

CHAPTER 6A. GENERAL

Section 6A.01 General

Support:

- 01 Whenever the acronym “TTC” is used in this Manual and Part 6 of the 2009 MUTCD, it refers to “temporary traffic control.”

Standard:

- 02 **The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, or on private roads open to public travel (see definition in Section 1A.13 of the Virginia Supplement to the 2009 MUTCD), including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.**

Support:

- 03 When the normal function of the roadway, or a private road open to public travel, is suspended, TTC planning provides for continuity of the movement of motor vehicle, bicycle, and pedestrian traffic (including accessible passage); transit operations; and access (and accessibility) to property and utilities.
- 04 The primary function of TTC is to provide for the reasonably safe and effective movement of road users through or around TTC zones while reasonably protecting road users, workers, responders to traffic incidents, and equipment.
- 05 Of equal importance to the public traveling through the TTC zone is the safety of workers performing the many varied tasks within the work space. TTC zones present constantly changing conditions that are unexpected by the road user. This creates an even higher degree of vulnerability for the workers and incident management responders on or near the roadway (see Section 6D.03). At the same time, the TTC zone provides for the efficient completion of whatever activity interrupted the normal use of the roadway.
- 06 Consideration for road user safety, worker and responder safety, and the efficiency of road user flow is an integral element of every TTC zone, from planning through completion. A concurrent objective of the TTC is the efficient construction and maintenance of the highway and the efficient resolution of traffic incidents.
- 07 No one set of TTC devices can satisfy all conditions for a given project or incident. At the same time, defining details that would be adequate to cover all applications is not practical. Instead, this Manual and Part 6 of the 2009 MUTCD displays typical applications that depict common applications of TTC devices. The TTC selected for each situation depends on type of highway, road user conditions, duration of operation, physical constraints, and the nearness of the work space or incident management activity to road users.
- 08 Improved road user performance might be realized through a well-prepared public relations effort that covers the nature of the work, the time and duration of its execution, the anticipated effects upon road users, and possible alternate routes and modes of travel. Such programs have been found to result in a significant reduction in the number of road users traveling through the TTC zone, which reduces the possible number of conflicts.
- 09 Operational improvements might be realized by using intelligent transportation systems (ITS) in work zones. The use in work zones of ITS technology, such as portable camera systems, highway advisory radio, variable speed limits, ramp metering, traveler information, merge guidance, and queue detection information, is aimed at increasing safety for both workers and road users and helping to ensure a more efficient traffic flow. The use in work zones of ITS technologies has been found to be effective in providing traffic monitoring and management, data collection, and traveler information.

Standard:

- 10 **TTC plans and devices shall be the responsibility of the authority of a public body or official having jurisdiction for guiding road users. There shall be adequate statutory authority for the implementation and enforcement of needed road user regulations, parking controls, speed zoning, and the management of traffic incidents. Such statutes shall provide sufficient flexibility in the application of TTC to meet the needs of changing conditions in the TTC zone.**

Support:

- 11 Temporary facilities, including pedestrian routes around worksites, are also covered by the accessibility requirements of the Americans with Disabilities Act of 1990 (ADA) (Public Law 101-336, 104 Stat. 327, July 26, 1990. 42 U.S.C. 12101-12213 (as amended)).

Guidance:

- 12 *The TTC plan should start in the planning phase and continue through the design, construction, and restoration phases. The TTC plans and devices should follow the principles set forth in this Manual and Part 6 of the 2009 MUTCD. The management of traffic incidents should follow the principles set forth in Chapter 6I.*

Option:

- 13 TTC plans may deviate from the typical applications described in Chapter 6H to allow for conditions and requirements of a particular site or jurisdiction.

Support:

- 14 The provisions of this Manual and Part 6 of the 2009 MUTCD apply to both rural and urban areas. A rural highway is normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians. An urban street is typically characterized by relatively low speeds, wide ranges of road user volumes, narrower roadway lanes, frequent intersections and driveways, significant pedestrian activity, and more businesses and houses.
- 15 The determination as to whether a particular facility at a particular time of day can be considered to be a high-volume roadway or can be considered to be a low-volume roadway is made by the public agency or official having jurisdiction.

Section 6A.02 Engineering Study and Engineering Judgment

Support:

- 01 Definitions of an engineering study and engineering judgment are contained in Section 6A.03.

