



Safe School Zone Program

Long-Term Outcomes

January 2020



Executive Summary

As part of the Safe Kids Walk This Way program, the Safe School Zone grant program was created by Safe Kids Worldwide and FedEx to focus on improving child pedestrian safety in school zones. The program provides funding to local Safe Kids coalitions to make environmental improvements near schools for child pedestrians. Beginning in 2010, Safe Kids Worldwide partnered with the University of North Carolina Highway Safety Research Center (HSRC) to assist the local coalitions in identifying locations in need of pedestrian safety improvements and selecting countermeasures and environmental modifications best suited to improve safety. Before and after the installation of these countermeasures, HSRC collected data to assess the projects' effectiveness in improving safety and increasing levels of walking.

After eight years, the Safe School Zone program has supported dozens of safety improvements at schools across the United States. These projects are the result of data-driven and collaborative processes spearheaded by local Safe Kids coalitions and supported by Safe Kids Worldwide and HSRC.

This report highlights the findings of an effort to assess long-term impact and outcomes from the grant-funded projects in nine communities across the United States. All of the projects profiled in the report were studied previously to determine whether the intervention had a measurable impact on pedestrian safety and walking activity. To determine longer-term impacts of these projects, further data were collected in early 2018 to understand whether the projects continued to perform as expected. The report features findings from school zone observations, speed data collection, reported crash events, and other factors collected at the project locations. Numerous positive impacts from these projects were found, including:

- Higher levels of walking at sites where projects were completed
- Documented increases in motorist yielding rates following project completion
- Reductions in motor vehicle speeds along corridors where projects were completed
- Almost no crashes between pedestrians and motor vehicles in the vicinity of project sites
- Expanded capacity of local coalitions to pursue other initiatives focusing on pedestrian safety, including the development of action plans and additional safety improvements

The following report summarizes the Safe School Zone program and findings from efforts to measure the impact of selected projects.

Safe School Zone Grant Process

Recipients of Safe School Zone grants follow an established process to use data and field observations to select and implement projects that are best suited to improve child pedestrian safety. Working with local coalitions, Safe Kids Worldwide and University of North Carolina Highway Safety Research Center (HSRC) used the following steps to guide this process.

Initial Data Collection and Review

Local coalitions who apply for grant funds provide several data sets, including crash and injury data, to help justify their need for safety improvements. Using these data and others gathered from third party sources, HSRC and the local coalitions prepare for a community workshop by examining high risk and high crash locations. This assessment produces a narrowed list of priority locations that may benefit from safety improvements, setting the stage for a community workshop.

Workshops

A two-day workshop, facilitated by an instructor selected by HSRC, is held in each community that receives a Safe School Zone grant. The workshop brings together a task force of local stakeholders and partners to decide how to best implement the grant funds. Partners include:

- Safe Kids coalition
- Local Engineer or Planner
- State Department of Transportation
- State or County Public Health Department
- School Representatives
- Advocates and Other Community Members

The first part of the workshop provides attendees with an overview of how to properly design infrastructure near schools for pedestrian safety. The instructor presents methods for identifying safety problems and how to link those problems with proven countermeasures. The attendees visit the short list of candidate sites prepared in advance and consider what can be done to improve safety at each site. On the second day of the workshop, the instructor facilitates a group discussion to determine the best use of grant funds. Arriving at a consensus, the group then completes an action plan to guide the remainder of the project.

Though the workshop was not the central focus of a Safe School Zone project, it nevertheless provided a great deal of benefit to the local coalition and its partners. Participants received information that could position them to pursue and implement pedestrian safety projects in the future, beyond the duration of the Safe School Zone project itself. One coalition report that their instructor “was able to connect and communicate well with a diverse group of individuals with a variety of backgrounds. I have had many task force members tell me how much they learned.” Another coalition leader mentioned that a workshop participant said the experience “added more tools to his toolbox.” One other member said “our task force members learned so much during the workshop. None of us will look at a sidewalk or crosswalk the same. There are so many factors to consider when designing pedestrian walkways.” This sort of feedback confirms that the workshops serve two important purposes: to establish a clear plan for using grant funds, and to equip and sustain future pedestrian safety activities.

Action Plan Development

During the workshop, each coalition and its partners develop a detailed plan for using the grant funds to support local pedestrian safety. These recommendations encompass a wide range of activities, from environmental improvements to educational programs and enforcement activities. The instructor leading the workshop helps participants understand the most effective treatments based on current research and encourages coalitions to select the treatments that best address observed safety problems. The following treatments have been installed by Safe Kids coalitions, all of which are proven to reduce crashes and improve safety for pedestrians.

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| Sidewalks Dedicated sidewalks have been shown to reduce the risk of pedestrian crashes by up to 87 percent. ¹ | Traffic Calming Treatments Speed cushions and other treatments for lowering speeds can decrease pedestrian crashes by 15 percent. ⁴ |
| Rectangular Rapid Flashing Beacons These push-button activated flashing signs can reduce pedestrian crashes by 53 percent and increase rates of yielding to 80 percent or higher. ² | Pedestrian Countdown Signals These signals give pedestrians clear right-of-way at signalized intersections and can reduce pedestrian crashes by up to 70 percent. ⁵ |
| Curb Extensions Though their impact on crashes remains unknown, these treatments shorten crossing distances and reduce vehicle speeds. ³ | Pedestrian Refuge Islands These refuge islands allow pedestrians to break up long crossings and reduce crash risk by 25 percent. ² |

Implementation

After each action plan was finalized, coalitions worked to turn their plans into action. This phase of the process was typically the most challenging, as the coalition members coordinating activities were not usually the ones responsible for roadway projects. Working with city staff, state DOTs, and contractors often resulted in delays to the project. Despite those challenges, most of the projects were successfully implemented. Coalitions worked to publicize their efforts through ribbon cutting events, press releases, and celebrations for International Walk to School Day and Global Road Safety Week.

Follow-up Data Collection

The action plan produced by each coalition provided a template for ways to measure the impacts of the grant-funded projects. In many cases, the coalitions themselves worked to collect these data and monitor progress. In certain cases, the HSRC worked with some local coalitions to collect these data and provide an objective look at the project's outcomes. Most of the findings from that work is compiled in this report, including an update of previously collected data. By emphasizing data collection and evaluation, coalitions are encouraged to use those findings to help guide future projects and publicize their success to hopefully receive more support for other initiatives down the road.

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Measures Used to Assess Project Impacts

Safe School Zone projects are intended to support and improve pedestrian safety for both children using the crosswalks and community members and others living nearby. Each of the interventions was selected specifically to address a problem identified by the local coalition during the workshop and data review. Since each intervention is designed to address a specific problem, we used different metrics to measure their impacts. For example, the addition of a rectangular rapid flashing beacon is intended to reduce conflicts between drivers and pedestrians, while the installation of speed cushions is intended to decrease motor vehicle speeds. The first is best measured by examining changes in driver yielding rates, while the second should be measured by collecting speed data.

With that in mind, the project team used the following types of measures to assess the impact of the Safe School Zone projects. These data were collected first-hand by researchers, coded using video data, or collected through a third party or the local coalition. The measures were captured before project installation, following the installation, and more recently to assess longer-term impacts of these projects.

