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**Submitted by:** Steve Oliver, Director of Public Works

**Report No:** 2023-036

**Council Meeting Date:** Regular Council - 05 Apr 2023

**Subject:** Aggregate Access Road Presentation

**File:** C11 Council Reports

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## RECOMMENDATION:

**That report 2023-036 from the Director of Public Works be received as information purposes.**

## BACKGROUND & COMMENTS:

At the December 21 regular Council meeting a notice of motion regarding Aggregate Road Sections was carried.

**Moved by Councilor Paul Mitchell**  
**Seconded by Councilor Kevin Stewart**

WHEREAS the Township of Zorra is a top ten municipality in Ontario for aggregate extraction.

AND WHEREAS many aggregate pits are accessed from Township gravel roads, which require extra maintenance and are often damaged by high volumes of heavy truck traffic.

AND WHEREAS residents who live and drive on “aggregate access roads” are negatively impacted by the compromised conditions of those roads.

THEREFORE BE IT RESOLVED that Public Works staff prepare a report, identifying all Zorra Township gravel road sections which provide access to one or more active aggregate pits, to be presented to Council no later than the April 5, 2023 Council meeting.

AND THAT this report includes but is not limited to the following information for each “aggregate road section”:

1. The length between the two nearest paved crossroads.
2. The number of active aggregate pits.
3. The extra maintenance work (grading, graveling, dust suppressant) on “aggregate roads” compared to typical gravel roads of the same length and the 2022 cost of that extra work.
4. The estimated cost to upgrade and pave the full section to the highest load rating (year-round or load restricted) of the nearest paved crossroads.
5. The estimated annual cost of maintenance once it is paved.
6. The estimated lifespan of the pavement before replacement is required.

The Director of Public Works has prepared a Power Point Presentation attached to this report in response to the above motion.

**FINANCIAL IMPLICATIONS:**

None

**LINK TO STRATEGIC PLAN:**

**Goal:**

We are an engaged community that values all members and actively encourages involvement, engagement, openness and transparency.

**Action:**

By being open and transparent.

**ATTACHMENTS:**

[Haul Road Study](#)

**Approved By:**

Don MacLeod, Chief Administrative Officer  
Karen Martin, Director of Corporate Services

**Status:**

Approved - 29 Mar 2023  
Approved - 29 Mar 2023



# Aggregate Access Road Analysis

April 5, 2023

Steve Oliver  
Director of Public Works

# Aggregate Access Road Analysis

- Zorra Township is the 6<sup>th</sup> top gravel producing Municipality in Ontario
- In 2021, 5.4 million tonnes of aggregate was produced in Zorra Township
- This equates to 270,000 tri-axel trucks or 135,000 hopper truck loads



# Aggregate Access Road Analysis

- Other extra loading associated with aggregate operations are the movement of equipment such as crushing plants, screening plants, stackers, payloaders, excavators, etc.



# Characteristics of a Gravel Surface Road

- The characteristics of a gravel surface road change dramatically with the weather conditions, when wet conditions persist, high volumes of heavy truck traffic will turn the surface to a slurry.
- These conditions are amplified when subsurface frost is still present and starting to thaw.



# Additional Aggregate Access Road Issues

- In winter 2023 we experienced mild temperatures and rain a week prior to load restriction season.
- Trucks from one pit on the 29<sup>th</sup> Line were hauling as much as possible before load restriction season started during this time and caused much damage to the road surface.

## Traffic Counts 29<sup>th</sup> Line

January 4<sup>th</sup> to 11<sup>th</sup> recorded a total of 1,456 vehicles.

February 6<sup>th</sup> to 13<sup>th</sup> a week before load restriction season recorded a total 8,283 vehicles.

# Aggregate Access Road Analysis

- Zorra Township has four sections of gravel road that provide access to active aggregate pits. These require extra maintenance and the associated costs for each section is as follows:

ROAD	ROAD SECTION	LENGTH	EXTRA GRADING HRS	EXTRA DUST SUPPRESSANT	EXTRA GRAVEL COSTS	EXTRA MAINTENANCE COSTS	EXTRA MAINTENANCE COST/KILOMETER
62	CR45 TO PIT	.7 K TO CR 45	1HRS @ &156.25/HR = \$156.25	N/A	\$1,910.00	\$2,066.25	\$2,066.25
29	Rd 92 to Rd 96	3 k FULL	5HRS @ &156.25/HR = \$781.25	16,548 LITERS @ 0.0825/L = \$1,365.21	\$7,640.00	\$9,786.46	\$3,262.15
31	Rd 92 to Rd96	3 K FULL	3HRS @ &156.25/HR = \$468.75	16,548 LITERS @ 0.0825/L = \$1,365.21	\$7,640.00	\$9,473.96	\$3,157.98
HUNT	Road 66 to Rd 64	1 k to 64	2.5 HRS @ &156.25/HR = \$390.63	5,516 LITERS @ .0825/L = \$455.00	\$2,546.67	\$3,392.30	\$3,392.30
<b>TOTAL</b>						<b>\$24,718.97</b>	<b>\$11,878.68</b>

