

A black and white photograph of a street with a bicycle lane. A large white bicycle symbol is painted on the asphalt. In the background, there are parked cars and a bright light source, possibly the sun, creating a lens flare effect.

Countermeasures Prove Effective in Reducing **Bicycle Collisions**

BY NAZIR LALANI, P.E. AND KRISTOPHER GUNTERSON

In 2014, the number of traffic fatalities in the United States reached its lowest level at 32,744. Unfortunately, since then, the number of fatalities has been increasing each year, and in 2016, traffic related fatalities rose to 37,461 with pedestrian fatalities reaching close to 6,000 and bicycle related fatalities at well over 800.

Across the United States, communities are committing to Vision Zero. In addition to setting a goal of zero traffic deaths and severe injuries, Vision Zero also commits communities to a fundamental shift in how they approach traffic safety. A hallmark of Vision Zero in the United States is the creation of action plans. From mid-sized communities like Fremont, CA and Columbia, MO to big, urban cities like Los Angeles, CA, Boston, MA, and Austin, TX, these action plans are intended to lay the groundwork for the strategies that should move communities from vision to action and help achieve the goal of zero traffic deaths and serious injuries.

As part of its Action Plan to reduce collisions on publicly maintained streets, the City of La Quinta, CA, USA (population 41,000) has been preparing Annual Traffic Safety Reports (ATSRs) each year since 2006. The reports use Crossroads™ software to identify:

- Intersections with the highest number of intersection collisions;
- Road segments with the highest number of mid-block collisions;
- The locations of all pedestrian collisions and bicycle collisions; and
- The locations of all single vehicle collisions, night time collisions and collisions involving parked vehicles.

The ATSRs propose mitigation measures to reduce collisions where a clear pattern can be identified for which there is an effective countermeasure.

Implementation of Effective Countermeasures to Reduce Bicycle Collisions

The City of La Quinta recognized the trend of rapidly rising bicycle collisions shown in Table 1, and in 2015 began a major effort to implement the following countermeasures to reduce bicycle collisions on public streets maintained by the City:

Lane Diets: As part of pavement resurfacing projects, on-street bike lanes were provided where they did not previously exist. This was done through narrowing travel lane widths to 10 or 11 feet in order to reduce traffic speeds and provide sufficient pavement to stripe on-street bicycle lanes. The minimum width of the bike lanes are 6 feet as measured from the face of curb. Refer to Figure 1 for an example of a location where lane diets were implemented to provide on-street bike lanes (In the before condition, no striped bicycle lanes existed).

Video Detection Loops: The City has been gradually changing detection at the 55 traffic signals it maintains from in ground



Figure 1. Lane Diet to Provide Bike Lanes

inductance loops to video cameras. As part of that process, detection for bicycles has been provided on all approaches where an on-street striped bike lane is provided.

Bike Legends: Bicycle legends with green colored backgrounds were striped on the approaches of all signalized intersections to provide guidance to bicyclists as to where they should position themselves to be detected and travel through signalized intersections. This improvement has been identified as a best practice in a recent article published in *ITE Journal*.¹ Refer to Figure 2 for an example of a location where bicycle legends were striped.

Green Paint in High Conflict Areas: In areas where bicycles were anticipated to weave or merge with motorized vehicles, green paint was used to heighten awareness of both drivers and bicyclists to the potential for conflicts. Refer to Figure 3 for an example of a location where green paint was used in a transition area.

Posting Parking Restrictions: No Parking in Bike Lane Signs (R7-9a) have been posted every 550 feet along most of the street with striped on street bike lanes. The project was initiated in 2015 but will be completed in the fall of 2018.



Figure 2. Bicycle Legends

Bicycle Signal Timing: Minimum greens were increased for all through and left-turn phases at traffic signals to meet the guidance published in the American Association of State Highway and Transportation Officials' (AASHTO) *Guidelines for the Development of*



Figure 3. Green Paint for Highlighting Areas of Weaving and Merging Conflicts

Bicycle Facilities, Part 4 of the *California Manual on Uniform Traffic Control Devices* (MUTCD), and the findings published in a presentation made at the ITE 2015 Western District Annual Meeting in Las Vegas, NV titled, “Minimizing the Impact of Latest MUTCD on Traffic Signal Operation.”^{2,3,4}

In 2018–2019, the City will be constructing five roundabouts. Four of them will be replacing existing traffic signals and one will be replacing an all-way stop where a recent bicycle collision in April, 2018 underscores the need to construct the roundabout as soon as possible. The streets connecting the roundabouts will also be reduced from four through lanes to two so that bicycle lanes can be provided between the roundabouts. The project is being funded by an Active Transportation Program grant exceeding \$7 million and located in the Old Town/Village area of La Quinta.

Results and Conclusions

Most of the countermeasures to reduce bicycle collisions were implemented by the end of 2015. Table 1, which provides a summary of the total number of bicycle collisions in the City of La Quinta by calendar year, shows a sharp decline in the number of bicycle collisions in 2016–2017 during a period of time when traffic volumes were increasing along many of the major traffic corridors in the City, and the numbers of fatal and injury collisions throughout the United States were increasing significantly.⁵

Recommendations

The results in Table 1 show that the countermeasures implemented by the City of La Quinta to reduce bicycle related collisions have been effective and should be considered by other public agencies. It is also recommended that public agencies consider working with bicycle vendors, bicycle clubs, and bicycle coalitions to:

- Identify locations for future improvements such as lane diets to provide on-street striped bicycle lanes;
- Use social media to encourage bicyclists to wear bright fluorescent colored clothing to increase their conspicuity during the day and to equip their bicycles with reflectors as well as flashing or steady burning front and rear lamps to increase their conspicuity at night. (Figure 4 shows a bicyclist “Riding Bright”);^{6,7}
- Encourage riding with the flow of traffic rather than against traffic so that drivers will see them more clearly when executing turning movements at intersections and driveways;
- Encourage respecting and obeying traffic control devices such as stop signs and traffic signals. (This may be best accomplished by partnering with law enforcement officers);
- Encourage riding in the on-street striped bicycle lanes so drivers can comply with California’s recently enacted lateral separation rule; and



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Figure 4. Bicyclist “Riding Bright”

- Implement an “Educating Road Users About Bicycle Infrastructure” program similar to the ITE award-winning video produced by the City of Edmonton, Alberta, Canada.⁸

Table 1. Bicycle Collision Trends in the City of La Quinta (2014–2017)*

	Year	Total Bicycle Collisions	Fatal/Injury
Before	2014	10	7
	2015	13	10
After	2016	2	0
	2017	5	5

*Includes collisions on public streets only

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