



Maintenance Best Practices



Maintenance Division
1401 East Broad Street
Richmond, VA 23219
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1. INTRODUCTION

Virginia Department of Transportation (VDOT) employees have the critical responsibility of maintaining the Commonwealth's transportation system for the safe mobility of the traveling public by implementing maintenance programs. The goal of the Maintenance Program is to maintain the transportation network in a condition as near as possible to the condition of its initial construction or subsequent improvement with effective and efficient use of the available resources.

The goal of the Maintenance Best Practices manual is to provide maintenance employees with the necessary guidance on how to conduct various activities, the resources to use, and the specific performance targets to achieve. Additionally, in the interest of making the maintenance best practices manual a useful tool for the business needs of maintenance employees, the goal is to ensure the manual contains current best practices guidelines. It reflects current VDOT policies, organizational structure, and roles and responsibilities of various maintenance employees and organizational units.

1.1 Background Information

- 1.1.1 VDOT's Maintenance Division undertook the following tasks as background information for the development of a VDOT maintenance manual which would reflect the business needs of VDOT employees and would contain best practices guidelines.
 - A. A literature survey of VDOT Maintenance Best Practices and Policy Manuals of 1991, 1994, and 2010 as to their contents, specificity, and clarity of the guidelines, format, and ease of access by maintenance employees to obtain the required information.
 - B. On-site interviews with VDOT maintenance employees, including a representative selection of employees with various years of service covering nine Districts as well as appropriate Central Office staff.
 - C. A literature survey of five other state B.P. Manuals, including Missouri, Texas, Washington, North Carolina, and Florida.
 - D. Interviews with appropriate maintenance personnel of the five selected DOTs.
- 1.1.2 The results of the literature survey and interviews with maintenance employees are documented and available at the Maintenance Division. They were utilized for the development of VDOT's current maintenance best practices manual. The lessons learned confirmed the need to have a maintenance best practices manual which:
 - A. Contains clear descriptions of various maintenance activities and their intended purposes,
 - B. Includes updated policies and guidelines for the implementation of various maintenance activities,
 - C. Provides definitive descriptions of the required standards, and a determination or guidance on situations where the necessary flexibilities are warranted, and

- D. A living document reflecting updated and current organizational policies and roles and responsibilities.

1.2 Purpose of the VDOT Maintenance BP Manual

- 1.2.1 The purpose of this manual is to provide VDOT employees with the necessary guidelines to perform their responsibilities in conducting various activities safely, effectively, and efficiently. Interviews with VDOT employees further indicate that best practices guidelines are also used for training new employees and for communication with VDOT customers, including local government staff and elected officials.
- 1.2.2 On that basis, while these guidelines do not establish absolute standards, they provide clear operating procedures and the required resources, including personnel, equipment, and materials to achieve the necessary performance targets.
- 1.2.3 Maintenance activities, however, are carried out in a dynamic environment where different solutions are needed to address a range of different maintenance problems. Specifically, the condition of assets and the required level of service may vary depending on various situations, safety requirements, customer expectations, and available funds. Many situations may create cases where the recommended guidelines do not address the specific needs of that situation; in these cases, the appropriate authorized employee or supervisor will have the flexibility/authority to make the necessary decisions to achieve the required level of service.
- 1.2.4 Moreover, this manual is not intended to be a standalone, all-inclusive document containing current information needed by various employees at all times and under various circumstances. As needed, the information provided should be used in conjunction with other Department directives, policies, and instructions.

1.3 Best Practices Template

- 1.3.1 The Best Practice Guidelines were developed using a template to facilitate ease of use. The template consists of five sections; Policy, Activity Description, Purpose of Activity, General Guidelines, Procedures. The template was developed based on comments received during interviews with VDOT employees. The guidelines are provided in a format with a consistent organization which has made the product more user-friendly by allowing users to find the information that they are looking for in a timely manner.
 - A. The Policy section details the VDOT policy statement for the various maintenance activities.

- B. The Activity Description and Purpose of Activity provide concise descriptive information related to the activity.
- C. The General Guidelines provide supportive information on the various maintenance activities. Procedures provide detailed steps to conduct maintenance activities. Both the General Guidelines and Procedures are intended to be supplemented, as needed, by the direction of the experienced staff and/or supervisor.

1.4 Best Practices Guidelines for Identified Programs

1.4.1 Best Practices Guidelines including Policy, Activity Description, Purpose of Activity, General Guidelines, and Procedures have been prepared for the following maintenance operations within a consistent adopted Template.

- A. Emergency Operations: The Department shall make every reasonable effort to respond to emergency situations as quickly and efficiently as possible to ensure the safety of the traveling public; this shall be accomplished by 1) eliminating hazards; and 2) re-establishing the transportation system for the safe mobility of the traveling public. See [Section 2 – Emergency Operations](#).
- B. Safety: The Department shall make every reasonable effort to ensure the safety of its workforce as well as that of the traveling public through training and planning for effective implementation of appropriate safety-related programs while carrying out its day-to-day operations. See [Section 3 – Safety](#).
- C. Roadway Surfaces: The Department shall maintain roadway surfaces as near as practical to the originally constructed, reconstructed, or improved condition to provide a reasonably smooth and safe travel surface. See [Section 4 – Roadway Surfaces](#).
- D. Roadway Drainage: The Department shall maintain drainage facilities to 1) provide safety and protection to the traveling motorist; 2) Provide reasonably adequate drainage of the roadway surfaces, shoulders, and other drainage items; and 3) Preserve the structural integrity of the roadway. See [Section 5 – Roadway Drainage](#).
- E. Snow and Ice Control: The Department shall plan for and attempt to promptly and efficiently treat and remove snow and ice from all highway systems or make them passable as soon as possible. This is considered an emergency activity and is intended to maintain roadway assets while ensuring the safety of the traveling public and year-round use of the state highways without undue delays. See [Section 6 – Snow and Ice Control](#).
- F. Roadside: The roadside shall be maintained in a manner so as to ensure the safety of the traveling public, protect roadside assets, and provide

an aesthetically pleasing roadside. See [Section – 7 Roadside](#).

- G. Traffic Control Devices: All traffic control and safety devices shall be fabricated, erected, and maintained in conformance with the current FHWA Manual on Uniform Traffic Control Devices (MUTCD) or Virginia Supplement to the MUTCD, standards, and specifications. The State Traffic Engineer, or his designee, shall render a decision regarding exceptions to the standards. In addition to the physical maintenance of tangible traffic control hardware, functional maintenance of intangible resources (e.g. traffic signal timing) is required to adjust traffic control devices to current conditions and to remove devices when no longer required. See [Section 9 – Traffic Control Devices](#)
- H. Structures: The Department shall maintain all structures to the level of service they were initially constructed to or better by subsequent improvements. This objective will be achieved by performing regular preventive maintenance activities, providing regularly scheduled inspections to determine structural deficiencies and performing restorative maintenance and repair activities as needed. See [Section 10 – Structures](#).
- I. Offender Labor: The Department uses Offender Labor for maintenance activities along roadways in select rural areas statewide. Supervised Offenders are authorized to perform such work based on a joint Memorandum of Agreement (MOA) between VDOT and the Virginia Department of Corrections (DOC). Security and safety concerns prohibit the use of Offender Labor in urban areas such as Richmond, Northern Virginia, Williamsburg, and Virginia Beach. See [Section 11– Offender Labor](#).

1.5 Roles and Responsibilities

- 1.5.1 A separate general guideline was prepared for the roles and responsibilities of Maintenance Division and the field organizational units, including Area Headquarters, Residencies, and District Sections – The document focuses on the responsibilities by the operational units, Area Headquarter, Residency, and District, as they provide the physical implementation of the routing of maintenance operations. See [Section 12 – Roles and Responsibilities](#).

1.6 Environmental Division Policy, Guidance Documents, and Training Modules References

- 1.6.1 It is important that VDOT maintenance personnel comply with established agency policies and guidance regarding environmental protection, protection of important cultural resources, and workers safety. This manual includes reference to relevant Environmental Division documents and training that may apply to various kinds of maintenance activities. For

employee convenience, the digital version of this Manual includes internet links to these Environmental Division Resources. The following are links to various resources being referenced.

- A. Waste Management/Pollution Prevention Guide:
[https://covgov.sharepoint.com/SITES/VDOT-ENV-COMPLIANCE/Facility Compliance/Forms/AllItems.aspx?id=%2FSITES%2FVDOT-ENV-COMPLIANCE%2FFacility Compliance%2FFacility Waste Management and Pollution Prevention Guide June 2019%2Epdf&parent=%2FSITES%2FVDOT-ENV-COMPLIANCE%2FFacility Compliance](https://covgov.sharepoint.com/SITES/VDOT-ENV-COMPLIANCE/Facility%20Compliance/Forms/AllItems.aspx?id=%2FSITES%2FVDOT-ENV-COMPLIANCE%2FFacility%20Compliance%2FFacility%20Waste%20Management%20and%20Pollution%20Prevention%20Guide%20June%202019%2Epdf&parent=%2FSITES%2FVDOT-ENV-COMPLIANCE%2FFacility%20Compliance)

- B. Construction Pollution Prevention Guide:
https://covgov.sharepoint.com/SITES/VDOT-LD-MS4/Shared Documents/Forms/AllItems.aspx?id=%2FSITES%2FVDOT-LD-MS4%2FShared Documents%2FVDOT_P2_Guide_2016%2Epdf&parent=%2FSITES%2FVDOT-LD-MS4%2FShared Documents

- C. Lead Control Programs: [https://covgov.sharepoint.com/SITES/VDOT-ENV/EnvironmentalMemoranda/Forms/SortedView.aspx?id=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda%2FLead Exposure Control Program%2Epdf&parent=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda](https://covgov.sharepoint.com/SITES/VDOT-ENV/EnvironmentalMemoranda/Forms/SortedView.aspx?id=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda%2FLead%20Exposure%20Control%20Program%2Epdf&parent=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda)

- D. Silica: [https://covgov.sharepoint.com/sites/ENVHub-VDOT/Environmental Memoranda/Forms/ListView.aspx?id=%2Fsites%2FENVHub-VDOT%2FEnvironmental Memoranda%2FCrystalline Silica Employee Protection %2Epdf&parent=%2Fsites%2FENVHub-VDOT%2FEnvironmental Memoranda](https://covgov.sharepoint.com/sites/ENVHub-VDOT/Environmental%20Memoranda/Forms/ListView.aspx?id=%2Fsites%2FENVHub-VDOT%2FEnvironmental%20Memoranda%2FCrystalline%20Silica%20Employee%20Protection%2Epdf&parent=%2Fsites%2FENVHub-VDOT%2FEnvironmental%20Memoranda)

- E. Hearing Protection: [https://covgov.sharepoint.com/SITES/VDOT-ENV/EnvironmentalMemoranda/Forms/SortedView.aspx?id=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda%2FHearing Conservation Program%2Epdf&parent=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda](https://covgov.sharepoint.com/SITES/VDOT-ENV/EnvironmentalMemoranda/Forms/SortedView.aspx?id=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda%2FHearing%20Conservation%20Program%2Epdf&parent=%2FSITES%2FVDOT-ENV%2FEnvironmentalMemoranda)

- F. Respiratory Protection: [Respiratory Protection Program \(sharepoint.com\)](#)

1.7 Virginia Capital Trail (Richmond & Hampton Roads)

1.7.1 The Capital Trail is maintained at an overall high level in Henrico County, City of Richmond, and James City County. VDOT is responsible for maintenance of the Trail from making repairs, clearing debris, or cutting the grass. VDOT works with the Virginia Capital Trail to collect information about maintenance issues and safety concerns to ensure the Trail stays safe and beautiful. Below is a chart that provides the most common maintenance activities, current frequency, and minimum recommended frequency.

| Activity | Current Maintenance Practice | Minimum Desired Frequency/Criteria |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Litter removal | Ranges from Monthly to Weekly | Bi-Monthly |
| Mowing | Ranges from Monthly to Weekly | Monthly |
| Tree Trimming | Ranges from none to Bi-Monthly | Monthly |
| Debris Removal | Ranges from as needed to weekly | Weekly |
| Patching | As needed | As needed |
| Signs | As needed | As needed |
| Bridge Inspection and Maintenance | 2 year frequency for official inspections; weekly inspections by maintenance personnel | Bi- Monthly checks and repair of deck boards. Preventative maintenance should be done yearly to include bridge washing and any measures to prevent the decking from degrading |
| Drainage - to include addressing low edges along trail | As Needed | Bi-Monthly, and after heavy rain events |
| Pavement Preventative Maintenance | N/A | Crack seal and micro seal surface once section is at year 5 of life. |
| Facilities (park benches, shelters, etc.) | N/A | |
| Resurfacing | As needed and conditions warrant | 10 year cycle for like sections of pavement |
| Restorative Maintenance | N/A | Yearly; program needs to be put in place to deal restorative maintenance of bridges and the assessment of such conditions. Restorative maintenance would include friction courses for decks |
| Traffic Engineering (Safety Assessments and Operational Improvements) | As needed | Yearly Review; signage would be reviewed for potential replacement and/or enhancements would be added based on safety and operational needs |
| User/Pedestrian Counts | | As needed - Batteries replaced every 2 years |

2. EMERGENCY OPERATIONS

Asset Type: EMERGENCY OPERATIONS

Policy: The Department shall make every reasonable effort to respond to emergency situations as quickly and efficiently as possible to ensure the safety of the traveling public; this shall be accomplished by 1) eliminating hazards; and 2) re-establishing the transportation system for the safe mobility of the traveling public.

2.1 Responding to Hazardous Materials (HAZMAT) Incidents

2.1.1 Activity Description: VDOT's role in responding to hazardous materials incidents on the state highway system includes 1) Assisting in redirecting traffic around emergency operations; and 2) Providing equipment and material for use in the containment of oil and hazardous material spills. *Note: VDOT is only an assisting agency in these situations, and VDOT personnel will not be directly involved in the cleanup of spills.

2.1.2 Purpose of Activity: The purpose of VDOT involvement in any oil or hazardous material incident is to support other responsible agencies and includes:

- A. Working with local governments, other state agencies, hazardous materials teams, and local fire departments to plan and prepare for appropriate measures.
- B. Participating, as requested, in life-threatening situations to protect lives, property, and the environment.
- C. Restoring the Commonwealth's roadway system in accordance with established priorities.

2.1.3 General Guidelines:

- A. Hazardous materials are defined under Virginia Law (Title 44-146.34) as: substances or materials which may pose unreasonable risks to health, safety, property, or the environment when used, transported, stored or disposed of, which may include materials which are solid, liquid, or gas.
- B. Hazardous materials may include: toxic substances, flammable and ignitable materials, explosives, corrosive materials, chemical and biological substances, and radioactive materials
- C. Hazardous materials response operations shall not endanger VDOT personnel or contaminate equipment.

2.1.4 Emergency Action Plan:

- A. An Emergency Action Plan for the workplace should be implemented and kept up-to-date. Plans should be placed in a conspicuous location and easily accessible to employees.
- B. Ensure that information about chemicals used within the workplace is kept up-to-date.
- C. Technical guidance regarding hazardous materials incidents shall come from Hazardous Material Officers in the Department of Emergency Management. VDOT is to act as an assisting agency to groups such as the Virginia State Police (VSP) or local fire departments.
- D. Contracts: Hazardous Materials Incident Response may be included in VDOT subcontracts for the maintenance of certain areas of the Interstate System.

2.1.5 Safety Data Sheets:

- A. A Safety Data Sheet (SDS) is required for each chemical in use or stored within the worksite.
- B. Each SDS must be kept in a conspicuous location and easily accessible to employees. Inquiries regarding chemicals within a work site are to be directed to the Hazard Communication Chemical Safety coordinator for the work site who will obtain the SDS and review the chemical label for completeness.
- C. SDSs for chemicals obtained through VDOT Inventory Supply Services Program (ISSP) are available through the internet site.

2.1.6 VDOT may provide equipment and material to assist with hazardous materials incidents off the highways when requested to do so under the provisions of the Executive Order Sixty-Five (1 April 2004), which appears in the Basic Plan. See the State Emergency Operations Plan, Volume 1 [<http://www.vaemergency.gov/em-community/plans/2012COVEOP>]

2.1.7 Reporting: All oil and/or hazardous material discharges should be reported to the regional Emergency Operations Center (EOC) immediately to ensure timely notification of the State Emergency Operations Center (SEOC) and the Virginia Department of Environmental Quality (DEQ).

2.1.8 For additional information and guidance refer to ESF (Emergency Support Function) #10, "Oil and Hazardous Materials Response", in the [State Emergency Operations Plan](#).

2.1.9 Procedure to Conduct Activity:

- A. Provide training in safety to personnel that have the potential to become involved in responding to an oil or hazardous materials incident.

- B. Identify the materials and equipment resources needed for each specific oil or HAZMAT incident
- C. Appoint an executive representative who can speak for the Department to ensure continued Commonwealth capability to respond to oil and hazardous materials incidents. These functions will normally be assigned and/or performed by the regional Emergency Operations Center (EOC).
- D. Provide necessary signs, barricades, lights, and flaggers to maintain flow of traffic and establish detours when required.
- E. Provide necessary abrasives, if available, and apply to roadway surface and shoulders.
- F. Provide material to block the flow of "run-off" contaminants from highways into sewer drains or bodies of water that would cause harm to human life, health, or the environment
- G. Assist evacuation of risk areas when possible.
- H. Provide the State Emergency Operations Center (SEOC) with a 24-hours-a-day, 7 days a week contact person who can initiate an immediate response if required.
- I. Assist in damage assessment of state highways, bridges, and rights of way.
- J. Equip response team members with portable radio and/or cellular phones.
- K. Ensure that assigned oil spill frequencies are used only as permitted under the FCC license requirements.
- L. Maintain agency cost documentation for possible use in recovery actions.

2.2 Responding to Disruptions of the State Highway System

- 2.2.1 Activity Description: VDOT's role in responding to disruptions of the state highway system due to emergencies (storms, snow, hurricanes, etc.) is to provide coordination to other support agencies such as the Virginia State Police, Department of Motor Vehicles, and Department of Rail and Public Transportation. This may include: processing and coordinating requests for transportation support as directed under the Commonwealth of Virginia Emergency Operations Plan (COVEOP); reporting damage to transportation infrastructure as a result of the incident; coordinating alternate transportation services; coordinating the restoration and recovery of the transportation infrastructure; performing activities conducted under the

direct authority of state agencies; and coordinating among transportation infrastructure stakeholders at the local level.

2.2.2 Purpose of Activity: The purpose of VDOT involvement in emergencies affecting the state highway system is to support other responsible agencies in performing the necessary activities to restore and reestablish the state transportation system for the safe mobility of the traveling public.

2.2.3 General Guidelines:

- A. Appoint a VDOT Incident Commander who will take the lead in aggressively pursuing the VDOT goal of opening the roadway(s) as quickly and safely as possible. The VDOT Incident Commander has the authority, responsibility, and commensurate accountability to be in charge of all VDOT activities associated with the incident
- B. Under federal law, the U. S. Secretary of Transportation is responsible for exercising leadership in national and regional transportation emergencies. The US. Department of Transportation (DOT) will be responsive to requests for assistance from the state in coordination with the Federal Emergency Management Agency (FEMA) during a resource crisis or a natural disaster.
- C. The Commonwealth's Secretary of Transportation will coordinate all emergency-related actions with the Virginia Emergency Response Team (VERT) Coordinator and/or State Coordinator of Emergency Management and may relocate to the Virginia Emergency Operations Center (VEOC).
- D. VDOT's Operations and Security Division (OSD) serves as the State Transportation Secretariat's coordinating entity for emergency operations.
- E. VDOT's Transportation Plan includes procedures for aviation support, how the Department of Motor Vehicles (DMV) will coordinate the movement of essential goods and supplies, and the activities of the Virginia Port Authority (VPA).
- F. State transportation agencies will coordinate with federal agencies and the private sector transportation industry to provide necessary equipment, facilities and personnel in response to emergency requirements. All intrastate transportation available for emergency management purposes will be subject to their control with the following exceptions:
 1. Transportation required for military, federal or civilian personnel or supplies.
 2. Federally controlled or operated vessels, trains, vehicles or aircraft, unless specifically made available.

3. Commercial or scheduled air carriers (interstate carriers).
4. Ocean-going vessels.

2.2.4 Carriers and Shippers:

- A. Carriers and shippers will conduct business as usual whenever possible.
- B. If exemptions to state rules and regulations are needed to expedite delivery of essential resources to disaster areas, VDOT will coordinate with the Governor to consider and/or implement accommodations.

2.2.5 Hurricanes:

- A. VDOT and law enforcement agencies play the major roles for the hurricane threat to Virginia's coastal areas.
- B. The COVEOP Hurricane Response Plan prescribes the concept of operations, responsibilities and tasking for hurricane evacuation.

2.2.6 For emergencies specifically related to oil or hazardous materials spills, see also [2.1 responding to Hazardous Materials \(HAZMAT\) Incidents](#).

2.2.7 For snow-related emergencies, see [6.4 Plowing and Snow Removal](#).

2.2.8 For guidelines specific to debris removal due to storms, hurricanes, etc. see [5.7 Removal of Debris and Emergency Roadway Cleanup](#).

2.2.9 For additional information and guidance refer to ESF (Emergency Support Function) #1, "Transportation", in the [State Emergency Operations Plan](#).

2.2.10 High Wind Guidance:

- A. Weather conditions are monitored by the District and guidance regarding safe operations of state forces is provided. As a rule of thumb, when sustained wind speeds exceed 39 mph, District personnel will make the determination as to whether staff should report to a safe haven (AHQ) or continue operations. Each weather event will be monitored independently and guidance provided specific to that event. The District will communicate with the Residency to provide guidance. Also keep in mind that some parts of the District are impacted on different levels and Residency (county) specific guidance may be required.
- B. Safe work practices shall be maintained during any weather event and the specific task being performed. It is also important to communicate effectively with Residency personnel on weather conditions in your particular area.
- C. Be sure state forces have all their necessary PPE for chainsaw operations (chaps, hard hat, hearing protection, face shield, safety

glasses, gloves) when traveling in their prospective areas as they may have to cut their way out or in to the AHQ. Other considerations should be communicated to state force personnel in the event the weather event is prolonged:

1. Change(s) of clothes
2. Extra socks and safety shoes
3. Extra food and drink

2.2.11 Procedure to Conduct Activity:

- A. VDOT's roles and responsibilities under the State Emergency Operations Plan include the following:
- B. Implement Volume 7 (Transportation) of the VDOT EOP, when required.
- C. Operate and maintain the Field Operations Section, and keep it informed of all significant information, actions, and plans.
- D. Provide an Initial Damage Assessment report within 72 hours of damages to state highways, roads, and bridges to the State Emergency Operations Center (EOC).
- E. Maintain the state highway system, to include debris clearance and removal from highways, roads, bridges, and state-owned property.
- F. Coordinate requests for federal assistance for debris or wreckage removal from state property.
- G. Provide for damage assessment and hazard mitigation surveys for highways, roads, and bridges in the state system
- H. Restore state-maintained highways, roads, and bridges and assist cities and counties in the restoration of their highways, roads and bridges, upon request (accounts receivable basis).
- I. Facilitate traffic movement during a large-scale evacuation and re-entry in coordination with the State Police and affected local governments.
- J. Provide ground transportation, back-up communications, and other available resources as needed in support of State EOC operations
- K. Coordinate emergency engineering services for highway operations.
- L. Provide back-up communications to support emergency services activities

- M. Coordinate waivers and/or clearances for the expedient but safe highway clearance for oversized and overweight vehicles.
- N. Conduct emergency demolition (not on private property) unless structure poses a safety hazard to the traveling public. (The phrase demolition here refers to any extraordinary uses of explosives, beyond what might be considered normal for removal of debris/wreckage. Such request will likely emanate from the State EOC and be accomplished in coordination with other state agencies).

3. SAFETY

Asset Type: SAFETY

Policy: The Department shall make every reasonable effort to ensure the safety of its employees as well as that of the traveling public through training and planning for effective implementation of appropriate safety-related programs while carrying out its day-to-day operations.

3.1 General Guidelines and Procedures for Safety & Health

- 3.1.1 Activity Description: Planning and effective implementation of activities and programs to ensure that VDOT employees have the necessary training to effectively respond to safety and health related issues and incidents.
- 3.1.2 Purpose of Activity: To protect lives, property, and the environment while maintaining and operating the Commonwealth's transportation system for safe mobility of the traveling public.
- 3.1.3 General Guidelines and Procedures:
- A. The Virginia Department of Transportation (VDOT) is dedicated to instilling a World Class Safety Culture for its most valuable asset, our workforce. We are committed to creating the right safety culture by instilling and reinforcing strong Safety expectations and appropriate behavior 24/7. Our “Safety First – One VDOT” approach is multi-faceted and extends beyond the normal work day for our workers.
 - B. VDOT employees are expected to routinely demonstrate safety behaviors, and advocate and practice safety in every day work activities.
 - C. VDOT’s safety culture comprises shared beliefs, shared practices and shared attitudes that shape the overall behavior of the organization. It defines our commitment to the workforce; it defines our commitment to each other; it is the cornerstone that shapes our behavior. Our culture is Safety First at all times.
 - D. DOs and DON’Ts:
 - 1. Take responsibility for your own safety as well as that of your coworkers.
 - 2. Do not turn a blind eye to an unsafe situation. It is not okay to simply say “I told them it was unsafe” or to file a report.
 - 3. If you are in a situation where known safety rules are not being

followed, stop immediately and talk to somebody.

3.1.4 Safety and Health Division:

- A. The Safety and Health Division provides uniform leadership for the Department's Loss Control Program by analyzing losses, resolving safety & health concerns, developing procedures, administering safety & health program, addressing employee safety & health concerns, and implementing claims management.
- B. Current safety & health documents, including "safety rules," are posted to the division website: [Safety Security & Emergency Management - Home \(sharepoint.com\)](#)
- C. An agency Safety Compliance Manager can be reached at Central Office location (804-371-6859); or, if after normal hours, you need assistance from a Safety Compliance Manager, please call the Highway Helpline at 1-800-367-ROAD, and request that a Safety Compliance Manager be contacted.

3.1.5 Audits Emergency Action Plan:

- A. Implement an up-to-date Emergency Action Plan for the work place.
- B. Plans should be placed in a conspicuous location and easily accessible to employees.

3.1.6 Actively improve safety and health conditions by doing the following:

- A. Become informed about safety and health issues.
- B. Learn to perform operations safely through on-the-job training and reviewing Job Safety Analysis (JSA) for the task: [Job Safety Analysis - Home \(sharepoint.com\)](#)
- C. Take advantage of available safety & health training.
- D. Select, maintain and wear personal protective equipment (PPE).
- E. Perform inspections (vehicle pre-trip), audits and assessments for safety & health, as assigned.
- F. Communicate with managers about safety and health.
- G. Report promptly any job-related fatalities, injuries, illnesses, incidents, hazards as well as potential losses (near misses).
- H. Recommend ways to control hazards and near misses.
- I. Evaluate new equipment, materials and procedures.

3.1.7 Virginia Occupational Safety and Health (VOSH) Regulations:

- A. These regulations are set by the Virginia Safety & Health Codes Board and are equivalent or more restrictive than regulations set by the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor.
- B. The Virginia Department of Labor and Industry (VDLI) enforces occupational safety and health regulations.
 - 1. VDLI Compliance Safety and Health Officers (COSHO) are granted access to inspect our facilities and work places.
 - 2. The Safety and Health Division can affect a reduction in citation severity, seek to have citations vacated, and help the work unit to formulate an appropriate response resolving the safety & health issued cited by the COSHO

3.1.8 Incidents and Injuries:

- A. Incidents and injuries should be processed in accordance with the S&HD Claims Management Manual issued to every Residency and Facility.
- B. If a fatality (or serious incident where there is potential liability against the state) occurs, contact a Safety Compliance Manager to assist with the investigation.
- C. Equipment Crashes and Moving Violations:
 - 1. Procedures have been established for reporting, investigating, classifying and determining disciplinary action for motor vehicle and unlicensed self-propelled equipment crashes and moving violations. These procedures are detailed in the Safety Directive for “Motor Vehicle Crashes and Convictions of Moving Traffic Violations”.
 - 2. See also Human Resources Policies regarding Standards of Conduct (HR Policy 1.60) and “Employee Relations”.

3.1.9 Employee Qualifications:

- A. Hiring Requirements:
 - 1. Comply with safety & health requirements when hiring job applicants and maintaining qualifications of current workforce (e.g. position description references, safety equipment, licensing, physical performance, medical screening, drug & alcohol testing).
 - 2. Licensing guidelines are found in “Manual of Instruction and Operators’ Guide” (Section 3.20) issued by Equipment Section, Maintenance.

3. Drug & Alcohol testing requirements are specified within the agency's Drug & Alcohol Testing Program and the state's Drug Free Workplace Act.
- B. Questionable Medical Status: When the medical status of an employee is in question, seek assistance from the Medical Coordinator at the main in S&HD number of 804-371-6859. If the loss of status is permanent affecting performance, S&HD will collaborate with the Office of Civil Rights.
1. Performance Loss: When an employee is potentially no longer capable of performing his/her duties due to a disease of life (e.g. diabetes, hypertension, leukemia), or other malady (e.g. severe depression, bipolar), seek assistance from the local manager, District human resource office and Office of Civil Rights for compliance with Americans with Disabilities Act.

3.1.10 Hazardous Materials Safety:

- A. A Safety Data Sheet (SDS) is required for each chemical in use or stored within the work site.
- B. Each SDS must be kept in a conspicuous location and easily accessible to employees. Inquiries regarding chemicals within a work site are to be directed to the Hazard Communication Chemical Safety coordinator for the work site who will obtain the SDS and review the chemical label for completeness.
- C. SDSs for chemicals obtained through VDOT Inventory Supply Services Program (ISSP) are available through the intranet site]
- D. See also [Emergency Operations - Responding to Hazardous Materials \(HAZMAT\) Incidents](#).

3.1.11 Work Zone Safety:

- A. Daily Safety Meetings:
 1. A daily safety meeting should be held by maintenance crews prior to commencement of work.
 2. Safety topics such as personal protective equipment, work zone traffic control layout plans, equipment safety and other relevant topics should be discussed.
- B. Temporary traffic control devices shall be used on all highway maintenance operations and in accordance with the [Virginia Work Area Protection Manual](#) and the [Manual on Uniform Traffic Control Devices](#).
- C. An appropriate traffic control plan will be developed according to specific job site conditions.

- D. All crewmembers will be trained regarding establishment and removal of work zone signs and devices. Crewmembers should also be made aware of hazards that may be encountered when working within a traffic control zone.
- E. Flaggers shall be certified according to the Virginia Flagger Certification Program and perform flagging activities in accordance with the [Virginia Work Area Protection Manual](#).
- F. Designated employees shall be trained in either the Basic or Intermediate Work Zone Traffic Control training courses and shall be in possession of their training cards at all times.
- G. Virginia Flagger Certification "or the Work Zone Traffic Control Training and Flagger Certification programs".

3.1.12 Employee Safety & Health Training:

- A. All employees must receive appropriate safety training in relation to job duties and hazards that may be encountered.
 - 1. All employees must receive safety instructions and any required safety and health training before performing the assigned duties.
 - 2. Seek counsel from District Trainers (and District Safety Compliance Manager) to assess safety & health training needs.
 - 3. The Safety and Health Division sponsors classes in a variety of topics. A list of topics and schedule of courses may be found on the VDOT Virtual Campus website.

3.2 General Guidelines and Procedures for High-Visibility Safety T-shirts and coats

- 3.2.1 T-shirts and coats may be worn by VDOT employees that work in the field that are required to wear safety vests, (Ex: all maintenance employees, construction inspectors, bridge crews, etc.).
 - A. The long and short sleeve high-visibility safety t-shirts may be worn in place of the flagging vest.
 - B. Each crewmember may be issued up to 5 t-shirts and 3 long sleeve shirts (any deviation above this number must be approved by the Supervisor).
 - C. Each crewmember may be issued 1 parka and 1 bomber jacket.
 - D. The coats will be on a 3 year replacement unless the Supervisor approves a replaced because of excessive wear and tear.

- E. The use of high-visibility t-shirts and coats are optional, although appropriate PPE must be worn.
- F. Employees are responsible for care and upkeep of the garments.
- G. If any shirts are replaced, the employee must present the garment for inspection to the Supervisor.
- H. Managers are accountable for ensuring that guidelines are not abused.

4. ROADWAY SURFACES

Asset Type: ROADWAY SURFACES

Policy: The Department shall maintain roadway surfaces as near as practical to the originally constructed, reconstructed, or improved condition to provide a reasonably smooth and safe travel surface.

4.1 Temporary Surface Repair including Premix Pothole Patching 4.1.1

Activity Description: Temporary patching of the road surface using commercial or shop prepared mixes.

4.1.2 Purpose of Activity: Temporary repair of roadway surfaces to provide reasonably smooth and safe travel surface.

4.1.3 General Guidelines: Patching is typically used to address the following conditions:

- A. Potholes of 6 inches and greater in width and greater than 1 inch in depth.
- B. Depressions of 1 inch and greater in depth.
- C. Cross slopes with deviations of more than 2 inches.
- D. Pipe settlement of greater than 1 inch.
- E. Settlement of bridge approaches.
- F. Surface breakup: replacement of the surface layer when loose sections can be removed and base materials are undisturbed.

4.1.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. When using hot mix, plan for trucks going to the asphalt plant to arrive when the plant opens, while the remainder of the crew travels to the job site. Asphalt should be covered with tarps to prevent heat loss or transported in a vehicle equipped with a “hot-box.”
- C. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- D. Remove loose, unstable or wet materials in the area to be patched. If there is water present in the hole, it should be blown out/dried.

- E. Premix materials and patching should be used to correct adverse surface conditions.
 1. Hot mix is the best choice for premix material. Do not place the hot premix in layers, but overfill the hole and compact it level to the roadway surface.
 2. Cold premix can be used in depths of no less than ½ inch and no more than 3 inches. In most cases a cold mix patch should be covered with a skin patch as soon as possible after the mix is cured.
 3. If cold mix is used, it should be placed in layers not to exceed 1 ½ inches after compaction.
- F. Lightly sprinkle patches with stone dust or sand to prevent tracking.
- G. Recover traffic control devices.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1-2 Operators • 2 Flaggers • 1 Laborer | <ul style="list-style-type: none"> • Dump Truck • Pickup Truck or Crew Cab • Tailgate Roller or Tamper (as required; depending on size and location of patch) | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Premixed asphalt (hot or cold) • Stone dust or sand • Hand tools |
| | <u>Include as required:</u> <ul style="list-style-type: none"> • Additional Truck • Traffic Control Devices / Signs • Truck Mounted Attenuator (TMA) | |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.2 Surface Repair: Permanent Pothole Patching

- 4.2.1 Activity Description: Permanent patching of the road surface using commercial or shop prepared mixes.
- 4.2.2 Purpose of Activity: Permanent repair of roadway surfaces to provide a reasonably smooth and safe travel surface.
- 4.2.3 General Guidelines: Patching is typically used to address the following conditions:

- A. Potholes of 6 inches and greater in width and greater than 1 inch in depth.
- B. Depressions of 1 inch and greater in depth.
- C. Cross slopes with deviations of more than 2 inches.
- D. Pipe settlement of greater than 1 inch.
- E. Settlement of bridge approaches.
- F. Surface breakup: replacement of the surface layer when loose sections can be removed and base materials are undisturbed.

4.2.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. When using hot mix, plan for trucks going to the asphalt plant to arrive when the plant opens, while the remainder of the crew travels to the job site. Asphalt should be covered with tarps to prevent heat loss or transported in a vehicle equipped with a "hot-box."
- C. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- D. Remove loose, unstable or wet materials in the area to be patched. If there is water present in the hole, it should be blown out/dried
 - 1. The sides of the hole should be vertical and trimmed to sound material.
 - 2. If the base material is loose or unstable, it should be removed and replaced.
 - 3. If there is water present in the hole, it should be dried.
- E. Premix materials and patching should be used to correct adverse surface conditions.
 - 1. Hot mix is the best choice for premix material. Do not place the hot premix in layers, but overfill the hole and compact it level to the roadway surface.
 - 2. Cold premix can be used in depths of no less than ½ inch and no more than 3 inches. In most cases a cold mix patch should be covered with a skin patch as soon as possible after the mix is cured.
 - 3. If cold mix is used, it should be placed in layers not to exceed 1 ½ inches after compaction.

F. Lightly sprinkle patches with stone dust or sand to prevent tracking.

G. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1-2 Operators • 2 Flaggers • 1 Laborer | <ul style="list-style-type: none"> • Dump Truck • Pickup Truck or Crew Cab • Tailgate Roller or Tamper (as required; depending on size and location of patch) | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Premixed asphalt (hot or cold) • Stone dust or sand • Hand tools |
| | <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • Additional Truck • Traffic Control Devices / Signs • Truck Mounted Attenuator (TMA) | |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.3 Spot Sealing/Skin Patching (“Chip Sealing”)

4.3.1 Activity Description: Placing a light application of emulsified asphalt on the bituminous surface and covering it with sharp, clean, uniformly-graded stone. This treatment is generally limited to low-volume roads. For extensive cracking, see [4.5 Heavy Mechanized Deficiency Repair](#).

