

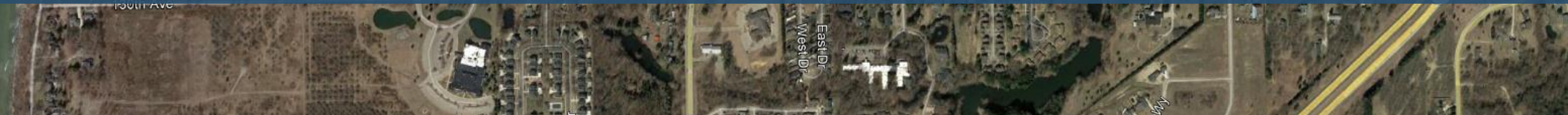


Wastewater and Stormwater Capital Improvement Plans

May 6, 2024

Lucas Timmer, P.E.

Prein & Newhof



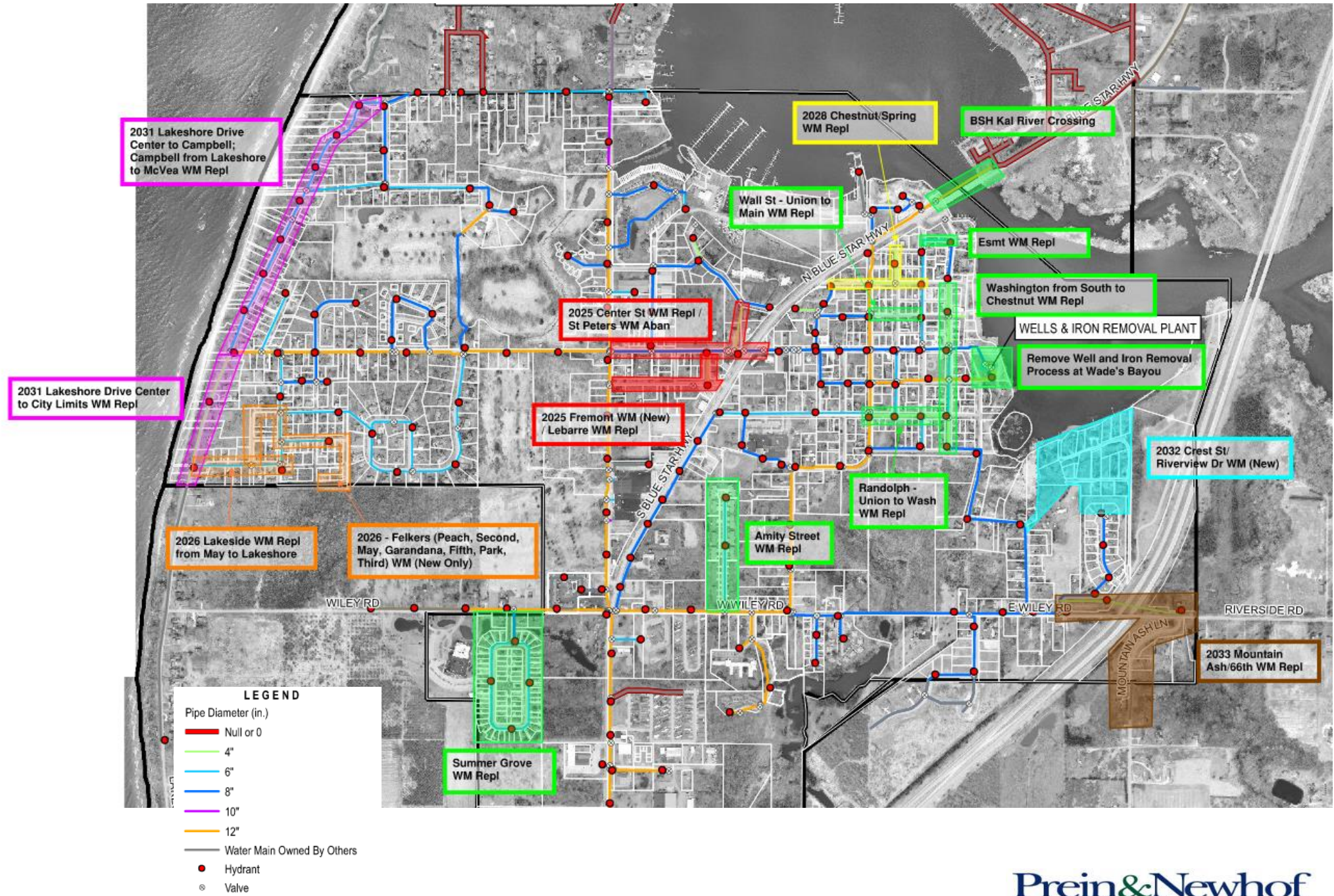
Outline

- Brief review of Water and Road Asset Management Plans and Capital Improvement Plans
- Stormwater Capital Improvements Plan
- Wastewater Capital Improvements Plan
- Geographic Information Systems Improvements

