



T2Center
Training and Technical Assistance

TRAFFIC SIGNAL BRIEF

Tech Brief Series

Tech Brief - 2018-4

Work Zone Safety for Signal Maintainers

Traffic signal maintainers provide a vital service to keep the traveling public safe, but in doing so they may face dangers from moving vehicles, falls and electrocution.

2014

A signal maintenance worker in New Jersey was critically injured when a tractor-trailer drove under the aerial lift bucket he was working in. The bucket with the worker inside scraped along the top of the trailer, tipped over and the maintainer fell first onto the roof of the truck, then 14 feet to the pavement.

1996

A 30-year old maintenance worker in California died after a metal combination street light/traffic signal standard he was positioning contacted an overhead high-voltage power line. His co-worker who was helping him position the standard was seriously burned.

2012

A 63-year old municipal signal electrician in Massachusetts died after he fell 17 feet from a vehicle-mounted aerial lift's raised bucket. The victim and one co-worker were at a four-way intersection replacing a traffic signal bulb when a tractor-trailer struck the raised bucket.



WPVI News, Camden, NJ

2003

A 39-year old technician replacing a burned-out green bulb on a traffic signal in Kentucky received fatal head injuries after falling out of the bucket of an aerial boom truck. As he worked from the lift, a cargo truck drove underneath the bucket, striking it and knocking the technician 10 feet to the ground.