4.3.2 Purpose of Activity: The primary purpose of chip sealing is to maintain pavement strength by sealing cracks in the surface layer and thus preventing moisture from weakening the base materials. To prevent serious pavement failure, small cracking should be monitored and should be skin patched when the opening exceeds ¼ inch.

4.3.3 General Guidelines: Skin patching is typically used to address the following surface conditions and their causes on low-volume roads:

- A. Alligator Cracking: Poor drainage or small cracks allowing water to saturate and weaken base materials.
- B. Longitudinal Cracking: Unstable base; first stage of alligator cracking.
- C. Edge Cracking: Poor drainage, inadequate base or insufficient lateral support.
- D. Raveling: Dusty stone or too little asphalt binder.

E. For additional information, see Section 3.12, VDOT Road and Bridge Specifications.

4.3.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. When necessary, clean and dry the areas to be patched. Broom area if necessary.
- D. Spray a light application of hot liquid asphalt over the deteriorated area, extending spray one foot beyond cracked area on each side. Do not spray beyond edge of pavement.
 - 1. Provide a square patch for a neat appearance and minimal annoyance to the travelling public.
 - 2. Application will vary due to the type of asphalt, size and type of distress, and absorption of underlying pavement.
 - 3. As a guide, the proper application will not flow and the texture of the existing pavement will be visible.
- E. Apply cover stone immediately after spraying the asphalt. The cover stone should be applied in the direction of traffic; it should be one stone thick and touching on all sides.
- F. Begin rolling immediately after the stone is spread, and continue until the stone is properly seated or the asphalt shows signs of hardening.
 - 1. On large patches, roll from the outside towards the center of the pavement.
 - 2. Do not over-roll.
 - 3. Stop rolling if crushing of the stone occurs.
- G. Hand sweep loose material off of the untreated road surface.
- H. Clean excess material from tools and equipment, leaving the work site in a clean condition.
- I. Recover traffic control devices.
- J. Set up loose gravel signs to alert traffic to conditions.
- K. Remove loose gravel signs when appropriate.

L. Follow up with mechanized sweeping as needed after 24-48 hours.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Person on Crew • 3 Operators • 2 Flaggers or 1 Operator | <ul style="list-style-type: none"> • 2 Dump Trucks • 1 Distributor/ Tar Kettle • Chip Spreaders (Tailgate-mounted) • 1 Roller (pneumatic tire preferred) and Trailer • Tractor Broom or • Truck-mounted Sweeper | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • #8 Stone (3/8" max.) • #78 Stone (1/2" max.) • #9 Stone (1/4" max.) • Liquid Asphalt • Sand or stone dust |
| <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 3 Additional Operators • 1 Additional Operator (depending on haul distance) • 1 Additional Flagger | <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 1 Pickup Truck • 1-2 Additional Dump Trucks • Traffic Control Devices/Signs • Truck Mounted Attenuator (TMA) | <p><u>Small tools:</u></p> <ul style="list-style-type: none"> • Shovel • Broom |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.4 Heavy Mechanized Leveling with Bituminous Materials

4.4.1 Activity Description: The leveling of areas of bituminous roadway surfaces with hot asphalt premix. Leveling shall not exceed 500 feet.

4.4.2 Purpose of Activity: Performed to correct irregularities and restore a smooth riding surface. Mechanized leveling can also be used to prepare a road for resurfacing.

4.4.3 General Guidelines:

A. Heavy mechanized leveling is typically used to address the following conditions:

1. Rutting
2. Depressions
3. Correcting cross slopes
4. Pipe settlement
5. Settlement of bridge approaches
6. Surface breakup: replacement of the surface layer when loose sections can be removed and base materials are undisturbed.

B. Pavement Markings: For guidance on selecting the proper pavement marking see TE-261 Type B Class VI Pavement Markings.

1. If the remaining pavement surface service life is 6 years or more:
 - a. Type B, Class VI markings shall be used for all lane division markings, including:
 - i. Skip lines between through lanes.
 - ii. Dotted lines to separate through lanes from deceleration lanes.
 - iii. Solid lines separating through lanes from deceleration/acceleration lanes.
 - iv. Solid and skip lines used to separate multiple exit lanes.
2. Durable markings specified as being Type B in the *VDOT Road and Bridge Specifications* shall be used for all other markings (edge lines; gore areas; and all ramp markings). Selection of the marking material will be based on engineering judgement. Examples of appropriate materials may include B VI tape, thermoplastic, epoxy, or any other approved Type B material.
3. If the remaining pavement surface service life is between 3 years and 5 years:
 - a. Durable markings specified as being Type B in the *VDOT Road and Bridge Specifications* shall be used for all markings. Selection of the marking material will be based on engineering judgment. Examples of appropriate materials may include tape, thermoplastic, epoxy, polyuria or any other approved Type B material. However, Type B, Class VI markings may not be a cost-effective choice when the pavement surface life is in this category.
4. If the remaining pavement surface service life is less than 3 years:
 - a. Any marking material specified as Type A or Type B in the *VDOT Road and Bridge Specifications* may be used for all markings. Selection of the marking material is based on engineering judgment.

4.4.4 Procedure to Conduct Maintenance Activity:

A. Procedure with Paver:

1. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
2. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
3. Ensure surface is clean; broom as necessary.

4. Apply liquid asphalt tack in accordance with type being used.
5. Apply hot-mix asphalt with asphalt paver.
6. Using asphalt lutes, hand shape uneven areas along the edges
7. Ensure that the joints of the patch overlay provide a smooth transition for traffic.
8. Immediately roll area thoroughly to provide maximum compaction.
9. Clean excess material from the tools and equipment, leaving the work site in a clean condition.
10. Set up maintenance and traffic signs as needed to alert traffic to conditions; remove when appropriate. If pavement will be left unmarked for more than three days, unmarked pavement signs should remain in place.
11. Notify VDOT District Traffic Engineering section if any pavement markings have been modified or need to be replaced.
12. Recover traffic control devices.

B. Procedure with Motor Grader:

1. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
2. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
3. Ensure surface is clean; broom as necessary.
4. Apply liquid asphalt tack in accordance with type being used.
5. Dump hot mix material and spread with motor grader or asphalt spreader to provide a level surface conforming to the existing roadway.
6. Using asphalt lutes, hand shape any small areas missed by the grader or spreader during their operation, and dress the edges as well.
7. Ensure joints of patch overlay are feathered to provide a smooth transition for traffic.
8. Immediately roll area thoroughly to provide maximum compaction.
9. Clean excess material from tools and equipment, leaving the work site in a clean condition.

10. Set up maintenance and traffic signs as needed to alert traffic to conditions; remove when appropriate. If pavement will be left unmarked for more than three days, unmarked pavement signs should be placed.
11. Notify VDOT District Traffic Engineering section if any pavement markings have been modified or need to be replaced.
12. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Person on Crew • 6 Operators • 2 Flaggers | <ul style="list-style-type: none"> • 4 Dump Trucks/Tandem Trucks • 1 Distributor Truck • 1 Steel-Wheeled or Vibratory Roller • 1 Asphalt Paver/Motor Grader | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment(PPE) • Liquid Asphalt • Premix Bituminous Material (hot mix) |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 2-4 Additional Operators (depending on haul distance) | <u>Include as required:</u> <ul style="list-style-type: none"> • 2-4 Additional Dump Trucks (depending on haul distance) • 1 Rotary Power Broom • Traffic Control Devices/Signs Truck Mounted Attenuator (TMA) | <u>Small tools:</u> <ul style="list-style-type: none"> • Shovels • Brooms • Rakes/Lutes |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.5 Heavy Mechanized Deficiency Repair

- 4.5.1 Activity Description: The repair of surface and base distresses for reshaping and reconditioning sections of roadway.
- 4.5.2 Purpose of Activity: To repair severe surface deficiencies and/or base failures to prevent further settling and deterioration by restoring the pavement structure. Can also be used to prepare a road for resurfacing.
- 4.5.3 General Guidelines:
 - A. Partial-depth patching: generally deals with the surface layer only for depths of up to 3 inches.
 - B. Full-depth patching: applies to depths greater than 3 inches.

- C. This Activity is not intended as a procedure for pothole repair, which is generally done by hand (see [4.1 Temporary Surface Repair including Premix Pothole Patching.](#))

4.5.4 Procedure to Conduct Maintenance Activity

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. Remove material as needed within area to be repaired.
- D. Replace base material, as needed, and square upsides.
- E. Apply liquid asphalt tack in accordance with type being used.
- F. When using asphalt paver: Apply premix with asphalt paver.
- G. When using motor grader: Dump material and spread with motor grader, or feed and spread with asphalt spreader.
- H. Provide a level surface conforming to the existing roadway.
- I. Using asphalt lutes, hand shape any small areas missed by the paver or motor grader and spreader during their operation, and dress the edges as well.
- J. Ensure that the patch provides a smooth transition for traffic.
- K. Immediately roll area thoroughly to provide maximum compaction.
- L. Clean excess material from the tools and equipment, leaving the work site in a clean condition.
- M. Notify VDOT District Traffic Engineering section if any pavement markings have been modified or need to be replaced.
- N. Recover traffic control devices.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Person on Crew • 5 Operators • 2 Flaggers (or as needed) | <ul style="list-style-type: none"> • 2 Dump Trucks/Tandem Trucks • 1 Asphalt Paver/Motor Grader • 1 Tar Kettle • 1 Steel-Wheeled Roller • 1 Gradall/Backhoe | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment(PPE) • Liquid Asphalt • Bituminous Premix (hot mix) • #21A Stone • #1 Stone • #25 Crusher Run • #21B Stone |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 2-4 Additional Operators (depending on haul distance) | <u>Include as required:</u> <ul style="list-style-type: none"> • 2-4 Additional Dump Trucks (depending on haul distance) • 1 Milling Machine • Traffic Control Devices/Signs • Truck Mounted Attenuator (TMA) (or as needed) | <u>Small tools:</u> <ul style="list-style-type: none"> • Shovels • Brooms • Rakes/Lutes <u>Include as required:</u> <ul style="list-style-type: none"> • Jack hammer • Pavement saw |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.6 Treating Bleeding Pavements

4.6.1 Activity Description: The application of sand, stone or stone dust to absorb excess asphalt and effectively increase skid resistance. May be done prior to Chip Sealing (see [4.3 Spot Sealing/Skin Patching \(“Chip Sealing”\)](#))

4.6.2 Purpose of Activity: To provide adequate skid resistance when flushing or bleeding of asphalt surfaces occurs and the asphalt flows to the surface during hot weather. Sanding pavements is a temporary measure that will require repeated applications to effectively increase the skid resistance.

4.6.3 General Guidelines:

A. Sand or stone dust: Roads should be sanded or have stone dust applied when the area shows signs of vehicles tracking the asphalt or the area becomes slippery.

B. Stone: No. 8 stone may be substituted for sand or stone dust to roughen extremely slippery surfaces.

4.6.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. Load material into spreader.
- D. Apply material as conditions require.
- E. The application rate for the sand or stone dust is the same as that used for spreading abrasives.
- F. Additional passes may be necessary in order to effectively absorb excessive surface asphalt.
- G. When necessary, apply No. 8 stone to extremely slippery surfaces. Roll after applying the stone.
- H. Set up loose gravel signs to alert traffic to conditions. If pavement will be left unmarked for more than three days, unmarked pavement signs should be placed.
- I. Notify VDOT District Traffic Engineering section if any pavement markings have been modified or need to be replaced.
- J. Recover traffic control devices

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Operator | <ul style="list-style-type: none"> • 1 Truck with Spreader (typ. Tailgate) • 1 Front End Loader (at stockpile) | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Sand or stone dust • #8 Stone |
| Include as required: <ul style="list-style-type: none"> • 1 Additional Operator | Include as required: <ul style="list-style-type: none"> • 1 Roller (pneumatic tire preferred) • Traffic Control Devices/Signs | Small tools: <ul style="list-style-type: none"> • Shovels • Brooms • Rakes |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.7 Patching of Non-Hard-Surface Roads

- 4.7.1 Activity Description: Patching holes, rough spots, ruts, and weak sections on dirt/gravel roads by adding spot surface material.
- 4.7.2 Purpose of Activity: To repair or stabilize isolated surface irregularities when time, weather or availability of equipment does not permit machining of the road surface.
- 4.7.3 General Guidelines: Guidelines for corrective action are as follows:
- A. Potholes: 2 inches or greater in depth and 6 inches or greater in width and covering over 1/5 of the affected area.
 - B. Rutting: greater than 2 inches in depth
 - C. Loss of surface stone: sections 20 feet or greater in length or any locations where mud is present and passage of vehicles is impeded (e.g. during periods of inclement weather, washouts, holes, soft spots, etc.)
- 4.7.4 Procedure to Conduct Maintenance Activity:
- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
 - B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
 - C. Place appropriately-sized stone for the depth of rut/distress in area as required. For especially soft or wet areas, use clean stone.
 - 1. 2 – 4 inches depth: #21-A stone
 - 2. 4 – 6 inches depth: #26 stone
 - 3. Over 6 inches depth: Clean stone
 - D. Compact material for best results. Level with existing surface.
 - E. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 2 Operators | <ul style="list-style-type: none"> • 1 Truck • 1 Front End Loader (at stockpile) | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • #26 Stone (Crusher Run) • #21-A stone • Clean stone |
| <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 1-2 Additional Operators | <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 1 Additional Truck (depending on haul) • 1 Motor Grader • Traffic Control Devices/Signs | <p><u>Small tools:</u></p> <ul style="list-style-type: none"> • Shovels |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.8 Machining, Grading and Shaping of Non-Hard-Surface Roads

4.8.1 Activity Description: Includes dragging and blading to pick up rock or debris. Also includes minor shaping of ditches.

4.8.2 Purpose of Activity: Two basic operations are conducted under this activity; blading and dragging. Non-hard-surface roads require frequent machining to restore proper crown, remove corrugations, correct potholing, remix loose surface stone, and re-establish ditch line.

4.8.3 General Guidelines:

- A. As a guideline, non-hard-surface roads should be machined for the following conditions:
 1. Corrugations: When depth exceeds 1 - 1 ½ inches in sections greater than 25 feet in length.
 2. Potholes: 2 inches or greater in depth and over 20% of affected surface area.
 3. Crown: Proper crown should be maintained at ¼ inch per foot with curves super elevated as required. This will not apply to sandy soils, as it is impractical and not necessary for proper drainage.
 4. “Three Ridges” (stone displaced by traffic): When ridge exceeds 2 inches.
- B. In dry weather: pull loose material into place without cutting into the crust.
- C. When there is sufficient moisture: cut and remix the material.

- 4.8.4 Procedure to Conduct Maintenance Activity:
- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
 - B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
 - C. Make one or more passes with the motor grader as needed.
 - 1. Pull all surface stone on one side to the center of the road.
 - 2. Pull all surface stone from the opposite side to the center of the road.
 - 3. If applicable, make a final pass to spread the stone to the shoulder break.
 - D. Compact stone as needed.
 - E. Stone in the drainage ditch should be reclaimed if possible.
 - F. Recover traffic control devices.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Operator | <ul style="list-style-type: none"> • 1 Motor Grader | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • #26 Stone (Crusher Run) |
| Include as required: <ul style="list-style-type: none"> • 1 Additional Operator | Include as required: <ul style="list-style-type: none"> • 1 Dump Truck • Roller • Traffic Control Devices/Signs | Small tools: <ul style="list-style-type: none"> • Shovel |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.9 Application of Dust Control Materials

4.9.1 Activity Description: Application of dust control materials such as calcium chloride, magnesium chloride, sodium chloride, and bituminous materials (e.g. asphalt or emulsion).

4.9.2 Purpose of Activity: The application of dust control materials is used to control excessive or unwanted dust on unpaved roads.

4.9.3 General Guidelines:

- A. As a general rule, apply dust control materials when the buildings are located within 200 feet of the road and the length of the road treated is

approximately 200 feet on either side of the building on roads with a traffic count of 10 vehicles per day or greater.

- B. Roadway surface condition and volume of traffic should receive consideration in determining which locations call for application of these materials.
- C. The application rate for Calcium Chloride is typically much lower than salt, for example, as salt is significantly less expensive

4.9.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. For Calcium Chloride (CaCl₂) dust application:
 - 1. Load material into spreaders.
 - 2. Apply material at the following rates: $\frac{3}{4}$ to 1 lb. per square yard in the spring; repeat application of $\frac{1}{2}$ to $\frac{3}{4}$ lb. per square yard during the summer.
 - 3. Problem areas may require a third application.
- D. For Liquid Calcium Chloride application: Applications for liquid CaCl₂ should be as follows:
 - 1. 26% solution = 3.5 lbs. CaCl₂/gal. of solution. Apply at 0.14 gal/SY to get 1/2 lb. CaCl₂/SY. Apply at 0.22 gal/SY to get 3/4 lb. CaCl₂/SY.
 - 2. 35% solution = 5.0 lbs. CaCl₂/gal. of solution. Apply at 0.10 gal/SY to get 1/2 lb. CaCl₂/SY. Apply at 0.15 gal/SY to get 3/4 lb. CaCl₂/SY.
- E. For bituminous material: for dust control purposes, this would typically be applied at 50% of its normal rate.
- F. Clean excess material from the tools and equipment, leaving the work site in a clean condition.
- G. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| For Calcium Chloride dust: <ul style="list-style-type: none"> • 1-2 Operators | For Calcium Chloride dust: <ul style="list-style-type: none"> • 1 Truck with Chemical Spreader • 1 Front End Loader (at stockpile) Include as required: <ul style="list-style-type: none"> • 1 Water Truck | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Calcium Chloride (CaCl₂) • Sodium Chloride (NaCl or salt) • Magnesium Chloride • Asphalt mix or emulsion |
| For Liquid Calcium Chloride: <ul style="list-style-type: none"> • 1 Operator • 1 Spray Bar Operator | For Liquid Calcium Chloride or asphalt emulsion: <ul style="list-style-type: none"> • 1 Distributor • Spray truck Include as required: <ul style="list-style-type: none"> • Traffic Control Devices/Signs | |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.10 Machining, Grading, and Shaping of Non-Hard-Surface Shoulders

- 4.10.1 Activity Description: Blading and shaping of non-paved shoulders. Includes the cutting and machining of shoulders and hauling of surplus material as needed.
- 4.10.2 Purpose of Activity: Non-hard-surface shoulders shall be maintained with a uniform slope sufficient to properly drain the roadway surface, be flush with the edge of pavement, be free of ruts and trenches, and be safe for vehicular use in case of emergency.
- 4.10.3 General Guidelines: As a guideline, shoulders should be maintained such that:
- A. Uniform slope: Shoulder slope of 1 inch per foot. If slope exceeds desired slope by more than 1 inch per foot it should be corrected as soon as possible.
 - B. Rutting: Maximum of 2 inches. Low shoulder: Maintain in close proximity to the edge of pavement. Schedule maintenance when appreciable sections of the shoulder do not meet this criterion.
 - C. High shoulder: Immediate correction if water is ponding or running along the edge of the pavement. Perform in the spring of the year when possible to aid the growth of vegetation.
- 4.10.4 Procedure to Conduct Maintenance Activity:
- A. Machining of non-hard-surface shoulders:

1. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
 2. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
 3. Make one or more passes with a motor grader.
 - a. Windrow material at the edge of the pavement with the blade at the proper slope.
 - b. On the final pass, spread excess material back over the shoulder at the proper slope.
 - c. Take care not to damage the pavement edge.
 4. Compact the material with a roller or with the vehicle making the final pass.
 5. Broom pavement surface, as required
 6. Recover traffic control devices.
- B. Restoration of non-hard-surface shoulders:
1. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
 2. Place traffic control devices in accordance with current Virginia Work Area Protection Manual.
 3. With a motor grader, blade at the proper slope, placing windrow material onto the edge of the pavement.
 4. Load material and haul it to a dump site.
 5. Broom pavement surface, as required.
 6. Recover traffic control devices.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 4 Operators • 2 Operators (if using TMAs) or Flaggers | <ul style="list-style-type: none"> • 1 Motor Grader/Gradall/Backhoe • 1 Rotary Broom/Sweeper • 1 Dump Truck or Pickup Truck • 1 Dump Truck | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • #26 Stone (Crusher Run) • #21-A Stone |
| | <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 2-3 Dump Trucks • 1 Athey Loader/Front End Loader • 1 Tailgate Conveyor • 1 Leeboy Paver • Traffic Control Devices/Signs 2 Truck Mounted Attenuators (TMAs) | <p><u>Small tools:</u></p> <ul style="list-style-type: none"> • Brooms • Shovels • Rakes |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.11 Repair of Non-Hard-Surface Shoulders with Soil or Aggregate

- 4.11.1 Activity Description: Blading and shaping of non-paved shoulders requiring additional material.
- 4.11.2 Purpose of Activity: Non-hard-surface shoulders shall be maintained with a uniform slope sufficient to properly drain the roadway surface, be flush with the edge of pavement, be free of ruts and trenches, and be safe for vehicular use in case of emergency.
- 4.11.3 General Guidelines: As a guideline, shoulders should be maintained such that:
- A. Uniform slope: Shoulder slope of 1 inch per foot. If slope exceeds desired slope by more than 1 inch per foot, it should be corrected as soon as possible.
 - B. Low shoulder: Maintain in close proximity to the edge of pavement. Schedule maintenance when appreciable sections of the shoulder do not meet this criterion.
 - C. Rutting: Maximum of 2 inches.
- 4.11.4 Procedure to Conduct Maintenance Activity:
- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
 - B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).

- C. Spot dump additional shoulder material as required.
- D. Blade material to proper grade and slope.
- E. Clean excess off pavement surface.
- F. Compact material.
- G. Recover traffic control devices.
- H. Set up loose gravel signs to alert traffic to conditions.
- I. Remove loose gravel signs when appropriate.

| Type of Staffing | Suggested Equipment | Materials |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Operator • 1 Laborer | <ul style="list-style-type: none"> • 1 Truck • 1 Front End Loader (at stockpile) | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment(PPE) • #26 Stone (Crusher Run) • #21-A Stone |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Foreman • 1-5 Additional Operators | <u>Include as required:</u> <ul style="list-style-type: none"> • 2 Trucks with Tailgate Spreaders • 1 Motor Grader • Additional Trucks (vary to suit haul) • 1 Tractor Broom • Roller (typ. Steel-wheeled) • Traffic Control Devices/Signs | <u>Small tools:</u> <ul style="list-style-type: none"> • Brooms • Shovels |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

4.12 Wedging of Non-Hard-Surface Shoulders with Bituminous Material

- 4.12.1 Activity Description: Placing and compacting of bituminous material along the edge of the pavement.
- 4.12.2 Purpose of Activity: Spot wedging of non-hard-surface shoulders is beneficial in areas where frequent shoulder work is required because of traffic or erosion displacing shoulder material.
- 4.12.3 General Guidelines: Areas most frequently benefitting from a shoulder wedge are:
 - A. Inside of curves.
 - B. Crest of hills.

C. Sections of roads with marginal surface width.

4.12.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment, traffic control devices and materials have been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. Using appropriate equipment, cut trench along edge of pavement for wedge.
- D. Place material in trench at the proper slope.
 - 1. Place #26 stone and compact, followed by a liquid asphalt primer/seal.
 - 2. Place hot asphalt premix and compact.
- E. The wedge should be 12" - 18" wide and may be built up with premix or stone with a seal treatment, and sloped to match the shoulder.
 - 1. Apply premix at a depth of 4 to 6 inches.
 - 2. Apply stone at a depth of 6 to 8 inches.
- F. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Foreman • 4 Operators | <ul style="list-style-type: none"> • Backhoe or Gradall • Roller • 2 Trucks | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • #26 Stone (Crusher Run) • #8 Stone • #78 Stone • Liquid Asphalt • Asphalt Premix |
| Include as required: <ul style="list-style-type: none"> • 1 Additional Operator • 3 Laborers | Include as required: <ul style="list-style-type: none"> • 3 Trucks with Tailgate Spreaders • 1 Asphalt Kettle | (hot) Small tools: <ul style="list-style-type: none"> • Shovels • Rakes |

****Note: Staffing, equipment, and materials are based on general guidelines and a variety of factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5. ROADWAY DRAINAGE

Asset Type: ROADWAY DRAINAGE

Policy: *The Department shall maintain drainage facilities to; 1) Provide safety and protection to the traveling motorist; and 2) Provide reasonably adequate drainage of the roadway surfaces, shoulders, and other drainage items; and 3) Preserve the structural integrity of the roadway.*

5.1 Cleaning and Flushing of Pipes and Culverts (Machine or Hand Cleaning)

- 5.1.1 **Activity Description:** The inspection and machine or hand cleaning of all drainage structures. May include water jetting of drainage structures, using a water pump to flush out debris.
- 5.1.2 **Purpose of Activity:** To identify and promptly remove sediment deposits or obstructions in order to keep culverts and other drainage structures clean and unimpeded. Critical areas should be patrolled during periods of severe storms and any evidence of drainage problems should be corrected immediately.
- 5.1.3 **General Guidelines:**
- A. Patrol, identify, and evaluate evidence of blockage of drainage structures during routine maintenance activities, especially after rain events.
 - B. Patrol critical areas during or after periods of severe rain events, particularly those where backed up water would cause property damage.
 - C. Any evidence of drainage problems should be corrected as soon as feasible.
- 5.1.4 **Procedure to Conduct Maintenance Activity:**
- A. Identify and adhere to applicable environmental requirements and regulations.
 - B. Verify the limits of state right of way (R.O.W.) and drainage easements.
 - C. Determine the need for and type of Erosion and Sedimentation (E & S) controls prior to starting work.
 - D. Check that all required permits, tools, and materials have been loaded prior to leaving area headquarters.
 - E. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).

- F. Install E & S Controls where necessary.
- G. Clean drainage structure using machine cleaning, hand cleaning, or pressure washer as appropriate.
- H. After pipe is clean, inspect for rust, deterioration, bituminous coating, and structural integrity, and report any deficiencies to Area HQ Manager.
- I. Remove and dispose of any accumulated debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
- J. Recover traffic control devices.
- K. Remove E & S Controls when appropriate.

| Type of Staffing | Suggested Equipment | Materials |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Crewperson • 2 Operators • 1-2 Laborers | <ul style="list-style-type: none"> • 1 Dump Truck • 1 Gradall/Backhoe • 1 Water Tank and Pump | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment(PPE) • Water • Hand tools |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 2 Flaggers | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 MicroTrax Machine • Truck Mounted Attenuator (TMA) | <u>Include as required:</u> <ul style="list-style-type: none"> • E & S Controls |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.2 Sweeping of Curbs and Gutters

- 5.2.1 Activity Description: The inspection and removal of sediment deposits or obstructions from curbs, gutters, and shoulders. May also include intersections or other surfaces.
- 5.2.2 Purpose of Activity: To clean curb and gutter, paved ditches, drop inlets, and drainage elements constructed along shoulders, sidewalks or trails in order to remove collected debris which impedes the flow of water.

5.2.3 General Guidelines:

- A. Curbs, gutters, and shoulders should be kept clean and unobstructed to allow water to flow unimpeded.
- B. Any sediment deposits or obstructions should be removed as soon as feasible.
- C. Damage to or settling of roadside curbs or gutters that adversely affects the efficiency of the drainage item should be repaired. [See 5.3 Repair of Drainage Structures.](#)

5.2.4 Procedure to Conduct Maintenance Activity:

- A. Identify and adhere to applicable environmental requirements and regulations.
- B. Verify the limits of state right of way (R.O.W.) and drainage easements.
- C. Check that all required permits, tools, and materials have been loaded prior to leaving area headquarters.
- D. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- E. Clean curb, gutters, and shoulders by hand and/or with a vacuum truck or power broom, as required.
- F. Evaluate adjacent roadways and intersections for any necessary sweeping.
- G. Remove and dispose of any accumulated debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
- H. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Crewperson • 1 Operator • 2-3 Laborers | <ul style="list-style-type: none"> • 1 Front End Loader with Sweeper • Attachment/Vacuum Truck/Vactor | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Hand tools |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 6-8 Offenders • 2 Flaggers | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Offender Transport Vehicle • 1 Dump Truck • 1 Backhoe • 1 Power Broom • Truck Mounted Attenuator (TMA) | <u>Include as required:</u> <ul style="list-style-type: none"> • Backpack blowers |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.3 Repair of Drainage Structures

- 5.3.1 Activity Description: The inspection and repair of all unnumbered drainage structures (i.e. those with less than a 36 sq. ft. opening) that are broken, damaged, deteriorated, or out of alignment.
- 5.3.2 Purpose of Activity: To inspect and repair drainage structures - especially footings and headwalls - that are deteriorating or have been broken or damaged by scour, erosion, settling, etc. This includes structures that are out of alignment due to settling or heaving.
- 5.3.3 General Guidelines:
- A. Footings and headwalls should be inspected for scour, erosion, or settling. Any required repairs should be made as soon as feasible.
 - B. When a drainage structure has been broken or damaged, or is out of proper alignment due to settling or heaving, the Area Headquarters Manager should be notified and the repair made as soon as scheduling permits.
 - C. Evaluate the inverts of pipes that have corroded or are worn through for repair in accordance with the Location and Design Division's [Instructional and Informational Memoranda \(I&IM\)](#).
 - D. In the case of major settlement, corrosion, or damage, the pipe should be scheduled for replacement (see [5.4 Drainage Structure Replacement](#)).
- 5.3.4 Procedure to Conduct Maintenance Activity:
- A. Identify and adhere to applicable environmental requirements and regulations.

- B. Verify the limits of state right of way (R.O.W.) and drainage easements.
- C. Obtain necessary State and Federal permits and contact VA811 (or VA811 (or Ms. Utility of Virginia). of Virginia). Contact USDA regarding problematic beaver dams.
- D. Determine the need for and type of Erosion and Sedimentation (E & S) controls prior to starting work.
- E. Check that required permits, tools, and materials have been loaded prior to leaving area headquarters.
- F. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- G. Install E & S Controls where necessary.
- H. Repair drainage structure as required. Inspect for rust, deterioration, bituminous coating, and structural integrity, and report any deficiencies to Area HQ Manager.
- I. Remove and dispose of any accumulated debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
- J. Recover traffic control devices.
- K. Remove E & S Controls when appropriate.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Crewperson • 2 Operators • 2-3 Laborers | <ul style="list-style-type: none"> • 1 Dump Truck • 1 Backhoe/Gradall • 1 Tamper/Compressor | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Concrete • Gravel • Pipe Sections • Pipe Liners • Plywood/Corrugated Metal (as needed) • Lumber (as needed) • Nails • Rebar/Angle Iron • Riprap (Stone) • Sandbags (for wet drainage structures) |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 6-8 Offenders • 2 Flaggers | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Offender Transport Vehicle • 1 Air Compressor • 1 Concrete Mixer • 1 Water Pump • Truck Mounted Attenuator (TMA) • Other Traffic Control Devices | <u>Hand tools:</u> <ul style="list-style-type: none"> • Shovels • Brooms • Trowels • 1 Jack (for crushed pipe) |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.4 Drainage Structure Replacement

- 5.4.1 Activity Description: The replacement of pipe culverts, catch basins, inlets, flumes, and other unnumbered drainage structures (i.e. those with less than a 36 sq. ft. opening) due to damage or deterioration. *Note: This activity does not include installations at new locations.
- 5.4.2 Purpose of Activity: To replace pipes or other unnumbered drainage structures compromised as a result of major settlement, corrosion, or other damage.
- 5.4.3 General Guidelines:
- A. Plan ahead for any necessary road closures and detours, including notification to impacted schools, property owners and emergency services. Plans for detours and lane closures should be reviewed by appropriate District staff and the Regional Traffic Engineer.
 - B. Determination of pipe size should be made by appropriate District staff. Consideration should also be given to head walls, wing walls, outlets, etc.

5.4.4 Procedure to Conduct Maintenance Activity:

- A. Identify and adhere to applicable environmental requirements and regulations. Ensure availability of staff with appropriate DCR certification.
- B. Verify the limits of state right of way (R.O.W.) and drainage easements.
- C. Obtain necessary State and Federal permits and contact VA811 (or VA811 (or Ms. Utility of Virginia). of Virginia). Contact USDA regarding problematic beaver dams.
- D. Ensure that all safety requirements have been met, including consideration for trenching, confined spaces, land disturbance, etc.
- E. Determine the need for and type of Erosion and Sedimentation (E & S) controls prior to starting work.
- F. Check that required permits, tools, and materials have been loaded prior to leaving area headquarters.
- G. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- H. Install E & S Controls where necessary.
- I. Replace drainage structure as required.
- J. Remove and dispose of any accumulated debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
- K. Recover traffic control devices.
- L. Remove E & S Controls when appropriate.

| Type of Staffing | Suggested Equipment | Materials |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Crewperson • 2-5 Operators/ Laborers | <ul style="list-style-type: none"> • 2 Dump Trucks • 1 Excavator • Trailer/Backhoe/Gradall | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) • Pipe Sections • Box Sections • Catch Basin Boxes and Grates • Gravel • Concrete • E & S Controls • Asphalt • Riprap (Stone) • Sandbags (for wet drainage structures) |
| <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 2 Flaggers • Environmental Inspector • Sediment Control Inspector • OSHA-certified “Competent Person” | <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 1 Concrete Mixer • 1 Concrete Saw • 2 Water Pumps • Trench Box • Truck Mounted Attenuator (TMA) • Traffic Control Devices | <p><u>Hand tools:</u></p> <ul style="list-style-type: none"> • Shovels • Brooms • Tamper/Compactor <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • E & S Controls |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.5 Hand Cleaning of Unpaved Ditches

5.5.1 Activity Description: Includes all non-mechanized hand ditch cleaning work of unpaved ditches.

5.5.2 Purpose of Activity: To remove silt and other debris from unpaved drainage ditches using hand tools.

5.5.3 General Guidelines:

A. Unpaved channels should be kept free of obstructions and have a uniform flow line with sufficient depth and grade to ensure adequate drainage and erosion control.

B. Outlet ditches, inlet ditches, and tail ditches should be checked routinely.

- C. The cross-section of the ditch should be free of debris and silt such that water will not back up or pond.
- D. Care should be taken to ditch only as far as is necessary to protect the roadway.

5.5.4 Procedure to Conduct Maintenance Activity:

- A. Identify and adhere to applicable environmental requirements and regulations.
- B. Verify the limits of state right of way (R.O.W.) and drainage easements.
- C. Obtain necessary State and Federal permits and contact VA811 (or Ms. Utility of Virginia).
- D. Determine the need for and type of Erosion and Sedimentation (E & S) controls prior to starting work.
- E. Check that required permits, tools, and materials have been loaded prior to leaving area headquarters.
- F. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- G. Install E & S Controls where necessary.
- H. Remove silt and debris to establish positive drainage.
- I. Remove and dispose of any accumulated debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
- J. Recover traffic control devices.
- K. Remove E & S Controls when appropriate.

| Type of Staffing | Suggested Equipment | Materials |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 2 Operators • Laborers (number will vary) | <ul style="list-style-type: none"> • 1 Dump Truck | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 8 Offenders | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Offender Transport Vehicle • 1 Pickup Truck • Backhoe • Truck Mounted Attenuator (TMA) | <u>Hand tools:</u> <ul style="list-style-type: none"> • Shovels • Wheelbarrow • Pitchfork • Potato Raker (Hoe Fork) • Brush Axe <u>Include as required:</u> <ul style="list-style-type: none"> • E & S Controls |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.6 Machine Cleaning of Unpaved Ditches

5.6.1 Activity Description: The mechanized cleaning of unpaved roadside ditches.

5.6.2 Purpose of Activity: To mechanically clean roadside ditches to remove obstructions and reshape as necessary to restore original cross-section.

5.6.3 General Guidelines:

- A. Roadside ditches should be kept free of obstructions and maintained with adequate depth, cross- section, and grade to handle the expected flow of water and ensure adequate drainage.
- B. Make the necessary evaluation to determine the type of equipment needed for each specific job.

5.6.4 Procedure to Conduct Maintenance Activity:

- A. Identify and adhere to applicable environmental requirements and regulations.
- B. Verify the limits of state right of way (R.O.W.) and drainage easements.
- C. Obtain necessary State and Federal permits and contact VA811 (or Ms. Utility of Virginia).
- D. Determine the need for and type of Erosion and Sedimentation (E & S) controls prior to starting work.

