

Department of Public Works Sewer Maintenance Fund (SMF)



Sewer Condition Report
Capital Improvement Committee (CIC)
June 25, 2015

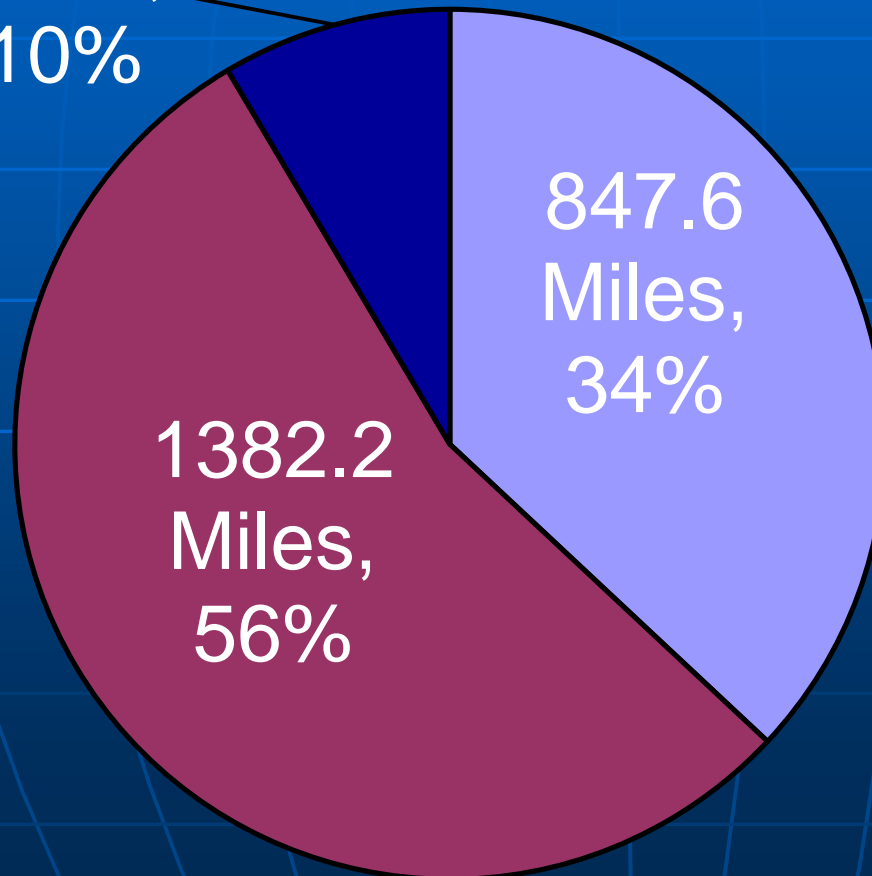
Total Sewer Mileage

Types of Sewers	Total	$\leq 21''$ Diameter	$> 21''$ Diameter and $\leq 48''$ Diameter	$> 48''$ Diameter and $\leq 54''$ Diameter	$> 54''$ Diameter
	(miles)	(miles)	(miles)	(miles)	(miles)
Combined	550.7	311.5	169	11.7	58.5
Sanitary	944.4	932.3	12.1	0.0	0.0
Storm	965.9	644.6	241.3	13.6	66.4
Total	2,461	1,888.4	422.4	25.3	124.9

