Manual on Uniform Traffic Control Devices
(Millennium Edition)

by Karen M. Brunelle

FHWA MUTCD Program:
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Effective traffic control devices — properly positioned and operational signs, signals and pavement markings — are among the critical elements that ensure the safe and efficient operation of our streets and highways.

Traffic control devices provide the driver with guidance and instruction on how to safely and most effectively use the road. Uniformity of size, color and shape also provide a consistent message to road users — messages that they can expect to see for similar traffic control applications anywhere in the country.

The Manual on Uniform Traffic Control Devices is a national publication that outlines the proper use of traffic control devices. Also known as the MUTCD, it contains national standards for the design, application and placement of signs, signals, pavement markings and other types of traffic control devices.

The Federal Highway Administration (FHWA) publishes the MUTCD for use by national, state and local transportation agencies and other public and private organizations responsible for transportation facilities.

The Millennium Edition MUTCD

On December 19, 2000, the FHWA published the Millennium Edition of the MUTCD. It is the sixth major revision since the first manual appeared in 1927. Also known as the 2000 MUTCD, it is the first full-scale revision since 1978.

The FHWA has chosen to publish the MUTCD on its web site (http://mutcd.fhwa.dot.gov). Printed copies can still be obtained through national associations and the Government Printing Office. Web technology allows changes to the Manual to be made available to traffic engineers as soon as they are accepted and approved.

The Millennium Edition contains significant changes that fall into the following categories:

A New Look for the Manual

The Millennium Edition provides a whole new, easy-to-use structure. The Manual has been entirely reformatted for ease of use, and the Manual's language has been standardized to reduce some of the confusion and vagueness of previous editions.

New Parts

Two new parts have been added to the Millennium Edition to address evolving transportation needs.

Part 5 describes the use of traffic control devices for low-volume roads. These are roads that lie outside built-up areas of cities, towns, and communities, and have a traffic volume of less than 400 average annual daily traffic. The new Part 5 includes standards and guidance for traffic control devices that are unique to, or most applicable to, low-volume roadways.

continued on page 5
In this issue of Roadtalk, Karen Brunelle presents highlights of the new Manual on Uniform Traffic Control Devices (MUTCD) in our lead article. The MUTCD is a must-have for any agency responsible for traffic control on public roadways. Karen discusses the major changes and additions to the Manual. We would encourage any interested agency to attend the MUTCD training course to be offered in Jackson, Nashville, Knoxville, and Chattanooga in March 2002.

Also in this issue, our very own Lawrence Perry presents the results of his survey of access management practices across Tennessee. Access management is an area that continues to receive attention as our communities grow and traffic increases every year. TTAP would like to extend our best wishes to Lawrence, who will return to the Tennessee Department of Transportation following the completion of his Master’s Degree in Civil Engineering this December.

Finally, we would encourage you to utilize TTAP as one of your transportation resources. We continue to offer training, videos, publications, and technical assistance at little or no cost to cities and counties across the state. Don’t be afraid to call us, whether you’re in Memphis or Mountain City, TTAP is here to help!

Each year the Tennessee Department of Transportation (TDOT) performs traffic counts at thousands of sites across the state. These counts are used to track the yearly increase in traffic on roadways across Tennessee. In the past, TDOT has distributed the results of these Average Daily Traffic (ADT) counts to agencies throughout the state in printed form. These books contain highway maps with ADT numbers for each of Tennessee’s 95 counties. In addition, the book contains additional maps for many cities and towns across the state. In all, the 2000 ADT book contains over 200 pages of ADT maps. While these books contain a wealth of useful traffic data, they are bulky and are expensive to distribute.

To make these ADT maps more accessible to local government and the public, TDOT has expanded its website to include the current year’s ADT count data. This move allows anyone with Internet access to view the ADT counts for any area of the state at the click of a mouse button. To view the maps, you will need to have Adobe Acrobat installed on your computer. If you don’t already have Acrobat, TDOT has provided a link to download the program on the ADT page.

To take advantage of this free online information, visit the TDOT website at:
http://www.tdot.state.tn.us/information-office/information-page.htm#TrafficCounts
Gibson County is located near the center of West Tennessee, and covers an area of over 600 square miles with a population of just under 50,000.

Carl Stoppenhagen serves as the county’s highway Superintendent, having been appointed to this position by the County Road Board in 1993. Carl came to the county with a solid background in road construction. He is a civil engineering graduate of Tennessee Technological University. Prior to assuming his present position, he worked eight years for the Tennessee Department of Transportation as a Resident Engineer, and ten years in construction with Rogers Group and Dement Construction Company as an engineer and project manager. He holds a PE License in Tennessee, Arkansas, Alabama and North Carolina. He presently serves as a board member of TCSA and is a past-president and current secretary of Region IV TCHOA. Carl and his wife, Carolyn, have four children and four grandchildren.

