



**TxDOT ROW**

**UTILITY WEEK**

*Partners in Coordination*

# Utility Operations Management

**Day 3 – December 4th  
Track Rm 1, Session 2  
2:30PM – 3:15PM**

## Presenter: Harsh Doshy, P.E.



Harsh Doshy currently serves as a Lead Worker in the Field Engineering group at MNT Division. After earning his Bachelors in Civil Engineering from Texas A&M University in 2009 and a Masters in Civil Engineering from Southern Methodist University in 2014.

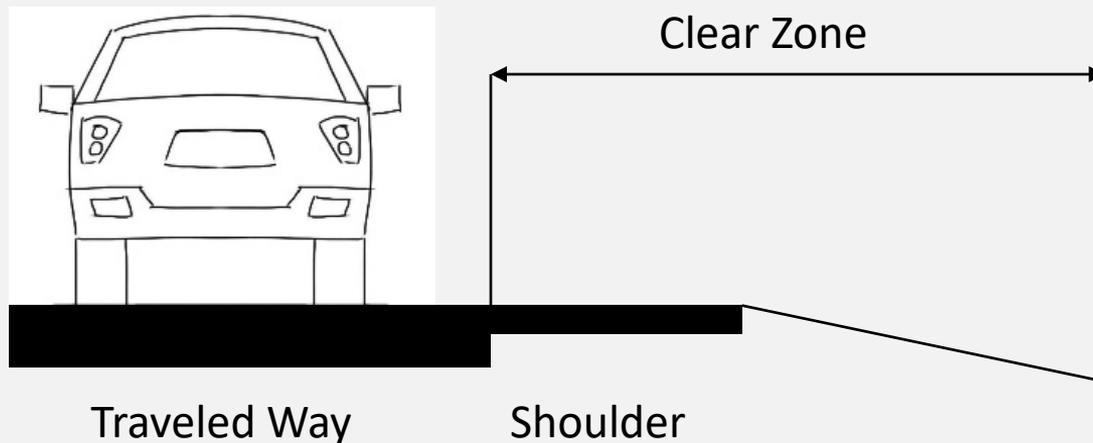
He began his TxDOT career in the Bryan District working out of the Bryan Area Office. During his time in the Bryan Area Office overseeing field inspection for roadway projects, pavement repair projects as well as design for change orders. Since then, Harsh has worked with ROW Division, Austin District engaged in various aspects of utility coordination. He currently serves as the Lead Worker in the Field Engineering group of the MNT Division working on aspects of ROW Agreements, Utilities, Spec Review, Approving CO's and Emergency Contracts.

His professional memberships include the American Society of Civil Engineers and he volunteer with the Central Texas food Bank.

