

Original article

European countries; this relationship is observed consistently across a wide range of contexts.¹⁸

Traffic can delay, and hence deter, walking and bicycling. Traffic also imposes injury risk on non-motorised travellers. In Sweden and Denmark, roadway investment planning incorporate methods for quantifying this barrier effect.¹⁹

Fear of traffic can be seen in how and where pedestrians cross streets. In the USA, 14% of the people on crosswalks ran rather than walked across the road.²⁰ Pedestrians are less likely to cross streets if the crosswalk is unmarked. Where legs of an intersection were otherwise matched and comparable, but only one of the crosswalks was marked with paint, pedestrians avoided the unmarked crosswalk in a 2/1 ratio. Young and older pedestrians were even more likely to avoid the unmarked crosswalk, more so as the number of traffic lanes increased.²¹

Even though motorists are legally obligated to yield at zebra crossings, three out of four motorists use speed to intimidate pedestrians into yielding. Only 5% of the motorists yield to pedestrians.²²

When roadways are equipped with sidewalks, nearly four times as many people walk. More than six times as many people walk along two-lane roads as four-lane roads.²³

Men and women bicycle at different levels, possibly reflecting different attitudes to risk. In communities with low levels of cycling, more men than women bicycle, but, as the number of bicyclists increases, the sex differences diminish.²⁴

Neighbours are less likely to know and trust each other in neighbourhoods with high traffic volume. Outdoor activities are less common on high-traffic streets. Children are rarely found playing except on the light-traffic streets. Residents felt their delay in crossing streets increased as traffic volume increased. The author of this study concluded that the "impacts of traffic on street life were extremely severe."²⁵

The amount of walking and bicycling changes with both long-term and short-term changes in traffic volume and speed. Over two generations, the amount of walking and bicycling has greatly decreased in many countries, with far fewer children playing in the streets.²⁶ Before automobiles dominated the streets, children played in them.²⁷ In the early 1900s, the advent of motor vehicles was seen as gradually driving bicyclists from the roads because of the dangerous and unpleasant nature of motor vehicle use.²⁸

In the long term, traffic volume and speed have increased. In the USA, traffic volume increased 63% between 1980 and 1997, almost three times faster than population growth.²⁹ In Western European countries, car use is now 2.5 times that of 1970.³⁰

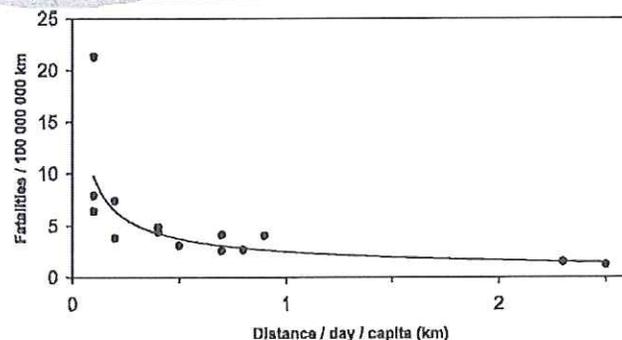


Figure 1 Fatalities/100 million km cycled as a function of distances travelled/day/capita in 14 European countries.¹⁷

Eastern European traffic has grown tremendously, but it is poorly documented.

In 1971 and again in 1990, children and parents from the same five neighbourhoods in England were asked about their freedom to travel. Despite essentially physically unchanged neighbourhoods, the surveys show that "whilst 80% of 7 and 8 year olds went to school on their own in the early 1970s, less than 10% were doing so two decades later."²⁶

This neighbourhood survey is matched by other, broader surveys. In a recent 10-year period in the UK, children's school trips on-foot and on-bike have decreased by 10 percentage points.³¹ In the USA, 48% of students walked or bicycled to school in 1969. Today, fewer than 15% of children walk to school and only 1% bicycle.³² In the USA, half of this change is due to greater travel distances.³³ However, for children who live within a mile of school, the share of children walking or bicycling to school also dropped precipitously, from close to 90% in 1969 to 31% 30 years later.³²

