Manual:	VDOT Maintenance and Operations Manual (TBD)	Date Issued:	DRAFT-v.7
Appendix:	Maintenance and Operations Service Levels	Effective Date:	
By:		Revised:	

Purpose:

This document has three purposes:

- To provide a framework for developing a new approach to delivering maintenance and operations services in the context of a declining resource environment
- To provide a tool for communicating VDOT's maintenance and operations services to the people we serve.
- To serve as the basis for a revised comprehensive VDOT Maintenance and Operations Manual, to be developed at a later date.

This initial document will be incorporated as an appendix to the final VDOT Maintenance and Operations manual. The manual will describe in detail the various means by which VDOT will deliver these services. Finally, the manual will also serve as an instructional resource for VDOT personnel who oversee and implement these services.

The following sections describe the VDOT's primary goal, our service areas, and services themselves, all of which provide a framework for delivery of maintenance and operations services.

Safety and the Centerline

VDOT's approach to delivering maintenance and operations services begins with the overriding principle and goal of ensuring the safety of the traveling public. Therefore, all VDOT maintenance and operations services shall be delivered in accordance with the following priorities:

1. The first priority in all maintenance and operations activities shall be work that is directed specifically to the immediate safety of the traveling public.
2. The second priority in all maintenance and operations activities shall be to those activities which contribute primarily to the preservation of the road.
3. All other activities intended primarily for aesthetics, upgrading (construction), or other items not relating to the preservation of the road or to specific safety hazards, shall not be done in lieu of work categorized as priority one or two.

Furthermore, in order to achieve our top priorities while carrying out these services, maintenance and operation services will be delivered by applying a *centerline-out approach* as follows*:*

- Safety dictates our services provided from the centerline of the roadway out.
- Financial resources dictate our services from the roadway shoulders out.

Maintenance and Operations Service Areas

Following this safety and centerline out approach, VDOT's maintenance and operation services can be generally placed into the following service areas:

1. Emergency and Safety Response Services
    1.1. Incident Response/Clearance Management
        - Crashes and Accidents
        - Hurricane and Severe Weather Events
        - Hazardous Materials Spills
        - Terrorist Events
    1.2. Snow and Ice Control Management
    1.3. Traffic Operation Center Management
2. Roadway Services
    2.1. Road Surface Management
    2.2. Bridge Management
    2.3. Tunnel Management
3. Traffic Control Services
    3.1. Signals, Signs, and Pavement Marking Management
    3.2. Lights and Guardrail Management
4. Roadside Services
    4.1. Drainage Management
    4.2. Vegetation Control Management
    4.3. Mowing Services
    4.4. Obstruction/Hazardous Debris Management
    4.5. Sidewalks/Trail Management
    4.6. Sound Barriers Management
    4.7. Fence Management
5. Facility Services
    5.1. Safety Rest Area, Waysides, and Park and Ride Lot Management
    5.2. Support Facilities Management
6. Equipment Services
    6.1. Equipment Management

The following sections describe the method used to evaluate each service area or combination of service areas for a framework to achieve VDOT's top priorities.

Maintenance and Operations Framework

Ensuring the safety of motorists on Virginia's roadways is VDOT's highest priority. During the current economic crisis within Virginia and abroad, VDOT is re-examining each of our service areas to ensure that the limited funding available is targeted solely towards meeting safety and centerline priorities.

In order to begin the re-examination, VDOT compiled and reviewed a number of other state DOT maintenance and operations' documentation. Borrowing from components of a program developed by the Washington State Department of Transportation, a service level approach was adopted to describe general service levels for each roadway category. In addition, program components from Ontario Canada were borrowed relative to developing critical service response times for non-routine activities.

As routine service levels and critical response time services apply to specific roadways for maintenance and operations purposes, Virginia's roads can be best categorized according to historical service level demands and the magnitude of safety risks to motorists. The roadway categories, service levels, and critical service response times provide the framework from which we will manage and deliver these services as described in the following sections.

Roadway Categories

Four categories of roadways have been developed to broadly reflect these prioritized demands and risks as represented in Table 1 below.

Table 1: Roadway Category Matrix

Average Daily Traffic (ADT)	Interstate and Other Limited Access Routes	Primaries	Secondaries	Unpaved Roads
200,000+	1			
100,000	1			
50,000	1	1		
25,000	1	1	1	
10,000	1	1	1	
5,000	1	2	2	
2,500	2	3	3	
1,000		3	3	4
750			4	5
450			4	5
100			4	5
50			4	5
<50			4	5

Category 1 includes approximately 18-20,000 miles of the State maintained network

Routine Service Levels

Ensuring the safety of motorists on Virginia's roadways is VDOT's highest priority. During the current economic crisis within Virginia and abroad, VDOT must re-examine our maintenance and operations services to ensure that limited funding available is targeted solely towards meeting this priority, the safety of Virginia's motorists.

