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Cover Page Footnote

We would like to thank St. Francis County Extension Agent Cody Griffin; Phillips County Extension Agent Julie Goings; Jennifer Conner; Jordyn Williams; Diane Ayers and Sahra Kahin of the CDC; the Forrest City Police Department and City Council; and the Mayor of Forrest City, Cedric Williams.

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Results of a Rural Traffic Calming Event to Promote Physical Activity

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Abstract. This article describes how community need was addressed through a traffic calming pop-up event in rural Arkansas. The event was conducted on routes connecting a neighborhood, two schools, and a municipal park. A brief survey assessed safety concerns of parents and/or guardians related to children walking or biking to school. Prior to the event, parents/guardians reported it was not safe for their children to walk or bike to school; however, the majority agreed the event made the area safer. Small-scale traffic calming events can provide evidence to stakeholders that built environment changes are an important childhood obesity prevention strategy in rural Extension work.

INTRODUCTION

Evidence demonstrates that child participation in physical activity reduces rates of obesity and other chronic conditions and improves academic achievement (U.S. Department of Health and Human Services, 2018). Improving access to active transportation, such as walking or biking, increases rates of physical activity in children (Ward et al., 2015). Safe Routes to School programs have been successful in encouraging children to walk and bike to school (Stewart et al., 2014). However, in recent years, there has been a decrease in children walking or biking to school, with parents citing barriers such as distance, traffic-related danger, and crime (Jones & Sliwa, 2016). Childhood obesity has been linked to numerous health problems, including type 2 diabetes and hypertension, and is a strong predictor of adult obesity (Pandita et al., 2016; Simmonds et al., 2016). Therefore, primary and secondary prevention of childhood obesity is a critical step in addressing the adult obesity epidemic in the United States.

The Centers for Disease Control and Prevention (CDC) implemented the High Obesity Program (HOP) to address health issues in counties with an adult obesity rate of over 40% through increasing access to healthy foods and providing safe and accessible places for physical activity. The CDC funded 15 Land-Grant University Cooperative Extension Systems to complete this work, aligning with Extension's National Framework for Health and Wellness and recent addition of physical activity as a focus area (Braun et al., 2014; CDC Division of Nutrition, Physical Activity, and Obesity, 2020). Program activities include collaborating with community partners to connect everyday destinations that could be linked via active transportation, including homes, schools, parks, and other community locations. Each awardee is required to evaluate the effectiveness of their strategies within these program activities.

PURPOSE AND OBJECTIVES

In 2018, the Arkansas Cooperative Extension Service received the five-year HOP cooperative agreement to implement obesity prevention strategies in the Arkansas Delta region. The Arkansas Delta Region Obesity Project (ArDROP) is available to five counties: Chicot, Lee, Mississippi, Philips, and St. Francis. Mortality rates in the Delta region from chronic diseases are 10% higher than non-Delta counties and 20% higher than the national rate (Felix & Stewart, 2005). Despite a steady decrease in mortality nationally, the rate of decline in the Delta is much slower (Cosby & Bowser, 2008).

St. Francis County has the highest adult obesity rate in Arkansas (43.2%), making it a critical location for obesity prevention strategies (Arkansas Department of Health, 2018). Forrest City is the St. Francis County seat and largest

city, with a population of 15,371 (Missouri Census Data Center, 2020). More than 2 in 5 (41.9%) students in the Forrest City school district are overweight or obese (ACHI, 2019). The high rate of adult and childhood obesity, the effectiveness of safe routes to school interventions, a strong relationship with city officials, and the support of an active community coalition motivated the ArDROP team to begin work on safe routes to school in Forrest City. Prior work within the community included helping the city secure Transportation Alternatives Program (TAP) funding, conducting healthy food assessments in local food pantries, and conducting walkability assessments in other areas of the city. This article describes the steps taken by the ArDROP team to increase access to physical activity in the community.

INTERVENTION APPROACH

The Mayor of Forrest City first identified several areas of need, which initiated ArDROP's activities to encourage the development of safe routes to school. ArDROP chose the area near Oak Avenue and Ash Street, because it contains a residential neighborhood, two schools, and a municipal park. The ArDROP team received training on conducting walkability assessments from CDC subject matter experts. ArDROP then conducted a walkability assessment of the identified area using a tool adapted from CDC's Walkability Audit Tool (Dannenberg et al., 2005) and North Carolina's Shape Your World Walkability Checklist (Move More Walk Now, 2011). The results of the walkability assessment demonstrated that the area was not pedestrian-friendly. Specifically, the area lacked sidewalks, crosswalks, connectivity to the community, safety features, and an attractive appearance. Previous rural Extension work has also cited inadequate signage, lack of sidewalks and crosswalks, and low pedestrian safety as significant barriers to walking and biking for rural residents (Jensen et al., 2019).

