

Welcome!



Urban Work Zone Design Training Course

Instructor

Instructor's Name Here



About This Course

- ◆ This material is based upon work supported by the Federal Highway Administration (FHWA) under grant agreement NO. DTFH61-06-G-00004



***Developed and
Presented by***

***American Traffic Safety
Services Association***



Course Objectives

- ◆ Review of **temporary traffic control standards and guidelines**
- ◆ Discuss issues and considerations related to the application (design) of those standards and guidelines in **urban areas**

Course Schedule

DAY 1	DAY 2
1. Introduction	5. Closures (& WORKSHOP)
2. Standards & Guidelines	6. Other Considerations
3. Component Parts	Closing / Exam
4. Devices	Adjourn

Exam

- ◆ **25 True/False questions @ 4 points each = 100 pts**
- ◆ Open book, open notes
- ◆ One hour time limit
- ◆ Passing score: **80%**

EXAM

Urban Work Zone Design

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Module Objectives

- ◆ Define Temporary Traffic Control (TTC)
- ◆ Quantify the traffic safety problem
- ◆ Define “urban” areas
- ◆ Describe some of the problems associated with work zones in urban areas

What is Temporary Traffic Control?

- ◆ A **SYSTEM** to **communicate** with road users to safely guide them through a roadway affected by:
 - ◆ Construction and reconstruction
 - ◆ Maintenance
 - ◆ Utility operations
 - ◆ Special events

***Same
standards
apply to all!!***

Why is Temporary Traffic Control Important?



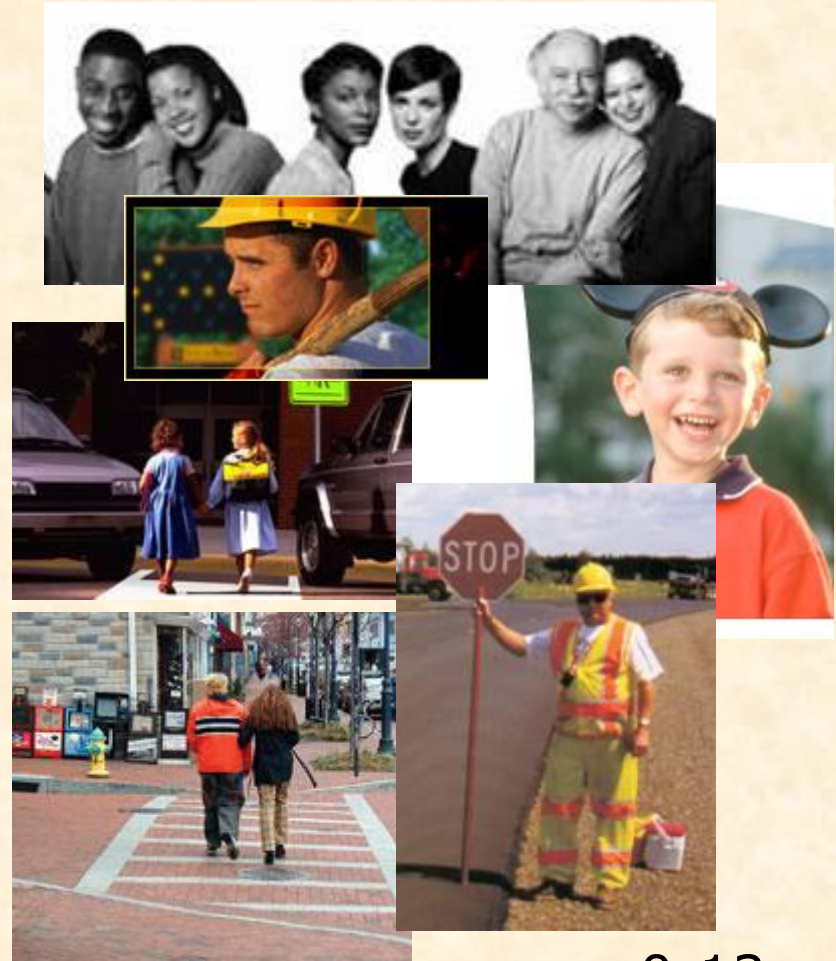
How Do We Make Urban Work Zones Safer?



- ◆ **Improving communication with ALL road users:**
 - ◆ Eliminates uncertainty
 - ◆ Gives more time to make decisions
- ◆ **Using standard devices and procedures**

Traffic Safety, Is There a Problem?

