

# Traffic Controls For Street Construction, Utility Work, And Maintenance Operations



October 2009

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## Manual on Uniform Traffic Control Devices Supplement For The City of Colorado Springs

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# **TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK AND MAINTENANCE OPERATIONS**

## **CITY OF COLORADO SPRINGS**

### **Executive Summary**

This field guide is a supplement to the Manual on Uniform Traffic Control Devices (M.U.T.C.D.) and is provided as a guide for any contractor, utility, or agency working in the public right-of-way. This document identifies the needs for traffic controls at work sites, establishes responsibility for traffic controls, defines the permit process, and gives typical urban traffic control applications. This manual also provides contact information for necessary agencies and establishes the need for public notification. The primary goal of this supplement is to increase awareness of the need for proper traffic control in work zones, ensuring efficient and safe completion of construction and maintenance operations.

# **TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK AND MAINTENANCE OPERATIONS**

## **CITY OF COLORADO SPRINGS**

### **Introduction**

Construction and maintenance areas have significantly higher than average accident rates. As a result, special care should be taken in applying traffic control techniques in these areas. Traffic safety in construction zones should be an integral part of every project from planning, through design and construction. The City of Colorado Springs is very concerned with traffic control in work zones and has prepared this manual to aid construction and maintenance personnel in implementing safe and efficient methods for handling traffic.

The Manual of Uniform Traffic Control Devices (M.U.T.C.D.) and the Traffic Control Devices Handbook, distributed by the Institute of Transportation Engineers, are the recognized standard for all traffic control devices. This supplement is not meant to replace these publications, but to address the standard practices in the City of Colorado Springs. In all cases, the traffic control plan should conform to, or be of higher standards than, the methods outlined in the above mentioned publications.

Section 10.1.309 of the city traffic code establishes the authority of the Traffic Engineer to determine the installation of traffic control devices and provide for street closures. Additionally, the City Council of Colorado Springs established a resolution authorizing the Traffic Engineer to impose traffic control fees. This supplement is created under that authority, and describes the objectives, goals and requirements of the City of Colorado Springs for traffic control at work sites.

# **TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK AND MAINTENANCE OPERATIONS**

## **CITY OF COLORADO SPRINGS**

### **GOALS**

Safety is the primary goal of any traffic control plan. Traffic control devices at work sites are necessary to protect motorists, bicyclists and pedestrians from encountering unexpected requirements or difficult maneuvers that could result in an accident. Traffic controls should route traffic through the work area in a manner that is as similar as possible to normal roadway conditions. Any unusual, unrecognized, or unclear traffic control device can have negative results such as drivers choosing an incorrect route or blocking the flow of traffic. Though work site hazards cannot be completely eliminated, they can be reduced through the following methods:

- Schedule work during off-peak traffic volume hours.
- Coordinate work with other agencies to provide fewer traffic interruptions.
- Investigate alternate locations for utility installations.

Consistency in device appearance and use throughout the city will lead to better understanding by the driver and result in fewer accidents. All traffic control devices must meet or exceed the standards in the latest edition of the MUTCD. Traffic control devices must be laid out according to the approved Traffic Control Plan and associated Work Zone Traffic Control Permit.

Maintenance of traffic control devices is very important to their effectiveness. All traffic control devices must be maintained throughout the construction period to provide correct placement and legible faces both day and night. Maintenance includes cleaning or replacing dirty, missing or damaged devices. Routine day and night inspections are necessary; however, no standard schedule can be used for all conditions. Frequency should be based on common sense, with heavy traffic arterials requiring more frequent inspections. If inclement weather, vandalism, or other difficulties occur, more frequent inspections will be required. Follow-up action is required to make sure that any deficiencies have been corrected. The permit holder is responsible for the inspections and the corrective action.

# **TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK AND MAINTENANCE OPERATIONS**

## **CITY OF COLORADO SPRINGS**

### **OBJECTIVES**

With the passage of resolution 39-02 the Colorado Springs City Council has authorized the City Traffic Engineer to impose traffic control fees. That resolution as well as city ordinance 01-42, states: “all work site traffic controls shall be approved by the city traffic engineer prior to commencement of work”, provided the need to implement an approval and inspection process. This is an outline of the objectives of the Traffic Control Program.

