

# Lake Forest Park WA

ATS Advanced Analytics

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- Fatal Crash Analysis
- Red Light & Speed Crash Analysis
- Safe Streets

# Safety Analysis

Fatal Crashes

# Safety Analysis | Analysis Notes

- Enforcement program started in 2009
  - Historical crash data used from 2001 to 2015
    - Before enforcement period: 2001-2008
    - After enforcement period: 2009-2015
- Fatal crash data source
  - Fatality Analysis Reporting System (FARS)
  - [http://www.nhtsa.gov/Data/Fatality-Analysis-Reporting-System-\(FARS\)](http://www.nhtsa.gov/Data/Fatality-Analysis-Reporting-System-(FARS))
- Small population
  - Between 2001-2015, there were 6 fatal crashes in Lake Forest Park. Due to the small population of fatal crashes, caution should be used when drawing conclusions from any trends.

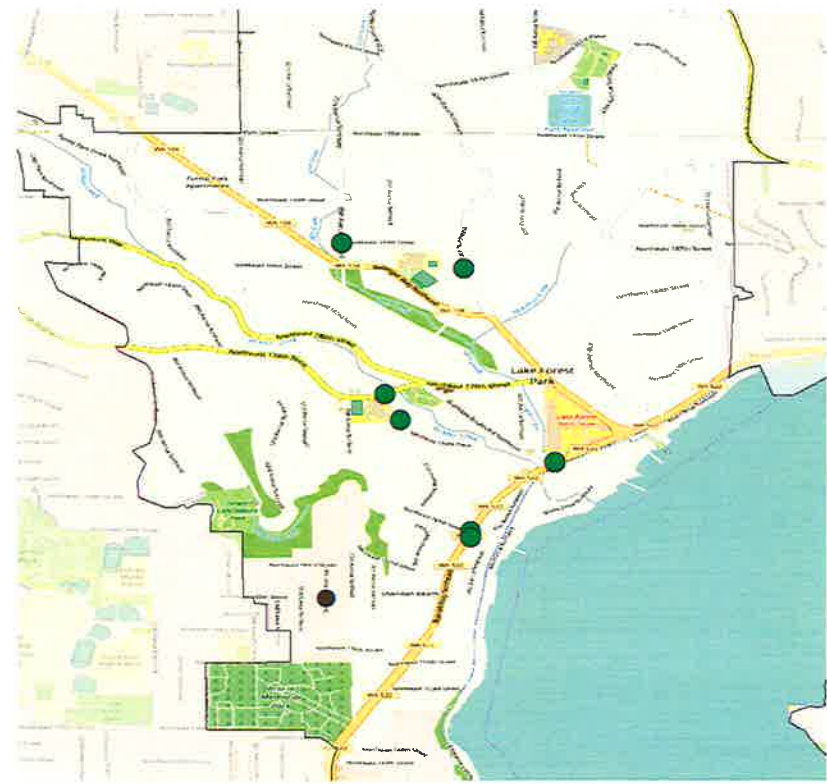
# Fatal Crash Locations | 2001 - 2015

- FATAL CRASHES
- CAMERAS

ALL CRASH TYPES

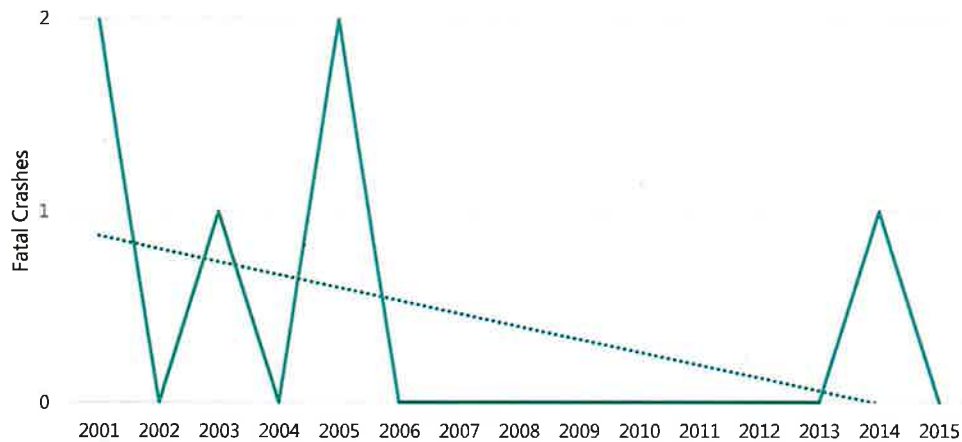


INTERSECTION RELATED CRASHES



# Safety Analysis | Fatal Crash Trending

FATAL CRASH VOLUME

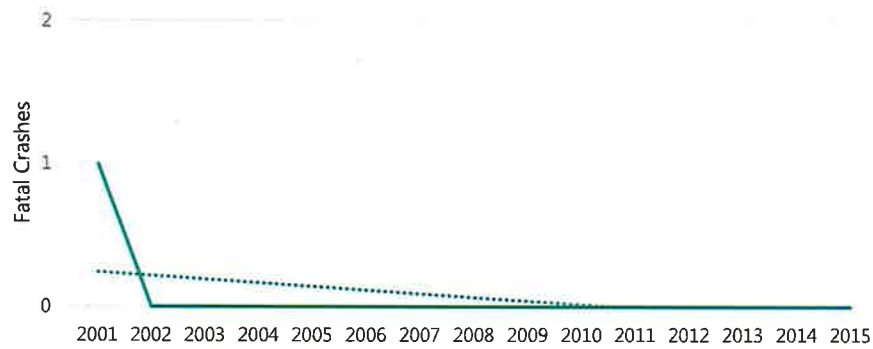


Before the program started (2001-2008) there had been 5 fatal crashes, since the program started (2009-2015) there has been only one.

From 2007-2013, there were no fatal crashes.

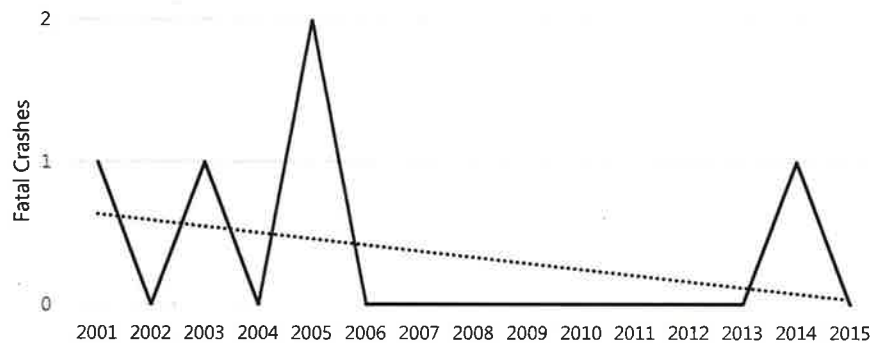
# Fatal Crash Analysis | Monitored vs. Rest of City

Monitored Locations



The only fatal crash that occurred within 500ft of a monitored location occurred in 2001.

Rest of the City



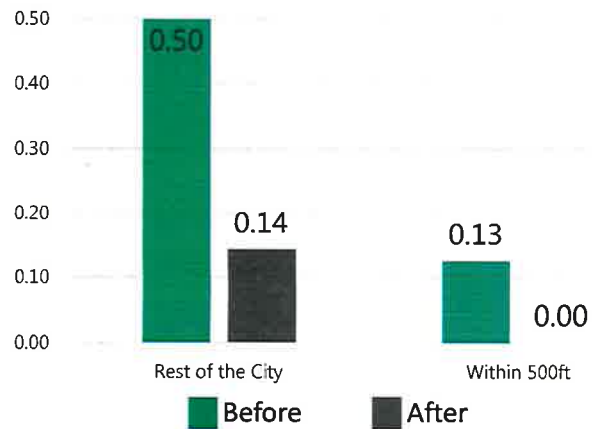
The rest of the city saw fatal crashes in 2001, 2003, 2005, and 2014.

