

# Jefferson County Engineer's Office

## 2023 Year End Report

February 22, 2024

James F. Branagan, P.E., P.S.

### YEAR END HIGHLIGHTS

Every year is different. You have good years. You have bad years. You have average years. 2023 was a BANNER YEAR.

After constructing repairs for over a hundred landslides (slips) along county roads since the heavy rains of 2018 and 2019, the final five landslides were completed in 2023 with two of the repairs the longest and most expensive. Fortunately, the repair design was performed in-house.

A record 15.39 miles of contract resurfacing was completed at a cost exceeding 3 million dollars. In addition, 12.78 miles of contract resurfacing was completed by gas and oil companies through our RUMA process.

Three new bridges were replaced; one by contractors and two by county forces. Plans are also underway for replacing four additional bridges in 2024.

In order to extend the service life of our roads, the county performed full depth reclamation and mill and fill repairs before resurfacing. In addition, our county workers completed over 20 miles of spot

paving, chip and sealed 10 miles of county highways and 22.1 miles of township roads. Several major equipment purchases including a new excavator, new tandem truck, a sign truck and pickup with plow were made.

Finally, upgrades to our winter maintenance program were made using salt brine and "beet juice" to improve performance on the roads while reducing salt use.

With all of the accomplishments noted above 2023 was an amazing year.

As always, I thank and commend each and every employee of the Engineer's Office, Highway Department and Tax Map Office for their hard work, dedication and skills for a very productive 2023.

I also thank the Board of Commissioners and their staff for their cooperation and assistance over the past year.

James F. Branagan, P.E., P.S.  
Jefferson County Engineer

### Snap Shot

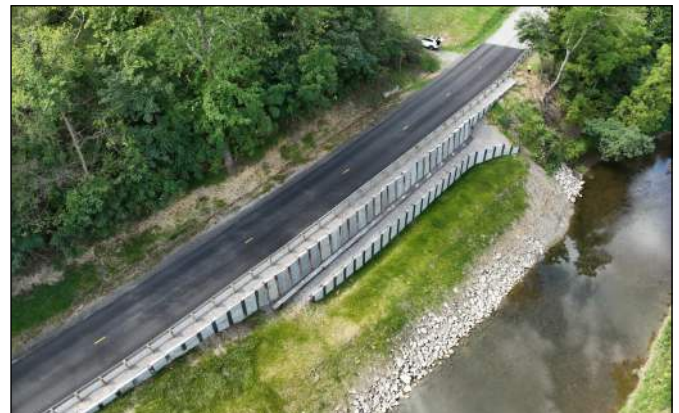
- ◆ Miles paved 28.17
- ◆ Miles chip sealed 10.08
- ◆ LF pipe installed 473
- ◆ Miles road markings 160
- ◆ Bridges replaced 3
- ◆ Bridges rehabilitated 2
- ◆ New signs installed 92
- ◆ Slip repairs 6
- ◆ Tons of aggregate 4,121
- ◆ Gallons of fuel 60,146
- ◆ Gallons emulsion 54,593
- ◆ Tons of salt 4,108
- ◆ SY base repair 12,347
- ◆ Tons of asphalt 7,213

### MAJOR SLIP REPAIRS

The slip along County Road 26 was one of the largest and most pronounced slips we have seen. The length of this slip was 351 feet, with the pavement dropping approximately 15 feet downward. Although the CR26 slip was major, the repair method was standard for this slip. A large diameter drilled shaft retaining wall with 16 feet of lagging depth was used for the repair. Construction benches were excavated in order to enter the worksite safely, and after the wall was installed the roadway was reestablished with embankment lifts and new aggregate base and pavement.

The slip along County Road 74 was a unique failure, measuring 194 feet long. An existing 100 feet long driven pile wall held the roadway after the initial rain event that caused the failure. The embankment between the road and Cross Creek completely washed away leaving a 35 feet tall high wall on the shoulder of the road. The repair method was not typical and required many forms of embankment support. The CR74 slip utilized the existing driven pile wall by installing drilled tie backs for additional support, drilled shaft end walls on each side, a drilled shaft toe wall to reinforce the base of the existing driven piling, and a rock

embankment to prevent further creek erosion and support the wall systems. The limited space and hazardous site conditions made this slip difficult and costly to repair.



