pennsylvania
DEPARTMENT OF TRANSPORTATION

494-16-03

DATE: June 7, 2016

SUBJECT: Publication 213 – Mobile Operation – Temporary Traffic Control Guidelines

TO: District Executives

FROM: Richard N. Roman, P.E., Director *Richard Roman /s/*
Bureau of Maintenance and Operations

This Strike-off Letter (SOL) revises Publication 213 – Temporary Traffic Control Guidelines. This revision is to the definition of a mobile operation and the PATA 302 series. The new definition of a mobile operation and the PATA 302 series will provide detailed guidance during a mobile operation.

Attached is a copy of the new definition of a mobile operation and the PATA 302 series. Replace the definitions section in the general notes and the PATA 302 series of Publication 213 with the corresponding attachments.

To enhance the internal vetting process for this policy BOMO created an email distribution lists for both the County and Assistant County Maintenance Managers to ensure we received feedback from field personnel during the Clearance Transmittal - Two-Step process. BOMO also contacted each District Maintenance office to ensure that their comments had been submitted, and BOMO additionally provided an overview of this policy revision during the 2016 Maintenance Executive Development Program.

Should you have any questions, please contact Matthew Briggs, Manager, Temporary Traffic Control Unit, at 717.783.6268

Attachments

4940/MBB/hmq

cc: Anthony Mento, P.E., Director of Technical Services, FHWA
Michael Castellano, P.E., Safety Engineer, FHWA
Timothy Scanlon, P.E., Director, Traffic Engineering and Operations, PTC
Jason Wagner, Director of Policy and Government Relations, APC
Eric Madden, Executive Vice President, ACEC
Assistant District Executives – Construction
Assistant District Executives – Design
Assistant District Executives – Maintenance
Maintenance Service Executives
District Planning and Programming Managers
District Plans Engineers
District Traffic Coordinators
District Training Coordinators
HOP Managers
County Maintenance Managers
Assistant County Maintenance Managers
Richard Kirkpatrick, Press Secretary, Press Office
Daryl St.Clair, P.E., Special Assistant, Highway Administration
Steven Roth, Assistant Counsel, Office of Chief, Counsel
Cindy Cashman, Director, Legislative Affairs
Richard Roman, P.E., Director, BOMO
Brian Thompson, P.E., Director, BOPD
Larry Shifflet, Director, Program Development and Management
Laine Heltebridle, Director, Planning and Research
Christopher Norris, Director, BHR
Glenn Rowe, P.E., Chief, Highway Safety and Traffic Operations Division, BOMO
Kimberly Martin, Chief, Maintenance Performance Division, BOMO
Jonathan Fleming, Acting Chief, Maintenance Technical Leadership Division, BOMO
Matthew Briggs, Manager, Work Zones and Regulations Unit, BOMO
Larry Fagan, Senior Civil Engineer, BOMO
Ryan Palman, Senior Civil Engineer, BOMO
David Gaffney, Civil Engineer, BOMO

General Notes
Definitions (Page 1 of 2)

Activity Area - Area of a temporary traffic control zone comprised of the buffer space and the work space usually separated from traffic flow by channelizing devices or barrier located parallel to the travel lanes.

Buffer Space - Area that separates traffic flow from the work space. Buffer spaces must remain clear of equipment, vehicles, workers, and materials. The length of longitudinal buffer spaces is defined as distance E on PATA figures and may be increased for downgrades or other conditions that affect stopping sight distance.

- Longitudinal buffer space is located in advance of and after the work space.
- Lateral buffer space is located between flowing traffic and the activity area.

Complex Condition (Temporary/Portable Traffic Signals) - A condition where driveways and/or side roads are located between the temporary signal installation locations. Additional signal installations or flaggers are required in additional to those shown on any PATA 700 series drawing.

Conventional Highway - Any highway other than a freeway or expressway.

Emergency Work – Emergencies may arise where it will be necessary to begin work even though all of the specific traffic control provisions may not be satisfied. In these cases all available safety measures shall be taken and the work zone shall be brought into compliance with this publication as soon as possible.

Expressway - A divided arterial highway for through traffic with partial control of access and generally with grade separations at major intersections.

Freeway - A highway to which the only means of ingress and egress is by interchange ramps.

Highway - The entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel.

Long-Term Stationary Operation - Work that occupies a location for a period of more than 24 hours.

Mobile Operation - An operation in the vehicular travel lane, or along the roadway, that proceeds in the direction of normal traffic flow. Every component of the operation, excluding advanced warning signs and flagger locations, must proceed in the direction of normal traffic flow at a rate of at least 100' for each 15 minute interval for the entire length and duration of the operation. This distance and time threshold must be met for the entire length and duration of the operation in order to utilize a PATA 300 or 600 Series drawing. The duration of a Mobile operation shall not exceed 24 hours.