In order to begin this re-examination, VDOT compiled and reviewed a number of other state DOT maintenance and operations' documentation. Borrowing from a program developed by the Washington State Department of Transportation, a service level approach was adopted to describe general service levels for each roadway category. Service levels range from A to E. Level A indicates a "like new" state. Level E indicates the most advanced or severe state

of disrepair or potential safety concerns. These service levels can be integrated or correlated into the roadway category matrix in order for VDOT maintenance and operations services to achieve our top priority.

The Roadway Category Routine Service Levels become the framework for delivery of all maintenance and operations services. Each service area requires unique defining criteria, and is spelled out in the relevant section below. For example, drawing on Road Surface Management service levels:

- Service Level A: Pavement with few unrepaired potholes, ruts, or unsealed cracks. No drop-off at the pavement edge. The shoulder is generally clean and free of debris.
- Service Level E: Pavement has an extensive amount of unrepaired potholes, ruts, or unsealed cracks. Extensive erosion or drop-off has developed at the pavement edge. The paved shoulder contains debris build-up that would prevent bicycle and pedestrian use, be a hazard to vehicles, and be unsightly. Unpaved roads are impassable.

In general, higher roadway categories require higher levels of service. Acceptable service levels for each roadway category are described below according to service area. Maintenance and operations action is mandated when the state of a road drops below the indicated service level. For example, the acceptable service level for a category 1 road surface has been set as:

- Service Level B: Pavement has a minor amount of unrepaired potholes, ruts, or unsealed cracks. A minor amount of drop-off and minor erosion is at the pavement edge. The paved shoulder contains a small amount of debris build-up at the edge.

If and when any element of the category 1 road surface were to deteriorate, as described below, service would be indicated.

- Service Level C: Pavement has a moderate amount of unrepaired potholes, ruts, or unsealed cracks. A moderate amount of drop-off has developed from at the pavement edge with some erosion. The paved shoulder contains a noticeable debris build-up that may be unsightly.

When service is performed, every effort will be made to return the roadway to an acceptable level, according to its type.

When a roadway degrades below a designated service level, maintenance and operation activities are triggered, and actions and repairs will be scheduled and implemented based on available resources.

Critical Service Response Times

In addition to roadway category routine service levels, certain roadway conditions warrant critical responses regardless of the roadway category or service level. Such activities are included in certain roadway service areas and represented as Critical Service Response Times.

If the safety or integrity of any roadway element or structure has been compromised in a manner that presents an immediate hazard to the traveling public, the road will be closed or necessary actions and repairs will be implemented immediately.

Service Levels

The following sections describe the routine service levels and critical service response times within each of VDOT's maintenance and operations service areas.

1. Emergency and Safety Response Services

In all cases, VDOT incident response will conform to the ER-1 SOP.

1.1. Incident Response/ Clearance Management

Service Level A: Emergency Response Team is fully staffed, running 24/7, on all designated routes. Incident response time is 15 minutes or less. Observation is 100%, between operators, cameras, and SSP.

Service Level B: Emergency Response Team is partially staffed, running at least 12/7, on some designated routes. Incident response time is 30 minutes or less. Observation is 80%, between operators, cameras, and SSP.

Service Level C: Emergency Response Team is staffed for peak hours only, on limited routes. Incident response is 60 minutes or less upon notification or discovery. No active observation.

Service Level D: No Emergency Response Team. VDOT does not respond, except when specifically requested by local authorities. Incident Response is within 2 hours of notification or discovery. No active observation.

Service Level E: No Emergency Response Team. VDOT does respond except when specifically requested by local authorities, and does not commit resources unless a review to assess asset damages indicates otherwise. No active observation.

Table 2: Incident Response and SSP Service Levels

Roadway Category	Incident Response
Tunnels	A
1	B
2	B
3	C
4	D

1.2. Snow and Ice Control Management

Service Level A: Snow or ice buildup encountered rarely. Full scale snow and ice control plans are implemented. Anti-icing services are provided. Bare pavement attained as soon as possible. Travel delays may be experienced in severe storms.

Service Level B: Snow or ice build up encountered at times but infrequent. Anti-icing services may be provided. Travel delays may be experienced in moderate storms and roads may have patches of black ice, slush, or packed snow.

