

City of Wooster
Division of Engineering

2006 Annual Report



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*Division of Engineering
City of Wooster
2006 Annual Report*

Summary & Narrative – Section 1

Division of Engineering
2006 Annual Report
Executive Summary

The 2006 Annual Report for the Division of Engineering is contained in the following pages. The intent of this report is to summarize the major projects and activities accomplished by the Division of Engineering for the year ending December 31, 2006, as well as provide information that can be used for planning infrastructure improvements and development for the coming year.

Including construction and development in 2006, the City now has over 400 miles of piping in its utility system and over 129 miles of roadway in its transportation system. Over 75% of the utility infrastructure is greater than 20 years old. Over 77% of the sanitary sewer and 70% of the water systems are over 30 years old. Although replacement of these facilities has been aggressive over the past 5 years, current funding levels do not allow for the amount of replacement needed to sustain an efficient, reliable utility system. In addition, recent upgrades to engineering design standards have ensured adequate construction of new streets, but older streets are in serious need of replacement.

The Division of Engineering attempts to balance the infrastructure needs of the city with the financial resources available. At the same time, current and future development and its associated demands are considered when attempting to develop a strategic plan for infrastructure improvements.

The Division of Engineering has attempted to meet those needs in the most cost effective way possible. Most projects are designed and managed in-house, keeping fees for professional services below 5% of construction costs, which is considerably lower than the industry average cost of 8% to 11%.

The number of permits issued by this division indicates a steady rate of development over the last 3 to 4 years. Reasonable adjustments to the fees charged for permits and inspections has allowed the division to recover 87% of its general fund operating costs.

**Division of Engineering
2006 Project Narrative
January, 2007**

INFRASTRUCTURE PROJECTS COMPLETED OR UNDER CONSTRUCTION IN 2006:

- 1. Long Road Sanitary Sewer:** The work consisted of approximately 8,000 linear feet of sanitary sewers from 12 inches to 24 inches in diameter, 26 manholes, 2 borings (state highway and railroad) and pump station removal. The engineer's estimate for this project was \$792,610. The project was bid in November 2005 and the contract was awarded to Underground Utilities in the amount of \$723,474.50 for construction. Construction was completed in mid-summer at a final construction cost of \$688,474.71.

- 2. Woodcrest Sanitary Sewer Replacement:** This work consisted of installing a new 12" PVC sanitary sewer line and appurtenances to replace an existing 8" clay sanitary sewer line. The new sewer consists of approximately 1,550 linear feet of 12" main sewer pipe and 7 manholes. Work also included the installation of new 6" PVC laterals. The new construction allowed for the abandonment of the existing sanitary sewer system which was undersized and allowed infiltration of ground water. The engineer's estimate for this project was \$275,000. The project was bid in October, 2005 and awarded to G.E. Baker in the amount \$246,657. Final completion cost was \$243,489.50.

- 3. Noble Drive Development:** This project consisted of the construction of approximately 4000 feet of asphalt street with concrete curb and gutter sidewalks; 8500 feet of sanitary sewer; 7000 feet of waterline; 6500 feet of 12 inch through 54 inch storm sewer and all associated appurtenances. The Engineer's estimated construction cost for this project was \$2,700,000. Project was funded by the Community Development Block Grant (CDBG) Economic Development Program and local government funds. Bid date was May 6, 2005 with a project completion date of November 1, 2005. Stout Excavating, Inc. was awarded the contract in the amount of \$2,055,099. Final cost of construction was \$2,068,764.80.

- 4. Buchholz Drive Sanitary Sewer:** This project consisted of replacing an existing sanitary sewer lift station on Buchholz Drive with a gravity sewer that would connect to an existing sanitary sewer line on Mechanicsburg Road. The new gravity sewer consisted of approximately 880' of 8" PVC pipe. This work included the removal of the existing lift station and installation of 4 new manholes. The Engineer's estimated construction cost for this project was \$75,500. The contract was awarded to Elite Excavating in the amount of \$63,058. Final construction costs was \$64,368.00.

5. **Bever/Beall Avenue Storm Sewer:** This project consisted of constructing approximately 11 manholes and 2,200 linear feet of 24-inch thru 60-inch storm sewers and appurtenances on Maple Street, Henry Street, Bever Street, South Street, Liberty Street, North Street, and an alley between North Street and Henry Street east of Bever Street. This project is part of the ongoing City's sanitary/storm sewer separation projects. The engineer's estimate was \$786,000 and the contract was awarded to Elite Excavating, Inc. in November 2005 in the amount of \$696,640. The final contract cost was \$712,290.24.
6. **West Liberty Street Storm Sewer Separation:** This project consisted of furnishing all materials and labor for the installation of approximately 13 manholes, 17 catch basins and 2,155 linear feet of storm sewer ranging in size from 12 inch to 36 inch including all appurtenances. This is another of the sewer separation projects that are scheduled to reduce the amount of storm flows to the Wastewater Treatment Plant. The engineer's estimated construction cost for this contract was \$350,000 with the contract being awarded to Newcomer Concrete in the amount of \$321,051. Final construction costs totaled \$322,826.74.
7. **E. Milltown Road Reconstruction:** Construction included approximately 5,000 feet of new asphalt roadway and concrete curb and gutter; 38,000 square feet of sidewalk; 5,200 feet of 12" through 36" storm sewer; 25,000 cubic yards of excavation and embankment; construction of a pedestrian bridge over the Little Apple Creek ; installing all new traffic control signs and pavement markings; and all associated appurtenances. The engineer's estimate for this project was \$1,444,000. Stout Excavating, Inc. was awarded the contract in November 2005 for a cost of \$1,474,906.47. Utility relocation work started in the fall of 2005 with completion scheduled for Summer of 2006. The project was completed by late fall of 2006 with final construction costs of \$1,535,622.00. Final pay paperwork has not been submitted; \$557,653.97 remained on the contract as of 12/31/06.
8. **North Street Bridge Replacement:** This project replaced the existing, deteriorating concrete slab bridge with a new concrete poured in place structure. The project also included the replacement/rerouting of approximately 475 linear feet of sanitary sewer, 6 new manholes and 370 linear feet of water main. The estimated cost for this project was \$441,000. The contract was awarded to V.O. Menezes & Sons, Inc. for \$511,894.11. The project was completed in August 2006 at a final cost of \$512,246.72.
10. **North/Walnut/Grant Streets Storm Sewer:** This project is part of the City's Master Plan for Sewer Separation. The project consisted of approximately 2,000 linear feet of 12" thru 24" storm sewer, 13 manholes and 16 catch basins. Construction of this project was in conjunction with the North Street Bridge replacement project. The engineer's estimated cost for construction was \$320,000. Wenger Excavating was awarded the contract in May, 2006 with a bid price of \$348,509.80. With an addition of approximately 260 feet of 15" sanitary sewer, 2 manholes and 5 sewer services, the final construction cost was \$379,476.80. Final payment had not been made as of 12/31/06; balance remaining on contract is \$31,648.04.

11. N. Bever and Quinby Avenue Sidewalk: The work consists of furnishing all materials and labor for the installation of approximately 3,000 square feet of concrete sidewalk including grading and seeding. The engineer's estimated construction costs for the project was \$29,000. The contract was awarded to Smith Paving for \$19,779.20. Final construction cost was \$18,894.00.

12. Grant, Walnut, Clark and Saybolt Area Storm Sewers: Designed by the Engineering Division this project consists of the installation of approximately 2,700 linear feet of storm sewer ranging in size from 12" to 27", 1,500 linear feet of 6" storm laterals, 350 linear feet of 6" D.I. waterline including 9 water services, 440 linear feet of sanitary sewer main and 300 linear feet of sanitary sewer laterals. The engineer's estimated construction cost was \$680,000 which will be partially funded by an OPWC grant and no interest loan. The project was bid in October, 2006 and was awarded to Stout Excavating in the amount of \$566,195.40. Construction began in December, 2006 with completion scheduled for early spring, 2007.

13. Interceptor Wells I-6 & I-7: This project consists of the installation of two new interceptor wells in the City's south well field complete with well pumps, waterline and air strippers. The engineer's estimated construction cost for this project is \$860,000. The project advertised for bid during February, 2005 and was awarded to Reynolds, Inc. in the amount of \$617,066.00. Construction was completed in late December with a final cost of \$616,373.76. Final payment has yet to be made leaving a balance of \$30,578.64 as of 12/31/06.

14. Cleveland Road Lift Station: This project consists of replacing the existing lift station on Cleveland Road to meet current sanitary sewer flows and OEPA regulations. The upgrade includes new force main, 4" non-clog explosion proof pumps, 8' diameter wet well, electric work, standby power system, and telemetry and control work. The engineer's estimated construction costs for this project was \$250,000. G.E. Baker Construction was awarded the project in November, 2006 with a bid price of \$235,892.40. Construction is slated to begin in January, 2007.

15. Christmas Run Waterline Replacement: Designed by the Engineering Division this project consisted of the construction of approximately 8,100 linear feet of 12" D.I. waterline including 107 service connections, valves and fire hydrants and other appurtenances on Christmas Run Blvd. from Wayne Avenue to Oldman Road. The engineer's estimated construction costs for this project was \$935,000. Underground Utilities was awarded the contract in May, 2006 with a bid price of \$643,198.40. Construction was completed by the end of November with final costs of \$778,527.63. Final pay has not been made as of 12/31/06; balance remaining on contract is \$34,522.78.

