How Effective Are Community Pedestrian Safety Training Workshops? Short-Term Findings from a Program in California

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Highlights

- Workshops build community capacity for pedestrian safety planning
- Social elements of workshop activities shifted participant's safety perceptions
- Continuing evaluations are necessary to measure longer-term safety outcomes
- Evaluations must be flexible to assess changing goals in established programs

Abstract

Introduction: Pedestrians and bicyclists make up a disproportionate share of road deaths and injuries, and low-income, majority person-of-color communities tend to face the greatest danger. Comprehensive pedestrian safety programs targeted toward such communities have the potential to build communities' capacity to address safety issues, but there is a lack of systematic research and evaluation on how effective these programs are. *Methods:* We use a mixed-methods approach of surveys, participant observation, and follow-up interviews to evaluate a community-based pedestrian and bicycle safety program in 13 California communities for its short-term effectiveness in meeting five goals: providing relevant safety information to participants, building community partnerships, increasing walking and cycling in host communities, improving perceptions of pedestrian and bicyclist safety, and planning for additional safety countermeasures. *Results:* Workshops have beneficial effects on identifying community needs, developing partnerships between stakeholders, and changing perceptions of safety in historically disadvantaged communities. The program improves participants' perceptions of the role that community organizations and community events play in pedestrian safety efforts. The program also provides a critical space for community stakeholders to meet, learn a common language about safety, and develop partnerships around pedestrian and bicycle safety. Host communities have used the workshops as support for grant applications, and several have obtained funding for pedestrian and bicycle improvements. *Conclusion:* The workshops intervene in the short-term on multiple levels to improve pedestrian safety as described in program goals. This study provides a model for evaluating a program for its short-term effects, providing a baseline set of conditions for longer-term evaluation.

Keywords*: Pedestrian safety; program evaluation; community engagement; equity*

1 Introduction

In 2016, 886 pedestrians and 164 bicyclists died in traffic crashes in California, and an additional 14,156 pedestrians and 11,605 cyclists were injured (California Highway Patrol 2017). Pedestrians and bicyclists made up a combined 29 percent and 9 percent of all fatalities and injuries respectively, despite taking 18 percent of all trips and 2 percent of all miles traveled (California Department of Transportation 2013). These deaths and injuries affect lower-income people and people of color to a greater degree. For example, although non-white, non-Hispanic individuals make up 35 percent of the US population, they accounted for 46 percent of pedestrian fatalities in 2014 (Smart Growth America 2017). Pedestrians die at rates four times higher in census tracts with poverty rates over 30 percent compared to census tracts with poverty rates equal to or below 5 percent (Maciag 2014), while risk factors are often greater for people of color or in low-income and majority person-of-color neighborhoods (Hwang, Joh, and Woo 2017; Thomas and Jones 2018). Because there is a history of disinvestment in infrastructure in such neighborhoods and a general failure to involve marginalized communities in transportation planning processes, there is a need for community-developed and community-specific pedestrian and bicycle safety countermeasures (Williams and Collins 2001). However, developing pedestrian and bicycle plans, building supportive infrastructure, and implementing program initiatives to address pedestrian and bicycle safety requires data, skills and resources that many jurisdictions do not have.

The Community Pedestrian and Bicycle Safety Training (CPBST) program was developed to increase community capacity and transfer knowledge about proven safety countermeasures to communities with the ultimate goal of reducing the incidence of injury and death. To achieve this, the program shares with communities data, skills, and the informational resources (e.g., technical assistance, grant programs, curricular) needed to plan, finance, and implement pedestrian and bicycle safety initiatives, specifically targeting historically underserved communities in California. It is a collaborative effort between California Walks, a non-profit pedestrian advocacy organization, and the Safe Transportation Research and Education Center (SafeTREC) at the University of California, Berkeley. CPBST facilitators provide tailored workshops to community residents and stakeholders. Several places in the US have programs similar to the CPBST program and many others have expressed interest in implementing programs that meet similar goals. However, there is a lack of research on and evaluation of how effective these programs are. The purpose of this study is to assess the effectiveness of the CPBST program using a process and outcome evaluation.

This paper begins by discussing the theoretical background of both collaborative methods of safety training and how the program aligns with behavioral change theories from public health literature. We then describe the CPBST program and evaluation outcomes. We found that the workshop helped bring attention to existing safety issues and potential countermeasures, and catalyzed partnerships around community-specific safety infrastructure improvements and programs. The community-driven and social elements of the program improved participants' perceptions of the role that community organization and events play in reducing barriers to walking. We expect these findings will inform changes to the CPBST program and implementation of similar programs.

2 Literature review

2.1 Community-based safety training programs: Theoretical background

CPBST program elements were initially derived from principles of Community-Based Participatory Research (CBPR) (Fearer and Beck, 2016). CBPR projects are co-constructed between researchers and communities; foster equitable, ongoing relationships among partners; and take a social-ecological perspective that addresses multiple determinants of health (Israel, Eng, and Schulz 2012). Critically, they address issues that the host community identifies as important (Minkler et al. 2003). Communities are equal partners in the research process and their interests are attended to in the same way that the researchers' interests are. The focus of CPBST workshops is determined by the community, and workshops throughout the years have included collaborative exercises with public officials, community members, and other partners, such as photovoice and videovoice projects to document the community's safety needs and walk audits to document locations that community members found unsafe for walking or bicycling (Fearer and Beck, 2016; Babka et al. 2011). Today, because of continued funding and growth, curriculum development, and expertise from facilitation partners, the CPBST program has evolved from its roots in CBPR into a broader community-engaged and technical assistance program.

