CITY OF WOODBURN

2005 PUBLIC FACILITIES PLAN

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City of Woodburn

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PUBLIC FACILITIES PLAN

INTRODUCTION

The Public Facilities Plan (PFP) identifies major infrastructure projects necessary to serve the Year 2020 projected population of 34, 919,[1] and examines the effect upon utility and transportation infrastructure resulting from 2005 expansion of the Urban Growth Boundary (UGB) of the City of Woodburn. As required by state statute, four elements have been studied: Domestic Water, Sanitary Sewer, Storm Drainage, and Transportation. Information for projects within the pre-2005 UGB was derived from existing Facilities Plans, updating where necessary.

In order to assess relative service costs and efficiency for alternative UGB expansion areas, the City's initial effort involved characterization of improvements and extensions that would be necessary to serve eight Study Areas surrounding the existing (pre-2005) UGB. These investigations were conceptual and the data used in comparisons between the Study Areas were preliminary in nature. The results of the initial work are contained in Appendix C.

A more comprehensive analysis was performed on four expansion areas recommended by the Planning Commission, identified as the North, South, Southwest, and West Expansion Areas. Tables summarizing project timing and costs for each area have been included in the body of the Public Facilities Plan. Maps showing the locations of infrastructure elements (Water, Sanitary Sewer, and Storm Drainage) for Southwest and North Areas (areas with high value farmland) are included in Appendix B. Transportation projects and maps were derived from the Woodburn Transportation Systems Plan (TSP), which also was updated in 2005.

Service Area Characteristics

Woodburn is located in Oregon's Willamette Valley approximately 17 miles north of Salem and 30 miles south of Portland in the Pudding River basin. The topography of the service area slopes slightly to the northeast. The area is relatively flat with an elevation differential of only 50 feet, ranging 150 to 200 feet above sea level.

The main drainage through the City is Mill Creek, which drains to the Pudding River. Senecal Creek drains a small portion of the City's UGB area west of I-5. A very small portion of the east part of the city (east of highway 99E) naturally drains directly to the pudding river.

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[1] In an exercise of caution, Woodburn's facility master plans are designed to serve somewhat higher population growth than adopted in the 2005 Woodburn Comprehensive Plan. The City has incorporated a margin of error: if actual population growth exceeds the coordinated population projection of 34,919 before 2020, the City will be able to accommodate this increased growth without further amendment to projects identified in facility master plans.

The climate is mild with wet winters and dry summers. Rainfall averages about 41 inches per year and one year in ten will exceed 51 inches. The wettest months are usually November, December and January with almost 20 inches of rainfall occurring during that time.

The soils in the area are of two associations, Amity silt loam and Woodburn silt loam. Both of these formations are found throughout the city in all areas except drainage channels. The Amity series consists of poorly drained soils formed in mixed alluvial silts. The layer is general 17 inches thick overlaying a 7-inch silt loam subsurface layer and a 13-inch silty clay loam subsoil. The Woodburn series consists of moderately well drained soils formed in silty alluvium and loess. The 17-inch surface layer overlays 37 inches of subsoil and a silt loam substratum to a depth of 68 inches. The course of Mill Creek is etched in Bashaw clay and Dayton soils and terrace escarpment are also found in the service area.

The geology of the area consists of Troutdale formation materials and Willamette silts overlaying Columbia River basalt. Depth to basalt is unknown but thought to be approximately 600 feet. The Troutdale formation consists of alternate layers of clay, silt, sand and gravel. The Willamette silt formation consists of stratified silt, sandy silt, clayey silt and silty clay and has poor drainage characteristics. The City is located in a Seismic Zone 3.

Two major highways traverse the City; Interstate 5 along the west side of the City and 99E along the east side of the City. Both routes run generally north-south through Woodburn. Oregon highway 214 is an east-west route through the City Highway 211 connects Woodburn to Molalla.

Woodburn is bisected by the Union Pacific Railroad main line. The railroad extends north-south through Woodburn and parallels Front Street through the City. Willamette Valley Railroad uses spur tracks that parallel Front Street and line that proceeds east from Front Street along Cleveland Street.

WATER PLAN

HDR Engineering, Inc. prepared a water master plan for the City of Woodburn. It was first prepared in 1997 and updated in 2001. The 2001 update provides a 20-year plan for the water system through the year 2020. The plan was based on a projected permanent population potential of 38,586, which exceeds the coordinated Year 2020 populatoin projection of 34,919. The City has 5,380 single family, multi-family, commercial, industrial, and public connections. The current service area of the water system is inside the City limits, although the service area will expand as annexations to the City occur.

The Water Master Plan assumed that all growth would occur within the current UGB (4050 acres). The PFP identifies additional projects necessary to serve the expanded UGB. Some projects identified during preparation of the Water Master Plan have been listed and entered into the Capital Improvement Plan (CIP). The CIP is a six-year plan

that focuses on improvements with in the existing City Limits. As land is annexed to the City, the CIP will be amended to incorporate and set priorities among additional projects. For example, the City anticipates that industrial land will be annexed to the City *in the short term*. Although most improvements necessary to serve expansion areas will be paid for by the developer, the CIP will be amended on an annual basis to include sanitary, sewer, water, storm drainage and transportation projects necessary to serve recently annexed areas.

Projected Population

When the Water plan was prepared, it was based on a projected year 2020 permanent population of 38,586. Also considered in the water plan were 4,099 projected seasonal workers.

Water Source

Water Rights

The City of Woodburn obtains water entirely from groundwater. Woodburn has existing water rights within its certified service area of up to 13.25 mgd (20.45 cfs). Table 1 shows a water rights summary from the Water Master Plan.

Table 1
City of Woodburn
Water Rights Summary
Certificates of Water Rights (Supply)

WRD Designation	Amount (GPM)	Well Name	Well No.
Permit No. G-10931	1000	Centennial	Well 10
Permit No. G-11921	1400	Donner	Well 9
Permit No. G-11922	2100	Nazarene	Well 7
Permit No G-12029	600	Astor Way	Well 11
Cert. No. 36537	500	Senior Estate	
Cert. No. 36538	750	King Way	Well A
Cert. No. 56379	750	Legion Park	Well 8
Regis. GR 2267	750	Shop No. 1	Well 1
Regis. GR 2268	300	Shop No. 2	Well 2
Regis. GR 2269	500	Library	Well 3
Regis. GR 2270	500	Settlemier	Well 4
Regis. GR 3815	300	Old SPRR	Well 5
TOTAL	9,200 gpm (13.25 mgd)		

The Water Master Plan found that Woodburn has sufficient water rights to meet the projected water demands through the year 2020.

Wells

The City's seven active wells tap the Troutdale aquifer, a large semi-confined aquifer. It is anticipated that the City will continue to utilize this aquifer as the sole source of water. Active wells are listed in Table 2.

Table 2 City of Woodburn Existing Wells			
No.	**Description**	**Capacity**	**Function**
3	Library	500 gpm Depth = 198'	Provides water to the central part of Woodburn
4	Settlemier Well located at the intersection of West Hayes St. and Settlemier Avenue. Drilled in 1952	600 gpm Depth = 183'	Provides water to the central part of Woodburn
7	Nazarene Well located on Woodland Avenue. Drilled in 1967	1,000 gpm Depth = 333'	Provides water to the northwest part of Woodburn
8	Legion Park Well located on Alexandra Avenue. Drilled in 1974	868 gpm Depth = 194'	Provides water to the southern area of Woodburn
9	Warren Donner Well located on Country Club Road	1,000 gpm Depth = 280'	Provides water to the north central area of Woodburn
10	Centennial Well located 2205 National Way. Drilled in 1988	1,000 gpm Depth + 279'	Provides water to the north central area of Woodburn
11	Astor Way located at 1200 Astor Way. Drilled in 1989	1000 gpm Depth = 288'	Provides water to the north central area of Woodburn

The 2001 Water Master Plan found that the City needed to install six new wells in the west and southwest area of the City to increase the total well capacity to approximately 12 mgd. To stay ahead of growth in water demands these wells were programmed to be installed at an approximate rate of one well every five years. The proposed well projects from the Master Plan are listed in Table 3 as follows (estimated in year 2000 dollars):

Table 3 Woodburn Water Master Plan Proposed Well Projects		
Project Description	**Year of Improvement**	**Estimated Costs (2000 Dollars)**
Drill 2 wells at South Woodburn site	2002	$680,000
Drill 2 wells at S. Woodburn site	2015	$425,000
Drill 2 wells at West Woodburn site	2022	$335,000
	Totals (2000 Dollars)	$1,440,000

Following the recommendations of the Water Master Plan, Woodburn developed two new wells in 2003 at south Woodburn sites as follows:

- Well 12 at 828 Parr Road
- Well 13 at 515 Settlemier Avenue

During the facility planning process for the water treatment facilities it was determined that the cost of connection of well 8 to the National Way Treatment Plant

were excessive and there were further concerns regarding the construction and future water production capability of Well 8. The decision was made to construct a new well in the northern area of the City that would allow simplified transmission line connection and be constructed in a manner to provide for a more reliable long term water source. Subsequently Well 14 was constructed at 3015 National Way and a raw water transmission line connects this well to the National Way Treatment Plant. The locations of the treatment facilities within the system are shown on Figure 10-11.

Source Water Protection Plan

Oregon Department of Human Services and Department of Environmental Quality have developed a Source Water Protection Plan for the City. The plan inventories potential sources of contamination, establishes best management practices for industries within the influence zone of the City's wells, allows the City to develop ordinances to provide protection of the aquifer, and maps the flow patterns of the aquifers. The Troutdale aquifer, from which the City's wells obtain the City's drinking water supply is not a critical or restrictively classified groundwater area. The City does not at this time plan to request certification of the delineations in the Source Water Protection Plan for Statewide Planning Goal 5 purposes.

Water Demand

Existing Demand

Table 4 contains information from 1992 to 1995 from metering records of the average daily water demand (ADD) and the maximum daily water demand (MDD).

Table 4
Woodburn Yearly Water Demand [1]

	Average Daily Demand	Maximum Daily Demand[2]	
Year	MGD	MGD	Month in which MDD Occurred
1992	1.89	4.36	June
1993	1.73	3.88	August
1994	1.91	4.45	July
1995	1.88	4.57	July
1996	1.88	4.21	July
1997	1.89	4.26	August
1998	2.01	4.41	July
1999	2.13	4.46	July
2000	2.18	5.30	August
2001	2.19	4.27	July
2002	2.31	4.86	August
2003	2.28	5.25	July
2004	2.38	5.43	July

[1] Based on metering records
[2] Based on ratio of MDD/ADD from pumping records

The following table shows the total water demand by land use category, the total number of connections (in 1996) by land use category, the water demand by each

connection by land use category and the percent of total water demand by land use category.

Table 5 Woodburn Existing Water Demand Per Demand Category				
Demand Category	**Total Demand (gpd)**	**No. of Connections (1)**	**Unit demand (2) (gpd/connection)**	**Percent of Total Demand (%)**
Single Family Residential	1,098,000	4,176	266	62.00
Multi-Family Residential	310,400	127	2,440	17.00
Commercial	315,800	386	820	18.00
Industrial	520	3	173	0.03
City Owned	38,300	56	697	2.00
Fire Service	1,300	53	26	0.07
Other (Flushing)*	13,800			0. 90
TOTAL	1,778,000	4,800		100.00

(1) As of April 1996
(2) Based on number of connections in June 1995 and demand from June 1994
(3) gpd = gallon per day

* Does not include "Unaccounted for" water.

Single-family residences used approximately 266 gpd per connection. Multiple family residential uses have from 2 to 192 dwelling units per connection, with a median of 12. Records show that the water demand per multi-family connection is higher than for single-family uses. The 2001 Water Master Plan estimated that water demand per capita was 97 gallons per capita.

As the table indicates, about 80 percent of the total water demand is from residential uses. Commercial uses account for 18 percent, city connections for 2 percent and less than one percent comes from industrial uses and fire service.

All water systems have a certain amount of water that is produced by the system that cannot be accounted for by billing records. This is termed "unaccounted-for water" and it results from un-metered demands, meter inaccuracies, leakage, hydrant and line flushing and testing, and authorized or unauthorized hydrant use. Typical water systems, nationwide, average from 5 to 10 percent unaccounted-for water.

Woodburn conducts annual audits of pumping and water consumption records. Data from 1986 through 2004 were summarized in Table 6 as follows:

Table 6 Woodburn Unaccounted For Water		
	Unaccounted for Water	
Year	**MG**	**Percent**
1986 – 87	31.0	5
1987 - 88	30.9	5
1988 - 89	50.1	8
1989 - 90	67.0	11
1990 - 91	50.4	8

1991 - 92	86.3	11
1992 - 93	64.4	10
1993 - 94	55.3	8
1994 - 95	56.6	9
1995-96	48.1	7
1996-97	41.2	6
1997-98	55.2	8
1998-99	58.7	8
1999-00	46.6	6
2000-01	71.8	9
2001-02	50.1	6
2002-03	58.9	7
2003-04	43.5	5
Average	**54.7**	**8**

The unaccounted-for water in Woodburn ranges from 5 to 11 percent of production with a median and average of 8 percent. Woodburn gives leaking pipelines priority for replacement in its distribution system maintenance budget.

Projected Year 2020 Demand

The 2001 Water Master Plan was based on moderate measures to conserve water, that the plan expects to reduce demand between 5 and 8 percent, including the following:

- Leak detection and water line repair and upgrading.
- Annual water audit to calculate the amount of unaccounted-for water.
- Metering of all service connections.
- A public education program using bill inserts to publicize the need for water conservation.
- Technical assistance measures including a bill showing the consumption history and customer assistance for questions related to water conservation.
- Promotion of conservation for nurseries and park department facilities and low water demand landscaping in all retail customer classes.
- Increasing Block Structure for water rates.

The Water Master Plan estimated that by the year 2020 average day demands (ADD) may increase to 4.47 million gallons per day and maximum day demand (MDD) may increase to 10.28 million gallons per day.

Table 7
Water Demand Projections

	No Conservation Impact		Moderate Conservation Impact	
Year	**ADD (mgd)**	**MDD (mgd)**	**ADD (mgd)**	**MDD (mgd)**
2010	2.96	6.81	2.73	6.28
2015	3.51	8.07	3.23	7.43
2020	4.14	9.52	3.82	8.79
2025	4.70	10.82	4.36	10.02
2030	5.25	12.08	4.86	11.18
2035	5.74	13.20	5.32	12.23
2040	6.17	14.19	5.71	13.14

Table 8 Water Production Capability Projections				
	No Conservation Impact		Moderate Conservation Impact	
Year	ADD (mgd)	MDD (mgd)	ADD (mgd)	MDD (mgd)
2010	3.20	7.35	2.95	6.78
2015	3.79	8.72	3.49	8.03
2020	4.47	10.28	4.130	9.50
2025	5.08	11.68	4.70	10.82
2030	5.67	13.05	5.25	12.08
2035	6.20	14.26	5.74	13.20
2040	6.66	15.32	6.17	14.19

Treatment

Historically, the City of Woodburn provided no water treatment or disinfection because the quality of water derived from city wells has proven not to require disinfection and neither state nor federal water regulations require treatment or disinfection for wells. Increasing concerns with the odor, taste and staining problems generated by iron and manganese in the groundwater, a potential decrease in the federal arsenic standard and potential regulation of radon led the City to update its master plan and develop a treatment plan for the City's water supply. Woodburn complies with the parts of the Safe Drinking Act that are currently in force and apply to the City.

Iron and manganese levels in the City's water source have caused numerous complaints about the aesthetic quality of the water. To eliminate the iron and manganese problems, the Water Master Plan recommended that the City construct neighborhood treatment plants.

Table 9 Woodburn Water Master Plan Treatment System Summary of budgetary Cost Estimates		
Treatment Component	**Year of Improvement**	**Estimated Costs (2000 Dollars)**
Raw Water Transmission Pipelines	2003	$1,079,000
Raw Water Transmission Pipelines	2015	$413,000
Raw Water Transmission Pipelines	2022	$195,000
Reservoir Improvements	2004	$4,127,000
Drill 2 Wells at S. Woodburn Site	2002	$680,000
Drill 2 Wells at S. Woodburn site	2015	$425,000
Drill 2 Wells at W. Woodburn Site	2022	$335,000
Construct three 2.7 MGD Treatment Plants	2005	$10,288,000
S. Woodburn Treatment Plant Expansion	2015	$1,500,000
Construct W. Woodburn Treatment Plant	2022	$1,720,000

	Totals (2000 Dollars)	$20,762,000

The City is nearing completion of three neighborhood treatment plants as recommended in the Water Master Plan. The three treatment plants are located at well sites on National Way, Country Club Road and Parr Road. These treatment facilities treat water from wells at their sites and water transmitted from nearby wells through raw water transmission lines constructed when the treatment plants were constructed in 2003-2004. The locations of the treatment facilities are shown on Figure 10-11.

