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Evaluation of *Buckle Up Phone Down* in Jackson, Mississippi, and Sioux Falls, South Dakota

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List of Acronyms

BUPD	<i>Buckle Up Phone Down</i>
C-G	comparison groups
DPS	Department of Public Safety
GHSA	Governors Highway Safety Association
HBM	health belief model
MoDOT	Missouri Department of Transportation
MOHS	Missouri Office of Highway Safety
MSDOH	Mississippi State Department of Health
NCSA	National Center for Statistics and Analysis
PSA	public service announcement
SCT	social cognitive theory
SDEMSC	South Dakota EMS for Children
SHSO	State Highway Safety Office
TATU	Teens Against Tobacco Use
TPB	theory of planned behavior

Executive Summary

Buckle Up Phone Down offers a non-enforcement approach to changing driver seat belt and cellphone use behavior. This report presents the results from process and outcome evaluations examining the implementation and effectiveness of adaptations of BUPD in two demonstration cities, Sioux Falls, South Dakota, and Jackson, Mississippi, where it was carried out with support from a separate and independent implementation contractor. This report is also a retrospective assessment of behavioral theories and constructs that explain behavior change and may apply to BUPD.

Process evaluation. The process evaluation examined BUPD execution in each demonstration city. It focused on describing the steps taken and partners involved in planning and implementing BUPD in new places. Key takeaways integrated successes, challenges, and lessons learned from interviews with stakeholders from both demonstration cities.

Outcome evaluation. The outcome evaluation observed seat belt and cellphone use behaviors of drivers in the demonstration cities and two control cities. To make valid statistical comparisons, similar criteria for choosing the demonstration cities were applied to selecting matched control cities. The city that best matched Sioux Falls was Fargo, North Dakota, and the best match for Jackson was Beaumont, Texas.

In comparison to matched control cities, neither seat belt use nor cellphone use changed significantly between the pre- and post-implementation periods. Similarly, in comparison to matched control cities, there were no significant changes in perceived seat belt use by sex, race/ethnicity, or vehicle type. Seat belt use among young adults in the post-implementation period showed a statistically significant decrease in the demonstration cities, largely driven by a substantial decrease in belt use in Jackson. In comparison to matched control cities, there were no significant changes in observed cellphone use by perceived sex, age, race/ethnicity, or vehicle type in Sioux Falls or Jackson.

Discussion. The discussion section delves into behavioral theories that may apply to BUPD. The discussion also identifies core components of BUPD based on behavioral theory and reviews additional theoretical elements that could be incorporated into BUPD to strengthen the program. Finally, it explores possible reasons for the evaluation's null results. It is important to note that the results of the process and outcome evaluations are specific to the adaptations of BUPD implemented in Jackson and Sioux Falls during this time period. It remains possible that other BUPD implementations could successfully influence driver behavior.

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Introduction

Motor vehicle crashes are a leading cause of accidental death in the United States. In 2023 there were 40,901 people killed in motor vehicle crashes on the Nation’s roads (NCSA, 2025b). Of these deaths, 10,484 people were not restrained, and 3,275 fatalities involved distraction (NCSA, 2025a; NCSA, 2025b). Addressing these two contributing factors—seat belt use and driver distraction—has the potential to substantially reduce crash fatalities.

New York and then New Jersey had the first mandatory seat belt laws beginning in 1984. Currently, every driver and front seat outboard passenger in every State and territory, except New Hampshire, is required by law to use a seat belt, although stipulations, exemptions, penalties, and enforcement levels vary widely (GHSA, n.d.-b). Seat belt use across the Nation was estimated as 91.9% in 2023, but Statewide rates ranged from 73.2% in Virginia to 98.4% in Hawaii (NCSA, 2024a). Local level use rates can vary even more widely.

The ability to use cellphones while traveling in vehicles also emerged in the 1980s. Since the first 1G phone was launched in 1982, the use of cellphone technology has expanded rapidly. With increasing prevalence and the danger associated with cellphone use while driving, many States have passed laws to curtail their use. At the time of this report, 49 States have driver texting bans, and 31 States have handheld cellphone bans for all drivers (GHSA, n.d.-a). Driver cellphone use (handheld and/or hands-free) was estimated at 6.4% during a typical daylight moment in the United States in 2023 (NCSA, 2025a).

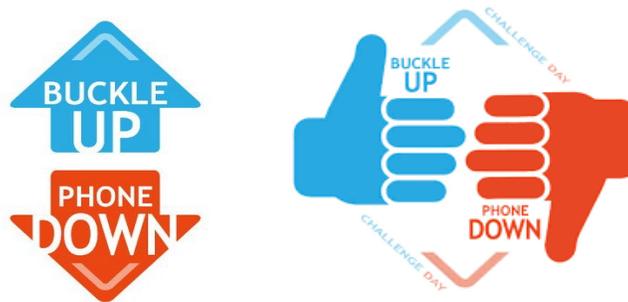


Figure 1. BUPD logos

To increase seat belt use and decrease distracted driving from cellphones, the Missouri Department of Transportation developed a voluntary, multifaceted safety program in 2017 called *Buckle Up Phone Down*. BUPD asks people, businesses, and civic leaders to accept the BUPD Challenge and to challenge a friend, relative, community member, leader, employee, or business to buckle seat belts and put phones down while driving. BUPD’s prominent logos (Figure 1) show contrasting up/down arrows and up/down thumbs to promote the BUPD message.

Missouri’s observed Statewide seat belt use increased by 7.5 percentage points from 2016, the year before the program began, to 2022—a numerically larger change than the 1.5 percentage-point increase in belt use nationwide over the same period (NCSA, 2023). However, there is no way to determine how much of that increase can be attributed to the BUPD program, specifically. As BUPD continues to gain traction in Missouri and spreads to other States, it is important to better understand the experiences of localities that adapt the program for their own communities.

Objective

Missouri's BUPD program offers a non-enforcement approach to changing driver seat belt and phone use behavior, but there has been no independent evaluation of any implementation of the program to date. The objective of this project was to conduct process and outcome evaluations examining the implementation and effectiveness of BUPD as implemented in two cities, Sioux Falls, South Dakota, and Jackson, Mississippi, where it was launched with support from a separate contractor. The process evaluations outline how implementation teams executed BUPD in each demonstration city, as well as lessons learned through its implementation. The outcome evaluations assess whether these adaptations of BUPD were effective in increasing seat belt use and decreasing driver cellphone use. This report also has a retrospective assessment of how existing behavioral theories and constructs relate to BUPD. Findings of this evaluation should not be applied to the Missouri or other BUPD programs.

Missouri's *Buckle Up Phone Down* Program

MoDOT created BUPD and champions the program on its website, www.modot.org/buckleupphonedown. While the BUPD Challenge is a core component of Missouri's BUPD program, BUPD is a multifaceted, multicomponent safety initiative. Here are its primary components.

- **BUPD Challenge.** The challenge involves high-profile influencers, such as the governor or recognizable public figures (such as popular sports coaches, who promote the BUPD message and challenge others to make the BUPD pledge—to buckle up and put their phones down while driving. People, civic leaders, businesses, and organizations such as schools can "challenge" (encourage) each other to take the BUPD pledge, broadly disseminating BUPD messaging across target audiences. For example, people can make the BUPD pledge on the BUPD website, then post about it on social media and tag others to challenge them to take the pledge, too. One school can challenge another to see how many people they can each encourage to take the pledge. A business can pledge on the BUPD website to change its policy to require employees to wear seat belts and drive with no handheld devices; it can then challenge another business (through a press release and social media) to do the same. In this way, challenges drive broader interest and engagement across a variety of community stakeholders and encourage them to make BUPD pledges.
- **BUPD planning and implementation.** MoDOT's outreach and engagement activities focus on a broad cross-section of community stakeholders with the goal of reaching people through messaging in a variety of ways (e.g., BUPD signs in schools, announcements and outreach through workplaces, personal and organizational posts on social media, billboards, variable-message signs along highways).
- **Business and organization engagement in BUPD.** To get the program started, MoDOT reached out to local businesses and asked them to set policies requiring employees to wear seat belts and put their phones away while driving company vehicles or personal vehicles for work-related purposes. Participating employees are encouraged to pledge to follow the policy and take BUPD thumbs-up/thumbs-down photos. MoDOT's website features the logos of businesses and organizations that adopt policies to indicate that they are "Gold Standard" partners.

- **Individual engagement in BUPD.** In addition to working with organizations, MoDOT encourages people to take the BUPD pledge, post pictures of themselves on social media making a BUPD thumbs-up/thumbs-down gesture and share it with others. When making the pledge on the State’s BUPD website, people can request BUPD window clings to put on the driver-side windows as a reminder of their pledges. MoDOT also sets up booths at the State fair and works with high schools to host BUPD-themed events.
- **BUPD media and outreach.** Public service announcements made by prominent members of the community helped to turn the thumbs-up/thumbs-down hand gesture into a recognizable emblem. MoDOT also posts BUPD messages on variable-message signs across the State.

Study Design

NHTSA hired a contractor to implement adaptations of the BUPD program in two cities and a contractor to evaluate the BUPD programs implemented in those two cities compared to two matched control cities. The implementation contractor worked with NHTSA to select two demonstration cities. The demonstration cities were selected based on State laws, seat belt use rates, local ordinances, media markets, and characteristics compatible with the Missouri experience in terms of selected city size and capacity to implement a compressed program fully. This report outlines the findings from process and outcome evaluations of the cities’ BUPD implementations. These evaluations were completed by the evaluation research team independent of the team involved in the BUPD implementations.

The process evaluation examined the organizational processes for planning and implementing an adaptation of the BUPD program and used data related to stakeholder interviews as well as communications, outreach, and numbers of people who took the BUPD pledge. The outcome evaluation observed driver seat belt and cellphone use behaviors in the demonstration cities. To make valid statistical comparisons, the research team applied similar criteria for choosing the demonstration cities to selecting matched control cities for both demonstration cities. The city that best matched Sioux Falls was Fargo, and the best match for Jackson was Beaumont. More data about the selected control cities is included in Outcome Evaluation Methods section.

Jackson, Mississippi

Mississippi had an observed seat belt use rate of 80% in 2021 (NCSA, 2022). Jackson is located in Hinds County, where the use rate was 74.7% in 2020 and 69.9% in 2021 (MOHS, 2022). Mississippi law does not provide for primary enforcement of seat belt violations.

Jackson is the capital of Mississippi and has a population of about 146,000, with a population density of 1,376 people per square mile (U.S. Census Bureau, 2022). The city is predominantly Black (82.8%) and has a median household income of about \$40,000. Jackson is home to a minor league baseball team, as well as three colleges and universities.

Sioux Falls, South Dakota

South Dakota had an observed seat belt use rate of 86.9% in 2021 (NCSA, 2022). South Dakota law does not provide for primary enforcement of seat belt violations.

Sioux Falls is the largest city in South Dakota, with a population of about 202,000 and a population density of 2,434 people per square mile (U.S. Census Bureau, 2022). The city is

predominantly White (82.3%) and has a median household income of about \$66,700. Sioux Falls is home to several minor league sports teams, including basketball, baseball, and indoor football, as well as three universities.

Retrospective Theory Assessment to Understand BUPD

While public health and psychological theories did not drive the development of BUPD, some of its components can be mapped to constructs in existing behavioral change theories. Doing so can be useful for understanding how specific program aspects may serve as mechanisms for driving behavior change. This section provides a retrospective theory assessment of BUPD and explores how BUPD could potentially increase seat belt use and decrease cellphone use.

Constructs From Theories of Behavioral Change

Behavioral change theories aim to describe and model the underlying mechanisms that drive individual behaviors and explain what leads to changes in those behaviors. To understand what components of BUPD might drive behavioral change, the research team identified potential theoretical constructs corresponding to the intent of each component of the BUPD program. In doing so, the team made some assumptions regarding the underlying mechanisms behind BUPD that would drive behavioral change. Because a theory lens was applied to BUPD retrospectively, not all constructs may be perfect fits in the context of BUPD; it is more common to use behavioral theories in the generation of initiatives, not in post hoc analysis.

Viewed through the lens of behavioral change theories, there are several potentially impactful aspects of the program that are outlined in Table 1.

Table 1. Possible BUPD mechanisms of behavioral change

BUPD program components	Possible mechanisms of behavioral change
Use of locally influential people and organizations	Messages from influential people, champions, strength of message, changes in attitudes
Employer involvement	Safety culture, social norms, sense of immediacy
Events dedicated to the initiative	Reminders, social norms
“Challenges” among groups (e.g., school teams)	Social norms, number of sources, immediacy
Mass media messaging including television and YouTube videos, messages on variable-message signs, social media, and radio	Subjective norms, positive reinforcement, attention, behavioral intention, changes in attitudes
BUPD pledge	Behavioral intention
Use of stickers placed on the car window as a reminder	Active prompting, cues to action

There are several theories of behavioral change that can be used to analyze the different components of BUPD and how they might work together to effectively encourage behavior change. Putting the various components of BUPD in the context of behavioral theories provides an analytical framework that may help explain any of the program’s effects.

Behavioral Change Theories Related to Seat Belt and Cellphone Use

Currently, there is no known research that uses behavioral theories to analyze the BUPD program. There are, however, evaluations of both seat belt use and distracted driving programs organized around different behavioral change theories.

Behavioral Theories and Seat Belt Use

A few studies have applied a theory-informed approach to understanding seat belt use. Most of those studies were performed outside of the United States and so generalizability may be limited for a U.S. audience. However, given the lack of other directly related studies, international studies still provide an informative context for how theories might frame the issues. For example, one international study looking at self-reported seat belt use compared the predictive power of the theory of planned behavior and the health belief model and found the TPB had a stronger relationship to seat belt use; moreover, the constructs of subjective norms and attitudes had positive correlations with seat belt use (Şimşekoğlu & Lajunen, 2008). Another more recent international study found that all constructs associated with the TPB were significantly correlated with self-reported seat belt use: perceived behavioral control, subjective norms, attitudes, and behavioral intention (Malekpour et al., 2021).

Behavioral Theories and Cellphone Use While Driving

Similar to belt use, a limited number of studies applied behavioral change theories to understanding cellphone use. One study used the TPB as a framework to understand cellphone use while driving and found that self-reported attitudes about cellphone use while driving were the most significant predictor of behavior (Tian & Robinson, 2017). Other components of the theory, such as perceived behavioral control and subjective norms, predicted some but not all of the distracted driving behaviors under investigation.

Another study used social cognitive theory (SCT) as a framework to develop a classroom-based intervention for texting while driving (Berlin et al., 2021). The decision to use SCT was due to young drivers being highly influenced by their peers. The intervention consisted of a series of classroom-based presentations and discussions about the dangers of distracted driving. Based on self-reports, the authors found that the intervention was successful at preventing many cellphone-based distracted driving behaviors.

Behavioral Theories Applied to BUPD

This section explores how several behavioral change theories might apply to BUPD. Its aim is to examine what components of BUPD may drive behavior change and how they might be implemented with fidelity if other localities try to adopt the program. The following theories are considered in this context: TPB, HBM, social impact theory, SCT, and Operant Conditioning.

Theory of Planned Behavior

The TPB states that a behavior can be predicted based on attitudes about the behavior, subjective norms, and one's feelings of control over their behavior (Ajzen, 2005). Figure 2 shows the TPB model and the relationships between its primary constructs. A primary tenet of BUPD is to change individual behavior (seat belt use/cellphone use) by using information, social media, and

reminders to change individual attitudes and cultural norms around using seat belts. Table 2 outlines key constructs from TPB and how they might apply to program components of BUPD.

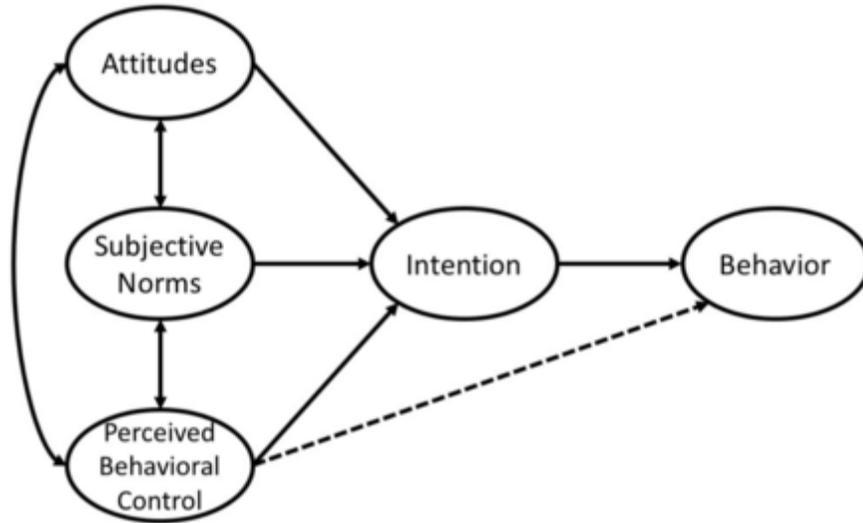


Figure 2. TPB model
(adapted from Ajzen, 2005)

Table 2. TPB model applied to BUPD

Constructs of theory	Possible BUPD program components
Attitudes (individual)	Social media messages were developed to make buckling up “cooler.” Bright, upbeat, easy-to-understand messaging was intended to change individual attitudes about buckling up and using phones while driving.
Subjective norms	Program components targeted changing norms around using a seat belt and phone use. Having groups issue “challenges” to each other linked group membership to the behavior, establishing a subjective norm of participation in BUPD. The governor, a popular coach, and other local leaders championing the cause encouraged broader community acceptance and support.
Perceived behavioral control	A static-cling window sticker placed on the window of the driver side door reminded drivers to “Buckle Up” and put their “Phone Down.” This visible reminder could have contributed to drivers feeling like they could indeed take these actions.
Behavioral intention	The BUPD pledge that participants signed online to get program materials (sticker) signaled their behavioral intention to buckle up and not use their phone. The previously mentioned window clings served as a reminder of that intention that appeared proximal to the desired behavior.

Constructs of theory	Possible BUPD program components
Behavior	As a result of these components, participants would be more likely to buckle up and put their phone down when driving.

Health Belief Model

The HBM focuses on people’ perceptions of risk for a health behavior, perceived benefits, and perceived behavioral control (Janz & Becker, 1984). The model conceptualizes decisions about health behavior as being reached based on an individual’s assessment of the severity and likelihood of an outcome, the ability to control his or her behavior, and the prompting of the behavior through cues.

The cues to action construct of HBM is particularly relevant to BUPD, as the act of taking the pledge is consistently reinforced with visual messaging using the image of the thumbs-down/thumbs-up hand gesture on in-vehicle reminder stickers, variable-message signs, BUPD events, and BUPD promotional initiatives.

One limitation in applying HBM to this campaign is that BUPD messaging does not focus on threats of what will happen if a person does not use a seat belt or drives while using a cellphone. Therefore, the constructs of perceived threat and weighing perceived benefits and barriers are not as relevant. However, the cues to action may serve as a reminder for drivers to think of what they have learned elsewhere and consider the potential threat.

Social Impact Theory

Social impact theory proposes behavior is a result of social forces, which can be broken down into strength, immediacy, and the number of forces (Latané & Wolf, 1981). In this model, the strength of social force is determined by two factors: First, is the influencer important, intelligent, in a position of authority, etc.; and second, is their importance, intelligence, or authority specific to the situation at hand? The next main construct of the theory is immediacy, comprising both physical/temporal proximity of the influence and social immediacy, or feelings of closeness with the influence. The final construct that influences social impact is the number of sources trying to influence the individual. As the overall number of people and entities increases so does the amount of influence until a certain point where adding more people or entities will have diminishing returns.

Figure 3 shows the social impact theory model with the constructs of strength, immediacy, and number of sources all having an influence on social impact. In this case, the social impact is behavior: seat belt use or cellphone use.