Gibson county has 850 miles of county roads. The road system contains 330 miles of hot mix asphalt, 230 miles of DBST and 290 miles of gravel. Gravel roads are being paved at a rate of 15 to 20 miles per year. The county acquires fifty feet of right-of-way, and road is “rebuilt” by county forces prior to paving.

The county also has 330 bridges with 225 of these being inspected by the Tennessee Department of Transportation. Bridges are improved and maintained by both county crews and by contract. Most contracts are for larger span bridges and involve bridge grant and federal bridge replacement monies. The county crews place their emphases on replacing small bridges with pipe culverts.

The Gibson County Highway Department has an annual budget of 4.6 million dollars received from local tax sources and state aid and bridge grant money. The Department has forty-six employees consisting of two maintenance divisions, a bridge crew, and a construction crew plus office and shop personnel. The construction crews rework and pave sections of existing county roads with county owned construction equipment.

The recent construction of the 600 acre Gibson County Lake altered several county roads with some being flooded and others being rerouted. As development occurs around the lake, the Department will be much involved in the planning and development of the roadway infrastructure to serve the new growth.

Carl says, “As demand for higher quality and safer roads and bridges increases, funding for local projects is vital. Funding of state aid and bridge grant programs is needed at current or higher levels to meet the demands. Innovative measures must also be utilized to stretch funds as far as possible.” The county currently is innovative by using herbicide spraying to reduce mowing, extended equipment warranties, contract services and alternative materials.

You can contact Carl by telephone at (731) 855-7684 or email at gehwyd@click1.net
Access Management in Tennessee

by Lawrence Perry

As a technical assistant, I receive a great deal of the requests for technical information. These requests include a wide variety of topics that are on videos, in publications, or in other electronic data information that we possess. One request we had recently for a CD-ROM happened to intrigue me.

In the spring issue of Roadtalk, Solomon Caviness, a research assistant, wrote an article about a CD-ROM entitled “Access Management: CD Library.” Access management is the process of balancing access with mobility, and this CD-ROM contains an interactive library of concepts and methods for access management. We were flooded with requests for this CD-ROM when this issue of Roadtalk reached the desks of our readers. The interest for the title was so great that I decided to see what kind of access management issues existed in Tennessee.

I surveyed 25 cities in Tennessee. I talked with city engineers, city planners, public works directors, and street superintendents. When I found the person who dealt with access management for the city, I asked them two questions. The first question was whether their city had developed any access management guidelines or whether they followed the Tennessee Department of Transportation guidelines. The second question was, did the city have any access management issues currently or any access management issues that were constantly reoccurring.

The survey yielded eight access management issues that the sample municipalities are currently facing (please see Table, page 8). Nine out of twenty-five cities had no access management issues. Twelve of the cities commented they had access management guidelines, but four of the twelve still had some type of access management issue. Here are the issues in detail:

1. Continuous Driveway: A continuous driveway is an undefined driveway. This enables vehicles to access the property anywhere along the frontage of the property, which can cause conflicts between drivers as to where vehicles should enter and exit the property. The AASHTO Greenbook feels it is necessary for the “...elimination of large graded or paved areas adjacent to the traveled way upon which drivers can enter or leave the facility at will” (AASHTO Greenbook, 1990). The cities of Bristol, Franklin, and Hendersonville stated this is a recurring problem on roads in older sections of town. However, Morristown and Lebanon reported some developers of properties are still creating wide driveways, one was up to 200 feet wide.

2. Two or more driveway connections for a single low volume property: This issue occurs in Hendersonville on roads in older sections of town. Springfield currently has a private developer who continuously creates two or more entries for his properties. Collierville is another city that is also dealing with this issue.

3. Narrow driveway throat width: The problem with a narrow driveway throat width is that it makes it difficult for some vehicle types, such as trucks and SUVs, that have a larger turning radius, to access the property. Franklin is currently dealing with this issue on properties that did not plan their driveway widths according to the turning radii of larger vehicles, which needed access to the properties.