Storage

Water system storage is considered to be comprised of three elements: equalizing, fire flow and emergency. "Equalizing storage" provides water supply when customer demand exceeds the capacity of the wells and pumps to produce water flow. "Fire flow reserves" provides the volume of water needed to provide the demand for fire flow for a fire having a finite duration. "Emergency storage" supplies water when a portion of the water production system is out of commission. The same volume of storage can serve all three purposes. The Water Master Plan projects that in the year 2020 these storage requirements will be as follows:

- Emergency standby 1,400,000 Gal
- Fire Flow Reserves 1,500,000 Gal
- Equalizing Storage 2,230,000 Gal

The City has an elevated reservoir located near Broadway and Front Street. It is 130-feet high, was built in 1965 and has a capacity of 750,000 gallons. This reservoir is in good condition and is planned to continue in service without substantial repair during the planning period. An older, smaller tank located next to this tank is scheduled for demolition.

In normal operating conditions, pressure within the water system is established by the elevated reservoirs. When demand in the system draws down the reservoir level, pumps at the wells are turned on to pump into the system and to replenish the reservoir supply. If the level in the reservoir continues to drop after the first well pump has turned on, more pumps receive signals to turn on and pump into the system until the tank water level reaches pre-determined shutoff level.

When the treatment plant becomes operational the pressure within the water system will be established by the larger elevated reservoir. Backup pressure, which had been from the smaller elevated reservoir, will now be established from booster pumps at each of the treatment plant sites and pressure sensors located at various locations in the City. The booster plant pumps will operate to maintain water levels in the elevated reservoir and to supply demands placed upon the system by users. If the elevated reservoir is out of service for maintenance or other reasons the treatment plant booster pumps and pressure sensor system will maintain desired system pressure.

The 2001 Water Master Plan found that there was a significant deficiency in water storage capacity. The existing storage was sufficient to equalize demand within the

system and to provide minimal fire flow reserves, but does not provide emergency standby storage nor to satisfy ISO fire flow standards. The plan recommends the City construction 4.4 million gallons of new storage capacity, to increase the total storage volume to 5.15 million gallons, comprised of 2.25 million gallons equalizing and 2.9 million gallons of emergency-standby/fire flow reserve storage. The plan recommends that the storage be provided in two reservoirs, each providing 2.2 million gallons and that the reservoirs be located at the proposed treatment plant sites. These reservoirs were recommended to be grade-level facilities.

In the design review process for treatment facility construction the decision was made to place reservoirs at all three treatment plant locations. The decision was made to allow the reservoirs to reduce levels of radon in the City groundwater supply. Although not finalized, the proposed federal limit on radon in drinking water is exceeded in some city wells. The City decided to place radon reduction systems in reservoirs. To fully treat all water supplies for radon required a reservoir at each treatment site. Reservoirs sizes were 2.7 million gallons at Parr Road, 0.3 million gallons at Country Club Road and 1.7 million gallons at National Way. With the 0.75 million gallons at the existing reservoir the City has a total of 5.45 million gallons which exceeds the projected 2020 master plan requirement of 5.13 million gallons of storage. The location of these reservoirs is shown on Figure 10-11.

Grade level storage utilizes pumps to move water into the distribution system and work with the elevated storage reservoir to maintain water pressure. The pumps need to be large enough to satisfy anticipated peak demand flow rates. They also need to have an automated auxiliary power supply to assure water is available during power failure. All three of the treatment plants have emergency generators capable of plant operation as well as operation of the wells located at each of the treatment plant sites. The City has portable generators that can used to provide emergency power to other wells.

In 2003-2005 the City is constructing a new storage facility at each of the three new treatment plants. The locations of the storage facilities within the system are shown on Figure 10-11.

Water Distribution System

There is approximately 66 miles of transmission and distribution piping ranging from 1-inch to 18-inches in diameter. Approximately four miles are piping with sizes of 4-inches or less. Substandard pipe of 1-inch and 2-inch diameter is being routinely replaced. The majority of the pipe within the service area is 6-inch or 8-inch diameter service piping. (The City is not required to address these segments of the distribution system in the public facilities plan).

A summary of the quantity of pipe by diameter is illustrated in Table 10 as follows:

Table 10 Summary of Woodburn 2004 Water System Pipe Inventory	
Pipe Size	**Total Length of Pipe (feet)**
4"	14,034
6"	153,201
8"	188,483
10"	17,670
12"	65,958
14"	8,419
16"	1,425
18"	2,336

The majority of the pipe in the system is ductile or cast iron. There is a significant amount of asbestos-cement pipe in the Senior Estates area. This asbestos-cement pipe has not caused any water quality problems. The City routinely repairs and replaces older leaking or undersized pipes as part of an annual maintenance program. These pipe repairs and replacements are performed by water division personnel or through contracts listed in the City's capital improvement program.

Pressure within the distribution system is generally between 50 and 60 psi. The water master plan did not identify significant pressure deficiencies during maximum day flows. When water is pumped from the distribution system to fight a fire, water pressure within the system can be reduced. State administrative rules require the system maintain a minimum pressure of 20 psi. Pumping systems installed as a part of the water treatment project (at each of three treatment plants) will allow this requirement to be met during a fire event.

The City requires the maximum day demand plus fire flow for a proposed development to be calculated. Demand must not exceed available supply. Calculated available fire flow is compared to the standards in Table 11, which include the Insurance Services Office standards for fire flow.

Table 11 Fire Flow Demands by Zoning Classification (All flows are calculated on the Maximum Day)		
Zoning Classification	Minimum Required Fire Flow (gpm)	Duration (Hours)
Residential (<12 units/acre)	1,000	2
Residential (>12 units/acre)	3,000	3
Commercial	3,000	4
Public Use	4,000	4
Industrial	5,000	5

If the available fire flow is less than the required value, the developer may be required to either modify the proposed method of construction to reduce the required fire flow or make system improvements to increase the available fire flow in the water system to the development.

The 2001 Water Master Plan recommended replacing inadequate segments of the water distribution system before emergency situations occur or before capacity problems arise. The City will annually fund an ongoing substandard main replacement program. The Water Master Plan established priorities for replacing pipes as follows:

- Pipes in areas of related frequent customer complaints.
- Leaking pipes.
- Pipes identified by either maintenance or operations as problem pipes.
- Pipes four inches or less in diameter, and in areas that have the potential for growth.
- Undersized transmission mains.
- Aged Asbestos cement pipe.
- Aged steel or cast iron pipe.
- Lead joint pipes

As areas within the UGB develop, the City will require developers to extend the transmission mains into these areas and make any improvements necessary to the distribution system. Although the 2001 Water Master Plan did not include project costs for distribution improvements in areas to be developed in the future, Table 13 describes water system improvements, costs and timing necessary to serve the expanded Woodburn UGB. As areas annex to the City and develop, the City will determine the exact configuration of the transmission pipe system.

Telemetry and Controls

The existing pumping system has an antiquated control system based on mercury switch technology. The treatment plants will utilize a modern Supervisory Control and Data Acquisition (SCADA) system. The SCADA system will automate operation of each individual facility, enable monitoring and control from a central location and provide reliable communication between sites. The SCADA system will optimize water production and control and alarm notification. An operations center at the water division shop will be the central base for the computer SCADA system. Existing water wells will be incorporated into the SCADA system. Communication between sites and the operations center will be through a radio telemetry system.

Short Term Water Projects

Table 12 shows the water distribution system projects in the Capital Improvement Program for the next six years. Note that:

1.) CIP projects occur within the existing (2005) utility service area. Utility service areas are coincident with City Limits.
2.) Service areas change as annexations occur, because the City must demonstrate that adequate services are available to serve potential annexation.
3.) Projects typically are added to the CIP when land is annexed to the City. Thus projects not identified on the CIP are possible within the short-term (next five years).

4.) Projects not listed on CIP may be developer-sponsored, grant-funded, or financed by other means, as City may approve.
5.) See Table 13 for projects required to serve land within the expanded Urban Growth Boundary.

Table 12
Planned Water Improvement Projects
Woodburn Capital Improvements Program
Fiscal Years 2003 – 2009

Project Number	Project	2003-04	2004-05	2005-06	2006-07	2006-08	2008-09
1	Hwy 214 widening			$44,000			
2	Laurel Avenue (replace line)		$46,000				
3	Hwy 99E: Tomlin to Laurel		$22,000				
4	Hwy 99E: Laurel to Aztec		$16,500				
5	99 E at Silverton Road (bore)				$110,000		
6	N First Street/N. Second (loop)			$18, 700			
7	N. Fifth Street (replace line)		$44,000				
8	Hwy 214 A Mill creek						
A	Bore	$55,000					
B	Loop line installation	$132,000					
9	Hwy 99E: Blaine to Aztec			$44, 000			
10	Hwy 99 E: Blaine to Lincoln			$66, 000			
11	Ogle/Parr/S. Boones Ferry			$96, 000			
12	McKinley St. Line Capacity Imp.	$22,000					
13	Lincoln to Hardcastle (loop)				$132,000		
14	99 E South (New Line)				$132,000		
15	Silverton Road (Loop)				$44,000		
16	Water System Rehabilitation						
17	Water Treatment	$9 million	$6.8 million	$1mi llion			
18	Hwy 214/99E Loop Line					$100,000	
19	Hazelnut Dr. -n Replace Bridge Line					$55,000	
20	Brown street - Line Rehab (materials only)	$27,500					
21	Parr Road to Evergreen Loop						
22	Woodburn Village Line Replacement		$61,600				

Funding

The City allocates its water budget into five funds: Water fund, Water Well Construction Fund, Water Equipment Replacement Reserve Fund, and the Water System Development Trust Fund. The available sources of revenues come from water user fees, service fees, interest revenues, system development charges and miscellaneous revenues.

The City last completed a rate study in 1999. The purpose of the study was to determine the rates and system development charges that would be necessary to fund needed capital improvements and to ensure the ongoing fiscal health of the water system. The study also ensured that required increases were equitable in terms of what each class of user pays. The rates and charges determined were to provide revenue for capital improvements and for operation of the water supply, treatment and distribution system.

Water rates were determined utilizing a cost-of-service or functional allocation of costs. The intent of this allocation is to recover revenue from classes of customers according to the demands that they place on the system. Customer classifications included single family residential, multi-family residential, commercial, industrial and fire service in recognition of the different demands placed by each of the classifications. Single family residential, the largest water user, includes a fixed rate meter charge and a three tier increasing block volume rate. The volume block rate increased at quantities equal to average winter and summer water use. Other classifications of users were charged a fixed meter charge and a single volume rate.

Service fees are evaluated annually and are based primarily on the cost to provide the service. The system development charge is the sum of a calculated reimbursement fee and improvement fee. The reimbursement fee recovers costs associated with capital improvements already constructed or under construction. The improvement fee recovers costs associated with capital improvements to be constructed in the future. The basis for the fee is peak daily water demand.

Table 13 on the following page identifies short- and intermediate-term projects necessary to serve 2005 UGB expansion areas.

Table 13
Project List - Water Plan

Minor distribution lines within expansion areas are not included
Refer to Maps for generalized locations of Trunk Lines

0-5 Year Projects

Expansion Area	Location	Description	LF	Unit $	Estimated Cost	Funding
Southwest Industrial						
	Looped Line - NW of I-5 to SE of I-5	12-inch Water Main	12,500	75	$937,500	SDC/Developer /CIP
	Woodburn Town Center	12-inch Water Main (Offsite)	8,200	75	$615,000	Developer
	Parr Road and Other	12-inch Water Main	9,700	75	$727,500	SDC/Developer /CIP
North Area						
	East of Boone Ferry	12-inch Water Main	8,900	75	$667,500	SDC/Developer /CIP

6-15 Year Projects

Southwest Industrial						
	Looped Line	12-inch Water Main	5,900	75	$442,500	SDC/Developer /CIP
Western Exception Area						
	Arney Rd to Butteville Rd.	12-inch Water Main	4,500	75	$337,500	SDC/Developer /CIP
	Butteville Road to POC on Hwy 214 West of Willow Lane	12-inch Water Main	4,800	75	$360,000	SDC/Developer /CIP
North Area						
	South of Crosby	12-inch Water Main	8,950	75	$671,250	SDC/Developer /CIP
South Area						
	Looped (99E to Settlemier)	12-inch Water Main	10,800	75	$810,000	SDC/Developer /CIP

SANITARY SEWER PLAN

In November 1993, the City of Woodburn was notified by the U.S. Environmental Protection Agency (EPA) and the Oregon Department of Environmental Quality (DEQ) to develop a plan to meet the more stringent Publicly Owned Treatment Works (POTW) effluent limits developed for the Pudding River. The volume of water in the Pudding River, during the summer months (July and August), is so low the river cannot dilute the treatment plant effluent sufficiently. Low flows result in oxygen levels, needed by certain aquatic life, to be below acceptable limits. The inability to maintain sufficient oxygen levels is the main reason the Pudding River has been classified as a water-quality-limited stream. Total maximum daily loads were established for the Pudding River and waste load allocations set for the Woodburn POTW.

In response to DEQ notification, the City prepared and adopted the 1995 Wastewater Facilities Plan for its wastewater treatment and collection system. This plan is designed to guide operations and improvements to the City's treatment system through the year 2020. In addition to providing upgrade guidelines for the existing system, to meet regulatory requirements, the facilities plan provides for increasing the system's capacity to accommodate planned residential, commercial and industrial growth.

Additional efficiency is built into the plan by providing for phased construction of the improvements. The estimated cost of treatment facilities is divided into two phases. Phase 1 estimated costs (in 1998 dollars) are $38.3 million; Phase 2 estimated costs (in 1998 dollars) are $11.9 million. The plan will enable the City to look ahead to long-term needs through the year 2020, while implementing the improvements only as they are needed.

The1995 Wastewater Facilities Plan was designed to 43,672 persons, and thus can readily accommodate the coordinated Year 2020 population project approved by Marion County (34,919). This projection was based on an average annual growth rate of 2.8%, whereas the Wastewater Facilities Plan utilized a growth rate of 3.4 percent. Based on this information, the existing Wastewater Facilities Plan will provide sufficient capacity for the 2005 UGB amendments and projected population growth through 2020. Table 13 identifies projects to serve the UGB as expanded in 2005. In fact, the master plan study area encompassed the area within the pre-2005 Woodburn UGB and potential UGB expansion areas that are now included within the 2005 UGB. Areas outside the UGB were also included in the study for public health reasons. The potential also existed that other uses, such as trailer parks, outside the UGB could be served in the interest of public health.

On December 28, 2004, the U.S. Environmental Quality Protection Agency (EPA) and Oregon Department of Environmental Quality (DEQ) issued the City a National Pollutant Discharge Elimination System (NPDES) Permit. The compliance schedule with this permit requires the City to develop a plan and construct facilities for meeting the more stringent POTW effluent limits developed for the Pudding River. The treatment plant's wastewater effluent temperature/winter ammonia discharge is higher than can be directly discharged to the Pudding River during parts of the year. Increased river

temperatures/winter ammonia levels have an adverse affect upon aquatic life. DEQ has established temporary temperature and winter ammonia limits until the establishment of total maximum daily loads for the Pudding River and waste load allocations are set for the Woodburn POTW. In response to the NPDES compliance schedule, the City will prepare a Wastewater Facilities Plan update for its wastewater treatment plant and collection system.

Treatment

Phase 1 of planned improvements to the wastewater treatment facility was completed in 2003. A diagram showing the physical layout of the treatment facility is shown in Figure 7-2 of the Wastewater Facilities Plan. Detailed descriptions and maps of the existing and proposed system also are included in the Wastewater Facilities Plan.

The hydraulic design capacity of the treatment plant is 3.3 mgd average dry weather flow, and 16 mgd peak hourly flow. The average total biochemical oxygen demand (BOD5) capacity is 6,500 lb/day BOD5. Currently, the plant has an average daily dry weather flow of 2.10 mgd, with average for the peak month being 2.9 mgd, and a wet weather peak hourly flow of 13 mgd. The plant average daily load of BOD5 is 4,500 lb/day and a maximum daily load of 10,575 lb/day.

No major improvements to the facility have been necessary since Phase 1 construction. Phase 2 improvements will be constructed when Phase 1 facilities near capacity which is anticipated to occur by 2008. As discussed above, Phase 1 and 2 improvements provide sufficient capacity for the 2005 urban growth boundary amendments and projected population growth through 2020.

Primary Collection System

The wastewater collection system conveys wastewater from residential, commercial and industrial facilities to the treatment facility. A diagram showing the layout of the existing sewer trunk and interceptor lines and pump stations is shown in Figure 2 of the Wastewater Facilities Plan. Figure 3 shows the pre-2005 sewerage service area. The Woodburn sanitary sewerage collection system is composed of approximately 14.4 miles of trunk and interceptor line and 10 pump stations. Figure 1 shows the sewerage service area analyzed in the Wastewater Facilities Plan and shows areas considered for service expansion outside of the current UGB.

