



WINTER MAINTENANCE OPERATIONS LEVEL OF SERVICE

Created January 2020

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1. Purpose, Policy, Considerations and Level of Service

Purpose

The purpose of the Winter Maintenance policy and procedure plan is to communicate the process and level of service for snow and ice removal for Lethbridge County. County roadways are divided into categories and subcategories based on priority levels as follows:

- Priority Level 1
 - Paved Roadways
 - Other Hard Surfaced Roadways
 - Hamlet Main Routes
 - Industrial Parks
 - Acreage Subdivisions
- Priority Level 2
 - Haul Route Network
 - Arterial Gravel Roadways - Priority 1 Gravel
 - Other Hamlet Roadways
- Priority Level 3
 - Collector Gravel Roadways - Priority 2 Gravel
- Priority Level 4
 - Local or Residential Gravel Roadways - Priority 3 Gravel

This prioritization of roadways will accommodate the majority of traffic and emergency services. The goal of Lethbridge County is to remove snow and ice from our roadways as rapidly and efficiently as possible while keeping roads open and essential traffic flowing. Clean, dry pavement should not be expected following a storm. The goal of Lethbridge County is to return road surfaces to safe winter driving conditions quickly by working within the limitations of this policy, limited resources, and weather conditions. With proper use of weather forecast technology, equipment, personnel, and de-icing materials this goal can be obtained. Patience and flexibility is required to adapt to a large variety of circumstances and conditions during a storm.

Plan Considerations

Lethbridge County considers multiple factors while developing policies for winter maintenance operations. These factors include, but are not limited to the following:

- Public Safety
- Funding dollars
- Competent personnel
- Ability to maintain emergency services
- Environmental impacts
- Historic weather conditions and temperatures
- Protection of property
- Effective resource allocation

Policy Statement

The snow and ice control objectives of the County are to:

- Provide safe travelling conditions for motorists
- Provide cost effective snow and ice control services
- Reduce economic losses to the County and local businesses
- Assist emergency services transportation
- Provide safe, passable roads

Lethbridge County has a commitment to provide effective and efficient winter maintenance to its citizens. However, it must be realized that circumstances may delay and/or prevent the completion of this plan. Some circumstances are:

- Unforeseen emergencies
- Parked or stalled vehicles that restrict operations
- Severe weather that crews will be called from duty, for their safety
- Inadequate equipment
- Mechanical failures
- Crew breaks
- Visibility for safe travel
- Lack of de-icing materials

Scope of Responsibility

Lethbridge County is responsible for snow and ice control on County roads within the County district boundary. Provincial highways within Lethbridge County boundary are handled by Alberta Transportation controlled contractors. Lethbridge County does not remove snow and ice from private streets, sidewalks, parking lots, or driveways unless approved by council. County parks and Hamlets will be handled primarily by the Public Works department.

Level of Service

It is the expectation of our citizens that we keep all County roads sufficiently passable during and following a winter storm. To accomplish this expectation, Lethbridge County will provide, to a reasonable extent, snow and ice maintenance services consistent with general accepted standard practices. Each winter storm event is unique. Factors that will heavily influence when and what services are delivered include:

- Air and road temperatures
- Wind speed and direction
- Precipitation type
- Precipitation amount
- Traffic activity
- Availability of supplies
- Availability of personnel
- Availability of equipment

Winter maintenance activities are directed to achieving and maintaining relatively safe traffic movement on County District of Lethbridge roadways. Therefore, efforts are prioritized first on Priority Level 1 – Hard Surfaced Roadways and Hamlet main routes. Followed by arterial gravel roadways (Priority 1 Gravel) and other Hamlet roadways, then collector gravel roadways (Priority 2 Gravel), followed by residential gravel roadways (Priority 3 gravel) as resources become available.

The maximum level of service is reached when Priority Level 1 roadways are clear of snow and ice from shoulder of road to shoulder of road. The minimum level of service is for the Priority Level 1 roadways to be cleared to a packed snow cover.

2. Implementation

The following policies and procedures outlined below will be in effect when weather conditions are forecasted to cause accumulations of snow, ice, frost, or sleet on Lethbridge County roadways. The County begins preparing for winter operations in late September. All winter operating equipment is serviced, installed and tested to ensure adequate service deliverance. A Sand/Salt (5%) mixture is stockpiled at storage sites in Picture Butte and Coaldale Public Works operations sites. Calcium Chloride for pre-wet or anti-icing operations is stored at the Public Works sites in Picture and Coaldale. Additional salt will be stored at each of these locations for specific maintenance activities when weather conditions allow. The County will apply best management practices in the applications of all maintenance products in order to protect the environment and reduce negative impacts on vulnerable areas. Spread rates for materials will be monitored and tracked.

Monitoring Winter Storm Events

During normal winter working hours, (08:00 to 16:30, Monday through Friday) through observations and discussions with Public Works operations staff, the Public Works department will coordinate winter maintenance activities as required. Prior to normal working hours, the Weekday supervisor will evaluate road conditions while communicating with District grader operators in each region to gain event information and evaluate the maintenance activities required. Based on the conditions communicated and observed, the supervisor will make the necessary decision to begin maintenance operations. For weekend maintenance activities a rotation of supervisors will be used for similar operations.

When Operations Begin

The Public Works appointed supervisor will decide when and where to begin winter maintenance operations and will communicate this decision and direction to the Public Works operations staff. The criterion for the decision is:

1. 5 cm (2") of snow accumulation, or expected accumulation
2. Icy conditions which affect travel
3. Time of the event in relationship to traffic volume peak periods

Snow and ice maintenance operations are expensive and involve the use of limited materials, personnel and equipment. During a winter storm event, snow maintenance becomes the operational priority above all other routine operations. Mid-week (Monday-Friday) plow/sander operations will begin at 05:00 and continue until completed or for eight hours. After eight hours of operation, if required, a relief operators will begin operating until completed or 20:00. If the winter storm event has not subsided, operations will begin again at 05:00 the following day.

Mid-week (Monday-Friday) grader operations will begin at 06:00 and continue until completed or for eight hours. If the winter storm event has not subsided, operations will begin again at 06:00.

Service start and end times will be adjusted to one hour later for weekend operations due to the lower peak traffic volumes. Plow trucks 06:00 and graders 07:00 respectively for weekends.