The rapid motorisation in developing countries has been accompanied by an even faster decline in bicycle riding. A survey in China found that 43% of bicyclists have reduced bicycling—and only 11% said it was because they had bought a car. The main reason was the perceived increased danger in the streets.³⁴ In many African cities, bicycle use was common and significant 20 or 30 years ago. For example, in Lusaka, Zambia, the share of commute trips by bike was 55% in 1969. Now bicycle use has become insignificant in the largest cities because of the increasingly hostile and unsafe environment created by motor vehicle traffic.³⁵ In contrast, Bogotá increased the use of bicycles from less than 1% to 4% in 3 years by constructing 250 km of bicycle facilities and by promoting bicycle use, including by closing many streets to motorised traffic on Sundays.¹⁰

Interventions that reduce the danger of traffic to people walking and bicycling, such as traffic calming, constructing trails, closing or restricting use of roads, road user charging, constructing bicycle infrastructure and implementing safe routes to school programs, encourage walking and bicycling.¹⁵⁻¹⁷

DISCUSSION

The real or perceived danger and unpleasantness of traffic discourages walking and bicycling. There is both survey and observational evidence for this and a strong association between increasing speeds and volumes of traffic and decreasing levels of walking and cycling.

Methodological strengths and weaknesses of the study

In most urban areas around the world it is difficult to find locales where traffic danger is not a continuing reality of everyday life—traffic and traffic danger are almost ubiquitous—yet have rarely been studied as a causal component of people's physical inactivity.

Given its ubiquity, it is hard to isolate the role of traffic from other factors influencing active travel behaviour. Indeed, many people, including researchers, are so accustomed to exposure to traffic that they may find it hard to conceive of a world without it; the influence of traffic on walking and cycling remains largely unresearched.

This omission also extends to interpreting injury statistics. In 1999, the US Centers for Disease Control and Prevention celebrated the 41% decrease in number of pedestrians killed over a 22-year period,³⁶ but they apparently did not consider the importance of the amount of walking. For young children, their

Given that many roadway projects make traffic more dangerous and less pleasant, the effects on people walking and bicycling should be routinely measured. Routine monitoring of walking and bicycling would address this, and allow identification of positive as well as negative effects of transport interventions.

The health benefits of increased physical activity resulting from changes in walking and cycling should be quantified and included in appraisals of transport projects. This approach can be used for schemes such as the London congestion charge as well as engineering and infrastructure projects.⁵⁹ Tools such as the WHO health economic assessment tool for cycling⁵¹ provide a powerful mechanism for doing this.

The evidence presented here shows that reducing traffic speed and volume encourages walking and bicycling. A shift in focus away from prioritisation of motorised mobility to a wider consideration of transport impacts, including the indirect impacts of traffic danger on physical activity, is an important step in moving towards a healthier, more active, and less obese society.

Competing interests: None.

We presented this paper, in an earlier form, at the 15 May 2006 WHO European Environment and Health Committee, Oslo.

Provenance and peer review: Not commissioned; externally peer reviewed.

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From: DPW-PUBWORKS AP
To: Arreola, Joel
CC: Witthaus, Jack
Date: 6/18/2012 12:15 PM
Subject: Fwd: [BULK] Kohl Gill reported Crosswalk button broken (#196360) within Sunnyvale Division of Transportation and Traffic

Hi Joel,

This email came from the PW answer point. Please respond to the customer and copy the answer point.

Thank you,

Cristina

>>> SeeClickFix <replies@seeclickfix.com> 6/17/2012 7:31 PM >>>
An Issue popped up within your area at
146 E Iowa Ave Sunnyvale, CA 94086, USA

Kohl Gill wrote Crosswalk button broken

The northbound Iowa-crossing crosswalk button does not trigger a walk sign.

