



# Guidelines



on  
**Work Zone  
Access  
and  
Egress**

This document describes concerns associated with work zone access and egress. The document offers recommended practices and describes effective strategies and techniques that can be employed during the planning and construction phases to help mitigate concerns.

This document is organized into the following sections:

- Importance of Work Zone Access and Egress Considerations
- Planning and Designing the Work Zone to Minimize the Impact of Accelerating and Decelerating Construction Vehicles on Traffic Flow
- Maintaining Access and Egress Points During Construction
- Incorporating Access and Egress into Internal Traffic Control Plans (ITCPs) with Examples of Innovative Ideas and Best Practices
  - Median Access from Cross-Street Overpass
  - Use of Intelligent Transportation System (ITS) Technology
  - Incorporation of Construction Access and Egress Details into Project Plans

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Refer to <http://www.workzonesafety.org> for a copy of this document.



# Guidelines on Work Zone Access and Egress

## Background

The establishment and maintenance of safe access and egress points are key determinants of project safety. In order for roadway construction jobs to maintain safe operations, there must be procedures to allow for safe and efficient passage of work vehicles into and out of the work space and for motorists to travel through the work zone. Effectively addressing safe access and egress at the project level requires planning during the project development phase and implementing traffic control plans throughout the entire project.

In December 2007, the U.S. Federal Highway Administration issued a new rule, 23 CFR 630 Subpart K, to promote safety for workers and motorists in roadway construction zones. One section of the new rule states, “In addition to addressing risks to workers and road users from motorized traffic, the agency processes, procedures, and/or guidance . . . should also address safe means for work vehicles and equipment to enter and exit traffic lanes and for delivery of construction materials to the work space, based on individual project characteristics and factors.”

## Importance of Work Zone Access and Egress Considerations

Access to and egress from highway construction and maintenance zones presents a significant challenge to both travelers and work crews when the work is taking place on or adjacent to a highway that is open to traffic. This is especially true if the highway carries high traffic volumes or traffic speeds are high.

Safety challenges include:

- motorists following construction vehicles into the work space;
- acceleration and deceleration of construction vehicles as they exit and enter open traffic lanes;
- proximity of workers-on-foot to access and egress locations; and
- proximity of parked or staged equipment to passing motorists.



Access and egress issues are most effectively addressed in the temporary traffic control (TTC) planning and design phase before construction begins. The designer should address how contractors will safely move personnel, materials, and equipment into and out of the work area with minimum disruption to traffic and exposure of workers to the traveling public.

While proper planning is important, systematic reviews of changing conditions are also essential throughout construction to ensure that planned access and egress points meet safety and mobility performance needs. This review process requires continued maintenance of all access points, communication with personnel using access points, and a mechanism to modify plans to rectify any access or egress problems that arise during construction.

## Challenge 1: Planning and Designing the Work Zone to Minimize the Impact on Traffic Flow from Accelerating and Decelerating Construction Vehicles

Construction vehicles entering or exiting the work space can create significant speed differentials between themselves and normal traffic using the facility. Large speed differentials have significant adverse effects on both work zone capacity and work zone crashes and should be minimized as much as possible. Access and egress considerations are particularly challenging in large-scale projects or on high speed/limited access highways. In addition, projects with significant roadside development and frequent driveway access create construction vehicle acceleration and deceleration conflicts.

### Recommended Practices



Project planners and work zone designers should strive to anticipate conditions requiring work vehicles to merge in/out of high-speed traffic or work activities that will generate frequent delivery of materials (i.e., paving operations, bridge work, and aggregate work). Planners must ensure adequate right-of-way is secured and obstacles are identified to allow for safe vehicle operations into and out of the activity area. Depending on the work operation, planners should also consider where vehicles waiting to deliver materials will be positioned so that they are not queued in active travel lanes.

A good practice is to observe and record site conditions and traffic patterns to plan for high traffic levels, peak period volumes, or potential crash areas and conditions that might arise if trucks begin to queue. Consideration should also be given to road speeds, average daily traffic (ADT), and factors impacting construction vehicle acceleration and deceleration when interacting with traffic lanes.

