2021 – 2023 Storm Drain Repairs Project

Basis of Design Report

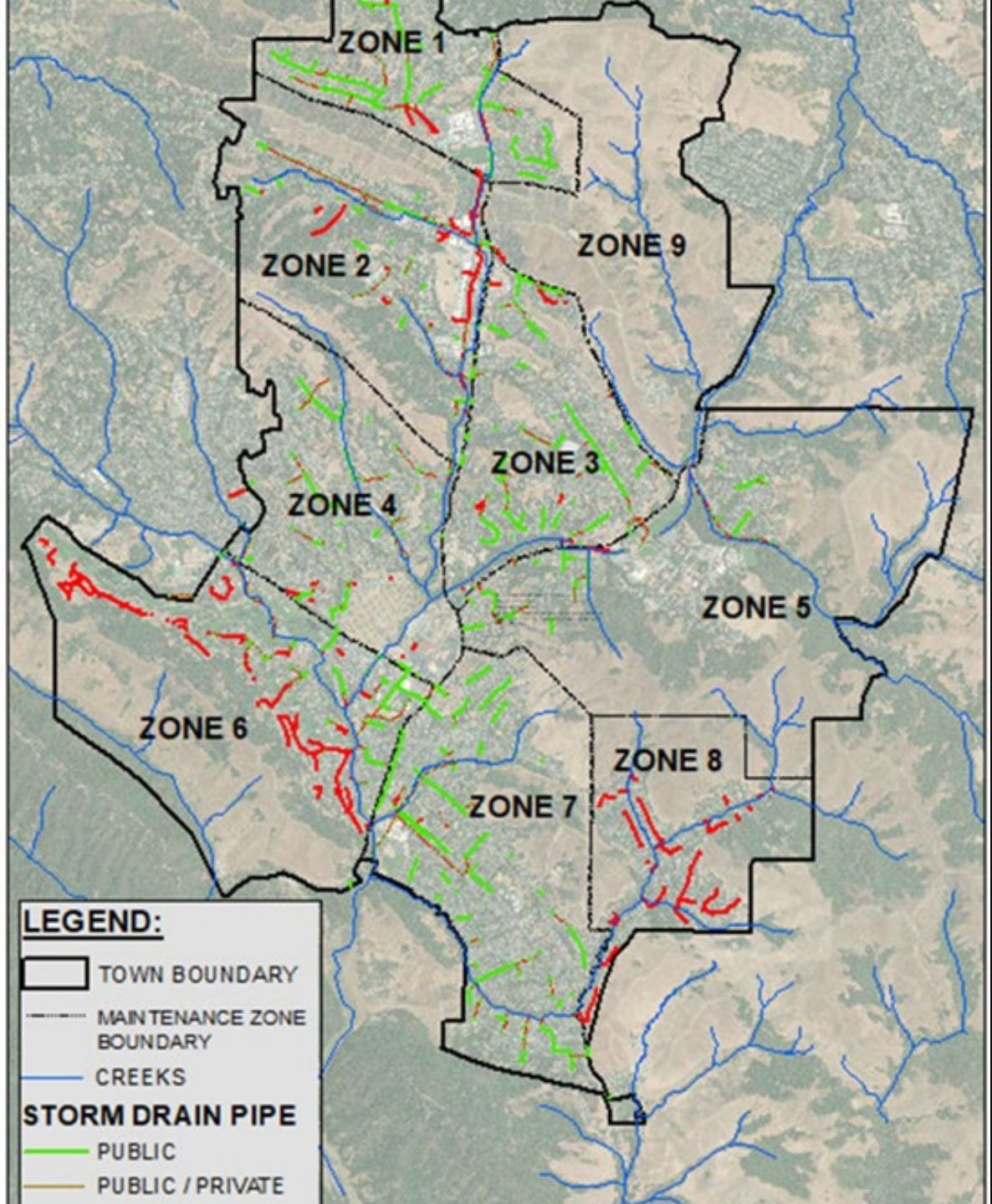
Town Council Meeting - November 9, 2022

Town Maintained Storm Drain System

- 7 Residential Zones

- 20.8 Miles of Storm Drain Pipelines (109,824 Linear Feet in 1,092 Segments)
  - 88% Reinforced Concrete Pipe (RCP)
  - 7% Corrugated Metal Pipe (CMP)
  - 15% Polyvinyl Chloride (PVC) or High-Density Polyethylene (HDPE)
  - 10 Inch to over 12 Feet in Diameter

