
## The Roadway Safety Alliance

Developed under a contract with the Centers For Disease Control & Prevention contract No. 212-2003-M-02677.

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*Produced in-house by LHSFNA*
*[OSH-0025E/May 2005]*


alliance
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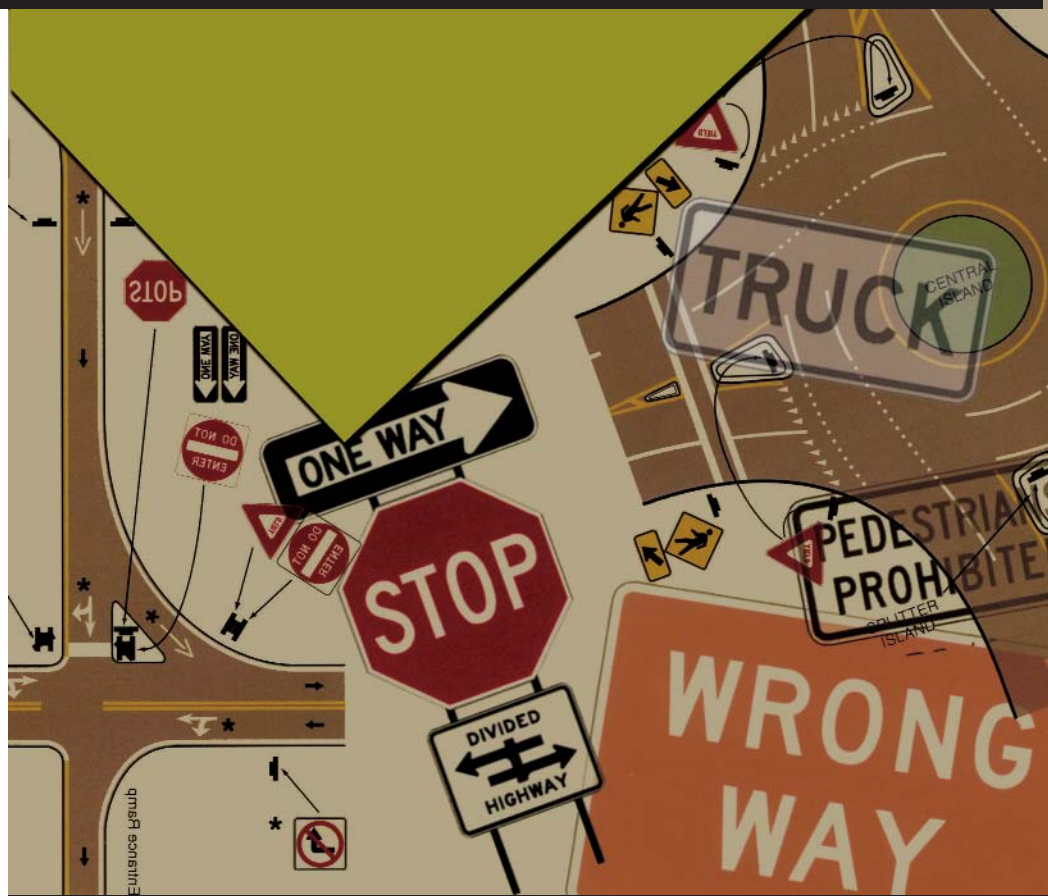
# INTERNAL TRAFFIC CONTROL PLANS