- E. Check that required permits, tools, and materials have been loaded prior to leaving area headquarters.
- F. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- G. Install E & S Controls where necessary.
- H. When using a motor grader, windrow material on shoulder in one or two passes as required such that it can be picked up with a loader. If an excavator or rotary ditcher is used instead of a motor grader, material may be windrowed or isolated spots may be loaded directly into truck.
- I. Use loader to put material in dump truck.
- J. Remove and dispose of any accumulated debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
- K. Use a rotary broom to sweep pavement clean.
- L. Re-seed where necessary.
- M. Recover traffic control devices.
- N. Remove E & S Controls when appropriate.

| Type of Staffing | Suggested Equipment | Materials |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 1 Lead Crewperson • 5-8 Operators • Laborers (number will vary) • 2 Flaggers | <ul style="list-style-type: none"> • 1 Motor Grader/Gradall/Excavator and Trailer • 3 Dump Trucks • 1 Athey Loader/Front End Loader • 1 Rotary Broom (mounted or non-) | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment(PPE) • Hand tools |
| | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Vacuum Truck • 1 Self-Loading Rotary Ditching Machine • Truck Mounted Attenuator(TMA) | <u>Include as required:</u> <ul style="list-style-type: none"> • E & S Controls/ Seeding |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.7 Removal of Debris and Emergency Roadway Cleanup

- 5.7.1 Activity Description: The removal of debris which impedes drainage of the roadway and associated structures as well as roadway cleanup associated with storms, floods, or other disasters.
- 5.7.2 Purpose of Activity: To keep the roadway and drainage structures free of debris, including that deposited by storms or other extraordinary causes, to ensure the safety of the traveling public.
- 5.7.3 General Guidelines:
 - A. Related assets such as guardrails, posts, signs, etc. should also be kept clear of debris.
 - B. This activity includes the removal of fallen trees or other obvious hazards that obstruct the roadway.
- 5.7.4 Procedure to Conduct Maintenance Activity:
 - A. Identify and adhere to applicable environmental requirements and regulations.
 - B. Verify the limits of state right of way (R.O.W.) and drainage easements (*Note: this may not be feasible in certain emergency situations where timing is critical).
 - C. Check that required permits, tools, and materials have been loaded prior to leaving area headquarters.
 - D. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
 - E. Remove and dispose of debris in accordance with current Department guidelines.
 - 1. Do not place debris on private property.
 - 2. Avoid placing debris upslope from drainage structures.
 - 3. Any abnormal oil sheen odors or water colors shall be investigated and reported as necessary. Refer to best management practices for Illicit Discharge Detection and Elimination (IDEE).
 - F. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 2 Operators • Laborers (number will vary) | <ul style="list-style-type: none"> • 1 Dump Truck • 1 Front End Loader/Gradall | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) - incl. chaps and hard hats |
| <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 1 Flagger | <p><u>Include as required:</u></p> <ul style="list-style-type: none"> • 1 Offender Transport Vehicle • 1 Chipper • 1 Motor Grader • 1 Backhoe • 1 Dump Truck • Truck Mounted Attenuator (TMA) • Specialized Equipment • Emergency Lighting | <p><u>Hand tools:</u></p> <ul style="list-style-type: none"> • Shovel • Chain Saw • Rake • Chain/Strap |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

5.8 Inspection and Maintenance of Stormwater Management Facilities

- 5.8.1 Activity Description: The inspection, maintenance and repair of stormwater management (SWM) facilities on VDOT right-of-way. This includes routine maintenance as well as emergency maintenance work necessitated by storms, floods and other conditions.
- 5.8.2 Purpose of Activity: Stormwater management facility types on VDOT right-of-way include impoundment, filtration, conveyance, and manufactured stormwater quality structures. These facilities shall be inspected for any necessary maintenance at the frequencies prescribed by the Virginia Stormwater Management Law and Regulations.
- 5.8.3 General Guidelines and Procedures:
- A. As a general rule, stormwater management facilities shall be inspected annually and after any storm event which has potentially caused the capacity of the facility's spillway to be exceeded.
 - B. Maintenance of stormwater management facilities on VDOT right-of-way is the responsibility of appropriate field staff in the respective VDOT District.
 - C. Policies, guidelines, and best practices related to stormwater management facilities should be as specified in VDOT's Erosion and Sediment Control and Stormwater Management Program Manual.

- D. Accumulated sediment in stormwater management facilities shall be removed and properly disposed of when it reaches the volume specified in the S.W.M. Facility Maintenance Inspection Checklist (see VDOT's Erosion and Sediment Control and Stormwater Management Program Manual).
- E. Vegetation shall be controlled so that it does not impact the operation of the stormwater management facility. Debris, including that resulting from vegetation control activities, should be removed and disposed of appropriately (see [5.7 Removal of Debris and Emergency Roadway Cleanup.](#))
- F. Access to stormwater basins (SWBs) and manufactured detention chambers should be at least 10 feet wide, on a slope of 3:1 or less, and stabilized to withstand the periodic or infrequent passage of heavy equipment. Access should be kept free of vegetation or debris that may impede passage.
- G. VDOT personnel will be responsive to the request of the field agents of any regulatory agency with regards to the maintenance of stormwater management facilities.

6. ROADWAY – SNOW & ICE CONTROL

Asset Type: ROADWAY – SNOW & ICE CONTROL

Policy: The Department shall plan for and attempt to promptly and efficiently treat and remove snow and ice from all highway systems or make them passable as soon possible. This is considered an emergency activity and is intended to maintain roadway assets while ensuring the safety of the traveling public and year-round use of the state highways without undue delays.

6.1 Route Planning and Priority Designations

6.1.1 Activity Description: The prioritization of all routes which should be cleared of snow and ice in accordance with the needs of all State highway systems and within the available resources.

6.1.2 Purpose of Activity: To identify and designate snow and ice control levels of service that are both efficient and attainable within the available resources.

6.1.3 General Guidelines:

A. Priority Designations

1. Priority 1 routes include all National Highway System Routes, all Interstate Routes, and selected primary and secondary routes.
2. Priority 2 routes include all other non-Priority 1, medium-service primary and secondary routes having a functional classification of Principal Arterial, Minor Arterial, Major Collector, or Minor Collector.
3. Priority 3 routes include low-service primary and secondary routes and subdivision streets not designated as Priority 1 or Priority 2 Routes.
4. Priority 4 routes include all other low volume routes within the state rights-of-way.

B. Additional Snow Preparation Factors and Priority Setting Criteria

1. Emergency access
2. Access to weather and road conditions
3. Personnel and equipment rosters
4. Alternate snow storage locations

5. Copies of any applicable local laws or ordinances, and other applicable training programs
 6. High accident locations
 7. Customer input
 8. Terrain/location
 9. Snow Routes
- C. Levels of Service for Various Amounts of Accumulation
1. Priority 1 Routes should be kept free of ice and snow so that traffic can proceed in safety without severe delays, except during periods of heavy falling or drifting snow and ice storms.
 2. Priority 2-4 routes will receive attention as soon as practical in accordance with the Levels of Service described below. In most cases, this can be accomplished within 24 hours on hard surfaced roads, but variances are allowed based on severity of the storm (see Table A).
 3. Priority 2 Routes should be kept free of ice and snow or covered with abrasives so that traffic can proceed safely without severe delays as soon as possible.
 4. Priority 3 Routes should be plowed or have the intersections and curves covered with abrasives as soon as possible as per table A.
 5. Priority 4 Routes should be made passable by appropriately equipped vehicle as soon as possible after treatment of Priority 1-3 Routes to minimize severe delays. *Note: The term “passable condition” indicates that the routes have been plowed and/or treated.
 6. Snow Emergency Routes: When routes in the State Highway System are designated snow routes by the governing body of a county or town in accordance with Section 46.2-1302 of the Code of Virginia, the Department shall erect necessary signs designating these snow emergency routes.
 7. Abrasives should be applied to hills, curves and other locations to facilitate safe travel during extended periods when Routes in Priorities 3 and 4 are covered with packed snow or ice and Routes in Priorities 1 and 2 are basically clear.
 8. Table A below identifies the specific snow and ice control activities and time factors for these four levels of services.

9. As a general practice, non-hard surfaced roadways with less than 2 to 3 inches of snow should not be plowed in order to prevent the damaging of the surface stone and pushing the stone off the roadway and into the ditch.
10. Bridges, overpasses, ramps, and other critical locations should be pretreated at the beginning of a storm.
11. Snow and ice should be plowed and abrasives applied in spots to restore travel as soon as practical after the end of snow and ice storms.

6.1.4 Procedures for Route Plans and Mapping:

- A. Interstate and other routes designated "Priority 1" by the Residency Maintenance Operations Manager and District Maintenance Engineer receive first service. When possible these routes should correspond with localized needs and posted Snow Emergency Routes.
- B. Other primary and high-volume secondary routes are of next consideration, followed by low-volume routes and stabilized roads.
- C. These routes should then be labeled on vicinity maps by maintenance area and used as needed by state force crews, hired equipment personnel, or service contractors.
- D. Snow removal plans should be prepared for each area and recorded on updated [Form M-41 \("Snow Removal and Ice Control Route Plan"\)](#) and [Form M-41A \("Salting/Chemical Application Route Plan"\)](#).
 1. Copies of these forms should be furnished to each TOM I and TOM II.
 2. Meetings should be held at the district and residency levels where a definite plan of operations is established.
 3. The TOM II should hold meetings with his or her personnel to assure that each employee is familiar with his or her assigned duties, including primary and secondary job assignments.
- E. Maps should also show Emergency Snow Routes and locations of staging sites for use during storms and clean-up operations.
- F. Currently there are no restrictions on the use of de-icing chemicals in proximity to rivers, streams, wetlands, etc. Regulatory agencies, however, have expressed written concerns with proper chemical application rates and cleanup of any spilled materials. Any over-application or spills of chemicals near such waterways must be cleaned up immediately and any spills of chemicals directly into water should be reported to the District Environmental Section.

Levels of Service for Snow & Ice Control
Table A

| Accumulation (inches) | Priority 1 Routes Treated/Plowed/Cleared | Priority 2 Routes Chemical Treatment & Plowing During the Storm | Priority 3 Routes Sanded/Plowed | Priority 4 Routes Sanding as needed; Plowing when feasible |
|-----------------------|-------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|
| 0 – 2 | 100% Bare Pavement within 12 hours after end of storm | Completion within 12 hours after end of storm | Sanding as needed; Plowing when feasible | All other roads not in Priorities 1 - 3 |
| 2 – 4 | 100% Bare Pavement within 12 hours after end of storm | Completion within 18 hours after end of storm | Sanding as needed; Roadways passable Plowing when feasible | |
| 4 – 8 | 100% Bare Pavement within 24 hours after end of storm | Completion within 36 hours after end of storm | Sanding as needed; Roadways passable Plowing when feasible | |
| 8 – 12 | 100% Bare Pavement within 24 hours after end of storm | Completion within 48 hours after end of storm | Sanding as needed; Roadways passable Plowing when feasible | |
| 12 – 18 | 100% Bare Pavement within 36 hours after end of storm | Completion within 48 hours after end of storm | Sanding as needed; Roadways passable Plowing when feasible | |
| 18+ | 100% Bare Pavement within 48 hours after end of storm | Completion within 72 hours after end of storm | Sanding as needed; Roadways passable Plowing when feasible | |
| Ice or Freezing Rain | 100% Bare Pavement within 12 hours after end of storm | Completion within 12 hours after end of storm | Sanding as needed; Plowing when feasible | |

6.2 Snow Readiness and Dry Run Training

6.2.1 Activity Description: Snow Readiness is a year-round program that involves inspection of and preventative maintenance for all VDOT and contractor snow-related equipment as well as employee assignments and familiarity with snow and

ice control operations. The program also includes annual “dry run” practice training.

6.2.2 Purpose of Activity: To assure the availability and reliability of equipment and materials, as well as the familiarity of state forces and contract employees with their assignments, in order to achieve the Department's objective of providing Snow and Ice Control services.

6.2.3 General Guidelines:

A. Year-Round Preventative Maintenance

1. Proper PM of all equipment should be a routine occurrence. Equipment should be maintained and ready for any emergency year-round. For example, a dump truck and spreader may be needed to respond to apply sand during a HazMat incident.
2. All Equipment:
 - a. All snow removal equipment, including spreaders and brine making equipment should be cleaned and lubricated at the conclusion of each snow or ice event.
 - b. All spreaders are to be completely cleaned and lubricated at the end of the snow season.
 - c. Stand-alone spreader stands are also to be inspected, cleaned, lubricated and stored properly at the end of the snow season.
3. Snow blowers and Brine making equipment are to be inspected and tested.
4. Truck-mounted plows and spreaders as well as grader-mounted plows are to be inspected and tested. [Hyperlink to Manual]
5. All equipment is to be checked over by the equipment shop to make certain it is in top working condition. The required safety items and devices should also be checked for at this time.
6. Calibration of Spreaders:
 - a. Properly calibrated spreaders will ensure the desired application rates for different materials and mixtures being used.
 - b. Chemical spreaders are to be calibrated before snow and ice events using a documented method such as the “[Application Mixing Rates](#)” and “[Calibration Procedures](#)”. See also [Application of Chemicals \(Anti-Icing and De-Icing\)](#).

- c. Transportation Operations Managers are encouraged to take “Spreader Calibration” E-learning in the Virtual Campus. The entire E-Learning Module can be printed and used as a work and training job aid.

B. Dry Run Events and Training

1. Employee training is a critical part of snow removal planning and should be scheduled on a year-round basis. Training for snow and ice operations should be ongoing to ensure that the assigned personnel are fully prepared.
2. To support Dry Run training, employees should also consider participating in formal Snow Operations Training (SOT) conducted or sponsored by the VDOT Learning Center Training Academy.
3. Preparation for the Dry Run events should begin in the midsummer time frame to ensure all equipment is properly prepared for snow and ice operations.
4. During the Dry Run, all equipment is to be cleaned, greased and recalibrated.
5. In the summer of each year, a Dry Run is to be conducted to ensure that snow and ice control equipment is available and working properly.
6. Operators must be trained in proper techniques of plowing various highway types and trained on timing and techniques for spreading chemicals and abrasives.
7. Additional instructions that should be covered during Dry Run training and Snow Operation Training (SOT) classes are listed in Section I (G) of VDOT’s “Planning for Snow and Ice Control” document.

6.2.4 Procedure to Conduct Dry Run Training:

- A. Road assignments for personnel should be made prior to the “Dry Run” event and confirmed by the assigned personnel (both state forces and contract).
- B. All assigned personnel are to be present during the Dry Runs. This is to include all VDOT personnel, contractors, and hired equipment personnel assigned to snow/ice operations as well as support staff involved with Va. Traffic, SWAS, and other data management systems.
- C. Personnel should receive their assignment, prepare their equipment (mount spreaders, plows, etc.), and run their routes.
- D. Check supplies for availability, including first aid kits, flares, tow chain, flashlight, etc. See suggested.

- E. [Dry Run Check List](#).
- F. During the Dry Run, employees should be trained with safe and efficient operation of assigned equipment:
 - 1. Care should be taken to ensure the employee understands how to attach and operate plows and chemical spreaders.
 - 2. The employee must be trained in the maintenance of equipment, calibration of chemical spreaders and its impact on chemicals, and how to operate the equipment safely.
 - 3. Proper installation, use, and repair of tire chains must also be addressed.
- G. Equipment Readiness:
 - 1. During the Dry Run, the equipment is to be cleaned, greased and recalibrated.
 - 2. Plows and spreaders are to be mounted on trucks and plows are to be mounted on graders.
 - 3. Snow blowers are to be readied.
 - 4. Spreaders are to be properly [calibrated](#).
 - 5. All equipment, including any required safety items and devices, is then checked over by the equipment shop to make certain it is in top working condition.
- H. Route Familiarity:
 - 1. During the Dry Run training, the employee should go over his assigned route(s) and inspect for obstacles that may be encountered, such as sign islands, guardrails, warning signs, railroad crossings, etc.
 - 2. As often as practical the operator should review these routes for changes that may have occurred. This can be accomplished during his or her routine maintenance travels during periods of good weather.

6.2.5 [Environmental Best Management Practices:](#)

- A. Waste Management Guide 3.19 addresses environmental BMPs for Salt Pond/Tank and Mixing Pad maintenance and use.
- B. Waste Management Guide 3.20 addresses environmental BMPs for Salt Spreader maintenance and use.

- C. Waste Management Guide 4.3 addresses environmental BMPs for Design and Maintenance of Secondary Containment for storage of De-icing/Anti-icing liquids and for Brine-Making Equipment.
- D. It is important for maintenance personal to properly dispose of any residual salt/brine. Appropriate Residency staff should be designated to ride the routes, note any salt piles and facilitate cleanup. This is especially important in Municipal Separate Storm Sewer System (MS-4) areas.

Snow Removal Operations Inventory Suggested List

| Equipment | Materials | Accessories | Supplies |
|--------------------------------|---------------------------------|--------------------------------------|----------------------------|
| Truck | Salt (NaCl) | Snow Blades | Fuel |
| Spreader | Salt Brine | Tire Chains (Single & | Oil (including Hydraulic) |
| Snow Blower | Calcium Chloride | Spare Tires | Windshield Wiper Blade |
| Loader | Magnesium Chloride | Chain Tensioner | Windshield Wash |
| Tractor | Treated Abrasives | Generators | Ice Scrapers |
| Plow | Calcium Magnesium Acetate (CMA) | Manual Pumps & Battery Pumps (Fuel & | Anti-fuel Gel Additive |
| Tanker | Sand | | Flares (30+ minutes) |
| Backhoe | Crusher Tailing (Stone | | Hydraulic Hoses |
| Skid-steer | #8 and #9 Stone | | Quick-Release Couplings |
| Truck Mounted Attenuator (TMA) | #25, #26, and #59 Aggregates | | Hand Lanterns / Flashlight |
| Grader | | | Extra Batteries |
| | | | Overshoes |
| | | | All-Weather Suits |
| | | | Extra Pins, Washers, |
| | | | Flasher Units |
| | | | Spare Flags |
| | | | Shovels |
| | | | Tow Chains (Certified) |

6.3 Application of Chemicals (Pre-Treatment and De-Icing)

- 6.3.1 Activity Description: The practice of chemical treatment of the pavement for snow and ice control and removal - either direct application of liquid chemicals, for pre-treatment before the storm or application of salt/prewetted salt as de-icing, during or after the storm.
- 6.3.2 Purpose of Activity: To delay or prevent the buildup of snow and ice before it bonds to the pavement (pre-treatment) and to remove snow and ice after it has already bonded to the pavement (de-icing). The chemicals serve to delay or break up the development of a bond between the snow or ice and the roadwaysurface. Pre-Treatment is limited to the application of liquid chemicals before snow or

ice hits the pavement (based on temperature and precipitation forecasts - as long as 48 hours prior). This practice helps buy time for the snow operators to apply salt (incl. prewetted salt) and/or plow before the pavement freezes (i.e., a pavement-ice bond occurs).

6.3.3 General Guidelines:

- A. Pre-Treatment is the practice of delaying the formation or development of bonded snow and ice by the timely application of a chemical freezing-point depressant. Pre-Treatment takes place before the pavement-ice bond occurs.
- B. Deicing is the practice of removing snow and ice once it has bonded to the pavement. Deicing takes place after the pavement-ice bond occurs.
- C. Modern pre-treatment involves the use of many different kinds of chemicals, some used in granular or flake form, some used in liquid form and some used both ways. The chemicals used by VDOT are sodium chloride (NaCl or salt), calcium chloride (CaCl₂), magnesium chloride (MgCl₂), and calcium magnesium acetate (CMA). Refer to FHWA's Manual of Practice for An Effective Anti-Icing Program for recommended conditions for use for each chemical.
- D. There are three basic methods for application of chemicals to the surface:
 - 1. Dry granular - The chemical (typically salt) is applied directly to the road in dry granular or flake form.
 - 2. Prewetted granular - The prewetted granular method sprays liquid chemical on the granular material ("prewetted salt") before application.
 - 3. Direct liquid application - The direct liquid method sprays chemical brine directly onto the pavement.
- E. Chemical application rates:
 - 1. Transportation Operation Managers and equipment operators should be mindful of the cost of the materials used during snow and ice control operations. Sodium chloride (NaCl or salt) is generally the most economical material per ton; other chemicals may cost five times as much.
 - 2. Other chemicals, however, may be more effective when temperatures fall below 20° F.
 - 3. Chemical application rates used to control snow and ice vary based on a number of factors including rising and falling temperatures, terrain, and material types. Actual applications also depend on traffic volume, severity of the storm, and speed of action required.

4. Proper application rate should lead to plowing equipment being able to achieve a riding surface free of snow or ice at the conclusion of a storm.
- F. See the [Pre-Treatment Recommendations](#) for additional general recommendations for successful pre- treatment practices that can be employed for various combinations of precipitation, pavement temperature, traffic volumes, and mandated levels of service. See also Pre-Treatment Application Decision Making Flow Chart.

Pre-Treatment Application Decision Making Flow Chart

| Weather Forecast | Mobilization Level | Response Plan | Salt Application Rate |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Precipitation: 20% or greater Accumulation: Ice/Snow Possible Ambient or Pavement Temp: 30-36 | Pre-Treatment | Spot treatment of critical structures and locations | Application Liquid Mag: 36 gal/LM Application Liquid salt brine: 50 gal/LM Application Salt: 325 lbs/LM |
| Precipitation: 20-49% or greater Accumulation: Snow Possible Ambient or Pavement Temp: 30-36 | 1 | Spot treatment of critical structures and locations | 325 lbs/LM |
| Precipitation: 50-100% chance Accumulation: Up to 1 inch of snow Ambient or Pavement Temp: 25-29 | 2 | Light Salting Operation | 400 lbs/LM |
| Precipitation: 50-100% chance Accumulation: Up to 2 inches of snow or up to 1/10 inch of ice Ambient or Pavement Temp: 20-24 | 3 | Salting: Operation | 475 lbs/LM |
| Precipitation: 50-100% chance Accumulation: Up to 6 inches of snow or up to 1/4 inch of ice Ambient or Pavement Temp: 15-19 | 4 | Salting/Plow Operation | 550 lbs/LM |
| Precipitation: 50-100% chance Accumulation: More than 6 inches of snow or more than 1/4 inch of ice Ambient or Pavement Temp: 10-14 | 5 | Salting/Heavy Plow Operations; All resources are deployed | 625 lbs/LM |
| <p>Notes: Lane Mile Per Truck reductions must be considered for areas that have unique challenges such as terrain or traffic volume.</p> <p>Heavy equipment and tractors may be used to offset the lane miles per truck. These offsets must be documents and follow the District's snow plan.</p> <p>Interstate Lane Miles Per Truck will be documented in the District's snow plan on the form M-41.</p> | | | <p>Notes: VDOT Single Axle Capacity: 12,000 lbs</p> <p>VDOT Tandem Axle Capacity: 28,000 lbs.</p> <p>VDOT Pickup Capacity: 3,000 lbs.</p> |

6.3.4 Procedure for Application of Chemicals – Anti-Icing and De-Icing:

A. Direct liquid application:

1. The direct liquid method sprays chemical brine directly on the pavement.
 - a. Apply the brine to the road using a tank (usually slip-in) equipped with a spray bar.

B. Dry granular application:

1. The chemical - salt or sand/salt mix - is applied directly to the road in dry granular or flake form.
 - a. Apply the granular material to the road using a rear discharge slip-in chemical spreader.

C. Prewetted granular application:

1. The prewetted granular method sprays liquid chemical on the granular material before application.
 - a. Prewet the granular material as it is discharged from the hopper onto the spinner.
 - b. Apply the mixture to the road using a rear discharge slip-in chemical spreader.

D. Chemical Application Rates:

1. Generally, the rate of application for salt is about 500 pounds per mile of two-lane pavement.
2. The following gives suggested rates of application for chemicals, including calcium chloride mixtures:
 - a. Salt: 200-550 pounds per 12-foot lane mile
 - b. Abrasives/salt mix: 200-550 pounds per 12-foot lane mile
 - c. Magnesium chloride: 100-500 pounds per 12-foot lane mile
 - d. Brine: 23% solution, no more 10% blend, 40 to 50 gallons per 12-foot lane mile

*Note: The above is intended as a guide only. All applications rates are for single lanes; these rates should be doubled for two lanes, etc.

3. [Suggested application rates for various materials and mixtures.](#)

E. Suggested winter mobilization guidelines for storms of various levels of severity are shown in the table Winter Weather Mobilization Guideline.

Winter Weather Mobilization Guideline

| Weather Forecast | Mobilization Level | Response Plan | Salt Application Rate* |
|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Precipitation: 20% or greater Accumulation: Ice/Snow Possible Ambient or Pavement Temp: 30-36 | Anti-ice | Spot treatment of critical structures and locations | Application Liquid Mag: 36 gal/In mi Application Liquid salt brine: 50 gal/In mi Application Salt: 325 lbs./In mi |
| Precipitation: 20-49% or greater Accumulation: Snow Possible Ambient or Pavement Temp: 30-36 | 1 | Spot treatment of critical structures and locations | 325 lbs./In mi |
| Precipitation: 50-100% chance Accumulation: Up to 1 inch of snow Ambient or Pavement Temp: 25-29 | 2 | Light Salting Operation | 400 lbs./In mi |
| Precipitation: 50-100% chance Accumulation: Up to 2 inches of snow or up to 1/10 inch of ice Ambient or Pavement Temp: 20-24 | 3 | Salting Operation | 475 lbs./In mi |
| Precipitation: 50-100% chance Accumulation: Up to 6 inches of snow or up to ¼ inch of ice Ambient or Pavement Temp: 15-19 | 4 | Salting/Plow Operation | 550 lbs./In mi |
| Precipitation: 50-100% chance Accumulation: More than 6 inches of snow or more than ¼ inch of ice Ambient or Pavement Temp: 10-14 | 5 | Salting/Heavy Plow Operation; All resources are deployed | 625 lbs./In mi |

* Based on Salt Institute Standards **VDOT Single Axle Capacity: 12,000 lbs. ***Pickup Capacity: 3,000 lbs.
**VDOT Tandem Axle Capacity: 28,000 lbs.

6.4 Plowing and Snow Removal

- 6.4.1 Activity Description: The plowing and removal of snow from state highways, bridges, and certain institutional roads. This activity may take place in conjunction with the de-icing involving the application of brine, salt or prewetted salt. See [6.3 Application of Chemicals \(Anti-Icing and De-Icing\)](#).
- 6.4.2 Purpose of Activity: To remove snow and ice from the roadway surface and to provide the levels of services that are consistent with the needs of all segments of the highway system to help ensure the safe mobility of the traveling public.
- 6.4.3 General Guidelines:
- A. Snow plow operators must be trained in proper techniques of plowing various highway types as well as in timing and techniques for spreading chemicals and abrasives. See [6.3 Applications of Chemicals \(Anti-Icing and De-Icing\)](#).
 - B. Ballast: In most cases ballast will be needed over the rear wheels.
 - C. Plowing efforts must be done in a manner recognizing that motorists are also trying to travel; therefore, every operation including tandem or multi-lane plowing must be mindful of motorists.
 - D. Snow should be removed before it is packed by motorists.
 - E. As a general practice, unpaved non-hard surface roadways with less than 2 - 3 inches of snow should not be plowed in order to prevent the damaging of the surface stone and pushing the stone off the roadway and into the ditch.
 - F. Snow and ice should be plowed and abrasives applied in spots to restore travel as soon as practical after the end of snow and ice storms.
 - G. The term "passable condition" indicates that the routes have been plowed and/or sanded.
 - H. Entrances:
 - 1. The removal of snow on private, commercial and public entrances, both on and off the right-of way, is the responsibility of the property owner.
 - 2. Any snow deposited on entrances to hospitals, fire stations and rescue squads during plowing operations should be removed.
 - I. City Streets: In urban areas, the Department is responsible for snow removal within the limited access lines of interchanges.
 - J. Institutional Roads: On roads for which a state agency has requested VDOT snow removal, plowing/pushing will be done of roads only (i.e. not parking lots).

- K. VDOT does not provide snow and ice control services for sidewalks, bike trails, pedestrian crossovers, and private entrances. Care should be given to ensure that snow from the road is not pushed back on sidewalks and not piled up at sidewalk ramps.

6.4.3 Procedure for Plowing:

- A. Plowing should begin after anti-icing or de-icing chemicals have been given a chance to work.
- B. Equipment that will only plow should be placed in action while the storm is underway on roads that are not being treated as Priority 1s.
- C. Plowing should always be performed with the flow of traffic, even on dual lane roads, unless the road is closed to traffic or under adequate traffic control.
- D. Plow type for various snow depths:
 - 1. For accumulation of approximately 2 - 10 inches, a standard plow should be adequate.
 - 2. For snow more than 8 - 10 inches deep, heavier express plows, V-plows or motor grader moldboard plows may be preferable as well as safer.
- E. Multi-lane highways: For diagrams showing recommended patterns for plowing using tandem plows in echelon formations, see [Tandem Plowing Patterns for Multi-Lane Highways](#).
- F. Intersections and urban/suburban features: For diagrams showing proper plowing techniques at intersections as well as features such as driveways, cul-de-sacs and dead ends see [Plowing Diagrams for Residential Streets](#).
- G. Sketches showing recommended patterns for plowing multi-lane highways using tandem plows in echelon formations are shown [in Tandem Plowing Patterns for Multi-Lane Highways](#).
- H. Sketches showing proper plowing techniques at intersections, driveways, cul-de-sacs, dead ends, and other urban features are shown in [Plowing Diagrams for Residential Streets](#).
- I. Bus stops, Sidewalks, and Gore Areas: Avoid creating large piles of snow at known or marked bus stops, sidewalks, or Gore Areas.
- J. Railroad Crossings: When operating snow removal equipment, the blades shall be raised before crossing the railroad tracks and no snow should be removed from the roadway for two feet outside the rails.
- K. Bridges:

1. Abrasives or deicing chemicals should be applied on bridges at the beginning of a storm or whenever unsafe conditions appear imminent. The rate of application should be sufficient to provide a skid-resistant surface and applied as often as necessary to maintain a skid resistant bridge deck.
2. Plowing on bridges and flyover ramps or other similar structures must be done cautiously so that no snow is cast over rails or parapets. Most of the shoulder snow will need to be pushed ahead, off the bridge, or loaded and hauled.
3. Cleaning: As soon as practical after snow season, the bridge should be cleaned of all abrasives and chemicals. During a severe winter season or on extremely long bridges, additional deck cleanings may be necessary.

6.5 Contracting for Hired Equipment or TAMS

- 6.5.1 Activity Description: Contracting for the use of hired equipment or for specified services (TAMS contracts) in snow and ice control operations.
- 6.5.2 Purpose of Activity: The use of either hired equipment or services under a TAMS contract is undertaken in order to facilitate effective snow and ice control and achieve the Department's objective of providing levels of service that are both efficient and attainable within the available resources.
- 6.5.3 General Guidelines:
- A. General Guidelines for Hired Snow and Ice Removal Equipment:
1. There are two ways to procure the use of snow and ice removal equipment.
 - a. The first recommendation is the use of snow and ice removal services through the competitive bidding process or an Invitation for Bid (IFB). Preparation time must be considered for the procurement process. Average time is 30 days after the snow removal document is completed. This may be accomplished by using the following process.
 - i. Create a purpose, description/scope of services, general and special terms and conditions, number of renewals, method of payment and pricing schedule. Include a pre-bid conference if necessary.
 - ii. Enter a requisition in Cardinal and send the request to the Administrative Services Division Procurement Office to procure.
 - iii. Once the IFB process is completed, a contract(s) is awarded to the lowest responsive and responsible bidder(s).

- iv. When a contract is awarded, a Contract Administrator is designated in writing. The Contract Administrator will receive a list of responsibilities that will be agreed to, signed, and returned to the Procurement Office.
- b. The second recommendation is the use of the Snow Removal Equipment Agreement, M-7B form by signing up vendors that may have their own equipment or may be assigned VDOT plows and spreaders.
 - i. The M-7B process must be followed in accordance with the Snow Removal Equipment Agreement and Renewal Procedures. VDOT will use the Snow Removal Equipment Agreement form M-7B, a Cover Letter to be sent to the vendors and the example advertisement for local newspapers.
 - ii. The M-7B is a one year agreement with two, one year renewals if mutually agreed by VDOT and the vendor. No equipment may be added to a current Agreement at renewal time. A new Agreement must be completed. Equipment may be deleted at renewal time if no longer needed or in service.
 - iii. The M-7B form and attachments may not be altered without the approval of the State Maintenance Engineer through the District Maintenance Engineer and must be requested yearly.
 - iv. Equipment not listed on Attachment A, Rate Schedule of the form M-7B may be added.
2. The process for hired snow ice removal equipment should take place following the procedures on the Snow Removal Equipment Agreement and Renewal Process.
- a. Each year the Central Office Maintenance Division will send out pertinent information detailing with any updates to the M-7B, its process and insurance requirements for the contracted period.
 - b. The District must create hourly price rates, mobilization rates, rigging rates, automatic vehicle location (AVL) rates and any other rates needed based on fair market value for the geographic location. The District Maintenance Engineer must approve these rates each year. Pay rates will be negotiated only if prices offered are above the approved hourly rate.
3. Contract Administration: Once an Agreement is signed by VDOT and the Contractor, the District and/or Residency will assigned the Agreement to a Residency or Area Headquarters. The designated Residency or Area Headquarters will be responsible for:

- a. Coordinating day-to-day delivery of the services;
- b. Assuring services are delivered in accordance with the contract price, terms and conditions;
- c. Certifying receipt of services billed were delivered in accordance with the contract terms and conditions;
- d. Promptly report contractor performance problems to the District and/or Residency Designated Coordinator;
- e. Initiating Procurement Complaint form if required;
- f. Completing and submitting periodic evaluations of contractor performance;
- g. Assuring contract terms and conditions are not extended, increased, decreased, or modified in any way without action through the Central Office Maintenance Division;
- h. Coordinating contract “start-up” activities with the Contractor and the appropriate agency personnel;
- i. Recommending solutions to the District/Residency Coordinator and the Central Office Maintenance Division if performance problems or contract issues persist.
- j. Once contracts are signed, arrangements should be made to install snowplows and other safety equipment on the contractor’s equipment.

4. Licensing Requirements for Hired Trucks:

- a. Any hired vehicle hauling any property of the - Department must have a “TH” (Truck-for-Hire) license. *Note: The “TH” license is not required on hired trucks used only for plowing snow.
- b. Property includes snow, sand, or any other substance that is being hauled for the Department.
- c. Property does not mean ballast, which is carried to improve the traction of snow removal trucks.

B. General Guidelines for TAMS Contracts:

- 1. The Procedures in the snow and ice removal for Turnkey Asset Maintenance Services (TAMS) contracts are similar to the IFB or M-7B form process. VDOT controls and directs how snow and ice will be

removed from the roadways. The contractor will provide all equipment requested and meet the written specifications in the TAMS contract.

2. The exception to the above is the Woodrow Wilson Bridge (WWB) TAMS contract which is “a one-stop shopping” where the contractor is responsible for all snow and ice removal activities along the specified routes or corridors of VDOT’s rights-of-way in accordance with the contract specification.
3. TAMS contracts also include management and performance of specified snow and ice activities that apply to incident management and emergency response.
4. During inclement weather, the Contractor shall enter current roadway condition information into VDOT’s VA Traffic System, updating information as necessary.
5. Snow and Ice Control Plan for WWB only:
 - a. Not later than June 1 of each Fiscal Year, the Contractor shall furnish to the Department its “Snow and Ice Control Plan” for the following Fiscal Year, which starts on July 1.
 - i. The Contractor shall demonstrate to the reasonable satisfaction of the Department that it has sufficient resources under contract (including equipment, materials, supplies and personnel) to meet the contract performance requirements for all assets and all snow and ice removal activities for the following Fiscal Year.
 - ii. The Contractor shall provide a detailed work plan presenting the intended response to the snow and ice events per the contract specifications.
6. Contract Administration: Once a contract is awarded, a Contract Administrator is designated in writing. The Contract Administrator will receive a list of responsibilities that will be agreed to, signed, and returned to the Procurement Office.

6.6 Mailbox Replacement

Policy: The following policies apply to mailboxes and/or newspaper boxes; [24VAC30-151-560](#) regulates the placement of mailboxes and newspaper boxes on state owned right of way (See the [Land Use Manual](#) for additional guidance); 1) Mailboxes may be replaced as indicated in the general guidelines section below if damaged by VDOT or VDOT’s contractors; and 2) The shoulder in front of the mail and newspaper boxes should be sufficiently stabilized to permit the carrier to deliver mail or newspapers without leaving their vehicle and to minimize the rutting of the shoulder by the carrier’s vehicle.

6.6.1 Activity Description: Placement, maintenance of shoulder in front of, and

replacement or reimbursement of damaged mailboxes/Newspaper boxes by VDOT.

6.6.2 General Guidelines on Mailbox Damage:

- A. For mailboxes damaged or knocked down during snow operations the following procedure applies (for standard mailboxes only (\$100 or less in value):
 - 1. Citizen calls about a standard mailbox damaged by snow plow.
 - 2. VDOT determines if snow plow caused the damage.
 - 3. If yes, VDOT replaces standard mailbox.
 - 4. If damage caused by contractor, VDOT provides copy of bill, and with contractor's concurrence, adjusts payment amount from HETS accordingly. Contractor signs HETS invoice and reduction amount due to mailbox.
 - 5. Reduced amount keyed into Cardinal and receipt kept with invoice paperwork for documentation.
- B. Mailboxes that are non-standard the process is to submit a claim through the tort claim process per [IIM-SHD-20.02](#).