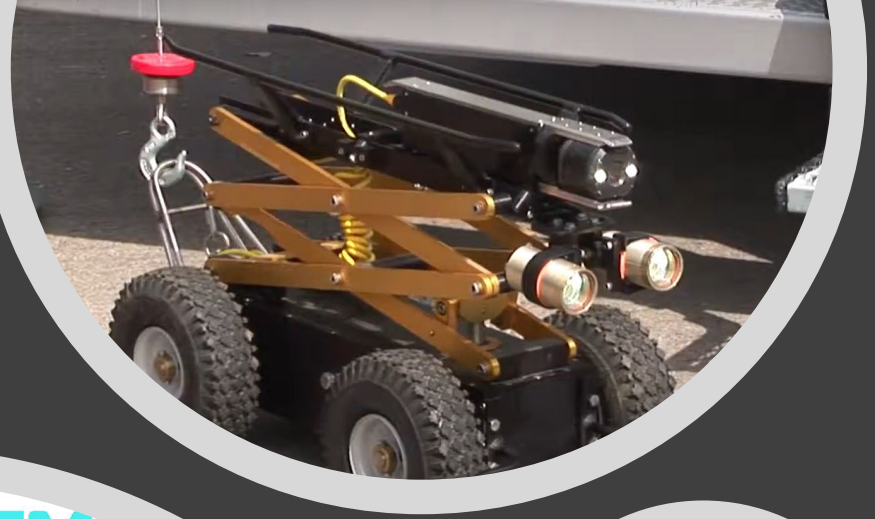
- ~ 8 Miles of Privately Maintained Storm Drain Pipelines



Major Storm Drain Program Efforts
Proactive Capital and Maintenance Plan

- **2022 – 2024 Pavement Rehabilitation Projects**
- Inspect Storm Drainpipe under roadway scheduled for rehabilitation
  - 2022 – Inspected 6,992 LF Storm Drainpipe
  - 2023 – Inspected 4,257 LF Storm Drainpipe
  - 2024 – Inspected 3,074 LF Storm Drainpipe

- **2021 – 2023 Storm Drain Repair Project – Town Wide**
  - Prioritizes High Risk pipes for inspections first, such as Corrugated Metal Pipe (CMP) under roadways
  - Completing 30,000 LF storm drainpipe video inspections
  - 1,000 LF Corrugated Metal Pipe (CMP)
  - 17,000 LF (Non-CMP Pipes > 36-inch)
  - 12,000 LF (Non-CMP Pipes < 36-inch)
  - Using NASSCO PACP inspection standard
  - Prioritizes Cleaning and Maintenance work



Distance	Fault Observation	Time	Picture
176.0	Deposits Attached Encrustation Position: 4 To 8 Severity: None Cont Defect: F01 Percent: 15 Maint Weight: 3	00:08:54	
176.0	Deposits Settled Other Position: 4 To 8 Severity: None Percent: 25 Remarks: ROCK/BRANCHES/TRASH AT INVERT OF PIPE Maint Weight: 4	00:09:50	
	Miscellaneous Water Level Severity: None Percent: 10	00:10:11	

POSM

Project: MORAGA RD.	
Date: 7/20/2022 8:19:00 AM	Pipe Segment Refer: 0116
Street: MARAGA RD.	Upstream MH: Z1_NODE_0003
Length Surveyed: 176	Downstream MH: N-0038
Run Number:	Direction of Survey: Downstream
Height (Diameter): 60	Material: Reinforced Concrete Pipe

Distance	Fault Observation	Time	Picture
0.0	Access Point Manhole Severity: None Remarks: Z1_NODE_0003	00:00:25	
0.0	Miscellaneous Water Level Severity: None Percent: 5	00:00:41	
46.3	Deposits Attached Encrustation Position: 4 To 8 Severity: None Cont Defect: S01 Percent: 15	00:03:09	

CCTV Inspection Equipment

O&M Defect Grades

Grade	O&M Obstruction (%)
1	N/A
2	≤10% Obstruction of Flow
3	<10% to ≤20% Obstruction of Flow
4	<20% to ≤30% Obstruction of Flow
5	>30% Obstruction of Flow

Pipe segment > Grade 3

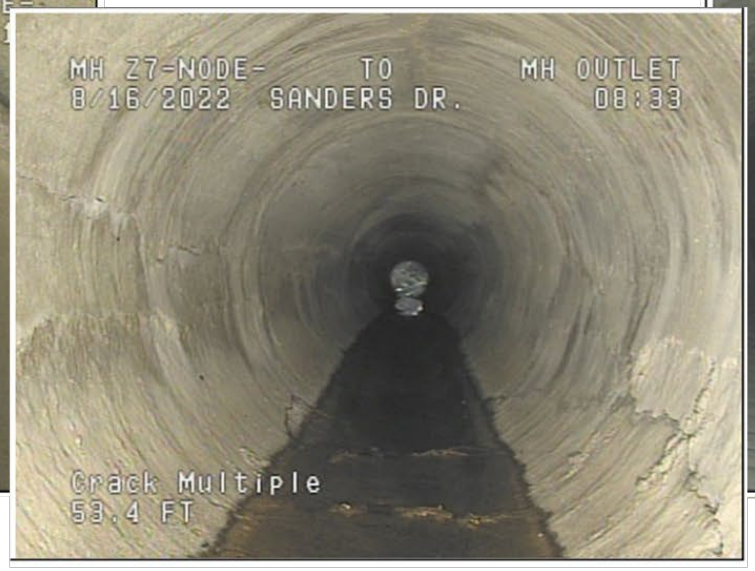
- Structural and operational and maintenance (O&M) defects within a pipe are graded from 1 to 5, increasing in severity with 5 being the most significant.