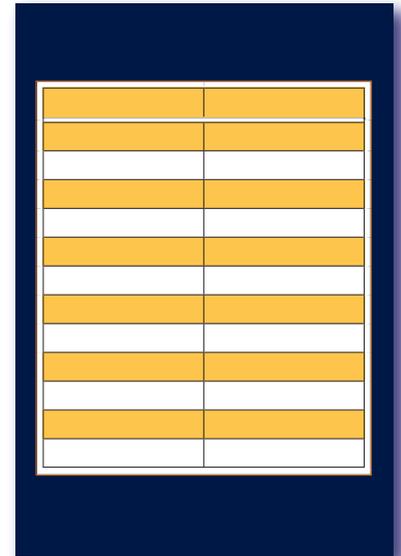


Further, access and egress locations should be planned and integrated in the TTC plan. Adequate acceleration/deceleration space for work vehicles should be provided and the location of access openings should meet the sight distance requirements as provided in stopping sight distance tables, such as Table 6E-1 from the national *Manual of Uniform Traffic Control Devices* (MUTCD). Lane and/ or shoulder closures may be necessary to provide sufficient acceleration/deceleration space in these plans.

Construction access openings in temporary traffic barriers should be planned per state and/or Federal requirements to ensure that blunt ends of barrier walls are properly protected. Channelization and delineation devices used in conjunction with barriers should be planned in a manner that does not create a sight distance problem for truck drivers, equipment operators, or motorists.



Elevation differences between the travel lanes and the work space can adversely affect the speed at which construction vehicles can enter and exit the work space. Consequently, work zone designers should strive to



keep such elevation differences to a minimum. Access/egress conditions may be further improved by lowering the speed limit when work is active and then enforcing the speed limit. Any reduction in the posted speed limit should be authorized by the appropriate, responsible traffic engineer and based on an engineering study.



Designers should also consider the possibility of motorists mistakenly following construction vehicles into the work space and take steps to prevent this confusion. A variety of devices or traffic control procedures should be considered to improve safety and mobility near access and egress points. Any changes to planned points should be coordinated with the TTC plan, access/egress controls, and driver notification devices.

Additional warning signs may be used to alert motorists about access/egress points when appropriate. These signs may include static signs (e.g., TRUCKS ENTERING ROADWAY or CONSTRUCTION VEHICLES ONLY), static signs with flashing beacons, and Portable Changeable Message Signs (PCMS). If a PCMS is used, it can also provide other information such as whether a work zone is active or real-time traveler information.

Modifications to the spacing of temporary traffic control devices (TTCDs) can be considered to allow easier access/egress into the construction area and clearer notification to motorists. For example, tapers may be lengthened on limited access highway lane closures to allow construction vehicles to merge smoothly with moving traffic.

Other modifications to temporary traffic control may include:

- temporary rumble strips;
- larger warning signs and additional sign messages;
- brighter sign sheeting and wider stripes on drums and cones;
- arrow panels;
- larger channelizing devices and use of longitudinal channelizing barricades;
- reduced spacing of channelizing devices;
- high quality temporary pavement markings and proper removal/covering of conflicting markings;
- use of truck mounted attenuators (TMAs); and
- temporary traffic signals, flaggers, and automatic flagger assistance devices (AFADs).

For night work operations, designers should anticipate special lighting needs near access/egress points to ensure motorists and construction vehicles clearly see and understand where such points are located.



## Challenge 2: Managing Access and Egress Points During Construction

On some projects, access/egress points may need to be relocated from time to time. On other projects, access/egress points may be used during some phases but not during others. In both cases, there are likely periods when work activity is not occurring and thus access/egress points are not active. All warning signs noting work zone access and egress activities should be covered or removed when work is not active. Appropriate techniques and strategies need to be in place during the day-to-day construction activities to facilitate safe utilization of access and egress points.

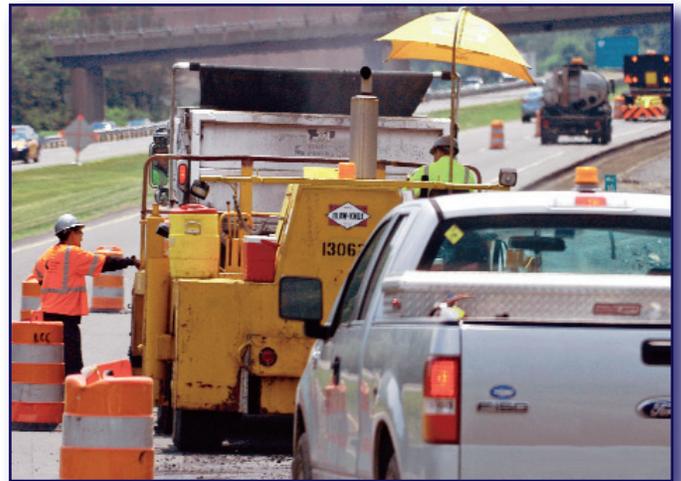
### Recommended Practices

Contractors should provide appropriate information to work vehicle drivers so that they know the safe locations to enter or exit the work zone.

