



# INDIANA DEPARTMENT OF TRANSPORTATION

*Driving Indiana's Economic Growth*

## Memorandum

October 30, 2007

### CONSTRUCTION MEMORANDUM 07-25

TO: District Deputy Commissioners  
District Highway Operation Directors  
District Construction Engineers  
District Testing Engineers  
District Area Engineers  
Project Engineers/Supervisors

FROM: Mark A. Miller, Director *Mark Miller*  
Division of Construction Management

SUBJECT: Measurement of Interstate Work Zone Queues and Delays

The Federal Highway Administration has amended the regulation that governs traffic safety and mobility in highway and street work zones. The final rule on **Work Zone Safety and Mobility** was published in the Federal Register on September 9, 2004 and requires state and local governments that receive federal aid highway funding to comply with the provisions of the rule no later than October 12, 2007.

Specifically, states are now required to measure work zone queue lengths and delays due to traffic restrictions on interstates. The full text of the rule can be found at:

[http://www.ops.fhwa.dot.gov/wz/docs/wz\\_final\\_rule.pdf](http://www.ops.fhwa.dot.gov/wz/docs/wz_final_rule.pdf)

The rule has many implications, but the purpose of this memo is only to address the required collection of work zone data through field observations.

Effective immediately, the PE/S will measure and report traffic queue lengths and delays on all applicable construction contracts involving interstate work zones. Instructions and forms are attached for performing work zone queue length and delay measurements. Please read the material carefully to determine which interstate construction contracts are applicable.

If further clarification or guidance is needed, the PE/S should contact the District Traffic Engineer.

MAM:RLH:jjn

attachments

## MEASUREMENT OF WORK ZONE QUEUE LENGTH AND DELAY

The Federal Highway Administration requires the Department to monitor and report traffic queue lengths and delays in interstate work zones during restrictions due to construction or maintenance operations. The queue length and delay measurements are also used by the Department to update the Interstate Lane Closure Policy to better reflect actual traffic conditions during restrictions. It is the responsibility of the PE/S to ensure that adequate measurements are taken and reported for construction contracts. The following are guidelines for performing work zone queue length and delay measurements. If further clarification or guidance is needed, the PE/S should contact the District Traffic Engineer.

### Definitions

#### **Delay**

The amount of time, to the nearest minute, spent traveling at an average speed of 10 mph or less through a work zone. Delay begins at the moment travel speed becomes 10 mph or less and ends at the moment normal travel speed is permanently, not intermittently, resumed.

#### **Point of Restriction**

The first point in a work zone at which the entire roadway is no longer open to normal traffic, including lanes, shoulders and ramps. This is typically the position of the flashing arrow sign for a lane closure or the point where a shoulder or ramp is closed.

#### **Queue**

A line or lines of traffic in which the average speed is reduced to 10 mph or less due to a restriction. This includes intermittent, "stop and go" periods above 10 mph.

#### **Queue Length**

Length, to the nearest 0.1 mile increment, from the point that a queue develops to the point of restriction.

#### **Segment**

The interstate between 2 consecutive interchanges.

### Requirements

Queue length and delay measurements are to be made on interstate projects when lane, shoulder or ramp restrictions will be in place in at least 1 direction for a total of at least 10 days. For purposes of taking measurements, the 10 days of restriction do not need to be consecutive and any portion of a day is counted as a whole day. In order to allow traffic to settle in to a given traffic maintenance pattern, measurements generally should not be taken until 3 to 5 days after:

- an initial traffic maintenance setup,
- a change in traffic maintenance phase,
- a shift of traffic maintenance from one highway segment to another,
- a change in traffic maintenance setup in response to excessive queue lengths, or
- a significant change in the traffic maintenance setup.

Likewise, the PE/S generally shouldn't wait more than 7 to 10 days after any of the above occurrences to take and record queue length and delay measurements.

Measurements are required to be reported at least twice during the highest traffic volume period when restrictions are in place. If a restriction is in place for at least 7 consecutive days, at least 1 measurement should be made during the highest volume period on a weekend day. The District Traffic Engineer can provide assistance in determining the highest traffic volume periods in which to take measurements.

