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1.1 WSDOT Traffic Functions

Traffic functions within the Washington State Department of Transportation (WSDOT) are administered, supported, and/or monitored by:

- The Headquarters Traffic Operations Office (State Traffic Engineer), Intelligent Transportation Systems (ITS) Office, (State ITS Engineer), and the Highway Maintenance Office (State Maintenance Engineer)
- The six Regional Traffic Offices (Regional Traffic Engineers)
- The six Regional Maintenance and Operations Offices (Regional Maintenance and Operations Engineers)
- The Urban Planning Office (UPO)
- The Transportation Data Office (TDO)
- The Office of Highways and Local Programs

A WSDOT organization chart showing the relationship between the six regions and the various Headquarters offices is available on the web at:

<http://www.wsdot.wa.gov/SiteIndex/ExecOrgChart.htm>

The following sections explain how each of these work groups accomplishes the goals of the department's traffic program.

1.2 Headquarters Traffic Administration

The Offices of the State Traffic Engineer, the State ITS Engineer, and the State Maintenance Engineer are part of the Headquarters Maintenance and Operations Programs group.

A. State Traffic Engineer's Office

Under the direction of the State Traffic Engineer, the Headquarters Traffic Operations Office is responsible for traffic engineering and related safety functions in three fundamental areas:

- Statewide Policy Development — To ensure statewide consistency and uniformity, the Traffic Office develops policy and responds to issues and questions on traffic engineering. These tasks often require efforts to research, coordinate, and summarize issues for executive level decision-making. Policies include traffic design and traffic operations standards and procedures.
- Statewide Resource Development and Deployment — The resources required to fund the traffic operations for the state highway system, and new and replacement statewide traffic and "spot" safety investments, are pursued through decision packages that require legislative approval. When approved by the legislature, these funds are allocated to the regions for implementation. Such traffic operations and "spot" safety functions are components of Program Q.
- Statewide Traffic Expertise — The Headquarters Traffic Office provides expertise to the regions and other agencies in areas of general traffic operations, traffic analysis, and traffic design activities. The Traffic Office provides technical training, and coordinates statewide traffic activities including: consultation with Attorney General's Office on legal matters, offering advice or guidance upon request from the regions and other WSDOT offices, and facilitating statewide meetings with regional traffic personnel.

The Headquarters Traffic Operations Office provides specific expertise in the following areas:

- Traffic Design
- Traffic Operations
- Work Zone Traffic Control
- Traffic Engineering Training
- Outdoor Advertising Control

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The following subsections describe the functions and services provided by work groups within the Headquarters Traffic Operations Office.

i. Traffic Design

- a. Provide statewide contract plan review for traffic signal, illumination, and delineation projects.
- b. Prepare signal system and illumination plans for WSDOT regions.
- c. Maintain operational standards, standard specifications, and standard plans for signals, illumination, ITS systems, and delineation.
- d. Provide guidance and support for the Attorney General's Office on traffic related tort claim cases.
- e. Assist the Materials Laboratory in the approval process for electrical, delineation, and other traffic items.
- f. Provide technical information to General Administration and WSDOT purchasing personnel involved in the development of procurement contracts for:
 - Materials and equipment for traffic signal systems
 - Materials and equipment for illumination systems
 - Materials and equipment for delineation
- g. Conduct or coordinate statewide training on:
 - Signal and Illumination Design
 - Fundamental traffic engineering principles
 - Electrical design portions of contract plan preparation
 - Signal operations, including optimization of timing and coordination
- h. Share information with the Materials Laboratory and manufacturers about current trends in materials and equipment used to construct signals, illumination systems, and delineation.

- i. Develop and maintain Operations and Maintenance Time Standards used for budget planning, and for planning preventative maintenance activities of electrical systems and delineation.
- j. Support the Transportation Planning Office and the regions by giving expert review and training in the benefit-cost analysis methodologies used to analyze I2 Safety Improvement Program issues.
- k. Review and research advanced traffic simulation and optimization software models. Distribute this software and pertinent information throughout the department.

ii. Traffic Operations

- a. Support regional safety audits that research and evaluate potential operational traffic improvements along existing state highways.
- b. Act as technical consultants to the regions in the design and construction of safety and operations improvement projects.
- c. Develop and implement the Corridor Safety Program. This multi-jurisdictional statewide safety program provides a forum for several traffic safety disciplines to identify low cost enhancements that increase safety on project corridors.
- d. Assist in developing the comprehensive safety planning components of the Washington Transportation Plan.
- e. Work with the Washington Traffic Safety Commission (a consortium of local and state organizations responsible for reducing death, injuries, and economic loss resulting from motor vehicle collisions) not to prevent all traffic collisions, but to make them more survivable.
- f. Administer the WSDOT DUI Victim Memorial Sign Program and Highway Fatality Memorial Program.
- g. Develop and initiate programs as required by the legislature, for example statewide speed limit changes and work zone safety programs.

