

Cass County Pavement Preservation Plan

Kyle Litchy PE.

Assistant County Engineer

I have been working at the Cass County Highway Department for 11 years doing design, construction management, and budgeting. Over this time, we have tried many different sections and we think we have narrowed it down to a process that works for us and may work for others throughout the state.

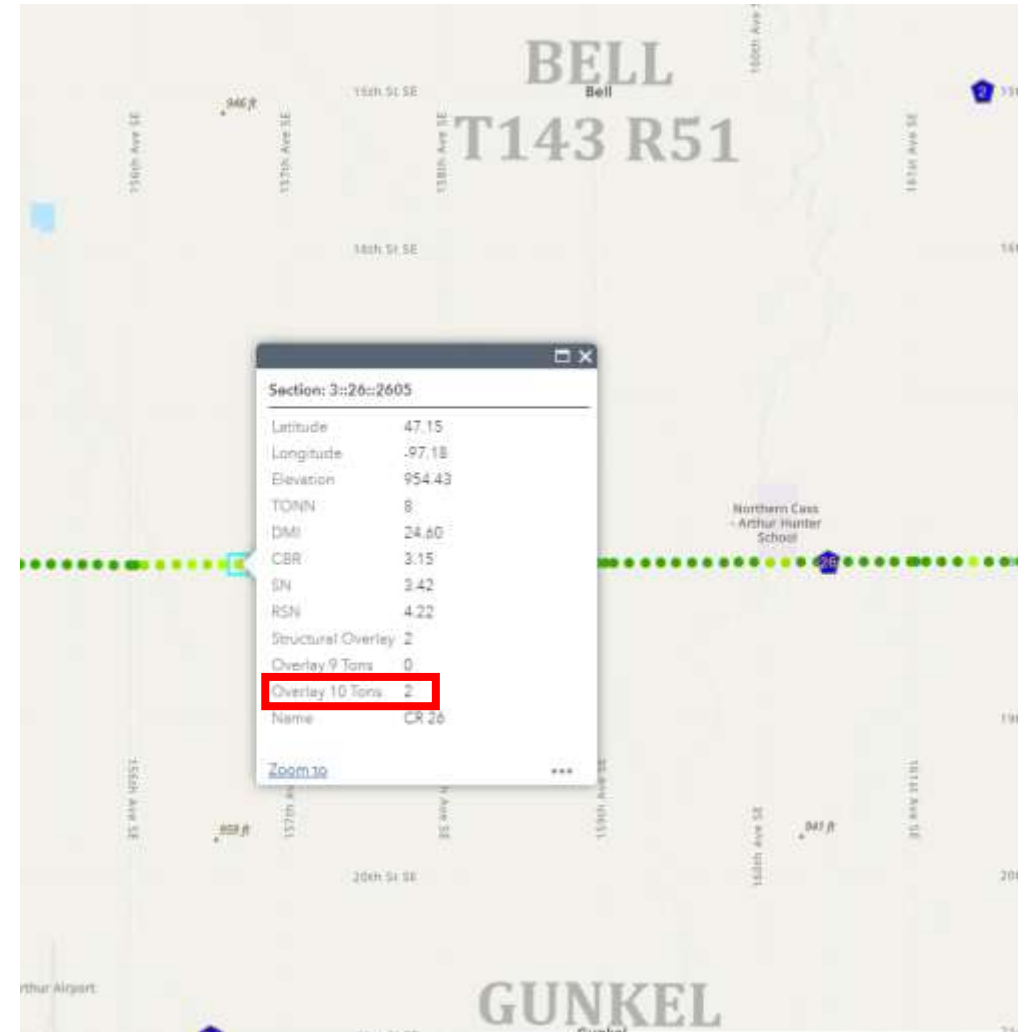
Planning

Where to start?