# Fatal Crash Analysis | Monitored vs. Rest of City

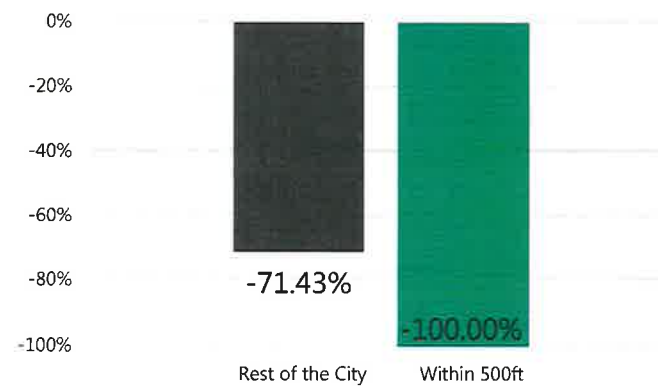
Before period : 2001-2008

After period : 2009-2015

Average Yearly Crash Volumes



Percent Change



The average yearly crash volume decreased by 100% within 500ft of camera locations when comparing the after period to the before period, and the rest of the city saw a decrease of 71% in average yearly crash volume.



# Safety Analysis | Fatal Crash Key Findings

- Before the program started (2001-2008) there had been 5 fatal crashes, since the program started (2009-2015) there has been only one.
- There have been no fatal crashes at monitored locations since the start of the enforcement program, and the rest of the city has seen a 71% decrease in average yearly fatal crashes.

# Safety Analysis

Red Light & Speed Crash Analysis

# Safety Analysis | Crash Category Definitions

The following mapping is used to categorize crashes based on the contributing circumstances identified by the investigating officer:

| <b>CRASH CATEGORY</b> | <b>CONTRIBUTING CIRCUMSTANCES</b>                               |
|-----------------------|---|
| Red Light Running     | Disregard Stop and Go Signal                                    |
| Speed Related         | Exceeding Reasonable Safe Speed<br>Exceeding Stated Speed Limit |
| Rear End              | Following Too Closely   |

# Safety Analysis | Red Light Related Crashes

| LOCATION         | DESCRIPTION   | TIME PERIOD | CRASHES | AVG YEARLY CRASHES | PERCENT CHANGE |
|------------------|---|-------------|---------|--------------------|----------------|
| Lake Forest Park | Entire Jurisdiction   | 2008-2010   | 10      | 3.3                | <b>-40%</b>    |
|                  |   | 2011-2016   | 12      | 2.0                |                |
| Bothell Way NE   | Entire Roadway  | 2008-2010   | 5       | 1.7                | <b>-20%</b>    |
|                  |   | 2011-2016   | 8       | 1.3                |                |
| LF05 / LF06      | Bothell Way & 165 <sup>th</sup> St<br><i>Red Light Camera</i> | 2008-2010   | 4       | 1.3                | <b>-63%</b>    |
|                  |   | 2011-2016   | 3       | 0.5                |                |
| LF09 / LF10      | Bothell Way & 170 <sup>th</sup> St<br><i>Red Light Camera</i> | 2008-2014   | 0       | 0.0                | <b>0%</b>      |
|                  |   | 2015-2016   | 0       | 0.0                |                |
| Proposed         | Bothell Way & Ballinger Way<br><i>Red Light Camera</i>        | 2008-2010   | 1       | 0.3                | <b>0%</b>      |
|                  |   | 2011-2016   | 2       | 0.3                |                |

City wide, there was a 40% decrease in average yearly red light running crashes after the first red light cameras went live in late 2010.

The entire stretch of Bothell Way NE has seen a decrease of about half that, while the intersection of Bothell Way NE & 165<sup>th</sup> St saw a decrease of 63%.

There have been no red light running crashes tagged to Bothell Way & 170<sup>th</sup> St, and at the proposed intersection of Bothell Way & Ballinger the yearly average has not changed.