To supplement the 1995 Wastewater Facilities Plan, the Woodburn Public Works Department analyzed of the ability of the City to provide wastewater facilities to 2005 UGB expansion areas (ref. UGB Study Area Public Services Analysis, 2004). This study provides an analysis of the wastewater collection system improvements needed to serve UGB expansion areas and cost estimates of the improvements. In all cases, it was concluded that the existing wastewater collection system would have sufficient capacity to serve the proposed expansion areas and all proposed expansion areas could feasibly be serviced on a cost efficient basis.

The Wastewater Facilities Plan provides a description of potential needed improvements to the collection system. The results of the hydraulic analysis showed that the Mill Creek

Pump Station and Pump Station Numbers 1, 2, 3, and 9 might require capacity upgrades. (Since preparation of the Wastewater Facilities Plan, Pump Station 1 has been replaced. Construction of a replacement is currently nearing completion at Pump Station 9. In addition, the Front Street Interceptor through the downtown area to Lincoln Street and the trunkline along Highway 214 and Astor Way serving the northern portion of town will require improvement to increase capacity. Additional problems are not expected, but the problems listed above are expected to get worse. Further analysis of the condition of wastewater collection facilities is included in Volume II of the Wastewater Facilities Plan.

Table 1 below identifies sanitary sewer projects necessary to serve 2005 UGB expansion areas.

Table 1
Project List - Sanitary Sewer Plan

Minor collection lines within expansion areas are not included
Refer to Maps for generalized locations of Trunk Lines

0-5 Year Projects

Expansion Area	Location	Description	Quantity	Unit $	Estimated Cost	Funding
Southwest Industrial						
Cost Share (60%)	East of I-5	1200 LF 18-inch Line Upgrade	720	100	$72,000	SDC/Developer /CIP
	NW of I-5	18-inch Trunk	1,500	100	$150,000	SDC/Developer /CIP
	NW of I-5	12-inch Trunk	3,000	75	$225,000	SDC/Developer /CIP
	NW of I-5	10-inch Trunk	1,200	55	$66,000	SDC/Developer /CIP
	NW of I-5	8-inch	900	45	$40,500	SDC/Developer /CIP
	SE of I-5	18-inch Trunk	3,000	100	$300,000	SDC/Developer /CIP
	SE of I-5	12-inch Trunk	3,200	75	$240,000	SDC/Developer /CIP
	SE of I-5	8-inch	1,000	45	$45,000	SDC/Developer /CIP
	Woodburn Town Ctr.	24-inch	3,600	150	$540,000	SDC/Developer /CIP
	I-5 Pump Station	Minor Upgrade	1	50,000	$50,000	SDC/Developer /CIP
North Area						
	East of Boones Ferry	8-inch gravity trunk sewer	1,325	45	$59,625	SDC/Developer /CIP
	East of Boones Ferry	12-inch gravity trunk sewer	4,160	65	$270,400	SDC/Developer /CIP
	N. Trunk/Hazelnut	Listed on CIP			$210,000	Funded

6-15 Year Projects

Southwest Industrial						
	North of South Arterial	12-inch Trunk	3,200	75	$240,000	SDC/Developer /CIP
Western Exception Area						
Cost Share (40%)	East of I-5	1200 LF 18-inch Line Upgrade	480	100	$48,000	SDC/Developer /CIP
Cost Share (40%)	SW Industrial Area	3240 LF 12-inch Line Extension	1,296	75	$97,200	SDC/Developer /CIP
	Butteville Road	8-inch Gravity	2,800	45	$126,000	SDC/Developer /CIP
	I-5 Pump Station	Pump Station Upgrade	1	300,000	$300,000	SDC/Developer /CIP
	Butteville Road	8-inch gravity trunk sewer	3,000	45	$135,000	SDC/Developer /CIP
North Area						
	South of Crosby	8-inch gravity trunk sewer	4,110	45	$184,950	SDC/Developer /CIP
	South of Crosby	10-inch gravity trunk sewer	4,470	55	$245,850	SDC/Developer /CIP
South Area						
	West of Hwy 99E	8-inch gravity trunk sewer	1,800	45	$81,000	SDC/Developer /CIP
	West of Hwy 99E	10-inch gravity trunk sewer	1,350	65	$87,750	SDC/Developer /CIP
	TBD	Pump Station	1	300,000	$300,000	SDC/Developer /CIP
	Brown Rd to Cleveland	Force Main	3,000	60	$180,000	SDC/Developer /CIP

Funding

To assure that the impact of providing and maintaining new sewer collection facilities is not a burden to the community, new development will be required to pay for the cost of collection facilities needed to serve such development. Extra capacity facilities required to meet the standards of the Master Sewer Plan will be paid from accumulated revenue of the System Development Charge Fund.

The City will continue paying the cost of maintaining and improving the existing collection system with funds derived from user fees. Treatment plant upgrades will be financed through a combination of system development charge funds, loans, and grants.

STORM WATER PLAN

The Woodburn Storm Drainage Master Plan was prepared by Crane and Merseth Engineering/Surveying in 1995, and was updated in 2002. The study area of the Storm Drainage Master Plan included the area within the UGB as it existed before the 2005 amendments and areas immediately surrounding the City that contribute runoff to Mill Creek and Senecal Creek upstream of the City. The study area comprised approximately 9,447 acres.

The Storm Drainage Master Plan is based on identifying the impervious area that existed in the base year, 1994. The study then calculated impervious areas for future land uses based on an assumption that every parcel within the UGB fully developed at the maximum density allowed by the 2001 Woodburn Comprehensive Plan Land Use Map.

As noted, there are two major drainage basins within Woodburn - Senecal Creek and Mill Creek. See Figure 1, Senecal & Mill Creek drainage basin boundaries. The small basin, Senecal Creek is divided into 13 sub-basins (see Figure 4) and the larger basin, Mill Creek, is divided into 51 sub-basins (see Figure 5). These drainage basins will continue to serve planned development in 2005 UGB expansion areas.

Existing Inventory – Major Drainageways

Appendix A to the Storm Drainage Master Plan contains an inventory, June 1999, of the existing public storm water systems 12-inches and larger in diameter in the Mill Creek and Senecal Creek basins in the City of Woodburn.

- Table 1 contains a summary listing (by basin) of pipe sizes, materials, and conditions.
- Table 2 includes data for culverts.

Table 1 Mill Creek Tributary and Sub-basin Storm Drain Capacity Inventory						
Pipe/Channel Segment Description	**Flow Node/ subbasin**	**Size/ Diameter (Inches)**	**Type**	**Approx Length (FT)**	**Adequacy Design Event Carried (YR)**	
					1996 Conditions	**Full Build**
SUB-BASIN M-6A2						
Hardcastle Ave. 30th Outfall Line	M-6A2	30"	CSP	2800	100	25
TRIBUTARY M-7 (Includes M-11-C2						
SETTLEMEIR TO FRONT ST.						
Front St. Crossing & Leaping Weir	#7	30	CMP	230	100 (Ponded)	2 (Ponded)
Open Channel, 1st to Front	#7		DITCH	250	25, Storage Area	Maintain as storage or Convey 100 cfs
1st Street Crossing	#7	30	CMP	150	2	<2
Open Channel, 2nd to 1st	#7		DITCH	200	100, out of bank	Convey 100 CFS
2nd St. Crossing	#7	36	CMP	70	5	2
36", 3rd to 2nd St. Crossing	#7	36	CMP	350	100	100
42" Lincoln to 3r4d St	#7b	42	CMP	1390	100	25
25" Settlemier to Lincoln	#7b	24	RCP	280	25	<2
***HAYES ST. LINE**	M-7B1.B2	18	RCP	390	10	(no add capacity)
****AUSTIN CT./HAYES ST. LINE**	M-7B1	18	RCP	750	10	(No add capacity)
*	M-7B1	15	RCP	440	10	(No add capacity)
*	M-7B1	18	RCP	520	10	(no add capacity)
TRIBUTARY M-9a, MCkINLEY/99e						
HWY 99e TO OUTFALL						
48" CMP Gatch St. Crossing	#9A	48	CMP	375	100	100
Open Channel, Gatch to Bryant	#9a		DITCH	800	100, ponded	Convey 75 CFS
48" Outfall @ Bryant	#9a		CMP	150	25	25
48" CMP, Bryant to McKinley	#9a	48	CMP	550	50	50
McKinley St. 24", Conf. 48" to 99E	M-9A3	24	CMP	600	<2	<2
SUB-BASIN M-10						
12" Collector, Outfall to Jana Ave.	M-10	12	CMP	470	2 \	(No add capacity
12" Collector, Jana Ave. to Hawley	M-10	12	CMP	650	2	(No add capacity
TRIBUTARY M-11						
CLEVELAND ST. OUTFALL TO SETTLEMEIR						
Outfall Culvert, Brown to Cleveland	#11	(2) 42"	RCP		100	5 (Undetained)
Open Channel, Front St. to Brown St.	#11		DITCH		50	5 (Undetained
Front St. Crossing	#11a	48"	RCP	200	50	5 (Undetained
Park pipe, Settlemier to Front	#11b	48"	RCP	1160	50	5 (Undetained
Settlemier Crossing	#11b	54"	CMP	50	50	5 (Undetained
18" A Street Collector	M-11	18"	1	1300	5	<2
SPUR M-11B/PARR ST. TO CONF.						
Open Channel, Brown St. to Conf. Main Tributary	M-11B1/B2		DITCH		100, Backwater Ponding	Convey 30 CFS

* A new storm drain, in the Hayes/Hall vicinity was constructed in 2001. The line diverts flow from the indicated lines to an existing 48-inch trunk situated in Highway 214. This line ultimately discharges to Goose Creek, east of Nuevo Amanecer apartments. Calculations show that lines downstream from the diversion are now operating without potential for backwater during design storm.

** A sliplining or pipebursting project will be completed spring 2006. The project will correct problems that have contributed to diminished capacity of this line.

Table 2 Mill Creek Main Stem Existing Culvert Inventory									
Crossing Description	**Flow Node**	**1995 Survey Data Size/ Diameter**	**Type**	**Length (FT)**	**Top of Road Overflow Elevation**	**Target Flood Elevation (FT)**	**APPROXIMATE CAPACITY**		
							Flow (CFS)	**Event (YR)**	
								1996	**Buildout**
Crosby Road Arch Culvert	M-1	7'x10"	CMP Arch	69	148.4	148.0	340	5	2
Private Drive	M-2	8.3'x7.8' (96")	CMP	26	149.1	149.0	280	2	<2
Hazelnut Ave. Bridge	M-4	Natural Section	NA	80*	157.1	152.0	>500	100	100
High School Entrance Drive	M-4	9.1'x14.0'	CMP Arch	66.8	158.9	153.4	490	100	100
Hwy 214 - Box Culvert	M-5/6	12'x7.7'	Con. Box	73	154.4	154.0	500	100 (Backwater Flooding)	
Front St and SPRR Culverts	M-6	96"	CMP	285	180/6(RR)	156.0	430	100	100
Hardcastle Avenue - &2" CMP	M-8	72" (deformed outlet)	CMP	182	163.6	161.5	250	50	25
Lincoln Street Culvert	M-9	84" (deformed)	CMP	130*	169.3	163.5	290	100	100
Young Street Box Culvert	M-10/11	8'x6'	Con. Box	100*	174.0	164.3	290	100	100
Cleveland Street Arch Culvert	M-10	9.3x16.4'	CMP Arch	150*	168 (street)	164.4	210	100	100
Marshall Street Culvert	M-10	48"	RCP	57	165.5	165.5	82	10	5
Stark Street Culverts	M-10	(2) 48"	RCP	62	167.9	167.0	200	100	100
Wilson Street Culverts	M-12	(2) 52"	RCP	74	169.0	169.0	200	100	100

*Indicates approximate length only, no field survey data.

Needed Drainage Improvements to Support Growth

Recommendations for needed storm drainage projects are found in Chapter 9 of the Storm Drainage Master Plan.

Detention Policy Implementation

The Storm Drainage Master Plan includes a Stormwater Flow Management Program, including policies regarding detention. This policy requires on-site detention for new developments and identifies several locations in the City where a public detention facility may be sited. Detention facilities are sized based on the Council adopted guide presented in Table 3, "Volumes for Different Intensity storms for 10-Acre Site."

Table 3 Volumes For Different Intensity Storms For 10 Acre Site							
Storms	**Results**	**I (Intensities)**	**A = 435,600 or 10 acres**	**Developed C=0.71 (Un)developed C+0.25**	**ft^3 Sec (cfs)**	**Volumes ft^3 storm sec**	**3600sec hrs hrs storm**
100 yr.	1.26" 1.7 hrs	0.467 in hr	435,600 ft^2 or 10 acres	0.1 0.25	3.313 1.167	32,205 ft^3 11,240 ft^3	32,205 ft^3 --11,340 ft 20,865 ft^3 storage volume
50 yr.	1.20" 1.76 hrs	0.435 in hr	435,600 ft^2 or 10 acres	0.1 0.25	3.087 1.087	32,672 ft^3 10,800 ft^3	32,672 ft^3 --10,800 ft 19,872 ft^3 storage volume
25 yr.	1.14" 2.86 hrs	0.399 in hr	435,600 ft^2 or 10 acres	0.1 0.25	2.830 0.996	29,138 ft^3 10,255 ft^3	29,138 ft^3 --10,255 ft 18,883 ft^3 storage volume
10 yr.	1.08" 2.97 hrs	0.364 in hr	435,600 ft^2 or 10 acres	0.1 0.25	2.582 0.909	27,605 ft^3 9,720 ft^3	27,605 ft^3 -- 9,720 ft 17,885 ft^3 storage volume
5 yr.	0.935" 3.28 hrs	0.285 in hr	435,600 ft^2 or 10 acres	0.1 0.25	2.024 0.713	23,899 ft^3 8,415 ft^3	23,899 ft^3 -- 8,415 ft 15,484 ft^3 storage volume
2 yr.	0.800" 3.64 hrs	0.220 in hr	435,600 ft^2 or 10 acres	0.1 0.25	1.560 0.549	20,448 ft^3 7,200 ft^3	20,448 ft^3 -- 7,200 ft 13,248 ft^3 storage volume

CITY OF WOODBURN
RUN OFF DETENTION REQUIREMENT

1) Construct a device that has capacity for detaining difference in run off volume received by undeveloped and developed land for a 25-year storm.
2) Construct a discharge orifice of a size that the quantity of run off through the orifice is equal to run off flow from a storm of 5-year or less, undeveloped land.
3) Construct a detention facility to have a post-development 25-year capacity with a discharge orifice (or structure) sized to limit outflow to no more than the undeveloped site peak run off for the existing (undeveloped) 5 year frequency storm. Detention volumes calculated by the following methods are acceptable:
   A. Santa Barbara Urban Hydrograph routing model (as prescribed by the King County Surface Water Design Manual) for the post development 25-year runoff hydrograph detained back to the existing 5-year peak site discharge.
   B. 18,883 CF/ 10 Acre drainage area as per City of Woodburn standard table, above, based on the rational method

SAFETY REQUIREMENTS

1) Depth of storm water within 30 feet from the edge of detention ponds, if open to public, shall be limited to 3 feet, then gradual slope (3%) to higher depth shall be allowed. Maximum pond side slopes shall be 3' horizontal to 1' vertical, however, gentler slope is desirable.

(End of Table)

Portions of the existing drainageways function as detention sites where East Lincoln Street and Hardcastle Street (and others) are crossed. These sites, four located in the Mill Creek drainage and one located in the Senecal Creek drainage basin will continue to function as detention areas. Programs directed at improving public safeguards during periods of high flow and incorporation of storm water treatment will be continued whenever possible.

Short and Long-Term Capital Improvements Projects

Table 4 summarizes needed drainage improvements projects and is derived from the Woodburn Drainage Master Plan.

TABLE 4
Needed Storm Improvement Project Summary
Woodburn Drainage Master Plan

Project ID	Project Name	Drainage Basin	Subbasin ID	Priority	Estimated Cost ($)
P1	Hardcastle Crossing	Mill Ck	M-8	High	$ 191,729
P2	Front Street Detention & Crossing	Mill Ck	M-7	High	$ 151,436
P3	Marshall Street	Mill Ck	M-10	High	$ 78.560
P4	Crosby Road Crossing	Mill Ck	M-1	N/A (county)	$ 587,159
P5	Boones Ferry Crossing	Mill Ck	M-1a	High	$ 53,157
P6	Old town - 2nd street	Mill Ck	M-7	Medium	$ 188,965
*P7	East McKinley	Mill Ck	M-9a	High	$ $953,101
P8	Stubb Rd Detention	Mill Ck	M-11a	Medium	$ 359,571
P9	Connect 48" at I-5 & Hwy 214	Senecal Ck	ES-2	High	N/A
P10	Goose Creek Re-alignment	Mill Ck	M-5	High	$ 224,577
					$2,788,255

* This project was completed in 2004.