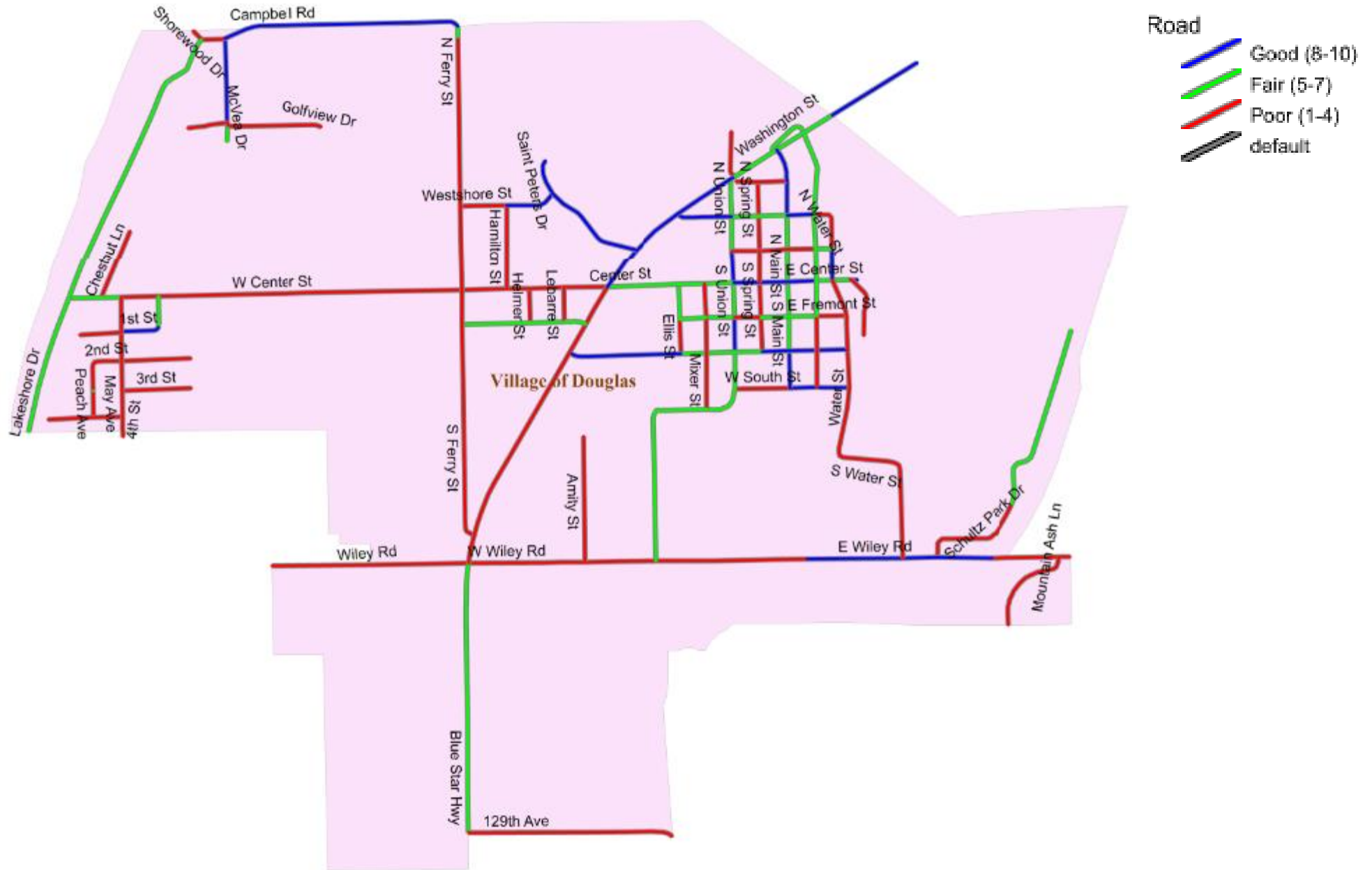
Water and Road Capital Improvements Plans

- Douglas received a Drinking Water Asset Management (DWAM) Grant in 2022 which provides funding to assist communities with:
 - Asset Management Plan (AMP) development and updates
 - Distribution System Material Inventories (DSMI) and necessary verification (i.e. potholing/hydrovacing)
 - Capital Improvement Plan (CIP) to lay out projects, costs, and funding (rate study) needed for the water system
- Douglas updated their Roads Asset Management Plan and Capital Improvements Plan in 2023/2024
- These Capital Improvement Plans help the City be proactive in replacement of their assets but also assist the City in determining what funding needs the City has for this replacement