View this issue here:
http://seeclickfix.com/issues/196360?utm_source=activity_notice&utm_medium=email&utm_campaign=pois

You can alter or delete this watch area here:
http://seeclickfix.com/watchers/6e3442530d20efb9c515d74eeca5c607b86500c3/edit?utm_source=activity_notice&utm_medium=email&utm_campaign=pois

You can also view all of the issues within this area here:
http://seeclickfix.com/issues?watcher_token=fe045158f18285c165740a380a58f2324bbcd469&utm_source=activity_notice&utm_medium=email&utm_campaign=pois

Thank You,
The SeeClickFix Team

~~~~~  
Unsubscribe:  
[http://seeclickfix.com/confirmed\\_emails/cf5b6eb1b56a783ca4a0d4ad28ebcc5a1de1d8a6/edit?utm\\_source=activity\\_notice&utm\\_medium=email&utm\\_campaign=pois](http://seeclickfix.com/confirmed_emails/cf5b6eb1b56a783ca4a0d4ad28ebcc5a1de1d8a6/edit?utm_source=activity_notice&utm_medium=email&utm_campaign=pois)  
Please note: Any replies to this email may be posted publicly to SeeClickFix.com.

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**Jack Witthaus - Re: Crosswalk speaker on the NE corner**

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**From:** "Public works" <pubworks@ci.sunnyvale.ca.us>  
**To:** "Katherine Miller" <Katherinemiller01@gmail.com>  
**Date:** 6/18/2012 1:53 PM  
**Subject:** Re: Crosswalk speaker on the NE corner  
**CC:** "jwitthaus@ci.sunnyvale.ca.us" <jwitthaus@ci.sunnyvale.ca.us>

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Dear Katherine Miller,  
We will have this looked at today and if it's possible, repaired as well. I will notify you when it has been repaired.

If you have any questions or concerns please let me know.

Thank you,  
Joel Arreola  
Public works Dept.  
Jarreola@ci.sunnyvale.ca.us  
408-730-7427

----- Your Original Message -----

**Request #:** 21742  
**From:** Katherine Miller  
**Date:** 06-16-12 8:32 am  
**Location:** NE corner of S. Fair Oaks Ave. & E. Olive Ave.  
**Subject:** Crosswalk speaker on the NE corner  
**Message:** The crosswalk speaker is running continuously all night saying "wait" over and over again. Sometimes during the day as well. This has been happening for several weeks and has become quite annoying. Please have a service tech look into this. Thank you.

52

**Jack Witthaus - Web Contact - Request ID: 21773 Reply: Yes, Subject: Please Support Cyclist Anti-Harrassment Ordinance**

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**From:** "emailer" <emailer@ci.sunnyvale.ca.us>  
**To:** "Contact - jwitthaus@ci.sunnyvale.ca.us" <jwitthaus@ci.sunnyvale.ca.us>  
**Date:** 6/18/2012 3:01 PM  
**Subject:** Web Contact - Request ID: 21773 Reply: Yes, Subject: Please Support Cyclist Anti-Harrassment Ordinance

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Dear **BPAC**,

Please respond to web request **21773** by clicking one of the three buttons below:

**From** lisa.hern@gmail.com <lisa.hern@gmail.com> 408-596-1008

**Reply Needed** Yes

**Subject** Please Support Cyclist Anti-Harrassment Ordinance

**Message** Hello, I ride bikes in Sunnyvale. A lot. I want to strongly encourage the council to support the Bicycle Anti-Harrassment ordinance that is being discussed at this evening's meeting. While I like to ride safely and while I follow the law when I ride, I recognize the fact that some riders do not. I believe these riders to be the minority, but sometimes their actions anger others. As a result, sometimes drivers take out their aggression on other cyclists - who may or may not have done anything inappropriate or illegal while riding. I hope an anti-harrassment ordinance would create penalties for harrassing cyclists, and thus decrease the incidents of harrassment against cyclists (who have the right to share the road with motorists, as per state driving guidelines). Thank you for your consideration.

53

**Jack Witthaus - Re: Deep hole in north bound bike lane on W. Fremont/S.Bernardo**

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**From:** "Public works" <pubworks@ci.sunnyvale.ca.us>  
**To:** "Public works" <pubworks@ci.sunnyvale.ca.us>  
**Date:** 6/20/2012 10:12 AM  
**Subject:** Re: Deep hole in north bound bike lane on W. Fremont/S.Bernardo  
**CC:** "Tony Pineda" <tpineda@ci.sunnyvale.ca.us>, "Connie Patchin Frank" <cpatchin@ci.sunnyvale.ca.us>, "Jim Craig" <jcraig@ci.sunnyvale.ca.us>, "Jack Witthaus" <jwitthaus@ci.sunnyvale.ca.us>, "Frances Morales" <fmorales@ci.sunnyvale.ca.us>

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Work order #ST-7839 was created yesterday for the Pavement crew regarding this issue.

Thank you,  
Michelle Cameron  
Public Works/Operations  
730-7562

----- Your Original Message -----