Crash Data

The most prevalent measure of pedestrian safety is the reported number of crashes between motor vehicles and pedestrians. In some cases, a history of crashes led the coalitions to a particular site to make improvements. Other sites lacked crash history but were prioritized because of their high risk of crashes. Measuring the change in crashes, if any, before and after the installation of a new treatment is one way to determine its impact. However, due to the random nature of crashes and small numbers, it is difficult to draw definitive conclusions based on a change in crashes alone. Where these data were available, we examined crashes that occurred before and after project installation date.

Counts

Another measure of a project's impact can be whether it increases the amount of walking at a particular location. This may seem counterintuitive, especially considering that more pedestrians or crossings may increase exposure to traffic and result in more opportunities for crashes. Research suggests, however, that increases in pedestrian activity makes those walking more visible to motorists. As motorists begin to expect more pedestrians, they may be more likely to notice them and adjust their behavior accordingly. Increases in pedestrian activity and crossings was used as another way to measure project impact.

Conflicts and Yielding Behavior

Interactions between motorists and pedestrians can be categorized in a number of ways. These interactions happen much more often than crashes, and while they typically don't result in deaths or injuries, they provide a useful way to measure a project's impact when crashes are infrequent or nonexistent. Conflicts may occur when a motorist turns across the path of a crossing pedestrian, or when a motorist stops at an intersection and blocks the crosswalk. A distinct observable measure is also yielding behavior. Vehicles can be observed to yield or not yield to pedestrians, resulting in a yielding rate (the percentage of vehicles that yielded to pedestrians). Measuring yielding rates and the occurrence of conflicts before and after a project can shed light on its impact.

Speeds

There may not be a factor more important in crash prevalence and severity than the speed of traffic. Speeds can be measured in cases where the specific purpose of the intervention is to reduce vehicle speeds. These data are typically collected for a short period of time to capture speeds from as little as 100 or as many as 750 vehicles over a fairly short period of time. Using the data, we can measure the 85th percentile speed (the speed that 85 percent of vehicles are traveling under and a metric used by road authorities to set speed limits) and the number of vehicles exceeding some threshold (either the speed limit or a certain range above the speed limit). Doing this allows us to understand a project's impact on these measures and determine whether the intervention resulted in lower (or possibly higher) vehicles speeds.

Detailed Project Information and Outcomes

The following pages provide detailed write-ups documenting the nine projects initiated in 2011 and 2012 where data were collected to assess longer-term outcomes. In some cases, these assessments relied on data collected by local coalitions and turned over to the project team. In other cases, data were collected first-hand by HSRC and coded to measure changes over time. The write-ups contain summaries of earlier assessments that have been updated to capture longer-term trends. When available, crash data were compiled to examine trends before and after the project.

Projects profiled in the following pages include those listed below:

- [Speed Management at Orchard Knob Elementary School \(Chattanooga, TN\)](#)
- [Safety Improvements at Graham Hill Elementary School \(Seattle, WA\)](#)
- [Intersection Improvements at Cobbs Creek Parkway \(Philadelphia, PA\)](#)
- [Pedestrian Signal and Intersection Upgrades at Williston Middle School \(Wilmington, NC\)](#)
- [Crosswalk Improvements at Torah Day School \(DeKalb County, GA\)](#)
- [Safety Improvements at Highland Park Elementary School \(Seattle, WA\)](#)
- [Crosswalk and Traffic Improvements at Treadwell Elementary School \(Memphis, TN\)](#)
- [Crosswalk and Sidewalk Upgrades at Carl Rhodenizer Recreation Center \(Clayton County, GA\)](#)
- [Intersection Conversion at Harrison Primary School \(Peoria, IL\)](#)

Speed Management at Orchard Knob Elementary School

Safe Kids Southeast Tennessee | Chattanooga, TN

Background

Orchard Knob Elementary School is located adjacent to N. Orchard Knob Avenue in Chattanooga, Tennessee. The corridor was identified by the local coalition based on its high traffic speeds, which represented a hazard to children walking along and crossing the street on their way to and from school. The four-lane corridor facilitated vehicle speeds that are higher than the posted speed limit and posed a risk to pedestrian safety. The coalition also identified the East Chattanooga Recreation Center, located along Dodson Avenue as a site for school zone stencils and other upgrades.

Project Details

As part of a suite of improvements in 2012, the local coalition installed school zone stencils and a dynamic speed feedback sign on the N. Orchard Knob corridor. The speed sign shows drivers the posted speed and uses radar technology to display the measured speed of drivers passing the sign. These signs have been shown to be effective in reducing motor vehicle speeds. The coalition also placed school zone stencils along the Dodson Avenue corridor, near the East Chattanooga Recreation Center. To supplement this activity, the coalition performed in-school education and coordinated with the local police to perform speed enforcement at key times during school arrival and dismissal periods.

Outcomes

To assess the impact of the project, the coalition worked with local police to perform speed studies at three locations near project sites before and after the improvements were made in the summer of 2012. Speed data collected in May 2012 were compared with data collected in December 2012 to assess the impact of the safety improvements. Data collected along N. Orchard Knob showed an average 85th percentile speed of 37.9 miles per hour and an overall average speed of 26.5 miles per hour before the school zone stencils and speed feedback sign were installed. Data collected after these improvements, in December 2012, showed that the 85th percentile speed decreased slightly to 36.7 miles per hour. However, the overall average speed increased to 31.4 miles per hour. On the Dodson Avenue corridor, 85th percentile speeds before the improvement were measured at 38.9 miles per hour, while the average speed was 34.3 miles per hour. After the school stencils were installed on Dodson Avenue, the 85th percentile speed was measured at 39.7 miles per hour and the average speed was 34.7 miles per hour, essentially showing no change between the two periods. The conclusions of the speed study indicate a desired reduction in the 85th percentile speed on the corridor where the dynamic speed feedback sign was installed, but the rise in the average speed may require further assessment to better understand its causes.

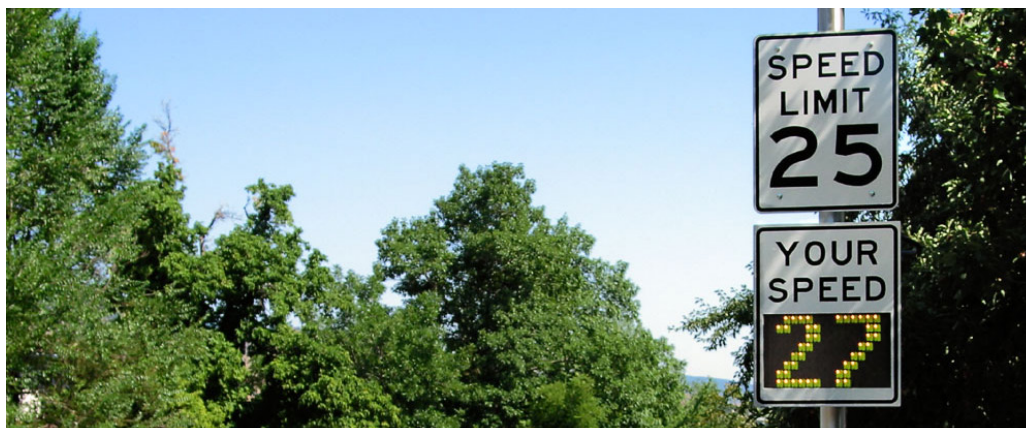


Photo source: Richard Durdul, Wikimedia Commons

Figure 1.
Example of a
dynamic speed
feedback sign

Safety Improvements at Graham Hill Elementary School

Safe Kids Seattle | Seattle, WA

Background

In May of 2011, the Safe Kids Seattle coalition selected Graham Hill Elementary School as the site for its Safe School Zone grant project. In reviewing data from 2002 to 2006, the coalition found that one pedestrian crash had occurred directly in front of the school. Numerous instances of near misses and other conflicts led the school to prioritize this location for safety improvements. The two-way, two-lane road was often congested and led to risky behaviors on the part of all road users.