The Storm Drainage Master Plan recommended that the city implement several storm drainage improvement projects. Five proposed projects within the Study area were given high priority for improvement. These are the Mill Creek/Hardcastle Road crossing; development of a detention facility at the Front Street park, addition of a 42-inch line across Front street and the railroad; adding capacity at Marshall street; increasing capacity at East McKinley near Bryan Street; and consolidation of storm flows into the existing 48-inch line crossing I-5 immediately north of Hwy 214.

- On Hardcastle Road, addition of a box culvert auxiliary (overflow) line in the embankment of the fill crossing Mill Creek is recommended.

- On Front Street, flow from an open ditch in the park enters an 18" diameter pipe before it goes under Front Street. Flows beyond the capacity of the 18" pipe are diverted to an open ditch and routed northerly to an existing 30" diameter pipe, which crosses under Front Street and the Railroad. The new system would create a detention facility at the park and increase capacity of the line under Front Street and the railroad by constructing a 42-inch line in place of the existing 30" pipe.

- At the Marshall Street crossing of Mill Creek, addition of a second conduit (tentatively 54-inch diameter) to increase capacity of the crossing and reduce flows that overtop the street is recommended for immediate development.

- In the area of Blaine and East McKinley Streets, the existing storm system has inadequate capacity the Storm Drainage Master Plan recommends that the City abandon the sub-standard pipes and construct new larger diameter pipes within the public right-or-way. (This project was completed in 2004)

- The study identified problems at the Crosby Road Crossing, owned by Marion County, and recommended that the City work with the County to improve this facility.

- A dry-line 48-inch storm sewer was constructed as part of the ODOT I-5 construction. this system can be utilized to relieve hydraulic loading to the storm system crossing under I-5 to the south of Hwy 214, when placed in service.

- The study identified two locations along the main stem of Mill creek that appear to be overtopped during very high flow periods. These are the Goose Creek confluence at Highway 214 near the Mill Creek Pump station and the private road crossing just south of Crosby Road.

- At Mill Creek at the confluence of Goose Creek just south of Highway 214 at the Mill Creek Pump Station there is significant probability of backwater build up during the 25-year event and overtopping at the highway embankment appears to be possible during the 100-year storm event. To alleviate this potential problem the Storm Drainage Master Plan recommends that the city realign the Goose Creek Tributary to cross Hwy 214 and intersect Mill Creek to the north of Hwy 214. This would include the installation of a 60" diameter culvert.

- The private drive south of Crosby Road is within the City limits but it is not a publicly-owned facility nor located within a public right-of-way. Therefore, the City does not have authority or responsibility for it. The capacity of the existing culver is inadequate to pass a 25-year event. The type, configuration and slope of the culvert limits the capacity to less than 250 cfs. The full build-out 100-year event flow at this location is estimated at 500 cfs. The Storm Drainage Master Plan recommends that it should be replaced with a 90" or 96" pipe.

Table 5 describes storm drainage projects that appear on the 6-year capital improvements program. As with the Water CIP, please not that projects change as annexation occurs, and that projects that do not appear on the CIP may be funded and constructed in the short-term. This is especially true of projects needed to support industrial development within the SWIR.

Table 5 summarizes storm drainage projects identified in the 6-year Capital Improvements Program. Note that projects may be added to this list based on Council priorities as land is annexed to the City.

TABLE 5
CAPITAL IMPROVEMENT PROGRAM: 2004-2005 THROUGH 2008 - 2009
STORM DRAINAGE FACILITIES

Project #	Project	2004-05	2005-06	2006-07	2007-08	2008-09
1	Bryan Street Outfall	$39,000	$48,000			
2	Brown/Wilson Storm		$130,000			
3	W. Lincoln: Leasure to Cascade		$45,000			
4	Landau/Laurel Storm (to Pudding)		$50,000	$500,000	$200,000	
5	Marshal Street Culvert		$80,000			
6	North 1st & 2nd (north of Church St.)	$62,000				
7	N Front Det. -culvert to Commerce		$151,000			
8	Hardcastle Culvert Replacement		$192,000			
9	Settlemier Regional Detention	$194,000	$295,000			
10	Misc. Wetland Mitigation	$25,000	$25,000	$25,000	$25,000	$25,000
11	Reline Settlemier Crossing N. of Hayes		$20,000			
12	Reclaim Channel N. of Progress Way	$7,000	$25,000			
13	Garfield-Workman-Hayes SD	$59,200				
14	3rd St. @ Nuevo Amanecer to Hwy 214	$26,000	$70,000			
15	Oak Street – 1st to 2nd	$25,000				

Funding

To assure that the impact of providing and maintaining new storm drainage facilities is not a burden to the community, new development will be required to pay for the cost of storm drainage facilities needed to serve such development. Extra capacity facilities required to meet the standards of the Master Storm Drainage Plan may be paid from accumulated revenue of the System Development Charge Fund.

The City will continue paying the cost of maintaining and improving the existing storm drainage system with funds derived from a combination of system development charges, Local Improvement Districts, and street maintenance and construction funds.

Table 6 identifies stormwater projects that will be needed to support planned development in UGB expansion areas. Note that minor collection lines within expansion areas are not including and that storm water detention facility area requirements are calculated without identifying specific locations. Please refer to Appendix B maps for generalized locations of storm water trunk lines.

Table 6
Project List - Storm Drainage Plan

Expansion Area	Location	Description	Quantity	Unit $	Estimated Cost	Funding
Southwest Industrial						
	NW of I-5					
	North end	42-inch Storm Drain	2,200	200	$440,000	SDC/Developer /CIP
	South end	36-inch Storm Drain	2,100	175	$367,500	SDC/Developer /CIP
	TDB	Detention Area	1.9	375,000	$712,500	SDC/Developer /CIP
	SE of I-5					
	Evergreen Extn to Settlemier Park	42-inch Storm Drain	6500	200	$1,300,000	SDC/Developer /CIP
	Parr Road	36-inch Storm Drain	3,800	175	$665,000	SDC/Developer /CIP
	Near Stacey Allison	30-inch Storm Drain	2,200	155	$341,000	SDC/Developer /CIP
	Near Stacey Allison	24-inch Storm Drain	2,700	120	$324,000	SDC/Developer /CIP
	TBD	Detention Area*	2.2	375,000	$825,000	SDC/Developer /CIP
		* If detention is used, final design may indicate a smaller size for 42-inch Storm Drain shown above.				
North Area						
	East of Boones Ferry	18-inch Storm Drain	900	85	$76,500	SDC/Developer /CIP
	East of Boones Ferry	24-inch Storm Drain	930	120	$111,600	SDC/Developer /CIP
	To Mill Creek	48-inch Storm Drain	3,040	220	$668,800	SDC/Developer /CIP
	TBD	3.1 Acre Detention Area	3.1	80,000	$248,000	SDC/Developer /CIP
6-15 Year Projects						
Southwest Industrial						
	Near South Arterial	24-inch Storm Drain	2,600	120	$312,000	SDC/Developer /CIP
Western Exception Area						
	South Collection Lines					
	Butteville Road / RR	30-inch Storm Lines	3,000	145	$435,000	SDC/Developer /CIP

	TBD	1.5 Acre Detention Area	1.5	80,000	$120,000	SDC/Developer /CIP
	North Collection Lines					
	Butteville / Senecal Cr	24-inch Storm Lines	3,400	120	$408,000	SDC/Developer /CIP
	TBD	3/4 Acre Detention Area	0.8	80,000	$60,000	SDC/Developer /CIP
North Area						
	South of Crosby Rd. (western area near I-5)	18-inch Storm Drain	3,500	85	$297,500	SDC/Developer /CIP
	South of Crosby Rd. (central area)	24-inch Storm Drain	850	120	$102,000	SDC/Developer /CIP
	South of Crosby Rd. (west of Boones Ferry)	36-inch Storm Drain	2,025	175	$354,375	SDC/Developer /CIP
South Area						
	East of Hwy 99E	18-inch Storm Drain	900	85	$76,500	SDC/Developer /CIP
	East of Hwy 99E	21-inch Storm Drain	800	100	$80,000	SDC/Developer /CIP
	TBD	Detention Area	1	80,000	$80,000	SDC/Developer /CIP

TRANSPORTATION PLAN

The information in this section of the PFP is derived from the 2005 Update of the Woodburn Transportation Systems Plan.[2] Planning for near- and long-term transportation system needs is a priority for the City. The purpose of the update is to amend the TSP based on the following criteria:

- State Transportation Planning Rule (TPR) requirements
- Updated transportation model structure consistent with (1) ODOT technical specifications, and (2) local land use designations
- Consistency with plans completed and underway since development of the 1996 TSP
- Compliance with Economic Development Rule (OAR Chapter 660, Division 009) requirements that local plans identify short- and long-term transportation projects necessary to serve planned commercial and industrial development.

The updated Woodburn TSP identifies planned transportation facilities and services needed to support land uses proposed in the Woodburn Comprehensive Plan in a manner consistent with the TPR (Oregon Administrative Rule [OAR] 660-012) and the Oregon Transportation Plan (OTP).

A system of transportation facilities and services adequate to meet the City's transportation needs to the planning horizon year of 2020 is established in the TSP update. The TSP includes plans for a transportation system that incorporates all modes of travel (i.e., auto, bicycle, pedestrian, rail, marine, and public transportation), serves the urban area, and is coordinated with the state and county transportation network.

Existing Facilities

This section provides a general inventory and a deficiencies assessment of the existing transportation facilities within the Woodburn UGB. A more detailed assessment of existing facilities is found in Section 3 of the TSP. The TSP addresses pedestrian and bicycle facilities, transit facilities, rail facilities, air transport facilities, pipeline transport facilities, water transport facilities, and roadway facilities.

Pedestrian Facilities

Figure 3-2 of the TSP illustrates the available pedestrian facilities and their relationship to major activity centers within Woodburn. As shown in Figure 3-2, gaps in the existing pedestrian system include the following areas:

[2] The City of Woodburn, in conjunction with the Oregon Department of Transportation (ODOT), initiated an update of the City's 1996 Transportation System Plan (TSP) in 2002. The City of Woodburn Comprehensive Plan has almost completed periodic review as required by state law. Updating the transportation element (Goal 12) of the Comprehensive Plan is Task 3B of the Period Review.

- *Oregon 214:* Pedestrian facilities are not provided from 5th Street to Park Avenue in front of Woodburn High School on either side of the road. Sidewalks are also absent west of I-5 and east of Oregon 99E around the commercial areas.
- *Boones Ferry Road*: Pedestrian facilities are not provided on either side of the road north of Oregon 214, which abuts French Prairie Middle School and Lincoln Elementary School.
- *Settlemier Road*: Sidewalks are not provided on the west side of the road north of Hayes Street nor on the east side of the road south of Cleveland Street. These connections would provide a continuous link between the residential areas to the south of Oregon 214 to French Prairie Middle School and Lincoln Elementary School.
- *Hayes Street:* Pedestrian facilities are not provided on the north side of the road across the street from Nellie Muir Elementary School.
- *Cascade Drive*: Sidewalks are not provided on either side of the road between Hayes Street and Oregon 214. This connection would provide a link between the residential area around Hayes Street and the commercial developments on Oregon 214.
- *Lincoln Street*: Pedestrian facilities are not provided on the south side of Lincoln Street between Washington Elementary School and the commercial developments on Oregon 99E.

Bicycle Facilities

Figure 3-3 of the TSP shows the existing bicycle routes in the city of Woodburn. As indicated in the figure, bicycle facilities in Woodburn have little connectivity between residential areas, schools, and commercial centers. Major connections are missing in the locations outlined below.

- *Boones Ferry Road/Settlemier Road*: Bicycle facilities are not provided on Boones Ferry Road and Settlemier Road. This connection would provide a link from residential communities north and south of Oregon 214 to the commercial areas on Oregon 214, French Prairie Middle School, and Lincoln Elementary School.
- *Oregon 214*: Bicycle lanes are not provided west of Boones Ferry Road to connect with the commercial developments near I-5.
- *Front Street*: Bicycle facilities are not provided on Front Street to connect residential areas to the downtown commercial area.
- *Oregon 99E*: Bicycle lanes are not provided south of Lincoln Street to connect with the commercial and industrial uses to the south.

Public Transportation

Figure 3-4 of the TSP shows existing transit routes in the city of Woodburn. Transit is provided in Woodburn by the Woodburn Transit System and Woodburn Paratransit System during the week. The Woodburn Transit System provides service on the major facilities within Woodburn, which include Oregon 99E, Oregon 214, Front Street, Boones Ferry Road, and Young Street. Intercity transit is also provided by OHAS, the Woodburn Family Clinic, Greyhound, and HUT Transportation.

Rail Facilities

Figure 3-5 depicts the location of rail crossings and the existing tracks. Nine at-grade crossings and one grade-separated crossing are located along Front Street and Cleveland Street within City limits. Three private rail crossings are not indicated on the map. These crossings are for driveways leading to residential dwellings. Of the 11 crossings indicated on the map, seven are gated.

The Union Pacific Railroad provides through train service and freight service north of Hardcastle Avenue. The Willamette Valley Railroad, a short-line operator, provides freight service along Front Street and Cleveland Street to serve local businesses. Willamette Valley also provides freight service to communities to the east of Woodburn on track leased from Union Pacific Railroad. No passenger train stops are provided in Woodburn. The nearest passenger service is available in Salem, approximately 20 miles to the south. A local group is currently exploring the possibility of using Willamette Valley Railroad equipment to develop excursion train service to Silverton.

Air Transport Facilities

No commercial or private aviation facilities are located within the Woodburn UGB. Regional freight and passenger service is provided via the Portland International Airport, approximately 33 miles from Woodburn via I-5 and I-205. Although commercial service is not available, passenger service is accessible at the Salem Municipal Airport (via private planes) approximately 20 miles from Woodburn, and at the Aurora State Airport approximately 10 miles from Woodburn.

Pipeline Transport Facilities

There are no major pipeline transport facilities within the Woodburn UGB.

Water Transportation Facilities

There are no water transport facilities within the Woodburn UGB.

Roadway Facilities

Ownership

Public roads in the city of Woodburn are owned and maintained by three different jurisdictions: ODOT, Marion County, and the city of Woodburn. As owners of a roadway, each jurisdiction is responsible for the following:

- Establishing the functional classification
- Maintenance
- Approving construction and access permits
- ODOT owns the following facilities within the Woodburn UGB:
- I-5 provides service from the northern Oregon border to the southern Oregon border. I-5 is classified as an Interstate Highway by ODOT and has a posted speed of 65 miles per hour (mph) in the vicinity of the City. The Oregon 214/I-5

interchange is the only interchange that provides a direct connection to the city of Woodburn.

- Oregon 214 within Woodburn is part of the Hillsboro-Silverton Highway, which connects Hillsboro through Newberg, St. Paul, Woodburn, and Mt. Angel to Silverton. Oregon 214 continues south of Silverton to Oregon 22, just south of Salem. Oregon 214 is classified as a District Highway by ODOT. The posted speed varies between 30 and 35 mph within the City limits.
- Oregon 219 is also part of the Hillsboro-Silverton Highway and is classified as a District Highway. According to the Oregon Highway Plan, the Hillsboro-Silverton Highway is considered Oregon 219 to the west of I-5 and Oregon 214 to the east. The posted speed within the City limits is 35 miles per hour.
- Oregon 99E connects from Portland to Salem and is classified as a Regional Highway by ODOT. The posted speed varies between 35 and 45 mph within the City limits.
- Oregon 211 connects Woodburn to Estacada via Molalla and is classified as a District Highway. The designation of the highway begins to the east of the Oregon 214/Oregon 99E intersection. The posted speed within the City limits varies between 35 and 45 mph.

Marion County has jurisdiction over the following facilities within the Woodburn UGB:

- Boones Ferry Road south of Ogle Street
- Parr Road west of Centennial Park west boundary
- Stubb Road
- Boones Ferry Road north of Vanderbeck Avenue
- Lincoln Street from 400 feet east of Oregon 99E

The remaining public facilities are owned by the city of Woodburn.

Functional Classification

The functional classification defines a street's role and context in the overall transportation system. In addition, it defines the desirable roadway width, right-of-way needs, access spacing, pedestrian and bicycle facilities, as well as other specifications. The city of Woodburn has established a functional classification system for the roadways within the City limits. Figure 3-6 illustrates the existing classifications.

Arterials

Arterials are the highest class of street and serve larger through volumes at greater speeds. Arterials serve as the major truck routes and emphasize regional mobility over access.

The city of Woodburn identifies two types of arterials: major arterials and minor arterials. Major arterials provide service to traffic entering and leaving the area and traffic to major activity centers in Woodburn. Minor arterials feed the major arterial

system and support moderate length trips and service to activity centers. Examples of major arterials in Woodburn include Oregon 214, Oregon 99E, and Oregon 211. Examples of minor arterials in Woodburn include Boones Ferry Road, Front Street, and Hardcastle Street.