Non-Complex Condition (Temporary/Portable Traffic Signals) - A condition where driveways and/or side roads do not exist in the temporary traffic control zone utilizing temporary traffic signals. PATA 700 series drawings can be implemented and run automatically exactly as shown without flagger assistance or additional signals.

Numbered Traffic Route - A highway that has been assigned an Interstate, United States, or Pennsylvania Route Number, consisting of one, two, or three digits, sometimes with an additional designation such as business route, truck route, or other similar designation.

PATA (Pennsylvania Typical Application) - Drawings within this publication that depict temporary traffic control conditions.

Portable Sign Post - Rigid device with steel posts for mounting temporary traffic control devices where minimum mounting heights of at least 5’ are required. Refer to Publication 111, Traffic Control – Pavement Markings and Signing Standards TC-8717, for details.

Portable Sign Support - A folding, collapsible, or telescoping device for posting temporary traffic control devices where minimum mounting heights of 1’ are acceptable.

Roadway - That portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the sidewalk, berm, or shoulder.

Roll Ahead Space - Space provided between the shadow vehicle and the work space in a closed lane. This space shall be clear of equipment, vehicles, workers, and materials. Shown as distance H on PATA drawings.

Rural Highway - A type of roadway normally characterized by lower volumes, higher speeds, and fewer conflicts with turning vehicles and pedestrians. Rural highways often have speed limits greater than 35 MPH, but are not freeways or expressways.

General Notes
Definitions (Page 2 of 2)

Shadow Vehicle - A vehicle positioned within the activity in advance of the work space and work vehicles. The primary purpose of the shadow vehicle is to provide advance information to approaching drivers while protecting workers and work vehicles. Any vehicle can be used as a shadow vehicle as long as it is equipped with a flashing, oscillating, or revolving yellow light which is visible from any direction (360° visibility) and is not being used as a work vehicle. The yellow light must be activated within an active work zone.

Short-Term Stationary Operation - An operation that will occupy a location for up to 24 hours. The work zone will have stationary beginning and ending points. Work activity may move freely within these limits.

Shoulder - The part of a highway adjacent to the roadway which has a surface constructed with the same or similar material as the roadway. Shoulder width is measured from the center of the painted edge line to the outside edge of pavement, concrete, or finished surface.

Sidewalk - That portion of a street between curb lines, or the lateral lines of a roadway, and the adjacent property lines, intended for use by pedestrians. A 48” minimum usable width must be maintained.

Taper - A series of channelizing devices and/or paint lines installed for the purpose of moving traffic out of or into the normal path. Various taper types have differing minimum lengths, most of which are based upon an 'L' distance. The formula to determine distance L is shown on the corresponding PATA notes page. It should be noted that the taper length is a distance per lane; so if a single taper covers two lanes, the total taper length will be double the calculated or minimum distance.

- Merging Taper - Used when drivers in multiple lanes are required to merge into a common road space. Minimum length is L.

- Shifting Taper - Used when a lateral shift is needed. Minimum length required is distance 1/2 L, unless traffic is approaching a one-lane, two-way condition; in this case the minimum length is 50'.

- Shoulder Taper - Required when closing a paved shoulder having a width of 8' or more; optional in other conditions. Minimum length is 1/3 L, unless traffic is approaching a one-lane, two-way condition; in this case the minimum length is 25'.

- Downstream Taper - Used in the termination area to provide a visual cue to the driver that access is available back into the original lane or path that was closed. Minimum distance is 50' per lane.

Temporary Traffic Control Zone - An area of a highway where road user conditions are changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel.

Truck Mounted Attenuators (TMA) - Shall be mandatory for placement on shadow vehicles utilized on freeways and expressways, including exit and entrance ramps. The TMA is optional on all other highways. When a TMA is used, the weight of the shadow vehicle must be greater than the minimum weight specified by the TMA manufacturer.

Urban Area or Urban Highway - A type of roadway normally characterized by wide ranges of traffic volumes, frequent intersections and driveways, significant pedestrian traffic, speed limits of 35 MPH and below, and most often parking along one or both sides of the roadway.

Warning Lights - Yellow lights that operate in steady burn or flashing mode. Warning lights on authorized vehicles may flash or revolve. Type A, B, C, and D warning lights are portable, powered, yellow, lens-directed enclosed lights.

Worker - A person on foot whose duties place him or her within the right-of-way of a highway, such as highway construction and maintenance forces, survey crews, utility crews, responders to incidents, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a highway.

Work Space - Area within a temporary traffic control zone that is set aside for workers, work vehicles, equipment, and material storage.

Work Vehicle - A vehicle available for use by workers within an activity area. All work vehicles shall be located outside of the buffer space and roll ahead space for shadow vehicles. Work vehicles being used in an active work zone must utilize the flashing, oscillating, or revolving yellow lights which are visible from any direction (360° visibility).

Work Zone - The area of a highway where construction, maintenance, or utility work activities are being conducted, and in which traffic control devices are required in accordance with Title 67, Chapter 212.

