Item G-2 **May 13, 1998**

Commissioners,

Commissioner Holbert, has requested staff to provide you with this information on a new lighting device for pedestrian crosswalks.

APR 22-98 12:52 FROM:TRAFFIC OPERATIONS

STATE OF CALIFORNIA-BUSINESS, TRANSPORTATION AND HOUSING AGENCY

PETE WILSON, Governor

DEPARTMENT OF TRANSPORTATION
TRAFFIC OPERATIONS
1120 N STREET, Mail Station 36
P O BOX 942873
SACRAMENTO, CA 94273-0001
PH (916) 654-4551
FAX (916) 653-6080

ATTACHMENT 10

April 17, 1998

Mr. Mark Miller, City Traffic Engineer
Engineering Department
303 West Commonwealth Avenue
Fullerton, CA 92832-1775

Dear Mr. Miller.

This responds to your letter of March 9, 1998 to Mr. Hamed Benouar, Program Manager, Traffic Operations, for the California Department of Transportation (Caltrans). In response to a recommendation of the California Traffic Control Devices Committee (CTDCD), Caltrans plans to adopt standards and specifications for pedestrian crosswalk lights pursuant to California Vehicle Code Section 21400. To do this we need the assistance of local jurisdictions that wish to try an experimental installation.

If your agency would like to install pedestrian crosswalk lights, you should send me a letter requesting approval for an experimental installation. The letter should include the location of the proposed installation, an estimated installation date, and responsible contact person with your agency. When pour letter is received, I will send you an evaluation form which we would like your agency to complete and return tc me at the end of one year ofoperetion. The evaluations will help Caltrans develop a standard for California.

You should be aware that standards, when adopted by Caltrans, will include a requirement that a pedestrian crosswalk light signal head shall not project more than 20 millimeters (3/4 inch) above the pavement surface (See Caltrans Highway Design Manual Section 1003.6).

We are *aware* of two vendors that have installed pedestrian crosswalk lights in California. These are Lightguard and Flight Light. Systems have been installed on local streets in the cities of Lafayette, Petaluma, and Santa Rosa, and on State highways in the cities of Fort Bragg and Willits.

Please let me know if you would like any additional information.

Sincerely,

Original Signed By

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GERRY MEIS, Chief,
Office of Sips, Delineation and
Technical Support . .

The Sacramento Bee

bee.com

BUSINESS
TECHNOLOGY

ATTACHMENT 10

Lights: Airports are still firm's primary customers

Continued from page C1

tions where a cenain level of traffic awareness is required b u : not enough to have $100.000 thrown at it."

The light system – intended to signal caution rather than control traffic – seems to be working wel! at an Ellicott City. Md., school crossing where. before the installation, two children received minor injuries last year crossing the busy east-west avenue

Morning motorists headed east at sunrise were having difficulty seeing the school crosswalk, said Edward Walter, chief of the traffic division for Howard County's Bureau of Highways

So the department installed six Flight Lights – and now children and their parents seem to like them. said Walter

'The child presses the button," he said, "and the lights flash off and or. for 30 seconds."

Flight Light also has one of the fixtures installed in the entrance to the Santa Rosa City Service Yard. where the city's entire fleet drives over it daily.

"We put one in for experimentation." said Pete Leras, electrical maintenance superintendent for the city of Santa Rosa "We put it in the most revere ' heavily trafficked* place we could think of.

"Dump trucks. cement trucks. fire trucks drive over i: We've had it in for three years You should see how much abuse it tnkes. It's like the Eveready battery."

He said the flashing light. which is triggered by the incoming trucks as they approach the blind intersection, serves as a good warning that traffic is approaching.

Owens has three installations scheduled for Chicago and two requests from other municipalities to test the system. And college campuses around the country have requested information.

But sales haven't outpaced the company's primary business of installing systems at airports

Flight Light. which Owens said will bring in $10 million this year, probably will have co wait a few years to realize significant sales from the crosswalk systems

"It's 3 long process to go from seeing our system, to testing il. to getting it approved by municipalities. to having it installed." he said "It's at least a couple of years."

Owens started the firm five years ago with partner Jack Hart. He had moved to Sacramento from Southern California and was looking for a business opportunity when he happened upon this industry.

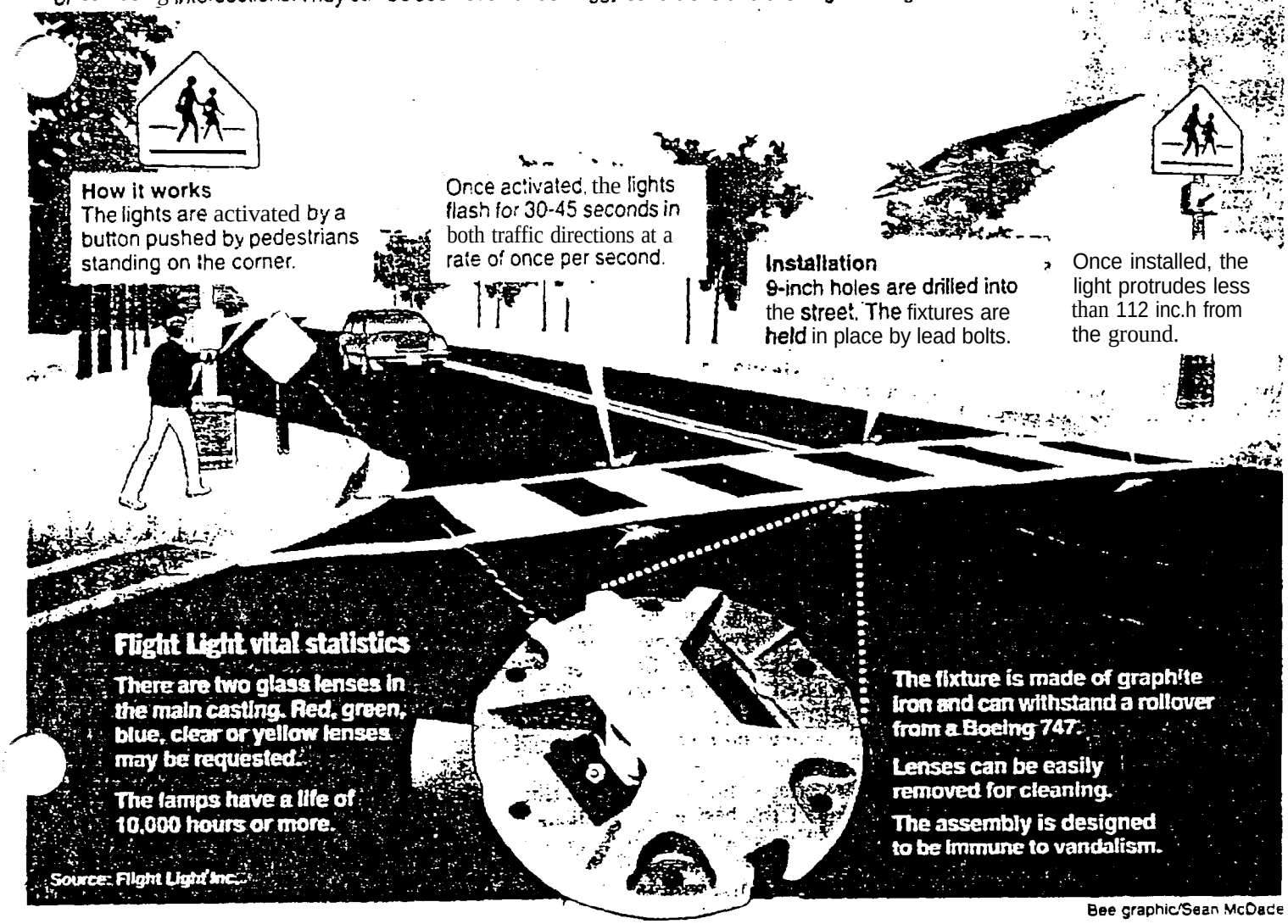
He now has 17 employees and contracts all over thr world Hz hopes to increase business in the Golden State. as well

"California ranks No 1 in pedestrian fatalities," he said. "it's a very serious problem "

ATTACHMENT 10

Lighting designed for a safer environment

The in-pavement lights, built by Flight Light Inc. of Sacramento, are designed to be used at crosswalks or potentially dangerous or confusing intersections. They can be seen even under foggy conditions and are bright enough to act as cautions or lane indicators.