#### **I. TRAFFIC CONTROL PERMIT APPROVAL**

- A. Any contractor that is in the city’s right-of-way, whether on the sidewalk or in the street, must obtain a Traffic Control Permit. Permits are issued at the Pikes Peak Regional Development Center, 2880 International Circle, 2<sup>nd</sup> floor. If you are a licensed contractor and have a valid pin number, you can apply online at [www.springsgov.com](http://www.springsgov.com). To set up a pin number, contact Engineering Inspections at (719) 385-5977.
- B. All Permits must have a method of handling traffic or a Traffic Control Plan attached to them. Engineering Inspections will accept custom plans if they are done neatly and with recognized drawing methods. Refer to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) and the Traffic Control Devices Handbook for assistance in making custom drawings. Traffic Control Plans for larger more complicated construction projects should be engineered drawings. Custom or engineered plans that need to be reviewed may be delivered to Engineering Inspections office at, 2880 International Circle, 2<sup>nd</sup> floor, Colorado Springs, CO 80910. For standard traffic control situations, a contractor may use the figures offered later in this section. This Traffic Controls Supplement is available as part of the Traffic Engineering Section of the Subdivision Policy, Public Works Design Manual or as a stand alone document. The stand alone document is available at City Engineering office or at Pikes Peak Regional Development Center for purchase. You can also view the document online at [www.springsgov.com](http://www.springsgov.com) and select “Community Infrastructure & Development”, “Community Development”, “City Engineering”, & “Traffic Controls for Street Construction, Utility Work & Maintenance”.

- C. For improved tracking and auditing purposes, permits applied for at the Pikes Peak Regional Development Center will be entered into the online system for review and approval. Online permits are reviewed and approved twice daily. Permits should be applied for at least five working days prior to commencement of work to ensure enough time for review and advance notice. Work Zone Traffic Technicians are available Monday through Friday from 7:30 A.M. to 4:00 P.M. to assist with any questions or problems you may have. Refer to the list below for days and phone numbers of the technicians assigned to the Work Zone Traffic Control Program:

North Area	Mon.-Fri.	Wk #385-5977
South Area	Mon-Fri.	Wk #385-5977

## **II INSPECTION**

- A. All temporary traffic control is subject to inspection by Engineering Inspections staff. Inspectors monitor city streets on a daily basis. Inspections are usually random except for larger or more complicated jobs which are inspected daily or as needed. Currently there are two full time inspectors involved with traffic control. Attached to this document, is a map showing which inspector to contact for a certain area of the city.
- B. Due to the increasing volume of night and weekend work, inspection after normal business hours will be at the discretion of Engineering Inspections staff. Under certain circumstances, random inspections will be done during non-business hours.

## **III FEES AND PENALTIES**

- A. Permit fees vary depending on traffic volumes where work is being done, and whether the contract work is telecommunication or non-telecommunication (see attached Appendix A).
- B. Fines are also outlined on this same schedule. Fines can be assessed for reasons ranging from no permit on site to safety issues; refer to your permit general requirements for additional reasons for fines.
- C. All permit fees and fines must be paid through City Engineering Inspections at Pikes Peak Regional Development Center. It is the responsibility of the contractor or project supervisor to have an approved Traffic Control Permit on site with a copy of the traffic control diagram.

# **TRAFFIC CONTROL FOR STREET CONSTRUCTION, UTILITY WORK AND MAINTENANCE OPERATIONS**

## **CITY OF COLORADO SPRINGS**

### **General Requirements**

1. Contractors are required to submit the Traffic Control application at least five working days prior to commencement of work to ensure enough time for review and advance notice. Activity requiring unique traffic control setups may require additional time for review and permit issuance, Engineering Inspections is not responsible for delays to a project due to this extended review time.
2. Traffic control permits are required for all operations that have a direct or indirect impact on public traffic (including motor vehicles (parked or moving), cyclists, and pedestrians) within the City Right-of-Way. Bicyclists and pedestrians should be provided with access and reasonably safe passage through the temporary traffic control work zone.
3. City policy does allow an exception for moving operations. Moving operations, defined as “activities in place less than thirty (30) minutes including time to setup and remove traffic control”, shall be exempt from the permit process. However, moving operations are not exempt from having a complete and appropriate setup per the latest edition of the MUTCD and the City of Colorado Springs supplement to the MUTCD. Improper setup does not exclude anyone from assessed fines for improper traffic control.
4. All traffic control devices shall meet or exceed MUTCD minimum requirements and comply with the NCHRP 350 criteria requirements.
5. Engineered drawings may be required for all minor arterial streets and above. Any waiver of this requirement will be at Traffic Engineering discretion.
6. Contractor generated traffic control plans will require a certified Traffic Control Supervisor to do work zone setups on all streets classified as Major Residential Collector and above.
7. Proof of Traffic Control Supervisor Certification by either the American Traffic Safety Service Association (ATSSA) or Colorado Contractors Association (CCA) with Flagger endorsement must be provided at time of submittal or be on record with the city.
8. Traffic control plan/permit shall be onsite at all times.
9. Permit fees are based on the number of traffic setups required to complete the project. Permit fees shall be paid in full prior to the permit being issued and prior to start of actual work.
10. Permits will be valid for the time period approved by City Engineering Inspections on the permit. Extensions may be granted if the contractor can justify the need.
11. Flagging personnel must be trained, certified and dressed appropriately.
12. Any changes to the Traffic Control Plan must have approval by City Traffic Engineering prior to implementation.

