



Cypress County

GRAVEL ROAD MAINTENANCE PLAN



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ENDORSEMENT FROM COUNCIL

This plan was endorsed at the **November 6, 2018** regular meeting of Cypress County Council.

INTRODUCTION

The Gravel Road Maintenance Plan has been created as a guide to gravel road maintenance to meet Cypress County's goals, strategies and policies. The intent of this plan is to advise the public, Council and County staff of when and how gravel road maintenance will be dealt with by Public Works Services as well as to identify some of the constraints and issues around gravel road maintenance. The Gravel Road Maintenance Plan has been endorsed by Cypress County's Council. It covers all developed gravel road surfaces within the boundaries of Cypress County.

The purpose of the Gravel Road Maintenance Plan is to sustain high quality standards of maintenance and safe travel on County roads. Public Works crews carry out the goals and strategies set by Council to maintain gravel roads in a safe and efficient manner.

The County takes care of over 2,000 km of roads, most with a gravel surface. Fourteen grader routes ensure timely and effective maintenance. Budgetary, equipment and manpower constraints render it impossible for all the roads in Cypress County to be bladed in a single day. The skilled operators assigned to each of these areas will generally take approximately two to three weeks, depending on weather and equipment break downs to make the rounds of their routes during the summer months.

Summer and Winter Maintenance of the County's gravel road network includes snow and ice control, gravel road grading, graveling, dust control and road re-conditioning, road signage, texas gates, traffic control device(s) installation and maintenance, drainage and culvert maintenance. Due to the large geographic region of Cypress County and its heavy agricultural and intensive livestock operations, gravel road maintenance is one of the biggest challenges to sustain high quality roads.

Please consider that weather is very unpredictable and that the County's ability to meet the goals and objectives set out in this plan can be impacted by equipment breakdowns, manpower shortages and budget limitations. This Gravel Road Maintenance Plan is considered a response to the best-case scenarios assuming that all the equipment is in good working order and all personnel is available for work. The County will make every attempt to achieve the goals set out in this plan in as short a timeframe as operationally possible.

MISSION

Cypress County's mission is to provide a transportation system that is to deliver high quality roads that are safe as much as possible within the limitations imposed by the natural environment and the availability of equipment, material, personnel and financial resources. As a result of those limitations, it is recognized that there will be occasions when gravel surfaces will endure wash board, edges that hold water, soft spots, slippery and/or drifting snow conditions. During these conditions, drivers must recognize the conditions and operate their vehicles and equipment in an appropriate safe manner.

DEFINITION OF TERMS

Public Roadway: course for the passage of vehicles and equipment

Bridge: a structure spanning an obstacle or waterway

Culvert: a conduit or drain passing under a roadway

Gravel: crushed rock

Texas Gate: a transverse grid of bars or tubes

Sign: a structure indicating directions, regulations, locations, warnings

Traffic Counter: a device that counts traffic in both directions

GOALS AND STRATEGIES

Cypress County's Strategic Plan will ensure Goals and Strategies are met for gravel road maintenance.

Goal 2.0:

Cypress County ensures infrastructure is effectively maintained, enhanced and evaluated

Strategy 2.2:

Evaluate maintenance practices and future construction goals

Goal 3.0:

Cypress County provides high quality, safe and affordable services and amenities

Strategy 3.3:

Maintain high quality roads and equipment

Cypress County's goal is to have all developed gravel roads maintained every two to three weeks. Main collector roads may need to be maintained more often than minor collector or local roads will follow. During winter months priority is given to roads with school bus routes, main collector roads and local roads. Generally, it takes three to four days to clear priority routes after a snow fall event.

LIMITATIONS

There are many variables to gravel road maintenance that can affect the County's ability to attain the goals set out in this plan, variables could be Multi-day storms, types of storms or weather conditions, severe cold temperatures, staff illness or injury, equipment breakdowns, and/or other emergencies within the County. Due to these and other conditions, the maximum legal speed limit may not be possible at all times and drivers are reminded to exercise caution and drive according to road conditions. Due to the size of maintenance equipment, operator's visibility can be limited, and operators must constantly focus on the operation of their own vehicles.

ALL VEHICLES MUST ALLOW COUNTY OPERATORS AMPLE ROOM TO MANOEUVRE. NO ONE MAY PARK BEHIND, FOLLOW TOO CLOSE OR PASS ANY MAINTENANCE EQUIPMENT UNTIL THE OPERATOR HAS STOPPED AND MADE EYE CONTACT WITH THE DRIVER OF THE OTHER VEHICLE.

