



Traffic Engineering Resources for Installation Planners and Engineers



Did You Know?

When non-standard, unnecessary, or excessive traffic controls are installed, or when roads or parking facilities are not designed to standards, hazardous traffic conditions usually result. Here are some situations that occur on installations:

Speed Limits

Unreasonably low speed limits can actually create safety problems because the majority of motorists will drive at higher speeds unless there is a viable safety issue or law enforcement effort. Slower vehicles become obstructions and can cause erratic traffic operation on the roadway.

Signs

Too many warning signs can have a negative effect by creating unnecessary clutter and distracting the driver from seeing the necessary traffic controls.

Pavement Markings

Markings that don't conform to proven and accepted standards can confuse or send the wrong message and increase crash potential. Correctly used, pavement markings delineate lanes, the direction of travel, the locations of shoulders and crosswalks, and provide other information and guidance to road users.

Signals

Unwarranted or poorly designed, maintained, or operating traffic signals can increase crash rates, delays, disobedience of signal indications, and circuitous travel by alternate routes. Poor signal timing can cause additional traffic congestion. Periodic retiming is critical to improve overall traffic flow and

minimize delays or interruptions. However, without a traffic engineering analysis, it may not be obvious that the timing of an existing signal needs to be adjusted to accommodate the current traffic volume and patterns.

Parking

Unplanned parking facilities can create driver confusion and frustration, unsafe conditions, and inefficient use of space. Parking is a transitional activity between travel and a user's end destination that should adequately accommodate the needs of the vehicle drivers and pedestrians, as well as comply with Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) guidelines.

Roadside Barriers

Many installations use inappropriate barrier devices to shield obstacles. These devices may shield the obstacles, but they do not protect the motorists. Fences, bollards, and rope do not provide adequate protection and in some cases, these devices are obstacles themselves. All barriers must conform to accepted design standards.

Geometric Modifications

In some cases, what may seem to be good roadway design could actually be hazards to motorists. For example, increasing the width of a street's access to a roadway may help accommodate intended traffic movements. However, if the width is too wide, a large conflict area is created and motorists may be confused on where to position their vehicle when accessing the roadway. Geometric modifications should be based on standard design principles.

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Traffic engineering studies, that are based on reliable resources, can ensure effective traffic control measures are in place. This helps to reduce motorist frustration, crash potential, and travel delay, and ultimately helps to improve the motorist's quality of life. There are numerous resources available to installation planners and engineers to identify the appropriate traffic engineering guidelines, standards, and regulations.

Why Conduct Traffic Engineering Studies?

To Identify Solutions to Recognized Problems

Installation planners and engineers conduct these studies to determine the best possible solutions to existing traffic problems involving congestion or highway safety.

Traffic engineering studies are the basis for formulating solutions to traffic problem areas.

To Identify Future Potential Problems and Opportunities for Improvement

Traffic engineering studies help identify potential traffic problems that can occur either from future events (such as a planned gate-closing or a new office building) or from existing substandard roadway design and/or inadequate traffic control measures. By analyzing study data, planners and engineers are able to identify possible remedial measures.

To Comply with Standards

Traffic engineering studies can also serve as a basis to promote installation compliance with Federal, State, and local standards related to traffic control and roadway design. Compliance with these standards is critical for tort liability reasons and because installation roads are considered an extension of the road system outside the installation boundaries. In addition, it is the Department of Defense's (DOD) policy for installation commanders to develop and maintain their roadways to nationally accepted standards.

To Employ Best Practices and Lessons Learned

Traffic engineering studies also provide installation planners and engineers the opportunities to incorporate best traffic operating practices based on current research and experience.

If recommendations are implemented, traffic engineering studies can improve safety concerns and enhance the quality of life by improved driving conditions for daily commuters, save time by reducing traffic delays, and save money in reduced crash costs. They can also ultimately help the economy by providing jobs for road construction or maintenance.

When Are Traffic Engineering Studies Needed?

Installation Growth and Land Use Changes

Traffic engineering studies are needed when there are population increases at installations (including redeployment of military units or base realignment changes) and/or land use changes that will cause traffic congestion and safety issues. If consideration is not given to long-term transportation needs in base-wide planning, problems will develop when traffic volumes exceed the roadway capacity. Vehicular and pedestrian traffic plans need to be integrated with master plans, as well as, ongoing or upcoming construction.