# Safety Analysis | Speed Related Crashes

| LOCATION         | DESCRIPTION  | TIME PERIOD | CRASHES | AVG YEARLY CRASHES | PERCENT CHANGE |
|------------------|--|-------------|---------|--------------------|----------------|
| Lake Forest Park | Entire Jurisdiction  | 2008-2010   | 36      | 12.0               | <b>-35%</b>    |
|                  |  | 2011-2016   | 47      | 7.8                |                |
| Bothell Way NE   | Entire Roadway   | 2008-2010   | 9       | 3.0                | <b>-33%</b>    |
|                  |  | 2011-2016   | 12      | 2.0                |                |
| LF05 / LF06      | Bothell Way & 165 <sup>th</sup> St<br><i>Red Light Camera</i>            | 2008-2010   | 1       | 0.3                | <b>-50%</b>    |
|                  |  | 2011-2016   | 1       | 0.2                |                |
| LF09 / LF10      | Bothell Way & 170 <sup>th</sup> St<br><i>Red Light Camera</i>            | 2008-2014   | 0       | 0.0                | <b>-0%</b>     |
|                  |  | 2015-2016   | 0       | 0.0                |                |
| Proposed         | Bothell Way & Ballinger Way<br><i>Red Light Camera</i>                   | 2008-2010   | 3       | 1.0                | <b>-50%</b>    |
|                  |  | 2011-2016   | 3       | 0.5                |                |
| LF01 / LF02      | 37 <sup>th</sup> Ave NE & NE 187 <sup>th</sup> St<br><i>Speed Camera</i> | 2008-2009   | 1       | 0.5                | <b>-100%</b>   |
|                  |  | 2010-2016   | 0       | 0                  |                |
| LF03 / LF04      | 35 <sup>th</sup> Ave & NE 187 <sup>th</sup> St<br><i>Speed Camera</i>    | 2008        | 1       | 1.0                | <b>-88%</b>    |
|                  |  | 2009-2016   | 1       | 0.1                |                |
| LF07 / LF08      | 40 <sup>th</sup> PI NE & 185 <sup>th</sup> St<br><i>Speed Camera</i>     | 2008-2010   | 0       | 0.0                | <b>0%</b>      |
|                  |  | 2011-2016   | 0       | 0.0                |                |

Interestingly, we also see a reduction in speed related crashes at the intersections that have red light photo-enforcement.

There was a city-wide reduction of 35% in average yearly speed related crashes. There were reductions of 50% at both the intersections of Bothell Way & 165<sup>th</sup> St and Bothell Way & Ballinger Way.

Speed enforced locations saw decreases of 88% and 100% at locations that had speed related crashes.

# Safety Analysis | Rear End Crashes

| LOCATION         | DESCRIPTION                        | TIME PERIOD | CRASHES | AVG YEARLY CRASHES | PERCENT CHANGE |
|------------------|------------------------------------|-------------|---------|--------------------|----------------|
| Lake Forest Park | Entire Jurisdiction                | 2008-2010   | 57      | 19.0               | <b>+66%</b>    |
|                  |                                    | 2011-2016   | 189     | 31.5               |                |
| Bothell Way NE   | Entire Roadway                     | 2008-2010   | 31      | 10.3               | <b>+81%</b>    |
|                  |                                    | 2011-2016   | 112     | 18.7               |                |
| LF05 / LF06      | Bothell Way & 165 <sup>th</sup> St | 2008-2010   | 4       | 1.3                | <b>+25%</b>    |
|                  |                                    | 2011-2016   | 15      | 2.5                |                |
| LF09 / LF10      | Bothell Way & 170 <sup>th</sup> St | 2008-2014   | 4       | 0.6                | <b>-13%</b>    |
|                  |                                    | 2015-2016   | 1       | 0.5                |                |
| Proposed         | Bothell Way & Ballinger Way        | 2008-2010   | 11      | 3.7                | <b>+49%</b>    |
|                  |                                    | 2011-2016   | 20      | 3.3                |                |

Across the city, there has been a 66% increase in average yearly rear end crashes. Given its high traffic volume, it is unsurprising that Bothell Way sees an even larger increase of 81%.

The enforced intersection of Bothell Way & 165<sup>th</sup> St saw less than half the increase that the rest of the city saw, while the intersection of Bothell Way & 170<sup>th</sup> St actually saw a 13% decrease.

The proposed intersection of Bothell Way & Ballinger saw an increase of 49%.

# Safety Analysis | Red Light & Speed Crash Key Findings

- Average yearly red light related crashes at LF05 / LF06 decreased by 63% while decreasing city-wide by 40% since the start of the enforcement program.
- Average yearly speed related crashes also saw a larger reduction at red light enforced intersections than did the city as a whole.
- Average yearly speed related crashes decreased by 35% across the city, while decreasing by 100% at LF01 / LF02 and by 88% at LF03 / LF04.
- Average yearly rear-end crashes increased by 66% city wide, but only increased by 25% at LF05 / LF06 and decreased by 13% at LF09 / LF10.

