CHAPTER 20
TRAFFIC CONTROL

PURPOSE AND SCOPE

I. Purpose

The purpose of safety signs and cones is:
- To provide a safe work area
- To warn drivers that the roadway is blocked
- To guide vehicles around the worksite
- To protect City employees doing the work

II. Responsibility

a. Management is responsible for implementing all facets of the Traffic Control Policy. This includes, but is not restricted to, the training of subordinate supervisors and personnel, securing and maintaining proper equipment for each crew, and supervising employees to insure that requirements of the policy are carried out.

b. Public Works Director or designee is responsible for general supervision of the Traffic Control Policy and should take the following minimum steps to insure proper functioning of the plan.

1. The Supervisor should make sure that all crews under their management have the needed signs, barricades, cones and devices available for use and that they are clean and legible.

2. The Supervisor should accept reports on damaged or lost devices and see that repairs are made or new devices ordered.

3. The Supervisor should also brief the Crew Supervisors on any special problems or needs that they might encounter in the day's work.

4. The Supervisor should make sure that Police, Fire, and other proper authorities are notified of road closings.

During work, the Supervisor should make a survey of the work area to check condition of Traffic control devices, personnel, and equipment. Times and changes, including unusual events or situations should be noted and written down.

End of Day-End of Project - Are you really satisfied that a good job on control traffic took place? If not, how do you feel it could have been improved? What could we do better next time? Take up any ideas with the Safety Coordinator and/or Supervisor.

Traffic Control Plans - The Streets Supervisor or designee will play a key role in all aspects of the Traffic Control Plan used by his/her crews.

c. The Field Supervisor is the key person in making the Traffic Control Policy work. The following checklists will help in meeting all day to day requirements.
Daily check list before leaving the shop:

1. Does the crew have needed signs, barricades, cones or other devices for today’s work?  yes______ no______
2. Were damaged or lost devices reported to Supervisor for inventory control? yes______ no______
3. Was the crew briefed on special problems or needs? yes______no______
5. Do all illuminated devices work, including truck mounted ones? yes______no______
6. Are the trucks equipped with cleaning materials needed? yes______no______
7. If needed, were Police and/or Fire Departments, and others notified? yes______no______
7. Are your crew properly dressed, especially flaggers? yes______no______

Field Supervisor Check List at worksite, before starting work:

1. If devices were used overnight, check to see if they are missing, vandalized /dirty, properly placed, reflectorized, mechanical/electrical devices work? yes______no______ not needed______
2. Relocate, clean, or replace devices. yes______no______
3. Install new or additional devices by first placing furthest sign in advance of worksite, then place remainder with flow of traffic ? yes______no______ not needed______
3. Are all tools and construction equipment properly stored so as not to create a safety hazard? yes______no______

Field Supervisor Check List End of Project:

1. Remove all signs beginning at the worksite and working downstream with the flow of traffic.
2. Next, remove barricades, cones, and other devices at the immediate worksite against traffic.
4. Once worksite is clean, remove vehicles.
5. Double check before leaving by making a windshield survey.
6. If needed, inform dispatch that the roadway is open to traffic and the problem has been resolved.
7. Were unusual events or situations noted and reported to the dispatcher? yes______no______
d. The Supervisor is responsible for keeping the Traffic Control Policy current and for assisting employees at each level in the carrying out of their responsibilities. The Supervisor also has responsibility for conducting job site inspections and employee interviews to insure compliance with procedures.

III. Equipment

a. Each truck will have flashing light, either a dome, flashers, or an arrow mounted on top of the truck.

b. Signs and cones: Each job site will be marked with appropriate traffic safety signs and safety cones (see figure G). The signs will have an engineering grade surface. The lettering will be black against an orange background. Sign shall be a minimum of 36” x 36” in size. The captions on the sign will be:

2 each " Utility Construction Ahead ">
2 each " Upward Slope Arrow ">
2 each " Flagman Ahead ">
1 each " Reversible Application Lane Merge ">

Safety cones will be a minimum of 28” high, and each truck shall carry a minimum of twelve at all times.

c. Flags and side paddles (see figure E): Each field crew will carry two flags or paddles. Flags shall be a minimum of 24” x 24” in size, made of a good grade of flag material securely fastened to a staff approximately 3’ in length. Sign paddles should be at least 18” wide, with letters at least 6” high. A rigid handle should be provided. The background of the " stop " face shall be red with white letters and border. The background of the " slow " shall be orange with black letters and border. The paddle should have reflectorized letters and border for night use.

d. Barricades: While the individual trucks are not required to carry barricades, their use might be required in some situations. A barricade is a portable or fixed device having from one to three rails used to control traffic by closing, restricting, or delineating the right of way.

