

# DEPARTMENT OF PUBLIC WORKS

## 2007 WASTEWATER INFRASTRUCTURE PERFORMANCE PROGRAM PERFORMANCE MEASURE ANNUAL REPORT

Anne Arundel County's public wastewater system consists of ten (10) service areas. The Water Reclamation Facility that ultimately treats wastewater collected in the area determines each service area designation. The wastewater is treated at County-owned and operated Water Reclamation Facilities in all but three (3) of the service areas. Non county-owned facilities treat wastewater from the remaining three (3) service areas.

Anne Arundel County wastewater customers produce in excess of eleven (11) billion gallons of wastewater annually. The wastewater is collected and transported through an extensive network of gravity infrastructure consisting of pipe that is as small as 4 inches and as large as 54 inches in diameter. In addition, there are 247 pumping stations that also are used to collect and transport the wastewater flow ultimately to a water reclamation facility. Currently, the County system has approximately 1410 miles of pipe used to transport the wastewater. Of this total approximately 1,175 miles are gravity sewer and 235 miles of pumping station force mains and low-pressure systems.

The Maryland Department of the Environment (MDE) approved the Wastewater Capacity, Management, Operations and Maintenance Program (C.M.O.M.) submittals to the County in June 2005. Included in this program is the requirement of a report and submittal to MDE and made available to all County Citizens.

The Anne Arundel County C.M.O.M. program was the first in the state to be approved by the MDE. The Department of Public Works' first calendar year working under the guidelines of the program was 2006.

In reviewing the goals, goals met, and other data within the audit report a number of important items are noted below:

**30 wastewater overflows were the second lowest in recent history although the goal of 27 was exceeded. 6 of the occurrences were either septic tank or grinder pump installations that served only one customer and were classified as minor.**

**156,558 gallons of overflow material was the second lowest recorded in the past 6 years.**

**62 basement backups were 31% under the goal of 90 and the second lowest recorded historically.**

**Pipe structural failure Sanitary Sewer Overflows (SSO's) per 100 miles per year was calculated at 0.68 per 100 miles of sewer pipe, which was the lowest ever recorded.**

**Service connection blockages that resulted in an SSO per 100,000 customers dropped from 9.89 in 2006 to 5.35, a 45.9% improvement.**

**Mainline blockages SSO's per 100 miles of sewer exceeded the goal of 0.43, with a 0.77 recorded.**

**Chapter 11 - CMOM Program Self-Audit Report**  
**Appendix 11-A**  
**CMOM Program Overall Performance Measures**

[2006 CMOM file](#)

	Goal Year <u>2007</u>	Year <u>2007</u>	Year <u>2006</u>	Year <u>2005</u>	Year <u>2004</u>	Year <u>2003</u>	Year <u>2002</u>
<b>11-A Sewer System Characteristics</b>							
Total Length of Gravity Sewer (miles)	1,174.68	1,174.68	1,166.56	1,118.10	1,116.20	1,091.10	1,081.30
Sewer Service Connections (#)	112,087.00	112,047.00	111,178.00	109,939.00	108,743.00	106,582.00	102,619.00
Total Number of Pump Stations (#)	247.00	247.00	245.00	244.00	243.00	243.00	243.00
<b>11-A.1 Overflows and Basement Backups</b>							
<b>11-A.1.1 Overflows and Basement Backups Data</b>							
Mainline Blockage SSO's (#)	5	9	4	7	5	8	15
Pipe Structural Failure SSO's (#)	15	8	11	40	21	14	15
Pump Station / WRF Failure SSO's (#)	0	7	3	4	0	41	4
Service Connection Blockage SSO's (#)	7	6	11	15	10	11	9
Total Number of Overflows (#)	27	30	29	66	36	74	43
Total Volume of Overflows (gallons)	85000	156558	58025	3253930	222660	334330	314140
Basement Backups (#)	90.00	62.00	61.00	105.00	151.00	168.00	130.00
<b>11-A.1.2 Overflows and Basement Backups Performance</b>							
Mainline Blockage SSO's (# / 100 mi / yr)	0.43	0.77	0.34	0.63	0.45	0.73	1.39
Pipe Structural Failure SSO's (# / 100 mi / yr)	1.28	0.68	0.94	3.58	1.88	1.28	1.39
Pump Station / WRF Failure SSO's (# / PS / yr)	0.00	0.03	0.01	0.02	0.00	0.17	0.02
Service Connection Blockage SSO's (# / 100,000 connections / yr)	6.25	5.35	9.89	13.64	9.20	10.32	8.77
Basement Backups (# / 100,000 connections / yr)	80.29	55.33	54.87	95.51	138.86	157.63	126.68
<b>11-A.2 Gravity Sewer Blockages</b>							
<b>11-A.2.1 Gravity Sewer Blockages Data</b>							

