Chapter 1 General Information

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1-1 Overview

The Washington State Department of Transportation (WSDOT) publishes the *Traffic Manual* to provide guidance on applicable policies, establish uniform methods and procedures, and communicate vital information about traffic operations on state highways. The intended audience is the department's employees and others who develop traffic projects or conduct traffic engineering studies on state highways. The information, guidelines, and references herein are intended to support and complement sound engineering judgment and reflect the agency's commitment to zero fatal and serious injuries and a sustainable, integrated multimodal transportation system.

The *Traffic Manual* is available on the Internet and in print. It can be accessed electronically at www.wsdot.wa.gov/publications/manuals/m51-02.htm.

The online version allows you to do a word search of the entire manual.

1-2 Subject Matter

The *Traffic Manual* is composed of thirteen chapters:

Chapter 2 Signs

Chapter 3 Delineation & Markings

Chapter 4 Multimodal Planning and Design/Operational Considerations

Chapter 5 Work Zone Traffic Control

Chapter 6 Traffic Regulations

Chapter 7 Specialized Highway Uses

Chapter 8 Highway Advertising Control and MIS

Chapter 9 Traffic Planning, Safety, Operations, and Design

Chapter 10 Intersection Control Evaluation

Chapter 11 Traffic Engineering Records Management

Chapter 12 Multimodal Traffic Impact Analysis Guidelines

Chapter 13 Cameras

Each chapter provides information, guidelines, and references relating to a specialized area of traffic operations. Because traffic control device systems and their application are dynamic, the *Traffic Manual* is updated periodically to reflect state-of-the-art traffic engineering practices.

The *Traffic Manual* does not attempt to address all the possible traffic operations situations or questions. Contact the Headquarters Traffic Office for discussion and guidance on unique traffic operations matters.

1-3 WSDOT Traffic Coordination

Most traffic activities within WSDOT are administered by the Headquarters Transportation Operations Division and the Regional Traffic Offices. Specialized support is provided by other subject matter experts as needed. The following subsections briefly describe how each of these work groups contribute to the goals of the department's Transportation Operations Division program.

A. **Headquarters Transportation Operations Division (Headquarters) –** Under the State Traffic Engineer, Headquarters Traffic Operations Division is responsible for traffic engineering and related safety functions in four fundamental areas:

1. **Statewide Transportation Operations Expertise –** Headquarters provides expertise to the regions and other agencies, focusing on traffic design, traffic operations, traffic regulations, ITS operations, work zone traffic control, traffic impact analysis, traffic engineering training, and highway advertising control. The Transportation Operations Division also coordinates statewide transportation activities including consulting with Attorney General's Office on matters of traffic law, offering advice or guidance when requested by the regions or other WSDOT offices, and facilitating statewide meetings with regional transportation operations personnel.

2. **Statewide Policy Development –** Headquarters develops policy and responds to issues and questions on traffic engineering to provide for statewide consistency and uniformity. These tasks often require efforts to research, coordinate, and summarize issues for executive level decision-making. Policies include injury minimization speed management, traffic design, and traffic operations standards and procedures.

3. **Statewide Resource Development and Deployment –** Headquarters identifies the resources required to fund transportation operations for the state highway system, and lower cost investments that reduce crash potential, improve traveler efficiency, or improve multimodal access. Decision packages are developed and submitted to the legislature for approval each biennium and once approved, the funds are allocated.

   Transportation operations activities are accomplished primarily under Program Q.

4. **Traffic Systems Management and Operations (TSMO) Program –** Headquarters serves as an agency TSMO champion, focusing on how to operate our existing facilities most efficiently. In coordination with other divisions and regions, the Transportation Operations Division leads the implementation and maintenance of the

statewide TSMO Program Plan. This effort requires evaluating, planning and addressing areas like business processes, workforce development, culture, and technology and performance management. See the TSMO website (TSMOWA.org).

B. **Regional Traffic Offices –** The six Regional Traffic Engineers provide traffic engineering services that include:

1. Traffic engineering investigations and studies which include crash and operational analyses.
2. Multimodal analyses and assessments.
3. Compliance with rules and regulations.
4. Regional transportation operations expertise.
5. Freeway and arterial management.
6. Traffic related design support to the I and P subprograms.
7. Traffic control device inventories.
8. Public and media relations.
9. Administration of Program Q allocations.
10. Project development and implementation.

