavior

Table A3. Secondary Research Priorities for Year 1 CPBS Projects

Research Priority	**USDOT RD&T Research Objective**
Pedestrian Level of Traffic Stress	Safety Data
Which Communities are Doing Well?	Safety Culture/Behavior
Transit Access and Ped/Bike Safety	Safety Design
Unhoused Populations	Safety Culture/Behavior
Equity in Police Enforcement	Safety Culture/Behavior