16. E. Liberty Waterline Improvements and Railroad Crossing: This project consisted of 750 linear feet of ductile iron waterline from 6" to 12", 10 gate valves for 6" to 12" and a boring under the railroad. It was designed by the Engineering Division with a cost estimate of \$197,000. Underground Utilities was awarded the contract in July, 2006 with a bid of \$153,340.00. Construction was completed by the end of the year with a final cost of \$163,284.20. Final payment has not been made as of 12/31/06; balance remaining on contract is \$20,648.62.

17. Water Treatment Plant Demolition: The Engineering Division provided contract and construction administration for the demolition of the old water treatment plant. This project was awarded to B&B Wrecking in December 2005 for \$288,000. The project was finalized in October, 2006 with a total cost of \$298,472.00.

18. Lime Sludge Lagoon Closure: The Engineering Division provided contract and construction administration for the removal of approximately 73,000 cu. yards of lime sludge from the old water treatment plant sludge lagoon, and closure of the lagoon. This project was awarded to Mark Haynes Construction in December 2005 for \$1,191,000. Actual volume of sludge removed was 45% greater than estimated resulting in a final project cost of \$1,634,336.00. The final pay paperwork has yet to be submitted leaving a balance of \$175,764.00 on the contract.

INFRASTRUCTURE PROJECTS SCHEDULED/PLANNED FOR 2007:

1. **Beall Ave. Streetscape:** This project consists of upgrading Beall Avenue from Liberty Street to Bloomington Avenue. New roadway will be constructed complete with curb and gutters, turn lanes, storm sewer and a boulevard section through the College of Wooster. Engineering plans were completed in 2006. Right-of-way acquisition is continuing and funding is being secured. Advertisement should take place early spring of 2007. The engineer's estimate for construction of this project is \$10,000,000.

2. **Intermediate Zone Water Tank & Booster Station:** This project is currently being designed by the Engineering Division to meet current demands on the Intermediate and High Pressure Systems. The initial estimate for a 1,000,000-gallon water storage tank and booster station is \$1,800,000. The tank will be located just south of Oldman Road, between Kean Elementary and Ida Sue schools. The tank will be approximately 110' high, 52' in diameter at the base and 74' in diameter at the top of the tank. Construction is anticipated to begin in summer 2007.

3. **Mechanicsburg Road Sanitary Sewer:** This project will be designed by the Engineering Division and consists of upgrading the sanitary sewer which runs along Mechanicsburg Road then adjacent to Bell & Howell. This upgrade is necessary to meet the current and future demands from development along the western border of the City. Construction costs are estimated to be \$200,000.

4. **WTP CL2 Storage Expansion:** The Engineering Division will design an addition to the Water Treatment Plant for Chlorine Storage for disinfection of the City's water supply. The cost estimate for the proposed building is \$30,000.

6. **Triway Lift Station Replacement:** This project will be designed by the Engineering Division and consists of replacing the existing lift station on S.R. 226 to meet current sanitary sewer flows and Ohio EPA regulations. The upgrade includes new non-clog submersible pumps, 8' diameter wet well, electric work, standby generator, and telemetry and control. The engineer's estimated construction costs for this project is \$350,000.

7. **Point-of-View Lift Station Replacement:** This project will be designed by the Engineering Division and consists of replacing the existing lift station on Point-of-View Drive to meet current sanitary sewer flows and Ohio EPA regulations. The upgrade includes new non-clog submersible pumps, 8' diameter wet well, electric work, standby generator, and telemetry and control. The engineer's estimated construction costs for this project is \$350,000.

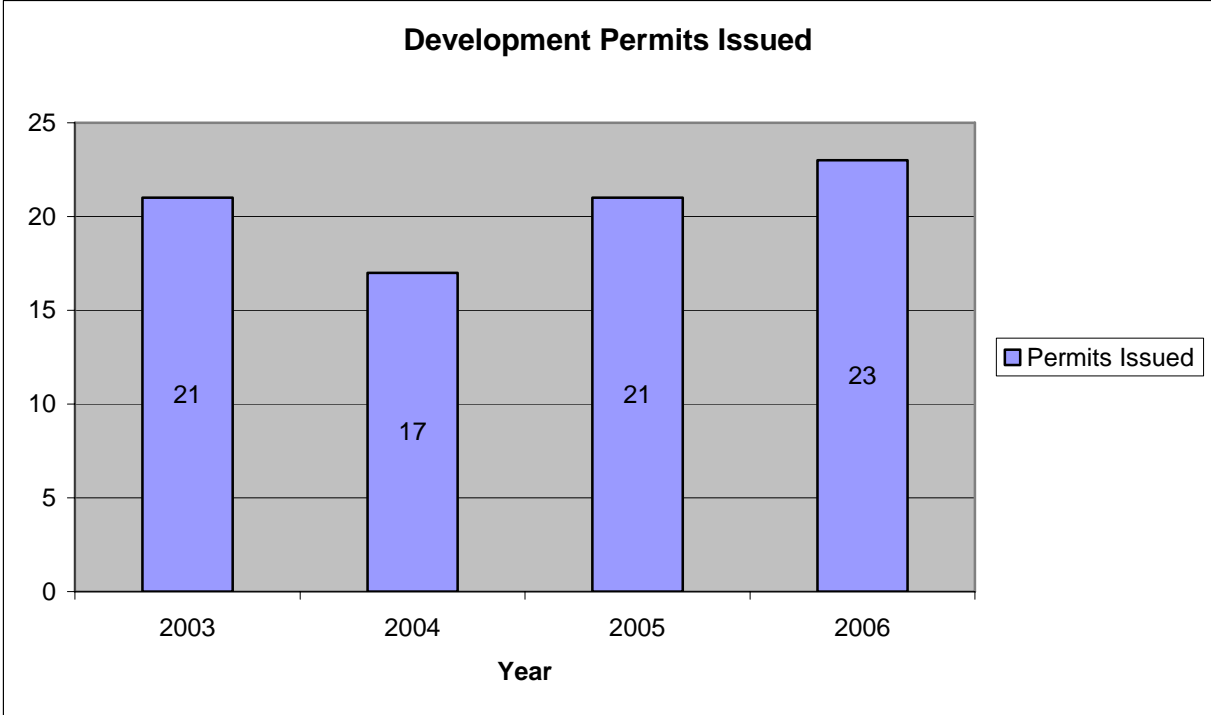
8. **College Avenue Storm Sewer:** This project is part of the City's Master Plan for sewer separation and is being designed by the Engineering Division. The project consists of approximately 1,500 linear feet of 12" through 27" storm sewer, manholes, catch basins, 1,000 linear feet of sanitary sewer rehabilitation and 600 linear feet of new 8" sanitary sewer. The engineer's estimated costs for construction is \$450,000 with partial funding from OPWC.

9. **Mechanicsburg Booster Station Improvements:** This project consists of upgrading the booster station on Mechanicsburg Road. The engineer's estimated costs for construction is \$485,000.

10. **Mechanicsburg and Mindy Lane Waterline Improvements:** This project consists of looping the waterline between the Mechanicsburg Booster Station and the Intermediate Pressure Zone. The engineer's estimated costs for construction is \$296,000.

11. **Larwill Street Bridge Replacement:** This project will replace the existing deteriorating concrete slab bridge with a new concrete poured in place structure. The project also consists of the replacement of approximately 300 linear feet of water main and placing storm sewer catch basins and junction chamber in anticipation of a future sewer separation project on Larwill. The estimated cost for this project is \$680,000.

Insert Project Map

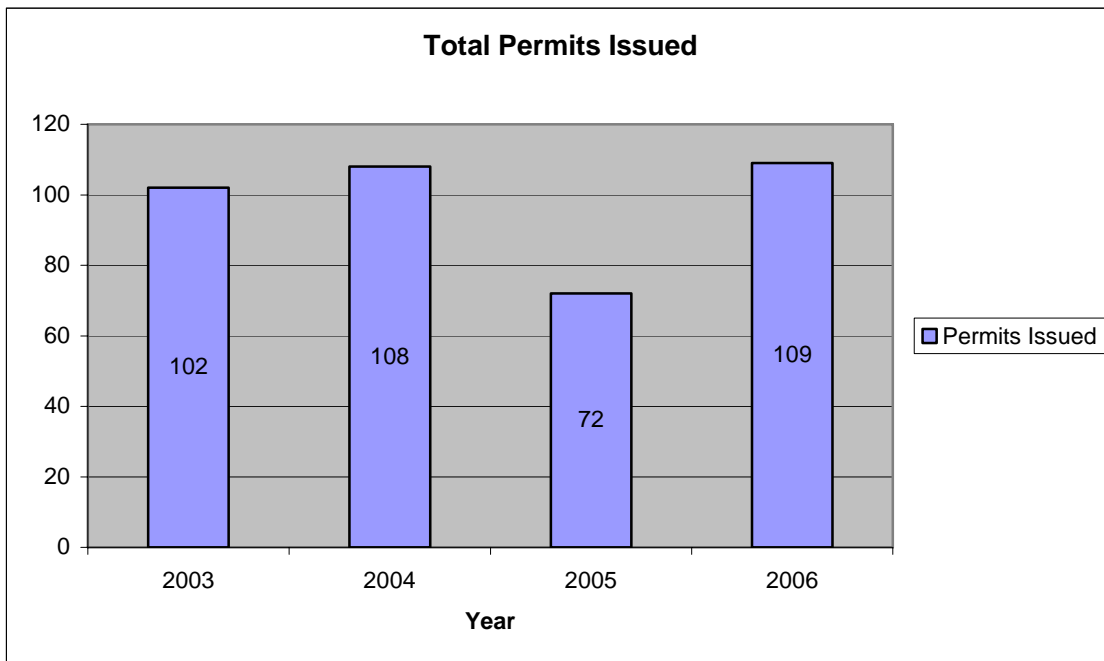


ENGINEERING FEES AND REVENUES FOR 2006:

The following breakdown details the revenues received in 2006 and 2005 by the Division of Engineering.