**11-A.2.1.1 Gravity Sewer Blockages Data - Sewer Main**

Sewer Main Blockages (#)	100.00	58.00	68.00	122.00	142.00	197.00	191.00
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**11-A.2.1.2 Gravity Sewer Blockages Data - Service Connections**

Service Connection Blockages (#) Private	800.00	485.00	736.00	831.00	804.00	971.00	1,025.00
Service Connection Blockages (#) Public	1,800.00	2,007.00	1,884.00	1,944.00	1,949.00	2,578.00	2,744.00

**11-A.2.1.3 Gravity Sewer Blockages Data - Sewer Maintenance Calls**

Total Sewer Maintenance Calls (#)	0.00	3,474.00	3,346.00	5,113.00	3,441.00	4,286.00	3,989.00
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**11-A.2.2 Gravity Sewer Blockages Performance**

Sewer Main Blockages (# / 100 mi / yr)	8.51	4.94	5.83	10.91	12.72	18.06	17.66
Service Connection Blockages (# / 100,000 connections / yr)	2,319.63	2,224.07	2,356.58	2,524.13	2,531.66	3,329.83	3,672.81

**11-A.3 Pump Station Maintenance**

**11-A.3.1 Pump Station Maintenance Data**

Pump Station Failures (#)	0.00	7.00	3.00	4.00	0.00	41.00	4.00
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**11-A.3.2 Pump Station Maintenance Performance**

Pump Station Failures (# / PS / yr)	0.00	0.03	0.01	0.02	0.00	0.17	0.02
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**11-A.4 Collection System Preventive Maintenance and I&I Field Work**

**11-A.4.1 Collection System Preventive Maintenance and I&I Field Work Data**

**11-A.4.1.1 Collection System Preventive Maintenance and I&I Field Work Data - Routine Sewer Cleaning**

Rod Cleaning Length (LF)	200,000.00	78,606.00	117,227.00	230,055.00	258,650.00	230,855.00	285,110.00
Jet-Vac Cleaning Length (LF) County	1,600,000.00	1,611,230.00	1,176,747.00	1,760,375.00	1,730,690.00	1,660,800.00	1,710,580.00
Jet-Vac Cleaning Length (LF) Contract	50,000.00	3,198.00	208,511.00	154,858.00	25,800.00	34,847.00	104,302.00

**11-A.4.1.2 Collection System Preventive Maintenance and I&I Field Work Data - Special Sewer Cleaning ("Specials")**

**11-A.4.1.3 Collection System Preventive Maintenance and I&I Field Work Data - TV Inspection:**

Standard TV Inspection (LF)	80,000.00	90,220.00	102,396.00	66,130.00	59,050.00	63,100.00	58,600.00
Hand-Cable TV Inspection (LF)	40,000.00	50,268.00	47,040.00	27,860.00	30,570.00	24,150.00	24,180.00
Rehabilitation TV Inspection (LF)	50,000.00	3,198.00	209,131.00	140,026.00	25,800.00	34,847.00	60,142.00
TV Inspection Total (LF)	170,000.00	143,686.00	358,567.00	234,016.00	115,420.00	122,097.00	142,922.00