EQUIPMENT

The County utilizes the following equipment and contractors to keep gravel roads maintained:

- 13 Graders
- 3 Contract Graders
- 8 Contract Gravel Haulers
- 1 Gravel Reclaimer attachment
- 13 V-Plows and Snow Wings
- 2 Roadside Mowers and Tractors – 1 Grader Mower Attachment
- 3 Pickup Trucks equipped with a Rapid Attack Unit for Fire Suppression
- 1 Contract Mower and Tractor with Rapid Attack Unit for Fire Suppression
- 1 Contract Roadside Sprayer

PERSONNEL

The County gravel road maintenance crew has full time, seasonal employees and contractors, including:

- 11 Full Time Grader Operators (incl. Gravel Road Maintenance Foreman)
- Seasonal Operators as required
- 3 Contract Grader Operators
- 8 Contract Gravel Truck Operators (incl. Gravel Checker Foreman)
- 3 Roadside Mower Operators and 3 Fire Watchers
- 1 Contract Roadside Mower Operator with 1 Fire Watcher
- 1 Contract Roadside Sprayer Operator

PRIVATE DRIVEWAYS

The County will blade and plow private driveways upon request for a fee. Private driveways will be bladed or plowed when all developed gravel roads are completely satisfied.

MAIN COLLECTOR ROADS

Main Collector Roads serve as collectors of local traffic which funnel to the primary and secondary highways or to other major destinations and communities. A Main Collector Road will generally meet one or more of the following criteria:

- Interconnects Provincial Highways, other Main Collector Roads, or communities;
- Connects multi-lot rural residential areas, hamlets, or other populated areas to the Provincial Highway system or other Main or Minor Collector Roads;
- Connects recreational sites to a Provincial Highway or equivalent Main or Minor Collector Road;
- Traffic volumes generally in excess of 100 vehicles per day.

MINOR COLLECTOR ROADS

Minor Collector Roads carry lower traffic volumes and have a surface width of 8 metres. A right-of-way width of 30 metres is recommended, but with proper design, these roads can be accommodated in a lesser right-of-way. A Minor Collector Road will generally meet one or more of the following criteria:

- Lower number of heavy vehicle traffic (local truck traffic only);
- May or may not be connected to other through roads;
- Less than 100 vehicles per day;








LOCAL ROADS

These are roads which serve a small number of residences (less than 10 per half mile), or farmland. These roads have occasional truck traffic, usually related to agricultural production. A Local Road will generally meet one or more of the following criteria:

- Low volume of truck traffic;
- Less than 50 vehicles per day;

ROAD CATEGORIES

Cypress County's gravel roads are broken down into road quality categories:

	Gravel-New High Grade	Grade approximately 1.2m with 8m Top - 3:1 to 4:1 Side Slope & Back Slope
	Gravel Medium Grade	Grade approximately 0.8m with 8m Top
	Gravel Low Grade	Grade approximately 0.5m with 8m Top
	Summer Road Only	Grade & Road Top Varies
	Trail	Grade & Road Top Varies
	Trail-impassable when wet	Grade & Road Top Varies
	Bridges/Large Culverts	

ROAD GRAVELLING PROGRAM

Most gravel road maintenance or rehabilitation problems are held responsible on the grader operator when the actual problem is often material related. This is particularly true when dealing with the problem of corrugation or "wash boarding" as it is often called in the field. This problem is often perceived as being caused by the grader, but it is primarily caused by the material itself.

Cypress County has an annual gravelling program that was implemented to manage its gravel road network. The gravelling program within the County will operate on a rational cycle for all local roads to ensure consistency and as needed to ensure safety.

Excess loss of gravel from a roadway results in a loss of traction, a reduction in strength, rutting, wash boarding and deterioration of the roadway and road slopes. Re-gravelling of a roadway improves the riding quality, stabilization and reinforces the roadway, and restores an all-weather driving surface.



The County aims to gravel approximately 1/3 of the County's roads each year. A roadway should be considered for re-gravelling when it exhibits any of the following characteristics:

- excessive loss of surface gravel
- numerous bald or shiny spots
- clay balls on the shoulders after blading
- excessive rutting.

Prior to re-gravelling, the roadway will be reshaped to the proper crown and width. Sometimes it may be necessary to "pull shoulders". The spread distance for each load of gravel should be marked on the roadway by the Gravel Checker. Gravel dumped on the roadway will be equalized by windrowing before it is spread over the surface.

Before the graveling season begins, the Public Works Operations Supervisor will ask grader operators in each area to develop gravel maps for their areas. Priority will be given to gravel roads that are determined to be significant maintenance objectives.