Douglas Water Capital Improvements Plan

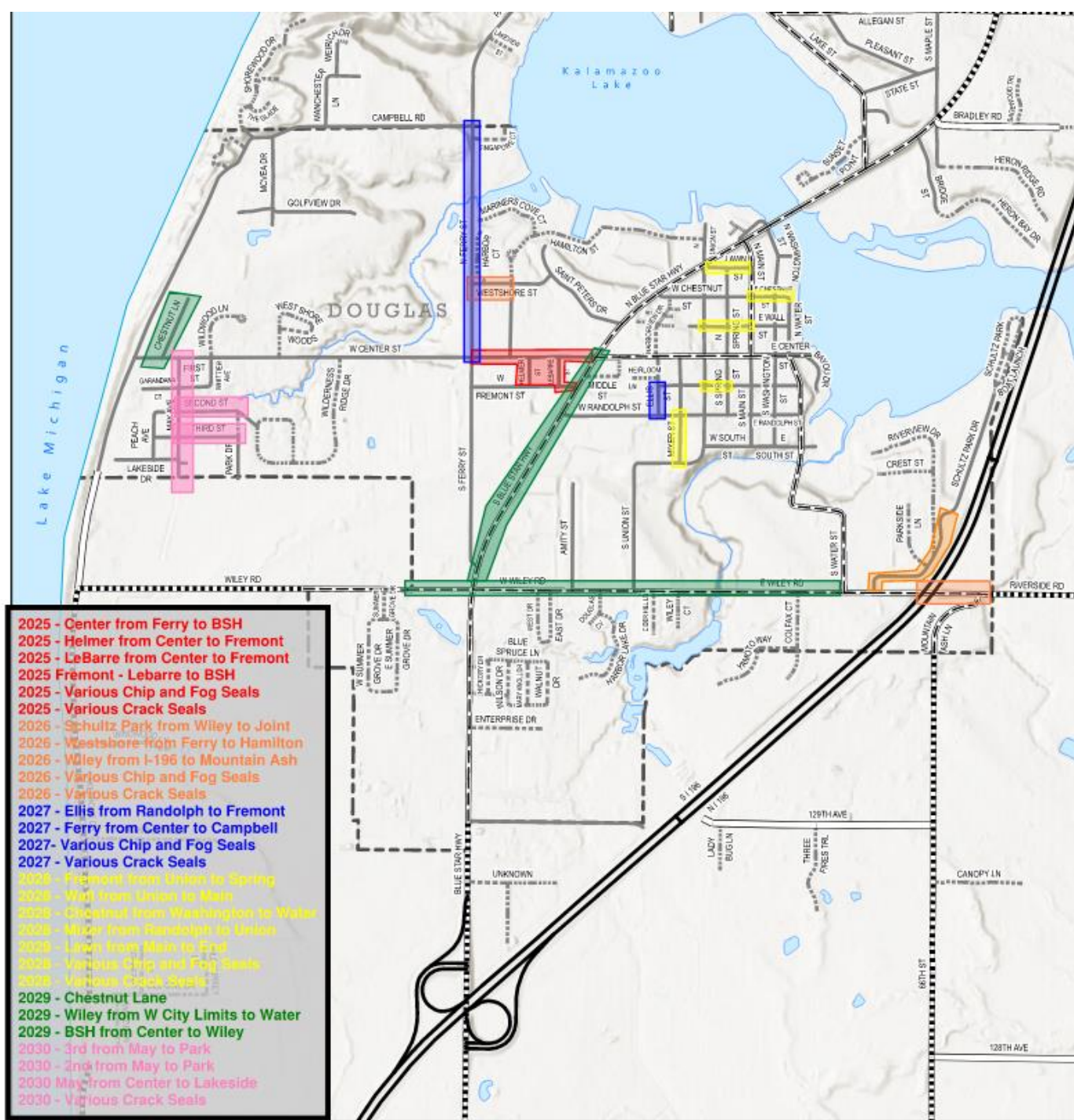


Douglas Road PASER Ratings



Douglas - 2023 TAMC (Good, Fair, Poor)