**11-A.4.1.4 Collection System Preventive Maintenance and I&I Field Work Data - Other Task:**

Dye Testing (#)	20.00	0.00	0.00	10.00	30.00	80.00	70.00
Root Treatment - Chemical (LF)	70,000.00	127,801.00	70,102.00	64,000.00	69,159.00	72,827.00	73,095.00
Smoke / Fog Testing (LF)	40,000.00	126,039.00	12,403.00	30,000.00	60,000.00	95,000.00	90,000.00
Manhole Inspection (#) County	3,000.00	8,907.00	4,502.00	1,676.00	1,884.00	2,582.00	2,588.00
Manhole Inspection (#) Contractor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Manhole Inspection	3,000.00	8,907.00	4,502.00	1,676.00	1,884.00	2,582.00	2,588.00
Right-of-Way Inspection and Clearing (mi)	50.00	54.06	54.06	53.83	54.12	54.22	53.83

**11-A.4.2 Collection System Preventive Maintenance and I&I Field Work Performance:**

**11-A.5 Collection System Rehabilitation**

**11-A.5.1 Collection System Rehabilitation Data:**

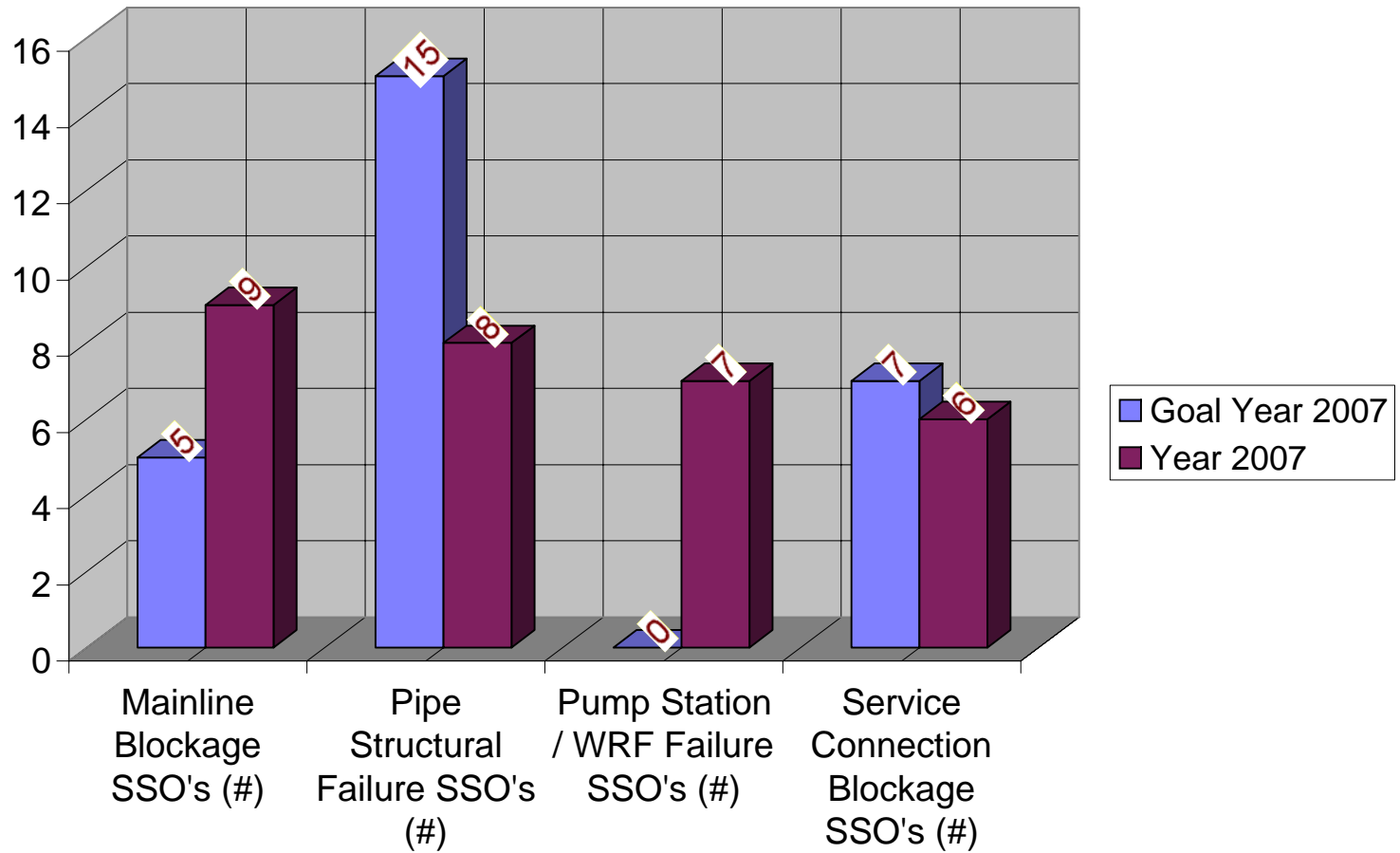
Cured-In-Place-Piping (CIPP) Sewer Pipe Rehabilitation (LF)	0.00	3,198.00	35,409.00	41,842.00	44,574.00	37,461.00	23,023.00
Other Sewer Pipe Replacement (LF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Sewer Pipe Rehabilitation (LF)	0.00	3,198.00	35,409.00	41,842.00	44,574.00	37,461.00	23,023.00
Point Repairs (#)	100.00	105.00	112.00	113.00	70.00	95.00	63.00
Manhole Rehabilitations (#)	200.00	188.00	152.00	297.00	341.00	199.00	251.00
Service Connection Repair & Rehabilitation (#)	400.00	334.00	345.00	447.00	485.00	396.00	620.00