For most projects, contractors, subcontractors, supervisors, and agency/company officials need special, site-specific training to ensure the movement of construction vehicles and motorist traffic operates in a smooth, coordinated fashion. In many situations, subcontractors and independent truck drivers are not included in these discussions. Work vehicle access/egress plans, including any changes to previously used plans, should be discussed with and communicated to contractor employees, truck drivers, owner/agencies, and others who are likely to visit the construction site. This discussion may take place during partnering or pre-shift meetings when subcontractors are present.

Some issues for consideration include:

- instructing truck drivers about access/egress points and acceleration/deceleration on an active roadway so they can position themselves to enter the work space smoothly, without erratic maneuvers;
- meeting pre-shift with truck drivers and project supervisors to discuss daily activities, traffic control plans, and project progression;
- meeting with new truck drivers and on-site employees to orient them to project traffic control and safety requirements;
- requiring truck drivers to keep windows open (weather permitting) when on the project and while entering the work space to hear communications and warnings;
- ascertaining how queues will impact traffic outside the work space and worker safety and operations inside the work space;
- talking with independent drivers about possible economic incentives that could cause them to take unnecessary risks, the impacts of reckless driving, and how the incentives may be mitigated;
- setting up a process and assigning responsibilities to monitor traffic conditions and coordinate delivery of materials to minimize delays (Traffic conditions may change frequently during the work shift.);



- ensuring employment of a qualified person to conduct a crash investigation (Careful assessment and documentation are important to account properly for damages to temporary traffic barriers and other temporary traffic control devices. Crash investigation equipment should be available at all times.); and
- considering use of media specialists to provide regular updates related to changes in traffic patterns (effective time, location, related traffic impacts, etc.) through media outlets.



Contractors must ensure acceleration and deceleration lanes are adequate for safe and smooth access/egress of loaded and unloaded construction vehicles.



Contractors may equip construction vehicles with a warning sign displaying language such as CONSTRUCTION VEHICLE DO NOT FOLLOW to minimize the risk of motorists following a work vehicle into the active work area. Another recommended practice to alert drivers is to equip vehicles and equipment entering or exiting the work area with amber high intensity rotating, flashing, or oscillating lights. Additionally, under some conditions, traffic spotters or police enforcement officers may be needed to assist work vehicles and equipment in entering and exiting the traffic space.

Specific time frames and expectations need to be set and understood regarding how and when temporary traffic control devices near access and egress points will be inspected, maintained, and repaired by the contractor in cooperation with the owner/agency. Contingency plans should be set for times when the contractor is not on-site.

Barrier treatments for openings, crash cushions, or attenuator placement for exposed barrier ends should be regularly monitored and evaluated for adequate performance.