The program is aligned with standard public health frameworks that explain how interventions can produce behavioral change. The social ecological model, for example, illustrates the roles that multiple domains play on health behaviors. According to this framework, health behaviors

are influenced by both individual factors and environmental factors: the interaction of intra- and interpersonal relationships, organizational and community ties, and public policy. Interventions must address influences on health outcomes across these levels to catalyze behavior change and improve health outcomes (Sallis, Owen, and Fisher 2008). For walking and cycling, this includes improving perceptions of social and built environments, building pedestrian and bicycle facilities, providing information and education, and developing plans and policies, among other strategies (Sallis et al. 2006). This approach is embodied in the "6 Es" approach to the CPBST presentation, explained section 3. The Stage of Change Theory describes how an individual's or group's willingness to change is based on their position along a five-stage continuum, including pre-contemplation, contemplation, preparation, action, and maintenance (Prochaska and DiClemente 1983). Potential communities are selected to host CPBST workshops only if the facilitation team identifies that they have taken some steps toward pedestrian and bicycle safety planning; in other words, if they are beyond pre-contemplation (not intending to take action) but not yet in maintenance (maintaining changes already made). One goal of the workshops is to move community partners further along the stage of change continuum—often to the preparation and action phases of addressing pedestrian and bicycle safety.

2.2 Related programs and evaluations

Many community pedestrian and bicycle safety programs incorporate various education, engineering, and enforcement components with a primary goal of reducing pedestrian and bicycle injuries and fatalities. Few of these programs are comprehensively evaluated. A study of a program in Miami-Dade County, Florida, found that the engineering improvements introduced by the program reduced pedestrian crashes by approximately 10 percent, though education and other components of the program did not show an effect (Zegeer et al. 2008). Programs can have positive effects in changing attitudes and perceptions of road users, law enforcement, and politicians. "Watch for Me NC" is a comprehensive pedestrian injury prevention program that includes engineering, education, outreach, and enforcement components. Researchers found significant, positive changes in law enforcement attitudes toward enforcement of pedestrian laws after a training session (Sandt, Marshall, and Ennett 2015), and found that drivers yielded to pedestrians about 5 percent more often at intersections with engineering improvements and significant enforcement operation (Sandt et al. 2016). One study measured the effectiveness of pedestrian safety advocacy campaigns targeted towards local politicians in the United Kingdom using a randomized trial over a 25-30 month period. Targeted campaigns did not have a significant impact on infrastructure or policy within the study time period, but politicians in the intervention group did report being more interested in pedestrian injury prevention compared to the control group (Lyons, 2013).

Fewer studies report on the effectiveness of safety training programs designed to build community capacity and transfer safety knowledge and best practices. An evaluation of a pedestrian safety program in Washington state that worked with city agencies to plan and apply for funding for pedestrian infrastructure improvements measured success of the program based on whether partner communities successfully planned and applied for infrastructure improvements. In this program, seven of ten communities successfully completed their specific project (Bergman et al. 2002). The Active Living by Design program from the Robert Wood Johnson Foundation funded many programs across the United States that built community partnerships to increase walking and cycling. They provided training and technical assistance to communities as well. Though they did not report outcome statistics, the program's evaluators

found that project success depended on building strong community and public partnerships in the host communities (Bors et al. 2009).

2.3 Public health program evaluation

Evaluation of public health programs is critical to determining systematic ways that accurately, feasibly, and ethically address the health and safety issues they are targeting (Centers for Disease Control and Prevention 1999). Programs like the CPBST program, that aim to change multiple factors relevant to public health outcomes, are often resource-intensive and have high costs. Therefore, in resource-constrained environments where there are many potential ways to address a public health issue, evaluation of programs allows agencies to allocate resources to the program that best addresses the issue and allows program coordinators to restructure the program as needed (Rossi, Freeman, and Lipsey 1999). Evidence-based programs are also politically popular, and program evaluations can be useful for gaining interest and support from elected officials or government employees (Rossi, Freeman, and Lipsey 1999). Additionally, evaluation can allow for replication of programs and solutions that are proven to work in similar environments.

3 The Community Pedestrian and Bicycle Safety Training program

Between 2009 and 2016, 43 communities across California have hosted a Community Pedestrian and Bicycle Safety Training (CPBST) workshop. Program administrators typically select low-income communities that have documented pedestrian or bicycle safety issues. Importantly, they must have already demonstrated real interest in working on safety beyond the workshop day, such as through committees or groups dedicated to that purpose. Once communities apply and are selected, they participate in a two-to-three month workshop planning process led by California Walks, SafeTREC's facilitation partner. The community partner develops a planning committee, consisting of representatives from pedestrian and bicycle stakeholder groups in the host community, which determines the focus and logistics of the workshop. Workshop leaders and the host community also attend an on-site planning session to document specific safety concerns and to design walking routes for a pedestrian safety audit conducted during the workshop. The planning committee invites community partners, residents, business owners, and other interested parties to attend the workshop. Stakeholders from multiple groups are typically represented, described in more detail below.

Workshop activities last four to five hours and include a presentation by the facilitation team, collaborative brainstorming and planning among participants, and a walking audit of pedestrian and bicycle safety concerns near the site. The presentation emphasizes a "6 Es" approach to safety, focusing on equity/empowerment, evaluation, engineering, enforcement, education, and encouragement. This attention on multiple dimensions of safety reflects the need to intervene across several domains to produce measurable reductions in crashes. After the presentation, the facilitators lead participants on walking routes so they can apply the information about the "6 Es" presented earlier in the workshop and observe the infrastructural and programmatic challenges their community faces. Finally, based on the findings from the walk audit, facilitators have participants group together to prioritize their desired improvements. Within about two months, the facilitation team provides the host community with a report that summarizes activities and priorities, and outlines potential next steps, such as applying for grants, developing plans and programs, or convening working groups. Upon request, the facilitation team will

provide follow-up support to the community, but responsibility for plan and program implementation, coalition building, and infrastructure installation is up to the community itself.