A single gravel map for the County will be compiled and reviewed by the Public Works Operations Supervisor and recommendations will be made to the Director of Public Works.

The County will use spot gravelling when it is required or when requested to ensure gravel roads under the control of the County are in a safe and reasonable condition.

Gravel quantities will follow a maximum guideline of 200 m³/km for 8m wide roads and 175 m³/km for roads less than 8m wide.

GRAVEL ROAD MAINTENANCE SUMMER

Good gravel road maintenance or rehabilitation depends on two basic principles: proper use of a grader and use of good surface gravel. The use of the grader to properly shape the road is equally as important as the quality, volume, and material in the distribution of gravel.



An important matter to consider is the dramatic change in the vehicles and equipment using low volume roads. Tire pressures have increased to accommodate an ever-expanding fleet of commercial trucks and agricultural equipment increasing in size, weight, and horsepower. The damaging effect of larger and heavier vehicles become increasingly more challenging as the

effect of these vehicles on gravel roads is often not recognized. The strength of the subgrade and depth of the material needed to carry today's heavy loads must be considered, along with proper drainage.

County gravel roads are maintained to a reasonably smooth safe standard and higher priority roads will be bladed more frequently considering general road conditions and traffic volumes. Weather conditions or equipment failures are contributing factors that can determine how quickly operators cover their designated areas.

County Operators will sustain gravel roads to a safe high-quality standard by using the following guidelines:

- Cut and shaped to maintain a uniform crown of 3 - 5%.
- Maintain crown through intersections and feathered back.
- Cut and shaped to remove larger rocks, potholes, washboards and ruts.
- Road surface must be free and clear of all large rocks that may appear after blading.
- Packed to maintain a firm solid surface.
- Bladed to keep shoulders free of grass and ridges.
- Bladed to maintain super elevations on curves.
- Gravel is to be spread no closer than 75 cm from the shoulder.
- Bridge decks and Texas Gates are kept free of material and gravel.
- Operators will blade private driveways only after all County roads are completed.
- Seasonal roads will be bladed once a year or as required at the operator's discretion.
- Dirt trails as designated on the County map will be bladed once a year and only when all County roads are completed.

County graders will make a sufficient number of passes to grade the entire width of the road, generally as follows:

Road Width	Number of passes
9 metres or more	5 minimum
6 to 8 metres	3 to 4 minimum

Final spread of gravel following maintenance blading is to be closer than 75 cm from the shoulder during routine blading.

Grader operators will grade the road in sections. Each section of road graded shall not exceed 3.2 km (two miles) in length, unless it is a through road with no yield or stop signs, up to a maximum of 9.6 km (six miles). At no time is a windrow to be left on a roadway overnight unless its location is clearly visible using barricades or signage.

Intersections:

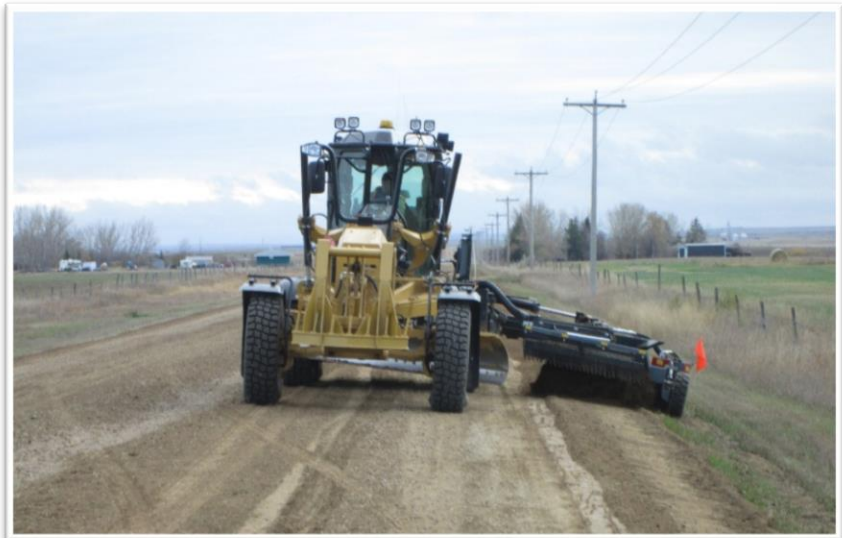
- When blading intersections, caution is used when backing into and out of the intersections.
- Roadways will be bladed through intersections, with the material spread back evenly to eliminate ridges and provide a smooth surface. The crown on the main roadway should be maintained through the intersection, while the crown on the intersecting roadways will be feathered back.
- At no time is a windrow to be left in an intersection as traffic approaching the windrow at 90 degree angle may not see it and hitting the windrow at driving speed could cause loss of control.
- The gravel from a gravel road will not be bladed onto the paved roadway where these two types of roads meet.