There are even cases where studies can be necessary when the population decreases. For example, traffic signals may need to be retimed to reduce green time for one approach when traffic volumes decrease on that approach. Also, the number of through lanes on larger roadways may be able to be reduced to give more room for bikes and pedestrians when traffic volumes are reduced.

ECF Construction or Modification

When Entry Control Facilities (ECF) [also called Access Control Points (ACP)] are to be constructed or upgraded with major construction, traffic engineering studies should be conducted to address security, safety, capacity (such as the required number of ID check lanes), and sustainability. The Traffic Engineering study should also identify problems and solutions regarding vehicular and pedestrian safety, traffic flow and congestion, signing, markings, lighting, and aesthetics. These studies should receive input from a diverse team, and consider existing terrain, available space, stand-off distances, and future development plans when developing design concepts that will meet any applicable standards or criteria.

High Crash Locations

A safety audit is a type of traffic engineering study in which the primary and secondary roadways of an installation are investigated for safety concerns. They should be performed at installations with high crash rates so that appropriate countermeasures can be identified to reduce the frequency or severity of crashes.

Parking Problems

Insufficient parking is a significant problem on many installations. Poor parking facility design and lack of adequate maintenance can increase potential for crashes. Traffic engineering studies can provide guidance on the appropriate number of spaces, proper layout including stall dimensions, signs and markings, lighting, access points, and necessary maintenance.

Inadequate Traffic Signals

Traffic signals can be extremely valuable in reducing delay and increasing safety. However, if not designed, maintained, or operating properly, they can significantly increase congestion, crashes, and delays. Traffic engineering studies can warrant or justify the installation of a traffic signal. They can also provide guidance on proper signal display, design, timing, and phasing. Installation planners and engineers should evaluate traffic signals periodically to ensure maximum efficiency.

Where Do Planners and Engineers Get Help?

The most common, essential, and helpful resources for installation planners and engineers can be ordered in hardcopy or CD-ROM, are available online, are right at their fingertips (like this and other bulletins), or are just a phone call away (see page 5).

The Military Surface Deployment and Distribution Command, Transportation Engineering Agency (SDDCTEA)

SDDCTEA assists military installations with their traffic engineering concerns and can conduct a wide-range of traffic engineering studies for installations. We are the proponent for traffic engineering within the DOD and we work with other components of the DOD to implement traffic engineering best practices, lessons learned, and standards.

We also focus on training and education; to include the development and distribution of comprehensive pamphlets, Traffic Engineering and Highway Safety Bulletins, software; and conducting traffic engineering and ECF workshops each year throughout the Continental United States (CONUS) and outside CONUS as detailed in Exhibit 1 on the following page.

If your installation requires a study or needs assistance in performing a study, SDDCTEA is a phone call away. Our mission is to improve highway safety and reduce traffic congestion for DOD installations.

Better Military Traffic Engineering
2011
SDDCTEA Pamphlet 55-17

Military Surface Deployment and Distribution Command
Transportation Engineering Agency

Traffic Engineering and Highway Safety Bulletin 12-01
Accessibility Compliance for Military Installations
February 2012

Did You Know?
More than 54 million Americans, almost 20 percent of the U.S. population, have disabilities. A disability is a physical or mental impairment that substantially limits a person's major life activities. There are several laws that protect Americans with disabilities from being discriminated against in the workplace, in public places, and in the use of new construction or altered facilities to be accessible and usable to persons with disabilities. Compliance with these laws is mandatory and will also help integrate those with disabilities into mainstream society. The Department of Defense (DoD) has adopted standards to implement the laws. All military departments, including installations, are directed to meet the standards to the maximum extent feasible.

The Three Laws
What is the ADA?
The Americans with Disabilities Act of 1990 (ADA) is a major civil rights law that prohibits discrimination against persons with disabilities and sets design requirements for construction or alteration of facilities. It applies to state and local government and private sector facilities. The Department of Justice and Department of Transportation maintain standards under the ADA.