The CPBST program is designed to increase community capacity and transfer knowledge about proven safety countermeasures to communities with the ultimate goal of reducing the incidence of injury and death. By virtue of its implementation, the program also acts as a safety intervention itself with the intention of changing participants' awareness of community conditions or their behavior in response to perceptions of environmental support for walking. In their CBPR study, Minkler et al. (2003) recommend using intermediate markers to evaluate public health programs, including new coalitions and partnerships, and enhanced community involvement and participation. For the CPBST program, the evaluation team identified five intermediate goals that align with Minkler's approach and reflect the vision of the program: (1) provide communities with safety information, (2) help build coalitions between community partners, (3) increase walking and cycling, (4) improve perceptions of pedestrian and bicycle safety, and (5) increase the number of pedestrian and bicycle safety countermeasures. The program evaluation measures both the processes and outcomes toward achieving these goals in the short term (Table 1). The evaluation and program management team agreed upon objectives and timelines while planning for the year's workshops, and they selected objectives that could be measured during workshop planning, during workshop activities, or upon follow-up interviews with key community stakeholders. Objectives measured before or during the workshop needed to include activities that directly involved the program staff; for example, evaluation included the composition of the planning committee, but not any outreach solely conducted by community members. Objectives measured after the workshop included community planning and implementation, but not changes in individual perceptions or behavior.

Objective	**Measurement tool**
Goal 1: Provide communities with the relevant information, data and resources to identify and address local pedestrian and bicycle safety issues	
Process Objective 1.1: At each workshop, participants receive community-specific information and resources to address safety issues	Observation protocol
Process Objective 1.2: At each workshop, facilitators and participants identify local pedestrian and bicycle safety issues	Observation protocol
Outcome Objective 1.1: After completing the workshop and upon follow-up, participants report an increase in their ability to identify unsafe walking and bicycling conditions	Post-workshop survey
Outcome Objective 1.2: After completing the workshop and upon follow-up, participants report an increase in their ability speak up for improvements in their community	Post-workshop survey
Goal 2: Build coalitions between a variety of community stakeholders to address pedestrian and bicycle safety issues	
Process Objective 2.1: Each workshop planning committee has representatives from local government, non-profit groups, residential organizations and local schools	Observation protocol

Process Objective 2.2: The planning committee conducts outreach about the workshop to a variety of community groups	*Not measured*
Process Objective 2.3: Outreach is conducted in languages and on platforms that target a variety of community stakeholders and members	*Not measured*
Process Objective 2.4: Barriers to participation in the workshops are lowered	Observation protocol
Process Objective 2.5: Representatives from a cross-section of community groups attend the workshop	Pre-workshop survey; Observation protocol
Process Objective 2.6: During the breakout sessions, walking audit and planning sessions, participants representing different community stakeholders discuss safety issues and solutions with one another	Observation protocol
Process Objective 2.7: After the end of each workshop, participants make plans to meet again to discuss safety issues	*Not measured*
Outcome Objective 2.1: Upon 6-9 month follow-up, community stakeholders report partnering with one another to address local pedestrian/bicycle safety issues	Follow-up interview
Goal 3: Increase walking and bicycling in participating communities	
Process Objective 3.1: At each workshop, facilitators and participants identify barriers to walking and bicycling in the community	Post-workshop survey
Process Objective 3.2: At each workshop, facilitators and participants develop solutions to barriers limiting walking and bicycling	Observation protocol
Process Objective 3.3: Upon 6-9 month follow-up, community partners have attained funding for solutions to barriers limiting walking and bicycling	Follow-up interview
Process Objective 3.4: Upon 6-9 month follow-up, community partners have implemented solutions to barriers limiting walking and bicycling	Follow-up interview
Outcome Objective 3.1: Upon follow-up, participants report reduced barriers to walking	*Not measured*
Outcome Objective 3.2: Upon follow-up, participants report increases in the number of days they have walked	*Not measured*
Goal 4: Improve perceptions of pedestrian safety in participating communities	
Process Objective 4.1: At each workshop, participants identify local pedestrian and bicycle safety issues	Pre-workshop survey
Process Objective 4.2: At each workshop, facilitators inform participants about local safety issues and best practices to addressing issues	Observation protocol
Outcome Objective 4.1: After completing the workshop, participants report improved perceptions of safety	Post-workshop survey

Outcome Objective 4.2: Upon follow-up, participants report improved perceptions of safety	*Not measured*
Goal 5: Increase safety measures in participating communities, including infrastructure, policy, programs, events and campaigns that aim to improve pedestrian and bicycle safety	
Process Objective 5.1: At each workshop, facilitators and participants identify local pedestrian and bicycle safety issues	Observation protocol
Process Objective 5.2: At each workshop, facilitators and participants develop solutions to local pedestrian and bicycle safety issues	Observation protocol
Process Objective 5.3: Upon 6-9 month follow-up, community partners have applied for funding to implement solutions to safety issues	Follow-up interview
Outcome Objective 5.1: Upon 6-9 month follow-up, at least one safety countermeasure was implemented in the community after the workshop	Follow-up interview

Table 1: Evaluation Objectives and Measurement Tools

4 Methods

4.1 Evaluation framework

The purpose of the evaluation was to analyze the processes and immediate outcomes of the CPBST workshops to increase effectiveness while the program was significantly expanding. Program managers were interested in understanding how the program structure was improving safety in the host communities. The evaluation was also developed to contribute to general knowledge about community-based programs addressing street safety. We conducted a prospective evaluation of workshops that had all occurred within the same year and were administered by the same team of people rather than conduct a retrospective evaluation of CPBST workshops that had occurred in the past. The research team evaluated the short-term effects of processes and outcomes. The process evaluation measured the program's design, operation, service delivery, and efficiency to determine where the program's activities were implemented as intended (Rossi, Freeman, and Lipsey 1999). The outcome evaluation measured the effectiveness of program to address intended outcomes in the host communities (Centers for Disease Control and Prevention 1999). The evaluation started by explicitly stating program goals and developing process and outcome objectives (Table 1). These goals were proposed by a research team member, and then the CPBST team reviewed and edited the goals and objectives. The research team selected objectives for evaluation that were feasible to measure within the project timeline, and then developed measurement tools for data collection that aligned with these objectives.

Programs similar to the CPBST program that attempt to address structural factors influencing public health issues are difficult to evaluate. While the overall aims of the CPBST program are to reduce pedestrian and bicyclist deaths, the program works to address long-term, structural factors, which will likely not have impacts on these aims for years. Therefore, a short-term evaluation must measure goals and objectives that move toward these larger aims and match the scope of the specific program. Additionally, comprehensive evaluations are expensive, resource

intensive and can take years to conduct. Therefore this evaluation measures only a subset of the program objectives.