Project Details

Safety improvements were planned and implemented on the school property and in the surrounding area. Those included speedbumps, curb ramp and crosswalk upgrades, and a painted intersection to calm traffic speeds.



Figure 2. Students painting an intersection mural (left) and crosswalk improvements and curb ramp upgrades (right) near Graham Hill Elementary School

Outcomes

Initial assessments of speeds along South Graham Street, prior to changes being made in 2011, revealed an 85th percentile speed of 28.3 miles per hour, with about 36 percent of vehicles exceeding 25 miles per hour. Following the speed hump installation, painted crosswalk, intersection improvements and other changes, speed data were collected again on South Graham Street. These data showed an 85th percentile speed of 23.1 miles per hour, about 5 miles per hour lower than before the treatments. Furthermore, only 7.4 percent of vehicles exceeded 25 miles in the after period, compared with 36 percent in the before period. These results indicate a clear improvement in safety due to lower traffic speeds.

As mentioned previously, one pedestrian crash occurred on South Graham Street in front of the school in 2006. In terms of longer-term follow-up, based on a review of crash data through the end of 2017, made available by the Seattle Department of Transportation, there have been no pedestrian crashes along South Graham Street near the school since the project was completed in 2011.

Intersection Improvements at Cobbs Creek Parkway

Safe Kids Southeastern Pennsylvania | Philadelphia, PA

Background

In 2011, the intersection of Cobbs Creek Parkway with Marshall Road and Spruce Street was identified by the local coalition and its partners as a priority for pedestrian safety improvements. It is a major intersection that handles a great deal of daily traffic, a high volume of pedestrians and sits in close proximity to numerous schools for children of all ages.

To improve safety at the intersection, the local coalition worked with a number of partners to improve pedestrian visibility and access. Since the intersection was already scheduled to receive updates from the Pennsylvania Department of Transportation (PennDOT), the grant funds were able to support an even larger project that was already scheduled.

Project Details

The intersection received new pedestrian signals with countdown timers and push buttons. The crosswalk markings themselves were repainted in a high-visibility pattern and widened to accommodate higher pedestrian volumes. Curb ramps were upgraded on all four corners to improve accessibility. Advance stop bars were installed for vehicles approaching the intersection, along with supplemental signage to keep vehicles from blocking the crosswalk.

Outcomes

Using PennDOT's Pennsylvania Crash Information Tool (PCIT), we were able to document a total of 32 crashes within 300 feet of this intersection in the six years prior to the improvements being made (2006 to 2011). Of those, three crashes involved a pedestrian. A similar six-year period (2012-2017) was selected to compare crash outcomes after the project was completed. During that period, a total of 43 crashes occurred at the intersection, and six involved pedestrians. It is important to note that this increase in crashes could be due to a wide range of factors, and is not necessarily caused by the intersection improvements. For example, an increase in crashes could be due to increases in traffic volume or other changes in traffic patterns that occurred beyond the scope of the grant-funded improvements at the intersection.



Figure 3. The intersection of Cobbs Creek Parkway with Marshall Road and Spruce Street before (left) and after (right) Safe School Zone improvements.



Figure 4. Ground-level view of the intersection improvements at Cobbs Creek Parkway and Marshall Road before (left) and after (right) changes were made.

Pedestrian Signal and Intersection Upgrades at Williston Middle School

Safe Kids Cape Fear | Wilmington, NC

Background

In 2012, Safe Kids Cape Fear, which is based in New Hanover County in North Carolina, focused its project in the City of Wilmington. Wilmington is one of the top ten largest cities, by population, in North Carolina, and the largest municipality located on the coast.

Though very close to the central business district in downtown Wilmington, the neighborhood of focus has longer block lengths that offer fewer crossing opportunities. For the many pedestrians who use the area on a regular basis, travel is made more difficult by the fact that the neighborhood is bisected by an extension of US Highway 76, which carries a high volume of traffic through the City.

Within this neighborhood, a specific area of need was identified. This area is anchored by a large community park, a middle school, and an elementary school. A bus line runs through the neighborhood, which also is home to two large public housing campuses. More than 13 percent of households do not have access to a motor vehicle.

In targeting this neighborhood, it was determined that the most need existed at the intersections where high-traffic corridors met low-volume streets leading to and from schools, parks, and housing complexes. Pedestrians walking along these low-volume streets were not able to call the signal in their direction of traffic without a motor vehicle first entering the queue. Only when vehicles approached the signal on the minor leg would the light turn green and allow pedestrians to cross. Therefore, many pedestrians relied upon spotting gaps in traffic and crossing against the light. In addition to the lack of suitable signal systems for pedestrians, crosswalk markings were faded and barely visible, and curb ramps were either nonexistent or in need of upgrade. No pedestrian crashes occurred at this site (using data from 2007 to 2011), yet there was a clear need for improvement based on the potential risk for a crash to occur.



Figure 5. Aerial views of Castle Street and 8th Street before (Left) and after (Right) improvements were made

Project Details

The first proposed intervention involved upgrading the signals, crosswalks, and pavement markings at two key intersections in the targeted neighborhood. Specifically, South 10th Street intersected with both Wooster Street and Dawson Street, which served as multilane one-way pairs carrying a high number of vehicles through the neighborhood. Those intersections lacked crosswalks, pedestrian signals, push-buttons, and proper curb ramps. Upgrading the intersections would improve crossings for pedestrians traveling along South 10th Street.

Though initially approved during the workshop, the project experienced delays due to the fact that the intersecting roads were owned by different jurisdictions. While the City of Wilmington controlled South 10th Street, both Wooster Street and Dawson Street were owned and maintained by the North Carolina Department of Transportation. Unfortunately, new design requirements would have required more financial investment to make improvements at the site. Since this amount exceeded the grant amount, the task force had to find a new project to support. The City and State agencies agreed to give future priority to these intersections, and the task force went back to the drawing board to select new intersections where the funds could be used.

The group quickly identified two other nearby intersections that suffered from similar deficiencies. The intersections of Castle Street with South 10th Street and South 8th Street were determined to be the best match. Castle Street carried a high amount of traffic and also served as a local transit corridor, intersection the minor streets of South 10th Street and South 8th Street. Pedestrians crossing at these intersections also had to wait for cross traffic to call the traffic signal, since there were no push buttons. The intersections also lacked pedestrian signals and upgraded curb ramps. Crosswalk markings existed, but were faded and not visible to either motorists or pedestrians.

To improve conditions for pedestrians, both intersections received upgrades to curb ramps, as well as pedestrian signals and push buttons in the direction crossing Castle Street. As shown in Figures 5 and 6, the pedestrian push buttons, pedestrian signals, and high visibility crosswalk markings were focused only on one leg of the intersection, where most pedestrians had been crossing. This focus allowed the task force to make improvements at two intersections, instead of just one.

In addition to physical improvements at the sites, the local coalition provided pedestrian safety education to children in the schools near the project site, in cooperation with the local Police and Sherriff's Departments. Classes were taken to the intersection to practice using the push buttons and learn safe crossing behaviors. The Bike Patrol of the local Police Department also assisted with increased enforcement in the area to support these improvements.