7. ROADSIDE

Asset Type:

ROADSIDE

Policy: The roadside shall be maintained in a manner so as to ensure the safety of the traveling public, and in support of the following needs; 1) Ensuring that all related highway safety requirements are met, including but not limited to clear zone, sight distance and guardrail deflection angle requirements, and proper and adequate drainage; and 2) Enabling access to, visual inspection of, and protection of roadside assets and other highway infrastructure (e.g. ditches, culverts, stormwater basins, pipes, and under drains) so that other maintenance needs can be identified and planned for; and 3) Ensuring efficient management of vegetation within the right-of-way and providing an aesthetically pleasing roadside; and 4) Certain areas established for pollinator habitat and stormwater pollution reduction credits are restricted to a single mow, to be performed as part of the Final (Dormant Season) Mowing Cycle.

7.1 Mechanical Mowing – Urban and Rural

- 7.1.1 Activity Description: Mechanical and Hand mowing of roadside vegetation within the designated mowing limits of Urban and Rural right-of-way. Mechanical mowing includes tractor mowing with sickle bars, rotary mowers, flail mowers, zero-turn mowers and guardrail mowers. Line trimming and hand mowing performed alongside this activity should be recorded as Hand Mowing.
- 7.1.2 Purpose of Activity: Mowing is performed to maintain safety requirements, enable access, inspection and maintenance of assets and to provide an aesthetically pleasing roadside. Additionally, mowing activities are performed to maintain pollinator habitat and assist with stormwater pollution reduction.
- 7.1.3 General Guidelines:
- A. The safety of the motoring public and VDOT personnel and contractors shall at all times supersede other standard mowing practices or operations.
 - B. Where mowing is required, the vegetation on medians, interchanges, and roadside areas shall be mowed as frequently as necessary to maintain the mowing height range for each VDOT district region as specified in Table: “Additional Mowing Practices Guidelines”, below.
 - C. For detailed diagrams of mowing areas for medians and roadsides see [Mowing Typical Sections for Outside Shoulders and Medians](#). Refer also to [Intersection Site Distances](#) for site guidance regarding intersection sight distances for different roadway types.
 - D. The vegetation around signs, guardrails, delineators, mailboxes, bridges, and intersections should be maintained to the same standard as the roadside on

which they are located. Hand mowing is to be done to provide safe sight distance, and in advance of tractor crews around fixed objects. Use Line Trimmer in areas inaccessible to a hand mower.

7.1.4 Procedure to Conduct Maintenance Activity:

- A. Participate in pre-work safety discussion as applicable prior to leaving area headquarters.
- B. Service equipment; grease, sharpen blades, etc.
- C. Adjust mower to the specified cutting height (modification to equipment may be needed to ensure correct height).
- D. Check that required equipment has been loaded prior to leaving area headquarters.
- E. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- F. Ensure that litter has been picked up prior to starting this activity.
- G. Mow only those areas within the designated mowing limits.
- H. Operate mowers in a safe manner.
- I. Use mowers to greatest efficiency.
- J. Larger mowers – wide open spaces – keep swaths long and straight.
- K. Flail and rotary mowers – major areas of right-of-way – keep maneuvering to a minimum.
- L. Sickle bars – where other mowers cannot reach or move efficiently.
- M. Hand mowers - may be required in areas not accessible to sickle bar, flail, and larger type mowers.
- N. Recover traffic control devices.

7.1.5 Additional Guidelines:

- A. Safety: To ensure clear zones and sight distance requirements (safety) of the motoring public, VDOT personnel, and contractors, these mowing practices may be superseded at the direction of the District Maintenance Engineer (in consultation with the District Roadside Manager). *Note: [Intersection site distance diagrams](#) are referenced above in the General Guidelines are provided as general guidance only. Field conditions and right-of-way limitations shall dictate the site distance maintenance requirements.

- B. Plant Growth Regulators (PGRs) usage may be considered on all areas of appropriate turf type vegetation as a means of reducing the number of mowing cycles and/or extending mowing cycle frequencies.
- C. Litter removal: Litter shall be removed prior to mowing operations and immediately thereafter (where litter remains). Where mowing activities can be reduced successfully, without compromising the stipulated business needs, litter removal activities may need to be increased. In Rural areas, workers must face traffic when performing operations such as line trimming and litter removal.
- D. Mowing Height Range: Mowing at a height less than the requirements above is neither desired nor permitted and may damage or kill the desirable turf species. Areas that are mowed to a height less than these requirements (or “scalped”) can create denuded areas and/or promote excessive weed growth, and shall be re-vegetated in accordance with the Road and Bridge Specifications. See Table: Additional Mowing Practices and Guidelines, below.
- E. Mowing Equipment: Blade sharpness is the most critical element to all mowing activities. Sharpness of mower blades should be visually verified prior to commencement of any mowing operation. Rough cuts due to dull blades will result in increased plant disease, increased mower energy costs, and poorly groomed turf. See Table: Additional Mowing Practices and Guidelines, below.
- F. Predominant roadside turf species reflect regional growth assessments and may include a mix of originally planted mixes, native grasses, native wildflowers, invasive plants, noxious weeds, and woody vegetation. Suggested mowing practices are based on these assessments and categorized into cool-season, warm-season, and no-mow plant species (leguminous or wildflowers). See Table: Additional Mowing Practices and Guidelines, below.
- G. Monarch CCAA: Specific interstate areas have been identified by the Districts for the purpose of meeting Monarch CCAA adopted acreages. Following the Final (Dormant Season) Mowing Cycle dates in the Table on these adopted acreages will allow VDOT to meet Monarch CCAA conservation goals.

Table: Additional Mowing Practices and Guidelines

| District | Mowing Height Range (inches) | Primary Roadside Turf Species | Mowing Cycle Timing | | | |
|----------------------------|------------------------------|-------------------------------|---------------------------------------|----------|---------------------------------------|--------------------------------------------------------|
| | | | Clear Zone (Partial Mow) ¹ | | | Entire ROW (Full Mow) ² |
| | | | First Mowing Cycle ³ | | Additional Mowing Cycles ⁴ | Final (Dormant Season) Mowing Cycle ^{5, 6, 7} |
| | | | Not before | Prior to | | |
| Bristol, Staunton | 4-6 | Cool | May 10 | June 10 | As needed | Oct 15 to March 1 |
| Salem, Lynchburg, Culpeper | 4-6 | Cool | May 5 | June 5 | As needed | Oct 15 to March 1 |
| Richmond | 4-6 | Cool | May 1 | June 1 | As needed | Nov 1 to March 1 |
| | 2-4 | Warm | May 25 | --- | As needed | Nov 1 to March 1 |
| Hampton Roads | 4-6 | Cool | April 20 | May 20 | As needed | Nov 1 to March 1 |
| | 2-4 | Warm | May 10 | --- | As needed | Nov 1 to March 1 |
| Fredericksburg | 4-6 | Cool | May 5 | June 5 | As needed | Nov 1 to March 1 |
| | 2-4 | Warm | June 5 | --- | As needed | Nov 1 to March 1 |
| Northern Virginia | 4-6 | Cool | May 5 | June 5 | As needed | Nov 1 to March 1 |
| | 2-4 | Warm | June 5 | --- | As needed | Nov 1 to March 1 |

7.1.6 Table Notes:

A. Turf Management Areas: Mowing shall be performed in accordance with the parameters established in [Mowing Typical Sections](#) as referenced above in the General Guidelines.

1. Clear Zone (or Partial Mow) mowing to be performed for only a portion of the ROW, shown as Areas A – C on the [Mowing Typical Sections](#);
 - a. Median (50 feet wide and less) – fill and cut areas
 - i. 3:1 slope or flatter with a vertical drop/height less than 7.5 feet, mow the entire median
 - ii. Greater than 3:1 slope with a vertical drop/height greater than 7.5 feet, mow from the edge of pavement to 5 feet behind the guardrail (in fill areas) or ditch (in cut areas)
 - b. Median (Greater than 50 feet wide) – fill and cut areas
 - i. 3:1 slope or flatter with a vertical drop/height less than 7.5 feet, mow 18 feet from the edge of pavement
 - ii. Greater than 3:1 slope with a vertical drop/height greater than 7.5 feet, mow from the edge of pavement to 5 feet behind the guardrail (in fill areas) or ditch (in cut areas)

c. Outside Shoulders

- i. 3:1 slope or flatter, mow 18 feet from edge of pavement or 5 feet beyond the ditch line
- ii. Greater than 3:1 slope, mow from edge of pavement to 5 feet behind guardrail

Local demands of urbanized and suburbanized areas, including especially the increased expectations for mowed turf aesthetics, or other reasons as determined by District Maintenance Engineer (DME), in consultation with the District Roadside Manager (DRM), may increase the extent of mowing practices to include a full mow of the entire ROW (during the non-dormant season). Such direction should be accompanied by justifying documentation in order to support the increased expenditures in mowing operations.

2. Entire Right of Way (ROW) (or Full Mow) includes all Turf Management Areas, Areas A – D, per-the Mowing Typical Sections

- a. Additional Mow Areas: (Shown as Area D on Mowing Typical Sections) – the areas outside of the Clear Zone or Partial Mow area, including but not limited to medians, slopes and interchange infield areas.

3. First mowing cycle: Strict adherence to the timing of the first mowing is essential to a cost effective roadside turf management program. The first mowing during this time frame enables plants to be cut during the reproductive stage in which seeds are produced, thereby enabling an over seeding program as a component of the first mowing. This mowing enables seed to spread in areas that promote an increase the density of desirable turf species, choking out undesirable weed species.

There will be no exceptions to the timing of the first mowing cycle in any District unless first approved by their respective DME in consultation with their DRM. The DME can approve an early start to the first mowing cycle. The DME and DMR may also recommend adjustments to the schedule of application of pesticides and/or PGRs.

- a. Grass Maturity: In fall and winter the short days with cold temperatures start the formation of buds in cool weather turf grass that can form stems with seed heads. These stems will die AFTER seed head maturity OR if mowed BELOW the newly forming seed heads. Mowing before seed head maturity, but after the seed heads have formed will result in an increase in density, shorter, more groomed appearance of the turf grass. This is done with the first spring mowing when grass has reached the optimal height of 4 to 6 inches. The optimal cut of 4 to 6 inches is based on the minimum height to maintain a healthy root system.

4. Additional Mowing Cycles: Conduct these mowing cycles to meet the minimum business requirements as described elsewhere in these Guidelines. Local demands of urbanized and suburbanized areas, including especially the increased expectations for mowed turf aesthetics, or other reasons as determined by DME in consultation with the DRM may increase the frequency and extent of mowing practices. Such direction should be accompanied by justifying documentation in order to support the increased expenditures in mowing operations.
 - a. Seasonal deviations: Extended growing seasons (wet warm years) may dictate the need for additional cycles. Likewise, dry seasons may enable the elimination of additional mowing cycles.
5. Final (Dormant Season) Mowing Cycle: Includes the *Entire ROW* (Clear Zone Areas A–C as well as *Additional Mow Areas*, Area D), and is the final mowing cycle of the year.
 - a. The *Additional Mow Area* (Area D in Typical Mowing Sections) requires mowing in order to control non-desirable species and/or woody vegetation. Mowing more often than once a year should not be permitted in order for these areas to serve as co-located pollinator habitat and stormwater pollution reduction credits. Depending on various factors such as seasonal deviations and plant species, these areas may not require annual mowing but should be mowed at least once per every three years.
 - b. A full mow should not be performed except during the dormant season as noted in Table: Additional Mowing Practices and Guidelines. The period of which is stated in Table E and varies by District.
 - c. Delaying this final mowing cycle (or full mow) until the dormant season is critical for these areas to serve as pollinator habitat. Mowing during the growing season and not waiting until the dormant season can be detrimental to pollinators by causing the mortality to pollinator species during critical migration and/or reproductive cycles during mowing operations. VDOT is required, to be in adherence with the requirements of their partnership with the Monarch Candidate Conservation Agreement with Assurances (CCAA), to conserve a certain amount of pollinator habitat.
6. Strict adherence to Final (Dormant Mow) Mowing Cycle dates should be met. Mowing earlier than this date should only proceed if approved by the DME in consultation with the DRM.
7. Non-mowable areas: Slopes greater than 3:1 should not be mowed unless for sight distance concerns or to control non-desirable species and/or woody vegetation and should not be mowed until the dormant season and treated the same as the Additional Mow areas.

8. Pollinator Habitat Program - Every effort should be made to preserve native pollinator plant species. If there are large areas of pollinator species within the parameters of mowable areas, and there are no safety issues, then consideration should be given to mow such areas between November 1st and March 31st only. Please contact the State Roadside Manager or District Roadside Manager for guidance regarding the pollinator habitat program.

| Location | Type of Staffing | Suggested Equipment | Materials |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rural | <ul style="list-style-type: none"> 3 Operators | For two-lane low volume routes: <ul style="list-style-type: none"> 3 Tractor Mowers 1 Truck (Pickup/Crew Cab/Dump Truck) | <ul style="list-style-type: none"> Appropriate Personal Protective Equipment (PPE) |
| | <u>Include as required:</u> <ul style="list-style-type: none"> 4 Operators 2 Flaggers | <u>For all other routes:</u> <ul style="list-style-type: none"> 3 Tractor Mowers 1 Batwing Mower 2 Trucks 1 or more Truck-Mounted Attenuator (TMA) 1 Arrow | <u>Small tools:</u> <ul style="list-style-type: none"> Line Trimmer <i>Hand Mowing:</i> Small tools: <ul style="list-style-type: none"> Brush Cutters (quantity will vary) Line Trimmer Hand Mower |
| Urban | <ul style="list-style-type: none"> 2 Operators | <ul style="list-style-type: none"> 1 Crew Cab with Trailer 1 Zero Turn Mower 1 Tractor Mower | <ul style="list-style-type: none"> Appropriate Personal Protective Equipment (PPE) |
| | <u>Include as required:</u> <ul style="list-style-type: none"> 1 Operator <i>For Hand Mowing:</i> <ul style="list-style-type: none"> 2 Operators 8 Offenders | <u>Include as required:</u> <ul style="list-style-type: none"> 1 Rear Mower Hand Mower <i>For Hand Mowing:</i> <ul style="list-style-type: none"> 1 Pickup Truck 1 Offender Transport Vehicle | <u>Small tools:</u> <ul style="list-style-type: none"> Line Trimmer <i>For Hand Mowing:</i> Small tools: <ul style="list-style-type: none"> Brush Cutters (quantity will vary) Line Trimmer Hand Mower |

***Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Options to manage woody vegetation include the use of selective herbicides, selective removal with hand tools, and machine removal. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.**

7.2 Removal of Trees

- 7.2.1 Activity Description: The removal of trees causing an obstruction (visual or physical) or traffic hazard or which limit sight distance or impede drainage.
- 7.2.2 Purpose of Activity: To preserve the natural beauty of our roadsides while effectively addressing maintenance and safety issues, including the protection of roadside assets such as drainage structures.
- 7.2.3 General Guidelines:
- A. Trees in one or more of the following conditions may be removed from the right-of-way (with appropriate authorization) for the purposes of safety, slope reclamation, or maintenance:
 - 1. Those that are dead, in an advanced stage of decline, or are significantly damaged.
 - 2. Those that are affected by pest infestation and are a significant threat to surrounding healthy trees.
 - 3. Those located above the ditch line or beyond the break of a fill slope.
 - 4. Those that create an unacceptable risk/safety hazard to the motoring public such as blocking sight distance, situated within the clear zone, obscuring signs, or leaning toward the roadway in such a manner that could cause the tree to fall into the roadway or damage an existing asset.
 - 5. Those species which are invasive or non-native such as Ailanthus (Tree of Heaven).
 - 6. Those blocking potential scenic vistas.
 - 7. Those that will negatively impact assets including, but not limited to, right of way fences, concrete or paved ditches, headwalls, wing walls, bridge abutments, and curbs and sidewalks.
 - B. Refer trees near utility lines to the utility owner per 16 VAC 25-73 (Tree Trimming Operations).
 - C. Dogwood trees shall not be removed unless approved by the District Roadside Manager.
 - D. Trees of Special Interest Trees designated by local, state, or federal government to be of “Historical, environmental, or social importance” shall not be removed unless approved by the District Roadside Manager.
 - E. All cut vegetation shall be chipped, beneficially used, or immediately removed and disposed of in accordance with the Solid Waste Management Regulations

(9 VAC 20-80-10 et seq.) of the Virginia Waste Management Board.
Exceptions:

1. Wood can remain on the right of way outside of the clear zone for no longer than seven days. Wood should be cut into lengths that can easily be handled by one individual.
 2. Vegetation may be left on a fill slope, as authorized by the District Roadside Manager.
- F. The use of climbing irons or spurs is positively forbidden in any tree not being removed unless they are to be used to rescue a climber.
- G. For additional information and for definitions of technical terms, refer to the Tree and Brush Trimming Policy.

7.2.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment has been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. Proceed with work in a safe, efficient manner. See safety manual for chainsaws.
- D. When removing trees, cut as low as possible to the ground (approx. 3 inches max.) with face parallel to the surrounding grade.
- E. When removing live trees, the stumps may be sprayed with an approved herbicide combination to prevent future sprouting as needed.
- F. Remove or dispose of all brush, laps, stumps, logs, etc., as the work progresses for safety and appearance. In no case should the material removed be disposed of on private property without the consent of the property owner.
- G. Recover traffic control devices.

7.2.5 Additional Guidelines and Procedures for Performing Work on Private Property:

- A. Guidelines:
 1. Trees and shrubs located on private property adjacent to the right-of-way that pose an unacceptable safety risk to the traveling public may be pruned or removed with the property owner's written permission. The processes below shall be used.
 2. Determine if pruning can be performed in compliance with current ANSI A300 Standards without entering onto private property. If this cannot be accomplished:

- a. Contact the property owner(s) to request that he/she perform the desired work.
- b. If the property owner(s) is not willing to perform the desired work, written permission must be requested from the property owner(s) for VDOT to enter and perform any required work.

B. Procedures:

1. Send a letter to the property owner(s) notifying him/her of the potential hazard and request permission to perform the work at state expense. Include a copy of the Right-of-Entry Agreement (to be signed by both the property owner(s) and a VDOT representative prior to entry upon the property).
 - a. Should a property owner(s) refuse VDOT entry to the property, the district shall notify the State Asset Management Director. In those situations when the property owner will not authorize access to the property, pruning will not extend beyond VDOT property and, therefore, may not be in accordance with current ANSI A300 Standards.
 - b. After the work is completed, document the comment section regarding completion of the work and attach pre- and post-work photographs of the site.
 - c. The State Asset Management Director shall approve revisions to this procedure.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 3 Operators • 2 Flaggers | <ul style="list-style-type: none"> • 1 Dump Truck (include more as required) • 1 Pickup Truck • 1 Limb/Brush Chipper | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 2 Operators • 1 Operator | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Tractor with Approved Boom • 1 Mowing Attachment • 1 Bucket Truck • 1 TMA Truck | <u>Small tools:</u> <ul style="list-style-type: none"> • Chain Saw • Brush Axe • Pole Saw • Rake • Broom |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

7.3 Tree and Shrubs: Trimming and Pruning

- 7.3.1 Activity Description: Tree trimming where tree growth may interfere with traffic sight distance, traffic signs, or signals.
- 7.3.2 Purpose of Activity: To preserve the natural beauty of our roadsides while effectively addressing maintenance and safety issues, including the protection of roadside assets such as drainage structures.
- 7.3.3 General Guidelines:
- A. The current version of the following publications shall govern vegetative pruning:
 - 1. American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practice (ANSI A300)
 - 2. American National Standard for Tree Care Operations – Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements (ANSI Z133.1)
 - 3. International Society of Arboriculture (ISA), Tree-Pruning Guidelines
 - B. A boom-axe shall not be used to prune trees or shrubs. Mechanical trimming will not be used:
 - 1. On Virginia byways, scenic highways or on roads with major tourist attractions.
 - 2. If opposed by the public or property owners.
 - C. Mechanical trimming may be authorized and designated by the District Roadside Manager on selected rural secondary routes while meeting the following criteria:
 - 1. On roads with low to moderate traffic counts relative to system averages.
 - 2. The height of cuts will not exceed 20 feet.
 - 3. Manual trimming to achieve ANSI 300 Standards shall be conducted within seven work days of mechanical trimming.
 - D. No more than 25% of a tree's foliage shall be removed during any one growing season. In any pruning operation, the natural form of the tree should be maintained when possible.
 - E. Trees designated to be of historical, environmental, or social importance shall not be pruned unless approved by the District Roadside Manager.

- F. The use of climbing irons or spurs is positively forbidden in any tree not being removed unless they are to be used to rescue a climber.
- G. All low, overhanging limbs which interfere with traffic or restrict sight distance shall be removed. No branches are to overhang the roadway below 20 feet and no live branches are to be cut above 20 feet unless it is necessary to provide adequate sight distance, roadway clearance, and/or minimize known cold spots.
- H. Removal may be an alternative. Dead wooding and crown cleaning is an accepted pruning practice. Limited crown rising of trees may be allowed, as authorized by the District Roadside Manager.
- I. All cut vegetation shall be chipped, beneficially used, or immediately removed and disposed of in accordance with the Solid Waste Management Regulations (9 VAC 20-80-10 et seq.) of the Virginia Waste Management Board.
Exceptions:
 - 1. Wood can remain on the right of way outside of the clear zone for no longer than seven days.
 - 2. Vegetation may be left on a fill slope, as authorized by the District Roadside Manager.
- J. For additional information and for definitions of technical terms, refer to the Tree and Brush Trimming Policy.

7.3.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment has been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. Proceed with work in a safe, efficient manner. See safety manual for chainsaws.
- D. Clean cuts shall be made at all times. Branches should be cut close to the tree trunk or parent limb without cutting into the branch collar or leaving a stub. Cuts should not be made flush with the trunk and should not injure the branch collar.
- E. Larger branches must be pre-cut to prevent splitting or peeling the bark. The three-cut method will be used. The resulting stub shall be cut to the branch collar.
- F. When removing brush, cut flush with the ground where possible and treat stumps as necessary.

- G. Remove or dispose of all brush as the work progresses for safety and appearance. In no case should the material removed be disposed of on private property without the consent of the property owner.
- H. Dispose of chips on the right-of-way (but not on mowed turf), if there is sufficient room.
- I. If there is not sufficient room for disposal on the right-of-way, haul chips to a designated disposal area in accordance with the DEQ Policy Manual and 9 VAC 20-80-10 (Virginia Solid Waste Management Regulations).
- J. Recover traffic control devices.

| Type of Staffing | Suggested Equipment | Materials |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 3 Operators • 2 Flaggers | <ul style="list-style-type: none"> • 1 Dump Truck • 1 Pickup Truck • 1 Limb/Brush Chipper | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) |
| <u>Include as required:</u> <ul style="list-style-type: none"> • 6-8 Offenders • 2 Operators • 1 Operator | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Offender Transport Vehicle • 1 Tractor with Approved Boom • 1 Mowing Attachment • 1 TMA Truck | <u>Small tools:</u> <ul style="list-style-type: none"> • Chain Saw • Brush Axe • Pole Saw • Rake • Broom |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

7.4 Brush Cutting

- 7.4.1 Activity Description: The cutting and removal of brush where vegetative growth may interfere with traffic sight distance, traffic signs, or signals.
- 7.4.2 Purpose of Activity: To preserve the natural beauty of our roadsides while effectively addressing maintenance and safety issues, including the protection of roadside assets such as drainage structures.
- 7.4.3 General Guidelines:
 - A. All undesirable brush shall be kept cut within a minimum distance of 20 feet from the edge of pavements on areas not accessible to mowing equipment.
 - B. Vegetation, such as pines, that are located between approximately 6 feet and 20 feet of the roadway shall be topped rather than cut.

- C. Desirable flowering shrubs, trees or any other vegetation as may be designated by the Environmental Quality Division that are located between approximately 6 feet of the roadway and the far edge of the right-of-way shall not be cut.
- D. The area between ditch lines shall be kept clear of all protruding brush which interferes with traffic or restricts adequate sight distance.
- E. At all bridges, curves, intersections, and signs the brush and trees shall be cut or trimmed where possible to provide adequate sight distance for traffic safety.
- F. For additional information and for definitions of technical terms, refer to Tree and Brush Trimming Policy.

7.4.4 Procedure to Conduct Maintenance Activity:

- A. Check that required equipment has been loaded prior to leaving area headquarters.
- B. Place traffic control devices in accordance with current [Virginia Work Area Protection Manual](#).
- C. Proceed with work in a safe, efficient manner.
- D. When removing brush, cut flush with the ground where possible and treat stumps as necessary.
- E. Mow from edge of pavement to top of fill slope.
- F. Mow from edge of pavement to ditch line.
- G. Mow once per year in early fall if area is accessible and if mowing is required. Do not mow slopes steeper than 4:1 and 5 feet in height in this area.
- H. Keep brush cut within a minimum distance of 20 feet from the edge of pavement on areas not accessible to mowing equipment.
- I. Recover traffic control devices.

| <u>Type of Staffing</u> | <u>Suggested Equipment</u> | <u>Materials</u> |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 2 Operators | <ul style="list-style-type: none"> • 1 Pickup Truck | <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE) |
| | <u>Include as required:</u> <ul style="list-style-type: none"> • 1 Limb/Brush Chipper | <u>Small tools:</u> <ul style="list-style-type: none"> • Brush Cutters (quantity will vary) <u>Include as required:</u> <ul style="list-style-type: none"> • Line Trimmer |

****Note: Staffing, equipment, and materials are based on general guidelines. Terrain, vegetation and other factors may create a need for modification to the information above. Appropriate VDOT staff is expected to make logical informed decisions on the needs of the maintenance activity being performed.***

7.5 Pesticide Management Program

- 7.5.1 Activity Description: To control pests utilizing an integrated pest management (IPM) program in order to maintain a safe, efficient, and effective transportation system that protects the transportation investment. The VDOT Pesticide Guidance Document provides detailed information and is available by clicking [here](#).
- 7.5.2 Purpose of Activity: The use of chemicals for the control of vegetation and insects is a vital element in maintaining a safe, efficient, economical, and effective transportation system.
- 7.5.3 General Guidelines: The VDOT Pesticide Guidance Document provides additional and detailed information and is available by clicking [here](#).

7.6 Illegal Signs on the Right of Way

- 7.6.1 Procedures:
- A. Removing illegal signs in the right of way
1. Non-permitted signs within the right of way are illegal and considered a public and private nuisance.
 2. When a sign is found within the right of way it may be removed without giving written notice to the sign owner.
 3. Signs that pose a safety hazard shall be removed immediately.
 4. The right of way should be verified prior to sign removal.

5. If a sign owner becomes confrontational with a VDOT employee, the State Police or local law enforcement should be contacted.
 6. Storage of the signs is not required under the statute but may be permitted by the Resident Engineer/Residency Administrator for up to 30 days.
- B. Sign Removal Prioritization
1. First Priority: signs that pose or contribute to a safety hazard
 2. Second Priority: signs that obstruct mowing operations or other VDOT work
 3. Third Priority: signs in areas where complaints have been received
 4. Fourth Priority: other signs
- C. Political campaign signs
1. A letter shall be sent to all political campaigns informing candidates of §33.2-1224 of the Code of Virginia. The Office of Land Use in Central Office will be responsible for notifying national, gubernatorial and senatorial election campaigns. The district will notify all congressional, state, and local election campaigns (Attachment A).
 2. Political candidates' mailing addresses should be obtained from the Virginia Board of Elections website.
<https://www.elections.virginia.gov/casting-a-ballot/candidate-list/>
 3. Campaign signs are subject to removal if they are in the right of way. If a campaign sign is removed, all illegal signs along that route within the right of way shall also be removed.
- D. Levying Civil Penalty for signs on the right of way
1. The decision on whether to levy fines shall be up to the resident engineer/residency administrator. When levying fines, the process must be applied consistently.
 2. When a sign is identified, it shall be photographed on the right of way. The photo should include date and time stamp to show evidence of a violation. The person removing the sign shall document the location from which the sign was removed. Each sign on the right of way is a separate \$100 civil penalty.
 3. Once a sign is removed, it should be photographed in VDOT possession. Multiple signs for the same business should be included in one photo. The photo should include date & time stamp for billing purposes.

4. A fiscal form (Attachment B) shall be completed to include locations of sign violations, the number of signs removed, and the advertiser and mailing address. If a person is caught placing signs on the right of way, their contact information should be obtained along with their license plate number. This information should be included on the fiscal form as they will be billed for the civil penalty. If no one is observed placing the sign on the right of way, the advertiser is billed for the civil penalty.
5. The fiscal form should be signed by the employee removing the signs and shall be signed by the Residency Administrator or designee. The fiscal form shall then be sent to the District Fiscal Section along with all photo documentation.
6. Fiscal will generate a bill and send a letter informing the party of the civil penalty.
7. All penalties collected shall be paid to the Highway Maintenance and Operating Fund.
8. The removed signs should be destroyed after sending all documentation to Fiscal Division.
9. No civil penalty shall be assessed for signs removed by Adopt-A-Highway participants.
10. No civil penalty shall be assessed for signs removed by mowing contractors preparing for mowing operations.
11. Local governments may remove illegal signs and levy civil penalties only after securing an agreement from the Commissioner to act as an agent of VDOT for enforcing the provisions of §33.2-1224 of the Code of Virginia.
12. The district may track personnel and equipment costs incurred during sign collection; however, such costs should only be billed for repeat violators. Collection costs are difficult to assign when multiple violators' signs are being removed.
13. A person, firm, or corporation may appeal to the District Administrator for VDOT-levied civil penalties and/or collection costs. The appellant must provide evidence that they were improperly assessed the civil penalty or the collection costs were improperly calculated. Stating they were not aware of the law is not sufficient grounds to reverse the civil penalty.

E. Agreements with Local Governments

1. Local governments may enter into agreements with the Commissioner to enforce the provisions of §33.2-1224 of the Code of Virginia.

2. The local government shall pass a resolution requesting the authority to enforce §33.2-1224 of the Code of Virginia.
3. The Office of Land Use in Central Office has an approved draft agreement (Attachment C) that shall be used.
4. The locality-executed agreement shall be sent to the Office of Land Use in Central Office for VDOT execution. The Office of Land Use shall return the fully executed original agreement to the residency, which shall then forward it to the local government.
5. Upon final execution, this agreement will allow the local government to act as an agent for the Commissioner in removing signs within the right of way, including the ability to levy penalties.

F. Adopt-a-Highway groups

1. Local Adopt-a-Highway groups may be authorized to remove signs on the rights-of-way as part of their cleanup efforts.
2. The adopting group cannot single out signs for removal. They must clean up all trash along their adopted route. Singling out specific signs may result in the Commissioner rescinding authorization to remove illegal signs or expulsion from the Adopt-a-Highway program.
3. The Commissioner, through Maintenance Division, will provide the adopting group with a letter authorizing them to remove signs as part of their Adopt-a-Highway work (Attachment D).

(Attachment A – Letter for Congressional, State, and Local Election Campaigns)

Date

Re: Election Signs within State Right of Way

Dear

With the November elections nearing, VDOT is contacting all political campaigns to specifically ask for your help in making sure that campaign signs are not placed within state right of way. Section 33.2-1224 of the Code of Virginia prohibits placing signs on state right of way, including campaign signs. As a general guide, the right of way is typically the entire roadway, including sidewalks, medians, ditches and the area between utility lines or fences lining the outside edges of state roads.

Signs placed in median strips are of particular concern. Not only is it a safety hazard for campaign workers to place and remove these signs adjacent to fast-moving traffic, the signs can be a distraction for drivers and often impede their sight distance. Please know that VDOT workers are instructed to remove illegal signs from the right of way, and VDOT is a strong advocate for their safety as well. In addition, removal costs come directly out of VDOT maintenance funds, reducing resources available for taking care of a wide variety of other highway and transportation infrastructure needs.

We recognize that your campaign efforts may have been ongoing. Consequently, if you have been previously contacted by others at VDOT, please accept this message as a reminder of the importance of those earlier requests to help us keep the right of way clear of signs. If you have assisted with that effort, I thank you for your kind cooperation in that regard.

Thank you and please let me know if you have any questions regarding this request.

Sincerely,

(Attachment B – Illegal Signs Civil Penalty Fiscal Form)

Date sign(s) removed: _____

Number of signs removed for this company: _____

Route _____ County _____

Total civil penalties being levied _____

Company/ Owner _____

Address _____

City _____ State _____ Zip _____

Telephone number _____

Comments _____

Name of person removing sign(s) _____

Signature of person removing sign(s) _____

Date _____

Residency Administrators signature _____

Date _____

Attach photos of the signs in the right of way prior to removal, with the total number of signs removed in one photo.

(Attachment C Agreement)

**AGREEMENT BETWEEN
THE VIRGINIA DEPARTMENT OF TRANSPORTATION
AND
THE BOARD OF SUPERVISORS
OF
_____ COUNTY, VIRGINIA
FOR ENFORCEMENT OF LAWS REGARDING ILLEGAL SIGNS AND ADVERTISING WITHIN THE LIMITS OF THE
HIGHWAY**

THIS AGREEMENT is made this ____ day of _____, 20 __, between the Commissioner of Highways of the Commonwealth of Virginia (Commissioner), and the County of _____, Virginia, acting by and through its Board of Supervisors (Board).

WITNESSETH:

WHEREAS, pursuant to Title 33.2, Chapter 12, Article 1 of the *Code of Virginia* (1950), as amended (*Code*), the Commissioner, as the chief executive officer of the Virginia Department of Transportation (VDOT), enforces the prohibition on the placement of signs and advertising within the limits of highways in the Commonwealth; and

WHEREAS, the Board, as the governing body of _____ County, has an interest in protecting the public health, safety, and welfare, and in protecting the appearance of the County, in general; and

WHEREAS, the Board has found that the proliferation of signs and advertising in the rights-of-way of highways in _____ County threatens the public safety and the welfare of the County, and has a negative effect on the appearance of highways; and

WHEREAS, by an appropriate resolution adopted by the Board at its meeting on _____, and attached hereto as Exhibit A, the Board expressed its desire and agreement to enter into an agreement with the Commissioner to enforce the provisions of § 33.2-1224 of the *Code of Virginia* (1950), as amended, and to collect the penalties and costs provided therein and has authorized execution of said agreement by a County representative; and

WHEREAS, the Commissioner desires the Board's assistance in removing signs and advertising from the VDOT-maintained highways in _____ County.

NOW, THEREFORE, for and in consideration of the mutual benefits to be derived from this Agreement, the parties hereto agree as follows:

1. The Commissioner hereby authorizes the Board to act as the Commissioner's agent for the purposes of removing any signs or advertising located within the VDOT-maintained rights-of-way, in violation of §33.2-1224 of the *Code*; and
2. The Commissioner further authorizes the Board to act as the Commissioner's agent for the purposes of collecting the penalties and costs from the person, firm, or corporation responsible for signs or advertising located within the VDOT-maintained rights-of-way in violation of and as provided for in §33.2-1224 of the *Code*; and

3. The Board may authorize local law-enforcement agencies or other local governmental entities (“hereinafter designee(s)”) to act as agents of the Commissioner for the purpose of fulfilling the terms of this Agreement; and
4. The Board shall be entitled to retain, in full, all sums lawfully collected by the Board or its designees as penalties and costs for removal of signs and advertising and enforcement of §33.2-1224 pursuant to this Agreement; and
5. The Board, or its designee, when collecting the penalties and costs referenced in Paragraph 2, above, shall:
 - a. Issue an invoice to the person, firm, or corporation being advertised for collection of any and all penalties and costs, as provided in §33.2-1224 of the *Code*, which shall provide that within thirty (30) days, Thirty-three (33) days if the invoice is sent by mail, the person, firm, or corporation being advertised shall either (a) remit payment of the invoice to the Board, or its designee, or (b) notify the Board or its designee in writing that the matter and/or the penalties and costs are disputed.
 - b. In the event that a person, firm or corporation disputes the matter and/or penalties and costs provided in such invoice, the Board shall be responsible for resolving the dispute in accord with all applicable laws.
6. The Board shall require local government employees and others who are authorized to act or perform services pursuant to this agreement to comply with the provisions of this Agreement and all applicable laws; and
7. This Agreement shall remain in full force and effect unless sooner terminated upon thirty (30) days’ written notice by either party to the other party; and
8. This Agreement may be amended at any time by the written agreement of the parties.

In WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives:

VIRGINIA DEPARTMENT OF TRANSPORTATION

_____ COUNTY, VIRGINIA

BY: _____
Commissioner’s Name
 Commissioner of Highways or his designee

BY: _____
 Printed Name: _____
 County Administrator of _____

(Attachment D - Adopt a Highway Popsicle Signs Removal)

Date

To Whom It May Concern:

The Virginia Department of Transportation (VDOT) operates the Adopt-a-Highway Program and wholeheartedly supports its volunteers in conducting their litter pickups. By law, and as a matter of VDOT policy, the Adopt-a-Highway volunteers are authorized to clear the highway right-of-way of all prohibited signage, including what are commonly known as "Popsicle Signs."