## Table of Contents



INTERNAL TRAFFIC CONTROL PLANS

| | Internal Traffic Control Plan Development Check List |
|---|---|
| | Draw basic work area layout, which can be taken from project drawings or the traffic control plan |
| | Plot where work activities will take place |
| | Plot the vehicle access points |
| | Identify where equipment will be backing and create pedestrian free zones |
| | Plot how workers will get to and from work areas |
| | Draw the traffic flow for large equipment |
| | Determine the storage areas |
| | Plot how materials will get to and from staging areas |
| | Establish parking areas for workers and visitors |
| | Establish restroom and break areas |
| | Plot utilities |
| | Write notes to explain the diagram and specify duties of personnel |
| | Write in vehicle speed limits |
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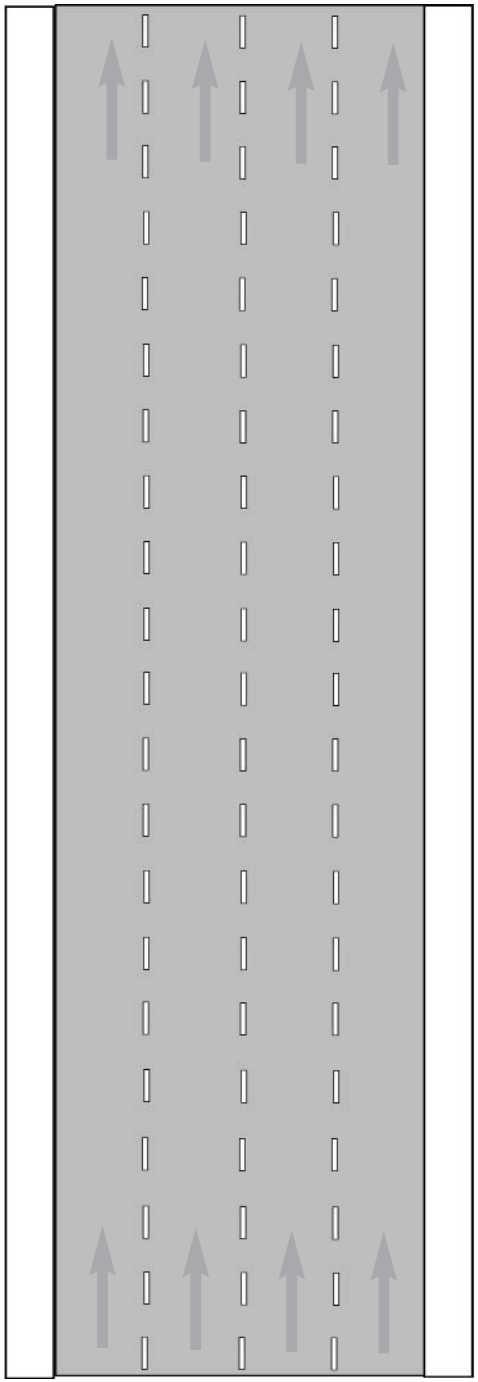
## Sample Internal Traffic Control Plans: Blank Four-Lane Highway



Use this blank four-lane highway and the checklist on the following page to practice sketching out internal traffic control plans for your operations. Remember, use the safe traffic control principles:
-Limit vehicle backing
-Control vehicle access points
-Isolate workers from vehicle and equipment movements
-Design buffer spaces to protect workers from vehicles and equipment.
-Use signage

Notes:





## Worker Crushed by Grader

On December 4, 2001, a 54-year-old construction laborer was killed when he was run over and crushed by a grader. The grader operator was driving in reverse on a road under construction in a housing development. The victim and a coworker were standing in the road at the rear of their parked pickup truck discussing the next stage of their work when the grader began backing in their direction. The back tire of the grader struck the victim, knocking him down. The operator stopped the grader when it struck the rear of the parked pickup. The victim was under the rear tire of the grader. Emergency care was initiated by EMS personnel, and the victim was transported to an area hospital where he died approximately 90 minutes after the incident.

## What is the Biggest Killer of Road Construction Workers?

Too many road construction worker fatalities occur inside the work zone as pedestrian workers are hit by construction vehicles. About 22 construction workers are killed this way each year (NIOSH, 2001). The biggest problem is dump trucks backing up.

Workers are struck mainly because many construction vehicles have large blind spots. The operators just can't see what is behind them. Back-up alarms are not always enough to protect pedestrian workers because 1) the alarms are not always working and 2) on a noisy site workers hear several back up alarms and get confused about the location of the vehicles. Internal traffic control plans (ITCPs) may help prevent deaths and injuries inside the work zone.