Standard:

- 02 **The 2009 MUTCD, Virginia Supplement to the 2009 MUTCD, and this Manual describe the application of traffic control devices, but shall not be a legal requirement for their installation.**

Guidance:

- 03 *The decision to use or not use a particular traffic control device at a particular location should be made on the basis of an engineering study and the application of engineering judgment. Thus, while the 2009 MUTCD, the Virginia Supplement to the 2009 MUTCD, and this Manual provide Standards, Guidance, and Options for design and application of traffic control devices, the 2009 MUTCD, the Virginia Supplement to the 2009 MUTCD, and this Manual should not be considered a substitute for engineering study and the application of engineering judgment. Engineering judgment should be exercised in the selection and application of traffic control devices, as well as in the location and design of the roads and streets that the devices complement. Jurisdictions with responsibility for traffic control that do not have professional engineers on their staffs should seek professional engineering assistance from others, such as a professional traffic engineering consultant.*
- 04 *An engineering study should be the basis for a decision to deviate from a Standard (see definition in Section 6A.03 of this Manual).*

Standard:

- 05 **Whether specified as part of a project's plan or contract assembly, or performance of a maintenance operation, or performance of utility work within the right of way, the provisions of the 2011 WAPM shall be used for the establishment of temporary traffic control as well as the modification to an approved Traffic Control Plan.**

Section 6A.03 Definitions of Words and Phrases in This Manual**Standard:**

- 01 **The following select words and phrases have been incorporated from Section 1A.13 of the Virginia Supplement to the 2009 MUTCD along with some additions for convenience in using this Manual. Additional words and phrases and references exist in Section 1A.13 and shall be applicable when such definitions are not within this Manual. When used in this Manual, the following words and phrases shall have the following meanings:**

1. **Advisory Speed**—a recommended speed for all vehicles operating on a section of highway and based on the highway design, operating characteristics, and conditions.

2. **Average Daily Traffic (ADT)**—the average 24 hour volume, being the total volume during a stated period divided by the number of days in that period. Normally, this would be periodic daily traffic volumes over several days, not adjusted for days of the week or seasons of the year.
3. **Centerline Markings**—the yellow pavement marking line(s) that delineates the separation of traffic lanes that have opposite directions of travel on a roadway. These markings need not be at the geometrical center of the pavement.
4. **Changeable Message Signs (CMS)**—signs that are capable of displaying more than one message, changeable manually, by remote control, or by automatic control. A CMS may be mounted on a trailer or vehicle. These signs are referred to as Dynamic Message Signs in the National Intelligent Transportation Systems (ITS) Architecture.
5. **Channelizing Line Marking**—a wide or double solid white line used to form islands where traffic in the same direction of travel is permitted on both sides of the island.
6. **Clear Zone**—the total roadside border area, starting at the edge of the traveled way, that is available for an errant driver to stop or regain control of a vehicle. This area might consist of a shoulder, a recoverable slope, and/or a nonrecoverable, traversable slope with a clear run-out area at its toe.
7. **Conflict Monitor**—a device used to detect and respond to improper or conflicting signal indications and improper operating voltages in a traffic controller assembly.
8. **Crashworthy**—a characteristic of a roadside appurtenance that has been successfully crash tested in accordance with a national standard such as the National Cooperative Highway Research Program Report 350, “Recommended Procedures for the Safety Performance Evaluation of Highway Features” or the 2009 AASHTO “Manual for Assessing Safety Hardware (MASH)” report.
9. **Crosswalk**—(a) that part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the center line; (b) any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by pavement marking lines on the surface, which might be supplemented by contrasting pavement texture, style, or color.
10. **Delineator**—a retroreflective device mounted on the roadway surface or at the side of the roadway in a series to indicate the alignment of the roadway, especially at night or in adverse weather.
11. **Detectable**—having a continuous edge within 6 inch of the surface so that pedestrians who have visual disabilities can sense its presence and receive usable guidance information.
12. **Detour**—the removal of traffic from one roadway or highway to an alternate roadway or highway under the following timeframes:
 - (a) **Short Term Detour**—a signed detour that occupies a location for more than 2 hours within a single work period but not longer than three consecutive days.
 - (b) **Long Term Detour**—a signed detour that occupies a location longer than three consecutive days, or on a periodic basis (less than 24 consecutive hours) longer than three days.
13. **Downstream**—a term that refers to a location that is encountered by traffic subsequent to an upstream location as it flows in an “upstream to downstream” direction. For example, “the downstream end of a lane line separating the turn lane from a through lane on the approach to an intersection” is the end of the lane line that is closest to the intersection.
14. **Edge Line Markings**—white or yellow pavement marking lines that delineate the right or left edge(s) of a traveled way.
15. **Engineering Judgment**—the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Changes to temporary traffic control as shown in this Manual based on engineering judgment shall be documented.

