Mid-Atlantic Construction Safety Council

Traffic Control Safety

Presented by Work Zone Contractors

WHAT IS TRAFFIC CONTROL?

The primary function of temporary traffic control is to provide road users, pedestrians, and vehicles with safe passage through roadway construction zones. It is also used to provide safety to workers and equipment. Traffic control is a vital part of our transportation system that affects the quality of life,
economic productivity, and environmental sustainability of communities.

TYPES OF TRAFFIC CONTROL

Vehicular

Pedestrian

Internal Jobsite Traffic Control

WHY IS TRAFFIC CONTROL IS IMPORTANT?

Some companies see traffic control as an unwanted cost. They believe that following proper traffic control procedures slows down production and is a waste of time. In reality, when traffic control procedures are followed, jobsites are safer and will have less accidents. This keeps downtime for the jobsite to a minimum which will result in more production. It also prevents companies from being tied up in lawsuits as result of an accident.

JOBSITE ACCIDENTS

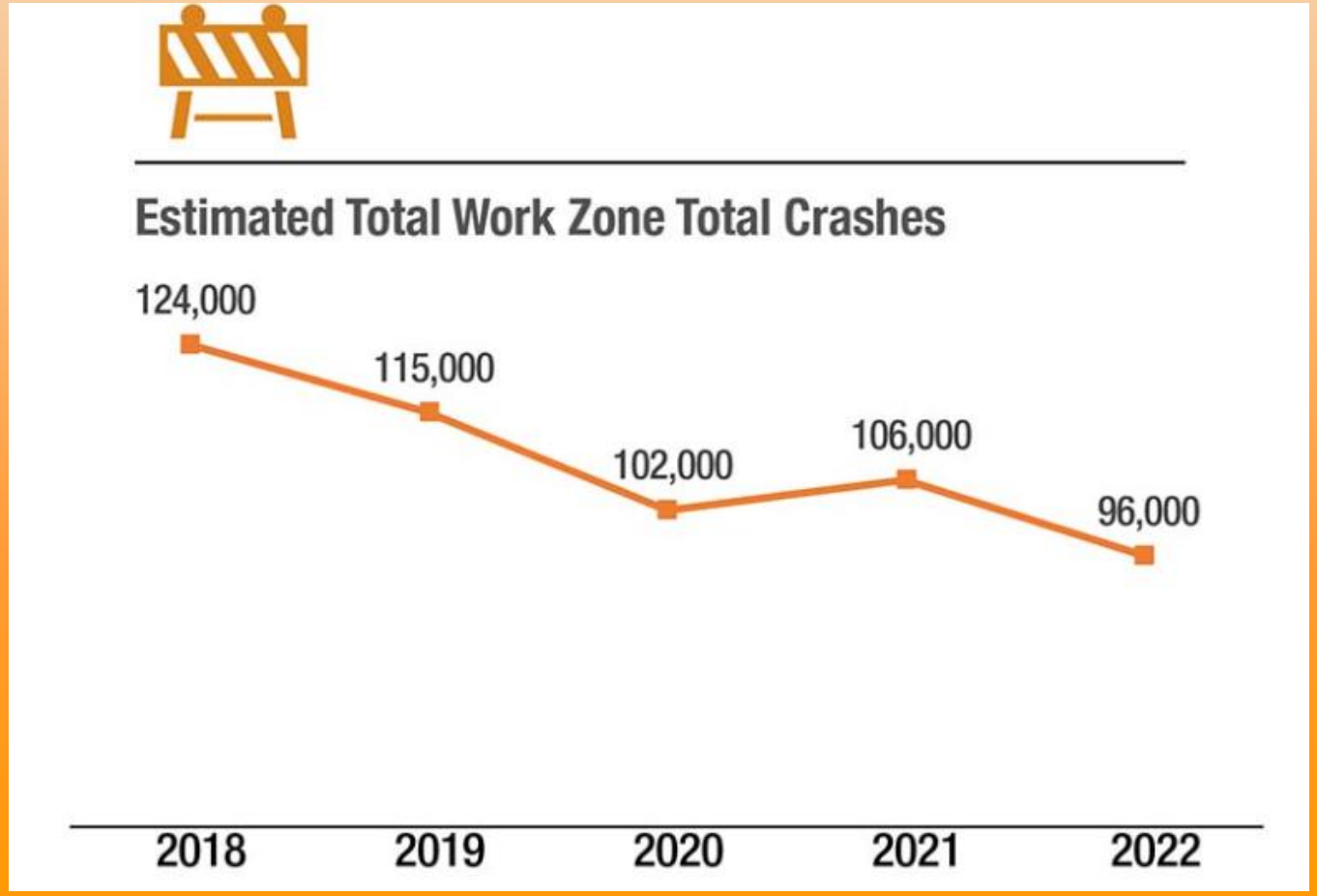
A work zone crash occurs once every **5.4** minutes (for an estimated total of over **96,000** crashes per year).

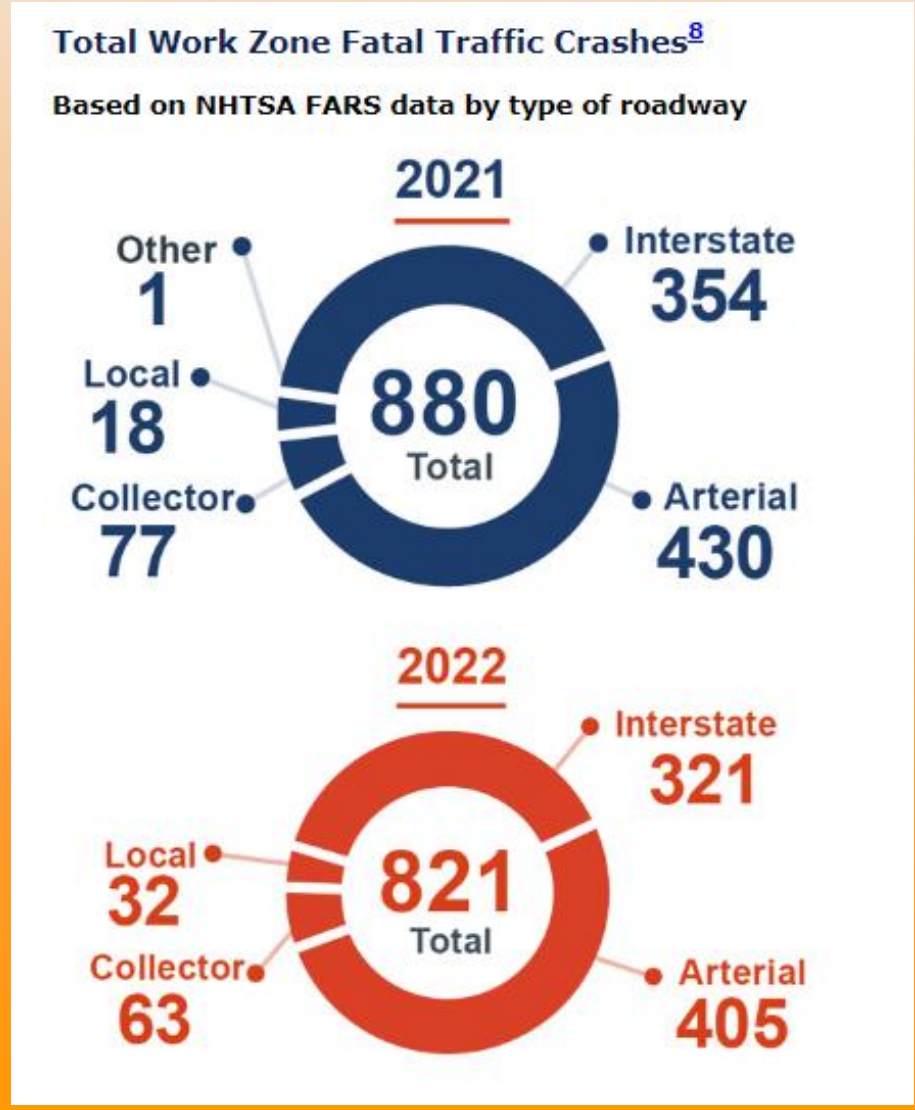
The most common types of road construction accidents are:

