Department of Public Works Sewer Maintenance Fund (SMF)

Sewer Condition Report

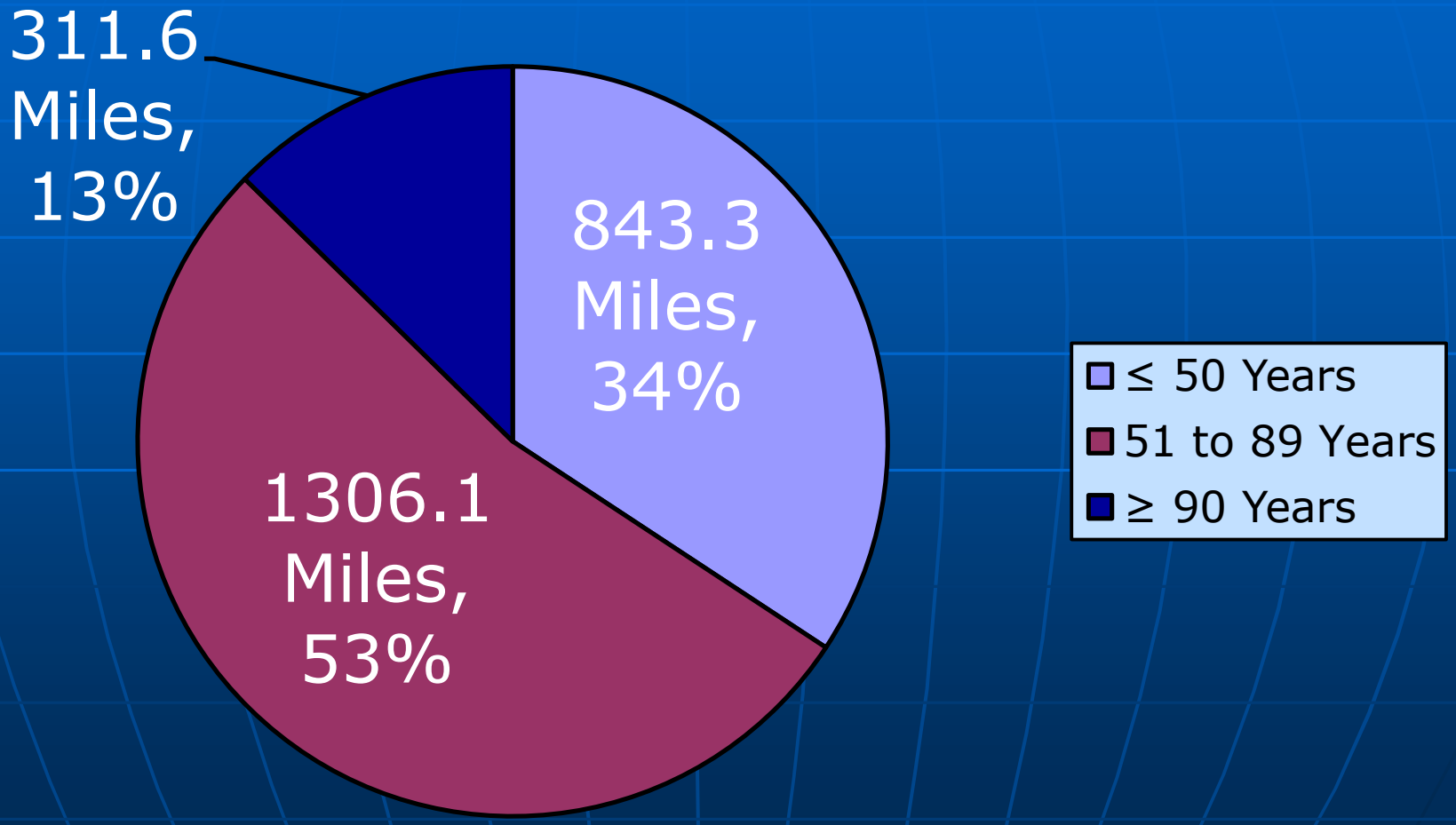
Capital Improvement Committee (CIC)