What is Section 504 of the Rehabilitation Act?
Section 504 of the Rehabilitation Act of 1973 prohibits discrimination against persons with disabilities in any Federally-funded program or activity. Requirements include accessible new construction and alterations.

What is the ABA?
The Architectural Barriers Act of 1968 (ABA) requires that buildings and facilities that are designed, constructed, or altered with Federal funds, or leased by a Federal agency, comply with Federal standards for physical accessibility. The ABA applies to Federal facilities including those on military installations. The DoD maintains standards under the ABA.

What is the Difference between ADA and ABA?
The ADA and the ABA differ in some of the provisions concerning employee work areas, modifications and waivers, definitions, and leased and residential facilities.

The ADA applies to state and local government and private sector facilities, while the ABA applies to Federal facilities. However, for the most part, the ADA and ABA application and scoping requirements are very similar. They also have similar implementing standards. This helps ensure consistency in access to all facilities, whether they are commercial or Federal, State, or local government-owned.

DoD's Standards
ADA-ABA Accessibility Guidelines
Per the October 31, 2008 Deputy Secretary of Defense (DepSECDEF) Memo, Subject: Access by People with Disabilities, the DoD accessibility standards are based on the 2004 Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (ADA-ABA Guidelines) developed by the U.S. Access Board (<http://www.access-board.gov/ada-aba.html>). Specifically, DoD's adopted standards are included in ABA Chapters 1 and 2, and Chapters 3 through 10 of the guidelines, which specify what has to be accessible and how to

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Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA)
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Exhibit 1: SDDCTEA Training and Education Services

TRAINING AND EDUCATION PROGRAM	SUBJECT MATTER COVERED
<p>Traffic Engineering And Highway Safety Bulletins</p> <p>Bulletins are published four to five times yearly and address a broad range of transportation and safety topics.</p> <p>Bulletins are available online at: http://www.tea.army.mil/pubs/dod.asp.</p> <p>Sign up to receive bulletins at: http://www.tea.army.mil/DODProg/TE/default.htm</p>	<ul style="list-style-type: none"> ✓ Traffic Signs ✓ Roadside Safety - A Forgiving Roadside ✓ Traffic Engineering For Better Gates ✓ Highway Safety Driver-Aid Treatments ✓ Safety Requirements of Active Vehicle Barriers ✓ Sign Retroreflectivity ✓ Intersection Control ✓ Roundabouts ✓ Travel Demand Management ✓ Retiming Traffic Signals ✓ Accessibility Compliance ✓ Parking Lots and Garages
<p>Pamphlets</p> <p>SDDCTEA has produced a variety of pamphlets and manuals on transportation issues. These materials provide specific, detailed engineering guidance on key issues.</p> <p>Pamphlets and manuals are available online at: http://www.tea.army.mil/pubs/dod.asp</p>	<ul style="list-style-type: none"> ✓ Pamphlet 55-8, Traffic Engineering Study Reference ✓ Pamphlet 55-10, Traffic Engineering for Better Roads ✓ Pamphlet 55-14, Better Traffic Engineering for Signs and Markings ✓ Pamphlet 55-15, Traffic and Safety Engineering for Better Entry Control Facilities ✓ Pamphlet 55-17, Better Military Traffic Engineering
<p>ACP/ECF SMART Decision Evaluator</p> <p>This interactive training tool, created in partnership by SDDCTEA, the Army's Office of Provost Marshal General, Army Corps of Engineers Protective Design Center, and Army Corps of Engineers Electronic Security Center, provides practitioners with a way of analyzing complex Access Control Point / Entry Control Facilities situations. The use of the ACP/ECF SMART Decision Evaluator should be under direct supervision and/or in close coordination with SDDCTEA.</p> <p>For information on how to obtain a copy, contact SDDCTEA.</p>	<ul style="list-style-type: none"> ✓ Number of traffic lanes needed ✓ Cost of needed lanes ✓ Infrastructure maintenance cost ✓ Vehicle queues ✓ Congestion cost ✓ Additional manpower needed ✓ Technology cost
<p>Workshops</p> <p>SDDCTEA-sponsored workshops are available, at no charge, to the military community. Participants are responsible only for travel, lodging, and meals.</p> <p>Information and registration for current workshops can be accessed here: http://www.tea.army.mil</p>	<ul style="list-style-type: none"> ✓ Maintaining Control Workshop – Provides guidance on planning, design, and operation of entry control facilities while addressing security, safety, and traffic requirements ✓ Traffic Engineering & Safety Workshop – Provides guidance on Traffic Engineering and safety considerations along roadways, intersections, and at entry control facilities for safe and efficient operation