### **Measurements**

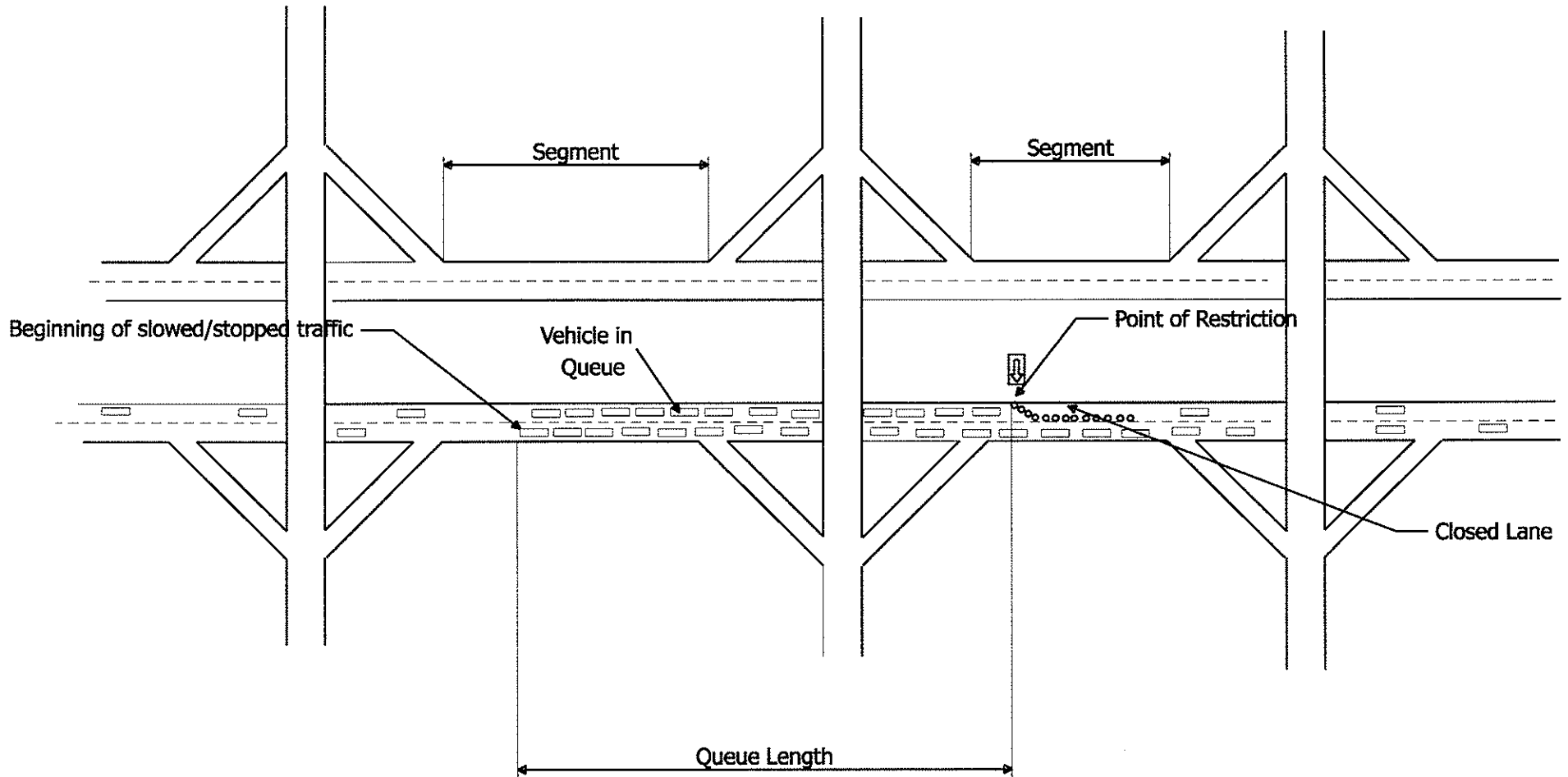
The best method of taking queue length and delay measurements is to drive through the work zone during the identified high traffic volume period. At the point where speed is reduced to 10 mph or below, basically stop and go traffic, note the odometer reading and the time. Continue through the zone to the point of restriction and again note the odometer reading. Continue through the zone until speed in excess of 10 mph can be maintained and note the time (*See following figure*).

### **Reports**

A Work Zone Queue and Delay Report (*See following form*) should be completed each time a set of measurements is taken. The original should be submitted to the District Traffic Engineer, a copy sent to central office Work Zone Safety Section, Rm N901 (or fax 317-232-5551 or email [jmccarty@indot.in.gov](mailto:jmccarty@indot.in.gov)), and a copy kept for the project file.

# Work Zone Queue Measurement Diagram

Interchange



**INDOT  
WORK ZONE QUEUE & DELAY REPORT FORM**

Contract No: \_\_\_\_\_

Route & Project Limits/Location: \_\_\_\_\_

County: \_\_\_\_\_ District: \_\_\_\_\_

Occasion: \_\_\_\_\_

*(see note 1)*

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Measurement 1:**

Direction of Travel: \_\_\_\_\_ Time: \_\_\_\_:\_\_\_\_ am/pm

Location of Queue *(see note 2)*: \_\_\_\_\_

Queue Length: \_\_\_\_\_ miles Delay: \_\_\_\_\_ minutes

**Measurement 2:**

Direction of Travel: \_\_\_\_\_ Time: \_\_\_\_:\_\_\_\_ am/pm

Location of Queue *(see note 2)*: \_\_\_\_\_

Queue Length: \_\_\_\_\_ miles Delay: \_\_\_\_\_ minutes

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
**Signed, Project Engineer/Supervisor**

\_\_\_\_\_  
**Report Date**

**NOTES:**

1. Occasion refers to the event (e.g. start of construction, phase change, location change) that is prompting the measurements.
2. Location of Queue refers to the location that the queue begins, for instance "the left lane merge taper for the crossover at station 123 + 50"

cc: District Traffic Engineer  
Work Zone Safety Section, Rm N901 (or fax 317-232-5551)  
Project File