Based on the results of the walkability assessment, ArDROP developed plans to conduct a "traffic calming pop-up" event in the area to demonstrate the feasibility of making small built environment changes that could encourage active transportation. Traffic calming pop-ups are a strategy of tactical urbanism in which simple, temporary changes to the built environment are tested, including traffic cones, signs, and paint, in order to demonstrate effective ways a city government can make permanent changes to improve the built environment (Safe Routes to School National Partnership, 2017; Trailnet, 2016). The ArDROP team conducting the pop-up event included five program associates, the lead evaluator, and the principal investigator.

The ArDROP team rerouted traffic to turn Oak and Ash into one-way streets. The team transformed Oak Avenue into a one-way street going west (toward the schools) and Ash Street into a one-way street going east (away from the schools) (Figure 1). For a detailed list of the methods and purpose of the temporary built environment changes used in Figure 1, see Table 1. The event occurred from 2 PM to 5 PM on a school day in September 2019.

EVALUATION METHODS

The team evaluated the event through observation during the event and a brief post-event survey. The ArDROP team used paper, pencil, and a mobile app to count the number of pedestrians, cyclists, and cars that drove down both Oak and Ash throughout the duration of the event. This count was an approximate measure conducted for process evaluation (i.e., to provide data to stakeholders on how many community members were exposed to the pop-up event), and, thus, the ArDROP team did not determine inter-rater reliability.

School staff were asked to distribute the survey to students at the local middle and elementary schools after the traffic calming pop-up event (Figure 1 does not depict the elementary school). School staff asked the students to take the survey home, have a parent or guardian complete the survey, and return the completed survey the following day. Passive consent was obtained through return of the completed survey. The eight-item survey asked students' parents/guardians to report how often their child walked or biked to school, whether it was safe for their child to walk/bike to school, concerns about letting their child walk/bike to school, whether or not they thought the event improved safety, and whether or not permanent changes would increase the likelihood of allowing their children to walk or bike to school. The ArDROP team collected completed surveys from the schools two weeks after they conducted the pop-up event. The team entered survey data into Microsoft Excel for analysis. This evaluation was determined to be exempt by the University of Arkansas for Medical Sciences Institutional Review Board.

RESULTS

The ArDROP team counted approximately 140 vehicles, 24 pedestrians, and one cyclist throughout the duration of the event. All vehicles and pedestrians adhered to the temporary built environment changes throughout the event.

A total of 49 parents/guardians responded to the survey. Summary statistics are provided in Table 2. According to survey responses, the majority of parents/guardians reported that their children never walk or bike to school (85.4% and 100%, respectively). Three-quarters (76.6%) of parents/guardians disagreed with the statement that it is safe for their child to walk/bike to school prior to the event. Parents/guardians listed several concerns about their children walking or biking to school, including distance, lack of sidewalks/crosswalks, speed and amount of traffic, and crime. The majority (85.3%) agreed that the changes to the area made