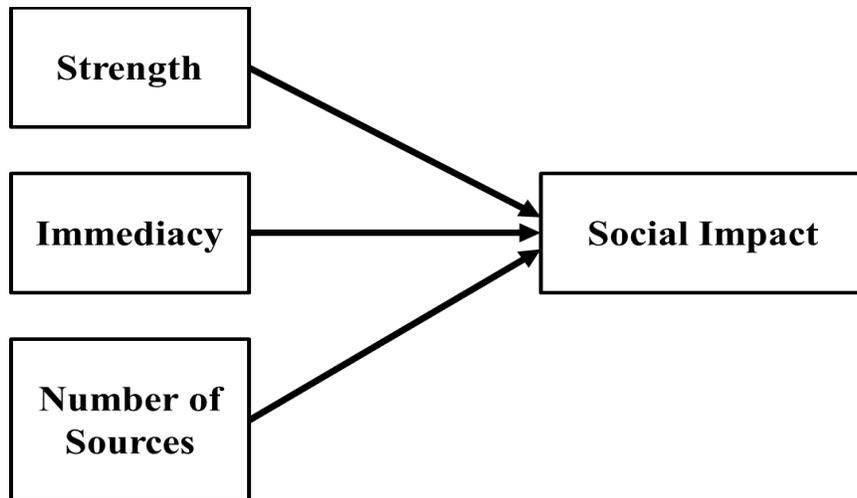


Figure 3. Social impact theory model
(image redrawn from Perez-Vega et al., 2016)

BUPD relies heavily on social influence through the use of employers, the community, and local celebrities as drivers of the message. Through BUPD’s channels, it potentially creates an impression that the program is widely used and can therefore influence more people to participate. The theoretical constructs of the social impact theory as they might relate to BUPD are outlined in Table 3.

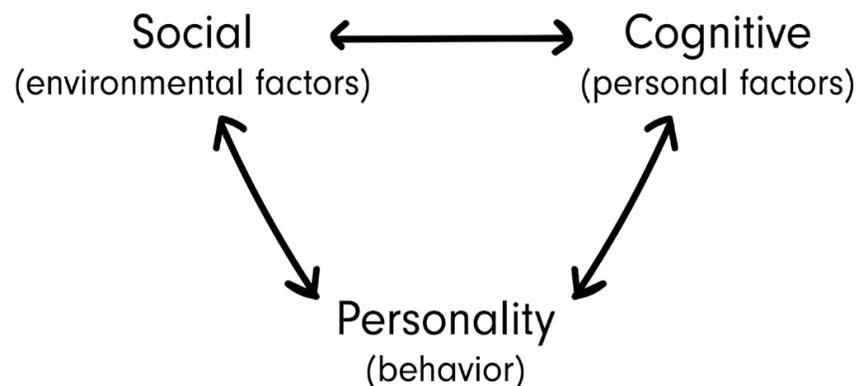
Table 3. Social impact theory applied to BUPD

Constructs of theory	Possible BUPD program components
Strength	A major influencing factor may be the invitation to participate in the BUPD Challenge (e.g., pledge and photo with hand sign) from employers, schools, or teams. Also, the use of locally important, as opposed to nationally known, celebrities may contribute to the sense that the program is a local, community-based movement, as opposed to a national ad campaign.
Immediacy	The social media and workplace aspects of BUPD likely increase the sense of immediacy. The program was shared through social media, where people are likely to personally know the person or people sharing the challenge. Employers and coworkers are also people who are known to the participant. Groups performing the BUPD Challenge generally challenge similar groups that are known to them: a baseball team challenges another baseball team; a tire store challenges another tire store.
Number of sources	Beyond the closeness of those sharing and participating in the challenge, people would also be exposed to less direct sharing, such as through billboards and PSAs. This can lead to a feeling of very large program participation.

Social Cognitive Theory

Similar to the social impact theory, SCT focuses on the interplay and connections between people' personal factors, their social environment, and their behaviors. Figure 4, showing the SCT model, outlines how social (environmental factors), cognitive (personal factors), and personality (behavioral factors) each influence and are influenced by the other construct. It illustrates a core tenet of the theory, reciprocal determinism, suggests that people both influence their environment and can be influenced by it. By participating in social media initiatives, such as BUPD, liking or sharing the “thumbs-up/thumbs-down” logo on social media, and receiving likes for making those posts, people are provided with positive reinforcement and may be more likely to continue the behaviors. By participating in the BUPD initiative, placing a sticker on the window of their vehicle, or sharing information about it, they are, in turn, modeling the behavior and providing positive reinforcement for others (Bandura, 2003).

In SCT, Bandura posits that people learn through observation and imitation of others' behavior. Social modeling, such as modeling behaviors through mass media initiatives like BUPD, may provide a way for people to learn a new behavior, see it modeled, imitate it without risk, and have an opportunity for them to change their attitude about that behavior (Bandura, 1998).



*Figure 4. SCT model
(image from Pixorize, 2022)*

Operant Conditioning

In operant conditioning, behavior that is rewarded is more likely to be repeated. Timing is also an important factor in determining how powerful a reward might be with proximal rewards more likely to drive repeated behavior (Skinner, 1965). When a behavior is no longer desired, a cessation of rewards will not immediately extinguish the behavior. In fact, extinguishing the behavior may take a great deal of time. When the behavior is self-rewarding (i.e., behavior and reward cannot be separated), conditioning the behavior is very easily accomplished. Not surprisingly, limiting or extinguishing a self-rewarding behavior is extremely difficult (Ainslie, 1975). The effect is so pervasive that animal trainers recommend training a new, incompatible behavior rather than trying to extinguish a current self-rewarding, but undesirable, behavior (Pryor, 2019). Indeed, cessation campaigns achieve lower effect sizes in mediated public health campaigns than do adoption campaigns (Snyder et al., 2004). In other words, extinguishing an existing behavior—even in humans—is more difficult than encouraging the adoption of a new behavior.

Applying operant conditioning to BUPD is straightforward. For humans, symbolic social rewards are powerful. Pairing in-group identification and approval with a desired behavior is the way that a behaviorist would describe social norms: taking the BUPD pledge would provide reinforcement in a symbolic social form.

Operant conditioning may also explain why cellphone use is difficult to discourage. Cellphone use is self-rewarding. Cellphone conversations can provide social contact and entertainment. Teens note it decreases boredom while driving (Larrea & Abdel-Rahim, 2017). Principles of operant conditioning would say that this self-rewarding behavior will be hard to extinguish. In fact, it may be better to train a new, incompatible behavior than to extinguish the existing, self-rewarding behavior.

Applied to driver distraction, the principles of behaviorism suggest a prescriptive (“do this”) strategy will be more successful than a proscriptive (“don’t do that”) approach. Focusing on the prescriptive act of “putting the phone down” encourages the adoption of a new behavior, whereas “don’t use your cellphone” requires cessation of an established, self-rewarding behavior. Based upon this theory, “Phone Down” may be more successful than “Don’t use your cellphone.”

Using Behavioral Theories to Understand Challenges in Implementation

Theories provide a framework for trying to understand how certain elements of BUPD may work to support behavior change. They can also provide some insight into what may be missing from BUPD that could decrease its potential impact when implemented in new locations. If BUPD is not shown to be effective in the demonstration cities, then, from a theoretical perspective, possible explanations might include:

- A critical component is missing or not adequately incorporated. For instance, one element that is often included in behavior change initiatives, which is absent from BUPD, is risk messaging to increase knowledge, communicate threats, and/or encourage attitude change.
- Some of the critical elements to encourage social norm change are difficult to implement. For instance, BUPD launched in Missouri with expansive support from political leadership at all levels and from other respected leaders, such as football coaches and State office holders. This type of high-profile support is hard to recreate, especially when a program is launched on a smaller scale at a local level.
- The BUPD program was not sufficiently disseminated. Program reach is an important aspect of initiatives like BUPD. If there is weak dissemination/dissemination over an insufficient length of time, or if the message does not inspire participants or organizations to challenge others through social media sites, then it could be difficult for an implementation of a BUPD to make an impact.
- A social norms approach might not be effective in the context of seat belt or cellphone use. The behaviors are performed in public but are not conspicuous or noticeable. If the target population does not see the behaviors being performed by others, the attempt to establish the norm might not attain credibility.

These are considered in more detail in the Discussion section in the context of the results from the process and outcome evaluations.

Process Evaluation

The section shares the Process Evaluation results of BUPD planning and implementation activities at the two demonstration cities, Sioux Falls and Jackson. The goal of the process evaluation was to understand the implementation of BUPD program activities and their outputs (e.g., pledges, number of partners).

The Process Evaluation focuses on describing the steps taken and the partners involved in planning and implementing new BUPD programs in the two demonstration cities. It outlines the data collected, its analysis, and the findings. The findings focus on describing the steps and partners involved in building the two BUPD programs from the ground up.

Background on BUPD in the Demonstration Cities

This section provides background on how champions (i.e., BUPD grantees) were identified to help launch BUPD in the two demonstration cities. It outlines the roles of the implementation contractor and the BUPD grantees in planning and implementing BUPD. Those who cooperated and contributed to the implementation (grantees, champions, businesses, institutions, agencies, and people) are described as the implementation team. Though the implementation contractor may have contributed to the implementation team, the implementation team comprises the broad group of those engaged in program activities.

BUPD Grantees and BUPD Implementation

The State Highway Safety Offices (SHSO) helped identify grantees—South Dakota Emergency Medical Services for Children in Sioux Falls and Mississippi Safety Services in Jackson—to champion BUPD in the demonstration cities. In both cases, these were entities with whom the SHSOs already had a working relationship; both organizations were known for their strong work in traffic safety.

Role of Implementation Contractor

The implementation contractor provided both grantees with drafts of BUPD outreach materials, based on MoDOT's BUPD, for their website and social media messages. The contractor also offered to provide other BUPD implementation support. The nature of their support varied depending on demonstration city and the needs identified by the grantee. In Jackson, the implementation contractor helped assemble a BUPD planning team. It then led bi-weekly planning meetings and supported outreach to businesses to engage them in BUPD. In Sioux Falls the grantee chose to keep the planning and implementation internal to the organization and led all planning and outreach efforts.

Role of BUPD Grantees

The grantees were charged with 1) allocating and spending BUPD funds to support the initiative and 2) leading the BUPD planning and implementation. Over a six-month implementation period, the implementation contractor expected grantees to perform the following:

- establish web and social media sites;
- develop a locally-tailored BUPD promotional video;
- form BUPD planning and implementation teams;

- host a high-visibility kickoff event;
- develop and implement an action plan to get people, organizations, and businesses across the area to take the BUPD Challenge; and
- track their activities (which provided data for this process evaluation).

Process Evaluation Methods

Over the six-month implementation period, the evaluation team collected a variety of process data to gain an understanding of what both implementation teams did to plan, launch, and implement BUPD. The team gathered this information primarily through monthly reports and action plan updates by the implementation team leads. The implementation contractor collected the and then shared them with the evaluation team. The team also collected meeting summaries and other planning documents (e.g., kickoff event material, press releases) and tracked social and news media. At the end of the implementation period, the evaluation team conducted interviews with implementation team champions and other key stakeholders.

Elements of Process Evaluation and Types of Data Collected

This section describes the data elements of the Process Evaluation. Specific research questions are outlined later in their relevant sections.

- **Planning of BUPD (Section 3.3.1).** This element analyzes the implementation teams' approaches to the early stages of planning the BUPD initiative.
- **Implementation of BUPD (Section 3.3.2).** This element describes the activities of the implementation teams following the launch of BUPD.
- **Business/Organization Engagement in BUPD (Section 3.3.3).** This element discusses the business and organizations the implementation teams reached out to and partnered with during BUPD implementation period.
- **Media & Outreach for BUPD (Section 3.3.4).** This element explores the implementation teams' use of media and social media to raise awareness of BUPD, and the levels of engagement with that media. It also describes the methods the implementation teams used to raise awareness about BUPD and encourage pledges.
- **Success Factors (Section 3.3.5).** This element outlines the factors identified by stakeholders as being crucial to BUPD implementation.

Data Tracking

Site champions, or the implementation team leads (also called the “executive team”), and the implementation contractor tracked much of the data and shared monthly updates with the evaluation team. The monthly reports included detailed information related to publicity and outreach (e.g., events, number of people reached, promotional materials shared) and pledge activity (e.g., organizational and individual pledges, website visits, social media views or likes). The data were grouped into two types: quantitative data, mostly consisting of social media metrics and pledge numbers, and qualitative data from written meeting minutes and action plan updates.

Quantitative Data

Quantifiable data were entered into an Excel spreadsheet to better assess trends and patterns. Types of process evaluation data assessed in this way included the following:

- social media (numbers of posts and numbers of engagements);
- traditional media;
- outreach events and giveaways, including numbers and types of events;
- organizational involvement (e.g., number of organizations who take the BUPD pledge, assessment of types of organizations); and
- individual pledges.

Qualitative Data

BUPD grantees developed and updated action plans on a monthly basis that outlined:

- Implementation team members,
- website development,
- program materials,
- kickoff event plans,
- implementation plans, and
- timeline.

The evaluation team also incorporated summaries and action items from BUPD meetings into the process evaluation, which provided an in-depth picture of the steps that members were taking to plan and implement BUPD in their jurisdictions.

Stakeholder Interviews

At the end of the implementation period, the evaluation team conducted nine in-person stakeholder interviews to better understand core elements and dynamics in each implementation team—four interviews in Jackson and five in Sioux Falls. Interviewees included the implementation team leads, representatives from the SHSO who were active in supporting BUPD in the locality, and other implementation team members.

Following the interviews, the team conducted a thematic analysis using interview notes, meeting minutes, and other documents provided by the local BUPD team. Thematic analysis provides a means for systematically identifying, organizing, and describing themes and patterns across data sets (Braun et al., 2012; Nowell et al., 2017). As used in this evaluation, the thematic analysis helped identify key implementation concepts in the two BUPD cities.

Process Evaluation Findings

This section interweaves findings from all data sources and draws comparisons between the two BUPD cities. It is organized by research question and key themes, presenting findings on the following topics:

- BUPD planning,
- BUPD implementation,
- Business and organization engagement in BUPD,
- BUPD media & outreach, and
- Success factors.

BUPD Planning

The following core research questions were explored to better understand the planning needed and the people involved prior to launching BUPD.

- What was the necessary planning for the launch of BUPD?
- What stakeholders were involved in the BUPD planning committee? What qualities/connections did they bring?
- What organizations pledged to join BUPD prior to the kickoff?

Most of the work described in this section happened before BUPD was launched publicly on October 21, 2022. The teams built key pieces of program infrastructure, such as the website and social media sites, and engaged organizations and businesses who could serve as high visibility participants, bring attention to the program overall, and challenge others to take the BUPD pledge.

Planning Prior to Launching BUPD

Prior to officially launching BUPD, the implementation teams prioritized establishing websites and social media handles. The websites were intended to be important pledge drivers, and social media through Facebook, Instagram, and X/Twitter (Sioux Falls only), were also set up as platforms to provide information and encourage pledges.

The websites featured the following components:

- home page;
- introductory video;
- pledge page for people, organizations, and schools/students;
- challenge page to send and accept the challenge;
- helpful resources (i.e., fact sheets, talking points, sample newsletter article);
- Wall of Fame/video gallery;

- BUPD Policy Partners/Gold Standard Pledge Partners (i.e., those organizations that made a BUPD pledge and adopted an internal policy for employees to buckle up and not use their phone while driving); and
- legal pages (e.g., disclaimer, privacy policy, terms of service).



Figure 5. Jackson BUPD website

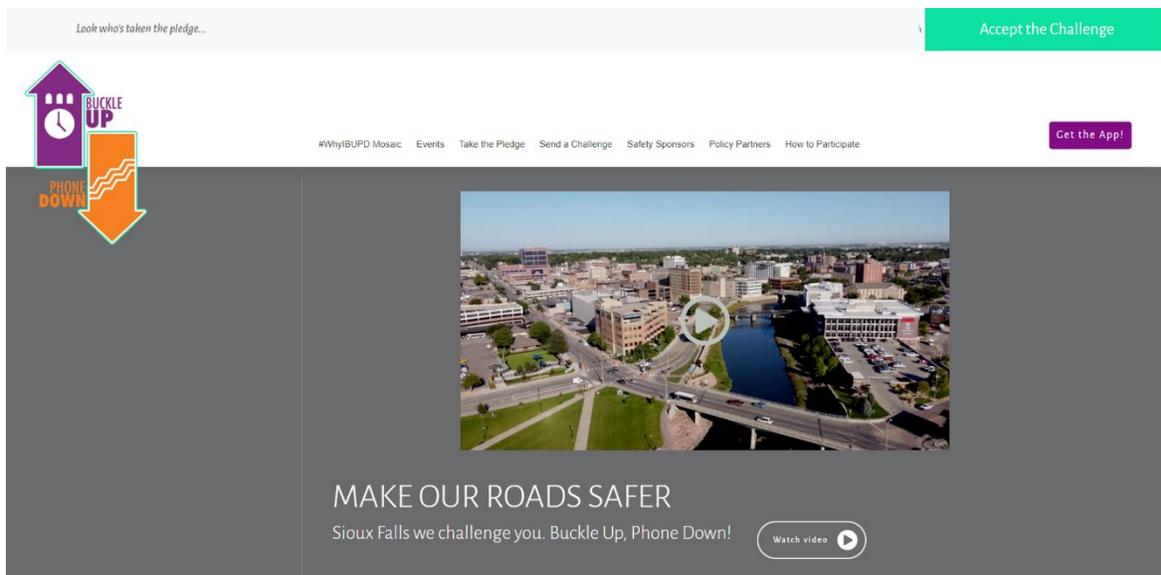


Figure 6. Sioux Falls BUPD website

Jackson’s website, shown in Figure 5, is modeled closely after MoDOT’s BUPD website with the same arrows logo and many of the elements arranged in the same order. Sioux Falls, shown in Figure 6, opted to tailor the BUPD logo and website materials to reflect their local area, changing the BUPD logo and colors. Sioux Falls also opted to direct some of its seed money to developing a BUPD app with Dakota State University. Similar to window clings that provide a regular visual reminder of the BUPD pledge, Sioux Falls intended for the app to provide daily

reminders to subscribers of their safety pledge. The app was launched in late January, part way through the Sioux Falls BUPD program period, due to delays in its development.

Both demonstration cities developed promotional videos with strong local elements such as scenes from the program locations, local sports teams, and employees of local businesses, that were ready soon after the BUPD launch in October.

The Jackson BUPD planning team used website and social media materials developed by the implementation contractor based on MoDOT's BUPD work. The Sioux Falls BUPD planning team opted to contract with a local firm to develop the website; the planning team also created BUPD informational and additional social media materials themselves to give the BUPD materials a local flair. The Sioux Falls BUPD planning team felt strongly their community would respond more positively to a "home-grown" initiative clearly tailored to their area.

Stakeholders Involved in BUPD Planning

The stakeholders involved in BUPD planning varied between locales, in part because of the planning approach that each grantee and demonstration city decided to take.

Role of the State Office of Highway Safety

The SHSO helped identify BUPD grantees, Mississippi Safety Services and South Dakota EMS for Children (SDEMSC), whom they felt could successfully implement BUPD based on the organizations' track record as current or former grantees of other State highway safety funds. Both grantees then designated an implementation team lead in their organization.

In both cities, the SHSO participated in the BUPD planning team, helped make connections on behalf of grantees, and identified locations for the kickoff event—a local business with a production center for Sioux Falls and the Mississippi Office of Highway Safety (MOHS) headquarters for Jackson. In Jackson, the SHSO played an active role in meeting with organizations and businesses while other planning team members made introductions and helped establish connections with Jackson State University and the Mississippi State Department of Health. Both of these partners later became active participants in Jackson's implementation team following the kickoff event.

Implementation Team Leads and Other Team Members' Roles and Responsibilities

Implementation team leads took different approaches to planning and implementation. The composition of the BUPD planning teams varied based on each grantee's approach. Jackson engaged planning team members across a variety of organizations, while Sioux Falls preferred for the implementation team leader to do the vast majority of the planning with some support from fellow staff members.

A brief description of the organizations and their roles in each BUPD planning team is included below.

Jackson BUPD Planning Team and Their Roles

In Jackson the implementation contractor assembled the BUPD planning team based on prior connections in the community. They also led the development of the website and introductory video by hiring a local web developer and led weekly BUPD planning team meetings starting two and a half months prior to the BUPD program launch.

Most of Jackson's BUPD planning team did not know each other prior to coming together to plan and implement BUPD and as a result, it took time for each member to identify specific roles and responsibilities. The Jackson BUPD planning team members provided input into the BUPD promotional materials developed for the program prior to its launch.

Planning team members are below.

- **MOHS:** Led outreach to other SHSO grantees and State departments (e.g., health, transportation) and heavily engaged in planning the kick-off event.
- **Mississippi Safety Services:** Oversaw grantee funds, led outreach efforts with the local school systems, hired staff to lead outreach, hired a youth intern to lead social media, and purchased outreach materials such as signage and giveaways.
- **Continental Tire Inc.** (one of the largest employers in Jackson): Made initial introductions to the business community to engage other businesses and organizations to support BUPD.
- **Ferreri Consulting Services, LLC** (an organization with deep connections and knowledge of the Jackson community): Contacted other people, businesses, and organizations to seek their support for BUPD and heavily engaged in planning the kick-off event.