13. Any city signs removed or damaged must be replaced. Temporary signs shall be installed until permanent signs are replaced. All temporary and replacement signs shall meet the city's installation and materials standards. All signs conflicting with approved traffic control plan shall be covered or removed. All expenses incurred to remove, cover and/or replace signs will be the contractor's responsibility.
14. The repair or replacement of any damaged roadway pavement markings shall be the responsibility of the contractor per City Code 3.3.203. All stop lines, crosswalks, legends and arrows shall be 90 mil thickness, thermoplastic or preform plastic tape. All longitudinal lines shall be 15 mil thickness epoxy. Temporary pavement markings shall not be in place for more than two weeks unless approved by City Traffic Engineering. All pavement markings shall conform to the most recent adopted editions of the MUTCD and City of Colorado Springs Signs & Pavement Marking Guidelines.
15. An all weather surface must be in place before opening the roadway. Specific conditions may require the use of traffic plates. If used, they shall be properly anchored and maintained according to work zone time restrictions and construction schedule.
16. Traffic control must meet or exceed contractual specifications.
17. Contractors shall comply with the City Noise Ordinance # 3.3.2111.
18. Engineering Inspections reserves the right to inspect all traffic control plans in operation and make changes as field conditions warrant.
19. Engineering Inspections shall be notified when an emergency occurs. All emergency work shall require that a permit application be filed and associated fees paid within 24 hours of the emergency or fines will be assessed accordingly.
20. Work involving state or county roadways within the Colorado Springs city limits must have permits from each of these agencies in addition to the required permit from the city. All permits must be on site at all times.
21. Vehicles and materials not related to the work in progress shall not be stored in the work area.
22. All temporary traffic control devices shall be removed once they are no longer needed. When work is suspended for short periods of time, temporary traffic control devices that are no longer appropriate shall be removed or covered.
23. When the construction zone involves metered parking, the contractor shall obtain parking meter bags or make other arrangements with Parking Administration for the allotted time.
24. A Uniformed Traffic Control Police Officer shall be required when traffic is shifted to run against a traffic signal unless the traffic signal can be modified to control the new roadway alignment.
25. Arrow boards are required for lane closures on all roadways that are 60 feet or wider with 4 or more lanes and, an average daily volume of 10,000 or more vehicles. They are also required where horizontal and/or vertical alignment limits sight distance.
26. All traffic lanes shall be open to vehicular traffic between the hours of 06:00 A.M. to 09:00 A.M. and between the hours of 04:00 P.M. to 07:00 P.M. unless authorized by City Traffic Engineering.

27. If a Special Event and Work Zone Traffic Control Permit are scheduled at the same time, coordination shall be required between the contractor, event holder and Engineering Inspections to resolve any potential conflicts that may occur.
28. All school districts within the city limits shall obtain an approved traffic control permit for the placement of traffic control devices within the City Right-of-Way.
29. All trenching will require adequate shoring or slope and any trench 5 feet or deeper requires notification of the Colorado Springs Fire Department.
30. Traffic Cones shall only be used during daytime operations. Traffic Cones shall not be less than 18” in height on all roadways with a posted speed limit of 30 MPH or less. Traffic Cones shall not be less than 28” in height on all roadways with a posted speed limit 35 MPH or greater. Nighttime operations shall require the use of drums, vertical panels, and tubular markers and/or Type I, II, or III barricades. These devices shall be retroreflectorized as required by the MUTCD).
31. To determine if the segment of roadway is on a City Transit Route, go to [www.springsgov.com](http://www.springsgov.com) and select “Transportation & Transit”, “Springs Transit”, “Springs Transit”, Route & Schedule Information” to view maps of current routes.
32. To determine if the segment of roadway is on a City Snow Plow Route, go to [www.springsgov.com](http://www.springsgov.com) and select “Community Infrastructure & Development”, “Street Division”, and “Snow & Ice Control” to view current plow routes.
33. To determine if the segment of roadway is on a City Truck Route, go to [www.springsgov.com](http://www.springsgov.com) and select “Planning & Community Development”, “Transportation Planning”, “Inter-Modal Transportation Plan”, and “Chapter 7. Freight” to view current truck routes.

**TRAFFIC CONTROL FOR STREET CONSTRUCTION,  
UTILITY WORK AND MAINTENANCE OPERATIONS**

**CITY OF COLORADO SPRINGS**

**Specific Requirements**

Temporary Traffic Barrier:

The Contractor shall install Pre-cast Type 7F concrete, Type IV concrete, or Plastic Water Filled barrier between any lanes carrying public traffic and any excavation, obstacle, or storage area when the following conditions exist:

- When an excavation is 12 inches or greater in depth a minimum clear zone (CZ) in feet shall be required for the following design speeds:

30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH
12' CZ	14' CZ	16' CZ	20' CZ	22' CZ	24' CZ	30' CZ