4.2 Site selection

Twenty communities in California were selected to host CPBST workshops between April and September 2017, thirteen of which were evaluated. We stratified the evaluation sites by geography and by urban character, though it was not possible to fill each stratum equally owing to the opt-in nature of the program. While the geographic focus of many workshops was a single city or neighborhood, some trainings took a regional approach to planning and recruitment when they occurred in urban areas with main corridors that transect several cities or when they occurred in rural communities that, by their nature, necessitate coordination between towns and counties. We excluded sites where youth participation was the primary focus to meet human subjects protections. None of the research procedures changed significantly from the pilot test site, so pilot site results are included in the analysis. All workshop sites, including those not selected for evaluation, are shown in Table 2.

City/community	Location	Rural/urban	Population (City or CDP)[c]	Median household income [c]
Fresno (Southwest) [a]	North	Urban	510,451	$41,531
Oakland (San Pablo Corridor)[a]	North	Urban	408,073	$54,618
Bakersfield (East) [a]	South	Urban	363,612	$57,095
Pomona [a]	South	Urban	151,753	$49,186
Chico	North	Urban	88,455	$42,342
Alhambra	South	Urban	84,782	$53,582
Merced	North	Urban	81,120	$37,627
Florence-Firestone [a]	South	Urban	63,177	$33,934
Azusa [a]	South	Urban	48,033	$53,135
Lompoc	South	Urban	43,428	$44,866
San Gabriel [a]	South	Urban	40,198	$51,579
Sanger [a]	North	Rural [b]	24,700	$43,099
Cudahy [a]	South	Urban	24,138	$36,429
Rosemont	North	Urban	23,515	$56,356
El Dorado County (Diamond Springs)	North	Rural [b]	10,471	$45,788
Orange Cove [a]	North	Rural [b]	9,565	$26,838
Palermo [a]	North	Rural	5,895	$39,366
North Shore [a]	South	Rural [b]	3,804	$26,655
Blue Lake [a]	North	Rural	1,310	$56,991
Rincon Reservation	South	Rural	1,131	$47,031

a Site selected for evaluation

b US Census defines these cities as urban clusters, though they have a rural character as determined by the research team

c Population and income figures are 2011-2015 American Community Survey estimates (2010-2014 for tribal land)

Table 2: 2017 CPBST Workshop Sites

4.3 Research procedures

The program evaluation consists of three research activities: surveys distributed to workshop participants to measure change in perceptions of pedestrian safety and barriers to walking, participant-observation of the workshop activities to gather data about process and collaboration, and follow-up interviews with planning committee members. The survey focused only on pedestrian safety for brevity, while the observations collected information on both pedestrian and bicycle safety. The research team received approval from the UC Berkeley Committee for Protection of Human Subjects for this study.

Paper-based surveys were distributed to all participants during each workshop session, prior to beginning and after finishing workshop activities. The pre-workshop survey asked participants to rate their perceptions of walking and pedestrian safety, barriers to walking, their usual travel patterns, and demographic and other personal characteristics. The pre-workshop survey established a baseline of participants' perceptions and barriers related to walking prior to receiving any training. The post-workshop survey contained identical questions about walking perceptions and barriers in order to measure how the workshop activities changed responses. Survey questions about walking experiences were adapted from the Neighborhood Quality of Life Study Survey, a previously validated instrument (Sallis et al. 2009). Perceptions were measured on a five-point Likert-type scale, ranging from strongly disagree to strongly agree. Barriers were also measured on a five-point scale, ranging from "not significant at all" to "so significant that it keeps me from walking." Surveys were administered in English and Spanish. The surveys were linked by a unique identification code to measure changes in individual responses. We analyzed survey responses using basic statistical tests of comparison, including paired Wilcoxon signed-rank tests to measure the strength of the change in the Likert-type question responses and McNemar's test to measure differences in agreement to the pre-workshop and post-workshop questions. The pre-workshop survey generated 190 responses and the post-workshop survey generated 135 responses from 271 participants who stayed from start to finish across all 13 workshops. Of the total surveys, 121 were matched pairs yielding a 45 percent response rate. We analyzed the survey results aggregated by workshop site because of the small number of responses per workshop.

Research team members were participant-observers in each workshop. They took notes on the groups and organizations participants represented, the topics that were discussed in each workshop, how attendees participated, and how different groups worked together during the activities. Researchers followed a common observation protocol to ensure consistency in the items observed and to ensure observations measured the outcomes outlined in table 1. When appropriate, the researchers provided expertise during the workshops as co-facilitators and participated in the group discussions and walking audits. The first cycle of analysis consisted primarily of descriptive coding using a pre-generated codebook, after which we developed themes or categories based on common codes across the workshops. We then assigned those themes as evaluation criteria for each goal. Two research team members participated in the first workshop as a pilot test to develop consistent observation procedures and to revise the common protocol for observing and coding. A single research team member attended subsequent workshops and coded his or her observations, then discussed the analysis with the larger research team.

About six to nine months after the workshops had concluded, we conducted phone interviews with between two and four members of the workshop planning committees to evaluate the program's short-term effects. We conducted 30 stakeholder interviews with key members of the planning committees from nine of the sites evaluated. Interviews followed a common script and asked questions about the effectiveness of the planning process, any early programmatic or infrastructure implementation, as well as mid-to-long-term planning based on priorities identified in the workshops. Analysis was primarily descriptive rather than generative to assess how community activities matched to already-identified themes.

5 Workshop findings: Achieving goals in the CPBST program

5.1 Goal 1: Information, data, and resources

The overall CPBST program was tailored toward community pedestrian and bicycle safety issues. About half of the communities that applied to host a CPBST workshop identified a particular safety concern they wanted the training to focus on, such as a dangerous corridor or children's safety in the vicinity of a school. The other half did not identify a specific need at the outset. Workshop planning centered around providing participants with the relevant information, data and resources to address local pedestrian and bicycle safety issues through both a series of planning committee calls between community representatives and training staff from California Walks and SafeTREC and a site visit. During workshop planning, training staff met with the community partners in person to identify safety issues and discuss resource and data availability.