## What is an Internal Traffic Control Plan?

An ITCP is a tool project managers can use to coordinate the flow of construction vehicles, equipment and workers operating in work zones to prevent vehicular crashes, worker injuries and deaths. ITCPs also can be used on building sites and pipeline jobs. Establishing safe construction traffic control principles is the foundation for setting up an effective ITCP. These principles are:

- Isolate workers from equipment
- Reduce the need to back up
- Limit vehicle access points to work zones
- Coordinate truck and equipment movements
- Provide signs within the work zone to give guidance to pedestrian workers, equipment and trucks
- Design buffer spaces to separate pedestrian workers from errant vehicles and work zone equipment
- Inform all on-site personnel and workers of ITCP provisions

## How Do I Set Up an ITCP?

The ITCP is developed by one or more members of the contractor's staff and should be part of the project's safety plan. The safety officer should be in charge of developing the ITCP. However, foremen and supervisors are crucial for implementing the plan. They should be taught the principles of safe construction traffic control and be in charge of the daily set up and monitoring of the ITCP.

Site-specific ITCPs should be developed for different phases of the project as the site conditions change. Remember, ITCPs are not fixed but living plans, reflecting current conditions and subject to change as conditions warrant.

*The steps for setting up an ITCP are as follows:*

1. For each ITCP, draw the basic work area layout. In many circumstances, the basic layout can be taken from the traffic control plan for the phase being shown.
2. The drawing does not need to be to scale but should be of sufficient size to allow the addition of personnel and equipment paths.
3. Plot pedestrian worker and vehicle paths using the principles of safe traffic control. The most important step in the development of an ITCP is to plot where pedestrian workers will normally be located, the types of equipment in the work area and the path each piece of equipment will take in the work area. Be sure to designate access and egress points for dump trucks and other equipment.
4. Complete the ITCP diagram by plotting the location of utilities and storage areas within the work area.
5. The last step in the preparation of the ITCP is to write plan notes that explain the diagram and that specify the duties of various personnel in the work area – e.g., posting pedestrian worker-free areas and speed limit signs, developing injury reduction measures and fulfilling contract requirements.

## What Signage Can I Use for My ITCP?

No signage is specific for ITCP use. Any type of signage that can display legible direction to pedestrian workers and vehicle operators is acceptable. Before any new path, walkway, detour or temporary route is opened, put all necessary signs in place. Signs required by road conditions or restrictions should be removed when those restrictions are withdrawn. Care must be given to ensure that signs for traffic control inside the work zone cannot be seen by or confuse motorists. Sample signs from the *Manual of Uniform Traffic Control Devices* (MUTCD) that could be used to provide guidance to pedestrian workers and equipment operators are shown on the next page.





## What about Independent Truck Drivers, Vendors and Site Visitors?

When access points can be controlled, truck drivers should be briefed or given a ITCP map on how to enter the project site, paths to follow, where to stop for staging and told how the spotter will instruct them. Truck drivers should also be briefed on procedures for leaving the project area and re-entering the traffic stream.

Vendor procedures for handling and storing construction materials arriving at the project should also be discussed. Visitors should park at an off-site staging area and then be briefed on the ITCP. If visitors drive to the site, they should enter at a recognized visitor entrance point, park and walk in approved areas.

## What Other Measures Can I Use to Protect Workers from Vehicular Traffic?

In addition to an ITCP, the use of backing video devices (especially rear view video) and the use of spotters may reduce work zone hazards.

***NIOSH Invites Input***

NIOSH believes ITCPs are a promising and useful intervention to address hazards inside the work zone. NIOSH is currently doing an evaluation of the value of ITCPs, and your help would be appreciated. If you can provide information about using ITCPs, or if you are involved in a large project where we can evaluate ITCP interventions, please contact David E. Fosbroke, at NIOSH Division of Safety Research, 1095 Willowdale Road, M/S 1808, Morgantown, WV 26505 or call (304) 285-6010.