Bee graphic/Sean McDade

Stepping lightly

Local company taking its runway system to the streets

By Norman D. Williams
and Loretta Kalb
Bee Staff Writers

For five years Kyle Owens has illuminated airports around the world with his Sacramento company's runway lighting system.

Now, he wants to put Flight Light Inc.'s technology to use on a smaller scale, albeit one with many more potential customers: pedestrian crosswalks.

"What we've done is taken an existing product that is Federal Aviation Administration certified, and moved it to a roadway application," Owens said. "It's very cheap, compared to the alternatives."

> "What we've done is taken an existing product that is Federal Aviation Administration certified, and moved it to a roadway **application.** It's very cheap, compared to the alternatives."
>
> Kyle Owens

pitch. While a standard traffic signal for crosswalks costs around $80,000, the ZA230 system from Flight Light runs about $8,000 installed.

Here's how it works.

High-intensity lights embedded in the pavement are activated by a pedestrian, who simply pushes a button. The lights flash once per second in both directions directly in motorists' line of vision.

The fixtures are about 8 inches in diameter and protrude less than half an inch above the road surface.

The lights are not intended to take the place of existing traffic control signal lights, said Owens. Rather, they are intermediate solutions "in situa-

Santa Rosa tests new crosswalk device

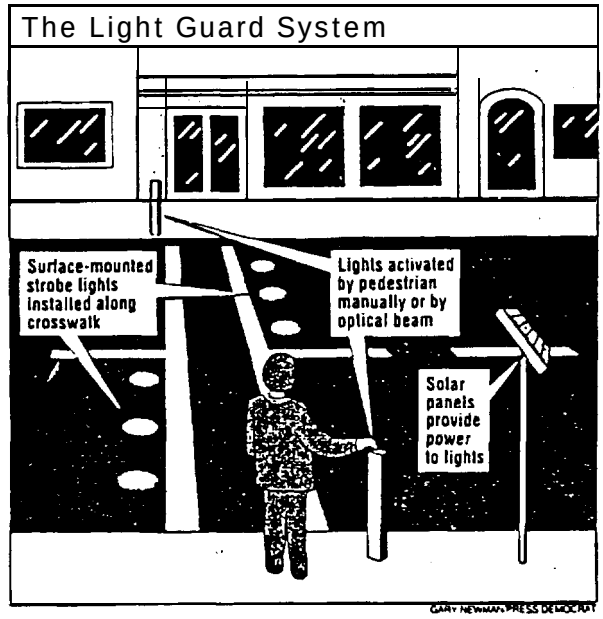
The City of Santa Rosa, CA. is the county seat of Sonoma County with a population of 125,000 residents. During 1990-l 993 the city recorded 115 vehicle/ pedestrian collisions, 11 of which were fatal to the pedestrian. The fatalities caught the attention of the news media, and a cry from the press demanded that the city "do something about the pedestrians getting killed in crosswalks."

Through a joint effort of city departments, the police department embarked on a strong police enforcement program. and the Public Works Department enhanced the pedestrian crossings with zebra stripe markings and additional signing and flashing lights where appropriate.

Public/private cooperation

Mike Harrison is a corporate pilot who had a friend who was the driver involved in a Santa Rosa pcdcsuian fatality. Harrison knew how devastating an accident of this type could be, not only for the pedestrian but also for the driver. He started looking for a way to prevent accidents like this from happening in the future. As a pilot, an idea came to him when hc was using the airport strobe lights for landing his plane. In 1993, he approached the city of Santa Rosa with a plan for a flashing device to be installed on the pavement surface along the crosswalk lines and facing traffic.

The Experimental Pedestrian Crosswalk Devices (EPCDs) are intended to warn the driving public of the presence of pedestrians in the crosswalk. A proposal to the CA Traffic Control Devices Committee requesting permission to test the device at selected locations was approved. The city also found funding from the CA Office of Traffic Safety for a consultant study to analyze the effectiveness of the device. ATSSA member company Hewlett-Packard worked with Harrison to develop the device and donated the lights to the city. The city arranged for installation of the devices and analysis of the data.



The LightGuard 'Crosswalk System combines markings with strobe lights for greater visibility of crosswalks, warning drivers of the presence of pedestrians in the crosswalk. Diagram courtesy of Gary Newman/Press Democrat.

Physical description

The EPCD is similar in appearance to standard Type H, one-way yellow reflective markers, but is larger and made of black plastic material. The devices are installed on both outside edges of the crosswalk suipcs with the lighting device facing away from the pedestrian crossing areas and towards the oncoming traffic. On a four-lane roadway, seven devices arc used; on a two-lane roadway, five devices arc used. Amber, solar-powered LED flashing lamps arc used with an optical lens in front of the amber LEDs which enhances the light beam.

What the driver and pedestrian see

Approaching the crosswalk, the driver of the vehicle will see a series of amber lights flashing in unison, and depending on the roadway alignment, the lights can be viewed from as far away as 1,000 to 1.500 feet from the crosswalk. The pedestrian at the crosswalk sees a sign on the pedestrian push button which reads, "Push Button for Crosswalk Warning Device" and does not see the amber flashing light?.

Interim findings

While the initial results have been encouraging, study of additional locations, particularly non-school sites, should provide more information on trends of the device's effectiveness. Based on the comments received from pedestrians and drivers, there seems to be some confusion on the proper action required on the part of pedestrians and drivers. The initial results from one crosswalk showed that vehicle speeds decreased approximately 10%; vehicles started braking approximately 18% sooner; deceleration time increased 13%; and from interviews, the number of drivers noticing the crosswalk increased 23%. A final report is due soon.

Editor's note: Thanks to Steve Kroeck, traffic safety analyst with the City of Santa Rosa, and *Mike* Harrison, inventor of the device. for their help with this article. For additional information on the device, contact Mike Harrison at (707) 838-0745.

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TS Grantees Take Strides In Pedestrian Safety

What should drivers do when a pedestrian is on the sidewalk at a crosswalk? What does the flashing DON'T WALK signal mean? Should you face traffic, or go with traffic when walking? Is wearing white at night enough to make pedestrians visible?

Although traffic safety professionals may know the right answers to these questions, many Californians are confused about rules of the road when pedestrians are involved, even when they're the ones walking.

'We must educate both motorists and pedestrians how to act in traffic ns to avoid crashes, because no matter who has the right of way, pedestrians always lose in a collision," said Arthur Anderson, Director of OTS.

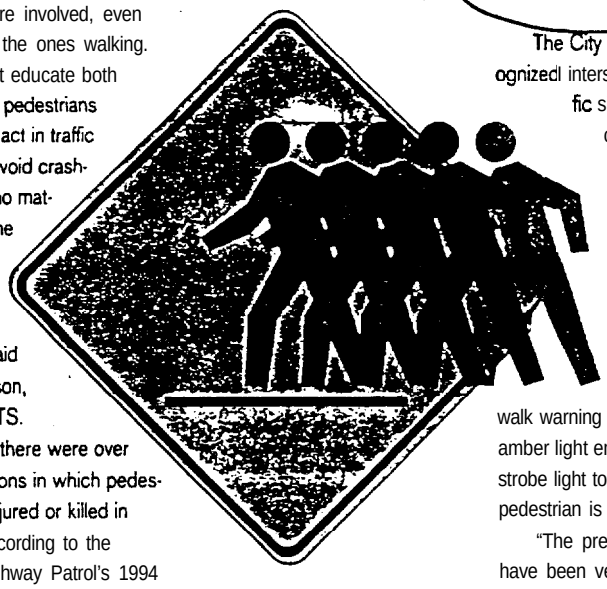
In 1994, there were over 16,000 collisions in which pedestrians were injured or killed in California, according to the California Highway Patrol's 1994 Annual Report of Fatal and Injury Motor Vehicle Traffic Collisions. To help reduce injuries and fatalities, OTS funds a wide range of programs that use innovative strategies to meet the goal.

"There are many solutions to pedestrian safety. The success of any program can be measured in the number of lives it saves," said Anderson.

hrough a grant from OTS, s Angeles County Department of Health Services saves lives by educating parents and pre-schoolers about pedestrian safety rules. The program targets families in South Central Los Angeles.