- **Rear-end collisions**: These are the most common type of accident in a work zone.
- **Head-on collisions**: These are another common type of accident in a work zone.
- **Pedestrians hit by vehicles**: This is the most common type of injury to a road construction worker, accounting for nearly 70% of all transportation incidents.
- **Workers hit by construction equipment**: This is a significant threat to road construction workers.
- **Single-vehicle accidents**: These include accidents where a vehicle runs off the road or collides with a nonfixed object.

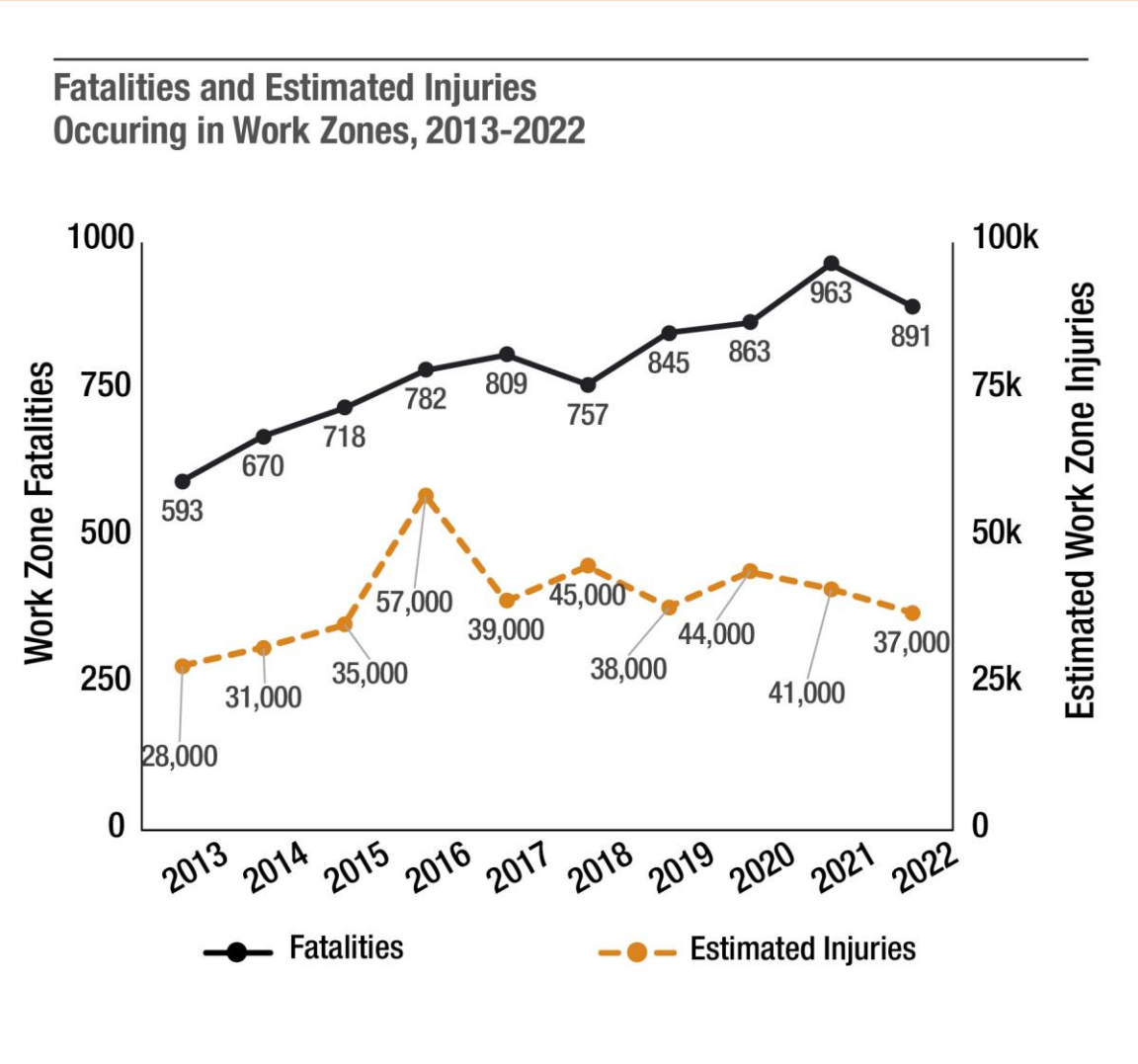
In 2022:

- Every day, **over 100** work zone crashes occurred that resulted in at least one injury.
- Every week, work zone crashes resulted on average **15.7** fatalities.
- That's **over 800** work zone fatalities a year.