The use of weather reports and road temperatures from Government of Alberta provided Weather Sentry in conjunction with other resources, satellite storm tracking, and radio will be used concurrently with internal road condition reports to determine and adjust the appropriate storm response to ensure a high level of service is delivered.

Snow Maintenance

Employees assigned to snow maintenance are responsible for the completion of their assigned route and appropriate snow and ice maintenance based on weather or roadway conditions. Each operator assigned to a specific route is responsible for monitoring its condition and shall maintain communication with the Public Works supervisor regarding progress and effectiveness of efforts. Supervisors are responsible to direct and coordinate work crews to complete winter maintenance operations in accordance with the established priority system.

Operators plow slush and heavy snow at speeds not to cause damage or injury to people or property by the spoils coming off of the blade.

Priority 1 – Hard Surfaced Roadways

Snow will be plowed by snow plows and motor graders in a manner as to minimize traffic obstructions. Each road will require a minimum of two passes (one in each driving lane). Snow will be pushed from the center of the roadway to the shoulder and side slope of the roadway resulting in an open, passible roadway. As required and directed by the supervisor, a sand/salt mixture will be applied to accelerate melting of ice following snow maintenance. As resources come available snow resting on the road shoulder / side slope of all Priority 1 roads will be pushed further down the slope using a wing attachment on a grader as required and directed by the supervisor.

The primary routes will always have priority during and following a winter storm event. Crews will continue working on Priority 1 roadways until the desired level of service is achieved. Once these roads are open operations will proceed to lower priority roadways.

Priority 2 – Arterial Gravel Roadways and Other Hamlet Roadways

Snow will be plowed on gravel roadways by a motor grader in a manner as to minimize traffic obstructions. Each road will require a minimum of two passes (one in each driving Lane). Snow

will be pushed from the center of the roadway to the shoulder and side slope of the roadway resulting in an open, passible roadway. If resources are available snow will be moved further down the slope using a wing. The grader blade needs to be lifted approximately 1-2" from the surface of the road to ensure extended gravel loss does not occur. The result will be a lightly snow covered gravel roadway. Remaining hamlet roadways will be plowed using small machinery such as skid steers and small tractors by the Agricultural Service Board and Hamlet Foremen. Sanding of intersections will occur following snow maintenance as required.

Priority 3 – Collector Gravel Roadways

Snow will be plowed by a motor grader in a manner as to minimize traffic obstructions. Each road will require a minimum of two passes (one in each driving Lane). Snow will be pushed from the center of the roadway to the shoulder and side slope of the roadway resulting in an open, passible roadway. If resources are available snow will be moved further down the slope using a wing. During plowing operations the grader blade needs to be lifted approximately 1-2" from the surface of the road to ensure extended gravel loss does not occur. The result will be a lightly snow covered gravel roadway.

Priority 4 – Residential Gravel Roadways

Snow will be plowed by a motor grader in a manner as to minimize traffic obstructions. Each road will require a minimum of one pass dependent of road width. Snow will be pushed from the center of the roadway to the shoulder and side slope of the roadway resulting in an open, passible roadway. If resources are available snow will be moved further down the slope using a wing. During plowing operations the grader blade needs to be lifted approximately 1-2" from the surface of the road to ensure extended gravel loss does not occur. The result will be a lightly snow covered gravel roadway.

Personnel Responsibility

The snow and ice maintenance plan used by Lethbridge County has been developed to establish communication channels through which winter maintenance policies can be converted into an effective and understood set of actions. The actions taken by maintenance crews are the result of the policies and procedures established by administration and approved by the Director of Public Works.

Operators

The maintenance crews and operators are vital to successful implementation of the snow and ice maintenance plan. Maintenance crews and operators are responsible for;

- Providing a timely, effective service for their designated routes
- Maintaining equipment
- Documenting snow maintenance activities
- Maintaining a positive work environment

Supervisors

Supervisors are responsible for;

- Coordination of services to ensure timely, effective coverage

- Coordinate with fleet maintenance to ensure proper equipment maintenance is complete
- Collecting and totaling de-icing quantities used
- Timely, courteous responses to complaints, requests, and inquiries
- Providing training opportunities for staff
- Maintaining a positive work environment

Management

Management is responsible for:

- Providing adequate resources for operations
- Creating training opportunities for supervisors and operators
- Maintaining de-icing material inventories
- Maintaining a positive work environment
- Timely, courteous responses to complaints, requests, and inquiries
- Promote and maintain public awareness and support for winter maintenance services

3. Equipment Preparation

All equipment utilized in snow maintenance operations are prepared and inspected for readiness and repairs prior and during the winter season by fleet maintenance to ensure efficient operations of winter maintenance.

Primary Snow Response Equipment

Public works uses the following equipment as required:

- 4 – Tandem axle snow plow/sanding/pre-wet truck trucks (2 Picture Butte, 2 Coaldale)
- 1 - Small truck mount plow and sander
- 10 – Motor graders with wings
- 2 – Loaders
- 2 - Backhoe
- 2 - Skid steers
- 2 – Tandem axle dump trucks

Agricultural Service Board use the following equipment as required:

- 1 – Tractor with mounted snow blower

4. Priorities

During a winter storm event, assistance required from Emergency Response Units is given top priority. Upon request the Public Works department will provide assistance as required. As a result of the urgency resulting from a winter storm event all other routine operations become secondary and winter maintenance operations will occur. Roads will be plowed and sand / salt will be applied according to the established priorities as directed by the supervisor. Priorities are established based on traffic volumes, public safety, and access to emergency facilities and

schools. All roads within Lethbridge County are prioritized into groups for maintenance operations. These groups are displayed on the attached maps and are color coded for easy identification. A description of each is below;

Priority 1 (YELLOW)

These roadways are the highly travelled **hard surfaced** roadways within Lethbridge County. These roads are given first priority as they hold the majority of traffic volume and act as a link for emergency services and schools. Priority 1 roadways will be maintained for all snow storms meeting the criteria outlined earlier.

Priority 2 (GREEN)

These roadways are highly travelled haul routes, **gravel** roadways and secondary hamlet roadways. These roadways carry primarily rural residential and agricultural traffic. These roads will likely connect to a provincial highway or a Lethbridge County hard surfaced roadway. These roads will be maintained primarily by the district grader operator as required and/or directed by the supervisor.

