City of Columbia
701 East Broadway, Columbia, Missouri 65201

Agenda Item Number: REP 105-15
Department Source: City Manager
To: City Council
From: City Manager & Staff
Council Meeting Date: 11/02/2015
Re: Report - Future Use of Red Light Cameras

Documents Included With This Agenda Item

Council memo
Supporting documentation includes: Exhibits to Report

Executive Summary

The City's red light camera program began operation in September, 2009 and was put on hold in November, 2013 due to conflicting court rulings on the constitutionality of red light cameras in other Missouri jurisdictions. The Missouri Supreme Court issued its ruling in two cases in August, 2015. The decision provides clarity as to how red light camera systems are to be operated in Missouri.

Discussion

The City of Columbia adopted its red-light camera ordinance on Aug. 21, 2006 placing responsibility on the driver for the red-light violation. Gatso USA, the city's red-light camera vendor implemented a program in September, 2009 that included photographs of the drivers and complied with Missouri law.

Relying on the Eastern District Court of Appeal's decision in the City of Creve Coeur vs. Nottebrok case, the City of Columbia amended its red-light camera ordinance on August 19, 2013 to place liability on the vehicle owner rather than the operator, and to treat violations as civil infractions instead of moving violations.
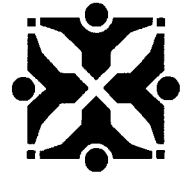
The City's red-light camera enforcement was suspended on November 7, 2013 due to conflicting court rulings and legal uncertainty over the proper enforcement approach. At that time, red light cameras were in use at the following intersections:

1. Northbound Providence at Broadway
2. Northbound Stadium at Worley
3. Northbound Providence at Stadium
4. Southbound Providence at Stadium
5. Northbound Forum at Stadium

For the time period when cameras began operating in September, 2009 through November 2013, approximately 6,000 red light camera tickets were issued. Total revenue from paid violations during that same period was $447,379, from which Gatso was paid $210,056 for operation and maintenance of the red light camera system (Exhibit: Red Light Camera Revenue by Fiscal Year). Just as

expected, as the community became more aware of the presence of red light cameras in Columbia, the number of tickets issued along with the associated revenue began to decline in 2011 (Exhibit: Total # of RLC Citations Issued by Year). However, the equally expected but more important statistic was the total number of The City of Columbia adopted its red-light camera ordinance on Aug. 21, 2006 placing responsibility on the driver for the red-light violation. Gatso USA, the city's red-light camera vendor implemented a program in September, 2009 that included photographs of the drivers and complied with Missouri law.

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While awaiting a decision from the Missouri Supreme Court, the City's contract with Gatso USA expired, and due to the uncertainty as to how the Court might rule, the City requested the removal of all red light cameras from Columbia. The Supreme Court issued its opinion in two cases, one involving the City of St. Peters and the other, the City of St. Louis. The court found St. Louis' law was unconstitutional because the burden of proof shifted to the owner of the vehicle, who would have to show he or she wasn't the driver. The Supreme Court found part of the St. Peters' ordinance was illegal because the tickets didn't apply points to a driver's license, which conflicted with state law.

On a national scale, according to the Insurance Institute for Highway Safety (IIHS), 683 people were killed and an estimated 133,000 were injured in crashes that involved red light running in 2012. An

Institute study comparing large cities with red light cameras to those without found the devices reduced the fatal red light running crash rate by 24 percent and the rate of all types of fatal crashes at signalized intersections by 17 percent (1). IIHS believes that since it is impossible for police to be at every intersection, "cameras can fill the void….. and are an effective way to discourage red light running". For those who believe that cameras violate privacy, it should be noted that driving is a regulated activity and drivers who obtain licenses are agreeing to abide by certain rules. Red light cameras are a mechanism to catch people who break those rules, just like traditional enforcement.

Attitudes around the acceptability of red light running are somewhat surprising. The 2011 Traffic Safety Culture Index by AAA found that seventy percent of drivers consider it unacceptable to drive through a red light when they could have stopped safely, yet 37 percent admit to having run a red light in the last 30 days (2). The Federal Highway Administration reports that their studies have shown that 97% of drivers feel that other drivers running red-lights are a major safety threat and 1 in 3 people claim they personally know someone injured or killed in a red-light running crash (3).

