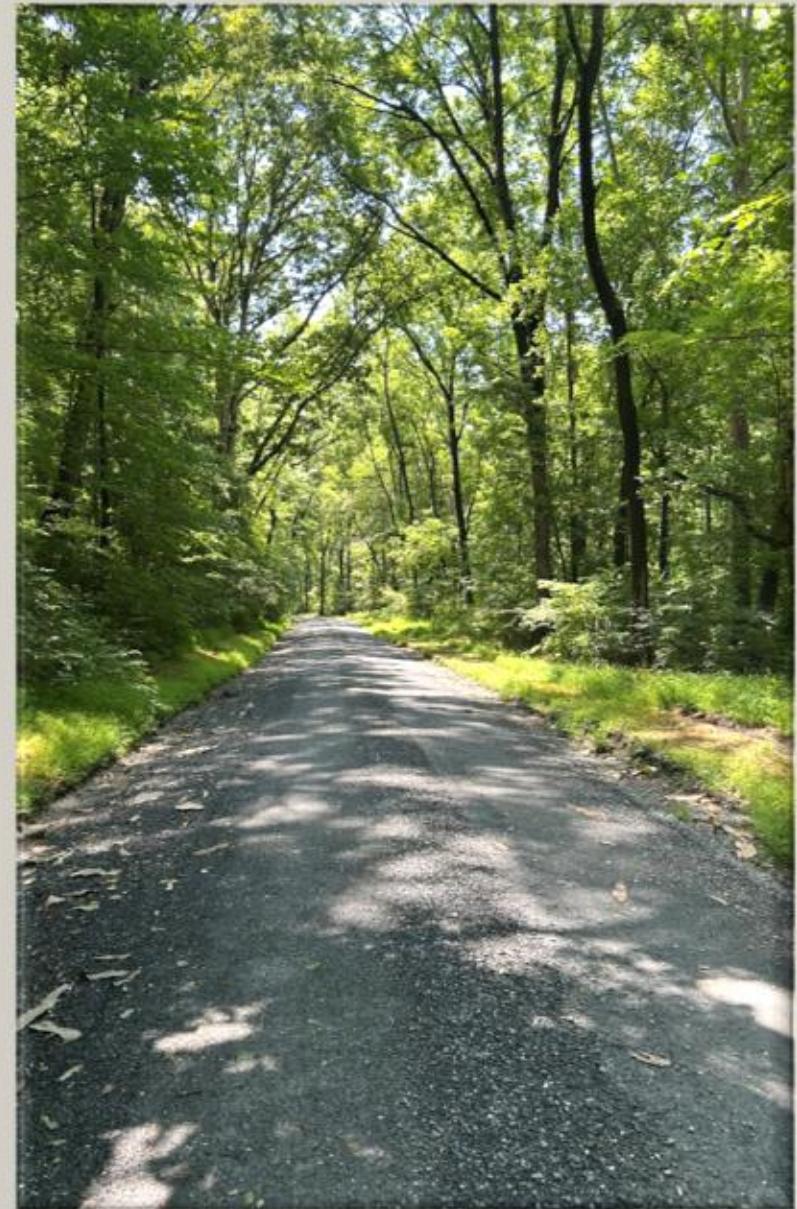


Frederick County



Gravel Road Program Practices



Greenfield Road

INTRODUCTION

The “Gravel Road Maintenance Standard Operating Procedures” was developed to provide clear expectations for road users, outline consistent maintenance practices, and establish a protocol for handling complaints or unique conditions. The program recognizes that maintenance must balance safety, serviceability, and available resources while preserving the rural character of these roads.

By defining expected maintenance levels, outlining seasonal activities, and clarifying emergency and complaint response protocols, Frederick County ensures that its gravel road system remains functional, safe, and sustainable within the limits of time, weather, and budget.