- h. Operate the statewide Traffic Sign Management System (TSMS), including the statewide sign inventory database. Maintain the Sign Fabrication Manual (M 55-05).
 - i. Serve as technical consultants to the regions regarding sign fabrication. Conduct periodic inspections of sign fabrication shops and develop inspection criteria for sign fabrication inspectors. Evaluate new sign fabrication shops for approval as WSDOT contract fabricators.
 - j. Review deviation requests, contract plans, and other WSDOT documents, for the proper application of traffic control devices. Ensure conformance to the MUTCD and other state standards for permanent signing and temporary traffic control.
 - k. Serve as technical consultant to the regions on permanent signing issues, challenges, and special applications.
 - l. Develop specifications for new or revised signing items to be included in the Standard Specifications, General Special Provisions, and Standard Plans.
 - m. Communicate with manufacturers to analyze current trends in materials and equipment used to construct signs and appurtenances.
 - n. Provide final approval for byway logo signing on eligible inter-regional scenic and recreational highways.
 - o. Develop statewide policies for the implementation of MUTCD principles and guidelines. Maintain operational policies in the Traffic Manual, and departmental directives. Provide standards for all traffic control devices used on public roadways.
 - p. Recommend approval or denial of traffic regulations for:
 - Permanent speed limits
 - High occupancy vehicle (HOV) designations
 - Bicycle prohibitions
 - Truck restrictions
 - Angle parking
 - Parking facilities, including park and ride lots operated by WSDOT
- Evaluate traffic regulations submitted by the regions to ensure that statutory requirements are met, and that engineering support data are complete and accurate.
- q. Interpret the provisions of state law and supporting departmental regulations for billboards and motorist information signs to resolve conflicts between sign owners and the regions. Process billboard permits and the annual permit renewals.
 - r. Sanction inter-regional events on state highways, such as running or bicycling events, caravans, or other special events. Provide information to event sponsors about how to safely conduct events on state highways, including all applicable traffic regulations. Provide the regions with support and direction regarding events on state highways in their areas.
 - s. Analyze traffic operations or safety-oriented legislation and respond to legislative inquiries on traffic matters. Provide executive management with information necessary to determine appropriate departmental positions.
 - t. Conduct quadrennial reviews of traffic related WACs and make related changes to brochures and other items for outdoor advertising control, motorist information signs, and the MUTCD. Respond to AASHTO Ballots, Federal Register notices, and inquiries from the public.
- iii. Work Zone Traffic Control**
- a. Provide statewide guidance and assistance for all work zone traffic control issues, including:
 - Design/PS&E
 - Work Zone Safety
 - Construction, Maintenance, Local Agencies and Public and Private Roadway Users
 - Public Information
 - Other State Agencies (L & I, WSP)

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b. Develop and conduct training in the following areas:

- Design Strategies
- Work Zone Reviews
- Traffic Control Supervisor (TCS)
- Maintenance Traffic Control Operations Training (MTCOT)
- Short Duration Work Zones
- Traffic Control Plan Design (TCP Design)

c. Research and develop new devices, equipment, and methods by working with industry associations and professional committees such as:

- American Traffic Safety Services Association (ATSSA)
- Associated General Contractors (AGC)
- American Association of State Highway & Transportation Officials (AASHTO)
- New Products Committee
- Safety Products Team
- Work Zone Safety Task Force Technical Committee (WZSTF)

d. Develop departmental policy, specifications, and procedures by working within Headquarters and the regions, and by partnering with:

- Work Zone Safety Task Force
- Safety Office
- Labor & Industries
- Washington State Patrol
- Traffic Safety Commission
- Washington Utilities & Transportation Commission
- FHWA
- Highway Contracting Industry

e. Upon request, provide expertise to the regions in the following areas:

- Field Reviews of Work Zones

- Design Strategies and PS&E Reviews
- Reduced Work Zone Speed Limits
- Specifications Review and Comment
- Applications of WSDOT and Federal (MUTCD) Standards

iv. Traffic Engineering Training

The Headquarters Traffic Engineering Training team assesses the regions' traffic engineering related training needs and establishes training sessions to meet them. This involves designing and instructing new courses to meet specific needs, and facilitating courses that are conducted by consultants.

v. Outdoor Advertising Control

Administer the department's statewide Outdoor Advertising Control Program under purview of the Scenic Vistas Act (RCW 47.42) and WAC 468-66.