Priority 3 (BLUE)

These roadways are moderately travelled **gravel** roadways. These roadways carry primarily rural residential and agricultural traffic. Some roads may lead directly to a provincial highway or a County road of a higher priority. These roads will be maintained primarily by the district grader operator as required and/or directed by the supervisor.

Priority 4 (PINK)

These roadways are lightly travelled **gravel** roadways. These roadways carry primarily rural residential and agricultural traffic. Some roads may lead directly to a provincial highway or a County road of a higher priority. These roads will be maintained primarily by the district grader operator as required and/or directed by the supervisor.

5. Travel Restrictions and Road Closures

During certain winter storm events it may become necessary to close roadways to traffic. This action will only be taken if extreme weather conditions deem an area of the County unfit for safe travel.

6. Winter Storm Categories

Winter storms that occur in Lethbridge County may be categorized into four levels. The response to the storm is different for each category. The following outlines the 4 levels of storm events and the service level following;

- **Level 1 Event**
 - **Storm characteristics**
 - Icy roads and/or accumulation of 0-5cm (0"-2")
 - **Service Level**

- Priority 1 roadways are maintained as required and directed by the supervisor
 - Sand / Salt usage as required
 - This storm level does not typically require multiple work shifts
- **Level 2 Event**
 - **Storm Characteristics**
 - Accumulation of 5cm – 15cm (2"-6")
 - **Service Level**
 - All roads to be maintained as per the plan and priorities set out
 - Typically all maintenance equipment required
 - Sand / Salt usage as required
 - This storm may require multiple work shifts
 - Potential for multiple day cleanup following the event
- **Level 3 Event**
 - **Storm Characteristics**
 - Accumulation of 15cm – 30cm (6"-12")
 - **Service Level**
 - All roads to be maintained as per the plan and priorities set out
 - All maintenance equipment required
 - Sand / Salt usage as required
 - This storm may require multiple work shifts
 - Multiple day cleanup required following the event
- **Level 4 Event**
 - **Storm Characteristics**
 - Accumulation of 30cm or more (12"or more)
 - **Service Level**
 - All roads to be maintained as per the plan and priorities set out
 - All maintenance equipment required including ASB works
 - Sand / Salt usage as required
 - This storm may require multiple work shifts
 - Multiple day cleanup required following the event
 - Possibility of road closures
 - All Lethbridge County personnel required
 - Possibility to use outside contractors for assistance
- **Level 5 Event**
 - **Storm Characteristics**
 - Accumulation of 50cm or more (25"or more)
 - **Service Level**
 - Potential assistance to Government of Alberta service provider for clearing numbered highways, case by case basis, upon request
 - All roads to be maintained as per the plan and priorities set out
 - All maintenance equipment required including ASB works
 - Sand / Salt usage as required
 - This storm may require multiple work shifts

- Multiple day cleanup required following the event
- Possibility of road closures
- All Lethbridge County personnel required
- Possibility to use outside contractors for assistance

7. Delay of Maintenance Operations

Winter maintenance of roadways is a very difficult task. The work is extremely rough on equipment and manpower. Delayed services may occur due to the following;

- Stuck vehicles on roadways
- Equipment breakdowns
- Manpower shortage due to sickness, injury, or lack of responsibility
- Manpower shortage due to the length of a storm and personnel requiring rest
- Operator breaks
- Downed trees or power lines
- Other County emergencies
- Visibility

8. Post Event

Following a winter storm event, crews will begin to clean up and relocate snow from hamlets to the locations outlined on the maps if required. The extent of operations will depend heavily on the forecasted weather. Areas that are shaded may require additions sand / salt to encourage melt off. Crews will attempt to remove as much snow and ice as reasonably possible, it is important to understand this does not always result in bare, dry pavement. As time permits, Fleet Maintenance will do an inspection of all maintenance equipment to ensure it is available for the next winter storm event.

9. Service Level Costs

As service levels change, so do costs and associated risks.

Costs to deliver the current level of service include:

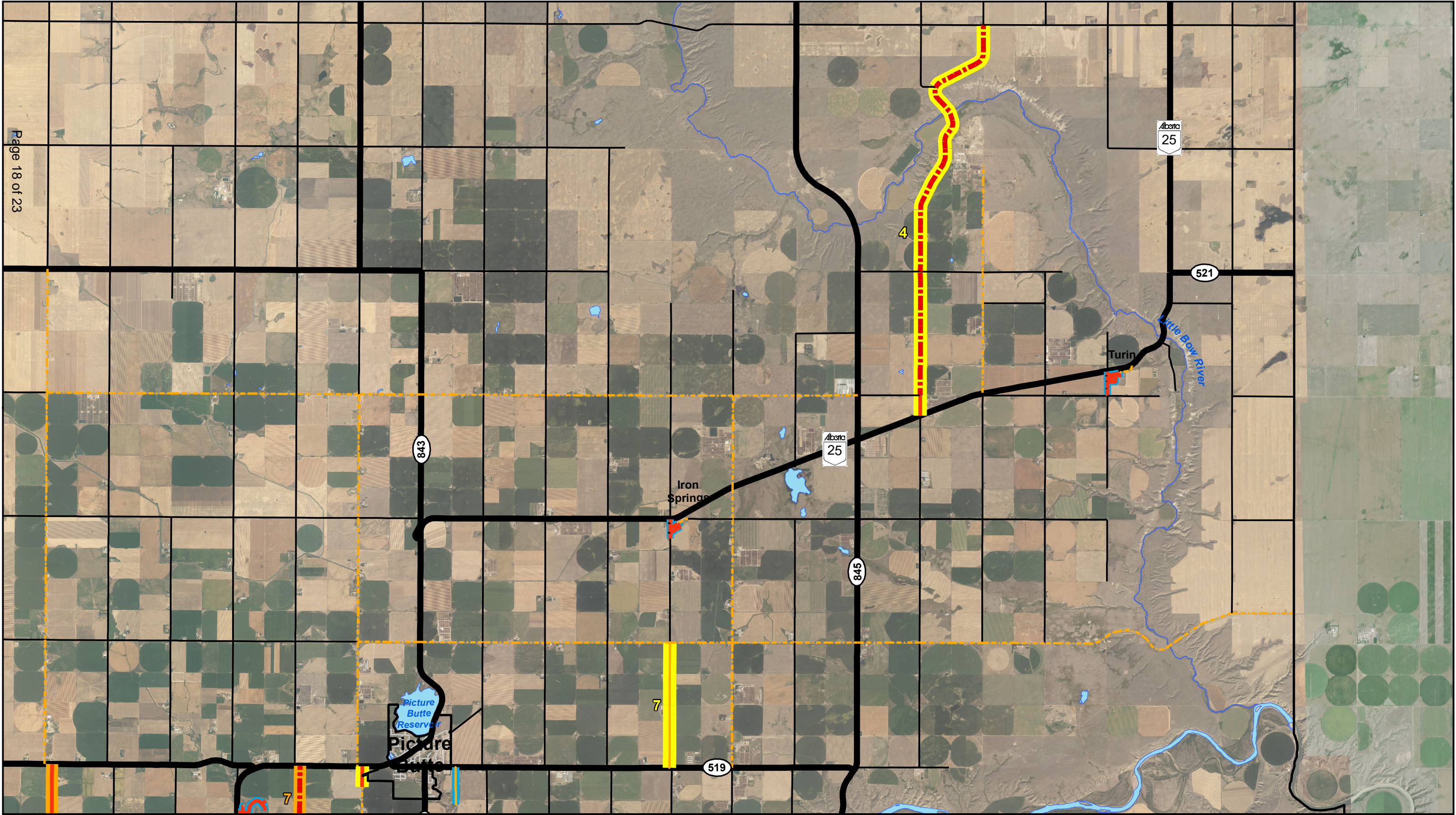
- Annual Operating budget Snow Plowing for Graders, Sanding and Truck Plowing
- Amortization of equipment and facilities
- Shop maintenance
- Sand, salt and prewet material purchasing and processing costs
- Administration cost
- Fuel
- Wear items
- Program adjustments