Sewers by Age

Total Miles: 2,461

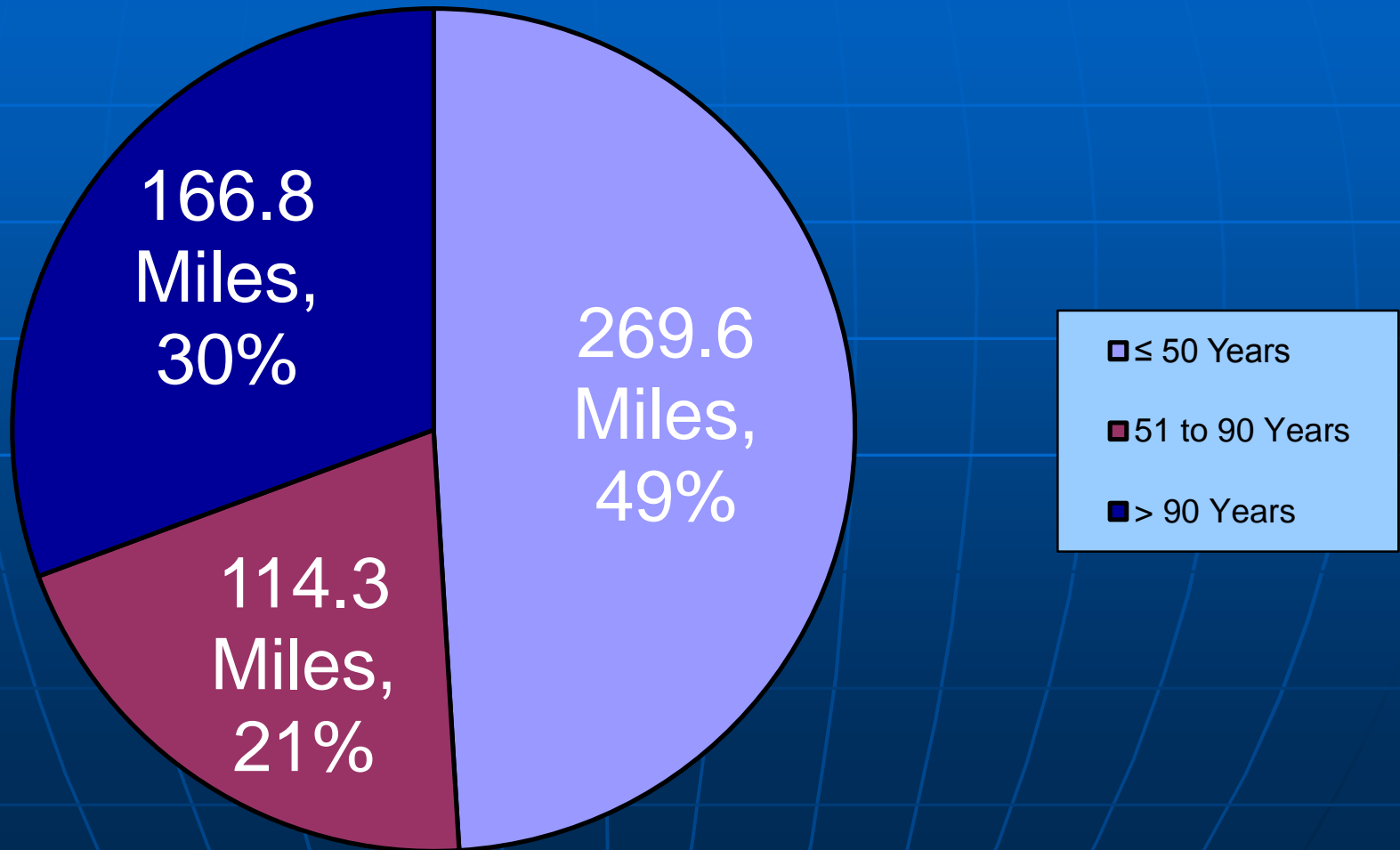
231.2
Miles,
10%



- ≤ 50 Years
- 51 to 90 Years