- ◆ **43,000+ traffic fatalities per year**
- ◆ **1,000+ in work zones**
- ◆ **15% of work zone fatalities are workers!**



Work Zone Fatalities: 1998 - 2006



Safety is Important For:

- ◆ Motorists
 - ◆ Motorcyclists
- ◆ Bicyclists
- ◆ Pedestrians
- ◆ Workers



What is "Urban"?

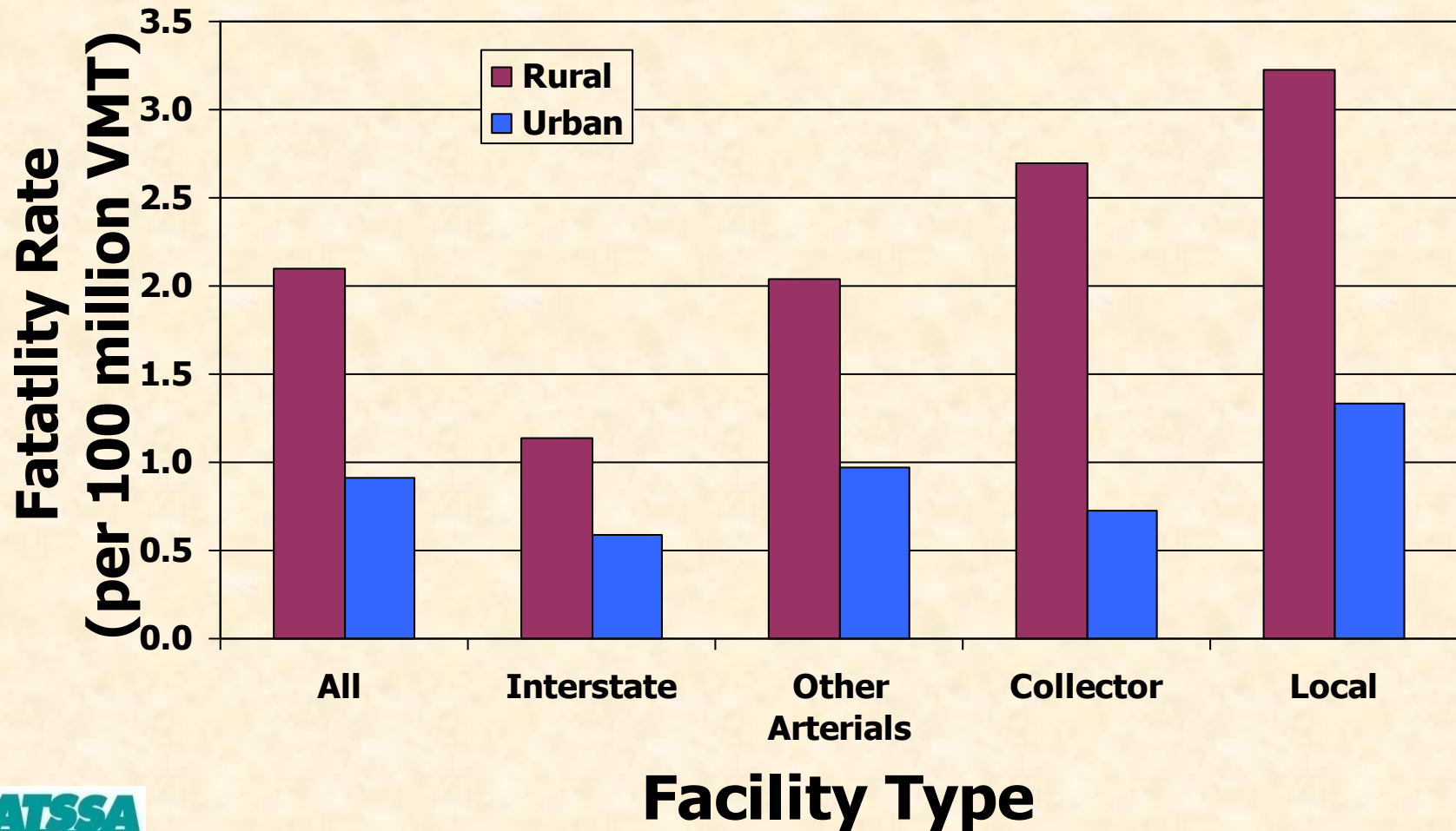


1. of, pertaining to, or designating a city or town
2. living in a city
3. characteristic of or accustomed to cities

What is an "Urban Area"?