Outcomes

To assess the impact of the pedestrian improvements at the intersections of Castle Street with South 8th Street and South 10th Street, observational data were collected at the primary crossing of each intersection. Pedestrians were observed as they crossed the intersection to determine compliance with the traffic signal and presence in the crosswalk. Motor vehicle yielding behavior (specifically left- and right-turning vehicles) was recorded, as was the overall number of pedestrians present during the before and after period.

Observational data were collected at the site in the before period for one hour during morning arrival and one and a half hours during afternoon dismissal on January 31, 2012.

The observations were repeated during morning arrival and afternoon dismissal in the after period, on May 31, 2012. Conditions were similar for both the before and after periods in terms of temperature and weather conditions. A total of 54 pedestrians were observed in total during the before period, compared with 45 pedestrians observed in the after period. While the overall number of pedestrians decreased, there was a documented increase in the percentage of pedestrians crossing with the appropriate signal, from 40.7 percent to 62.2 percent. Furthermore, only one pedestrian was seen crossing outside of the crosswalk in the after period, compared to six in the before period. Of the 45 pedestrians observed in the after period, 18 (or 40 percent) used the push button when crossing the street. Unfortunately, a pushbutton was not present in the before period so pushbutton use data could not be recorded during that period.

Longer-term follow-up data were collected on April 9, 2018, approximately six years after the project was implemented and the most recent data were collected. The same observations were collected at the intersections during arrival and dismissal. Overall there were fewer pedestrians observed during this period than in the previous observations. A total of 34 pedestrians were observed crossing at the crosswalks improved during the project. Of those, 29 (85 percent) used the push button activated walk signal. There were only 10 vehicles turning during the time of the pedestrians crossing, but all of those yielded to pedestrians when making their turns, allowing the pedestrians to complete their crossing before turning.



Figure 6. Ground-level view before (left) and after (right) changes at Castle and 8th

In terms of crashes, there had not been a pedestrian crash near these intersections prior to the installation of the treatment (based on data available since 2007). In the time since the projects have been in place through the end of 2017, there have not been any crashes involving pedestrians at the project sites. Though there were no crashes before the improvement was made, it is promising to see that none have occurred since it was installed.

The follow-up evaluation resulted in a very similar finding to the previous period: pedestrian traffic was somewhat low at these two sites, and overall numbers of pedestrians decreased between the initial observations and the follow-up period. However, the results show a promising shift toward safe crossing behaviors by pedestrians. In particular, the fact that 85 percent of pedestrians used the push button before crossing and all of the vehicles yielded to those pedestrians indicates a sustained benefit from the project.

Crosswalk Improvements at Torah Day School

Safe Kids DeKalb | DeKalb County, GA

Background

Located just East of downtown Atlanta, Georgia, the project in DeKalb County in 2012 focused on a high-traffic corridor near a local school. Specifically, Torah Day School of Atlanta is an Orthodox Hebrew school that includes children from Kindergarten through 8th Grade. A very high percentage of students walk to and from school on a regular basis. This represented 250 of the 337 school enrollment that year. When follow-up observations were collected in 2018, local partners estimated that roughly half of the school's 335 students walked to school. This is partly due to religious practices, and those numbers even increase on religious holidays.

The major corridor that runs past the school is LaVista Road, which serves as a connection between major employment centers like Emory University, Emory Hospital, and the Centers for Disease Control and Prevention. Observations from local groups noted that traffic volumes and crashes, along with risky driving behaviors, increased markedly during morning and afternoon hours. These behaviors coincided with the school's arrival and dismissal times, presenting unsafe conditions for students walking to and from school.

The project site specifically experienced unsafe motorist behavior due to increasing traffic volumes at peak travel times. An acceleration lane from a nearby neighborhood was located at the school's primary crosswalk. The lane allowed vehicles to pass a left turning vehicle on the right, creating an additional lane of traffic at the site of the crosswalk. The lane can be seen in the bottom right corner of the image above.

Project Details

The overall purpose of the project at Torah Day School was to improve the safety of pedestrians while crossing LaVista Road. There were several major environmental changes associated with this project, including a raised median, elimination of the acceleration lane, and the addition of a rectangular rapid flashing beacon (RRFB).



Figure 7. Aerial view of the Torah Day School project before (left) and after (right) improvements were made

Due to the length of the crossing, the task force decided to build a raised concrete median island where there was previously a painted median. This raised median would serve to eliminate illegal passing by motor vehicles, and to provide a refuge area for pedestrians who wanted to focus on crossing one leg of the crosswalk at a time.

Secondly, the decision was made to completely eliminate the acceleration lane coming from the southern neighborhood to LaVista Road. By removing this lane, vehicles would not be able to make a high-speed passing maneuver to the right of a left-turning vehicle, thereby reducing the risk of high-injury crashes at the crosswalk. Also, by eliminating the slip lane, the sidewalk was widened and extended into the roadway to decrease the overall length of the crossing.

Finally, the task force chose to install a system of RRFB signs on both sides of the crosswalk. These push-button activated beacons provide a high-intensity rapid flash indicator when the button is pressed, making the crosswalk more visible to approaching motorists. The signs replaced existing crosswalk signs.

The local coalition added a number of education and enforcement measures to the project to enhance the environmental modifications. This included education and outreach to the local community about pedestrian safety issues, as well as pedestrian safety education for the children in the school. Local law enforcement also agreed to monitor speeds along the corridor and retrain school crossing guards at this location.



Figure 8. Ground-level view of the crosswalk at Torah Day School before (left) and after (right) the installation of the median, curb extension, and RRFB

Outcomes

Observations of pedestrians crossing to and from Torah Day School were collected during the before period in September 21, 2011. These observations were collected during one hour of morning arrival and one hour of afternoon dismissal. The same data were collected during the after period in May 29, 2012. Conditions were similar in the before and after periods, in terms of temperature and weather conditions. Based on this initial period, there was not a noticeable increase or decrease in the number of pedestrians observed or the yielding behaviors of motorists between the before and after periods. A total of 119 pedestrians were observed in the before period, compared to 122 pedestrians observed in the after period. The number of vehicles failing to yield to pedestrians or crossing guards remained the same: eight in the before period and eight in the after.

There was one major difference between the before and after periods. In the before period, 35 of the pedestrians were observed crossing in an organized group with school officials and crossing guards at one time. In the after period, a total of 70 students crossed the street in this fashion, but in two separate groups. In talking with officials at the school, this process was used to get as many children across the street at one time as safely as possible. While certainly a positive step for the safety of those crossing, it is not possible to attribute this change solely to the physical modifications at this site.

In June 2018, project team members visited the site to collect additional follow-up observations to assess the project's longer-term impact. These observations were collected about six years after the initial after period data were collected. Overall there were nearly the same number of pedestrians observed in this period (129) as there were in the two previous rounds of observation. There were more vehicles observed during these crossings than in the previous period. Of the 28 vehicles approaching the crosswalk in during the crossings, only three did not yield to the pedestrians (resulting in a yielding rate of 89 percent).

Prior to the installation of the crosswalk, there had not been a pedestrian crash in the general vicinity of the project site. Though there were factors contributing to the risk of a crash, none had occurred. Reviewing data available through the Georgia statewide GEARS crash database, it was determined that no pedestrian crashes occurred in the vicinity of the project site between January 2013 and December 2017. It is important to note that crash data prior to 2013 were not readily available, and therefore there is a nearly two-year period for which we do not have crash data following the installation of the treatment. No reports of crashes at the site could be found from other sources, and we can say with some confidence that none occurred during this period.