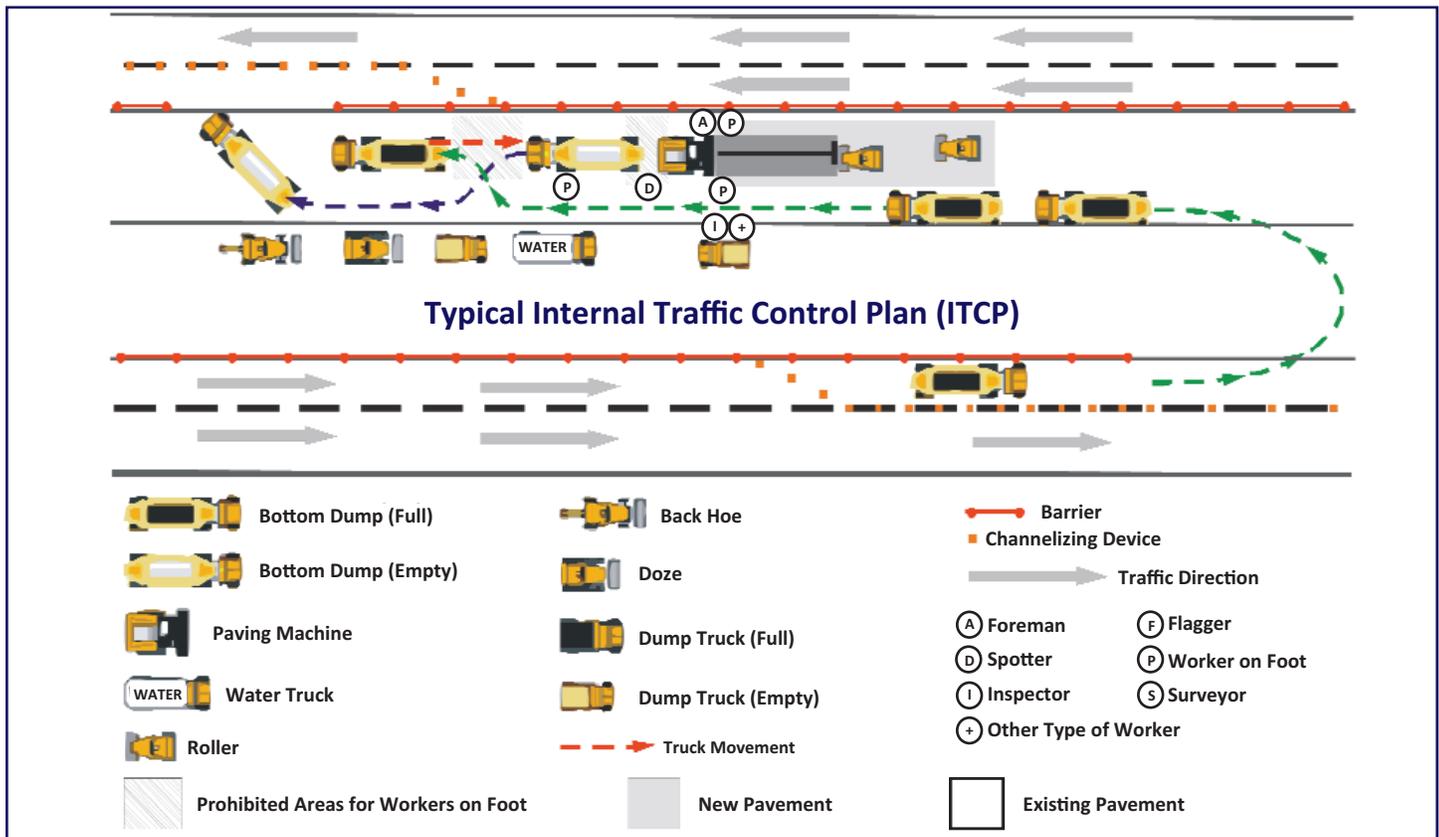
### **Challenge 3: Incorporating Access and Egress into Internal Traffic Control Plans (ITCPs)**

An Internal Traffic Control Plan (ITCP) is a tool to coordinate the flow of construction vehicles, equipment, and workers operating in work zones. ITCPs help prevent worker injuries and deaths from being stuck by work vehicles and equipment and reduce the risk of impacts between work vehicles. In regard to work space access/egress, ITCPs are useful in:

- isolating workers on foot from trucks and equipment;
- limiting/controlling vehicle access points;
- coordinating truck and equipment movements; and
- providing guidance to workers on foot, truck drivers, and equipment operators.

See NIOSH Highway Work Zone Safety website at

<http://www.cdc.gov/niosh/topics/highwayworkzones/>



## Recommended Practices

Activities that occur under the direction of construction contractors include maintaining a clear/open area around access/egress points where equipment or vehicles should not be parked. Contractors are also responsible for educating on-site employees about areas near access/egress points that are prone to heavy truck traffic and inspection of trucks entering the work area for proper safety functions (i.e., lights, beacons, backup alarms, and other safety features).

## Examples of Innovative Ideas and Best Practices

When planning and designing for work zone access and egress, care should be taken not to rely only on procedures used in previous projects. Innovative approaches have been developed that not only have improved safety for workers and motorists, but have also improved the efficiency of project operations.

The following examples of innovative ideas were developed to improve safety and productivity during a project with significant access/egress challenges.

### Median Access from Cross-Street Overpass

During a major Interstate reconstruction project in North Carolina, the plans called for construction of two new lanes in the median which required the delivery of approximately 17,000 loads of asphalt. The loads would have to be delivered via an Interstate carrying 100,000 vehicles per day with a posted speed limit of 65 miles per hour. This created a significant access/egress concern for the contractor.