Exhibit 2: SDDCTEA's Traffic Engineering Services

Safety	<ul style="list-style-type: none"> ✓ Crash Location Enhancement Studies (CrashLES) ✓ Fatal crash analysis ✓ Safety audits ✓ Pedestrian studies ✓ Speed studies ✓ Traffic calming evaluations ✓ Sign retroreflectivity assessments ✓ Sign management studies
Transportation Engineering	<ul style="list-style-type: none"> ✓ Traffic impact studies ✓ Signal warrant and operations evaluations ✓ Corridor evaluations ✓ Comprehensive transportation studies ✓ Roadway and intersection design/reviews ✓ Operational audit for traffic signal sustainability ✓ Parking studies ✓ Desktop plan/study reviews
Force Protection and Installation Access	<ul style="list-style-type: none"> ✓ Gate (ECF/ACP) studies and assessments ✓ Gate design ✓ Force protection assessments ✓ Access roads studies ✓ Active vehicle barrier location assessment and safety schemes

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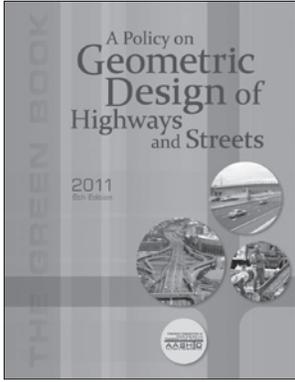
Fax: 618-220-5125

E-mail: usarmy.scott.sddc.mbx.omb-for-traffic@mail.mil

Web Site: <http://www.tea.army.mil> for pamphlets, bulletins, and studies

Publications

Important traffic engineering publications to reference in your work are shown on pages 6-10. The following publications are listed alphabetically and not by priority.

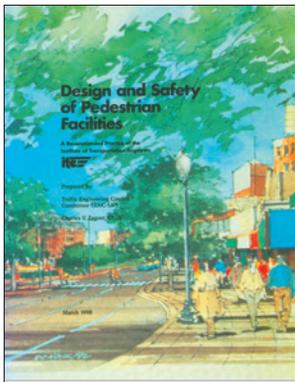


A Policy on Geometric Design of Highways and Streets (commonly known as the “Green Book”), American Association of State Highway and Transportation Officials, 6th Edition, 2011.

The Green Book contains the current design research and practices for highway and street geometric design.

Design guidelines are included for freeways, arterials, collectors, and local roads, in both urban and rural locations, paralleling the functional classification used in highway planning. The Green Book is one of the most common resources and a must have for installation planners and engineers.

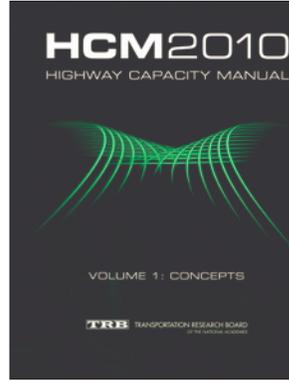
Ordering information is available online through AASHTO’s Bookstore at https://bookstore.transportation.org/collection_detail.aspx?ID=110.



Design and Safety of Pedestrian Facilities: An ITE Recommended Practice, Institute of Transportation Engineers, 1998.

This report discusses guidelines for the design and safety of pedestrian facilities to provide safe and efficient opportunities for people to walk near streets and highways.

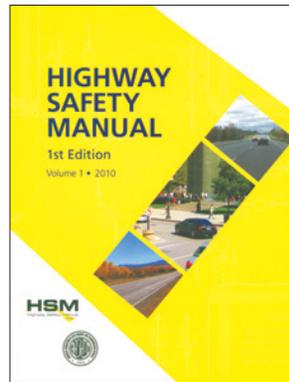
Ordering information is available online through the ITE Bookstore at: <http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=RP-026A>.