County Road 74 Slip Repair Completed in 2023

## BRIDGES

2023 Bridge Replacements						
Township	Route	SLM	Description	Cost	Funding	Contractor
Springfield	CR 49	0.19	95' Steel Beam Structure	\$ 1,424,000.00	ST EXCH	Contractor
Island Creek	TR 383	0.50	10' X 4' Precast Box Culvert	\$ 93,955.00	TWP/Local	In-house
Steubenville	TR 1235	Emery St	9' Diameter Steel Culvert	\$ 27,375.00	LOCAL	In-house
Total Replacement Cost				\$1,545,330.00		
2023 Bridge Maintenance/Rehabilitation						
Township	Route	SLM	Description	Cost	Funding	Contractor
Springfield	TR 309A	Wolf Run	Bridge removed due to safety concerns	\$ 12,611.24	LOCAL	In-house
Warren	TR 1269	Ace Dr	Guardrail installed	\$ 7,101.50	LOCAL	In-house
Total Maintenance / Rehabilitation Cost				\$19,712.74		
<b>2023 Total Bridge Improvements</b>				<b>\$1,565,042.74</b>		

Future Bridge Replacements						
Township	Route	SLM	Description of Existing	Funding	Contractor	Year
Springfield	TR 472	0.12	53' Steel Truss	OBPP	Contractor	2024
Knox	TR 289	0.06	105' Steel Truss	BHJ	Contractor	2024
Cross Creek	TR 173	0.01	19' Concrete Slab	LOCAL	Contractor	2024
Smithfield	CR 6	0.00	52' Steel Beam	LOCAL	Contractor	2025
Mount Pleasant	CR 7	0.85	37' Concrete Girder	LOCAL	Contractor	2025



County Road 49—Elkhorn Road—Bridge Replacement



Steubenville Township Road 1235—Emery St—Bridge Replacement

## SLIP REPAIRS

Road	SLM	Length (FT)	Repair Type	Funding	Cost
CR 23	2.50	240	Drilled Shaft	County	\$ 175,724.50
CR 26	6.40	351	Drilled Shaft	County/Ascent/OPWC	\$ 906,419.70
CR 34	0.50	188	Drilled Shaft	County/ARPA	\$ 308,324.00
CR 34	0.55	112	Drilled Shaft	County/ARPA	
CR 74	2.20	194	DS/RF/TB	County/ARPA	\$ 1,198,574.15
CR 14	0.80	544	Pavement	County	\$ 24,817.60
<b>Total Length</b>		<b>1085</b>	<b>Total Repair Costs</b>		<b>\$ 2,613,859.95</b>
<b>5 Sites</b>			<b>County Funds</b>		<b>\$ 1,797,886.25</b>



County Road 26 Slip—Spring 2023



County Road 26 Slip—Repairs Completed



## PAVEMENT

Road	Begin	End	Miles	Description	Funding	Cost
22	Harrison County Line	SR 152	3.07	2" overlay	County	\$ 675,025.30
22A	SR 152	US 22 Interchange	3.24	Mill and 2" overlay	County	\$ 712,488.24
23	Bloomington Corp	SR 151	5.01	1.75" overlay	County/OPWC	\$ 871,180.85
50	SR 213	East Ave	1.47	2" overlay	County	\$ 286,884.64
60	CR 58	CR 75	0.99	2" overlay	County	\$ 193,208.02
75	CR 60	SR 164	1.25	Mill and 2" overlay	County	\$ 243,949.52
75A	CR 75	SR 164	0.36	Mill and 2" overlay	County	\$ 70,257.46
		<b>Total Length</b>	<b>15.39</b>		<b>Total Cost</b>	<b>\$ 3,052,994.04</b>

### 2023 Upgrades and Repairs to County Roads by Gas and Oil Industry

Road	Begin	End	Miles	Description	Company	Cost
CR14	Well Site	CR 15	0.50	1.5" overlay	Gulfport	\$65,500.00
CR15	SR 150	Well Site	7.90	Base repairs and 1.5" overlay	Ascent/Gulfport	\$1,575,800.00
CR19	Well Site	TR 167	1.53	Base repairs and 4" overlay	Ascent	\$934,900.00
CR19	TR 167	New Alexandria	1.35	1.25" overlay	Ascent	\$164,300.00
CR33	CR 26	Well Site	1.50	Base repairs and 3" overlay	Ascent	\$675,000.00
CR58	CR 60	TR 263	0.50	Chip Seal	Encino	\$43,299.00
CR60	CR 59	CR 58	1.90			
		<b>Total Miles 2023</b>	<b>15.18</b>	<b>Total Investment by Gas and Oil Industry</b>		<b>\$3,458,799.00</b>

## PAVEMENT REPAIRS

Prior to contract resurfacing projects County forces performed base and pavement repairs on various County Roads. Full Depth Reclamation (FDR) was performed on County Roads 60 and 75, this process includes pulverizing failed sections of the existing road and adding cement and water to create a stable base. A two inch thick lift of asphalt is placed over the FDR. On County Roads 22A, 23, 50, 60, 75 and 75A crews performed mill and fill asphalt repairs. This work is completed by milling out failed sections along the outer edge of the pavement and replacing with base or intermediate asphalt and compacting. A summary of this work is below.