**11-A.5.2 Collection System Rehabilitation Performance:**

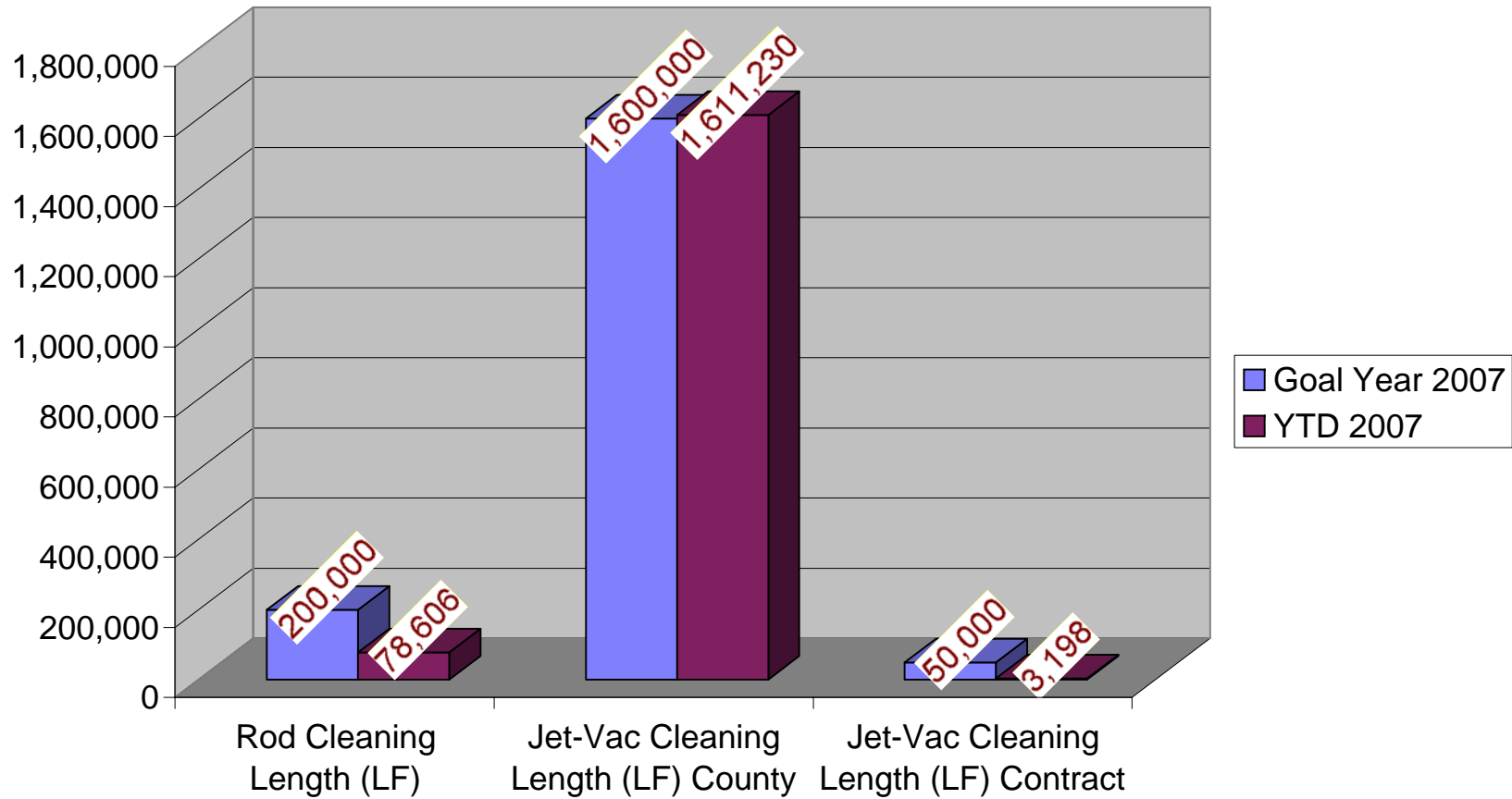
**Notes:**

The intent of this table is to provide a 5-year running total plus current year actual and goal data.  
N/A = Not Available