- > 90 Years

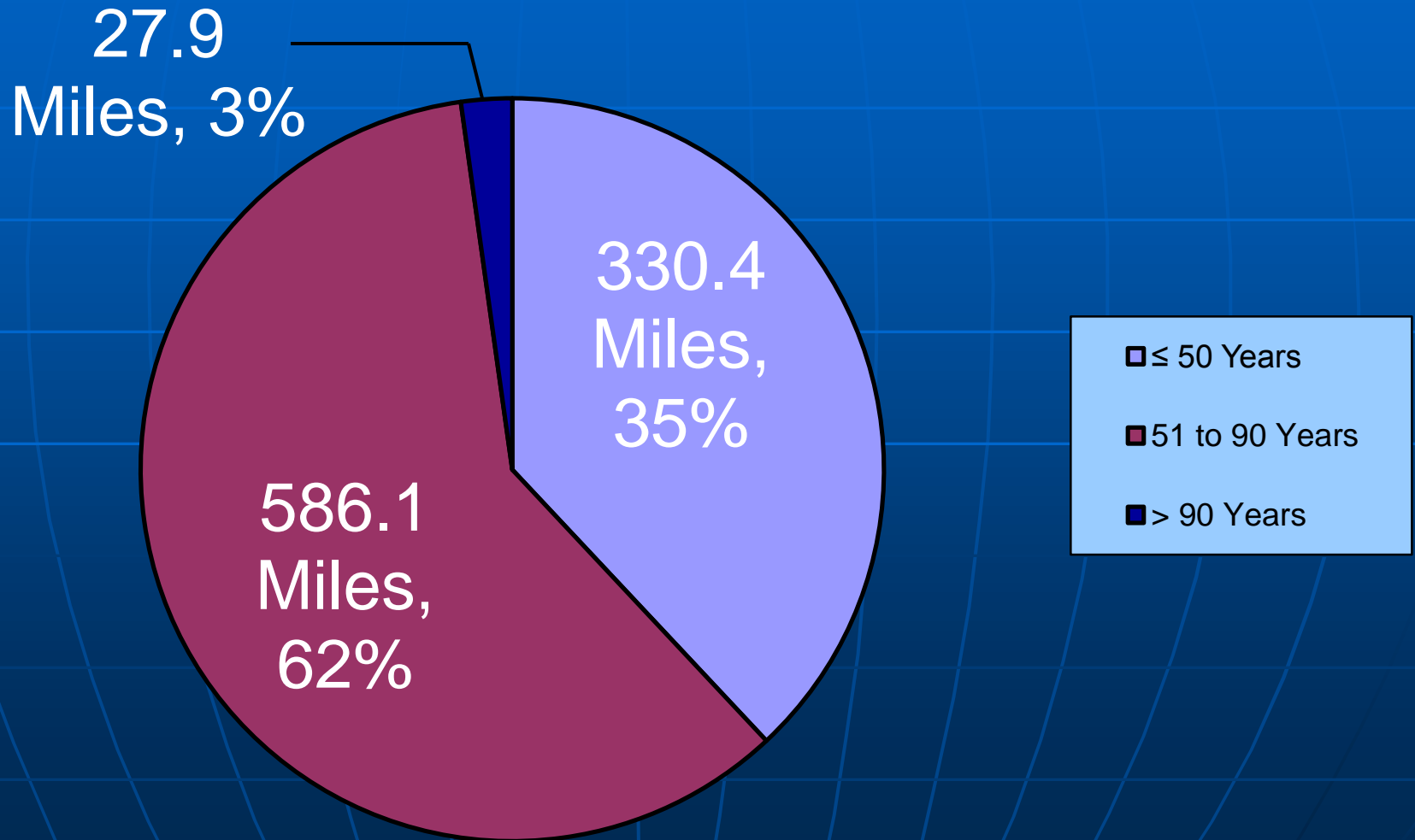
Combined Sewers by Age

Total Miles: 550.7



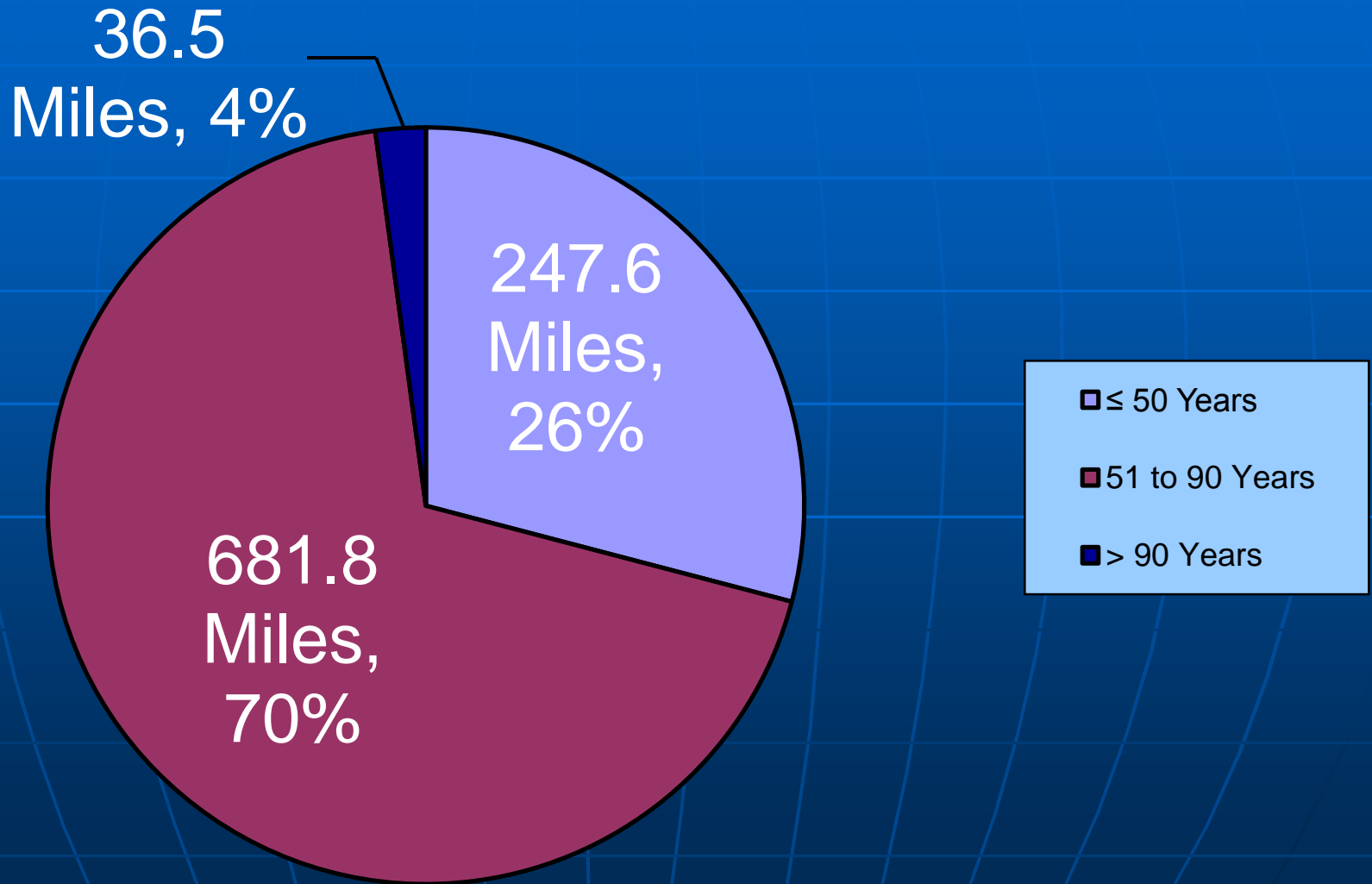