4. Driveway spacing is too close: A driveway causes a conflict between vehicles wanting to turn into the driveway and other vehicles in the same lane that want to continue moving straight ahead. The AASHTO Greenbook views this as no access control and “...interference from the roadside that become a major factor in reducing the capacity, increasing the accident potential, and eroding the mobility function that the facility was designed to provide” (AASHTO Greenbook, 1990). The cities of Bristol, Cleveland, Franklin, McMinnville, Springfield, and Tullahoma are currently dealing with this problem on arterials in their towns.

5. Driveway is placed too close to an intersection: If a driveway is placed in an area too close to where vehicles are operating under control of the intersection, a conflict can develop between cars wanting to turn into a driveway and those cars wanting to move through to the intersection. The AASHTO Greenbook states “Driveways should not be situated within the functional boundary of at-grade intersections” (AASHTO Greenbook, 1990). A specific example of this problem is in Maryville. A convenience store in Maryville was built so that the frontage of the property was on the corner of an intersection. The store then placed their driveways in the functional area of the intersection. Now cars behind the vehicles turning left into the convenience store do not know whether the car is turning into the store or turning at the intersection, which can result in rear end accidents. The cities of Collierville, Goodlettsville,
Part 10 addresses the needs of light rail transit vehicles operating in the roadway & at grade crossings.

New Signs and Markings

The Millennium Edition offers important new signs and markings that are designed to increase the safety of road users and facilitate mobility and traffic flow.

Pedestrians and Bicyclists

The Millennium Edition provides additional guidelines for traffic control devices that serve the needs of pedestrians and bicyclists, including some suggestions for compliance with the Americans with Disabilities Act (ADA).

Keeping up with Technology

New and ongoing research that increases safety and mobility will continue to drive changes in the Manual. New additions to the MUTCD include:

Retroreflectivity and illumination for all signs. FHWA has extended the general requirements of sign retroreflectivity or illumination to all signs, not just regulatory and warning signs.

Intelligent Transportation Systems. The addition of Intelligent Transportation Systems (ITS) in the Millennium Edition reflects the increased application of advanced technologies within our society and to our roadways.

Weather research on traffic control devices. Over time, weather conditions degrade a sign’s retroreflectivity. This can result in signs that may not provide drivers and pedestrians with a sufficient level of safety. Research being conducted by the FHWA may lead to the development of new minimum guidance for brightness on retroreflective signs and pavement markings. These standards will likely be incorporated into the MUTCD at some future time.

Improving work zone safety. FHWA is looking at ways of increasing work zone safety by improving the visual communications between the work zone and the motorist.

An Experimentation database. The MUTCD sets out a process for requesting the opportunity to experiment with traffic control devices. Once approved, experiments are input into a database that will be posted on the MUTCD web site, giving traffic engineers a way to stay current with creative solutions that prove effective around the country.

Next Steps for Traffic Engineers

Now that the Millennium Edition of the MUTCD has been released, what impact does it have on the jobs of traffic engineers around the state?

First, there are significant changes to the Manual that suggest it will be vital for traffic engineers to frequently refer to this new edition. Many of the changes in this edition may make it easier for them to do their job, or easier to find better solutions to traffic problems.

Second, in the next two years—by January 2003 — the Millennium Edition’s provisions will become law. Important dates to keep in mind are the following:

* The MUTCD was published on December 18th, 2000.
* The Tennessee Department of Transportation (TDOT) must adopt the provisions of the Manual within two years, or by January 17, 2003. This is the date by which most traffic control devices must be in compliance with this edition of the Manual. TDOT is in the process of adopting the Millennium Edition. Until that time, the current MUTCD is the minimum standard for use in Tennessee.

* There are extended compliance dates for some of the new traffic control devices. These dates are longer than the two-year adoption period. The FHWA provides these extended periods to minimize the economic impact to state and local agencies. This list can be found of the MUTCD web site.

Third, the MUTCD is an important tool for traffic engineers. It provides a common language to communicate with all road users to help ensure the safety and efficiency of our roadway system. To promote this new manual, TTAP will be hosting training workshops throughout the state this spring on the significant changes in the Millennium Edition.

2002

Mark your calendar

March 12 - Jackson
March 14 - Nashville
March 19 - Knoxville
March 21 - Chattanooga

For the latest MUTCD information, please either visit the MUTCD web site at http://mutcd.fhwa.dot.gov or contact the FHWA Tennessee Division Office. Karen Brunelle and David Martin on the Division’s Safety and Traffic Operations Team are available to answer your questions. Contact:
Karen Brunelle (615-781-5772)/ karen.brunelle@fhwa.dot.gov
David Martin (615-781-5757)/ david.d.martin@fhwa.dot.gov.
Education and training opportunities are available through the University of Tennessee Center for Transportation Research (CTR), Southeast Transportation Center (STC), and Tennessee Transportation Assistance Program (TTAP).