May 25 2016

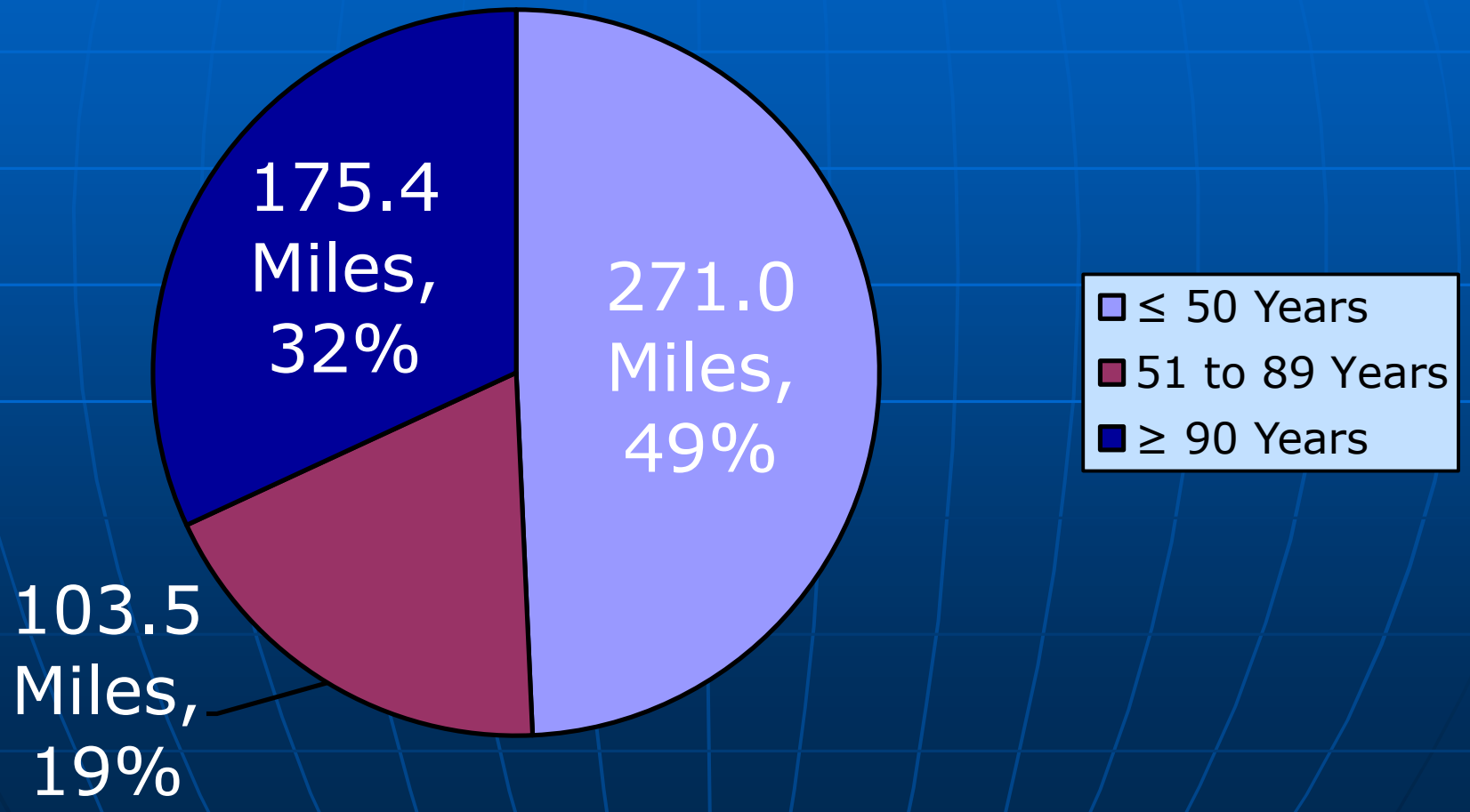
Total Sewer Mileage

Types of Sewers	Total	≤ 21" Diameter	> 21" Diameter and ≤ 48" Diameter	> 48" Diameter and ≤ 54" Diameter	> 54" Diameter
	(miles)	(miles)	(miles)	(miles)	(miles)
Combined	549.9	310.1	169.5	11.4	58.9
Sanitary	944.6	932.5	12.1	0.0	0.0
Storm	966.5	643.9	242.1	13.8	66.7
Total	2,461	1,886.5	423.7	25.2	125.6