# Safety Analysis

Safe Streets Initiative



# Safety Analysis | Safe Streets Initiative

## **Local Transportation System Master Planning (Safe Streets)**

- “The City will develop a master plan for the development and “finishing” of streets for connection to the state system, **for safe pedestrian and bicycle connectivity to key nodes around the City** including the town center, Southern Gateway and 3 elementary schools.”

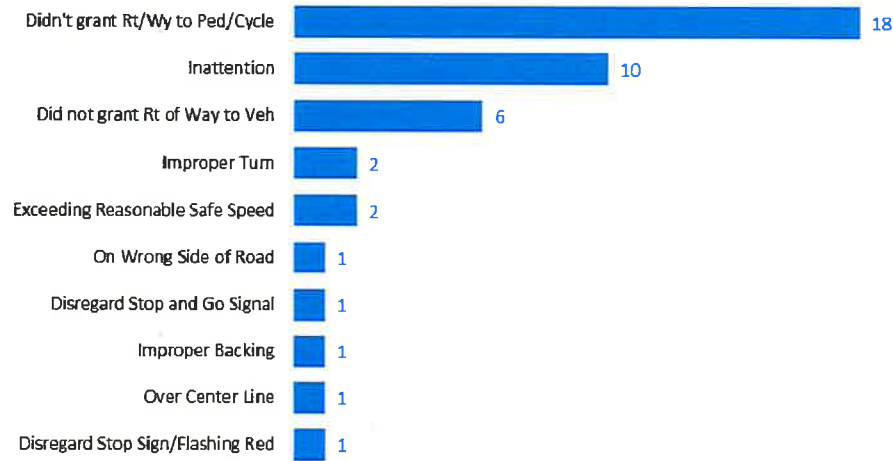
## **Safe Highway Study Request for Qualifications (RFQ)**

- “The goals of the study are to examine scenarios that improve access and connectivity and **reduce mobility barriers for all types of travel, including pedestrian, bicycle,** automobile, and public transit; improve area health and safety by increasing walkability and bikeability; and identifying needed safety improvements and corresponding remedies.”

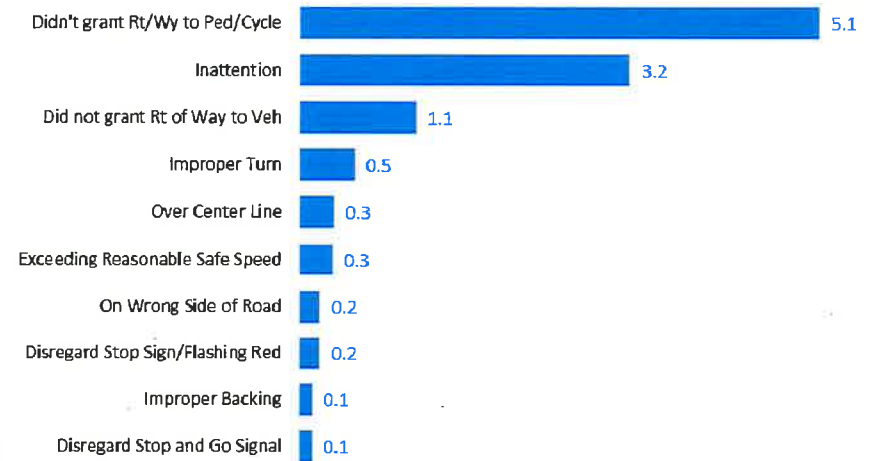
**We believe that we can offer some insight into crashes involving bicyclists and pedestrians.**