16. **Engineering Study**—the comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.
17. **Expressway**—a divided highway with partial control of access.
18. **Flashing (Flashing Mode)**—a mode of operation in which a traffic signal indication is turned on and off repetitively.
19. **Flagger**—a certified person who actively controls the flow of vehicular traffic into and/or through a temporary traffic control zone using hand-signaling devices or an Automated Flagger Assistance Device (AFAD).
20. **Guide Sign**—a sign that shows route designations, destinations, directions, distances, services, points of interest, or other geographical, recreational, or cultural information.
21. **Highway**—a general term for denoting a public way for purposes of travel by vehicular travel, including the entire area within the right-of-way.
22. **Interchange**—a system of interconnecting roadways providing for traffic movement between two or more highways that do not intersect at grade.
23. **Lane Line Markings**—white pavement marking lines that delineate the separation of traffic lanes that have the same direction of travel on a roadway.
24. **Limited Access Highway**—a highway especially designed for through traffic, over which abutters have no easement or right of light¹, air, or access to by reason of the fact that their property abuts upon such highway. This includes freeways, expressways and other partially-controlled access facilities.
25. **Longitudinal Markings**—pavement markings that are generally placed parallel and adjacent to the flow of traffic such as lane lines, centerlines, edge lines, channelizing lines, and others.
26. **Manual for Assessing Safety Hardware (MASH)**—a national standard for crash testing of safety roadside appurtenances required after January 1, 2011.
27. **Median**—the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges, and at opposite approaches of the same intersection.
28. **Object Marker**—a device used to mark obstructions within or adjacent to the roadway.
29. **Parking Lane**—a space reserved for parking of vehicles.
30. **Pedestrian**—a person afoot, in a wheelchair, on skates, or on a skateboard.
31. **Plaque**—a traffic control device intended to communicate specific information to road users through a word, symbol, or arrow legend that is placed immediately adjacent to a sign to supplement the message on the sign. The difference between a plaque and a sign is that a plaque cannot be used alone. The designation for a plaque includes a "P" suffix.
32. **Portable Changeable Message Signs (PCMS)**—a portable trailer-mounted sign that is capable of displaying more than one message, changeable manually, by remote control, or by automatic control.
33. **Portable Temporary Rumble Strip (PTRS)** — is a transverse rumble strip that consists of intermittent, narrow, transverse areas of rough-textured, slightly raised or depressed surface that extend across the travel lane to alert drivers to unusual vehicular traffic conditions. The PTRS can be quickly installed or removed.¹
34. **Portable Traffic Signal**—a temporary traffic control signal that is designed so that it can be easily transported and reused at different locations.
35. **Post-Mounted Sign**—a sign that is placed to the side of the roadway such that no portion of the sign or its support is directly above the roadway or shoulder.