- ◆ *"An area normally characterized by:*
 - ◆ *Relatively low speeds*
 - ◆ *Wider range of traffic volumes*
 - ◆ *Narrower lanes*
 - ◆ *Frequent intersections & driveways*
 - ◆ *Significant pedestrian traffic*
 - ◆ *More businesses & houses"*

Rural vs. Urban Statistics



Why Crashes in Urban Work Zones?



- ◆ Users confront unknown conditions
- ◆ “Normal” conditions changed
- ◆ Hazards present
- ◆ **Minimal standards for urban WZ exist**

Problems with Urban Work Zones

- ◆ Restricted spaces
- ◆ **Heavy traffic**
- ◆ Signals
- ◆ Restricted sight distance
- ◆ Parking



Problems with Urban Work Zones

- ◆ Conflicts with pedestrians
- ◆ Conflicts with “other” vehicles
 - ◆ Delivery trucks,
 - ◆ Utility vehicles
 - ◆ Bicycles, **buses**

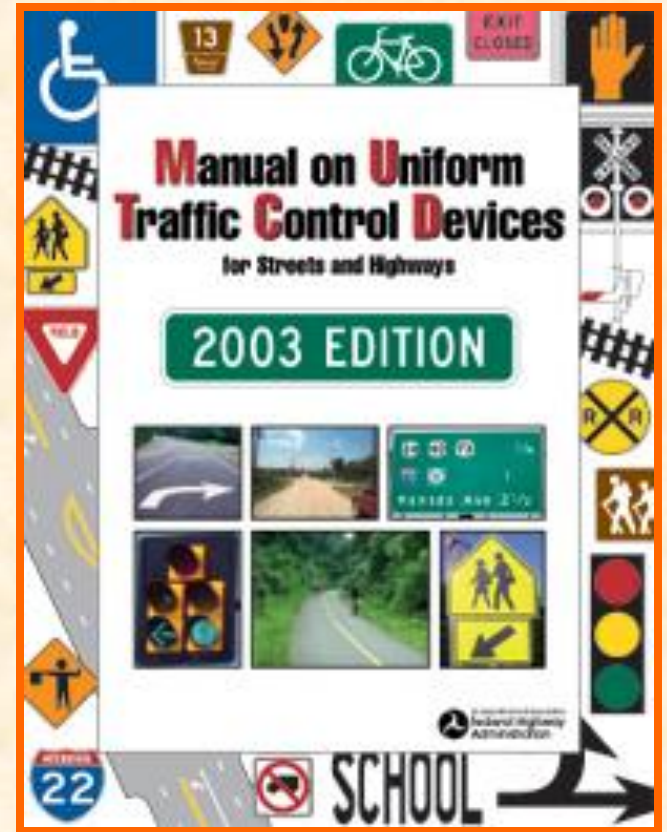


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The MUTCD

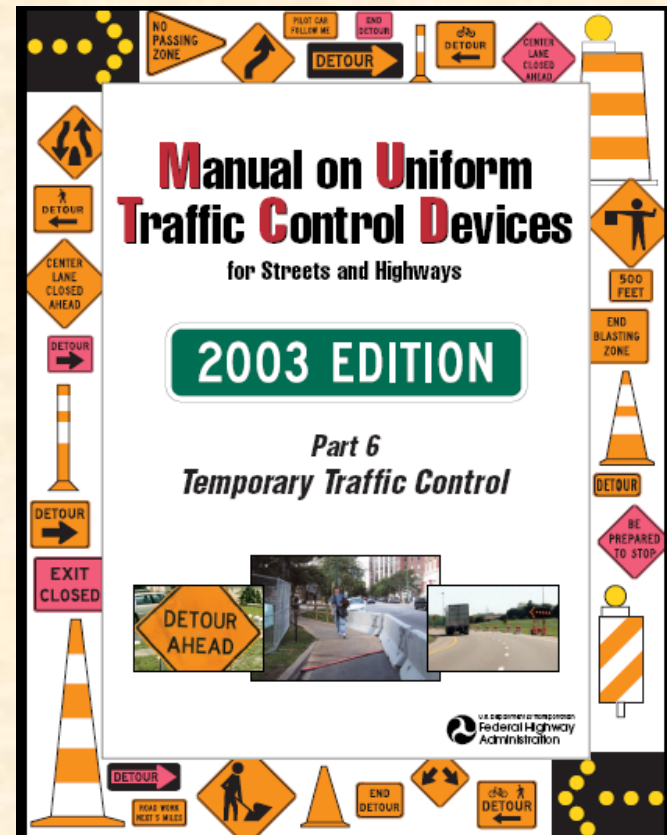
- ◆ **MINIMUM** standards and guidelines
 - ◆ States and local agencies can go beyond them
- ◆ Applies to **ALL** streets & highways open to the public



Does the MUTCD Apply to Urban Areas?