Initial research showed that five health districts in that part of the city had significantly higher injury rates than other parts of the county. And, unlike many studies, this one showed 1- to 4-year-olds were more at risk than 5- to 9-year-olds.

'Notably, many of the child fatalities and injuries occurred in areas away from street traffic," said Billie Weiss, epidemiologi is and director of the injury and violence prevention program at the Los Angeles County Department of Public Health.



To help make children safe in different situations, the department recognized the need to incorporate pedestrian safely awareness into the day-to-day activities of both the children and their parents. Teachers developed a program that uses safe playing and other simple traffic safety concepts to teach kids how to walk and play safely. The program includes a street safety rodeo. In the rodeo, kids and parents walk through a miniature street scene while confronted with potentially dangerous traffic situations. Storybooks and other collateral materials reinforce the lessons learned at school.

"The eight-week program has resulted in young children changing their behavior by seeking adult supervision before entering areas where there is a traffic danger," said Weiss.

Field Testing Grant

The City of Santa Rosa recognized intersections without traffic signals and mid-block crosswalks as danger areas for pedestrians. Funded by an OTS field testing grant, the city is testing a new crosswalk warning device that uses an amber light emitting diode (LED) strobe light to alert drivers that a pedestrian is in a uosswalk.

"The preliminary results have been very encouraging, with drivers stating that the LED strobe lighting catches their attention and they do slow down to look for pedestrians," said Steve Kroeck, traffic safety analyst for the City of Santa Rosa.

At a crosswalk near the Matanzas School, the number of drivers headed northbound who notice the crosswalk has increased from 80 percent to 98 percent. Average speed has decreased and drivers are reacting to pedestrians sooner by applying their brakes further from the crosswalk.

The LED strobes line the crosswalk facing traffic. They are triggered when a pedestrian pushes a crosswalk button or steps across an infrared light beam in the crosswalk's entrance. Drivers say the strobes catch their attention even in bad weather conditions, such as rain or fog.

In-road amber LED strobe lighting of crosswalks is in the preliminary stages of development and testing, and has yet to be proven effective in reducing collisions or approved for use by agencies such as the California Traffic Control Devices Committee and the Federal Highway Administration (FHWA).

The City of Santa Rosa, Caltrans and the FHWA will be evaluating the results of the field testing program.

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On The Move

OTS grantee South Gate Police Department won the Special Achievement Award given by the National Association of Governor's Highway Safety Representatives (NAGHSR) at the 1995 annual meeting for the department's 'Community Traffic Safety Program."

As part of its OTS-funded 'Community Traffic Safety Program,' the San Gabriel Police Department last yaar increased safety belt compliance in the community to 92 percent, surpassing the statewide average of 84 percent. The program also resulted in a 21 percent drop in DUI-related crashes, and a 13 percent decrease in traffic collision fatalities and injuries.

The San Francisco Police Department, through its OTS-funded "San Francisco Traffic Offender Program (STOP),' reduced hit-and-run collisions by 13 percent between January and June last year. During that same time, the police department also seized 21 firearms, made 58 narcotics arrests and 35 on-view felony arrests, and recovered 20 stolen vehicles.

SAFECO Insurance Company awarded $10,000 to the Los Angeles countywide "Multicultural Child Safety Seat Program."

KLFA-FM, a Salinas-based Spanish-language radio station, hosted a month of traffic safety programs featuring proper use of safety belts that included speakers from OTS grantee Monterey County Injury Prevention staff.

Fox TV-40 in Sacramento supported California 3-D Month, National Collegiate Alcohol Awareness Week and Sacramento's DriveSmart Alliance in a 45day "Be a Responsible Host Campaign.' Channel 40 aired public service announcements promoting a non-alcoholic recipe and drink brochure.

William Boehly moved from his position as the National Highway Traffic Safety Administration's (NHTSA) Associate Administrator for Safety Assurance to become Associate Administrator for Research and Development at NHTSA. Michael Brownlee, formerly the Associate Administrator for Traffic Safety Programs at NHTSA, replaced Boehly.

The Pediatric Injury Prevention Group at UC Irvine is asking for help in educating Caiiiomians about the law that prohibits people from riding in the back of pickup trucks. Anyone with articles or reports about pickup truck crashes in their area should call 714/824-5371, fax them to 714/824-8091 or E-mail them to prhynder@uci.edu.

The Press Democrat

ATTACHMENT 10 B

EMPIRE NEWS

ıursday, February 27, 1997

Lighted crosswalk system lauded

By MIKE McCOY
Staff Writer

Three years after Santa Rosa installed experimental strobe-lighted crosswalks to increase pedestrian safety — the first in the country to do so — the city is being honored by the state.

Gov. Pele Wilson has bestowed the Helen Putnam Award fur Excellence on Santa Rosa for a highly illuminated crosswalk system that former Santa Rosa police chief Sal Rosano said has substantially increased the safety of those attempting to cross city streets.

Wilson presented the award to Mayor Sharon Wright. City Manager Ken Blackman and Rosano during ceremonies held in Sacramento last week. The award is named for the former mayor of Petaluma.

Rosano said testing at the three crosswalks where rows of strobe lights have been installed into the pavement to warn motorists of the presence of pedestrians indicates that drivers "have been braking sooner and stopping further back."

"So far there has not been one pedestrian accident in any of the crosswalks where the lights were installed," he said.

The crosswalks — located on Yulupa Avenue at Matanzas. School, Summerfield Road at Howarth Park and Bryden Lane at Proctor Terrace School — were installed to test an early warning system for motorists.

Rosano said tests show the bright flashing lights grab the attention of molorists and cause them to slow down and stop sooner.

"It doesn't stop people from operating negligently, but it catches the attention of most drivers," Rosano said.

The original system, and subsequent improvements to it. was developed by Windsor resident Mike Harrison, a commercial pilot. who came up with the idea after a friend struck and killed a pedestrian in a crosswalk in Santa Rosa in 1991 — a year when seven pedestrians were killed in city crosswalks. mostly by drivers who said they didn't see them until it was too late.

Harrison, who patterned his crosswalk safety system after the runway lights at airfields. has a patent pending on his inve..tion.

Rosano said Harrison's invention — which still awaits state approval — has been installed in Petaluma and Lafayette and is in the process of being installed for testing along Highway 101 in Wiltits, Highway 1 in Fort Bragg and along Sunset Boulevard in West Hollywood.

"If all the test findings are similar to those in Santa Rosa, and there is a measurable difference in the behavior of drivers, they (crosswalk systems) be may approved as standard traffic control devices," Rosano said.

Rosano said other states also

Sc› Lighted, Page B3

Lighted

Continued from Page B1

have shown an interest in Harrison's invention.

Rosano said the system. which involves installing the lights in the pavement, an ultrasound system to detect curbside pedestrians read:; to cross and a nearby solar panel to power the system costs about $15,000.

"That's half the cos: to put in overhead lights and substantially less than the $100,000 and more it costs for a signalized intersection." he said.

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Opinions

'Lightguard' crosswalk system offers hope for Willits pedestrians

by Ed Burton

Our Main Street is full of cars, trucks and giant RV's battling for supremacy. Unfortunately, there are also pedestrians trying to get across the busy three or four lanes.

As many of you know. my wife Hattie was struck and severely injured while crossing Main Street in a Crosswalk in front of the Mall where there is no signal.

It seemed at the time that the only answer was the bypass to reduce the traffic flow through town.

1 didn't know that a pilot, Mlcbael Harrison, bad invented a Lightguard System that probably would have alerted tbc driver of the pickup and avoided the accident.

This simple, but high tech system uses the same amber flashing lights glued to the runways and taxiways at airports to guide pilots. These little blocks, about four inches square, contain a Hewlett Packard strobe light that flashes when a pedestrian pushes a button similar to those at signal crosswalks.

