Version 1

When is the Right Time for a Signal?

To aid the traffic engineer in designing the appropriate control for an intersection, the Manual on Uniform Traffic Control Devices (MUTCD) contains 9 warrants (conditions) that determine whether the traffic situation at an intersection justifies considering a traffic signal.

Colorado law requires a signal warrant study be performed before a signal is installed on any public roadway, including city streets and county roads. At a minimum, one of the nine warrants must be met. Additionally, an engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.

Signalization of an intersection can have large payoffs, but only for intersections that truly need to be signalized. Traffic signals aren't a "cure all", but they are a valuable tool.

COLORADO
Department of Transportation

TRAFFIC SIGNALS 101

Most drivers encounter traffic signals every day. To some, traffic signals are a source of frustration while others regard them as the solution to crashes and traffic problems at intersections. Are traffic signals always the solution? Let's see just what the abilities and limitations are of traffic signals.

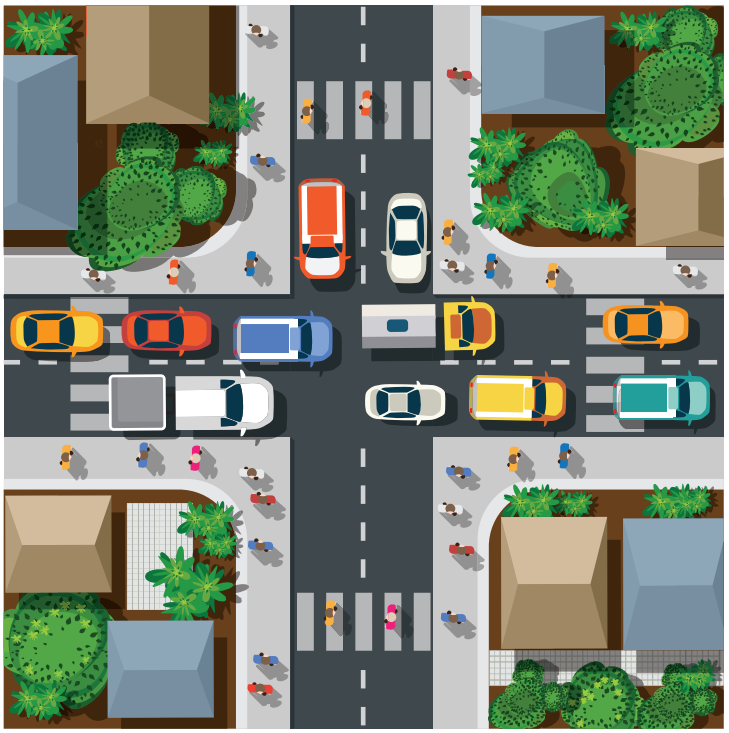
COLORADO
Department of Transportation

Here to Help...

Let's explore the operation of a traffic signal. The primary purpose of a traffic signal is to assign the right-of-way permission to proceed safely at intersecting streets or highways. Without this control, a continuous flow of traffic on one roadway would cause excessive delay to vehicles and pedestrians waiting on the other.

Traffic signals as we know them began appearing in the U.S. about 1914, eventually replacing the policeman for intersection control. Today, some of our large signalized intersections assign the right-of way to 50,000 or more vehicles each day, thus providing for the orderly movement of traffic.

Signals can increase the traffic capacity of an intersection, along with improving the safety and efficiency for both pedestrians and vehicles. A signal at an intersection tends to reduce certain types of crashes, particularly the more severe right angle (broadside) collisions.



...But Not the Cure-All

Traffic engineers look at signals as a vital tool for dealing with many traffic flow situations. But, no tool is perfect for every situation, and the same is true with traffic signals. Although signals may be able to reduce broadside collisions, they may cause an increase in other types of crashes, especially rear-end collisions. At an intersection that has a limited history of broadside crashes, installing a signal might actually decrease the overall safety of the intersection because of an increase in rear-end collisions.

In addition, improperly timed or unjustified traffic signals can cause excessive delays, increasing frustration and potentially disrespecting the signal and other traffic devices. Unnecessary delays lead to a loss of billions of dollars each year nationwide and contribute to air pollution. In certain situations, there are better and safer alternatives than installing traffic signals. For example, a roundabout may be considered as an alternative for low flow or uncongested traffic conditions.

Traffic signals are also expensive, generally costing $400,000 to $500,000 to install depending on the geometrics and the type of signal design. The construction cost could increase significantly (approx. $750,000 or more) at railroad crossings with preemption requirements. Traffic engineers seek to install signals only when other less extreme measures of control have proven to be ineffective.

Version 2

COLORADO
Department of Transportation

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