Purpose

The “Gravel Road Maintenance Grading Policy” establishes a consistent framework for maintaining and managing gravel-surfaced roads in Frederick County. These roads are vital for rural mobility, agriculture, emergency access, and connecting residents to the broader transportation network. Because gravel road conditions can change rapidly with weather, traffic, and seasonal effects, the program defines the minimum level of service that the traveling public can expect. It also sets standards for routine and seasonal maintenance, identifies special and emergency procedures, and outlines how resident concerns and complaints will be addressed.

The purpose of the program is to:

- Ensure gravel roads remain safe and serviceable year-round.
- Provide clear standard maintenance practices, procedures and predictable schedules.
- Establish a transparent complaint and response protocol.
- Balance service expectations with available time, funding, and resources.
- Preserve the rural and scenic character of Frederick County’s road network.

Annual Maintenance Overview



Seasonal Activities



Spring

Grading, compacting, cleaning
ditches/culverts and dust control



Summer

Roadside mowing,
culvert
repairs/replacements
weed control



Fall

Grading, compacting, tree
trimming, leaf removal



Winter

Snow removal,
anti-skid
application,
tree trimming

General Maintenance

Minor Reconstruction:

- Full regrading
- Additional aggregate applied as needed
- May change crown/slope for drainage
- Cleaning drainage ditches/culvert repairs

Tree Trimming and Removal:

- Safety and visibility-focused
- Generally completed in dormant seasons or as needed throughout the year
- Removal of dead roadside trees or trees creating a hazard to motorists

Roadside Mowing:

- Focused on visibility and safety
- Maintaining a single 5ft pass during the growing season as needed

Boom Mowing:

- Mowing with the extended reach is prohibited unless the request is evaluated by management staff, these requests are generally for sight distance improvements.

Grading Potholes



Why Grading Works

- Potholes aren't just "holes" — they are signs the road surface lost shape and drainage.
- Simply filling them with loose gravel won't last (the material just kicks back out).
- Grading re-establishes the **road crown** (the slope that sheds water) and blends in new material evenly.

Steps to Grade Out Potholes

- **Scarify (Loosen Surface)**
 - Use the grader blade to cut into the road surface 2–3 inches deep, or the appropriate depth needed
 - Break up pothole edges so the repair blends with the surrounding surface.
- **Pull Material Inward**
 - Bring gravel and fines from the road edges toward the center.
 - This helps restore the crown shape (slopes $\frac{1}{2}$ inch per foot from center).
- **Fill & Blend**
 - Spread loosened material into the potholes.
 - Ensure fines are mixed with larger aggregate so the surface binds.
- **Compact**
 - After grading, traffic or a roller compacts the material.
 - Compaction locks the surface and prevents loose gravel from scattering.

Best Practices overview

- **Moisture Helps:** Grading is most effective when the road surface is slightly damp (not too dry, not muddy).
- **Frequent Light Grading:** More frequent shallow passes are better than waiting until potholes are deep.
- **Add Gravel as Needed:** If fines are low or material is thin, new gravel should be added during grading.

Maryland CR-8 Aggregate

In Maryland, CR8 stone is commonly used for gravel roads due to its excellent packing properties. Here are some key points:

- **CR-8 is a graded aggregate base (crusher run) material defined by the Maryland State Highway Administration (MSHA).**
- It is commonly called “**1 inch minus**” because the largest stone size is about 1”.
- A blend of **crushed stone (up to 1") and stone dust/fines**, which allows excellent compaction.



Driving Surface Aggregate (DSA)

Description:

Driving Surface Aggregate (DSA) is a specially engineered blend of crushed stone designed for use as a stable, long-lasting surface on unpaved roads. Unlike traditional gravel, DSA is produced with strict gradation and quality control standards to provide optimal compaction, durability, and resistance to erosion. The material typically includes a well-graded mix of coarse aggregate, fines, and binding agents that interlock under compaction, creating a smooth, firm surface.