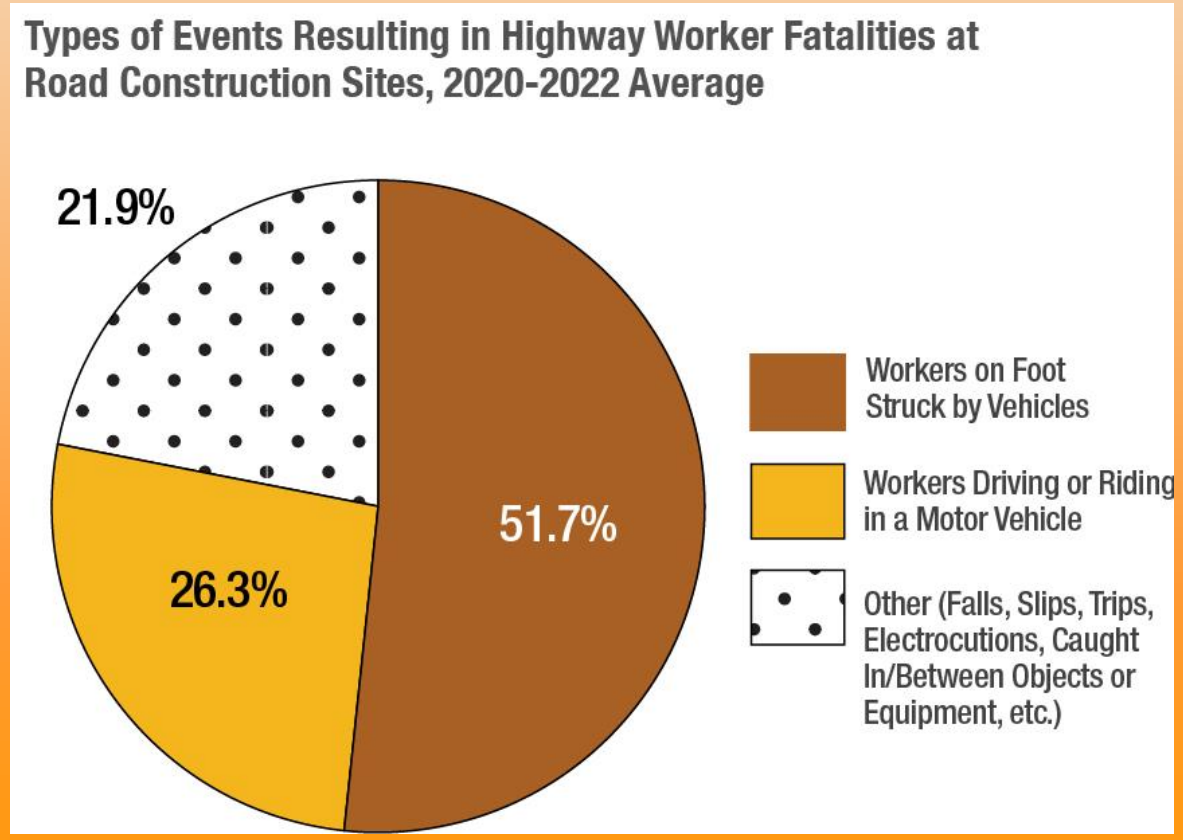




In the United States, one work zone fatality occurs for every 4 billion vehicle-miles of travel and for every $112 million worth of roadway construction.



Bureau of Labor Statistics shows that on average, between 2020 and 2022, more than half of road worker fatalities were due to workers on foot being struck by vehicles on the job site.

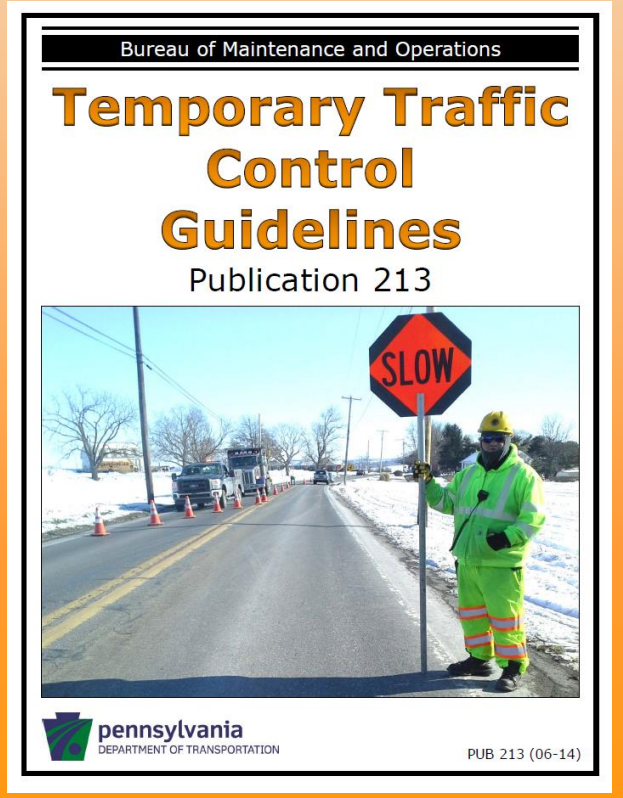


How do we prevent these accidents from happening?

FOLLOWING THE CORRECT STANDARDS

When doing temporary traffic control, it is imperative to follow applicable standards and guidelines.
Following standards and guidelines:

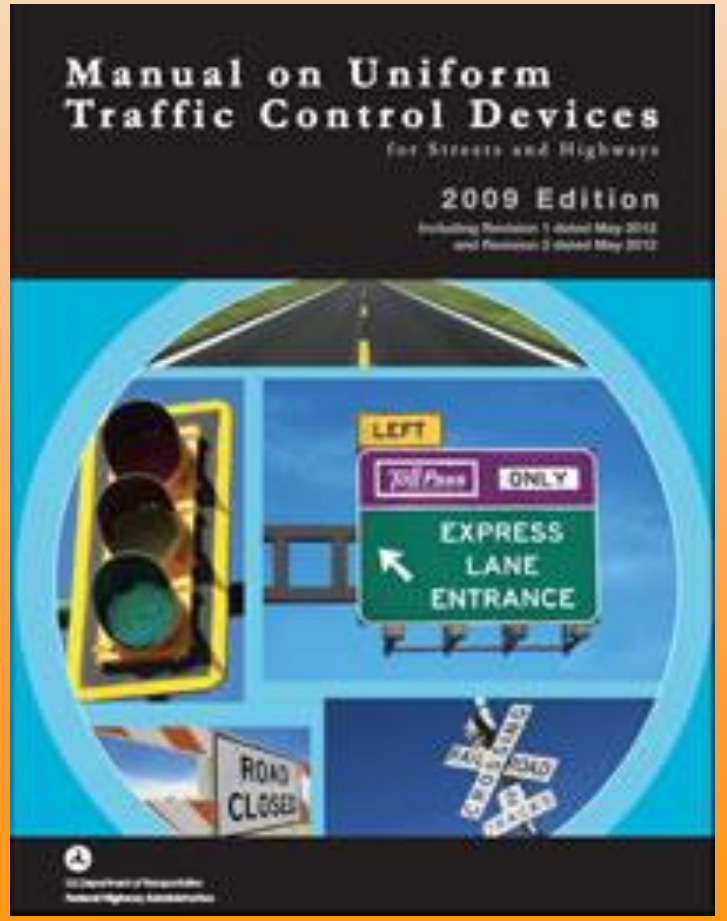
- Promotes uniform response;
- Minimizes drivers' confusion;
- Minimizes liability
- Increases motorists' respect.



MANUEL ON UNIFORM TRAFFIC CONTROL DEVICES

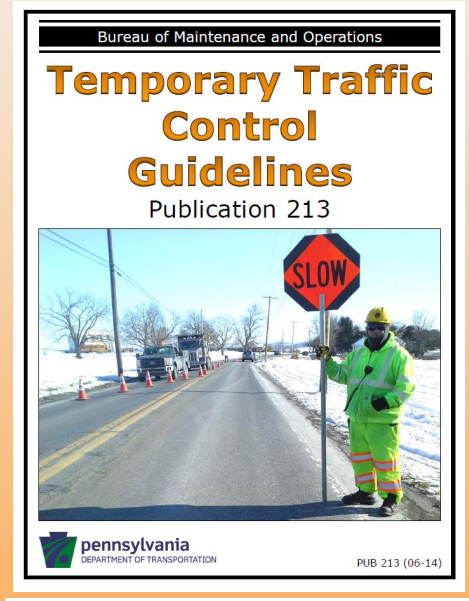
What is the MUTCD?