PATA 302 - Notes

1. Interim Be Prepared To Stop (W3-4) signs are required for any project over 1 mile in length and shall be spaced at intervals not exceeding one mile. The signs shall be installed on the roadway approaching the work being performed.

2. The signing for side roads is optional. If signed, refer to PATA 006 for guidance.

3. The minimum distance of A is only required between the first Be Prepared To Stop (W3-4) sign and Flaggers A and B. The minimum distance of A is not required between the flagger and interim Be Prepared To Stop (W3-4) signs.

4. Flagger A and Flagger B are permitted to relocate by walking if proper sight distance (i.e. Distance E) is maintained. If the flaggers cannot safely relocate, refer to PATA 302A for the appropriate flagger relocation option.

5. A flagger shall not relocate to a new location while holding stopped traffic.

6. If the operation temporarily does not meet the distance and time requirements of a mobile operation (i.e. minimum of 100' every 15 minutes), one of the following options must be utilized:

   a. PATA 302B.

   b. PATA 302C.

   c. Set up an appropriate short-term operation (PATA 100 Series).

   d. Remove all workers and equipment from the roadway until the mobile operation can resume.

7. If a pilot vehicle is utilized for the entire length and duration of the mobile operation, the distance and time requirements of a mobile operation (i.e. minimum of 100' every 15 minutes) are waived. Refer to PATA 302C.

Signs

W20-1 W20-4 W3-4

Sign Spacing Chart

Condition	Distance			
	A	B	C	F
	Feet	Feet	Feet	Feet
Urban 35 MPH or less	100	100	100	100
Urban Greater than 35 MPH	350	350	350	350
Rural	500	500	500	500

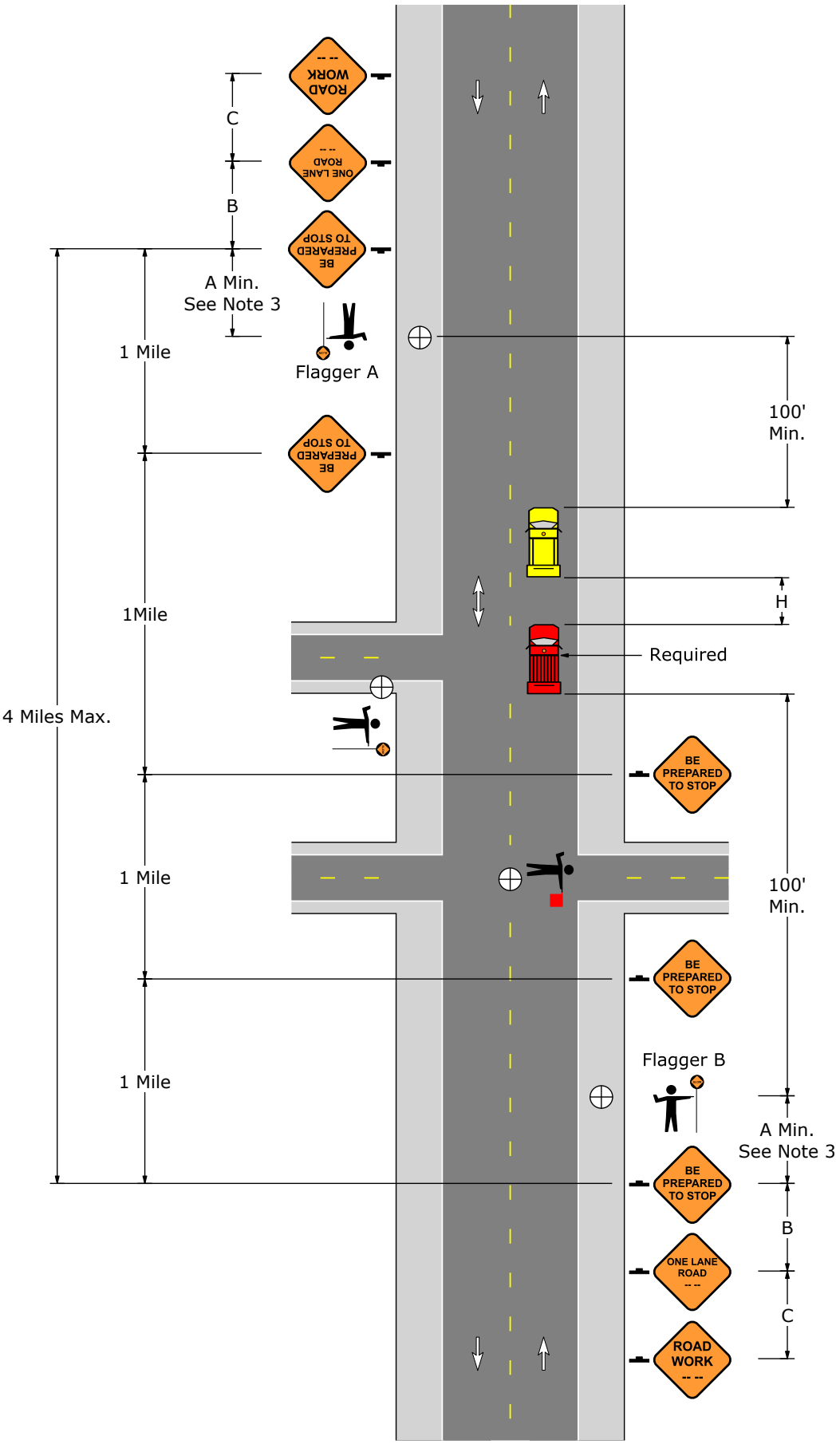
When multiple distance plaques are used on advance warning signs, they shall all be of the same series type.
Example: either all "AHEAD" or XXX FEET.