There Is A Better Way

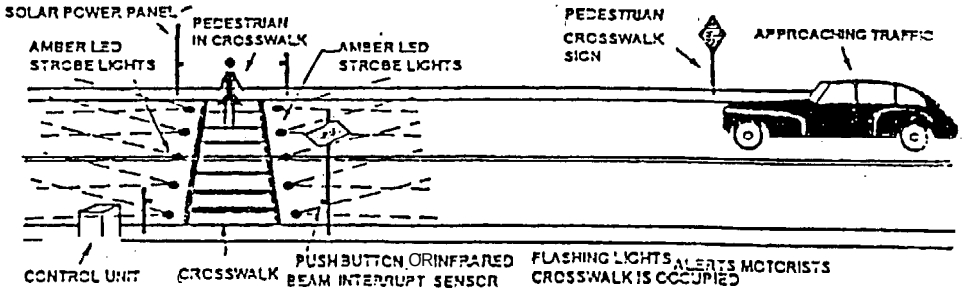
Many times we stop for pedestrians who cross in front of us while cars in the other lanes pass us on the left or right. This is particularly dangerous for children who often run across the street when one car has stopped for them. This Is similar to what caused Hattie's accident.

Tbe Lightguard System has been tested at two school crossings in Santa Rosa since1994 with good results. Typically, this called for a study which was done by an engine-ring firm on bright, sunny days when the Lightguard would have the least benefit. Even so. the study showed that cars did slow down 2nd were more aware of pedestrians. There were almost no negative comments from the drivers that were stopped and interviewed.

Many volunteered that the lights were much more effective on nights or rainy or foggy days but no data was taken during these times.

These were some of the remarks made to the interviewers: "Didn't notice the pedestrian until I saw the light." "Long overdue." "Shouid have tbem 21 every school crosswalk."

The cost is small. from $12,000 to $15,000 per crossing. about one-fifth the cost of a signal system. Yet. no others have been installed pending approval by state 2nd federal bureaucrats. These folks talk about needing new and innovative answers and kill new ideas by delays while they call for studies.



This "paralysis by analysis" is rampant in our highway, wastewater and water supply industries which are government monopolies.

The Willits bypass has been mapped. engineered, estimated and received public input for 45 years yet we are no closer — probably farther away — than in 1950.

The net effect of delays is that companies with new and innovative ideas run out of money waiting for approval.

Mike Harrison operated Brooktrails Aviation in the early 80's proving once again that Willits people can find Better Ways.

We need the Ligbtguards on Highway 101. They are not perfect and we will still have to be careful, but Lightguard could have saved Hattie her pain and anguish and help 10 avoid the death of others.

ATTACHMENT 10

Petaluma ARGUS-COURIER

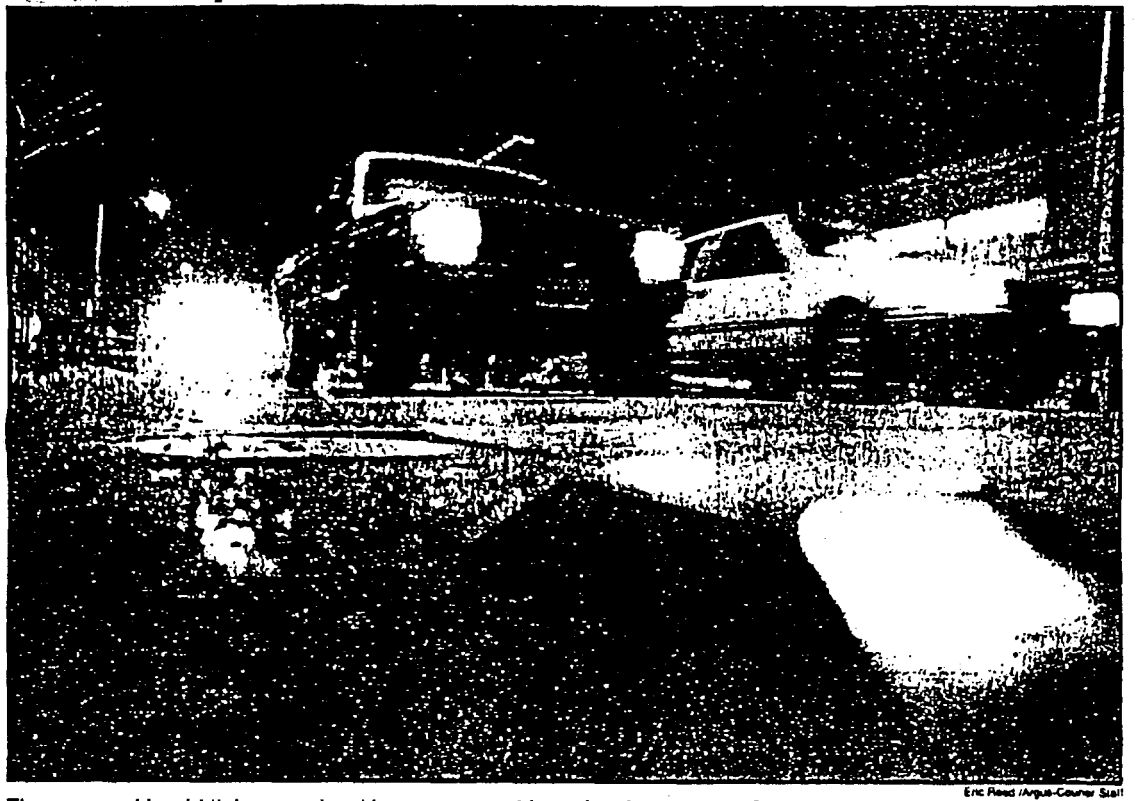
A Pulitzer Community Newspaper

YOUR HOMETOWN NEWSPAPER SINCE 1855

MIDWEEK EDITION February 4-6, 1997 50 Cents

ATTACHMENT 10

Downtown ***flashers***



Eric Reed /Argus-Courier Staff

These ground-level blinkers are breaking new ground in pedestrian safety in California. The experimental lights warn drivers whenever anyone steps into the crosswalk at Putnam Plaza.

Crosswalk blinkers warn cars

Lights protect pedestrians at Petaluma Boulevard crossing

By JAY GAMEL
Argus-Courier Staff

The next time you step off the curb to cross Petaluma Boulevard North at Putnam Plaza, you won't see it. but a double row of ground-level lighu will start blinking. warning motorists to slow down. Hopefully, they will make the busy crosswalk safer, but don't take it for granted that the cars will stop.

Those automatically activated blinking lighis are more than a new wry to protect pedestrians venturing across a bury street. They are part of a statewide experiment with new pedestrian safety systems.

City traffic engineers have wanted to put a signal in at the busy downtown crosswalk for years and the new blinkers offered a cheaper alternative.

"The trouble with signal lighu' is we couldn't get pedestrians to wait long enough for a green light," said traffic engineer Allan Tilton. And the price was right. "This costs about $15,000," he said. "Signalization would cost $30,000 with fighu. poles and digging."

The blinking lighu are the brainchild of ex-corporate jet pilot Mike Harrison, who founded LiteGuard Systems Inc. in Santa Rosa in 1992. A personal experience started him thinking about ways to help people 'cross streets and the blinking crosswalk system is the result.

The first blinking systems were installed in Santa Rosa in 1993. at two school crosswalks. A third system was put in on Summerfield Road by Howarth Park and the Lakeside Cinemas. Those systems require the pedestrians w push a button to activate the lights.

Both Harrison and Tilton are adamant in ruling that the system is designed to help drivers know someone's in the crosswalk. They are NOT meant w give pedestrians any increased sense of safety when they step off the sidewalk.

While he likes the blinking lights idea, Tilton said he wouldn't mind seeing 90 percent of the crosswalks removed altogether. "San Luis Obispo took out pedestrian crossings and cut pedestrian accidents in half." San Diego and other cities have also reduced pedestrian accidents by removing crosswalks, he added.

Tilton and others believe that pedestrians are far more cautious getting across an unmarked street than they are when they believe they arc protected by the

(See Lighis, page 6A)

• Lights

(Con tinued from page I)

crosswalk signs and painted strips.

With patents pending, Harrison said the system is undergoing changes constantly. *Making* the lights automatic instead of using a button was the result of studying the Santa Rosa crosswalks in action.

tal, Petaluma needed and rcccivcd a dispensation from the State Traffic Control Dcviccs Committee, composed of representatives from CalTrans, the American Automobile Association and county officials from throughout the state, according to Tilton. "They look at and evaluate new systems

Another Santa Rosa firm, Whitlock & Weinberger Transportation Inc. will be monitoring the system for a month Of so. "Our role is collecting an evaluation the the device to determine if it's effective in getting drivers' attention," Stephen J. Weinberger said. The traffic engineer will be presenting

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ATTACHMENT 10

LightGuard™ Systems, Inc.