### Resources

*Building Safer Highway Work Zones*, NIOSH, April 2001: http://www.cdc.gov/niosh/2001128.html.

*Internal Traffic Control Plan Draft Development Guide,* C.L. Williams Consulting, Inc., Final Report to NIOSH, contract No. 200-2002-00596, June 2003.

*Internal Traffic Control Plans*, Graham-Migletz, LHSFNA, 1997.

*Highway Work Zone Safety Manual*, LHSFNA, December 2003.

LHSFNA: www.lhsfna.org

*Manual on Uniform Traffic Control Devices*, FHWA, November 2003: http://mutcd.fhwa.dot.gov/.

NIOSH: www.cdc.gov/niosh/injury/traumazone.html.

## How Do I Adapt Samples to Specific Sites?

1. Compare actual worksite and conditions to that shown in samples and adjust accordingly.
2. Determine personnel and equipment needed.
3. Determine where pedestrian workers will face vehicle hazards:
    a. Where will equipment be backing?
    b. Where are the vehicle access points?
    c. Where will work activities take place?
    d. How will workers get to and from work areas?
    e. What are the traffic flow paths of large equipment?
    f. Where are the utilities?
    g. Where will workers and visitors park, eat lunch and use port-a-johns?
    h. Where will materials and equipment be stored, and how will the material get from staging areas to the work area?
4. Redraw or modify plan to make it site-specific.
5. Distribute plan to all work zone personnel.

## How Do I Communicate the ITCP to Staff, Subs and Site Workers?

Copies of the ITCP should be given to all personnel on the project, including inspectors, subcontractors and vendors. The ITCP should be updated daily at safety meetings. Subcontractors should be required to attend ITCP briefings. During the project, the ITCP should be consulted when reviewing construction progress and adapting to the daily challenges that are part of any construction project.

During construction, the safety officer, site supervisors and foremen should update and review the ITCP with workers daily. The plan is useful in showing the project owner and personnel that worker safety is being addressed.

## How Do I Enforce the ITCP?

The safety officer, foremen and supervisors are all responsible for maintaining work zone compliance and should be able to warn pedestrian workers or vehicle operators of violations of the ITCP. Warnings should be given to workers out of position, vehicle operators in pedestrian worker zones or truck drivers moving at speeds above the site limit. Violations should be treated as violations of standard company policy.