Annual Estimates (2021)


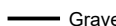

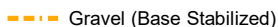

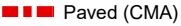


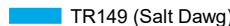


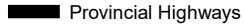
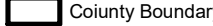
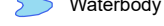
Annually, the municipality plows hard surfaced and gravel roads.

Total cost for service allotted to plow trucks and sanding of roadways is **\$475,000 (2021)**.

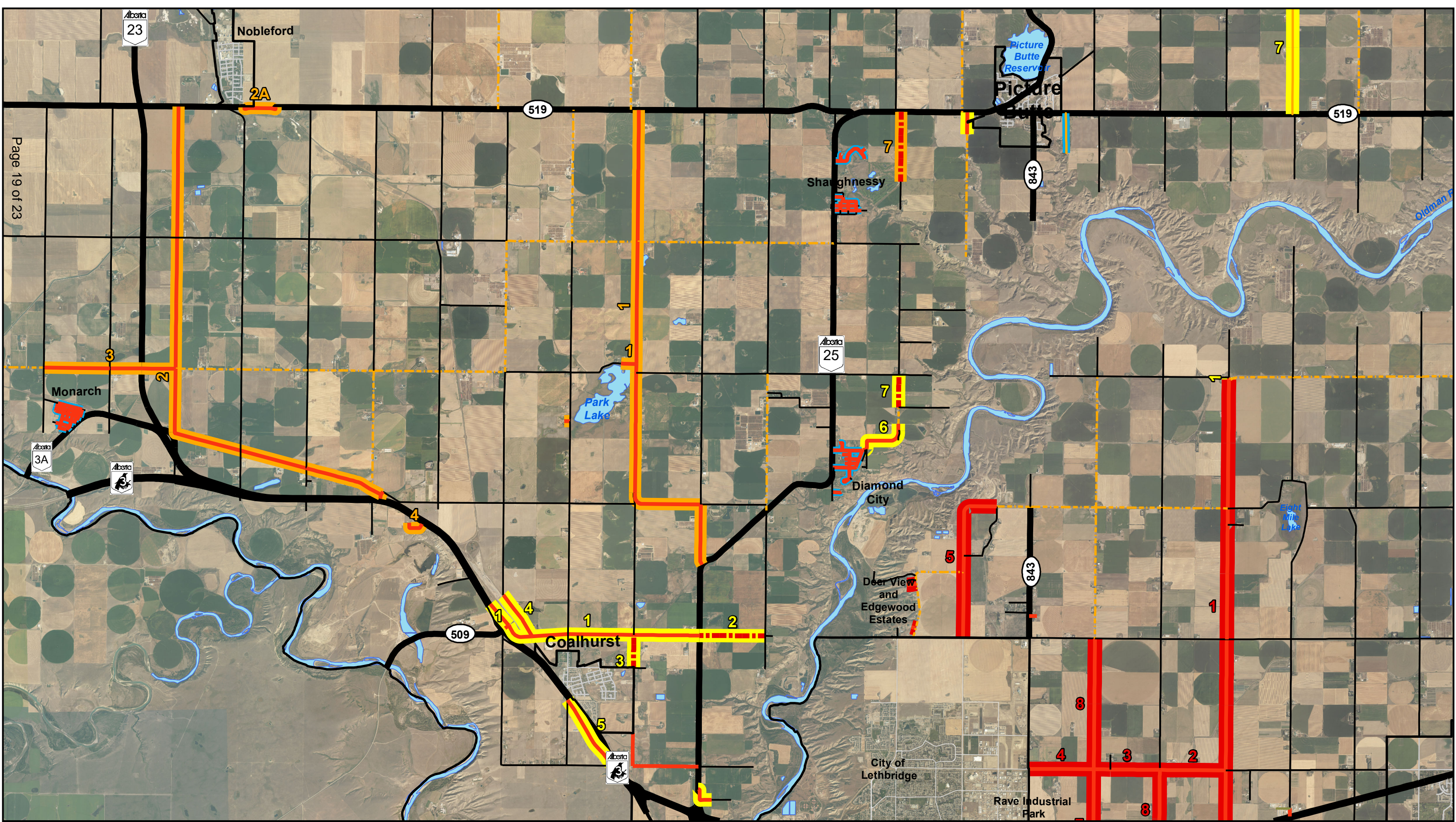
Total cost for service allotted to graders plowing roadways is **\$375,000 (2021)**.