Sioux Falls BUPD Planning Team and Their Roles

In Sioux Falls the implementation team leader decided to keep all BUPD planning internal to the organization. Staff members in the grantee organization handled all the logistics involved in initial BUPD planning and outreach efforts.

- **South Dakota Office of Highway Safety:** Provided outreach to other SHSO grantees and the State DOT and helped find a venue for the kick-off event in January.
- **SDEMSC** (including the implementation team leader, another staff member, and the program director at times): Planned kick-off event, sent letters to try to engage partners prior to the BUPD program launch, and led the development of the website and introductory video by hiring a local web developer.

The implementation contractor provided initial social media messages and offered to provide additional support to the Sioux Falls BUPD planning team, but the implementation team leader preferred for these tasks to remain with the BUPD planning team.

Engaging Organizations to Pledge to Join BUPD

Engaging organizations and businesses new to BUPD was challenging, especially with organizations the team did not have any prior relationships or connections with. Both BUPD planning teams reported following-up several times with businesses and organizations, even when someone on the planning committee contacted a person they knew. Throughout the

implementation, the most successful methods of contact were telephone calls or in-person visits. Emails and letters were not effective in engaging other organizations.

Prior to implementation, the Jackson BUPD planning team worked together to address a long list of “to do” items, including meeting planning, goal setting, and action plan development. MOHS recruited the transportation commissioner to be the voice of BUPD and a person on the DPS marketing team to help with outreach to other State agencies. Another team member reached out to news outlets, businesses, and organizations, and a third person worked with schools. Another member contacted other large employers in Jackson.

The Sioux Falls BUPD planning team tried to contact influencers and organizations to engage them in the initiative early. Despite letters and follow-up phone calls, they received minimal responses. Organizations that did respond wanted more specificity about the program before committing support, and they mentioned there was no website to visit for more information.

Kickoff Event

Planning a high-visibility BUPD kickoff event was a requirement of the implementation contractor for both demonstration cities. Neither community saw a spike in BUPD pledges following the kickoff event, but the kickoff event generated important engagement with new partners and helped build momentum that BUPD implementation teams leveraged in future efforts.

Jackson Kickoff Event

For the Jackson BUPD team, the kickoff event was the first high visibility opportunity to share information about BUPD, including the website, with the public. Despite the press release and calls to engage the media, no news articles were issued about the BUPD launch. However, the kickoff event did generate new partners and excitement about BUPD that propelled its implementation forward. The new partners either joined the implementation team or hosted BUPD outreach events later to help garner additional pledges. Jackson’s kickoff event included speakers from the MOHS, Mississippi Department of Public Safety commissioner, Mississippi State Medical Association, an influential business, and the Mississippi Braves Minor League baseball team.

Following the Jackson kickoff event, several organizational speakers and participants in the kickoff event expressed interest in becoming involved in BUPD implementation. In addition:

- The BUPD planning team met with the student council at a local high school and set up two BUPD pledge events at Jackson State University.
- A business agreed to keep BUPD window clings/stickers in their Jackson area store and sent an internal email with the BUPD informational video attached to all its employees.
- MSDOH agreed to host an internal BUPD event for staff.
- The Mississippi Braves sponsored high dollar giveaways, such as box seats, that the team used as raffle items to encourage pledges.

The new leads and connections from the kickoff event drove the Jackson BUPD team’s next steps for implementation.

Sioux Falls Kickoff Event

In Sioux Falls the BUPD planning team held an initial virtual kickoff event that gained little traction, and then held an in-person kickoff/press event. Similar to the way the Jackson kickoff event helped make connections with new partners, the visibility of the second Sioux Falls kickoff event enabled the team to build partnerships with several organizations. The second Sioux Falls kickoff speakers included a representative from NHTSA Region 8, the Sioux Falls fire chief, the Sioux Falls police chief, and a trauma surgeon. Guest collaborators were also invited to speak, including an owner of a small business and members of the South Dakota Highway Patrol.

Following the Sioux Falls kickoff event, two high schools in the area expressed interest in becoming involved in the BUPD implementation. Soon after, the Sioux Falls School District agreed to work with the Sioux Falls implementation team to raise awareness about BUPD program in four of their high schools. The implementation team shared information about the initiative with students and disbursed keychains, pens, window clings, yard signs, and banners. BUPD yard signs were also posted at the schools.

BUPD Implementation

The evaluation team explored the following core research questions to better understand how BUPD was implemented and who was involved. The research questions included:

- What specific meetings and/or activities did each implementation team conduct as a part of the BUPD program?
- What community stakeholders were engaged in implementing the initiative over time (i.e., continuing momentum)?
- How was the initiative sustained over time?

This section describes the work of implementation teams. The Jackson implementation team included many of the same members as the BUPD planning team with the addition of other members that joined following the kickoff event. Sioux Falls BUPD opted to continue leading implementation efforts without outside partners.

Meetings and Activities

Both demonstration cities reported their promotional video and kickoff event were pivotal launch moments, as they both provided a strong public safety message to people and offered ways to share information about BUPD and connect with other partners and organizations.

Leveraging Sports Events

Both demonstration cities have popular minor league sports teams. In Sioux Falls the implementation team paid to staff a table at Skyforce basketball games and stated that it provided an excellent opportunity for outreach, sharing that community members would report seeing BUPD at the game later in the week. The Mississippi Braves baseball team in Jackson donated prizes, such as box seats, the BUPD team raffled as prizes to pledge participants.

School Activities

Both implementation teams partnered with local schools to spread awareness about BUPD and encourage pledges. The Jackson implementation team developed relationships with schools at the beginning of the implementation period. They attended homecoming events at one of the

high schools and Jackson State University, and a second high school allowed them to present to a class and host a schoolwide pledge event. Later in the implementation period, Jackson BUPD team members visited several local high schools for “Prom Promise” events, where they encouraged students to wear their seat belts and not text and drive when going to and from prom.

The Sioux Falls implementation team partnered with the Carroll Institute’s Teens Against Tobacco Use program, whose participants introduced BUPD and encouraged pledges at their seven Sioux Falls schools. The TATU participants also presented at several driver education classes in the area and facilitated outreach to five local institutions of higher education: University of South Dakota—Sioux Falls, Avera McKennan Hospital School of Radiologic Technology, Southeast Technical College, Augustana University, and University of Sioux Falls. As a result, following connections made during the kickoff event, the Sioux Falls BUPD team began to collaborate directly with school district contacts, which led them to form additional connections with 11 local schools to spread BUPD messaging.

Engaging and Coordinating with Community Stakeholders

Stakeholders from both demonstration cities reported spending significant hours and effort launching and implementing BUPD.

Managing the BUPD Workload

The demonstration cities offer examples of two different approaches to implementation. In Sioux Falls one organization led and primarily shouldered the entire BUPD workload. By contrast, in Jackson, the implementation team leader relied heavily on other partners to make connections with organizations and businesses to encourage BUPD pledges. Even when sharing the load, the implementation team believed the implementation involved a lot of work. As one team member shared,

If you are going to do this [BUPD], everyone has to be involved. Directors, program managers, everyone. Like all of the Department of Public Services. It is too discouraging and overwhelming to be in it by yourself. You have other duties, [you] can’t do it alone.

By the end of the BUPD implementation period, staff in both cities reported frustration, fatigue, being over budget (\$25,000 per city), and spending substantially more time on BUPD implementation, as opposed to other organizational priorities, than planned. Their experience underscored the large, unanticipated toll of initiating and leading the program took, including budget impact.

Expanding Networks

Jackson BUPD team members said by working together they were able to access more places and expand their reach to more people. Organizations and businesses came together through the BUPD planning and implementation teams when they had no prior working relationship. These partners planned and participated in pledge events together and expressed satisfaction with the partnership and their collective increased visibility.

Leveraging Expertise

Both implementation teams acknowledged the different skills each member brought to the team and leveraged those skills and expertise when implementing BUPD. Some of the areas of expertise team members felt were particularly important included:

- knowledge and skills in communications, marketing, and social media;
- existing connections to people, organizations, and businesses in the community;
- ability to reach out to known or new contacts and ask them for support; and
- ability to manage the program by facilitating regular meetings, including project partners, and keeping everyone on track.

Building Sustainability

At the end of the six-month implementation period, both demonstration cities stated that the best way to sustain a BUPD program would be for a State agency, rather than a local one, to lead, as modeled in Missouri. They emphasized the broader networks and resources States can deploy in implementing BUPD and the limitations in gaining attention and support when the program is implemented locally.

Business and Organization Engagement in BUPD

An important aspect of BUPD planning and implementation is engaging businesses and organizations to participate in the program. This section discusses different ways the implementation teams engaged these partners and how they were able to collaborate with them to promote the BUPD program.

Some of the core research questions explored in this section include:

- What industries were most engaged with BUPD?
- What outreach was done with businesses and organizations?
- How did different organizations, companies, and industries engage to support BUPD?

Types of Businesses and Organizations Engaged with BUPD

Both demonstration cities looked for partners with missions aligned with BUPD. They tried to find common causes and opportunities to raise awareness of BUPD or integrate BUPD pledge drives in the context of other work. Some examples of this included:

- Jackson State University's Occupant Safety Coordinator integrated BUPD into presentations and events he led or participated in on high school and college campuses as he also covered information on reckless and distracted driving.
- Two large employers active in Jackson's BUPD implementation were a phone and tire company. The Jackson implementation team was also looking to engage insurance companies and auto shops when the implementation period ended.
- A security firm in Sioux Falls that uses cameras in vehicles as a mechanism to maintain security was interested in highlighting seat belts as a way to keep drivers safe.

- Other partners that demonstration cities identified were physicians (e.g., trauma surgeons and medical associations), chiropractors, emergency medical services, police, and insurance companies.

The two implementation teams' outreach strategies differed in the types of organizations they targeted and the frequency of requests. The Jackson implementation team focused on schools and universities early and made connections with large area employers. Their outreach tended to leverage existing connections in the Implementation team. The Sioux Falls implementation team's outreach strategy initially contacting a wide range of local small businesses, nonprofits, churches, and schools through letters, emails, and cold calls with little success. The team then shifted their focus towards local sports teams, larger local employers, and high schools. Both implementation teams were successful in heavy pushes to engage local high schools at the end of the implementation period, which earned a large number of pledges from young drivers according to stakeholder interviews.

Outreach Centered on Businesses and Organizations

BUPD team members' pitches to organizations and businesses focused on the BUPD program alignment with the organizational goals, and they also used available data to underscore the extent of the problem. However, both teams expressed that even with common goals, the outreach and engagement process was time-consuming.

Engaging a Partner Takes Many Points of Contact

Both teams acknowledged it was difficult to involve businesses and organizations. It took many contacts and frequently required team members to leverage existing networks, groups, and meetings to receive a response. In some cases, implementation team members had people with existing contacts at businesses facilitate in-person introductions to decision-makers.

Following Up After Commitment of Support

Even after a commitment to support BUPD, team members had to follow-up several times on promises from new or existing partners. Several times, business partners promised to share BUPD employees but did not do so. For instance, an exciting outreach opportunity with a pizza company to share the BUPD message through a flyer on pizza boxes took contacts before approval was reached to move forward, and then planning logistics (e.g., when they could be included, what size, etc.) delayed dissemination.

Finding the Right Person

Even when BUPD teams successfully connected with an interested business or organization, it was challenging to identify the "right" marketing or program person.

Building Steam

Once BUPD gained recognition in the communities, teams reported that organizations and businesses began to reach out to them with promotional ideas.

Ways Businesses Engaged to Support BUPD

Even though there was a limited involvement by businesses and organizations outside of the implementation teams, both teams felt they benefited significantly from the level of engagement they did receive.

Types of Involvement

There are many roles businesses and organizations played in supporting BUPD in Jackson and Sioux Falls, such as:

- adopting a BUPD policy for employees and asking them to take the BUPD pledge;
- challenging employees to take the BUPD pledge or challenging other similar organizations to accept the BUPD Challenge (i.e., require seat belt use in all company vehicles and prohibit employees' handheld use of cellphones and other electronic devices);
- sharing BUPD messages through outreach networks (e.g., social media, website, and store signs);
- making a space for BUPD promotional material and giveaways at counters;
- helping make connections with other businesses to engage them in BUPD; and
- donating giveaways to be used to incentivize pledges.

In addition, the teams highly valued businesses and organizations sharing BUPD messages efficiently through existing modes of communication.

Increased Capacity to Spread BUPD Message Through Social Media

Both teams struggled with building a social media audience for their implementations of BUPD from the ground up. They felt tweets from businesses and organizations such as the Mississippi Department of Transportation and other businesses were important as they had a wider network of contacts. Stakeholders also reported they could have benefitted from more social media savvy and felt this could have been an important area of expertise certain businesses and other organizations could offer to support BUPD.

Using Roadway Signage to Share BUPD Message

Both teams focused on broader ways to spread the BUPD message. State DOTs were important partners in posting the BUPD message on variable-message signs. BUPD teams also paid for or sought donations for the BUPD message to be posted on highway billboards in key traffic corridors in their jurisdictions.

BUPD Media and Outreach

Media outreach is an important component of BUPD as it is critical in raising awareness of the initiative and driving pledges. The core research questions explored in this section include:

- How did participants, organizations and companies engage with BUPD via media and social media?
- To what degree did users engage with the material posted on social media?
- How did BUPD outreach and engagement change over time?

Methods of Engagement with BUPD Via Traditional Media and Social Media

Implementation teams tried a number of traditional media and social media mechanisms to engage participants, organizations, and companies.

Websites

Both implementation teams created websites designed to encourage pledges and serve as a source of information. The Jackson BUPD program launched on October 20, 2022. Over the span of the six-month implementation period, its website received approximately 1,500 visits (not necessarily from unique visitors). The Sioux Falls BUPD program launched on October 3rd, 2022. Its website also experienced approximately 1,500 visits over the implementation period.

The implementation teams envisioned the websites as the main way to collect data on the number of individual pledges. Website pledges were not linked directly to social media and so did not always translate to shares and likes on social media, where numbers of posts were much lower. After a person made a BUPD pledge on the website, it asked them to spread the word on X/Twitter or Facebook.

Social Media

Both demonstration cities used the social media sites Facebook and Instagram. There was minimal social media engagement in either demonstration city. Specific numbers are discussed in the section titled "Extent of Social Media Engagement" below.

News Media

Both demonstration cities struggled to gain earned media from local news stations early in the implementations. The Jackson implementation team sent out press releases announcing their kickoff event and the launch of the BUPD initiative, and followed up with media outlets afterward, but news outlets never picked up the story. The Sioux Falls BUPD program started to receive press coverage in January when the implementation team leader was interviewed for news stories related to State policy changes and distracted driving (Pfankuch, 2022) and also received coverage for their kickoff event ("Buckle Up Phones Down Sioux Falls," 2023).

Video Public Service Announcements

Both demonstration cities developed city-specific PSA videos that were released on YouTube and posted on their websites. Jackson's video started with an introduction from the Executive Director of the State's Medical Association, who made the BUPD thumbs-up/thumbs-down hand gesture and passed a BUPD branded football to other residents of Mississippi, symbolizing passing on the challenge to other people to take the pledge. Sioux Falls' video focused on the local community with a narrator talking about shared values and beliefs before turning to the importance of not using a cellphone while driving and wearing a seat belt. Both videos have view counts on YouTube in the low hundreds, 116 for Sioux Falls and 122 for Jackson as of November 2024.

The Jackson implementation team used their video in conjunction with other outreach efforts as well. For example, a local cellphone service provider shared the video and other BUPD program information with its employees. In addition, a local tire manufacturer, one of the largest employers in the area, ran a shortened version of the video in their break room. The Sioux Falls implementation team contracted with a media group to broadcast the video thousands of times on

local channels and a shortened version at sporting events. These airings were potentially the most widespread exposure the Sioux Falls community had to the program.

Variable-Messaging Signs

The implementation teams partnered with the State DOTs to have the *Buckle Up Phone Down* message shown on overhead variable-message signs throughout the demonstration cities. Jackson ran the signs starting in February of 2023 until the end of the implementation in March. Sioux Falls displayed BUPD messaging on both stationary and portable variable-message signs from mid-March to the end of March 2023.

Extent of Social Media Engagement

The two primary social media platforms that the implementation teams used were Facebook and Instagram.

Facebook

The content of posts on Facebook fell into two categories: BUPD-branded messaging or infographics, and photos of outreach events around the demonstration cities. The branded content contained professional photos of people engaging in safe driving behaviors in cars or statistics related to the safety impacts of the targeted behaviors. Photos of outreach events were mostly of the booth set ups at the events or of event attendees making the BUPD thumbs-up/thumbs-down hand gesture. While the two teams' content was similar, Jackson tended to feature more outreach events, and Sioux Falls focused on the branded content.

The teams averaged five and seven posts a month for Jackson and Sioux Falls, respectively. Posts rarely gained more than one or two likes and had very few comments. This indicates that there were few people viewing the content, which is further reflected by the low number of page likes and follows on the two teams' BUPD Facebook pages, with Jackson having 12 likes and 25 follows and Sioux Falls having 27 likes and 35 follows.¹

Instagram

The content strategy for Instagram differed from the Facebook strategy and between the two cities. Sioux Falls posted mostly infographics and branding materials while Jackson's account contained mostly infographics along with photos of sports mascots and local prominent community members such as the Public Safety Commissioner and the Executive Director of the State Medical Association doing the BUPD thumbs-up/thumbs-down hand gesture.

Like Facebook, engagement was low for the two cities' Instagram accounts. Jackson's account had 25 followers and Sioux Falls' account had 39. Jackson's posts accrued between two and 14 likes, and Sioux Falls' posts had almost no likes.

Hashtags

Each implementation team developed their own hashtags, #bupdjax and #sfbupd, that they added in the descriptions of their posts. Other posters could use these hashtags to link their posts to those made by the implementation organizations. Some of the highest engagement posts about the implementations came from other more established pages using the hashtags. For example, a

¹ The difference between a "like" and a "follow" on Facebook is that a like shows the user supports the page and a follow means that the user will receive notifications from the page and get updates in their feed. Those who follow a page would have more opportunities to engage with published content.

post on Instagram by a school district working with the Jackson team gained 229 likes, and in Sioux Falls, a post on Facebook by the State Highway Patrol gained 111 likes. These posts suggest hashtags are a potential way to associate with other organizations and expand reach.

Change in Approach Over Time

Both teams initially envisioned using their websites and social media to drive individual pledges; however, this was not the case. The website and social media platforms instead became a place for people to post a photo of themselves making a pledge at in-person pledge activities. Jackson stakeholders felt that young people enjoyed being able to post a photo of themselves, and this opportunity by itself was often an incentive to encourage them to take the BUPD pledge.

Working with schools to host challenges and pledge events was always a priority for both Jackson and Sioux Falls. As BUPD teams realized they needed more in-person events to reach people, they looked for event opportunities to expand their reach. Table 4 outlines the types of pledge events held by each team and the potential reach of those events. The “dissemination reach” indicates the number of people who were able to access information about BUPD, not the number of people who took the BUPD pledge.

Table 4. Pledge events’ reach and resource distribution

Type of event	Jackson		Sioux Falls	
	Dissemination reach (size of potential audience)	Promotional materials distributed*	Dissemination reach (size of potential audience)	Promotional materials distributed
Sporting events	1,500+	Footballs, paddle hands	2,700+	9 window clings, 2 posters, 69 tear-off sheets, 293 keychains, 400 pens
School events	458	Paddle hands, wristbands, stickers	15,950	6,435 window clings, 3 posters, 201 tear-off sheets, 150 yard signs, 10 banners, 1,451 keychains, 6,300 pens
Community events	622	Paddle hands, stickers, window clings, info sheets, banners, QR code cards (linked to website)	1,019	417 window clings, 10 posters, 411 tear-off sheets, 6 yard signs, 180 keychains

Type of event	Jackson		Sioux Falls	
	Dissemination reach (size of potential audience)	Promotional materials distributed*	Dissemination reach (size of potential audience)	Promotional materials distributed
Employer events	80	Paddle hands, stickers, window clings, banners, QR code cards	320	100 window clings, 1 poster, 56 tear-off sheets, 104 keychains

* There are no counts for promotional materials distributed by the Jackson team as these data were not reported by the implementation team.

Change in Outreach and Engagement Over Time

Both implementation teams’ websites garnered less attention and individual BUPD pledges than originally anticipated. However, both sites saw a similar spike in activity in late March/early April, likely as a result of increased outreach activities at local high schools. Table 5 shows the number of online pledges for Jackson and Sioux Falls.