36. **Posted Speed Limit**—a speed limit determined by law or regulation and displayed on Speed Limit signs.
37. **Preemption**—the transfer of normal operation of a traffic control signal to a special control mode of operation.
38. **Private Road Open to Public Travel**—private toll roads and roads (including any adjacent sidewalks that generally run parallel to the road) within shopping centers, airports, sports arenas, and other similar business and/or recreation facilities that are privately owned, but where the public is allowed to travel without access restrictions. Roads within private gated properties (except for gated toll roads) where access is restricted at all times, parking areas, driving aisles within parking areas, and private grade crossings shall not be included in this definition.
39. **Public Road**—any road, street, toll road, or similar facility under the jurisdiction of and maintained by a public agency and open to public travel.
40. **Raised Pavement Marker**—a device mounted on or in a road surface that has a height generally not exceeding approximately 1 inch above the road surface for a permanent marker, or not exceeding approximately 2 inches above the road surface for a temporary flexible marker, and that is intended to be used as a positioning guide and/or to supplement or substitute for pavement markings.
41. **Regional Traffic Engineer**—a person of responsible charge per the Code of Virginia, or their designee working under their supervision, who is responsible for design and maintenance of temporary traffic control within their jurisdiction.
42. **Regulatory Signs**—a sign that gives notice to road users of traffic laws or regulations.
43. **Retroreflectivity**—a property of a surface that allows a large portion of the light coming from a point source to be returned directly back to a point near its origin.
44. **Right-of-Way [Assignment]**—the permitting of vehicles and/or pedestrians to proceed in a lawful manner in preference to other vehicles or pedestrians by the display of sign or signal indications.
45. **Road User**—a vehicle operator (including cars, trucks, and motorcycles), bicyclist, or pedestrian (including persons with disabilities), within the highway or on a private road open to public travel, including workers in temporary traffic control zones.
46. **Roadway**—that portion of a highway improved, designed, or ordinarily used for vehicular travel and parking lanes, but exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by persons riding bicycles or other human-powered vehicles. In the event a highway includes two or more separate roadways, the term roadway as used in this Manual shall refer to any such roadway separately, but not to all such roadways collectively.
47. **Roadway Network**—a geographical arrangement of intersecting roadways.
48. **Roundabout**—a circular intersection with yield control at entry, which permits a vehicle on the circulatory roadway to proceed, and with deflection of the approaching vehicle counter-clockwise around a central island.
49. **Rumble Strip**—a series of intermittent, narrow, transverse areas of rough-textured, slightly raised, or depressed road surface that is installed to alert road users to unusual traffic conditions.
50. **Rural Highway**—a type of roadway normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians.
51. **Safe-Positioned**—the positioning of emergency vehicles at an incident in a manner that attempts to protect both the responders performing their duties and road users traveling through the incident scene, while minimizing, to the extent practical, disruption of the adjacent traffic flow.
52. **Shared Roadway**—a roadway that is officially designated and marked as a bicycle route, but which is open to motor vehicle travel and upon which no bicycle lane is designated.
53. **Shared-Use Path**—a bikeway outside the traveled way and physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent alignment. Shared-use paths might also be used by pedestrians (including skaters, users of manual and motorized wheelchairs, and joggers), and other authorized motorized and non-motorized users.

54. **Sidewalk**—that portion of a street between the curb line, or the lateral line of a roadway, and the adjacent property line or on easements of private property, that is paved or improved and intended for use by pedestrians.
55. **Sign**—any traffic control device that is intended to communicate specific information to road users through a word or symbol legend. Signs do not include traffic control signals, pavement markings, delineators, or channelization devices.
56. **Sign Assembly**—a group of signs, located on the same support(s), that supplement one another in conveying information to road users.
57. **Sign Illumination**—either internal or external lighting that shows similar color by day or night. Street, highway, or strobe lighting shall not be considered as meeting this definition.
58. **Sign Legend**—all word messages, logos, and symbol designs that are intended to convey specific meanings.
59. **Sign Panel**—a separate panel or piece of material containing a word or symbol legend that is affixed to the face of a sign.
60. **Speed**—speed is defined based on the following classifications:
 - (a) **Advisory Speed**—a recommended speed for all vehicles operating on a section of highway and based on the highway design, operating characteristics, and conditions.
 - (b) **Average Speed**—the summation of the instantaneous or spot-measured speeds at a specific location of vehicles divided by the number of vehicles observed.
 - (c) **Design Speed**—a selected speed used to determine the various geometric design features of a roadway.
 - (d) **85th-Percentile Speed**—the speed at or below which 85 percent of the motorized vehicles travel.
 - (e) **Operating Speed**—a speed at which a typical vehicle or the overall traffic operates. Operating speed may be defined with speed values such as the average, pace, or 85th-percentile speeds.
 - (f) **Statutory Speed**—a speed limit established by legislative action that typically is applicable for highways with specified design, functional, jurisdictional and/or location characteristic and is not necessarily shown on Speed Limit signs.
61. **Speed Limit**—the maximum (or minimum) speed applicable to a section of highway as established by law.
62. **Speed Zone**—a section of highway with a speed limit that is established by law but which may be different from a legislatively specified statutory speed limit.
63. **Stop Line**—a solid white pavement marking line extending across approach lanes to indicate the point at which a stop is intended or required to be made.
64. **Temporary Traffic Control Spotter**—a certified flagger who watches and advises co-workers who are installing and removing temporary traffic control devices, traffic counting devices or removing debris from the roadway. A TTC Spotter may stop or slow traffic using a red flag and the correct flagger procedures.
65. **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, police, or other authorized personnel.
66. **Traffic**—pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel.
67. **Traffic Control Device**—a sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, private road open to public travel, pedestrian facility, or shared-use path by authority of a public agency or official having jurisdiction, or, in the case of a private road open to public travel, by authority of the private owner or private official having jurisdiction.
68. **Traffic Control Signal (Traffic Signal)**—any highway traffic signal by which traffic is alternately directed to stop and permitted to proceed.