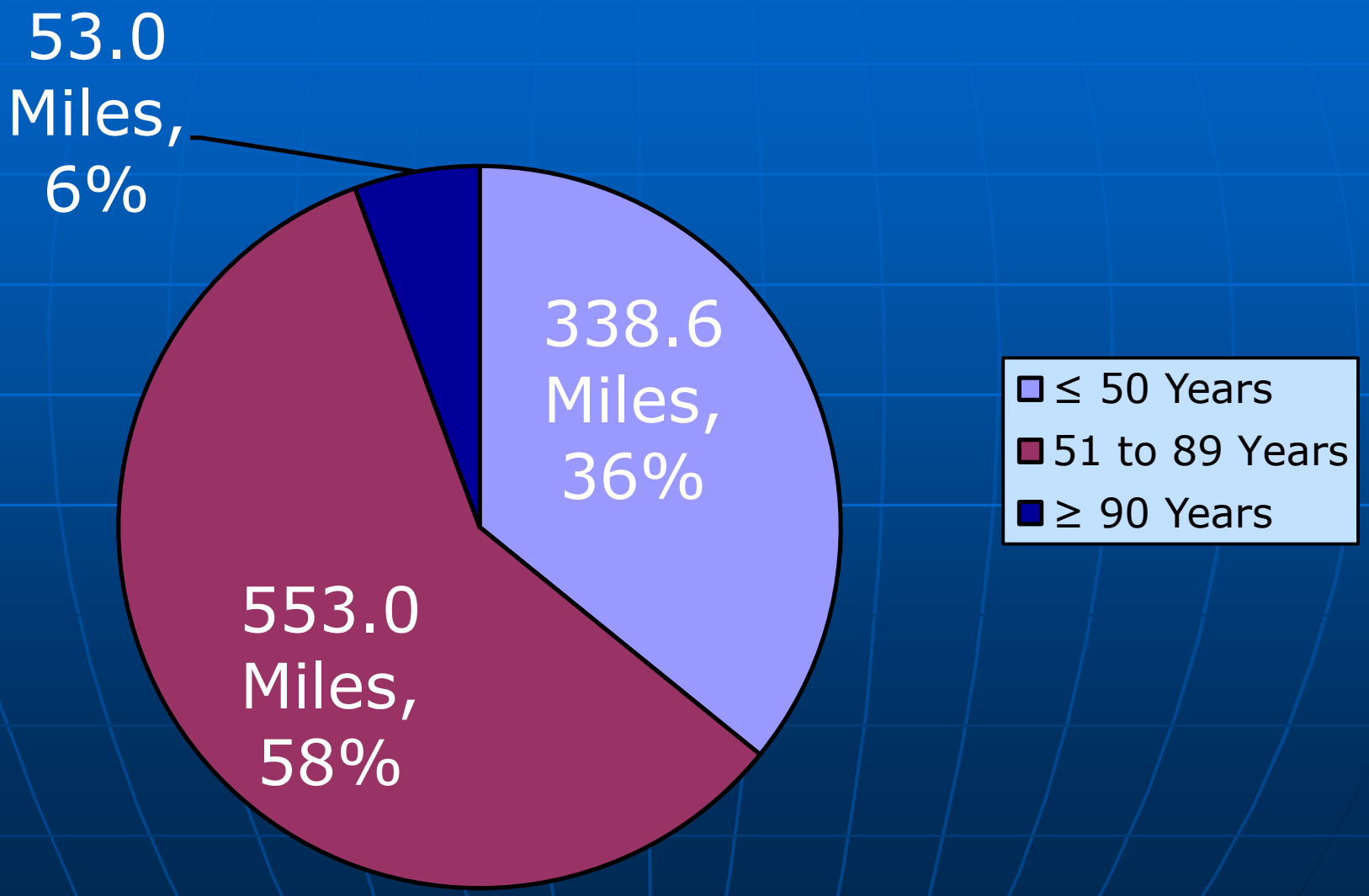
Sewers by Age
Total Miles: 2,461



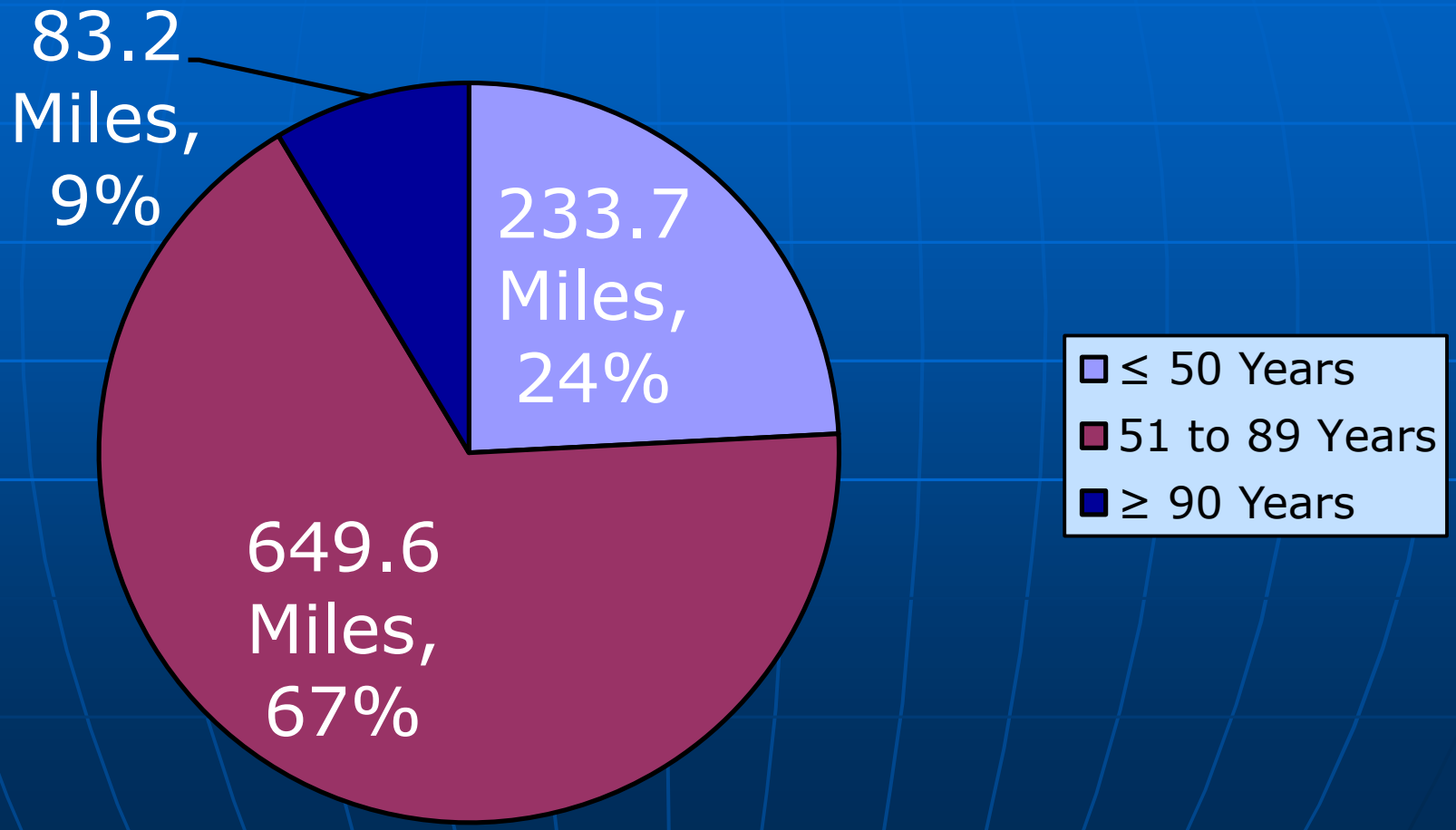
Combined Sewers by Age
Total Miles: 549.9