Table 5. Number of online pledges received

Month	Jackson	Sioux Falls
October	45	83 (data combined for October and November)
November	48	
December	0	0
January	14	28
February	176	21
March	115	10*
Total	398	142

* During this time there were an additional 520 student pledges from BUPD events at area high schools. They are not included in this table because the pledges were not made on the website.

Factors of Success

To understand how to plan and implement a successful program, the BUPD team members interviewed were asked about key factors they felt played a role in the program’s success. Key stakeholder interviews explored the following research questions.

- What were critical factors of success?
- What key elements had to be in place for BUPD to be implemented?

- What resources were needed?
- What roles did champions and other committee members play in the success of BUPD?

Critical Factors for Success

Interviewed stakeholders from the BUPD grantees identified the following critical factors for success that others could consider.

- **Plan sufficient time to build the team needed.** It takes planning to bring the right people on board to build an effective BUPD team. Once they are on board, the work starts slowly as team members get to know each other, learn about the BUPD program, and figure out how they can contribute to supporting the program’s implementation. It takes time for the team to learn to work together effectively. Both BUPD planning teams began their work in early August for a planned BUPD program launch on October 21, and everyone interviewed felt more planning time was needed.
- **Identify a leader.** The BUPD team needs someone who has a strong vision of the program should be in the community, available to host regular meetings, send meeting summaries out to remind team members of action items and other commitments, and keep everyone informed of plans underway.
- **Build a network of partners.** BUPD involves a lot of outreach work. To spread the BUPD message widely, it is helpful to engage people from different arenas with varied connections to expand the program’s reach. Think about how to involve organizations and businesses with common goals or overlapping interests.
- **Continue to follow-up with potential contacts.** Most businesses, organizations, and schools that are active members of the BUPD programs had to be contacted more than once, in some cases several times, either to engage them as a partner or to follow-up on plans.
- **Know the community.** There needs to be a well-connected stakeholder on the BUPD team who is integrated into the fabric of the community and understands the dynamics among influencers, organizations, and other potential partners.
- **Know the audience.** There are many different possible audiences that span different demographic groups (high schoolers, older drivers, parents, etc.). Try to find common ground among groups and be prepared to tailor the BUPD message to be relevant for each of these groups. For instance, the Jackson BUPD team found that a football with the BUPD message was popular across a number of audiences.

Key Elements for BUPD Implementation

Much of the feedback from stakeholders on essential elements for BUPD implementation focused on how to reach community members to share the BUPD message. Some elements stakeholders interviewed emphasized as being particularly important:

- **Make a buzz.** Figure out how to draw people’s attention to and get the BUPD program in front of people.
- **Employ digital marketing.** Much of the BUPD program relies on the website, social media, and reaching people through other than face-to-face contact. Stakeholders

believed strong visual imagery and messages, either through an initiative video or social media, helped draw in more participants.

- **Acknowledge pledge takers.** Both BUPD teams had ways of recognizing people who made the BUPD pledge. For instance, in addition to pictures on their website, the Jackson BUPD has a scrolling list of names on the top of their website. Stakeholders reported that young people enjoyed seeing their faces on the website or on the Facebook page.
- **Have media savvy.** The BUPD teams recognized the importance of having people on the implementation team with different kinds of media experience—connections with the print and news media, as well as fluency and comfort using social media to reach broad audiences.
- **Host a kickoff event.** Both teams recognized the kickoff event as being a pivotal moment in which they were able to engage partners in a more meaningful way than they had before, build excitement about BUPD among local organizations and businesses, and guide implementation activities in the initial implementation phase.

Resources Needed

Both demonstration cities were given funding to implement BUPD with some spending requirements, but otherwise the implementation team leaders had significant leeway in how they expended funds. While some of the resources outlined below are not tied to funding, all were identified as potential needs or ways to make it easier for future localities considering launching BUPD.

- **Allocate staff.** Team members agreed that BUPD implementation is a big endeavor requiring dedicated staff time. It cannot easily be led as a side project given the level of effort required. The program should be staffed adequately from the start, and, at least for the first several months, task leads felt BUPD required a full-time position.
- **Media resources.** Media savvy and access to media resources are critical, niche skillsets. BUPD teams recognized the importance of having someone with these skills in place to effectively launch BUPD. A representative from a business with a broad media presence could be an important partner.
- **Giveaways.** Team members did not agree on whether giveaways were important. Some felt strongly that it was important to have giveaways to draw people in and offer to partners who were interested in joining the effort. At sports games, for instance, it was useful to have giveaways on tables to entice spectators to stop and learn more about BUPD. If a partner was already planning to be at an event, providing BUPD giveaways was an easy way to have them support BUPD outreach. Other members felt there was too large of a focus on giveaways rather than other methods of outreach that might be able to reach a broader audience.
- **BUPD Templates.** Teams felt that the less they had to create, the better. Possible useful templates include social media messages, elevator speeches, and outreach flyers.
- **Local data.** Data are imperfect and minimal at the local level, but both BUPD teams tried to use local data to describe the impact of seat belt and cellphone use on crashes to help show the importance of the BUPD message.

Roles of Implementation Team Leaders and Other BUPD Team Members

Stakeholders felt that the primary role of the implementation team leader was to have a vision for how to implement BUPD, bring stakeholders together, and support the team in collectively identifying and taking concrete steps towards implementation. The leader convened meetings, outlined action steps, and helped make connections in the community to move BUPD implementation forward. Stakeholders recognized another important role BUPD team members play is making and expanding connections to community leaders, businesses, organizations, and schools in the community to either support the BUPD program or engage others in making BUPD pledges. Lastly, interviewed stakeholders stated at least one BUPD team member should have traditional and social media expertise to build the BUPD brand and identify opportunities for earned media.

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Outcome Evaluation

The outcome evaluation assessed whether the implementations of BUPD in Jackson and Sioux Falls increased vehicle occupant seat belt use and decreased cellphone use by drivers. This evaluation included a pre- and post-initiative observational survey of seat belt and cellphone use using a matched site sample design.

Outcome Evaluation Methods

Baseline data were collected in September 2022, prior to any program activity. Post-program data were collected in March 2023, five months into program implementation. During each survey period in each city, 5,000 drivers were observed at 45 locations, including 40 intersections and 5 freeway exit ramps, referred to as observation sites. A quota of 100 vehicles was observed at each of the 40 intersections and 200 at each freeway ramp. The survey was not time-based, and observers completed data collection at each site for the length of time it took to obtain the 100-driver sample. The size of the sample was hypothesized to be sufficient to detect differences between implementation and control cities following the BUPD implementation, based on hypothesized base proportions, difference in proportions, and appropriate statistical power to reject the hypothesis of equal proportions. The data collection procedures, sites, sampling, and survey personnel were consistent for both survey waves.

Site Selection

Sioux Falls and Jackson were selected based on State laws, seat belt use rates, local ordinances, media markets, and characteristics compatible with the Missouri experience in terms of selected city size and capacity to fully implement a compressed program. The research team applied similar criteria to select matched control cities. The most desirable matches would have been cities of similar size in the same State, albeit in different media markets. Because there were none that met these criteria, consideration was extended to locations in the same region of the country with similar laws and seat belt use rates. States or cities with active BUPD programs or known plans to launch BUPD were excluded from consideration, as were locations with other traffic safety programs that targeted the same behaviors.

Other criteria prioritized matching the following characteristics.

- State laws
 - enforcement of seat belt requirement (primary/secondary)
 - handheld device use prohibition
 - enforcement of handheld device use prohibition (primary/secondary)
- demographics
 - median income
 - percent of population in various race groups
 - presence of university/colleges

- anticipated initial use rates
 - city-level seat belt use rates when available; State rates used as a proxy for city rates when unavailable
 - low cellphone use was considered a selection factor but not available for most cities

Sioux Falls Control City

As seen in Table 6, Fargo hit the most points of comparability with Sioux Falls regarding State laws, size, and demographics. Using the Statewide seat belt use rate for comparison, South Dakota was 86.9% in 2021, and North Dakota was lower at 81.9%. Given that South Dakota is a secondary law enforcement State with a low belt use rate, the decision was to select a State in the region with a similar and consistently low belt use rate for the comparison city. Fargo was deemed to be the best control city for Sioux Falls.

Jackson Control City

Close matches on State laws with similar demographics at the city level were not found for Jackson. Demographics and belt use rates were prioritized as matching criteria (see Table 6). Beaumont was selected as the control city for a matched comparison with Jackson. Although the Texas statewide seat belt use rate in 2021 was 89.8% (Womack, 2021), surveys conducted in Beaumont annually have shown usage lower than the State average, and in 2021 was measured at 82.8%, which compares closely to the Mississippi 2021 State rate of 80% (Mississippi Office of Highway Safety, 2021). Jackson’s county use rate (Hinds County) was 74.7% in 2020 and 69.9% in 2021 (Mississippi Office of Highway Safety, 2022), and Beaumont provided the closest match on this and other demographic criteria.

Table 6. Seat belt, cellphone, demographic, and traffic characteristics of sites

Criterion	Sioux Falls	Fargo	Jackson	Beaumont
Seat belt use rate in 2021 (NCSA, 2022; Womack, 2021)	State rate – 86.9%	State rate – 81.9%	State rate – 80.0%	City Rate – 82.8%
Cellphone use rate (Womack & Johnson, 2021)	N/A	N/A	N/A	8.4% ^d
City population in 2020 (U.S. Census Bureau, 2022)	192,700	125,952	153,705	115,268
County population in 2020 (U.S. Census Bureau, 2022)	197,214	184,525	227,742	256,526
Universities	Yes	Yes	Yes	Yes
% White/% Black (U.S. Census Bureau, 2022)	82.3/6.8	82.5/8.0	15.0/82.8	39.0/46.0

Criterion	Sioux Falls	Fargo	Jackson	Beaumont
Median household income (U.S. Census Bureau, 2022)	\$66,761	\$60,243	\$39,969	\$49,765
Median age (U.S. Census Bureau, 2019)	34.4	31.0	33.0	33.9
Mean commute time to work (U.S. Census Bureau, 2022)	16.8 mins.	15.7 mins.	20.6 mins.	19.5 mins.

The boundaries for observation site selection were based on city limit boundaries, which were determined by using basemap shapefiles and ArcGIS software. Sioux Falls and Beaumont were bounded by city limits. The Fargo area included Fargo and West Fargo. The Jackson area included Jackson and the communities of Clinton, Pearl, Richland, Flowood, and Ridgeland.

To select intersections for data collection, each city defined with boundaries as described was roughly quartered, generally with delineations by freeways in East-West and North-South directions. Ten observation sites in each quadrant were selected at high-volume intersections on primarily arterial roads. Due to sparseness of intersections in some quadrants, the dividing lines were moved or followed a straight line instead of the freeway, as needed. High volume was defined as at least 4,000 vehicles of annual average daily traffic (AADT, sourced from Sioux Falls Traffic Count Locations, MoDOT MARIS, Texas TxDOT Roadway Inventory, and ADT from North Dakota NDDOT Traffic Counts). Additionally, 5 freeway single exit ramp observation sites spread throughout the area were selected, giving a total of 45 observations sites per city.

Figure 7 shows the intersection observation sites for each city and illustrates the broad coverage of the survey sites. Attempts were made at the intersection level to match observation sites between implementation and control cities. Intersections were matched for data collection on the same day of the week and same time of day as often as possible and paired with proximity to the following.

- a large high school in each city,
- a major hospital,
- a university area,
- a large elementary school,
- three major shopping centers for Saturday observation sites,
- areas of several restaurants or fast-food locations for noon observation sites (in some cases matching the same chain restaurant),
- central business district observation sites during peak hours,
- at least one industrial area,
- high-volume residential arterials,

- big box and home improvement stores,
- large recreational or family entertainment centers, and
- the 5 freeway locations at comparable days and times.

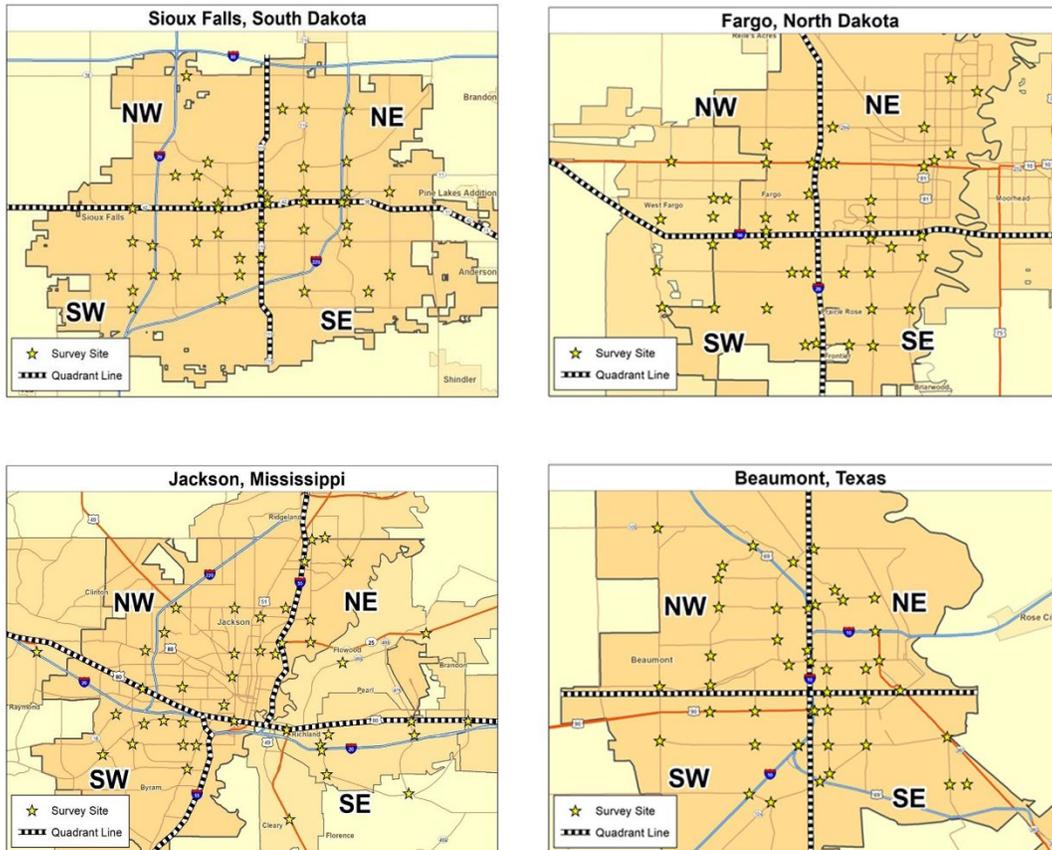


Figure 7. Quadrant delineations and observation site locations in the four study cities. Maps of Sioux Falls, SD, Fargo, ND, Jackson, MS, and Beaumont, TX, are shown with observational data collection quadrants separated by dotted lines and observation site locations marked by yellow stars.

Data Collection

Prior to data collection at study observation sites, the survey team performed two days of training. All surveyors had previous experience with seat belt and cellphone use data collection. The training consisted of a thorough review of the survey protocol and a full day of practice. Each surveyor was instructed individually by the lead survey trainer until full confidence was reached. The team met for several rounds of paired comparisons to test for inter-rater reliability for seat belt and cellphone use. Scores for each pair were analyzed using odds ratio and Fisher’s exact test. The conclusion was no significant difference among the surveyors on 50 observations.

The surveys were conducted from September 12 to October 1, 2022 (i.e., prior to any program activity) and March 13 to April 1, 2023 (i.e., 5 months into program implementation). Local law

enforcement authorities were notified by the project supervisor of surveyor presence in their jurisdictions. The survey in each location took place over the course of 4 weekdays and 1 weekend day (Saturday) during daylight hours. During the 5-day survey period each surveyor collected data at 4 to 5 observation sites per day, with none repeated, according to a fixed schedule. Observations were scheduled with start times at 7:30 a.m., 9:30 a.m., 12 p.m., 2 p.m., and 5 p.m. The same schedule of days and times was used during the baseline and post-program periods.

Eligible vehicles included all passenger vehicles having a gross vehicle weight rating under 10,000 lb, which excluded larger truck types designed for cargo hauling (e.g., box trucks) rather than as passenger vehicles. A distinction was made between passenger cars and pickup trucks.

Observations were made for a quota of drivers at each observation site, recording “yes” or “no” for drivers using a cellphone and being restrained by a seat belt shoulder harness. Cellphone use included talking, texting, and reading/scrolling while holding the phone. Specifically, cellphone and seat belt use observations were defined in the following ways.

- Cellphone use for talking
 - The driver is holding a phone and is talking into or appears to be listening to the phone. The position of the phone in relation to the driver’s ear or mouth does not define use. In other words, the phone may be in front of their mouth or face, or to the side of their head. The qualifying determination will be if the driver is talking or listening to the device. (Note: hands-free device use was not counted.)
- Cellphone use for texting/reading
 - The driver is in the act of texting or using screen function on cellphones, including touching the screen for scrolling while holding a cellphone.
 - The driver has eyes on and is actively reading the screen of a cellphone they are holding.
- Seat belt use
 - A seat belted driver is one whose shoulder belt is in front of their shoulder and is fastened. (Note: mis-positioned shoulder harness use—for example, under the arm or not making contact with the shoulder or torso at any point—was considered non-use.)

In addition, observers noted perceived sex, perceived age (teen, 15-19; young adult, 20-29; adult, 30-64; and older driver, 65+ years) and perceived race/ethnicity for each driver. Perceived race/ethnicity was coded by observers as White/Black/Hispanic/Asian/Other but analyzed as White compared to either Black/Hispanic + Asian + Other or Black + Hispanic + Asian + Other to provide sufficient statistical power for intergroup comparisons. A distinction was made between passenger cars and pickups, with pickup defined as a vehicle with a passenger compartment and a separate cargo bed. The presence of both front and back seat passengers in the vehicle was also noted.

Observations were made from a standing position curbside for vehicles in the nearest lane at a traffic-controlled intersection. The first choice was to collect data from stopped vehicles; however, in some cases, observations were feasible when vehicles were moving slowly enough

such that both the hands and shoulder/chest area of the driver were discernible while making a right turn or passing through the intersection. Whether the vehicle was moving or stopped was not recorded. Observation sites, except those at freeways, were observed by a single observer. Freeway traffic was observed from exiting ramp traffic that stopped at the next intersection. In one case where ramp traffic merged with service road traffic prior to stopping, one observer was positioned at the exit point to identify exiting vehicles and communicate through an open phone call to the observer at the intersection for confirmation of exiting vehicles.

Outcome Evaluation Findings

The section outlines the findings from the outcome data collected.

Data Collected

Table 7 provides a breakdown of the number of observations for each of the variables at each study site and illustrates the similarity of the two samples not only in total driver counts, but also in driver demographics.

Table 7. Observed driver sample sizes, pre- and post-BUPD initiative

Driver description		Sioux Falls		Fargo		Jackson		Beaumont	
		Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
Sex	Male	2,756	2,873	2,737	2,801	2,484	2,345	2,545	2,613
	Female	2,244	2,127	2,263	2,199	2,516	2,655	2,455	2,487
Age	Teen	118	88	121	124	84	64	84	94
	Young Adult	648	542	862	617	911	983	775	840
	Adult	3,699	3,778	3,492	3,755	3,440	3,383	3,555	3,489
	Older Driver	535	592	525	504	565	570	586	577
Race/Ethnicity	White	4,248	4,213	4,510	4,462	1,866	1,842	2,335	2,505
	Black	324	330	260	271	2,946	2,972	1,904	1,863
	Other*	428	457	230	267	188	186	761	632
Vehicle	Car/SUV/Van	4,069	4,035	3,927	3,932	4,114	4,144	3,733	3,709
	Pickup	931	965	1,073	1,068	886	856	1,267	1,291

* Includes Hispanic/Asian/Other, observed/perceived by surveyors.

Observed Seat Belt and Cellphone Use

Figure 8 shows observed driver seat belt use for implementation and control cities before and after BUPD implementation. Figure 9 shows cellphone use similarly. Figures 10 through 25 show seat belt and cellphone use by observer perception of driver sex, age, race/ethnicity, and type of vehicle. Error bars denote +/- 1 standard error. Between-group statistical comparisons are presented in Section 4.3.