# Safety Analysis | What is Causing Pedestrian and Bicyclist Crashes?

**Pedestrian and Bicyclist Involved Crashes by Cause (2008 - 2016)**  
Total Crash Volume



**Pedestrian and Bicyclist Involved Crashes by Cause (2008 - 2016)**  
Time Weighted

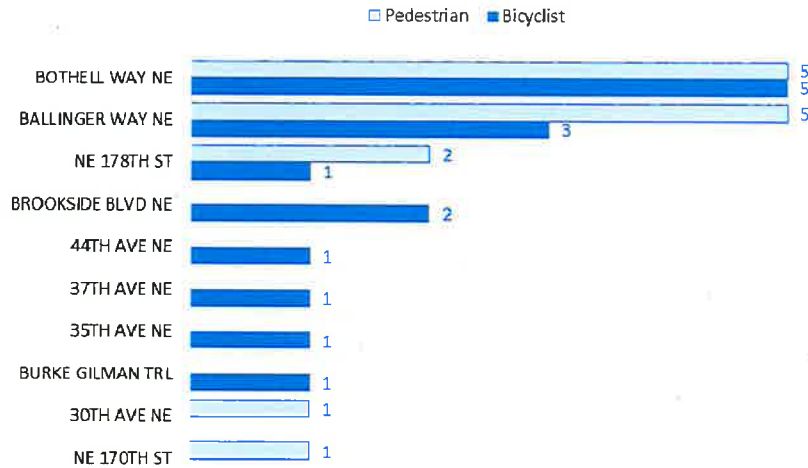


From these two bar charts, we can see that the biggest threats to pedestrians and bicyclists are failing to grant right of way by the vehicle and inattention.

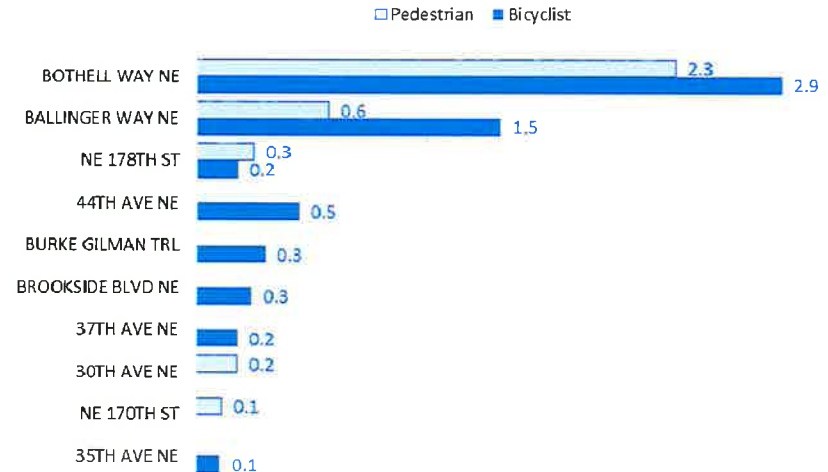
$$C_{tw} = \sum_{i=2008}^{2016} (2016 - i + 1)$$

# Safety Analysis | Where are Pedestrian and Bicyclist Crashes?

**Pedestrian and Bicyclist Involved Crashes by Roadway (2008 - 2016)**  
Total Crash Volume



**Pedestrian and Bicyclist Involved Crashes by Roadway (2008 - 2016)**  
Time Weighted



- Bothell Way, Ballinger Way, and NE 178<sup>th</sup> St top both lists.
- On both Bothell Way and Ballinger Way, the Pedestrian time weighted value decrease more substantially compared to the total crash value than did the Bicyclist time weighted value (especially along Ballinger Way). From this, we can infer that more crashes involving bicyclists tended to happen more recently than those with pedestrians (since a higher value is associated with crashes closer to 2016). This is validated by looking at the crashes over time.

$$C_{tw} = \sum_{i=2008}^{2016} \frac{(2016 - i + 1)}{n}$$

# Safety Analysis | Where are Pedestrian and Bicyclist Crashes?

This visual overlays the crash locations, enforcement locations, and time weighted crash scores for roads. Note that each dot actually represents multiple crashes that occurred at the same place.



# Safety Analysis | Safe Streets Key Findings

- The roadways of Bothell Way NE, Ballinger Way NE, and NE 178<sup>th</sup> St tend to pose the greatest safety risk with regards to bicyclist and pedestrian mobility.
- These roadways pose a bigger risk to bicyclists in the recent years than to pedestrians.
- Failing to grant right of way by the vehicle and inattentiveness are the two highest contributors to bicycle and pedestrian involved crashes.



# ROAD SAFETY CAMERAS GIVE BACK TO THE COMMUNITY

Red-light, speed and school bus safety cameras across the country not only reduce the dangerous act of speeding, red-light and school bus stop arm running, but also give back to the community through the revenue generated.