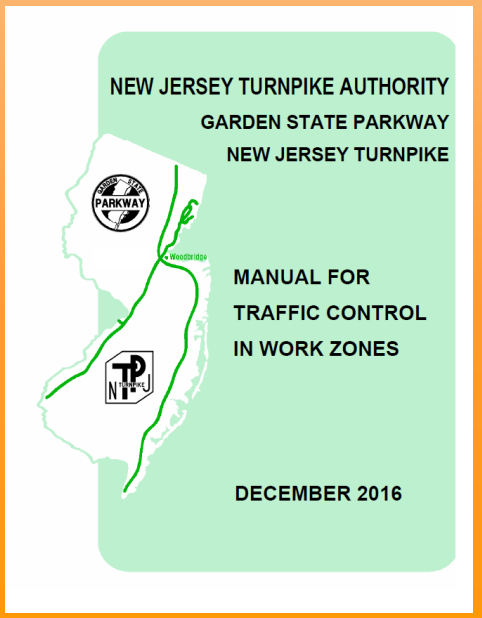
- The MUTCD stands for Manual on Uniformed Traffic Control Devices.
- It is a federal document which lists the standards and guidelines to be followed in traffic control zones. Basis for the course.
- Part 6 refers to temporary traffic control.
- MUTCD lists minimum standards.
- Some states exceed minimum standards and institute their own stricter guidelines.
- In NJ, the MUTCD typical applications are used for non state work like utility work most of the time. State project use NJDOT Traffic Control Details.
- In PA Publication 213 is followed for Temporary Traffic Control.
- Shall, Should and May conditions



Other Standards and Guidelines

- The following documents would override the MUTCD:
- DOT specifications(ex. NJDOT Traffic Control Details)
- Contract plans
- Special provisions to the contract plans
- Special sheets in the plans called Traffic Control Plan or TCP
- If none are available, follow the MUTCD.





TRAINING

Proper training is crucial for traffic control personnel to perform their duties safely and effectively. It can help people develop the skills and knowledge to manage traffic in a variety of situations, including construction zones, special events, and other situations where normal traffic patterns are disrupted.

What is ATSSA?

- ATSSA stands for American Traffic Safety Services Association.
- They represent the road safety, traffic safety, and highway safety industry with effective legislative advocacy, traffic control safety training, and a far-reaching member partnership.
- Their core purpose is to advance roadway safety through the design, manufacture, and installation of road safety and traffic control devices.
- They brings together members, road safety experts, and public agencies to identify and solve road safety issues.
- Their goal is no matter where in the country you are, traffic control devices and procedures will be done in the same way so drivers can become more familiar with work zones to make them safer for everyone.

TRAINING

ATSSA Flagger certs

- PA & NJ require that all flaggers are certified.
- PA Accepts virtual training
- NJ does not accept online training for DOT projects.

RUTGERS–NEW BRUNSWICK
Center for Advanced Infrastructure and Transportation
School of Engineering

ATSSA Traffic control technician

- An introduction to temporary traffic control in work zones for individuals who work in the field installing and removing traffic control devices. The course provides concepts, techniques and practice exercises in the installation and maintenance of traffic control devices.

ATSSA Traffic Control Supervisor

- Designed to train those who will be actively involved in designing, setting up and maintaining temporary traffic control in a work zone. In PA, it is required on larger projects.

Traffic Control Coordinator (NJ)

- Training is through Rutgers' Center for Advanced Infrastructure and Transportation.
- Required on NJDOT projects.

SAFETY BRIEFINGS

Daily safety briefings are important because they:

- Promote safety awareness
- Improve communication
- Create accountability
- Help with compliance
- Refresh traffic control knowledge

The last thing you want is to try and train someone how to set up traffic control while you have cars going past you at 65 MPH.

Daily Safety and Traffic Control Briefing Guide.

WORK PLACE SAFETY STARTS WITH YOU!

When on the job, safety is our **Number ONE PRIORITY!** Enforcing safe work practices and ensuring a safe work environment is a leadership responsibility. It shall be the responsibility of the employee in charge of a crew to see that all crew members are briefed before work activities begin. The following shall be discussed at a **minimum**. Other items or requirements may be added. A copy of the completed forms shall be handed in at the office of Work Zone Contractors at the end of evey shift.

Contractor: _____ _____ **Job Site:** _____**Job#**_____
Date: _____ **Meeting Time:** _____
T.C.C/Leader_____ **Crew:** _____

SAFETY BRIEFING

Review:

1. **Work Zone Traffic Control Review:**

- What standards apply?
- What type of closure is needed?
- What type of road will the work take place (2 Lane, 4 Lane etc.)?
- Is there proper sight distance?
- Are there hills or curves to consider?
- Night or Day operation
- What are the expected weather conditions?
- How long will we be working at this location?
- Is it a mobile operation?
- Are the proper policies being followed?
- Go over traffic plans that will be used
- Discuss any additions to the traffic plans

Proper Traffic control Equipment:

Signs, Windmasters, Cones, etc.
TMA, AB, Cone Truck
Message Board

SAFETY BRIEFINGS

Example of a traffic crew's safety briefing.

SAFETY OVERVIEW

Crew:

- Does each crew member know what their duties are?
  _____
- Has each crew member been trained to perform their duties?
  _____
- If no, explain (First time, Training onsite?) etc.
  _____

Personal Protective Equipment (check the appropriate PPE)

__Work boots
__Long pants
__Safety shirt at least short sleeved shirt
__Hard Hat
__Hearing protection
__Gloves
__Class 3 Safety Vest
__Harness
Any other items needed? _____

Today's Job Site Hazards:

_____
_____

Today's Safety Precautions:

_____
_____

Any Comments or Questions:

_____
_____

Daily Safety Briefing Attendees:

Print: **Signature:** **Date:**

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

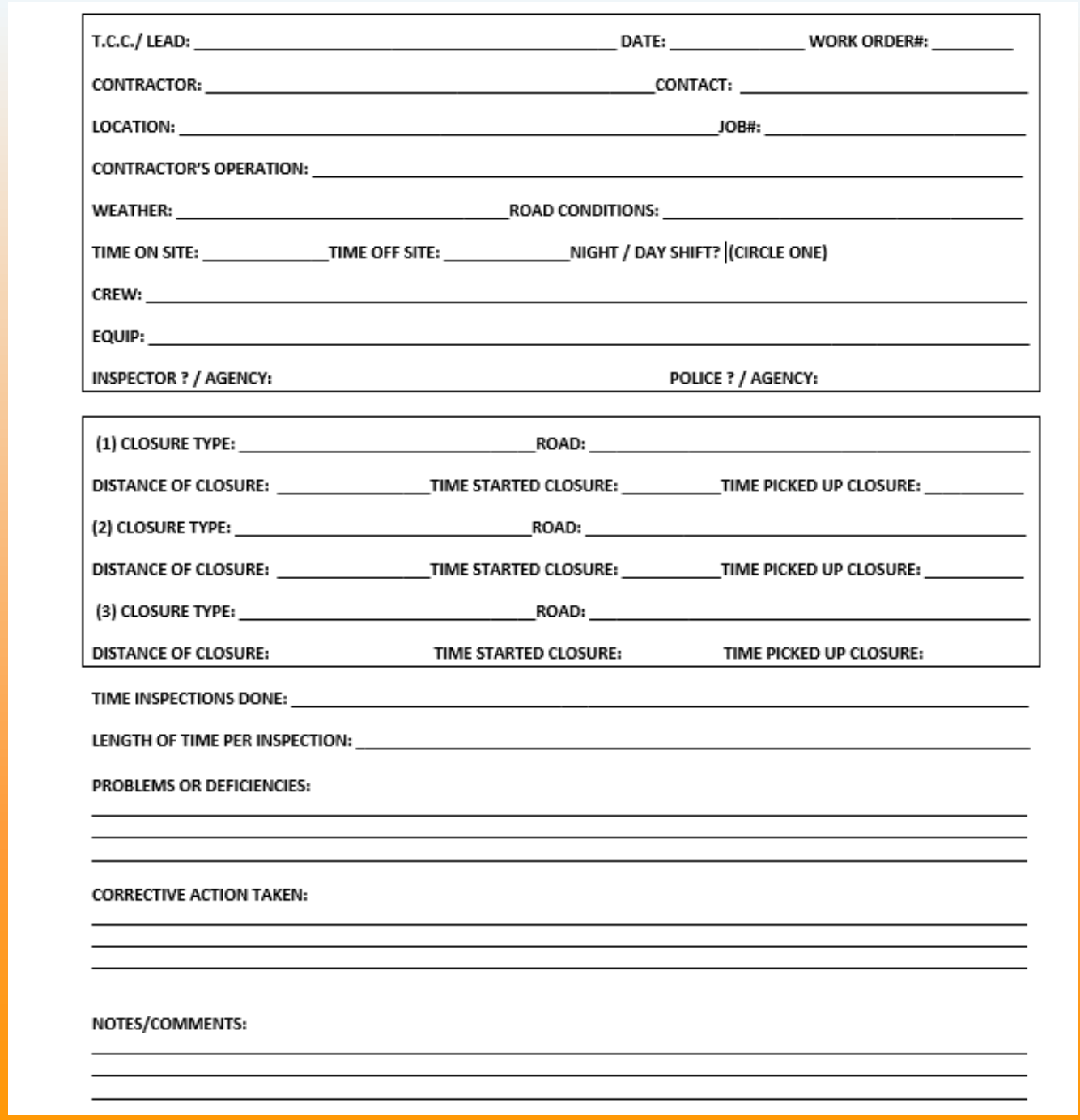
TRAFFIC LOGS

Having your traffic foreman fill out traffic logs daily will help understand how traffic control was set up each day for a project.

These should include:

- location of work
- type of closure
- times inspections were done
- deficiencies/ corrective action.

In the event of an accident, someone's memory will not hold up two years later. To the right is an example of a traffic control log.



T.C.C./ LEAD: _____ DATE: _____ WORK ORDER#: _____

CONTRACTOR: _____ CONTACT: _____

LOCATION: _____ JOB#: _____

CONTRACTOR'S OPERATION: _____

WEATHER: _____ ROAD CONDITIONS: _____

TIME ON SITE: _____ TIME OFF SITE: _____ NIGHT / DAY SHIFT? (CIRCLE ONE)

CREW: _____

EQUIP: _____

INSPECTOR ? / AGENCY: POLICE ? / AGENCY:

(1) CLOSURE TYPE: _____ ROAD: _____

DISTANCE OF CLOSURE: _____ TIME STARTED CLOSURE: _____ TIME PICKED UP CLOSURE: _____

(2) CLOSURE TYPE: _____ ROAD: _____

DISTANCE OF CLOSURE: _____ TIME STARTED CLOSURE: _____ TIME PICKED UP CLOSURE: _____

(3) CLOSURE TYPE: _____ ROAD: _____

DISTANCE OF CLOSURE: TIME STARTED CLOSURE: TIME PICKED UP CLOSURE:

TIME INSPECTIONS DONE: _____

LENGTH OF TIME PER INSPECTION: _____

PROBLEMS OR DEFICIENCIES:

_____

_____

_____

CORRECTIVE ACTION TAKEN:

_____

_____

_____

NOTES/COMMENTS:

_____

_____

_____

EQUIPMENT

Traffic control equipment needs to be kept in working condition and replaced when needed. Due to most traffic control devices having some level of reflectivity, when those parts are damaged or fade it is crucial that they be replace immediately. Devices should be inspected daily for deficiencies and document when possible.

Marginal

Needs to be Replaced.

Just because a sign may look ok during the day, it doesn't mean it will be visible at night.

Little to no reflectivity.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

High Visibility Safety Apparel

- Safety Vest / Color and type may vary by state
- MUTCD requires type 2 for daytime (Shall condition) and Recommends Type 3 for nighttime (Should condition).
- NJ Class 3 for flaggers)
- Vests must be connected in the front for 360-degree visibility
- Must be visible from 1000 Ft away
- Vest must be clean / immodest or sloppy dress detracts from job / neat appearance demands respect
    - Vest are only good for 25 washes

Hardhats

- Not required by MUTCD but some states/companies may.
- OSHA required them if there is overhead work.

Safety Glasses

Not required by MUTCD but some companies may.

Class 2

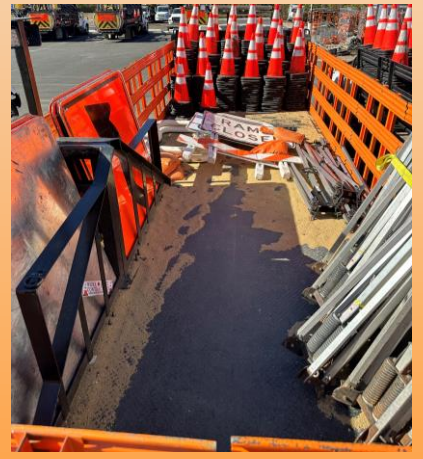
Class 3

CONE TRUCKS

Correctly utilizing the proper tools and equipment is an important way to minimize the chance of an accident. Cone trucks give workers a safe way to set and pick up cones, especially when doing a lane closure.

Setting out and picking up closures are dangerous for workers as this could be the most confusing time for motorist. Cones trucks make this process quicker which reduces risk.

Baskets mounted on the back of trucks help minimize how often a worker will need to get off the truck and walk on the roadway.



Keeping cone trucks organized helps prevent workers from slips and falls.

TRUCK MOUNTED ATTENUATORS (TMA)

An attenuator truck, also known as a truck-mounted attenuator (TMA), is a highway safety vehicle that protects workers and motorists from injury and death in construction zone.

- **Reduces the severity of crashes**

Attenuator trucks are equipped with crash cushions that absorb the kinetic energy of a collision, reducing the damage and potential for serious injury.

- **Redirects vehicles**

Curved bars on the truck can nudge a vehicle away from the work zone to prevent an impact.

- **Prevents accidents**

Attenuator trucks are deployed with flashing lights to warn motorists of construction zones.

- **Protects workers**

Attenuator trucks help keep work crews safe from distracted workers who may enter roadside work zones.