Sanitary Sewers by Age
Total Miles: 944.6



Storm Sewers by Age
Total Miles: 966.5



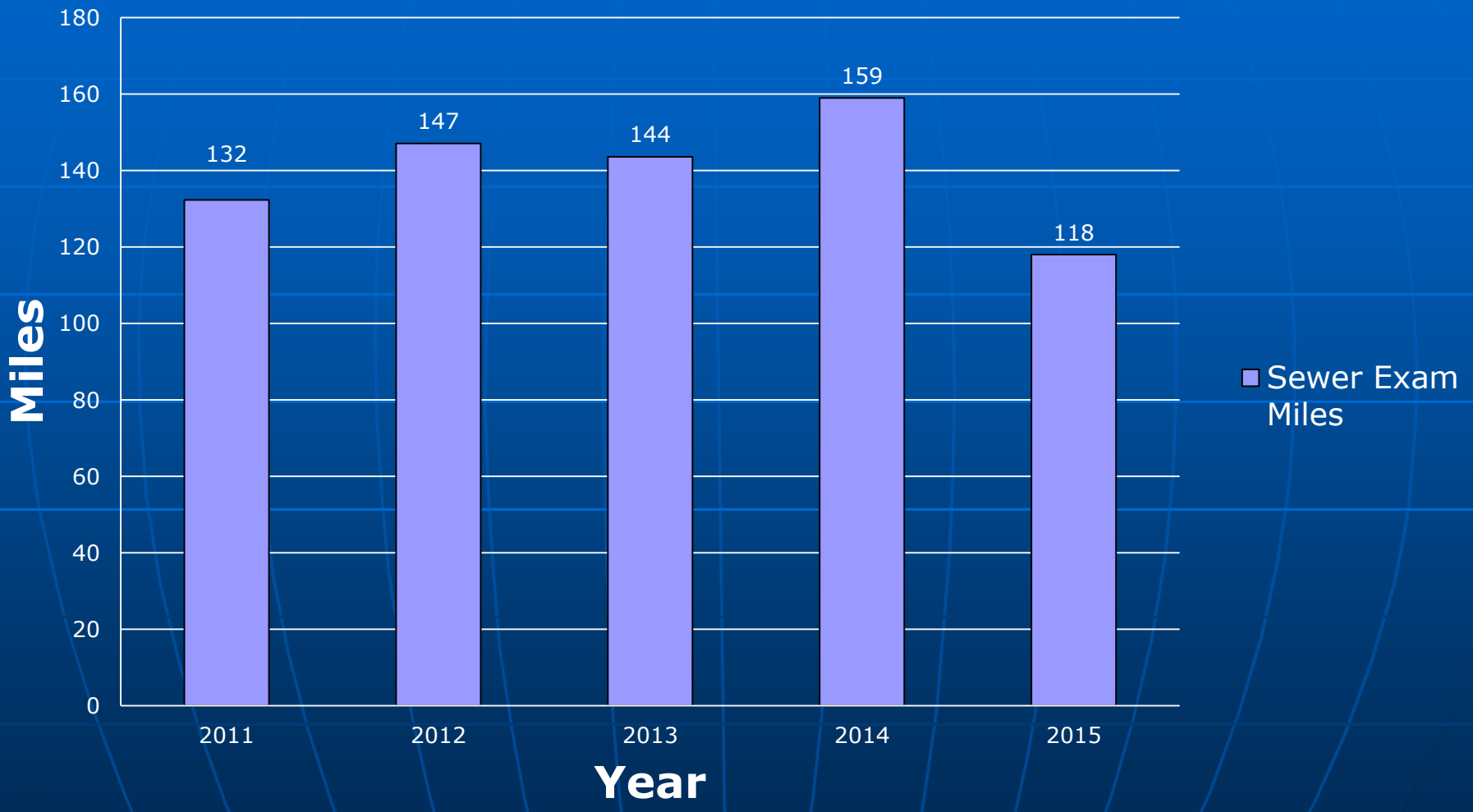
Sewer Replacement Program

- On what basis are Sewer Mains selected for replacement?
  - Index Rating based on Sewer Exams
  - Existing Hydraulics – Sewer back-up investigations
  - Paving Projects