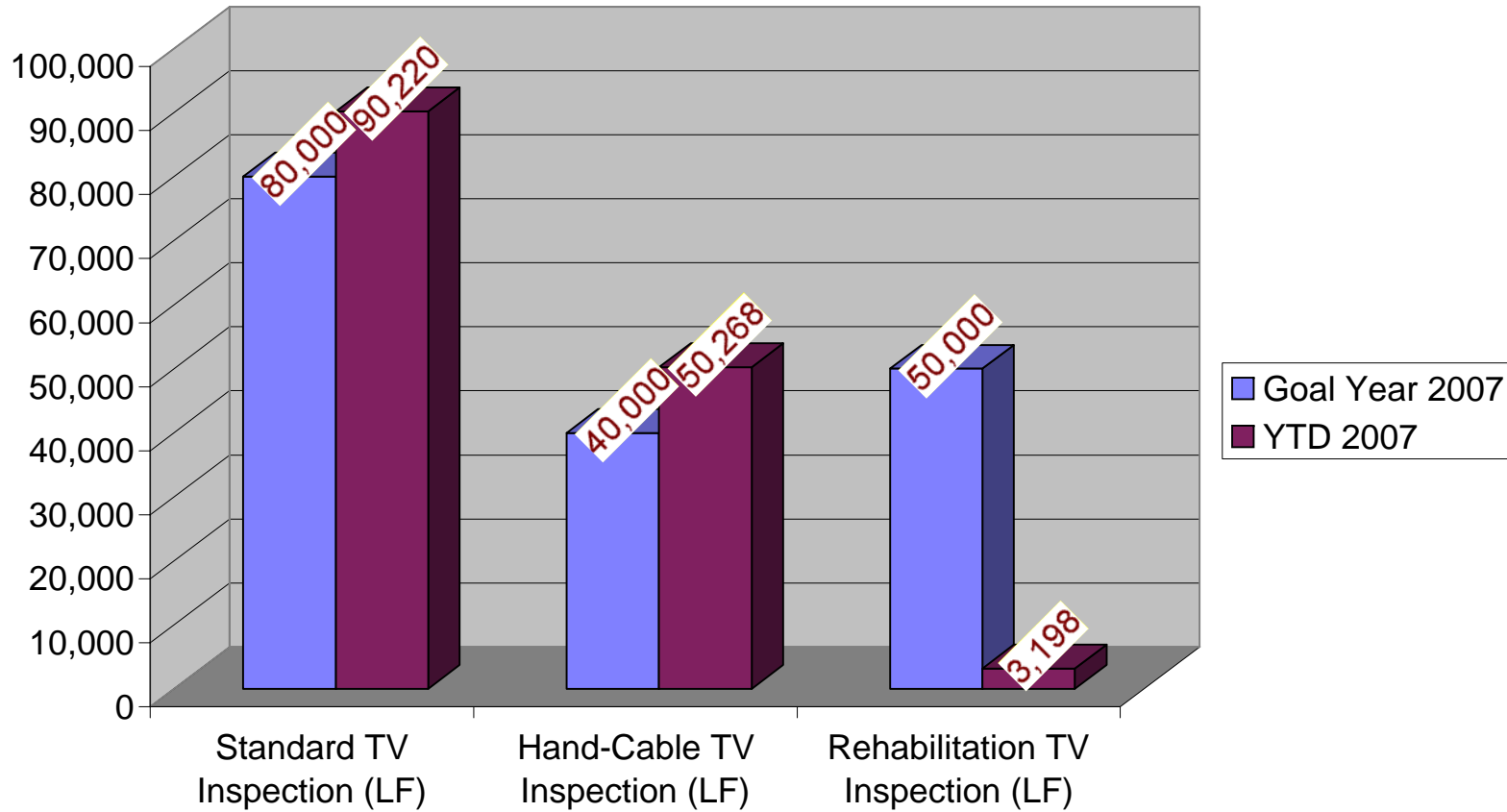
## Sanitary Sewer Overflows