In a report to the Federal Highway Administration, the Pedestrian and Bicycle Information Center concluded that automated enforcement systems, together with engineering countermeasures and education, can assist in making roads safer and more appealing for pedestrian and bicycle use. "Educating the public and other key stakeholders allows the program to gain support, and also dispels myths about what these systems are and what they are not" (4).

In an article published in the ITE Journal, May, 2010, Brian Bochner, P.E. and Troy Walden, Ph.D reviewed accident data from a number of national studies on red light cameras (5). They summarize their findings as follows:

"If installed at locations with significant red light running crashes and/or violations, over a group of intersections, red light cameras

- *Substantially reduce red light violations rates;*
- *Reduce crashes that result from red light running;*
- *Usually reduce right angle collisions;*
- *May result in an increase in rear end collisions;*
- *May or may not reduce total crashes, but barely result in a substantial increase, and*
- *Usually reduce crash severity by virtue of reducing the more severe right angle crashes while sometimes increasing the less severe rear end collisions."*

In Missouri, the Department of Transportation reports similar findings in a study based on the analysis of 55 intersections conducted in 2010 (see Exhibit: Red Light Running Crash Analysis). The data indicates a small increase in rear-end style and total collisions, but a significant reduction in angled crashes and severe crashes, both of which have the potential for more serious injury.

Columbia's program was established under the premise that following a thorough engineering review of the intersection where cameras are to be deployed, an automated enforcement system used in conjunction with an effective education program designed to inform the public about the dangers of

red light running, are in total, the most effective way to deter bad behavior.

Legislation aimed at banning or severely limiting red light cameras throughout Missouri has been introduced and considered by the state legislature for at least the past 9-10 years, but has failed to garner sufficient support.

REFERENCES

1. Red Light Running. Insurance Institute for Highway Safety.
http://www.iihs.org/iihs/topics/t/red-light-running/topicoverview
2. 2011 Traffic Safety Culture Index. AAA Foundation for Traffic Safety, 2011.
https://www.aaafoundation.org/sites/default/files/2011TSCI.pdf
3. Red Light Running. U.S. Department of Transportation, Federal Highway Administration, September, 2014. http://safety.fhwa.dot.gov/intersection/redlight/outreach/marketing/rlr_pps022509/long/
4. An Overview of Automated Enforcement Systems and Their Potential for Improving Pedestrian and Bicyclist Safety. Pedestrian and Bicycle Information Center, December, 2012.
http://www.pedbikeinfo.org/cms/downloads/WhitePaper_AutomatedSafetyEnforcement_PBIC.pdf
5. Effectiveness of Red Light Cameras, Brian Bochner, P.E. and Troy Walden Ph.D, ITE Journal, May 2010. http://ncsrsafety.org/evidence/effectiveness-of-red-light-cameras/

Fiscal Impact

Short-Term Impact: See Exhibit – Red Light Camera Revenue
Long-Term Impact: See Exhibit – Red Light Camera Revenue

Vision, Strategic & Comprehensive Plan Impact

Vision Impact: Transportation
Strategic Plan Impact: Public Safety...Safe Wherever you Live, Work, Learn and Play
Comprehensive Plan Impact: Not Applicable

Suggested Council Action

Should Council desire to re-implement the City's red light camera program, Council should direct staff to prepare legislation amending Chapter 14 of the City Code relating to automated traffic control systems (red light cameras) in compliance with the recent Supreme Court ruling, and authorizing the City Manager to initiate a request for proposals process for the installation, operation and administration of a red light camera system.

Legislative History

08/19/2013 B219-13 Amending Chapter 14 as it relates to automated traffic control systems.
05/21/2012 B94-12 Authorizing an agreement with the Missouri Highways & Transportation Commission for the installation of automated traffic signal enforcement equipment.

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12/15/2008 R293-08 Rescinding the contract with Lasercraft for red light camera enforcement.
08/21/2007 R187-07 Authorizing an agreement with Lasercraft, Inc for the operation and administration of a red light camera system.
08/21/2006 B316-06 Amending Chapter 14 to add a section relating to red light cameras.