To resolve the access/egress dilemma, the contractor proposed closing down one lane and the shoulder of an overpass that crossed the Interstate. A portion of the parapet wall on the closed side of the overpass was removed, and an earthen ramp was constructed from the median to the overpass. Using this configuration, construction vehicles could access the Interstate median via the less-traveled overpass without impacting the high-speed traffic in the Interstate.

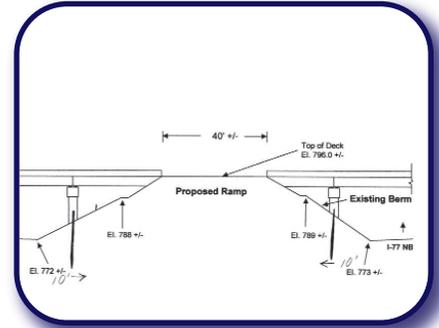
*“I looked at the plan and thought ‘This is crazy,’” said the state engineer who oversees construction. “But the more we looked at it, the more sense it made. We’re going to let them do it.”*



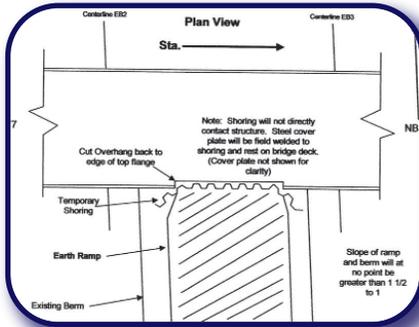
**Widening 8 miles of I-77  
\$85 million contract  
3 Interchanges including I-85**



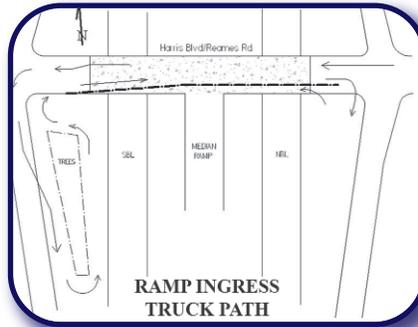
**Phase I – Construct 2 new lanes in the median; haul 300,000 tons of asphalt into median.**



**“Crazy” proposal: build earth ramp up to overpass to create access point.**



**Plans called for building a ramp to the overpass and allowing access without compromising the ramp’s integrity.**



**To access the ramp, a lane and shoulder of the overpass were closed and barricaded to prevent motorist access.**

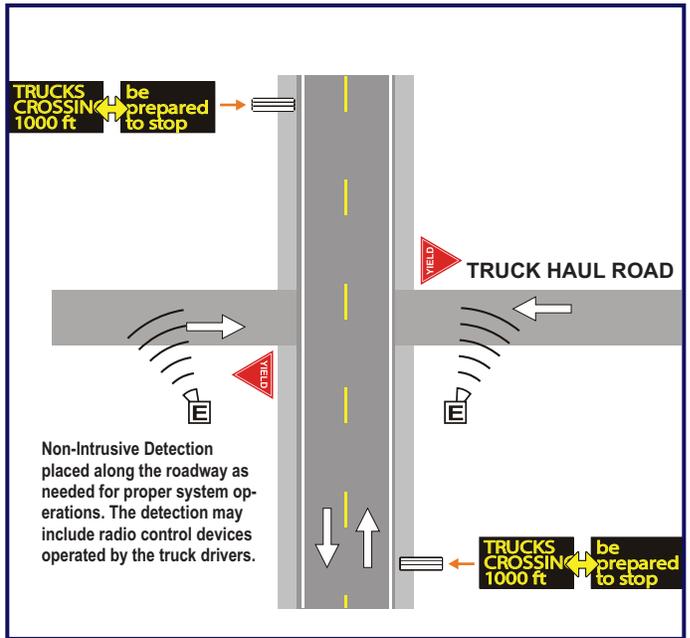
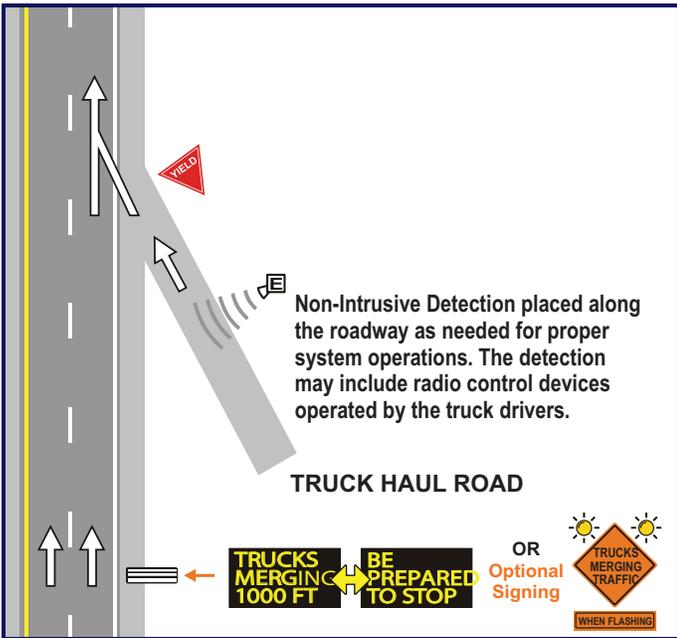