Sanitary Sewers by Age

Total Miles: 944.4



Storm Sewers by Age

Total Miles: 965.9



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

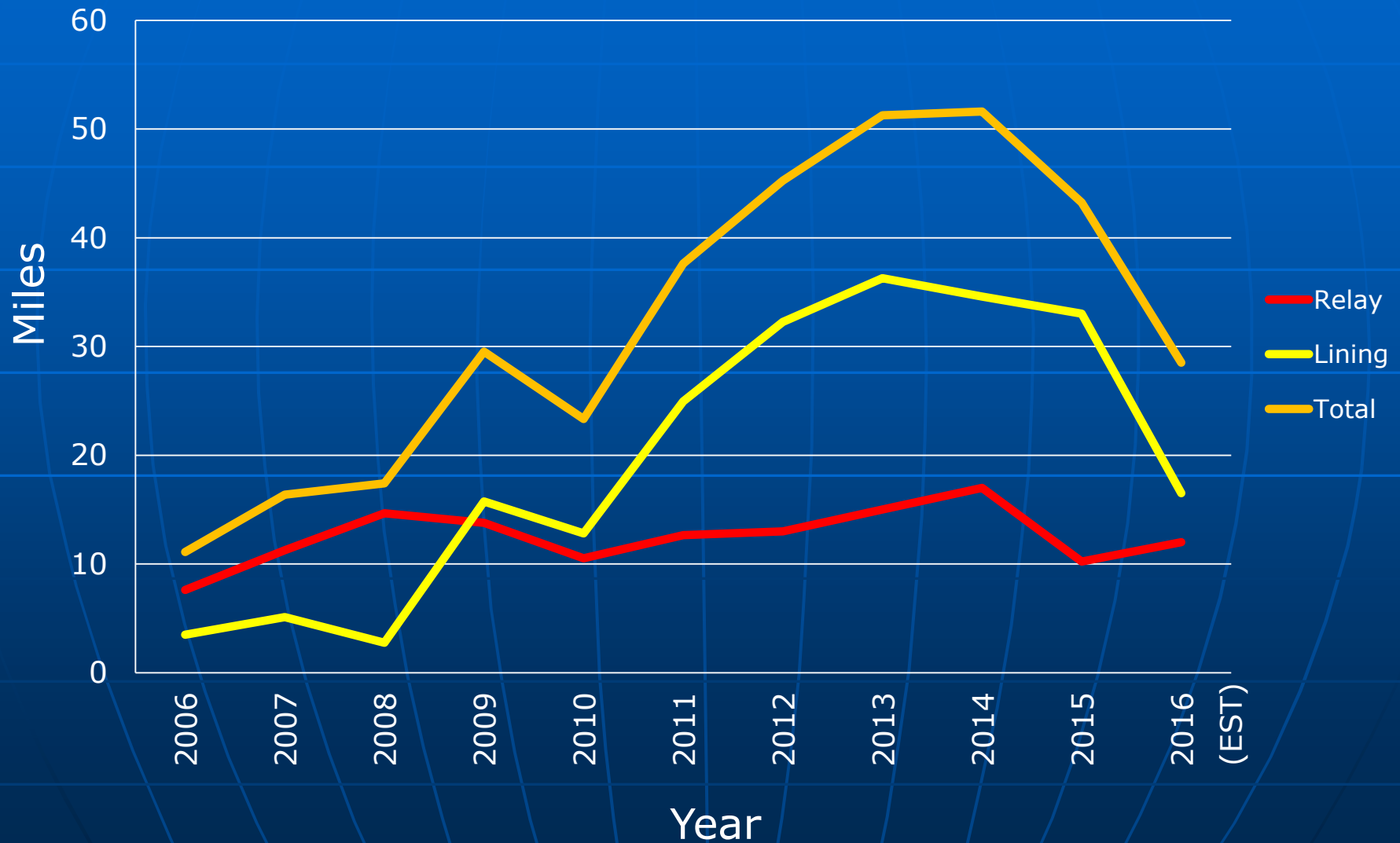
Sewer Exams Frequency for Condition Assessment