_____
Department Approved

_____
City Manager Approved

City of Columbia

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SUPPORTING DOCUMENTS INCLUDED WITH THIS AGENDA ITEM ARE AS FOLLOWS:

Exhibits to Report

Red Light Camera Revenue by Fiscal Year

Fiscal Yr	Total Red Light Camera Revenue	Payments to Gatso
FY2009	$1,970.00	$1,936.00
FY2010	$128,268.00	$58,608.00
FY2011	$116,650.00	$54,076.00
FY2012	$97,090.00	$44,000.00
FY2013	$103,401.00	$47,608.00
FY2014		$3,828.00
Totals:	**$447,379.00**	**$210,056.00**

Total # of Accidents at RLC Intersections by Year

Total # of RLC
Citations
Issued by
Year
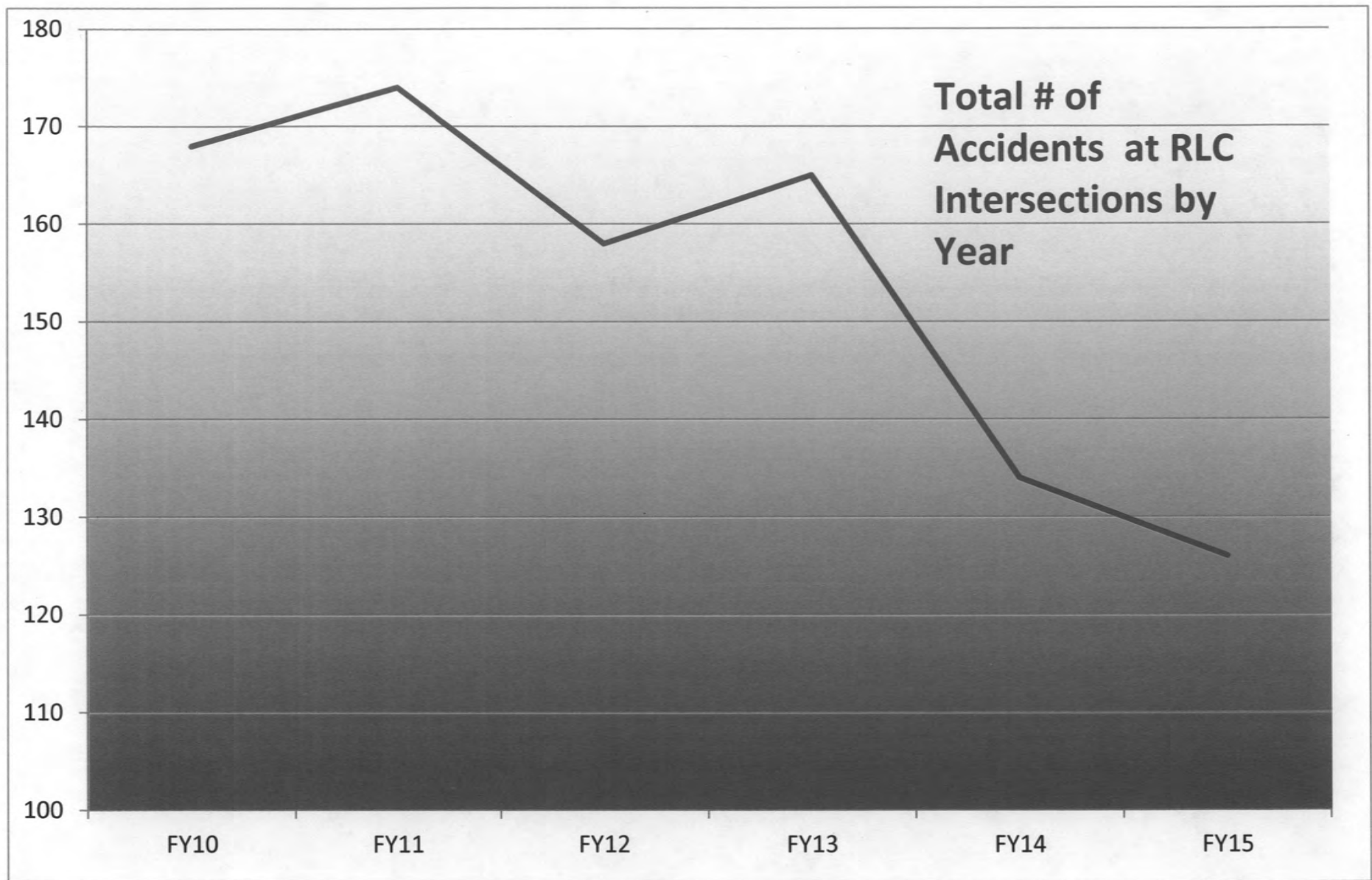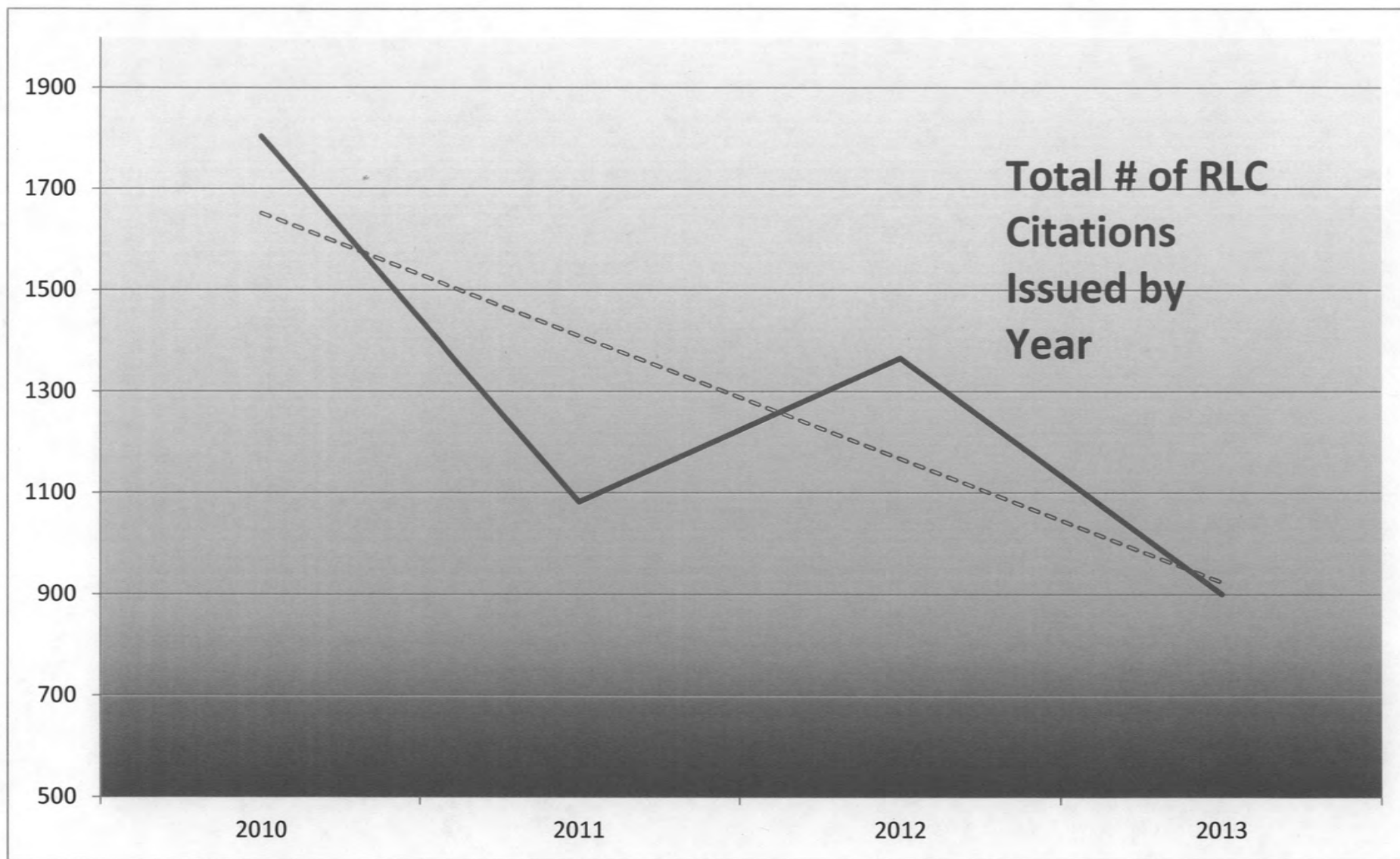
Red Light Running Crash Analysis
(Results based on Analysis of 55 Intersections)