- Overall Goal
 - Get everyone of our paved roads to 10-ton Capacity
- Standard Projects (Cass County is confident with these three techniques)
 - Mill and Overlay
 - Crackseal
 - Chipseal
- Prioritization of Projects
 - Visual
 - Cracking
 - Blowouts
 - Rutting
 - Striping
 - Pavement Testing
 - Traffic Counts
 - Costs

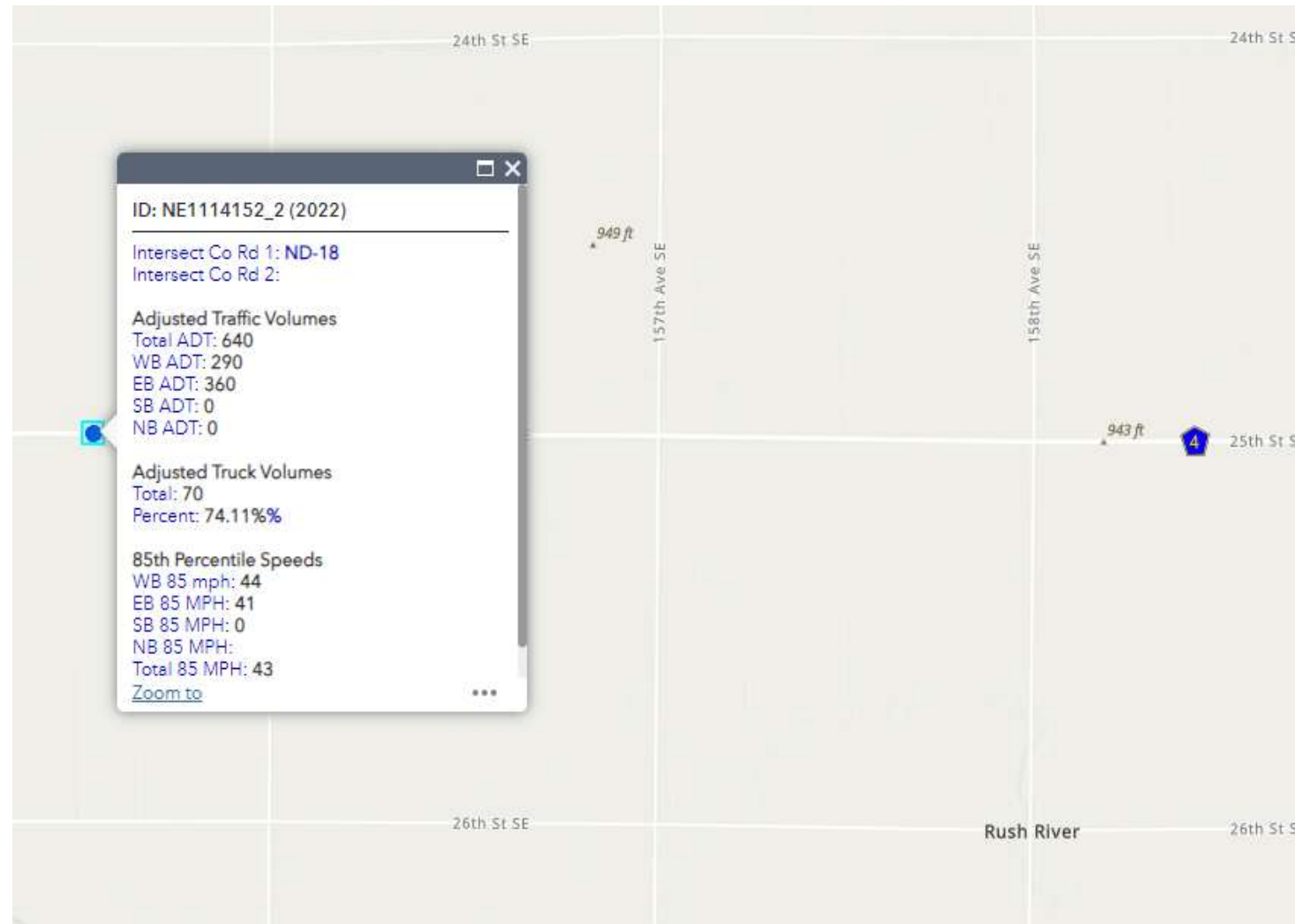
Pavement Testing

- Pavement Testing
 - FWD (Falling Weight Deflectometer) Testing
 - Completed every 5 years on all of our paved road sections every 0.1 Mile
 - Gives us existing road strength of roadway
 - California Bearing Ratio (CBR)
 - Structural Number (SN)
 - Can check if your recent projects achieved the strength what you planned
 - Road Capacity (Tons)
 - Gives us necessary Asphalt Overlay thickness (1-4IN) to achieve a 10-ton Roadway