- National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) Condition Grading System

Structural Defect Grades

Grade	Description	Likelihood of Failure	Examples
1	Excellent Condition –Minor Defects	Unlikely in the foreseeable future	Surface Damage – Roughness Increased Crack – Circumferential
2	Good Condition – Minor to Moderate Defects	Unlikely to fail for at least 20 years	Surface Damage – Aggregate Visible Crack – Longitudinal
3	Fair Condition – Moderate Defects	May fail within 10-20 years	Joint Offset or Separation – Medium Crack – Multiple or at Hinges
4	Poor Condition – Significant Defects	Likely to fail within 5-10 years	Joint Offset or Separation – Large Hole or Broken – No Soil/Voids Visible
5	Immediate Attention Needed	Has failed or likely to fail within 5 years	Hole or Broken – Soil/Voids Visible Total Collapse

Grade 3 – Medium Joint Offset



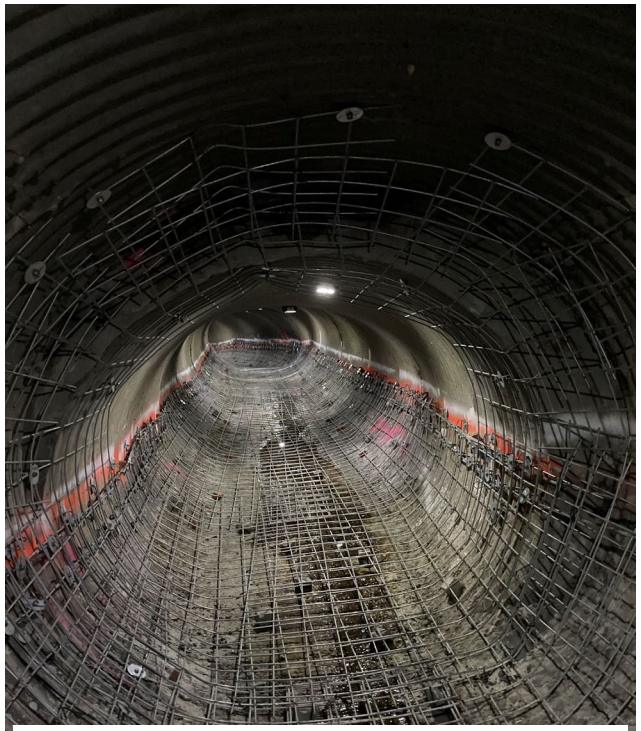
Grade 4 – Severe Cracking

Grade 5 – Broken Hole with Visible Soil

STORM DRAIN INSPECTION RESULTS

- 180 Pipe Segments, 27% of the system, were CCTV Inspected
- Significant Maintenance Cleaning was Needed
  - 3,089 Linear Feet Cleaned
  - 2,303 Linear Feet Scheduled to be Cleaned
- 66% of Inspected Storm Drain Pipes (60 segments) have Grade 3 or higher Deficiencies and are in need of Repairs

BEFORE: ERODED BOTTOM



DURING: FORMING NEW STEEL GRID BOTTOM

AFTER: GROUTED BOTTOM

HACIENDA STORM DRAIN REPAIR

MORAGA ROAD STORM PIPE CIPP LINING

Basis of Design Recommendations

- Repair Storm Drain Pipes with Grade 3 or Higher Deficiency
- Design Repairs for 22 Pipe Segments at an Estimated $1,353,170 (construction)
  - 7 Point Repairs In Pipe
  - 4 Invert Paving Bottom of Pipe
  - 5 Install New Pipe Liner
  - 3 Remove and Replace Pipe Completely
  - 3 Heavy Cleaning and Reinspect Pipe
- 3,203 Linear Feet Additional Heavy Cleaning (ongoing)

- 38 Pipe Repair Segments are Deferred. The estimated construction cost (excluding design) is $1,613,820 NPV

Staff recommends the Town Council receive and accept the Basis of Design Report for the 2021-2023 Annual Storm Drain Repairs Project (CIP 21-205); and provide staff with direction, if any, on the implementation of the Proposed Storm Drain Pipe Projects list.