Purpose:

- **Improved Performance:** Reduces dust, potholes, and wash boarding compared to traditional gravel.
- **Erosion Control:** Maintains road shape and crown, minimizing sediment runoff into nearby waterways.
- **Cost Efficiency:** Extends maintenance cycles by reducing the frequency of regrading and reapplication.
- **Safety & Accessibility:** Provides a more reliable travel surface for residents, emergency vehicles, and agricultural equipment.
- **Environmental Benefit:** Designed to meet requirements for low sediment loss, supporting local water quality protection efforts.



Maintenance Trimming

- Maintenance trimming is a critical part of gravel road management because uncontrolled vegetation growth along roadways directly impacts safety, accessibility, and road durability. Tree limbs, brush, and roadside growth can block visibility and encroach into the travel way, creating hazards for drivers, pedestrians, and maintenance crews. Trimming restores safe sight distances at curves, intersections, and driveways, ensuring road users can see and react to oncoming vehicles, wildlife, or obstacles.
- Trimming is also essential for emergency and maintenance operations. Overhanging limbs and narrow, overgrown roads can prevent fire trucks, ambulances, school buses, and other large vehicles from safely passing. During winter, vegetation that hangs into the roadway restricts the ability of snow removal equipment to properly clear the surface, increasing the risk of blocked or unsafe roads.
- In addition, trimming helps protect the roadway itself. Trees and brush trap moisture, keeping the road surface wet and soft, which accelerates rutting and erosion. By clearing vegetation, roads stay drier, last longer, and require fewer costly repairs.
- Overall, routine maintenance trimming ensures gravel roads remain **safe, accessible for emergency equipment and snow removal, and structurally sound**, while also protecting the County's investment in its rural road network.

Maintenance Practices For Winter

Why Remove Snow from a Gravel Road?

Removing snow from a gravel road is essential for several reasons:

- **Preventing Ruts and Potholes:** Snow and ice can create ruts and potholes as they melt, leading to uneven surfaces that can cause damage to vehicles and equipment. Snow removal helps maintain the integrity of the gravel surface.
- **Maintaining Safety:** Clearing snow ensures that the gravel road is safe for travel, reducing the risk of accidents and injuries.
- **Preventing Ice Rinks:** Snow can form ice rinks, which can be hazardous for driving and walking. Removing snow helps to prevent these icy conditions.





Anti-Skid Stone for Gravel Roads in Winter

What It Is

- **Anti-skid stone** (sometimes called *traction sand*, *winter grit*, or *abrasives*) is crushed stone or coarse aggregate applied to icy or snowy road surfaces.
- Common sizes: **1/4"–3/8" stone chips**.
- Unlike salt, anti-skid does **not melt ice** — it provides traction only.

Why Use It on Gravel Roads

- **Improves Traction**
 - Gives vehicles grip on icy, compacted snow or frozen gravel.
 - Especially useful on hills, curves, and intersections.
- **Safer Alternative to Salt**
 - Salt is less effective on gravel because the brine can wash away fines and damage the road base.
 - Salt accelerates thawing/freezing cycles, which can create ruts and potholes in gravel roads.
- **Protects the Road Surface**
 - Anti-skid stone stays on top of the ice instead of dissolving it.
 - Less damaging to drainage and less corrosive to vehicles compared to heavy salt use.

Application Practices

- **Targeted Use:** Spread on hills, curves, bridges, shaded spots, and high-traffic sections. Depending on the snow event the road is plowed, often leaving a skim or hard pack behind prompting the need for Anti-Skid application.
- **Regrading in Spring:** After winter, excess stone often collects in ditches or low spots and should be bladed back onto the road surface.
- **In short:** Anti-skid stone is an important winter safety material for gravel roads because it improves traction on ice without damaging the road structure the way salt can.

Supporting Activities

- Traffic Signs: Minimum use per MD MUTCD
- Weed Control:
Herbicide is sprayed along with routine mowing to combat the growth and spread of noxious weeds
- Calcium Chloride application



Calcium Chloride (CaCl₂)

- is an **inorganic compound** made up of calcium and chlorine. It appears as a **white crystalline solid** that is highly soluble in water. Calcium chloride is widely used for various applications.