Highway Capacity Manual, Transportation Research Board, 5th Edition, 2010.

The Highway Capacity Manual (HCM2010) provides an integrated multimodal approach to the analysis and evaluation of urban streets from the points of view of automobile drivers, transit passengers, bicyclists, and pedestrians. It also addresses the proper application of micro-simulation analysis and the evaluation of results, active traffic management in relation to both demand and capacity, and provides specific tools and generalized service volume tables to assist planners in quickly sizing future facilities. The HCM2010 is one of the most common resources and a must have for installation planners and engineers.

Ordering information is available online through the TRB website at <http://books.trbbookstore.org/hcm10.aspx>.



Highway Safety Manual, American Association of State Highway and Transportation Officials, 1st Edition, 2010. The Highway Safety Manual (HSM) was developed to help measurably reduce the frequency and severity of crashes on American roadways by providing tools for considering safety in the project development process.

It includes validated highway research, procedures for including safety in project decisions, and analytical tools for predicting impact on road safety. The HSM is one of the most common resources and highly recommended for installation planners and engineers.

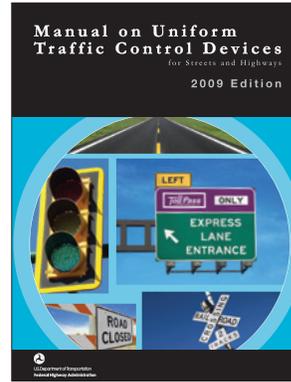
Ordering information is available online through AASHTO’s Bookstore at https://bookstore.transportation.org/collection_detail.aspx?ID=33.



Manual of Traffic Signal Design, 2nd Edition, Institute of Transportation Engineers, 1998.

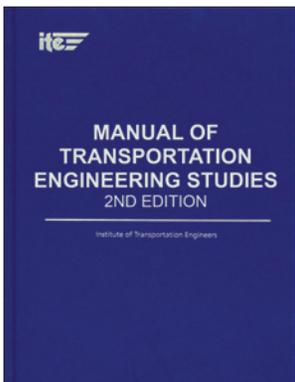
This resource covers traffic signal fundamentals, wiring and cabling specifics, preparation of contractual documents, and construction supervision.

Ordering information is available online through the ITE Bookstore at: <http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=TB-005A>.



Manual on Uniform Traffic Control Devices for Street and Highways (MUTCD), US Department of Transportation, Federal Highway Administration, 2009 Edition. The *MUTCD* is recognized as the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. The *MUTCD* is

one of the most common resources and a “must have” for installation planners and engineers. The official version of the 2009 *MUTCD* is available in PDF format at <http://mutcd.fhwa.dot.gov/pdfs/2009/mutcd2009edition.pdf>.



Manual of Transportation Engineering Studies, 2nd Edition, Institute of Transportation Engineers, 2nd Edition, 2010.

The Manual of Transportation Engineering Studies, 2nd Edition is a “how to” guide on conducting various studies using standardized study techniques and

current technology. This publication should be used in conjunction with ITE’s Traffic Engineering Handbook, Transportation Planning Handbook and other resources in order to prove most useful.

Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=TB-012A>.

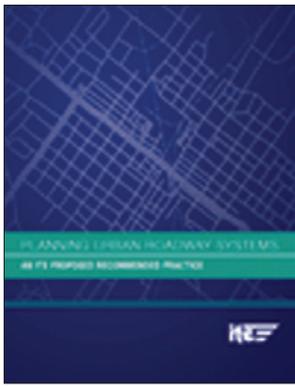


Parking Generation, 4th Edition: An ITE Information Report, Institute of Transportation Engineers, 2010.

This publication contains land use descriptions, parking generation rates, equations and data plots, peak parking demand rates, and additional quantitative and

qualitative information on the influence of numerous factors on parking demand rates. It is used for parking requirement analyses, site impact studies, on-site circulation studies and other land use related studies.

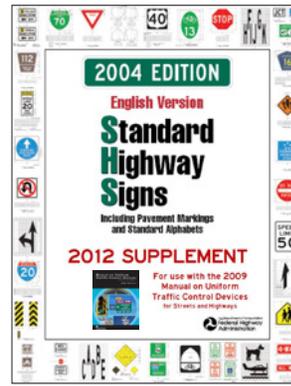
Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=IR-034C>.