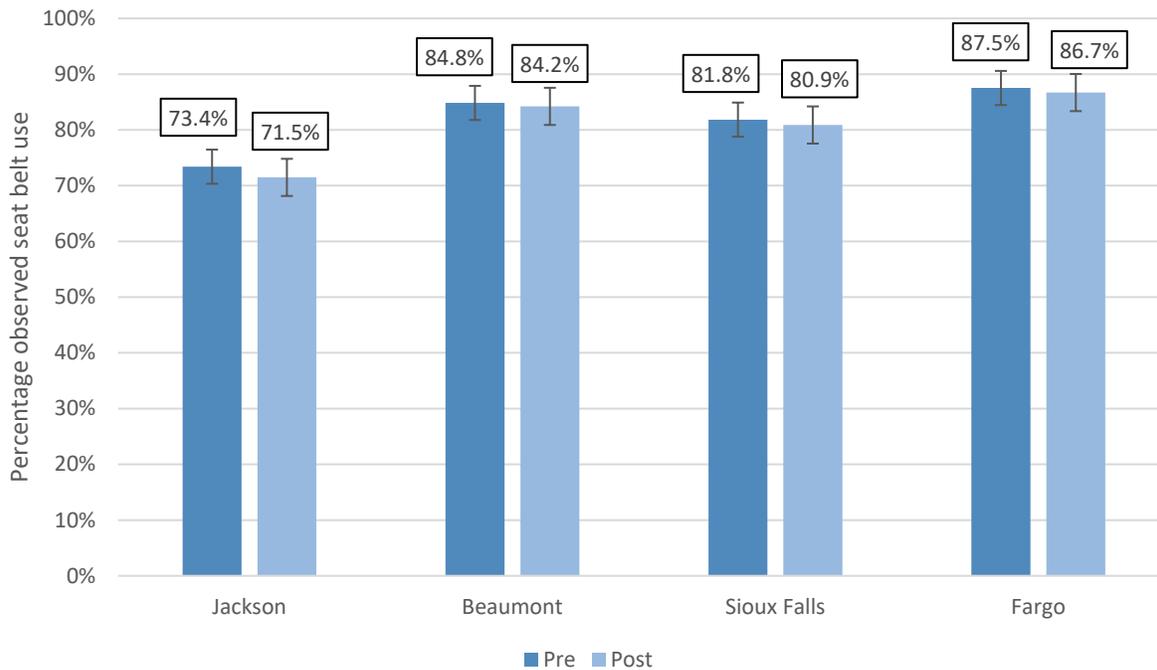


Figure 8. Pre- and post-BUPD initiative driver seat belt use
N = 5,000 per site

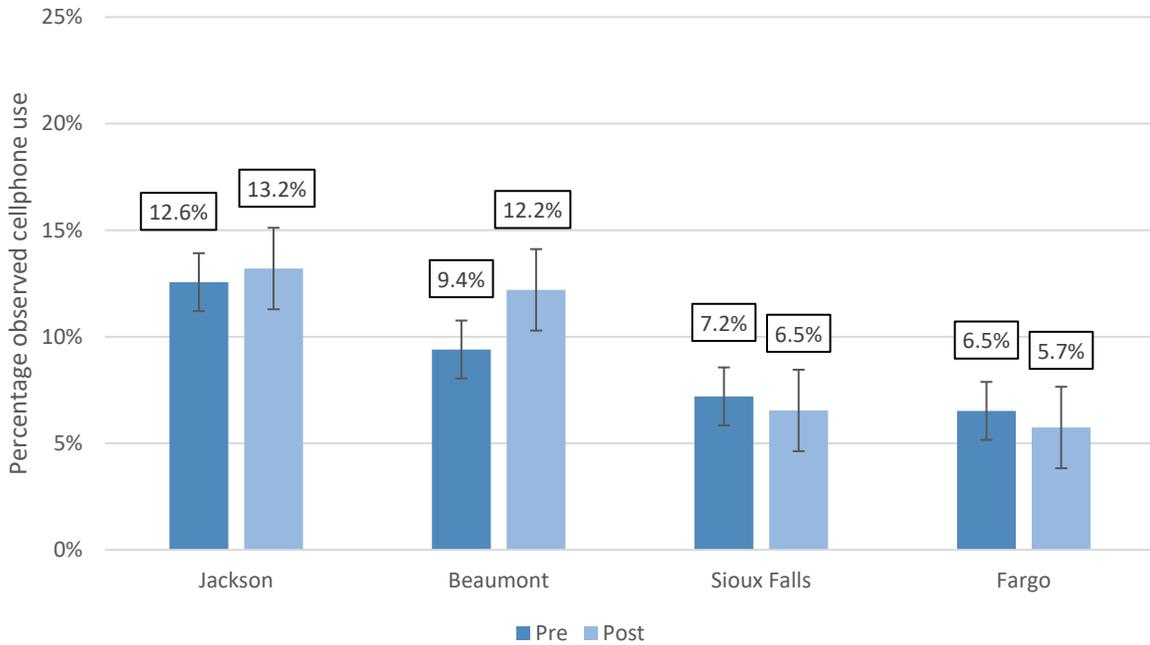


Figure 9. Pre- and post-BUPD initiative driver cellphone use
N = 5,000 per site

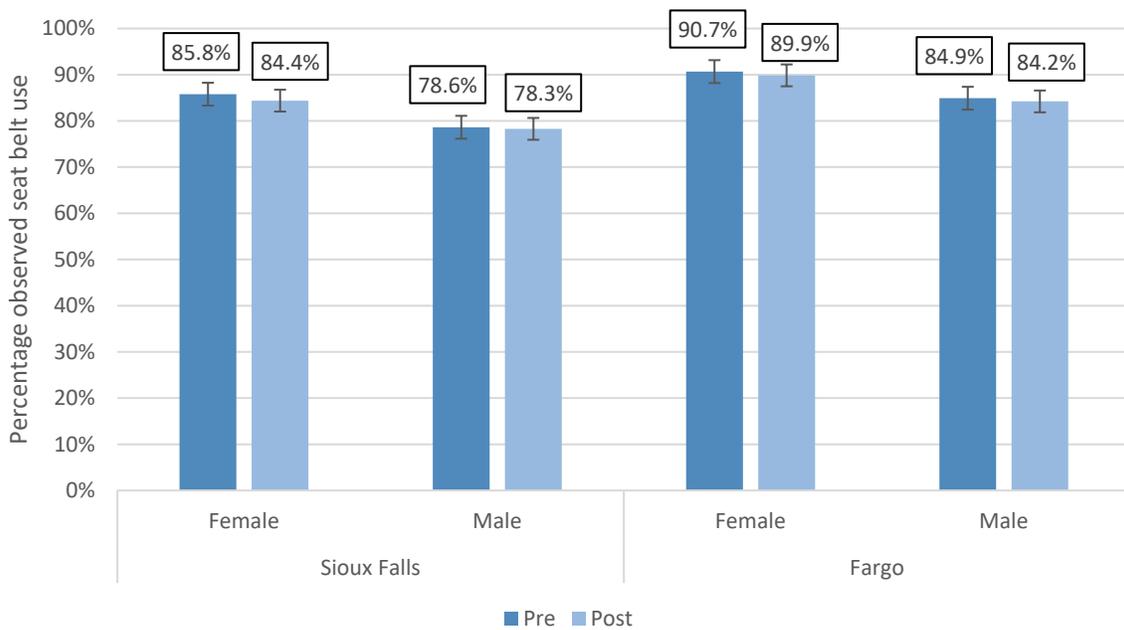


Figure 10. Pre- and post-BUPD initiative driver seat belt use by sex:
Sioux Falls and Fargo comparison
N = 5,000 per site

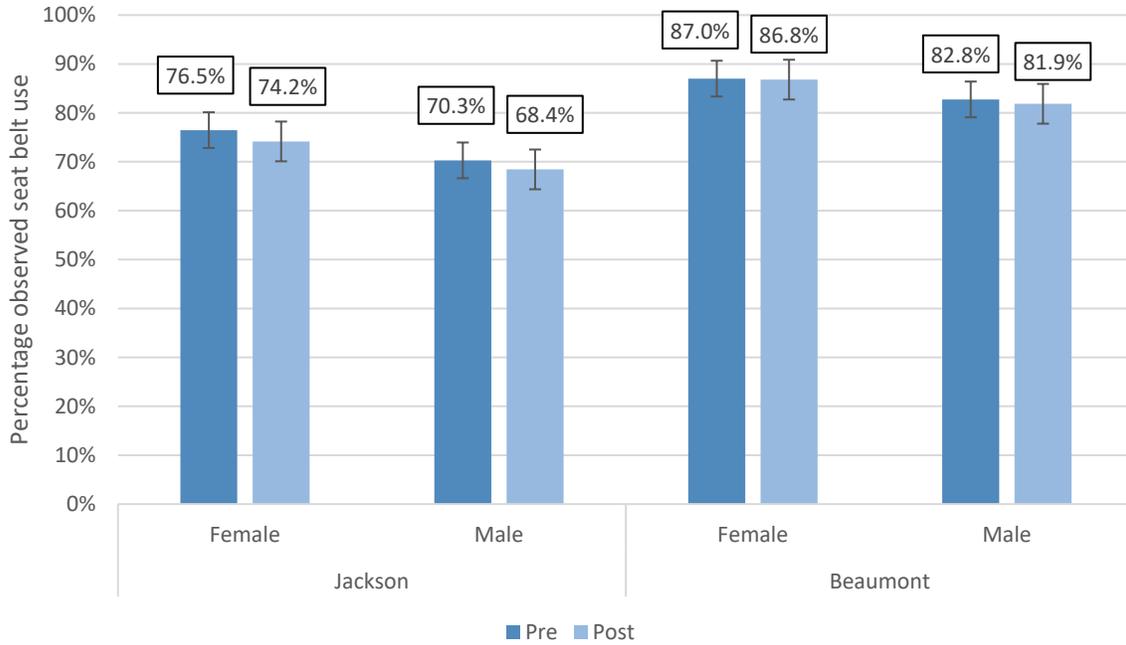


Figure 11. Pre- and post-BUPD initiative driver seat belt use by sex:
Jackson and Beaumont comparison
N = 5,000 per site

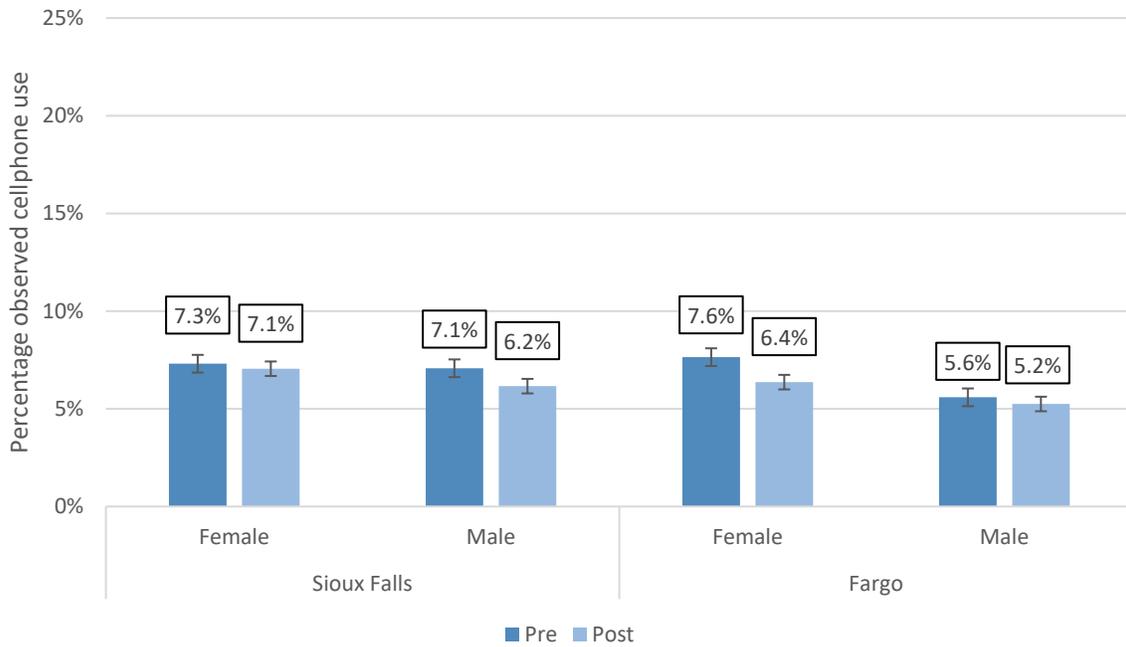


Figure 12. Pre- and post-BUPD initiative driver cellphone use by sex:
Sioux Falls and Fargo comparison
N = 5,000 per site

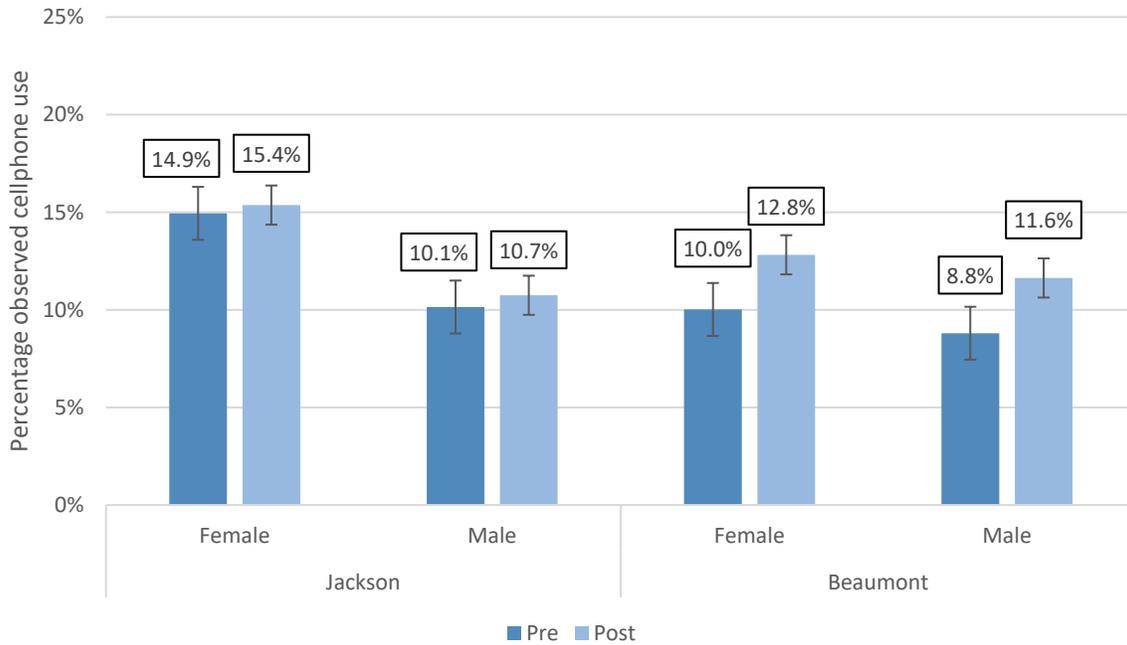


Figure 13. Pre- and post-BUPD initiative driver cellphone use by sex:
Jackson and Beaumont comparison
N = 5,000 per site

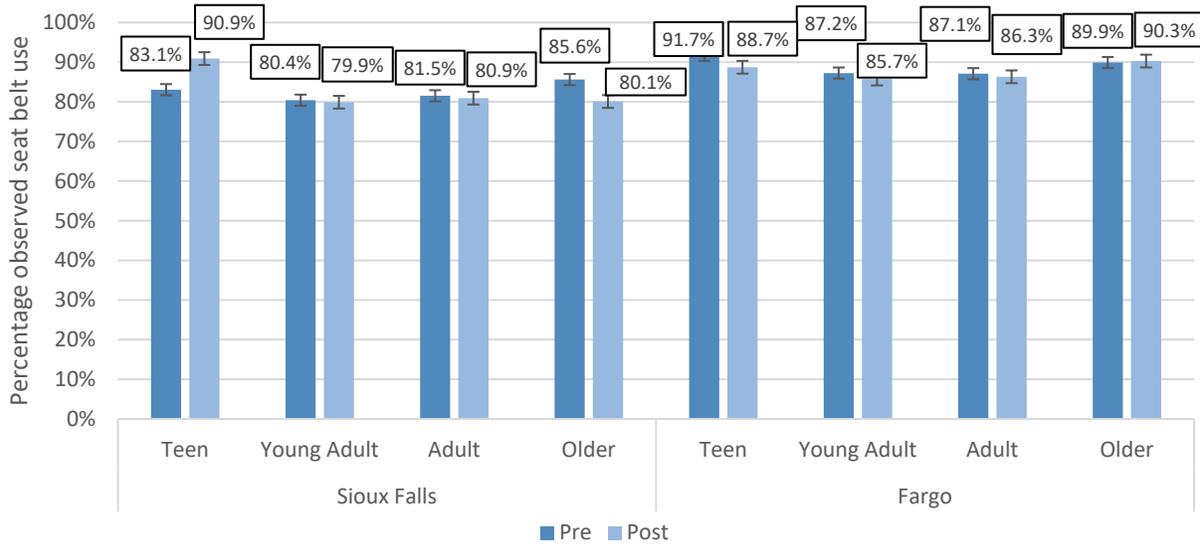


Figure 14. Pre- and post-BUPD initiative driver seat belt use by age:
Sioux Falls and Fargo comparison
N = 5,000 per site

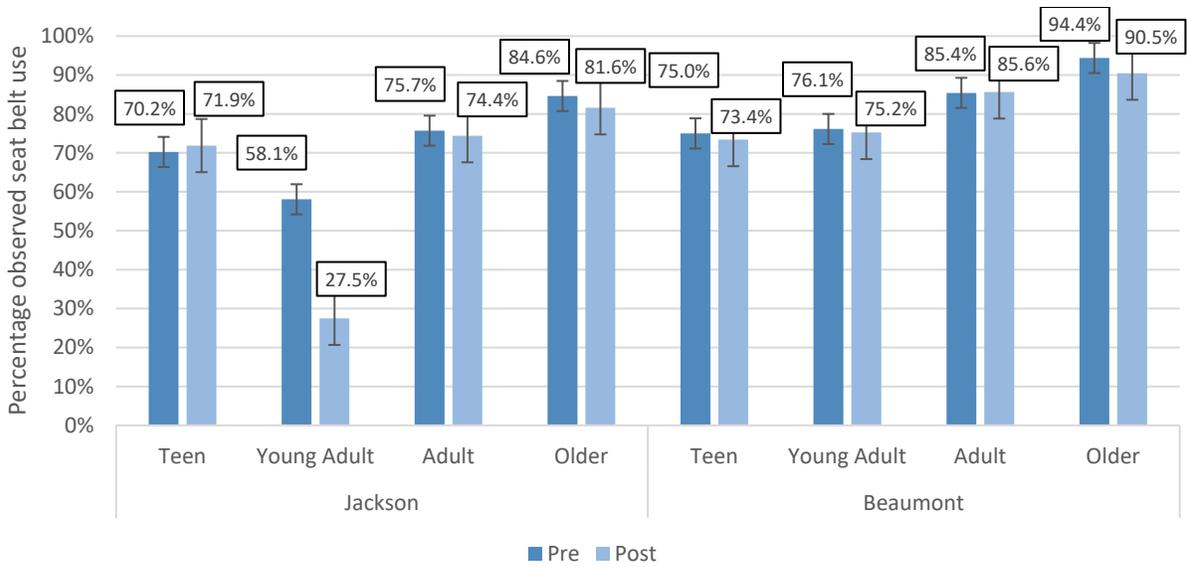


Figure 15. Pre- and post-BUPD initiative driver seat belt use by age:
Jackson and Beaumont comparison
N = 5,000 per site