The Grader Operator is responsible to watch for culverts that are plugged or damaged, signs that are damaged, knocked down or missing, observe what caused damage to the road, flag washouts, all dangerous situations and report them to their supervisor. The operator should also document any required graveling and add to the graveling list to be reviewed for the upcoming year.

GRAVEL RECLAIMING PROGRAM

Cypress County prospers by recycling gravel from shoulders and road slopes. This is a method used to sustain reduced aggregate costs and maintain roads by removing ridges and ruts that can store water.

During the spring and fall the County activates the gravel reclaiming program. Gravel that has been broadcasted onto the road slope by traffic use over a period of time will be pulled up from the ditch bottom and added back onto the road top. This work is done either by one grader making multiple passes or two graders working in tandem making less passes.



ROAD ALLOWANCE TREE AND BRUSH CONTROL



The County is responsible for the direction, control and management of all municipal roadways within its boundaries and recognizes that the control of trees and brush within road rights-of-way of developed roads is important for public safety. Snow and ice control, minimizing drifting of snow, providing optimum melting and drying of road surfaces, drainage, ditch maintenance, wildlife/vehicle impact, protecting the integrity of County road structures and

potential damage to County road maintenance equipment are important aspects.

Cypress County will make efforts to preserve trees where they do not present a hazard, obstruct sight-lines for the travelling public, where no complaints have been received, and where trees have no direct adverse impact on road conditions and County road maintenance operations.

The removal of trees and brush along developed roads will be carried out to the entire width of the road right-of-way:

- All trees and brush on the road side slope from the road edge to the centre of the ditch bottom will be removed regardless of size.

- Consideration will be given to leaving healthy historical (large) trees that stand alone between the centre of the ditch and property line or backslope as they may provide shelter and resting spots for birds of prey.
- The removal of trees and brush within an existing County Right-of-way, will be considered following a discussion with landowners in proximity of the immediate areas.
- In Hamlets, trees and brush “between the centre of the ditch and property line” that require maintenance will be thinned, pruned or removed; those of impressive size or shape, provide shelter and privacy to a residential yard, are of historical significance, or rare species, may be considered for preservation if possible.

At intersections, trees may be removed to meet designated sight distance requirements as stated in current County design guidelines and construction standards. Any removal on private property will only be done once authorization has been obtained from the landowner and a written agreement signed. On sections of roadway with significant horizontal curvature, additional removal on private land may be required on the inside of the curve to establish proper sight distance.

Trees, brush and stumps will be removed by mowing, cutting, chipping or other mechanical equipment. Trees taller than 2.5 metres (approximately) will be mechanically removed and debris will be chipped and/or removed from the site.

Stumps will be ground to ground level.

Trees and brush that are about 2.5 metres or less in height may be sprayed and left standing in the road allowance. Removal will be dependent on location and density.

Any required spraying operations will be carried out under the direction of the Agricultural Supervisor, who will maintain a liaison with the Director of Public Works or his designate regarding locations of trees and brush and necessary actions for spray treatments.

Spray treatment of trees and brush within an existing County right-of-way, will be considered following a discussion with landowners in proximity of the immediate areas.

Sites where trees and brush have been cut shall be inspected for regrowth, in the spring immediately following their removal, and at least once each spring for the following two years.

Where spraying is not feasible, control of regrowth will be carried out by repeat mechanical methods as necessary.

All developed road rights-of-way will be inspected, and control implemented on a five-year rotation. To maximize operational efficiency, trees and brush requiring removal will be prioritized at the township level. Administration will utilize a method of evaluating and scoring trees and brush based on criteria that include:

- The type of tree (large tree, bush, shrub, large bush patch etc)
- Which side of a road the trees are on (north, south, east, west)
- The classification of the road (arterial, collector, local)
- Townships with the highest scoring trees and brush will be the priority for removal.

Irrigation area developed roads will be inspected and basal bark spraying implemented on a two-year rotation.

GRAVEL ROAD MAINTENANCE WINTER

County gravel roads are plowed to maintain safe traveling conditions and higher priority roads will be plowed more frequently considering general road conditions and traffic volumes. Weather conditions or



equipment failures are contributing factors that can determine how quickly operators cover their designated areas.