## TOPICS

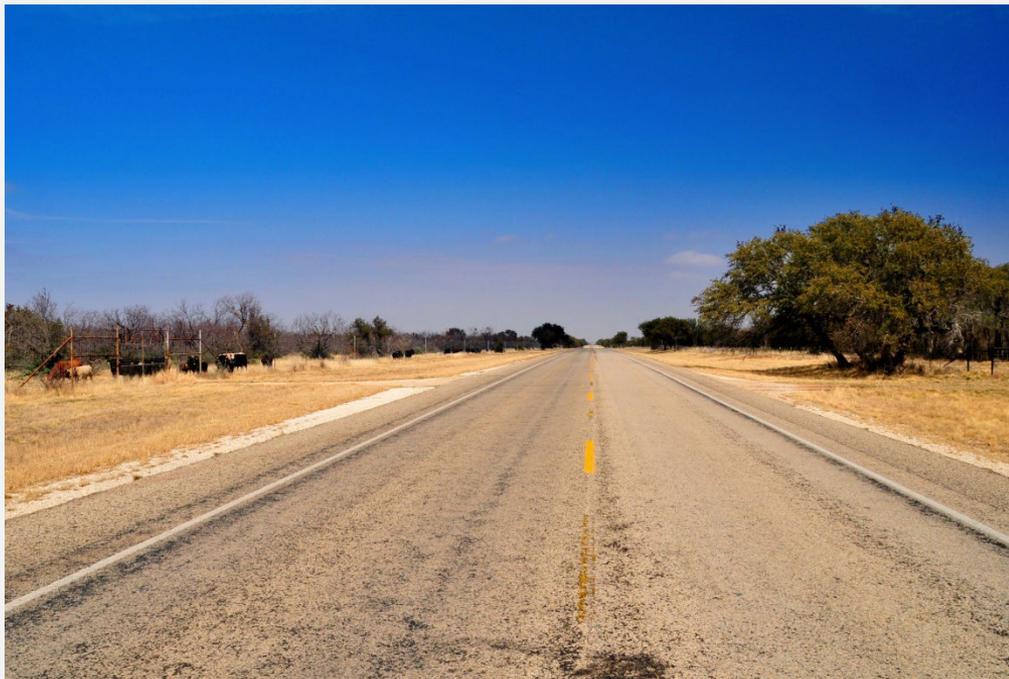
- UTILITY POLES
- WORK ZONE SAFETY
- SHORT TERM CONSTRUCTION TCP'S

## Clear Zone and Fixed Objects



- The unobstructed, traversable area provided beyond the edge of the through traveled way for the recovery of errant vehicles. The clear zone includes shoulders, bike lanes, and auxiliary lanes, except those auxiliary lanes that function like through lanes.

## Clear Zone Factors

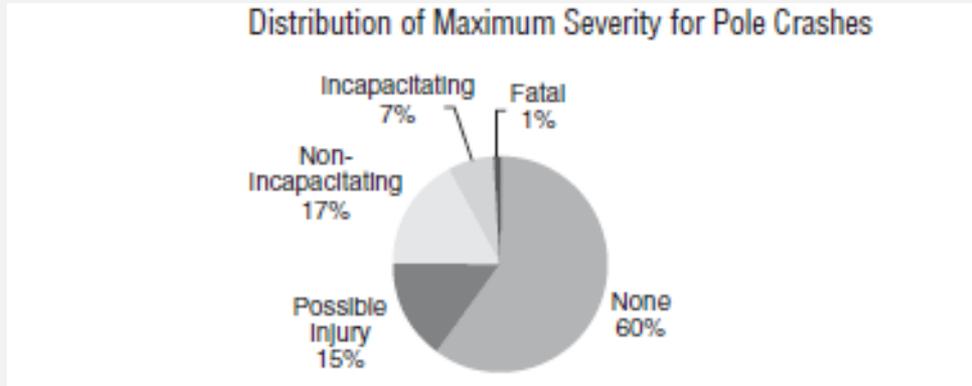


- Design Speed
- Traffic Volume
- Curvature and Slope
- Highway Classification



## Utility Poles

- Review Crash Data
- Analyze Accident Patterns
- Treat High Risk Locations
- 1608 Fatal Crashes Involving Poles in 2018





## Strategies

- Relocate poles in hazardous locations
- Shield drivers from poles in high-risk areas
- Apply traffic operation measures
- Use breakaway poles





## Low Impact Strategies



- Relocate poles in high-crash locations
- Install traffic barriers
- Breakaway poles in the clear zone
- Traffic calming measures



## Breakaway Devices

- No alternate to location in clear zone
- Reduce hazards for pedestrians, vehicles, property owners
- Safe recovery area behind the pole





## Traffic Modifications

- Guard Rails
- Crash Cushions
- Improve Visibility





## Moderate to High Impact Strategies

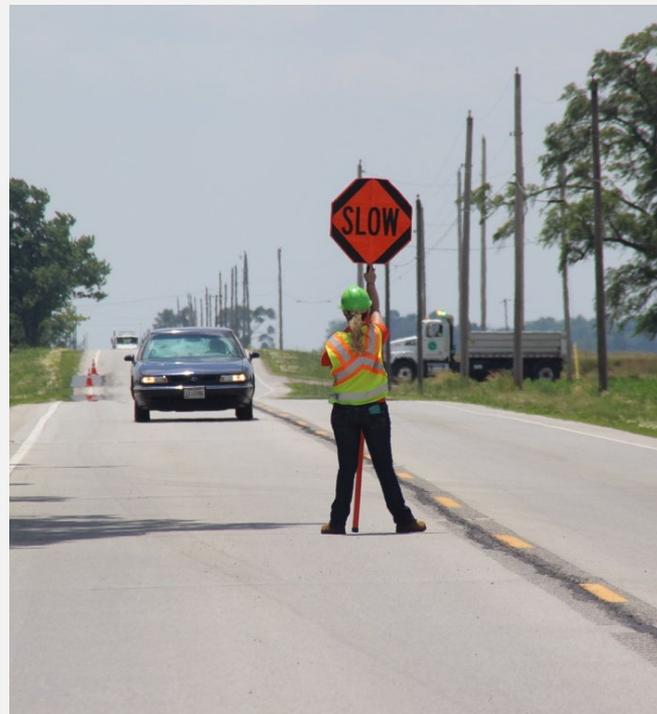
- Relocate poles along the corridor farther from pavement
- Decrease the number of poles