All Crash Types

Crash Severity Level	All Severity	Severe Only
Effectiveness (% Change)	14.0	12.1
Direction of Change	Increase	Decrease
Statistical Significance	Significant at 95% confidence level	Not significant at 90% confidence level

Left Turn Crash Types

Crash Severity Level	All Severity	Severe Only
Effectiveness (% Change)	12.3	63.6
Direction of Change	Decrease	Decrease
Statistical Significance	Not significant at 90% confidence level	Significant at 95% confidence level

Angle Crash Types

Crash Severity Level	All Severity	Severe Only
Effectiveness (% Change)	22.8	44.7
Direction of Change	Decrease	Decrease
Statistical Significance	Significant at 95% confidence level	Significant at 90% confidence level

Rear-End Crash Types

Crash Severity Level	All Severity	Severe Only
Effectiveness (% Change)	30.7	37.6
Direction of Change	Increase	Increase
Statistical Significance	Significant at 95% confidence level	Not significant at 90% confidence level

Total Crashes (All Crash Types)

Number	Intersection	# of Approaches	# of Years of "After" Data	Observed Crashes Before Period	Observed Crashes After Period	Empirical Bayes % Change
1	US 61 at MO 168	4	2	22	17	10.295
2	US 61 at Pleasant	4	2	58	41	5.856
3	MO 291 at Courtney	4	3	11	12	7.818
4	US 61 at MO 141	4	3	106	119	21.107
5	OR 55 at IS 55 (Richardson/Vogel)	4	3	14	80	370.316
6	US 61 at Rockport School	3	3	9	8	-3.920
7	MO 141 at Astra Way	4	3	36	69	90.443
8	OR 270 (Graham/N Hanley at Dunn)	4	3	75	73	4.733
9	US 67 at Trotterway	4	3	56	53	16.052
10	US 67 at Manresa Ln	4	2	41	34	42.156
11	US 67 at Lindsay/St Denis	4	2	36	44	118.691
12	US 67 at Elm Grove	4	2	93	70	40.365
13	US 67 at McDonnell Blvd	3	2	53	37	27.511
14	US 67 at RT AC	4	2	132	92	19.165
15	MO 115 at RT U	4	2	55	30	-10.802
16	MO 180 at IS 170 (SPUI)	4	2	120	68	9.671
17	MO 115 at Kingshighway Blvd	4	2	175	133	25.305
18	US 67 at Utz Ln	4	2	18	9	-2.965
19	OR 270 (US 67 SB Ramps at Lynn Haven)	4	2	8	9	110.717
20	CST Lynn Haven Ln at Taylor Rd	4	2	3	1	-63.826
21	US 67 at Fee Fee Hills	4	2	43	19	-7.678
22	OR 270 (N Hanley at Pershall)	4	2	26	18	4.236
23	CST Ladue Rd at IS 270/Emerson	4	2	13	10	26.689
24	RT AB at Coeur De Ville	4	2	5	1	-77.487
25	MO 115 at Clearview/West	4	2	5	3	-27.559
26	MO 94 at Central School	4	2	57	42	-3.648
27	MO 340 at IS 270 (SPUI)	4	2	60	42	6.599
28	MO 100 at Kingshighway Blvd	4	1	115	36	-4.000
29	MO 115 at Grand Ave	4	1	128	41	10.892
30	MO 115 at Goodfellow Blvd	4	1	134	31	-25.402
31	CST Goodfellow Blvd at IS 70 WB Ramps	4	1	11	3	-25.915
32	CST Goodfellow Blvd at IS 70 EB Ramps	4	1	19	2	-68.694
33	MO 115 at Union Blvd	4	1	100	35	15.464
34	RT N at McCluer High School	4	1	1	0	-100.000
35	MO 30 at Hampton/Germania	4	1	54	26	68.643
36	MO 100 at Grand Blvd	4	1	91	6	-78.748
37	MO 367 at Berwyn	4	1	13	2	-63.924
38	MO 180 at St Gregory	4	1	28	6	-29.825
39	CST Jefferson Ave at IS 44 WB Ramps	4	1	64	28	37.930
40	RT U at San Diego	4	1	12	2	-51.111
41	MO 180 at Adie	4	1	38	10	-18.314
42	OR 270 (Washington at Dunn)	4	1	65	23	33.196
43	RT D at Kingshighway Blvd	4	1	68	39	77.168
44	MO 180 at Brown	4	1	46	19	31.933
45	MO 180 at RT B (Natural Bridge)	4	1	89	20	-31.941
46	MO 180 at IS 270 E	4	1	11	3	-28.280
47	MO 180 at McKelvey	4	1	75	14	-49.212
48	CST West Florissant Ave at Bircher/E Taylor	4	1	11	3	-28.888
49	CST Grand Blvd at Detonty/IS 44 EB (on ramp)	4	1	17	4	-33.202
50	CST Grand Blvd at Lafayette Ave	4	1	75	10	-59.557
51	OR 70 (SOR at Wentzville Pkwy)	4	1	17	3	-26.537
52	LP 44 at LP 44 (Chestnut)	4	1	35	22	73.963
53	BU 65 at Battlefield	4	1	117	42	-2.033
54	BU 65 at RT D (Sunshine)	4	1	134	43	-15.504
55	MO 13 at MO 413 (Sunshine)	4	1	104	37	12.149