Graders are the machine of choice for gravel roads. The County's practice is to wait until there is an accumulation of 4" (10 cm) of snow before plowing as any less may result in too much gravel being removed from the ridges that naturally form

from the traffic. The first priority for the graders is school bus routes. Then main collectors and arterial roads are completed. The last roads to be done are minor collectors and local roads leading up to individual farm residence driveways. After a general snow storm, it will take approximately three to four days before all roads have been plowed. In the interest of operator and public safety, equipment typically only operates during daylight hours.

County Operators will sustain snow and ice control on gravel roads to a safe high-quality standard by using the following guidelines:

- Snow plowing will commence when accumulations reach 10 cm however, if drifting conditions prevail, plowing operations may be commenced sooner.
- Priority will be given to school bus routes and arterial roads and then remaining County roads will be cleared.
- Ice blading if roads become slippery due to compact snow or ice.
- Plowing shoulders to show the edge of the driving surface.
- If rear visibility is obscured, operators will pull over at intervals of 2 to 3 km to give traffic the opportunity to pass by.
- Operators will plow private driveways only after all County roads are open and clear.

ROADSIDE MOWING AND SPRAYING MAINTENANCE

Gravel roadside mowing and spraying is done to control and maintain vegetation and invasive weeds in an effective, safe and cost - efficient manner. Mechanical mowing is done by pull behind mowers or mower attachment on a grader.



County Operators will sustain roadside mowing and spraying on gravel roads to a safe high-quality standard by using the following guidelines:

- Trained Fire Guardians will follow at least 1000 metres behind the mower.
- During extremely dry, hot and windy weather the Director of Public Works will consult with the Emergency Services Supervisor daily in regard to relative humidity, temperature, wind and may temporarily suspend roadside mowing.
- All designated County roads will be mowed twice a year or as required.
- Regrowth on designated roads, where deemed necessary, may be mowed a second time as budget, weather and time permits.
- Weed control spraying of roads will be coordinated to compliment the roadside mowing program in accordance to Policy: ASB P3.0
- The mower shall travel on the roadway surface in the direction of traffic.
- Mowing must be performed making all practicable effort to prevent debris from being deposited on the roadway surface.
- Where possible roadside mowing shall be performed such that the resulting stand of growth does not exceed 100 mm (4 inches) in height and produces a consistent and even cutting across the plain.
- The work shall consist of mowing a 2.4 metre (8 feet) shoulder cut on designated roadsides where possible.



- Roadside mowing around structures such as signs, guardrails, mailboxes or other objects shall be performed such that the cut is within: 1.8 metres (6 feet) of the structure in the direction of travel of the mower.

BRIDGES

There are 198 bridge and culvert crossings throughout Cypress County's transportation system. Bridge management is the process of making decisions on structure needs and arranging for resulting actions to occur at appropriate times. These may include maintenance, repair, rehabilitation, and replacement actions. Some routine maintenance actions are regularly scheduled, while other maintenance and repair actions are identified through the Department's Bridge Inspection and Maintenance (BIM)

system. Rehabilitation and replacement strategies are typically determined through a bridge assessment that involves varying levels of analysis and engineering. All bridge management decisions require inventory and inspection data on the structure to identify needs and appropriate actions.



TRAFFIC COUNTERS

The County currently has two traffic counters to assess major, minor collector roads and local roads to determine when a road would require upgrading to a higher-grade standard or more frequent maintenance may be required.

SIGNS



The purpose of traffic signs is to inform drivers of traffic regulations, posted speed limits, suggested speed limits, school zones and playgrounds, yield and stopping at intersections, way finding, warn of road characteristics or hazards, and necessary for route selection. Most signs are made of diamond grade, so they are easily recognized during night time driving. Signs are installed and maintained throughout the year. Most County rural roads are clearly marked by Range Roads or Township Roads.

TEXAS GATES

Texas gates or also known as cattle guards found in mostly agricultural areas to prevent livestock from passing along a roadway or railway which penetrates the fencing surrounding an enclosed piece of land or border. It consists of a depression in the road covered by a transverse grid of bars or tubes, normally made of steel and firmly fixed to the ground on either side of the depression, so that the gaps between them are wide enough for an animal's feet to enter, but sufficiently narrow not to impede a wheeled vehicle or human foot. This provides an effective barrier to animals and they are reluctant to walk onto the gates. Texas Gates are clearly marked with chevron signs and the posts can be removed for large agricultural equipment to pass through. Landowners may apply to have a Texas Gate and once installed will become the property of Cypress County. Installation must comply with the County's construction standards and design guidelines.



Texas gates are continually monitored for deficiencies and are repaired and maintained throughout the year.