Planning Urban Roadway Systems: An ITE Proposed Recommended Practice, Institute of Transportation Engineers, 2011.

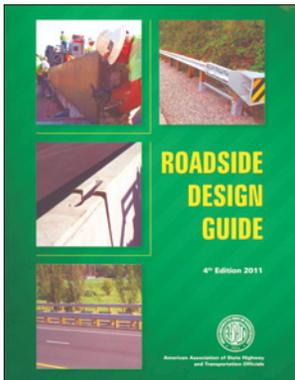
This reference addresses roadway system planning for transportation professionals who are developing comprehensive and subarea plans including new or

modified transportation systems. Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=RP-015C>.



Standard Highway Signs, US Department of Transportation, Federal Highway Administration, 2004 Edition and 2012 Supplement. This resource provides the design details for signs referenced in the *MUTCD*. These are some of the most common resources and a must have for installation planners and engineers.

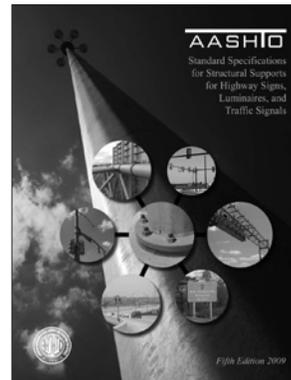
They are available in PDF format at http://mutcd.fhwa.dot.gov/ser-shs_millennium_eng.htm (2004 Edition) and http://mutcd.fhwa.dot.gov/SHSe/shs_2004_2012_sup.pdf (2012 Supplement).



Roadside Design Guide, American Association of State Highway and Transportation Officials, 4th Edition, 2011

The Roadside Design Guide provides current information and operating practices related to roadside safety. It is intended to be used as a resource document for highway agencies to

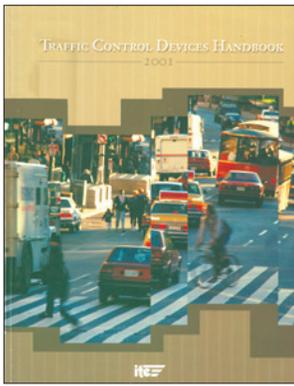
develop standards and policies. The Roadside Design Guide is one of the most common resources and highly recommended for installation planners and engineers. Ordering information is available online through AASHTO's Bookstore at https://bookstore.transportation.org/collection_detail.aspx?ID=105.



Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, with 2010 and 2011 Interim Revisions, American Association of State Highway and Transportation Officials, 5th Edition, 2009.

This resource discusses design criteria for structural supports, including loads, methods of analysis, designs, and general design features.

Ordering information is available online through AASHTO's Bookstore at https://bookstore.transportation.org/item_details.aspx?ID=1319.

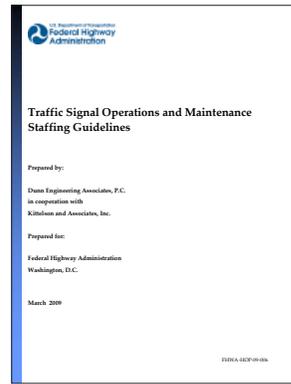


Traffic Control Devices Handbook 2001: An ITE Informational Report, Institute of Transportation Engineers, 2001.

The Traffic Control Devices Handbook provides guidance and information to implement provisions of the *MUTCD*. The objective of the Handbook is to bridge the gap between

the *MUTCD* requirements and field applications. It is meant as guidance material to assist in determining the appropriate device(s) for a specific condition based on judgment and/or study. The second edition of the Traffic Control Devices Handbook is expected to be available in late 2012.

Ordering information is available online through the ITE Bookstore at: <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=IR-112>.

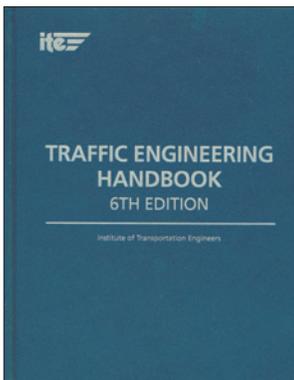


Traffic Signal Operations and Maintenance Staffing Guidelines, US Department of Transportation, Federal Highway Administration, March 2009.