This listing of courses currently available includes both TTAP and TATE courses that are offered in conjunction with the University of Tennessee Department of Civil and Environmental Engineering and the Tennessee Section of the Institute of Transportation Engineers. Local roadway departments can benefit from all of the workshops. Because of this, we ask that you please share this listing with others who might be interested in our workshops. The Center for Transportation Research is always eager to meet your research and training needs. If you have a special course in mind or would like a course held on site especially for your employees, please contact Jean Spangler at 1-800-252-ROAD

*CEU and PDH credit hours available.

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*Changes:
Highway Design for Older Driver Nov. 27 (Knoxville)
Utility Accommodations Manual Nov. 29 (Nashville) Cancelled

Access, continued from page 4

McMinnville, and Springfield are also dealing with this issue.

6. Excessive median cuts: Having too many median cuts can result in the same problems for left turning vehicles as having too many driveways spaced too close to each other. The AASHTO Greenbook states having too many median cuts is an, "...alternative, which would only benefit the property owners abutting the divided highway..." and that, "This option would defeat a major purpose of the median and would lead to complete erosion of this (median) control feature" (AASHTO Greenbook, 1990). Bristol and Franklin are dealing with arterials that have three or four median openings in a four hundred foot section of arterial highway.

7. Access solution is in conflict with access management guidelines: This category is a generic category that encompasses all decisions that would favor access over mobility. Smyrna, for example, has a pharmacy that has no other access to a road other than an expressway called Sam Ridley Parkway. The limited access expressway facility should not be accessed by private drives, but under these circumstance there is no alternative connection to the road system for the pharmacy. Jackson is another example of having to favor access over mobility in their central business district. The confined area of the central business district yields developments of smaller lot sizes. This then causes many driveways to be spaced too closely together; however, there is no other solution for this development to obtain access to or from the road system when other developments can not or will not give the new business joint access to their driveways.

continued on page 7
8. **Insufficient sight distance**: When a driver on a driveway does not have enough sight distance, he becomes a road hazard because he is "hidden" from other drivers. The driveway might be on a crest vertical curve, sharp horizontal curve, or it may be hidden because of some other obstruction (vegetation, building, etc.) or combination of any of these factors. The cities of Collierville, East Ridge, and Hendersonville are dealing with this problem.

What do all of these issues tell us? The survey has revealed that nine of the sample survey of Tennessee’s municipalities do not have access management problems, but many do have issues that are difficult to address. The issues that the survey revealed can be grouped into three broad categories. Four of the issues deal with the construction of the driveway for a property. These construction problems include the actual dimensions of the driveway either being too wide or too narrow; how many driveways are provided for one property; and the issue of insufficient sight distance. The next group of issues deals with the spacing of the driveways. These spacing problems include the spacing of adjacent property driveways; spacing of a driveway from an intersection; and median opening spacing. The final category deals with variations for driveways that cannot comply with the access management rules.

Four out of twelve of these cities have their own access management guidelines, but they are still having problems. Many cities do not have access management guidelines. So where can these cities look for help? This is where TTAP can be of assistance. The CD-ROM entitled “Access Management: CD Library” is a great resource. We also offer courses to inform city personnel on the values of access management. If you would like any information on the matters of access management, please contact us at (865)-974-5255 or 1-800-252-ROAD.

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**Issue Number**

1. **Continuous Driveway.**
2. **Two or more driveway connections for a single low volume property.**
3. **Narrow driveway throat width.**
4. **Driveway spacing is too close.**
5. **Driveway is placed too close to an intersection.**
6. **Excessive median cuts.**
7. **Access solution conflicts with access management guidelines.**
8. **Insufficient sight distance**
We are always looking for your comments, ideas and suggestions to help make the TTAP program more useful to you.

1. Please send me more information on the following articles mentioned in this newsletter.

2. Please list any additional training workshops you would be interested in attending.

3. Please list topics for videos you would like TTAP to obtain.

4. Please list any other ideas or suggestions on how TTAP could assist you.

5. Please list your name and organization to verify for TTAP's mailing list.
   Name __________________________
   Address __________________________
   Title __________________________
   Organization __________________________
   Phone __________________________ Fax __________________________
   Email __________________________
   Are you currently on TTAP's mailing list? ______ yes ______ no

Please fax your form to TTAP at (865) 974-3889 or mail to TTAP; Suite 309 Conference Center Building; Knoxville, TN 37996-4133.
FROM: ___________________________________________