	<u>2006</u>	<u>2005</u>
Single Inspection	\$ 2,692.00	\$ 1,790.00
Street Cut Permit	\$ 13,290.00	\$ 850.00
Construction Inspection	\$ 29,268.00	\$ 15,522.00
Plan Review Fee	\$ 42,258.00	\$ 36,674.00
Plan Copies	\$ 2,765.00	\$ 9,406.00
Yard Pipe Permit	\$ 476.00	\$ 354.00
Sanitary Sewer Permit	\$ 5,850.00	\$ 2,338.00
San. Sewer Availability Charge	\$ 72,225.00	\$ 13,530.00
Water Availability	\$ 39,819.00	\$ 5,229.00
Water Service Permit	\$ 960.00	\$ 582.00
Development Permit Waiver	(\$ 37,500.00)	
Total Fees Collected:	\$172,103.00	\$86,276.00

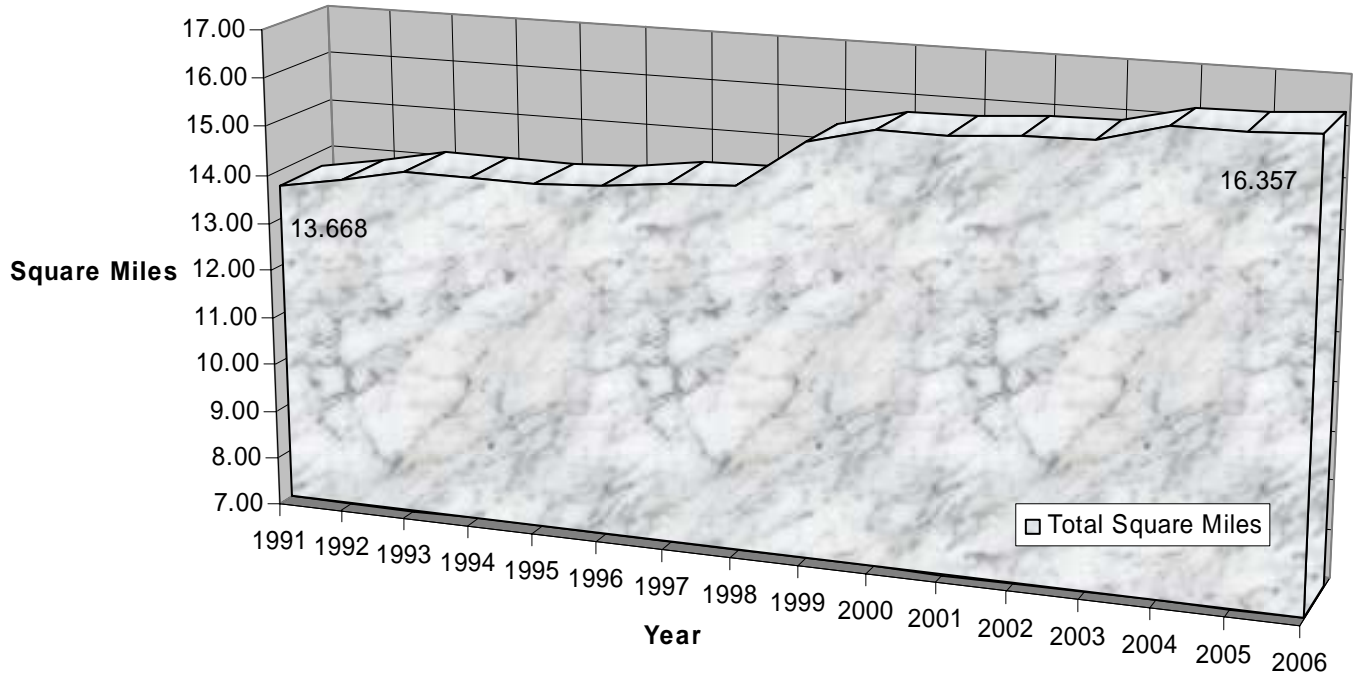
Total Permits for the 2006 year were up substantially from 2005. Revenues were increased by 100% and permits issued were increased by 50%. Fees were increased in June 2006. An Industry Waiver was instituted in October to help promote growth in Wooster by allowing a credit on permits for new jobs created.



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City Growth Statistics – Section 2

City Growth Total City Area



City Area Statistics

City Area				
Year	Increases (Acres)	Total Acres	Total Square Miles	% Increase
1965	0.000	4,966.400	7.760	0.000
1966	648.890	5,615.290	8.774	13.066
1967	0.000	5,615.290	8.774	0.000
1968	0.000	5,615.290	8.774	0.000
1969	331.550	5,946.840	9.292	5.904
1970	62.470	6,009.310	9.390	1.050
1971	0.000	6,009.310	9.390	0.000
1972	181.810	6,191.120	9.674	3.025
1973	54.380	6,245.500	9.759	0.878
1974	173.858	6,419.358	10.030	2.784
1975	4.000	6,423.358	10.036	0.062
1976	19.532	6,442.890	10.067	0.304
1977	25.032	6,467.922	10.106	0.389
1978	79.990	6,547.912	10.231	1.237
1979	56.819	6,604.731	10.320	0.868
1980	3.000	6,607.731	10.325	0.045
1981	135.195	6,742.926	10.536	2.046
1982	2.730	6,745.656	10.540	0.040
1983	47.046	6,792.702	10.614	0.697
1984	148.203	6,940.905	10.845	2.182
1985	0.000	6,940.905	10.845	0.000
1986	45.319	6,986.224	10.916	0.653
1987	0.000	6,986.224	10.916	0.000
1988	187.711	7,173.935	11.209	2.687
1989	1,031.835	8,205.770	12.822	14.383
1990	0.000	8,205.770	12.822	0.000
1991	541.763	8,747.533	13.668	6.602
1992	166.072	8,913.605	13.928	1.899
1993	160.949	9,074.554	14.179	1.806
1994	1.080	9,075.634	14.181	0.012
1995	0.000	9,075.634	14.181	0.000
1996	23.626	9,099.260	14.218	0.260
1997	123.047	9,222.307	14.410	1.352
1998	40.564	9,262.871	14.473	0.440
1999	610.865	9,873.736	15.428	6.595
2000	217.389	10,091.125	15.767	2.202
2001	2.781	10,093.906	15.772	0.028
2002	64.491	10,158.397	15.872	0.639
2003	24.120	10,182.517	15.910	0.237
2004	226.640	10,409.157	16.264	2.226
2005	11.090	10,420.247	16.282	0.107
2006	537.062	10,957.309	17.121	5.154

2006 Annexations

No.	Description	Date	Area
1	OARDC	2/1/2006	489 Ac.
2	Schellin Road	8/22/2006	48.062 Ac.

City Growth Information

Year	City Population	City Area	City Streets
1990	22, 427 (a)	12.8222 Sq. Mi.	106.42 Miles
1999	26,100 (b)	15.428 Sq. Mi.	119.38 Miles
2000	24,811 (a)	15.767 Sq. Mi.	120.41 Miles
2001	25,047 (b)	15.772 Sq. Mi.	120.79 Miles
2002	25,342 (b)	15.872 Sq. Mi.	121.55 Miles
2003	25,420(b)	15.910 Sq. Mi.	122.87 Miles
2004	25,801 (b)	16.264 Sq. Mi.	125.39 Miles
2005	26,166 (b)	16.282 Sq. Mi.	127.20 Miles
2006	26,411(b)	17.126 Sq. Mi.	129.76 Miles

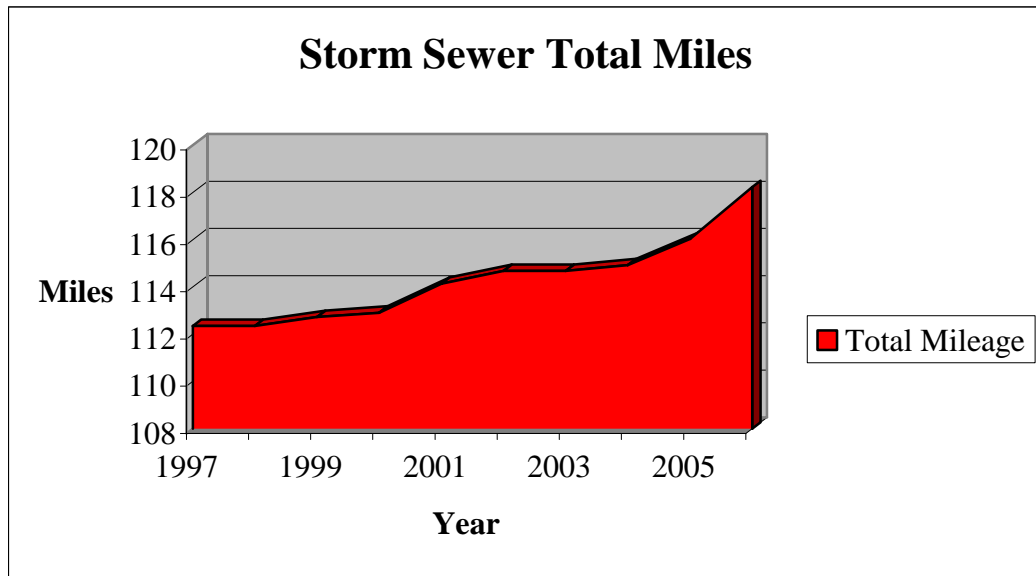
(a) Census (b) Estimated

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City of Wooster
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Utility Statistics – Section 3