69. **Traffic Spotter**—A certified flagger who alerts and assists motorist through a temporary traffic control zone on low volume (under 500 VDP), low speed (30 MPH or lower) roadways using a red flag, the correct flagging procedures and the minimal sign requirement of a Road Work Ahead sign.
70. **Traveled Way**—the portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.
71. **Truck-Mounted Attenuator**—Energy-absorbing device attached to the rear of trucks to reduce the severity of rear-end crashes.
72. **Upstream**—a term that refers to a location that is encountered by traffic prior to a downstream location as it flows in an “upstream to downstream” direction. For example, “the upstream end of a lane line separating the turn lane from a through lane on the approach to an intersection” is the end of the line that is furthest from the intersection.
73. **Urban Street**—a type of street normally characterized by relatively low speeds, wide ranges of traffic volumes, narrower lanes, frequent intersections and driveways, significant pedestrian traffic, and more businesses and houses.
74. **Warning Light**—a portable, powered, yellow, lens-directed, enclosed light that is used in a temporary traffic control zone in either a steady burn or a flashing mode.
75. **Warning Sign**—a sign that gives notice to road users of a situation that might not be readily apparent.
76. **Warrant**—a warrant describes threshold conditions to the engineer in evaluating the potential safety and operational benefits of traffic control devices and is based upon average or normal conditions. Warrants are not a substitute for engineering judgment. The fact that a warrant for a particular traffic control device is met is not conclusive justification for the installation of the device.
77. **Worker**—a person on foot whose duties place him or her within the right-of-way of a street, highway, or pathway, such as street, highway, or pathway construction and maintenance forces, survey crews, utility crews, responders to incidents within the street, highway, or pathway right-of-way, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a street, highway, or pathway.
78. **Work Zone**—a work zone is an area on or above a highway, roadway, pedestrian facility or shared-use path with construction, maintenance, permit or utility work activities.
79. **Wrong-Way Arrows**—slender, elongated, white pavement marking arrows placed upstream from the ramp terminus to indicate the correct direction of traffic flow. Wrong-way arrows are intended primarily to warn wrong-way road users that they are going in the wrong direction.

Section 6A.04 Meanings of Acronyms and Abbreviations in this Manual

Standard:

01 The following acronyms and abbreviations, when used in this Manual, shall have the following meanings:

1. AADT—annual average daily traffic
2. AASHTO—American Association of State Highway and Transportation Officials
3. ATSSA—American Traffic Safety Services Association
4. ADA—Americans with Disabilities Act
5. ADT—average daily traffic
6. AFAD—Automated Flagger Assistance Device
7. ANSI—American National Standards Institute
8. CFR—Code of Federal Regulations
9. CMS—changeable message sign
10. EPA—Environmental Protection Agency
11. FHWA—Federal Highway Administration
12. HOT—high occupancy tolls
13. HOV—high-occupancy vehicle
14. IIM-LD—Location and Design Division Instructional and Informational Memorandum
15. ICS—Incident Command System
16. ITE—Institute of Transportation Engineers
17. ITS—intelligent transportation systems
18. LED—light emitting diode
19. MASH—Manual for Assessing Safety Hardware
20. MPH or mph—miles per hour
21. MUTCD—Manual on Uniform Traffic Control Devices
22. NCHRP—National Cooperative Highway Research Program
23. NIMS—National Incident Management System
24. PCMS—portable changeable message sign
25. PRT—perception-response time
26. PTRS—portable temporary rumble strip¹
27. RPM—raised pavement marker
28. SHSM—Standard Highway Signs and Markings book
29. TCP—traffic control plan
30. TED—Traffic Engineering Division Memorandum
31. TIMC—traffic incident management control
32. TMP—Transportation Management Plan
33. TOC—Transportation Operations Center
34. TRB—Transportation Research Board
35. TRPM—temporary raised pavement marker
36. TTC—temporary traffic control
37. U.S.—United States
38. U.S.C.—United States Code
39. USDOT—United States Department of Transportation
40. UVC—Uniform Vehicle Code
41. VDOT—Virginia Department of Transportation
42. VSHS—2011 Virginia Standard Highway Signs book
43. VPH or vph—vehicles per hour
44. VSP—Virginia State Police
45. WAPM—Work Area Protection Manual
46. WZTC—Work Zone Traffic Control