The arterial system is fairly limited and constrained by the railroad tracks, I-5, and the manner in which land has developed in the City over time.

Collectors

Collectors are the intermediate class of street. They provide a link between local roadways and the arterial system. Access and mobility functions are also important. The city of Woodburn identifies two classifications of collectors: service collectors and access streets. The purpose of service collectors is to provide significant linkage with arterials and accommodate a higher volume of traffic, while access streets are meant to provide single-family residential local street access and accommodate lower volumes of traffic. Examples of service collectors in Woodburn include Parr Road, Arney Road, and Evergreen Road. Examples of Access Streets include Hazelnut Drive, Woodland Drive between Arney Road and Willow Avenue, and Astor Way between Country Club Road and Oregon 214.

The collector street system in Woodburn is also fairly limited by the manner in which the City has developed over time.

Local Streets

Local streets provide direct access to homes and neighborhoods and feed into collectors. Access is the most important role of local streets. The local street grid system is well developed between Boones Ferry Road and Front Street south of Oregon 214, and north of Oregon 214 between Boones Ferry Road and I-5. The local street grid system is still developing in the remaining area.

Traffic Operations

Manual turning movement counts were collected for intersections of arterials and collectors within the Woodburn UGB on typical weekdays in November 2002 and January 2003.

Roadways

Figure 3-7 of the TSP presents the existing p.m. peak hour traffic volumes on all collector and arterial roadways. These volumes are two-way volumes derived from the intersection traffic counts. As shown in the figure, Oregon 99E and Oregon 214 carry the most traffic during the weekday p.m. peak hour, with approximately 1,900 and 1,500 vehicles, respectively.

Intersections

Traffic operations at intersections are described by a level of service, which corresponds to a range of delays a driver experiences at an intersection. The level of service ranges from "A" to "F." A level of service "A" corresponds to little delay and

good operations, while a level of service "F" corresponds to high delays and poor operation.

Signalized intersections and unsignalized intersections have different measures of level of service. For signalized and four-way stop intersections, level of service is based on the average delay experienced by all vehicles entering the intersection. For two-way stop intersections, level of service is based on the delay experienced by the worse movement, which is usually the left-turn movement on the stopped approach. The city of Woodburn does not have an operations standard for signalized and unsignalized intersections within City limits.

ODOT has specific mobility standards for the state facilities within the city of Woodburn based on the facility's classification and volume-to-capacity ratio. The volume-to-capacity ratio is the degree of saturation of an intersection. The ODOT requirements for intersections on state highways are as follows:

- On Oregon 214, Oregon 211, and Oregon 219, ODOT requires a maximum volume-to-capacity ratio of 0.85 based on the district highway designation.
- On Oregon 99E, ODOT requires a maximum volume-to-capacity ratio of 0.80 based on its classification as a regional highway.

Levels of service analyses were performed at 33 study intersections using the procedures described in the 2000 Highway Capacity Manual. These included 11 signalized intersections, as outlined below.

- *Oregon 214/Woodland Avenue*: This intersection is located east of I-5 and provides access to residential neighborhoods to the north and the Woodburn Factory Stores.
- *Oregon 214/I-5 Southbound Ramp*: This intersection provides the city of Woodburn and other areas of Marion County with access to I-5 southbound.
- *Oregon 214/I-5 Northbound Ramp*: This intersection provides the City and other areas of the county with access to I-5 northbound.
- *Oregon 214/Evergreen Road*: This intersection provides access to the commercial developments on Oregon 214.
- *Oregon 214/Oregon Way/Country Club Road*: This intersection provides access to the residential dwellings to the north and south of Oregon 214.
- *Oregon 214/Boones Ferry Road*: This intersection provides access to residential dwellings to the north and south of Oregon 214. In addition, French Prairie Middle School and Lincoln Elementary School are located in the northwest quadrant of this intersection.
- *Oregon 214/Meridian Drive/5th Street*: This intersection provides access to the business developments to the north and the residential dwellings to the south of Oregon 214. In addition, 5th Street provides a connection to the commercial developments along Front Street.
- *Oregon 214/Oregon 211/Oregon 99E*: This intersection was improved in August 2002 to include additional turn lanes on the northbound approach.

- *Oregon 99E/Hardcastle Street*: This intersection provides access to the residential developments to the east and west of Oregon 99E.
- *Oregon 99E/Lincoln Street*: This intersection provides access to the residential developments and Washington Elementary School to the east Oregon 99E.
- *Oregon 99E/Young Street*: This intersection provides access to the industrial and commercial uses to the east and west of Oregon 99E.

The remaining study intersections are stop-controlled intersections. Figure 3-7 of the TSP summarizes both the intersection control and the results of the intersection operations analysis for all study intersections. Table 3-1 summarizes the volume-to-capacity ratios for each intersection. The intersection operations are reported as being under, near, or over capacity. The capacity was based on level of service for signalized intersections, and the volume-to-capacity ratio of the critical movement for unsignalized intersections. For analysis purposes, over capacity was defined as not meeting ODOT mobility standards. As shown in the figure and table, all study intersections currently meet ODOT mobility standards with the exception of the Meridian/5th/Oregon 214 intersection. At this intersection, the critical southbound left-turn movement currently operates over capacity.

TABLE 3-1
Existing Operations at Key Intersections (volume-to-capacity [v/c])

Intersection	Existing
Butteville Road/Oregon 219*	0.16
Woodland/Oregon 219	0.45
I-5/Oregon 214 northbound ramps	0.78
I-5/Oregon 214 southbound ramps	0.78
Evergreen Road/Oregon 214	0.90
Oregon Way/Oregon 214	0.72
Cascade Drive/Oregon 214	0.31
Boones Ferry Road/Oregon 214	0.85
Meridian/5th/Oregon 214	**> 1**
Front Street/Oregon 214	0.73
Park Avenue/Oregon 214	0.51
Oregon 99E/Oregon 214	0.82
Cleveland Street/Oregon 99E	0.67
Hardcastle Street/Front Street	0.35
Lincoln Street/Front Street	0.30
Garfield/Young Street/Front Street	0.42
Cleveland Street/Front Street	0.24
Boones Ferry Road/Crosby	0.27
Parr Road/Settlemier Road	0.20

*Note: Butteville/Oregon 219 refers to the southern intersection of the two roadways

The 20-year intersection traffic operations were analyzed for the 33 study intersections identified. As shown in Figure 4-2 of the TSP, the following locations were identified to experience capacity problems if no improvements are made to the existing system:

- Butteville Road/Oregon 214
- I-5/Oregon 214northbound ramps
- I-5/Oregon 214southbound ramps
- Evergreen Road/Oregon 214
- Boones Ferry Road/Oregon 214
- Front Street/Oregon 214
- Park Avenue/Oregon 214
- Oregon 214/Oregon 99E
- Cleveland Street/Oregon 99E
- Hardcastle Street/Front Street
- Lincoln Street/Front Street
- Garfield/Young Street/Front Street
- Cleveland Street/Front Street
- Boones Ferry Road/Lincoln Street

Based on the anticipated intersection deficiencies, the following roadway segments are anticipated to exceed capacity in year 2020:

- Oregon 214/Oregon 219 between Butteville Road and Oregon 99E
- Front Street between Hardcastle Street and Cleveland Street

In addition to the identified capacity deficiencies, an analysis was performed to identify areas of high-volume growth within the UGB. Although not identified to operate over capacity in year 2020, the Parr Road, Butteville Road, and Crosby Road corridors are anticipated to experience a high increase in traffic volumes, as compared to today's conditions. Because of the anticipated capacity deficiencies along Oregon 214 between the interchange and Boones Ferry Road/Settlemier Road as well as the high employment and household growth anticipated in each of the three corridors, it is quicker for travelers to use these three corridors to access the I-5 interchange from the west than to travel along Oregon 214 to access the interchange from the east.

Truck Freight Transportation

As shown in Figure 3-8, the city of Woodburn designates truck routes and truck ways through the City. Although Woodburn does not sign for truck freight routes and ways, the City does sign where trucks are not allowed.

Truck routes through Woodburn include Oregon 214 and Oregon 99E. By designating these roads as truck routes, the City allows through traffic of motor trucks, truck trailers, and truck tractors on these roadways.

Truck ways are designated as acceptable roads for commercial operation of motor trucks, truck trailers, and truck tractors, but does not allow a through-city route necessary for specialized traffic directional control signs.

Transportation Improvements

This section summarizes transportation improvements needed over the 20-year planning period as illustrated in Section 7 of the TSP. Figure 7-1 shows the functional classification designations for all existing and future streets within the proposed Woodburn UGB. Construction of new roadways in the area being studied for UGB expansion is contingent upon the expansion occurring. If the UGB is not expanded, the roadway system is anticipated to operate acceptably in the absence of these facilities.

The designation for all streets is as follows:

- *Freeway*: I-5
- *Major Arterial*: Oregon 219, Oregon 214, Oregon 99E, and Oregon 211
- *Minor Arterial*: Southern Arterial, Boones Ferry Road, Settlemier Avenue, Evergreen Road, Front Street, Hardcastle Avenue, Young Street (between Oregon 99E and Front Street), and Butteville Road

- *Service Collector*: Parr Road, Crosby Road, Lincoln Street (Front Street to Oregon 99E), West Hayes Street (Settlemier Avenue to Evergreen Road), Arney Road, Progress Way/Industrial Avenue, Park Avenue, Gatch Street (Lincoln Street to Cleveland Street), Cleveland Street (Settlemier to Oregon 99E), Woodland Drive (Arney Road to Oregon 214), Stacy Allison, Robin Avenue, the extension of Evergreen Road into Crossroads Shopping Center, Harrison, Garfield (Settlemier to Front Street), Park (Oregon 214 to Lincoln), Cooley (Oregon 211 to Hardcastle)

- *Access Street*: Woodland Drive (north of Robin Avenue), the extension of Woodland Avenue to Butteville Road south of Oregon 219, Oregon Way, Astor Way (Country Club Road to Oregon 214), Country Club Road (Astor Way to Boones Ferry Road), Hazelnut Drive (Tukwila to Front), Tukwila (Hazelnut to Boones Ferry), Meridian (Oregon 214 to Hazelnut), 5th Street (Oregon 214 to Harrison), Brown Street (Cleveland Street to Southern Arterial), , Country Club Road (Oregon 214 to Rainier).

The remaining streets within the UGB are designated as local streets.

Needed Street Upgrades

Over time, many of the existing streets within the City will be upgraded, and will be improved in compliance with the cross sections in Figure 7-2 of the TSP.

Priority (short-term) upgrades for the City are as follows:

- Oregon 214/219/I-5 interchange: Reconstruct to a Partial Cloverleaf Design in accordance with the Environment Assessment currently being conducted.

- Oregon 214/219: Widen to a major arterial standard between Woodland and Oregon Way.

- Oregon 214/219: Widen to a full five-lane cross section with sidewalks and bicycle lanes per the major arterial standard between Butteville Road and I-5.

- Parr and Butteville Road: As new development occurs in the corridors within the UGB, upgrade to reflect the transition from the currently rural-character roadways to those more urban in nature. Improving these minor arterials to urban standards is essential to serve the Southwest Industrial Area (SWIR) over the next five years.

Other important projects to be constructed in the intermediate to long-term (approximately 2010-2020) include the following:

- Boones Ferry and Front: Upgrade to ensure that continuous pedestrian and bicycle facilities are provided along the corridors.

- Settlemier: Upgrade to ensure that continuous pedestrian facilities are provided along the corridor.

- Oregon 214/219: Widen to a full five-lane cross section with sidewalks and bicycle lanes per the major arterial standard between I-5 and Oregon 99E.

- Crosby Road: As new development occurs in the corridors within the UGB, upgrade to reflect the transition from the currently rural-character roadways to those more urban in nature.

- Oregon 99E: As redevelopment occurs in the corridor, upgrade to be compliant with major arterial standards. This would ensure continuous pedestrian and bicycle facilities along the route as well as the implementation of access management strategies.[3]

Other existing streets within Woodburn will be upgraded to the appropriate standards as development and redevelopment occur.

New Streets

The following new streets and street extensions are planned over the next 5 years. [4]

- Widening Oregon 214 to include four through travel lanes (two per direction) between Butteville Road and Oregon 99E and the provision of turn lanes at intersections between Woodland Avenue and Oregon Way
- Reconstructing I-5 on-ramps and off-ramps
- Extending Evergreen Road to Parr Road
- Extending Stacy Allison Drive to Parr Road
- Constructing a new service collector between the Evergreen Road and Stacy Allison Drive extension
- Terminating Parr Road to the east of Butteville Road and connecting it into the South Arterial
- A grid system of collector and local streets should be constructed as part of the Nodal Development Area between Stacy Allison and Settlemier to the north of Parr Road. The construction of this system would occur with development and within the constrains of the existing built environment. This grid system should provide connectivity options for pedestrians, cyclists, and motorists and also help reduce reliance on the historic Settlemier corridor.

The following new streets and streets extensions are planned over the next 10-15 years:

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[3] Currently, the City and ODOT are pursuing potential funding for a modernization project between Lincoln and the south City limits. Although the specifics of the project are not available at this time, it is likely that this could include the construction of curbs and sidewalks where gaps currently exist, as well as access consolidation.

[4] Projects related to state highways depend in large part on ODOT funding. Projects in the SWIR depend in large part on funding from private developers.

- Constructing the South Arterial from Butteville Road to Evergreen Road
- Constructing the South Arterial from Evergreen Road to Oregon 99E
- Extending Evergreen Road from Parr Road to the South Arterial
- Extending and upgrading Brown Street to the South Arterial
- Constructing a new loop ramp connection on Oregon 214 with Front Street in the southwest quadrant of the existing intersection.

Over the next 20 years, it is the City's priority to coordinate with Marion County to provide an extension of Crosby Road to Goudy Gardens and Oregon 99E, and to extend the southern arterial from Oregon 99E to Oregon 214. The improvements provide needed east-west connections and an alternative route to the Oregon 214/I-5 interchange area.

Intra-City Fixed Route Transit

Improvements to the fixed route transit system should be implemented incrementally over time. The top priorities are outlined sequentially below.

- *Increasing Service Frequency on Existing Route:* Initially, the existing one-way loop route should be maintained, with service extended to a 12-hour period from 7:00 a.m. to 7:00 p.m. at 60 minute headways. An expansion of the hours of operation of the fixed route service would encapsulate morning and evening peak commuting times thereby increasing the likelihood that transit could be used for employment-related travel. As ridership increases, service frequency should be provided every 30 minutes during peak periods and every 60 minutes during non-peak periods on the weekdays. The feasibility of weekend service should also be investigated in the future.

- *Converting Single Route to Two Way Operations:* To improve passenger accessibility, the existing one-way loop route should be modified to two-way operations. This service concept would be operated under the increased frequency described above.

- *Creating Two Routes (East/West) with One-Way or Two-Way Operations:* An east route and a west route with a common connection in the downtown should ultimately be established. The common connection could be provided at a new transit center in the downtown that may be tied to an intercity bus and/or rail station. The east-west boundary between the two routes could either be split at Front or at Settlemier. It would be preferable to increase the service frequency to 30 minutes on both routes between 7:00 a.m. to 7:00 p.m. These routes could be operated with either one-way or two-way operations.

In addition to the incremental approach identified above, the route should be expanded as growth occurs to include the Parr Road and Crosby Road corridors and potentially the South Arterial. The connection to Parr Road could occur via the extension of Evergreen Road. The route should also be expanded to include the Woodburn Industrial Park located in the Progress and Industrial corridors.

Intercity Transit

The feasibility of an intercity transit system should be further investigated. Top priority should be given to establishing a shuttle service to downtown Salem and the state office building area. As a second priority, shuttle service should be investigated between Woodburn and the Tualatin Park-and-Ride. Ultimately, the provision of service into downtown Portland may be feasible. Under any of these options, it is likely that service would be provided during the morning and evening commute hours with a potential mid-day connection.

The City and ODOT should continue to investigate the feasibility of establishing a park-and-ride in the northeast quadrant of the I-5/Oregon 214 interchange as part of the interchange reconstruction project. If a park-and-ride were developed, consideration should be given to provide more spaces than the anticipated intercity transit demand to accommodate carpooling to Portland and/or Salem. In addition, Woodburn's intracity fixed route system should incorporate a stop at the potential park-and-ride and should connect to any future north-south MAX line.

Special Needs Transportation

Although improvements in the fixed route system could allow Woodburn to reduce the paratransit service, the existing paratransit system provides an essential service for many elderly and handicapped persons in the community. If City resources are concentrated on expansion of the fixed route system, the City may investigate transferring the paratransit system to a local social service agency.