These findings indicate that there were no major increases in pedestrian activity over time and vehicle yielding rates remain quite high. In reviewing the site and speaking with local partners, there is a desire to continue making improvements to support pedestrian safety in this area. Some observations were made about vegetation and shrubs that are approaching the roadway and potentially blocking the RRFBs from view. A recommendation was made to maintain the area and keep the signs clear so they can be seen by oncoming motorists.

Safety Improvements at Highland Park Elementary School

Safe Kids Seattle | Seattle, WA

Background

Safe Kids Seattle has been an active participant in Safe Kids Worldwide pedestrian safety activities and programs. For the 2012 project, this coalition chose to focus its efforts at an area near Highland Park Elementary School. Located in a primarily residential area approximately eight miles south of downtown Seattle, Highland Park Elementary is located in a very walkable area that helps facilitate student trips to school by foot. This location helps minimize the need for parents to drive their children to and from school, instead allowing for fairly easy walking trips.

Though the street layout and availability of sidewalks contribute to a comfortable walking environment, several key crossings near the school were targeted as problem areas. Crashes were dispersed in the area, and did not cluster at any particular location. However, discussions with local stakeholders and officials revealed two locations where safety for children walking to and from school was a concern. These sites included two crossings at the school location, and one critical crossing along the route to school.

Each of these intersections, located at the school property, lacked marked crosswalks across several legs of the intersection. In several cases, students traveling to school did not have marked crosswalks to facilitate the crossing of one of the major streets around the school property, and student safety patrols were not legally capable of stopping traffic to facilitate this crossing due to the lack of a marked crosswalk. Curb ramps at these intersections were also in need of repair.

This problematic crossing was located less than one mile north of the school property and serves as a critical for children walking to school. With a volume of 16,000 vehicles per day, Holden Street was the highest volume road that needed to be crossed on a typical walking trip to Highland Park elementary school. Though it was a critical crossing point, there were no marked crosswalks across Holden Street in a roughly half mile stretch surrounding this intersection. In addition to posing a safety risk for students, this intersection had been targeted as a priority area for the larger community and neighborhood due to its proximity to several neighborhood parks.

Project Details

Following the Safe Kids coalition's workshop, the community agreed on several improvements at each of the targeted intersections. Near the school site, at the intersections with SW Trenton Street, the task force recommended the addition of an additional crosswalk at each intersection. These new crosswalks would facilitate pedestrian travel to each of the corners of the school property across Trenton Street and 10th Avenue SW and 11th Avenue SW, respectively.

In addition to the new crosswalks, two curb extensions were added to the intersection of SW Trenton Street and 11th Avenue SW. The primary reason for adding curb extensions was to shorten the overall crossing distance at this intersection and to improve pedestrian visibility at this crossing. The extensions allowed the pedestrians to begin their crossing in a more visible position, rather than crossing from behind parked vehicles.



Figure 9.
Improvements at
SW Trenton Street
and 11th Avenue
SW before (left)
and after (right)
the project was
completed

At the SW Holden Street at 11th Ave SW location, the primary improvement was the installation of a high visibility crosswalk along with upgrades to each of the curbs. On the north east corner, a curb extension was added to shorten the crossing distance across Holden and improve pedestrian visibility to motorists.



Figure 10. The intersection of SW Holden Street and 11th Avenue SW, located a distance away from the school, before (left) and after (right) improvements.

At all of the locations, supplemental pedestrian signage was added to further emphasize the crosswalks and improve pedestrian visibility.

In addition to physical improvements, the local coalition proposed several educational and enforcement activities to help support pedestrian safety in the area. These activities included a parent meeting to discuss pedestrian safety, law enforcement during pick up and drop off times, and the development of walking routes to and from school as well as maps showing these routes.

Outcomes

To assess the impact of the pedestrian improvements, data collectors chose to focus on the improvements made at the corner of SW Holden Street and 11th Avenue SW. This location was selected since it was the highest traffic site and had the potential for more severe crashes. Pedestrians were observed as they crossed the intersection during both the before and after periods. Motor vehicle yielding behavior was recorded, as was the overall number of pedestrians present during the before and after period.

Observational data were collected at the site in the before period for one hour during afternoon dismissal on May 21, 2012, and one hour during morning arrival on May 22, 2012.

The same data were collected during morning arrival and afternoon dismissal in the after period, on April 27 and April 28, 2015. Using observations from this initial comparison, a total of 37 pedestrians were observed in total during the before period, compared with 45 pedestrians observed in the after period – a slight increase from the before period. In the before and after periods, it was very difficult to assess rates of yielding to pedestrians due to the heavy traffic along the corridor. Traffic was at a standstill when pedestrians arrived at the corner, and so all of them were able to cross from one corner to the next while traffic remained stalled.

Follow-up observations were conducted during afternoon dismissal on June 14 and arrival on June 15, 2018, approximately three years after the previous period was completed. Between 2015 and 2018, the project site had received further upgrades from the Seattle Department of Transportation (SDOT). In June 2015, the intersection was upgraded with a set of push-button-activated Rectangular Rapid Flashing Beacons (RRFBs). During the follow-up data collection period, traffic was fairly low and therefore more free-flowing vehicles were observed during the pedestrian crossings. This free movement allowed observers to more readily assess vehicle yielding behavior.

During the follow-up observations, a total of 39 pedestrians were observed crossing the crosswalk, which represents neither a significant increase or decrease from previous periods. Those pedestrians accounted for 27 unique crossings (several pedestrians crossed in small groups), and during all of the crossings a pedestrian activated the push-button RRFB. During the 27 crossings, 40 vehicles were observed approaching the crosswalk, of which 34 (85 percent) yielded to the pedestrians. This overall yielding rate is in line with other observed RRFB and curb extension installations. While the volume of traffic during previous periods makes it difficult to assess the change in yielding behavior before and after the project, these findings are promising and indicate a relatively high rate of yielding by motorists.

In addition to the data collected above, the local coalition documented changes in motor vehicle speeds as part of another component of the project: speed cushions placed along 10th Avenue Southwest. This corridor runs along one side of the school property and features several crossing locations used by children. Speed data collected along the corridor before (April 2012) and after (October 2012) installation of the speed cushions documented a reduction in the 85th percentile speed of 18 percent, from 29.7 miles per hour to 24.2 miles per hour. Vehicles traveling above the speed limit of 25 miles per hour decreased by 72 percent, and vehicles traveling more than 35 miles per hour decreased by 81 percent. These speed reductions help create a safer environment for both motorists and pedestrians traveling along and crossing 10th Avenue SW.

Crash data made available through the City of Seattle's Open Data portal and its Vision Zero Dashboard were reviewed. The database includes crash records dating back to 2004 and as recent as the full year of 2017. There were no crashes at or near the various project sites prior to the installation of these grant-funded treatments. There was, however, one pedestrian struck downstream of the intersection of SW Holden Street and 11th Avenue SW, approximately 250 feet East of the improvements made at this intersection. Further details about this crash, including the age of the pedestrian or the circumstances that led up to the crash, could not be located. The crash occurred on a Sunday night at 7:00pm, so we can probably determine that it was not related to school travel.