Road Capital Improvements Plan Projects

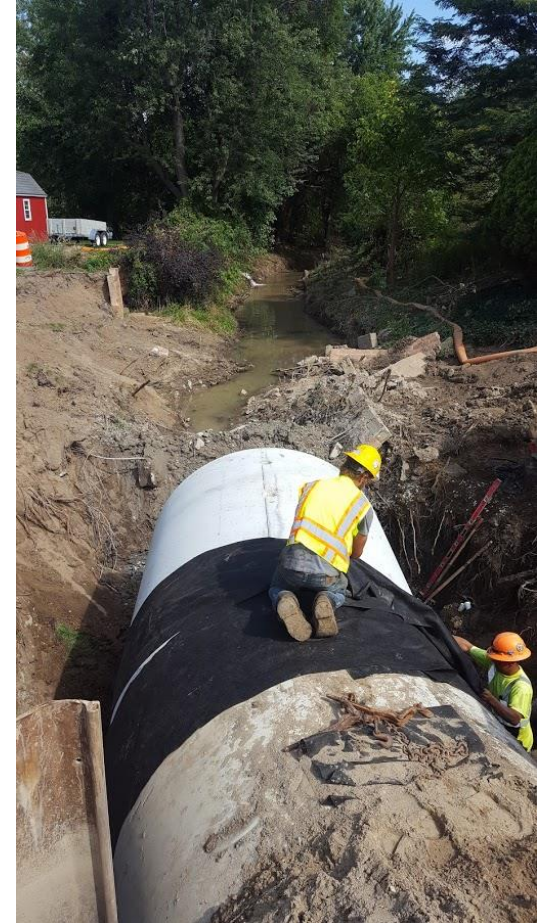


- 2025 - Center from Ferry to BSH
- 2025 - Helmer from Center to Fremont
- 2025 - LeBarre from Center to Fremont
- 2025 Fremont - Lebarre to BSH
- 2025 - Various Chip and Fog Seals
- 2025 - Various Crack Seals
- 2026 - Schultz Park from Wiley to Joint
- 2026 - Westshore from Ferry to Hamilton
- 2026 - Wiley from I-196 to Mountain Ash
- 2026 - Various Chip and Fog Seals
- 2026 - Various Crack Seals
- 2027 - Ellis from Randolph to Fremont
- 2027 - Ferry from Center to Campbell
- 2027 - Various Chip and Fog Seals
- 2027 - Various Crack Seals
- 2028 - Fichmont from Union to Spring
- 2028 - Wolf from Union to Wash
- 2028 - Chestnut from Washington to Water
- 2028 - May from Randolph to Union
- 2028 - Lakes from Main to Elm
- 2028 - Various Chip and Fog Seals
- 2028 - Various Crack Seals
- 2029 - Chestnut Lane
- 2029 - Wiley from W City Limits to Water
- 2029 - BSH from Center to Wiley
- 2030 - 3rd from May to Park
- 2030 - 2nd from May to Park
- 2030 - May from Center to Lakeside
- 2030 - Various Crack Seals

J:\GIS - Client\ugr-G0\Douglas\22336112_Road AMP\22336112_Road AMP.aprx-odm.aprx 1/26/2024 11:32 AM

Douglas Stormwater Capital Improvements Plan

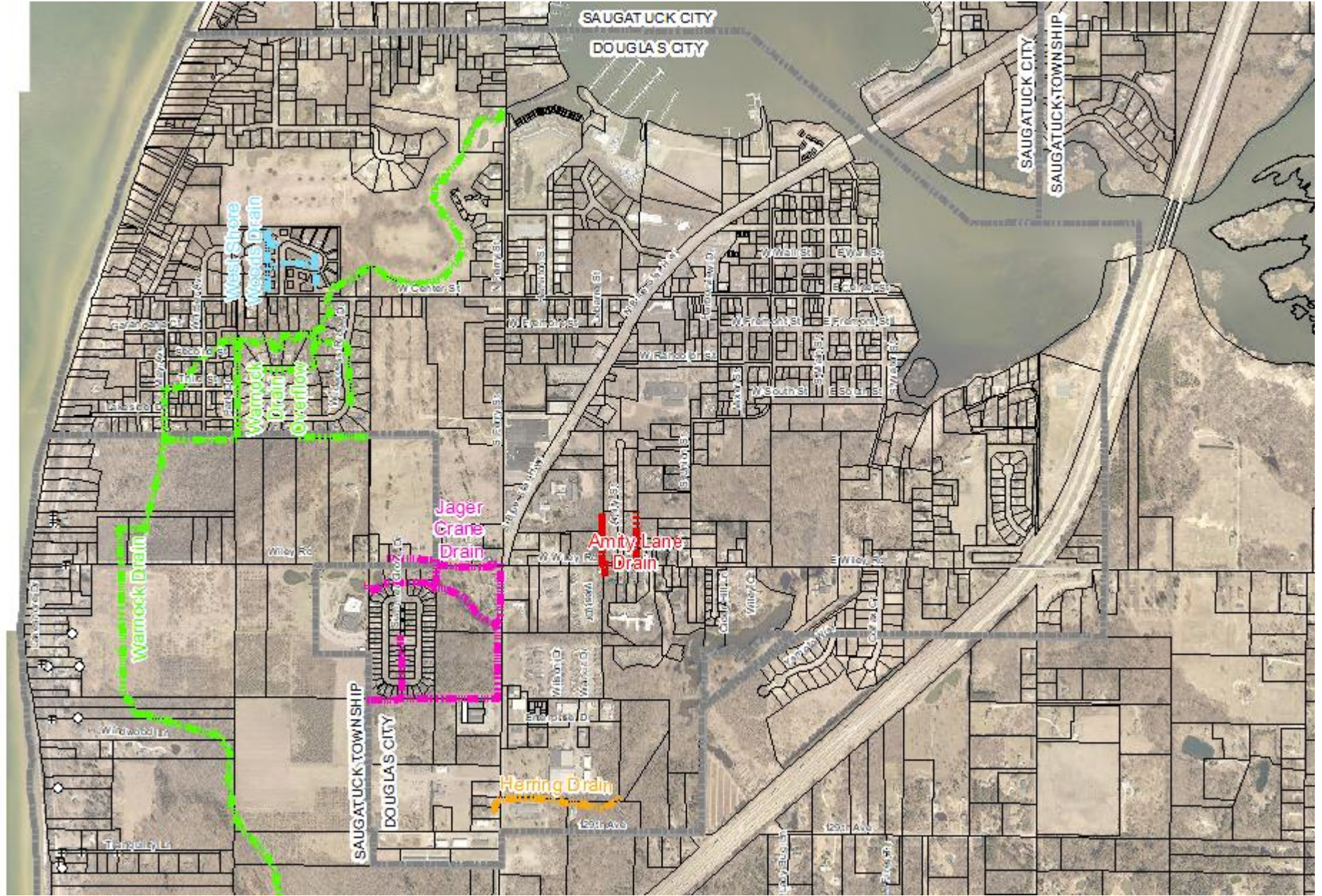
- Douglas completed a Stormwater, Asset Management, and Wastewater (SAW) Grant in late 2019 for the City's stormwater system
 - Inventory of Storm Sewer System Assets
 - Condition Assessment
 - Risk of Failure
 - Consequence of Failure
 - Criticality
 - Capacity Analysis
 - Capital Improvement Recommendations
- Utilize data from 2019 SAW Report in creating an updated Capital Improvements Plan
- Exhaustive field review not proposed since this work was completed in 2019 as part of the SAW Report