C. **Maintenance Operations –** Maintenance Operations personnel work through many challenges in maintaining the state highway system, including increasing growth in population and vehicles, and extreme weather patterns that can bring wind, rain, snow, and ice. Providing for movement on our highway system during each season while performing a variety of maintenance activities that minimize the potential for crashes involving our maintenance workers is a priority for WSDOT's Maintenance Operations staff. Using tools, technology, techniques and talent; the maintenance professionals take on these challenges and deliver through it all.

D. **Active Transportation Division –** The Active Transportation Division provides leadership and expertise to guide policy, practice, and problem solving to increase walk, bike and roll safety, mobility and accessibility. Their work supports the agency's mission of enabling Washingtonians of all ages and abilities to get where they want to go using the modes that work best for them. This includes an emphasis on active transportation network connectivity and quality, systematic safety, multimodal access, pedestrian crossing permeability, and injury minimization speed management on roadways where people walking or biking may be present. The division leads development of agencywide policies and procedures for implementing the Complete Streets requirement, provides technical assistance within WSDOT and to local partners, coordinates with active transportation coordinators housed in region offices and oversees the Safe Routes to School, Pedestrian and Bicycle, and Sandy Williams Connecting Communities funding programs.

E. **Transportation Data, GIS & Modeling Office –** The Transportation Data, GIS and Modeling Office (TDGMO) is part of Headquarters Multimodal Planning Division. The TDGMO collects, analyzes, reports, and stores much of the data the department uses to identify and address operational deficiencies on our state highways. Data includes information about the type of roadway surface, width of the travel lanes and shoulders, number and types of vehicles using the highway each day, and the location and severity of crashes. The TDGMO also provides technical support for planning functions, maintains video and digital imaging of state highways, and maintains the milepost system. www.wsdot.wa.gov/mapsdata/tdgo_home.htm

Transportation Safety Division – WSDOT's Transportation Safety Division supports programs across the agency to help WSDOT achieve its strategic safety plan by providing actionable information through research, data analysis and coordination with other programs to help agency leaders make decisions.

F. **Local Programs Division –** The Local Programs Division provides traffic engineering assistance to cities, counties, tribal governments, transit and other agencies, as well as other organizations. They assist with traffic safety, operations, and design issues, help advance projects, and promote information sharing. Local Programs also operates as a contact point between local agencies, tribal governments, WSDOT, Federal Highway Administration, and other state agencies. Local Programs answers general questions about state highways but directs questions about specific locations to the appropriate WSDOT region.

Examples of the services offered are available at www.wsdot.wa.gov/LocalPrograms/Traffic/default.htm.

The Local Programs Division also hosts the Washington Transportation Professionals peer exchange, a group of Washington State city and county traffic, transportation, and public works engineers and technicians, public works directors, managers, planners, and related professionals. This peer exchange provides a forum for local agencies to share ideas and information about traffic issues affecting local agencies through email, website, and regular meetings. Meeting dates and topics are listed at www.wsdot.wa.gov/LocalPrograms/Traffic/WTPF.htm.

For more information about these services, contact the Local Programs Manager at www.wsdot.wa.gov/LocalPrograms/staff.htm.

G. **Multimodal Planning Division –** The Multimodal Planning Division informs decisions through expertise and innovation in planning, policy, data and analysis services to support a sustainable and integrated statewide multimodal transportation system.

   The Multimodal Planning Division:

   1. Plans transportation improvements for a variety of travel modes including transit, carpools, freight, general-purpose highway use and active transportation.
   2. Coordinates with local agencies, sub-area transportation management forums, the Puget Sound Regional Council (PSRC), and other transportation providers to determine cost-effective investments for the state transportation system that meet the mobility needs of people and goods while systematically working to meet greenhouse gas reduction goals set in state law.
   3. Improves the performance of the existing highway system by implementing new technology and developing congestion pricing and tolling strategies.
   4. Coordinates state transportation facility planning between WSDOT's Olympic and Northwest Regions, Tolling Organization, Washington State Ferries, and with local jurisdictions and the Puget Sound Regional Council.
   5. Collects, processes, analyzes and reports data on over 80,000 miles of public roadway, including over 7,000 miles of state highway. Provides specialized GIS products and services in support of business operations throughout WSDOT.

H. **Risk Management & Legal Services Division –** The Risk Management & Legal Services Division (RMLS) is responsible for the agency's risk management function, including managing agency litigation, investigating tort claims, pursuing financial recovery for damage to agency property and resources, records and information management, public disclosure, agency rules, policies, and forms. RMLS provides consultation and support on legal compliance issues, including the state public records laws. RMLS manages the agency's records management and public disclosure programs and assists regions, divisions and offices with records retention schedules and disposition of records and responding to public records requests. See *Records and Information Management Manual* M 3124. The Transportation Operations Division's records retention schedules can be found in *Traffic Manual* Chapter 11, Traffic Engineering Records Management.