This resource provides a methodology for identifying operations and maintenance objectives and performance measures. It also provides a

methodology for estimating staffing and resource needs required to achieve the specific operations objectives.

The Traffic Signal Operations and Maintenance Staffing Guidelines is available in PDF and HTML format at <http://ops.fhwa.dot.gov/publications/fhwahop09006/index.htm>.



Traffic Engineering Handbook, Institute of Transportation Engineers, 6th Edition, 2009.

The Traffic Engineering Handbook is a resource of principles and proven techniques in Traffic Engineering. It is one of the most common resources and a must have for installation planners and engineers.

Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=TB-010B>.



Traffic Signal Timing Manual, US Department of Transportation, Federal Highway Administration, June 2008. The purpose of the Traffic Signal Timing Manual is to provide practical, comprehensive guidance on signal timing concepts, procedures, and applications to reduce congestion and fuel consumption and ultimately improve quality of life.

The Traffic Signal Timing Manual is available in PDF and HTML format at http://ops.fhwa.dot.gov/arterial_mgmt/tstmanual.htm.



Transportation Impact Analyses for Site Development: An ITE Recommended Practice, Institute of Transportation Engineers, 2010.

This resource is for transportation professionals responsible for preparing and reviewing transportation impact analysis studies for

new and expanding land developments. It contains practical guidance to encourage consistency in planning site access, on-site circulation and parking layouts, and mitigation alternatives for off-site improvements. It also addresses key topic areas such as trip generation, distribution and assignment, level of service analysis, and traffic impact analysis report preparation.

Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=RP-020D>.

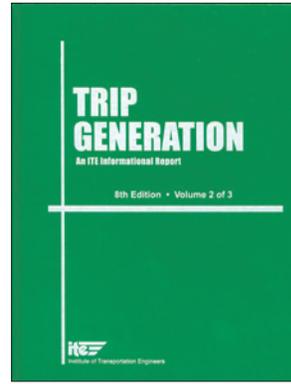


Transportation Planning Handbook, 3rd Edition, Institute of Transportation Engineers, 2009.

This is a reference for practicing transportation professionals involved with the administrative, technical and legal aspects of transportation planning. Basic information covers legal framework; urban

travel characteristics and modeling; environmental considerations; land use and urban design; evaluation and prioritization methods; and asset management.

Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=TB-011B>.

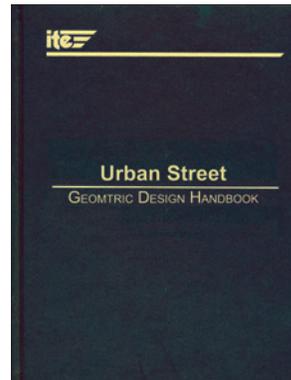


Trip Generation, 8th Edition: An ITE Informational Report, Institute of Transportation Engineers, 8th Edition, 2008.

Trip Generation, 8th Edition: An ITE Informational Report provides land use descriptions, trip generation rates, equations and data plots for use in site impact studies, on-site circulation

patterns, access management studies, traffic signal timing and environmental assessments.

Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=IR-016F>.



Urban Street Geometric Design Handbook, Institute of Transportation Engineers, 2008.

The Urban Street Geometric Design Handbook provides comprehensive, practice-oriented guidance that focuses on the operational and safety aspects specifically related to the geometric design of all

classifications of urban surface streets (local streets, collector streets, arterial streets and their intersections). It identifies techniques, procedures and guidelines that have been applied to a wide variety of newly constructed or reconstructed street projects.

Ordering information is available online through the ITE Bookstore at <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=TB-018>.

Software

Traffic analysis tools are software-based procedures supporting different transportation and traffic analyses. They are categorized by their methodologies such as sketch-planning, travel demand modeling, analytical/deterministic tools, traffic signal optimization, and traffic simulation. These tools help planners and engineers evaluate specific projects or alternatives without having to complete in-depth engineering analyses. Numerous tools have been developed by public agencies, research organizations, and private companies. Two of the most common are Synchro 8 and HCS 2010.