- If the minimum Clear Zone can not be maintained, then a temporary traffic barrier shall be required for work site protection. The barrier must be pinned together, and a two foot shy line should be provided between vehicular traffic and the barrier.
- A temporary traffic barrier shall be supplemented with standard delineation (reflectors), pavement markings, or channelizing devices to provide nighttime visibility for vehicle traffic. The delineation or pavement marking color shall conform to the latest edition of the MUTCD.
- Temporary traffic barrier ends shall be installed in accordance with AASHTO's "Roadside Design Guide" by flaring until the end is outside the acceptable clear zone (clear zone is based on 85<sup>th</sup> percentile speed) or by providing crashworthy end treatments that meet or exceed NCHRP Report 350.
- A temporary traffic barrier is required when the contractor has installed a permanent obstacle and the protective system, such as guardrail has not been installed or when a portion of an existing protective guardrail has been removed.
- A temporary traffic barrier is required when materials or equipment are stored within the clear zone of the work site.
- The two accepted forms of anchoring steel pins are either with a cotter pin and washer at the bottom of each steel pin, or by driving the steel pin 4 inches into the surface to prevent the pin from jumping out of place during vehicle impact.
- The use of a 12 ft. transition section is allowed at the downstream end of the installation pointing away from approaching traffic out of the clear zone, or at locations outside the clear zone, generally more than 30 ft. from the high speed travel lane edge.
- Glare Screens may be required, if used the blade height shall be 24".

### Temporary Traffic Signals:

Temporary traffic signals must meet the physical display and operational requirements of conventional traffic signals. A minimum of two signal faces shall be provided for each approach, and each signal face shall consist of three 12 inch sections. The traffic signal controller must be capable of two-phase operations unless otherwise specified, and have all-red timing intervals.

### Pedestrian Requirements:

- All pedestrian access must meet the American Disabilities Act (ADA) standards. All temporary walk surfaces shall be cold patched, asphalt or concrete and must not exceed 8.3% grade per ADA standards.
- When doing work involving a sidewalk or pedestrian walkway, the traffic control plan must contain appropriate protection for pedestrians (fencing, barriers, or covered walkways) and must be approved by Traffic Engineering.

### Scaffolds & Overhead Work:

- The contractor shall provide protection to the pedestrian when doing overhead work. All heights 6 ft. and greater are considered overhead.
- An overhead, lighted canopy shall be constructed for pedestrians adjacent to any erected scaffolding. Pedestrian clearance shall be eight feet in height and five feet in width. ADA ramps, with an 8.3% grade or flatter shall be constructed if the pedestrian canopy walk is constructed in the roadway.
- All canopy construction within the city right-of-way shall comply with the requirements of the applicable local agency or the latest edition of the Uniform Building Code whichever contains the higher standard.
- To prevent objects from falling off, scaffolds shall provide guardrail systems, safety nets or personal fall arrest systems. Scaffolds shall have toe boards, screens, or guardrail systems to prevent objects from falling from a higher level.
- Materials shall not be stored on scaffolds. All material placed on scaffolds shall be removed at the end of the work shift.

Excavation and Trenches:

Excavations and/or trenches, which cannot be properly back-filled and patched prior to the end of the work day, shall be bridged to permit unobstructed traffic flow. Trench walls and adjacent soils shall be sufficiently stabilized prior to the use of steel plates for bridging.

Where traffic must cross trenches:

- The use of steel plates shall be approved by Engineering Inspections prior to installation.
- The Colorado Springs Fire Department – Heavy Rescue Response Group shall be notified when the excavation or trench is 5 feet or greater in depth.
- Steel Trench Plate width and thickness requirements:

18” or less in width	Minimum thickness of ¾”
> 18” in width to 72” in width	Minimum thickness of 1”

- The thickness of Steel Plates for trench widths exceeding 72” a structural design shall be prepared by a Licensed Professional Engineer Registered in Colorado.
- Steel Plates can be installed in two ways. First, the Steel Plates can be installed flush with the existing pavement, milling out the pavement surface to ensure that the top of plate elevation matches the existing elevations of adjacent pavement surface. Second, the Steel Plates can be installed on top of the asphalt with transitional ramps (cold mix) on all four sides of the plates, with feathered edges to match the existing asphalt (8% or a lesser slope).
- Steel Plates shall be attached to the roadway by a minimum of 4 dowels pre-drilled into the corners of the plates and drilled 2 inches into the pavement.
- The Steel Plates shall extend beyond the edge of the trench a minimum of 18” but no more than 30” on both sides.
- A non-skid surface treatment shall be applied to the entire surface area of the plate in the direction of traffic flow.
- The contractor should avoid using a long series of plates that run parallel to traffic wheel paths. If allowed, the length of a series of plates running parallel to traffic wheel paths shall not exceed 30’.
- The trench shall be adequately shored to support the steel plates and traffic loads.
- Steel Plates shall be installed to operate with minimum noise.
- All Steel Plates within the right-of-way, whether used in or out of the traveled way, shall be without deformation (free from any clips, chains, attachments, weldments, or surface irregularities).
- No one is allowed in the trench while covered by the Steel Plate.
- The use of Steel Plates shall not exceed four weeks and Rough Road or Bump signs shall be required during this period of time.