- **Protects motorists**

Attenuator trucks protect motorists from the risk of injury or death if they collide with a slow-moving or stopped work vehicle.

TRUCK MOUNTED ATTENUATORS (TMA)

Even when TMA trucks are not required, they are highly recommended.

Safe Practices when using a TMA:

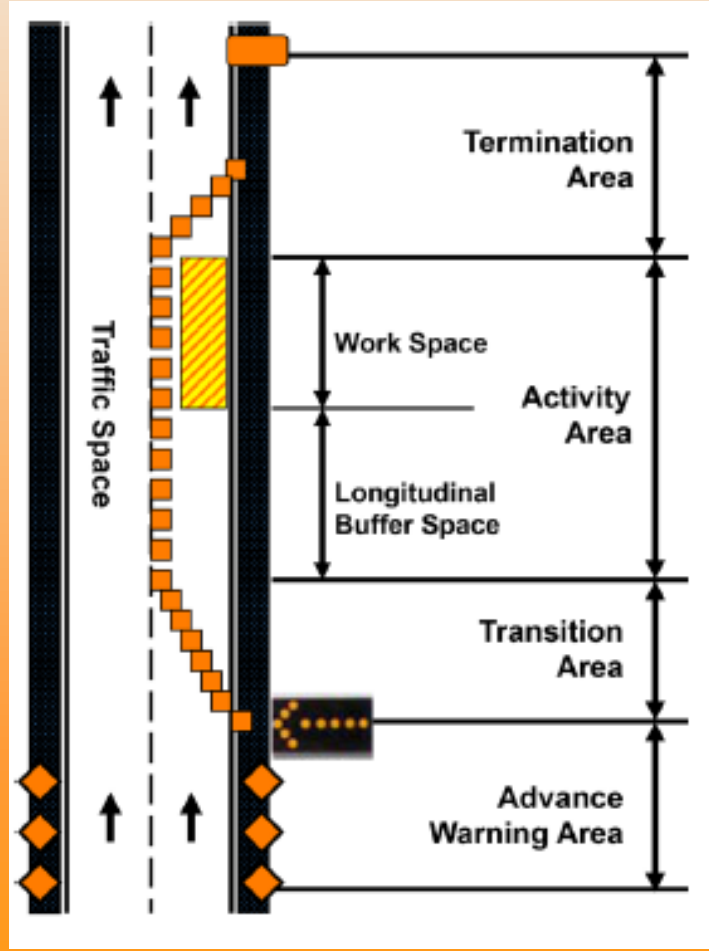
- Only use drivers who have been trained in operating a TMA truck.
- Nothing should be stored on the back of the TMA as they could become projectiles if hit.
- Ensure TMA has proper roll ahead distance so it will not hit any workers.
- Turn wheel the opposite direction of traffic so it will not roll into traffic if hit.

Nothing here will provide protection to the workers on the back of the cone truck.

Driver hit the TMA truck at 55 MPH and was able to walk away unharmed.

TRAFFIC CONTROL SET UPS

Properly setting up temporary traffic control zones will help minimize accidents and increase worker safety. Using the proper signs, buffer space, taper length all go into making the work zone safer. Understanding the different types of set ups and what everyone's responsibilities are is an important step to creating a positive safety culture at you company.



SIGNS

Signs must always be in place before you begin work. Drivers need proper notice when entering a work zone. They need to know what to expect ahead. Using proper signs and placement is key to ensuring drivers will safely pass through the work zone as intended.

Sign Spacing

- Sign spacing is critical and depends mainly upon the approaching speed of the traffic.
- Use the chart below to determine sign spacing.
- You can always put the signs further away but never closer than the recommended distances below.
- If you are unsure of which distance to use, always go with 500’ as a min.

Table 6C-1. Recommended Advance Warning Sign Minimum Spacing

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	100 feet	100 feet	100 feet
Urban (high speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

Safe Practices

Sign is sticking out in the lane.

Secure sign in brackets

Remove all signs as soon as possible when work is complete.

BUFFER SPACE

The buffer space is a crucial safety feature of a work zone. It serves to separate traffic flow from the work area or potentially hazardous area provides recovery space for an errant vehicle.

A buffer space isn't always required or feasible but should be used whenever possible.

Buffer spaces must remain clear of equipment, vehicles, workers, and materials. This includes shadow vehicles and TMA trucks.