During the workshops, specific safety issues were brought to light for participants through the use of local examples in the presentation and through discussion during the walking audit. Participants most commonly mentioned pedestrian and bicycle infrastructure as community needs, which was consistent with survey results finding that the lack of infrastructure was one the most commonly reported barrier to walking (see section 5.3). In rural community workshops, the most common infrastructure-related concerns related to breaks in pedestrian and bicycle connectivity, including non-existent sidewalks, and missing paths for walking or cycling. Participants at the urban workshops focused primarily on traffic control and pedestrian/bicycle visibility.

The workshop facilitators presented information and resources for the majority of safety concerns that participants raised. Participants were particularly interested in infrastructure projects and programs that were community-led, easy, and inexpensive to implement. Many of the potential solutions that interested participants most involved maintenance of existing infrastructure and small-scale projects. Large-scale projects, like road diets or paving rural gravel roads, were mentioned less frequently. It was also common for participants to suggest programs and events that aimed to encourage walking and bicycling. However, in many workshops participants raised barriers to walking and cycling safety that were not covered formally in the presentation, including pedestrian and bicycle safety issues related to high temperatures and rain, and issues regarding stray dogs in neighborhoods that were frightening to pedestrians.

Statistics about pedestrian and bicycle crashes in the host communities were presented at the workshops and in the final report. In workshops located in larger cities, crash data better illustrated safety issues because there were more incidents. In small, rural communities, however, the incident data were often sparse or non-existent. Workshops in these communities

included a crowdsourcing exercise where community members identified locations they knew to be unsafe.

Two survey questions measured the extent to which workshop participants felt their capacity to advocate for pedestrian safety improved after the workshop. The first asked participants whether they knew how to identify unsafe pedestrian conditions. The proportion of all people who agreed, defined as responding "somewhat agree" or "strongly agree," increased from 74 percent before the workshop to 83 percent after the workshop, a marginally significant increase ($\chi^2 = 3.36$, $df = 1$, $p = 0.067$, *one-tailed test*). However, the degree to which participants changed their response after the workshop was not significantly greater (mean change = +0.05; $V = 508$, $p = 0.196$). The second asked whether an education program would enable participants to speak up for safety improvements. Prior to the workshop, 80 percent of participants agreed with the question, increasing to 90 percent following the workshop ($\chi^2 = 6.53$, $df = 1$, $p = 0.011$, *one-tailed test*). Changes in individual perceptions were also statistically significant (mean change = +0.25; $V = 300$, $p = 0.009$).

In all, the workshops adequately met the goal of providing relevant, local information, data and resources to community members, although there were some common concerns that were not formally covered in the workshops.

5.2 Goal 2: Build community stakeholder coalitions

The CPBST workshops drew a cross section of stakeholders. Community residents, non-profit leaders and employees, and public sector employees took part, though not equally so at all workshops (Table 3). Residents with no other professional community affiliation made up 37 percent of workshop participants. People affiliated with non-profit organizations made up just under one-third of attendees, while government-affiliated individuals were about a quarter of participants. Workshop participants were generally long-time residents of the towns where trainings were held, and nearly three-quarters were already engaged with planning activities and processes by virtue of having attended public meetings previously. Compared to the California population, workshop participants were more likely to be Hispanic or Latino and less likely to be White, more likely to be college educated, and had household incomes at about the statewide median.

The planning committee was key to ensuring diverse participation at workshop sites. Workshop sessions were usually the first time that representatives from the variety of stakeholder groups were in the same space for a significant amount of time together, though planning committee members were usually frequent collaborators with each other. Public sector employees in planning, public health, and public works; advocacy groups, such as local bicycle coalitions; and other community organizations were usually present. Elected officials welcomed community members at the beginning of some workshops but did not always participate for the entire duration of the sessions. At some workshops, participants mentioned that not all critical stakeholder representatives were present. Those missing were often groups whose primary responsibilities lay outside pedestrian or bicycle safety, such as law enforcement, school administrators, or the business community. In some cases, the groups missing from the discussions had been invited to the workshop and had not attended, while in a few cases the planning committee discovered missing groups as discussions progressed during workshop activities. Community turnout met expectations at most workshops, but was lower than expected

at six of the fourteen training sessions based on projections made during workshop planning sessions.

Variable	Summary value
Relationship to workshop community	
Live in town	48%
Work in local or state government	24%
Work in a local non-profit	31%
Work at a school	3%
Work in public safety (police, fire, emergency services)	3%
Average # of years living or working in host community	14 (SD = 14)
Previously attended community safety meeting	72%
Education	
High school or less	25%
Some college	18%
College degree	52%
Race/ethnicity	
Hispanic/Latino	54%
White	27%
Black	4%
Asian	5%
Other	2%
Other characteristics	
Median income	$50,000–$74,999
Female	67%

Table 3: Selected workshop demographics

To lower barriers to workshop participation, some trainings were presented in multiple languages. Several members of the training staff were Spanish speakers and supplementary training materials were available in English and Spanish at all workshops. Simultaneous translation into Spanish or other predominant community languages was available at nine of the fourteen evaluated workshops, and one workshop was facilitated entirely in Spanish. Although providing workshops in Spanish increased the inclusivity of workshops, and thus the ability of residents with limited English skills to participate, not all planning activity could adequately predict who would attend workshops or their language needs. For example, one training session where most attendees spoke Spanish natively or fluently was delivered in English with simultaneous interpretation into Spanish, which inhibited the fluidity of conversation among the participants. Nevertheless, the various planning committees and management staff had a strong commitment to inclusivity in building cross-sector, cross-cultural, and multilingual community coalitions.