- Administer permitting process
- Provide guidance to regions
- Serve as liaison with Attorney General's office regarding legal questions and for illegal sign abatement activities
- Carry out Rule-making
- Coordinate with FHWA

B. State ITS Engineer's Office

Under the direction of the State ITS Engineer, the Headquarters ITS Office supports traffic administration by:

- Developing policy for ITS operations programs, ITS communication and wireless technology, and truck freight related programs.
- Developing and implementing statewide procedures for incident response.
- Maintaining state of the art traffic management center applications for surveillance, control, and traveler information.

- Developing, implementing, and monitoring highly specialized advanced technology projects.
 - Incorporating ITS communication strategies into ITS operations.
- ii. Conduct accident analyses and provide information to other department work groups, including Planning and Programming, Design, Maintenance, and Project Engineers.

C. State Maintenance Engineer's Office

Under the direction of the State Maintenance Engineer, the Headquarters Highway Maintenance Office is responsible for maintaining traffic control devices, and issuing road approach permits.

The resources required to fund the maintenance of traffic control devices, such as lane markings, signs, safety hardware, electronic traveler information systems, traffic signals, and illumination equipment are pursued through decision packages. When funded by the legislature, these resources are allocated to the regions for implementation. Such traffic maintenance functions are components of Program M.

1.3 Regional Traffic Administration

Approval authority for various traffic considerations has been delegated to the Regional Administrators through Departmental Directives and other documents. This approval authority may be further delegated to senior regional managers. All regions appoint a Regional Traffic Engineer who is responsible for traffic related services. Depending on regional organization, the Traffic Engineer reports to one of the region's senior managers, typically the Regional Maintenance and Operations Engineer.

The responsibilities for regionally administered traffic engineering and safety services can be summarized into six components:

A. Coordinate Traffic Studies, Data Collection, and Analysis

- i. Provide traffic data for upcoming projects or planning functions.
- ii. In addition, the Regional Administrator is charged with the following duties that can impact traffic operations:
 - Conduct the Outdoor Advertising Control and Motorist Information Signing programs
 - Review access permits required under State Access Management legislation

B. Maintain Compliance With Rules and Regulations

Ensure that all traffic control devices are installed in accordance with appropriate portions of the MUTCD, WAC Rules, and WSDOT policies. In addition, ensure that outdoor advertising is in compliance with applicable regulations.

The regional traffic offices develop and process appropriate traffic regulations that ensure safe and efficient operation of the transportation system within the region.

- i. Through departmental directives and policies, the Regional Administrators have been delegated the authority to approve:
 - Permits for installation of traffic signals on state highways
 - Stop control on state highways
 - Turn prohibitions
 - Pedestrian prohibitions on partial access controlled highways
 - Roadside parking restrictions (except angle parking and park and ride restrictions)
 - Prohibitions on fishing from bridges
 - Temporary reduced regulatory speeds in construction or maintenance areas
 - Regulatory speeds in rest areas
 - Transit vehicle stop zone locations
 - Vehicle weight restrictions
- ii. In addition, the Regional Administrator is charged with the following duties that can impact traffic operations:
 - Conduct the Outdoor Advertising Control and Motorist Information Signing programs
 - Review access permits required under State Access Management legislation

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- Review development proposals for potential impacts to safety, capacity, and maintenance of the state highway system

C. Provide Traffic Expertise

- i. Ensure that traffic signals and signal systems operate efficiently to meet traffic operation goals.
- ii. Provide expertise on traffic related items included in project design (signals, illumination, signing, delineation).
- iii. Review traffic design elements for construction projects.
- iv. Approve or deny requests to conduct special events or filming operations on state highways within the region.
- v. Conduct design and operational reviews for work zone traffic control plans.
- vi. Perform periodic operational and safety reviews to verify that posted advisory speeds, intersection sight distances, and other roadside features comply with accepted standards.

D. Manage Freeway and Arterial Operations

Manage freeway and arterial operations through:

- i. Surveillance, Control, and Traveler Information (SC&TI) systems, including data stations, ramp meters, cameras, signal systems, changeable message signs (CMS), other Intelligent Transportation Systems (ITS), and highway advisory radio (HAR).
- ii. The HOV system.
- iii. Incident response methods.
- iv. Coordinating with local agencies regarding traffic flow management, serving as technical advisor when appropriate.
- v. Signing and channelization.

E. Coordinate Traffic Information

Respond to local agency and citizen concerns, and the news media, about traffic related issues. Represent WSDOT at city, county, and other public forums regarding traffic issues.