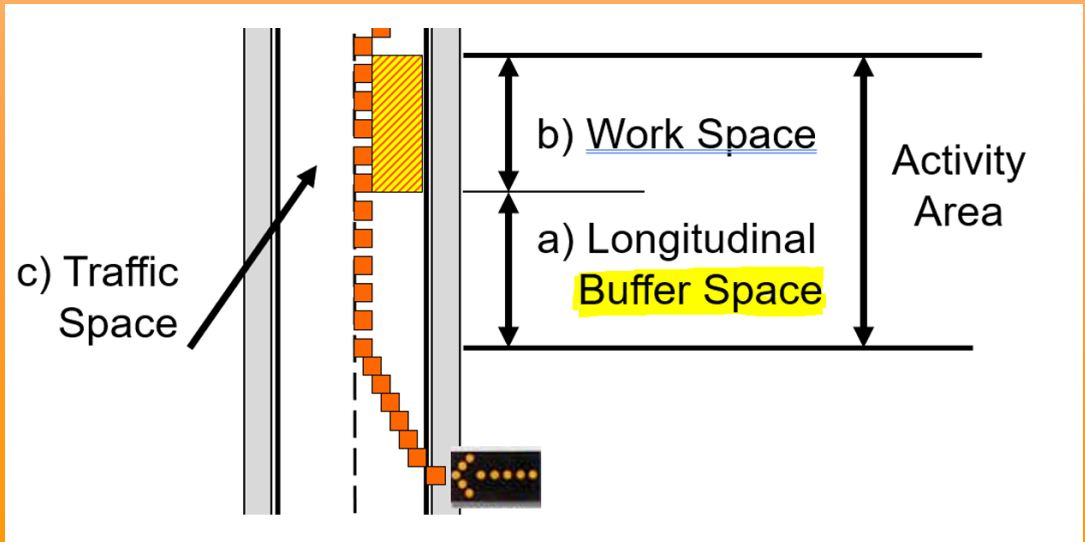


Table 6C-2. Stopping Sight Distance as a Function of Speed

Speed*	Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet
75 mph	820 feet

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

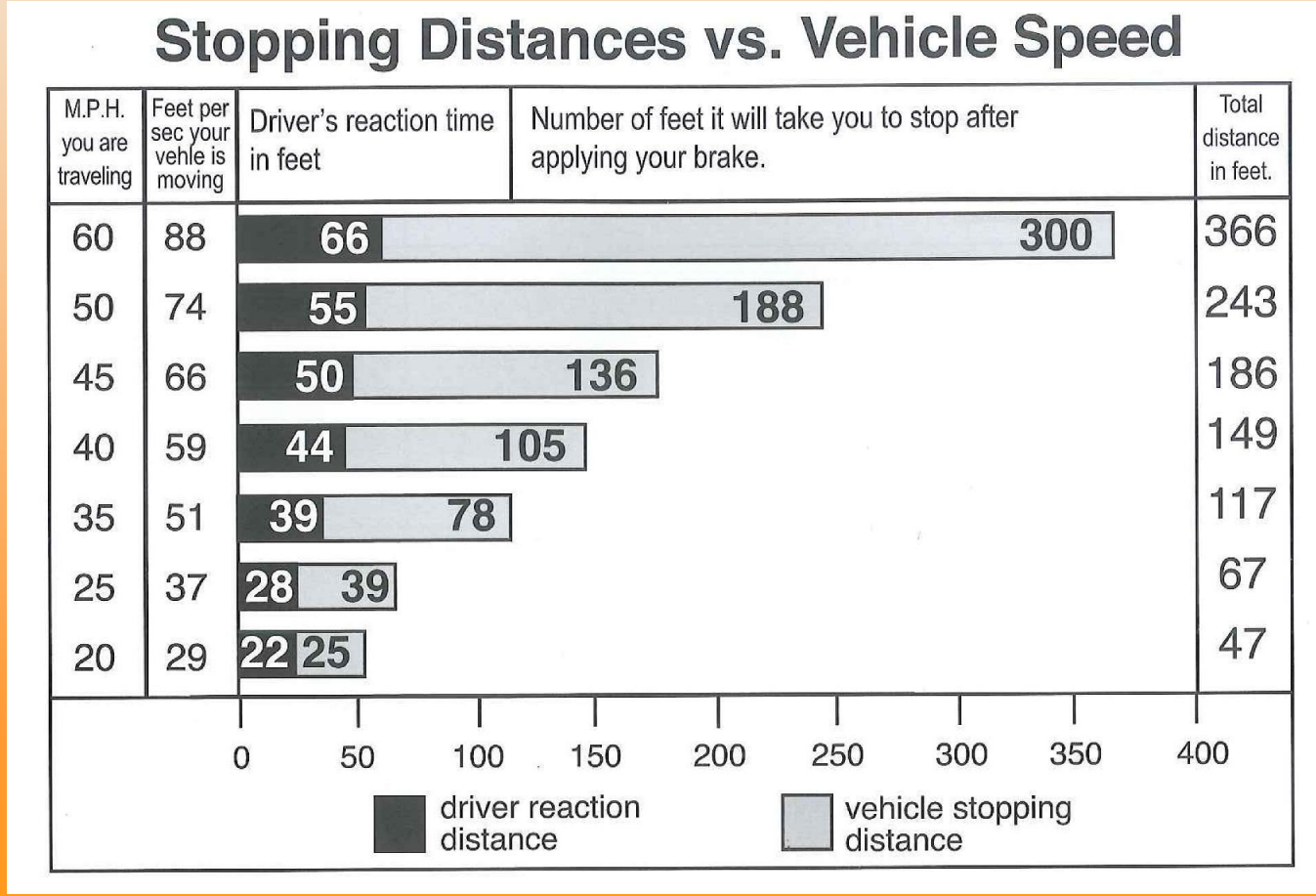
BUFFER SPACE

Factors That Affect Your Visibility

- Hills
- Curves
- Obstructions
- Shade
- Color Contrast
- Bad Weather and Fog
- Darkness (light towers)
- Other Workers – Do not allow other workers to stand near the flagger station

Factors That Affect Stopping Distance

- Traffic Volume and traffic speed
- Vehicle weight
- Cross-traffic movement
- Pedestrians and bikes
- Type of road
- Road and weather conditions
- Visibility
- Road gradient

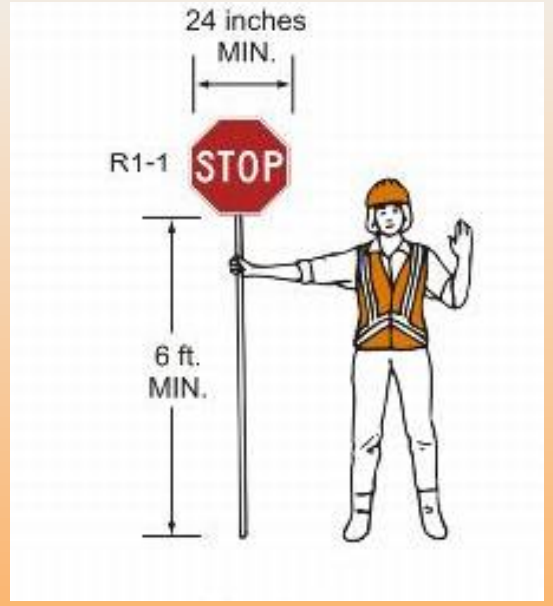


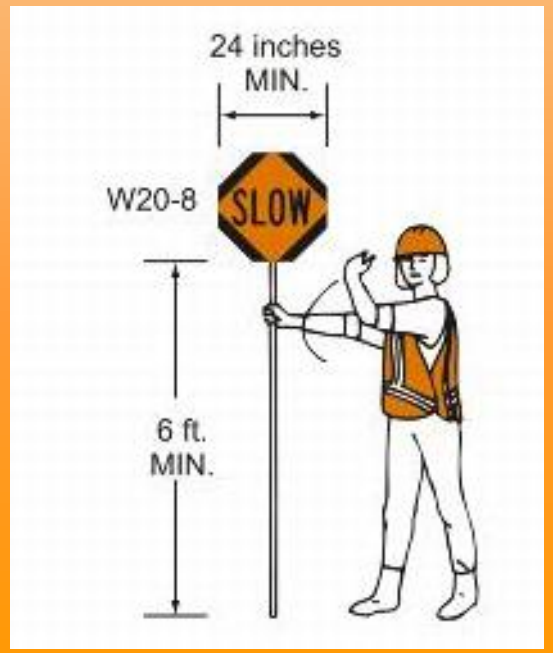
FLAGGING / ALTERNATING TRAFFIC

Abilities of a Good Flagger

Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in safe traffic control practices and public contact techniques. They should be able to demonstrate the following abilities:

- Receive and communicate specific instructions clearly, firmly, and courteously.
- Move and maneuver quickly to avoid danger from errant vehicles.
- Control signaling device(such as paddles) to provide clear and positive guidance to drivers as they approach the work zone.
- Understand proper flagging procedures for stopping and releasing traffic.
- Recognize dangerous traffic situations and be able to warn workers.





FLAGGING / ALTERNATING TRAFFIC

Safe Practices When Flagging

- Flaggers can stop and release traffic, but not direct it, like a police officer. PA is the only state that allows flaggers to direct traffic at intersections. ATSSA is trying to get PennDOT to change their rules.
- Flaggers need to control every point of access to the work zone. Every side street or heavily used driveway will need a flagger
- Nighttime Flagging
  - Retroreflective signs and cones
  - Light towers are required at all times.
  - Light sticks
  - Safety vests (Class 3)

Items NOT To Be Used While Flagging

- Radio/MP3 player/iPod/ headphones
- Chair
- Books or magazines
- Cell phone/texting
- Sunglasses are discouraged(cannot make eye contact)

FLAGGING / ALTERNATING TRAFFIC

Flagger Station

Where the flagger stands is very important to their safety. Flagger stations should be located far enough from the workspace so that the approaching traffic will have sufficient distance to stop before entering the workspace(buffer space). Flaggers must make sure they can see approaching vehicles and approaching vehicles can see them. Flaggers must make sure they have an escape route.