Follow-up interviews confirmed the CPBST workshop strengthened existing relationships and fostered new ones. While many partnerships existed prior to the workshops, seven communities

reported that the CPBST provided the opportunity and space for existing and new partnerships to develop. For example, in one urban community, a community development organization collaborated with the county public transit agency and the county transportation commission to prioritize improvements and lead community engagement in the planning process for a corridor extension in their neighborhood. In another community, the Parks and Recreation Department and a non-profit working on educational equity have worked together to organize community engagement events to transfer knowledge and continue the conversations about safety. These events incorporated some of the content introduced during the CPBST workshop.

5.3 Goal 3: Increase walking and cycling in communities

Other survey questions tested the short-term effects of the workshop on participants' ability to identify barriers to walking (Figure 1). Most participants were likely to be familiar with walking conditions in the workshop communities. Even though few walked as their main mode of transportation, 92 percent of people walked for at least ten minutes in the previous week, and 34 percent had walked every day. People walked a mean of about four days per week, though there was substantial variation in the average. Prior to the workshop, survey respondents identified lack of street lighting as the most significant barrier to walking, followed by car traffic, lack of crosswalks, sidewalks in poor condition, and danger from crime. In aggregate, perceived barriers to walking did not change much and most were not statistically different after the workshop. Nevertheless, the proportion of people who agreed that lack of crosswalks were a significant barrier to walking increased from 65 percent prior to the workshop to 77 percent after the workshop ($\chi^2 = 3.78$, $df = 1$, $p = 0.051$). The degree of change was significant also, where the mean response changed from 3.7 to 4.0 on a 5-point scale ($V = 503$, $p = 0.005$). Crosswalks and pedestrian signals were a central focus of the engineering portion of the training presentation, and participants often identified crossings as an area of concern during the walking audit. Conforming with qualitative observations, people were more likely to report stray dogs as a walking barrier after the workshop, increasing from 49 percent to 58 percent ($\chi^2 = 5.88, df = 1, p = 0.015$). Conversations in small-group breakout sessions seemed to remind the larger group of issues they had forgotten about or not thought were significant prior to the workshop.

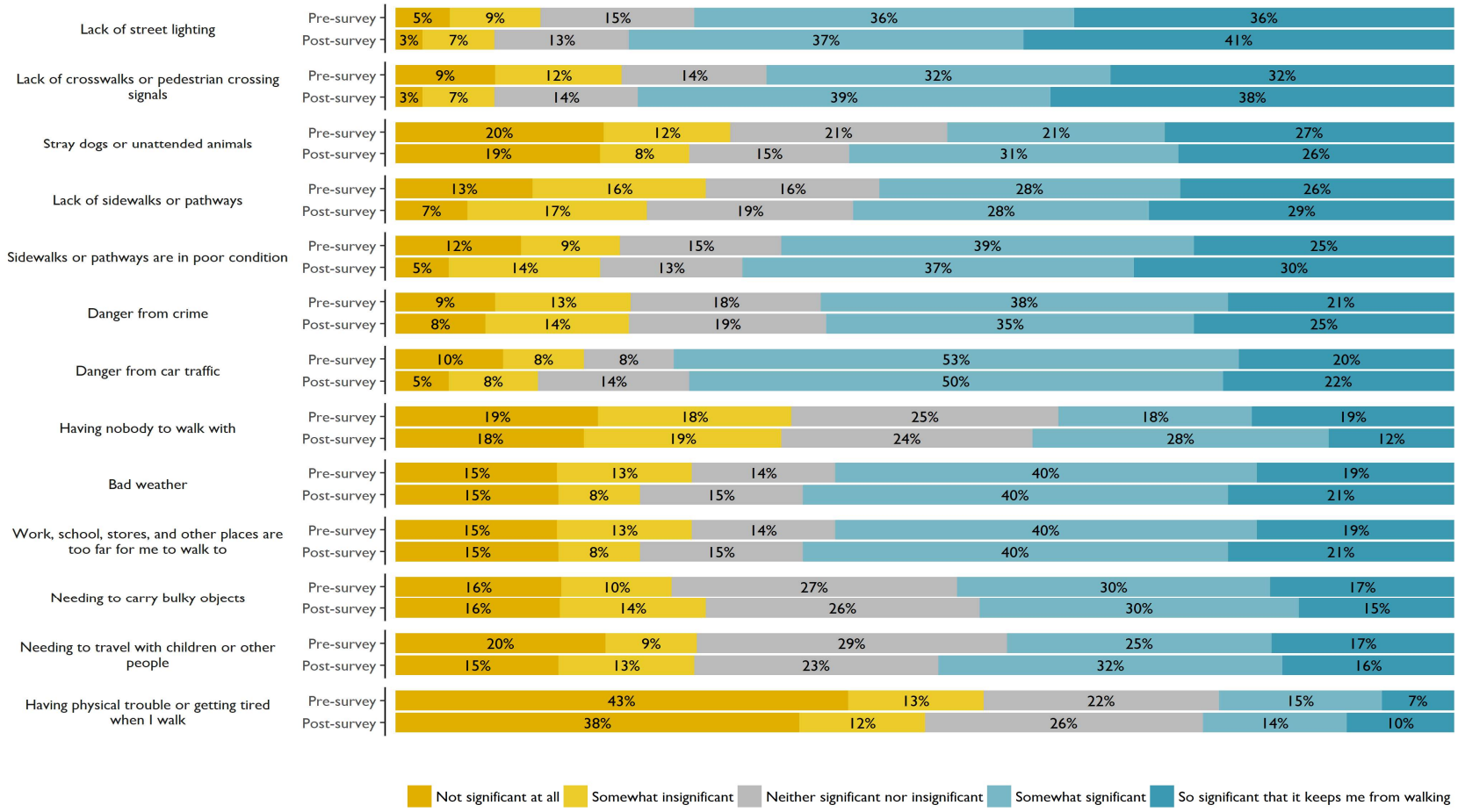

Figure 1: Barriers to walking, pre- and post-workshop

At each workshop, facilitators and participants discussed context-appropriate solutions to reduce walking and cycling barriers. Components of the training sessions that resonated most clearly with participants were those that promoted inexpensive, but effective, ways to implement safety improvements. Community residents felt empowered to develop education and encouragement strategies that they could implement themselves. At several sites, community members discussed planning for open streets events in order to encourage more walking and cycling. And by the end of one workshop, participants had exchanged contact information to begin planning. At other workshops, participants often deemed student involvement in encouragement and education programs as critical to improving safety. For example, a school official and parents suggested that creating a crossing guard program for students would encourage them to take responsibility for pedestrian safety. At some workshops, planning, engineering, and public works representatives made plans to begin the grant application process for larger infrastructure projects while also sharing what interventions were feasible within their current budgets. Because of the amount of content delivered and the number of activities included in the training sessions, it was unusual for workshops to conclude with concrete or detailed safety improvement plans. However, workshops promoted dialogue and enabled key stakeholders to build relationships that would set the stage for future plan-making exercises (see also section 5.2).