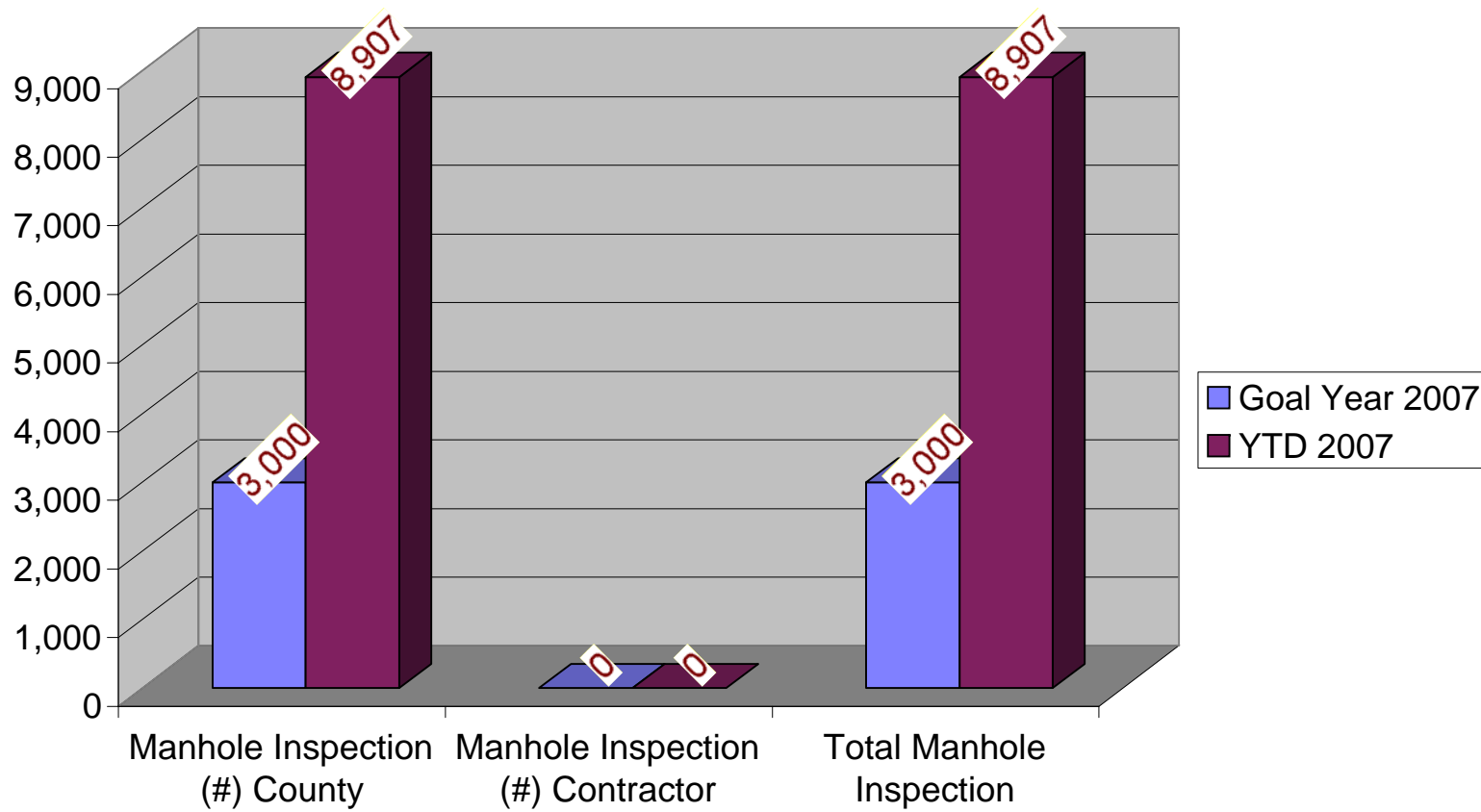
## Collection System PM & I&I Field Work Routine Sewer Cleaning