### Full Depth Reclamation and Mill Fill Repair Summary

Road	FDR - SY	Mill and Fill SY	Portland - Tons	Asphalt - Tons	Total Cost
22A	x	2265	x	518	\$ 80,846.64
23	x	1794	x	383	\$ 65,586.37
50	x	2678	x	528	\$ 65,481.40
60	1306	520	21.26	110	\$ 81,059.07
75	2235	1131	14.99	440	\$ 121,518.51
75A	x	418	x	112	\$ 15,918.24
<b>Total</b>	<b>3541</b>	<b>8806</b>	<b>36.25</b>	<b>2091</b>	<b>\$ 430,410.23</b>



CR 75—County Forces Spot Paving



CR 22A—County Forces Tree Trimming

### Summary of Spot Paving by County Forces

Road	Begin	End	Length	Tons used	Cost
7F	Toronto	SR 7 Ramp	1.95	782.80	\$ 87,769.44
17	SR 7	CR 18	4.32	632.48	\$ 74,864.54
18	TR 156	SR 151	1.04	325.00	\$ 39,547.66
20	Well Site	Smithfield	1.75	222.31	\$ 27,375.34
21	CR 15	TR 151	0.53	136.54	\$ 22,935.44
24	CR 23	Well Site	2.52	273.74	\$ 33,946.04
38	Curve	CR 39	0.22	160.80	\$ 18,953.55
39A	CR 39	CR 39	0.80	70.00	\$ 16,077.27
45	Curve	Curve	0.15	155.21	\$ 21,912.06
50A	SR 213	Bridge	0.55	420.14	\$ 44,583.34
51	SR 213	SR 213	4.62	336.66	\$ 41,371.59
75	SR 43	CR 60	3.60	340.33	\$ 55,160.39
		<b>TOTALS</b>	<b>22.05</b>	<b>3856</b>	<b>\$ 484,496.66</b>

## CHIP SEAL

County crews placed a chip seal on 10.08 miles of County Roads including 25, 49, 58 and 60. The total cost was \$232,023.86. Encino contributed \$43,299.55 toward the chip seal of existing haul routes. Crews also sealed 22.10 miles of Township Roads.

## SIGNS

At the end of 2022 the sign inventory consisted of 4,060 signs of varying types. The County uses three types of signs, Regulatory, Warning and Informational. In 2023, 92 new signs were added, 376 signs were replaced, 167 signs were reset or relocated and 26 signs were removed. Including materials, equipment and labor the total cost was \$62,874.15.

## VEGETATION MANAGEMENT

Contract tree trimming and removal was completed on County Roads 23, 25 and 75 at a cost of \$129,177.98. County crews completed right of way clearing on sections of County Roads 22A, 50 and 50A in preparation of resurfacing. Right of Way mowing consisted of three passes at a cost of \$45,066.00. County forces applied 277 gallons of herbicide at a cost of \$52,143.07. Total cost of Vegetation Management was \$623,546.76.

## GUARDRAIL

The County Engineer maintains over 84 miles of guardrail which requires frequent repairs in order to retain its function. County crews replaced 962.5 LF on various County Roads. Total cost for guardrail maintenance in 2023 was \$102,329.00.

## CULVERT & CATCH BASIN INSTALLS

Road	Culvert Size						CB
	8"	12"	15"	18"	24"	60"	
17						60	
22A		80		10	20		1
23		20	100				
26	35						
30				9			
40	40						
54				16			
56				20			
57				6			
60			53				
72				4			
<b>Total</b>	<b>75</b>	<b>100</b>	<b>153</b>	<b>65</b>	<b>20</b>	<b>60</b>	<b>1</b>

**473 LF pipe and 1 catch basins installed.**

In addition to the above work, MPW was hired to clean catch basins and drainage pipes on CR 22A., 46 and 56. County crews completed 9.35 miles of ditch cleaning and 7.73 miles of shoulder grading. Total cost for drainage work is \$870,635.73.