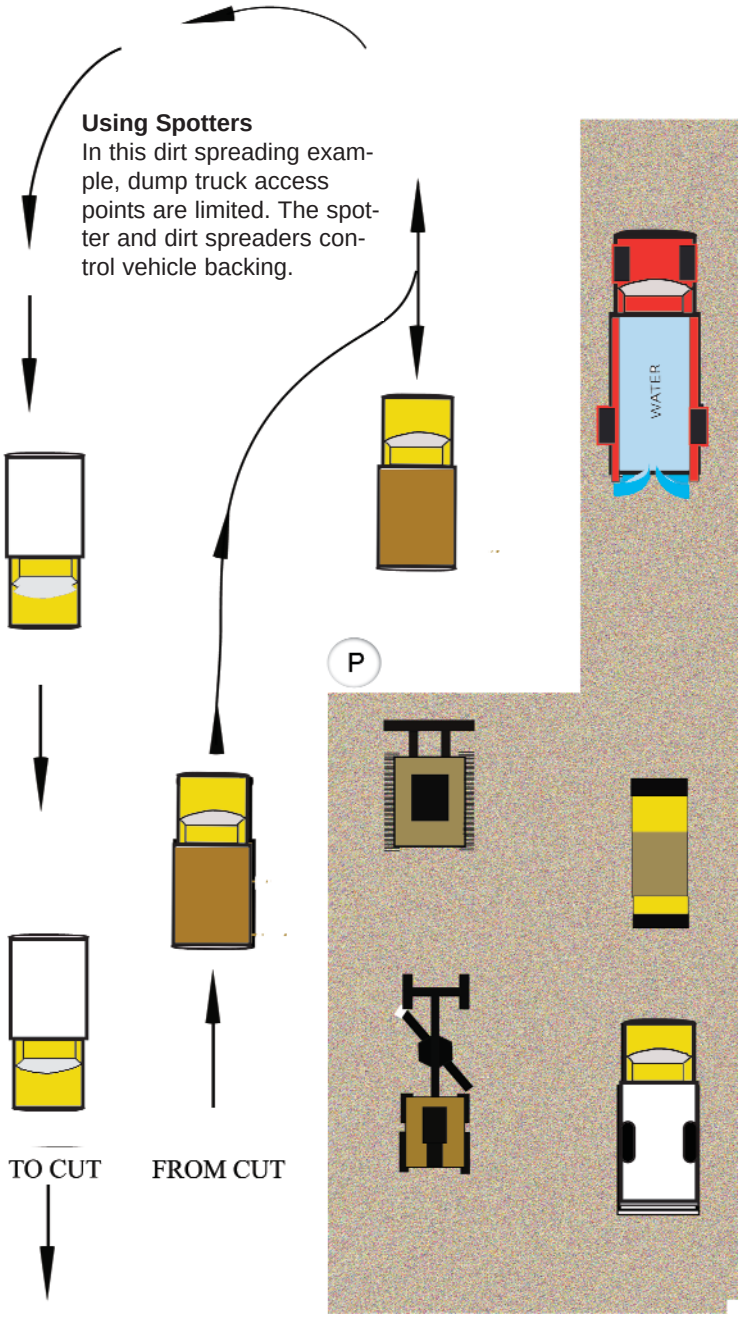




## Samples from the MUTCD of Signage that can be incorporated into Internal Traffic Control Plans:

**Signs should be used only where justified and should not be seen by passing motorists.**

## *Sample Internal Traffic Control Plans: Dirt Spread Model Plan*



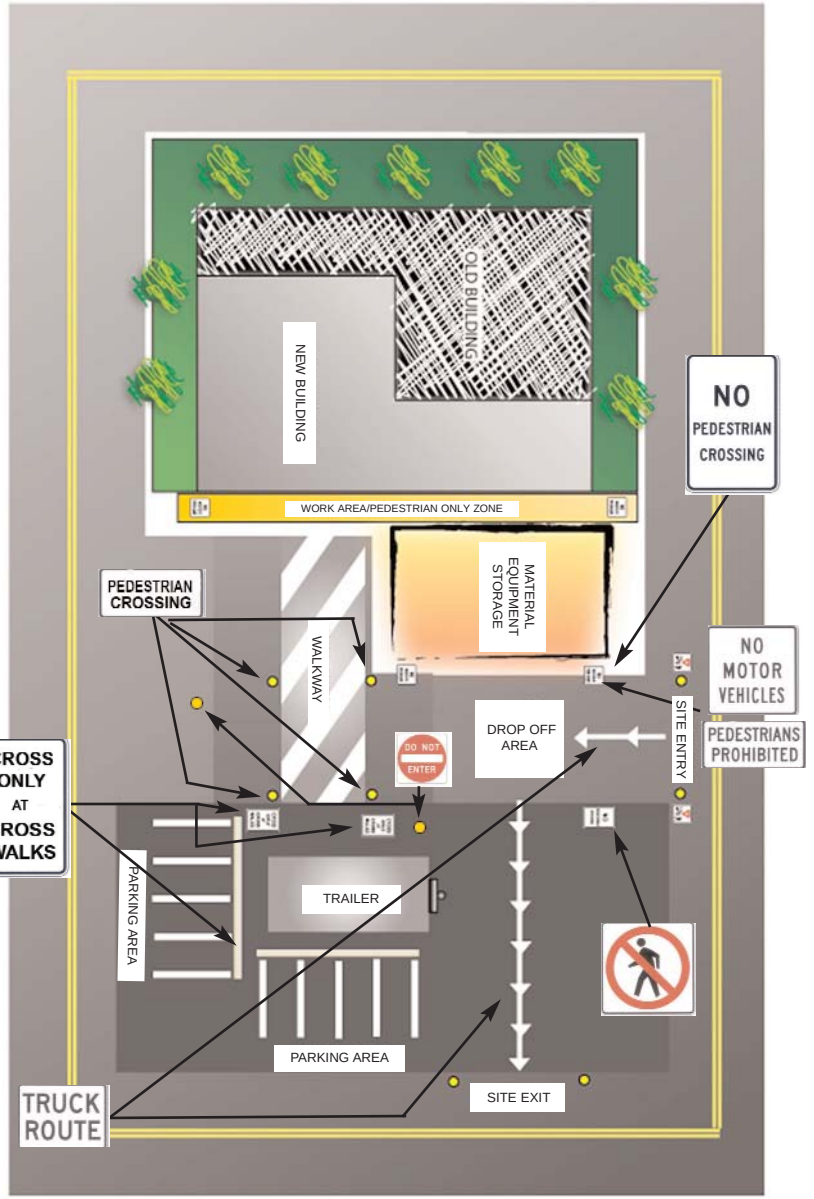




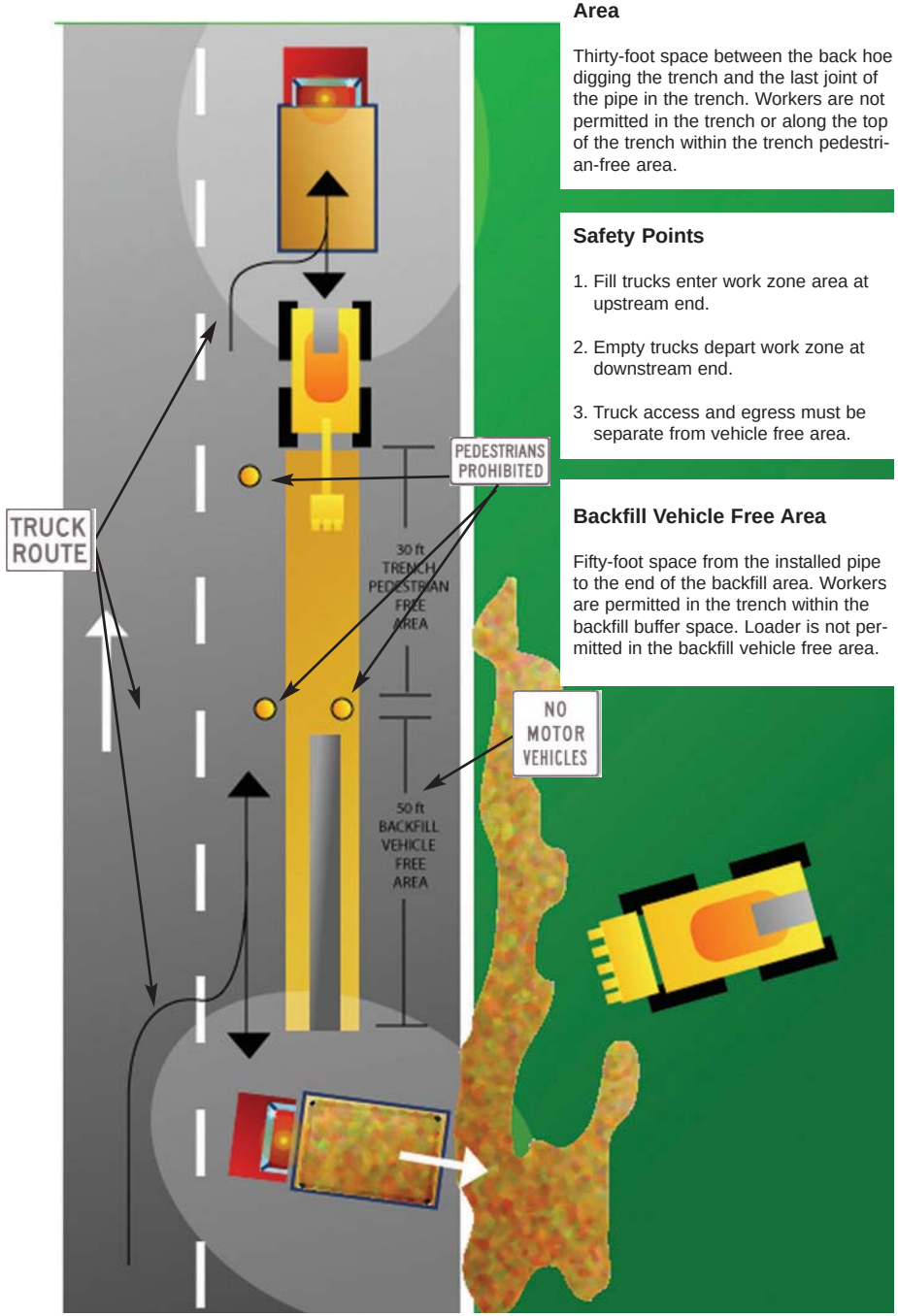

## *Internal Traffic Control Plans: Building Construction*

**Safety Points**

- Vehicle traffic flow is separated from pedestrian traffic. Vehicles are prohibited in areas where pedestrian workers are working.
- Pedestrian worker free areas have been designated around specific pieces of equipment and operations.
- Vehicle backing has been eliminated or severely restricted.
- Storage locations for material and equipment are designated away from pedestrian worker flows.
- Worker and visitor parking areas are designated away from vehicular traffic.



## *Sample Internal Traffic Control Plans: Trenching/Pipelaying ITCP*




**Trench Pedestrian Worker Free Area**

Thirty-foot space between the back hoe digging the trench and the last joint of the pipe in the trench. Workers are not permitted in the trench or along the top of the trench within the trench pedestrian-free area.

**Safety Points**

1. Fill trucks enter work zone area at upstream end.
2. Empty trucks depart work zone at downstream end.
3. Truck access and egress must be separate from vehicle free area.

**Backfill Vehicle Free Area**

Fifty-foot space from the installed pipe to the end of the backfill area. Workers are permitted in the trench within the backfill buffer space. Loader is not permitted in the backfill vehicle free area.