"Pursuing Safety Through Technology"

2292 Airport Blvd.
Santa Rosa, CA 95403-1003
PH: (707) 542-4547
FAX: (707) 525-6333

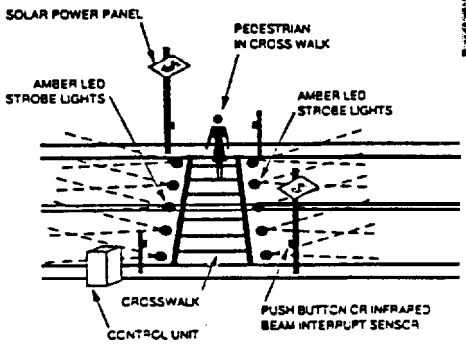
LightGuard™ Develops Safer X-Walk

Pedestrian Crosswalk Device Approved in CA.

LightGuard™ Systems, Inc. has developed a new pedestrian crosswalk warning system using in-roadway amber LED strobe lighting to alert motorists that they are approaching an occupied crosswalk. Both sides of a crosswalk are lined with durable encased signal heads, placed in the roadway facing the oncoming traffic. The flashing amber lights are easily seen by the approaching motorists along the full length of the motorist viewing distance path to permit vehicles to easily slow down and stop for a pedestrian. The lights are activated by push button assemblies and can be augmented with automatic activation using a presence detection system covering the entrance to the crosswalk. The California Traffic Control Devices Committee recommended approval of the Crosswalk Warning System in July of 1997 and forwarded the device to Caltrans for specification approval and inclusion in the State's ***Traffic Manual.***

This new System has shown to increase driver attentiveness while reducing the hazards for crossing pedestrians and may offer a cost saving alternative to other signalized traffic control devices currently used.

A roadside cabinet contains the drive electronics and controller, The System operates off 12 volt dc, supplied by a solar panel and battery or an ac-to-dc current off an ac line. The battery reserve permits operation during nighttime hours, winter months, or sustained cloud cover.



Owr 5000 pedestrians are killed and 95,000 injured each year in the United States. NGW there is something to make crosswalks safer for pedestrians and drivers. *(Source: CSAA)*

The light source in the signal head flasher is the Hewlett Packard TS AlInGaP, amber, nondiffused LED lamp. LED lamps are durable, providing long term reliability with low maintenance. LED light degradation is negligent given the intermittent flash rate usage upon activation. The Hewlett-Packard Optoelectronics Division has enthusiastically endorsed the development of the LightGuard Crosswalk System.

W-Trans Traffi Study Shows Positive Results

Santa Rosa based Whitlock 8 Weinberger Transportation, Inc. (W-Trans) has submitted ik Final Report to the State of California evaluating the Experimental Crosswalk Warning System. These studies, funded by the California Office of Traffic Safety and conducted over several years, indicates the device is effective under most conditions and generates favorable public response. Evaluation results show a fairly significant increase in crosswalk awareness where the system has been installed. Drivers apply their brakes sooner and the percentage of drivers yielding to pedestrians increases substantially when the System is activated.

The Federal Highway Administration approved an application in January, 1997 to test this device designated FHWA#IV-*138(E).* Any city interested in the evaluations of the Crosswalk System should contact Stephen Weinberger of W-Trans at (707) 542-9500. For more information on the LightGuard™ Crosswalk Warning System, call (707) 542-4547, Fax *525-6333.*

"An ounce of prevention is worth a pound of cure."

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More Info: ***This innovative Crosswalk Warning System is now available for use in your community. Call, fax or e-mail LGS@pacbell.net today for safer crosswalks tomorrow.***

ATTACHMENT 10

LightGuard™ Systems, Inc.

"Pursuing Safety Through Technology"

2292 Airport Blvd.
Santa Rosa, CA 95403-1003
PH: (707) 542-4547
FAX: (707) 525-6333

Thank you for your interest in the LightGuard™ Crosswalk Warning System.

This packet includes System operation information and articles from industry newsletters about the LightGuard Experimental crosswalk Warning System and its developmental progress. The Crosswalk System has been undergoing testing and evaluation in California since 1993 under the auspices of the California Traffic Control Devices Committee (CTCDC). The CTCDC recommended approval and adoption of the device on July 17, 1997 and forwarded the device to Caltrans for development of specifications and inclusion in *the* State's *Traffic Manual.*

The Califomia Office of Traffic Safety funded the field study grants to evaluate the Crosswalk System in several cities. Caltrans (District 1) authorized two cities to install and test the device on State Hwy. 1 and US Hwy. 101. The Center for Applied Research and the University of North Carolina Highway Safety Research Center, funded by a Federal Highway Administration contract study on pedestrian facilities, is also evaluating the Crosswalk System. The evaluation reports continue to indicate compelling positive effects on driver behavior where the System has been installed. The Federal Highway Administration (FHWA) approved an application in January of 1997 to test the device designated FHWA #IV-138(E).

Continuous quality improvement plans for the Crosswalk System include pedestrian presence detection systems providing additional automatic activation in conjunction with the primary activation mechanism of push button assemblies. Future improvements include in dash, on-board vehicle notification to warn approaching drivers of an occupied crosswalk ahead.

This is a new concept in alerting drivers to the presence of a pedestrian.

This crosswalk device does not require the motorist to stop. When activated, it simply warns the approaching driver of the possible presence of a pedestrian and the driver should react accordingly. The typical reaction of most drivers, upon seeing the activated in-roadway flashing LED warning lights, is to let off the accelerator, slowing or braking as they approach the crosswalk. This creates a heightened state of awareness and may provide additional time for the approaching motorist to come to a safe stop for a pedestrian or pass safely through the crosswalk without impeding the traffic flow. The flashing lights automatically shut off after a set period of time, usually 15-30 seconds. The pedestrian can not easily view the in-roadway flashing lights operating, especially during daylight hours. We want to encourage the pedestrian to be as cautious as if there were no signals or markings. Our goal is to get the pedestrian to stop, look and start crossing only after they know that the motorist can see them and is stopping. As with any new warning device, some public education about its proper use and reaction is advised. Fortunately, a rapid learning curve seems to be inherent to this type of warning device using in-roadway flashing yellow lights to warn approaching motorists to "pay attention, something is happening ahead!"

To receive update bulletins of our progress, or if you have any questions or comments regarding the LightGuard Crosswalk Warning System, please write or call LightGuard Systems. We appreciate your concern for pedestrian safety and thank you again for your interest. Please DRIVE & WALK ALERT!

THE URBAN TRANSPORTATION MONITOR

ATTACHMENT 10

VOL 10, NO 21 NOVEMBER 8. 1996

Four Metropolitan Sites for ITI Demonstrations Officially Announced

Atlanta Showcase of Intelligent Transportation Viewed as Forerunner

The U.S. Department of Transportation has officially announced the four metropolitan areas chosen for demonstrations of intelligent transportation infrastructure (ITI). Approximately $38.7 million has been allocated for the proposed sites in Phoenix ($7.5 million), San Antonio ($7.1 million). Seattle ($13.7 million), and the New York, New Jersey, and Connecticut metropolitan area ($10.4 million).

The Department of Transportation received a total of 23 applications in response to a notice published in the Feb. 26, 1996, *Federal Register* seeking offers from the public and private sectors to form partnerships and participate in the intelligent transportation systems (ITS) model deployment initiative.

The intelligent transportation systems technologies funded by the U.S.DOT, and showcased this past summer at the 1996 Olympics in Atlanta. are viewed as forerunners to the model projects selected. Models at the four selected sites will provide additional showcase demonstrations where the traveling public and local officials can see and experience the benefits of high-tech transportation systems in a real life settings.

The purpose of these projects is to design systems that will reduce the daily travel time of people living in congested metropolitan areas by 15% over the next 10 years.