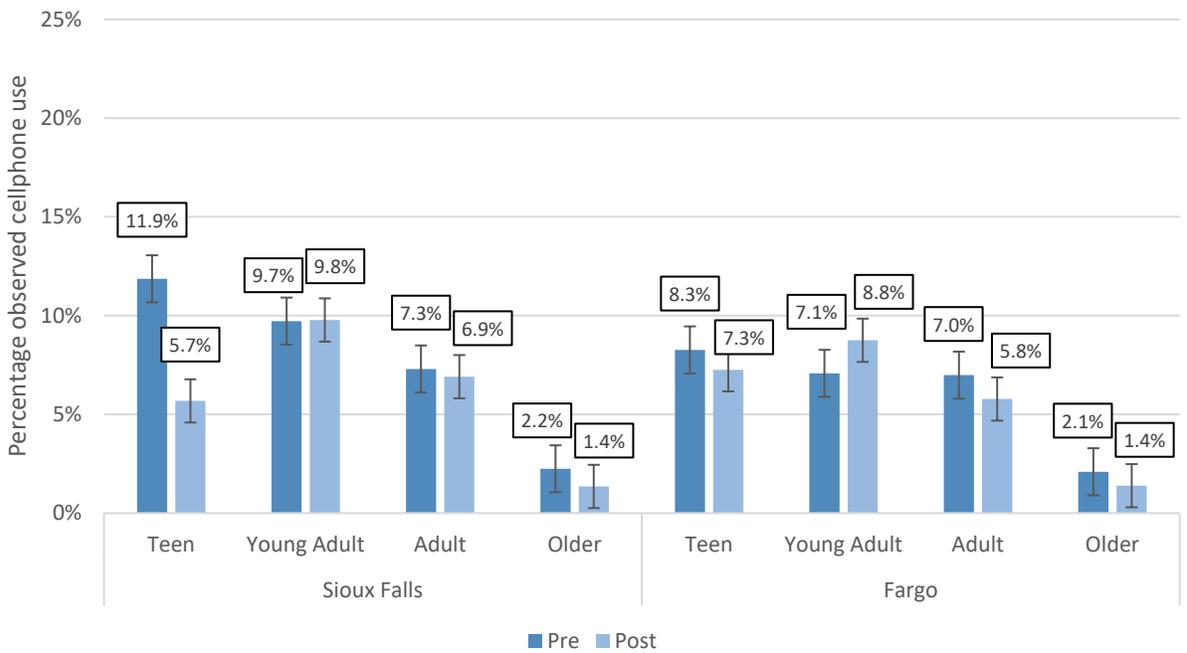


Figure 16. Pre- and post-BUPD initiative driver cellphone use by age:
Sioux Falls and Fargo comparison
N = 5,000 per site

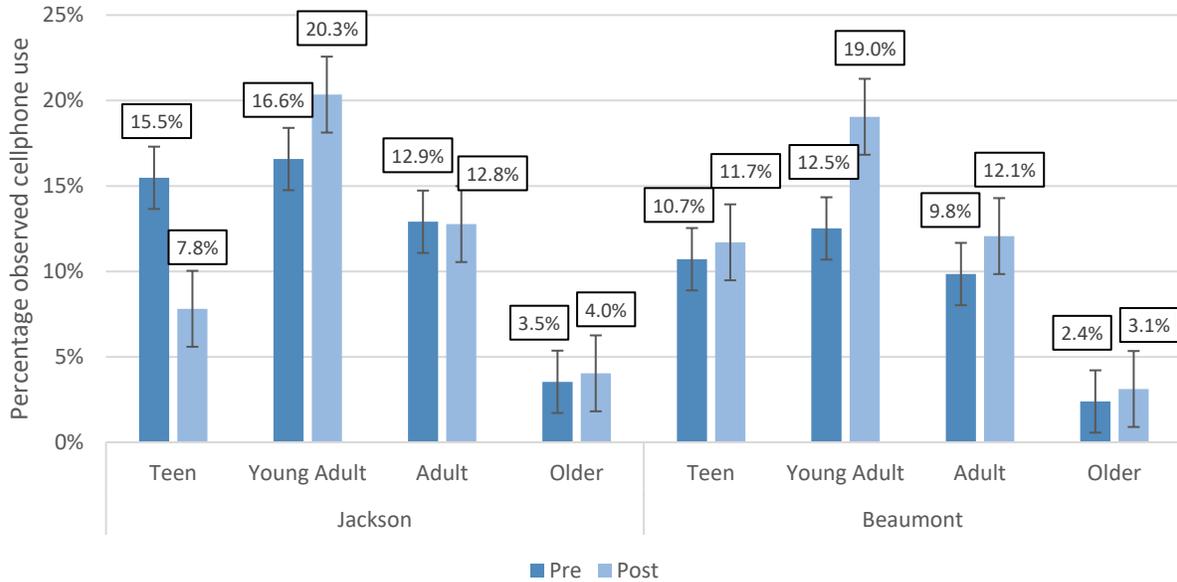


Figure 17. Pre- and post-BUPD initiative driver cellphone use by age:
Jackson and Beaumont comparison
N = 5,000 per site

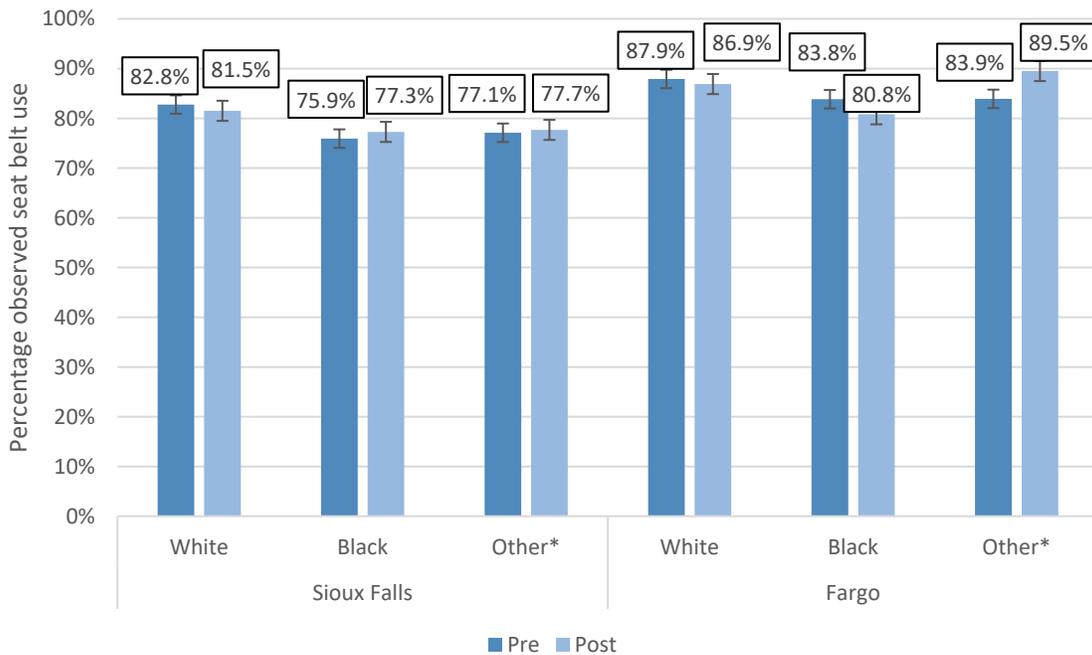


Figure 18. Pre- and post-BUPD initiative driver seat belt use by race/ethnicity:
Sioux Falls and Fargo comparison

* "Other" includes Hispanic/Asian/Other, observed/perceived by surveyors
N = 5,000 per site

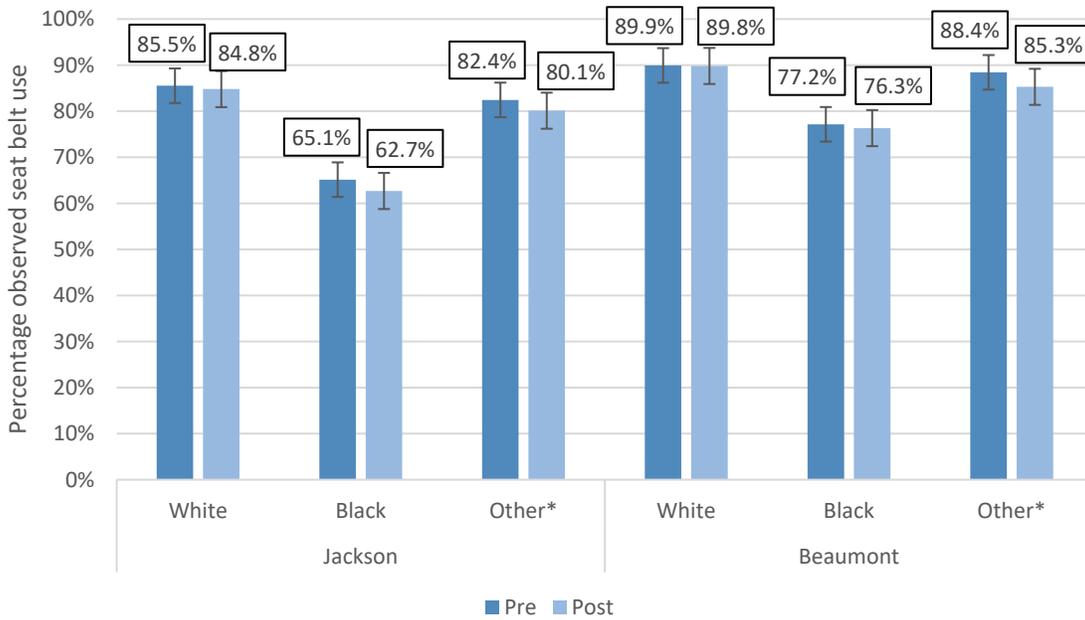


Figure 19. Pre- and post-BUPD initiative driver seat belt use by race/ethnicity: Jackson and Beaumont comparison
 * "Other" includes Hispanic/Asian/Other, observed/perceived by surveyors
 N = 5,000 per site

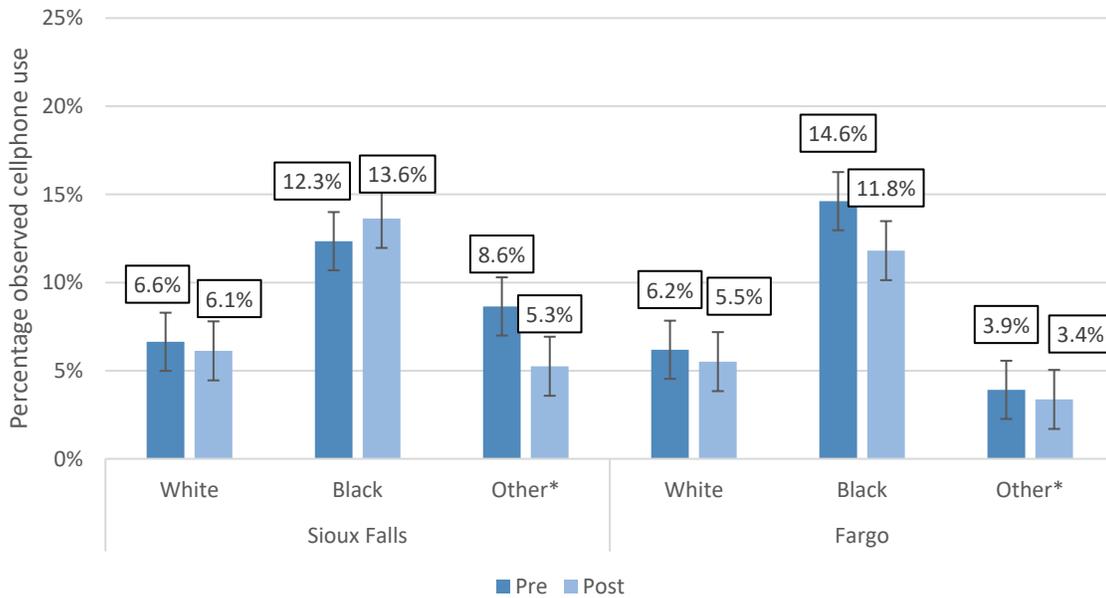


Figure 20. Pre- and post-BUPD initiative driver cellphone use by race/ethnicity: Sioux Falls and Fargo comparison
 * "Other" includes Hispanic/Asian/Other, observed/perceived by surveyors
 N = 5,000 per site

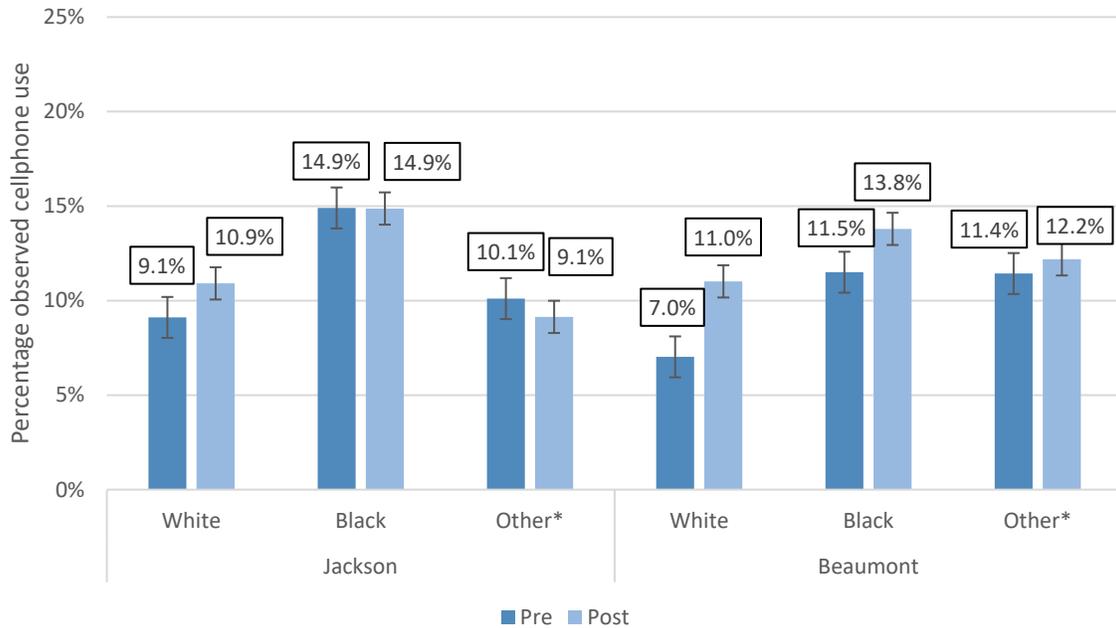


Figure 21. Pre- and post-BUPD initiative driver cellphone use by race/ethnicity:
 Jackson and Beaumont comparison
 “Other” includes Hispanic/Asian/Other, observed/perceived by surveyors
 N = 5,000 per site

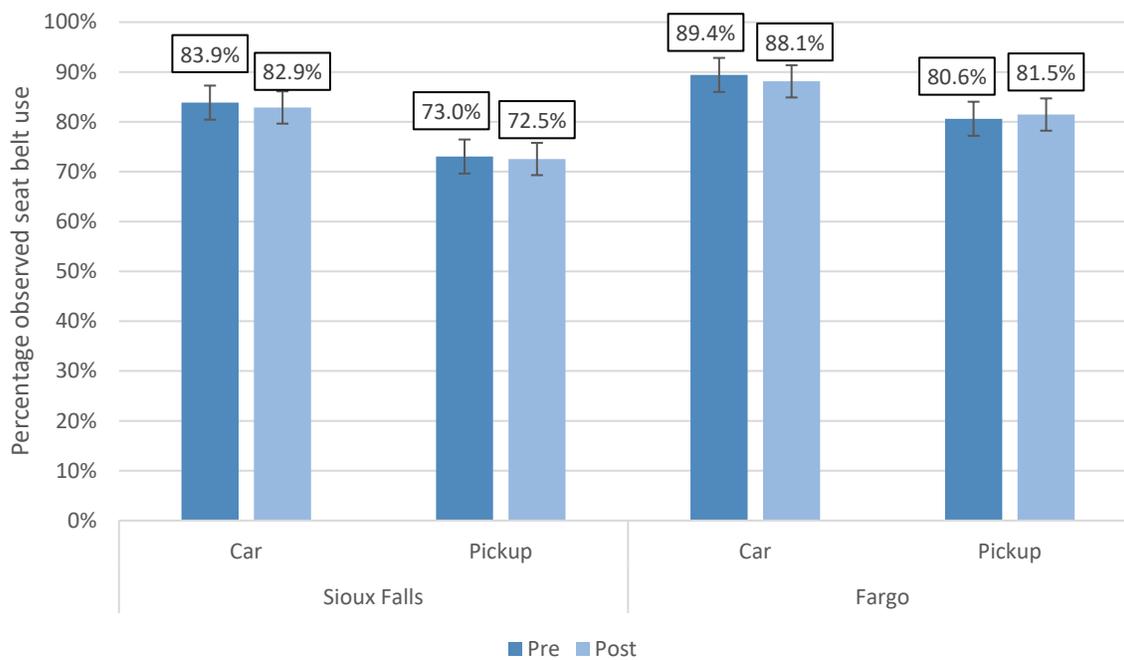


Figure 22. Pre- and post-BUPD initiative driver seat belt use by vehicle type:
 Sioux Falls and Fargo comparison
 N = 5,000 per site

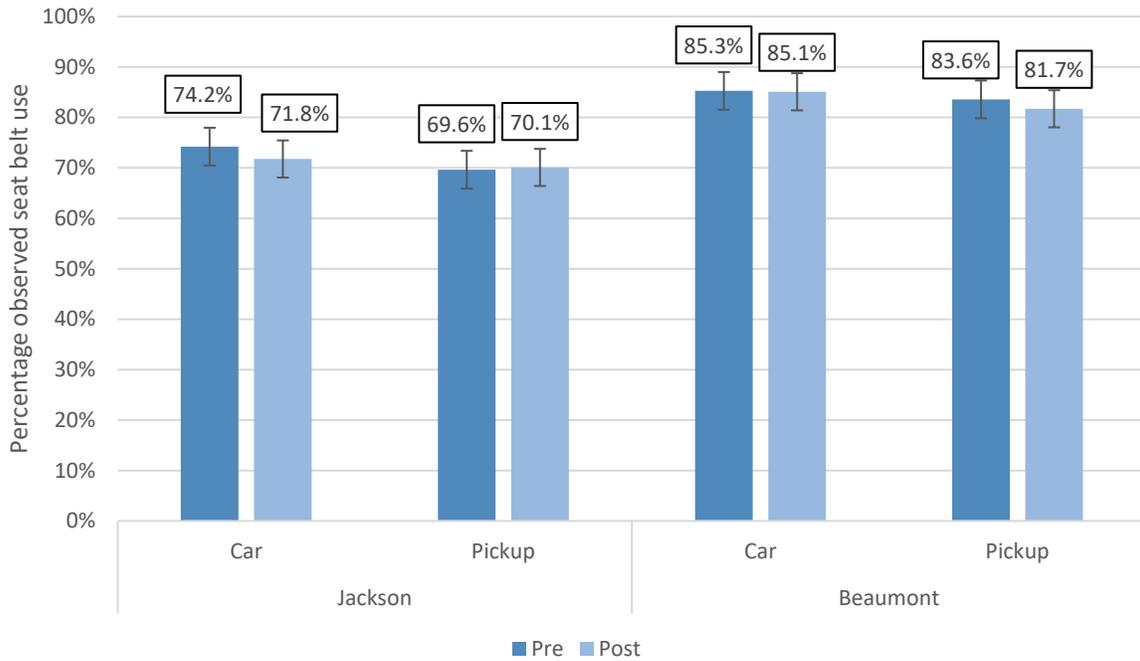


Figure 23. Pre- and post-BUPD initiative driver seat belt use by vehicle type:
Jackson and Beaumont comparison
N = 5,000 per site

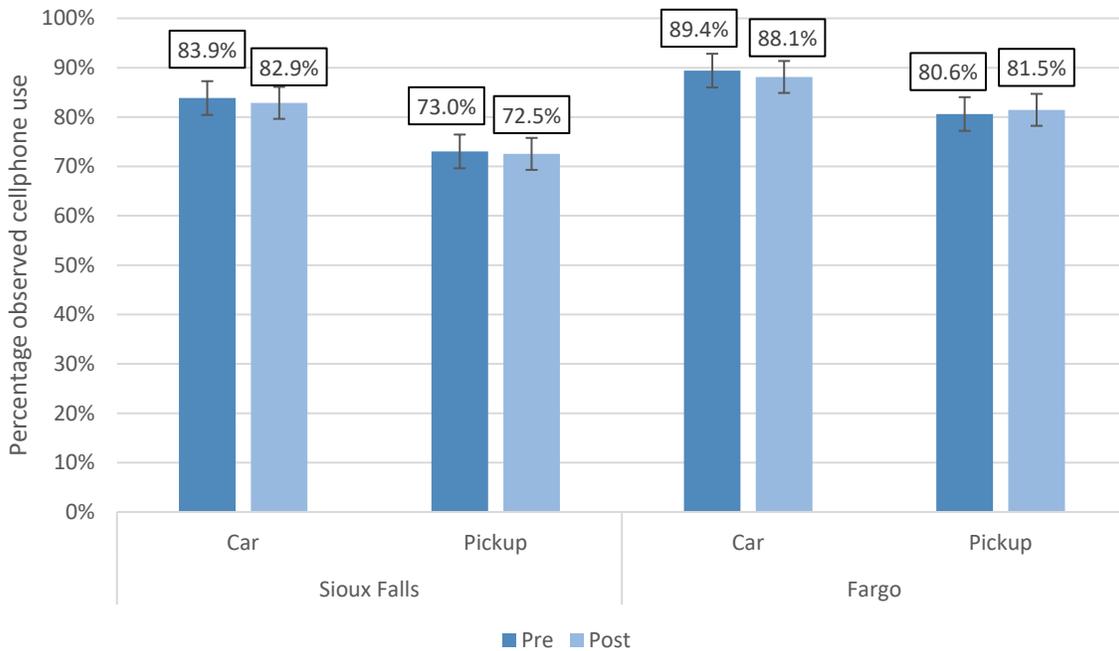


Figure 24. Pre- and post-BUPD initiative driver cellphone use by vehicle type:
Sioux Falls and Fargo comparison
N = 5,000 per site

