



Standard Traffic Signal Configuration

An Online Continuing Education Course for Engineers

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Credit: 2 Hours / 2 PDH / 2 CPD

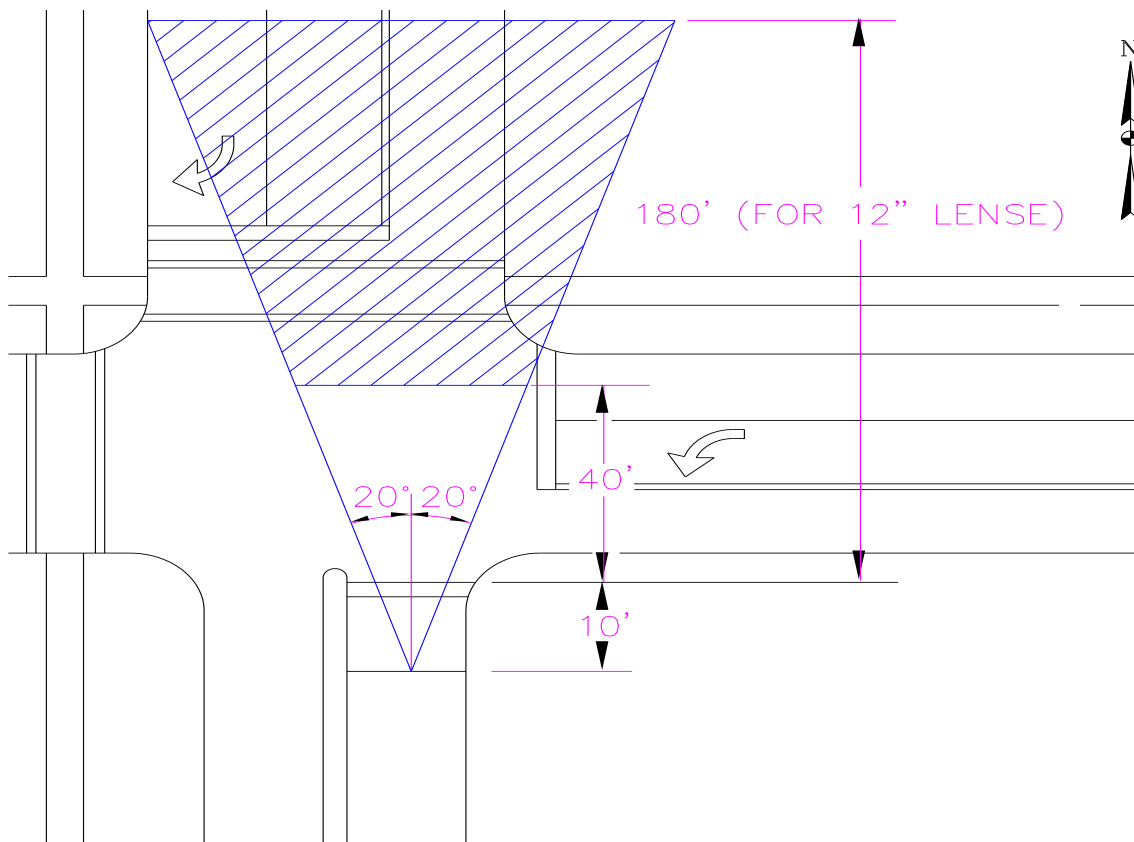
STANDARD TRAFFIC SIGNAL CONFIGURATIONS

Jeffrey W. Buckholz, PE, PhD, PTOE

This Traffic Signal Design course provides a description of the meaning and use of vehicular and pedestrian signal indications as well as a discussion of basic signal operations. Also included in this course is a discussion of lane use control signals and signs commonly associated with traffic signal installations.

The Manual on Uniform Traffic Control Devices (MUTCD) requires that two “primary signal faces” control the main movement of an approach (usually the thru movement). The MUTCD also requires that there be at least 40 feet of distance from the stop line to one of the primary signal faces and that one of these primary signal faces must be located no further than 180 feet from the stop line.

SIGNAL HEAD LOCATIONS



The MUTCD also recommends that the primary signal faces be located within a 20-degree "cone of vision" as measured from a point 10 feet behind the stop line and in the center of the approach. The purpose of these signal face placement requirements is to ensure good signal visibility.

Supplemental near side signal heads can be added if the primary signal heads are located further than 180 feet from the stop line, or if the primary signal heads cannot be clearly seen when approaching the intersection.



The same location requirements are also beneficial for non-primary signal faces, which typically are those controlling turn lanes.

The MUTCD requires that a minimum vertical clearance of 15 feet be provided between the road surface and the bottom of the lowest signal head. 15 feet provides enough clearance for all vehicles of legal height to pass under the signal head. However, many states have higher vertical clearance requirements to accommodate unusually tall vehicles. For example, the State of Florida has a minimum vertical clearance requirement of 17.5 feet. The MUTCD also requires that the distance between the roadway and the top of the highest signal head be no greater than 25.6 feet. This prevents the signal heads from being mounted too high, making them less likely to be seen by the motorist.