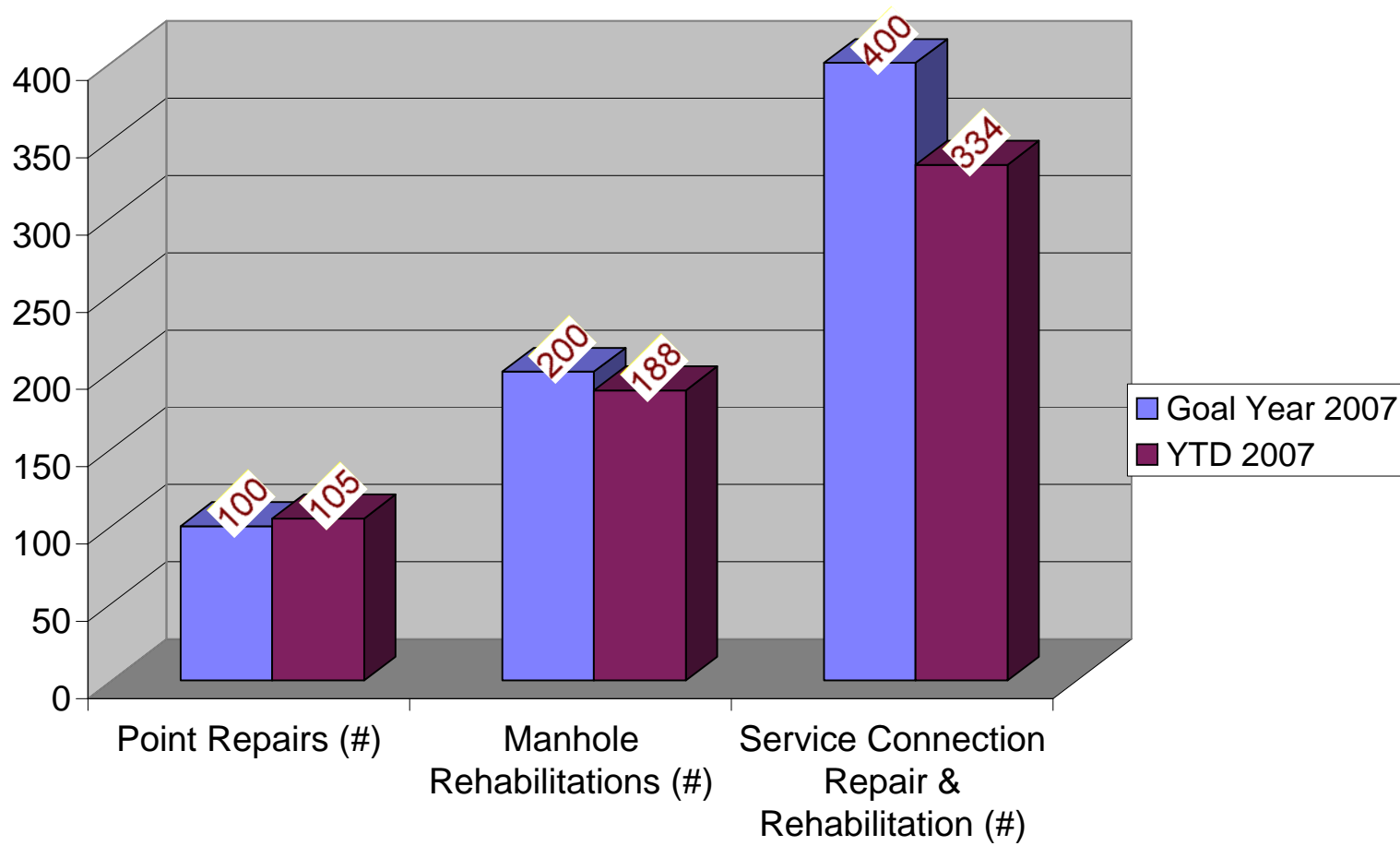
## Collection System PM & I&I Field Work TV Inspection