## Arrow Boards:

Arrow Boards shall be furnished as required by project conditions and shall meet the following requirements:

Type	Minimum Size	Min. # of Panel Lamps	Min. Legibility Distance
A	48" x 24"	12	½ mile
B	60" x 30"	13	¾ mile
C	96" x 48"	15	1 mile

(Example: length of arrow equals 48"; width of arrowhead equals 24")

An arrow panel is a sign with a matrix of elements capable of flashing or showing sequential displays. This sign shall provide additional warning and directional information to assist in merging and channeling road users through or around a temporary traffic control zone. The panel face shall be rectangle in shape, solid construction and finished in non-reflective black. The arrow panel shall have the capability of the following mode selection: left arrow, right arrow, left and right arrow and caution. The caution mode consists of four or more flashing lamps arranged in a pattern which does not indicate a direction. Arrow panels shall include an automatic photocell sensor type signal lamp dimmer with manual override and shall be capable of a minimum of 50 percent dimming from rated lamp voltage.

## Portable Variable Message Signs:

Variable Message Signs (VMS) are temporary traffic control devices with the flexibility to display a variety of messages. Each message shall consist of one or two phases. A phase consists of up to three lines of eight characters per line. Each character module shall use at least five wide and seven high pixel matrixes.

- VMS's shall be used on all major residential collector streets and higher classification of roadways, including roadway closures and detour routes. Also, VMS's shall be used when lane reductions can not handle the normal volume of traffic (no greater than 1,000 vehicles per lane per hour).
- VMS's shall be used to advise vehicular traffic of alternate routes and expected delays due to construction activity.
- VMS's shall be used to notify the general public of upcoming construction activities up to two weeks prior to start of construction.
- VMS's shall be solar powered or a non-internal combustion device.
- VMS's shall have their own separate power source with an independent battery backup and shall operate continuously for ten days without sun light.
- VMS's shall be capable of 360 degree rotation and elevated so the bottom of the sign is 5 feet above the ground.
- The sign shall be visible from one-half mile during both daytime and nighttime conditions.
- The message shall be legible from a minimum of 650 feet.
- The sign shall automatically adjust its light source to meet nighttime legibility requirements.

## Appendix “A”

### Fee Schedules and Penalty Assessment Chart

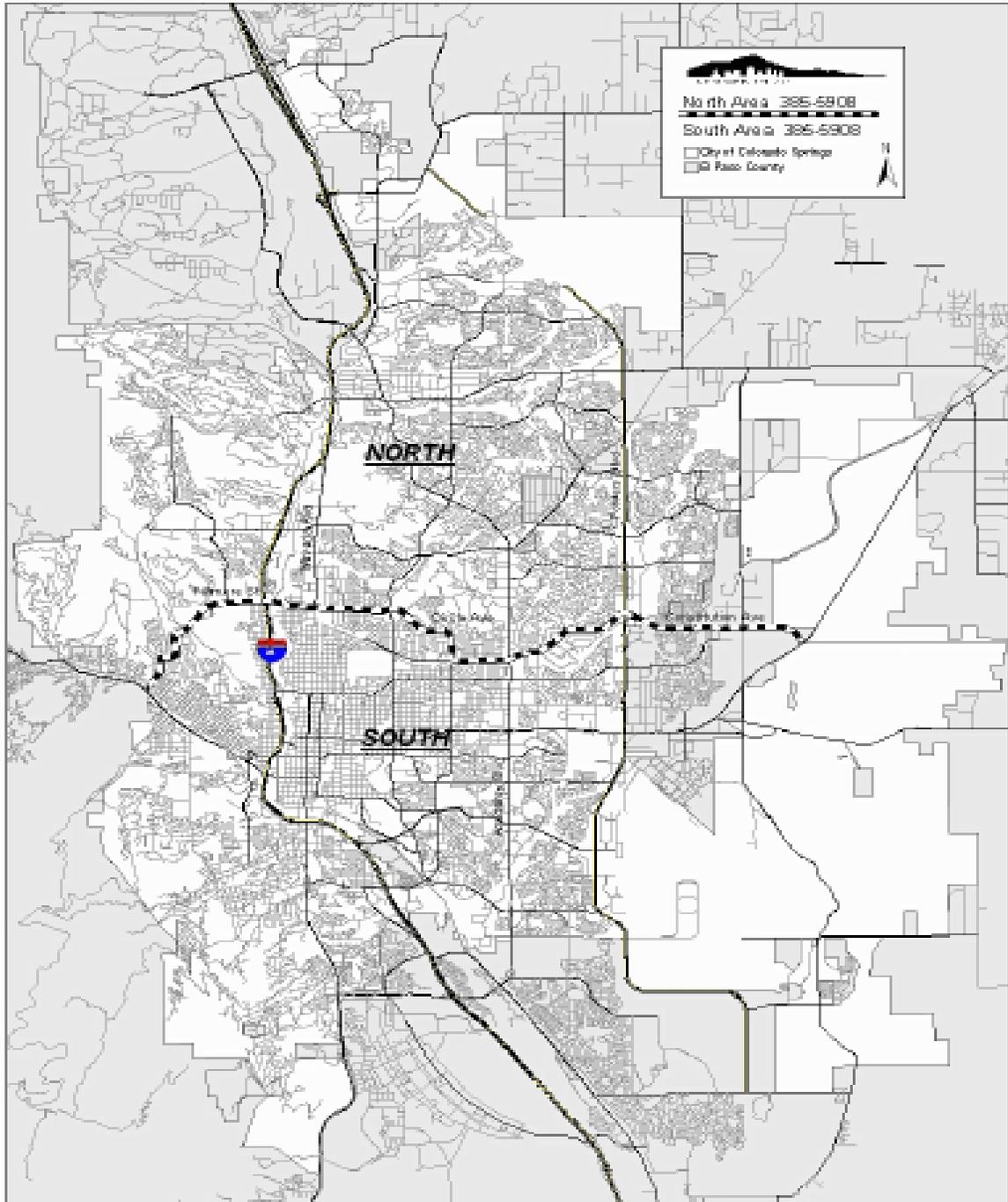
Traffic Control Permit Non-Telecommunication Provider/Non-Cable Operator	<b>Rate</b> (per permit, per setup)
≥ 5,000 Average Daily Traffic on affected street	\$180.00
< 5,000 Average Daily Traffic on affected street	\$50.00