Selection of the ITI model areas is another step toward achieving the goals of the Operation Timesaver Initiative announced by the U.S.DOT in January. (The goal of the ITI initiative was for 75 of the largest metropolitan areas lo have a complete intelligent transportation infrastructure in IO years).

Descriptions of the ITI model projects, which arc expected to be in operation within the next 18 months, and the public and private sector partners for each project, follow.

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Crosswalk Warning Device Attracts Increasing Interest

Caltrans Looks at Possible Standardization as Pilot Tests Show Impact on Safety

Testing of an experimental pedestrian crosswalk warning device is paining momentum in California. The *LightGuard* Experimental Crosswalk Warning Device system was designed to warn approaching motorists of pedestrians crossing the street within marked crosswalks. The device was first installed in the City of Santa Rosa, CA. The city (pop. 125,000) experienced a high number of vehicle-pedestrian collisions. including 11 pedestrian fatalities, over a three-year period from 1990 lo 1993. In an effort to mitigate this safety problem. the city installed the *LightGuard* Experimental Crosswalk Warning Device system in 1994. The system was developed by Mike

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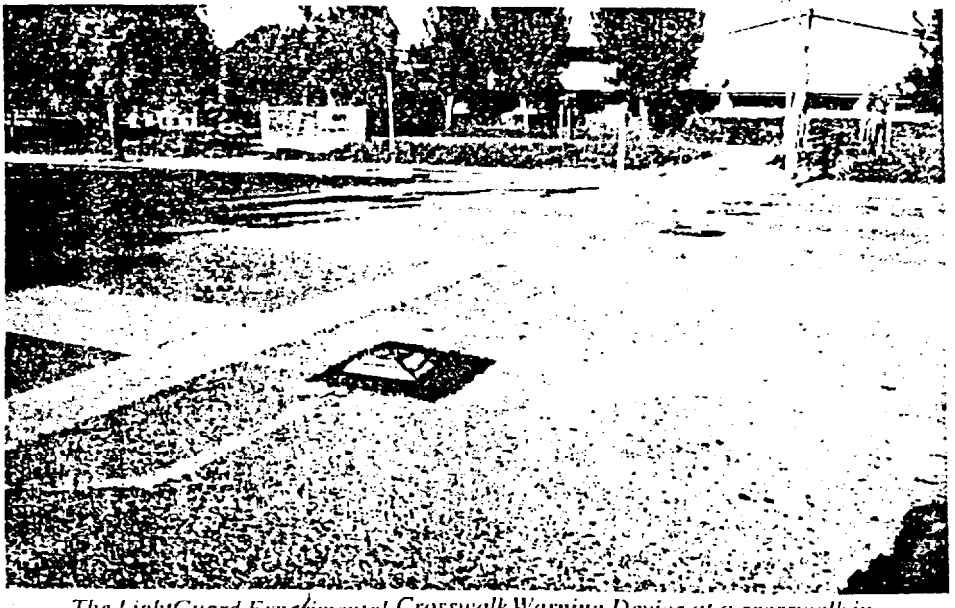

The LightGuard Experimental Crosswalk Warning Device at a crosswalk in Santa Rosa, CA.

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Crosswalk Warning Device Attracts Increasing Interest

Harrison. a corporate pilot who had a close friend involved in a fatal pedestrian accident. Knowing the devastation of such an accident, Harrison sought a way to reduce pedestrian accidents. His idea for the crosswalk warning system came from airport strobe landing lights.

The experimental device consists of a series of Light Emitting Diode (LED) flashing lights which are embedded in the pavement adjacent to a marked crosswalk. The lights reflect out towards the oncoming traffic to warn drivers of a pedestrian's presence. The lights are activated by a microwave presence detector which senses when a Pedestrian has entered the crosswalk.

A weather-proof cabinet located at the roadside contains the control and LED drive electronics. The systems operate off 12 volt dc, supplied either from solar panels or hy an ac-to-dc rectifier off the ac line. In this way, each bank of LED strobe light modules allows low voltage wiring in the roadbed. The control unit provides such functions as pedestrian crossing data (date, lime, direction, total volume of pedestrian traffic); adjustable pedestrian crossing lime in S-second intervals; and adjustment of LED flash rate.

In a typical mid-block crosswalk installation across 3 four-lane roadway, one LED strobe light is located at the center of each traffic lane. One is located at the center of the roadway, and one near the parking lane. Placement on the roadway is designed to he outside the normal traffic tire travel wear pattern to reduce the wear abuse on the LED strobe light module housings. Any crosswalk pattern markings on the roadway surface are offset from the LED strobe light locations. The dark roadway surface acts as a contrasting background, enhancing the viewability of the amber LED strobe lights by motorists in bright sunlight conditions.

The system is currently in place at three locations in the City of Santa Rosa, CA, the initial testing site of the device. The California Traffic Control Devices Committee (CTCDC) has endorsed the testing of the device in six additional cities in California in order to determine if the device should be sent on to the State Department of Transportation for standardization. The system has garnered national attention. It has been featured on "Dateline NBC" and has received funding for testing at two locations from the Federal Highway Administration's Pedestrian Facilities Program underway at the University of North Carolina Highway Safety Research Center. In addition. several cities across the U.S. have expressed interest and plan to install the device.

A study of the first applications is encouraging.11 shows that vehicle speeds decreased approximately 10%; vehicles started braking approximately 18% sooner; deceleration lime increased 14%; and from interviews, the number of drivers noticing the crosswalk increased 23%.

Stephen Weinberger of Whitlock & Weinberger Transportation Inc., contributed to this article He is currently managing a study of the system's effectiveness for the cities endorsed by the CTCDC to test the device. He can he contacted at tel. (707)542-9500. Mike Harrison, inventor of the *LightGuard* Crosswalk Warning Device system, can be reached at (707)542-4547, fax (707)525-6333.

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Four IT1 Demonstration Sites Officially Announced

Seattle

The TimeSaver project will provide intermodal transportation management and integrated, real-time highway and transit information services for the entire Seattle metropolitan area. The North Seattle Advanced Traffic Management System will link the traffic signal systems of 15 jurisdictions, including nine cities. two counties and three transit agencies. Etak and Metro Traffic Control are leading a team of private sector firms that will deliver traveler information through 3 variety of' devices.

Other partners in the Timesaver project include the state of Washington Dept. of Transportation, Arenel International Inc., Battelle Pacific Nonhwest Laboratories, Boeing Company, Ciry of Bellevue Transportation Department. David Evans and Associates, Inc., Etak Inc., Fastline, IBI Group. Infrastructure Consulting Corporation, King County Dept. of Transportation, Metro Traffic Control, Inc.. Microsoft. Inc., Overlake Transportation Management Association, Pacific Rim Resources, Inc., PB/Farradyne Inc., Rockwell International Corporation, Seiko Communications Systems, Inc.. TCI Telephony Services, Inc., Puget Sound Regional Council. TRAC-UW, Transportation Division Seattle Engineering Department, US WEST Communications, University of Washington, Washington State Department of Information Services, Willows Corridor Transportation Partnership, and XYPOINT Corporation.

New York, New Jersey, Connecticut

In the New York City metropolitan region, current information on traffic conditions will he available to millions of local commuters, commercial vehicle operators and other travelers. TRANSCOM, the lead organization, is a consortium of 14 transportation and public safety agencies. The widely dispersed public agencies will deploy a regional transportation management system that connects member agencies via a virtual transportation management center. SmartRoutes systems, a radio and television traffic information service, will provide personalized information to the public for a fee. It is expected that the service will eventually become self-supporting.

Other partners include Lockheed Martin Federal Systems, PB Farradyne, JHK & Associates, Metro Vision of' North America, Walcoff & Associates, Sam Schwartz Company, Shadow Broadcasting, MetroCommute Options Group, Nation Technologies. and CALSPAN. For more information, contact Karen Whitney at (202)366-0660.

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LightGuard™ Systems, Inc.
"Pursuing Safety Through Technology"

2292 Airport Blvd.
Santa Rosa, CA 95403-1003
PH: (707) 542-4547
FAX: (707) 525-6333

September 12, 1997

RE: STATE TRANSPORTATION AGENCY APPROVES NEW TRAFFIC CONTROL DEVICE
CROSSWALK WARNING SYSTEM

Dear APWA Attendee:

On July 17, 1997, after almost four years of state testing and evaluation, the California Traffic Control Devices Committee (CTCDC) has recommended approval of a new Experimental Crosswalk Warning System and forwarded the device to Caltrans for review and approval of specifications. LightGuard Systems, Inc. in Santa Rosa, California developed the crosswalk warning device, known and trademarked as the LightGuard™ System.