- 100 Years and Older5 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

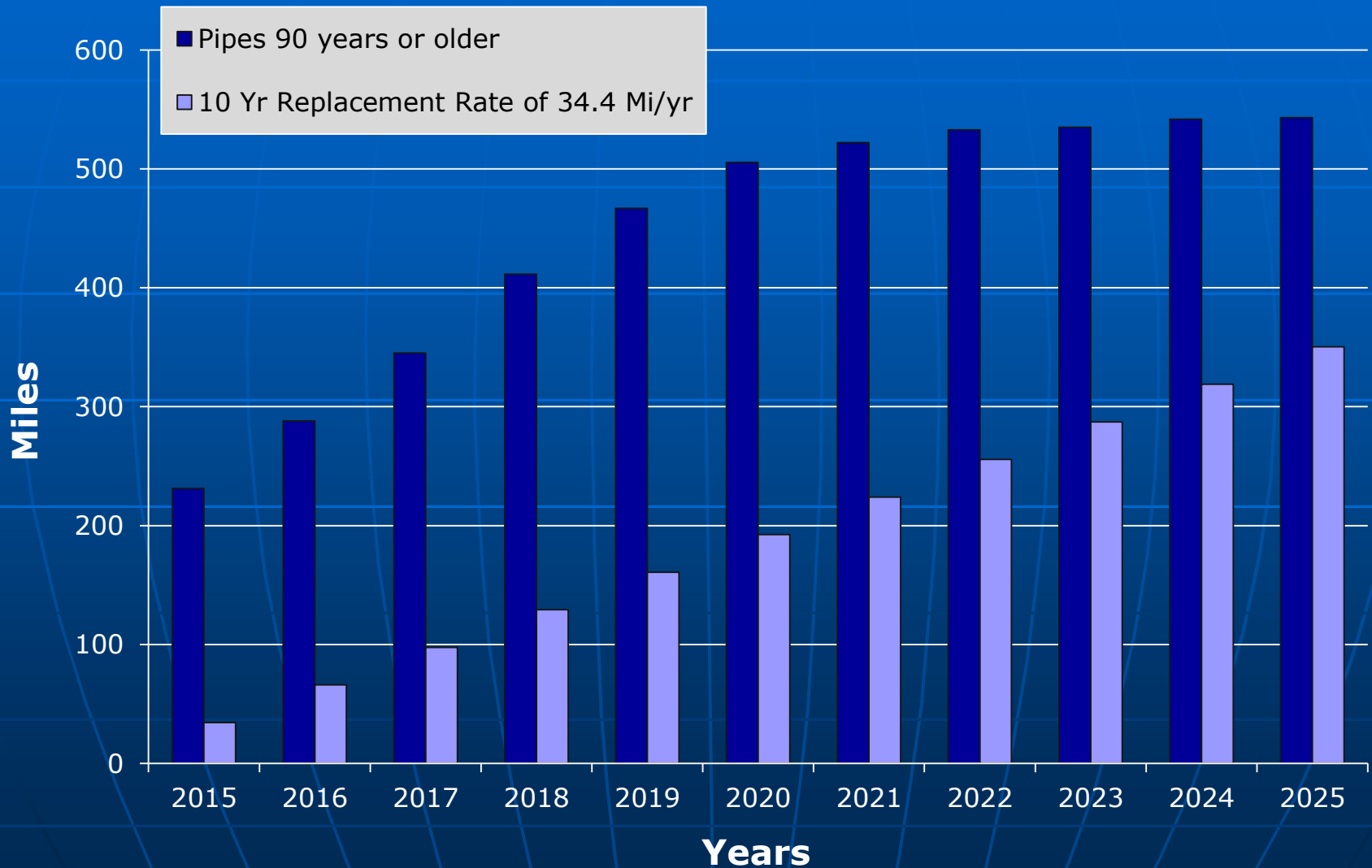
Sewer Exams within last 5 years



2006-2016 Sewer Replacement



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



Sewer Replacement Information

- 231.2 miles of sewers greater than 90-years old
- 2,461 miles of sewer in the City
 - Annual replacement rate: 34.4 miles (10 year average)
 - Estimated useful sewer life cycle is 90 years
 - Required replacement rate: 27.3 miles
- Current 10 year average for replacement rate using lining & replacement methods is 34.4 miles/year, which allows us to meet this need.

2015 Major Projects

- Area bounded by W Villard Ave, W Hampton Ave, N Sherman Blvd, and W Fond du Lac Ave \$3.8 M
 - CIPP – 84,000 ft of 8 - 18 inch dia. sanitary sewer
- Area bounded by W Hampton Ave, W Capitol Dr, N Green Bay Dr, and N 33rd St \$3.0 M
 - CIPP – 60,000 ft of 8 – 15 inch dia. sanitary sewer
- Area bounded by W Congress St, W Hope St, N 27th St, and SOO Line Railroad (N 30th St Corridor) \$3.0 M
 - 2,100 ft of new storm sewer, 4'x6' box, 5'x8' box
- W Keefe Ave (N/S) – N 18th St to N 22nd St \$2.2 M
 - CIPP 2,000 ft of 60 inch dia. combined sewer (104 years old)
- Area bounded by W Congress St, W Capitol Dr, N 35th St and N 50th St \$1.7 M
 - CIPP - 32,000 ft of 8, 10, and, 12 inch dia. sanitary sewer

* Cured-in-place lining (CIPP)

2016 Major Projects

- W Keefe Ave (S/S) – N 17th St to N 24th Pl: \$3.5 M
 - CIPP - 3,200' of 60" dia. (1939) combined sewer

- Area Bounded By W Center St to W Vienna Ave and N 59th St to N Argonne Dr: \$2.9 M
 - CIPP - 74,000' of 8" to 15" dia. sanitary sewer

- Area bounded by W Congress St, W Hope St, N 27th St, and SOO Line Railroad (N 30th St Corridor) \$1.5 M
 - 2,100 ft of new storm sewer, 4'x6' box, 5'x8' box

- W Montana St – S 6th St to S 9th St: \$1.5 M
 - 1,400' of 30" dia. (1933) combined sewer relay

* Cured-in-place lining (CIPP)

Efforts to Reduce Backwaters

- Since 2010...
 - \$18.5 M spent for 68 miles of sewer lining or replacement
 - \$5.4 M spent for 8,130 sanitary manholes to be rehabbed
 - \$36.1 M spent for 87 projects in poorly performing MMSD metersheds