Distance and Spacing Quick Reference Chart

Speed	W	L	1/2L	1/3L	Min. Channelizing Devices Per Taper Type (Length)				D	E	H
MPH	Feet	Feet	Feet	Feet	L	1/2L	1/3L	50'	Feet	Feet	Feet
25	10	105	55	35	6	6	6	6	50	155	150
	11	115	60	40							
	12	125	65	45							
30	10	150	75	50	6	6	6	6	60	200	150
	11	165	85	55	7						
	12	180	90	60	7						
35	10	205	105	70	7	6	6	6	70	250	150
	11	225	115	75	8						
	12	245	125	85	8						
40	10	270	135	90	8	6	6	6	80	305	150
	11	295	150	100	9						
	12	320	160	110	9						
45	10	450	225	150	11	6	6	6	90	360	150
	11	495	250	165	12	7					
	12	540	270	180	13	7					
50	10	500	250	170	11	6	6	6	100	425	250
	11	550	275	185	12	7					
	12	600	300	200	13	7					
55	10	550	275	185	11	6	6	6	110	495	250
	11	605	305	205	12	7					
	12	660	330	220	13	7					

Note: Channelizing devices used in taper shall be equally spaced at ½ D Max.

PATA 302
Mobile Operation



PATA 302A (Page 1 of 3)
Flagger Relocation

General - All Relocation Options

1. This PATA shall only be used in conjunction with PATA 302 to relocate flaggers.
2. Downstream is in reference to the direction the operation is proceeding.
3. The shadow vehicle driver may be a temporary flagger.
4. Only the downstream flagger (Flagger A) may allow traffic to free-flow during relocation since traffic maintains its original travel lane.
5. Flaggers shall not be relocated to a new location when holding stopped traffic.
6. Vehicles that are relocating flaggers shall only proceed in the direction of traffic flow through the work zone.
7. Flaggers shall exhibit safe practices when relocating to new flagging locations.

Option A - Walking

Flagger A

1. To relocate Flagger A using a temporary flagger:

    a. Station a temporary flagger (Temporary Flagger A) downstream of Flagger A.
    b. When the Temporary Flagger A is in position, Flagger A walks to the new flagging location while holding stop/slow paddle at side (neither side of the stop/slow paddle is displayed to traffic).
    c. When Flagger A arrives at the new flagging location, Flagger A will resume flagging duties.

2. To relocate Flagger A without using a temporary flagger:

    a. While Flagger B has traffic stopped, Flagger A releases traffic and walks downstream to the new flagging location while holding stop/slow paddle at side (neither side of the stop/slow paddle is displayed to traffic).
    b. While Flagger A is walking to the new flagging location, the traffic that Flagger A was controlling is free-flowing.
    c. When Flagger A arrives at the new flagging location, Flagger A will resume flagging duties.