Truck Plow Routes - North of River - East of Picture Butte

Truck Number/Name		Road Surface	
	TR138		Gravel
	TR154		Gravel (Base Stabilized)
	TR (TBD)		Paved (CMA)
	TR (TBD)		Concrete
	TR149 (Salt Dawg)		Cement Stabilized
			Paved (HMA)
			Provincial Highways
			County Boundary
			Waterbody

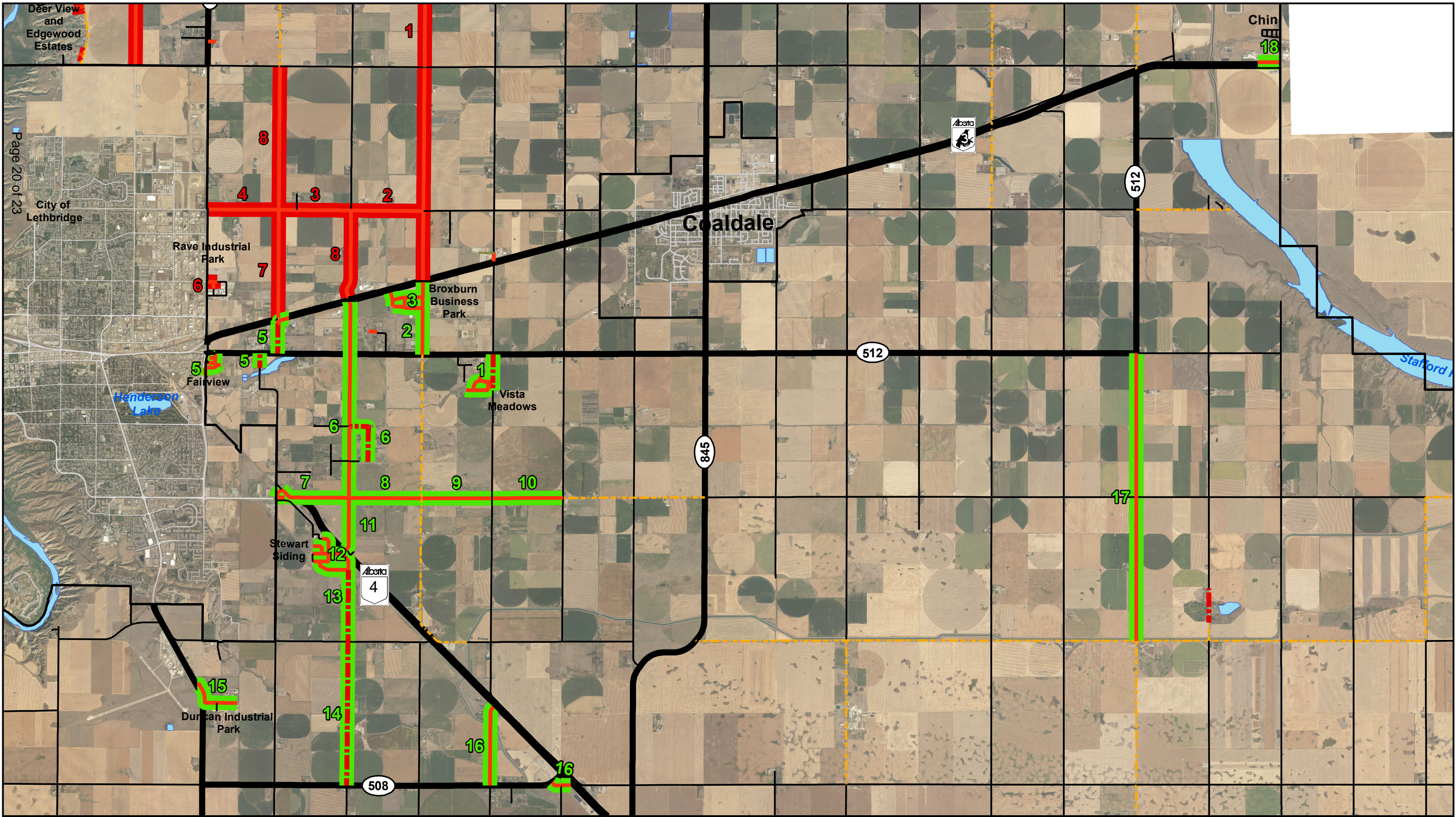
* For SaltDawg area detail, see SaltDawg Map



Truck Plow Routes - North of River - West of Picture Butte

Truck Number/Name		Road Surface	
	TR138		Gravel
	TR154		Gravel (Base Stabilized)
	TR (TBD)		Paved (HMA)
	TR (TBD)		Paved (CMA)
	TR149 (Salt Dawg)		Concrete
			Cement Stabilized
			Provincial Highways
			County Boundary
			Waterbody

* For SaltDawg area detail, see SaltDawg Map



Truck Plow Routes - South of River - Route 2

Truck Number/Name

TR138

TR154

TR (TBD)

TR (TBD)

TR149 (Salt Dawg)

Road Surface

Gravel

Gravel (Base Stabilized)

Paved (HMA)

Paved (CMA)