Crosswalk and Traffic Improvements at Treadwell Elementary School

Safe Kids Memphis | Memphis, TN

Background

The 2012 project in Memphis, Tennessee, was the result of a months-long data analysis effort conducted in collaboration between Safe Kids Worldwide, the UNC Highway Safety Research Center, and the local task force. In order to identify sites in need of improvement, pedestrian crashes occurring across the city were analyzed and used to identify crash hot spots. These high-density crash locations were reviewed during field visits, and ultimately a final candidate site was selected.

The selected site was the property containing both Treadwell Elementary School and Treadwell Middle School. Between 2003 and 2011, the area around Treadwell had experienced 16 pedestrian crashes. Of those crashes, ten involved children under the age of 15, and five resulted in either fatal or serious injuries.

During the site review period, it was determined that Highland Street should be the primary focus of the project. This corridor is a busy, four-lane road that carries a great deal of traffic past the school. The corridor separates the school from a nearby neighborhood, and though there were existing crosswalks, these facilities were nothing more than faded markings with no additional treatments. The combination of multiple lanes of traffic, high traffic volumes and speeds, and the existence of only marked crosswalks created a high-risk location for those crossing Highland Street to and from the school.

In addition to the problems associated with these crosswalks, the workshop in Memphis also revealed issues with the pick-up and drop-off procedures at the school. Congestion associated with these procedures caused safety risks for children and prompted aggressive and sometimes dangerous driving behaviors on the part of parents.

Project Details

The primary improvements completed as part of this project were the upgrades made to two crosswalks across Highland Street. Each crosswalk was upgraded to a high visibility marking pattern, and Rectangular Rapid Flashing Beacons (RRFBs) were installed at each site. The RRFBs are push-button activated, stutter-flash systems that draw driver attention to the crosswalk when a pedestrian is attempting to cross. To help improve site distance and driver visibility at the site, supplemental pavement markings were installed to require drivers to stop ahead of the crosswalks when pedestrians are crossing. These advance stop bars reduce the risk of “multiple threat” crashes that sometimes occur when drivers pass other drivers who are yielding to pedestrians. By stopping further back from the crossing, visibility is improved and pedestrians are able to better determine whether drivers have stopped for them.



Figure 11. The view of the crosswalk at Highland Street before (left) and after (right) the installation of the RRFB system.

In addition to these crosswalk improvements, the school worked with FedEx to reassess its pattern for pick-up and drop-off procedures. These improvements resulted in a smoother traffic operation around the school property. Additional improvements were made by trimming back vegetation and upgrading school zone signage to improve safety and visibility around other parts of the school area.

Outcomes

To measure the ability of the site improvements to improve safety, pedestrian crossings were observed at the two main crosswalks at Highland Street during the before and after periods. Observational data were used to primarily monitor pedestrian behavior and determine if there was any change in the number of pedestrians crossing at these locations.

Data were collected on September 29, 2012 during afternoon dismissal and October 1 during morning arrival (the “before” period). Similar data were collected during the “after” period on September 10 and 12, 2014. During this initial period, there was a large increase in the number of pedestrians crossing at these locations, from 538 to 777. In fact, there were 239 more pedestrians observed crossing during the after period, which represents an increase of about 44 percent. At the same time, pedestrian behaviors also seemed to improve when comparing the before to the after period. More pedestrians were observed stopping at the curb, looking left-right-left, and following the instructions of the crossing guard. Risky behaviors like running across the street and weaving in and out of traffic decreased.

Follow-up observations were made at Treadwell Elementary School in February 2018. Overall there were fewer pedestrians observed in 2018 than there were during the initial “after” period data in 2014 (613 versus 777), however the number was still higher than the initial observations in 2012. This appears to be a natural fluctuation and may mean that the data collected during the first “after” period was randomly higher than what would be expected on a normal day. Observations of pedestrians showed that they observed crossing guards and waited for traffic to stop before crossing. The push buttons at the RRFB were used during the crossings. These findings indicate that the improvement is continuing to work as intended, even after more than three years since it was assessed.

In addition to the observational data collected above, local police also collected speed data along Highland Street in the before and after conditions. Speeds were measured for eight days in September 2012, before the modifications were made, and eight days in September 2014, after the project was completed. In both periods, the posted speed of 40 miles per hour was unchanged. During the before period, the average speed recorded was 42.76 miles per hour. During the after period, the average speed dropped by about 8 miles per hour, to 34.04 miles per hour. Further speed data were collected in April 2018, but only for a few days during daytime hours to capture free-flowing vehicles. The average speed recorded during this period was 38.7 miles per hour. This is higher than the initially observed speed on the corridor after the improvement was made, but not as high as the average speed recorded during the before period. If more speed enforcement were conducted along this corridor on a regular basis, this may help keep speeds at the desirable level for this corridor.

To further assess the impact of this project on safety in Memphis, HSRC examined records of police-reported crashes occurring in the vicinity of Treadwell Elementary School and three other comparison sites. As mentioned previously, there were 16 crashes involving pedestrians that occurred within a quarter mile of Treadwell Elementary School between January 2003 and December 2011. We looked at Treadwell’s crash experience since the crosswalk was improved, specifically from January 2013 to June 2019 (the most recent month available), and compared it to the crash experience of three comparison sites:

- Dunbar Elementary School, 2606 Select Ave, Memphis, TN
- Cherokee Elementary School, 3061 Kimball Ave, Memphis, TN
- Klondike Prep Academy, 1250 Vollintine Ave, Memphis, TN

Each of these sites had been a candidate for a pedestrian safety improvement during the 2012 workshop that had resulted in the selection of Treadwell Elementary School. Each site features an uncontrolled crossing along a corridor similar to N. Highland Street, where Treadwell Elementary School is located. Each of these sites also had experienced crashes involving pedestrians within a quarter mile of the school between 2003 and 2011:

- Dunbar Elementary School: 18 crashes involving pedestrians
- Cherokee Elementary School, 15 crashes involving pedestrians
- Klondike Prep Academy, 19 crashes involving pedestrians

To assess the crash outcomes at each of these schools compared to Treadwell Elementary School in the period since the treatment was installed, HSRC acquired reported crash records for Shelby County through the Tennessee Department of Transportation (TDOT) TITAN database. The database contained records for 622 crashes involving pedestrians or bicyclists in the period of time between January 2013 to June 2019. Unfortunately, a portion of the crashes occurring prior to 2015 (estimated by Tennessee DOT at 30 to 50 percent of all records) did not contain corresponding spatial data and were unable to be mapped. Therefore, the analysis is based on only the 50-70 percent of records that did have spatial data. We looked at whether these crashes occurred within a quarter mile of the four schools of interest: Treadwell Elementary, Dunbar Elementary, Cherokee Elementary, and Klondike Elementary. The assessment revealed the following:

- Treadwell Elementary School: 0 crashes involving pedestrians
- Dunbar Elementary School: 4 crashes involving pedestrians
- Cherokee Elementary School, 0 crashes involving pedestrians
- Klondike Prep Academy, 0 crashes involving pedestrians (NOTE: Klondike Prep Academy was closed in 2016)

Considering these crash statistics, there was a fairly dramatic reduction in pedestrian-involved crashes in the vicinity of these schools when comparing the periods before and after the Treadwell Elementary School project was completed. The reduction in crashes at Treadwell Elementary School may not only be attributed to the project implemented at that site considering that similar reductions were documented at other comparison schools. However, considering the inaccuracy of the location data and the corresponding crashes that could not be mapped prior to 2015, we may not be seeing the full sample of crash events that occurred at these four sites.