Combined Sites   14.0%

We included 55 intersections in our analysis. The other 33 intersections were installed recently and did not have a minimum of one year of data for the after period. We used a program developed by Midwest Research Institute (MRI) that is based on an Empirical Bayes (EB) analysis. The EB analysis has become the accepted method to evaluate safety improvements and confirms the change in crashes was a result of the improvement and not just the random fluctuation in crashes that can occur from year to year. The recent release of AASHTO's Highway Safety Manual encourages this approach for all evaluations. The EB analysis allows us to account for variations among different intersections and puts all those intersections on a level playing field. For example, one intersection may have had the Automated Enforcement for one year while the next intersection has had it for 4 years, traffic volumes differ from site to site and intersection geometry (3 approaches vs. 4 approaches).

Total Severe Crashes (All Crash Types)

Number	Intersection	# of Approaches	# of Years of "After" Data	Observed Crashes Before Period	After Period	Empirical Bayes % Change
1	US 61 at MO 168	4	2	1	0	-100.000
2	US 61 at Pleasant	4	2	1	3	418.378
3	MO 291 at Courtney	4	3	0	0	-100.000
4	US 61 at MO 141	4	3	2	0	-100.000
5	OR 55 at IS 55 (Richardson/Vogel)	4	3	0	0	-100.000
6	US 61 at Rockport School	3	3	1	0	-100.000
7	MO 141 at Astra Way	4	3	0	1	155.664
8	OR 270 (Graham/N Hanley at Dunn)	4	3	1	0	-100.000
9	US 67 at Trotterway	4	3	1	0	-100.000
10	US 67 at Manresa Ln	4	2	1	0	-100.000
11	US 67 at Lindsay/St Denis	4	2	0	0	-100.000
12	US 67 at Elm Grove	4	2	0	0	-100.000
13	US 67 at McDonnell Blvd	3	2	3	1	18.420
14	US 67 at RT AC	4	2	0	1	252.094
15	MO 115 at RT U	4	2	1	0	-100.000
16	MO 180 at IS 170 (SPUI)	4	2	0	0	-100.000
17	MO 115 at Kingshighway Blvd	4	2	0	3	1011.513
18	US 67 at Utz Ln	4	2	0	0	-100.000
19	OR 270 (US 67 SB Ramps at Lynn Haven)	4	2	1	0	-100.000
20	CST Lynn Haven Ln at Taylor Rd	4	2	1	0	-100.000
21	US 67 at Fee Fee Hills	4	2	3	0	-100.000
22	OR 270 (N Hanley at Pershall)	4	2	0	0	-100.000
23	CST Ladue Rd at IS 270/Emerson	4	2	0	0	-100.000
24	RT AB at Coeur De Ville	4	2	0	0	-100.000
25	MO 115 at Clearview/West	4	2	1	0	-100.000
26	MO 94 at Central School	4	2	0	0	-100.000
27	MO 340 at IS 270 (SPUI)	4	2	0	1	271.725