Service Level C: Snow or ice buildup encountered regularly. Roads are plowed and opened within 24 hours or once higher service level roads are complete. Travel delays will be experienced in moderate storms and roads are likely to have patches of black ice, slush, or packed snow.

Service Level D: Compact snow buildup encountered regularly. Roads are plowed and opened within 48 hours or once higher service level roads are complete. Traveler will experience delays and slow travel during snow and ice events.

Service Level E: Closed periodically or for the duration of the winter season.

Table 3: Snow and Ice Control Service Levels

Roadway Category	Snow and Ice Control
1	A
2	B
3	C
4	D

2. Roadway Services

2.1. Road Surface Management

2.1.1. Critical Service Response Times

A pothole with the potential to cause injury or vehicle damage will be repaired in less than 24 hours. Other potholes that meet the critical dimensions in Table 4: Pothole Patching Response Times and Table 5: Shoulder Pothole Response Times will be addressed according to the times listed, regardless of routine service level.

Table 4: Pothole Patching Response Times

Roadway Category	Surface Area	Depth	Time
1	100 sq”	3”	4 days
2	130 sq”	3”	4 days
3	155 sq”	3”	30 days
4	155 sq”	3”	Annual Maintenance

Table 5: Shoulder Potholes Response Times

Roadway Category	Surface Area	Depth	Time
1	100 sq”	3”	10 days
2	130 sq”	3”	30 days
3	155 sq”	3”	60 days
4	155 sq”	3”	Annual Maintenance

2.1.2. Routine Service Levels:

Service Level A: Pavement with few unrepaired potholes, ruts, or unsealed cracks. No drop-off at the Road surface edge. The shoulder is generally clean and free of debris.

Service Level B: Road surface has a minor amount of unrepaired potholes, ruts, or unsealed cracks. A minor amount of drop-off and minor erosion is at the Road surface edge. The paved shoulder contains a small amount of debris build-up at the edge.

Service Level C: Road surface has a moderate amount of unrepaired potholes, ruts, or unsealed cracks. A moderate amount of drop-off has developed from at the Road surface edge with some erosion. The paved shoulder contains a noticeable debris build-up that may be unsightly.

Service Level D: Road surface has a significant amount of unrepaired potholes, ruts or unsealed cracks. A significant drop-off has developed at the Road surface edge with noticeable erosion. The paved shoulder contains significant debris that would restrict bicycle or pedestrian use, and be unsightly. In addition to the above, unpaved roads have washboarding.

Service Level E: Road surface has an extensive amount of unrepaired potholes, ruts, or unsealed cracks. Extensive erosion or drop-off has developed at the Road surface edge. The paved shoulder contains debris build-up that would prevent bicycle and pedestrian use, be a hazard to vehicles, and be unsightly. Unpaved roads are impassable.

Table 6: Road surface Management Service Levels

Roadway Category	Service Level
1	B
2	B
3	B
4	C

2.2. Bridge Management

All repairs and maintenance to bridges are conducted according to bridge inspection reports or discovery. Bridge cleaning is conducted annually to prevent corrosion.

2.2.1. Critical Service Response Times

A bridge deck defect with the potential to cause injury or vehicle damage will be repaired in less than 24 hours from discovery or notification. Other defects that meet the critical dimensions in Table 7: Bridge Deck Patching, will be addressed according to the times listed, regardless of routine service level.

Table 7: Bridge Deck Patching Response Times

Roadway Category	Surface Area	Depth	Time
1	100 sq”	2”	4 days
2	130 sq”	2”	4 days
3	155 sq”	2”	30 days
4	155 sq”	2”	Up to 60 days

2.2.2. Routine Service Levels:

Service Level A: Deck Surface with few unrepaired potholes, or unsealed cracks. The shoulder is generally clean and free of debris.

Service Level B: Deck Surface has a minor amount of unrepaired potholes, or unsealed cracks. The paved shoulder contains a small amount of debris build-up at the edge.

Service Level C: Deck Surface has a moderate amount of unrepaired potholes, or unsealed cracks. The paved shoulder contains a noticeable debris build-up that may be unsightly.

Service level D: Deck Surface has a significant amount of unrepaired potholes or unsealed cracks. The paved shoulder contains significant debris that would restrict bicycle or pedestrian use, and be unsightly.

Service Level E: Deck Surface has an extensive amount of unrepaired potholes or unsealed cracks. The paved shoulder contains debris build-up that would prevent bicycle and pedestrian use, be a hazard to vehicles, and be unsightly.

Table 8: Bridge Deck Service Levels

Roadway Category	Service Level
1	B
2	B
3	B
4	B

2.3. Tunnel Management

Facility-specific manuals shall be adhered to and dictate both critical and routine services.