## Work Zones

- Typically have black letters or symbols on an orange background
- Tell drivers what to do
- Tell drivers how soon they will encounter the work zone
- Tell drivers the work zone's speed limit



## Risk Factors

- Impaired Drivers
- Cell Phones
- Disabled Vehicles
- Lost Drivers





## Common Work Zone Signs





## Common Work Zone Signs





## Common Work Zone Signs

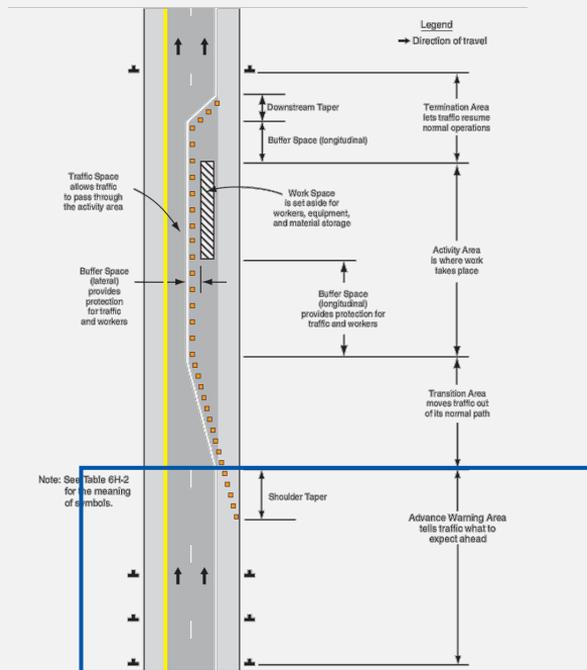




# Components of a Work Zone

## ADVANCE WARNING AREA:

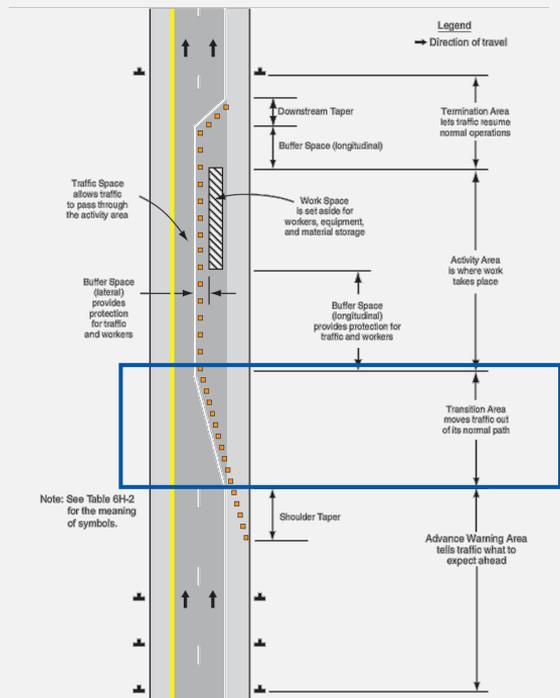
Tells traffic what to expect ahead





# Components of a Work Zone

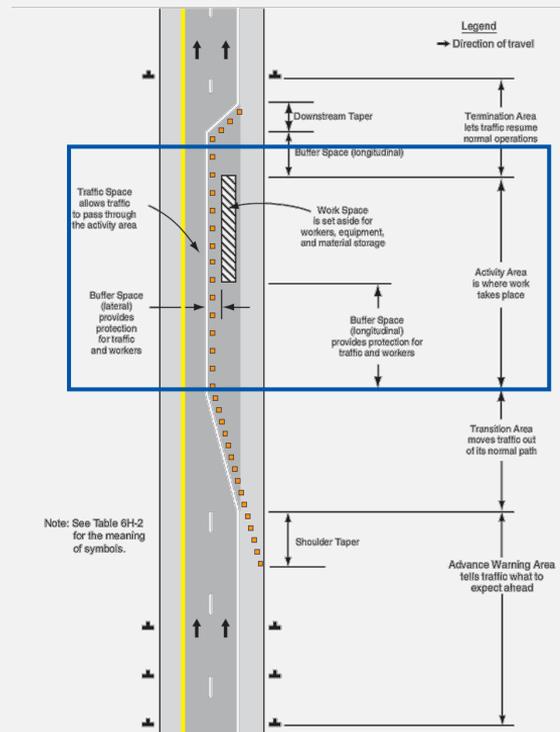
- Transition Area
  - Moves Traffic out of the routine flow