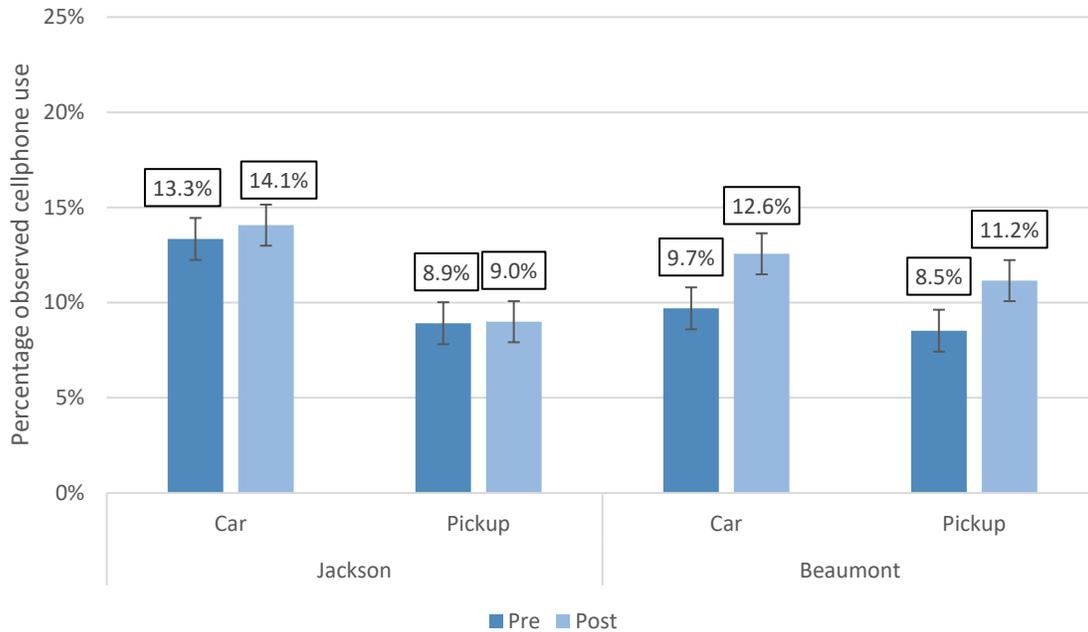


Figure 25. Pre- and post-BUPD initiative driver cellphone use by vehicle type:
 Jackson and Beaumont comparison
 N = 5,000 per site

Seat Belt Use and Cellphone Use Behavior Combinations

Table 8 shows the four combinations of seat belt and cellphone use behaviors. The first row is the most desirable behavior combination, using a seat belt and not using a cellphone. The second row is the least desirable behavior combination, not using a seat belt and using a cellphone. As would be expected due to the high seat belt use rate relative to the rate of cellphone use, most drivers in both waves were belted and not using a cellphone.

Table 8. Pre-implementation driver seat belt and cellphone use combinations
N = 5,000 per site

Combination	Sioux Falls		Fargo		Jackson		Beaumont	
	% Pre-	% Post-	% Pre-	% Post-	% Pre-	% Post-	% Pre-	% Post-
Seat belt use = yes Cellphone use = no	76.9	76.3	82.4	82.6	65.3	63.3	77.5	75.0
Seat belt use = no Cellphone use = yes	2.3	2.0	1.4	1.6	4.9	5.1	2.1	3.0
Seat belt use = yes Cellphone use = yes	4.9	4.6	5.1	4.1	7.6	8.1	7.3	9.2
Seat belt use = no Cellphone use = no	15.9	17.1	11.1	11.7	21.6	23.5	13.1	12.8

Analysis of Outcome Evaluation Results

The objective of this analysis was to evaluate the effectiveness of the BUPD initiative in Jackson and Sioux Falls based on the data obtained from a pre-and post-initiative observational survey of seat belt and cellphone use using a matched site sample design. The statistical method used to evaluate the effectiveness of the initiative was a before-after evaluation with control cities, which is also referred to as a before-after evaluation with comparison groups in transportation safety literature [See Hauer (1997) and Harwood et al. (2002) for detailed explanations of the C-G method]. This approach was employed to account for the underlying general trends in seat belt and cellphone use over time (i.e., changes due to unobserved extraneous factors, not the initiative) by using a counterfactual outcome (rate) at demonstration cities, as explained below.

The before-after evaluation with control cities assumes that the change in outcomes (seat belt use or cellphone use) between the before and after periods for control cities is representative of the change in outcomes that would have occurred for the corresponding demonstration cities had the initiative at the demonstration cities not occurred. Thus, the change in outcomes at the demonstration cities due to extraneous factors (other than the initiative) between the before and after periods is accounted for by the change at the control cities. The effectiveness of the initiative can be assessed by the effectiveness index (θ), which is the ratio of the rate of seat belt use (or cellphone use) after the initiative (here, per 5,000 drivers) to what it would have been

without the initiative at demonstration cities (i.e., a counterfactual rate), which can also be considered as the odds ratio. The steps of the before-after evaluation with control cities used to obtain the effectiveness index estimate ($\hat{\theta}$) are given below.

- 1) Let $\lambda(j)$ be the rate of seat belt use or cellphone use after the initiative and $\pi(j)$ be the predicted rate of seat belt use or cellphone use that would have occurred without the initiative for the j th demonstration city. Let $BP(j)$ and $AP(j)$ be the rate of before seat belt use or cellphone use and the rate of after seat belt use or cellphone use for the j th demonstration city, respectively, and $BC(j)$ and $AC(j)$ be the rate of before seat belt use or cellphone use and the rate of after seat belt use or cellphone use for the j th control city, respectively. Find estimates of $\lambda(j)$ and $\pi(j)$ for each of J ($J=2$, here) demonstration cities.

$$\hat{\lambda}(j) = AP(j) \quad (1)$$

$$\hat{\pi}(j) = BP(j) \times \frac{AC(j)}{BC(j)}. \quad (2)$$

- 2) Find an estimate of the index of effectiveness $\theta(j)$ for the j th demonstration city:

$$\hat{\theta}(j) = \frac{\hat{\lambda}(j)}{\hat{\pi}(j)} = \frac{AP(j)BC(j)}{BP(j)AC(j)}. \quad (3)$$

- 3) compute the log odds ratio, R_j , as follows:

$$R_j = \ln \left(\frac{AP(j)BC(j)}{BP(j)AC(j)} \right) = \ln \hat{\theta}(j). \quad (4)$$

- 4) compute the squared standard error for R_j by

$$\{s.e.(R_j)\}^2 = \text{Var}(\hat{R}_j) = \frac{1}{BP(j)} + \frac{1}{AP(j)} + \frac{1}{BC(j)} + \frac{1}{AC(j)} \quad (5)$$

- 5) compute an overall log odds ratio as a weighted average log odds ratio across all J demonstration cities where the weight for each demonstration city represents the reciprocal of the squared standard error of the log odds ratio.

$$R = \frac{\sum_{j=1}^J w_j R_j}{\sum_{j=1}^J w_j} \quad (6)$$

$$\text{where } w_j = 1/\{s.e.(R_j)\}^2.$$

6) compute the standard error and the approximate 95% confidence interval for R .

$$s.e.(R) = 1 / \sqrt{\sum_{j=1}^J w_j}, \quad (7)$$

$$R_{upper} = R + 1.96s.e.(R), \quad (8)$$

and

$$R_{lower} = R - 1.96s.e.(R) \quad (9)$$

where R_{upper} and R_{lower} stand for the upper and lower limit of the approximate 95% confidence interval, respectively.

7) The estimate of the overall index of effectiveness (θ) of the initiative and the corresponding 95% confidence interval can be obtained by exponentiation of R , R_{upper} , and, R_{lower} respectively, as

$$\hat{\theta} = e^R, \quad (10)$$

$$\theta_{upper} = e^{R_{upper}}, \quad (11)$$

and

$$\theta_{lower} = e^{R_{lower}}. \quad (12)$$

The average percent change in seat belt or cellphone use can be estimated as $100(1 - \hat{\theta})$.

Table 9 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative in Jackson and Sioux Falls on seat belt use obtained by the before-after evaluation with control cities method described above, as well as the percent seat belt use for each pair of implementation-control cities before and after the initiative. Because the 95% confidence interval for θ contains 1, the effect of the BUPD initiative in Jackson and Sioux Falls on seat belt use is not statistically significant at $\alpha = 0.05$.

Table 9. Driver seat belt use before and after the BUPD initiative

City	Percent seat belt use before initiative	Percent seat belt use after initiative	Odds ratio $\theta(j)$	θ (CI)
Sioux Falls	81.8 (BP=4092)	80.9 (AP=4044)	1.00	0.99 (0.95, 1.03)
Fargo	87.5 (BC=4376)	86.7 (AC=4335)		
Jackson	73.4 (BP=3670)	71.5 (AP=3574)	0.98	
Beaumont	84.8 (BC=4242)	84.2 (AC=4211)		

Note. Percent is based on $N = 5,000$ drivers per site for each period. θ denotes the overall effectiveness index (odds ratio).

Table 10 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative in Jackson and Sioux Falls on cellphone use obtained by the before-after evaluation with control cities method as well as the percent cellphone use for each pair of implementation-control cities before and after the initiative. The 95% confidence interval for θ contains 1, which indicates that the effect of the BUPD initiative in Jackson and Sioux Falls on cellphone use is not statistically significant at $\alpha = 0.05$.

Table 10. Driver cellphone use before and after the BUPD initiative

City	Percent cellphone use before initiative	Percent cellphone use after initiative	Odds ratio $\theta(j)$	θ (CI)
Sioux Falls	7.2 (BP=359)	6.5 (AP=327)	1.03	0.88 (0.78, 1.01)
Fargo	6.5 (BC=326)	5.7 (AC=287)		
Jackson	12.6 (BP=628)	13.2 (AP=660)	0.81	
Beaumont	9.4 (BC=470)	12.2 (AC=610)		

Note. Percent is based on $N = 5,000$ drivers per site for each period. θ denotes the overall effectiveness index (odds ratio).

Note that the procedure in Steps 1-7 (above) assumes both implementation and control cities have the same change in the number of drivers between the before and after period. The assumption holds for Tables 9 and 10 because the number of drivers is 5,000 for each period and city. However, when evaluating the effectiveness of the Jackson and Sioux Falls BUPD initiatives by sex, age, race/ethnicity, or vehicle type, the number of drivers for each category (e.g., for each of males and females category) changes from the before period to the after period for each city, which needs to be incorporated into $\hat{\theta}$. In that case, the before count at demonstration city j , $BP(j)$, will need to be replaced by $BP(j) \times (N_j^{AP} / N_j^{BP})$ where N_j^{BP} and N_j^{AP} are the number of female (or male) drivers at the j th demonstration city during the before period and the after period, respectively. Likewise, the before count at the j th control city will

need to be replaced by $BC(j) \times (N_j^{AC} / N_j^{BC})$ where N_j^{BC} and N_j^{AC} are the number of female (or male) drivers at the j th control city during the before period and the after period, respectively.

Tables containing the estimates of the overall indices of effectiveness (θ) of the BUPD initiative in Jackson and Sioux Falls on seat belt use and cellphone use by sex, age, race/ethnicity, and vehicle type obtained by the before-after evaluation with control cities method, as well as the count of seat belt use or cellphone use and the number of drivers for each pair of implementation-control cities by these variables before and after the initiative, are included as Tables A1-A8 in the Appendix.

These analyses show that the estimates of the overall effectiveness index for the BUPD initiative in Jackson and Sioux Falls on seat belt were not statistically significant at $\alpha = 0.05$ for any individual category of sex, race/ethnicity, or vehicle type. Regarding age, there was a statistically significant change in seat belt use for only Young Adults at $\alpha=0.05$, as the 95% confidence interval for θ contains 1 for age groups. However, the significant difference in seat belt use for Young Adults was largely driven by a large *decrease* in belt use observed in Jackson during the post-initiative wave.

Similarly, there were no statistically significant effects of the BUPD initiative on cellphone use for any individual category of sex, race/ethnicity, age, or vehicle type (at $\alpha = 0.05$).

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Discussion

BUPD offers a unique approach to encouraging safer driving behaviors without the use of enforcement. Countermeasures that center around enforcement or communication and outreach in tandem with enforcement are the best evidence-based tools that highway safety officials and safety advocates currently have at their disposal to increase seat belt use rates (Venkatraman et al., 2021). However, these countermeasures often rely on State or local primary seat belt laws that facilitate seat belt enforcement. A non-enforcement program, such as BUPD, could be particularly useful to highway safety officials and advocates in States with secondary enforcement seat belt laws.

However, as highlighted through the process evaluation, adapting and implementing BUPD in new localities requires a significant commitment of time and staffing resources. Additionally, the outcome evaluation conducted in this project did not yield evidence that the implementations of BUPD in Jackson or Sioux Falls had positive impacts on increasing seat belt use and decreasing cellphone use while driving.

This discussion section draws on behavioral theory to explore potential reasons that BUPD may not have had a statistically significant impact in the demonstration cities, while allowing for the possibility that the program may be effective in Missouri and still hold promise for other States and localities. It also identifies core components of BUPD that should be included based on behavioral theory as well as additional theoretical elements that could be incorporated into BUPD to strengthen the program. Finally, it explores possible reasons why it may be difficult to detect the impact of BUPD on behavior, irrespective of its implementation.

Why BUPD May Not Have Had a Statistically Significant Impact in the Demonstration Cities

Despite substantial effort by the teams involved in both BUPD demonstration cities, they struggled to translate their efforts to drive BUPD pledges, BUPD Challenges, or a build broader social media presence. This section outlines some of the challenges of implementation and discusses why they may have mattered for effectiveness from a behavioral theory perspective.

Difficulties that Influenced BUPD implementation

Some of the challenges that the implementation teams in both demonstration cities faced include:

- **Local leadership.** Neither demonstration city was able to engage their local political leadership and therefore lacked the messaging support from higher profile community members who might have been able to be the public face for BUPD.
- **Media coverage.** Both teams struggled to get press coverage as well as to build traction in social media. Even though the press was invited to the kickoff events, the events were not covered in local media.
- **Developing partnerships.** Both teams spent a lot of time and effort working to engage businesses and organizations as partners in BUPD. Despite the time-consuming nature of the task, both felt that these relationships were beneficial in providing resources or expanding the potential reach of the BUPD message. However, it continued to be a work in progress; both teams felt it was important to continue to build partnerships.

- **Gaining momentum.** It took longer than anticipated by either demonstration city to get partners on board, to understand how to begin implementing BUPD in their communities, to establish the foundation needed to feel comfortable moving forward with implementation, and to begin building momentum. At the time the implementation period ended, both BUPD teams felt that they had finally begun to hit their stride and make the headway they had been hoping to make earlier in the implementation process.
- **Short implementation period.** The BUPD teams had six months to implement the BUPD program, in addition to the 1–2 months of planning prior to their launch on BUPD Day. Given the time it takes to engage partners and for everyone to understand their role, both teams felt a 6–month implementation period was too short. By comparison, Missouri began the BUPD program in 2017, and it has been active continually since then.
- **Timing of implementation period.** Sioux Falls experienced record-breaking levels of snow fall during the implementation period, which made outreach harder, as opposed to the summer when more people are out in the community.
- **BUPD Challenge not implemented.** In Missouri, the BUPD Challenge component created social media buzz and generated media stories. Groups of employees or students or teams recorded themselves “challenging” another similar group, who could then respond by recording and challenging a new group. Posting group videos generated shares and views that spread. This aspect of the program never took off in either demonstration city and could have offered additional opportunities to draw attention to BUPD. More importantly, the Challenge invoked group identities and used a heavy social norms lever to encourage BUPD participation. The Challenge made participation public and observable, two aspects of behavior that are important for a social norms countermeasure.
- **Difficulties in coalition building.** The BUPD program has been described largely as a combination of communication/outreach and partnerships. Both of these approaches are familiar territories for safety stakeholders. However, it was clear throughout the process evaluation that both implementation teams found the program to be far more than communication / outreach and partnerships. As shown by the implementation teams, much of the BUPD core—engaging businesses, enlisting partners, creating buzz, and harnessing a variety of people and groups in pursuit of a common goal—could be more accurately described as coalition building. Stakeholders had previously engaged experienced partners in pursuit of safety initiatives, so the partnership component of BUPD seemed familiar. However, BUPD places intensive networking and engagement at the center of the program and requires engagement with businesses and partners that have varying degrees of experience with safety initiatives. Coalition building is a skillset, and stakeholders had no blueprint for this difficult task. Teams learned by trial and error to use their personal contacts, to follow up again and again, and to be patient in building relationships with novice partner organizations. A transparent description of the program will acknowledge the need for coalition building and the time and resources required for such a task—demands that go beyond a communications/outreach program and beyond partnership with one or two experienced safety organizations.

Theoretical Implications of Difficulties in BUPD Implementation

This section discusses how certain behavioral theories, and theoretical constructs might explain why BUPD was successful in Missouri (assuming the program contributed to the State's increased belt use rate) but not in the demonstration cities, given the difficulties they experienced in implementing the program.

Program Reach. For a program to be effective in promoting behavior change, people must be exposed to the program's message. The challenges listed above outline many of the reasons that implementation teams struggled to get BUPD's message out to the broader community. Some studies have examined the effect of message exposure on behavior change, finding consensus that increased exposure to messaging encouraging behavior change is associated with increased likelihood of engagement in that behavior change, including reduced drinking, increased exercise, and better weight management (e.g., Bessinger et al., 2004; Cugelman et al., 2011). Cugelman and colleagues (2011), for example, conducted a meta-analysis that found a significant positive relationship between exposure to online messaging and health behavior change. While these studies do not involve seat belt or cellphone use, they highlight the importance of message reach and repeated exposure for a message in promoting behavior change.

The social impact theory suggests that a larger number of sources reinforces the feeling that more people are participating in a program and increases the potential social impact. Given the challenges experienced, it is unlikely that the demonstration cities were able to disseminate the program to a degree that it would have reached a lot of people through a number of sources.

Lack of Positive Reinforcement. Operant conditioning posits that positive reinforcement for behaviors is important to reward taking on new behaviors. People receiving "likes" on social media for BUPD posts, challenges, or pledges could provide them with positive reinforcement to continue participating. This positive reinforcement can also reframe the social environment in which seat belt use and not using a cellphone when driving are more socially acceptable behaviors, ultimately influencing attitudes and behaviors, as suggested by the SCT model. Ultimately, both models bolster the idea that the lack of program reach could impact effectiveness.

Role of Influencers. MoDOT's implementation of BUPD relied heavily on social influence through the use of employers, the community, and local celebrities as drivers of the message. The social impact theory suggests that engagement of locally important stakeholders, such as coaches or beloved leaders, increases the strength of a program. For the most part, these types of figures were largely absent in BUPD promotion in both demonstration cities.

Key BUPD Components Based on Behavioral Theory

This section explores how behavioral theories could inform future iterations of BUPD in other States or localities. Some program outreach components are necessary for any program: if no one knows what the program is, no one can participate (e.g., public service announcements, initial outreach). Some form of "getting the word out" is necessary for any program. But if BUPD can indeed be successful in changing driver behavior, what BUPD-specific components are important to include in new implementations? Based on the theoretical assessment, some potential core components are outlined below.

Pledge and Window Cling. The pledge is an explicitly stated commitment to perform two behaviors (buckling up, putting the phone down). TPB terms this commitment “behavioral intention” and posits that it forms an important component of future behavior. Associated with the pledge is a potentially more powerful tool—the window cling. Simple and cheap, the window cling has the potential to impact behavior in several ways. It is a giveaway (Robinson et al., 2014), with a value too small to be interpreted as a bribe for behavior. Placed on the driver’s side window, the driver sees the cling upon each entry to the vehicle. It can provide a reminder of behavioral intention proximal to the performance of the behavior. To avoid cognitive dissonance (Festinger & Carlsmith, 1959), the driver can perform the behavior and maintain cognitive consonance between their stated intention and their behavior.