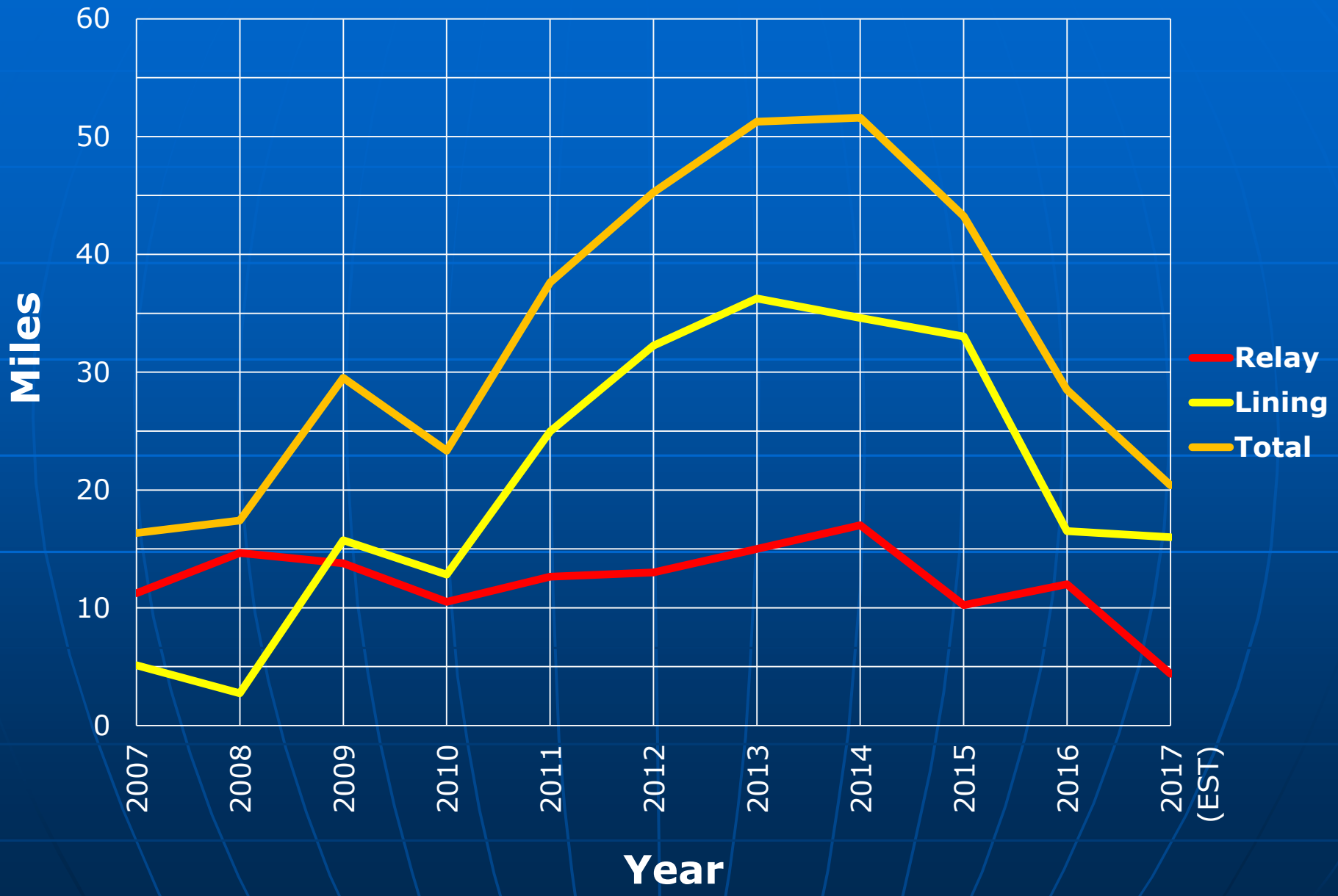
Sewer Exams Frequency for Condition Assessment

- 100 Years and Older……5 years
- 75 to 99 Years Old……15 years
- 50 to 74 Years Old……25 years
- 25 to 49 Years Old……50 years
- Less than 25 years old are not examined unless needed for sewer back-up complaints or paving projects