Follow-up interviews with community partners confirmed that seven communities have attained funding for solutions to barriers limiting walking and bicycling, while members of other communities reported how the CPBST supported their efforts to apply for various types of funding sources that align with communities' priorities. In one community, the CPBST provided city staff with an opportunity to engage the local community and better inform affordable housing grant applications. Other communities used the CPBST experience as support in state funding applications. Successful awards included funding for a rail-to-trail conversion, temporary street murals, new sidewalks and bike lanes in a senior community, and a planning grant for mobility plans. Overall, partners found that the CPBST had been useful in supporting both grant-writing and overall application processes to secure funding. While most communities had not yet implemented the infrastructure improvements recommended from the workshops, some had begun to improve crossings, install signage, and introduce speed reduction countermeasures. Other communities were assessing intersection safety to determine priorities for future implementation.

5.4 Goal 4: Improve safety perceptions

While the primary program objectives included coalition and capacity building and were the most important outcomes of the workshops, they were also educational interventions with secondary goals of changing participants' perceptions of pedestrian safety. In other words, the workshops themselves could be counted as one of the 6 Es the program promotes. At the outset of the training sessions, participants rated pedestrian safety in their neighborhood. The median response to perceptions of pedestrian safety in workshop communities was that it was neither safe nor dangerous, and 38 percent reported feeling "Somewhat safe" or "Very safe." About one third thought it was somewhat dangerous to walk, while 11 percent believed it was very dangerous to walk in the host community. We expected that perceptions where the workshops directly intervened would improve, such as participating in walking groups or workshops, but that perceptions would remain similar or decline where the workshops brought attention to potential safety problems.

Perceptions of pedestrian safety improved marginally (Figure 2). Some of the strongest levels of agreement for improving perceptions of safety include the importance of traffic enforcement, special events and group activities, and slower driving. In aggregate, the largest and most significant changes were those concerning the social aspects of walking. Prior to the workshop, 62 percent of respondents agreed that special events like street fairs improved safety perceptions, increasing to 75 percent after the workshop ($\chi^2 = 9.81, df = 1, p = 0.002$). The increase in the proportion of participants who thought neighborhood groups would improve their perceptions of safety was also significant, improving from 65 percent of participants to 76 percent ($\chi^2 = 6.04, df = 1, p = 0.014$). These changes in perceptions were likely to have resulted from the workshops' structured activities. They were designed to encourage participants to experience and visualize their own role in promoting pedestrian and bicycle safety. Although not a significant change in aggregate, the mean individual rating of sidewalk conditions decreased from 2.6 to 2.2 ($V = 1474, p = 0.007$), suggesting that experiencing neighborhood conditions during the presentation slightly changed personal evaluations of infrastructure quality. While the outcome objectives of this goal are difficult to measure given the short timeframe of the evaluation, both process objectives were adequately met in all thirteen workshops.