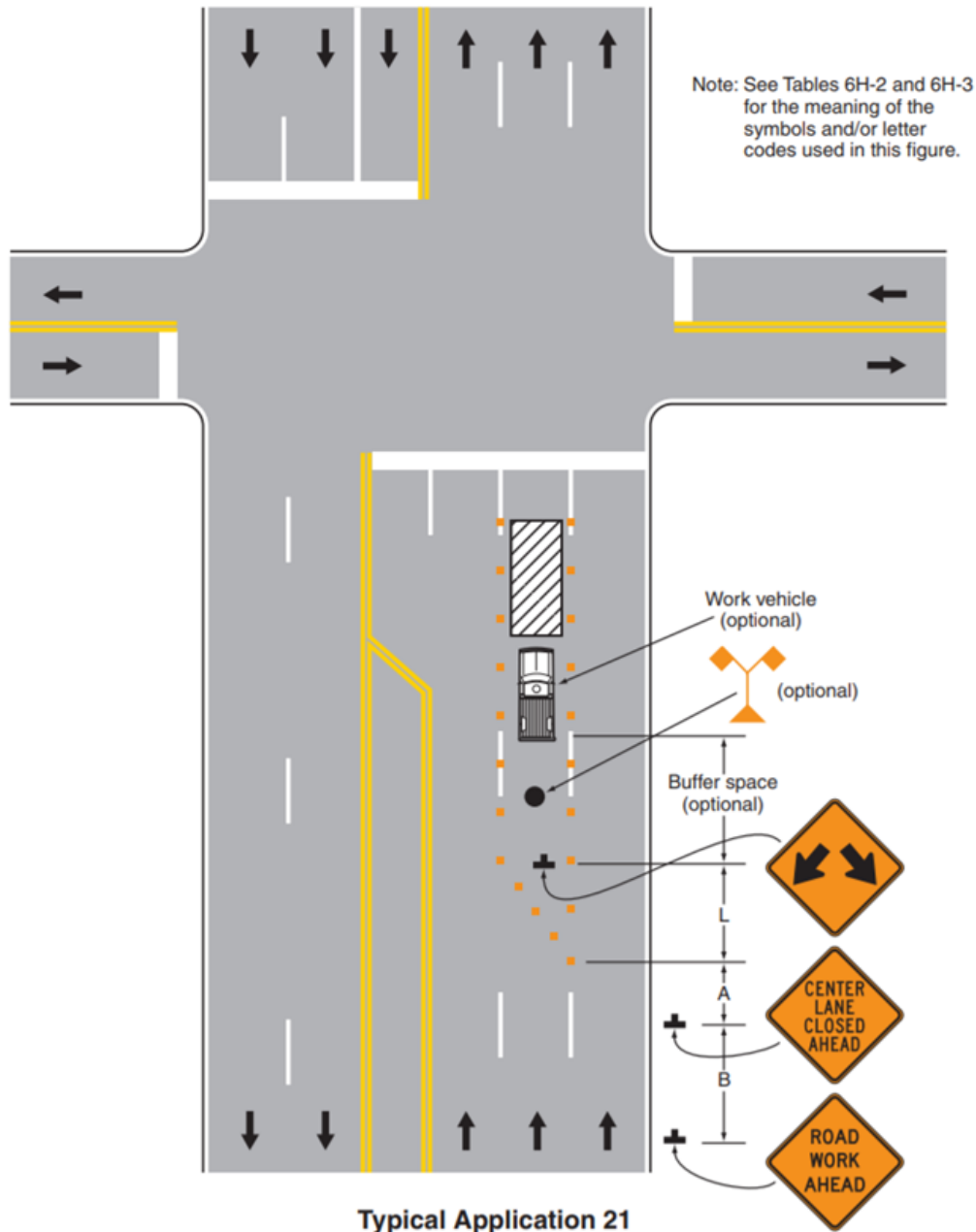
2011

A 58-year old signal maintainer in Massachusetts died when the aerial lift bucket he was using to repair a faulty signal was hit by a tractor-trailer. The victim was ejected from the bucket and fell 17 feet to the pavement.

National Institute for Occupational Safety & Health (NIOSH)

The common denominator in these incidents was failure to set up a safe work zone. With preparation, training and proper planning, incidents like these can be prevented.

Work within an intersection typically falls into one of three categories: near side, far side and in-the-intersection. Several typical plans for these instances are discussed in this technical brief, but Section 6 of the MUTCD is the ultimate authority and should be referenced for creating a traffic control plan for a specific location.



Near-Side Work Spaces

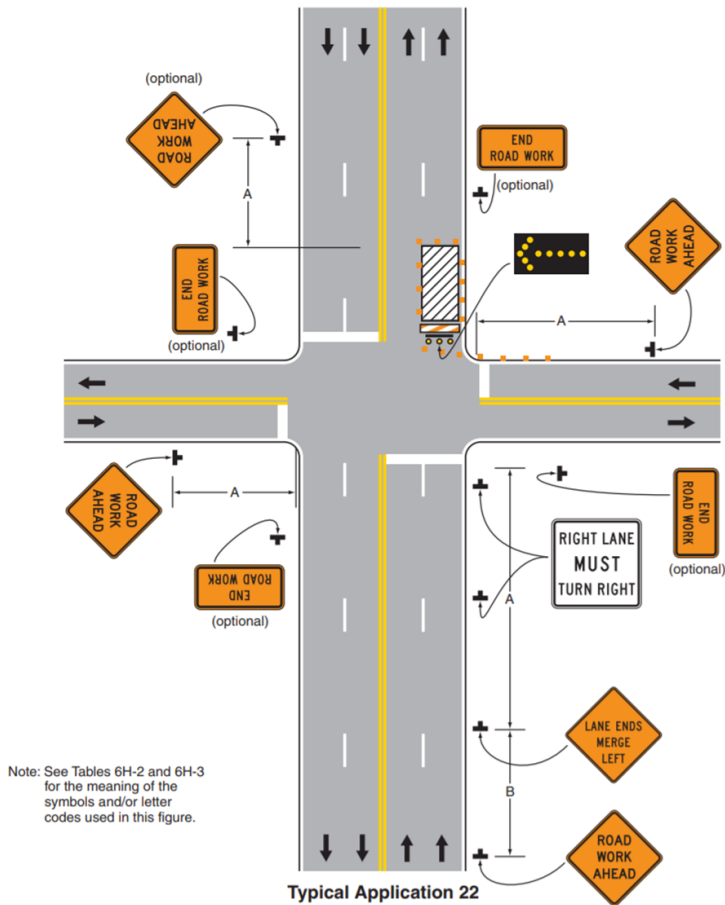
Near-side work spaces, as depicted in MUTCD Figure 6H-21, are simply handled as a midblock lane closure. A problem that might occur with near-side lane closure is a reduction in capacity, which during certain hours of operation could result in congestion and backups.