Section 33.2-1224 of the *Highway Laws of Virginia* states, in part, that, "Advertisements placed within the limits of the highway are hereby declared a public and private nuisance and may be forthwith removed, obliterated, or abated by the Commonwealth Transportation Commissioner or his representatives without notice."

Adopt-a-Highway volunteers who remove such advertisements are acting as Commonwealth Transportation Commissioner's representatives, and as such receive the Department's full support. Any disputes or questions about this policy should be referred to VDOT personnel. You can contact the statewide Adopt-a-Highway coordinator by calling 1-800-PRIDE-VA (1-800-774-3382).

Sincerely,

Commissioner's Name
Commonwealth Transportation Commissioner

7.7 Roadway Animal Carcass Composting

- 7.7.1 Activity Description: Virginia typically has more than 56,000 deer-vehicle collisions on its roadways each year. VDOT's predominant means of managing these and other animal roadway carcasses includes using disposal facilities and, where possible, burying or setting aside individual carcasses within the right of way. The [Roadway Animal Carcass Composting Guidelines](#) were developed to provide additional tools for the disposal of animal roadway carcasses.
- 7.7.2 Purpose of Activity: Removal of large animal carcasses from VDOT maintained roadways.
- 7.7.3 General Guidelines and Procedures: VDOT and the Virginia Department of Environmental Quality (DEQ) signed a Memorandum of Understanding to govern the conditions under which VDOT may perform composting of animal carcasses. The provisions in the memorandum were developed to ensure that composting is protective of human health and the environment. The Roadway Animal Carcass Composting Guidelines for the Virginia Department of Transportation may be found by clicking the following hyperlink: [Roadway Animal Carcass Composting Guidelines](#)

8. ENVIRONMENTAL STEWARDSHIP PROGRAMS

Asset Type: ENVIRONMENTAL STEWARDSHIP PROGRAMS

8.1 VDOT’s Pollinator Habitat Program

The Virginia Department of Transportation initiated the Pollinator Habitat Program (PHP) in 2014. The PHP creates naturalized areas planted with native nectar and pollinator plant species along state-maintained roadways, within safety rest areas, and park and rides. Pollinator areas can also be established by allowing appropriate areas of VDOT ROW or facilities to go fallow and naturally regenerate. The Pollinator Habitat Program is funded through the purchase of Virginia Wildflower and Protect Pollinators license plates. Funding from these two license plates generates approximately \$240K per year.

The goals of the PHP are to:

- A. Provide habitat areas for threatened and dwindling pollinator species such as bees and butterflies;
- B. Reduce maintenance costs by reducing mowing and other vegetation costs, such as invasive species control and herbicide applications;
- C. Decrease erosion and stormwater runoff while providing sediment control, using fewer pesticides and increasing aesthetics.

Pollinators — including honey bees, native bees, birds, bats, and butterflies — contribute substantially to the U.S. economy and are vital to keeping fruits, nuts and vegetables in our diets by moving pollen from one part of the flower of a plant to another, or from one plant to another, to fertilize the flower. Only fertilized flowers can make fruit and/or seeds. Over the past few decades, there has been a significant decrease in pollinators. “Pollinator Waystations” filled with pollinator-friendly plants provide those species the environment needed for survival. Beyond agriculture, pollinators are keystone species in most terrestrial ecosystems. Fruits and seeds derived from insect pollination are a major part of the diet of birds and mammals. Additionally, insect pollinators themselves contribute a large portion of the diet of many birds and other wildlife.

The PHP started as a pilot project in partnership with Dominion Energy Charitable Foundation & the Loudoun Wildlife Conservancy with four 900 ft² Pollinator Waystation plots in 2014 in the Northern Virginia Area at three at 3 Park & Rides and 1 Safety Rest Area. Since then, pollinator plantings have been added at 7 additional VDOT properties, including 5 safety rest areas, a VDOT residency office and an additional Park & Ride. Pollinator friendly plantings are now considered for storm water facilities as well and an existing 5,760 ft² Bio retention Basin located at the New Kent West SRA was revegetated with native pollinator plants in the fall of 2019

Maintenance of these established PHP sites is an ongoing issue for the PHP program. The largest

PHP site, located at the Dale City North SRA is maintained by volunteers associated with the Prince William Chapter of the Virginia Native Plant Society. This partnership will hopefully be modeled and expanded upon at similar PHP sites to endure their ongoing success. Additionally, VDOT is cooperating with Virginia Tech's School of Plant and Environmental Sciences to identify ways to manage PHP project sites for the long-term with research into potential effects of pesticide applications for undesirable species control. Four test plots installed by VA Tech in the summer of 2018 at 4 SRAs will eventually serve as pollinator gardens to add to our PHP inventory.

VDOT is also partnering with Virginia Tech's Department of Entomology and Virginia Cooperative Extension to study native bee populations at select safety rest areas.

The program will continue to grow throughout the state, focusing on naturalized gardens and meadows at Safety Rest Areas, Park & Rides and additional VDOT facilities for the next few years.

- 8.1.1 Dormant Mowing: Mowing of pollinator habitat should be limited to a single annual mow during the dormant season (October 31 – March 1).

From BMP Manual: Pollinator Habitat Program: *Every effort should be made to preserve native pollinator plant species including but not limited to milkweed. Many of these plants are located within "Additional Mow Areas" and it is recommended that mowing of these areas occur in March and/or after October 31st. If there are large areas of pollinator species within the parameters of "Mow Areas" and there is no safety issue, delineate the areas and mow in March and/or after October 31st. Please contact the State Roadside Manager or District Roadside Manager for guidance regarding the pollinator habitat program.*

VDOT Vegetation Management Staff will continue to work with VDOT Maintenance staff and contractors to provide education on the importance of reduced mowing and other maintenance practices that will benefit pollinators and to continue to identify additional roadside areas where mowing can be reduced.

8.2 Virginia's Pollinator Protection Strategy Advisory Program

VDOT is an active member and participant of the Virginia Pollinator Protection Strategy Advisory Committee. The Virginia Pollinator Protection Strategy was enacted by the 2016 Session of the Virginia General Assembly, which requires the Virginia Department of Agriculture and Consumer Services (VDACS) to establish and maintain a Strategy to promote the health of and mitigate the risks to all pollinator species and ensure a robust agriculture economy and apiary industry for honey bees and other managed pollinators. The Strategy is to include a plan for the protection of managed pollinators that provides voluntary best management practices for pesticide users, beekeepers, landowners, and agricultural producers.

The Strategy requires that VDACS provide for the protection of managed pollinators, through the

development of best management practices for pesticide users, beekeepers, landowners and agricultural producers. The Strategy is to contain a plan to support: 1) communication between beekeepers and applicators; 2) reduction of the risk to pollinators from pesticides; 3) increases in pollinator habitat; 4) maintenance of existing compliance with state pesticide use requirements; 5) identification of needs for further research to promote robust agriculture and apiary industries; and 6) identification of additional opportunities for education and outreach on pollinators.

The Pollinator Protection Strategy Advisory Committee was formed as a result of the Strategy and is comprised of representatives from state agencies, including VDOT and relevant stakeholder groups. The Advisory Committee typically meets annually at a minimum in person and through email and other correspondence in an effort to ensure objectives of the Strategy are met while preventing the duplication of efforts of the various state agencies. These meetings and coordination of efforts will allow for sharing of information and efficient use of resources while improving pollinator populations.

8.3 Monarch Butterfly Candidate Conservation Agreement with Assurances (CCAA) for Transportation and Energy Sectors Program

The Monarch Butterfly Candidate Conservation Agreement with Assurances (CCAA) is a formal, voluntary conservation agreement between the USFWS and one or more non-federal property owner(s) (ROW managers, easement holders, leaseholders). VDOT has recently joined the Monarch CCAA for Transportation and Energy Sectors and is the process of enrolling much of our roadsides and other VDOT owned lands. The monarch butterfly CCAA for the transportation and energy sectors represents an extraordinary opportunity for collaborative conservation. As of early January 2019 there are 33 other participating organizations which include 11 other Department of Transportations (DOTs): Arizona, Colorado, Delaware, Georgia, Idaho, Illinois, Iowa, Maine, Minnesota, Ohio and Wisconsin, FHWA, and 21 energy/utility companies/organizations.

In 2014, the U.S. Fish Wildlife Service (USFWS) received enough information in a petition to determine that the Monarch butterfly may be warranted for federal listing and protection under the Endangered Species Act (ESA). By joining this CCAA, VDOT and other participants will address concerns and commit to the long-term conservation of the Monarch butterfly as a whole, based on industry-level energy and transportation contributions and efforts. A joint fund to which VDOT will contribute annually and CCAA Task Force have been established to pool resources from partners in energy, utility and transportation.

Conservation measures that benefit monarchs include many practices that are already undertaken by VDOT. Conservation measures include, but are not limited to:

- A. Conservation Mowing: Adjusting the timing of mowing and other mowing practices to reduce impacts to monarchs
- B. Seeding or planting of native wildflowers, such as VDOTs Pollinator Habitat Program (PHP)
- C. Control of invasive or defined noxious weed species
- D. Using more selective herbicides to avoid impacts to the milkweed and flowering plants that

monarchs rely upon

- E. Promote supplemental landowner pollinator conservation efforts
- F. Maintaining suitable habitat idle lands, or set-asides, or lands that sustain suitable habitat throughout the growing season without being disturbed by any other maintenance or modernization activity.
- G. Monitoring the quantity and quality of habitat resources such as milkweed and flowering plants.

VDOT's Vegetation Management Staff is currently working with the Environmental Division to quantify acreages/road miles and determine approximate locations on which conservation measures are already being implemented by VDOT to enhance habitat for monarchs. Additionally Staff is working to determine where additional conservation measures can be increased or added, many of which could be at minimal additional cost to VDOT but that can have large contributions to monarch conservation.

8.4 Virginia Native Plant Marketing Partnership Program

VDOT is a Steering Team member of the Virginia Native Plant Marketing Partnership (VNPMP) and a member of the newest regional native plant marketing campaign, *Plant RVA Natives*. In August of 2011, the Virginia Coastal Zone Management (CZM) Program initiated the Virginia Native Plants Marketing Partnership (VNPMP) - a forum to collaborate and coordinate, leading to more consistent messaging to the general public and more efficient use of limited resources. The partnership is guided by a Steering Team of members, representing organizations with a regional and state-wide mission and focus on native plant marketing. The Steering Committee developed the following goals for the partnership:

- A. Increase collaboration and coordination among partners engaged in native plant education, communication and marketing.
- B. Increase Virginia Grown native plant stock (availability).
- C. Increase the availability of native plants at local plant retailers.
- D. Increase demand and use of Virginia native plants by:
 - 1. Landscape and land use professions (including engineers, L.A.'s , anyone who specify for land development/use)
 - 2. Homeowners
 - 3. Landscaping and demonstration restoration projects on public lands (state, federal) and also private (landowners or non-profit ownership)

In 2017, the partnership launched a new website as a hub for native plant information, which can be found at <https://www.plantvirginianatives.org>.

To ensure native pollinator populations can thrive, adequate populations of native plants must be

available to pollinators. One of the ongoing initiatives supported by the CZM is regional native plant marketing campaigns focused on selling the aesthetic and ecological benefits of native plants and educating and demonstrating to the public the importance of native habitat for wildlife, especially birds and pollinators.

Marketing campaigns are currently underway in many regions of the state. The campaigns include regional native plant guides with information on planting for pollinators and identifying species that support pollinator. Strategies also include point of sale materials at garden centers— such as plant tags and signs.

VDOT's PHP is a member of the most recent marketing campaign for the Richmond Region, referred to as *Plant RVA Natives*.

8.5 Virginia's Noxious Weeds Advisory Program

The Virginia Department of Agriculture and Consumer Services (VDACS) regulates the movement of noxious weeds. A Noxious weed is defined as any living plant, or part thereof, declared by the Board through regulations under this chapter to be detrimental to crops, surface waters, including lakes, or other desirable plants, livestock, land, or other property, or to be injurious to public health, the environment, or the economy, except when in-state production of such living plant, or part thereof, is commercially viable or such living plant is commercially propagated in Virginia. The Noxious Weeds Law provides authority to the Board of Agriculture and Consumer Services (BACS) to add or delete weeds from Virginia's noxious weeds list.

Proposed weeds are submitted to the Noxious Weeds Advisory Committee who assesses and recommends to BACS the addition or removal of weeds from the list. VDOT is an active member and participant of the Noxious Weeds Advisory Committee. The Committee meets at minimally once annually but typically has met several times per year since its formation.

8.6 Invasive Species Advisory Committee, Invasive Species Program

The Virginia Invasive Species Advisory Committee developed the Invasive Species Management Plan through coordination with the Invasive Species Working Group. The Advisory Committee includes representatives of Virginia's natural-resource agencies, the departments of Transportation and of Health and Human Services, academic researchers, private citizens, nonprofit conservation organizations, and private business associations.

The Invasive Species Working Group (ISWG) was created by the Virginia General Assembly in 2009 (*Code of Virginia* § 2.2-220.2). The ISWG is chaired by the Secretary of Natural Resources, and the Secretary of Agriculture and Forestry serves as vice chair. The secretaries are directed to "coordinate the development of strategic actions to be taken by the Commonwealth, individual state and federal agencies, private businesses and landowners related to invasive species prevention, early detection, rapid response, control and management, research and risk assessment, and education and outreach." VDOT is an active member of the ISWG.

The ISWG is required to develop a state invasive species management plan and a list of invasive species that pose the greatest threat to the commonwealth. VDCR provides staff for the ISWG.

General goals outlined in the enabling legislation include:

- A. Prevent additional introductions of invasive species.
- B. Procure, use, and maintain native species to replace invasive species.
- C. Implement targeted control efforts on those invasive species that are present in the Commonwealth and are susceptible to such actions.
- D. Identify and report the appearance of invasive species before they can become established and control becomes less feasible.
- E. Implement immediate control measures if a new invasive species is discovered in Virginia, with the aim of eradicating that species from Virginia's lands and waters if feasible given the degree of infestation.
- F. Recommend legislative actions or pursue federal grants to implement the plan.

8.7 VDOT Partnership with Blue Ridge PRISM (Partnership for Regional Invasive Species Management) and Virginia Department of Conservation & Recreation (DCR) – Natives/Invasive

Blue Ridge PRISM (Partnership for Regional Invasive Species Management, hereafter referred to as PRISM) is a Cooperative Weed Management Area (CWMA), the first such organization headquartered in Virginia. There are approximately 100 CWMA's in the U.S., mostly in the West. As with its western counterparts, PRISM is a collaborative partnership between individuals and various private and public agencies, who work in a coordinated fashion over a wide geographical area to combat invasive species and to restore native habitats. VDOT has recently joined the partnership as an active participant and will work cooperatively with PRISM specifically to restore native habitats and combat invasive species along VDOT's Roadsides within the 3 VDOT Districts (Culpepper, Lynchburg and Staunton) that cover portions of PRISM's targeted geographical area.

The Virginia Department of Conservation and Recreation (DCR) Natural Heritage Program (DNH) is partnering with VDOT and PRISM in this effort and is an appropriate agency as the DCR is responsible for conserving, protecting, enhancing and advocating wise use of the Commonwealth's unique natural, historical, recreational, scenic and cultural resources. DNH's mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The Partnership will work initially to identify the most troublesome invasive plant species growing along VDOT Roadsides.

The Partnership will also work on developing recommendations for appropriate native vegetation that VDOT can use to substitute non-native turf that is typically established along roadsides for new construction and on-going maintenance. The non-native turf species that VDOT has utilized have been selected for due to their properties of quick establishment and low maintenance requirements. Roadsides are challenging environments for vegetation

establishment due to the high level of soil disturbance and lack of native topsoil that typically follows after roadside construction and ongoing maintenance. Coupled with these inhospitable conditions, the requirement for quick establishment of vegetation cover in order to minimize storm water, sediment and erosion control problems makes the choice for the proper vegetation critical.

Research will be performed to gather and review of previous studies using native species along roadsides. VDOT will seek assistance from the Virginia Transportation Research Council. Additionally, several pilot projects involving test plots using native plant substitutions for VDOT roadside vegetation will be implemented in partnership with VDOT's Vegetation Management section and DNH.

8.8 Partnerships to Improve Stream Health and Restore Fish/Aquatic Organism Passage at Virginia Road-Stream Crossings via VDOT Bridge and Culvert Repair/Replacement Projects Program

VDOT is exploring opportunities and considering pilot projects to partner with local governments, other state and federal agencies, and non-profit organizations to better coordinate improvements for aquatic organism passage (AOP) and transportation infrastructure. More specifically, VDOT is interested in expanding the scope of bridge and culvert repair and replacement projects at certain road-stream crossings where the existing VDOT structure represents a significant barrier to the movement of aquatic organisms (e.g., fish, aquatic salamanders, crayfish, aquatic macroinvertebrates, etc.). The scope of the repair or replacement project may be expanded or modified relative to VDOT's standard option to repair or replace an existing structure. For example VDOT and partnering organizations may enter an agreement to:

- A. Upgrade the proposed structure relative to the typical replacement structure for the purpose of increasing AOP (e.g., replacing a box culvert with a bridge, replacing a culvert with a hydraulically oversized and countersunk culvert, etc.);
- B. Remove rather than repair a low water structure and replace with a stream ford;
- C. Install rock step pools at a culvert outlet; or
- D. Perform stream restoration, using natural channel design, at the road-stream crossing within VDOT ROW and possibly in an adjacent easement.

Partnering organizations would provide project support in the form of direct funding, services, and/or materials, to offset the additional cost of the expanded project scope. A successful project contributes to the goals of the partnering organization (e.g., improving the eastern brook trout fishery in Piedmont Virginia) in a manner consistent with VDOT's goals for public safety, cost-effectiveness, hydraulic performance, and environmental stewardship, while integrating VDOT's current infrastructure maintenance prioritization, as established in the Code of Virginia.

The current implementation of selected pilot projects in Piedmont Virginia could serve as a model to be replicated throughout the Commonwealth. Two road-stream crossings have been proposed to VDOT by the Piedmont Environmental Council (PEC) as part of their Brook Trout Stream Restoration Initiative: Sycamore Ridge Road/Route 653 at Piney River, and Mill Hill

Road/Route 631 at Bolton Branch. Both sites would be considered for maintenance in the near future and are therefore prime opportunities for pilot projects. Both PEC and VDOT agree that partnering on AOP projects for these two road-stream crossings addresses important issues of (1) aquatic organism passage and habitat degradation; and (2) water quality improvement and pollution reduction.

These projects provide the opportunity to leverage infrastructure design and selection methods to which VDOT already adheres, but allow the opportunity to consider VDOT's goals for fish passage and crossing design in light of:

- A. Best practices from the U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service, and others leading efforts for AOP implementation, especially trout stream restoration; and
- B. Standard project design options, costs and outcomes as illustrated by similar completed projects for AOP across the Mid-Atlantic and Eastern U.S.

References on AOP design and implementation, including design standards from other state DOTs and the FHWA, are provided at the end of this section.

This kind of activity expands on similar partnerships VDOT has sought with sister state agencies, such as the Department of Conservation and Recreation (DCR) and Department of Game and Inland Fisheries (DGIF) to engage in collaborative projects to achieve Chesapeake Bay TMDL pollution reductions. Such partnerships can integrate the goals, service capacities and financial objectives of all involved entities. The results of such projects will help VDOT to better prioritize future work through collaborative modeling and planning and develop effective partnerships to expand available funding and educational capacities.

Contact Information for AOP Initiative with External Organizations

An Environmental Memorandum (EM) will be developed to describe the process by which AOP opportunities will be identified, assessed, designed, constructed and monitored under agreements executed with external partners. In the interim, please direct questions to:

POC: Daniel Redgate, Water Quality Permit Program
Manager VDOT Central Office, Hospital Building, 3rd
Floor Richmond, VA 23219
804-371-6835(o); 804-968-8557(m)

8.9 References on Aquatic Organism Passage Design for Bridges and Culverts

Barnard, RJ., Johnson, J., Brooks, P., Bates, KM., Heiner, B., Klavas, JP., Ponder, DC., Smith, PD, Powers, PD. 2013. Water Crossings Design Guidelines. Prepared by Washington Department of Fish and Wildlife: Olympia, WA.

Bates, K., Kirn, R. 2009. Guidelines for the design of stream/road crossings for passage of aquatic organisms in Vermont. Prepared by Kozmo, Inc. and Vermont Department of Fish and Wildlife:

Waterbury, VT.

Behlke, C.E., Kane, D.L., McLean, R.F., and Travis, M.D. 1991. Fundamentals of Culvert Design for Passage of Weak Swimming Fish. Alaska Department of Transportation. FHWA-AK- RD-90-10.

FishXing - Software and Learning Systems for Fish Passage through Culverts: <https://www.fs.fed.us/biology/nsaec/fishxing/>

Fitch, G.M. No anadromous Fish Passage in Highway Culverts. 530 Edgemont Road, Charlottesville, VA 229903-0817: Virginia Department of Transportation. VTRC 96-R6:1-18, 1995. Final Report

Forest Service Stream-Simulation Working Group. 2008. Stream simulation: an ecological approach to providing passage for aquatic organisms at road-stream crossings. Prepared by USDA Forest Service Technology and Development Program: San Dimas, CA.

Hotchkiss, R. H., and C. M. Frei. 2007. Design for fish passage at roadway-stream crossings: synthesis report. Federal Highway Administration, Publication FHWA-HIF-07-033, McLean, Virginia.

Jackson, SD., Bowden, A., Lambert, B., Singler, A. 2011. Massachusetts River and Stream Crossing Standards. Prepared by River and Stream Continuity Partnership.

Maine Department of Transportation. 2004. Fish Passage Policy and Design Guide. Second Edition. University of New Hampshire. 2009. New Hampshire Stream Crossing Guidelines.

8.10 Emergency Streambank and Shoreline Protection Program

VDOT is successfully collaborating with federal agencies such as the U.S. Army Corps of Engineers (USACE), to construct emergency shoreline and streambank protection works to protect public facilities, such as bridges, roads from imminent threats of damage or failure by natural erosion processes. This partnership also results in enhanced environmental protection and restoration of stream and river environments.

Section 14 of the 1946 Flood Control Act provides the USACE authority to work with non-federal partners (VDOT) to construct emergency shoreline and streambank protection works to protect public facilities, such as bridges, roads, public buildings, sewage treatment plants, water wells, and non-profit public facilities, such as churches, hospitals, and schools.

The Continuing Authorities Program (CAP) establishes a process by which the USACE can respond to a variety of water resource problems without the need to obtain specific congressional authorization for each project. The CAP is comprised of legislative authorities under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects.

When VDOT identifies a location at which a VDOT maintained public facility such as a road or bridge is in imminent threat of damage or failure by natural erosion processes, a letter of

interest is submitted to USACE. After receipt of the letter of interest, USACE conducts an initial assessment with a site visit in the Feasibility Phase to determine whether the project meets the program criteria.

The initial assessment provides a basis for determining the scope and cost of an entire feasibility study. Once a project moves past the initial assessment, the feasibility study begins. The solution that results from the feasibility study must be economically feasible and environmentally acceptable. One result of the feasibility study is the generation of an Environmental Assessment document in compliance with the National Environmental Policy Act of 1969, as amended (NEPA). The feasibility study is the first phase and it is 100 percent federally funded up to \$100,000. VDOT is required to cost share equally the cost of the part of the feasibility study that exceeds \$100,000.

If the feasibility study identifies an acceptable alternative, the USACE prepares plans and specifications. If VDOT concurs with the solution and funding requirements, then USACE manages construction of the project. Final design (plans and specifications) and construction costs are shared: 65% Federal and 35% VDOT.

One example of the partnership between VDOT and USACE in leveraging the CAP Section 14 (CAP-14) program is the mitigation of erosion along the Indian Run Creek located in western Virginia approximately 13 miles northeast of Lynchburg. Approximately 50-foot of streambank along Indian Run Creek is severely eroded by the effects of natural erosion processes. The resulting 12-foot high receding bluff is an imminent threat to existing public facilities, causing continual loss of soil and threatening a section of the existing public road along U.S. Route 501. At the site location, the bank has encroached to within approximately 1 foot of the existing road and damage to public facilities is expected in less than two years. A total loss of the threatened road would cause an adverse impact to the environment, public health, safety and security. VDOT has requested USACE, to evaluate structural and non-structural measures that could be implemented as a part of the CAP-14 program for this situation.

Thus far, the project has received a favorable initial assessment. On April 16, 2018, VDOT received an approved Federal Interest Determination (FID) (project evaluation) for a shoreline erosion protection study along the Indian Run Creek. Next, the project moves into the Feasibility Phase during which planning activities will be performed to demonstrate that federal participation in this project is warranted and justified. The feasibility study provides the basis for decisions on project construction. In this study, the Project Delivery Team (PDT) will evaluate all formulated solutions to the erosion problem identified in the study area. Once the Indian Run Feasibility Phase is completed, USACE will prepare plans and specifications, and if VDOT concurs with the solution and funding requirements, the USACE will move forward with the construction phase of the project, which they manage.

This kind of activity expands on similar partnerships VDOT has sought to engage in collaborative projects, to ultimately achieve Chesapeake Bay TMDL pollution reductions. Such partnerships can integrate the goals, service capacities and financial objectives of all involved entities.

8.11 VDOT'S Nutrient Credit Purchasing Program

VDOT is subject to the Virginia Stormwater Management Act ([§ 62.1-44.15:24 et seq.](#)) and Virginia Stormwater Management Program (VSMP) regulations ([9 VAC 25-870 et seq.](#)), promulgated and administered by the Virginia Department of Environmental Quality (DEQ). The statute and regulations require VDOT to employ control measures to prevent flooding, erosion, and nutrient pollution (represented by the indicator or “keystone” pollutant, Total Phosphorus, or TP) downstream from agency facilities and construction projects. In complying with these Codes, VDOT is doing its part to protect the Commonwealth’s water resources.

Stormwater quantity and quality control measures, called Best Management Practices (BMPs), must be installed in conjunction with land development projects to meet the regulatory criteria, particularly the more stringent criteria in Part II-B of the regulations. Given the spatial limitations of linear projects such as roadways, the siting of BMPs can often be challenging. Depending upon a project’s nutrient reduction requirements and the feasibility of on-site options, the use of off-site options, including the purchase of certified nutrient credits, has proven to be a valuable tool that can be used in addition to, or in lieu of, traditional onsite BMPs for achieving post-development water quality requirements.

The Chesapeake Bay Watershed Nutrient Credit Exchange Program (Code [§ 62.1-44.19:14 et seq.](#)) allows regulated land disturbance activities to use off-site compliance options to achieve post-development water quality criteria. This includes, under certain circumstances, the purchase of nutrient credits. Nutrient credits are generated by Nutrient Credit Banks through the use of BMP enhancements such as sustainable agricultural practices or land cover conversion through reforestation. Nutrient Credit Banks are certified by the State Water Control Board and regulated by the DEQ. For a map of current Bank locations that can be used by VDOT, go to:

http://www.virginiadot.org/business/locdes/nutrient_credits.asp

In order for the project to qualify for the use of nutrient credits, the project must meet one of the following criteria:

- A. The project area contains less than 5-acres of land disturbance, or
- B. The project’s post-construction TP reduction requirement is less than 10 pounds per year, or
- C. Where the project does not meet the conditions noted in items 1 and 2, and at least 75% of the required TP load reduction can be met onsite, the remaining load reduction (up to 25%) may be met through the purchase of nutrient credits. On a case by case basis, more load reduction (up to 100%) may be achieved through the purchase of nutrient credits by obtaining written approval from the DEQ. DEQ approval requires written documentation explaining the rationale for requesting higher levels of offsite load reductions. Where approval from the DEQ is required, the District Hydraulics Engineer must provide all of the necessary documentation to the Project Manager and he or she forwards the documentation to the VDOT State Stormwater Management Program Administrator in the Central Office’s Location and Design Division. The VDOT State Stormwater Management Program Administrator then coordinates with the DEQ Central Office to secure the necessary approvals.

Other offsite options that can be used to address post-construction water quality reduction requirements for construction activities are as follows:

- A. Participation in a local watershed comprehensive stormwater management plan, or
- B. Participation in a locality pro rata share program, or
- C. Use of other VDOT properties within the same or upstream 6th Order (12 digit) HUC as the project, or (with DEQ approval) within the same watershed, (i.e. basin / tributary) as the project, or
- D. Other offsite options, as approved by the DEQ.

In 2016, VDOT requested that the Virginia Transportation Research Council conduct a cost comparison of traditional stormwater management BMPs versus the costs of purchasing Nutrient Credits. The study results were published in Vo. 53, No. 1 (February 2017) of the *Journal of the American Water Resources Association*.

The study concluded that, based on the credit prices procured by VDOT at that time, purchasing nutrient credits is a cost-effective option for the agency, especially when factoring in the cost of additional right of way for the BMP. Purchase of nutrient credits may eliminate the need for the purchase of additional right of way or permanent easements and relieve the Department of future maintenance costs. Therefore, the purchase of nutrient credits to address post-construction water quality reduction requirements for construction activities is considered VDOT's preferred alternative for water quality compliance when available and economically feasible.

VDOT IIM-LD-251.4 sets forth the parameters and procedures for using the Nutrient Program to satisfy the agency's pollution reduction requirements pursuant to the VSMP regulations. IIM-251.4 can be found on VDOT's website at the following URL:

<https://www.virginiadot.org/business/resources/LocDes/IIM/IIM251.pdf>

VDOT Nutrient Credit purchases from various nutrient credit banks around Virginia help to achieve post-development water quality protection requirements. Using associated calculation procedures, the TP reductions can also be translated into reductions of Nitrogen and Sediment pollution loads to Virginia's local streams and rivers as well as the Chesapeake Bay.

9. TRAFFIC CONTROL DEVICES

Asset Type:

TRAFFIC CONTROL DEVICES

Policy: All traffic control and safety devices shall be fabricated, erected, and maintained in conformance with the current FHWA MUTCD, Virginia Supplement to the MUTCD, Virginia Work Area Protection Manual, VDOT Road and Bridge Standards, and VDOT Road and Bridge Specifications. The State Traffic Engineer, or his designee, shall render decision[s] regarding exceptions to the Standards. In addition to the physical maintenance of tangible traffic control hardware, functional maintenance of intangible resources (e.g. traffic signal timing) is required to adjust traffic control devices to current conditions and to remove devices when no longer required.

9.1 Breakaway Sign Supports

- 9.1.1 Activity Description: The inspection and repair of breakaway sign supports to ensure they are in accordance with the edition of the [VDOT Road and Bridge Standards, Volume II, Section 1300](#), that was effective at the time of construction, and applicable sections of the [VDOT Road and Bridge Specifications](#) with respect to damage, rusting, debris buildup, deterioration, vandalism, and footing erosion/sedimentation.
- 9.1.2 Purpose of Activity: To maintain and repair breakaway sign supports to reduce the severity of accidents involving vehicles and fixed objects.
- 9.1.3 General Guidelines:
- A. Periodic inspection of breakaway sign supports to determine if damage or knockdowns have occurred.
 - B. Over-tightening of the nuts, or use of materials other than those specified, may destroy the effectiveness of this safety device.
 - C. Breakaway support features should be checked for deterioration, vandalism, etc.
 - D. Either wood or metal breakaway supports are used in single and multi-post installation in accordance with the [VDOT Road and Bridge Standards, Volume II, Section 1300](#), and applicable sections of the [VDOT Road and Bridge Specifications](#).
 - E. To function properly, breakaway sign supports must be maintained as originally installed. Replacement of damaged supports, both wood and metal, must be in accordance with [the VDOT Road and Bridge Standards, Volume II, Section 1300](#), and applicable sections of the [VDOT Road and Bridge Specifications](#).

- 9.1.4 Procedures for Breakaway Sign Supports:
- A. Conduct the inspection as needed or when performing sign panel maintenance and replacement.
 - B. This inspection should include an evaluation of fuse plates and slip plates to ensure that bolts are properly torqued and rusting has not occurred on bearing surfaces. It should also include examination of footings, for erosion that would increase the height of the foundation stub, or sedimentation above the slip plate elevation.
 - C. Slip bases must be kept free of all debris to prevent the possibility of deterring the breakaway characteristics of the sign support. Any damages or debris noted should be reported to the appropriate manager.

9.2 Concrete Traffic Barriers

- 9.2.1 Activity Description: Inspection and repair of concrete traffic barriers.
- 9.2.2 Purpose of Activity: To repair or replace damaged or poorly aligned concrete traffic barriers to reduce hazards to the traveling public.
- 9.2.3 General Guidelines: Alignment of concrete traffic barriers should be maintained as near as possible to original, or subsequently improved condition.
- 9.2.4 Procedures for Concrete Traffic Barriers: Concrete traffic barriers should be inspected as needed.

9.3 Guardrail

- 9.3.1 Activity Description: The inspection and maintenance of guardrail to ensure compliance with FHWA's requirement that all permanent safety hardware systems meet [National Cooperative Highway Research Program \(NCHRP\) Report 350: Recommended Procedures for the Safety Performance on Highway Features](#) with respect to a damaged and broken appearance, as well as compliance with the 2009 AASHTO [Manual for Assessing Safety Hardware \(MASH\)](#).
- 9.3.2 Purpose of Activity: To ensure the guardrails provide maximum protection to the traveling public.
- 9.3.3 General Guidelines:
- A. Level of Service
 - 1. Alignment of guardrail should be maintained as near as possible to original, or subsequently improved condition.
 - 2. To attain this level of service, the following items should receive special consideration.

- a. Any broken or damaged guardrail and guardrail posts should be scheduled for repair as soon as possible to restore its effectiveness and appearance.
- b. Cable guardrail should be kept at the proper tension at all times for maximum effectiveness. (See [VDOT's Road and Bridge Specification, Section 505](#), for installation instructions and required cable tension).
- c. All reflectors, or reflectorized sheeting should be maintained in such condition to promote maximum night time visibility.
- d. Shoulders should be maintained at the proper level to maximize efficiency of the guardrail.

B. NCHRP 350 Requirements

- 1. In compliance with FHWA's requirement that all permanent safety hardware systems meet NCHRP Report 350 the Department issued Location and Design Division Joint Memorandum [LD-222.11/TE- 358.6: Roadway Safety Features | NCHRP 350 Test Requirements](#). This memorandum covers requirements on longitudinal barriers, guardrail terminals, impact attenuators/crash cushions, and concrete barriers, breakaway supports for signs and luminaries, and work zone devices.
- 2. In addition, the Department issued two memoranda; [TE 366.3: Guardrail System Upgrade](#) and [TE 367: Guardrail System Spot Repair](#). These memos cover guidance that apply to the repair, replacement and upgrading of existing guardrail installations. All existing substandard guardrail systems and components shall be upgraded to the latest standard in accordance with current [VDOT Road and Bridge Standards](#) and this memorandum when hit, or when upgraded through maintenance projects.
- 3. For Construction Projects, Location and Design Division Joint Memorandum [LD-220.4: Guardrail Repair, Replacement and Upgrade Guidelines](#) shall be followed.
- 4. All hardware and roadside safety apparatus accepted under NCHRP 350 meets the standards set forth in the [Manual for Assessing Safety Hardware \(MASH\)](#).

9.3.4 Procedures for Repair and Upgrading of Guardrail:

- A. When guardrail and/or terminal treatments that do not conform to current standards are damaged, the guardrail and/or terminal treatments should be replaced in accordance with current guardrail replacement/repair criteria.
- B. Reference: Traffic Engineering Division's Memoranda [TE 366.3: Guardrail System Upgrade](#) and [TE 367: Guardrail System Spot Repair](#), Location and Design Division's Joint [Memorandum LD-220.4: Guardrail Repair, Replacement and Upgrade Guidelines](#), and [VDOT's Road and Bridge Standards, Volume I,](#)

Section 500.

- C. When guardrail that are adjacent to bridges are damaged, the replacement guardrail should be attached to the bridge in accordance with current standards.