The LightGuard System alerts motorists that they are approaching an occupied crosswalk using in-roadway amber LED flashing lights placed on both sides of a crosswalk facing oncoming traffic. When activated, the flashing amber lights are visible to the approaching motorist as an advance warning to permit vehicles to slow down and stop for a pedestrian. The device was tested at mid-block and intersection pedestrian crosswalks where no controls previously existed. The California Office of Traffic Safety funded evaluation report recommends the Crosswalk Warning System should be used at uncontrolled crosswalks with approach speeds of 45 mph or less.

In most pedestrian / vehicle mishaps, or yield violations, motorists say they just did not see the pedestrian in the crosswalk until it was too late to stop. The LightGuard System mitigates this common problem by alerting the approaching motorist in advance permitting the driver to take the appropriate action of slowing or stopping for the pedestrian. Field studies consistently show the percentage of drivers yielding to pedestrians increases dramatically and drivers begin to brake sooner where the device has been installed and activated.

The LightGuard System may offer a substantial cost saving alternative to the traditional signalized traffic devices currently used for pedestrian protection and may reduce pedestrian / vehicle collisions and injuries at crosswalks, not to mention the untold number of lives that might be saved.

Your city likely has problem locations that you may deem best suited for this device. Following your review, please contact us to receive more information about the LightGuard System or to discuss the feasibility of a specific location. We look forward to working with you in your pedestrian safety efforts. Thank you for your consideration of this potentially life saving device in your community.

Sincerely,

Peter Floodman
Vice President, Sales

Attachment

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THE URBAN TRANSPORTATION MONITOR

ATTACHMENT 10

VOL 11, NO 24 DECEMBER 19, 19

Global Warming Treaty Will Have Effect on Transportation

U.S. Industries Voice Strong Opposition

Under the global warming treatyreached recently in Kyoto, Japan, the U.S. would commit to reduce the amount of greenhouse *gases it* emits to a level 7% below its 1990 emissions. The goal must be reached between the years 2008 and 2012.

The European Union pledged to cut its emissions by 8% and Japan by 6%. The treaty does not demand specific reductions by developing countries. Greenhouse gases are produced in large measure by the burning of fossil fuels such as coal and oil, which means that highway transportation will be a source of the necessary reductions.

'In the U.S., highway transportation contributes a significant but declining percentage of greenhouse gas emissions. Carbon monoxide has declined from 69% in 1984 to 62% in 1993; nitrogen oxides from 36% to 32%: and volatile organic compounds from 37% to 26%.

Response *from* U.S. industry leaders has largely been negative, with most comments focusing on the problem of the U.S. operating at a competitive disadvantage under these reductionscompared to many of the 130 developing countries which include China, India, and South Korea. Andrew Sharkey. president ofthe American Iron and Steel Institute, the industry's main trade association, mainrains that the pact would serve to benefit *rival* steel industries in developing nations that have refused to participate in reducing emissions.

What is ofconcern among some leaders of the transportation industry is that the pact's emissions standards will force the creation of more stringent U.S. fuel-economy requirements to reduce gasoline use. This, in turn, will call for increased production of small cars which are not as popular and profitable for auto makers as the larger, heavier-polluting vans, sport-utility vehicles, and pickups.

In-Pavement Warning Lights Show Promise at Pedestrian Crossing

Test Going Well -- Airport Runway Lights Used

A unique and innovative application of in-pavement lighting found on airport runways is being tested in Ho&d County, MD, to warn approaching motorists of a school pedestrian crossing. The application is performing well so far.

Ed Walter, chief of the traffic engineering division of Howard County, was faced with the problem of improving an accident-prone school crossing which did not meet warrants for traffic signal installation. He took the unique approach of adapting in-pavement lights used on airport runways to use as warning lights at the school crossing.

The lights installed at the crossing have a projection above the pavement of

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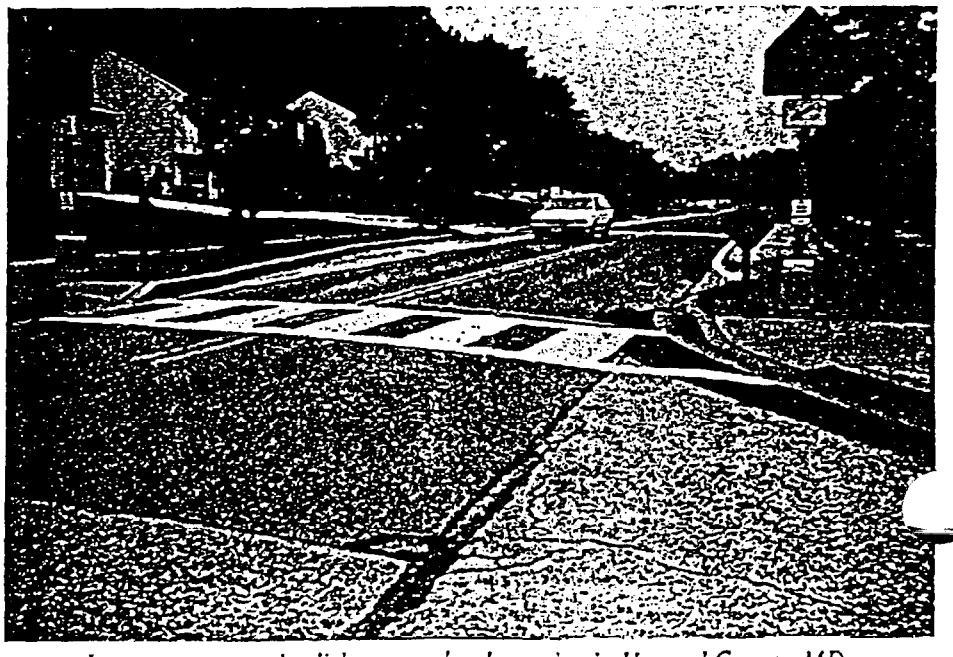

In-pavement warning lights at a school crossing in Howard County, MD.

Inside

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&-Pavement Warning Lights Show Promise at Pedestrian Crossing

, 1/2" which allows snow-plow blades to pass over the fixture and do not hinder bicyclists. Each fixture is 8" in diameter and is set in an underground canister of galvanized ***steel.*** The fixtures are designed to withstand a dynamic load of 11 tons and routinely handle rollover by Boeing 747's and L-101 I's when used on airport runways.

Forty-five watt lamps and yellow lenses project bright beams in both directions (30 watt lamps and clear and red lenses were also considered.) The lights are activated by pedestrian push-buttons at the curbs and flash once per second for 30 seconds.

At the Howard County location the sidewalks on both sides of the crosswalk were widened to reduce the speed of approaching vehicles. cut the number of fixtures required, and limit the time pedestrians were in the crosswalk.

According to Ed Walter, installation was a quick, straightforward process, except that conduit and cable had to be run 300 feet from the crosswalk to a power source.

Three 9" holes, 4" deep, were core drilled on each side of the crosswalk. Saw cuts were made in the pavement to accommodate electrical lines between the fixtures. Base cans were then installed using flat metal leveling bars bolted through temporary plywood covers on the cans. These cans feature a bottom rim to prevent uplift and anti-rotation fins to avoid lateral shifting over time.

The cans were held in place by Traffic Loop Sealant (epoxy) which cures in about four hours, after which the jigs and the protective plywood covers were removed and the ZA230 fixtures bolted in place with vandal-proof hardware.

There have been positive responses from both motorists and pedestrians. Currently, traffic speed data on the installation is being collected. The costs amount to less than 10% of what a traffic signal would have cost. 'The lighting hardware came to about $3,500," Walter said, "and other materialsand labor brought the total cost to approximately $7,000, not includingthecostofrunningcable toadistant power source. We think it will prove to be more effective -- especially since we could afford to do the job immediately, before another child got hurt."