These are the three types of barricades and their uses: Type I or Type II barricades are intended for use in situations where traffic is routed through the area being constructed. They may be used individually or in groups to mark a specific hazard, or they may be used in a series for channelizing traffic.

Type I barricades have one rail and are used on conventional roads or urban streets. Type II barricades have two rails and are used on expressways and freeways. Type III barricades have three rails and are used on construction projects when a road is closed to traffic.

The Type III barricades are erected at the points of closure. For nighttime use, add flashing lights when barricades are used singly, and steady burn lights when barricades are used in a series for channelization.

Marking for barricades: Rails shall be alternate oranges and white stripes sloping downward at an angle 45 degrees in the direction that traffic is to pass. A barricade with stripes starting in the upper left and angling down to the right, would be a left-hand barricade. It would be placed in the left-hand lane to have vehicles go to the right. A barricade with stripes beginning in the upper right and angling down to the left is a right hand barricade. It is placed in the right hand lane to have the traffic go left.
e. Orange or yellow vests shall be worn by all flagpersons working on roadways, and by all workers not inside a barricaded area.

f. Care and Maintenance of Signs and Cones: All signs and cones should be carried in their rack or holders. If not, they should be transported in such a way that their surfaces are not marred or damaged in any way. Heavy objects should not be placed upon them, nor should they be placed in such a way they might fall or get scraped.

Signs and cones should be kept in proper position, clean and legible all the time. Damaged, defaced, or dirty signs should be cleaned, repaired, or replaced. Signals and flashers should be kept clean.

IV. Work Site Categories

a. An emergency is any situation which immediately threatens the life or property of the Citizens of Moore. There may not be time to put out all the signs and cones. If the traffic is light, the flashing mounted lights may be enough, but if traffic volume is heavy, someone should be used as a flagperson while the work is done. If a flagperson is not available, and the City employee involved feels that the traffic endangers their lives or City property, then the Police should be called for assistance.

b. Routine, Scheduled Work: This includes the scheduled flushing, TV monitoring, short term construction, etc., that can be completed in less than one day. These work sites are small in area and are located on streets with low or medium traffic volume.

An example of this type of traffic is that which is found on residential streets. The signs and cones carried on each truck are intended to be used for this type of work site.

c. Long Term or Large Projects: These are projects that last longer than one day and/or are large in area. Included in this category are job sites on routes with a heavy volume of traffic or complex traffic flows.

A "Traffic Control Plan" should be drawn up prior to the beginning of each project. For the most part, the signs and cones carried on each truck will not be adequate to control traffic in such an area. If they are, they should be put up and taken down each day. Otherwise, necessary signs obtained from equipment maintenance should be used.

If a route or intersection has to be closed, or if a major traffic stoppage or shift is necessary, then the Emergency Management/Communications Department for the City of Moore should be notified at least two working days in advance.

V. Road and Intersection Closing

Before closing any road, street or intersection, notification should be given to the Emergency Management/Communication Department. They should be notified, as far in advance as possible, at least two working days notice should be sufficient.

VI. Traffic Control Plans

Before a long term or complex work project is begun, a Traffic Control Plan should be prepared and understood by all parties before the site is occupied.

It should be in detail suitable to the complexity of the project. This Traffic Control Plan should include, but not be limited to, the type and placement of signs and cones, lying down or removal of pavement markings, construction scheduling, roadway lighting, traffic regulations,
maintenance, and inspection of the job site. Any unusual traffic problem created by a job site should be identified, along with a method of dealing with it.

The main responsibility of developing a Traffic Control Plan falls on the Department Head and the Field Supervisor concerned with that particular work site.

a. Routine Traffic Control Plans: These plans are to be used when the crews are performing routine work on low volume roads or streets. These plans involve simple traffic flows on job situations that would be encountered day after day. These plans are for: a) closing the right hand lane on a 4 lane road, b) blocking the center of a four lane road, c) blocking the left lane of a 3 or 4 lane road which has one direction traffic, and d) use of a flagger.

1) If the job requires the employees to work in the right hand lane of a 4-lane road, the signs should be placed as shown in Figure A. The " Utility Construction Ahead " signs should be placed as advanced warning signs. These signs are farthest away from the work area and are placed onto the right shoulder approximately two feet from the pavement.

Actual distance of these signs from the cone taper will depend on traffic speed. Halfway between the " Utility Construction Ahead " signs and the beginning of the cone taper, place " Reversible Application Lane Merge " sign, signifying the right lane merging. It also should be located on the right shoulder of the road. And finally, within the transition area, the " Upward Sloping Arrow " sign should be placed just inside the cone taper or channelizing devices; and should be placed where motorists can see it, but not run over it.