Storm Sewer Mileage

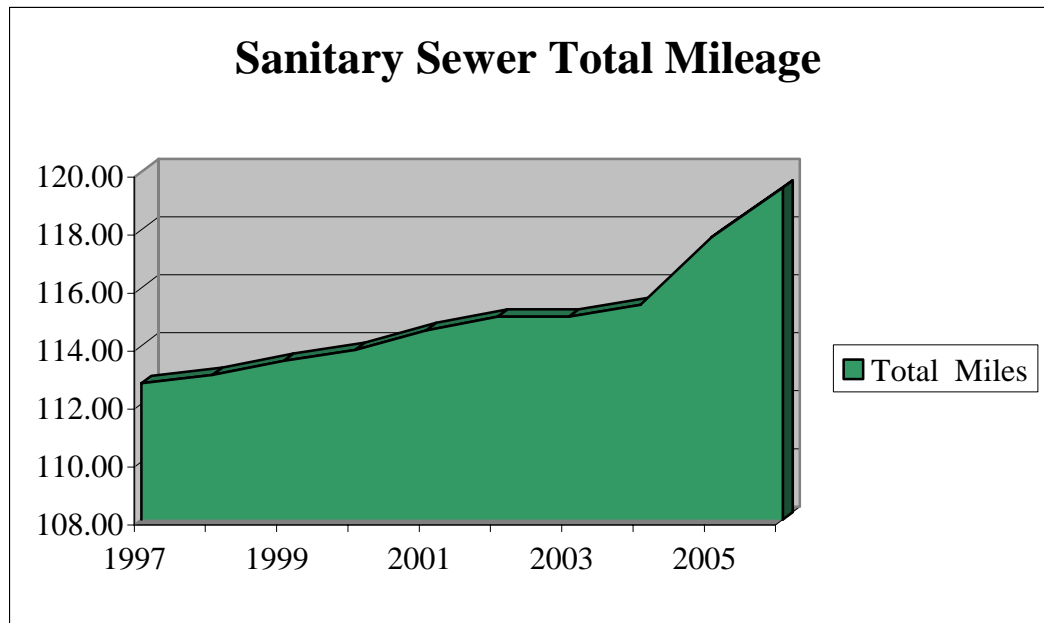
Year	Increase in Miles	Total Mileage	% Increase
		112.35	
1997	0	112.35	0.00%
1998	0	112.35	0.00%
1999	0.38	112.73	0.34%
2000	0.18	112.91	0.16%
2001	1.22	114.13	1.08%
2002	0.55	114.68	0.48%
2003	0	114.68	0.00%
2004	0.24	114.92	0.21%
2005	1.11	116.03	0.97%
2006	2.2	118.23	1.90%



The substantial increase in storm sewer mileage since 2003 and the rate of increase over the past 3 years is the result of the aggressive implementation of the City’s sanitary and storm sewer separation plan. It should be noted that an additional effect of the separation program has been the decrease of peak flows to the Water Pollution Control Plant during rain events.

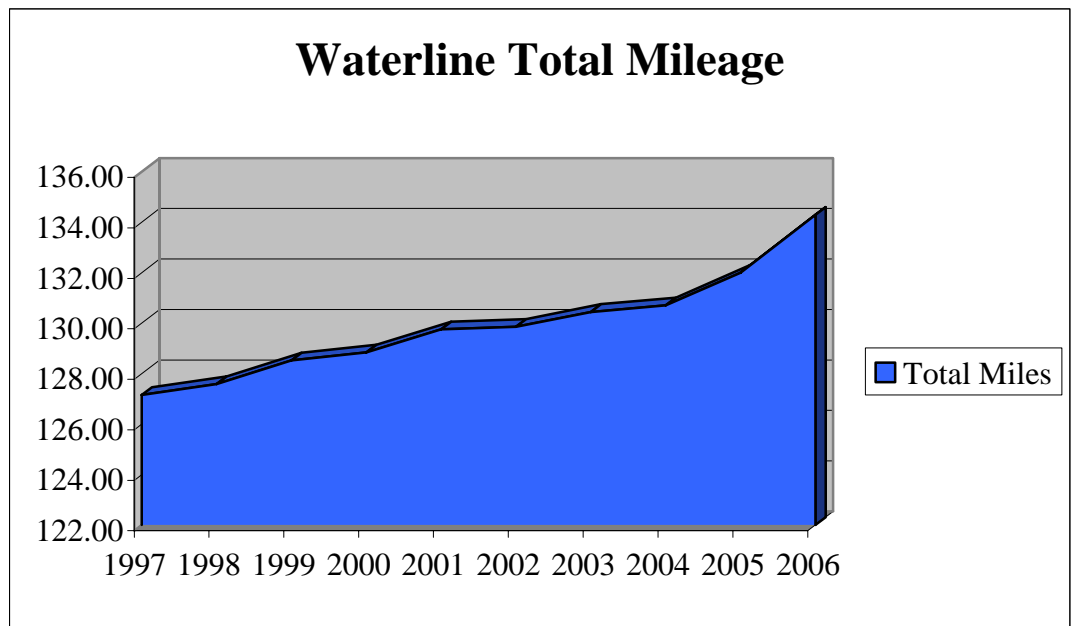
Sanitary Sewer Mileage

Year	Increase in Miles	Total Miles	% Increase
		112.7	
1997	0	112.70	0.00%
1998	0.29	112.99	0.26%
1999	0.49	113.48	0.43%
2000	0.37	113.85	0.33%
2001	0.68	114.53	0.60%
2002	0.47	115.00	0.41%
2003	0	115.00	0.00%
2004	0.41	115.41	0.36%
2005	2.33	117.74	2.02%
2006	1.71	119.45	1.45%



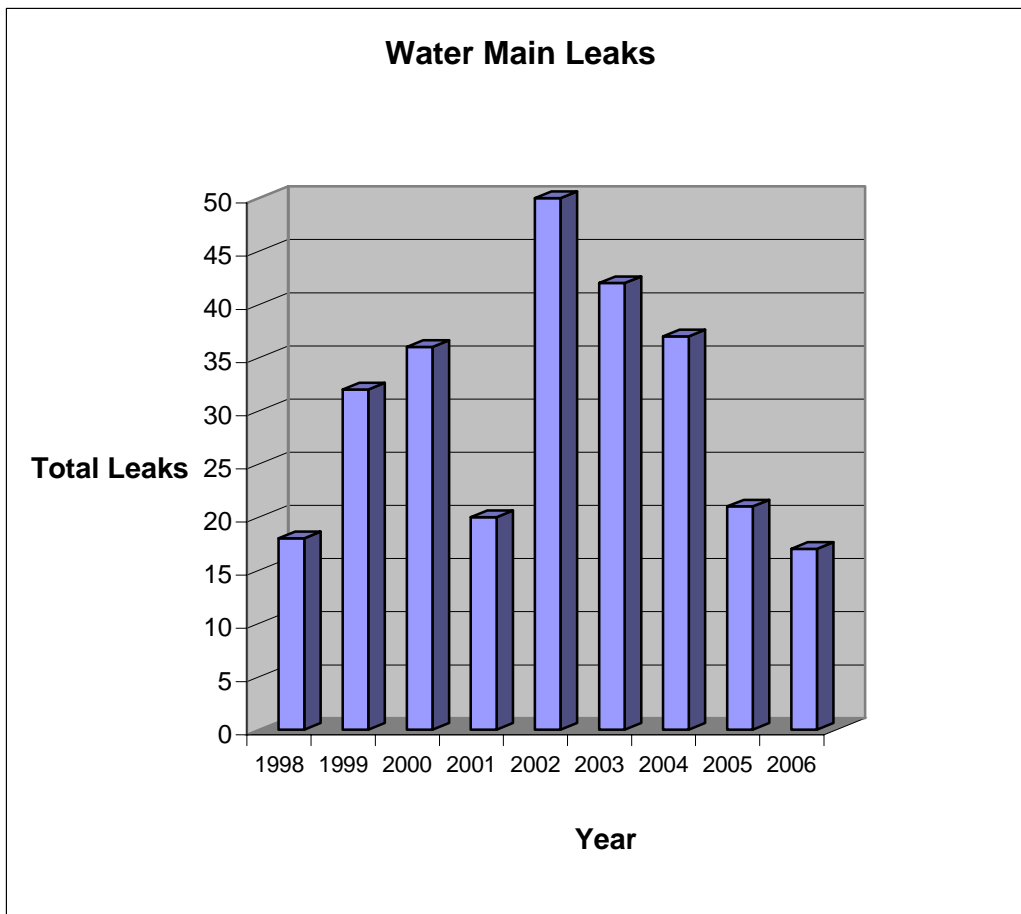
Waterline Mileage

Year	Increase in Miles	Total Miles	% Increase
		126.55	
1997	0.60	127.15	0.47%
1998	0.43	127.58	0.34%
1999	0.94	128.52	0.74%
2000	0.32	128.84	0.25%
2001	0.91	129.75	0.71%
2002	0.10	129.85	0.08%
2003	0.59	130.44	0.45%
2004	0.26	130.70	0.20%
2005	1.30	132.00	0.99%
2006	2.29	134.29	1.73%