9.4 Highway Signs

- 9.4.1 Activity Description: Ensure highway signs¹ are erect, clean, and satisfy the requirements of the most current adopted versions of the FHWA [MUTCD](#), [Virginia Supplement to the MUTCD](#), [VDOT Road and Bridge Standards](#), and [VDOT Road and Bridge Specifications](#) regarding visibility, reflectivity, and illumination.
- 9.4.2 Purpose of Activity: To repair or replace regulatory, warning, and guide signs as needed to ensure the safe operation of the highway system.
- 9.4.3 General Guidelines:
 - A. All Signs
 - 1. Inspection Frequency
 - a. All signs - visual as needed
 - b. All illuminated signs - visual as needed
 - B. Changeable Message Signs (CMS)/Variable Message Signs (VMS)
 - 1. Message should be simple, brief, legible and clear.
 - 2. Message should not include animation, rapid flashing, or other dynamic elements.
 - 3. Message should not include animation, rapid flashing, or other dynamic elements.
 - 4. For additional guidance regarding CMS/VMS use, refer to the [MUTCD](#) and [VDOT's IIM-OD-13-03: Changeable Message Signs](#).
 - 5. To report issues with CMS/VMS signs call VDOT's Customer Service Center at 1-800-367-7623.
 - C. Road and Street Name Signs
 - 1. Counties can request that VDOT install post-mounted street names signs in lieu of the county completing the installation.²

¹ A highway sign is a traffic control device mounted on a support above the level of the roadway that conveys a specific message by means of words or symbols intended to guide, warn, regulate on direct traffic.² Code of Virginia, Section 33.1-69.01

2. Maintenance of post-mounted street name signs is the responsibility of the local jurisdiction, unless there is a written agreement with VDOT.
3. This local jurisdiction responsibility includes replacement post-mounted street name signs and new post-mounted street name signs on roads constructed by the jurisdiction (or under the authority of the jurisdiction) that will be submitted to VDOT for inclusion into the state system of roads.
4. Maintenance of overhead street name signs on VDOT structures is the responsibility of VDOT.

D. Safety Slogan Signs

1. Unless expressly authorized, no safety slogan signs should be erected within the right-of way of any highway.

E. School Zone Signs

1. A statutory 25-MPH speed limit generally exists between portable signs, tilt-over signs, or fixed blinking signs placed in, or along any highway bearing the word 'school', or 'school crossing'.
2. VDOT will furnish the portable and tilt-over signs and perform such physical maintenance as may be required. No Permit is required for these signs.
3. For fixed blinking
4. signs, the school board shall acquire a permit. Should the permit be approved, VDOT is responsible for furnishing the sign panel only. See VDOT's [TE-183 \(H&TS-183\): Agreement for the Installation and Management of Time Actuated Flashing School Speed Limit Signs](#) for maintenance requirements and additional information.
5. A reduced speed limit on roadways adjacent to a school i.e. school zone should be encouraged where the speed limit is deemed too high to safely accommodate students crossing the roadway to/from school grounds, or cars and buses entering and exiting the school property.

F. Speed Limits Signs

1. The black and white numbered (regulatory) speed limit signs are posted to encourage the appropriate safe speed for motorists under normal roadway conditions. Speed regulations and speed limits are intended to supplement motorists' judgment in determining speeds that are lawful, reasonable, and appropriate for the roadway, particularly in cases where

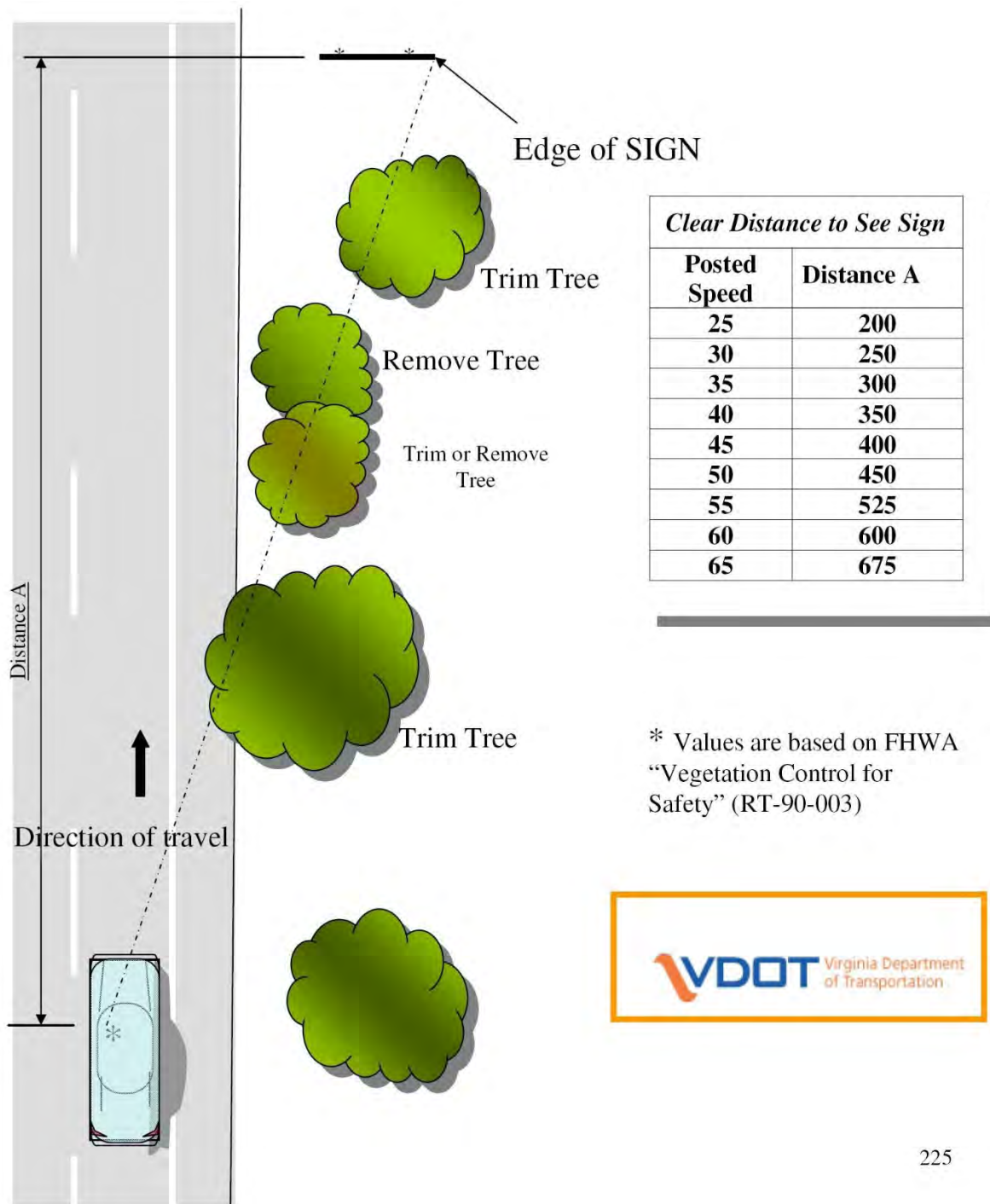
the motorist may not readily discern conditions that dictate a certain speed.

2. The VDOT Commissioner has delegated the authority to change speed limits on state-maintained roadways under VDOT's jurisdiction to the Regional Traffic Engineer and on Interstates jointly to the State Traffic Engineer and the Regional Traffic Engineer. This authority provides for decreasing, or increasing speed limits and may also establish variable speed limits and differentiated speed limits for daytime and nighttime. Such a change in speed limits shall be effective only when prescribed after a traffic engineering investigation and when indicated on the highway by signs.
3. For roadways where there has been no significant change or improvement to the roadway since the last review, or study was conducted, another review or study of the governing speed limit will not generally be initiated.

9.4.4 Procedures for Maintenance of Highway Signs:

- A. Inspections of regulatory, warning, and guide and information signs should be conducted as needed.
- B. Regulatory and warning signs that are damaged, or otherwise disturbed should be replaced or repaired upon discovery, if the condition affects the safe traveling of the motorists.
- C. All other damaged or disturbed signs, including guide signs, should be corrected as soon as practical.
- D. Vegetation should not be allowed to obscure any sign.
 1. Vegetation should be in general conformance with "A Guide for Line of Sight Clearance".
 2. The tops of foundations for sign structures should be kept clear of soil, debris, vegetation, etc.

EXHIBIT 1 - A GUIDE FOR LINE OF SIGHT CLEARANCE



9.5 Historical Markers

9.5.1 Activity Description: To ensure that historic markers are erect, clean, and satisfy the requirements of the Code of Virginia and the Department of Historic Resources.

A. Additional Information

1. Reference VDOT's [Land Use Permit Regulations \[24 VAC 30-151\]](#).
2. See also Section 10.1-2202(12) of the [Code of Virginia](#).

9.5.2 Purpose of Activity: Identify and sign person(s), place(s), or event(s) found to be of significant State, or National historic value.

9.5.3 General Guidelines: Damaged, vandalized, or missing markers should be reported to the Regional Maintenance Manager, who will coordinate as necessary with the Virginia State Police, the Virginia Department of Historic Resources, etc.

9.5.4 Procedures for Maintenance of Historical Markers:

A. Historical Markers on Non-Limited Access Roadways

1. Historical markers will be furnished by the Virginia Department of Historic Resources. VDOT will erect and maintain such markers within non-limited access highway right-of-way, or within waysides, scenic overlooks, or rest areas. Similarly, existing markers not within the highway right-of-way may be maintained by VDOT, provided that that appropriate documents have been recorded with the deed.
2. Localities may request VDOT to maintain historical markers within the locality. Contact the Regional Maintenance Manager to ascertain whether there is a Memorandum of Agreement on file.
3. Turnouts for the historical markers should be well drained, stabilized and maintained flush with the edge of pavement.

B. Historical Markers on Interstate and Limited Access Roadways

1. Historical markers will be furnished by the Virginia Department of Historic Resources. Historical markers on the Interstate system are subject to the approval of the Federal Highway Administration. Typical approvals that may be granted may be locations within rest areas, scenic overlooks, or waysides etc. Obtaining approval from the Federal Highway Administration for historical marker locations on the Interstate system should be coordinated through the Regional Maintenance Managers.
2. Historical markers on limited access highways should be restricted to locations within waysides and overlooks.

9.6 Integrated Directional Signing Program (IDSP) Signage

Policy: Establishments of IDSP signage is approved based upon the Participation Criteria and Fees adopted by the Commonwealth Transportation Board (CTB) in 2004 (with the additional criteria adopted in 2005). All sign designs shall be approved by the IDSP Program Manager. The IDSP shall follow guidelines set forth in the IDSP Operating Procedures Manual.

9.6.1 Activity Description: Installation and maintenance of IDSP signs includes site clearing, repair of signs or structures, replacement of signs or structures, and sign cleaning.

9.6.2 Purpose of Activity: To ensure IDSP signage remains in acceptable condition.

9.6.3 General Guidelines:

A. Program Overview

1. The Integrated Directional Signing Program (IDSP) was developed to provide directional guidance to motorists on VDOT right-of-way. The IDSP serves as a single point of contact for Virginia businesses, attractions, tourist destinations and other points of interest seeking signage. Four main signage programs fall under the purview of the IDSP: Specific Travel Services (Logo) Signs, Tourist-Oriented Directional Signs (TODS), Supplemental Guide Signs (SGS), and General Motorist Service Signs (GMSS). Also included in the program are some Watershed signs and Trail signage. Criteria for the IDSP were adopted by the Commonwealth Transportation Board (CTB) in 2004, with additional criteria adopted in 2005.
2. The program is responsible for tasks including but not limited to: fielding questions from prospective participants and guiding them through the process to obtain signage, inspecting signage on a periodic basis to ensure signage and structures are in adequate condition, maintaining existing signage, invoicing customers, maintaining a database of all signage under the IDSP, and ensuring businesses remain in compliance with the IDSP criteria as adopted by the CTB.
3. When a request is received for signage, the requestor is directed to contact the IDSP Contractor to determine what signage program would best suit their needs and provide assistance in filling out an application. A site visit is conducted to check that the establishment complies with all criteria concerning accessibility, hours of operation, services provided, permits (where necessary), and other factors. After this, sign designs are produced and locations are proposed for the signage. This is reviewed and must be approved by IDSP Program Manager at VDOT's Central Office, as well as the VDOT region where the sign will be located. Once the signage is approved, the IDSP Contractor will fabricate and install the signage. In some cases, the customer has the option for signage to be fabricated and

installed by a company of their choosing after fulfilling all other requirements and obtaining the appropriate permitting.

4. To cover the cost of administering the program, the IDSP charges annual fees for signage for certain programs. See the fee sheet for additional information on the fees for each program within the IDSP. The [VDOT Sign Programs webpage](#) contains brief synopsis of each signage program.

B. Additional Information

1. Contact the IDSP Program Manager for information about IDSP criteria, fees, or operating procedures.

9.6.4 Procedures for Maintenance of IDSP Signage: If an IDSP sign is in need of maintenance, the IDSP Program Manager or the IDSP Contractor should be contacted.

9.7 Impact Attenuators

9.7.1 Activity Description: The inspection of Impact Attenuators, to check for normal deterioration, damage, and vandalism.

9.7.2 Purpose of Activity: To maintain impact attenuators close to an “as installed” condition to provide maximum energy absorption and safety to the public.

9.7.3 General Guidelines: Impact attenuators should be maintained according to the manufacturer’s recommendations.

9.7.4 Procedures for Impact Attenuators: Impact attenuators should be inspected as needed.

9.8 Pavement Markings

9.8.1 Activity Description: Inspect and take appropriate action to ensure pavement markings are visible and comply with requirements of the FHWA [MUTCD](#) and the [Virginia Supplement to the MUTCD](#) regarding visibility, reflectivity, and placement.

9.8.2 Purpose of Activity: To support highway safety for motorists by refreshing, replacing, or refurbishing pavement markings.

9.8.3 General Guidelines:

A. Inspections, Maintenance, and Upgrades

1. Pavement markings should be inspected as needed.

2. All pavement markings shall be installed in accordance with FHWA's [MUTCD](#), [Virginia Supplement to the MUTCD](#), [VDOT Road and Bridge Specifications](#), [VDOT Road and Bridge Standards](#), [Traffic Engineering Memoranda](#), and the VDOT Materials Division [Pavement Marking Certification School Manual](#).
 3. Certain marking materials should not be applied over other materials, or over themselves. Care should be used in determining the most suitable material to use for refurbishment. For additional information, see Sections 246 and 704 of the [VDOT Road and Bridge Specifications](#), and Traffic Engineering Division Memorandum [TE 261.1: Type B, Class VI Pavement Markings](#).
 4. For information regarding VDOT's adoption of 6-inch wide line markings, refer to Part 3 of the [Virginia Supplement to the MUTCD](#).
- B. Edge Line Marking Criteria
1. Edge line markings should be applied based upon the criteria established in Part 3 of the [Virginia Supplement to the MUTCD](#).
 - a. Edge line markings should not be applied on residential streets.
 - b. Edge line markings should be applied at locations where an engineering study indicates a need for them.
- C. Centerline Markings on Interstate, Primary and Secondary Systems
1. Centerline markings should be applied based upon the criteria established in Part 3 of the [Virginia Supplement to the MUTCD](#).
 - a. Centerline markings should be applied at locations where an engineering study indicates a need for them.
- D. Replacement of Pavement Marking after Resurfacing
1. The maximum time period between resurfacing and replacement of centerline and lane line markings is based on the traffic volume thresholds denoted in [VDOT's Road and Bridge Specifications, Section 704.03](#).
 2. Edge lines on all types of roads should be delayed until shoulder buildup is completed.
- E. Durable Pavement Markings
1. To increase the effectiveness and longevity of pavement markings, and to promote personnel safety by increasing the time between pavement markings replacement, VDOT has decided to use durable pavement markings on limited access highways and other high volume highways.

2. For additional information and criteria, refer to Traffic Engineering Division's Memorandum [TE-261.1 Type B, Class VI Pavement Markings](#).

9.8.4 Procedures for Pavement Marking:

- A. When refurbishing existing pavement markings, care shall be taken to install the new marking material over the old markings as exactly as possible.
- B. Obsolete marking should be completely removed before the new markings.
- C. Replacement of pavement markings should occur within the recommended time period in [VDOT's Road and Bridge Specifications, Section 704.03](#).

9.9 Roadway Lighting Systems

9.9.1 Activity Description: Perform inspection, preventative maintenance, and maintenance of roadway lighting systems.

9.9.2 Purpose of Activity: To support highway safety by ensuring the level of service provided by roadway lighting is as good as or better than when the lighting was initially constructed or subsequently improved.

9.9.3 General Guidelines:

- A. The Regional/District Maintenance Division, Traffic Engineering, Location & Design, Transportation Operations Center, authorized VDOT staff, have responsibility for the performing of preventive maintenance, maintenance, and repairs on lighting systems.
- B. Regional/District Traffic Engineers and L&D offices shall consult with Central Office Location and Design's Traffic 21 to making any roadway lighting or intersection lighting design modifications.
- C. All equipment replacement shall utilize the same, or equivalent devices and shall be installed in accordance with the manufacturer's specifications and standards, [VDOT Road and Bridge Specifications, VDOT Road and Bridge Standards](#), Virginia adopted National Fire Protection Association (NFPA)/National Electrical Code ([NEC](#)) Standards.
- D. Each individual lighting fixture shall adhere to the existing roadway lighting design and provide the same illumination, as other individual fixtures. Any variation shall be discussed with Central Office Location and Design, the Regional/District Traffic Engineer, and the L&D offices responsible for the project.

9.9.4 Procedures for Electrical and Roadway Lighting Systems:

- A. All procedures for the replacing and/or repairing roadway lighting and electrical systems devices shall be in accordance with the [VDOT Road and Bridge Specifications](#) and [VDOT Road and Bridge Standards](#).

- B. The Regional/District staff responsible for electrical maintenance and repair shall follow [NFPA 70B: Recommended Practice for Electrical Equipment Maintenance](#), and [NFPA 70E: Standard for Electrical Safety in the Workplace](#) standards and guidelines for all activities.
- C. A visual survey of roadway lighting structures shall be performed at the time of inspection.
- D. Upon completing the visual survey, necessary repairs should be performed as soon as practical.
- E. Inspections shall be conducted as needed.
- F. Inspection and testing of grounding systems for electrical services shall be in accordance with [VDOT Road and Bridge Specifications](#), and/or [MM-312 Inspection and Testing of Grounding Systems](#).

9.10 Raised Snow Plowable Pavement Markers

- 9.10.1 Activity Description: Perform inspection and maintenance, as needed to maintain the effectiveness of the pavement marker system.
- 9.10.2 Purpose of Activity: To ensure optimal delineation of the traveled way in order to maximize safety for the traveling public.
- 9.10.3 General Guidelines:
 - A. Refer to: [VDOT's Road and Bridge Standards](#), [VDOT's Road and Bridge Specifications, Section 704.03](#), the VDOT Materials Division [Pavement Marking Certification School Manual](#), and the [Virginia Supplement to the MUTCD](#).
- 9.10.4 Procedures for Raised Snow Plowable Pavement Markers:
 - A. Markers should be installed according to the procedures in [VDOT's Road and Bridge Specifications, Section 704.03](#).
 - B. Raised Snow Plowable Pavement markers should be inspected as needed.

9.11 Traffic Signals

- 9.11.1 Activity Description: The inspection, maintenance, repair, and operation of non-structural traffic signal components (excluding signal structural elements such as poles and mast arms).
- 9.11.2 Purpose of Activity: To maintain traffic signal hardware and provide optimal operation of traffic signals in order to maximize highway safety and allow the traveling public to utilize intersection capacity in an efficient manner.
- 9.11.3 General Guidelines:
 - A. Signal operations and maintenance, including inspection/evaluations of physical hardware and non-tangible resources, is accomplished according to

Federal, State & National Code requirements as well as published national guidance and best practices such as:

1. [VDOT Road and Bridge Specifications](#),
 2. [VDOT Standard Drawings](#),
 3. VDOT Directives set forth by [Traffic Engineering Memoranda](#),
 4. Federal Manual of Uniform Traffic Control Devices ([MUTCD](#)),
 5. the [Virginia Supplement to the MUTCD](#),
 6. the Virginia adopted National Electrical Code ([NEC](#)), and
 7. Various publications of the Institute of Transportation Engineers (ITE).
- 9.11.4 Procedures for Inspections and Repairs of Traffic Signals:
- A. Generally, signal related inspection, repairs, and maintenance should be accomplished only by specialized traffic signal personnel.
 - B. All signals related inquiries should be directed to the Regional Operations Director, the Regional Traffic Engineer, the Regional Traffic Operations Engineer, or the Regional Operations Maintenance Manager.

References

1. [Code of Virginia](#). §§ 18.2-323, 18.2-324, 33.1-12, 33.1-210, 33.1-373, 33.1-346, 33.1-347.
2. 24 VAC 30-151-10 et seq., Land Use Permit Regulations, VDOT, Transportation and Mobility Planning Division
http://www.virginiadot.org/business/resources/Land_Use_Permit_Regulations_2010/abs/2010_Land_Use_Permit_Regulation_031710.pdf
3. VDOT, Road and Bridge Specifications (current edition), Scheduling and Contracting Division. <http://www.virginiadot.org/business/const/spec-default.asp>
4. VDOT, Road and Bridge Standards (current edition), Location and Design Division.
http://www.virginiadot.org/business/locdes/2008_road_and_bridge_standards.asp
5. VDOT, Location and Design Division, [Drainage Manual](#).
<http://www.virginiadot.org/business/locdes/hydra-drainage-manual.asp>
6. Virginia Department of Environmental Quality, Erosion and Sediment Control Handbook.
7. Virginia Department of Environmental Quality, Stormwater Management Program Manual.

8. VDOT, Materials Division Approved Lists. <http://www.virginiadot.org/business/materials-download-docs.asp>
9. VDOT, Maintenance Division, Tree and Brush Trimming Policy
10. VDOT Maintenance Division, Vegetation Control Manual
11. VDOT, Office of Land Use, Outdoor Advertising Manual
12. VDOT, Maintenance Division, Planting Guidelines
13. VDOT, Maintenance Division, Adopt-A-Highway Manual
14. 24 VAC 30-310-10, Virginia Supplement to the Manual on Uniform Traffic Control Devices (Virginia Work Area Protection Manual), Traffic Engineering Division, VDOT
15. 4 VAC 50-30-10 et seq., Virginia Erosion and Sediment Regulations, Division of Soil and Water Conservation, Department of Conservation and Recreation, 203 Governor Street, Richmond, Virginia 23219
16. 9 VAC 20-81-10 et seq., Solid Waste Management Regulations, Waste Division, Department of Environmental Quality, 629 East Main Street, Richmond, Virginia 23219
17. 9 VAC 20-101-10 et seq. Vegetative Waste Management and Yard Waste Composting Regulations, Waste Division, Department of Environmental Quality, 629 East Main Street, Richmond, Virginia 23219
18. American National Standards Institute (ANSI) Standard for Tree Care Operations, Tree, Shrub, and Other Woody Plant Maintenance-Standard Practices – ANSI A300 (current edition), American National Standards Institute, 11 West 42nd Street, New York, NY 10036
19. Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush-Safety Requirements – ANSI Z133.1 (current edition), American National Standards Institute, 11 West 42nd Street, New York, NY 10036
20. Tree Pruning Guidelines (current edition), International Society of Arboriculture, P.O. Box 3129, Champaign, IL 61826-3129

10. STRUCTURES

Asset Type:

STRUCTURES

Policy: The Department shall maintain all structures to the level of service they were initially constructed to or better by subsequent improvements. This objective will be achieved by performing regular preventive maintenance activities, providing regularly scheduled inspections to determine structural deficiencies, and performing restorative maintenance and repair activities as needed.

10.1 Preventative Maintenance

10.1.1 Activity Description: Preventive maintenance (PM) includes any planned cyclical activity performed in advance of a critical need for repair, to reduce or arrest the rate of future deterioration. Preventive maintenance activities consist of the following characteristics: planned and cyclical; proactive (not reactive); and activities that are condition based as determined in safety inspections.

10.1.2 Purpose of Activity: The purpose of preventive maintenance is to extend the useful life of VDOT's assets and to preserve their related public investment. The activities may correct minor defects as a secondary benefit, but are not typically initiated based upon an observed deterioration.

10.1.3 General Guidelines for Preventative Maintenance:

A. Responsibility for Correction of Structure Defects

1. Structure defects and their correction can be classified as major or minor.

a. Minor repairs may be made by field maintenance forces through routine ordinary maintenance or preventative maintenance activities, which typically do not require plan development and thus does not need a review by the S&B Engineer. Minor repairs should be made upon discovery of defects, subject to compliance with all appropriate environmental regulations, and the work may be performed by the State Forces or Contractors.

b. Major repairs require the review by the State Structure and Bridge Engineer and usually require the development of engineering plans, and specialized equipment, or a specific allocation.

B. Guidelines for Minor Repair

1. Keeping bridges cleared of debris is an important routine maintenance item in preventing or curtailing structural repairs.

- a. Abrasives and chemicals used in snow removal should be flushed from the bridge after each storm, if possible.
 - b. The bridge should receive a thorough cleaning at the end of the winter season.
 - c. Bridge seats, bearing assemblies, all joints and the lower chord of trusses shall be kept clean.
 - d. All scuppers and down drains should receive frequent attention to ensure proper functioning at all times.
 - e. Environmental considerations shall be addressed before bridge washings.
2. Brush should be kept cut under all bridges over land to reduce the fire hazard, and all debris accumulated against piers and abutments shall be removed as soon as possible.
 3. Debris and vegetation build-up should be removed from culverts and channels to ensure the proper hydraulic opening is maintained.
 4. Sign placement, repair, or replacement for bridge weight restrictions as required by Structure and Bridge Signage form SB503.
- C. Guidelines for Defects Requiring Major Repairs
1. Examples of defects requiring major repairs
 - a. Large spalls/potholes in concrete deck,
 - b. Complete replacement of timber decks,
 - c. Extensive washouts of approaches,
 - d. Damaged beams, girders or truss members,
 - e. Corroded steel members, and
 - f. Settlement of piers and abutments.
 2. In emergencies, the District S&B Engineer should be contacted immediately to determine the procedure to follow to restore the structure to a practical and safe level of service as soon as possible.

D. Recommended Frequency for Various Maintenance Tasks

| Maintenance Tasks for all Systems by recommended yearly frequency | |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| TASK | Recommended Frequency* |
| Bridge Deck Washing | Every year |
| Deck Sweeping | Every year |
| Seat and Beam Ends Washing | Every 2 years |
| Cutting and Removing Vegetation | Every 2 years |
| Routine Maintenance of Timber Structures | Every 2 years |
| Lubricate Bearing Devices | Every 4 years |
| Removing Debris from Culverts | Every 5 years |
| Scheduled Replacement of Pourable Joints | Every 6 years |
| Scheduled Replacement of Compression Seal Joints | Every 10 years |
| Beam Ends Painting | Every 10 years (At years 10 and 20. Replace paint system at year 30) |
| Scheduled Installation of Thin Epoxy Concrete Overlay | Every 15 years |
| *Or as necessary and determined from recommendations in the specific structure's safety inspection report | |

10.1.4 Procedure to Conduct Preventative Maintenance Activities:

A. Bridge Deck Washing

1. Include the removal and disposal of debris and pressure washing of the bridge roadway surface, joints, sidewalks, curbs, parapet walls, drainage grates, scuppers, and drain pipes.
2. All concrete decks and slabs without asphalt overlay.
3. Environmental Operating Procedures shall apply to State Forces and contractors during bridge washing procedures.

a. Primary Requirements

- i. Wash-water must not be allowed to discharge directly to the underlying waterbody. Discharges of this sort require an environmental permit from the Virginia Department of Environmental Quality (VDEQ).
- ii. Sediments and debris accumulated during the bridge washing procedures must not be disposed of in the underlying water body or on adjacent wetlands, if they exist.

b. Environmental Protection Procedures

- i. Utilize water from the underlying water body as wash water, whenever possible, unless there are drought conditions or your withdrawal would “dry” the water body.
- ii. Accumulated sediments or other debris must not be disposed within the underlying water body or adjacent wetlands. Sediments that have been swept or shoveled off the bridge deck may be placed along the right-of-way in a vegetated area along the bridge approach.
- iii. Wash-water shall be prevented from directly discharging to the underlying water body. All deck drains, scuppers, inlets and flumes on the structure shall be blocked during washing operations. For open-sided bridges such as corral-style (Kansas-style) bridges, berms must be placed along the sides to prevent wash-water from flowing over the sides and into the underlying water body. Wash-water may be directed to a vegetated area within the right-of-way, along the bridge approach; however, it must not be discharged to wetlands.
- iv. Painted surfaces must not be power-washed; however they may be “rinsed” at water pressures that will not cause paint chips to flake off.

B. Deck Sweeping

- 1. Include the removal and disposal of debris and sweeping of the bridge roadway surface, joints, sidewalks, and curbs.
- 2. All concrete decks and slabs with asphalt, metal decks, and timber decks and slabs.

C. Seat and Beam Ends Washing

1. Include the removal and disposal of debris and pressure washing of the bridge seat and bearing areas. Bridge seat and bearing areas to be cleaned include abutment seats, pier seats, bearing devices, the end five feet of beams and girders, and end diaphragms.

D. Cutting and Removing Vegetation

1. Include cutting, removing and disposing of vegetation, brush and trees that are on, adjacent to, or under bridges that cross over waterways.

E. Routine Maintenance of Timber Structures

1. Include tightening and/or replacing fasteners such as those used on timber decks, railing systems, and other miscellaneous connections. Sealing end sections of timber elements, such as deck boards, bent caps, railings, posts, etc.

F. Lubricate Bearing Devices

1. Include removal and disposal of debris, and lubricating moveable type of bearings.

G. Removing Debris From Culverts

1. Include the removal and disposal of debris that is collected inside and/or at inlets or outlets of box and pipe culverts.

H. Scheduled Replacement of Pourable Joints

1. Include removal of existing joint material, prepare and install new joint material.
2. For planning and budgeting purposes for this type of joints in the PM program, only joints that are in good condition will be considered. Joints that are not in good condition will be accounted for and addressed in Pontis (BMS).

I. Scheduled Replacement of Compression Seal Joints

1. Include removal of existing joint material, prepare and install new joint material.

2. For planning and budgeting purposes for this type of joints in the PM program, only joints that are in good condition will be considered. Joints that are not in good condition will be accounted for and addressed in Pontis (BMS).
- J. Beam Ends Painting
1. Include preparing and over coating the end 5 feet of painted steel beams or girders that are located under open joints, except for bridges with timber decks.
 2. For planning and budgeting purposes in this program, only steel members that are in overall good condition will be considered. Steel members that are not in good condition will be accounted for and addressed in Pontis (BMS).
- K. Scheduled Installation of Thin Epoxy Concrete Overlay
1. Include the installation of new overlay system and or replacement of existing overlay systems.
 2. Only bridge decks that are in overall good condition are considered in this program.
- L. Vehicle Weight Restriction Signage Placement
1. The District's Structure and Bridge Engineer or designee will complete the Bridge Signage Form SB503 through the Sharepoint online. The completed form from the App identifies the appropriate signage, weight restrictions and a required completion date for new bridge signage installation/placement. The App's workflow will then forwarded to the appropriate VDOT residency/area headquarters or other sections for sign fabrication and placement. Sign fabrication and placement should be in accordance with Traffic Engineering recommendations.
 2. When bridge weight restriction are changed and/or new signage placed, the VDOT Residency or Local Government Liaison/District Communication will be responsible for outreach to local government agencies, local emergency services, regional asphalt industry, Virginia Transportation Construction Alliance (VTCA) and the Virginia Trucking Association. This notification is in addition to the statewide monthly CO Structure & Bridge notifications and subscription services.

Where the Interstate, Arterial, or Toll Road system provides an interchange within a municipality charged with the responsibility for maintenance of its street systems, the Department will be responsible for the maintenance of the complete highway facility within the interchange. Under this provision, maintenance payment will not be paid to any municipality for street or road mileage maintained by VDOT. Municipalities desiring to maintain municipal streets passing through Interstate, Arterial, or toll interchanges may maintain such streets in accordance with following Bridge Maintenance Reasonability Table.

The maintenance of interchanges and grade separation bridges at all intersections of Interstate and Primary routes, including Arlington and Henrico counties, will be the responsibility of VDOT.

| Options | Bridge Maintenance Responsibility | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------|
| | City or Town | County (ALL) |
| <u>Interchange</u> | VDOT | VDOT |
| <u>Grade Separation Structure (Interstate over road)</u> | | |
| Interstate Structure | VDOT | VDOT |
| Roadway below Structure | City or Town | VDOT |
| <u>Grade Separation Structure (Interstate under road)</u> | | |
| Interstate | VDOT | VDOT |
| Road Structure over Interstate | | |
| Surface, Sidewalks, and Approach Roadways ⁺ | City or Town | VDOT |
| Remainder of the Structure* | VDOT | VDOT |
| <p>+ The practical extent of the responsibility is snow removal, pavement marking, and keeping the sidewalk and bridge surface clear of debris.</p> <p>*Including handrails, guardrails, repairs to the structure, roadway slab and slopes beyond the shoulder line</p> | | |

11. OFFENDER LABOR

Asset Type:

OFFENDER LABOR

Policy: Virginia Department of Transportation (VDOT) uses Offender labor for maintenance activities along roadways in select rural areas statewide. Supervised Offenders are authorized to perform such work based on a joint Memorandum of Agreement (MOA) between VDOT and the Virginia Department of Corrections (DOC). Security and safety concerns prohibit the use of Offender labor in urban areas such as Richmond, Northern Virginia, Williamsburg, Virginia Beach, etc.

11.1 Use of Offender Labor for Maintenance Activities

11.1.1 Activity Description: Actions needed for the Virginia Department of Transportation to effectively and safely use Offender labor, under the supervision of the Department of Corrections, for performing maintenance activities.

11.1.2 Purpose of Activity: To provide favorable conditions for effective and safe use of offender labor by the Virginia Department of Transportation in performing labor-intensive maintenance activities such as litter pick-up, brush cutting, hand mowing, and culvert cleaning.

11.1.3 General Guidelines:

A. Certified VDOT Foreman

1. A Certified VDOT Foreman is a VDOT employee certified by the DOC/DCJS to supervise inmates and carry a weapon.
2. The DOC Facility Warden and/or Superintendent shall swear in each VDOT employee who becomes certified to supervise offenders. This oath protects the VDOT employee in case it should become necessary for him/her to shoot to prevent escape or to protect others.
3. All VDOT employees seeking to become Certified VDOT Foremen shall satisfactorily complete a Department of Corrections (DOC)/ Department of Criminal Justice (DCJS) approved training course. After initial training, Certified VDOT Foremen shall repeat in-service training annually to maintain credential.
4. Before a VDOT employee starts the DOC/DCJS training, he/she must have a National Crime Information Center (NCIC) background check. This is to determine that the VDOT candidate has no felony convictions that would prohibit him/her from certification to carry weapons. The DOC will perform the background check.

5. The Certified VDOT Foreman will be authorized to carry a firearm, although it is only required when providing relief for the Corrections Officer. Firearms will be issued by and will be the responsibility of the DOC.
6. Certified VDOT Foremen will have the option of receiving Hepatitis B vaccinations for their personal protection if they so choose. VDOT will pay for any associated vaccinations necessary to safely supervise offenders. The Certified VDOT Foreman should also have an annual TB test.

B. Prohibited Work Areas

1. Offender labor shall NOT be used within the following areas.
 - a. The intent is to prohibit work in areas that would interfere with supervision or allow public contact. Further, discretion must be exercised in the daily work schedule and location; for example, offenders may not work around schools in sessions or churches during service.
 - i. Within the boundaries of any city or town unless specifically exempted by the DOC.
 - ii. Within any outlying part of a city or town, to include any smaller adjacent community, residential neighborhood or subdivisions and shopping centers.
 - iii. Interstate highways except as otherwise provided in the section Approved Work Areas
 - iv. Within 50 yards of businesses or homes at interchanges
 - v. Within villages and subdivisions along highway and roads
 - vi. Within 50 yards of businesses at intersections and along highways and roads
 - vii. Within 200 yards of a school that is in session
 - viii. VDOT facilities except as specifically authorized.

C. Approved Work Areas and Activities

1. Effective July 1, 2011, offender labor may be used along the Interstate Highway System only for maintenance at rest areas, provided that such

maintenance activities do not jeopardize public safety and are jointly approved by the DOC and VDOT.

2. Offender labor may be used along rural portions of primary and secondary highways and roads except in villages, subdivisions or with 50 yards of any built-up area(s) (e.g. crossroads or intersections with gas stations, convenience stores, homes). The terms “village” and “built-up area” refer to communities consisting generally of a few homes, a store, a church, and in some cases a post office.
3. Offender labor may be used along any other state maintained road, in addition to rural portions of primary and secondary highways, provided that such road meets all other requirements of primary and secondary highways and use of offender labor does not otherwise violate the provisions of the section on prohibited work areas and does not jeopardize public safety.
4. Offender labor may be used within rural areas of the cities of Chesapeake and Suffolk, and other approved towns and cities, subject to the same restrictions as in primary and secondary highways.
5. Marked maps showing the work areas permitted shall be maintained in each Residency and/or VDOT Area Headquarters and DOC Facility. The Maps should be updated at least annually to reflect changes in land usage.

D. Use of Offender Labor for Emergency Work

1. VDOT may use offenders on emergency highway work at all times, including holidays, Saturdays or Sundays. VDOT officials, in coordination with the DOC Facility Warden or Superintendent, will determine when an emergency exists. In such cases, the VDOT responsible manager or designee and the DOC Facility Warden and/or Superintendent shall assign such offenders to the VDOT work as are deemed necessary.
2. Offenders working under armed supervision shall not be outside of the security perimeter after dark.