Synchro 8

Synchro 8 is a macroscopic analysis and optimization tool that implements the Highway Capacity Manual (HCM) procedures to determine intersection capacity. It is suitable for analyzing isolated or small-scale transportation facilities. Turning movement traffic volume counts or projections at intersections can be entered into a Synchro traffic model to identify congestion problems. Once a traffic model is accurately populated with traffic volumes, the lane configurations and traffic control can be analyzed for needed changes to improve circulation and reduce delay. More information can be found at <http://www.trafficware.com>.

HCS (Highway Capacity Software) 2010

HCS 2010 also implements the new Highway Capacity Manual (HCM 2010) procedures for Urban Streets, Signalized Intersections, Roundabouts, Basic Freeway Segments, Freeway Weaving Segments, Freeway Merge & Diverge Segments, Freeway Facilities, Two-Lane Highways and Multilane Highways. More information is available at <http://mctrans.ce.ufl.edu/hcs/>.

Other Resources

Federal Highway Administration (FHWA)

FHWA is the nation's leader and the DOD's partner for research, development, and technology advancement of highway transportation solutions. They offer a wealth of information on their website concerning a broad range of highway transportation matters. The address is www.fhwa.dot.gov.

Additionally, FHWA has excellent information on highway safety at <http://safety.fhwa.dot.gov>. Topics include proven safety countermeasures such as rumble

strips, roundabouts, corridor access management, and two-way left-turn lanes. This web page has links to the current *MUTCD*, and information on retroreflectivity, work zone safety, and many other programs and areas of study.

Institute of Transportation Engineers (ITE)

ITE is an international community of transportation professionals responsible for meeting mobility and safety needs. With almost 17,000 members, they use technology and scientific principles for research, planning, functional design, implementation, operation, policy development and management for any mode of ground transportation. They provide professional development training opportunities and serve as a conduit for information exchange for all ground transportation engineering issues. Their online articles, briefing sheets, reports, and publications can offer valuable insight to installation planners and engineers when facing their transportation challenges. The ITE website address is www.ite.org.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO is an organization made up of representatives from all 50 states, the District of Columbia, and Puerto Rico, and serves as a liaison between the State transportation departments and the Federal government. It establishes highway system standards, develop policy, and participate in technical transportation activities. It also develops and publishes guidelines that are used worldwide for the design, maintenance, construction, operation, and administration of transportation facilities. The AASHTO Subcommittee on Traffic Engineering (SCOTE), under the Standing Committee on Highways, is one of the sectors that may offer helpful information to installation planners and engineers. The AASHTO website address is www.transportation.org.

State and Local Transportation Departments

Because installation roads are considered extensions of the public highway system in their vicinity and can be impacted by them, and vice versa, installation planners and engineers should collaborate closely with their State and local transportation departments on mutual highway matters. The State or local transportation websites may serve as an invaluable resource for planners and engineers to stay connected and keep abreast of significant transportation issues.



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OFFICIAL BUSINESS

Reference List

- ✓ Better Military Traffic Engineering, SDDCTEA Pamphlet 55-17, 2011
- ✓ Joint Regulation DOD Transportation Engineering Program (AR 55–80, OPNAVINST 11210.2, AFMAN 32-1017, MCO 11210.2D, and DLAR 4500.19)
- ✓ www.transportation.org
- ✓ www.fhwa.dot.gov
- ✓ www.ite.org
- ✓ www.highwaysafetymanual.org
- ✓ www.mctrans.ce.ufl.edu/hcs/
- ✓ www.tea.army.mil
- ✓ www.trafficware.com
- ✓ www.trb.org

Continuing Education	Phone	Web Site
Pennsylvania State University; The Pennsylvania Transportation Institute	(814) 865-4700	www.pti.psu.edu
University of Maryland; MD Transportation Technology Transfer Center	(301) 403-4623	www.ence.umd.edu/ttcc
Georgia Institute of Technology	(404) 385-3501	www.gatech.edu
Northwestern University Center for Public Safety	(800) 323-4011	www.northwestern.edu/nucps/index.htm
Texas A&M University	(979) 845-3211	www.tamu.edu
University of Washington; College of Engineering	(206) 543-2100	www.engr.washington.edu/epp