Why Calcium is Used on Dirt/Gravel Roads

Dust Control

- Calcium chloride attracts moisture from the air (it's *hygroscopic*).
- This keeps the road surface damp, which reduces airborne dust.

Soil/Gravel Stabilization

- Helps bind fine particles to larger aggregates.
- Reduces erosion and loss of material from wind and vehicle traffic.

Road Longevity

- Less material loss means roads need fewer regrading's.
- Helps reduce potholes and wash boarding.

Overall Benefits

- Cuts down on maintenance costs (fewer regrading's).
- Improves driving conditions and visibility.
- Reduces sediment runoff into ditches and waterways.

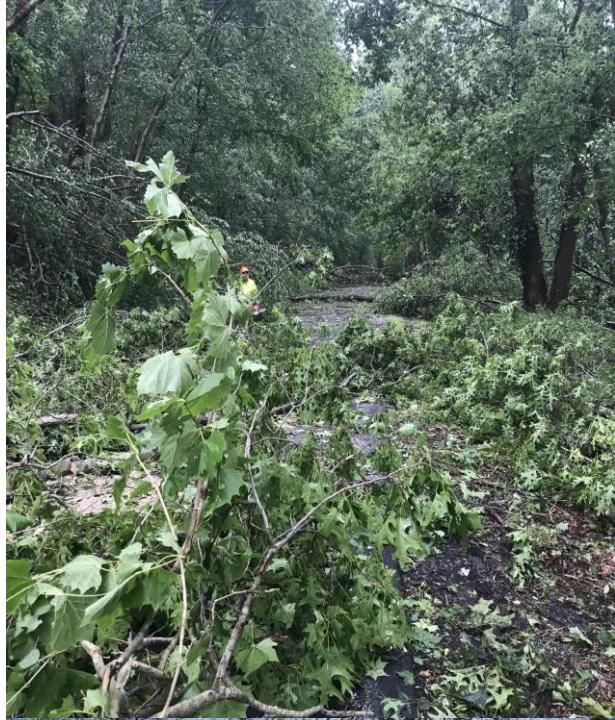


Emergency Maintenance

Triggers; Storms, floods, crashes, sinkholes.

Responses Include:

- Clearing trees/debris
- Regrading, erosion control
- Guardrail repair



Spot Maintenance & Complaint Protocol



Report Concerns Faster
Get Alerts
Stay Connected

Issue Reporting

- Call Highway Operations: 301-600-1562 or Email OHighOpsEmail@FrederickCountyMD.gov
- Submit request via **FCG FixIT! | Frederick County MD – Official Website**

Investigation

- Staff perform a field assessment to determine the issue and make contact with the resident.

Prioritization

- **Urgent = Immediate action** (safety hazards, blocked access, severe road failure)
- **Routine = Next scheduled maintenance cycle** (minor potholes, grading needs)

GRADER



DHO currently has (5) Graders in inventory.

STINGER BLADE



Carbide scarifier bit

Stinger blades, also known as carbide scarifier bits, are used for gravel maintenance and road milling operations. They help eliminate washboarding and potholes, requiring fewer passes than standard grader blades.

TAILGATE SPREADING



Staff spread aggregate utilizing 10-ton dump trucks, needing to frequently raise the beds. Tree trimming maintenance is crucial to avoid damages to equipment during operations.

VIBRATORY COMPACTION ROLLER



Hamm HD Double Drum Vibratory Roller.

DHO currently have (3) Hamm rollers, divided up among the 6 District yards for shared use.

VIBRATORY COMPACTION ROLLER



Rental Unit:
Vibratory Smooth Single Drum Roller

BUFFALO TURBINE BLOWER



DHO utilize the Turbine Blowers to clear ditches and shoulders of roadways with leaves/debris where applicable. This effort minimizes the loss of aggregate and where applicable more efficient on gravel roads.

Thank You / Questions?

- Contact: Division of Public Works -
Frederick County (301) 600-1562 or
OHighOpsEmail@FrederickCountyMD.gov
- Address: 331 Montevue Lane, Frederick,
MD 21701