Pedestrian Plan

The Pedestrian Plan, depicted in Figure 7-3, identifies the sections of the City's arterial and collector system where gaps currently exist. In future development areas, the sidewalks will be constructed to ADA (Americans with Disabilities Act) standards; in the downtown and other older neighborhoods, the existing sidewalk width, clear zone for pedestrians, and the ramp requirements will need to be addressed as properties redevelop and/or roadway improvement projects occur.

Retrofitting existing streets to include sidewalks should be balanced with developing an off-street pathway system. A 7-mile pedestrian and bicycle trail system is recommended along the Mill Creek and Goose Creek corridors. This trail system would include connections to adjacent neighborhoods. The sidewalk system should incorporate wayfinding signage to direct pedestrians to the off-street trail system.

Bicycle Plan

Figure 7-4 shows the City's bicycle plan. As portions of the City's streets are widened, either through adjacent development or public works projects, bicycle lanes would be provided where indicated on the plan.

The bicycle plan establishes a network of bicycle lanes and routes that connect Woodburn's bicycle trip generators to provide a safe, interconnected bicycle system. Bicycle lanes are designated on arterial and service collector street segments with anticipated future volumes of over 3,000 daily vehicles with the exception of arterials and collectors within the historic area. On other roadways, it is typically appropriate for

bicyclists to share a lane with other vehicles. This on-street system should be supplemented by an off-street trail system along the Mill Creek and Goose Creek corridors, as discussed under the Pedestrian Plan.

Although bicycle lanes are not provided on arterial and collector streets within the historic area, a signed bike route will be provided on Settlemier, Garfield, Meridian, and 5th to guide bicyclists into the downtown area. The signage would direct cyclists north of ORE 214 into the downtown via 5th and Meridian. Cyclists originating south or ORE 214 would be signed into the downtown via the east-west facilities.

Rail Facilities Plan

As the opportunity arises, the City should pursue a potential rail passenger stop. Current discussions focus on extending the commuter rail planned between Wilsonville and Beaverton down to Salem. If this occurs, the City should seek a passenger stop. This stop could occur west of Butteville Road, north of Oregon 219. If this stop is established, the intra-city fixed route transit system should incorporate a stop at the rail station.

The City should also continue to investigate the opportunity to remove private grade crossings by providing alternative access to parcels as development and redevelopment occurs.

Air, Water, and Pipeline Transport Facilities Plans

There are no significant air, water or pipeline transportation facilities in Woodburn and none will likely be needed in the future.

Cost Estimates and Timing of Transportation Improvement Projects

Estimated costs for proposed transportation improvements were developed and grouped into three categories that include existing facility upgrades, construction of new facilities and existing facility extensions, and intersection improvements. In all, about $136.5 million (in 2004) dollars of road and transit service improvements for the City have been identified for the next 20 years.

Table 8-3 shows short-term (through the Year 2010) and long-term projects (2011-2020), including proposed improvement costs and associated owning jurisdiction.

TABLE 8-3
Proposed Transportation Improvements

Project Title	Estimated Capital Cost	Owning Jurisdiction
Short-Term (2005-10)		
Reconstruct I-5 interchange and Improve OR 214 between Woodland Avenue and Oregon Way	$50,000,000	State
OR 214 widening between Oregon Way and OR 99E and Woodland to Butteville Road	$21,950,000	State
Upgrade Butteville Road to minor arterial standards from Highway 211/214 to I-5	1,800,000	County/City

TABLE 8-3
Proposed Transportation Improvements

Project Title	Estimated Capital Cost	Owning Jurisdiction
standards from Highway 211/214 to I-5		
Ext. Stacey Allison Drive to Parr Road	$5,980,000	City
Service class facility between Evergreen Road and Stacy Allison Drive extensions	$2,260,000	City
Ext. Evergreen Road to Parr Road	$4,730,000	City
Ext. Stubb to Evergreen	$3,900,000	City
Upgrade of Parr Road to service collector standards	$3,000,000	County/City
Sub-Total	**$21,670,000**	
Intermediate Term (2011-2015)		
Upgrade of Crosby Road to minor arterial standards	$1,500,000	County/City
OR 99E widening between Lincoln Street and south city limits	$5,750,000	State
Ext. Ben Brown to Evergreen Extension	$4,700,000	City
5th Street upgrade to access street standards	$1,400,000	City
Signalize Meridian Drive/5th Street/OR 214	$400,000	City/State
Signalize Park Street/OR 214	$380,000	City
Add eastbound right-turn lane to Parr Road/Settlemier Road	$600,000	State
Signalize Front/OR 214 ramps	$180,000	City
Increase service frequency on transit routes	$400,000	City/State
Upgrade Boones Ferry and Front to provide continuous sidewalks and bicycle lanes	$975,000	City
Add northbound right, southbound left, eastbound right turn lanes and eastbound through-lane to Boones Ferry/OR 214	$900,000	State
Add loop ramp in southwest quadrant of OR 214/Front Street intersection	$1,800,000	State
Add southbound right-turn and westbound left-turn lane to OR 99E/OR 214	$580,000	State
Convert transit route to two-way operations	$180,000	City
Sub-Total	**$19,745,000**	
Long-Term (2016-2020)		
OR 99E widening between south city limits and south UGB	$2,900,000	State
Signalize southern Butteville Road/OR 214 intersection and add northbound right-turn lane	$275,000	State
Signalize northern Butteville Road/OR 214 intersection and add southbound right-turn lane	$750,000	County/City
Signalize Cleveland Street/OR 214	$400,000	State

TABLE 8-3
Proposed Transportation Improvements

Project Title	Estimated Capital Cost	Owning Jurisdiction
South Arterial between Parr Road and OR 99E	$11,780,000	City
Ext./Upgrade of Brown to South Arterial	$780,000	City
Two transit routes with one-way or two-way operations	$360,000 - $700,000	City
Off-street pathway along Mill and Goose Creek Corridors	$750,000	City
Sidewalks on existing service collectors, access and local streets	$540,000	City
Bicycle lanes on Garfield, Hardcastle, Young	$700,000	City
Sub-Total	**$19,235,000 – 19,575,000**	
Grand Total	**$60,650,000 – 60,990,000**	

* Improvements to County facilities outside of City of Woodburn urban growth boundary (UGB).

TABLE 8-4
Capital and Operating Costs for Transit Improvements

Alternative	Estimated Capital Cost	Operating Cost
1 – Increased Frequency	$180,000	$352,000
2 – Single Route with Two-Way Operations	$180,000	$352,000
3 – Two Routes with One-Way Operations	$360,000	$352,000
4 – Two Routes with Two-Way Operations	$700,000	$704,000
Grand Total	$1,420,000.00	$1,760,000.00

TABLE 8-5
2004-2009 Capital Improvement Program Major Projects

Project Title	Year(s)	Estimated Cost
Boones Ferry Road – Street Improvement	2004-05	$511,324
Boones Ferry Road – Undergrounding	2004-05	$96,000
Country Club Road Undergrounding	2004-05	$326,700
Front Street Improvements: Settlemier-Cleveland	2004-05	$675,000
Front Street Improvements: Hardcastle-WHS	2006-07	$585,000
Front Street Improvements: WHS-UGB	2007-09	$700,000
Front Street Undergrounding/Streetscape: Settlemier-Cleveland	2004-05	$250,000
Front Street Undergrounding/Streetscape: Cleveland-Hardcastle	2005-06	$640,000

TABLE 8-4
Capital and Operating Costs for Transit Improvements

Front Street Undergrounding/Streetscape: Hardcastle-UGB	2006-07	$442,606
Highway 214 to Front Street Connection Study	2008-09	$75,000
Hardcastle/Railroad Realignment	2006-07	$200,000
Parr Road Improvement: School to Centennial Park	2004-05	$297,600
West Hayes Improvement: Settlemier to Cascade	2008-2010	$464,000
Evergreen Road Improvement: Connect to Parr Road	2007-09	$950,000
Alley Improvement: Garfield-Cleveland	2004-05	$150,000
Cleveland Improvement: Front to First	2004-05	$117,800
Cleveland Improvement: Widen First to Second	2006-08	$175,000
N. Woodland Improvement: Camas-Stevens	2006-07	$50,000
Fifth Street Improvement North of Harrison	2008-09	$300,000
Harrison Street Improvement: Front to Settlemier	2006-07	$120,000
Hayes Street Improvement: Front to Second	2006-07	$80,000
Ogle Street/Settlemier Intersection	2004-06	$45,000
Grand Total		$7,251,030

Funding for Transportation Improvements

Existing Transportation Funding in Woodburn

Year 2002 transportation-related expenditures in Woodburn totaled $1,611,303 versus revenues of $4,819,672. Road-related expenditures represented 86 percent of the total transportation-related expenditures for 2002. Revenues for road-related funding needs represented 95 percent of total revenues. Revenues for both road-related and transit-related transportation funding exceeded expenditures.

Road-Related Funding

Table 8-1 presents itemized road-related revenues and expenditures for the 5 previous fiscal years. Revenues are itemized by source of funds. Expenditures are divided into cost categories. Transit-related revenues are reported separately in Table 8-2.

TABLE 8-1
Road-Related Funding in Woodburn

	1997-98	1998-99	1999-2000	2000-01	2001-02
			Revenues		
Working Capital Carryover	1,493,104	1,696,614	2,186,578	2,424,545	2,706,399
Interest from Investments	4,224	5,769	6,316	7,861	8,336
State Highway Trust Fund	690,045	695,835	754,253	766,843	842,069
State Revenue Sharing	35,000	40,000	40,000	40,000	40,000
Federal ISTEA Revenue	0	0	0	0	0
City Gas Tax	98,783	108,967	108,517	105,620	102,766
Fees and Assessments	547,719	795,772	548,412	718,501	806,212
Bond Proceeds	0	0	0	0	0
Other Revenues	26,412	78,630	41,414	17,960	50,410
Total Revenues	2,895,287	3,421,587	3,685,490	4,081,330	4,556,192
			Expenditures		
Personnel	299,145	310,667	321,460	346,114	362,004
Materials and Services	301,460	322,141	310,774	336,910	341,568
Capital Outlay	361,410	384,441	388,611	401,497	399,650
Bonds and Assessments	0	0	0	0	0
Transfers/Contingencies/UNAP	236,658	241,760	240,100	290,410	286,550
Total Expenditures	1,198,673	1,235,009	1,260,945	1,374,931	1,389,772

Source: City of Woodburn Budget

The City has a number of large, stable contributors to road-related transportation revenue. The State Highway Trust Fund, the City's Transportation Impact Fees (TIF), and the City gas tax all contribute significantly to available revenue. During the past 5 years, revenues from the State Highway Trust Fund have risen from $690,045 to $842,069, an increase of 22 percent. The Transportation Impact Fee program, which was instituted in 1994-1995, has increased dramatically from $547,719 to $806,212

(47 percent). The City gas tax revenue has remained steady at around $100,000 per year during the same period.

The largest category of expenditure during the past 5 years has been capital outlay, which comprised about 30 percent of total expenditures on average. Personnel and material and services costs typically represent 45 to 55 percent of total expenditures. Remaining expenditures are associated with transfers to other City departments and accounts for operating facilities and replacing equipment.

Transit-Related Funding

Table 8-2 presents itemized transit-related revenues and expenditures for the 5 previous fiscal years. Revenues are itemized by source of funds. Expenditures are divided into cost categories.

TABLE 8-2
Transit Funding in Woodburn

	1997-98	1998-99	1999-2000	2000-01	2001-02
			Revenues		
Working Capital Carryover	51,817	60,690	47,451	32,264	41,671
Property Taxes	77,711	85,317	96,447	93,853	105,979
Interest from Investments	976	1,110	1,240	1,976	2,630
Revenue from Other Agencies	36,215	78,626	160,331	48,530	91,790
Transit Fares	24,210	22,920	21,641	20,850	21,410
Total Revenues	190,929	248,663	327,110	197,473	263,480
			Expenditures		
Personnel	88,802	94,520	99,650	107,650	116,760
Materials and Services	35,937	39,615	41,246	41,562	41,740
Capital Outlay	0	60,577	147,450	0	56,531
Transfers/Contingencies/UNAP	5,500	6,500	6,500	6,500	6,500
Total Expenditures	130,239	201,212	294,846	155,802	221,531

Source: City of Woodburn Budget

Outlook for Existing Transportation Funding Sources

The State Highway Fund should be a relatively stable source of revenue for Woodburn. Because these funds are distributed to cities based on population,

Woodburn's share could increase or decrease depending on how it grows relative to the state average. Nonetheless, Woodburn's share of state funds will probably not increase as fast as its street maintenance requirements, especially as the system expands to serve current and future demands.

Revenue from the City's $0.01/gallon gas tax will gradually erode with inflation if not increased. Because the tax is based on quantity rather than price, tax revenues do not increase with gasoline prices. In fact, increases in gasoline prices may actually decrease tax revenue as higher prices reduce demand.

Revenues from development and impact fees will remain important sources of revenue for Woodburn. Bonds financed by Local Improvement Districts (LIDs) and fees from Systems Development Charge (SDC) will be largely dependent on the willingness of property owners to form LIDs and to initiate development projects that trigger SDC fees. Both may be dependent on population growth to increase property values and the general economic outlook from which to gauge risk. To the extent that these revenues are accurately set to the full cost of transportation improvements, they should allow Woodburn to construct basic capital improvements to serve commercial and residential development.

In summary, it is expected that sources of transportation revenue will remain relatively stable. Population growth should help support LID-financed improvements and SDCs assessed to new development will allow the City to put some resources toward future improvements. In addition, population growth may continue to give the City a slightly bigger share of the State Highway Fund.

The Oregon Transportation Investment Act (OTIA) was passed by the 2001 Oregon Legislative Assembly and is funded through bond proceeds derived from increased DMV fees. OTIA currently provides $650 million (including $150 million local matching funds) for 173 construction projects that will improve pavement conditions, increase lane capacity, and improve bridges throughout Oregon. Projects were selected with extensive input from local communities and other stakeholders. In 2002, the Oregon Transportation Commission allocated these funds for modernization, preservation, and bridge projects throughout the State. This signals a willingness and by the State Government to address transportation needs throughout the state.

The 2004 budget lays the groundwork for a $247 billion, 6-year reauthorization proposal, as compared to the current TEA-21 level of $218 billion. Of the proposed total, $195 billion would fund the highway program (up from $168 billion) over 6 years, and $45 billion would fund the transit program (up from $41 billion). Federal funding is typically distributed through the state.

Financing Needed for Transportation System Improvements

The projects identified represent an ambitious program of roadway and transit improvements for the City. The plan identifies over $85 million in transportation infrastructure improvements, which does not include the cost of the I-5 interchange

improvement project that has been identified as a high priority for funding. Constructing these improvements likely will require a higher level of transportation expenditures than Woodburn has made in the past. In the past 5 fiscal years, Woodburn has spent between $1.3 and $1.6 million for road improvements and transit service. Depending on how the projects are eventually sequenced and staged, the improvements identified may require Woodburn to spend twice the amount (annually) they have averaged during the past 5 years.

It is expected that Woodburn will want to pursue additional funding for transportation from the following sources:

- State or Marion County funds.
- Obtain funds from the state for improvements to the state highway. Explore cost sharing with the County for mutually beneficial projects.
- Local Improvement Districts.
- For public improvement projects with localized benefit (e.g., neighborhoods), property owners pay all or a portion of the project cost.
- Urban Renewal Districts.
- Formed to finance projects to remove "blight" (typically, poor-quality buildings or inadequate streets). Property taxes allocated to district based on "division of tax" calculation for the renewal district.
- Transportation Impact Fees.

For projects that do not relate directly to new development or directly benefit property owners, spread the cost and provide funding from existing transportation funding sources such as TIF fees.

- General Obligation Bonds.

Obtain bond backing from property tax revenue if determined by City staff and the governing body to be fair and viable.

The likely funding sources for transportation improvements in Woodburn are presented below. Woodburn should pursue funding sources at the federal, state, and local level and develop strategies to maximize the potential for each of these sources to implement its transportation improvements.

Federal and State Sources

Woodburn should access federal funds by working with ODOT. A key action will be to get improvement projects listed as part of the STIP in order to qualify them for funding in the adopted plan every 2 years. The City should also work with ODOT to determine the potential for project funding under the upcoming highway bill reauthorization.

The state has a number of programs that can be tapped for improvements related to congestion relief, footpaths and bikeways, and other special projects.

County Sources

Woodburn may be able to secure an occasional cost-sharing arrangement with Marion County and should seek to coordinate with the County on transportation improvements within the County in order to partner on projects wherever possible.

Local Sources

Woodburn should continue to seek funds from property owners who directly benefit form transportation improvements that enable new development.

APPENDIX A

CITY OF WOODBURN

2005-2006 CAPITAL IMPROVEMENT PROGRAM

CAPITAL IMPROVEMENT PROGRAM SUMMARY

The six-year capital improvement program (CIP) estimates spending on capital projects (infrastructure construction) for the years 2005-06 through 2010-11. The CIP is updated annually and is a component of the annual budget. Appropriations for 2005-06 are included in the adopted capital budgets.