Traffic Control Permit Telecommunication Provider/Cable Operator	<b>Rate</b> (per permit, per setup)
≥ 5,000 Average Daily Traffic on affected street	\$164.00
< 5,000 Average Daily Traffic on affected street	\$45.00

Penalty for No Traffic Control Permit Non-Telecommunication Provider/Non-Cable Operator & Telecommunication Provider/Cable Operator (not including permit fee, penalty only)	<b><u>Penalty</u></b> ≥ 5,000 ADT	<b><u>Penalty</u></b> < 5,000 ADT
First Penalty for No Permit for Activity	\$ 360.00	\$100.00
Second Penalty for No Permit for Activity	\$ 540.00	\$150.00

Penalty for Non-Compliance of Traffic Control Permit Non-Telecommunication Provider/Non-Cable Operator & Telecommunication Provider/Cable Operator (not including permit fee, penalty only)	<b><u>Penalty</u></b> ≥ 5,000 ADT	<b><u>Penalty</u></b> < 5,000 ADT
First Penalty for Non-Compliance Permit	\$ 360.00	\$100.00
Second Penalty for Non-Compliance Permit	\$ 540.00	\$150.00

# Appendix “B”



# Appendix “C”

## TYPICAL APPLICATIONS

Typical Application Description	Typical Application No.
<b>Sidewalk Detour</b>	<b>T.A. # 1</b>
<b>Sidewalk Diversion</b>	<b>T.A. # 2</b>
<b>Sidewalk Diversion within Parkway</b>	<b>T.A. # 3</b>
<b>Ramp Closure Pedestrian Detour</b>	<b>T.A. # 4</b>
<b>Work Beyond the Shoulder</b>	<b>T.A. # 5</b>
<b>Work on the Shoulder</b>	<b>T.A. # 6</b>
<b>Shoulder Work with Minor Encroachment</b>	<b>T.A. # 7</b>
<b>Lane Shift with Parking Restrictions</b>	<b>T.A. # 8</b>
<b>Lane Closure on Two-Lane Road with Flaggers</b>	<b>T.A. # 9</b>
<b>Work in Center of Road with Low Traffic Volume</b>	<b>T.A. # 10</b>
<b>Outside Single Lane Closure on Four Lane Road</b>	<b>T.A. # 11</b>
<b>Inside Single Lane Closure on Four Lane Road</b>	<b>T.A. # 12</b>
<b>Interior Lane Closure on Multi-Lane Road</b>	<b>T.A. # 13</b>
<b>Half Road Closure on Multi-Lane Road</b>	<b>T.A. # 14</b>
<b>Outside Lane Closure on Five Lane Road</b>	<b>T.A. # 15</b>
<b>Continuous &amp; Inside Lane Closure on Five Lane Road</b>	<b>T.A. # 16</b>
<b>Work in the Continuous Lane on Five Lane Road</b>	<b>T.A. # 17</b>
<b>Multi-Lane Closure on Five Lane Road</b>	<b>T.A. # 18</b>
<b>Inside Lane Closure on Multi-Lane Road - Raised Median</b>	<b>T.A. # 19</b>
<b>Outside Lane Closure on Multi-Lane Road - Raised Median</b>	<b>T.A. # 20</b>
<b>Outside Lane Closure on Far Side of the Intersection with Sidewalk Closure</b>	<b>T.A. # 21</b>
<b>Outside Lane Closure on Far Side of the Intersection with No Sidewalk Closure</b>	<b>T.A. # 22</b>
<b>Inside Lane Closure on Far Side of the Intersection</b>	<b>T.A. # 23</b>
<b>Half Road Closure on Far Side of the Intersection</b>	<b>T.A. # 24</b>
<b>Multiple Lane Closure on Far Side of the Intersection</b>	<b>T.A. # 25</b>
<b>Closure in Center of the Intersection</b>	<b>T.A. # 26</b>
<b>Closure in Corner of the Intersection</b>	<b>T.A. # 27</b>
<b>Overlapping Routes with Detour</b>	<b>T.A. # 28</b>
<b>Alley Closure</b>	<b>T.A. # 29</b>
<b>Local Road Closure</b>	<b>T.A. # 30</b>
<b>Multi-Lane Closure on Six Lane Road</b>	<b>T.A. # 31</b>
<b>Outside Lane Closure on Far Side of the Intersection</b>	<b>T.A. # 32</b>
<b>Left Turn Bay Closure</b>	<b>T.A. # 33</b>
<b>Right Turn Bay Closure</b>	<b>T.A. # 34</b>