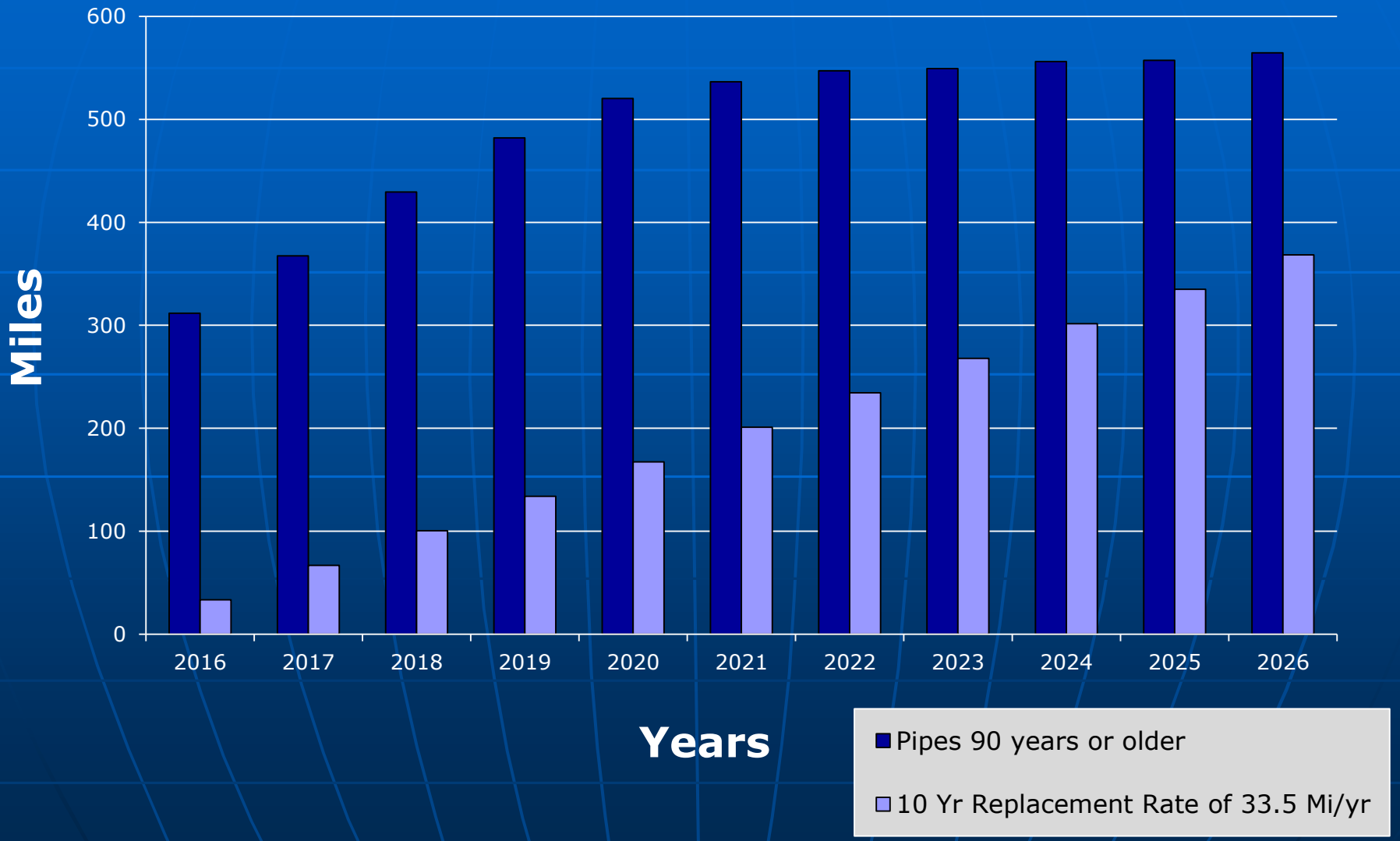
Sewer Exams within last 5 years



2007 - 2017 Sewer Replacement



Future Sewer Lengths Needed To Be Rehabilitated That Are Greater Than 90-Years Old



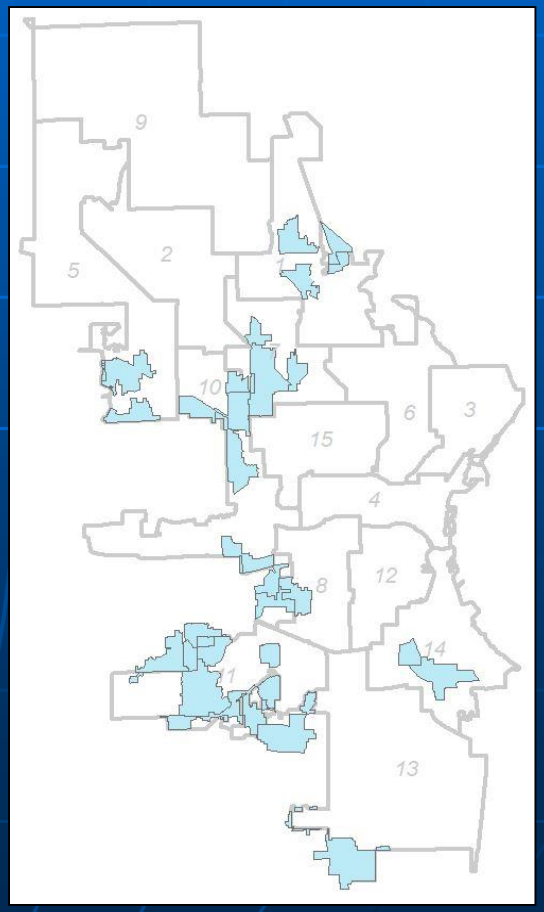
Sewer Replacement Information

- 311.6 miles of sewers 90-years old or greater
- 2,461 miles of sewer in the City
  - Annual replacement rate: 33.5 miles (10 year average)
  - Estimated useful sewer life cycle is 90 years
  - Required replacement rate: 27.3 miles