Table 6C-2. Stopping Sight Distance as a Function of Speed

Speed*	Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet
75 mph	820 feet

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

Safe Practices For The Flagger Location

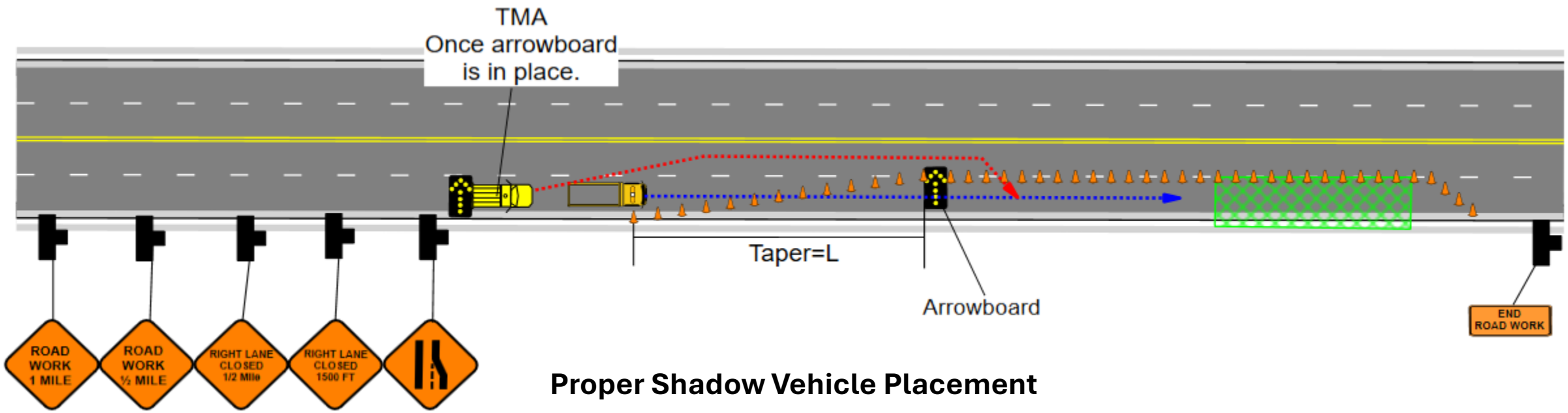
- A flagger should ALWAYS stand in the shoulder.
- Be visible at all times.
- Never stand in the open lane.
- Never in the path of approaching vehicles.
- Only step towards the open lane once traffic has safely come to a stop at a designated point.
- Be aware of traffic behind you.
- Never abandon your post, unless relieved by another trained flagger.
- Never be distracted by the work behind you.

LANE CLOSURES

The most danger for workers when working in a lane closure is when they are installing or removing the taper. Doing this properly Is crucial to ensuring they traffic crew is safe along with the workers in the work area.

Safe Practices For Lane Closures

- Install all required advance warning signs.
- Use the correct traffic control devices to close the lane.
- Use a shadow vehicle in advance of the work area.
- All workers should use high visibility apparel.
- Have an escape plan
- Keep work inside of the cone line.



Proper Shadow Vehicle Placement

LANE CLOSURES

Tapers

A taper is a series of channelizing devices (Cones/Barricades) or pavement marking placed, so they provide visual guidance to the motorist to help move traffic out of its normal path.

Formula For Finding Taper Lengths

Table 6C-4. Formulas for Determining Taper Length

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	50 feet minimum, 100 feet maximum

Note: Use Table 6C-4 to calculate L

= Taper Length (L)

PEDESTRIAN TRAFFIC

When closing sidewalks, a pedestrian detours may need to be created.

Safe Practices for Pedestrian Detours

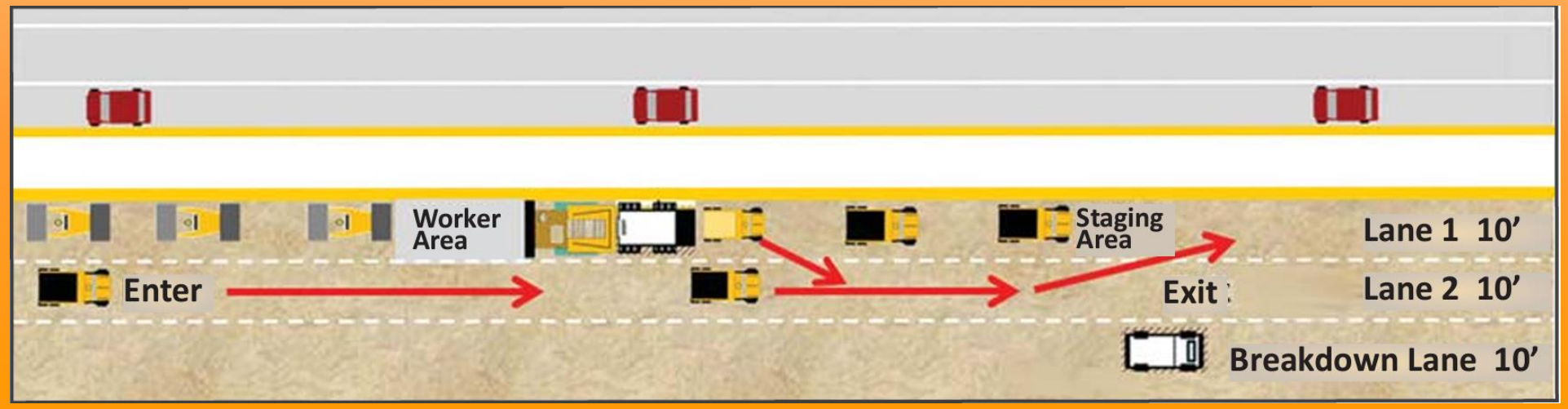
- If pedestrians are required to cross a street, they should always cross at a crosswalk (a temp. one may need to be added).
- If crossing is not an option, temporary barrier may need to be installed to create a safe walking path.
- Per USDOT, sidewalks require a minimum width of 5.0 feet if set back from the curb or 6.0 feet if at the curb face.
- Sidewalk surface must be firm, stable, and slip-resistant. They should be free of cracks, uneven concrete slabs, and trip hazards.
- Handicap ramp may need to be installed to accommodate wheelchairs.

INTERNAL JOBSITE TRAFFIC CONTROL

Internal jobsite traffic control plans are important to minimize runover and back over incidents in roadway work zones. They help by assessing and providing countermeasures for the various hazards within the work zone.

Steps For Developing An ITCP

1. Identify project and ITCP Scope.
2. Determine the construction sequence during the project.
3. Determine locations and safe movements for vehicles, equipment and workers.
4. Determine movements to and from each operation.
5. Assess and resolve potential internal traffic conflicts.
6. Identify individuals who will need to understand and use the ITCP.
7. Develop the ITCP communication, monitoring and enforcement plan.



WORK ZONE CONTRACTORS

HIGHWAY SAFETY PRODUCTS & SERVICES

www.WorkZoneContractors.com