There are five basic types of traffic signal supports:

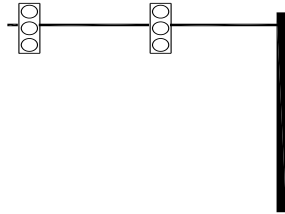
1. Pedestals
2. Mast Arms

3. Poles
4. Unipoles
5. Existing Structures

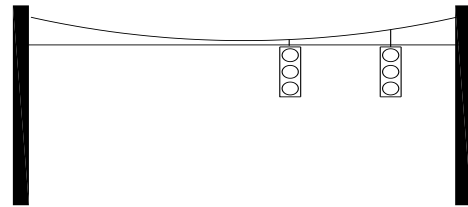
FIVE TYPES OF SIGNAL SUPPORTS



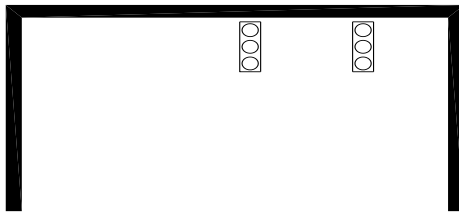
PEDESTAL



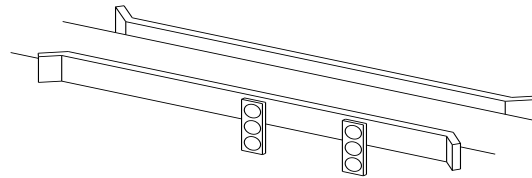
MAST ARM



STRAIN POLES



UNIPOLES



EXISTING STRUCTURE

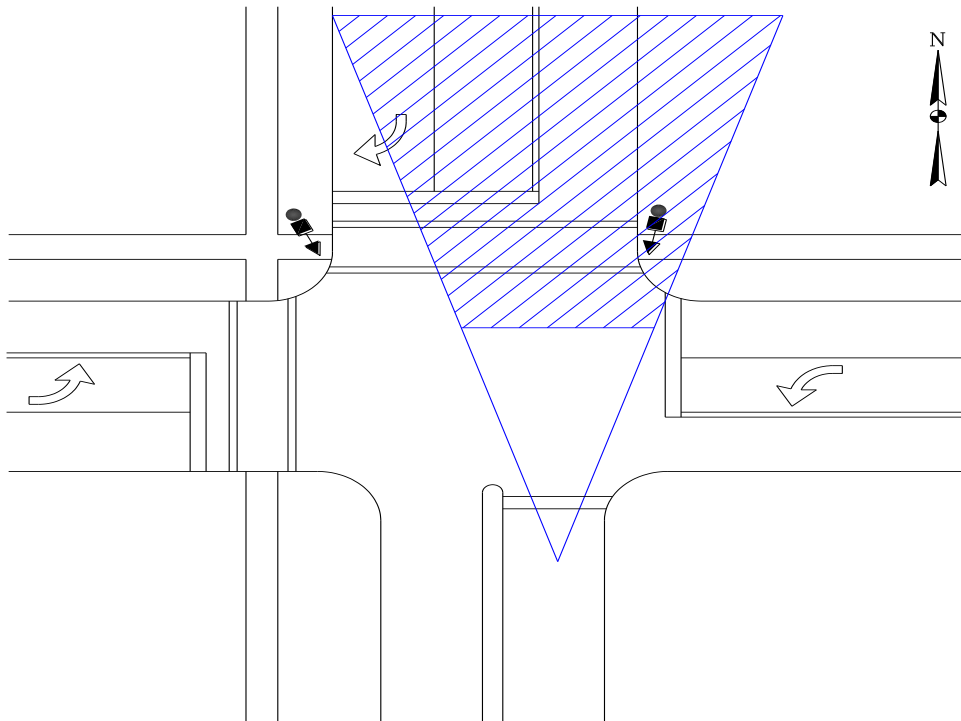
PEDESTALS

Pedestal supports, which are most commonly found in the downtown areas of older cities, are the simplest and least expensive traffic signal support.



In order to provide the dual indication of thru movements required by the MUTCD, a pedestal is typically provided on each side of a signalized intersection or, if a median exists, one pedestal is located on the right side of the intersection and the other is located in the median.