MMSD Non-Compliant System

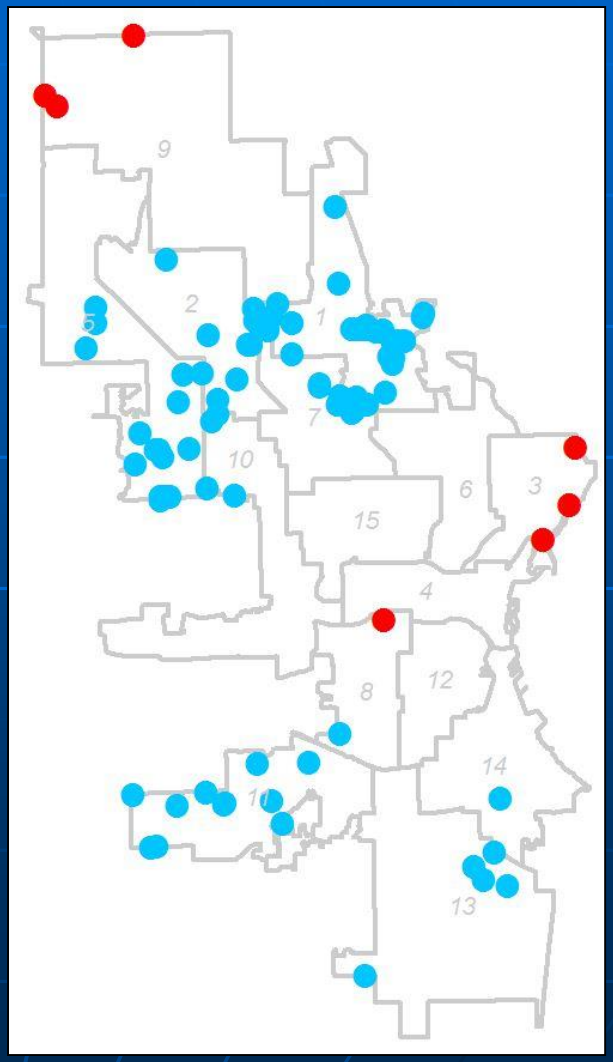
- In 2010, MMSD identified several metersheds that are non-compliant with MMSD Rules for allowable peak hourly flows.

- Since 2010…
  - $5.5 M spent for 8,497 sanitary manholes to be rehabbed
  - $75.3 M spent for 207 projects totaling 142.1 miles in poorly performing MMSD metersheds



Status of Sanitary Pump Rehabilitation Project

- Sanitary Bypass Pump and Lift Station Locations
  - The City owns and maintains two types of pumping facilities, sanitary bypass pumps and sanitary lift stations.
    - Bypass Pumping Stations (83)
    - Lift Stations (7)
  - Bypass pumps are located in areas where there has been a history of backwaters.
  - Lift stations are located where gravity sewer service is not available, usually in low-lying areas.



Status of Sanitary Pump Rehabilitation Project

- Inspections
  - City has an annual contract to perform a check of all bypass pumps and lift stations on a monthly basis for a total of 90 tests per month or 1,080 tests annually.
  - Contractor makes 35 electrical and visual assessments for each site.
  - Provides City with an electronic report that is added to a database that allows us to observe trends over time.
  - Engineers can use this information for establishing priorities for troubleshooting work and for future pump rehab projects.

Status of Sanitary Pump Rehabilitation Project

- Bypass Pump Wet Testing
  - City has contracted with a private firm to perform "wet testing" of bypass pumping sites.
    - This testing simulates a high water event by isolating and filling pump manholes with clean water.
    - A comprehensive test, evaluates all components working together.
    - Indentifies deficiencies that may not be apparent during a monthly inspection.

Year	Wet Tests
2011	66
2012	50
2013	64
2014	54
2015	35
2016	46

    - All sites are wet tested once every two years, critical sites tested annually.

Status of Sanitary Pump Rehabilitation Project

- Bypass Pump Rehabilitation
  - The City lets contracts annually to perform significant repair or replacement of bypass pump sites and lift station components.
    - Major Rehab typically includes replacement of pump and manhole.
    - Minor Rehab typically includes electrical components, such as level sensors, communications, logic controllers, etc.

Year	Major Rehab	Minor Rehab
2009	3	12
2010	8	0
2011	5	25
2012	4	15
2013	3	12
2014	6	7
2015	2	9
2016	2	8
2017 (proj.)	3	10

    - Trend towards more minor rehab indicative of success from pump wet testing and inspection program.

Green Infrastructure (GI)

GI facilities are designed to filter out pollutants from stormwater runoff and for volume reduction

- GI Program started in 2008:
  - 119 Bioswales in medians and terrace areas:
    - Approximately 1.4 million gallons of runoff captured
  - 12 Alleys with Permeable Pavement – 8,935 feet
    - Over 8,900 feet installed and 800,000 gallons of runoff captured
  - Permeable pavers in parking lanes in public ROW:
    - 3,400 feet installed and150,000 gallons of runoff captured
  - Porous pavement in the sidewalk portion of the driveway approach:
    - 4,700 sq. ft. installed and 14,000 gallons of runoff captured