Stormwater Capital Improvements Plan - Scope

- Prepare a Capital Improvements Plan including forecasted costs for the next 10 years to replace/improve existing stormwater infrastructure (based on previous Stormwater SAW report)
- Review with Allegan County Drain Commissioner's office if there are any upcoming maintenance projects on county drains or any locations within the City that the City may consider wanting to become a county drain
- City could consider reviewing with Baker Tilly to identify any funding gaps in the City's projected revenue and determine what policies are needed to be proactive in maintaining the City's stormwater system
- Present the Capital Improvements Plan to City Council

County Drains in Douglas



KLSWA Wastewater SAW Report

- Kalamazoo Lake Sewer and Water Authority (KLSWA) completed a Stormwater, Asset Management, and Wastewater (SAW) Grant in mid-2017 for Douglas, Saugatuck, and Saugatuck Township's sewer system
 - Inventory of Wastewater System Assets
 - Televised 18% of the wastewater system
 - Condition Assessment
 - Critical Assets
 - Capital Improvements Planning
 - Operations and Maintenance
- Since 2017, KLSWA has televised most sanitary sewer lines in the City of Douglas which gives a better idea on condition of the system

Wastewater Capital Improvements Plan Scope

- Condition Assessment
 - Evaluate 2017 SAW Report
 - Obtain KLSWA Televising Videos
 - Utilize televising videos and past data from 2017 SAW Report to determine:
 - Risk of Failure - condition noted from televising
 - Consequence of Failure - rated based on social, economic, and environmental impacts of a wastewater failure
 - Criticality - Risk of Failure x Consequence of Failure - helps order what system improvements should be implemented
 - Generate similar maps/data as Stormwater SAW Maps (see next slides)

Tabular Report of PSR SS2682-SS2981

for KLSWA

Setup	12	Surveyor	Andrew	Certificate #	U-914-06021529	System Owner	
Drainage		Survey Customer					
P/O #		Date	2023/11/15	Time	9:20	Street	Wiley Rd
City	Douglas	Further location details					
Up	SS2682-1	Rim to invert		Grade to invert		Rim to grade	Ft
Down	SS2681	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	
Shape	Circular	Height	8	Width	ins	Preclean J	Date Cleaned 2023/11/15
Material	Polyvinyl Chloride	Joint length		Ft	Total length	168.4 Ft	Length Surveyed 168.4 Ft
Lining		Year laid		Year rehabilitated		Weather	Dry
Purpose		Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project						Work Order	
Northing						Elevation	
Coordinate System						GPS Accuracy	

Count	Video	CD Code	In1	In2	% JntFr	To	ImRef	Remarks
0.0		ST	Start of Survey					
0.0		MGO	General Observation				866	[ST]
0.0		AMH	Manhole				867	SS2682
0.0		MWL	Water Level		5		868	
16.7		MWLS	Water Level Sag		5		869	
123.8		MWLS	Water Level Sag		5		870	
138.9		MWLS	Water Level Sag		5		871	
153.3		MWLS	Water Level Sag		10		872	
162.9		TF	Tap Factory	6.000		11	873	
166.5		FC	Fracture Circumferential			11	2	874
168.4		MGO	General Observation				875	[FH]
168.4		AMH	Manhole				876	SS2681
168.4		FH	End of Survey					

168.4 Ft Total Length Surveyed

Structural:	Pipe Rating	10	Pipe Ratings Index	2	Quick Rating	2500
O&M:	Pipe Rating	0	Pipe Ratings Index	0	Quick Rating	0000
Overall	Pipe Rating	10	Pipe Ratings Index	2	Quick Rating	2500

SAW Stormwater Risk of Failure Map



THE CITY OF THE VILLAGE OF DOUGLAS
ALLEGAN COUNTY, MICHIGAN
STORMWATER SYSTEM

MAP 8: RISK OF FAILURE

DECEMBER 2019

Prein&Newhof
2130545

LEGEND

Risk of Failure - Gravity Main Sewer

- Not Rated
- 1 - Lowest Risk of Failure
- 2
- 3
- 4
- 5 - Highest Risk of Failure

- The City of the Village of Douglas Catch Basin
- Catch Basin Owned by Others

- The City of the Village of Douglas Manhole
- Manhole Owned by Others

- The City of the Village of Douglas Culvert

- Gravity Main Owned by Others

- Culvert Owned by Others

- Pond
- Open Drain



SCALE: 1" = 800'