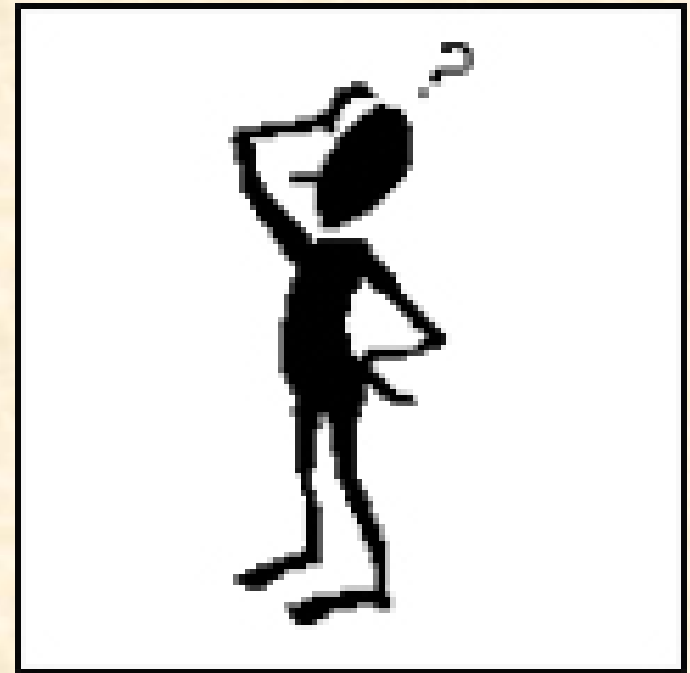
- ◆ Section 6A.01:
"The criteria of Part 6 apply to both rural and urban areas".

YES!



What does the MUTCD say about Urban Work Zones?

- ◆ *"The test concerning adequate taper lengths involves observation of driver performance **after TTC plans are put into effect.**"*



Questions to Ponder...

- ◆ What adjustments should be made?
- ◆ How do we adjust to field conditions?
- ◆ Are these adjustments within the MUTCD standards & guidelines?
- ◆ Does the MUTCD address urban work zones adequately?
- ◆ How can we protect against lawsuits?

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Module Objectives

- ◆ Define temporary traffic control zone (TTCZ)
- ◆ Describe its four component parts
- ◆ Describe the requirements of each
- ◆ Discuss possible adjustments applicable to urban areas

Longitudinal Buffer Space

- ◆ Recovery area for errant vehicles
- ◆ Protects **BOTH** workers & motorists
- ◆ **COMPLETELY** empty
 - ◆ No vehicles, equipment or materials
- ◆ Provide a buffer space unless you have a documented reason not to

Based on stopping sight distances

Buffer Spaces in Urban Areas

- ◆ They may not fit
- ◆ This is the reason buffer spaces are not required in the MUTCD
 - ◆ **FLEXIBILITY!**
- ◆ Provide as much as you can!
- ◆ If you cannot provide the numbers on the table, document the reason!

END
ROAD WORK

PARKING
10
MINUTES
←
PASSENGER
LOADING ZONE

NO
STOPPING
→

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What are Traffic Control Devices?

- ◆ “Things” used to implement a TTC plan in the field
- ◆ **Objects** motorists see and respond to when they drive through a TTCZ
 - ◆ **Shall be approved in the MUTCD and NCHRP 350-compliant**



Warning or Regulatory?





Adopt A Highway
LITTER CONTROL
DON'T LITTER. IT'S THE WAY TO
A BETTER WORLD.



Urban Area Challenges

Types of Crash Cushions



- ◆ Redirective
 - ◆ **Redirect** the errant vehicle

- ◆ Non-redirective
 - ◆ **Decelerate** the vehicle to a stop



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Module Objectives

- ◆ Define lane closures and street closures
- ◆ Discuss tapers
- ◆ Discuss the various types of tapers
- ◆ Discuss their lengths and how to determine them
- ◆ Review device spacing

What is a Taper?