# Aggregate Access Road Analysis

## Annual Gravel Road Maintenance Cost

Maintenance Operation	Cost	Kilometers of Gravel Road	Cost Per Kilometer
Gravel/Dust Suppressant Application	\$796,520	345	\$2,308.75
Grading, Washouts, Spot Repair	\$266,560.00	345	\$772.64
Winter Control	\$121,529.50	345	\$352.26
			<b>COST EXCLUDING HAUL ROADS</b>
<b>TOTAL COST PER KILOMETER</b>			<b>\$3,433.65</b>
<b>COST PER YEAR TO MAINTAIN A GRAVEL ROAD WITH an AGGREGATE PIT</b>			<b>\$6,331.67</b>

## Annual Asphalt Road Maintenance Costs

Maintenance Operation	Cost	Kilometers of Paved Road	Cost Per Kilometer
line Painting, Sweeping, Patching, Shoulder Maint./	\$171,542.00	130	\$1,319.55
Winter Control	\$364,588.50	130	\$2,804.52
			<b>\$4,277.92</b>
<b>COST PER KILOMETER</b>			
<b>TOTAL MAINTENANCE, PRESEVATION AND REPLACEMENT COST PER YEAR</b>			<b>\$26,807.51</b>

# Aggregate Access Road Analysis

- Asphalt roads do not last forever, they need preservation measures to prolong their lifespan.
- An estimated lifespan of an asphalt road with heavy aggregate traffic is 20 years.
- After the lifespan is over it would be replaced by means of pulverizing and repaving.

Pavement Preservation and Replacement	Cost	Kilometers of Gravel Road	Cost Per Kilometer
Crack Sealing 2x	\$3,00/m	1	\$30,000.00
Surface Treatment 2X	\$7,13/m <sup>2</sup>	1	\$99,820.00
Pulverize and Repave	\$38.82/m <sup>2</sup>	1	\$278,771.84
Line Painting Once Every Two Years	\$1.00/m	1	\$30,000.00
	<b>TOTAL 20 YEAR PRESEVATION AND REPLACEMENT COST</b>		<b>\$438,591.84</b>
	<b>COST PER YEAR FOR A 20 YEAR LIFE CYCLE</b>		<b>\$21,929.60</b>

# Aggregate Access Road Analysis

- It is estimated asphalt with proper maintenance would last approximately 20 years.
- This table shows the cost to maintain both a gravel surface, paved surface and a gravel surfaced access road over a 20 year cycle.
- The totals shown do not include inflation, it would be safe to include 2%-3% per year.

COST CALCULATION OVER 20 YEARS	PER KILOMETER
COST TO MAINTAIN ONE KILOMETER OF PAVED ROAD FOR 20 YEARS	<b>\$85,558.40</b>
COST TO MAINTAIN, PRESEVATION AND PREPLACEMENT OF A PAVED ROAD FOR 20 YEARS (DOES NOT INCLUDE INITIAL PAVING COST)	<b>\$536,159.24</b>
COST TO MAINTIAN ONE KILOMETER OF GRAVEL ROAD FOR 20 YEARS	<b>\$67,240.00</b>
COST TO MAINTIAN ONE KILOMETER OF GRAVEL ROAD WITH AN ACTIVE GRAVEL PIT FOR 20 YEARS	<b>\$126,633.40</b>

# Cost to Pave Aggregate Access Roads

## COST TO HOTMIX ASPHALT HAUL ROAD SECTIONS

ROAD NAME	ROAD SECTION	WORK DESCRIPTION	DISTANCE TO FULL LOAD ROAD (OPTION A)	DISTANCE TO PAVE ENTIRE ROAD SECTION (OPTION B)	COST OPTION A	COST OPTION B
29TH LINE	ROAD 92 TO ROAD 96	TWO 50MM LIFTS HOTMIX ASPHALT	2 KILOMETERS	3 KILOMETERS	\$543,543.68	\$815,315.52
31ST LINE	ROAD 92 TO ROAD 96	REBUILD/WIDEN/CROSS CULVERTS TWO LIFTS HOTMIX ASPHALT	1.7 KILOMETERS	3 KILOMETERS	\$972,012.13	\$1,715,315.52
HUNT ROAD	ROAD 66 TO ROAD 64	REBUILD/WIDEN/CROSS CULVERTS TWO LIFTS HOTMIX ASPHALT	2.5 KILOMETERS	2.8 KILOMETERS	\$1,429,429.84	\$1,600,961.15
ROAD 62	15TH LINE TO 17TH LINE	TWO 50MM LIFTS HOTMIX ASPHALT	.7 KILOMETERS	N/A	\$190,240.29	N/A
<b>TOTAL</b>					<b>\$3,135,225.94</b>	<b>\$4,131,592.19</b>

**NOTE:** COST TO REBUILD ONE KILOMETER OF ROAD IS \$300,000.00. THIS INCLUDES ROAD BASE, WIDENING, CROSS CULVERT REPLACEMENT AND TREE REMOVAL IF NEEDED.

# Possible Solutions

1. Pave all active aggregate access roads to the nearest connecting paved road(s).
2. Increase gravel and dust suppressant frequency on all aggregate access roads to better maintain crown for drainage.
3. Ensure new aggregate pit applications include access road upgrades at the owners' cost.
4. Give the power to the Director of Public Works to declare “Emergency Load Restrictions” when conditions warrant outside the February 15 to April 30 “Load Restriction Season”.

# Questions?