E. Equipment for use by Offender Labor

1. Satisfactory clothing, safety helmets, eye and ear protection, gloves, boots and shoes shall be made available by the DOC.
2. VDOT will high-visibility safety apparel vests and chain saw chaps as necessary.

3. Offenders are not authorized to have footwear constructed with steel reinforcement.
4. An offender may operate all maintenance equipment where adequate security measures can be taken.
5. The VDOT responsible manager or designee is responsible for determining whether the offender(s) can safely operate the equipment.
6. VDOT will provide for offender training upon all equipment provided by VDOT.
7. VDOT will supply all necessary hand tools and power equipment to perform assigned tasks and will transport these tools and equipment to and from the work site.
8. VDOT will furnish and arrange the transportation of portable toilet facilities to the site if required.

F. Transportation

1. VDOT will be responsible for all costs associated with offender transportation, portal to portal.
2. VDOT will provide, furnish and maintain appropriate transportation to pick up, deliver and drop off offenders to and from work sites.

11.1.4 Procedures for Using Offender Labor:

A. Supervision

1. Offenders shall not be left unguarded or unsupervised at any time.
2. Under no condition shall the Certified VDOT Foreman engage in disruptive behavior with offenders or engage in or permit the use of obscenity by any offender under his or her control. He/she shall at all times deal with the offender(s) in a fair and impartial manner³.
3. Under no circumstances shall a Certified VDOT Foreman offer to or accept from an offender any special favors of any nature (e.g. gifts of food, drink, cigarettes or other contraband, or any other special favors). Any such activities shall be addressed under the Standards of Conduct⁴.

³ DHRM Policies and Procedures Manual, Policy #1.60. ⁴ DHRM Policies and Procedures Manual, Policy #1.60, DOC Policy 130.1.

4. If a Certified VDOT Foreman supervising offenders gives instructions that are not obeyed, the Certified VDOT Foreman shall repeat the instructions in the presence of the Corrections Officer. If the offender(s) still refuse to obey the instructions, the Certified VDOT Foreman will ask the Corrections Officer to issue the instructions. The Corrections Officer will handle the procedure from this point.
5. All unsatisfactory work or misbehavior shall be reported to the DOC Facility Warden and/or Superintendent after the Certified VDOT Foreman and Corrections Officer have talked to the offender and given him a chance to correct his behavior. The Certified VDOT Foreman may dock the offender's hours and/or the Corrections Officer may issue a charge.
6. Any object found by an offender is to be turned over to the Corrections Officer. VDOT employees are not to assume responsibility for any objects found by offenders.
7. A VDOT employee shall immediately report the following information to the Corrections Officer if the employee:
 - a. observes an offender in the act of finding and pocketing an object or contraband, or
 - b. observes an offender in possession of a found object or contraband.
8. During cold or inclement weather, the DOC Facility Warden and/or Superintendent will determine whether conditions are suitable for offenders to work. Effort should be made to find more desirable work under such conditions.

B. Rules Violations and Disciplinary Reports

1. The prosecution of offenders for violation of work rules and regulations shall follow DOC procedures. To ensure that DOC procedures are followed, a disciplinary report on violations shall be prepared by a member of the staff of the DOC when possible. This step will also reduce the possibility of VDOT employees having to appear before the Offender Hearing Officer.
2. The preparation of a disciplinary report by DOC staff does not prohibit the presence of the Certified VDOT Foreman or other VDOT employee(s) at the hearing as a witness if required⁵. The Certified VDOT Foreman will be responsible to complete witness forms or "Reporting Officer response forms" as required by offense codes that do not also require the presence of the Reporting Officer. If a VDOT employee is required to be present, he/she shall make every effort to be present.

C. Daily Work Crew Location and Communication

1. The VDOT responsible manager or designee shall advise the DOC Facility Warden and/or Superintendent or designee where each offender work crew, or group of offenders, will be located each day. The route or routes and approximate location will be furnished so that the DOC Facility Warden and/or Superintendent will be able to locate any or all offenders without difficulty should necessity require.
2. A vehicle equipped with a state radio or alternate approved communication device shall remain with each offender work crew to be available for any emergency and to facilitate communication. At a minimum one communication device (cellular phone, radio, or pager) should be assigned to each Corrections Officer before he/she leave the DOC facility.
3. When offenders are employed on maintenance work in a given maintenance area, it will be satisfactory for information to be kept posted at the requesting VDOT facility showing the exact location of all working offenders. This information should also contain any planned change(s) in location(s) of offenders during the day.
4. The DOC is required to notify the locality of all offenders assigned to perform work in the community.

D. Timesheets and Payment

1. Sufficient copies of time sheets should be made so that one copy is furnished to the DOC facility and one copy retained for the files of the VDOT responsible manager or designee. All time sheets should be properly checked and signed by the VDOT responsible manager or designee, and the DOC Facility Warden and/or designee.
2. Payment will be made based upon a signed time sheet from portal to portal. Payment will be remitted in accordance with the Virginia Prompt Payment Act. VDOT will process the payment through electronic data interchange (EDI) to the DOC.

E. Transportation of Sick or Injured Offenders

1. In cases of medical emergency when an offender falls sick or sustains a personal injury while on site, the DOC facility shall be notified and the Corrections officer shall abide by the DOC facility's instructions.

2. The Certified VDOT Foreman should request that the sick or injured offender be picked up, if possible, by the DOC facility to be returned to the DOC facility, provided that first aid and proper treatment are available there. This practice allows the remainder of the offender work crew to remain working at the site. The Corrections Officer shall administer all on-site first aid and medical attention.
3. If the DOC facility deems it necessary, the sick or injured offender should be taken directly to the nearest physician, hospital, etc., for immediate treatment. The Corrections Officer, armed with a handgun, shall escort the offender into the emergency room or medical facility. The Certified VDOT Foreman shall remain at the transport vehicle with a weapon providing security for the remainder of the offenders.

F. Escape of Offenders While in Custody of VDOT Employees

1. The responsible VDOT employee in the field at the site of the escape must immediately notify the District Duty Officer by contacting the supervising Residency office, relaying the escape information, and requesting notification of the District Duty Officer.
2. If an escape is either attempted or occurs, the Certified VDOT Foreman and DOC officer will end work at the site for the day. The remaining offender work crew will return to the DOC facility.
3. The responsibility to locate and return the escapee rests with DOC and local law enforcement, not with VDOT.
4. VDOT will assist, at the request of the DOC or law enforcement, with local traffic control for detours or blockades to help in the recapture effort.
5. The VDOT District Duty Officer is responsible for immediately notifying all concerned District parties;
 - a. The Residency Administrator in charge of the offender work crew
 - b. The District Maintenance Manager
 - c. The District Human Resources Manager
 - d. The District Administrator
6. In the event that the escape situation is protracted, and other crimes are being committed during the offender(s) escape, the VDOT District Duty Officer is to keep the District Administrator informed by telephone throughout the situation.

7. The VDOT District Duty Officer is responsible for notifying the corresponding Duty Officer for the Central Office. The Central Office Duty Officer is responsible for immediately notifying all concerned Central Office parties, including:
 - a. The State Maintenance Engineer
 - b. The Human Resources Division Administrator
 - c. The Chief of System Operations
 - d. The Chief Deputy Commissioner
 - e. The VDOT Commissioner
8. After the escape situation has been resolved, VDOT will require a thorough investigation and report on the escape. This report shall be prepared under the supervision of the Residency Administrator and District Maintenance Manager. Report drafts will be coordinated with the DOC Facility Warden. Once parties have completed their investigation and final report, the report should be reviewed and approved by the District Administrator.
9. Once the District Administrator has approved a final report, it will be forwarded to the Maintenance Division Administrator, the Human Resources Division Administrator, the Chief of System Operations, the Deputy Chief Commissioner, and the VDOT Commissioner.
10. The investigation and report on escape are necessary to document the actions VDOT employee at the time of, and immediately following, the escape. After review and approval by the VDOT Commissioner or designee, the VDOT investigative report shall be forwarded to the DOC.
11. Each investigative report of an escape shall include the following information:
 - a. A statement from the VDOT employee in charge of the offender(s) at the time of escape, describing the employee's actions during and immediately after the escape, with appropriate times, date and locations.
 - b. A report from the VDOT Residency Administrator on the situation surrounding the escape and immediately after the escape, including recommendations as to the conduct of the VDOT employee in charge of the offender(s) at the time of the escape.

- c. A copy of the standard Escape and Recapture Form, prepared by the DOC Facility Warden and/or Superintendent will be included as part of the investigation report.
- d. A cover memorandum from the Residency Administrator with recommendations regarding the escape and regarding the conduct of the VDOT employee(s) will accompany the report.

12. ROLES AND RESPONSIBILITIES

Asset Type:

ROLES AND RESPONSIBILITIES

12.1 Maintenance Program Basic Objectives

The basic objective of the Department is to plan, construct, operate, and maintain a system of state highways that is adequate to meet the highway transportation needs of the Commonwealth of Virginia. The Department as a public agency uses public funds for these services. As such, all VDOT employees are custodians of tax payer funds. Within this basic objective, the major objectives of the Department's maintenance function are to maintain and operate the highway system in a manner such that:

- A. Comfort, convenience and safety are afforded to the traveling public.
- B. The investment in roads, bridges, special facilities, and other assets is preserved or enhanced.
- C. The aesthetics and the compatibility of the highway system with the environment are preserved or enhanced.
- D. Appropriate investment programs and operational strategies to achieve the Department's performance targets are implemented.
- E. Customer satisfaction through timely and economical delivery of quality services is achieved.

12.1.1 Work Priorities:

- A. First priority in all maintenance work shall be work that is directed specifically to the immediate safety of the traveling public.
- B. Second priority shall be work in clearing accidents and impediments to traffic flow.
- C. Third priority shall be those maintenance activities contributing primarily to the preservation of the assets in an as constructed or subsequently improved condition.

12.1.2 Preservation of Assets:

- A. It is the objective of the Department to maintain all roads, bridges, and special facilities in an "as constructed" or subsequently improved condition to ensure that the public investment for transportation infrastructure is preserved.
- B. An integral component of asset preservation is the systematic application of preventative maintenance.

- C. Routine maintenance work should receive highest priority. Restorative planned work, which will be done in a reasonable length of time provided funds are available, should be the only reason for deferring routine maintenance.

12.1.3 Environmental Considerations:

- A. Maintenance operations shall be performed in such a manner that air, water, and noise pollution are kept within established criteria as administered by VDOT's Environmental Division.
- B. The maintenance of the roadside should be directed toward the preservation or enhancement of the natural beauty of the highway right of way and the highway corridor. Special emphasis shall be directed toward the control of roadside erosion.

12.1.4 Maximize Performance Improvements:

- A. To provide a highway system adequate to meet the needs of the State, the goal of the Maintenance Program is to maintain all roads with efficient implementation of appropriate strategies to maximize the preservation of investment and service to the traveling public.
- B. Further, it is the goal of the Maintenance Program to constantly improve the performance of the maintenance programs through a process of continuous improvements.
- C. To further assure that consistent levels of maintenance are attained statewide on all systems, maintenance budgets should be developed based on needs based programs and consistent levels- of-service.

12.2 Maintenance Program Areas and Activities

Following program areas include primary maintenance activities to achieve the Department's objectives, for which Operational and best practices guidelines, based on current state of the industry practices have been developed here in this manual.

- A. Safety
- B. Emergency Operations
- C. Snow and Ice Control
- D. Roadway Surfaces
- E. Structures
- F. Traffic Control Devices

G. Roadway Drainage

H. Offender Labor

I. Rest Areas

12.3 Maintenance Organizational Structure

The manner in which the Department is organized is such that at each major level in the Department, managers are concerned, and responsible for, not only maintenance duties, but also operations, administrative and related construction duties and activities. As such, the administration and management of the Maintenance and Operations (M&O) Programs is integrated with these other functions.

As indicated in the attached current organizational structure of VDOT this inclusive responsibility promotes better communication between various units and sections in the Department and promotes an atmosphere in which issues may be more easily resolved.

For maintenance and operations programs, the Department's responsibilities are placed around the following positions;

- A. Commonwealth Transportation Board
- B. Commonwealth Transportation Commissioner
- C. Transportation Commissioner's Staff
- D. State Maintenance Director
- E. District Administrator
- F. District Maintenance Engineer
- G. Residency Administrator
- H. Assistant Residency Administrator
- I. Residency Maintenance Operations Manager
- J. Maintenance Superintendent
- K. Maintenance Supervisor
- L. Maintenance Crew Member

12.3.1 Commonwealth Transportation Board:

- A. The Commonwealth Transportation Board (CTB) directs and controls highway affairs in the Commonwealth of Virginia and has such specific responsibilities as are recorded in Title 33.1 of the Code of Virginia, Article 1, and other appropriate sections of the Code.
- B. General Powers and duties of the CTB are documented in the Code, § 33.1-12. The Secretary of Transportation shall serve as Chairman of the Board. The Commonwealth Transportation Commissioner shall serve as Vice-Chairman of the Board.

12.3.2 Commonwealth Transportation Commissioner:

- A. The Commonwealth Transportation Commissioner is the Chief Executive Officer of the Virginia Department of Transportation and is charged with the responsibility for constructing, improving, operating, and maintaining the roads in the systems of State Highways.
- B. Duties of the Commissioner are authorized in the Code § 33.1-13 and other appropriate sections of the Code.

12.3.3 Commissioner's Staff: The Commissioner's Staff consists of the following positions;

- A. Chief Deputy Commissioner/Chief Operating Officer
- B. Chief Engineer
- C. Deputy Chief Engineer
- D. Chief of Policy
- E. Chief of Administration
- F. Chief Financial Officer
- G. Chief of Planning and Programming
- H. Construction Division Administrator
- I. Location and Design Division Administrator
- J. Maintenance Division Administrator
- K. Materials Division Administrator
- L. Operations Division Administrator
- M. Structure and Bridge Division Administrator

N. Traffic Engineering Division Administrator

O. Nine District Administrators

12.4 Maintenance Division Responsibilities

The Maintenance Division directs the Department's Maintenance Program on the Interstate, Primary and Secondary highway systems, and directs the Central Office programs/sections for Equipment Management, Infrastructure Management, and Infrastructure Systems Management. The division provides policies, guidelines, and procedures for Maintenance operation. Also, it provides guidance, input, and assistance to other Divisions in matters pertaining to Maintenance Program.

- A. More specifically, the Maintenance Division is responsible for the activities listed below. These are Department-wide responsibilities and are shared and /or coordinated with the Districts.
- B. Directs the Department's Maintenance Program on the Interstate, Primary and Secondary highway system.
- C. Directs the Central Office programs of Equipment Management, Infrastructure Management, and Infrastructure Systems Management.
- D. Exercises oversight over the statewide conduct of the maintenance function and evaluates the progress and performance of operating units.
- E. Participates in the operating, deliberations and decisions of the Department as they affect the Maintenance Program, assuring that the efforts of other divisions complement the overall objectives of the maintenance function.
- F. Directs the preparation and authorizes distribution of directives, best practices, procedures, performance measures, quality standards and other items of general use for field personnel.
- G. Actively participates at the state-wide meetings, including TEMOC, to provide guidance, solicit input, and take necessary actions for appropriate coordination of all matters related to planning, development, implementation, and achievement of maintenance programs goals.
- H. Works with VDOT Training Academy to identify the training needs of all, develop training programs, and facilitates the trainings.
- I. Conducts research and analysis directed toward improvement of Maintenance methods and management, and the impact of Legislation and Departmental policies on the conduct of Maintenance.
- J. Works with District Administrators and other field staff to establish appropriate staffing levels for maintenance functions.

- K. Supports the districts in the development and implementation of all maintenance related plans and programs including the development of Maintenance budgets.

12.5 Maintenance Field Organization – Area Headquarters, Residencies, and District Sections

The VDOT field Organizational units/groups responsible for maintenance programs include area headquarters, residencies, and various sections within districts (primarily infrastructure management, structure and bridge, equipment, as well as other District sections responsible for planning, design, construction, and operation).

In general, the field organizational units --i.e., the District, including various Sections, Residencies, and Area Headquarters are responsible for the implementation and delivery for the maintenance practices. The area headquarters serve as the fundamental operational unit used by maintenance employees. The location and number of area headquarters are set to best serve the business needs of the transportation system within a defined geographical area. A residency has the responsibility for maintenance of the highway system within one or more counties. A district consists of several residencies; and a Residency consists of several Area Headquarters.

The VDOT District Administration Offices throughout the Commonwealth of Virginia are;

1. Bristol
2. Salem
3. Lynchburg
4. Richmond
5. Hampton Roads
6. Fredericksburg
7. Culpeper
8. Staunton
9. Northern Virginia



12.6 Area Headquarters – Roles and Responsibilities

- 11.6.1 Area Headquarters Roles: Maintenance Crew Members operate from the area headquarters. They serve as the boot-on-the-ground that have the day to day interaction with the traveling public. A team of Maintenance Crew Members are

overseen by a Maintenance Supervisor. All employees at the Area Headquarters are supervised and managed by a Maintenance Superintendent that also resides at the area headquarters. These three positions provide the “hands-on” implementation of the required maintenance services.

11.6.2 Area Headquarters Responsibilities: The Area Headquarters has the responsibility to provide essential maintenance and operations activities. The Area Headquarter staff direct all maintenance and operations in an area with particular emphasis on the planning and scheduling of work and the implementation of proper operational methods.

Key responsibilities include;

A. Inspection

1. Inspects roads for preventive maintenance, maintenance restoration and operation’s needs, and makes recommendations to the Residency.
2. Inspects all completed maintenance and construction work for workmanship and level of service.

B. Maintenance Operations

1. Determines the needs for routine maintenance and prepares short-term work schedules within general plans.
2. Makes specific personnel and equipment assignments to specific activities and instructs Maintenance Crew Members on work to be done, special considerations, materials and traffic control.
3. Directs the reporting of maintenance and operations work completed and the preparation of cost documents for labor, equipment, materials and accomplishments.
4. Prepares general plans, based on guidelines and performance Standards, showing the amount of work to be done within the geographical area related to the Area Headquarters on each activity with seasonal variations.
5. Monitors progress of area crews against planned amounts of work and productivity of individual operations, against performance Standards.

6. Controls the number of personnel, amount of equipment and rate of materials usage, to ensure that expenditures stay within budgeted amounts.

C. Personnel Development

1. Conducts on-the-job training and makes recommendations, concerning special training desirable for his or her personnel.
2. Evaluates the performance and potential of personnel and recommends personnel action indicated.
3. Recruits and screens personnel for field maintenance positions and recommends hiring.
4. Instructs area personnel in the use of proper methodology and criteria for evaluating employee performance.
5. Reviews the training needs of the Residency and recommends specific programs to the Residency for action.

12.7 Residencies – Roles and Responsibilities

12.7.1 Residency Roles: The Maintenance Superintendents are overseen by the Residency Maintenance Operations Manager (MOM). The MOM is responsible for all maintenance work performed in the assigned geographical area of the county(s) under the administration of residency. This responsibility involves a regular review of all roads under his or her jurisdiction for maintenance requirements and for consistency of service among the various maintenance areas.

One or more superintendents may be supervised by one MOM. Also, depending on its size of the Residency, the Residency may have one or more MOMs for maintenance programs within one or more Counties

The MOM works under supervision and guidance of the Assistant Residency Administrator (ARA) and the Residency Administrators (RA) are concerned, and responsible for, not only maintenance duties, but also operations, administrative and related construction duties and activities. These three positions provide primarily oversight, support, and guidance to the area headquarters to provide the required maintenance services.

12.7.2 Residency Responsibilities: The Residency has the responsibility to ensure the coordination, integration and management of VDOT resources that impact the Residency program as it supports VDOT's mission. The Residency staff directs all Department activities in a geographic region, ranging in size from one to four counties, with primary emphasis on construction inspection, maintenance of all

systems, and the conduct of the Department's local public relations activities. The Residency staff serves as the focal point for all VDOT services in the residency.

Key responsibilities include;

A. Oversight

1. Reviews quality of completed work, additional needs, and the levels of service attained within the residency.
2. Reviews performance problems with Area Headquarter personnel and provides guidance as to methods, priorities and other assistance as may be required.
3. Reviews operations for compliance with agency, state, and federal environmental regulations and Dashboard goal.
4. Reviews the use of personnel and equipment, performance achieved and progress of individual areas, against maintenance plans.
5. Reviews public complaints concerning maintenance and directs necessary corrective actions.

B. Public Outreach

1. Communicates with a cross section of stakeholders (legislators, citizens, government/VDOT officials, and employees) to provide appropriate and authoritative information about business plans and actions, and to receive feedback so that transportation goals may be achieved.
2. Facilitates discussions on sensitive land development issues between local, private, and technical staff.

C. Management Support

1. Provides general direction for residency maintenance and operations personnel and technical assistance on matters relating to maintenance and operations.
2. Directs the maintenance training program in the residency.
3. Works with local government and is their liaison with VDOT maintenance functions, especially as those functions impact the local geographic region of the residency.

4. Leads and manages the residency team to deliver programs and service to ensure that internal and external customers are provided quality and professional service.
5. Actively works with District engineering, construction, traffic engineering etc. staff to provide local context and direction regarding project delivery and to receive briefings on project scope and status.
6. Communicates and coordinates with Area Construction Engineers to ensure projects are constructed to meet project intent and does not pose any future maintenance issues.

D. Programming and Budgeting

1. Prepares programs and budgets for preventive maintenance, maintenance restoration and operations, as appropriate.
2. Works with appropriate District staff to develop SYP priorities, programs, and strategies.
3. Administers maintenance budgets and projects effectively to meet Dashboard targets.
4. Appropriately utilizes available staff to ensure and reflect the most effective management of budgets and resources for the Citizens of the Commonwealth.
5. Manages fiscal, inventory, and budget programs to support the District's Dashboard targets within these areas.
6. Develops sound and thorough budget requests. Ensures allocated funds are effectively utilized to address business needs and expenditures do not exceed allocations.
7. Reviews recommendations from Residency Transportation Operations Managers concerning major maintenance and operation's needs.
8. Controls the number of people, equipment assignment, materials usage and the amount of contract maintenance scheduled for the residency, based upon approved authorizations, policies and procedures.

12.8 Districts – Roles and Responsibilities

- 12.8.1 District Roles: As assistant to District administrator for maintenance programs, the District Maintenance Engineer (DME) directly oversees and is responsible for all maintenance-related programs and activities performed by various Residencies

and District sections, either sections which are totally responsible for maintenance-related activities, such as Equipment or Infrastructure Management, or those with responsibilities for maintenance as well as programs in construction, planning, administration, or operations. These District sections include;

- A. Equipment
- B. Infrastructure Management
- C. Materials
- D. Bridge and Structures
- E. Traffic Engineering
- F. Environmental
- G. Location and Design
- H. Contract Administration

Furthermore, the DME advises the District Administrator who is responsible to assure allocated funds are effectively and efficiently utilized for addressing the needs of all assets and services under the responsibility of the District, and that all residencies within his or her jurisdiction are providing equivalent levels of service that are consistent with Maintenance Directives and Best Practices.

12.8.2 District Responsibilities: The District has the ultimate responsibility and authority for the District's maintenance programs in terms of budget, planning, implementation, and oversight for meeting performance objectives within the available resources. The District staff provides technical guidance and assistance to residency personnel on all matters relating to maintenance.

Key responsibilities include;

- A. Oversight
 - 1. Directs and conducts the district's maintenance quality control program.
 - 2. Directs the maintenance training program for the district and conducts various training sessions.
- B. Management Support
 - 1. Provides technical guidance and assistance to residency personnel on all matters concerning Maintenance Program.

2. As needed, coordinates with State Maintenance Director and his/her assistants or program managers, involving review of plans, policies, best practices, procedures, reports and other matters relating to the District Maintenance Program.
3. Coordinates maintenance work with the needs and schedules of other district sections and arranges for services related to the Maintenance Program with the District Bridge, pavement management, asset data collection, equipment, traffic engineering, environmental, and materials sections, as well as coordination with Regional Operations Directors.
4. Reviews district maintenance personnel needs, recruiting and training goals, and personnel actions recommended by the Residency.
5. Coordinates the transfer of equipment between residencies.

C. Planning

1. Conducts the district's planning responsibility for maintenance, involving the utilization of forecasts, performance and procedural information from the Maintenance Division. Reviews and furnishes assistance to the residencies concerning residency plans.
2. Periodically reviews residency organization, equipment, staffing and facilities.
3. Ensures the soundness/appropriateness of the planning of work by the residency crews.

D. Budgeting

1. Prepares maintenance budgets and contracts maintenance projects for the district, based upon recommendations from the Residency and District Sections.
2. Controls residency maintenance expenditures in relation to budget allocations.

13. GENERAL ENVIRONMENTAL REQUIREMENTS

Asset Type:

GENERAL ENVIRONMENTAL REQUIREMENTS

13.1 Facility Compliance

Most VDOT roadway maintenance activities begin at the Area Headquarters (AHQ) / storage lot or the Residency / District Complex, where equipment and supplies such as stone, pipe, fuel, salt etc. are stored. Likewise most equipment repairs occur at select facilities with Maintenance Shops. Environmental Division developed a number of training and guidance modules to support Maintenance staff in complying with the numerous environmental requirements related to facility management operations. This information can also be used as a reference for roadway maintenance activities

The following sub-sections highlight important environmental compliance assistance tools.

13.1.1 Waste Management and Pollution Prevention Guide (WMPPG): While most of the individual guides were written in the context of a facility, many also apply to roadway activities. In addition to the individual guides, there are several appendices that detail various programmatic approaches and agreements applicable to both Maintenance facility and road way operations. The [Facility Waste Management and Pollution Prevention Guide](#) and [Appendices](#) are located on the [Environmental Compliance Sharepoint Site](#).

13.1.2 Facility Stormwater Pollution Prevention Plans (SWPPP): Per the MS4 Permit, a Facility Stormwater Pollution Prevention Plan (SWPPP) is required for each high priority facility in a Census Urban Area. The SWPPP details the various potential pollutants at the site and the controls needed to prevent pollutants from entering stormwater, which is largely based on the WMPPG. Facility SWPPPs require monthly and annual inspections and initial and annual training of personnel. NOTE: The [MS4 Facility SWPPP](#) is distinct from a Capital Outlay Construction or Maintenance Project SWPPP associated with land disturbing activities.

Details regarding the [MS4 Facility SWPPP](#) are found on the Environmental Compliance Sharepoint Site.

13.1.3 Good Housekeeping and Pollution Prevention Training: Regulatory requirements and specifically, VDOT's MS4 Permit, have various training requirements for VDOT employees and contractors working in the regulated MS4 area associated with good housekeeping and pollution prevention, waste management and disposal, SPCC, SWPPP and IDDE. To meet these training needs the Environmental Division has developed various on-line multi-media training modules and in-person training options. The on-line modules currently offered are listed on the [Environmental Compliance Training Sharepoint Site](#).

13.1.4 Facility Compliance Assessment Program: In addition to providing program

guidance and procedure, the Environmental Division implements a Facility Compliance Assessment Program. The Program consists of a full compliance assessment at each VDOT facility once every three years. Facilities that are located within the MS4 Area are evaluated once a year. A report of the assessment finding is submitted to each facility and the Residency and District Administration. The report details any compliance findings, along with a map and photos. Corrective actions closeout will be documented in the CEDAR Facility Compliance Module, primarily by AHQ, Residency and District Maintenance Staff. For more information regarding the Environmental Compliance Assessment Program, contact the Central Office Environmental Compliance Section at ENVCOMPLIANCE@VDOT.Virginia.Gov.

13.1.5 Facility Compliance Tracking in CEDAR: The Environmental Division developed the CEDAR Facility Compliance Module to assist Maintenance Facility staff and managers more efficiently manage their environmental requirements. A few features of the database include:

- A. A compliance documentation repository,
- B. Facility compliance details such as wastes generated, storage tank capacities and containment, salt infrastructure features, etc.,
- C. Mobile data collection technology for the Facility and MS4 Compliance Assessments and the Spill Prevention Control and Countermeasures (SPCC) and Storm Water Pollution Prevention Plans (SWPPP) Monthly and Annual Inspections;
- D. Corrective Action Tracking for Monthly and Annual SPCC/SWPPP Inspection and Facility and MS4 Compliance Assessments ;
- E. Console View for Managers to review status of inspections and corrective actions

For more information regarding the system use, access permissions, user guides, job aides and general questions contact the Central Office Environmental Compliance Section at ENVCOMPLIANCE@VDOT.Virginia.Gov or visit the CEDAR Facility Compliance Module Sharepoint site.

13.2 Environmental Clearances for Emergency Projects/Activities

Maintenance projects and maintenance activities that are performed in response to emergency events such as flooding still require environmental review, however, allowances for expedited or even after-the-fact environmental clearances are provided to ensure that roadway functionality is promptly restored. A link to the procedures is here:

[Link]

13.3 Cultural Resources – General Awareness

Many different Cultural resources can be present within VDOT right of way. Some of the most common include archaeological sites, Civil War earthworks, family cemeteries or graveyards, navigation canals, buildings, structures, and bridges, as well as objects such as signboards/posts, milestones, commemorative markers, boundary markers, and stone walls (click here for example pictures). Maintenance crews should always be alert to the possibility of encountering cultural resources during maintenance activities and projects and should contact District Cultural Resources staff if a cultural resource is discovered while performing work. If a cultural resource has previously been identified or discovered during maintenance work, VDOT has management guidelines to ensure that the resource is protected (Click here for [Management Considerations for Cultural Resources in Virginia Department of Transportation Rights of Way](#))

If the ownership and/or historic significance of a resource is uncertain especially in prescriptive ROW, these issues should be resolved between District Right-of Way staff (for ownership) and District Cultural Resources staff (for historic significance) avoid maintenance project/activity delays.



Figure 1. Civil War Earthworks, Henrico County



Figure 2. Commemorative Civil War Historical Marker, Spotsylvania County



Figure 3. Historic Stone Wall, Alleghany County



Figure 4. WPA Stone Guttering, Westmoreland County



Figure 5. Sign Rock at Valentine's , Brunswick County



Figure 6. Bridge over an Historic Mill Race in the City of Petersburg



Figure 7. Ruins of an Historic Stone Bridge, Chesterfield County



Figure 8. Historic Family Cemetery, Northumberland County

13.4 Spill Prevention Control and Countermeasures (SPCC)

An SPCC plan is required for each facility where oil (including liquid asphalt) is stored in excess of 1,320-gallons in aboveground containers 55-gallons or larger. SPCC Plans require monthly and annual inspections and initial and annual training for oil-handling personnel. In addition to the fixed tanks at VDOT Facilities, the requirement also applies to tankers of asphalt that are temporarily staged to support paving and chip seal operations. For tankers, a mobile plan can be developed using a Template. Where the storage at a location is less than 10,000 gallons, the plan can be self-certified. For information regarding SPCC plans, contact the Central Office Environmental Compliance Section or your Regional Hazardous Materials Manager. [Click here for Information for fixed and mobile-plan SPCC plans.](#)

13.5 Environmental Requirements for Hydro-demolition

Hydro-demolition of concrete bridge deck and road surfaces continues to be a frequently used rehabilitation method. Most, if not all, of the work is conducted by contractors. In addition to the P2 for Construction Activities, Section 425.03(a)(3)(c) of the Road and Bridge Specifications detail the requirements to have a plan to control runoff from the operation in compliance with all laws and regulations, and where required, appropriate permit for disposal and discharge.

In general, the DEQ's review of contractor plans has allowed the following option without a permit:

- A. Capture, containment and off-site disposal at a treatment facility of the waste water and slurry. Capture, containment, filtering, pH adjustment of the water for reuse in the hydrodemolition operation or discharge to vegetated areas as long as not discharge to surface water occurs.

13.6 EP-6 Re-coating and Steel Repairs

Section 411.09 and 411.10 of the Road and Bridge Specifications address the Environmental Protection and Worker Health and Safety Requirements related to recoating of steel structures. Section 413.02 address the Environmental Protection and Worker Health and Safety Requirements for Dismantling and Removing Existing Structures. General information related to the environmental requirements associated with bridge projects, including asbestos screening and inspection, is located under [Bridge Environmental Issues of the Environmental Compliance Sharepoint Site](#).

13.7 Illicit Discharge Detection and Elimination (IDDE)

VDOT MS4 Permit has a requirement to evaluate reports of illicit discharges entering into our stormwater system. The Environmental Division has developed an [IDDE Program Manual and Field Guide](#) to assist maintenance staff and select contractors to identify and report suspected illicit discharge instances.

In addition to the Program Manual and Field Guide, a training and information video is available on VDOT-U, the EBB and the [VDOT Training Youtube Channel](#).

13.8 Industrial Hygiene

In addition to the Safety and Health Program elements outlined in Section 3.1 of the BMP Manual, there are several Industrial Hygiene Programs applicable to Maintenance Activities and Operations. The Industrial Hygiene Program is managed through the Environmental Division in cooperation with the Human Resources Division and the Office of Safety, Security, and Emergency Management. The core function of VDOT's Industrial Hygiene Program is to evaluate those workplace environments and tasks which have the potential to cause injury or illness to employees. Areas under the purview of Industrial Hygiene which impact the maintenance division include:

- 13.8.1 Respiratory Protection: Exposure to respiratory hazards for VDOT maintenance employees may occur during job activities that involve, but are not limited to, the use and/or disturbance of lead and other toxic metals, respirable crystalline silica dust, vehicle and equipment exhaust fumes, as well as adhesives, solvents and paint/coating vapors. Maintenance workers completing tasks which may expose them to respiratory hazards should consult the job task tables located in the [Respiratory Protection Program Manual \(linked\)](#). Certain tasks, such as lead work, have been identified by VDOT as requiring respiratory protection. Workers may wish to voluntarily wear a respirator or a filtering face-piece for tasks not requiring respiratory protection upon approval. Guidance for VDOT's Respiratory Protection

Program is found in the [Respiratory Protection Program SharePoint Site \(linked\)](#).

- 13.8.2 **Respirable Crystalline Silica:** The Respirable Crystalline Silica Standard for the Construction Industry impacts work practices within VDOT including, but not limited to, road construction and maintenance activities. Information about the VDOT Silica Program can be found on the Environmental SharePoint site. VDOT workers must use the controls outlined in the [Silica Control Manual \(linked\)](#) and the [Silica Exposure Control Plans \(linked\)](#). In most circumstances, a respirator will not be required when the Silica Exposure Control Plans are being followed.
- 13.8.3 **Lead:** Lead exposure for VDOT maintenance employees may occur during job activities that involve the disturbance of lead-based coatings or lead-containing materials. VDOT's Lead Exposure Control EM and Program Manual can be found on the Environmental [SharePoint Site: Lead Exposure Control Program \(linked\)](#). Known VDOT activities which involve the disturbance of lead, and their required control measures, are addressed in the Program. Additionally, a quick task based reference for the Lead Program is available on the SharePoint Site and is entitled: [Table Identified Lead Exposure Activities \(linked\)](#).
- 13.8.4 **Hearing Conservation:** Overexposure to noise can cause irreversible hearing loss and health impairment. The goal of VDOT's hearing conservation program (HCP) is to prevent initial hearing loss, preserve and protect remaining hearing, and equip workers with the knowledge and protection necessary to safeguard themselves from noise-induced hearing loss and other health effects associated with noisy environments. Information concerning VDOT's HCP can be found on the Environmental SharePoint Site at: [Hearing Conservation Program](#) and in the [VDOT Hearing Conservation Program Manual \(linked\)](#).

13.9 New Products

The Environmental Division participates in the New Products Review process. The process is applicable to any chemical products proposed for use through the ISSP procurement option or through the Material Division's New Product Committee Review Process. Any chemical products being used during Maintenance activities and operation should be either be through the ISSP or one on the Materials Divisions Approved Products List.

13.10 EP-1 Vegetation Management – Bat Protection

Routine vegetation clearing has the potential to impact roosting bats that are protected by state and federal regulations The US Fish and Wildlife Service considers suitable bat roost trees as those trees with a minimum of 3-inch diameter at breast height (DBH).. . Therefore, any routine vegetation clearing tree, brush, or limb trimming or removal of stems three (3) inches or larger could potentially impact roosting federally-protected bats.

District Maintenance staff should notify District Environmental of any planned routine vegetation clearing (any tree, brush, or limbs greater than 3-inch DBH) in advance of the activity to determine any applicable requirements such time-of-year restrictions (TOYR) or other Bat Conservation requirements.

Through agreement with the Virginia Department of Game and Inland Fisheries, VDOT is obligated to protect State Threatened and Endangered Bats. That agreement requires the District Maintenance Manager or Designee:

- A. Maintenance field staff and contractors are informed of the Bat Conservation Plan conservation measures and reporting requirements
- B. Annually assess District Maintenance project needs and communicate work priorities with District Environmental staff
- C. Ensure that if evidence of dead or injured bats, or other signs of bat use are observed during vegetation management activities, report to District Environmental staff within 5 business days and document with photos.

