

RECREATIONAL PATH INTERSECTION SAFETY

CROSS ALERT SYSTEMS, INC.

Introduction

A large and growing network of rail trails, greenways and other recreational paths provide a safe area for path users to recreate away from vehicular traffic. Creating a safe intersection crossing for these trails where they intersect public roadways is an ongoing challenge, particularly at mid-block crossings.

Safety Options at Intersections

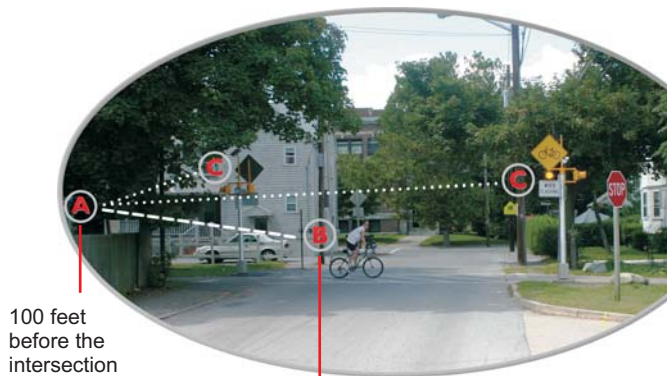
There are several different options available to address safety concerns at these intersections. Static road signs, for example, mark the crossing and warn vehicles of the upcoming path. Twenty-four hour flashing amber beacons also provide this warning. Path user-activated warning lights are another option that present flashing amber warning lights to approaching vehicles but only when a path user activates the lights. A fully functioning crosswalk system stops traffic for path users to cross at the intersection. Grade separation in the form of either an over or underpass takes path traffic off of the road altogether.

Selecting a Safety Option

Several factors are frequently taken into account when selecting a treatment for a given intersection:

- ◆ Quality of the sight distance from the road to the intersection
- ◆ Motor vehicle traffic speed
- ◆ Number of lanes of travel
- ◆ Traffic volume on both on road and path
- ◆ Cost

Cross Alert 2-Pole Intersection



Path user is detected by the Cross Alert System motion detector at point **A**.

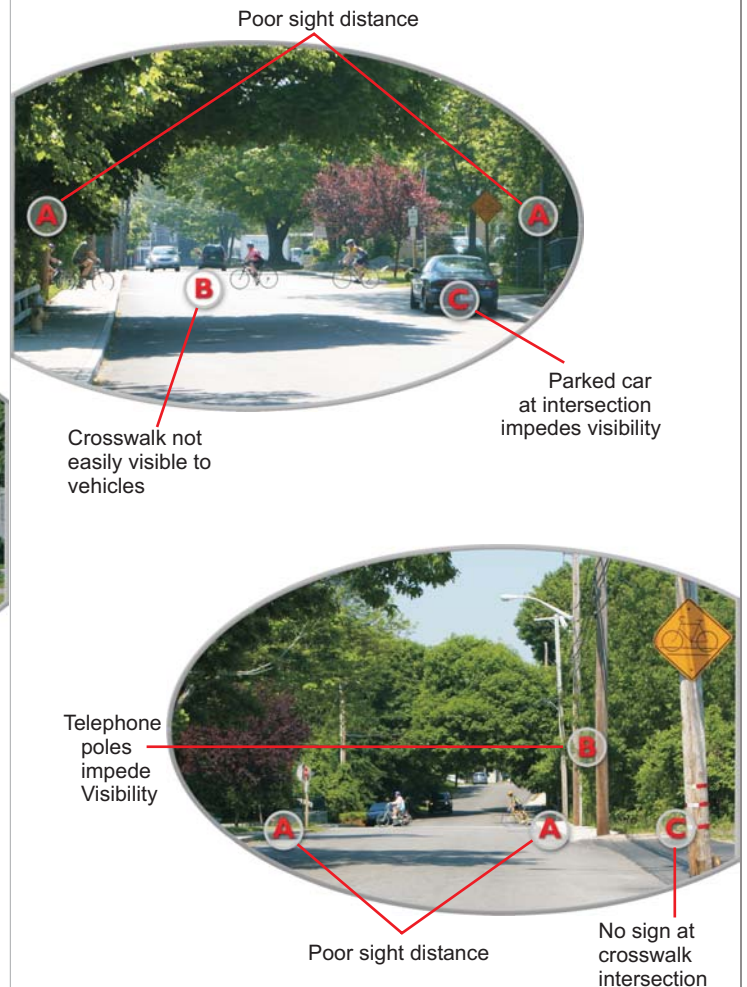
Motion sensor immediately triggers flashing lights on Cross Alert poles at points **C**.