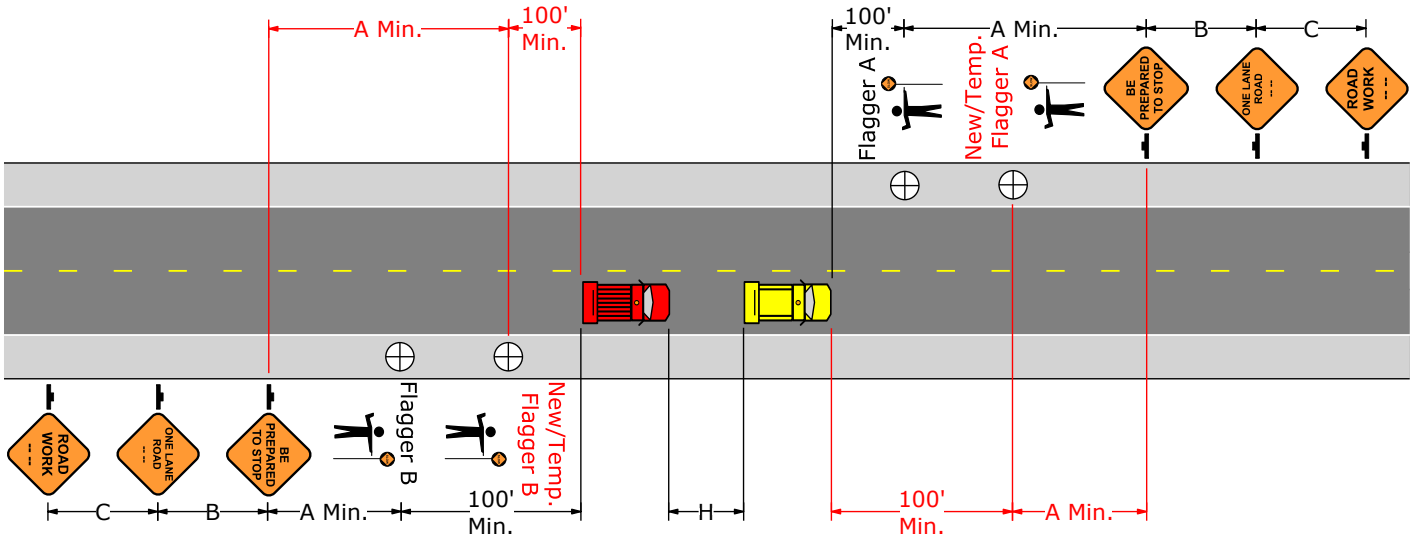
Flagger B

1. To relocate Flagger B using a temporary flagger:

    a. Station a temporary flagger (Temporary Flagger B) downstream of Flagger B.
    b. When the Temporary Flagger B is in position, Flagger B walks to the new flagging location while holding stop/slow paddle at side (neither side of the stop/slow paddle is displayed to traffic).
    c. When Flagger B arrives at the new flagging location, Flagger B will resume flagging duties.

2. To relocate Flagger B without using a temporary flagger:

    a. Flagger B is not permitted to relocate without a temporary flagger.



PATA 302A (Page 2 of 3)
Flagger Relocation

Option B - Work Vehicle

Flagger A

1. To relocate Flagger A using a temporary flagger:

    a. Station a temporary flagger (Temporary Flagger A) downstream of Flagger A.
    b. When the Temporary Flagger A is in position and controlling traffic, Flagger A enters work vehicle for transportation to the new flagging location.
    c. When Flagger A arrives at the new location, Flagger A will resume flagging duties.

2. To relocate Flagger A without using a temporary flagger:

    a. While Flagger B has traffic stopped, Flagger A releases traffic and enters work vehicle after queued traffic has cleared out.
    b. While Flagger A is being transported to the new flagger location, the traffic that Flagger A was controlling is free-flowing.
    c. When Flagger A arrives at the new flagging location, Flagger A will resume flagging duties.