F. Administer Program Q

Each Region administers its allocation of Program Q funds. This includes identifying safety and efficiency investment priorities and programming low-cost enhancement funds.

G. Traffic Control Device Inventories

Maintain inventories of traffic control devices within the region.

1.4 Urban Planning Office

The Urban Planning Office (UPO) coordinates WSDOT activities within the geographic area covered by the Puget Sound Regional Council (PSRC). PSRC is the Metropolitan Planning Organization (MPO) for King, Kitsap, Pierce, and Snohomish Counties. The UPO recognizes the need to integrate transportation modes and coordinate long-range regional growth management plans to create a balanced transportation system, and works with the Olympic and Northwest Regions, Washington State Ferries, and local officials to accomplish that integration.

A few of the office's activities are:

- Transit Planning/HOV — Represent the department in establishing a Regional Transit Plan and promote transportation alternatives through transportation demand management methods. Provide lead responsibility for planning and prioritizing HOV facilities.
- Regional Coordination — Work with the PSRC, sub-regional groups, and local jurisdictions in the regions to develop regional transportation plans that maintain accessibility, manage congestion, and are modally balanced and coordinated with land use objectives. Represent the department's interests in regional forums, including programming and prioritization activities.
- Technical Analysis of Corridor Challenges — Provide assistance and expertise during the evaluation of alternative proposals for transportation facilities. Activities include travel forecasting, providing modeling

expertise to support EIS documentation, and providing guidance on system management and demand management project alternatives.

- Advocate a Balanced, Multi-modal Transportation System — Support Washington's Transportation Plan by evaluating and identifying feasible strategies for transportation modes that are state owned, and in which the state is a stakeholder.

1.5 Transportation Data Office (TDO)

The Transportation Data Office (TDO) is part of Headquarters Strategic Planning and Programming. The TDO collects, analyzes, stores, and reports much of the data used by the department to identify and address deficiencies on our highways. This includes information about the type of roadway surface, width of the travel lanes and shoulders, number of vehicles using the highway each day and the location and severity of traffic collisions. The TDO is responsible for:

- Statewide Database Development and Support
 - Traffic, roadway, and collision data reported to various state and federal systems, e.g., HPMS, NHS, PAS, WSPMS, CPMS, SWIBS.
 - Washington's statewide collision records system. This includes the capture, storage, safeguarding, retrieve and release of collision data as well as copies of the collision reports submitted by citizens and law enforcement officers. The TDO also produces the High Accident Location (HAL), High Accident Corridor (HAC), and Pedestrian Accident Location (PAL) lists.
 - Traffic counting, summarization, and reporting in support of statewide system, projects, and planning studies. Special traffic counts are conducted on request for turning movements and signalization

studies. For state highways, the TDO currently maintains 174 permanent traffic-reporting (PTR) sites and conducts approximately 600 short duration traffic counts each year.

Depending on the equipment and sensors used, traffic data may include volume, classification, speeds and/or weight of vehicles. The Annual Traffic Report (ATR) is produced by the TDO and lists Annual Average Daily Traffic (AADT), location of PTR sites, Average Weekday Traffic (AWDT), Annual Vehicle Miles Traveled (AVMT), flow map, and a complete set of couplet diagrams for state highways.

- Traffic forecasting expertise for planning and design projects statewide.
- Technical Support for Planning Functions — Providing statewide review of all traffic data and analysis in Environmental Impact Statements, developer submittals, design projects, and prioritization projects. Provides capacity analysis to determine if proposed roadway configurations can adequately accommodate existing and estimated future year traffic volumes. Provides annual tonnage on state routes for the Freight and Goods Transportation System (FGTS). Calculates future travel delay. Maintains a traffic model to provide the official distance and travel time between cities using state routes.
- Technical Support for Work Zone Functions — Providing technical support and review expertise for work zone working hours, penalties (liquidated damages), and incentives costing analysis.
- Video and Digital Imaging of State Highways — Providing video and digital imagery of the state highway system. This includes products such as video logs, SRView 2.0, and 360 degree panoramic views. Highways are filmed in the North Central, Olympic, and Southwest Regions

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on even years, and in the Northwest, South Central, and Eastern Regions on odd years.