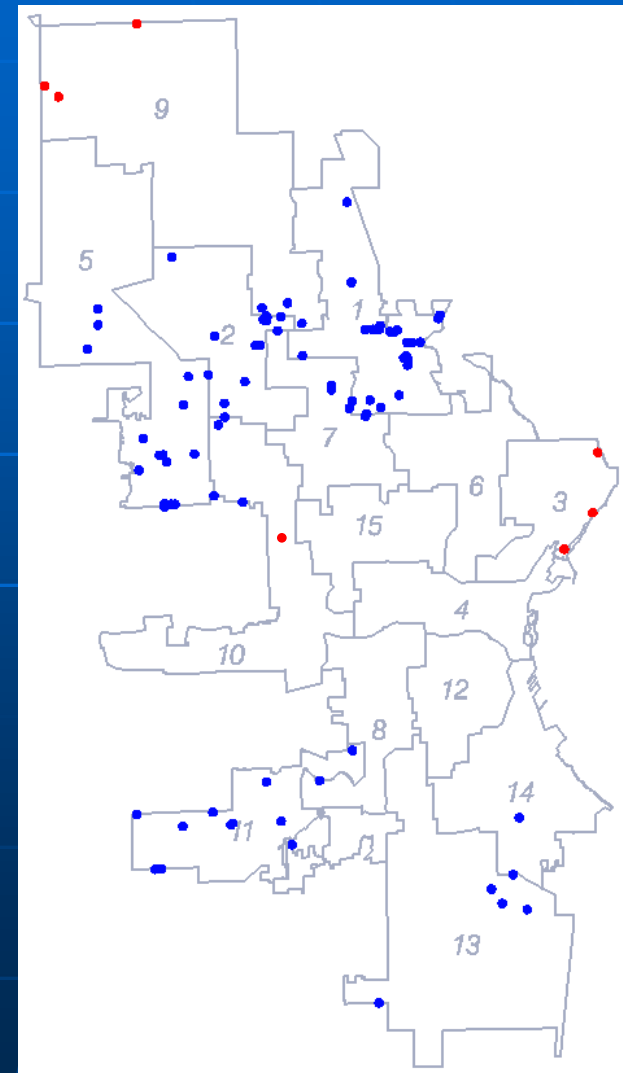
Status of Private Property I&I Reduction Projects

- Lateral Lining Projects
 - 2012: Cooper Park
 - 526 homes
 - 2013: Clemens School Neighborhood
 - 359 homes
- Foundation Drain Disconnection Project
 - 2014: Cooper Park
 - 25 homes completed spring 2015



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 contracted with a private firm to perform a check of all bypass pumps and lift stations on a monthly basis.
- Contractor makes 35 assessments for each site.
- Provides City with a written report.
- Field managers can use this information for establishing priorities for troubleshooting work.
- Engineers use this information 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.
 - Identifies deficiencies that may not be apparent during a monthly inspection.
 - Results from this testing provide us with excellent feedback on the readiness of our bypass pumps.
 - Testing is a high level of Asset Management.
 - All sites are wet tested bi-annually, 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
2008	4	0
2009	3	12
2010	8	0
2011	5	25
2012	4	15
2013	3	12
2014	6	7
2015	2	9
2016 (proj.)	4	10

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

Green Infrastructure

- Constructed from 2008 to 2014...
 - 112 Bioswales
 - 8 Alleys with permeable pavement
 - 65 Driveways with permeable sidewalk



Green Infrastructure

■ Permeable Pavement Projects

2013



W Freshwater Way –
S 3rd St to S 6th St

2014



E Greenfield Ave –
S 1st St east to its terminus

Green Infrastructure

- 2015

- Retrofit Bioswale

- N 107th St – W Good Hope Rd to W Brown Deer Rd
 - N 17th St - W North Ave to W Lloyd St
 - N Lake Dr – E Kenwood Blvd to E Park Place
 - N Sherman Blvd – W Lisbon Ave to W Burleigh St

- New Bioswale

- Highland Community School, 1706 W Highland Blvd

- State Paving related projects

- S Howell Ave – W Howard Ave to W Layton Ave
 - W Layton Ave – S Howell Ave to I794

- Green Alleys

- Pulaski Park Neighborhood: Alleys Bounded By W Arthur Ave, S 18th St, W Windlake Ave, and S 19th St

QUESTIONS ?