# Components of a Work Zone

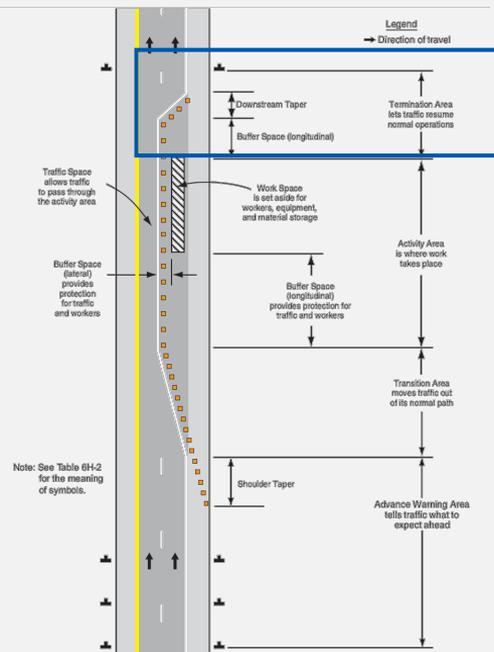
- **ACTIVITY AREA:**
- Where work takes place, composed of:
  - Longitudinal Buffer
  - Lateral Buffer
  - Work Space
  - Traffic Space





# Components of a Work Zone

- **TERMINATION AREA:**
- Lets traffic resume normal operations, may include:
  - Downstream longitudinal buffer
  - Downstream taper
  - END ROAD WORK sign



## Traffic Control Plans

- TCPs are standard sheets prepared by TxDOT
- Generally go “above and beyond” their counterpart Typical Application
- May be used in maintenance activities



# Traffic Control Plans Selection

- Duration of work
- Location of Work Zone
- Nature of Work

TCP	TITLE	MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
1-1	CONVENTIONAL ROAD SHOULDER WORK		✓	✓		
1-2	ONE-LANE TWO-WAY TRAFFIC CONTROL		✓	✓		
1-3	TRAFFIC SHIFTS ON TWO-LANE ROADS		✓	✓		
1-4	LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS		✓	✓		
1-5	LANE CLOSURES FOR DIVIDED HIGHWAYS		✓	✓		
1-6	AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)		✓	✓		
2-1	CONVENTIONAL ROAD SHOULDER WORK		✓	✓	✓	✓
2-2	ONE-LANE TWO-WAY TRAFFIC CONTROL		✓	✓	✓	✓
2-3	TRAFFIC SHIFTS ON TWO-LANE ROADS				✓	✓ (12-30 ONLY)
2-4	LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS			✓	✓	✓
2-5	LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL ROADS				✓	✓
2-6	LANE CLOSURES ON DIVIDED HIGHWAYS				✓	✓
2-7	DIVERSIONS AND NARROW BRIDGES				✓	✓
2-8	LONG TERM ONE-LANE TWO-WAY CONTROL				✓	✓
3-1	MOBILE OPERATIONS UNDIVIDED HIGHWAYS	✓				
3-2	MOBILE OPERATIONS DIVIDED HIGHWAYS	✓				
3-3	MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/REMOVAL	✓				
3-4	MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS	✓				
3-5	MOBILE OPERATIONS HERBICIDE TRUCK OPERATIONS	✓				
5-1	SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS		✓ (15-10 only)	✓ (15-10 only)	✓ (15-10 only)	
6-1	FREEWAY LANE CLOSURES		✓	✓	✓	
6-2	WORK AREA NEAR RAMP		✓	✓	✓	
6-3	WORK AREA BEYOND RAMP		✓	✓	✓	
6-4	WORK AREA AT EXIT RAMP		✓	✓	✓	
6-5	WORK AREA BEYOND EXIT RAMP		✓	✓	✓	
6-6	FREEWAY CLOSURE		✓	✓	✓	
6-7	SHORT DURATION FREEWAY CLOSURE SEQUENCE		✓	✓	✓	
6-8	WORK IN EXIT GORE FOR ADT GREATER THAN 10,000		✓	✓	✓	
6-9	WORK IN EXIT GORE FOR ADT LESS THAN 10,000		✓	✓	✓	
7-1	TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS		✓	✓	✓	✓

MOBILE: Work must occur continuously or intermittently (requiring the use of approximately 15 minutes).