 - If over 4IN overlay, then time to reconstruct
 - PCI (Pavement Condition Index) Testing
 - Completed every 5 years on all of our paved road sections
 - Gives us existing road top condition
 - Lets us know if another chipseal or other surface type is needed
 - Maybe the strength of the road is good, but it needs a surface treatment to improve ride



Traffic Counts

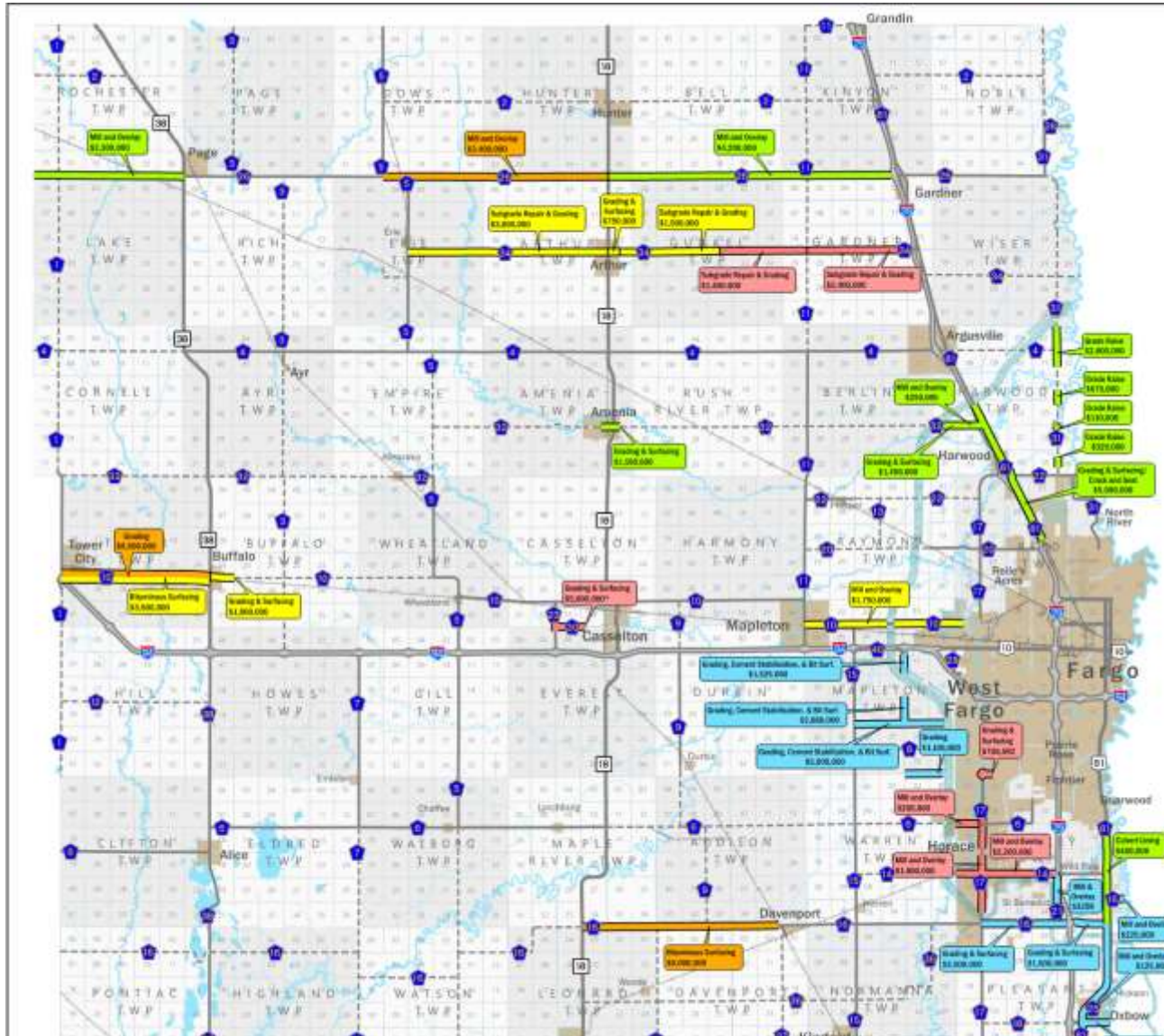
- Traffic Counts
 - Completed every 5 years on all of our roads
 - Lets us know where county road traffic coming/going, changes in traffic patterns, and what routes are seeing most traffic as well as how many trucks are traveling that route
 - Traffic counts are used in conjunction to the Pavement testing to give us more accurate numbers