The projects included here do not represent all of Woodburn's improvement needs, only the most pressing needs at the present time, as recommended by the department heads and staff. It is fully expected that upon annual review in successive years the list will grow, and priorities will be changed to meet then-current needs and conditions.

#	Fund Title	2002-03 Expended	2003-04 Expended	2004-05 Amended	2004-05 Yr End Est.	2005-06 Baseline	2005-06 Adopted	Change ($)	Change (%)
135	State Revenue Sharing	118,284	109,376	294,400	217,285	229,715	251,715	-42,685	-14.5%
169	City Gas Tax	25,694	8,670	439,238	185,000	381,738	381,738	-57,500	-13.1%
336	Economic Development	36,730	36,085	329,507	75,424	259,583	259,583	-69,924	-21.2%
358	General Fund CIP	576,804	877,452	559,491	432,000	97,491	468,541	-90,950	-16.3%
360	Special Assessment	717,746	625,795	1,548,613	444,000	582,000	582,000	-966,613	-62.4%
363	Street/Storm Cap. Improv	277,553	365,115	2,377,648	920,300	1,750,721	3,051,721	674,073	28.4%
364	Parks Cap. Improvement	25,000	0	724,982	0	943,000	943,000	218,018	30.1%
376	Transp. Impact Fee	996,442	3,156,050	6,207,023	96,500	5,885,412	5,885,412	-321,611	-5.2%
377	Storm Water SDC	93,673	14,509	1,099,839	215,000	944,839	969,839	-130,000	-11.8%
378	PW Facility Expansion	4,738	3,278	46,994	14,377	30,876	30,867	-16,127	-34.3%
461	Sewer Cap. Development	47,860	47,860	168,146	79,860	106,089	116,089	-52,057	-31.0%
465	Sewer Construction	3,138,146	2,638,126	4,569,244	3,037,856	3,063,331	3,338,331	-1,230,913	-26.9%
466	Water System Const.	2,002,689	11,271,282	9,155,829	5,922,118	3,327,601	3,509,256	-5,646,573	-61.7%
474	Water System Develop.	2,443,000	0	1,597,885	740,000	1,087,885	1,087,885	-510,000	-31.9%
475	Sewer System Develop.	500,000	0	2,195,536	845,139	1,747,397	1,747,397	-448,139	-20.4%
	TOTAL	11,004,359	19,153,598	31,314,375	13,224,859	20,437,678	22,623,374	-8,691,001	-27.8%

The six-year plan proposes projects totaling $40,181,027. Street improvements total $10,460,313; water improvements total $1,467,400; sewer improvements total $13,275,200; Parks improvements total $8,045,064; Police Construction improvements total $6,701,000; and other General Fund projects total $232,050.

Project costs for fiscal years 2005-06 to 2010-11 are estimated at current values. Actual cost will depend on variables including the timing of projects, contractor availability, modifications to the scope of projects, and the future value of money. Projects designated to be funded from the General Fund are done so within the limits of resources in that Fund.

The criteria used to develop the CIP are as follows:

- Accommodate future growth;
- Resolve known or predictable problems;
- Upgrade major deteriorated portions of infrastructure; and
- Improve level of service to the public.

Projects to be completed in 2005-06 total $13,712,745. Of that amount, SDC's will fund $2,258,400 of parks, water, sewer, street, and storm projects. Utility rates will finance $1,391,700, of water and sewer projects. Of the remaining projects, $6,701,000 will be supported by the Police Facility General Obligation Bond, $448,050 will be supported by the General Fund, $686,500 by franchise fees, $586,195 by gas tax, $43,600 by special assessments, $1,251,000 by Urban Renewal, and $346,300 by grants and loans.

CAPITAL IMPROVEMENT PROGRAM: 2005-06 THROUGH 2010-11

No	Project	Revenue Source	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
	General Fund Capital Improvement Program								
	Other Programs								
1	Replace Library HVAC Compressors	General Fund CIP	10,000						10,000
2	Upgrade Library Restrooms	General Fund CIP	6,200						6,200
3	Replace Library Windows w Broken Seals	General Fund CIP	850						850
	Total Other Programs		17,050	0	0	0	0	0	17,050
	Police Facility								
3	Police Facility Construction	Gen Oblig Bond	6,701,000						6,701,000
	Total Police Facility		6,701,000	0	0	0	0	0	6,701,000
	Aquatic Center								
1	Replace Main Pool Heater	General Fund CIP	25,000						25,000
2	Replace Main Pool Electrical Panel	General Fund CIP	20,000						20,000
3	Paint Facility Exterior			10,000					10,000
4	Resurface Main Pool			105,000					105,000
5	Locker Room Tile			55,000					55,000
	Total Aquatic Center		45,000	170,000	0	0	0	0	215,000
	Recreational Facilities								
1	Boones Crossing	Developer Dedication					850,000		850,000
2	Burlingham Park Renovation	Unknown		77,000					77,000
3	Senior Estates Park Renovation	Unknown			60,500				60,500
4	Nelson Park Improvements	Unknown			132,000				132,000
5	Centennial Park - Conc. Bldg. Picnic Shelter	Unknown		50,000	100,000				150,000
6	Centennial Park – Ballfield #3	Donations	32,500						32,500
7	Centennial Park - Ballfield #4/Field Ltg.	Unknown			50,000	82,500			132,500
8	Settlemier Park Acquisitions	Unknown		110,000	325,000				435,000
9	Settlemier Park Renovations	Unknown		191,245		391,245		567,250	1,149,740
10	Legion Park Renovations	Unknown			612,037		612,037		1,224,074
11	Locomotive Park	Unknown			15,000				15,000
12	Library Park	Unknown			17,000				17,000
13	Hermanson Pond Design and Improvement	WHIP Grant	45,000						45,000
14	Greenway Acquisition	Grants		33,000					33,000
15	Greenway Construction - Future	Grants			10,500		32,750	39,500	82,750
16	Greenway Construction - Hermanson I, II, III	Grants/Donations	78,000						78,000
17	Comprehensive Plan Revision	Parks SDCs	15,000						15,000
18	Woodburn Community Center Replacem.	Prop Liquidation		300,000					300,000
		Parks SDCs		1,565,200					1,565,200
		Private Grants		500,000					500,000
		CDBG Grants		800,000					800,000
		Fund Raising		100,000					100,000
19	Woodburn Community Center Design	Parks SDCs	50,000	50,000					100,000
	Total Recreational Facilities		220,500	3,776,445	1,322,037	473,745	1,494,787	606,750	7,894,264

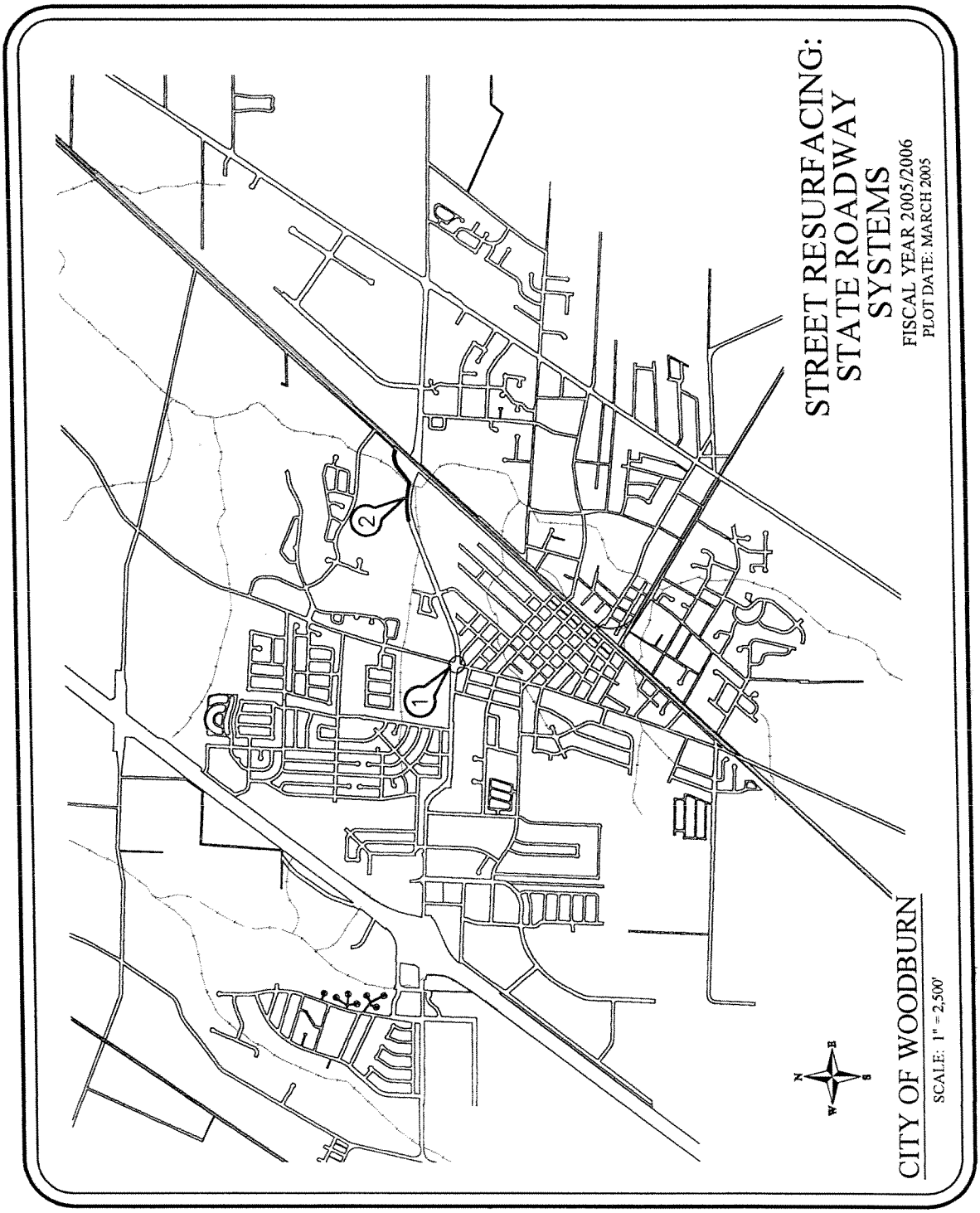
No	Project	Revenue Source	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
	Parks Maintenance								
1	Settlemier Park Irrigation (Phase I)	General Fund CIP	15,000						15,000
2	Settlemier Park Irrigation (Phase 2)			30,000					30,000
3	Settlemier Park Fence Repair			6,800					6,800
4	Legion Park Irrigation Plan			4,000					4,000
5	Playground Equipment Replacement			10,000	10,000				20,000
6	Legion Park Irrigation				40,000				40,000
7	Settlemier Park Elec Syst Upgrde (Phase I)	General Fund CIP	20,000						20,000
8	Settlemier Park Elec Syst Upgrde (Phase 2)			15,000					15,000
	Total Parks Maintenance		35,000	65,800	50,000	0	0	0	150,800
	Total General Fund CIP		**7,018,550**	**4,012,245**	**1,372,037**	**473,745**	**1,494,787**	**606,750**	**14,978,114**
	Public Works Capital Improvement Program								
	Street Resurfacing: State Roadway Systems								
1	Boones Ferry/Settlemier/Hwy 214 Intersection*	TIF/ODOT/SpAsmt	611,900						611,900
2	Highway 214 Sidewalk - Phase 2**	ODOT Grant/SRS	107,000	200,000	198,550				505,550
	Total State Roadway System		718,900	200,000	198,550	0	0	0	1,117,450
	** Project bid to be let by ODOT.*								
	*** Local share of project is $25,000*								
	Street Improvements: Major Upgrades								
1	Country Club Rd	TIF/SpAsmt/CIP	326,700						326,700
2	Hwy 214 to Front St. Conn. (study)	St. Storm CIP	75,000						75,000
3	Front St Undergrounding/Streetscape								
	A. Front St.: Cleveland to Hardcastle	UrbRen	640,000						640,000
	B. N. Front: Hardcastle-N UR bound.	UrbRen		442,606					442,606
4	Front Street Street Improvements								
	A. S. Front St: Settlemier- Cleveland	UrbRen/TIF/CIP/EcDev	611,000						611,000
	B. N. Front St.: Hardcastle - WHS	UrbRen/ODOT/CIP			585,000				585,000
	C. N. Front St: WHS to UGB	St. CIP/TIF/Sp Asmt				200,000	500,000		700,000
5	Hardcastle/Railroad Realignment	St. CIP/TIF/Other		200,000					200,000
6	Parr Rd.: School to Centennial Park	WaterConst/ParksSDC	297,600						297,600
7	W. Hayes: Settlemier to Cascade	St. CIP/TIF				100,000	364,000		464,000
8	Evergreen Rd: connect to Parr Rd	Developer/TIF			475,000	475,000			950,000
9	Alley: Garfield - Cleveland	Street CIP/SpAsmt	169,900						169,900
10	Cleveland: Front to First	St. Storm CIP	117,800						117,800
11	Cleveland -- widen First to Second	State Rev. Sharing		25,000	150,000				175,000
12	N. Woodland: Camas - Stevens	St. CIP/Sp Asmt		50,000					50,000
13	Fifth St: north of Harrison	St. CIP/Sp Asmt				300,000			300,000
14	Harrison; Front to Settlemier	St. CIP/TIF/Sp Asmt		120,000					120,000
15	Hayes: Front to 2nd	SRS/Other		80,000					80,000
16	Ogle Street Design Study	St. Storm CIP	35,000	20,000					55,000
17	Miscellaneous Modifications								
	A. Pedestrian Movements								
	1. Brown St Walkway 0.5 City/0.5 Developer	Str CIP	20,000						20,000