Taking this all into consideration, the Treadwell Elementary School project continues to be a success and serve as a model for other related projects occurring in Memphis. In addition to these measurable outcomes, the project at Treadwell Elementary School helped launch the development of a citywide Pedestrian and School Safety Action Plan. Completed between 2013 and 2015, that plan uses a similar set of data to identify and prioritize safety projects across the entire city that can be implemented to improve child pedestrian safety. The Safe School Zone project can count this as a “win” and take some credit for the plan.

Crosswalk and Sidewalk Upgrades at Carl Rhodenizer Recreation Center

Safe Kids Georgia | Clayton County, GA

Background

The 2011 project site in Clayton County Georgia was selected after reviewing a number of other sites in the area. Three other locations were reviewed based on data collected by the local task force, but the site on Rex Road was selected as the final location for improvement. The specific location selected for improvement was the area of Rex Road at the Carl Rhodenizer Recreation Center. This recreation center is the base for many youth events such as summer camps and other recreational activities. There are three schools within just a few miles of the site, and collectively there are around 200 students who walk or ride bikes to these schools. Nearby residents use the recreation center for its park, swimming pool, and gyms, on a regular basis. In 2010, a child pedestrian was struck on Rex Road across from the recreation center, and one of the county commissioners began to push for safety improvements at this site.

Specific problems at the site included the fact that there was no crosswalk leading from the neighborhoods across the street to the recreation center. Additionally, there was no sidewalk on the far side of Rex Road, opposite the recreation center, despite the volume of foot traffic in the area. The Safe Kids workshop in November 2011 allowed the local task force to finalize plans for improvements at the site.

Project Details

As mentioned above, the project focused on establishing a crosswalk at the entrance to the recreation center to help facilitate foot traffic between the recreation center and nearby neighborhoods. A high visibility crosswalk was added at this location, complete with a push-button activated rectangular rapid flashing beacon (RRFB). The RRFB allows a pedestrian to push a button to activate a high-frequency stutter flash beacon that draws motorists' attention to pedestrians attempting to cross the street.

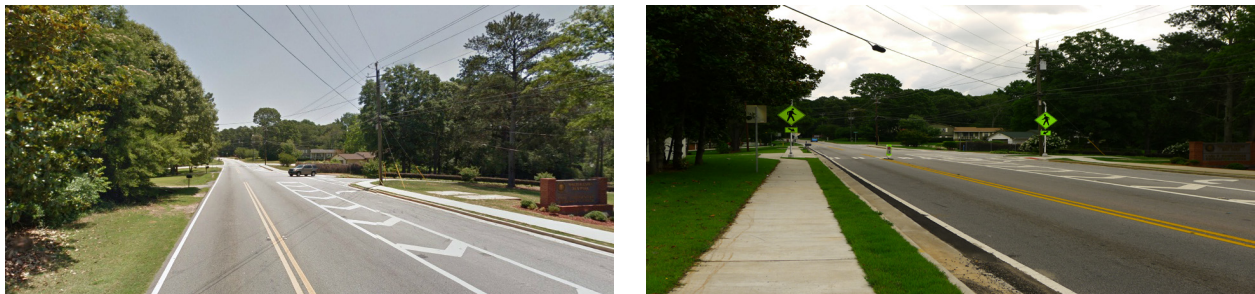


Figure 12. Street-level view of the reconfigured road and crossing before (left) and after (right)

In addition to the crosswalk improvements, a sidewalk was also added to the north side of Rex Road, across the street from the recreation center. This sidewalk would allow pedestrians to travel from the nearby neighborhoods to the crosswalk and allow them to cross at the entrance. Prior to the installation of the crosswalk, pedestrians were observed crossing all along the corridor, as they were not capable of safely walking down the street toward the recreation center entrance. The resulting project transformed the corridor and allowed pedestrians to travel much more easily to and from the recreation center from surrounding neighborhoods.

In addition to the physical improvements at the site, education and media events also took place in the area. The task force was successful in getting three news stories in the local media – two in newspapers and one television story. Educational sessions were held at the recreation center concurrent with project implementation in June and July 2012, kicked off with a groundbreaking event.

Outcomes

Assessing the impact of the project in Clayton County was done by observing changes in pedestrian behaviors along the entire Rex Road corridor near the recreation center, as opposed to observing only one location. Since a crosswalk did not exist in the before condition, it was not possible to measure changes in crosswalk use.



Figure 13. Map of zones used to assess pedestrian crossing locations and measure project impacts

To monitor pedestrian activities, staff divided the 0.20 mile corridor into six sections, each measuring 175 feet in length (as shown in Figure 13). Observations of pedestrian behaviors within each of those zones, specifically crossing location, were recorded during two days in the before period and two days during the after period. Data collection was conducted during the summer months when camps held at the recreation center increased the overall amount of foot traffic. Following an initial comparison of data collected before the treatment installation (July 2012) with data collected after the installation (July 2014), our team returned to the site in July 2018 to collect follow-up observations.

The table below compares the position of pedestrian crossings during the before and after periods. The numbers indicate the number of pedestrians crossing in that zone, and the percentage indicates the percentage of crossings within that zone compared with the total. There were comparable numbers of pedestrians observed in the before and after periods (46 and 54, respectively). In the before period, crossings were fairly well distributed along the corridor: nearly 20 percent of crossings in zone 1 and another 20 percent of crossings in zone 2. Zone 6 had the majority of crossings with 43.5 percent. Only 6.5 percent of crossings occurred at the entrance to the recreation center.

Table 1. Pedestrian Observations along Rex Road by Zone (Before vs After)

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5 | Zone 6 | TOTAL |
|----------------------------|------------|-----------|----------|-----------|------------|------------|-------|
| Before (July 2012) | 10 (21.7%) | 9 (19.6%) | 4 (8.7%) | 0 (0%) | 3 (6.5%) | 20 (43.5%) | 46 |
| After (July 2014) | 12 (22.2%) | 6 (11.1%) | 5 (9.3%) | 0 (0%) | 14 (25.9%) | 17 (31.5%) | 54 |
| Follow-Up (August 2018) | 12 (25.0%) | 0 (0.0%) | 4 (8.3%) | 6 (12.5%) | 23 (47.9%) | 3 (6.3%) | 48 |

In the after period, more crossings were observed at the entrance to the recreation center (zone 5). This zone had about one quarter of all crossings, while fewer crossings were observed in zones 2 and 6. The fact that more crossings occurred at the location entrance could be due to the fact that a crosswalk was installed to improve the safety of the crossing. It is also likely due to the new sidewalk, which allowed pedestrians to more easily access the entrance on foot. One other notable finding is that all crossings in zone 5 during the “after” period occurred within the crosswalk. Only half of the 14 pedestrians who crossed at the crosswalk activated the push button for the RRFB. During a follow-up period in August 28, 48 total pedestrians were observed crossing in one of these six zones. Unlike both previous periods, the largest percentage of these crossings took place in Zone 5 (more than the previous two periods). Zone 1 (nearest to the signalized intersection) saw a similar share of crossings as had been documented in previous periods. Fewer crossings occurred in Zone 6 than in the previous periods. Overall these results are promising, given that more pedestrians were observed crossing at the crosswalk area than in previous periods.