Concrete

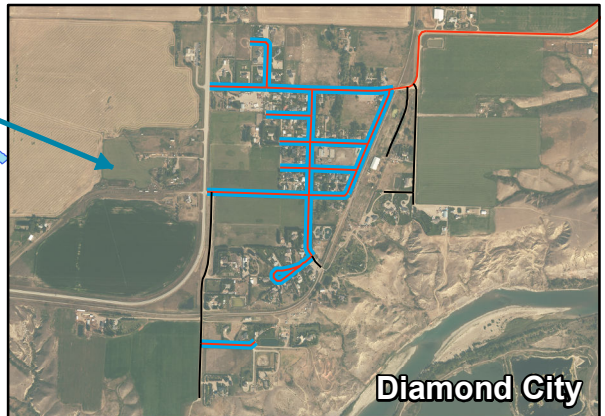
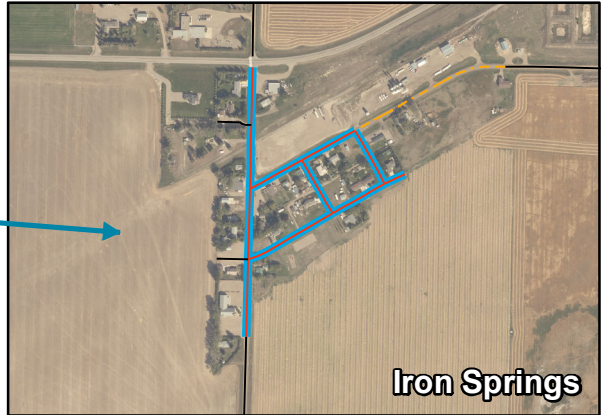
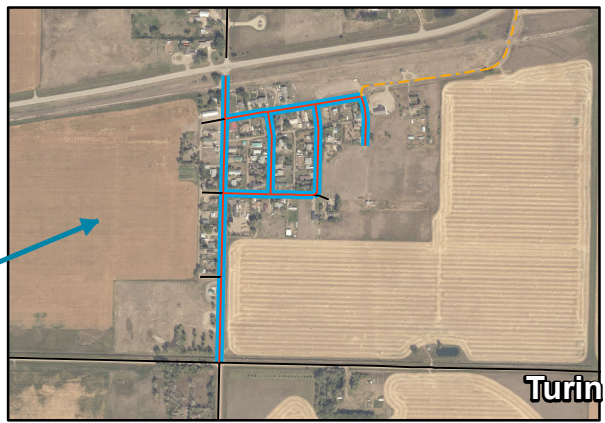
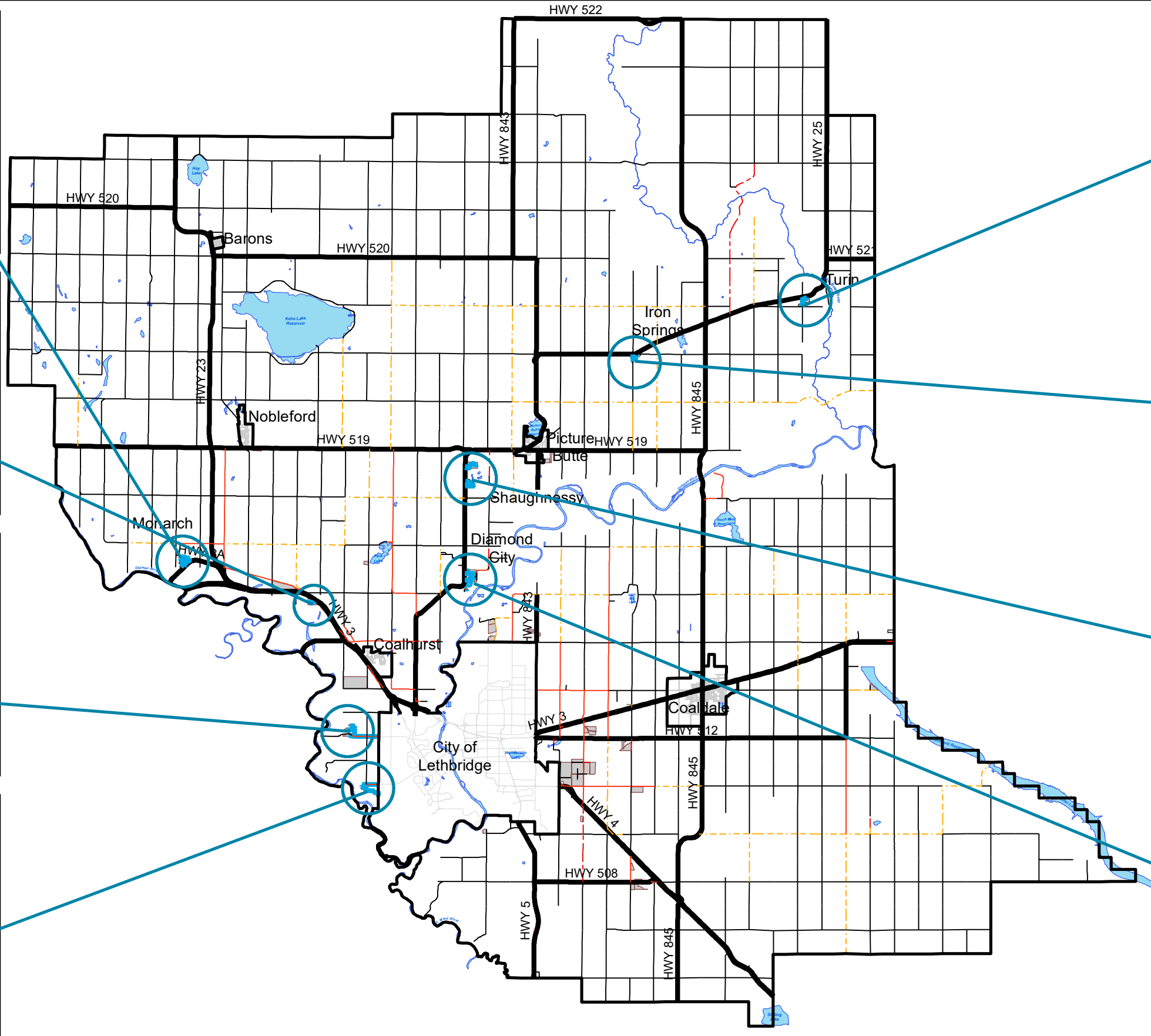
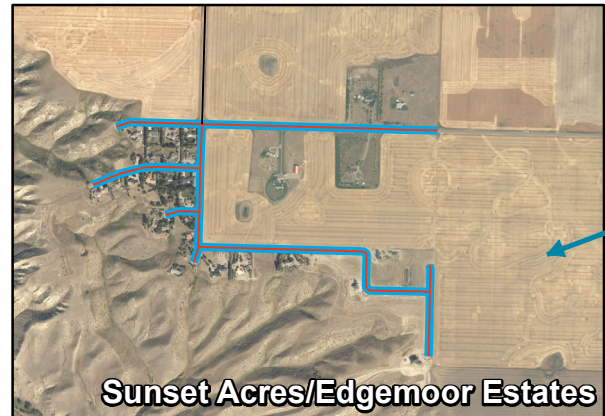
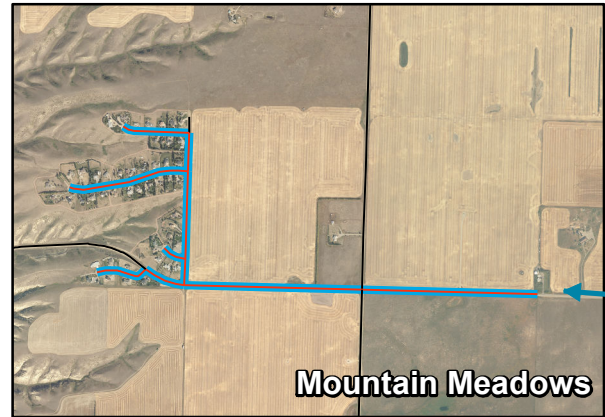
Cement Stabilized