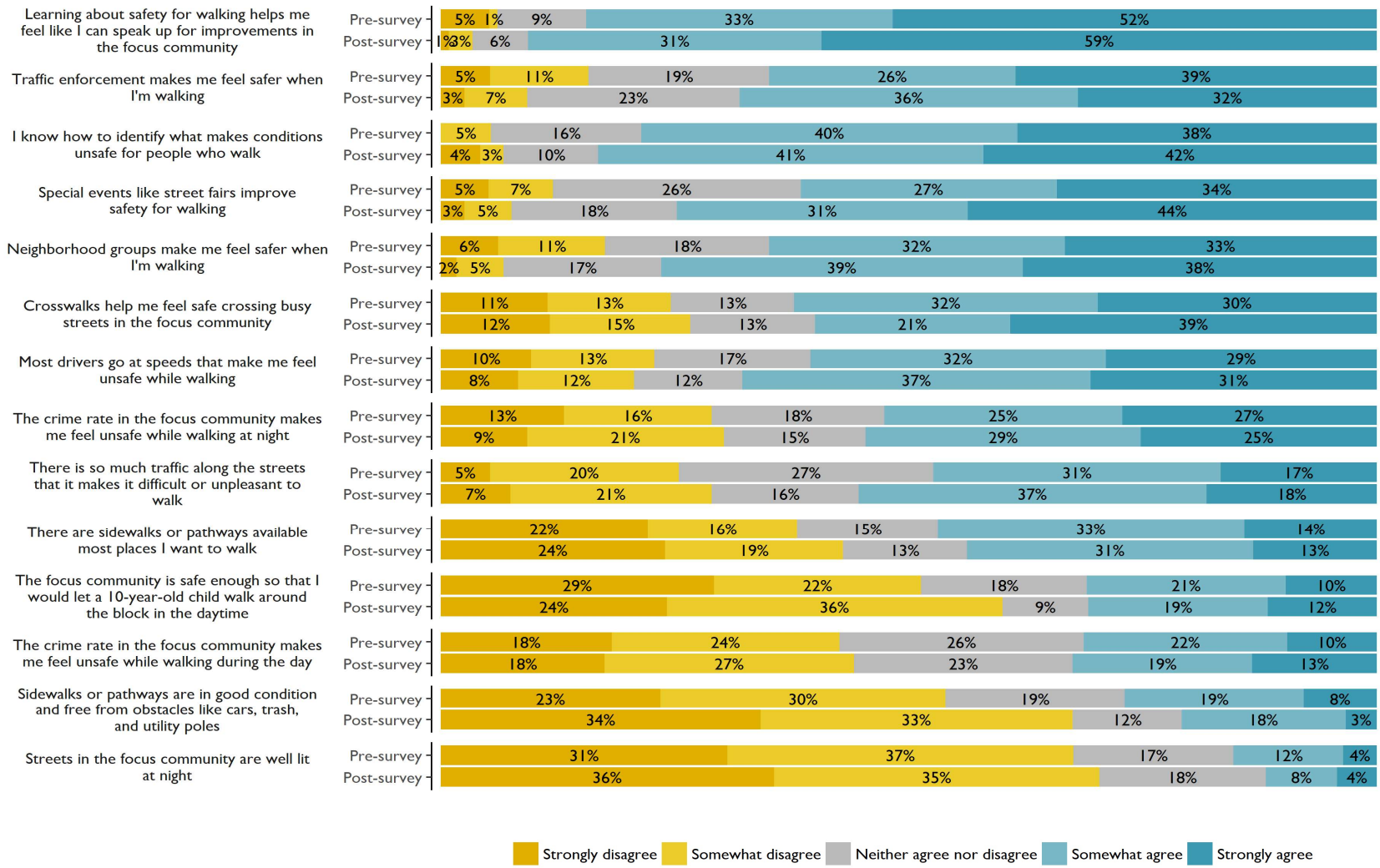

Figure 2: Perceptions of pedestrian safety, pre- and post-workshop

5.5 Goal 5: Increase safety measures

Workshops were successful in generating ideas for safety solutions that would have strong community support. For example, participants in a workshop held at a local school identified dangerous pedestrian crossings near a major thoroughfare as a priority to remedy through infrastructure countermeasures like signals and high-visibility crosswalks. A county engineer stated that he would incorporate these ideas into the next application they submitted for state safety funds. Similar ideas from other workshops were documented in final recommendations reports distributed to each planning committee and posted on SafeTREC's public website.

Although the CPBST program has the goal of improving pedestrian and bicycle safety and increasing walking and biking trips, these goals are very difficult to evaluate in the short term. Planning processes to install infrastructure often take years to conclude because of community outreach, grant funding applications, and design and engineering processes. Even elements that do not involve permanent installation of infrastructure, such as temporary demonstration projects or educational and encouragement programming, take many months to implement. Crash data are not available for analysis for at least one year following data collection, and even then, trends take several years to identify because pedestrian and bicycle crashes occur relatively infrequently. Therefore, the program's ability to achieve this goal must be systematically evaluated at a later time.

During follow-up interviews, five communities mentioned that the walk assessments during the training helped to prioritize sites and projects for improvements, and two communities had conducted additional pedestrian and bicycle safety assessments since the CPBST. Seven sites were either in the process of submitting or had submitted new proposals to state, county and local funders for safety infrastructure projects or programs (see also section 5.3). For example, one rural community had recently applied for funding to assess the safety of a trucking route that went through their community, while an urban, majority Spanish-speaking community had applied for street improvements discussed during the workshop as part of an affordable housing grant. In terms of infrastructure projects, two communities were able to install safety infrastructure in workshop focus area in the short time between the workshops and the follow-up interviews. Both community installed crosswalks, flashing signage, street markings and/or speed humps near local schools.

6 Discussion and conclusion

The challenge of measuring the outcomes of safety programs is well-documented, as is the growing need to measure performance and promote data-driven programming. The findings from this study begin to support the proposition that the CPBST workshop intervenes in the short-term on multiple levels to improve pedestrian safety and increase walking as described in program goals. Workshop participants took away new knowledge from the training sessions directly applicable to the host site. At sites where practitioners were the primary audience, workshops provided the catalyst for professionals to come together to strengthen ideas and enhance partnerships to address local safety issues, which could lead to increased political attention on pedestrian safety in the short term (Lyons, 2013). Where residents were more involved, the workshop acted as both a partnership-building exercise and an intervention to change some perceptions about walking and bicycling in the community. In particular, the social aspect of the walking audit enabled them to identify and coalesce around common safety improvement

priorities. It also helped people experience walking with the support of a social group, which likely had an effect on removing some personal barriers to walking. Indeed, there is some evidence that programs that specifically promote walking in groups has a moderate effect on increasing physical activity among adults (Ogilvie et al. 2007; Kassavou, Turner, and French 2013). The findings from this study provide additional evidence of how collaborative safety workshops build community capacity to achieve longer-term goals (Bergman et al. 2002; Bors et al. 2009).

Although we designed this study to systematically evaluate the program effects, several limitations arise. First, while site selection was designed to be representative of all workshop communities in the program year evaluated, the sites selected are not necessarily representative of other communities in California or across the United States given the unique nature of local safety issues, group dynamics, and statewide funding climate and safety policy. Second, small sample sizes of survey responses within each workshop site do not allow disaggregation of responses by site location or type. Thus, the results cannot speak to how those factors influence the variation of success within the program, though they speak to program effects on the whole. Finally, fuller analysis of some of the program goals, such as increasing walking and bicycling rates and installing safety measures require evaluation over a longer period of time. Resource constraints prevent sustained evaluation efforts in a systematic fashion. However, additional follow-up interviews, review of planning documents, and media searches will help informally document the extent to which safety improves in workshop communities. This study has collected baseline information that can be used for longer term evaluations in the future. Although the program team has conducted interviews with communities who have received trainings in prior years, institutional memory of workshops often only lasts two to three years, while many of the long-term objectives need to be measured five to ten years after the workshops.

A robust evaluation framework should be designed from the outset of program development, and process and outcome objectives should be established at the beginning of the program development. In this case, the research team evaluated an already-established program, developing objectives that fit within the scope of the program but that were not necessarily envisioned when the CPBST program was initiated. Nevertheless, this study provides a model for evaluating a safety program to ensure that implementation meets goals as the program evolves. Such an evaluation framework can help to provide a structure that can serve other continuing programs nationwide.

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