<b>Typical Application Description</b>	<b>Typical Application No.</b>
<b>Center Lane Closure on Six Lane Road</b>	<b>T.A. # 35</b>
<b>Lane Closure Shifting Traffic into the Continuous</b>	<b>T.A. # 36</b>
<b>Lane Closure on Low Volume Road</b>	<b>T.A. # 37</b>
<b>Work Inside of a Roundabout</b>	<b>T.A. # 38</b>
<b>Work Outside of a Roundabout</b>	<b>T.A. # 39</b>
<b>Work Inside of a Multi-Lane Roundabout</b>	<b>T.A. # 40</b>
<b>Inside Lane Closure Multi-Lane Roundabout</b>	<b>T.A. # 41</b>
<b>Outside Lane Closure Multi-Lane Roundabout</b>	<b>T.A. # 42</b>
<b>One Lane Road with Temporary Traffic Signals</b>	<b>T.A. # 43</b>
<b>Outside Lane Closure with Sidewalk Closure</b>	<b>T.A. # 44</b>
<b>Half Road Closure on Multi-Lane Road</b>	<b>T.A. # 45</b>

# Appendix “D”

**General Guide to Work Zone Traffic Control**

	Interstate (2)		Expressway (2)		Principal Arterial (2)		Minor Arterial (2)		Industrial Commercial		Major Res. Collector		Minor Res. Collector		Residential Street		Minor Residential		Hillside Minor Res.	
	2-4.6	2-4.6	2-4.6	2-4.6	15,000 to 50,000	10,000 to 25,000	7,500 to 10,000	3,500 to 10,000	1,500 to 3,500	750 to 1,500	100 to 200	2-4.6	2-4.6	2-4.6	2-4.6	2-4.6	2-4.6	2-4.6	2-4.6	
Number of Traffic Lanes	80,000	75,000	15,000 to 50,000	10,000 to 25,000	7,500 to 10,000	3,500 to 10,000	1,500 to 3,500	750 to 1,500	100 to 200											
ADT																				
Time Restrictions (No Work 6 AM to 9 AM & 4 PM to 7 PM)	yes	yes	yes	yes	possibly	possibly	possibly	possibly	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Noise Restriction (7 PM to 7 AM in All Residential Areas)																				
Shoulder Closure Allowed	yes	yes	possibly	possibly	possibly	possibly	possibly	possibly	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sidewalk Closure Allowed																				
Single Lane Closure (9 AM to 3 PM) Allowed	yes-night	yes-night	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Multi-Lane Closure (Weekends & Nights) Allowed	note #5	note #5	note #5	note #5	note #5	note #5	note #5	note #5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Street Closure Allowed	note #5	note #5	note #5	note #5	note #5	note #5	note #5	note #5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Night Work Allowed	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Weekend Work Allowed	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Flaggers Required																				
Detour Routes (reasonable distance w/o cut thru's) Required	yes	yes	yes	yes	possibly	possibly	possibly	possibly	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Portable VMS's Required	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Arrow Boards Required	yes	yes	yes	yes	yes	yes	possibly	possibly	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Portable Traffic Signals Allowed																				

Note:

- \* This table represents general requirements under average conditions.
- 1. All subject to change pending on site evaluation, roadway design, ADT, hourly vpi, speed, # of lanes, weather, time of year, school walk routes, Fire, Transit, and Truck routes.
- 2. All roadways which are under CDOT jurisdiction requires CDOT's approval and permit.
- 3. Flaggers required for One-Lane Roadways and Truck Access (entering & exiting)
- 4. Uniform Traffic Control (UTC) required where traffic is routed against a traffic signal.
- 5. Requires extensive coordination with City, County and CDOT and only allowed under extreme conditions.
- 6. All requirements subject to City Code.