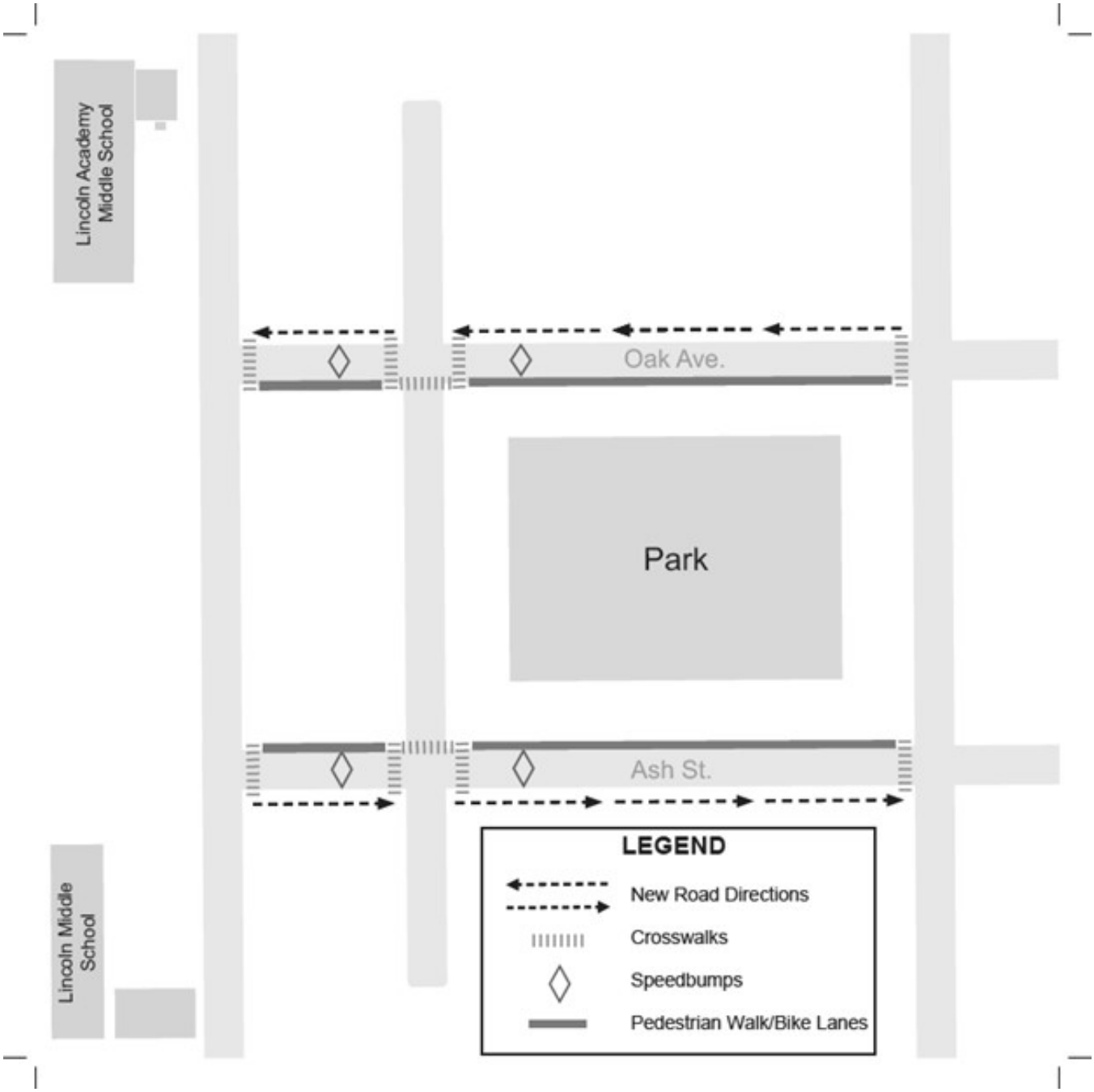

Figure 1. Map of temporary built environment changes.

Table 1. Methods and Purpose of Temporary Built Environment Changes

Methods of Environment Changes	Purpose
Added dedicated walking/biking lanes to Oak and Ash using temporary pavement tape and yellow footprint stickers	To account for the lack of sidewalks
Added crosswalks at all four intersections using temporary pavement tape	To account for the lack of crosswalks
Added four temporary speedbumps on Oak and Ash	To slow traffic travelling to and from the schools
Added temporary signage to stop signs in affected area	To indicate the newly designed one-way streets
Placed traffic cones near new crosswalks and pedestrian lanes	To aid in pedestrian visibility

it safer for their children to walk/bike to school. More than one-third (36.8%) of parents/guardians agreed that making these changes permanent would increase the likelihood of allowing their kids to walk or bike to school.

IMPLICATIONS FOR PUBLIC HEALTH

The traffic calming pop-up event provided preliminary support for the necessity of permanent built environment improvements to promote physical activity. Two of the primary concerns respondents identified—lack of sidewalks/crosswalks and the speed of traffic—are issues that are feasibly addressed with micro-changes to the built environment (i.e., those that can be implemented at a lower cost and more rapidly than complex infrastructure improvements) (Community Preventive Services Task Force, 2016). Based upon the traffic calming pop-up event and the results of the survey, ArDROP and the city implemented immediate infrastructure improvements. City officials agreed to keep the temporary crosswalks in place until the pavement tape began to detach from the pavement, at which point they have committed to paint them permanently. In addition, as a result of the pop-up event, ArDROP received CDC approval to purchase flashing speed limit signs, additional speed bumps, and pedestrian signage to slow traffic on Oak and Ash. Taken together, the ArDROP team received community feedback and data to support the need for permanent changes. Permanent built environment improvements make the community safer and increase access to physical activity, which may encourage parents/guardians to allow their children to walk or bike to school (Stewart et al., 2014).