Water Main Leaks

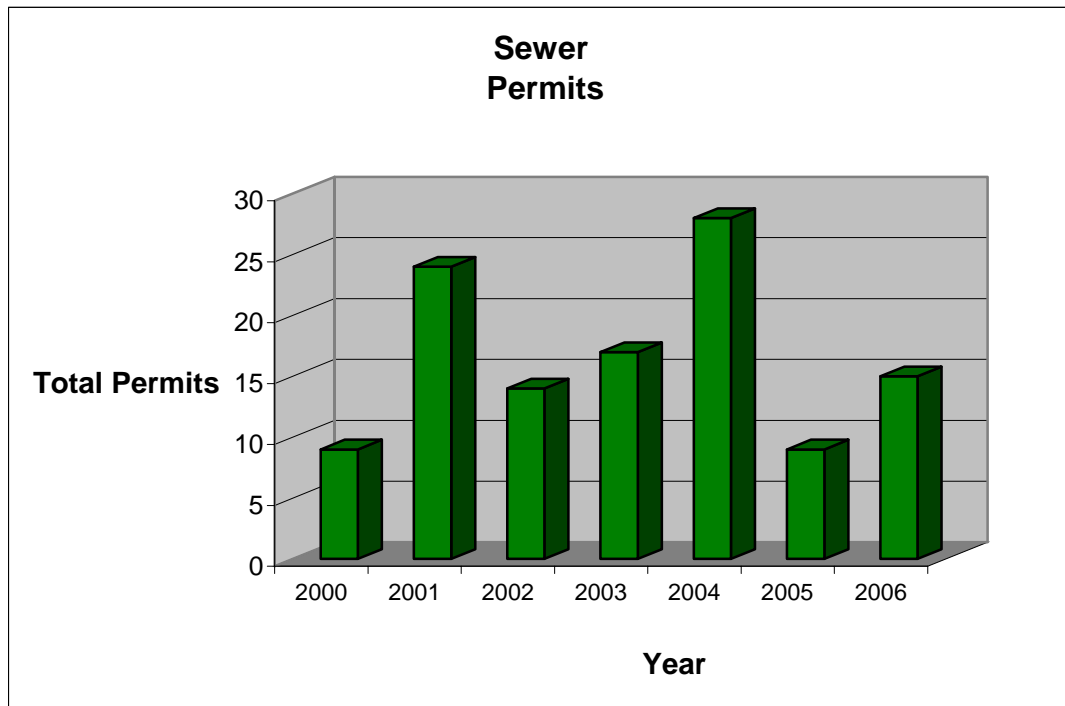
Year	Number
1997	23
1998	18
1999	32
2000	36
2001	20
2002	50
2003	42
2004	37
2005	21
2006	17



The above chart clearly indicates a significant and steady reduction in the number of water main breaks over the last 5 years. This reduction is due to several factors. The Utility Division has performed proactive leak detection in the distribution system resulting in the detection and repair of several leaks. A significant amount of leaks were eliminated due to waterline replacement projects administered by the Division of Engineering.

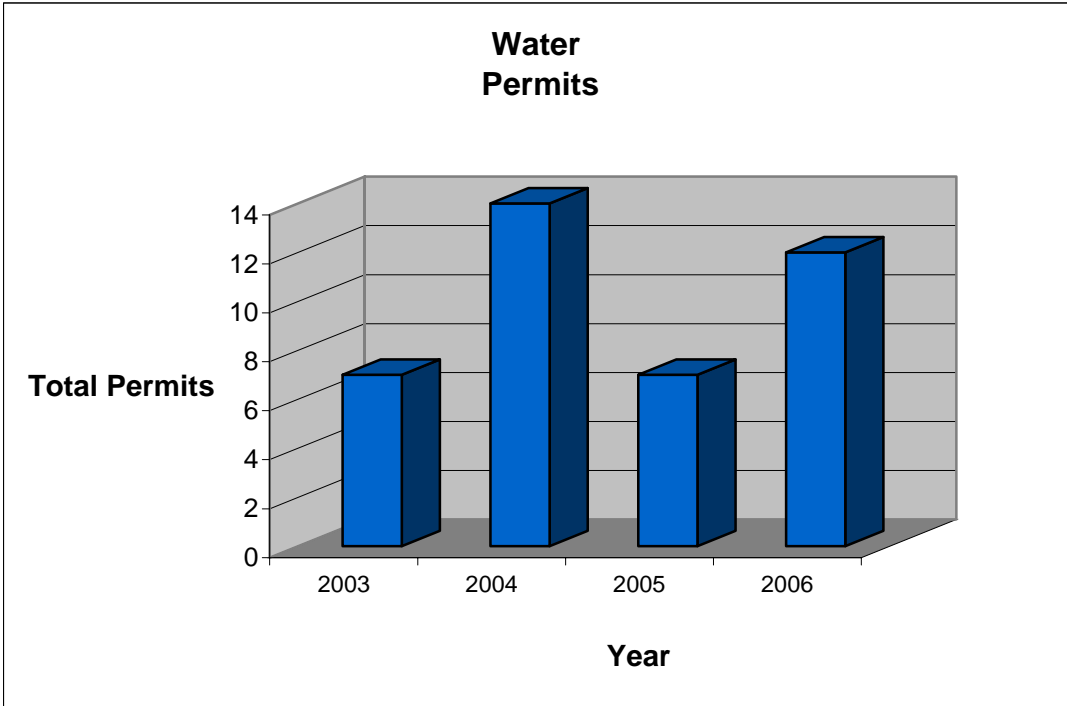
Sewer Permits

<u>Year</u>	<u>Number</u>
2000	9
2001	24
2002	14
2003	17
2004	28
2005	9
2006	15



Water Permits

Year	Number
2003	7
2004	14
2005	7
2006	12



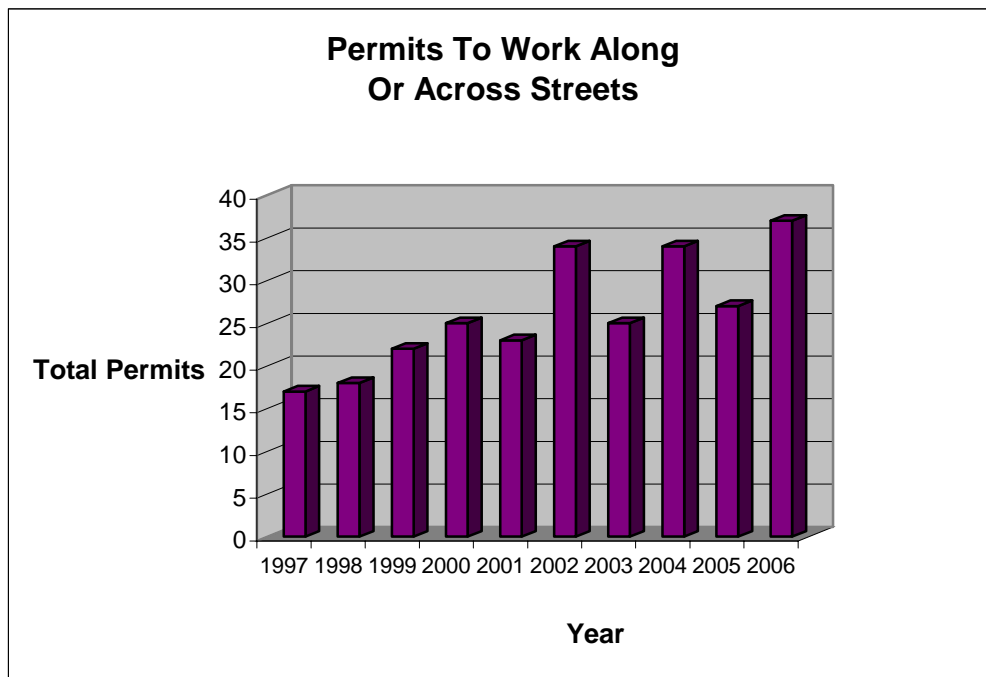
Street Cut Permits

<u>Year</u>	<u>Number</u>
1997	27
1998	21
1999	34
2000	31
2001	26
2002	28
2003	32
2004	15
2005	8
2006	22