2) If the work is in the center of the roadway, the signs and cones should be placed as shown in Figure B. Traffic speed tells us how to space the signs and how to space the cones.

Traffic speed and lane width tells us how long to make the cone taper.

The " Utility Construction Ahead " signs should be placed farthest away from the job site. Halfway between the " Utility Construction Ahead " signs and the beginning of the cone taper, place the appropriate " Lane Merge " signs. Both signs should be located on the right shoulder of the road. The " Upward Sloping Arrow " sign should be placed just inside the cone taper, behind the first cones. They should be located so motorists can see them, but not run over them.

3) If you need to close the left lane of a three or four lane roadway, see Figure C. The " Utility Construction Ahead " signs should be placed farthest from the work site. They should be placed on the right hand shoulder, about two feet off the travel path. Halfway between the " Utility Construction Ahead " sign and the beginning of the cone taper place the " Reversible Application Lane Merge " sign, signifying the left lane merging. It should also be located off the left lane merging. It should also be located off the right hand shoulder of the road. Next in the left-hand lane, just behind the inside the beginning of the cone taper, the " Upward Slope Arrow " sign should be placed. It should be located so that motorists can see it, but where a driver cannot hit it.

4) Flagman Operations (see Figure D). If a flagperson is necessary, then the " Flagman " signs should be used between the " Utility Construction Ahead " signs and the beginning of the cone taper. They should be placed on the road shoulder approximately two feet from the pavement. Next, the " Upward Sloping Arrow " sign should be just
behind and inside the beginning of the cone taper. (Please see Figure F for correct flagging procedures).

VII. On Site Procedure

When a City vehicle arrives at a work site, the driver should turn on his/her warning lights, either dome or flashing arrows. If possible, trucks or equipment should be placed between the work area and oncoming traffic.

The first traffic control device to be placed is an advanced warning sign (Utility Construction Ahead "U.C.A."), placed in upstream traffic. This will be seen first by the motorist and will be the farthest of all devices from the work site. Advanced warning signs should normally be placed to the right and outside of the roadway. From this starting point, you should set up the other signs and cones with the flow of traffic until the work site is reached.

The work site may then be barricaded by placing cones at appropriate intervals around the job site. (In a large work site, regular barricades may be used). Finish by placing the advance warning sign (U.C.A.), which is beyond the job site on the opposite side of the road.

Where hills, curves, buildings, parked vehicles block the motorist's view of the work site, extra care must be taken to be sure that they are given early warning. This might mean adding extra advance warning signs and/or moving the one you have farther from the work site.

Watch the traffic pattern after you set out your cones and signs. If the motorists are experiencing problems, making sudden lane changes, or if unusual congestion is seen, then an extra sign (or the one you have) should be placed in advance of the backed-up vehicles or your cone taper should be lengthened.

After you have finished the initial set up, take a few minutes to walk or drive through the area to see if it is the way you would want it if you were the motorist. If the signs aren't placed properly and easy to understand, then make the changes necessary to correct it before starting the maintenance or construction.

A. Cone Taper: The most important factor in the traffic control system is the cone taper used to channel vehicles through the work site. The minimum length shown on the chart applies to streets and roads that are straight and flat. Adjustments might be required to give enough sight distance on the approach to the channelization. Also the closeness to interchange ramps, crossroads, etc., to the job site may be the reason for adjustments. Usually, better traffic operations will result when the adjustments are in increasing the length of the taper rather than reducing the length.

Here is a chart showing the length of the taper for various traffic speeds:

<table>
<thead>
<tr>
<th>Traffic Speed</th>
<th>Cone Taper Length</th>
<th>Cone Spacing Feet Apart</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mph</td>
<td>20 feet</td>
<td>10 feet</td>
</tr>
<tr>
<td>15 mph</td>
<td>45 feet</td>
<td>15 feet</td>
</tr>
<tr>
<td>20 mph</td>
<td>80 feet</td>
<td>20 feet</td>
</tr>
<tr>
<td>25 mph</td>
<td>125 feet</td>
<td>25 feet</td>
</tr>
<tr>
<td>30 mph</td>
<td>180 feet</td>
<td>30 feet</td>
</tr>
<tr>
<td>40 mph</td>
<td>320 feet</td>
<td>40 feet</td>
</tr>
<tr>
<td>45 mph</td>
<td>540 feet</td>
<td>45 feet</td>
</tr>
<tr>
<td>50 mph</td>
<td>600 feet</td>
<td>50 feet</td>
</tr>
<tr>
<td>55 mph</td>
<td>660 feet</td>
<td>55 feet</td>
</tr>
</tbody>
</table>
For traffic safety signs, the spacing is:

<table>
<thead>
<tr>
<th>Speed Limit mph</th>
<th>Distance from taper to first sign</th>
<th>Space between additional signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 25</td>
<td>100 feet</td>
<td>100 feet</td>
</tr>
<tr>
<td>26 - 35</td>
<td>120 feet</td>
<td>120 feet</td>
</tr>
<tr>
<td>36 - 50</td>
<td>250 feet</td>
<td>250 feet</td>
</tr>
<tr>
<td>over 50</td>
<td>350 feet</td>
<td>350 feet</td>
</tr>
</tbody>
</table>

Note: The cone taper to be used in a flagging operation should be shortened 50 - 100 feet.