28	MO 100 at Kingshighway Blvd	4	1	1	0	-100.000
29	MO 115 at Grand Ave	4	1	4	1	55.822
30	MO 115 at Goodfellow Blvd	4	1	4	2	191.791
31	CST Goodfellow Blvd at IS 70 WB Ramps	4	1	0	0	-100.000
32	CST Goodfellow Blvd at IS 70 EB Ramps	4	1	0	0	-100.000
33	MO 115 at Union Blvd	4	1	0	1	663.572
34	RT N at McCluer High School	4	1	0	0	-100.000
35	MO 30 at Hampton/Germania	4	1	1	0	-100.000
36	MO 100 at Grand Blvd	4	1	0	0	-100.000
37	MO 367 at Berwyn	4	1	1	0	-100.000
38	MO 180 at St Gregory	4	1	2	0	-100.000
39	CST Jefferson Ave at IS 44 WB Ramps	4	1	1	0	-100.000
40	RT U at San Diego	4	1	0	0	-100.000
41	MO 180 at Adie	4	1	0	0	-100.000
42	OR 270 (Washington at Dunn)	4	1	0	0	-100.000
43	RT D at Kingshighway Blvd	4	1	2	0	-100.000
44	MO 180 at Brown	4	1	1	0	-100.000
45	MO 180 at RT B (Natural Bridge)	4	1	3	1	71.446
46	MO 180 at IS 270 E	4	1	0	0	-100.000
47	MO 180 at McKelvey	4	1	1	0	-100.000
48	CST West Florissant Ave at Bircher/E Taylor	4	1	0	1	696.321
49	CST Grand Blvd at Detonty/IS 44 EB (on ramp)	4	1	0	0	-100.000
50	CST Grand Blvd at Lafayette Ave	4	1	0	0	-100.000
51	OR 70 (SOR at Wentzville Pkwy)	4	1	0	0	-100.000
52	LP 44 at LP 44 (Chestnut)	4	1	0	1	656.606
53	BU 65 at Battlefield	4	1	0	0	-100.000
54	BU 65 at RT D (Sunshine)	4	1	1	0	-100.000
55	MO 13 at MO 413 (Sunshine)	4	1	3	0	-100.000

Combined Sites   -12.1%

We included 55 intersections in our analysis. The other 33 intersections were installed recently and did not have a minimum of one year of data for the after period. We used a program developed by Midwest Research Institute (MRI) that is based on an Empirical Bayes (EB) analysis. The EB analysis has become the accepted method to evaluate safety improvements and confirms the change in crashes was a result of the improvement and not just the random fluctuation in crashes that can occur from year to year. The recent release of AASHTO's Highway Safety Manual encourages this approach for all evaluations. The EB analysis allows us to account for variations among different intersections and puts all those intersections on a level playing field. For example, one intersection may have had the Automated Enforcement for one year while the next intersection has had it for 4 years, traffic volumes differ from site to site and intersection geometry (3 approaches vs. 4 approaches).