3. Traffic Control Services

3.1. Signals, Signs, and Pavement Marking Management

3.1.1. Critical Service Response Times

If a traffic signal system or intersection signage is defective in any way, the minimum standard is to deploy resources as soon as practicable after becoming aware of the defect to restore its function. Response times for critical defects for other traffic control elements are listed in Table 9Table , and will be addressed accordingly, regardless of routine service level.

Table 9: Signals, Signs, and Pavement Marking Response Times

Roadway Category	Traffic Signals	Other Regulatory & Warning Signs	Pavement Marking
1	<2 Hours	7 days	<30 days
2	<2 Hours	14 days	60 days
3	<2 Hours	21 days	90 days
4	<2 Hours	30 days	120 days

3.1.2. Routine Service Levels:

Traffic signals and striping are maintained to a serviceable level and according to manufacturers' specifications.

Service Level A: All stripes, signs and delineators are highly visible at night. All traffic signals are fully functional.

Service Level B: Minor amount of stripes, signs and delineators have lost some night reflectivity, are worn, or missing. Traffic signals are operating as intended.

Service Level C: Moderate amount of stripes, signs and delineators have lost some night reflectivity, are worn, or missing. Traffic signals are not operating as intended.

Service Level D: Significant amount of stripes, signs and delineators have lost night reflectivity, are worn, or missing. Traffic signals nonfunctioning, or signal failure mitigated.

Service Level E: Extensive amount of stripes, signs and delineators have lost night reflectivity, are worn, missing, or do not exist. Traffic signals absent.

Table 10: Signals, Signs, and Pavement Marking Service Levels

Roadway Category	Traffic Signals	Regulatory & Warning Signs	Pavement Marking
1	B	B	B
2	B	B	B
3	B	C	C
4	B	C	n/a

3.2. Lighting and Guardrail Management

3.2.1. Critical Response Times

Lighting (to include lighting on overhead signage) or guardrail defects which have the potential to cause injury or vehicle damage will be repaired in less than 24 hours from discovery or notification.

3.2.2. Routine Service Levels

Service Level A: All lighting is fully functional. Guardrail does not show any significant damage.

Service Level B: Lighting is experiencing minimal outages or down time. Guardrail has sustained minor visible damage.

Service Level C: Lighting is experiencing moderate outages or down time, with no more than two in a row out. Guardrail has sustained moderate visible damage and some structural deterioration.

Service Level D: Lighting is experiencing frequent outages or down time. Guardrail has sustained significant visible damage and moderate structural deterioration.

Service Level E: Lighting must be turned off or shut down. Guardrail is not functional.

Table 11 Lighting and Guardrail Service Levels

Highway Class	Lighting	Guardrail
1	B	B
2	C	C
3	C	C
4	C	C

3.3. Traffic Operations Centers

Facility-specific manuals shall be adhered to and dictate both critical and routine services.

4. Roadside Services

4.1. Drainage Management

If the safety or integrity of a roadway or adjacent property is impacted due to a blocked drainage structure, flooding, or erosion, necessary repairs are implemented immediately upon notification or discovery.

4.1.1. Routine Service Levels

Service Level A: Ditches, curbs, gutters and culverts flow freely. Storm drains are free of blockages, and slopes are stable. No standing water on pavement.

Service Level B: Ditches, curbs, gutters and culverts have minor silt and debris build-up. Storm drains have minor blockages. Minor puddling may occur during normal storm events.

Service Level C: Ditches, curbs, gutters and culverts have moderate silt and debris build-up. Storm drains have moderate blockages and slopes have moderate erosion or slides. There may be some standing water on shoulder and in ditches during major storm events.

Service Level D: Ditches, curbs, gutters and culverts have significant silt and debris build-up. Storm drains have significant blockages. Erosion or slides may encroach or threaten the roadway. Standing water in traveled lane during normal storm event.

Service Level E: Ditches, curbs, gutters and culverts have extensive silt and debris build-up. Drains are blocked. Erosion and slides threaten roadway. Water will be over the roadway during normal storm events.

Table 12: Drainage Service Levels

Roadway Category	Service Level
1	B
2	B
3	C
4	C

4.1.2. Stormwater Management

Facility-specific manuals shall be adhered to and dictate both critical and routine services.

4.2. Vegetation Control Management Routine Service Levels:

Sight distance and clear zones shall be maintained at all times in accordance with VDOT Road Design Manual.

Roadside Service Level A: Roadside has minimal visible litter, no noxious weeds, nuisance vegetation. Ditch lines, guardrails, signs, or sight lines are unobstructed.