Construction Projects/Prioritization

- Mill & Overlay
 - Mill to correct cross slope and to get millings for RAP corporation into the mix
 - We use overlay thickness that came out of the Pavement Testing results to achieve a 10-ton road if applicable
 - Our Min Mill & Overlay requirements are 1.5" Mill and 2" Overlay
- Chipseal
 - Perform chipseal the next year after a new overlay project to preserve the new asphalt
 - Perform chipseal at the 10-15 year mark on asphalt pavement if PCI is low
- Crackseal
 - Perform crackseal the next year after a new overlay project to preserve the new asphalt
 - Perform crackseal every 5 years or so on asphalt pavement

5-year Plan



Appendix 1 2024 - 2028 5 Year Capital Improvement Plan Proposed Highway Projects

2024 2025 2026 2027 2028

TABLE 5 - PROPOSED HIGHWAY IMPROVEMENTS

WAY	LOCATION	PROJECT TYPE	FUNDING YEAR	EST. COST
22nd Ave	22nd Ave & Hwy 17 Roundabout & E Linn to 22nd Ave	Grading & Surfacing	Local	2024 \$706,262
25th St	Hwy 17 to 25th St	Grading & Surfacing	Local	2024 \$2,090,000*
8	Waynes to Cass to Hwy 27	M/I and Overlay	Local	2024 \$208,000
14	Waynes River to 27	M/I and Overlay	Local	2024 \$2,300,000
17	20th Ave to 27th St & Broadway to Broadway to Hwy 16	M/I and Overlay	Local	2024 \$1,400,000
20	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
21	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
22	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
23	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
24	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
25	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
26	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
27	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
28	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
29	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
30	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
31	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
32	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
33	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
34	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
35	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
36	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
37	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
38	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
39	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
40	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
41	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
42	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
43	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
44	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
45	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
46	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
47	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
48	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
49	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
50	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
51	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
52	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
53	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
54	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
55	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
56	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
57	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
58	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
59	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
60	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
61	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
62	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
63	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
64	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
65	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
66	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
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68	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
69	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
70	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
71	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
72	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
73	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
74	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
75	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
76	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
77	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
78	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
79	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
80	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
81	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
82	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
83	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
84	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
85	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
86	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
87	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
88	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
89	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
90	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
91	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
92	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
93	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
94	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
95	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
96	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
97	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
98	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
99	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000
100	Hwy 17 to 27th St	Signage Repair & Overlay	Local	2024 \$1,400,000

*Note: There is to be completed and distributed and subject to change when approved already used for its accuracy by the Road Authority Director.
*Project cost which is possible.