SAW Stormwater Consequence of Failure Map



THE CITY OF THE VILLAGE OF DOUGLAS
ALLEGAN COUNTY, MICHIGAN
STORMWATER SYSTEM

MAP 9: CONSEQUENCE OF FAILURE

DECEMBER 2019

Prein&Newhof
2130545

LEGEND

Consequence of Failure - Gravity Main Sewer

- 1 - Lowest Consequence of Failure
- 2
- 3
- 4
- 5 - Highest Consequence of Failure

▸ The City of the Village of Douglas Catch Basin

• Catch Basin Owned by Others

○ The City of the Village of Douglas Manhole

◉ Manhole Owned by Others

— The City of the Village of Douglas Culvert

— Gravity Main Owned by Others

— Culvert Owned by Others

☞ Pond

— Open Drain



SCALE: 1" = 800'

SAW Stormwater Criticality Map



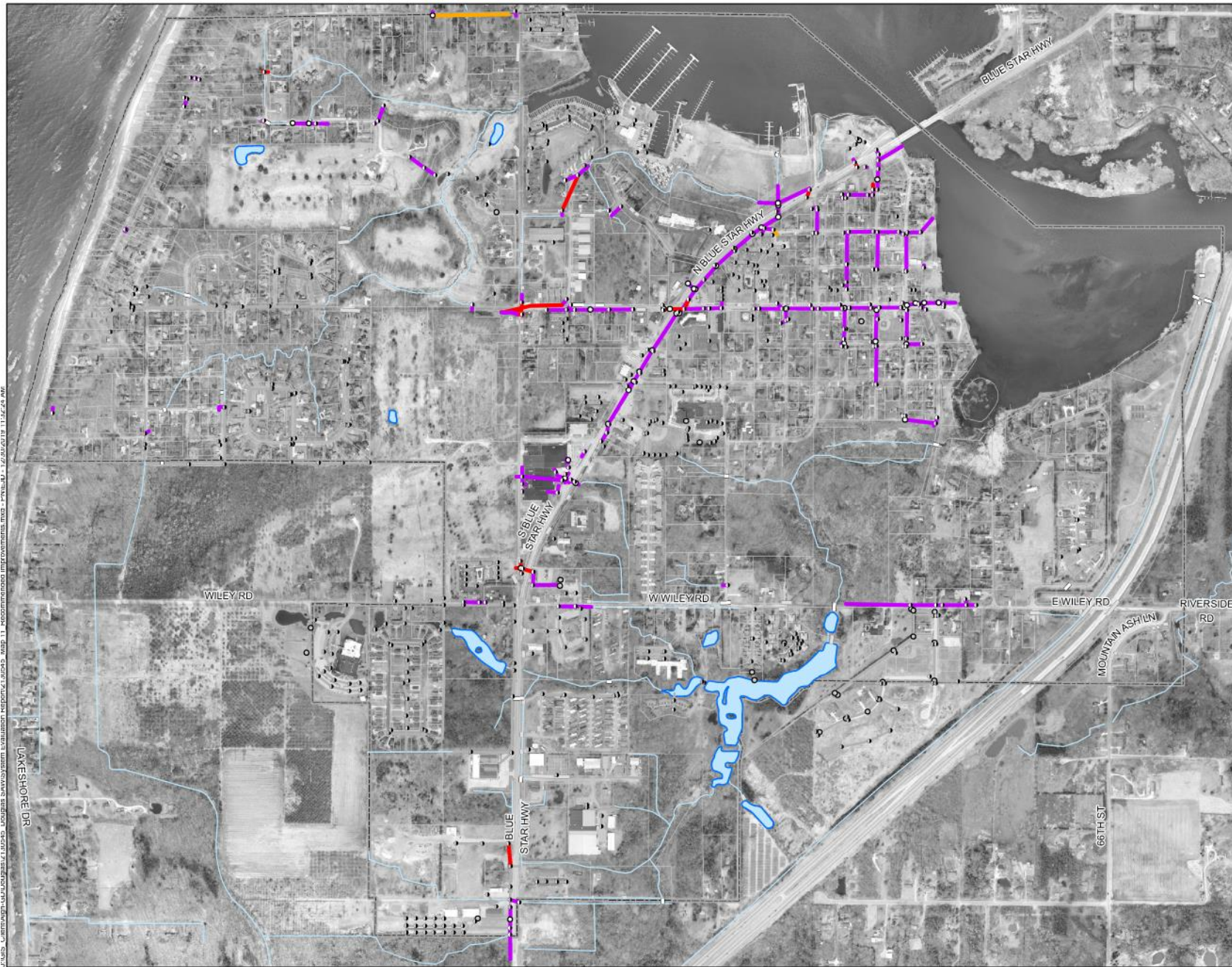
THE CITY OF THE VILLAGE OF DOUGLAS
 ALLEGAN COUNTY, MICHIGAN
 STORMWATER SYSTEM
MAP 10: CRITICALITY
 DECEMBER 2019
 Prein&Newhof
 2130545

LEGEND

- Criticality Rating**
- Least Critical
 -
 -
 -
 - Most Critical
- The City of the Village of Douglas Catch Basin
 - Catch Basin Owned by Others
 - The City of the Village of Douglas Manhole
 - Manhole Owned by Others
 - The City of the Village of Douglas Culvert
 - Gravity Main Owned by Others
 - Culvert Owned by Others
 - ⊕ Pond
 - Open Drain