Roadside Service Level B: Roadside has a minor amount of visible litter, noxious weeds, nuisance vegetation. Some ditch lines and guardrails are slightly obscured by encroaching vegetation. Some signs and sightlines are at risk of being obscured by vegetation.

Roadside Service Level C: Roadside has a moderate amount of visible litter, noxious weeds, nuisance vegetation. Vegetation is starting to encroach on the pavement edge, moderately obscuring ditch lines and guardrails. Some signs and sightlines are being obscured by vegetation.

Roadside Service Level D: Roadside has a significant amount of visible litter*, noxious weeds, nuisance vegetation. Vegetation is encroaching on the pavement edge, significantly obscuring ditch lines, guardrails, signs, and sight lines.

Roadside Service Level E: Roadside has an extensive amount of visible litter*, noxious weeds, nuisance vegetation. Vegetation has encroached on the pavement, extensively obscuring ditch lines, guardrails, signs, and sight lines.

* No litter removal is performed by VDOT. Adopt-a-Highway and local and state correctional partnerships for litter removal will be optimized for all Roadside Service Levels, and exclusively for service levels D and E.

Landscape plan beds and wildflower beds meet a separate performance measure and will be addressed in a separate document.

4.3. Mowing Routine Service Levels

VDOT Maintenance and Operations Manual (TBD), Table ???—Required Mowing Practices shall be utilized for statewide mowing services. Sight distances shall be maintained on all roadways and service levels.

Service Level A: ROW line to ROW line is mowed once a year. The shoulder between ditch line and pavement edge is mowed no more than four cycles annually.

Service Level B: ROW line to ROW line is mowed once every four years. The shoulder between ditch line and pavement edge is mowed no more than three cycles annually.

Service Level C: Only one swath from the pavement edge is mowed no more than two cycles annually.

Service Level D: Mowing occurs for safety only; cut to remove sight distance problems only.

Service Level E: No mowing. Only encroaching brush and trees are cut or removed.

Table 13: Roadside and Mowing Service Levels

Roadway Category	Roadside Service Level	Mowing Service Level
1	B	B
2	B	C
3	B	C
4	D	D

4.4. Obstruction/ Hazardous Debris Management

Obstructions or hazardous debris that may impair roadway safety or integrity are removed immediately upon notification or discovery. Other obstructions or debris shall be removed in accordance with the response times in Table 14.

Table 14: Obstruction/ Hazardous Debris Response Time

Highway Class	Response Time
1	< 1 day
2	3 days
3	14 days
4	30 days

4.5. Sidewalks/ Trail Management Routine Service Levels

Service Level A: Travel surface with few unrepaired potholes, ruts, or unsealed cracks. No drop-off at the surface edge. Surface is generally clean and free of debris.

Service Level B: Travel surface has a minor amount of unrepaired potholes, ruts, or unsealed cracks. A minor amount of drop-off and minor erosion is at the surface edge. Surface contains a small amount of debris build-up at the edge.

Service Level C: Travel surface has a moderate amount of unrepaired potholes, ruts, or unsealed cracks. A moderate amount of drop-off has developed from at the surface edge with some erosion. The surface contains a noticeable debris build-up that may be unsightly.

Service Level D: Travel surface has a significant amount of unrepaired potholes, ruts or unsealed cracks. A significant drop-off has developed at the surface edge with noticeable erosion. The surface contains significant debris that would restrict bicycle or pedestrian use, and be unsightly.

Service Level E: Travel surface has an extensive amount of unrepaired potholes, ruts, or unsealed cracks. Extensive erosion or drop-off has developed at the road surface edge. The surface contains debris build-up that would prevent bicycle and pedestrian use, be a hazard to vehicles, and be unsightly.

Table 15: Road Surface Management Service Levels

Roadway Category	Service Level
1	C
2	C
3	C
4	D

4.6. Sound Barriers Management Routine Service Levels

All repairs and maintenance to bridges are conducted according to bridge inspection reports or discovery.

4.7. Fence Management Critical Response Times

Fence damage that may impair roadway safety or integrity is corrected immediately upon notification or discovery. Other damage shall be repaired in accordance with the response times in Table 16.

Table 16: Fence Repair Response Times

Highway Class	Response Time
1	30 day
2	60 days
3	90 days
4	N/A

5. Facility Services

5.1. Safety Rest Area, Waysides, and Park and Ride Lot Management

Facility-specific manuals shall be adhered to and dictate both critical and routine services.

5.2. Support Facilities Management

Facility-specific manuals shall be adhered to and dictate both critical and routine services.

6. Equipment Services

6.1. Equipment Management

Equipment management shall be dictated by state equipment policy.