Right Angle Severe Crashes

Number	Intersection	# of Approaches	# of Years of "After" Data	Observed Crashes Before Period	Observed Crashes After Period	Empirical Bayes % Change
1	US 61 at MO 168	4	2	1	0	-100.000
2	US 61 at Pleasant	4	2	0	1	256.304
3	MO 291 at Courtney	4	3	0	0	-100.000
4	US 61 at MO 141	4	3	0	0	-100.000
5	OR 55 at IS 55 (Richardson/Vogel)	4	3	0	0	-100.000
6	US 61 at Rockport School	3	3	0	0	-100.000
7	MO 141 at Astra Way	4	3	0	1	284.795
8	OR 270 (Graham/N Hanley at Dunn)	4	3	0	0	-100.000
9	US 67 at Trotterway	4	3	1	0	-100.000
10	US 67 at Manresa Ln	4	2	0	0	-100.000
11	US 67 at Lindsay/St Denis	4	2	0	0	-100.000
12	US 67 at Elm Grove	4	2	0	0	-100.000
13	US 67 at McDonnell Blvd	3	2	2	1	55.136
14	US 67 at RT AC	4	2	0	0	-100.000
15	MO 115 at RT U	4	2	0	0	-100.000
16	MO 180 at IS 170 (SPUI)	4	2	0	0	-100.000
17	MO 115 at Kingshighway Blvd	4	2	0	1	461.653
18	US 67 at Utz Ln	4	2	0	0	-100.000
19	OR 270 (US 67 SB Ramps at Lynn Haven)	4	2	0	0	-100.000
20	CST Lynn Haven Ln at Taylor Rd	4	2	0	0	-100.000
21	US 67 at Fee Fee Hills	4	2	0	0	-100.000
22	OR 270 (N Hanley at Pershall)	4	2	0	0	-100.000
23	CST Ladue Rd at IS 270/Emerson	4	2	0	0	-100.000
24	RT AB at Coeur De Ville	4	2	0	0	-100.000
25	MO 115 at Clearview/West	4	2	0	0	-100.000
26	MO 94 at Central School	4	2	0	0	-100.000
27	MO 340 at IS 270 (SPUI)	4	2	0	0	-100.000
28	MO 100 at Kingshighway Blvd	4	1	0	0	-100.000
29	MO 115 at Grand Ave	4	1	1	1	215.349
30	MO 115 at Goodfellow Blvd	4	1	1	1	196.407
31	CST Goodfellow Blvd at IS 70 WB Ramps	4	1	0	0	-100.000
32	CST Goodfellow Blvd at IS 70 EB Ramps	4	1	0	0	-100.000
33	MO 115 at Union Blvd	4	1	0	0	-100.000
34	RT N at McCluer High School	4	1	0	0	-100.000
35	MO 30 at Hampton/Germania	4	1	1	0	-100.000
36	MO 100 at Grand Blvd	4	1	0	0	-100.000
37	MO 367 at Berwyn	4	1	0	0	-100.000
38	MO 180 at St Gregory	4	1	1	0	-100.000
39	CST Jefferson Ave at IS 44 WB Ramps	4	1	0	0	-100.000
40	RT U at San Diego	4	1	0	0	-100.000
41	MO 180 at Adie	4	1	0	0	-100.000
42	OR 270 (Washington at Dunn)	4	1	0	0	-100.000
43	RT D at Kingshighway Blvd	4	1	0	0	-100.000
44	MO 180 at Brown	4	1	0	0	-100.000
45	MO 180 at RT B (Natural Bridge)	4	1	1	0	-100.000
46	MO 180 at IS 270 E	4	1	0	0	-100.000
47	MO 180 at McKelvey	4	1	0	0	-100.000
48	CST West Florissant Ave at Bircher/E Taylor	4	1	0	0	-100.000
49	CST Grand Blvd at Detonty/IS 44 EB (on ramp)	4	1	0	0	-100.000
50	CST Grand Blvd at Lafayette Ave	4	1	0	0	-100.000
51	OR 70 (SOR at Wentzville Pkwy)	4	1	0	0	-100.000
52	LP 44 at LP 44 (Chestnut)	4	1	0	0	-100.000
53	BU 65 at Battlefield	4	1	0	0	-100.000
54	BU 65 at RT D (Sunshine)	4	1	0	0	-100.000
55	MO 13 at MO 413 (Sunshine)	4	1	0	0	-100.000

Combined Sites — -44.7%

We included 55 intersections in our analysis. The other 33 intersections were installed recently and did not have a minimum of one year of data for the after period. We used a program developed by Midwest Research Institute (MRI) that is based on an Empirical Bayes (EB) analysis. The EB analysis has become the accepted method to evaluate safety improvements and confirms the change in crashes was a result of the improvement and not just the random fluctuation in crashes that can occur from year to year. The recent release of AASHTO's Highway Safety Manual encourages this approach for all evaluations. The EB analysis allows us to account for variations among different intersections and puts all those intersections on a level playing field. For example, one intersection may have had the Automated Enforcement for one year while the next intersection has had it for 4 years, traffic volumes differ from site to site and intersection geometry (3 approaches vs. 4 approaches).