Further Characteristics of the Crosswalk Lights

Photometric output ranges from aslowas 20 candela (intensity) for green light to as high as 5,000 candela for clear (white) light. Lenses are temperature shock resistant and can be focused narrowly or widely depending on the desired results. Narrow beam pattern lenses tend to be intensely bright.

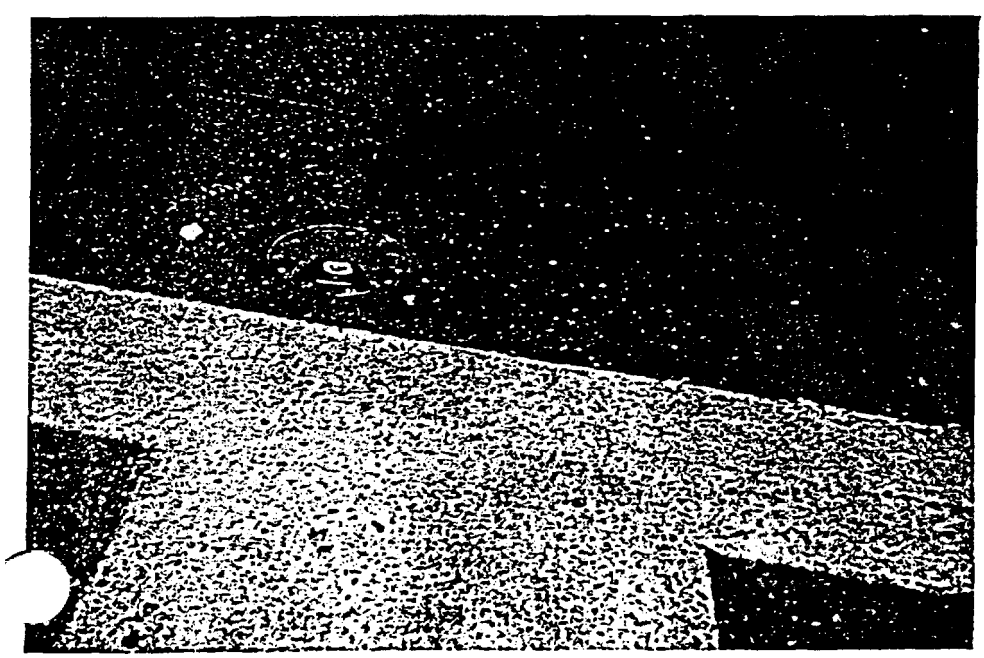
In-pavement light intensity at airports is varied based on the severity of weather conditions. Typical lamp life is 4,000 hour: based on average usage, minimum lamp life is at least 1,000 hours at maximum intensity. Considering lamp life in setting constant current regulators and/or designing custom power adapters can extend theoretical lamp life to 10,000 hours or more.

The most commonly used colors are clear (white), red, green, and yellow. Blue is available for special applications. Fixtures can be bi-directional. uni-directional. or omni-directional. Bi-directional fixtures can have a different color on each side.

Since airport circuits may be up to six miles long they normally use a series circuit powered by a constant current regulator. This ensures that every lighr in the circuit. from first to last, burns with the same intensity.

California's Traffic Control Device Committee recently endorsed in-pavement lights for crosswalks.

For core information call Flight Light, Inc., at 916-394-2800, or send e-mail to L861@aol.com.



The warning lights project above thepavement by 1/2" which allows snow plowing.

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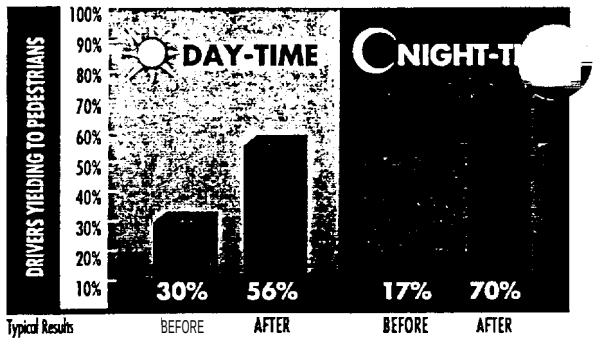
More and more drivers are seeing the light.

Pedestrian vs. vehicle collisions are occurring at an alarming rate. In fact, pedestrians account for up to 50% of traffic fatalities in urban areas.

In most pedestrian accidents, motorists say they just didn't notice there was a pedestrian in the crosswalk until it was too late to stop.

If motorists have a hard time seeing pedestrians in daylight hours, imagine what happens when it's dark. According to the National Safety Council a pedestrian's chances *of being hit increases 1100 times at night,* and according to studies, *8 out of 10 drivers who struck people* at *night didn't see them in time.*

On average, the economic cost per pedestrian struck in a traffic collision is nearly a quarter of a million dollars.



INCREASED DRIVER AWARENESS

Before and after field study evaluations consistently report the percentage of drivers yielding to pedestrians increases dramatically after installation of the LightGuard System. Approach speeds decrease, motorists start braking sooner and the number of drivers noticing the crosswalks have increased up to 100%.

"An attention getting device seemingly impossible to ignore." Drivers say the **strobe-like** flash catches their attention, especially at night or in bad weather conditions, such as rain or fog.

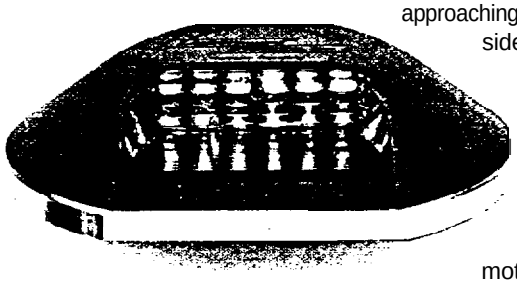
Motorists typically react by letting off the accelerator, slowing or braking as they approach the crosswalk. The LightGuard System creates a heightened state of awareness and may provide additional time for the approaching motorist to come to a safe stop for a pedestrian, or pass safely through the crosswalk without impeding the traffic.

AN ECONOMICAL SOLUTION

The LightGuard system offers a potentially cost-saving alternative to other signalized traffic control devices currently in use.

"In most pedestrian accidents, motorists say they just didn't notice there was a pedestrian in the crosswalk until it was too late to stop."

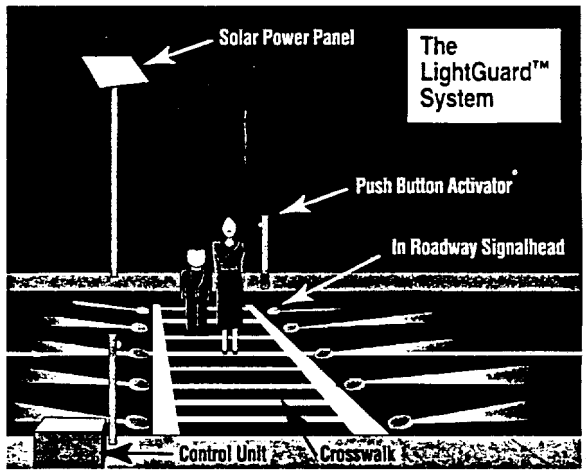
Now motorists are seeing the light!



The LightGuard System alerts motorists that they are approaching an occupied crosswalk. Both sides of a crosswalk are lined with a series of amber LED flashing lights encased in durable housings and embedded in the roadway facing oncoming traffic. The pedestrian activated flashing lights are visible to the approaching motorist as an advance warning that someone is in or near the marked crosswalk.

- Amber LED's provide the best visibility for motorists at distances in bright sunlight and adverse weather conditions.
- Low cost installation with containment of all electronics in one roadside cabinet.
- Solar cell battery power at crosswalk locations where electrical power is not available. The efficiencies of the LED strobe lights permit operation off solar power during daytime hours as well as operation off battery power during nighttime hours.
- Flashing in-roadway lights can be viewed from **as** far away as 1000 to 1500 ft. from the crosswalk.

Currently recommended for uncontrolled **crosswalks at intersection or midblock locations.**



Simply put, if you are concerned about pedestrian injuries -- fatalities in your community...

LightGuard Systems, Inc.
2292 Airport Blvd.
Santa Rosa, CA 95403
e mail: LGS@pacbell.net

707-542-4547
Call or write today for more information

Patent Pending

*. . . The **LightGuard System** could be the solution you're **looking** for.*