PEDESTAL MOUNTED SIGNAL HEADS



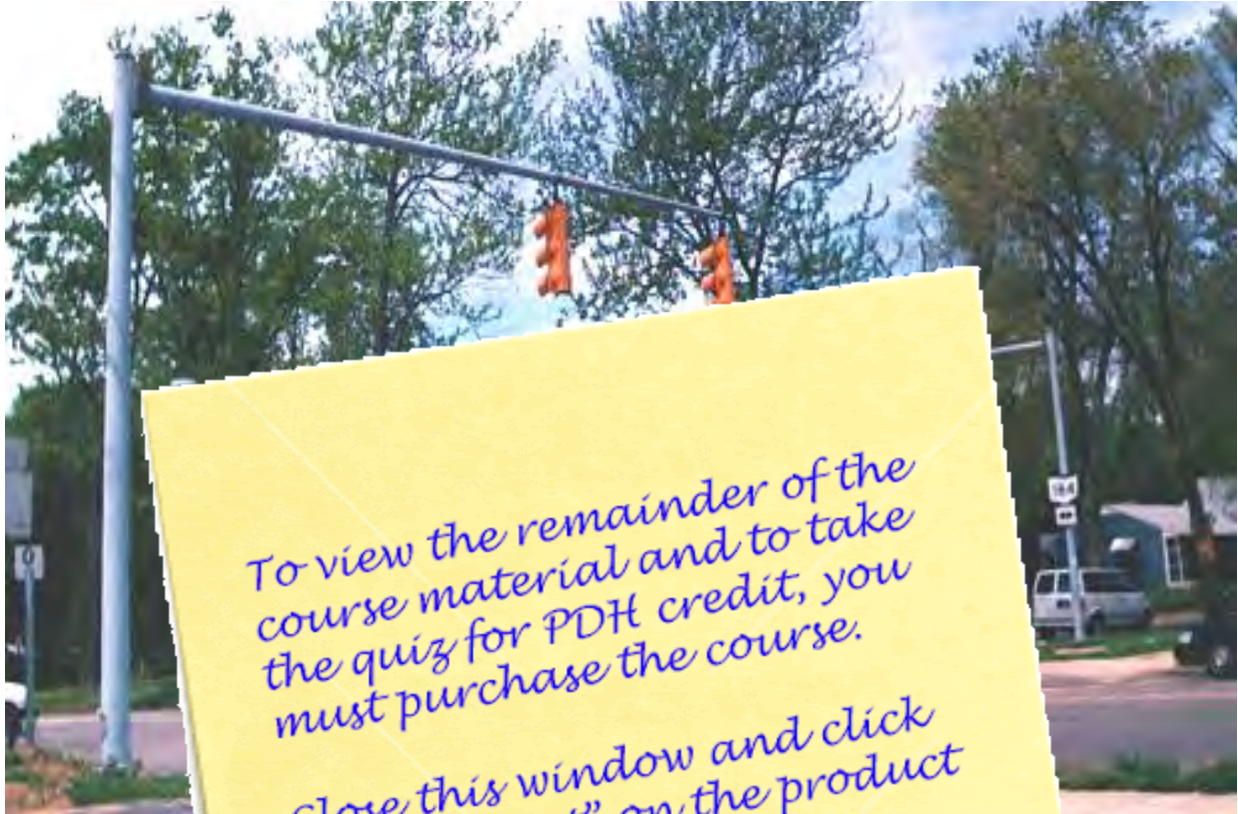
In downtown areas where room is tight, the pedestal often ends up being located within the sidewalk. Signal pedestals are typically constructed of either steel or aluminum although other materials, such as concrete, can be used. In most instances, the pedestals are bolted to an underground concrete foundation, which gives the pedestal structural stability. The pedestal is typically hollow and the cable from the signal head passes through the inside of the pole to conduit located in the foundation of the pole, and then through this conduit to external conduit that takes the signal cable back to the traffic signal controller.

Signal pedestals are usually around 8 to 10 feet in length. Since the signal head is almost always attached to the top of the pedestal, the 8 to 10 foot of pedestal length is sufficient to provide adequate vertical clearance for any pedestrians or cyclists that might pass under it.

With signal pedestals the traffic signal heads are located to the side of the road whereas, with the other types of traffic signal supports, the signal heads are usually mounted over the road. Mounting the heads over the road requires taller poles since there must be enough vertical clearance for vehicles to pass underneath.

MAST ARMS

In a mast arm assembly, the signal heads are mounted on a rigid arm that extends over the roadway.



The mast arm assembly consists of a vertical component and a horizontal component. The vertical component is the mast arm pole. This assembly is attached to the signal head.

which is the signal head which is the signal head attached to the mast arm to transport the signal heads.

The signal heads are mounted to the mast arm by brackets. The brackets are attached to the mast arm and the signal head. The brackets allow the signal head to be positioned from the mast arm. A number of brackets are used to accommodate rigid mounting. These brackets allow the signal head to be positioned to virtually any viewing angle and also allow the head to be vertically positioned as desired. Both horizontal and vertical signal head mounting can be achieved with these brackets. Rigid mounting can also be obtained by fabricating nipples into the mast arm itself; however, this method of attachment greatly reduces the amount of signal head adjustment that can take place.

Suspended signals "give" with the wind, resulting in less of a wind load on the mast arm assembly.