Resources:

Virginia Endangered Species Act Compliance for State-listed Bats Environmental Memorandum:
<https://covgov.sharepoint.com/sites/ENVHub-VDOT/Environmental%20Memoranda/Forms/List%20View.aspx?id=%2Fsites%2FENVHub%2DVDOT%2FEnvironmental%20Memoranda%2FVirginia%20Endangered%20Species%20Act%20Compliance%20for%20State%2DListed%20Bats%2Epdf&parent=%2Fsites%2FENVHub%2DVDOT%2FEnvironmental%20Memoranda>

VDOT's Statewide Little Brown Bat and Tricolored Bat Conservation Plan:
https://covgov.sharepoint.com/SITES/VDOT-ENV-BIOLOGICALRESOURCES/LHSIBats/Forms/AllItems.aspx?id=%2FSITES%2FVDOT-ENV-BIOLOGICALRESOURCES%2FLHSIBats%2FVDOT_Bat_Plan2016%2Epdf&parent=%2FSITES%2FVDOT-ENV-BIOLOGICALRESOURCES%2FLHSIBats

13.11 EP-2 Mechanical Mowing and Monarch Butterfly Protection

The U.S. Fish Wildlife Service (USFWS) is currently evaluating the need to list the monarch butterfly for protection under the Endangered Species Act (ESA) due to a significant decline in numbers. VDOT has entered into an agreement with USFWS called the Monarch Butterfly Candidate Conservation Agreement with Assurances (CCAA) that has the objective to institute actions to prevent, and hopefully reverse, the decline of the monarch.

As party to the CCAA, VDOT must define which conservation measures will be implemented in order to address key threats to the monarch include adjusting the timing of vegetation management practices such as mowing, using more selective herbicides, and monitoring vegetation establishment.

In coordination with District Maintenance Sections, the Environmental and Maintenance Divisions evaluate interstates and other mowed properties to enroll under the Monarch CCAA and that would potentially be subject to the monarch conservations measures. These lands can include acreage within VDOT's managed right-of-way, interstate facilities such as waysides, weigh stations, and truck stops as well as Pollinator Habitat Program areas. If your District or Residency plans to modify your mowing schedules, coordinate with Central Office Environmental and Central Office Maintenance Division to determine if those areas subject to a modified mowing schedule could

either be added to enrolled monarch conservation strategies or should be deleted from the enrolled lands inventory.

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13.12 EP-3 Expedited Environmental Clearances for Paving Projects

13.12.1 Non-Plant Mix Paving Procedures: Pavement preservation projects that meet the requirements of 'Expedited Environmental Review for Non-Plant Mix' qualify for an expedited environmental review process. A procedure for clearing these projects is in CEDAR and is available for District Paving Managers to follow. For more information, see Job Aid – CEDAR Entry - Paving Managers:

<https://covgov.sharepoint.com/SITES/VDOT-ENV-DEP/Expedited Project Reviews/Forms/AllItems.aspx?id=%2FSITES%2FVDOT-ENV-DEP%2FExpedited Project Reviews%2FPreventative Pavement Maintenance Activities%2FJob Aid - CEDAR entry - Paving Coordinators%2Epdf&parent=%2FSITES%2FVDOT-ENV-DEP%2FExpedited Project Reviews%2FPreventative Pavement Maintenance Activities>

13.12.2 Plant-mix Paving Procedures: Plant-mix paving projects have the potential to impact certain plant and animal species protected by state and federal regulations when conducted in sensitive habitat areas. The main types of paving activities that could impact protected species include work such as trenching or pavement wedging outside of the active shoulder (threats to protected plants and invertebrate animals) and vibratory noise generated during slab repair (threat to protected bats).

A streamlined environmental clearance procedure for Plant-Mix Paving is available in CEDAR for District Paving Managers to use and where the Managers will be required to answer the six questions below related to the scope of the plant-mix paving project:

Type of Paving Project:

Plant-Mix Paving Expedited Project Review:

Tree removal?

Night-time milling in rural areas?

Paving on bridges?

Drainage or culvert improvements?

Work in surface waters?

Pavement slab repair >20% surface area?

If all answers above are 'No' and plant mix paving will occur in a county that does not have sensitive habitat, the project will be closed out in CEDAR and no further environmental review will be required. If any of the answers is "yes" then the project/activities will require further environmental review and clearance. For more info, see Paving Managers Job Aid - CEDAR Plant Mix Expedited Project Review CEDAR Enhancement:

Paving Managers

<https://covgov.sharepoint.com/SITES/VDOT-ENV-DEP/Expedited Project Reviews/Forms/AllItems.aspx?id=%2FSITES%2FVDOT-ENV-DEP%2FExpedited Project Reviews%2F11-Plant Mix Activities%2FPaving Managers CEDAR Plant Mix Expedited Project Review CEDAR Enhancement%2Epdf&parent=%2FSITES%2FVDOT-ENV-DEP%2FExpedited Project Reviews%2F11-Plant Mix Activities>

13.13 EP-4 Environmental Permit Determination

Maintenance work/project activities that potentially impact waters regulated by the US Army Corps of Engineers (ACOE) and the Virginia Department of Environmental Quality require review by the District Environmental Section to determine permit requirements and obtain any necessary permits. Certain work/project activities will require that maintenance staff provide a permit sketches to visually communicate details to the District Environmental Section. It is important to include adequate information to make the proper permit determination and facilitate permit acquisition. Click [Permit Sketches Checklist](#) or a checklist of requirements for permit sketches.

Certain ditch maintenance operations that do not require cofferdams or other water diversion activities qualify for a streamlined permitting process. The details of this process is contained in [EM-NR-03-29-2018](#).

13.14 EP-4 Environmental Emergency Clearance Process for Storm Damage and Failed Asset Repair Projects

This guidance provides a process for obtaining environmental clearances in emergency repair operations related to flooding and washouts from storm events and for repairs to unexpected structure damage/failure.

| TERM | MEANING |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| After-the-Fact Permit | A water quality permit that is required for work in Waters of the U.S. performed due to an emergency but before such a permit can be authorized by a federal or state regulatory agency under standard procedures. |
| Critical Project/Emergency Repair | A project that involves a failed structure, an imminent threat to the structure (significant structural damage that will likely lead to structural failure, debris accumulation, etc.), a threat to public safety, property damage, critical route for emergency services/commerce, route with non-viable detours, and/or projects that will be “initiated” within one month. Project “initiation” includes at a minimum ordering materials, scheduling equipment/labor; or start of construction/maintenance activities. |
| Non-Critical Project/Permanent Repair | Projects that will not be “initiated” within one month, have viable detours, contracted work, and/or require design/funding to complete the work. |
| Emergency | A situation resulting in an unacceptable hazard to life, significant loss of property, or an immediate, unforeseen, and significant economic hardship. Storm related emergencies may be declared by the President (federal-declared); the Governor (state-declared) or VDOT authority (VDOT-declared). |
| Maintenance Responsible Charge | Designated Maintenance Staff that communicate and coordinate with the District Environmental Manager or designee regarding any storm related repair projects. Such Staff may include the District Maintenance Engineer, Resident Engineer, Regional Operations Manager, Area Superintendent, or Maintenance Operations Manager. |
| Ordinary High Water | The average elevation of high water in non-tidal areas |

13.14.1 Introduction: Significant storm events can cause minor to severe flood damage to Virginia’s roadway network. These situations often require timely or immediate repair of existing structures to avoid unacceptable hazard to life or significant loss of property. In order to proceed with storm related damage and/or unexpected structure damage/failure repair work, proper coordination with the appropriate District Environmental staff must be performed immediately to ensure an expedited review and approval. The degree of coordination with District Environmental staff will depend on the type of activity necessary to accomplish the repairs.

Following a storm event and/or identification of unexpected structure

damage/failure, several types of projects may qualify as an emergency and therefore qualify for emergency after-the-fact (ATF) environmental permits and approvals. Storm related repair projects that will likely require a permit include:

- A. stream channelization,
- B. stream relocation,
- C. structure cleanout,
- D. non-woody debris removal,
- E. repair/replacement of a drainage structure,
- F. slope stabilization, and
- G. other work involving a wetland, stream or work below ordinary high water.

Projects that do not qualify as critical/emergency repair cannot proceed until all required permits have been acquired prior to work being performed. The funding mechanism for a storm related repair project does not exclusively result in the project being declared as critical/emergency repair and does not drive the permitting process. Failure to meet permit requirements or conducting non-emergency work without the proper permits may result in fines or other legal actions against the Department, as well as disciplinary action against VDOT employees.

13.14.2 Activities to be Avoided: Certain activities should be avoided immediately following a significant storm event, as such activities may result in more extensive impacts to surface waters and difficulty in obtaining water quality permits. Such activities may include:

- A. Place fill within a floodplain to a level higher than pre-flood elevations;
- B. Side-cast or berm material in a stream or on the side of a stream;
- C. Stockpile or berm material in a wetland or adjacent to a wetland; and/or,
- D. Clean out a stream channel when not related to restoring the function of a roadway or drainage structure.

13.14.3 Coordination: Immediately following a storm event and/or identification of unexpected structure damage/failure, the Maintenance Responsible Charge will provide the DEM or designee with notification of emergency project(s) along with a general scope of work and schedule for each project. Information to be included with the scope of work shall include:

- A. Location (route, County, geographic coordinates);

- B. Stream name;
- C. Description and photographs of storm damage and/or failed assets;
- D. Proposed repairs (replace culvert, construct temporary bridge, stabilize stream bank with riprap, etc.);
- E. Brief summary for why project qualifies for an emergency (including documentation of the emergency declaration); and
- F. Anticipated timeframe and duration of the repair.

The Maintenance Responsible Charge will keep the DEM updated regarding any changes to project scope or schedule, and provide the DEM with any additional emergency repair activities that are identified following the initial notification to the DEM. The DEM or designee will review the schedule and scope for each project and assign it to one of three process tracks described below.

13.14.4 Process for Emergency Repair Projects Initiated Immediately (Red Track): In rare circumstances, a project may need to be immediately addressed without prior coordination with Environmental. This is limited to actions that must be completed outside typical business hours immediately following the storm damage event. In such cases, the Maintenance Responsible Charge shall provide the final scope of work to the DEM or designee following completion of the work along with a description as to why work needed to proceed immediately and prior to Environmental notification. This information or notification is to be provided on the next available business day to Environmental along with applicable written emergency declaration(s). The Maintenance Responsible Charge shall also provide photographs of the work area during construction and immediately following construction.

District Environmental staff will subsequently coordinate with applicable agencies and obtain any necessary after-the-fact permits and authorizations. No further action is required from the Maintenance Responsible Charge.

Project Example

A winter storm with a mix of rain and sleet occurs Friday evening. The State Police contact the District at 4:27am Saturday morning from the scene of a vehicle accident in freezing conditions on a state secondary road. VDOT conducts a site visit and finds debris blocking a 24" CMP at a road-stream crossing, causing freezing sheetflow across the road, and creating life-threatening travel conditions. The winter storm with overnight freezing conditions is expected to continue until Monday. That same day, the District Engineer declares an emergency, and the VDOT crew removes the accumulated sediment and debris and places 6

13.14.5 Process for Critical Projects/Emergency Repairs (Yellow Track): For critical projects/emergency repairs, the Maintenance Responsible Charge will provide the scope of work and schedule of repairs to the DEM or designee prior to beginning work.

Most critical projects/emergency repairs qualify for District-issued permits. Quantities and construction methods may be requested by District Environmental staff in order to process these permits. Copies of these permits and supporting information along with any additional limitations of work (if applicable) will be provided to the Maintenance Responsible Charge. Work may then proceed.

If the project requires permits the District cannot issue, District Environmental Staff will supply any required limitations of work (if applicable) to the Maintenance Responsible Charge and communicate that work may proceed prior to receiving permits. The Maintenance Responsible Charge shall provide photographs of the work area during and immediately following construction. District Environmental staff will obtain necessary permits and authorizations from applicable agencies, and provide copies to the Maintenance Responsible Charge for inclusion in project files.

Project Example

A high rainfall event causes widespread flooding and severe erosion at several crossing structures and to road shoulders adjacent streams. Maintenance Division prioritizes a number of projects that can be repaired in the next 8 weeks, beginning tomorrow, with materials on hand and using State Forces. The District Engineer declares an emergency for these projects, which involve activities such as a culvert replacement on a small tributary crossing for a populated dead-end secondary road with no available detours; riprap streambank stabilization along a busy secondary road shoulder where erosion has resulted in pavement loss;

13.14.6 Process for Non-Critical Projects/Permanent Repairs (Green Track): For non-critical projects/permanent repairs, the Maintenance Responsible Charge will provide the scope of work and schedule of repairs to the DEM or designee. District Environmental Staff will assess permitting and agency consultation requirements to determine if the time needed to obtain such authorizations/approvals is compatible with the project schedule provided by the Maintenance Responsible Charge.

If it is determined that there will be no conflicts with the project schedule, District Environmental Staff will proceed with the standard permitting and agency coordination process to receive the required authorizations/approvals. Work may not proceed until the required permits and authorizations are received.

If it is determined that there WILL be conflicts with the project schedule, District Environmental Staff will request an expedited permitting process from the environmental agencies. Work may proceed once approval is received. Environmental will subsequently obtain necessary permits and provide to the Maintenance Responsible Charge for inclusion in project file.

If the expedited process is still in conflict with the schedule, the DEM or designee shall communicate with the Maintenance Responsible Charge and verify that a delayed repair schedule is unacceptable. If the schedule conflicts (and with an emergency declaration), District Environmental Staff shall subsequently proceed with the Yellow Track process as summarized above.

Project Example

A high rainfall event causes widespread flooding and severe erosion at several crossing structures and to road shoulders adjacent streams. Maintenance Division prioritizes the projects into those that need to be repaired in next 2-3 months, and those that can be repaired in the next 3-12 months. The projects with 2-3 month timeframe are designated for the Yellow Track emergency permit process, while those that can wait 3-12 months are on the Green Track. Green Track projects such as the failed roadside stream bank where the road shoulder has not yet eroded, the washout behind the bridge abutment wingwall, and the culvert replacement on the road that can be temporarily closed are prepared for submittal to an IACM within the next several months. The District declares an emergency since VDOT staff and contractors may be called

14. RIGHT OF WAY EASEMENTS

Asset Type:

RIGHT OF WAY EASEMENTS

Policy: The Department is responsible for maintaining the State's transportation infrastructure which can require purchasing land from private citizens to ensure that there is adequate right-of-way for roadway maintenance purposes. At times, instead of purchasing the property, the Department will acquire an easement. The easement allows the Department to use a property for a specific purpose, but the land ownership remains with the private citizen. A prescriptive easement enables VDOT to access to a private citizen's land for maintenance use and purposes under special and/or agreed upon conditions.

14.1 Easement

An Easement is defined as;

“[T]he right of VDOT to use all or part of the property of a property owner for some specific purpose. Easements can be permanent or temporary (i.e., limited to a stated period of time). The term may be used to describe either the right itself or the document conferring the right.”
[\[A Guide for Property Owners and Tenants\]](#)

14.2 Prescriptive Easement

A Prescriptive Easement is defined as;

“[E]asements in perpetuity for the continued maintenance and use of state roadways as defined in Section 33.1-184 of the 1950 Code of Virginia, as amended. The [prescriptive] easement is typically measured 15 feet in width on either side of the center of the existing road making a total width of 30 feet.” [\[VDOT Right of Way Manual 2011\]](#)

14.3 Code of Virginia on Prescriptive Easements

Section 33.1-184 of the Code of Virginia;

“When a way has been worked by road officials as a public road and is used by the public as such, proof of these facts shall be prima facie evidence that the same is a public road. And when a way has been regularly or periodically worked by road officials as a public road and used by the public as such continuously for a period of twenty years, proof of these facts shall be conclusive evidence that the same is a public road. In all such cases the center of the general line of passage, conforming to the ancient landmarks where such exist, shall be presumed to be the center of the way and in the absence of proof to the contrary the width shall be presumed to be thirty feet.

Nothing herein contained shall be construed to convert into a public road a way of which the use by the public has been or is permissive and the work thereon by the road officials has been or is done under permission of the owner of the servient tenement.”

14.4 Application of Prescriptive Easements for VDOT Maintenance Purposes

The Byrd Road Act created the Virginia Secondary Roads System by transferring the maintenance responsibility of county roads from the counties to the State in the 1930s. As specified in the Code of Virginia, for those Secondary Roads with no easements on record, VDOT maintains a Prescriptive Easement for the roadway based on their previous maintenance history. It is important to note, that while a Prescriptive Easement is typically 30 feet, it can be modified by landmark structures, such as a fence. If a landmark structure exists, it shortens the width of the easement, making it critical that all landmark structures be maintained in their original location to preserve the Prescriptive Easement.

14.5 Types of Easements

An easement can be either temporary or permanent.

14.5.1 Temporary Easements: Temporary easements have a limited duration that is specified in the easement agreement. Temporary easements include;

- A. Allow reconstruction of slopes during construction
- B. Allow construction equipment to access a site

14.5.2 Permanent Easements: Permanent easements have an indefinite period. Permanent easements include;

- A. Road Easements
- B. Slope Easements
- C. Drainage Easements
- D. Footing Easements
- E. Utility Easements
- F. Private Easements

14.6 Maintenance Responsibilities with Easements

An easement is restrictive in nature. The easements that the Department acquires for transportation purposes can only be used to construct, operate, and maintain the infrastructure for transportation purposes. An additional easement would be required for any non-transportation related activities.

Maintenance Employees should be aware of the easements that exist on the roadways that they are responsible for maintaining. Care should be taken with any structures, landmarks, or

obstacles that exist within an easement to ensure the property rights of the private citizens are respected. Research with the Right of Way Division may be required to clarify the type of easements that exist along a roadway.

GLOSSARY

The Glossary provides a brief list of Maintenance related terms and an explanation of each. The prepared list was based on the VDOT 2010 Maintenance Manual, with obvious and finance related terms removed. Additional terms were added where appropriate based on the prepared Best Practice guidelines. The provided explanations are intended to facilitate understanding and are not intended to serve as definitive definitions.

| Term | Definition |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>AASHTO</i> | American Association of State Highway Transportation Officials (basically, all 50 State DOTs and others) |
| <i>Accountability</i> | Being liable for a designated task or a portion of the Maintenance Program's delivery and progress |
| <i>American Traffic Safety Services Association (ATSSA)</i> | ATSSA represents the road safety, traffic safety, and highway safety through legislative advocacy and traffic control safety training. |
| <i>Annual Budget</i> | VDOT fiscal year (July 1-June 30) financial plan for estimated expenses such as maintaining highways or to operate facilities. |
| <i>Anti-icing</i> | Anti-icing is the practice of delaying the formation or development of bonded snow and ice by the timely application of a chemical freezing-point depressant. Anti-icing takes place before the pavement-ice bond occurs. |
| <i>Appurtenances</i> | Peripheral inventory items within the Department's right-of-way including, but not limited to, fences, retaining walls, sound barriers, and guardrail. |
| <i>Asset Maintenance System (AMS)</i> | A system that integrates systematic and economic decision tools that will enable VDOT to more efficiently and effectively manage roadway assets. The decision tools include a Needs-Based Budget Request System, Work Order and Work Accomplishment System, Inventory Models, Condition Assessment Models, Cost Models, and Repair Models. |
| <i>Asset Maintenance System (AMS) Data Dictionary</i> | The data dictionary identifies the business elements and allowable attributes for each infrastructure asset in the AMS. Quite simply, the data dictionary identifies the physical data available for AMS Analysis. |
| <i>Asset Maintenance System (AMS) Metadata Repository</i> | Metadata is all the descriptive information that explains the data. It explains information on the data such as how to interpret the data, business and technical descriptions, the data's constraints, where the data originated, who creates the data, how to interpret the data, and much more. All this information about the data will be stored in the VDOT Enterprise Metadata Repository. |

| Term | Definition |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Best Practices</i> | Guidelines and processes whereby specific actions have been validated by appropriate experts and/or through the positive experiences of similar organizations. |
| <i>Bicycle and Pedestrian Accommodation</i> | Any facility, design feature, operational change, or maintenance activity that improves the environment in which bicyclists and pedestrians travel. Examples include the provision of bike lanes, sidewalks, and signs; the installation of curb extensions for traffic calming; and the addition of paved shoulders. |
| <i>Bike Lane</i> | A portion of a roadway designated by signs and pavement markings for the preferential use of bicycles. |
| <i>Call-Back Program</i> | When an employee is required to respond to a sudden, unexpected, or unpredictable situation; or a situation presenting clear and imminent danger; or an emergency related event requiring an additional return trip (commute) to work outside the normal workschedule. |
| <i>Certified VDOT</i> | VDOT employee certified by the DOC / DCJS to supervise offenders and carry a weapon with respect to Offender Labor. |
| <i>Clear Zone</i> | The roadside border area, starting at the edge of the traveled way (edge of pavement), available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. |
| <i>Cold Spot</i> | An area within the traveled way that receives limited sunlight due to vegetation, terrain, etc., and requires application of additional materials during snow and ice storms or other inclement weather conditions. |
| <i>Commercial Entrance</i> | Any entrance connection to or from the state highway system that serves land uses other than two or fewer individual private residences. In addition to entrances to business uses, an entrance to a school, church, apartment complex, private subdivision road, or a subdivision street are commercial entrances. |
| <i>Corrections Officer (Department of</i> | Individual employees of the Department of Corrections charged with the responsibility of the supervision, safety and security of offenders remanded to the DOC's custody. |
| <i>Crossover</i> | A constructed cross connection between the through roadways of a divided highway on which vehicles can reverse direction. |
| <i>Crosswalk</i> | Either the part of a roadway at an intersection that is an extension of a sidewalk or shoulder or any portion of a roadway at an intersection or place distinctly indicated for pedestrian crossing by lines or other surface markings. |
| <i>Curb Ramp</i> | A combined ramp and landing that accomplished a change in level to provide access to and across streets and other travel ways from sidewalks and other pedestrian ways. |
| <i>DACHS</i> | Database for Additions and Changes to Highway Systems. |

| Term | Definition |
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| <i>Deicing</i> | Deicing is the practice of removing snow and ice once it has bonded to the pavement. Deicing takes place after the pavement-ice bond occurs. |
| <i>Department of Correction (DOC) Facility</i> | A state facility where offenders are confined (e.g. correctional center, state prison, field unit, work center, detention center, diversion center, private prison) housing DOC offenders. |
| <i>Directive</i> | A strategic or operational instruction issued for the Maintenance Program. Directives identify general, overview directions whereas best practices document more specific guidelines and procedures. |
| <i>DOC Facility Warden</i> | The person occupying the highest position in a DOC Correctional Center and/or State Prison. |
| <i>Dormant Mow</i> | A single mow in areas designated for pollinator habitat and / or stormwater pollutant removal credits |
| <i>Drainage Easement</i> | A right given to, or purchased by, the Department to install and maintain parts of a drainage system located on a landowner's property. |
| <i>Drainage System</i> | The transportation drainage system includes, but is not limited to, paved and unpaved ditches, underdrains, cross drains, gutters, culverts, drainage pipes, catch basins, drop inlets, manholes, storm sewers, and other storm water maintenance items. |
| <i>Dry Run</i> | A rehearsal of a procedure before the real one. |
| <i>Emergency Response</i> | Typically applies to events of a longer duration as opposed to call-back situations. Examples are floods, snow, ice storms, tornadoes, or other natural or human-related disasters or incidences. |
| <i>EOC</i> | Emergency Operations Center |
| <i>Equipment Class Code</i> | Code assigned to each class of equipment for grouping identification. Examples: Code 864 for Trucks — Standard Dump 30000 GVW; Code 824 for 1/2-ton Pickup. |
| <i>Equipment Log Book</i> | Notebook in each CDL unit of equipment that contains pre-operational check list forms and other documentation. |
| <i>Equipment Modification</i> | Any structural or cosmetic change to the original design or original intended use of the equipment. |
| <i>Equipment Operating Cost</i> | Cost to operate specific piece of equipment based on parts, labor, fuel, supplies, overhead, and depreciation. |
| <i>Equipment Operator Checklist</i> | This is a system-generated list that includes specific tasks to be performed by the operator. Depending on the equipment this will be either a “pre-operational” or “fuel-up” operator checklist. |
| <i>Equipment Overhead</i> | Cost which consists of, but is not limited to, heat, lights, power, telephone, water, administrative salaries, insurance, shop equipment, tools and supplies, certain traveling expenses, undistributed time associated with equipment functions, and VDOT rental fleet operational function. |

| Term | Definition |
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| <i>Equipment Primary Repair</i> | This is the equipment repair shop that is responsible for performing equipment repair/maintenance activities for units within their area of responsibility. |
| <i>Equipment Repair Shop</i> | A VDOT facility designated to perform repair and maintenance of equipment owned by the Commonwealth. |
| <i>F.O.B.</i> | Free-on-Board. A purchase practice whereby delivery is made without a fee or into a carrier at a specified point or location. |
| <i>FCC</i> | Federal Communications Commission. Federal agency empowered to enforce law, rules and regulations concerning telecommunications in the United States. |
| <i>Fixed Bridge</i> | A bridge having its superstructure spans fixed in position except that provision may be made in their construction for expansion and contraction movements resulting from temperature changes, loadings, or other forces. |
| <i>Functional Maintenance</i> | The repair or upkeep when tasks are performed with intangible items instead of physical materials. An example would include the timing of traffic control signals. |
| <i>HAR</i> | Highway Advisory Radio. A radio system that broadcasts highway information messages to the general public in the standard broadcast band (AM radio) |
| <i>Highway Advisory Radio System</i> | A radio system designed to provide Radio System information to motorists on traffic conditions relating to incidents and maintenance/construction activities on interstate, tunnels, and major urban interchanges. In the event of problems, it provides motorists with alternate route information. |
| <i>Highway Sign</i> | A traffic control device mounted on a support above the level of the roadway or at ground level that conveys a specific message by means of words or symbols. |
| <i>Inventory Management System (IMS)</i> | Web based IMS is a standardized, computerized perpetual inventory system that tracks and assists in the management of the Department's Road Stock and Store Stock inventories. Objectives of the Web IMS system are to: (1) Establish a uniform identification for all material, (2) Control the amount of money invested inventory, (3) Establish stock levels based on need, (4) Provide adequate accountability, (5) Provide for automatic reorder notification of material, and (6) Establish order quantities and reorder levels for material. |
| <i>Level of Service (LOS)</i> | Specific and possibly quantitative measures that describe the condition of an asset; examples are quantitative measures describing the condition of pavement in terms of smoothness, roughness, or riding quality. |
| <i>Loss Control</i> | Actions taken to recognize, evaluate, eliminate, or at least control, the destructive effects of occupational hazards. |
| <i>Maintenance Program</i> | Programs and activities related to VDOT's Maintenance Division and the nine transportation districts' maintenance program. |

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| <i>Maintenance Replacement</i> | Maintenance replacement projects or programs are usually referred to restoring a transportation facility or a maintainable item as near to its original or reconstructed design condition as practicable. |
| <i>Major Emergency</i> | An immediate safety hazard to the traveling public or a severe immediate damage to the Department's infrastructure caused by a natural event. Major emergencies usually include, but are not limited to, repairing roads due to significant damage from hurricanes, floods, and rock slides. |
| <i>Major Rehabilitation</i> | This maintenance work usually applies to bridges and pavements. Work in this category includes full depth reconstruction where the entire pavement is removed and replaced. The work may also include restoring structural integrity or correcting major safety defects for bridges and pavement. Examples include restoring and/or strengthening the load carrying capacity of a bridge, recycling or reworking existing materials to maintain their structural integrity, and reworking or strengthening the base or sub-base of a pavement section. |
| <i>Minor Emergency</i> | An immediate safety hazard to the traveling public or an immediate damage to the Department's infrastructure. Minor emergencies include, but are not limited to, repairing cut slopes and roads due to minor storms or slides. |
| <i>Movable Bridge</i> | A bridge having one or more spans capable of being raised, turned, lifted, or slid from its normal service location to provide for the passage of navigation. |
| <i>Non-Rental Equipment</i> | Typically lower cost equipment acquired by Maintenance Division, but funded through user's budget. Maintenance Division assigns ID numbers that are preceded by the letter "N". |
| <i>Offender</i> | An individual that is incarcerated and under the supervision of the Department of Corrections. |
| <i>Offender Work Crew</i> | The group of offenders approved to participate on a VDOT work crew, to perform maintenance on state highways as detailed in the Code of Virginia. |
| <i>Operation Snow Alert</i> | A statewide program involving the trucking industry to allow Department work crews an opportunity to clear highways in the least amount of time by preventing vehicles from entering areas where traffic has been blocked by inclement weather. |
| <i>Ordinary Maintenance</i> | Day-to-day maintenance activities to preserve and correct minor defects of transportation assets during their expected service life and which contribute to the safety and comfort of the traveling public. Ordinary maintenance is performed to care for and maintain the highway and associated assets so that it retains its original intended use. This includes maintenance work on assets exhibiting wear from weather, or work designed to prevent further deterioration and damage. |
| <i>Palliatives</i> | General term for materials (such as water or calcium chloride) that are used for dust control. |

| Term | Definition |
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| <i>Performance Targets</i> | The expectations, established by management, for the delivery of services including specific and /or quantitative measures which describe the condition of an asset or the level of service to be provided. |
| <i>Physical Maintenance</i> | The repair or upkeep where tangible materials are added, rearranged, or removed. |
| <i>Planned Preventive Maintenance (PM)</i> | Any planned activity performed in advance of a need for repair or in advance of accumulated deterioration so as to avoid or minimize such occurrences and reduce or arrest the rate of future deterioration. The activities may correct minor defects as a secondary benefit. PM is usually planned cyclical, and generally is designed to extend the useful life of the asset, without, necessarily, extending structural capacity of the assets. |
| <i>Equipment Preventive Maintenance (PM) Interval</i> | A "PM Interval" is the system-generated notification that includes specific tasks to be performed by "Preventive Maintenance" personnel responsible for equipment repair. |
| <i>Private Entrance</i> | An entrance connection to or from the state highway system that serves up to two private residences and is used for the exclusive benefit of the occupants, or an entrance that allows agricultural operations to obtain access to fields (not the main entrance), or an entrance to civil and communication infrastructure facilities that generate 10 or fewer trips per day such as cell towers, pump stations, storm water management basins, and electrical substations. |
| <i>Reconstruction</i> | Replacing completely an existing facility (e.g., replacement through the sub- base of a pavement structure or complete replacement of a bridge) or significantly improving the functionality of an existing facility (e.g., widening a road or bridge to increase physical capacity). |
| <i>Rental Equipment</i> | Typically higher cost equipment acquired and financed through the Maintenance Division revolving fund. Maintenance Division assigns ID numbers that are preceded by the letter "R". |
| <i>Rental Rate</i> | Specific hourly rate charged for VDOT Rental Equipment based on cost and usage. |
| <i>Repair/Corrective Maintenance</i> | Any work that is required to return a damaged or deteriorated asset to design functionality and capability. (72000 series) |

| Term | Definition |
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| <i>Residue Materials</i> | Any materials left over from a project and activity performed on a VDOT asset. Such materials include, but are not limited to, excess asphalt or bituminous materials from maintenance schedules, scrap pieces of wood from carpenter shops, unused paint from paint shops, dirt spoils from ditching operations, cut tree trunks, limbs and other wood debris from tree trimming operations. |
| <i>Restorative / Replacement</i> | The replacement or complete restoration of assets that cannot be repaired. If the asset no longer functions, is obsolete, or does not conform to current federal or state mandates for design performance, then it must be replaced or overhauled. Examples include work performed on pavements, bridge decks, or other major assets to restore the asset to its original or reconstructed design condition, as practicable, or replaced to its originally functioning service level. |
| <i>Roadside and Roadside activities</i> | The roadside shall include the area from the edge of pavement to the right-of-way line. Roadside activities include vegetation control, dead animals, litter and debris removal, sidewalks, fences and sound walls from the edge of pavement. |
| <i>Routine Maintenance</i> | A program strategy in which minor distresses are repaired as they develop. Includes ordinary maintenance activity routinely performed for maintenance of an asset. |
| <i>Shared Lane</i> | A travel lane of standard width that is shared by motor vehicles and bicycles. |
| <i>Shared Use Path</i> | A facility which is usually physically separated from the roadway, either within a highway right-of-way or within a separate right-of-way, intended for the use of bicycles, pedestrians, and other non-motorized users. |
| <i>Sidewalk</i> | The portion of a public right-of-way between the curb lines or lateral lines of a highway and the adjacent property lines that is intended for pedestrian use. |
| <i>Signed Shared Roadway</i> | A highway open to bicycle and motor vehicle travel, such as a shared lane, wide outside lane, or road with paved shoulders that has been designated by signs to either provide continuity to other accommodations or indicate a preferred route for bicycle use. |
| <i>Sound Walls</i> | A wall along a major highway that reflects traffic noise back towards the noise source thus decreasing noise levels in adjacent public areas and neighborhoods for aesthetic or quality of life reasons. Most walls consist of reinforced concrete, reinforced concrete block, or an earth mound/wall, with trench footings, pile footings or spread footings. |
| <i>Special Operations</i> | Those major functions that are provided by the Department and generally operated on a 24-hour basis. These operations include, but are not limited to, rest areas, tunnels, ferries, traffic management systems, and safety service patrols. |
| <i>State-wide Interdepartmental Radio System</i> | Statewide Interdepartmental Radio System. A radio system established by the Commonwealth of Virginia to provide mutual aid communications between law enforcement agencies within Virginia. |

| Term | Definition |
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| <i>Structure</i> | A broad term commonly used for all highway structures including any overhead sign/Changeable Message Sign structure, bridge, footbridge, pipe, box culvert, or arch culvert having an opening of 36 square feet or greater. Structures also include retaining walls for FMS purposes. |
| <i>Temporary Transfer of Equipment</i> | A short-term physical relocation of equipment which does not require EMS reassignment. |
| <i>Term Contract</i> | Agreement with a designated supplier for specific commodities, parts, or services for a specified period of time. |
| <i>Traffic Control and Safety Devices</i> | All signs, signals, pavement markings, barriers, impact attenuators, guardrail, and other safety devices placed on, over or adjacent to a street or highway by authority of a public body to help ensure highway safety by regulating, warning, or guiding traffic, motorized and non-motorized, throughout the highway systems. |
| <i>Traffic Operations Management</i> | Managing the existing network to promote the safe and efficient movement of traffic. This includes the installation of such traffic-control devices and the improvement of existing turns lanes as are necessary for the safe and efficient use of the highway as well as planning, design, and installation of devices and other equipment related to incident management and congestion management. |
| <i>Transfer of Equipment</i> | A long-term physical relocation of equipment requiring EMS reassignment. |
| <i>Turnouts</i> | Turnouts are normally extensions of the shoulder that provide a wider surface for truckers/operators to perform safety checks on their vehicles. |
| <i>Unconstrained Budget</i> | The term “unconstrained” means that the budget was based on identified total actual needs instead of being based on historical data. |
| <i>Virginia Administrative Code (VAC)</i> | Virginia Administration Code include General rules and regulations adopted pursuant to the authority of the Code of Virginia, specifically to §§ 33.1-12 and 33.1-13, et al. |
| <i>VTCA</i> | Virginia Transportation Construction Alliance. Consultants, contractors and suppliers of equipment and materials. |
| <i>Wide Outside Lane</i> | An outside travel lane wider than standard width that may be shared by motor vehicles and bicycles. |

Section Change History

| Section | Date of Change | Summary of Change |
|--------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | December 26, 2019 | Changed: Anti-Ice to Pre-Treatment |
| 1.6 | June 17, 2020 | New Section Added: VDOT Environmental Division Policy, Guidance Documents, and Training Modules References |
| 1.7 | July 10, 2020 | New Section Added: Virginia Capital Trails |
| 2.2 C | July 10, 2020 | Added: High Wind Guidance |
| 7.1 C. | June 17, 2020 | New Bullet Added: Pollinator habitat and Stormwater mow restriction |
| 7.1 F. | June 17, 2020 | Add: Dormant Mow Cycle to Table |
| 7.1 F. | June 17, 2020 | Add d: New Dormant Mow Area |
| 7.2 F. | June 17, 2020 | Add Dormant Mow Cycle to Table |
| 7.7 | June 17, 2020 | Section Revised: Illegal Signs on the Right of Way |
| 12 | June 17, 2020 | New Section 12, General Environmental Requirements |
| 20.1 | June 17, 2020 | Add sentence to first paragraph: "Pollinator areas can also be established by allowing appropriate areas of VDOT ROW or facilities to go fallow and naturally regenerate." |
| 20 | June 17, 2020 | Re-organized for better flow |
| 20.1 | June 17, 2020 | 7 th Paragraph: Add Dormant Mow dates |
| Glossary | June 17, 2020 | Add: Dormant Mow Definition |
| All sections | June 21, 2020 | Reformatting of entire document |
| 10.1.3, B | September 16 2021 | Add number 4. New requirement for signature on bridge weights |
| 10.1.4 | September 16, 2021 | Add Letter L, Vehicle Weight Restriction Signage Placement |