**Request #:** 21791

**From:** Anonymous<>

**Date:** 06-19-12 2:02 pm

**Subject:** Deep hole in north bound bike lane on W. Fremont/S.Bernardo

**Message:** While biking this morning I hit a ~6 inch diameter hole, that was maybe 6 inches deep in the northbound bike lane of W. Fremont at S. Bernardo (SE) corner, because I was watching traffic & not looking at the road surface (since it was recently repaved). It was enough to stop my bike & I went over the bars. Now I have 4 contusions & possibly a broken rib (bike landed on my chest). I know it doesn't sound like a big deal, maybe because the hole is so deep. But, it is such a busy intersection, that most riders are likely watching traffic & I'm just lucky I didn't land in traffic. I was only going 8 -10 mph. Could you please spray paint a large orange circle around that hole (or something) to make it obvious to bicyclists please?

54

## Jack Witthaus - Bicycling related safety items needing attention

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**From:** "Cathy B. Switzer" <cbsbikes@me.com>  
**To:** Jack Witthaus <JWitthaus@ci.sunnyvale.ca.us>  
**Date:** 6/28/2012 11:10 AM  
**Subject:** Bicycling related safety items needing attention  
**CC:** <bpac@ci.sunnyvale.ca.us>

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Jack,

Wondering if you would follow up on a few safety items:

1. Saratoga-Sunnyvale Road, sidewalk construction in front of Fremont High School  
 -- signage "Bike Lane Ends" - please replace with "Bikes allowed full use of lane" or at a minimum, a "SHARE the ROAD" sign. The lane 'ends' in the middle of the block, where is the bike supposed to go?
2. Persian Drive closed at Borregas to .. where?  
 -- no signage besides a flag man saying the road is closed. He did indicate that it's PG&E construction. That is, again, a relatively well travelled bike route. When Persian was closed between Lawrence and Fair Oaks, there was also no signage for length of time, or alternate route, I got caught there a few times, had to backtrack, and give two other cyclists directions. As with car commuters, Sunnyvale is a 'through city' for bike commuters, they don't necessarily know the different SAFE options. Can't the City require some small lane of access for bicycles? As unfriendly as it is, that's what SVBC pushed PG&E for on Manila Drive - that road is a major E/W (N/S?) route for cyclists, and having it closed with NO alternate routes suggested, was hell. The same thing is happening a Persian now, surely PG&E needs to get permits from the City of Sunnyvale to do the work, we must have some sort of requirements for bicycle and pedestrian safety?
3. Fair Oaks & 101  
 -- lots of shattered glass in the SB lane, just past the NB entrance. Yes, I know that the intersection is CalTrans' responsibility, would you contact them or just have the glass swept up?
4. Fair Oaks & Duane  
 -- SB Fair Oaks to WB Duane - the divots in the road surface require strong navigation if you're on a bike, and noticeable in a car. Any possibility for them to be filled?
5. Fair Oaks & Arques  
 -- SB Fair Oaks, lane closest to the sidewalk - there's a long time round depression in the lane, right where you'll be riding your bike. Any possibility for this to be corrected?

A request to forward to the Parks & Recreation department:

1. Sunnyvale Baylands Park  
 -- a sign inside the park, at the end [start?] of Baylands Park Drive, indicating to turn left (or right) to get to Lawrence Expressway. It may be obvious to a Car Driver who can only enter the park there, but to bike commuters who come in from Santa Clara, they are not sure where to

55

turn. I've watched some confused cyclists, and helped.

Observation, hoping we get our signs soon:

1. Rode from home to Palo Alto Medical Foundation last week. Maude -> Middlefield -> E. Meadow -> Bryant Street Bike Boulevard. I didn't know exactly how to get across the train tracks... but BINGO, a sign! Perfect sized, directing me to "Palo Alto Medical via Homer Underpass". Made the left, and arrived safely, under the train tracks, at Palo Alto Medical.

I don't recall the signage which was decided for Sunnyvale, but the PA signs worked for me - smaller than car-specific signs, green, with a bike. Simple, elegant and let's not reinvent the wheel - just blatantly copy them (!).

General update requested:

1. Downtown sidewalks. You had mentioned that we've received complaints about the furniture - what changes are being planned? I'm getting pinged from a variety of different audiences, and was walking downtown last night with a visitor from Madison WI, who commented that if the lights were 6" closer to the road, they wouldn't block the pedestrians so much... ouch, that hurt!

2. John W. Christian Greenbelt - haven't been on it for a while, did we ever get signs?

Ok, this is a long email, sorry about that!

Cathy

Bicycle and Pedestrian Advisory Commission

Active Items List - Attachment C

| Item # | Item                                                 | OPR       | Due Date (Approx) | Status                                                                                                                                                                                                                                                                                                                                     | Last Updated |