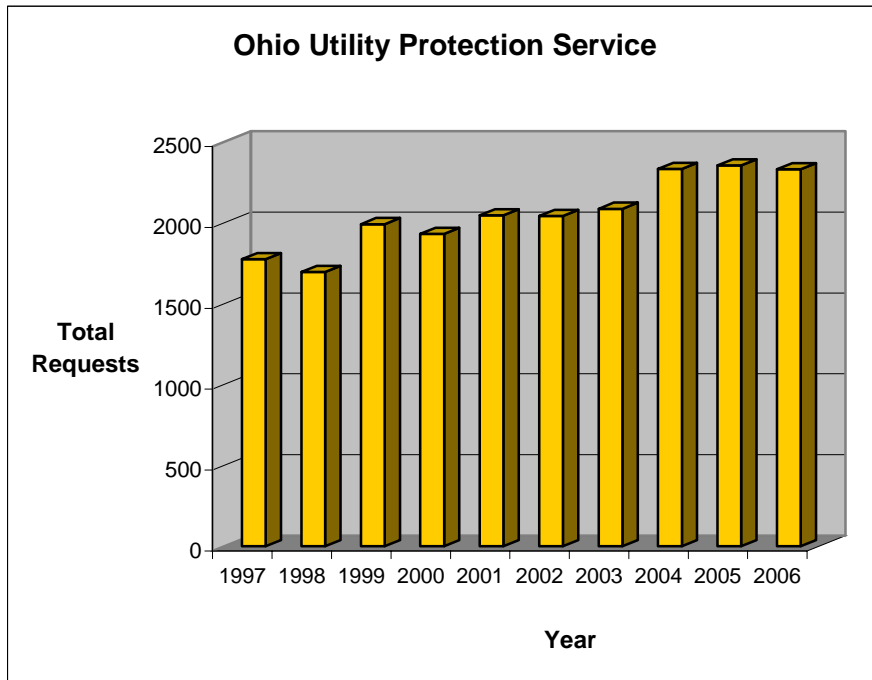
**Permits To Work Along
Or Across Streets**

<u>Year</u>	<u>Number</u>
1997	17
1998	18
1999	22
2000	25
2001	23
2002	34
2003	25
2004	34
2005	27
2006	37



Ohio Utility Protection Service
Location Requests

<u>Year</u>	<u>Number</u>
1997	1776
1998	1697
1999	1992
2000	1932
2001	2047
2002	2043
2003	2087
2004	2334
2005	2356
2006	2332

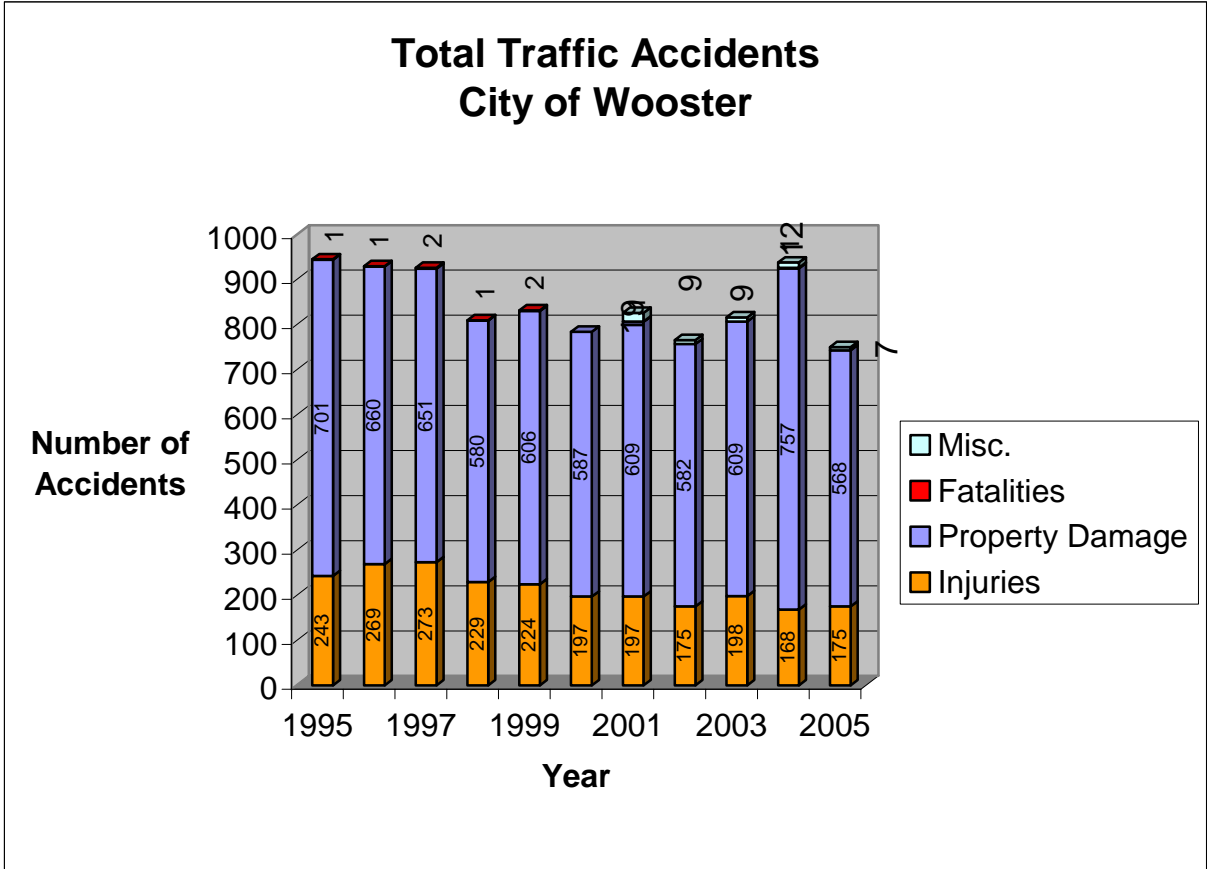


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Traffic Statistics – Section 4

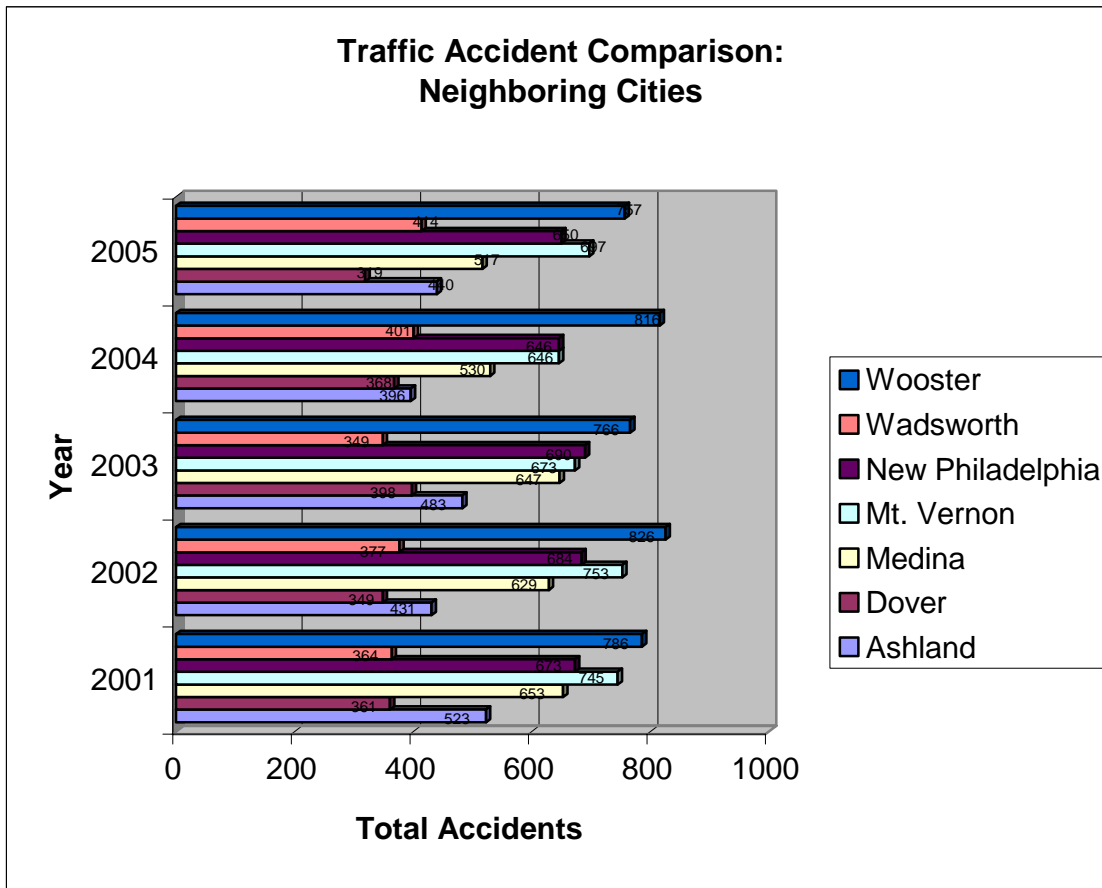
**City Of Wooster
Traffic Accidents**

Year	Injuries	Property Damage	Fatalities	Misc.
1995	243	701	1	
1996	269	660	1	
1997	273	651	2	
1998	229	580	1	
1999	224	606	2	
2000	197	587		
2001	197	609	1	19
2002	175	582		9
2003	198	609		9
2004	168	757	1	12
2005	175	568		7