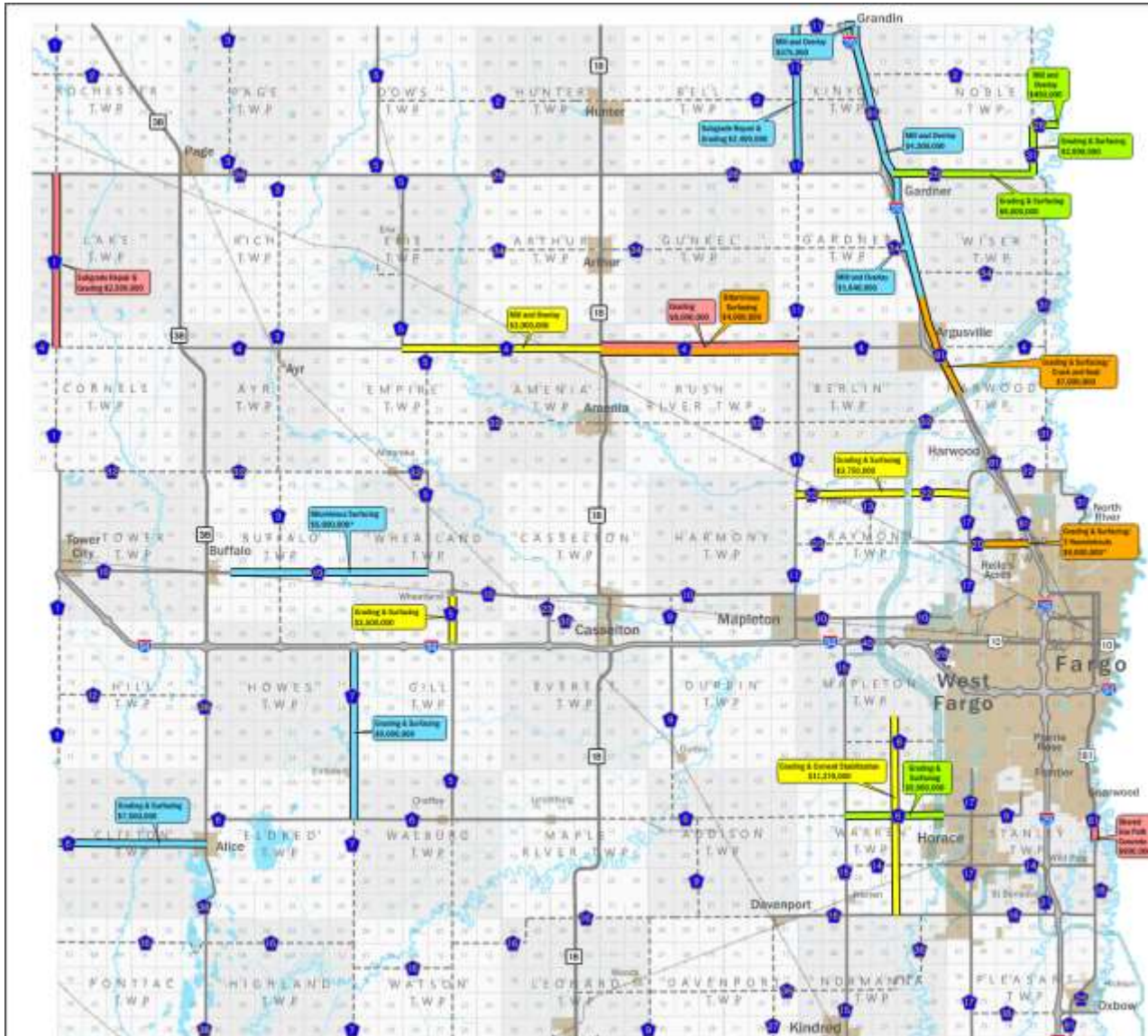
Cass County Highway Department

Jason Benson
County Engineer, P.E.
Tom Soucy
Department Administrator

CASS COUNTY
GOVERNMENT

1201 Main Ave. W
West Fargo, ND 58078
(701) 298-2370

5-10 year Plan



Appendix 15 2029 - 2033 6-10 Year Capital Improvement Plan Proposed Highway Projects