SHORT DURATION: Work must occur at a location up to 1 hour.

SHORT TERM STATIONARY: Work must occur at a location up to 3 days, or night time work lasting more than 1 hour.

INTERMEDIATE TERM STATIONARY: Work must occur at a location more than 3 days, or night time work lasting more than 1 hour.

LONG TERM STATIONARY: Work must occur at a location more than 3 days.

NOTE: THIS SHEET IS A WORKSHEET FOR PLAN PREPARATION ONLY. IT IS NOT TO BE INCLUDED IN PLS&C'S.

Texas Department of Transportation  
Statewide Planning & Construction Division

**TRAFFIC CONTROL PLAN SELECTION WORKSHEET**

DATE: \_\_\_\_\_ BY: \_\_\_\_\_ FOR: \_\_\_\_\_

PROJECT: \_\_\_\_\_

NO. \_\_\_\_\_

DATE: \_\_\_\_\_

NO. \_\_\_\_\_

DATE: \_\_\_\_\_

NO. \_\_\_\_\_

DATE: \_\_\_\_\_

NO. \_\_\_\_\_

TCP	TITLE	MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
1-1	CONVENTIONAL ROAD SHOULDER WORK		✓	✓		
1-2	ONE-LANE TWO-WAY TRAFFIC CONTROL		✓	✓		



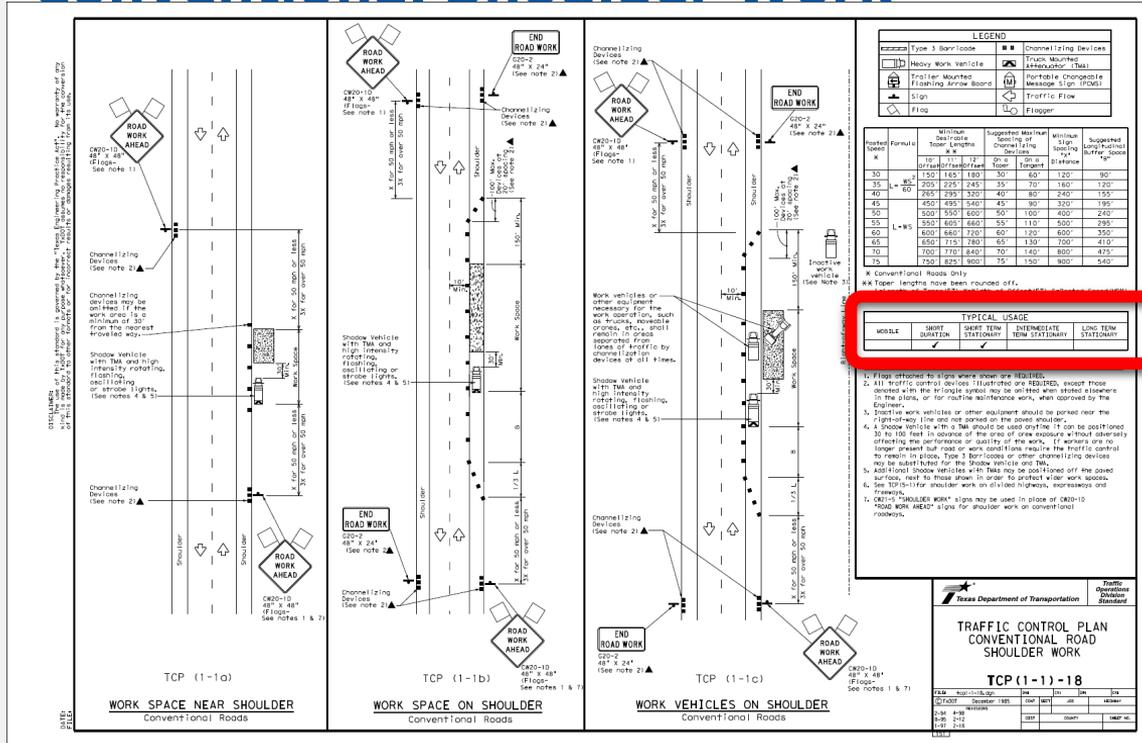
## TCPs

### The **(2) Series TCP (2-1) through TCP (2-8)**

- Short Duration to Long Term Stationary
- Work On & Near the Shoulder
- One-Lane, Two-Way Roadways
- Two Lane Roads
- Multilane Conventional Roads