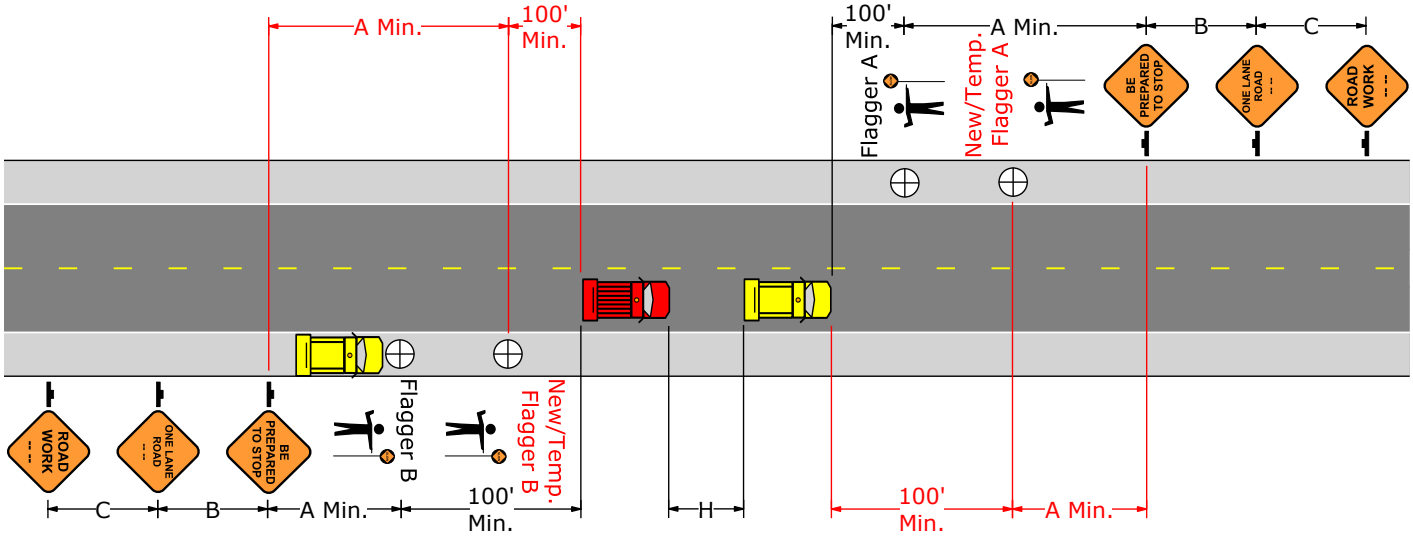
Flagger B

1. To relocate Flagger B using a temporary flagger:

    a. Station a temporary flagger (Temporary Flagger B) downstream of Flagger B.
    b. When the Temporary Flagger B is in position, Flagger B enters work vehicle for transportation to the new flagging location.
    c. When Flagger B arrives at the new location, Flagger B will resume flagging duties.

2. To relocate Flagger B without using a temporary flagger:

    a. Flagger B is not permitted to relocate without a temporary flagger.



PATA 302A (Page 3 of 3)
Flagger Relocation

Option C - Pilot Vehicle

Flagger A

1. To relocate Flagger A using a temporary flagger:

    a. Station a temporary flagger (Temporary Flagger A) downstream of Flagger A.
    b. When the Temporary Flagger A is in position and controlling traffic, Flagger A enters pilot vehicle for transportation to the new flagging location.
    c. When Flagger A arrives at the new location, Flagger A will resume flagging duties.

2. To relocate Flagger A without using a temporary flagger:

    a. After the pilot vehicle has guided the traffic controlled by Flagger B through the work zone, the pilot vehicle pulls off the road in the vicinity of Flagger A.
    b. While Flagger B has traffic stopped, Flagger A releases traffic and enters pilot vehicle after queued traffic has cleared out.
    c. While Flagger A is being transported to the new flagger location, the traffic that Flagger A was controlling is free-flowing.
    d. When Flagger A arrives at the new flagging location, Flagger A will resume flagging duties.

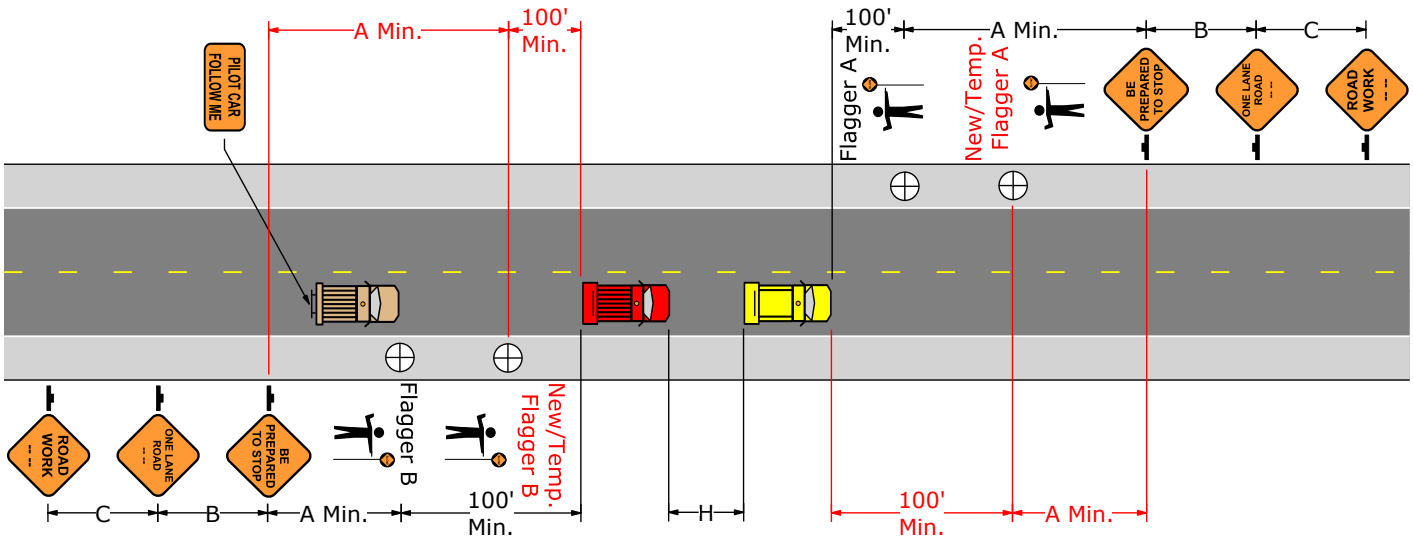
Flagger B

1. To relocate Flagger B using a temporary flagger:

    a. Station a temporary flagger (Temporary Flagger B) downstream of Flagger B.
    b. When the Temporary Flagger B is in position, Flagger B enters pilot vehicle for transportation to the new flagging location.
    c. When Flagger B arrives at the new location, Flagger B will resume flagging duties.