The visibility of the cling to others is also a classic example of Bandura’s reciprocal determinism, where each participant models the desired behavior and provides reinforcement to others (Bandura, 2003). It may also enhance perceived behavioral control (also termed self-efficacy in some theories), making the action seem feasible. Furthermore, the window cling provides a visible symbol of the desired behaviors, perhaps counteracting the lack of visibility noted earlier as a potential limitation to the social norms lever of the BUPD approach. For all these reasons, the window cling is likely to be a key feature of the initiative.

BUPD Challenge. A core component of MoDOT’s BUPD implementation was the challenge aspect. Modeled after other viral social media challenges, such as the ALS Ice Bucket Challenge, which consisted of people pouring a bucket of ice water over their head, capturing it on video, and challenging friends to do the same. MoDOT’s initiative gained significant traction in both news media and social media thanks to the practice of tagging and challenging people to take the pledge. People engage in social media challenges if they feel socially pressured to do so (Abraham et al., 2022) or if they anticipate that their participation will provide them with entertainment or increased social connection (Falgoust et al., 2022).

The MoDOT initiative incorporates all these aspects: its spread on social media leads people who are challenged to take the pledge and feel pressured to do so, it provides a kind of entertainment by displaying the hand sign in images, and it increases social connection through social media. Furthermore, the MoDOT initiative encouraged groups such as sports teams, coworkers, and social groups to record themselves challenging others. Not only did this practice encourage views and shares, the use of group membership supplied social norms leverage, as noted earlier.

The BUPD demonstration cities both chose to encourage people to participate by uploading photos to the website rather than emphasizing the challenge aspect. The lack of BUPD Challenge content on social media may have resulted in a less energetic environment regarding the challenge itself and restricted the aspects of social media challenges which potentially brought success to the MoDOT initiative.

The Challenge contributes to the ideas posited by the social impact theory that who drives the message is important, the number of sources where the message is coming from matters, and that there is a call to action in which a response is required (i.e., immediacy) (Perez-Vega et al., 2016). Based on behavioral theory, the BUPD Challenge is a core component of the program and provides a great deal of the social norms approach.

Prominent Champions. Participation by prominent citizens in BUPD may be critical for at least two reasons: first, social capital and influence can push a message into driver awareness. Second, and perhaps more importantly, it can drive engagement by businesses, agencies, and other

sources of influence. Missouri's BUPD program featured popular leaders and coaches, which likely provided the important media draw.

Participation by Businesses and Institutions. BUPD incorporates a “challenge” component that is usually performed by a group. Sports teams, groups of workers, clubs, and other groups record video of themselves citing the BUPD pledge and “challenging” another similar group (e.g., a team, department, club, or company) to take the pledge. The performative aspect, along with the recorded evidence, can function similarly to the window cling by documenting the behavioral intention, incentivizing cognitive consonance, modeling the desired behavior, providing reinforcement to others, changing attitudes, and potentially reframing social norms. Businesses and institutions can serve an additional function: by adopting BUPD as an entity, they can provide a social norm of seat belt use and cellphone non-use. If they follow up with policy and sanctions, the effect might be as powerful for their members as laws and enforcement.

Mode of Outreach. If successful, the power of BUPD is lodged in its social strategies. Social media is perhaps the most salient component of BUPD, as it serves to drive people to take the pledge and post photos of the thumbs-up/thumbs-down sign. The biggest difference between this type of communication and mass media-based initiatives is its reciprocal nature.

The rise of social media over the past two decades has allowed public health practitioners to leverage this two-way communication to promote behavioral health initiatives. For example, one study used several social media sites, along with traditional print and radio, to influence college students to not text and drive (Atchley & Geana, 2013). The number of channels used to get the message out was similar to BUPD. The researchers were able to reach a large number of students using those channels, and a third of students who viewed the initiative spoke with their friends about cellphone use while driving. This study did not, however, measure changes in distracted driving behavior.

By contrast, efforts that are anonymous or performed by strangers may be less likely to achieve results. A booth at the State Fair or a sports game may reinforce the number of sources repeating the messaging (as described by social impact theory) and may provide contacts with potential participants. However, the social levers of the program are less powerful when pulled by strangers staffing a booth than when operated by friends, coworkers, and acquaintances.

Components to Increase BUPD Impact. BUPD is a multifaceted program that uses a variety of levers in its attempt to change behavior. The strategies are social in nature: there is no risk messaging, no fear appeal, and no coercion or punishment. Educational messaging is ad hoc in nature—paired with social media messages or press releases—and is not integrated into the initiative's structure. Behavioral theories like the HBM model underscore the importance of educational messaging to frame the perceived benefits, barriers, and threats.

Theoretical Exploration of Why BUPD May Have No Statistically Significant Impact

Despite the seat belt gains Missouri observed in the years following the launch of BUPD, it is important to consider the possibility that BUPD may not have been the reason for the State's success and explore why that might be the case.

Interrelated Connection Between Environment and Behavior

One focus of the SCT is reciprocal determinism—the interplay between people's beliefs, their environments, and their behavior. An important question to ask in the case of BUPD is: do the various components of BUPD work together sufficiently to create a change in the social environment, or do they need to be interactively supported with other countermeasures?

BUPD is a multi-faceted initiative with core components of the program leaning heavily on communication and social norms. Communication efforts alone do not have a strong record of successful driver behavior change. A meta-analysis of media-delivered public health campaigns, including seat belt use campaigns, found that these campaigns were generally not very effective at changing behavior but performed slightly better when paired with an enforcement component (Snyder et al., 2004). Communication campaigns about seat belt use typically occupy only one of the three parts of successful seat belt use campaigns, along with enforcement and laws (Venkatraman et al., 2021).

In a rare example of a successful communication-only initiative called *Pick Up the Habit for Someone You Love*, North Dakota targeted male pickup truck drivers with tailored messaging. Using survey information, North Dakota identified message goals, strategies, and placement expected to reach male pickup drivers. Pre- and post-program observations established a 7% increase in seat belt use by male pickup drivers (North Dakota DOT, 2004, as reported in Venkatraman et al., 2021).

BUPD alone may not be able to create a change to the social environment at a large enough scale to influence attitudes and behavior related to seat belt and cellphone use in the vehicle. However, BUPD paired with other countermeasures might operate reciprocally to influence behavior.

Influence of Stalled Seat Belt Rates

Since 2016, national observed daytime seat belt use rates have remained around 90% (Werth, 2025). The national front seat belt use rate in 2023, 91.96%, was not significantly higher than in 2022, 91.6% (Werth, 2025). Once seat belt use rates are relatively high, the opportunity for large percentage-wise increases from any program are diminished. Thus, it may be difficult for a behavioral program aimed at improving the rate of seatbelt use to generate statistically detectable improvements across the population. Indeed, as seen in the outcome evaluation, overall belt use did not improve in the general population in the two cities; the statistical tests were unable to detect the improvement against baseline or against the level of noise in the data in the overall data for the implementation and comparison cities.

The reason for stalled seat belt rates may also stem from long-observed phenomena of behavior change. When encouraging the public to adopt a new behavior, it is common to see an “S”-shaped behavior curve (Snyder et al., 2004). Similarly, the Diffusion of Innovations Theory suggests that new behaviors tend to follow a similar pattern of adoption over time (Rogers, 1983). That is, adoption by the first 10% is slow. The process accelerates (sometimes called a

“bandwagon” effect) from around 10% to around 90% adoption. Rates of adoption tend to decelerate and may flatten out for those last 10% – 15% of people. Rogers (1983) calls them “laggards,” and Snyder et al. (2004) called this a “resistance effect.” Laggards are described as being skeptical of and resistant to change and can be the hardest group in which to encourage behavior change. Achieving adoption among the last 10% of people tends to be difficult across behaviors and is not limited to seat belts. Stagnation in the adoption of seat belt use, then, may reflect the difficulty of achieving behavior change in the last 10% of the population. Further, if the “laggards” are those who resist the “bandwagon” (i.e., social norms) effect, then a social norms approach is unlikely to move those non-users. Given that BUPD hinges heavily upon social norms, the “laggards” may remain unpersuaded and require a more focused approach with targeted or tailored messaging.

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Conclusion

Despite a thorough attempt at implementation in two cities over six months, this controlled evaluation did not find evidence that these adaptations of BUPD changed driver behavior: neither seat belt use nor cellphone use changed statistically significantly from before to after the implementation.

Both demonstration city teams stated that Statewide implementation and a longer time frame would have provided a greater foothold for the BUPD program. At the end of the six-month implementation period, both cities reported new partners, connections with schools, and sports teams building steam. It took time for BUPD teams to figure out the necessary steps to implement BUPD and learn to work together, but both felt more confident in their ability to make plans and accomplish their goals moving forward. It is possible that a longer implementation period would allow a more developed coalition and program maturity. This evaluation cannot assess that possibility.

Although both cities tried to implement MoDOT's BUPD model with as much fidelity as possible, potentially important components—such as the BUPD Challenge uptake, the influence of well-known local leaders, larger participation by employers, and expansive social media messaging—were not successfully recreated. Given some of the difficulties the demonstration cities experienced, those involved said that State-level implementation of BUPD could potentially draw on more resources, partner connections, and engage more State and local leadership. However, in this evaluation, BUPD as implemented in Jackson and Sioux Falls did not statistically significantly increase seat belt use or decrease cellphone use.

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**Appendix A. BUPD Effects on Seat Belt and Cellphone Use Analysis:
Sex, Age, Race/Ethnicity and Vehicle Type**

Table A-1 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative in Jackson and Sioux Falls on seat belt use by sex (along with the count of seat belt use and the number of drivers) for each pair of program-control cities before and after the initiative. Because the estimates for θ for both Females and Males are close to 1 as well as the 95% confidence intervals contain 1, it can be concluded that the effect of the BUPD initiative on seat belt use is not statistically significant for either Females or Males at $\alpha = 0.05$.

Table A-1. Driver seat belt use by sex before and after the BUPD initiative

Sex	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q (CI)
Female	Sioux Falls	1,925 (<i>N</i> =2244)	1,795 (<i>N</i> =2127)	0.99	0.98 (0.92, 1.05)
	Fargo	2,052 (<i>N</i> =2263)	1,976 (<i>N</i> =2199)		
	Jackson	1,924 (<i>N</i> =2516)	1,969 (<i>N</i> =2655)	0.97	
	Beaumont	2,136 (<i>N</i> =2455)	2,072 (<i>N</i> =2387)		
Male	Sioux Falls	2,167 (<i>N</i> =2756)	2,249 (<i>N</i> =2873)	1.00	1.00 (0.94, 1.06)
	Fargo	2,324 (<i>N</i> =2737)	2,359 (<i>N</i> =2801)		
	Jackson	1,746 (<i>N</i> =2484)	1,605 (<i>N</i> =2345)	0.98	
	Beaumont	2,106 (<i>N</i> =2545)	2,139 (<i>N</i> =2613)		

Note. *N* denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-2 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on cellphone use by sex (along with the count of cellphone use and the number of drivers) for each pair of program-control cities before and after the initiative. Because the 95% confidence interval for θ contains 1 for both Females and Males, it can be concluded that the effects of the BUPD initiative on cellphone use were not statistically significant for either Females or Males at $\alpha = 0.05$.

Table A-2. Driver cellphone use by sex before and after the BUPD initiative

Sex	City	Count of cellphone use before initiative	Count of cellphone use after initiative	Odds ratio $\theta(j)$	q
Female	Sioux Falls	164 ($N = 2244$)	150 ($N = 2127$)	1.16	0.90 (0.76, 1.08)
	Fargo	173 ($N = 2263$)	140 ($N = 2199$)		
	Jackson	376 ($N = 2516$)	408 ($N = 2655$)	0.86	
	Beaumont	246 ($N = 2455$)	306 ($N = 2387$)		
Male	Sioux Falls	195 ($N = 2756$)	177 ($N = 2873$)	0.93	0.85 (0.70, 1.03)
	Fargo	153 ($N = 2737$)	147 ($N = 2801$)		
	Jackson	252 ($N = 2484$)	252 ($N = 2345$)	0.80	
	Beaumont	224 ($N = 2545$)	304 ($N = 2613$)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-3 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on seat belt use by age (along with the count of seat belt use and the number of drivers) for each pair of program-control cities before and after the initiative. Only the change for Young Adults was statistically significant at $\alpha = 0.05$, as the 95% confidence interval for θ contains 1 for ages other than Young Adults. However, the significant difference in seat belt use for Young Adults was largely driven by a large decrease in belt use observed in Jackson during the post-wave.

Table A-3. Driver seat belt use by age before and after the BUPD initiative

Age	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q
Teen	Sioux Falls	98 (N =118)	80 (N =88)	1.13	1.10 (0.79, 1.52)
	Fargo	111 (N =121)	110 (N =124)		
	Jackson	59 (N =84)	46 (N =64)	1.05	
	Beaumont	63 (N =84)	69 (N =94)		
Young adult	Sioux Falls	521 (N =648)	433 (N =542)	1.01	0.67 (0.59, 0.77)
	Fargo	752 (N =862)	529 (N =617)		
	Jackson	529 (N =911)	246 (N =983)	0.44	
	Beaumont	590 (N =775)	632 (N =840)		
Adult	Sioux Falls	3015 (N =3699)	3057 (N =3778)	1.00	0.99 (0.94, 1.04)
	Fargo	3041 (N =3492)	3241 (N =3755)		
	Jackson	2604 (N =3440)	2517 (N =3383)	0.98	
	Beaumont	3036 (N =3555)	2988 (N =3489)		
Older	Sioux Falls	458 (N =535)	474 (N =592)	0.93	0.97 (0.85, 1.10)
	Fargo	472 (N =525)	455 (N =504)		
	Jackson	478 (N =565)	465 (N =570)	1.01	
	Beaumont	553 (N =586)	522 (N =577)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-4 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on cellphone use by age (along with the count of cellphone use and the number of drivers) for each pair of program-control cities before and after the initiative. The 95% confidence interval for θ contains 1 for all age categories, which indicates that none of those changes are statistically significant at $\alpha = 0.05$.

Table A-4. Driver cellphone use by age before and after the BUPD initiative

Age	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q
Teen	Sioux Falls	14 (N =118)	5 (N =88)	0.55	0.50 (0.19, 1.33)
	Fargo	10 (N =121)	9 (N =124)		
	Jackson	13 (N =84)	5 (N =64)	0.46	
	Beaumont	9 (N =84)	11 (N =94)		
Young adult	Sioux Falls	63 (N =648)	53 (N =542)	0.81	0.81 (0.61, 1.07)
	Fargo	61 (N =862)	54 (N =617)		
	Jackson	151 (N =911)	200 (N =983)	0.81	
	Beaumont	97 (N =775)	160 (N =840)		
Adult	Sioux Falls	270 (N =3699)	261 (N =3778)	1.14	0.92 (0.79, 1.08)
	Fargo	244 (N =3492)	217 (N =3755)		
	Jackson	444 (N =3440)	432 (N =3383)	0.81	
	Beaumont	350 (N =3555)	421 (N =3489)		
Older	Sioux Falls	12 (N =535)	8 (N =592)	0.91	0.88 (0.42, 1.88)
	Fargo	11 (N =525)	7 (N =504)		
	Jackson	20 (N =565)	23 (N =570)	0.87	
	Beaumont	14 (N =586)	18 (N =577)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-5 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on seat belt use by race/ethnicity (along with the count of seat belt use and the number of drivers) for each pair of program-control cities before and after the initiative. Because the estimate for θ is close to 1 and the corresponding 95% confidence interval contains 1 for each category of race/ethnicity, it can be concluded that the effect of the BUPD initiative on seat belt use was not statistically significant for either White drivers or Black/Hispanic/Asian/Other (combined) drivers at $\alpha = 0.05$.

Table A-5. Driver seat belt use by race/ethnicity before and after the BUPD initiative

Race/ethnicity	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q
White	Sioux Falls	3516 ($N = 4248$)	3434 ($N = 4213$)	1.00	1.00 (0.94, 1.05)
	Fargo	3965 ($N = 4510$)	3877 ($N = 4462$)		
	Jackson	1596 ($N = 1866$)	1562 ($N = 1842$)	0.99	
	Beaumont	2142 ($N = 2335$)	2665 ($N = 2505$)		
Black/Hispanic/Asian/Other (combined)	Sioux Falls	576 ($N = 752$)	610 ($N = 787$)	1.00	0.99 (0.91, 1.07)
	Fargo	411 ($N = 490$)	458 ($N = 538$)		
	Jackson	2074 ($N = 3134$)	2012 ($N = 3158$)	0.98	
	Beaumont	2142 ($N = 2665$)	1961 ($N = 2495$)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-6 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on cellphone use by race/ethnicity (along with the count of cellphone use and the number of drivers) for each pair of program-control cities before and after the initiative. The 95% confidence interval for θ contains 1 for both White drivers and Black/Hispanic/Asian/Other (combined) drivers, which indicates that the effects of the BUPD initiative on cellphone use were not statistically significant for any race/ethnicity group at $\alpha = 0.05$.

Table A-6. Driver cellphone use by race/ethnicity before and after the BUPD initiative

Race/ethnicity	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q
White	Sioux Falls	282 ($N = 4248$)	258 ($N = 4213$)	1.04	0.91 (0.76, 1.09)
	Fargo	279 ($N = 4510$)	246 ($N = 4462$)		
	Jackson	170 ($N = 1866$)	201 ($N = 1842$)	0.76	
	Beaumont	164 ($N = 2335$)	276 ($N = 2505$)		
Black/Hispanic/Asian/Other (combined)	Sioux Falls	77 ($N = 752$)	69 ($N = 787$)	1.08	0.88 (0.73, 1.05)
	Fargo	47 ($N = 490$)	41 ($N = 538$)		
	Jackson	458 ($N = 3134$)	459 ($N = 3158$)	0.85	
	Beaumont	306 ($N = 2665$)	334 ($N = 2495$)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-7 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on seat belt use by vehicle type (along with the count of seat belt use and the number of drivers) for each pair of program-control cities before and after the initiative. Because the estimate for θ is close to 1 as well as the corresponding 95% confidence interval contains 1 for each category of vehicle type, it can be concluded that the effect of the BUPD initiative on seat belt use was not statistically significant among car drivers or pickup drivers at $\alpha = 0.05$.

Table A-7. Driver seat belt use by vehicle type before and after the BUPD initiative

Vehicle type	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q
Car	Sioux Falls	3412 ($N = 4069$)	3344 ($N = 4035$)	1.00	0.99 (0.94, 1.04)
	Fargo	3511 ($N = 3927$)	3465 ($N = 3932$)		
	Jackson	3053 ($N = 4114$)	2974 ($N = 4144$)	0.97	
	Beaumont	3183 ($N = 3733$)	3156 ($N = 3709$)		
Pickup	Sioux Falls	680 ($N = 931$)	700 ($N = 965$)	0.98	1.01 (0.91, 1.11)
	Fargo	865 ($N = 1073$)	870 ($N = 1068$)		
	Jackson	617 ($N = 886$)	600 ($N = 856$)	1.03	
	Beaumont	1059 ($N = 1267$)	1055 ($N = 1291$)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

Table A-8 contains the estimate of the overall index of effectiveness (θ) of the BUPD initiative on cellphone use by vehicle type (along with the count of cellphone use and the number of drivers) for each pair of program-control cities before and after the initiative. Because the confidence interval for θ contains 1 for each vehicle type, it can be concluded that the effect of the BUPD initiative on cellphone use was not statistically significant among car drivers or pickup drivers at $\alpha = 0.05$.

Table A-8. Driver cellphone use by vehicle type before and after the BUPD initiative

Vehicle type	City	Count of seat belt use before initiative	Count of seat belt use after initiative	Odds ratio $\theta(j)$	q
Car	Sioux Falls	292 (N =4069)	269 (N =4035)	1.00	0.88 (0.76, 1.01)
	Fargo	255 (N =3927)	237 (N =3932)		
	Jackson	549 (N =4114)	583 (N =4144)	0.81	
	Beaumont	362 (N =3733)	466 (N =3709)		
Pickup	Sioux Falls	67 (N =931)	58 (N =965)	1.18	0.91 (0.67, 1.25)
	Fargo	71 (N =1073)	50 (N =1068)		
	Jackson	79 (N =886)	77 (N =856)	0.77	
	Beaumont	108 (N =1267)	144 (N =1291)		

Note. N denotes the number of drivers by sex for each site and period. θ denotes the overall effectiveness index (odds ratio) by sex. CI = Confidence Intervals for θ .

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