To assess the crash history at the site, team members reviewed data provided in the Georgia statewide GEARS crash database. Data prior to 2013 were not available at the time of the query. Since 2013, the year when the treatment was installed, there have been two crashes along the corridor, neither involving pedestrians. The initial data collection performed by the local coalition documented no pedestrian crashes during the years 2010-2011. Though we are missing data from 2012, the available data indicate that the project performed at the site resulted in no increased risk of pedestrian crashes.

These are promising results, suggesting that the provision of a new crosswalk and sidewalk may have encouraged pedestrians to cross closer to preferred locations, rather than crossing along different parts of the corridor.

Intersection Conversion at Harrison Primary School

Safe Kids Peoria Area | Peoria, Illinois

Background

In 2012, Safe Kids Peoria selected Harrison Primary School, which sits in the middle of a predominantly residential neighborhood in the southeast section of the city. Due to its location and the abundance of sidewalks, the school has a large number of students who walk to school. In addition to the school itself, the property also features a community park that is used by residents of all ages.

Speeding vehicles were cited as one of the major concerns around the school. A Walk to School Day volunteer was almost struck by a vehicle while helping children cross the street. In a survey, residents only ranked the area's sidewalks, streets and crossings as "mediocre."

Project Details

The location selected for improvement was located at the northeast corner of the school property, at the intersection of S. Griswold St. and W. Grinnell St. Though the intersection featured crosswalk markings, it was only stop-controlled in one direction, meaning two of the legs required vehicles to yield to pedestrians. The width of the street influenced higher driver speeds, and a crossing guard's presence was necessary for bringing children safely across the intersection.

To address these problems, the intersection was converted to an all-way stop by adding a stop control on the previously uncontrolled leg. Pavement markings were refreshed to increase the visibility of the crosswalks, and parking lanes were added using paint to help narrow the roadway and deter speeding.

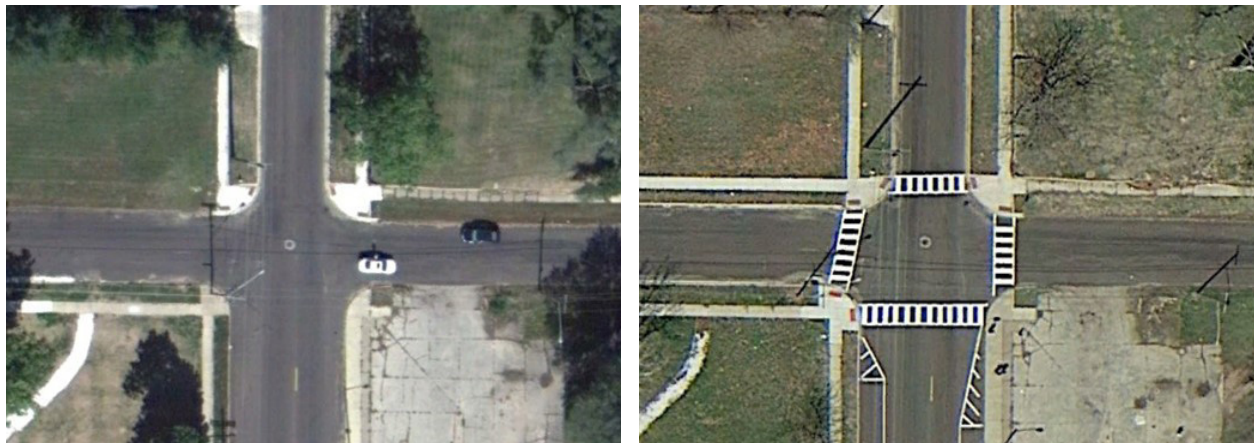


Figure 14. Aerial view of the intersection before (left) and after (right) improvements were made

Outcomes

Observations of crossings were collected at the intersection both before and after the improvements were made to the intersection. Children were recorded if they crossed one of the legs of the intersection, and vehicles were observed to determine yielding behavior.

Data were collected during school arrival and dismissal on May 23, 2012. During that time, a crossing guard was present to assist students crossing the uncontrolled legs of the intersection. A total of 35 students were observed crossing those uncontrolled legs of the intersection during arrival and dismissal. During those crossings, the crossing guard helped stop traffic to aid the crossing. We observed four cases in which vehicles sped around the crossing guard or passed them without obeying their instruction. Following the improvements, the same observations were made at the intersection on October 17, 2014. During an arrival and dismissal period, 47 pedestrians were observed crossing at the intersection. Thirty-one of these pedestrians crossed one

of the legs previously uncontrolled, but now controlled by a stop sign. During this initial period, there were no cases of vehicles not obeying the stop sign: each vehicle approaching the intersection as pedestrians were crossing stopped to allow them to cross. The biggest change between the before and after condition was that a crossing guard was not present in the after condition, yet vehicles obeyed the new stop signs and allowed the students to cross.

Follow-up observations were collected on April 13, 2018, almost four years after the initial “after” period. During that period, more pedestrians were observed than either of the two initial periods. A total of 61 pedestrians crossed at the intersection, and 24 of these crossed at one of the previously uncontrolled legs. All drivers observed the stop signs and yielded appropriately to the crossing pedestrians, as they had in the previous period.

We were not able to obtain crash data for Peoria, Illinois to assess the crash history at the site. There had not been a crash at the site prior to the improvement, but it is unknown whether crashes have occurred at the site since the change was made.

The follow-up results indicated that more students crossed at the intersection after the improvements (even more than in the previous “after” period). It is promising to see that drivers continue to comply with the stop signs and yield right of way to the crossing pedestrians. When compared with the uncontrolled nature of the intersection before any improvements were made, this change represents an excellent example of a low-cost improvement that is working quite well.

Conclusions

Results of the 2011 and 2012 Safe School Zone program-related improvements reported here showcase the range of interventions that can support pedestrian safety near schools. The program also highlights the value of bringing together diverse teams of stakeholders and community members to develop action plans for supporting safety. The projects were shown to be successful through the assessment of speed, conflict, count and other data, and these projects have had lasting benefits. Examples of those positive impacts include:

- Higher levels of walking at sites where projects were completed
- Documented increases in motorist yielding rates following project completion
- Reductions in motor vehicle speeds along corridors where projects were completed
- Almost no crashes between pedestrians and motor vehicles in the vicinity of project sites
- Expanded capacity of local coalitions to pursue other initiatives focusing on pedestrian safety, including the development of action plans and additional safety improvements

Moving forward, Safe Kids Worldwide can continue to support Safe School Zones by connecting community members with experts, providing funding, and helping monitor short- and long-term successes. As research identifies new best practices and safety benefits associated with low-cost interventions, the Safe School Zone program can play a valuable role in implementing these proven safety countermeasures. In particular, there is an opportunity to fund more low-cost improvements and programs that enhance safety through speed reduction. There is an opportunity to evaluate more projects in terms of their impact on speed, which is one of the primary risk factors contributing to pedestrian crashes and resulting injury severity. Speed data can be fairly robust, and usually Safe Kids coalitions can collect it by requesting speed studies from law enforcement partners. Documenting speed reductions following project implementation can tell us something about the project's safety performance, even if crash data or other observational data are not available.

These Safe School Zone program also highlights the value of bringing together diverse teams of stakeholders and community members to develop action plans for supporting safety.

By supporting these projects and documenting their outcomes, Safe Kids Worldwide can improve safety while providing valuable case studies and project examples.

Acknowledgements

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Safe Kids Southeast Tennessee, TN

Safe Kids DeKalb, GA

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Safe Kids Cape Fear, NC

Safe Kids Peoria, IL

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