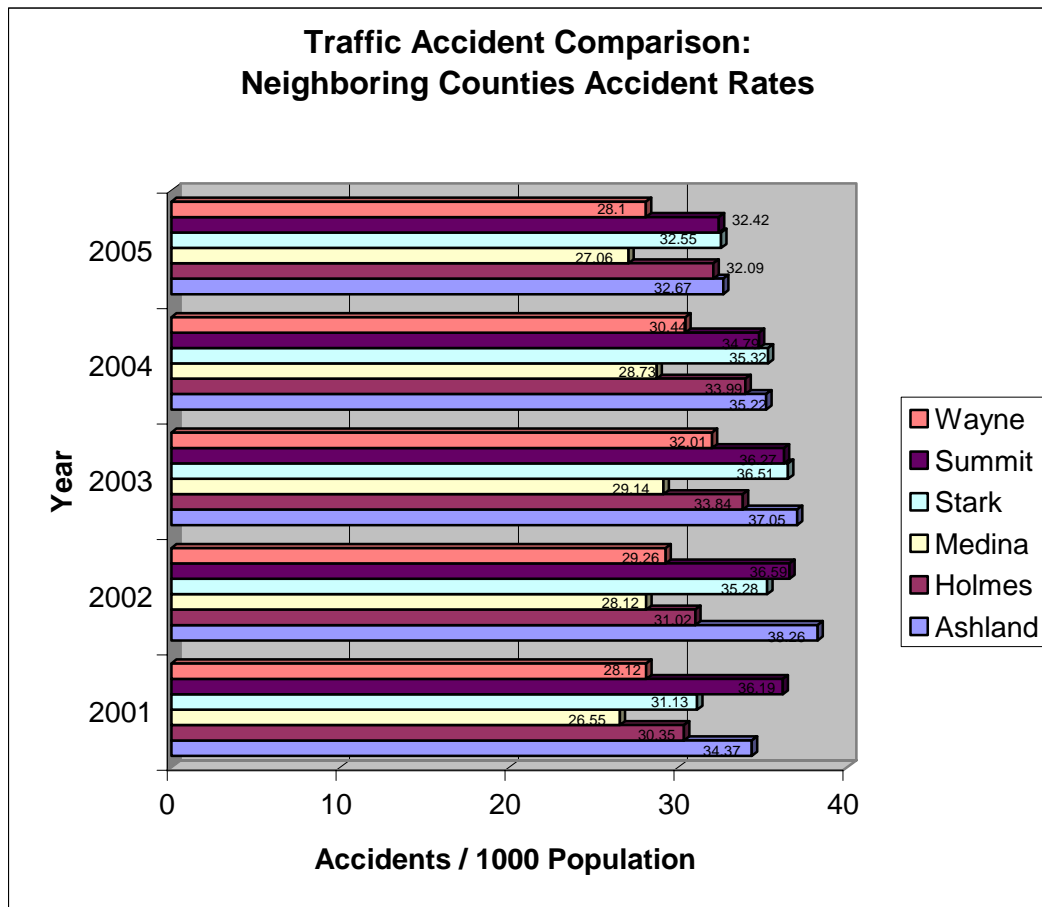
Traffic Accident Comparison
Totals By Neighboring Cities

Year	New						
	Ashland	Dover	Medina	Mt. Vernon	Philadelphia	Wadsworth	Wooster
1996							928
1997	514	357	716	707	601	362	926
1998	548	389	605	735	726	374	810
1999	558	387	603	773	730	366	832
2000	523	361	593	745	673	364	786
2001	431	349	653	753	684	377	826
2002	483	398	629	673	690	349	766
2003	396	368	647	646	646	401	816
2004	440	319	530	697	650	414	757
2005	378	350	517	629	648	431	750



**Traffic Accident Comparison:
Rates By Neighboring Counties**

Year	Accidents Per 1000 People					
	Ashland	Holmes	Medina	Stark	Summit	Wayne
1997	35.78	31.94	30.45	35.27	38.38	32.67
1998	35.78	28.73	26.61	34.64	36.1	28.99
1999	36.16	31.13	27.68	34.29	38.45	30.37
2000	38.67	31.51	26.81	34.75	27.97	30.36
2001	34.37	30.35	26.55	31.13	36.19	28.12
2002	38.26	31.02	28.12	35.28	36.59	29.26
2003	37.05	33.84	29.14	36.51	36.27	32.01
2004	35.22	33.99	28.73	35.32	34.79	30.44
2005	32.67	32.09	27.06	32.55	32.42	28.1



*Division of Engineering
City of Wooster
2006 Annual Report*

Engineering Design Statistics – Section 5

(Projects Designed or Constructed in 2006)

PROJECT	DESIGNER/CONSULTANT	DESIGN COST	CONTRACTOR	ESTIMATED			Contract Balance	% Complete
				CONST. COST	BID PRICE	FINAL COST		
GIS Mapguide	Imaginit Technologies		Imaginit Technologies		N/A			
Long Road Sanitary Sewer	Jones & Henry	\$10,000.00	Underground Utilities	\$792,610.00	\$723,475.50	\$688,474.71		
Woodcrest Sanitary Sewer	Wooster Engineering Div.	\$0.00	GE Baker Const.	\$275,000.00	\$246,657.00	\$243,489.50		
Noble Drive Development	Shaffer, Johnston	\$110,500.00	Stout Exc.	\$2,700,000.00	\$2,055,099.00	\$2,068,764.80		
Buchholz Drive Sanitary Sewer	Wooster Engineering Div.	\$0.00	Elite Excavating	\$75,500.00	\$63,058.00	\$64,368.00		
Bever/Beall Sewer Separation	Arcadis	\$29,100.00	Elite Excavating	\$786,000.00	\$696,400.00	\$712,290.24		
W. Liberty Storm Sewer	Engineering Associates	\$23,000.00	Newcomer	\$350,000.00	\$321,051.00	\$321,051.00		
Milltown Road East	Shaffer, Johnston	\$170,000.00	Stout Exc.	\$1,444,000.00	\$1,474,906.47	\$1,541,262.46	\$557,653.00	100%
North Street Bridge Repl.	Engineering Associates	\$65,000.00	V.O. Menez	\$441,000.00	\$511,894.11	\$612,246.72		
North/Walnut/Grant Storm Sewer	GGJ	\$20,075.00	Wenger	\$320,000.00	\$348,509.80	\$379,476.00	\$31,648.00	100%
Bever/Quinby Sidewalk	Wooster Engineering Div.	\$0.00	Smith Paving	\$29,000.00	\$19,779.20	\$18,894.00		
Grant/Walnut/Clark W/L & Sewer	Wooster Engineering Div.	\$0.00	Stout Exc.	\$680,000.00	\$566,195.40	UC	\$566,195.40	0%
Interceptor Wells I-6 & I-7	Malcolm Pirnie	\$12,910.00	Reynolds	\$560,000.00	\$617,066.00	\$616,373.76	\$30,578.64	100%
Cleveland Road Lift Station	Engineering Associates	\$18,000.00	G.E. Baker	\$250,000.00	\$235,892.40	UC	\$235,892.40	0%
Christmas Run Blvd. W/L Replace	Wooster Engineering Div.	\$0.00	Underground Utilities	\$935,000.00	\$643,198.40	\$778,527.00	\$34,522.78	100%
E. Liberty W/L	Wooster Engineering Div.	\$0.00	Underground Utilities	\$197,000.00	\$153,340.00	\$163,284.00	\$20,648.62	100%
Water Treatment Plant Demo	CTI Environmental Inc.		B&B Wrecking	\$600,000.00	\$288,000.00	\$298,472.00		
Lime Sludge Lagoon Closure	CTI Environmental Inc.	\$22,930.00	Mark Haynes Const.	\$1,600,000.00	\$1,191,000.00	\$1,634,336.00	\$175,764.00	100%
Subtotals		\$481,515.00	4.74%	\$12,035,110.00	\$10,155,522.28			
Campbell W/L Imp.s	Wooster Engineering Div.	\$0.00	N/A	\$75,000.00	N/A	DC		
Clark W/L Imp.s	Wooster Engineering Div.	\$0.00	N/A	\$30,500.00	N/A	DC		
St. Rt. 83 Resurfacing	ODOT	\$0.00	N/A	\$512,000.00	N/A	DC		
Subtotals		\$620,430.00		\$617,500.00				
Inter. Zn. Water Tk & Booster	Wooster Engineering Div.	\$0.00	N/A	\$1,800,000.00	N/A	UD		
Mechanicsburg Rd. SS	Wooster Engineering Div.	\$0.00	N/A	\$200,000.00	N/A	UD		
WTP CL2 Storage	Wooster Engineering Div.	\$0.00	N/A	\$30,000.00	N/A	UD		
Buckeye Booster Station	Arcadis	\$50,000.00	N/A	\$500,000.00	N/A	UD		
Mechanicsburg Booster Station	Arcadis	\$78,700.00	N/A	\$750,000.00	N/A	UD		
Beall Avenue Streetscape	Brandstetter, Carroll Inc.	\$645,000.00	N/A	\$10,046,750.00	N/A	UD		
Triway Lift Station	Wooster Engineering Div.	\$0.00	N/A	\$350,000.00	N/A	UD		
Point-of-View Lift Station	Wooster Engineering Div.	\$0.00	N/A	\$350,000.00	N/A	UD		
College Ave. Storm	Wooster Engineering Div.	\$0.00	N/A	\$450,000.00	N/A	UD		
Larwill St. Bridge Replacement	Engineering Associates, Inc.	76305	N/A	\$680,000.00	N/A	UD		
Highland Ave. Sidewalk	Wooster Engineering Div.	\$0.00	N/A	\$35,000.00	N/A	UD		
Subtotals		\$850,005.00		\$15,191,750.00				