|--------|------------------------------------------------------|-----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1      | Bernardo Caltrain Under-crossing                     | Witthaus  | TBD               | Feasibility Study accepted by the City Council. Funds for 20% local matching funds must be identified before further project initiation. BEP Tier 1 update submitted. VTA will program 80% funds out to 2016 to allow for time to secure matching funds. Project update submitted for Valley Transportation Plan (VTP) 2035 consideration. | 4/9/2009     |
| 2      | Code of Ethics and Conduct                           | Witthaus  | Annual            | Agendized for review by BPAC during the meeting of January 19th, 2012.                                                                                                                                                                                                                                                                     | 1/1/2012     |
| 3      | Utility Bill Insert                                  | Witthaus  | Annual            | Complete.                                                                                                                                                                                                                                                                                                                                  | 7/12/2012    |
| 4      | Bike to Work Day                                     | Witthaus  | Annual            | Staff and BPAC staffed two energizer stations..                                                                                                                                                                                                                                                                                            | 5/11/2012    |
| 5      | Earth Day                                            | Witthaus  | Annual            | No BPAC or transportation staff participation.                                                                                                                                                                                                                                                                                             | 5/11/2012    |
| 6      | Fit and Fun Fair                                     | Witthaus  | Annual            | 38 bike helmets donated by the County Public Health Department, fitted and distributed by volunteer Kevin Jackson. Bike safety tune ups also provided.                                                                                                                                                                                     | 4/14/2012    |
| 7      | Road Overlay, Slurry, Reconstruction & Chip Schedule | T. Pineda | Annual            | Transmitted at the January, 2012 BPAC meeting                                                                                                                                                                                                                                                                                              | 5/11/2012    |
| 8      | Signage request - Entrance of Baylands Park          | Witthaus  | 5/12/2012         | Complete.                                                                                                                                                                                                                                                                                                                                  | 5/11/2012    |
| 9      | State of the City                                    | Pilger    | Annual            | Pending for 2012                                                                                                                                                                                                                                                                                                                           | 1/1/2012     |

| Item # | Item                                                               | OPR       | Due Date (Approx) | Status                                                                                                                                                                                                                                                                                    | Last Updated |
|--------|--------------------------------------------------------------------|-----------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 10     | VTA Bicycle Expenditure Program (BEP)                              | Withtaus  | Annual            | TFCM Program Manager call for projects circulated, Mathilda Avenue bike lane project from Maude Avenue to California Avenue and Wildwood Avenue bike lanes projects approved for funding. Funding agreements anticipated to be prepared by July, 2012.                                    | 5/11/2012    |