## EQUIPMENT

Item	Cost
1 Kobelco Excavator	\$189,745.00
1 Ford F-250 Pickup w/ Plow	\$61,615.00
1 Chevy 3500 Sign Truck	\$76,070.69
1 Jeep Grand Cherokee	\$40,035.00
1 Tandem Dump Truck	\$174,205.00
2 Snow Plows	\$27,931.90
2 Salt Spreaders	\$69,265.78
2 Wetting Systems	\$11,624.00
1 Automatic Tire Chain Set	\$4,499.01
1 Truck Mounted Broom	\$16,750.00
47 Radios and CBs	\$26,081.78
2 Portable Truck Scales	\$10,390.00
1 Generator	\$1,930.00
<b>Total Cost</b>	<b>\$710,143.16</b>



Kobelco SK 140 Excavator

## BUILDING AND GROUNDS

Maintenance costs included HVAC maintenance, brine tank fill equipment, garage door repairs, parking lot pavement markings, lighting upgrades, salt shed replacement, locker room remodeling and architectural services. The total cost was \$389,439.44.

## MAP OFFICE STATS

Deeds reviewed and recorded	4,233
Property splits and/or combinations	258
Copies provided per month	694
New surveys and descriptions reviewed	229

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## PAVEMENT MARKINGS

Double Yellow Center Line			
Road	Begin	End	Miles
2	Yorkville Corp.	Dead End	2.42
3	SR 647	Dead End	1.67
4	CR 17	CR 16	1.22
5	SR 150	Belmont Co. Line	1.41
6	SR 150	Adena Corp.	4.59
7	SR 150	CR 6	3.11
7B	Mingo Jct. Corp.	Dead End	0.63
7E	SR 7 Ramp	Brilliant Corp.	1.34
7F	Toronto Corp.	SR 7 Ramp	1.92
7G	SR 7 Ramp	SR 7 Ramp	0.77
9	Wintersville Corp.	Dead End	0.85
10	Adena Corp.	End New Asphalt	0.10
11	CR 10	SR 152	3.86
12	CR 10	Harrison Co. Line	1.29
14	SR 150	CR 15	2.89
15A	CR 15	CR 16	0.40
16	CR 15	CR 17A	4.23
16A	CR 16	CR 14	0.06
17	SR 7 Ramp	CR 15	5.93
17A	Rayland Corp.	Last Industrial Drive	0.80
18	SR 151	CR 17	2.60
20	Smithfield Corp.	TR 118	2.56
21	SR 151	CR 15	1.58
22A	US 22 Interchange	Wintersville Corp.	2.75
25	SR 151	CR 26	4.20
28	CR 26	CR 74	2.56
29	CR 30	Mingo Jct. Corp.	0.35
30	Steubenville Corp.	CR 28	2.91
34	CR 26	Wintersville Corp.	5.07
36	SR 152	TR 136	4.64
38	CR 22A	CR 39	2.73
40	SR 152	SR 646	2.97
41	SR 43	SR 43	1.84
42	CR 46	Toronto Corp.	1.72
43	SR 43	Steubenville Corp.	3.54
43A	SR 213	US 22 Overpass	0.08
44	CR 7G	Bryon Street	0.29
45	SR 43	SR 213	4.70
46	SR 213	SR 7	2.47
47	SR 152	SR 7	3.99
49	SR 164	New Bridge	1.95
50A	SR 213	Truss Bridge	0.38
51	SR 213	SR 213	4.63
54	SR 43	CR 58	6.65
55	CR 50	TR 302	5.40
56	SR 152	SR 7	8.20
57	CR 56	CR 53	4.23
58	CR 60	CR 53	7.40
59	CR 60	CR 54	3.34
60	SR 43	CR 58	2.74
61	CR 75	Amsterdam Corp.	2.21
65	CR 28	CR 26	1.47
68	SR 152	CR 51	4.10
72	SR 213	TR 218	3.52
74	Mingo Jct. Corp.	TR 175	5.46
75	SR 43	CR 60	3.67
77	Steubenville Corp.	Steubenville Corp.	1.41
152A	SR 152	SR 152	0.31
<b>Total Center Line Miles</b>			<b>160.12</b>

Contractor also completed 23.58 miles of edge lines, 2.92 miles of lane lines and multiple arrows, stop bars and diagonal lines. Total project cost was \$134,740.62.