The safest solutions are often the most expensive to implement. Grade separation of the trail and road does not interrupt the flow of traffic, but can cost anywhere from several hundred thousand dollars to several million dollars.

A fully functioning crosswalk that stops traffic to allow path users to cross can run from \$50,000 to \$150,000. There is often hesitancy to install this type of device due to the disruption of motor vehicle traffic flow. Crossings with multiple lanes of traffic and higher vehicle speeds require one of these solutions to most safely get path users across the road.

A lower cost solution provides what is known as an active warning to motorists that path users are at the intersection. Path users can activate this type of device either via a push button, or the device can detect path users and automatically flash warning lights (passive detection).

Poor Visibility Intersections



Active warnings have been shown to be more effective than either static signs or 24 hour flashing signals. The latter devices are frequently ignored by motorists over time because they are always there and tend to blend into the surroundings.

When an active warning light is flashing, motorists will see a path user near the intersection, providing reinforcement that when the warning light is flashing extra precaution should be taken when approaching the intersection.

Active Warning

The Cross Alert system is an active warning device that detects path users passively using infrared detection. In our research leading up to the development of this system, we were surprised at how many path users did not activate a push button when one was present to facilitate a crossing.

Common reasons given for not utilizing the push button included the button's lack of proximity to the path, cyclists whose shoes were clipped into their pedals and who did not want to unclip, etc.

The incident that provided the impetus for Cross Alert was a novice roller blader who was unable to stop (or activate a button) as she entered a blind mid-block crossing uncontrollably.

Approaching motorists had to swerve into oncoming traffic to avoid hitting the roller blader. A passive detection system would have detected the out of control path user and forewarned vehicles to the presence of the roller blader.

Another surprise in our research was that intersections with quieter streets were often more dangerous than busier crossings. Path users tended to enter the quieter intersections more aggressively, knowing that the likelihood of an approaching car was low.

An astonishingly high number of path users of all ability levels would enter these intersections recklessly (at a high enough rate of speed that the path user would be unable to stop if a motor vehicle was entering the intersection). This behavior was observed even when the intersection was completely blind.

Design Considerations

To provide the most cost effective safety solution for mid-block crossings, we designed our motion activated system to be solar powered, utilizing radio signals for communications between poles.

This design decision eliminates all wiring and electrical installation costs, although a Cross Alert model is available that can be wired into the electric grid.

The radio signal can reach 500 feet from the intersection, which makes it possible to install an advance warning pole that can sit 500 feet in front of the intersection and flash when path activity is detected at the intersection.

In our design considerations, we wanted to reinforce to the path user that the user should stop before entering the

crossing. This is accomplished with a stop sign and a flashing red light that is activated when the pole detects path activity.

An integrated trail counter makes available a count of the number of trail users who have crossed the intersection.

Planner Feedback

A Cross Alert intersection system has been operating in Coventry, RI since July 2004, where the Coventry Greenway intersects State Highway 117. Coventry Parks and Recreation Department Director Guy Lefebvre noted that, "Prior to the Cross Alert installation, motorists often did not realize that they were crossing a trail until they were at the intersection, which has been a notorious problem [it is near a popular ice cream store]."

Following installation, path users are exercising greater caution when crossing RT 117, and we find that motorists are being more courteous and watchful at the intersection. Safety has been significantly enhanced at this intersection."

Designed for the Real World

Whenever a pole is placed in the ground along a roadway, engineering consideration must be given to the possibility of vehicle/pole crashes, wind storms, lightning strikes and other catastrophes.

In Arkansas, a Cross Alert device was struck and knocked down by a truck (successfully testing the breakaway abilities of the pole). Motorist/vehicle damage was minimized as designed. A replacement base was shipped out which was welded to the pole, minimizing the effort necessary to get the pole back in operational order.

In 2004, a Cross Alert installation in Sanford, Florida took direct hits from hurricanes Charley, Frances and Jeanne. The system survived the extreme weather unscathed, requiring no repairs or maintenance.

Conclusion: A Proven Technology that Works

Addressing safety concerns at recreational path/public road intersections is becoming increasingly important as path building and use accelerates.

Active warning systems play an increasingly important role as an affordable safety solution for mid-block crossings.

For more information, specifications or a brochure about the Cross Alert System please visit <http://www.crossalert.com> or phone toll free (866) CROSSALERT.

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