## Collection System PM & I&I Field Work Other Tasks



## Collection System Rehabilitation Data



As a result of a major sanitary sewer overflow at the end of 2005, plans were put into place to inspect more than 50 miles of concrete gravity sewer pipes within the system. County personnel were re-assigned from their normal duties to facilitate this effort.

The preliminary inspection resulted in requiring additional internal TV inspections and ultimately produced repair projects in a number of areas. During 2006 the Department lined approximately 1650 feet of 36-inch concrete pipe, 1500 feet of 21-inch concrete pipe and completed the bidding and initial startup of a contract to line approximately 700 feet of 36-inch and 2475 feet of 42-inch concrete pipe. This project is scheduled for completion in early 2007. The cost for the work described is approximately \$3,132,000. Pipe lining involves inserting a fiberglass liner into the pipe. This rehabilitation technique will add an additional 30 to 50 years of useful life to the existing pipes.

In addition, the Department lined 34,360 feet of 8-inch pipe; 2,984 feet of 10-inch pipe and 2,845 feet of 12-inch pipe with a total cost of \$1,065,800.

The rehabilitation work completed or currently under construction is the first phase of a multi-phased approach over multiple years to address the concrete infrastructure deterioration. The program will continue to evaluate the current status of the concrete infrastructure, which will result in setting up a priority list for rehabilitation based on the condition of the pipe. This should minimize future occurrences of catastrophic failures in large diameter concrete in the county.

The effort the Department put forth to deal with the issues just described required the redirection of a significant portion of our staff. It is because of this redirection that we were unable to meet some of the goals in 2006, but exceed others. We re-assigned 4 personnel from our Collection Maintenance Team for approximately six (6) months to assist the System Evaluation Rehabilitation Team in performing a preliminary inspection of all concrete gravity pipe located within the system. In addition other personnel were also re-assigned to this effort that took them away from repairing manholes, performing smoke testing, and other related tasks. The re-direction of effort totaled over 3000 man-hours that are normally used in the direct preventive maintenance of the system. This redirection of personnel reduced our ability to keep up with our annual preventive maintenance efforts, which produced results that did not meet our goals in the following areas:

- Rod Cleaning Length
- Jet-Vac Cleaning Length
- Manhole Rehabilitation
- Sewer Connection Repair and Rehabilitation

It is however equally important to note that virtually all the inspection goals were exceeded and resulted in the development of the work and plans discussed previously.

The Department of Public Works is committed to working toward continuous improvement in all areas of the wastewater infrastructure. Please take the time to review all the information supplied in the included CMOM Program Self-Audit Report Performance Measures.



Department of Public Works  
Director Ronald E. Bowen, P.E.



County Executive John R. Leopold



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