2. To relocate Flagger B without using a temporary flagger:

    a. While Flagger A and Flagger B has traffic stopped, the pilot vehicle pulls in front of queued traffic that Flagger B is controlling.
    b. Flagger B enters pilot vehicle for transportation to the new flagging location.
    c. While Flagger B is being transported to the new flagging location, the traffic that Flagger B was controlling is being guided by the pilot vehicle.
    d. When Flagger B arrives at the new location, Flagger B will resume flagging duties after pilot vehicle and all queued traffic have cleared out.



PATA 302B - Notes

1. This PATA shall only be used in conjunction with PATA 302 when the operation temporarily does not meet the distance and time requirements of a mobile operation (i.e. minimum of 100' every 15 minutes).

2. When a shadow vehicle is not used, distance E is measured from the end of the taper to the beginning of the work space.

3. The buffer space is not required if a shadow vehicle is used.

4. The minimum distance of A is only required between the first Be Prepared To Stop (W3-4) sign and Flaggers A and B. The minimum distance of A is not required between the flagger and interim Be Prepared To Stop (W3-4) signs.

5. The signing for side roads is optional. If signed, refer to PATA 006 for guidance.

Signs

W20-1 W20-4 W3-4

Sign Spacing Chart

Condition	Distance			
	A	B	C	F
	Feet	Feet	Feet	Feet
Urban 35 MPH or less	100	100	100	100
Urban Greater than 35 MPH	350	350	350	350
Rural	500	500	500	500

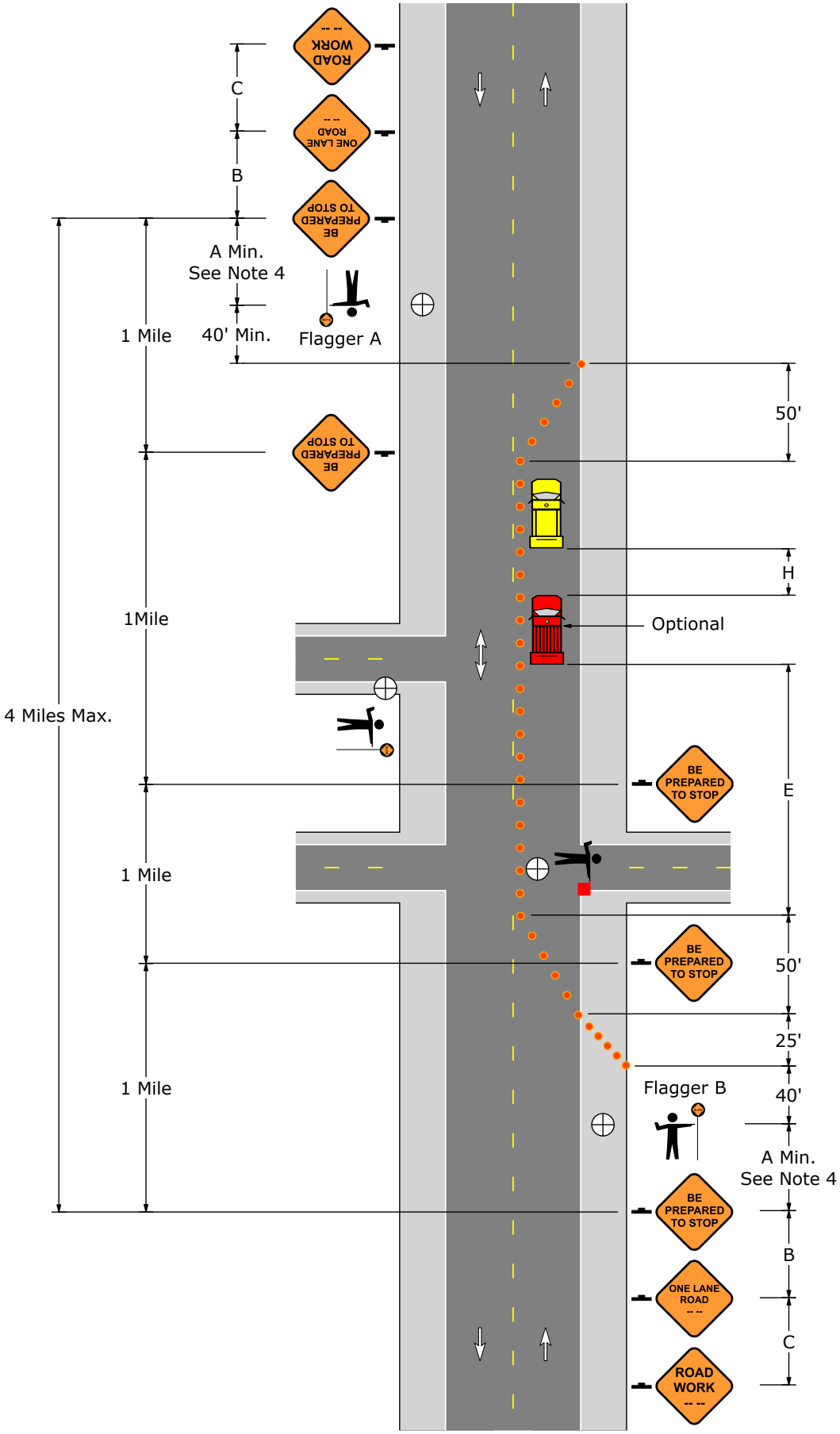
When multiple distance plaques are used on advance warning signs, they shall all be of the same series type.
Example: either all "AHEAD" or XXX FEET.