When near-side work spaces are used, an exclusive turn lane may be used for through vehicular traffic.

Where space is restricted in advance of near-side work spaces, as with short block spacings, two warning signs may be used in the advance warning area, and a third action-type warning or a regulatory sign (such as Keep Left) may be placed within the transition area.

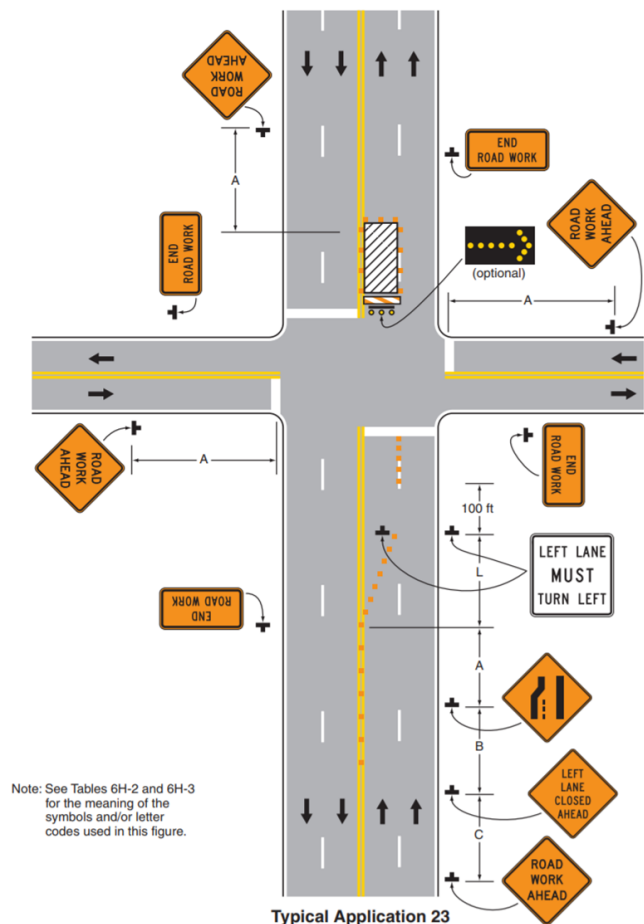
Far-Side Work Spaces

Far-side work spaces, as depicted in MUTCD Figures 6H-22 through 6H-25, involve additional treatment because road users typically enter the activity area by straight-through and left- or right-turning movements. When a lane through an intersection must be closed on the far side, it should also be closed on the near-side approach to preclude merging movements within the intersection. If there are a significant number of vehicles turning from a near-side lane that is closed on the far side, the near-side lane may be converted to an exclusive turn lane.



Typical Application 22 shows traffic control for closure of the right lane on the far side of an intersection.

Typical Application 23 shows traffic control for closure of the left lane on the far side of an intersection.