## FLORIDA

Pursuant to the Mark Wandall Traffic Safety Act passed in 2010, cities and counties in Florida using red-light safety cameras are to issue \$158 fines for running a red light. Each fine is distributed this way: \$70 goes to the state's general revenue fund; \$75 goes to the local government; \$10 goes to local trauma centers and \$3 is allocated for spinal and brain injury research through The Miami Project. As of May 2016, the red-light safety camera programs across the state have contributed more than \$35 million to Florida trauma centers and over \$10 million to the Miami Project.



### LAKELAND

- City Park Improvements
- The Arts <sup>1</sup>



### ORLANDO

- Community Safety Projects Throughout the city.



### NEW PORT RICHEY

- Traffic Safety Campaign for Public Safety <sup>2</sup>



### HILLSBOROUGH COUNTY

- Fire Rescue
- Road Maintenance
- The Sheriff's Office
- Code Enforcement
- Parks and Recreation <sup>3</sup>



### AVENTURA

- A Trauma Center in the Aventura Hospital
- Charter School Needs <sup>4</sup>

## TEXAS

50 percent of the revenue derived from civil or administrative penalties collected by the local authority is designated to the trauma facility and emergency medical services account. The other 50 percent is used to fund intersection improvements, traffic enforcement and other traffic, pedestrian and public safety programs throughout the cities that utilize road safety camera technology.



### FRISCO

- ✓ Shattered Dreams Program, Educating Youths on Drunk Driving Prevention
- ✓ Engineering Improvements
- ✓ Battery Backups for Traffic Signals <sup>5</sup>

### FORT WORTH FORT WORTH

- ✓ Signage Upgrades
- ✓ Pavement Markings in School Zones
- ✓ Replacement of Crosswalks Citywide
- ✓ Replacement of Aging Traffic Signal Infrastructure at High-Priority Intersections
- ✓ Vehicles <sup>6</sup>



### AMARILLO

Funds from paid red-light running tickets have provided **more than \$1.3 million** since 2007 to:

- ✓ Sidewalk Improvements
- ✓ New Signals
- ✓ Roadway Striping and Repairs
- ✓ Freeway Lighting Repairs
- ✓ Signal Preemption System for the Fire Department <sup>7</sup>



### CLEVELAND

Total Station Accident Investigation Equipment. <sup>8</sup>

## TENNESSEE

Red-light safety camera revenue is placed in each city's public safety general fund. Each city uses these funds for projects to enhance the safety of their communities.



### BLUFF CITY

- ✓ Support of County Library <sup>9</sup>



### MEMPHIS

In 2016, **more than \$26,000** in **Neighborhood Crime Prevention** grants were delivered to 11 groups. To date, 52 groups have been awarded **a total of \$122,462** from red-light camera program revenue funds. <sup>10</sup>

## WASHINGTON

Red-light safety camera revenue is placed in each city's public safety general fund. The cities designate these funds through community initiatives.



- Personnel
- Programs
- Services
- Equipment Related to the Enforcement and Processing of Traffic and Criminal Laws Within the City <sup>11</sup>



### SPOKANE

- Crosswalks <sup>12</sup>

## NORTH CAROLINA

10% of revenue from the Red-light safety camera programs is used to cover the program's operating costs and the remainder of the proceeds are dispersed to the County Schools general fund.



### WILMINGTON, NC

- New Hanover County Schools <sup>13</sup>



### FAYETTEVILLE, NC

- Cumberland County Schools <sup>14</sup>

## FUNDS FROM ADDITIONAL PROGRAMS



### PHILADELPHIA, PA

Nearly **\$5.5 million** collected from fines for red-light violations at 28 Philadelphia intersections will fund **23 safety-improvement projects** in 18 municipalities across the state. <sup>15</sup>



### ARIZONA

- Training Law Enforcement Officers
- Treating Juvenile Drug Addicts in the State
- Clean Elections Fund <sup>16</sup>



### MARIETTA, GA

- Installation of Solar Powered Crosswalk Lighting for Students
- Safety Video PSA for Students
- Supported the Eight and Under Program
- Bus Driver National Safety Council Defensive Driving Instructor Course
- Windshield Mounted Cameras on School Buses <sup>17</sup>