Distance and Spacing Quick Reference Chart

Speed	W	L	1/2L	1/3L	Min. Channelizing Devices Per Taper Type (Length)				D	E	H
MPH	Feet	Feet	Feet	Feet	L	1/2L	1/3L	50'	Feet	Feet	Feet
25	10	105	55	35	6	6	6	6	50	155	150
	11	115	60	40							
	12	125	65	45							
30	10	150	75	50	6	6	6	6	60	200	150
	11	165	85	55	7						
	12	180	90	60	7						
35	10	205	105	70	7	6	6	6	70	250	150
	11	225	115	75	8						
	12	245	125	85	8						
40	10	270	135	90	8	6	6	6	80	305	150
	11	295	150	100	9						
	12	320	160	110	9						
45	10	450	225	150	11	6	6	6	90	360	150
	11	495	250	165	12	7					
	12	540	270	180	13	7					
50	10	500	250	170	11	6	6	6	100	425	250
	11	550	275	185	12	7					
	12	600	300	200	13	7					
55	10	550	275	185	11	6	6	6	110	495	250
	11	605	305	205	12	7					
	12	660	330	220	13	7					

Note: Channelizing devices used in taper shall be equally spaced at ½ D Max.

PATA 302B
Temporary Operation Stoppage During A Mobile Operation



PATA 302C - Notes

1. A Pilot Vehicle with a Pilot Car Follow Me (G-20-4) sign mounted on the rear and an activated flashing or revolving yellow light shall be used at all times to lead vehicles through the work zone.

2. This PATA applies to roads with an ADT of 5000 or less.

3. The minimum distance of A is only required between the first Be Prepared To Stop (W3-4) sign and Flaggers A and B. The minimum distance of A is not required between the flagger and interim Be Prepared To Stop (W3-4) signs.

4. Interim Be Prepared To Stop (W3-4) signs are not required when a pilot vehicle is used.

5. The Turning Vehicles - Wait For Pilot Car (G20-4-1) sign is authorized for use on side road approaches but is not required. If used, the sign shall be positioned in the vicinity of the stop sign, or if none, immediately in advance of the intersection and facing the traffic on the side road.

6. When a shadow vehicle is not used, distance E is measured from the end of the taper to the beginning of the work space.

7. The buffer space is not required if a shadow vehicle is used.

Signs

W20-1 W20-4 W3-4 G20-4 G20-4-1

Sign Spacing Chart

Condition	Distance			
	A	B	C	F
	Feet	Feet	Feet	Feet
Urban 35 MPH or less	100	100	100	100
Urban Greater than 35 MPH	350	350	350	350
Rural	500	500	500	500

When multiple distance plaques are used on advance warning signs, they shall all be of the same series type.
Example: either all "AHEAD" or XXX FEET.

Taper Length Formulas

S	L
40 MPH or less	$L = \frac{WS^2}{60}$
45 MPH or more	L = WS

S = Regulatory Speed Limit
W = Width of Offset
L = Length

Distance and Spacing Quick Reference Chart

Speed	W	L	1/2L	1/3L	Min. Channelizing Devices Per Taper Type (Length)				D	E	H
MPH	Feet	Feet	Feet	Feet	L	1/2L	1/3L	50'	Feet	Feet	Feet
25	10	105	55	35	6	6	6	6	50	155	150
	11	115	60	40							
	12	125	65	45							
30	10	150	75	50	6	6	6	6	60	200	150
	11	165	85	55	7						
	12	180	90	60	7						
35	10	205	105	70	7	6	6	6	70	250	150
	11	225	115	75	8						
	12	245	125	85	8						
40	10	270	135	90	8	6	6	6	80	305	150
	11	295	150	100	9						
	12	320	160	110	9						
45	10	450	225	150	11	6	6	6	90	360	150
	11	495	250	165	12	7					
	12	540	270	180	13	7					
50	10	500	250	170	11	6	6	6	100	425	250
	11	550	275	185	12	7					
	12	600	300	200	13	7					
55	10	550	275	185	11	6	6	6	110	495	250
	11	605	305	205	12	7					
	12	660	330	220	13	7					

Note: Channelizing devices used in taper shall be equally spaced at ½ D Max.

PATA 302C
Mobile Operation With A Pilot Vehicle