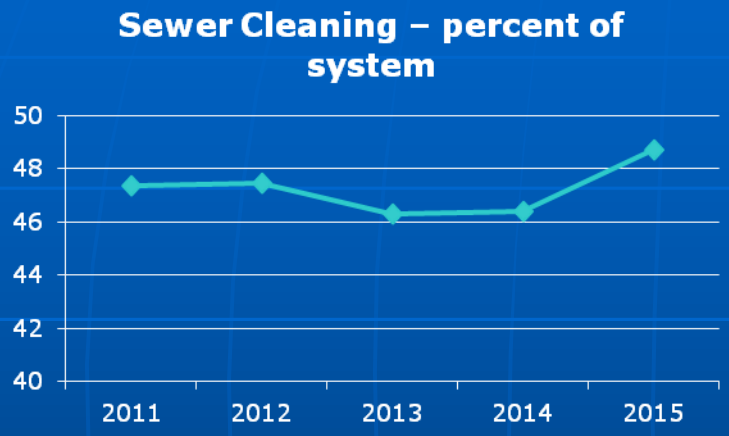
2016 Green Infrastructure Projects

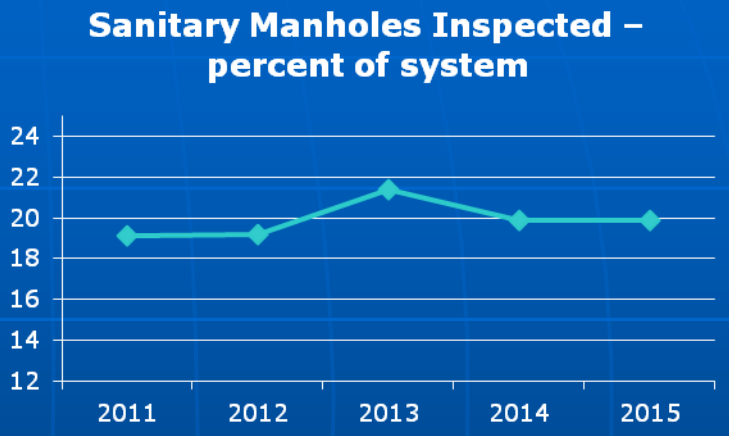
- Retrofit Bioswales
  - S 5th St: W Scott St to W Virginia St – 6 bioswales (Spring 2016)
  - W Good Hope Rd: N 91st St to N 107th St – 9 bioswales
  - Windlake Avenue Bioswale @ W Windlake Ave and S 20th St – 1 bioswale
  - N Sherman Blvd: W North Ave to W Locust St – 10 bioswales under const.
- State Paving related projects
  - W Fond Du Lac Ave: W Capitol Dr to W Hampton Ave – 6 bio. under const.
  - W Highland Ave: N 12th St to N 27th St – 15 bioswales (Fall 2016)
  - N 91st St: W Capitol Dr to W. Hampton Ave – 5 bioswales
  - N 92nd St: W Good Hope Rd to W Brown Deer Rd – 9 bioswales
- Kinnickinnic Ave Silva Cells Project
  - Stormwater Management Trees
  - S KK Ave: W Lincoln Ave to W Morgan Ave – 198 cells (June 2016)

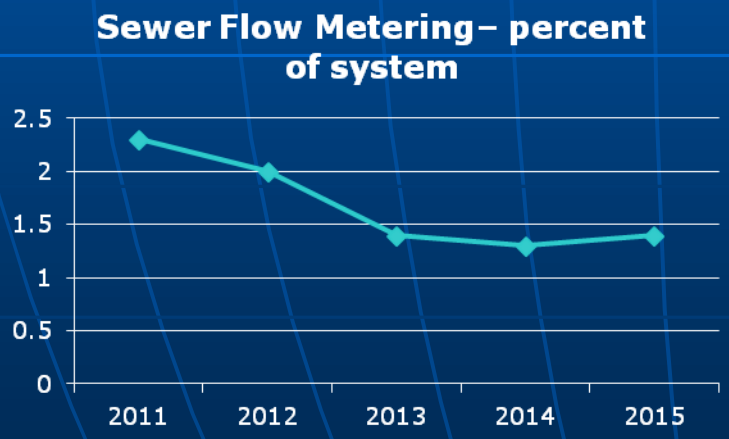
Compliance Maintenance Annual Report (CMAR)

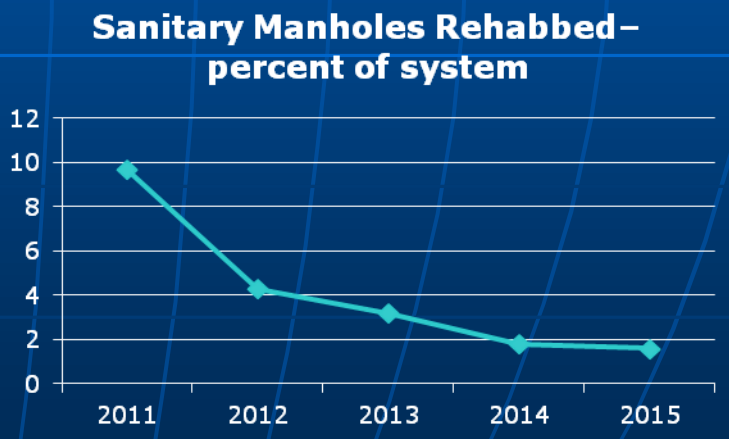
- Self-evaluation tool that promotes the owner's awareness and responsibility for collection systems and needs.
- Measures the performance of a collection system during a calendar year.
- Assesses its level of compliance with permit requirements.
- The CMAR report contains two major sections titled Financial Management and Collection System and each section is electronically graded based upon data entered.
- In 2015 the City of Milwaukee scored an “A” in both the Financial section and the Collection System section.
- Electronic CMAR (eCMAR) form is completed by June 30 with a resolution having the Common Council review and provide comments on the City’s CMAR

2011-2015 WDNR Compliance Maintenance Annual Report (CMAR)









QUESTIONS ?