UD = Under Design

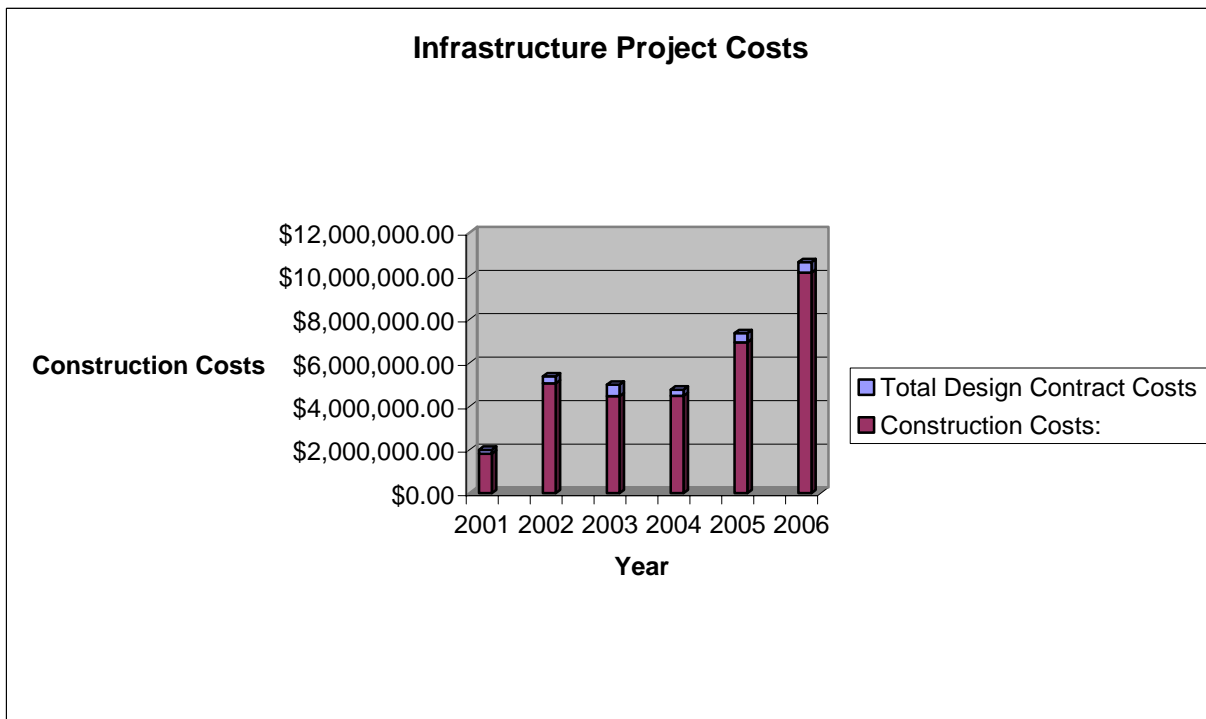
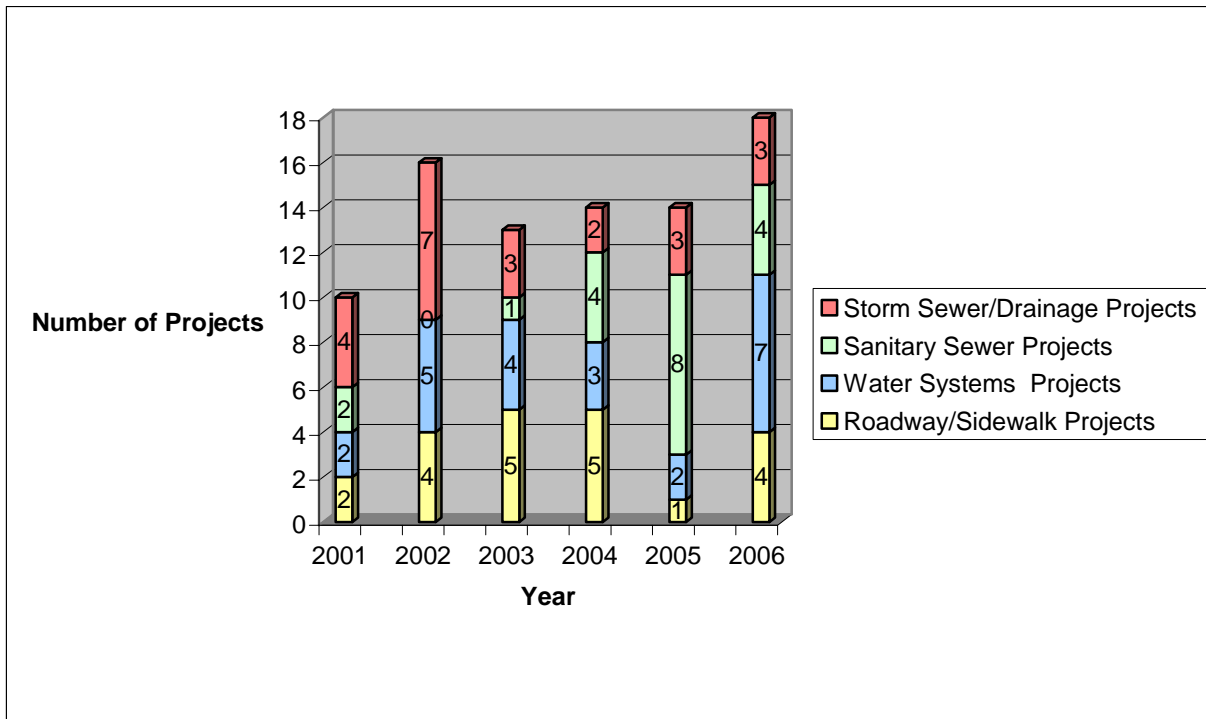
DC = Design Complete

UC = Under Construction Page 5.01

**Major Public Works
Projects**

Project Information	2001	2002	2003	2004	2005	2006
Roadway/Sidewalk Projects	2	4	5	5	1	4
Water Systems Projects	2	5	4	3	2	7
Sanitary Sewer Projects	2	0	1	4	8	4
Storm Sewer/Drainage Projects	4	7	3	2	3	3
Total Projects	10	16	13	14	14	18
Projects Designed In-House	5	5	4	3	7	8
Consultant Designed Projects	5	10	9	11	7	10
Total Design Contract Costs	\$172,500.00	\$319,008.00	\$528,700.00	\$291,700.00	\$424,100.00	\$481,515.00
Construction Costs:	\$1,826,000.00	\$5,059,426.00	\$4,471,061.89	\$4,480,225.77	\$6,950,852.87	\$10,155,522.00

1. Only projects with construction activity occurring in the designated year have been included.
2. Construction and Design costs represent the total contract amounts.



The City had \$10,155,522 of infrastructure projects in 2006 and associated design contracts of \$481,515. The Division of Engineering designed 8 of the 2006 projects resulting in a decrease in design costs of 1.4% for the year 2006, and an overall design cost of 4.7% of construction costs. Industry averages for design fees are 7% to 11% of construction costs. The reduced design costs are the result of performing design service with the Engineering Division staff.

The City of Wooster Saves Truckloads of Cash with Autodesk® Civil 3D® and IMAGINiT's Take AIM Implementation



The City of Wooster Lime Lagoon Project.

THE CUSTOMER

The City of Wooster, Ohio, named in honor of General David Wooster of the Revolutionary War, was awarded the Best Hometown for northeast Ohio by Ohio Magazine in the November 2006. The city is located just southwest of Cleveland with an estimated population of 27,000.

THE CHALLENGE

The City of Wooster had a more practical reason for implementing Autodesk® Civil 3D®. They were loading various combinations of Autodesk® Land Desktop, Autodesk Map®, Autodesk® Civil Design, and Autodesk® Survey for their users, and needed to establish consistency. "Autodesk Civil 3D combined the functionality we needed into one package, and allowed us to implement one uniform solution," stated Joel Montgomery, City Engineer.

DESIRED OUTCOME

The City realized that Autodesk Civil 3D would allow them to design projects faster and more efficiently. "With Civil 3D, setting up projects takes significantly less time and incorporating design changes is virtually instantaneous," added Joel.

THE SOLUTION

The City of Wooster made a clear decision to migrate to Civil 3D and adopt IMAGINiT's Take AIM (Assured Implementation Method), a proven, repeatable process. IMAGINiT's multi-phased implementation plan incorporated on-site training that was customized to fit their needs. "It was very beneficial having our projects integrated into the core curriculum, showing us features such as volume and surface analysis with familiar data and current scenarios," commented Joel. As a part of the Take AIM program, IMAGINiT went on-site and developed the initial setup of styles and templates. "By having IMAGINiT build the styles and templates, we were able to cut a lot of time out of our project development for future projects. We recommend Take AIM to others making the transition from the Land Desktop product suite to Civil 3D," noted Joel.

THE RESULTS

"One of biggest advantages and time savings for the City is the dynamic engineering model in Civil 3D. This feature allows us to evaluate multiple alternatives quickly, minimize manual edits and output updated plans automatically," noted Joel.

The City uses Civil 3D with all their projects, including those they started in Land Desktop. "After focusing on getting over the learning curve, we find Civil 3D much easier to use than Land Desktop. We made a clear decision to drop using Land Desktop and are pleased with the functionality and increased productivity we have experienced," concluded Joel.

One particular project with which the City saw an immediate ROI, was their Lime Lagoon Project. There was a large discrepancy between the data from the City and the contractor responsible for lime removal. The contractor was counting buckets and truck loads to measure volumes. "We verified the data at several times during the project, measuring before, during, and after the removal. With the volume calculation functionality of Civil 3D, we were able to double check the calculations from our contractor and reduce our project cost by \$100,000. In the end, there was no argument after referencing the real survey data and information we provided," concluded Joel.