**The completed project allowed for safe access to the median by construction vehicles while improving productivity.**

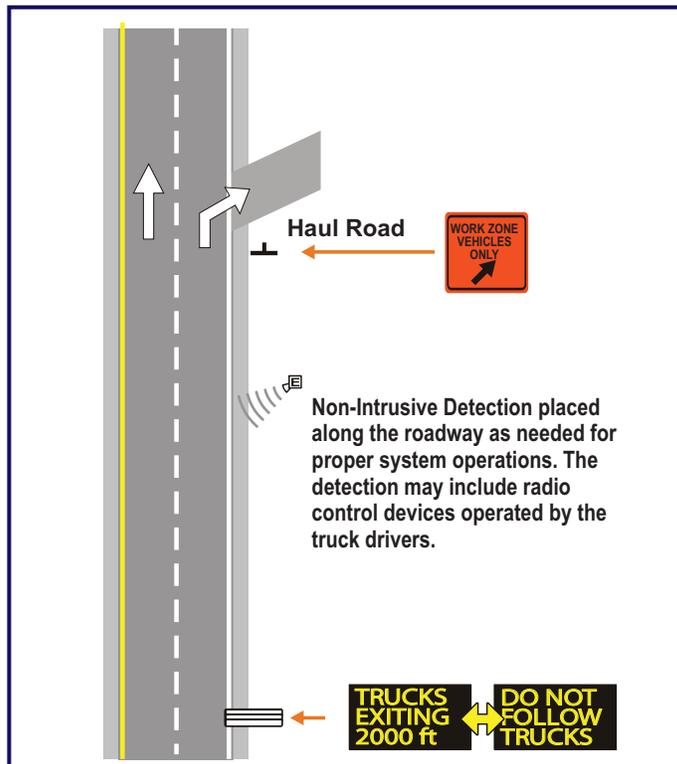
## **Use of Intelligent Transportation System (ITS) Technology to Improve Access and Egress Safety**

A few agencies have experimented with the concept of using ITS technology to detect automatically when construction vehicles are planning to enter or exit the work space and notify motorists traveling through the work zone. The intent is to prepare motorists for construction vehicle slowdowns and possible merging conflicts. In addition, it is hoped that the warning may also reduce the frequency of motorists following construction vehicles into the work space.

Specific examples are illustrated in the figures from the Minnesota Department of Transportation (DOT) on the following page.



Specific examples of ITS application from the Minnesota DOT.



### Incorporation of Construction Access and Egress Details into Project Plans

As part of its ongoing review of work zone activities and continuous improvement process, the Ohio DOT noted a recurring problem regarding crashes that appeared to result from conflicts between work vehicle access/egress to the work space and motorists. As a result, a standard construction access point plan inset was developed (see figure on next page) to be followed by contractors when establishing these access and egress points on multi-lane divided facilities.



## How Can I Locate More Information Regarding This Topic?

Guideline for Intelligent Work Zone System Selection. Minnesota Department of Transportation. 2008 Edition.

<http://www.dot.state.mn.us/trafficeng/workzone/iwz/MN-IWZToolbox.pdf>

Construction Access Points. Plan Inset Sheet 209563. Ohio Department of Transportation.

[http://www.dot.state.oh.us/Divisions/HighwayOps/Traffic/publications2/PISs/Documents/209563\\_041610.pdf](http://www.dot.state.oh.us/Divisions/HighwayOps/Traffic/publications2/PISs/Documents/209563_041610.pdf)





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**International Union of Operating Engineers**  
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