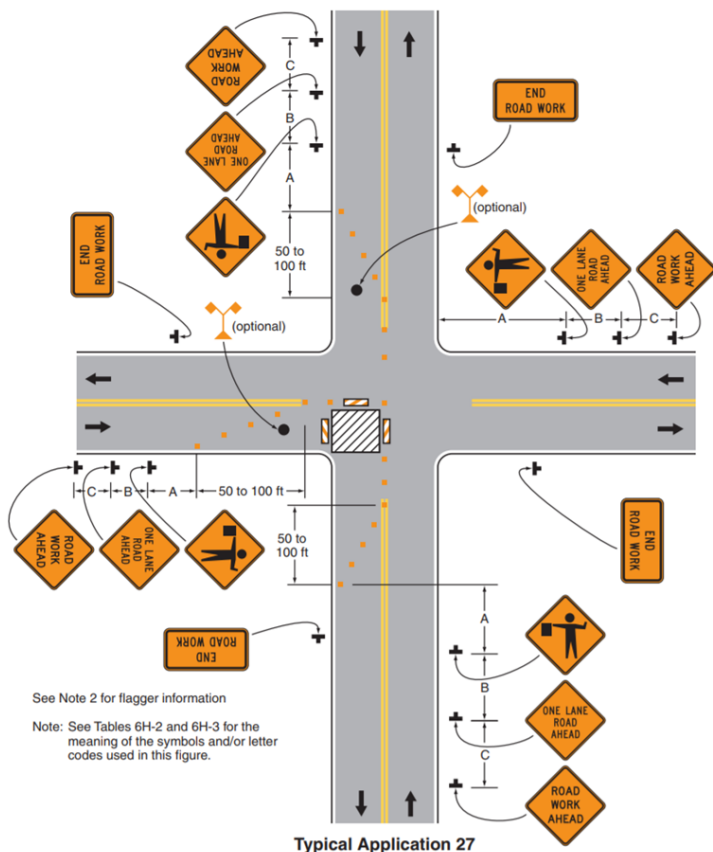
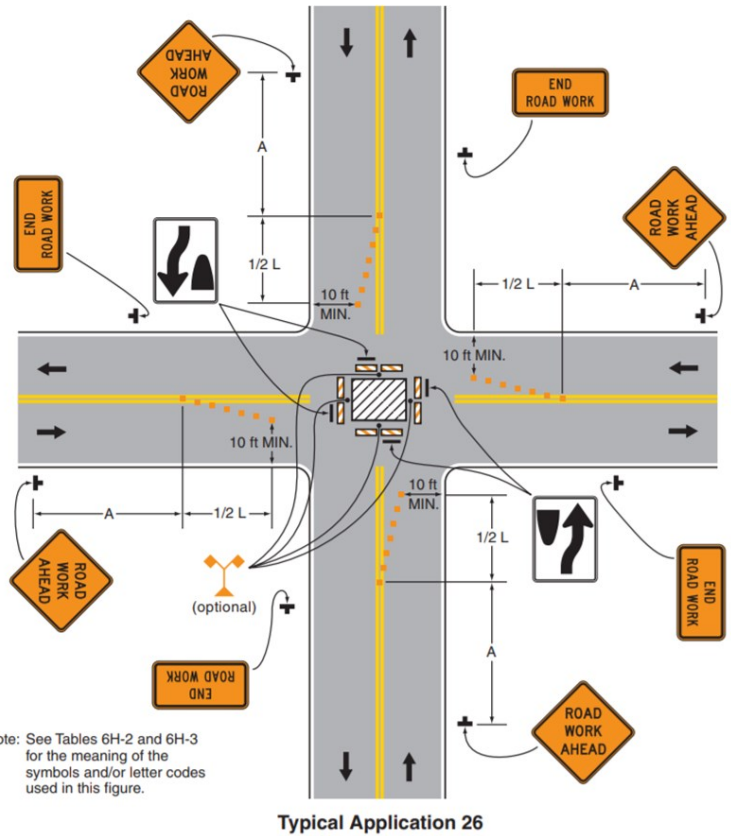


In-the-Intersection Work Spaces

MUTCD Figures 6H-26 and 6H-27 provide guidance on applicable procedures for work performed within the intersection. If the work is within the intersection, any of the following strategies may be used:

- A small work space so road users can move around it
- Flaggers or uniformed officers to direct road users
- Work in stages so the work space is kept to a minimum
- Road closures or upstream diversions to reduce road user volumes

Typical Application 26 shows a small work space closure in the center of an intersection that road users can move around.



Typical Application 27 shows the use of flaggers for an in-the-intersection road closure at the side of an intersection.