 SCALE: 1" = 800'

SAW Stormwater CIP Map



THE CITY OF THE VILLAGE OF DOUGLAS
ALLEGAN COUNTY, MICHIGAN
STORMWATER SYSTEM

MAP 11: RECOMMENDED IMPROVEMENTS

DECEMBER 2019

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2130845

LEGEND

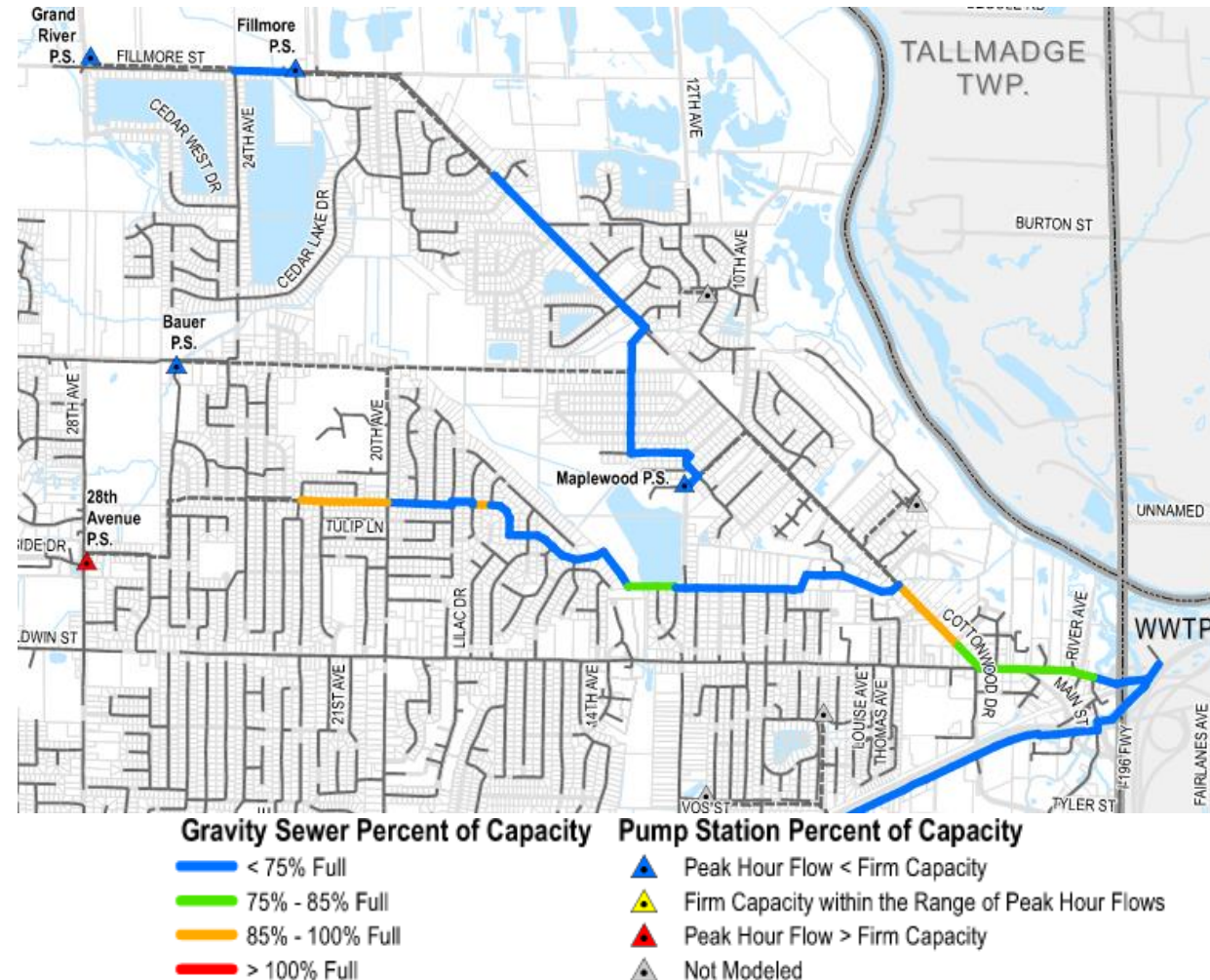
- No Immediate Action
- Spot Repair
- Replace
- The City of the Village of Douglas Catch Basin
- Catch Basin Owned by Others
- The City of the Village of Douglas Manhole
- Manhole Owned by Others
- == The City of the Village of Douglas Culvert
- Gravity Main Owned by Others
- Culvert Owned by Others
- ☞ Pond
- Open Drain



SCALE: 1" = 800'