I. **Public Transportation Division –** The Public Transportation Division's goal is to develop and deliver innovative, distinctive programs, services and approaches that support an integrated, multimodal, sustainable transportation system, to consistently exceed our customers' and partners' expectations; and to be recognized as a great place to work. The Public Transportation Division strives to create and support integrated transportation solutions that connect people statewide through partnerships with local and regional services and organizations.

J. **Development Division –** The Development Division consists of over 300 employees working in six geographic areas – Regions - actively supporting the agency's goals and mission by providing responsive, reliable and progressive professional products and services to our customers. The division is committed to employee development and recognizing accomplishments, while fostering a productive and modern work environment. The Design Office in the Development Division maintains and updates the WSDOT *Design Manual* (DM). Staff across the agency engaged in highway design use the DM, along with other guidance resources, in the course of that work. Assistant State Design Engineers, who work in the division, are a primary staff resource when interpreting guidance and in addressing conflicts between manuals, providing information about the procedures and documentation that may be required.

K. **Ferries** – WSF Marine Operations manages all aspects of day-to-day operations for WSF's fleet. We manage over 800 deckhands, 300 terminal staff and dispatch more than 200 engine personnel ensuring that sufficient staff meet federally determined crewing levels assigned to deck, engine and terminal positions, that they have appropriate documentation, and comply with federal, state, and Collective Bargaining Agreement requirements. Marine Operations coordinates and jointly manages all aspects of operation that fall to other departments such as emergency response, supply acquisition and delivery, negotiating Collective Bargaining Agreements, U.S. Coast Guard regulation and inspection, training and qualifications, and counselling and progressive discipline.

L. **Urban Mobility and Access –** The Urban Mobility and Access (UMA) Office is focused on transportation needs in the central Puget Sound (King, Kitsap, Pierce, and Snohomish counties). The UMA Office has three divisions: Management of Mobility, Regional Transit Coordination, and the Toll Division.

The Management of Mobility Division coordinates plans for state facilities with regional, local and modal partners; develops system strategies, corridor plans and investment proposals to improve multimodal mobility and access on state routes. In addition, the division works closely with regions and local agencies to coordinate future construction impacts as well as develop strategies to manage major system changes and congestion caused by major incidents.

Regional Transit Coordination Division supports and liaisons with Sound Transit, King County Metro, Community Transit, Everett Transit, and Pierce Transit. This includes collaborating and coordinating with transit and other agencies as well as with WSDOT divisions and offices if there is a potential for impacts to transit or opportunities for enhanced transit in the central Puget Sound Region.

The Toll Division implements and operates the statewide toll program. The Toll Division works closely with the Northwest Region Traffic office and other offices statewide on key Transportation System Management & Operations (TSMO) concepts like express toll lanes and variable tolling rates, and provides revenue to fund transportation improvements, maintenance and operations.

M. **Capital Program Development and Management Division (CPDM) –** CPDM is responsible in varying degrees for development and management of the capital construction programs for highways, ferries, and rail, as well as for transportation operations and capital facilities. CPDM develops the highway construction program working with region program management and project development and oversees development of construction programs for all other modes and functional areas, working with their respective staffs. CPDM is also responsible to ensure that construction programs meet the cost, scope and schedule of Legislative intent. CPDM seeks the most efficient means of utilizing available funding and workforce resources provided by the Legislature to construct projects that preserve and improve the state transportation system. As projects are scheduled for construction, CPDM allocates funding, monitors progress, and reports results to the Legislature, Governor's Office, WSDOT executives and the public. CPDM works with many others both within and outside the department to ensure the successful delivery of the department's Construction Program.

N. **Rail, Freight and Ports Division –** Rail, Freight, and Ports Division is responsible for:

- Managing the Amtrak Cascades passenger rail system in conjunction with ODOT.
- Planning for the future of Washington's rail, freight and ports programs and projects.
- Funding freight rail projects across the state through both grant and loan programs.
- Coordinating with ports, regional planning organizations and other freight stakeholders across the state to align priorities.
- Overseeing the WSDOT-owned short line railroad in eastern Washington– the Palouse River & Coulee City Rail System.