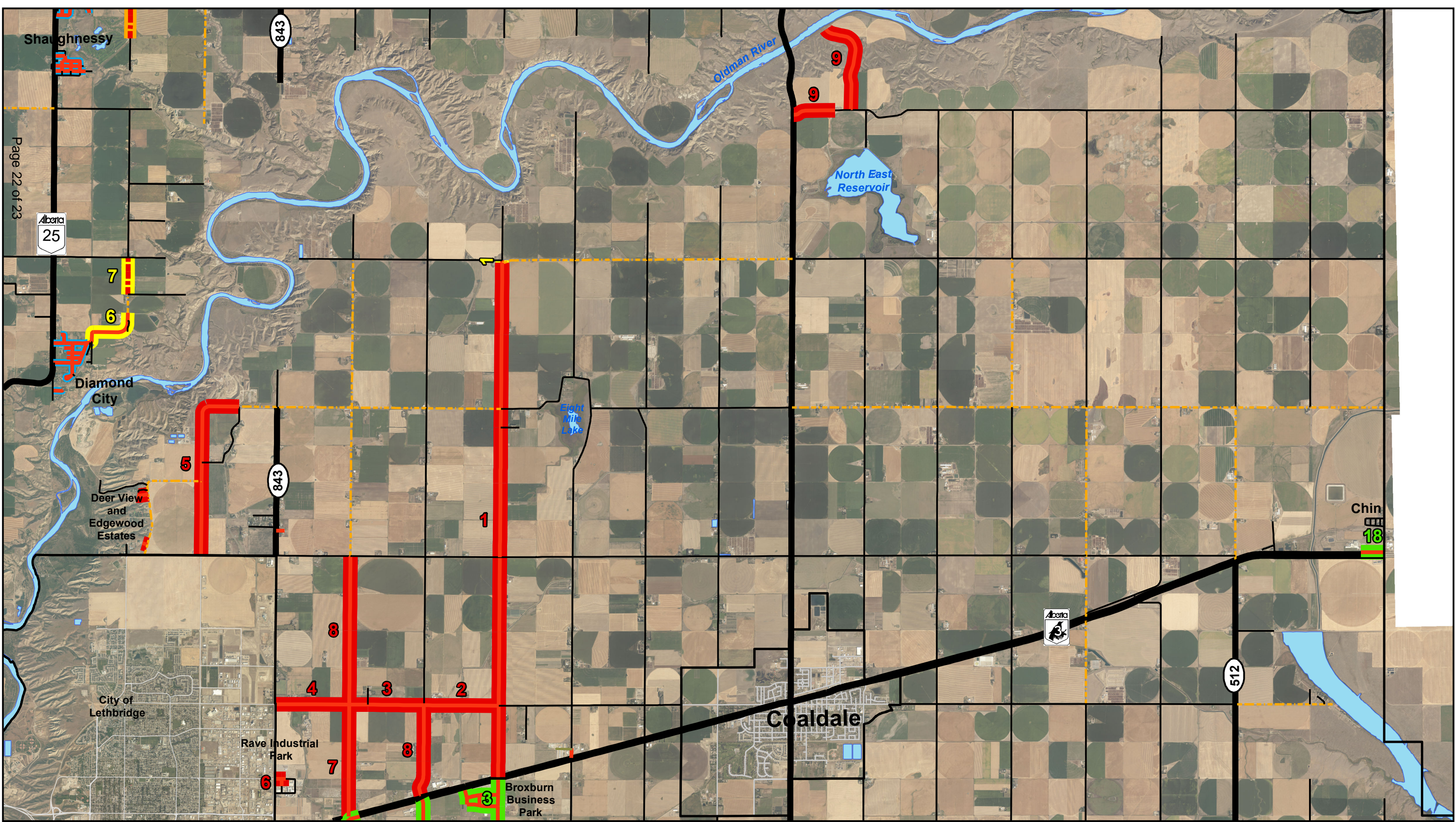
Provincial Highways

County Boundary

Waterbody

* For SaltDawg area detail, see SaltDawg Map



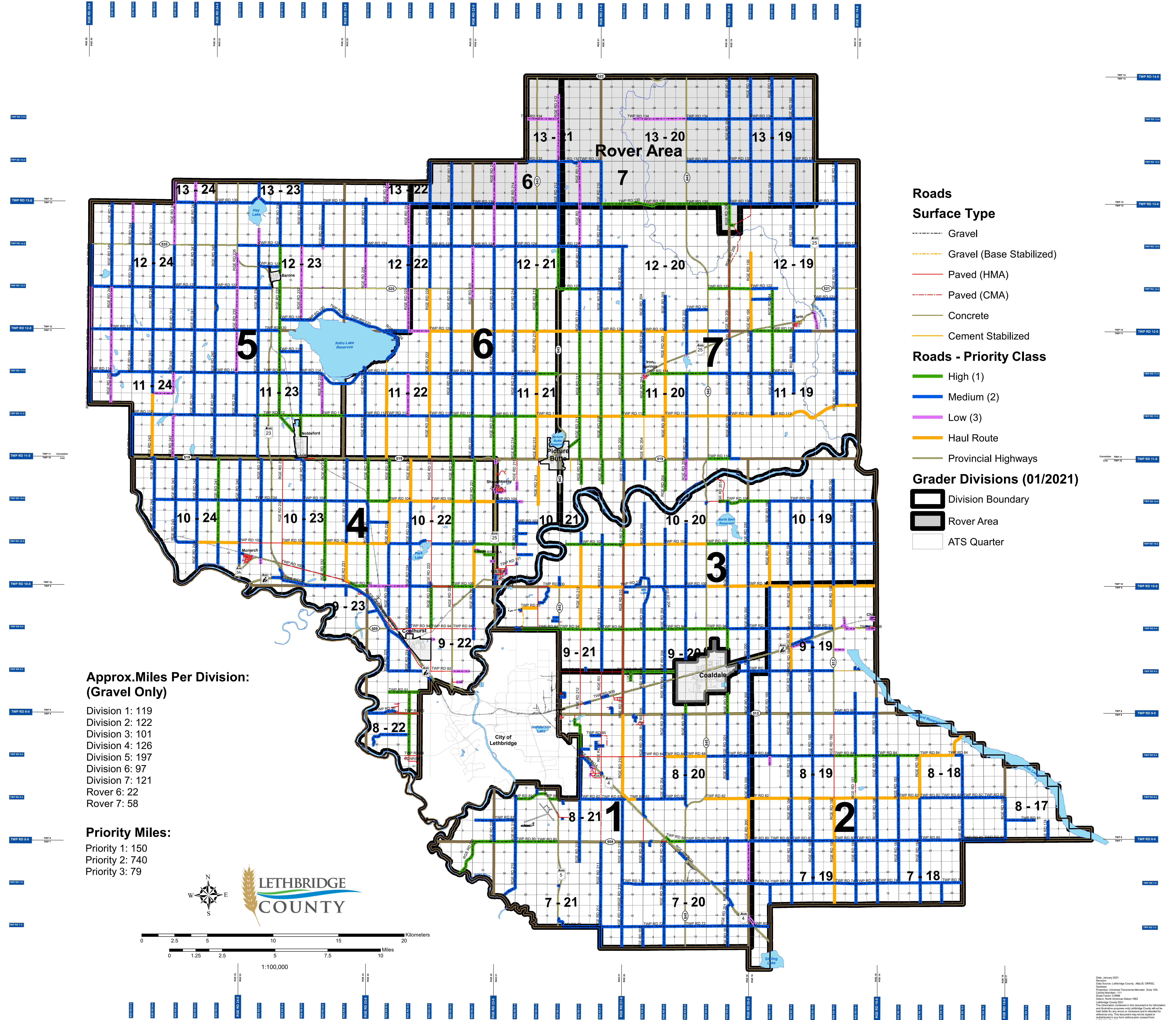


Truck Plow Routes - South of River - Route 1

Truck Number/Name	<div>TR (TBD)</div>	Road Surface	<div>Paved (CMA)</div>	<div>Provincial Highways</div>
<div>TR138</div>	<div>TR (TBD)</div>	<div>Gravel</div>	<div>Concrete</div>	<div>County Boundary</div>
<div>TR154</div>	<div>TR149 (Salt Dawg)</div>	<div>Gravel (Base Stabilized)</div>	<div>Cement Stabilized</div>	<div>Waterbody</div>
		<div>Paved (HMA)</div>		