- ◆ A series of channelizing devices (and sometimes pavement markings) placed on an angle to move traffic out of its normal path



"A gradual increase or decrease"
"A gradual transition"

Combo table for your reference (includes BUFFER length!)

MPH	9'	10'	11'	12'	Buffer
25	95	105	115	125	155
30	135	150	165	180	200
35	185	205	225	245	250
40	240	270	295	320	305
45	405	450	495	540	360

Proper Taper?

S = 45 mph
W = 12 ft

L = 540'
Buffer = 360'
13 devices!



WORKSHOP

- ◆ Refer to the scenario provided

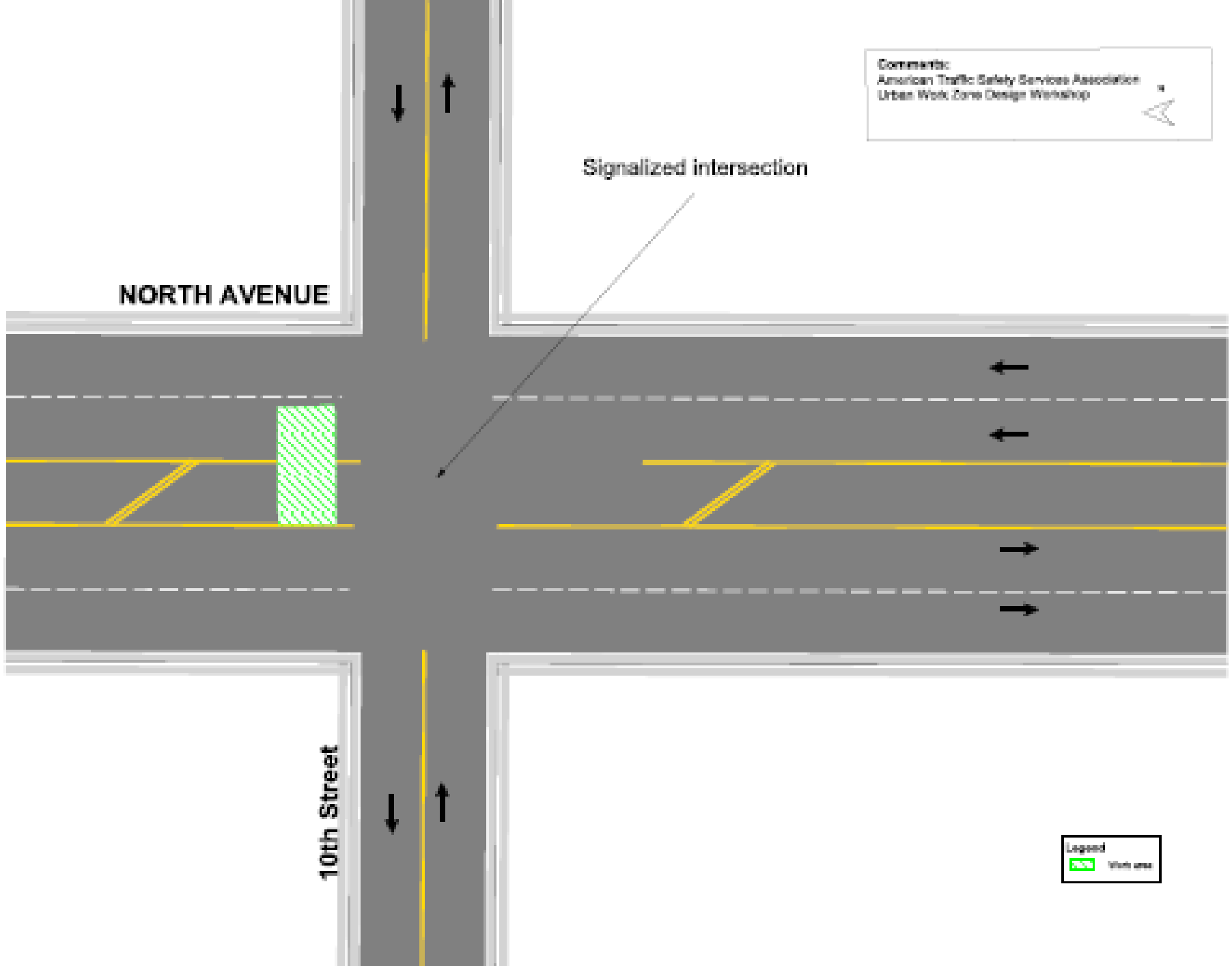


Signalized intersection

NORTH AVENUE

10th Street

Legend
Work area



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Module Objectives

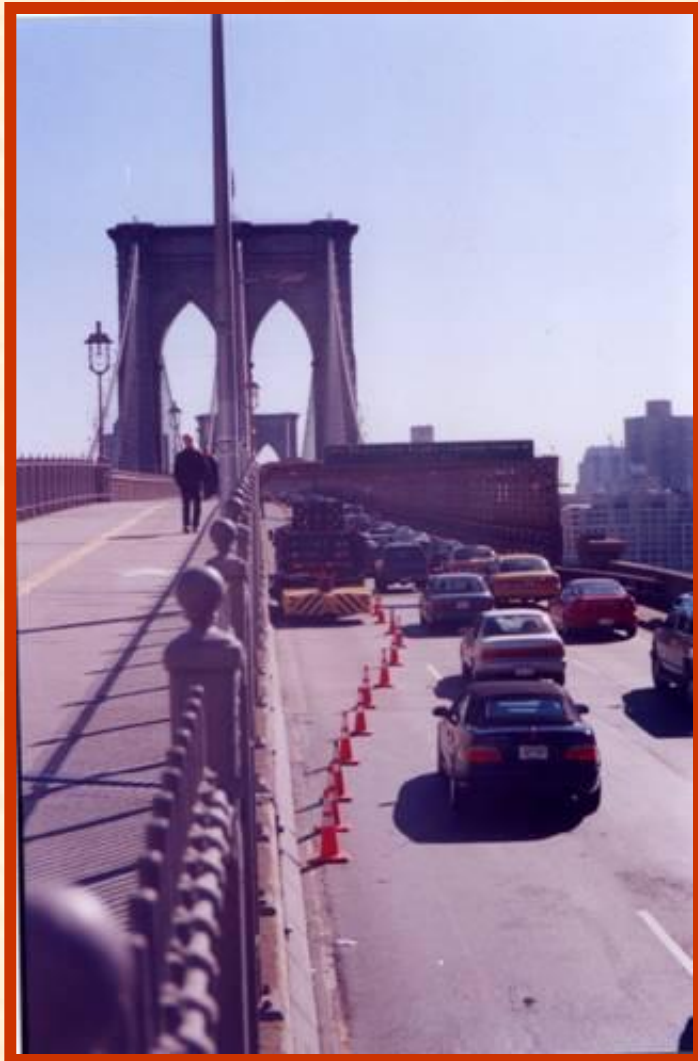
- ◆ Discuss “other” considerations that may improve safety
- ◆ Discuss potential adjustments to a traffic control plan
- ◆ Discuss high-visibility safety apparel requirements

Other Considerations



- ◆ **“Non-typical”** urban conditions may require **adjustments** to the TTC zone

When Are Adjustments Needed?



- ◆ Unexpected field conditions
- ◆ Overlooked situations
- ◆ Changed conditions
- ◆ Special conditions
- ◆ Long queues
- ◆ Special users

Other Considerations to Discuss:

1. Factors affecting visibility/location
2. Factors affecting stopping distance
3. Night operations