# Appendix “E”

## LETTER CODES

ROAD TYPE	Distance between Signs in Ft (metric)		
	A	B	C
Urban (low speed)	100 (30)	100 (30)	100 (30)
Urban (high speed)	350 (100)	350 (100)	350 (100)
Rural	500 (150)	500 (150)	500 (150)
Expressway / Freeway	1000 (300)	1500 (450)	2640 (800)

Type of Taper	Taper Length (L)*
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	100 ft (30m) maximum
Downstream Taper	100 ft (30m) per lane

## FORMULAS

Speed Limits of 40 mph (60 km/h) or less / Speed Limits of 45 mph (70 km/h) or >:

$$L = \frac{WS^2}{60} \quad (L = \frac{WS^2}{155}) \quad L = WS \quad (L = \frac{WS}{1.6})$$

Lane Width	Speed in MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH
10 ft.	Merging Taper	105'	150'	205'	270'	450'	500'	550'	600'	650'
11 ft.	Merging Taper	115'	165'	225'	294'	495'	550'	605'	660'	715'
12 ft.	Merging Taper	125'	180'	245'	320'	540'	600'	660'	720'	780'

Where: L = Taper length in feet (meters).

W = Width of offset in feet (meters).

S = Posted speed limit, or off-peak 85<sup>th</sup>-percentile speed prior to work starting, or the anticipated operating speed in mph (km/h)

\* Distances are shown in feet (meters).

## Appendix “F”

### Important Phone Numbers

Engineering Inspections  
30 S. Nevada Ave., Suite 405  
Colorado Springs, CO 80903  
Office (719) 385-5977  
Fax (719) 385-5050

Questions Concerning Work Zone  
Traffic Control

City Engineering Signals  
404 W. Fontanero St.  
Colorado Springs, CO 80907  
Office (719) 385-6721  
Fax (719) 385-6727

Questions Concerning Traffic Signals  
and Work at Signalized Intersections

Traffic Management Center  
234 W. Colorado Ave.  
Colorado Springs, CO 80901  
Office (719) 385-5966  
Fax (719) 385-7630

Questions Concerning Signal Timing  
and Video Vehicle Detection

Engineering Signs/Markings  
404 W. Fontanero St.  
Colorado Springs, CO 80907  
Office (719) 385-6720  
Fax (719) 385-6727

Questions Concerning Signs and  
Markings on Public Streets

City Engineering Inspections  
2880 International Cir., 2<sup>nd</sup> floor  
Colorado Springs, CO 80910  
Office (719) 385-5977  
Fax (719) 385-5050

Questions Concerning Excavation,  
Concrete and Traffic Control Permits

Colorado Springs Police Department  
Gold Hill – 705 S. Nevada Ave.  
Colorado Springs, CO 80903  
Office (719) 444-7000  
Fax (719) 632-1663

Notification of Street Closures and Work  
on Major Arterials

Colorado Springs Fire Department  
375 Printers Parkway  
Colorado Springs, CO 80910  
Office (719) 444-7000  
Fax (719) 632-1663

Notification of Street Closures and  
trench excavation depths 5 feet or  
greater in-depth

**Important Phone Numbers**

Colorado Springs Parking System  
130 S. Nevada Ave., Suite 606  
Colorado Springs, CO 80903  
Office (719)385-5681  
Fax (719)385-5683

Questions regarding the renting of  
Parking Meter Hoods

**Other Agencies**

Colorado Department of Transportation

Pueblo Office:  
P.O.Box 536  
905 Erie St.  
Pueblo, CO 81002  
Office (719) 546-5743  
Fax (719) 546-5414

Questions Concerning Permits and Work  
Zone Traffic Control on Federal and  
State Highways

Springs Office:  
1480 Quail Lake Loop - Suite A  
Colorado Springs, CO 80906  
Office (719) 634-2323  
Fax (719) 227-3298

Questions Concerning Permits and Work  
Zone Traffic Control on Federal and  
State Highways

El Paso County Dept. of Public Works  
3640 Marksheffel Rd.  
Colorado Springs, CO 80922  
Office (719) 520-6460  
Fax (719) 520-6879

Questions Concerning Permits and Work  
Zone Traffic Control on County  
Roadways

**School District Phone Numbers**

District 49 (719) 495-3601  
District 20 (719) 598-2566  
District 12 (719) 475-6100  
District 11 (719) 520-2000  
District 2 (719) 579-2000

**Utility Locating**

UNCC (800) 922-1987  
Traffic Signals (719) 385-6721  
Qwest (719) 290-0901  
Cablevision (719) 633-3444

**Metro Traffic**

Main Number (719) 527-9799  
Fax (719) 527-1850

**Springs Transit**

Main Number (719) 385-7429 or (719) 385-7408  
Fax (719) 385-7428