Traffic Signals are often thought to be the best solution for all kinds of traffic problems. Theoretically, they totally control traffic movements at intersections, prevent conflicts, assign right of way for traffic movements, allow pedestrians to cross streets by stopping traffic, and improve safety. In reality, they can result in more crashes at an intersection, increase delays to all traffic including cross street traffic, and are often ignored by pedestrians.

Because of the potential negative operation from traffic signals, “Warrants” for their installation have been established and are published in the Manual on Uniform Traffic Control Devices (MUTCD). These warrants are generally based on traffic volumes with a minimum hourly volume on both main streets and cross streets. Other warrants are based on pedestrian volumes, street system characteristics and crash history.

A good traffic signal installation will keep main street delay and stopping of traffic to a minimum. “Detectors” will sense the presence of traffic and keep the signal green for main street as long as traffic is present, up to a preset maximum time. If there is a vehicle or pedestrian present on the cross street, the main street detectors will also sense a “gap” in main street traffic and change the signal to give a green light to the cross street vehicle (or Pedestrian) when the gap occurs.

Cross street traffic often will have more delay with a traffic signal than a stop sign during non peak traffic times. They must wait for the traffic signal to cycle from main street to cross street. Pedestrians who could step into the crosswalk at almost any time under stop sign control can only enter the intersection on the walk light interval under traffic signal control. Thus not only is main street traffic now delayed, cross street traffic and pedestrians may face increased delays.

Because of the added delay time waiting for the traffic signal controller to find a gap in traffic and then cycle the signal to show the pedestrian a walk light, pedestrians often will ignore the traffic signal and cross against the don’t walk or even the red light. Numerous observations of pedestrians at traffic signals, especially secondary school and college students, show that only a very low percent will push the pedestrian push button and wait for a walk light. Only very heavy or fast traffic volumes or high levels of enforcement have reduced the violations.

Motorists approaching a traffic signal must focus their primary attention on the traffic signal. Thus they are less alert for other traffic in the area. A pedestrian crossing against the signal is unexpected and in heavier traffic may not be noticed by the motorist approaching a green light. Pedestrians crossing away from the traffic signal controlled intersection are also unexpected and may not be seen by a motorist looking primarily at the traffic signal.
Statistics have repeatedly shown that the number of crashes will increase at an intersection that has volumes below the minimums in the MUTCD Warrants. Observations at any traffic signal controlled intersection will show a surprising number of violations of a red light. Many occur when a motorists tries to “beat the yellow” and enters at the beginning of the cross street green light. Unfortunately, many cross street motorists and pedestrians are focused on their control and not conflicting traffic. There are also a lot of motorists who are distracted and drive through the middle of a red light.

Traffic signals do generally create “gaps” in traffic at adjacent intersections on main streets. Sometimes these gaps are filled by traffic turning from the cross street. If there is only one traffic signal, the gaps are only in one direction, for traffic leaving the traffic signal.

Concept 5B.  9/4/07