Depending on road user conditions, flaggers and/or a uniformed law enforcement officer should be used to control traffic.

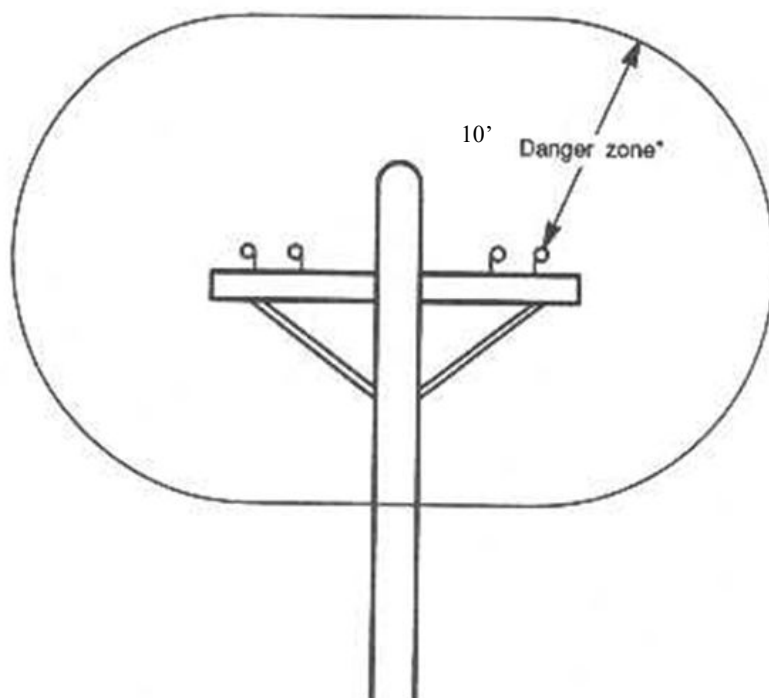
The MUTCD provides general guidance for all three of the above categories, but work spaces often extend into more than one portion of the intersection. In such instances, some discretion must be used in developing an appropriate traffic control plan by combining features shown in two or more of the typical applications. In addition, the safety of pedestrians and bicyclists present at the intersection must be ensured by adding elements of other plans as appropriate.

The effect of the work upon signal operation should also be considered, and temporary corrective actions should be taken, if necessary. Corrective actions may include revising signal phasing and/or timing to provide adequate capacity, maintaining or adjusting signal detectors, and relocating signal heads to provide adequate visibility as described in MUTCD Part 4.

Electrical Considerations

According to National Safety Services, 10% of all fatal work injuries in the US every year are the result of falls, and 53% of fall accidents are a result of electrocution.

A general guideline for working near power lines is to maintain a clearance of at least ten feet between the primary power line and any part of your body, equipment or vehicle. If there is any question regarding whether proper clearance is available, contact the utility for assistance.



Aerial Lift Safety and Fall Protection

Aerial lift trucks should only be used by properly trained personnel. When working from an elevated bucket, keep your feet firmly on the floor of the bucket at all times and always remember to wear a harness secured to the bucket with a lanyard. Maintain equipment on a regular basis, and inspect the vehicle and all personal fall protection devices before each and every use.



References and Resources

- MUTCD Part 6 <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part6.pdf>
- Sign spacing, taper lengths and other MUTCD Chapter 6 information is summarized in the T2 Center Work Zone Guidebook, which makes an excellent pocket reference: https://www.t2center.uconn.edu/pdfs/Work%20Zone%20Safety%20Guidebook_Final.pdf
- T2 Center's Custom Training Brochure: [https://www.t2center.uconn.edu/pdfs/Custom%20Training%20Program%20Flyer%20\(2018\).pdf](https://www.t2center.uconn.edu/pdfs/Custom%20Training%20Program%20Flyer%20(2018).pdf). To set up custom training in Fall Protection & Prevention and/or Bucket Truck Safety for your organization, contact Lisa Knight at (860) 486-4396 or lisa.knight@uconn.edu.



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