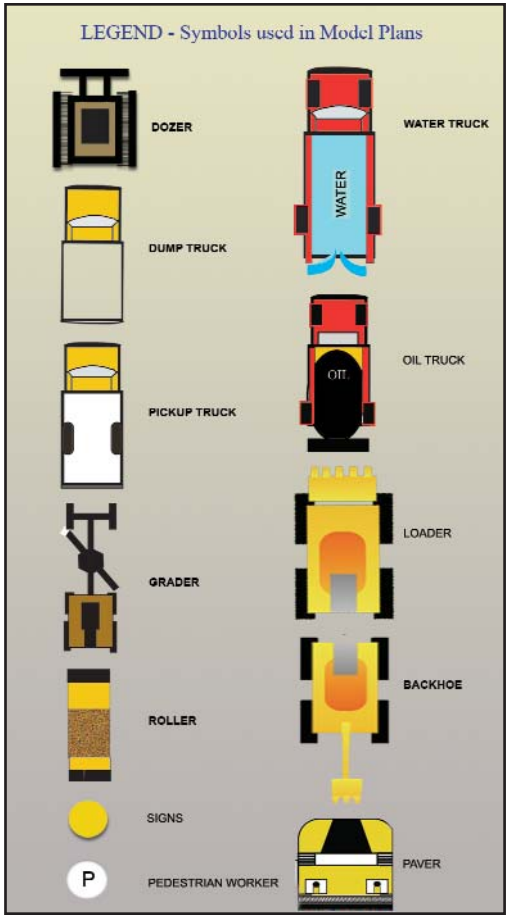




## *Sample Dirt Spread Model Plan Notes*

### SAFETY POINTS–INJURY REDUCTION MEASURES

1. Where possible use earth movers to eliminate backing
2. When trucks are used, spacing of dumps is critical
3. Eliminate backing to improve safety and speed operations
4. Give the trucker a point to back to - don't wave
5. Use as few pedestrian workers as possible
6. Inspectors stay near pickup trucks which are easier to see
7. Work in long rows to eliminate crossing trucks and equipment




### PERSONNEL

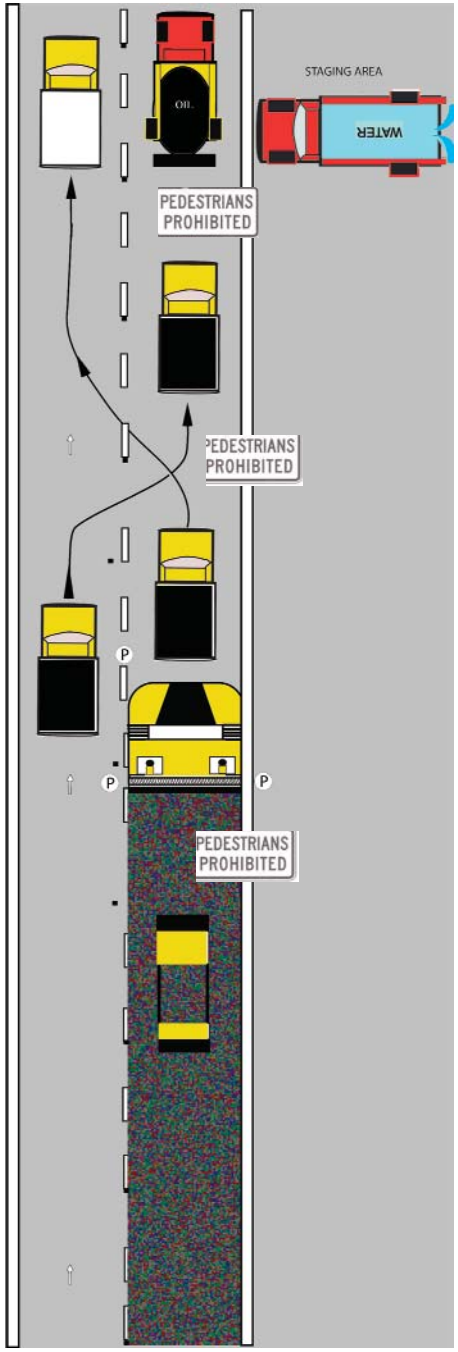
Truck Drivers
Spotter
Dozer Operator
Grader Operator
Water Truck Driver
State Inspector

### EQUIPMENT

Water Truck
Dozer
Grader
Roller
Dump Truck with fill
Fill

Adapted from *Internal Traffic Control Plan,* Graham-Migletz, LHSFNA, 1997.

## *Sample Internal Traffic Control Plans: Paving Model Plan*




**Establish Pedestrian Worker Free Zones**

During paving operations pedestrian workers are not allowed to walk behind trucks, in front of the paver or across the hot mat.





## *Sample Paving Model Plan Notes*

### SAFETY POINTS–INJURY REDUCTION MEASURES

1. Truck spotter stays at paver
2. Stage trucks to minimize backing
3. No walking behind backing trucks, in front of paving machine or across hot mat

### PERSONNEL

Truck Drivers
Truck Spotter
Paver Operator
Roller Operators
Inspector
Superintendent
Test Personnel

### EQUIPMENT

Oiler Trucks
Dump Trucks
Pavers
Rollers