- Establish and Maintain a Distance Measuring Instrument/Linear Referencing System (DMI/LRS) Milepost System for all State Highways — Establishing milepost locations for all existing and proposed state highways using a DMI. This includes collecting, maintaining, and storing roadway geometric data within the Transportation, Information, Planning, and Support (TRIPS) system, and publishing and distributing the annual State Highway Log.
- **Develop and Maintain Global Positioning System/Linear Referencing System (GPS/LRS)** — Partnering with the Geographic Services Office to develop a GPS/LRS system (scheduled for completion in 2007) that will provide GPS locations for all highways including ramps. As routes are completed, data is made available for customer use in Geographic Information Systems (GIS) software applications. The completed GPS/LRS routes can be accessed on the web at:

<http://www.wsdot.wa.gov/mapsdata/geodatacatalog/>

1.6 Local Agency Traffic Services

Local agency traffic services are a function of the Highways and Local Programs Division. The department's Traffic Services Engineer provides on-call traffic engineering and computer services to local agencies throughout the state, particularly those smaller agencies lacking in professional engineering staff.

1.7 Abbreviations

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ARM	Accumulated Route Mileage

CADD	Computer Aided Drafting and Design
CMS	Changeable 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
HAR	Highway Advisory Radio
HAC	High Accident Corridor
HAL	High Accident Location
HOV	High Occupancy Vehicle
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
PAL	Pedestrian Accident Location
PSRC	Puget Sound Regional Council
PTR	Permanent Traffic Recorder
RCW	Revised Code of Washington
SC&TI	Surveillance, Control, and Traveler Information
SMS	Safety Management System
SP & P	Strategic Planning and Programming
SRMP	State Route Milepost
TEA-21	Transportation Equity Act for the 21st Century
TDO	Transportation Data Office

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

1.7 References

The following reference materials may be useful to regional personnel involved in traffic operations and traffic design duties.

- Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) and Washington State Modifications to the 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 laws, certain modifications to the MUTCD have also been adopted into the WAC. A booklet of these modifications, Washington State Modifications to the MUTCD (M 24-01), is available from WSDOT Engineering Publications.

Amendments to the MUTCD are developed by the FHWA through the Federal Register process. These FHWA amendments become effective when 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 provides guidance for the development of traffic features included in design reports and contract plans. Numerous sections contain information on traffic design features. Many of these features may also apply to traffic operations. The Traffic Manual,

to the extent possible, avoids duplication of Design Manual materials, but provides cross-references where appropriate.

- WSDOT Sign Fabrication Manual (M 55-05) — The Sign Fabrication Manual provides sign fabricators and designers with the detailed layout information for official traffic signs used in Washington State.
- WSDOT Standard Plans for Road, Bridge, and Municipal Construction (M 21-01) — The Standard Plans for Road and Bridge and Municipal Construction provides standard plans for the following traffic items:
 - Sign Bridges
 - Signing
 - Cantilever Sign Structures
 - Striping (typical layouts)
 - Guide Posts
 - Lane Markers
 - Illumination
 - Signals
 - Concrete Barrier
 - Guardrail
 - Earthberms
- WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (M 41-10) — The Standard Specifications provides detailed requirements and techniques for construction and installation of the following traffic related items:
 - Guide Posts
 - Plastic Traffic Buttons
 - Lane Markers
 - Signing (materials and fabrication)
 - Illumination
 - Signals (electrical)

General Information

- Pavement Markings (temporary and permanent)
- Work zone traffic control items (flagging, signs, delineation devices, etc.)

Other Documents

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

WSDOT Manuals

- Plans Preparation Manual (M 22-31)
- Construction Manual (M 41-01)
- Maintenance Manual (M 51-01)
- Traffic Control Guidelines for Survey Operations (M 55-02)
- Motorist Information Signs (M 55-94)
- Scenic Vistas Act of 1971 (M 55-95)
- Traffic Forecasting Guide
- Training Manual, "Traffic Operations in WSDOT" (class available through Traffic Operations Office)

Many WSDOT publications are available on the internet. Contact the department's Engineering Publications website at:

<http://www.wsdot.wa.gov/fasc/EngineeringPublications>

FHWA (Federal Highway Administration)

- T21 Regulations
- Traffic Control Devices Handbook (TCDH)
- Traffic Control Systems Handbook
- Traffic Monitoring Guide

AASHTO (American Association of State Highway and Transportation Officials)

- A Policy on Geometric Design of Highways and Streets
- Guide for Selecting, Locating, and Designing Traffic Barriers
- Guidelines for Traffic Data Programs

TRB (Transportation Research Board)

- Highway Capacity Manual

ITE (Institute of Transportation Engineers)

- Transportation and Traffic Engineering Handbook
- Manual of Traffic Engineering Studies
- Traffic Detector Handbook

Other Reference Sources

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

- SR View
- Washington State Highway Video log
- TRIPS — WSDOT corporate mainframe database for transportation data
- Internet information — The WSDOT homepage url is:
www.wsdot.wa.gov