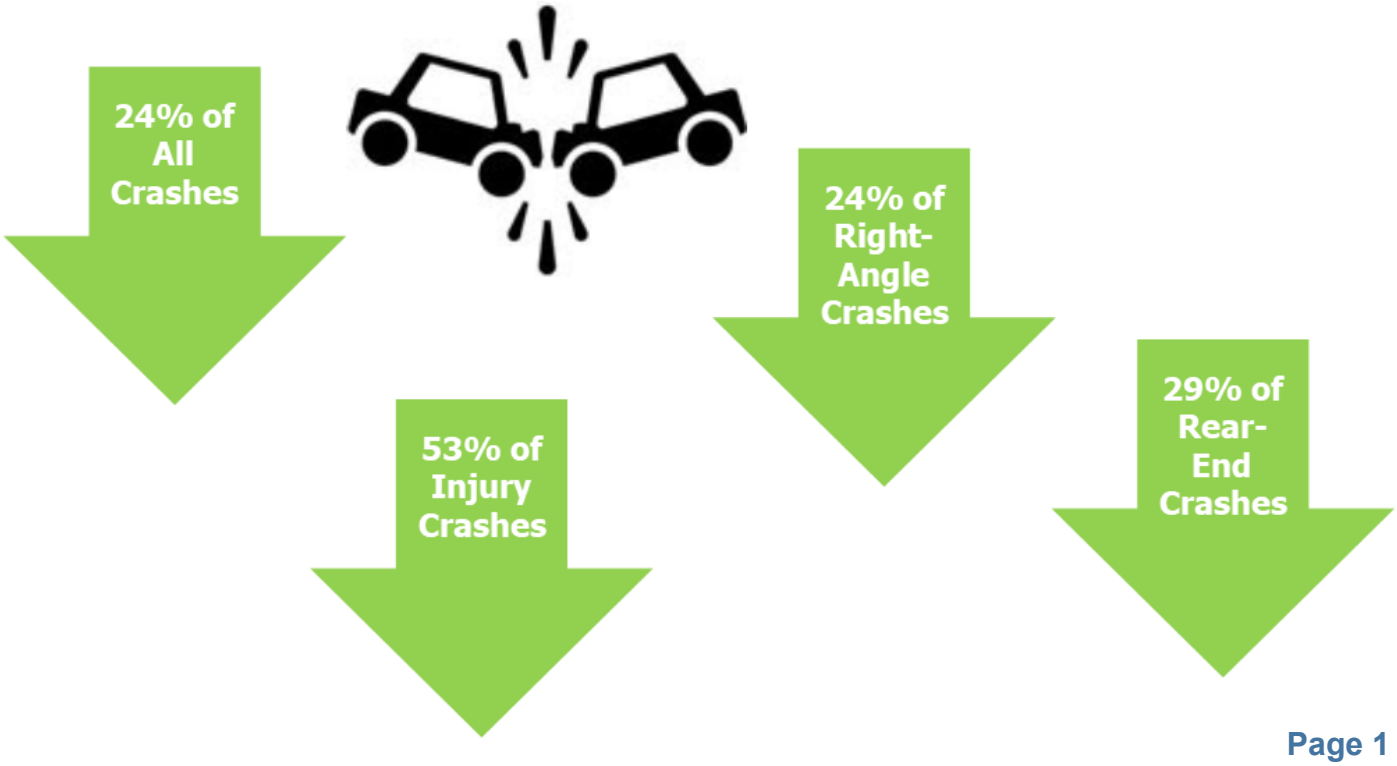
Tech Brief - 2020-1

Removing Unwarranted Traffic Signals — A Signalized Intersection Strategy

Why remove a Traffic Signal?