4. Intersections
5. Utility work
6. Pedestrian/bicycle considerations
7. Motorcyclist considerations
8. Worker considerations

Recommended Min. Illuminance Levels & Categories for NWZ

LEV.	Min. Illuminance Level, lx (fc)	Area of Illumination	Examples of Activities
I	54 (5)	Throughout spaces	Excavation, sweeping & cleanup, movement area in work zone, movement between two tasks
II	108 (10)	Of tasks and around equipment	Paving, milling, concrete work, around paver or miller
III	216 (20)	Illuminance on task	Crack filling, pot filling, tasks requiring extreme accuracy and attention

6. ***Pedestrian and Bicycle Considerations***



- ◆ **MUTCD Section 6G.05:** “Bicyclists and pedestrians should not be exposed to unprotected excavations, open utility access, overhanging equipment, or other such conditions.”



STOP

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NORTH SHORE
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Assuring Worker Safety

- ◆ Proper training
- ◆ High-visibility apparel
- ◆ Positive protection
- ◆ Use of police
- ◆ Proper lighting
- ◆ Special devices
- ◆ Public information



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Module Objectives

- ◆ Review course objectives
- ◆ Review the “Parking Lot”
- ◆ Complete course evaluation form
- ◆ Take exam
- ◆ Adjourn!