B. Temporary Removal of Signs: Portable signs not needed during a period of work should be taken from the view of the motorist. Use care where you place them after they are removed. Standing them at the side of the roadway might still make them visible to the motorists. Turning them out of view or covering them up with a cloth or sack are better alternatives. Laying signs down, even face up, runs a risk that they will be damaged.

C. Pedestrians: If the job cuts a sidewalk or otherwise blocks pedestrian traffic, you must provide an alternate walkway. Pedestrians must be separated from work areas and vehicles.

VIII. Flagging

Note: It is important to have a flagperson who is responsible and intelligent. The safety of the work crew and the motoring public rests with the flagger.

Flaggers are needed:

1. Where workers or equipment periodically block an unprotected lane.

2. Where one lane is used for two directions of traffic and the one stretch is not visible throughout from either end. Or if the traffic is of volume that the motorists arrive at both ends frequently.

3. Where judgement indicates flagpersons are needed to warn, guide, or control traffic.

Flaggers have three basic jobs:

1. To guide traffic safely through a work area.

2. To protect the lives of fellow employees working on and near the public right-of-way.

3. To courteously and intelligently answer reasonable questions asked of them.

If any motorist refuses to follow instructions, the vehicle license number and description should be written down and the event reported immediately to your Supervisor. But, remember not to leave your post unless someone relieves you at your flagging station.

Position: Stand in a noticeable position on the right edge of the traveled lane facing the approaching traffic. If there is a closed lane next to the shoulder, you should stand just to
the right of the lane of traffic. At a "spot" work site, you might have to stand on the shoulder to the left of the traveled lane or opposite the barricaded section to flag effectively. **Never stand in an open traffic lane.** Take a position that is not blocked to the motorist view by parked vehicles or machines or by hills or curves.

Stand alone and do not let workers stand around you.

Stand at least 150 feet from the work site and no further than 250 feet. This will give you time to warn the workers of approaching danger, such as an out of control vehicle.

Flagging stations must have an adequate advance warning sign. Flagging stations used after dark must be adequately illuminated.

**Control Methods For Flags:** (See Figure F)

To Stop Traffic - Stand in a stationary position on the shoulder of the road or in a closed, non-traveled lane. Face traffic and extend the flag staff horizontally across the traffic lane so the full area of the flag is hanging below the staff, visible to the motorist.

To Slow, Warn or Alert Traffic - Face traffic and wave the flag in a sweeping motion of the arm across the front of the body without raising the arm above the horizontal position.

To Release Traffic - When it is time and safe for the traffic to go on, move to the side of the line of traffic. Stand parallel to the flow of traffic; lower the flag out of view of traffic and motion the traffic to go with your free arm. Caution: Do not use flags to signal or wave traffic by you, or use rapid motions with your hand. The motorists may think you are impatient or making a motion to hurry.

**Control Methods for Paddle Sign:**

To Stop Traffic - Hold the paddle straight up with the full area (stop) of the sign visible to approaching drivers. Keep the palm of your hand extended toward the driver and maintain eye contact until the vehicle comes to a full stop.

To Slow, Warn or Alert Traffic - The slow sign should be displayed. For added effect, the flagger may slowly raise and lower his/her hand with the palm down.

To Release Traffic - Move to the right of traffic, stand parallel to the flow of traffic, show the waiting vehicles the "Slow" side of the paddle and motion with your free arm for them to go.

**Flag Control:**

Where the one-lane section is short enough so each end is visible from the other end, traffic flow may be controlled by a flagperson at each end. One of the two should be designated as the chief flagperson for purposes of coordinating movement. They should be able to communicate with each other verbally or by signals.

Where the end of a one-lane section is not visible from the other end, the flagperson may maintain contact by means of radio or field telephones. So the flagperson may know when to allow traffic to proceed into the section, the last vehicle from the opposite direction can be identified by description or license.

**Nighttime Flagging:**

Lights, reflectorized sign paddles or reflectorized flags should be used to flag traffic during dusk.
and night. Daytime flagging procedures should be followed when these lights, paddles or flags are used at night.

Night operations require precautions including illumination of the flagging station so the motorist can easily see the flagger's signals.