Signals that were unwarranted when installed or are no longer warranted due to changes in traffic conditions can create safety and operational issues. Problems created by an unwarranted signal include excessive delay, increased rerouting of traffic to less appropriate roads or intersections, higher crash rates and disobedience of the traffic signal. As noted in NCHRP Report 500/*Volume 12: A Guide for Reducing Collisions at Signalized Intersections*, a 2005 study showed that depending on the alternative treatment used, the strategy of removing unwarranted signals may result in decreases of:



Where Should Signal Removal Be Considered?

At a signalized intersection where the traffic volumes and collision data do not warrant a traffic signal.

What is the Process?

Section 4B.02 of the MUTCD outlines the following process for removing traffic control signals once an engineering study has been conducted:

a. Determine the appropriate traffic control to be used after removal of the signal.
b. Remove any sight-distance restrictions as necessary.
c. Inform the public of the removal study.
d. Flash or cover the signal heads for a minimum of 90 days, and install the appropriate stop control or other traffic control devices.
e. Remove the signal if the engineering data collected during the removal study period confirms that the signal is no longer needed.

What Should Be Included in the Engineering Study?

While the MUTCD does not provide specific guidance on the subject, a review of the MUTCD traffic warrants is a first step in determining if a traffic signal may no longer be justified. Additional guidance may be found in FHWA Implementation Package FHWA-IP-80-12, *User Guide for Removal of Not Needed Traffic Signals,* dated November 1980. Additional elements to be considered include:

- Sight distance
- Special site considerations (i.e. major vehicular or pedestrian traffic generator)
- Crash experience
- Special justifications

What Does Removing a Signal Cost?

Removing unwarranted traffic signals is one of the few safety improvements that can save an agency money over time. The cost of removing signal hardware, installing stop signs, and maintaining the signs is often significantly less than that of operating a traffic signal, which requires electricity, labor, parts and equipment, and retiming.

Post-Removal Control Options and Monitoring

Following removal of a traffic control signal, two-way stop control, all-way stop control or roundabout control may be used at the intersection. The MUTCD allows for poles, controller cabinets and cables to be left in place during the evaluation period of the signal removal, typically 12 months. During this time the intersection should be monitored for collisions and other impacts. Some types of collisions at an intersection may increase, particularly at two-way stop-controlled intersections, while others may decrease.

Below is a summary of potential benefits and considerations related to implementing each of the three alternative control options.

Alternative Control Options			
	Two-Way Stop Control 	**All-Way Stop Control** 	**Roundabout** 
Collision Impacts	Varies – may be estimated (see FHWA-IP-80-12)	Decrease of approximately 60% given low volumes (less than 800 during peak hour) and relatively balanced flows	Reduction in overall crash frequency of approximately 35% and reduction in injury and fatality crashes of approximately 75%
Total Delay	Reduced by 10 seconds per vehicle	Minimal impact	Reduced by 62% to 74%
Idling Delay	Reduced by 5-6 seconds per vehicle	Reduced by 5 seconds per vehicle	Reduced by 25%
Stops (percentage of total volume)	From 50% to about 20-25%	From 50% to 100%	From 50% to about 25%
Excess Fuel Consumption	Reduced by about 0.002 gallons per vehicle	Increased by about 0.0015 gallons per vehicle	Reduced by 16%

References & Resources:

- Connecticut Crash Data Repository: https://ctcrash.uconn.edu/
- Wyoming Department of Transportation Traffic Studies Manual: http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Traffic%20data/Traffic%20Studies%20Manual.pdf
- OSTA Traffic Control Signal Application: https://portal.ct.gov/DOT/Commissions/STC/Traffic-Signal-Permit
- FHWA-IP-80-12, *User Guide for Removal of Not Needed Traffic Signals*: https://ohiomemory.org/digital/collection/p267401ccp2/id/24
- MUTCD Chapter 4C — Traffic Control Signals Needs Studies: https://mutcd.fhwa.dot.gov/htm/2009/part4/part4c.htm
- NCHRP Report 500/*Volume 12: A Guide for Reducing Collisions at Signalized Intersections:* http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v12.pdf

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