1-4 Key Reference Material

The following reference materials are essential to Transportation Operations personnel for traffic operations and traffic design duties:

- *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) and *Washington State Modifications to MUTCD* M 24-01. RCW 47.36.030 directs WSDOT to adopt a uniform standard for the application and location of traffic control devices installed along public roadways in the state of Washington. The MUTCD, published by FHWA, has been adopted into Chapter 468-95 of the Washington Administrative Code (WAC). To comply with state law, modifications to specific MUTCD sections have also been adopted into WAC 468-95.

  Amendments to the MUTCD are developed by the FHWA through the Federal Register process. The amendments become effective in our state after the department receives notification of the approved changes from the FHWA and adopts them into WAC 468-95.

WSDOT *Design Manual* M 22-01. The *Design Manual* | Manuals | WSDOT (DM) is maintained by the Design Office in the Development Division, and is the agency's primary reference for highway design policy and guidance. In addition, it provides a uniform approach to methods and procedures for development of multimodal highway designs. Besides policy, methods, and guidance for designers, the DM provides the basic framework for documenting and approving designs. The DM also provides guidance for developing traffic components included in design reports and contract plans per the *Plans Preparation Manual*. Many of the components may also apply to traffic operations. Where possible, the *Traffic Manual* avoids duplication of *Design Manual* materials, but provides appropriate cross-references.

- WSDOT *Sign Fabrication Manual* M 55 05. The *Sign* Fabrication *Manual* provides sign fabricators and designers with detailed layout information for official traffic signs used in Washington State.
- WSDOT *Standard Plans* M 21-01. The Standard Plans provide plans for traffic-related items.
- WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction* M 41-10. The *Standard Specifications* provide detailed requirements and techniques for construction and installation of traffic-related items.

1-4.1 Other Documents

The following reference documents may also be helpful in conducting traffic related designs and analyses:

WSDOT Manuals www.wsdot.wa.gov/publications/manuals

- *Plans Preparation Manual* M 22-31
- *Construction Manual* M 41-01
- *Maintenance Manual* M 51-01
- Highway Advertising Control Act M 22-95
- *Developer Services Manual* M 3007

FHWA (Federal Highway Administration) www.fhwa.dot.gov

- Traffic Monitoring Guide

AASHTO (American Association of State Highway and Transportation Officials) www.transportation.org

- A Policy on Geometric Design of Highways and Streets
- Guidelines for Traffic Data Programs
- *Highway Safety Manual*
- Guide for the Development of Bicycle Facilities, 5th Edition
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2nd Edition

NACTO (National Association of City Transportation Officials)
https://nacto.org/publications, https://nacto.org/safespeeds

- Urban Street Design Guide
- Urban Bikeway Design Guide

TRB (Transportation Research Board) www.trb.org/main/public/home.aspx

- *Highway Capacity Manual*

ITE (Institute of Transportation Engineers) www.ite.org

- Traffic Control Devices Handbook
- ITE Trip Generation Manual Traffic Engineering Handbook
- Manual of Transportation Engineering Studies

1-4.2 Other Reference Sources

The following internal reference sources may also be helpful in conducting traffic engineering investigations and analyses:

- Safety Analysis Guide
- Traffic Electrical Design Webpage
- *Multimodal Traffic Impact Analysis Guidelines*
- SR View
- Interchange Viewer
- *Washington State Highway Log*
- TRIPS — WSDOT corporate mainframe database for transportation data
- NCHRP Human Factor Guides

1-5 Abbreviations

Common abbreviations used in the *Traffic Manual* and other traffic engineering related publications are:

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ARM	Accumulated Route Mileage
VMS	Variable Message Sign
CVISN	Commercial Vehicle Information Systems Network
DMI/LRS	Distance Measuring Instrument/Linear Referencing System
FHWA	Federal Highway Administration
GPS/LRS	Global Positioning System/Linear Referencing System
HOV	High Occupancy Vehicle
HOT	High Occupancy Toll
HPMS	Highway Performance Monitoring System

HSIS	Highway Safety Information System
ITE	Institute of Traffic Engineers
ITS	Intelligent Transportation Systems
MPO	Metropolitan Planning Organization
MUTCD	*Manual on Uniform Traffic Control Devices for Streets and Highways*
NHS	National Highway System
PSRC	Puget Sound Regional Council
PTR	Permanent Traffic Recorder
RCW	Revised Code of Washington
SRMP	State Route Milepost
MAP-21	Moving Ahead for Progress in the 21st Century Act
TDGMO	Transportation Data, GIS & Modeling Office
TMC	Traffic Management Center
TRAC	Transportation Research Center (University of Washington)
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WSP	Washington State Patrol
WTSC	Washington Traffic Safety Commission