One limitation of this study was that the ArDROP team did not observe traffic in the area prior to the pop-up event; therefore, the team was unable to compare use prior to the event to use during the event. Another limitation was the low number of parent/guardian responses to the survey. Surveys were delivered to administration offices at both schools, but it is unknown how many children were present on the day the surveys were distributed or whether every student was given a survey to take home to their parents/guardians; therefore, a precise response rate could not be calculated.

The majority of parents/guardians reported distance as a concern; however, the ArDROP team did not have data detailing the distance respondents lived from the school. Therefore, further work should investigate what distance is feasible for parents/guardians to allow children to walk or bike to school in order to make safe routes projects and traffic calming measures effective. Parents/guardians also reported crime as a concern, which was not specifically addressed with temporary changes and may account for the proportion of respondents who would *not* be more likely to allow their children to walk or bike to school. Before crime prevention can be addressed, stakeholders need to conduct

Table 2. Parent/Guardian Attitudes and Concerns about Active School Transportation, n=49

Survey Items And Response Options	no. (%)
How often does your child walk to school?	
Always	3 (6.3)
Often	0 (0)
Sometimes	0 (0)
Rarely	4 (8.3)
Never	41 (85.4)
How often does your child bike to school?	
Always	0 (0)
Often	0 (0)
Sometimes	0 (0)
Rarely	0 (0)
Never	47 (100)
It is safe for my child to walk/bike to school.	
Strongly Agree	1 (2.1)
Agree	10 (21.3)
Disagree	18 (38.3)
Strongly Disagree	18 (38.3)
What concerns do you have about letting your child walk/bike to school?[a]	
Distance to/from school	34 (69.4)
Amount of traffic along the route	24 (49.0)
Speed of traffic along the route	22 (44.9)
Lack of sidewalks/crosswalks along the route	18 (36.7)
Crime along the route	15 (30.6)
Other	6 (12.2)
The Safe Routes to School pop-up made the area around the school safer for walking/biking.	
Strongly Agree	3 (8.8)
Agree	26 (76.5)
Disagree	1 (2.9)
Strongly Disagree	4 (11.8)
If the temporary changes were made permanent, it would increase the likelihood that I would walk/bike to school with my child or let my child walk/bike to school.	
Strongly Agree	1 (2.6)
Agree	13 (34.2)
Disagree	14 (36.8)
Strongly Disagree	10 (26.3)

Note. Number of responses varies by item due to participant non-response. Percentages may not total 100 due to rounding.
[a]Multiple responses were allowed for this item.

additional assessments to determine the types of crime and environmental elements that impact personal safety—such as visibility, obstruction, and areas of concealment (Cozens et al., 2005). This knowledge can guide future efforts to prevent crime through environmental design (e.g., natural surveillance and access control or maintenance) (Cozens et al., 2005).

CONCLUSION

Physical activity promotion and environmental change are both recent focuses of Extension work (United States Department of Agriculture, 2014). This case study may serve as an example for other Extension practitioners. Safe Routes to School National Partnerships recommend pop-ups (Safe Routes to School National Partnership, 2017); however, as of yet, pop-ups have been unreported in the Extension literature. These brief feasibility studies can be used within the health promotion process to work with community coalitions, identify needs, and select, test, implement, and evaluate evidence-based interventions. This case study demonstrates how a brief traffic calming pop-up event was used to make permanent built environment changes in a short period of time. The ArDROP team will continue working with community-driven coalitions like the one in Forrest City to conduct traffic calming pop-up events in other counties and to demonstrate to city governments the feasibility of improving the built environment. This article demonstrates simple strategies for encouraging communities to increase physical activity by walking and biking to school. Changes to the built environment are easily replicable in Extension work in rural areas and can be a critical first step in reducing childhood obesity.

DISCLAIMERS

We have no conflicts of interests to declare. No copyrighted materials, surveys, instruments, or tools were used in this work. This work was funded by a High Obesity Program (HOP) award (no. NU58DP006561) from the Centers for Disease Control and Prevention. The findings and conclusions in this report are ours and do not necessarily represent the official positions of the funder.

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