# Conventional Shoulder Work



1. Flagger stationed to sign when work area is REARWARD.  
 2. All traffic control devices illustrated are REQUIRED, except those denoted with the asterisk (\*) which may be omitted when stated otherwise in the plan, or for routine maintenance work, when approved by the Engineer.  
 3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.  
 4. A Show Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the front of work equipment without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control by means of signs, Type B barrels or other channelizing devices may be substituted for the Show Vehicle and TMA.  
 5. Additional Show Vehicles with TMAs may be positioned off the paved surface, rear to those shown in order to protect other work spaces.  
 6. See TCF-101 for shoulder work on divided highways, interchanges and freeways.  
 7. CBE-10 "SHOULDER WORK" signs may be used in place of CBE-10 "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.







# Mobile Operations

**TCP (3-1a)**  
**UNDIVIDED MULTILANE ROADWAY**

LEGEND	
Trail Vehicle	ARROW BOARD DISPLAY
Shadow Vehicle	RIGHT Directional
Work Vehicle	LEFT Directional
Heavy Work Vehicle	Shade Arrow
Truck Mounted Attenuator (TMA)	CAUTION (Warning Stand or 4 Corner Flare)
Traffic Flow	

TYPICAL USAGE			
VEHICLE	SHORT TERM STATIONARY	IMMEDIATE	LONG TERM STATIONARY
SUBSTITUTION	THE STATIONARY	STATIONARY	STATIONARY

**TRAIL/SHADOW VEHICLE A**  
with FLIGHT STRIPES  
display Flashing Arrow Board

**TCP (3-1b)**  
**TWO-WAY ROADWAY WITH PAVED SHOULDERS**

**TRAIL/SHADOW VEHICLE B**  
with Flashing Arrow Board  
in CAUTION display

**TCP (3-1c)**  
**TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS**

**TRAIL/SHADOW VEHICLE B**  
with Flashing Arrow Board  
in CAUTION display

**GENERAL NOTES**

- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used, the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE or SHADOW VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
- The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles is required. Slow or flashing rotating, flashing, oscillating or strobe lights when required on the rear or side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
- The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL SPECIFICATION DMS 8300, Type A.
- Flashing arrow boards shall be Type B or Type C as per the Department and Construction (C) standards. The board shall be controlled from inside the vehicle.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to create the other convoy vehicles.
- Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on a sight distance restriction. Distances approximating the work convoy should be used to see the TRAIL VEHICLE in time to rise down under change lanes on their own section. VEHICLE spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to traffic, work activity and other factors.
- "X VEHICLE CONVOY" (X21-104T) or "WORK CONVOY" (W21-104T) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped WORK CONVOY (W21-104T) or "X VEHICLE CONVOY" (X21-104T) signs may be used where oblique mounting is not feasible. When used, the "X VEHICLE CONVOY" sign shall have the number of the convoy vehicle displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
- On two-lane two-way roadways, the work and protection vehicles should all over-occupy the 1/2 mile or more vehicle traffic no-pass. If no-pass signs are not allowed to post the work convoy, a "DO NOT PASS" (84-11) sign should be placed on the back of the most protection vehicle.

**STRIPING FOR TMA**

Texas Department of Transportation

**TRAFFIC CONTROL PLAN  
MOBILE OPERATIONS  
UNDIVIDED HIGHWAYS**

**TCP (3-1)-13**

REV	DATE	DESCRIPTION	BY	CHKD	DATE	SCALE
01	08/10	ISSUED	...	...	...	...
02	08/10	...	...	...	...	...
03	08/10	...	...	...	...	...
04	08/10	...	...	...	...	...
05	08/10	...	...	...	...	...

Utility Week 2024

December 2 - 5, 2024

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## Work Zone Remedies

- Increased smart work zone technologies
- Targeted Improvements
  - Coordination with law enforcement
  - Improve lighting





## Traffic Products

### Products must meet:

- Manual for Assessing Safety Hardware (MASH) (2016)
- NCHRP 350 (if no MASH Equivalent)
  - Recommended Procedures for the Safety Evaluation of Highway Features
- Current TMUTCD



# Questions





*Thank You!*