2029 2030 2031 2032 2033

LONG RANGE PROPOSED HIGHWAY IMPROVEMENTS 2029-2033					
HWY	LOCATION	PROJECT TYPE	FUNDING	YEAR	COST
81	17th Ave S to 20th Ave S	Shoulder Tack Concrete	State	2029	\$980,000*
4	State Hwy 18 to Hwy 11	Local	Local	2029	\$8,000,000
1	Hwy 4 to Hwy 20	Shoulder Repair & Grading	Local	2029	\$2,700,000
4	State Hwy 18 to Hwy 11	Shoulder Sealing	Local	2030	\$4,000,000
20	Hwy 17 to Hwy 11	Grading & Surfacing / Shoulder Sealing	State/FED	2030	\$4,000,000*
81	Shorewood to Hwy 20	Grading & Surfacing / Shoulder Sealing	Local	2030	\$1,000,000
5	Shorewood to Hwy 10	Grading & Surfacing	Local	2031	\$1,500,000
4	State Hwy 18 to Hwy 8 North	Mill and Overlay	Local	2031	\$1,000,000
	Improvement 11: 23rd Ave to Hwy 20	Grading & Shoulder Stabilization	Distal	2031	\$1,175,000
33	Hwy 17 to Hwy 11	Grading & Surfacing	Local	2031	\$1,000,000
30	SPAX CR	Grading & Surfacing	Local	2032	\$8,000,000
31	Hwy 24 West to Hwy 18 East	Grading & Surfacing	Local	2032	\$1,000,000
20	Hwy 21 to Red River	Mill and Overlay	Local	2032	\$400,000
4	Shorewood to Hwy 20	Grading & Surfacing	Local	2032	\$1,000,000
7	Hwy to Hwy 5	Grading & Surfacing	Local	2032	\$8,000,000
10	CR to Buffalo	Shoulder Sealing	Distal	2032	\$1,400,000*
11	Hwy 28 North & Main	Shoulder Repair & Grading	Local	2032	\$2,400,000
81	Hwy 20 to 23rd County	Mill and Overlay	Distal	2032	\$4,200,000
11	Through Grading	Mill and Overlay	Distal	2032	\$275,000
84	Distal SP	Mill and Overlay	Distal	2032	\$1,400,000
4	Hwy 20 to State County	Grading & Surfacing	Local	2033	\$7,500,000

*Note: State to be completed on their schedule and subject to change when approved. Funding not to be necessary by the Road Advisory Committee.
*Funding for which grant is possible.

Cass County Highway Department

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County Engineer, P.E.

CASS COUNTY
GOVERNMENT

1201 Main Ave. W
West Fargo, ND 58078

Tom Soucy
Deputy County Engineer, P.E.

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Asphalt Specifications

- Asphalt
 - Now we use PG58-34H
 - Have seen way better performance out of this oil with cracking and stripping
 - Special Provisions (we use on every paving job)
 - Ride Spec
 - Longitudinal Joint Spec
 - Intelligent Compaction
 - Used to use compaction spec before spec book put incentives for compaction
 - Rap
 - 15-20% Rap
 - We require contractor to crush millings to 5/8" for more consistence mix (we have seen tighter mats)
 - Tack
 - 0.05 Gal/SY on non milled surface
 - 0.1 Gal/SY on milled surface
 - 0.1 Gal/SY on centerline joint
 - Fog
 - We always fog after final lift while pavement is still warm @ 0.05 Gal/SY

Crackseal/Chipseal Specifications

- Crackseal
 - We always require routing on new cracks and band existing cracks (3/4"X3/4")
- Chipseal
 - CRS-2P Oil
 - 0.40 Gal/SY Mainline
 - 0.20 Gal/SY Shoulder (no chips)
 - CL 41 Agg.
 - Always Fog finished Chipseal
 - SS-1H or CSS1H Emulsified Asphalt
 - 0.05 Gal/SY



Questions?