* For SaltDawg area detail, see SaltDawg Map

2021 Gravel Road Grading Priority

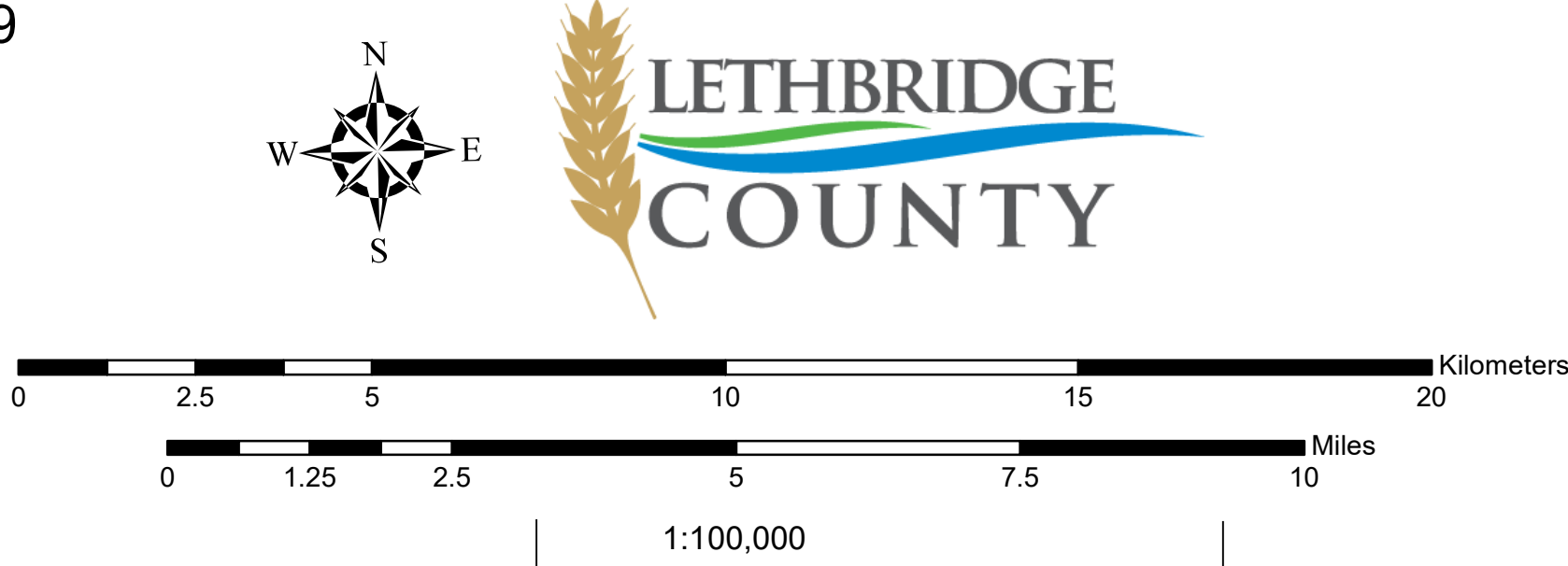


Approx. Miles Per Division: (Gravel Only)

Division 1: 119
Division 2: 122
Division 3: 101
Division 4: 126
Division 5: 197
Division 6: 97
Division 7: 121
Rover 6: 22
Rover 7: 58

Priority Miles:

Priority 1: 150
Priority 2: 740
Priority 3: 79



Date: January 2021
Revised: Lethbridge County, Alberta, Canada
Copyright: Universal Transverse Mercator, Zone 12N
Central Meridian: 111°
Scale Factor: 0.9996
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