| 11     | Block Grants                                                       | Withtaus  | Annual            | Hendy Avenue between Fair Oaks and Sunnyvale Avenues sidewalks, bike lanes, underground utilities, and other improvements at 95% design. Left-turn, signal and pedestrian improvements at the intersection of Old San Francisco Road/Sunnyvale Avenue 95% design.                         | 1/1/2012     |
| 12     | Construction Zone Safety Complaints received                       | Withtaus  | Ongoing           | No complaints received                                                                                                                                                                                                                                                                    | 4/11/2012    |
| 13     | Bicycle Detection Complaints received                              | Withtaus  | Ongoing           | No complaints received                                                                                                                                                                                                                                                                    | 4/11/2012    |
| 14     | Community Design and Transportation (CDT) - Planning Grant Program | El-Guendy | Annual            | Feasibility study/concept plan for the West Channel Trail corridor capital project approved by Council.                                                                                                                                                                                   | 1/1/2012     |
| 15     | 2011/12 Transportation Planning Grant Funds                        | Withtaus  | Annual            | No projects submitted.                                                                                                                                                                                                                                                                    | 5/11/2012    |
| 16     | Safe Routes to Schools Projects                                    | Fakih     | Annual            | Cycle 10 project at 99% design. City awarded \$ 820,000 in Safe Route funding, Council approved project in December, 2011. A non-infrastructure application for the Cities of Sunnyvale and Campbell was submitted under TSCN of the County's Health Department and approved for funding. | 5/11/2012    |

| Item # | Item                                                                   | OPR       | Due Date (Approx) | Status                                                                                                                                                                                                                                                                                                                                                                                                      | Last Updated |
|--------|------------------------------------------------------------------------|-----------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 17     | 2010 Community Design and Transportation (CDT) - Capital Grant Program | Fakh      | Annual            | East Channel Trail project determined to require coordination with Water District flood control improvements. Timing of grant funds would not allow construction. Funds shifted to Downtown Streetscape Project to improve sidewalk and other streetscape features on Iowa Avenue.                                                                                                                          | 1/1/2012     |
| 18     | Establishment of Bike Lanes on Mary Avenue                             | Witthaus  | Ongoing           | Street Space Allocation Study to move forward as a stand alone project. Technical work 90% complete, interpretive and environmental studies to be completed. Contract amendment approved by Council, May 8, 2012. Data collection underway.                                                                                                                                                                 | 7/12/2012    |
| 19     | Vehicle Emissions Reductions Based at Schools (VERBS) Grant Program    | El-Guendy | Ongoing           | Teaming with the Traffic Safe Communities Network (TSCN), an application for non-infrastructure initiatives was submitted on October 4th. The project was awarded funding of \$1 million excluding local match which will be split between the City of Sunnyvale and the County of Santa Clara. About 80% of Sunnyvale elementary and middle schools will be evaluated. Site coordination meetings ongoing. | 1/1/2012     |
| 20     | National Bike Registry                                                 | Moretto   | 6/30/2012         | Fee schedule to be revised, public outreach, implementation pending.                                                                                                                                                                                                                                                                                                                                        | 7/12/2012    |