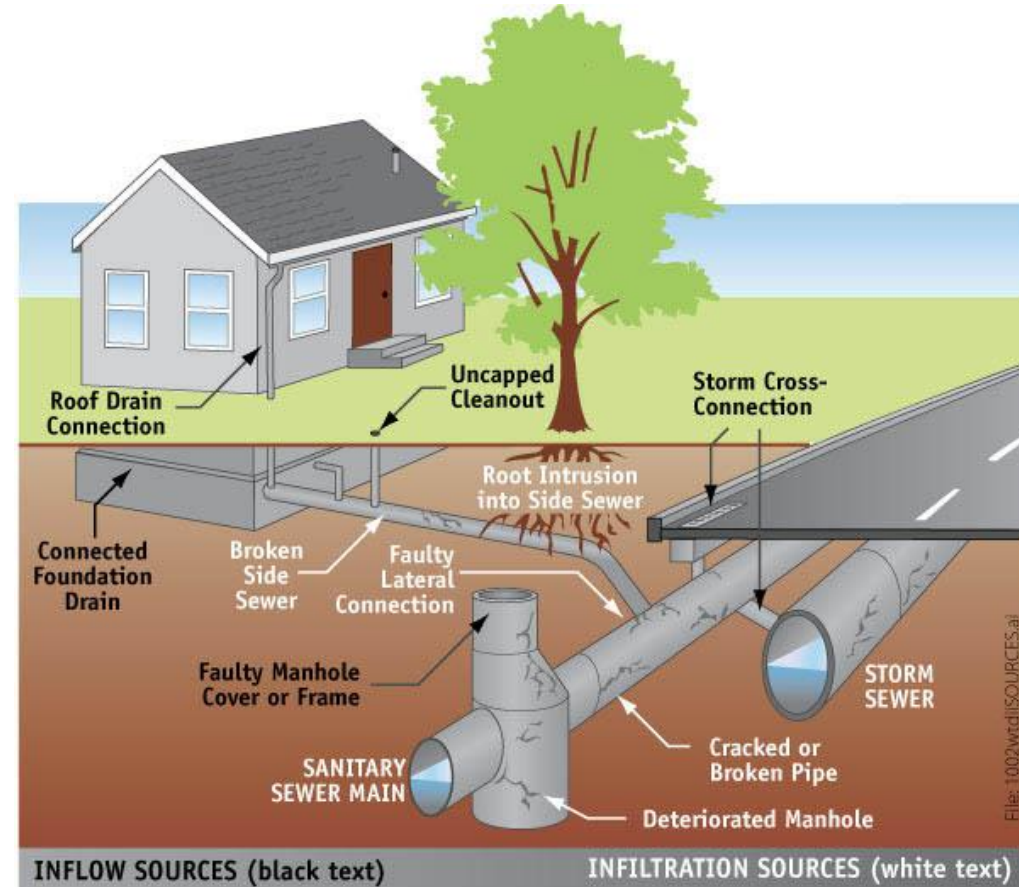
Wastewater Capital Improvements Plan Scope

- System Modeling
 - Review information provided from KLSWA including O&M manuals and drawdown test information (if available)
 - Complete GIS data input for pump stations and receiving sewers (i.e. inverts, sizes, rim elevations, lift station details)
 - Prepare a hydraulic model using City water usage from KLSWA (looking at winter/summer data)
 - Estimate base flows and determine peak flows using diurnal curves and peaking factors
 - Identify most critical system components and document on a map



Wastewater Capital Improvements Plan Scope

- System Metering (Optional)
 - Purpose of this is to gain an understanding on what peak flows are through the system during wet periods from inflow and infiltration
 - Calibrates the model to obtain more accurate peak flows
 - Install and maintain (2) meters in the City of Douglas trunk sewers near West Shore Court and Ferry Street to determine typical flows in the system for 12 weeks to cover both dry and wet periods
 - Check meters every (2) weeks to ensure they are operating as expected and we will recalibrate the meters if necessary



Wastewater Capital Improvements Plan Scope

- Lift Station Assessments (Not Necessary?)
 - Perform a condition assessment of lift station assets (electrical, mechanical, structural, instrumentation, and controls) and their ability to perform as intended
 - Perform a capacity analysis for the lift stations to confirm structures/equipment are sized properly for anticipated peak flows
 - KLSWA maintains/operates lift stations. Determination should be made on who is responsible for replacing/up sizing in the future.



Wastewater Capital Improvements Plan Scope

- Capital Improvements Plan
 - Prepare a CIP including forecasted costs for the next 10 years to replace and/or improve existing infrastructure
 - Coordinate with Baker Tilly (City to contract separately) to identify any funding gaps in the City's projected revenue from utility rates and determine what rates and policies are needed to be proactive in maintaining the City's wastewater system



Wastewater Capital Improvements Plan Scope

- Report, Meeting(s), and Presentation to Council
 - Prepare a report detailing findings from each component of the scope
 - Conduct (2) meetings with the City to review the results of the reports and also to finalize the CIP
 - Present findings to City Council



Total Estimated Costs

- Stormwater Capital Improvements Plan Update - \$14,000
- Wastewater Capital Improvements Plan
 - Condition Assessment - \$5,500
 - System Metering (Optional) - \$15,000
 - System Modeling - \$22,500
 - Lift Station Assessments (Not Necessary?) - \$23,500
 - Capital Improvements Plan - \$10,000
 - Report, Meeting(s), and Presentation to Council - \$9,500
- Geographic Information Systems - \$15,000



Thank you!

Lucas Timmer, P.E.
May 6, 2024

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