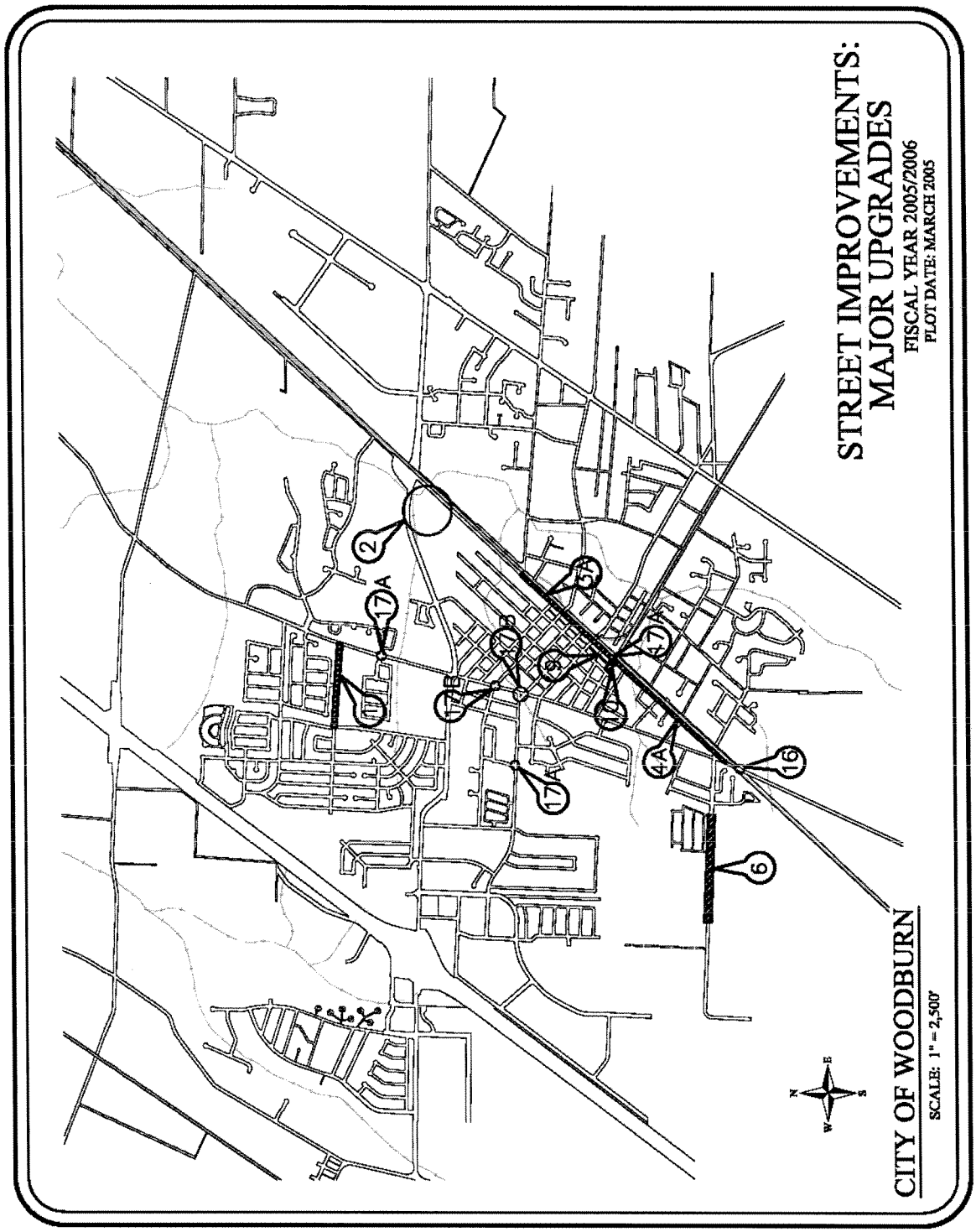
No	Project	Revenue Source	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
	2. Safety Sidewalk Construction	St. CIP	15,000						15,000
	3. Safety Signal	St. CIP							
	N. BoonesFerry @ Henrys Farm	SRS	26,400						26,400
	Hayes @ Cozy Lane	SRS	26,400						26,400
	Hardcastle @ Park Ave.	SRS		27,700					27,700
	4. Downtown Walkway	SRS	22,000						22,000
	B. Intersections								
	1. Hayes/Bottle/Settlemier	St.CIP/Water Const.	150,000	30,000					180,000
	2. Settlemier/W. Lincoln	St. CIP	25,000						25,000
	3. Lawson/Highway 214	SRS			50,000				50,000
	C. Misc. Capacity Improvements	TIF/CIP	35,000	35,000					70,000
	Major Upgrades Total		2,592,800	1,030,306	1,260,000	1,075,000	864,000	0	6,822,106
	Street Resurfacing: Gravel Streets								
1	No Name Street	SRS, GF, SpAsmt	60,000						60,000
2	Tout Street	SRS,CIP, GF, SpAsmt		106,000					106,000
3	Carol Street	SRS,CIP, GF, SpAsmt			117,046				117,046
4	Wilson Street	SRS,CIP, GF, SpAsmt				82,277			82,277
5	Alexandra Street	SRS,CIP, GF, SpAsmt					78,000		78,000
6	Elm Street	SRS,CIP, GF, SpAsmt						50,000	50,000
7	Church Street, 1st to 2nd	SRS,CIP, GF, SpAsmt						TBD	
8	Yew Street, 2nd to 3rd	SRS,CIP, GF, SpAsmt						TBD	
	Total Gravel Streets		60,000	106,000	117,046	82,277	78,000	50,000	493,323
	Street Maintenance & Restoration: Poor Streets - 1-1/2" Lift "C" Mix								
1	Bryan St:McKinley to Lincoln, 650'	Gas Tax/SRS/St Fund	34,000						34,000
2	McKinley St: Bryan to Hwy. 99E	Gas Tax/SRS/St Fund	83,000						83,000
3	Rainier Rd: Astor to Delmoor, 1275'	Gas Tax/SRS/St Fund	70,000						70,000
4	Broughton Way, All	Gas Tax/SRS/St Fund	25,000						25,000
5	Vanderbeck:Princeton to Upmqua	Gas Tax/SRS/St Fund	39,115						39,115
6	Cahill, All, 440 ft.	Gas Tax/SRS/St Fund	25,880						25,880
7	Hampton Way	Gas Tax/SRS/St Fund	45,000						45,000
8	Garfield St: Alley to 2nd, 500 ft.	Gas Tax/SRS/St Fund	15,000						15,000
9	Arthur St: Front to First	Gas Tax/SRS/St Fund	20,000						20,000
10	Arthur St: Third to Settlemier	Gas Tax/SRS/St Fund	15,000						15,000
11	Grant, Front to First	Gas Tax/SRS/St Fund	30,000						30,000
12	Oak St: Front to Settlemier	Gas Tax/SRS/St Fund	48,000						48,000
13	Micellaneous Repair	Gas Tax/SRS/St Fund	50,000						50,000
14	Thompson, All	Gas Tax/SRS/St Fund		160,000					160,000
15	Ecola Way	Gas Tax/SRS/St Fund		23,422					23,422
16	Elana Dr. (North)	Gas Tax/SRS/St Fund		46,884					46,884
17	Quinn Road	Gas Tax/SRS/St Fund			112,000				112,000
18	Walton Way	Gas Tax/SRS/St Fund			65,000				65,000
19	Dellmoor Way	Gas Tax/SRS/St Fund			71,000				71,000
20	Brown Street, Pvmt Rest (½ cost)	Gas Tax/SRS/St Fund				50,000			50,000
21	Miscellaneous Street Resurfacing	Gas Tax/SRS/St Fund				150,000	150,000		300,000
	Street Maintenance & Restoration Total		499,995	230,306	248,000	200,000	150,000	0	1,328,301

No	Project	Revenue Source	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
	Street Preventative Maintenance: Fair Streets - 3/4" to 1" Lift "D" Mix								
1	Blaine St: Gatch to Hwy. 99E	Gas Tax/SRS/St Fund	44,000						44,000
2	Rainier/Delmoor/Country Club	Gas Tax/SRS/St Fund	40,000						40,000
3	Tomlin Avenue	Gas Tax/SRS/St Fund	81,300						81,300
4	George St./Landau	Gas Tax/SRS/St Fund	51,000						51,000
5	First St. - Cleveland to Harrison	Gas Tax/SRS/St Fund		50,000					50,000
6	Second Street - Oak to Harrison	Gas Tax/SRS/St Fund		45,000					45,000
7	Elana Dr. (South)	Gas Tax/SRS/St Fund		13,175					13,175
8	Brandywine Ct.	Gas Tax/SRS/St Fund		14,639					14,639
7	Kelwona Ct.	Gas Tax/SRS/St Fund		16,103					16,103
8	Kelwona St.	Gas Tax/SRS/St Fund		21,958					21,958
9	Miscellaneous Street Resurfacing	Gas Tax/SRS/St Fund		21,958	100,000	100,000	100,000		321,958
	Street Preventative Maintenance Total		216,300	182,833	100,000	100,000	100,000	0	699,133
	Water: Water System Reconstruction								
1	Hwy. 214 widening	Water Fund		44,000					44,000
2	Laurel Avenue (replace line)	Water Fund/SDC 474	35,000						35,000
3	Hwy. 99E: Tomlin to Laurel	Water Fund/SDC 474	52,000						52,000
4	Hwy. 99E: Laurel to Aztec	Water Fund/SDC 474	16,500						16,500
5	99E at Silverton Road (bore)	Water Fund/SDC 474			110,000				110,000
6	N. First Street/N. Second (loop)	Water Fund/SDC 474		18,700					18,700
7	N. Fifth Street (replace line)	Water Fund		44,000					44,000
8	Hwy. 214 @ Mill Creek								
	A. Bore	Water SDC 474	68,200						68,200
	B. Loop Line installation	Water SDC 474		132,000					132,000
9	Hwy. 99E: Blaine to Aztec	Water Fund/SDC 474			44,000				44,000
10	Hwy. 99E: Blaine to Lincoln	Water Fund/SDC 474			66,000				66,000
11	99E South (New Line)	Water Fund/SDC 474			132,000				132,000
12	Water Treatment	Wtr Const/SDC	500,000						500,000
13	Hazelnut Dr. - Replace Bridge Line	Water Fund			55,000				55,000
14	Parr Road to Evergreen Loop	Developer/Wtr/Wtr Const						TBD	0
15	Hawthorne Circle Line Extension	Water Fund/SDC 474	35,000						35,000
16	Remove Small Water Tank	Water Const		75,000					75,000
17	Misc. Capacity Improvements	Water SDC 474	40,000						40,000
	Water System Reconstruction Total		746,700	313,700	407,000	0	0	0	1,467,400
	Wastewater: Treatment Plant								
1	Storm Water Treatment Impvts	Sewer Const 465			120,000				120,000
2	Effluent Storage Pond	Sewer Fund/SDC			80,000				80,000
3	Pilot Poplar Harvest & Replant	Sewer Fund/SDC			5,000	25,000			30,000
4	UV System Expansion	Sewer Fund/SDC		75,000	75,000				150,000
5	Chemical & Generator Roof Replacement	Sewer Fund/SDC			12,000				12,000
6	FSL Dredge Installation	Sewer Fund			160,000				160,000
7	Bypass Aeration @ Outfall	Sewer Const 465		15,000	20,000				35,000
8	Reuse System Phase 1.5	Sewer Fund		25,000	450,000	2,500,000			2,975,000
9	Excess Thermal Load-Complaince	Sewer Fund		25,000	500,000	175,000	30,000		730,000
10	Winter Ammonia-Compliance	Sewer Fund		10,000	100,000				110,000
11	Facility Plan Update -- Phase II	Sewer Const			25,000	100,000			125,000

No	Project	Revenue Source	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
12	Second MCPS Design & Construction	Sewer Const			25,000	200,000	1,500,000	1,500,000	3,225,000
13	MCPS Pump Replacement & Monorail Const	Sewer Const 465			62,000	75,000			137,000
14	Rainier LS Base Repair	Sewer Fund 472			35,000				35,000
15	LS Electrical Upgrade Complaince & Monitoring	Sewer Fund 472			45,000				45,000
16	Industrial Ave Pump Station Rehab	Sewer Const/Eq Repl	390,900						390,900
17	Greenview Pump Station Upgrade	Sewer Const/Eq Repl	499,000						499,000
18	Rainier, Force main Extension	Sewer Fd/SwrConst		125,000	125,000				250,000
19	SW Pump Station (City Share)	Sewer Fund				100,000			100,000
20	Septage Expansion	Sewer Const 465	20,000						20,000
	Treatment Plant Construction Total		909,900	275,000	1,839,000	3,175,000	1,530,000	1,500,000	9,228,900
	Wastewater: Collections System Construction								
1	Santiam Lift Sta/Line Installation	Sewer Const 465		210,000					210,000
2	N. Trunk Rehab/Hazelnut Br Xing	Sewer Const 465				25,000	75,000	350,000	450,000
3	Mill Creek Trunk								
	A. Extension to Shalimar	Sewer Const 465					125,000	150,000	275,000
	B. Rehab Cleveland-Wilson	Sewer Const 465				325,000			325,000
4	N. 1st Harrison to Noname	Sewer Const 465			30,000	30,000			60,000
5	Smith Addn to New Well at Settlemier	Sewer CIP 461		16,000					16,000
6	Arthur - Third to Settlemier	Sewer Const 465		52,700					52,700
7	Alley - Hayes to Garfield (East of Plaza)	Sewer Const 465/I&I	40,000						40,000
8	Rehab/I & I Removal	Sewer Fund 472	10,000	20,000	20,000	20,000	20,000	20,000	110,000
9	Alley Pipe	Sewer CIP/Const	20,000						20,000
	Collections System Construction Total		70,000	298,700	50,000	400,000	220,000	520,000	1,558,700
	Wastewater: Storm Drain Construction								
1	Bryan St Outfall Upgrade	Storm SDC/CIP	48,000						48,000
2	Brown Storm: Wilson - Cleveland	Storm SDC/CIP	150,000						150,000
3	Garfield-Workman-Hayes SD	Storm CIP	59,200						59,200
4	W. Lincoln: East of Cascade (500')	Storm SDC/CIP		45,000					45,000
5	Landau/Laurel Storm (to Pudding)	Storm SDC/CIP	50,000	500,000	200,000				750,000
6	Marshall Street Culvert (P3)	Storm SDC/CIP			80,000				80,000
7	North 1st & 2nd - North of Church St. (P6)	Storm SDC/CIP				95,000	95,000		190,000
8	N. Front Det. -culvert to Commerce (P2)	Storm SDC/CIP	51,000	100,000					151,000
9	Hardcastle Culvert Replacement (P1)	Storm SDC/CIP		192,000					192,000
10	Settlemier Det. & Outlet Works (P8) Ph. 1	Storm SDC	194,400						194,400
11	Settlemier Det. & Outlet Works (P8) Ph. 2	Storm SDC	200,000	200,000					400,000
12	Misc. Wetland Mitigation	Storm SDC/CIP	25,000	25,000	25,000	25,000			100,000
13	Reline Settlemier Crossing N. of Hayes	Storm SDC/CIP	20,000						20,000
14	Reclaim Channel N. of Progress Way	Storm SDC/CIP	7,000						7,000
15	3rd St @ Nuevo Amanecer - to Hwy 214	Storm SDC/CIP		26,000					26,000
16	N. 1st & 2nd Street – Oak Street	Storm SDC/CIP	75,000						75,000
	Storm Drain Construction Total		879,600	1,088,000	305,000	120,000	95,000	0	2,487,600
	Total Public Works CIP		**6,694,195**	**3,724,845**	**4,524,596**	**5,152,277**	**3,037,000**	**2,070,000**	**25,202,913**
	TOTAL CITY CIP		**13,712,745**	**7,737,090**	**5,896,633**	**5,626,022**	**4,531,787**	**2,676,750**	**40,181,027**

CAPITAL IMPROVEMENT PROGRAM MAPS




STREET IMPROVEMENTS:
MAJOR UPGRADES
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
2
17A
17B
17A
5A
17A
4A
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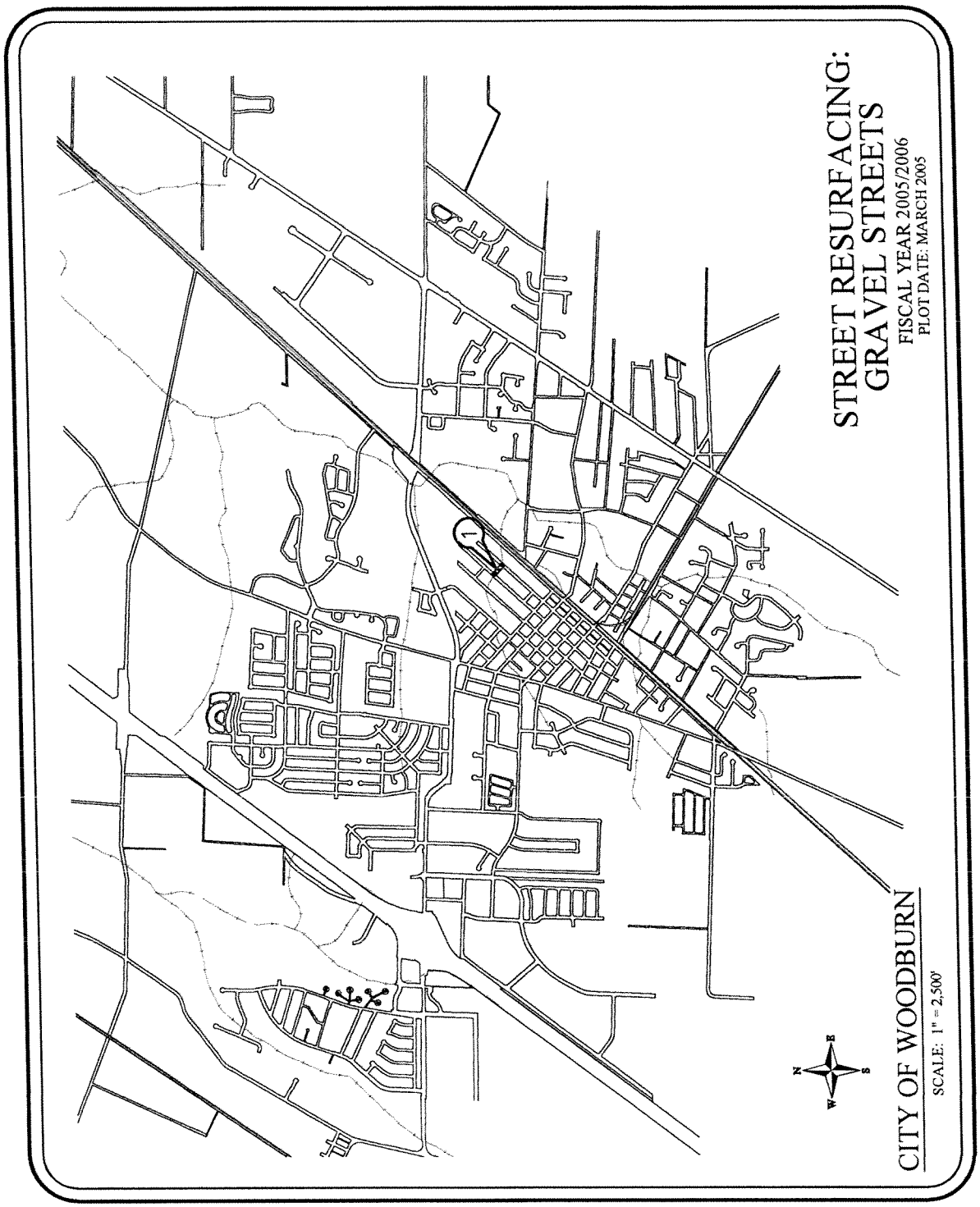
STREET RESURFACING:
GRAVEL STREETS
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
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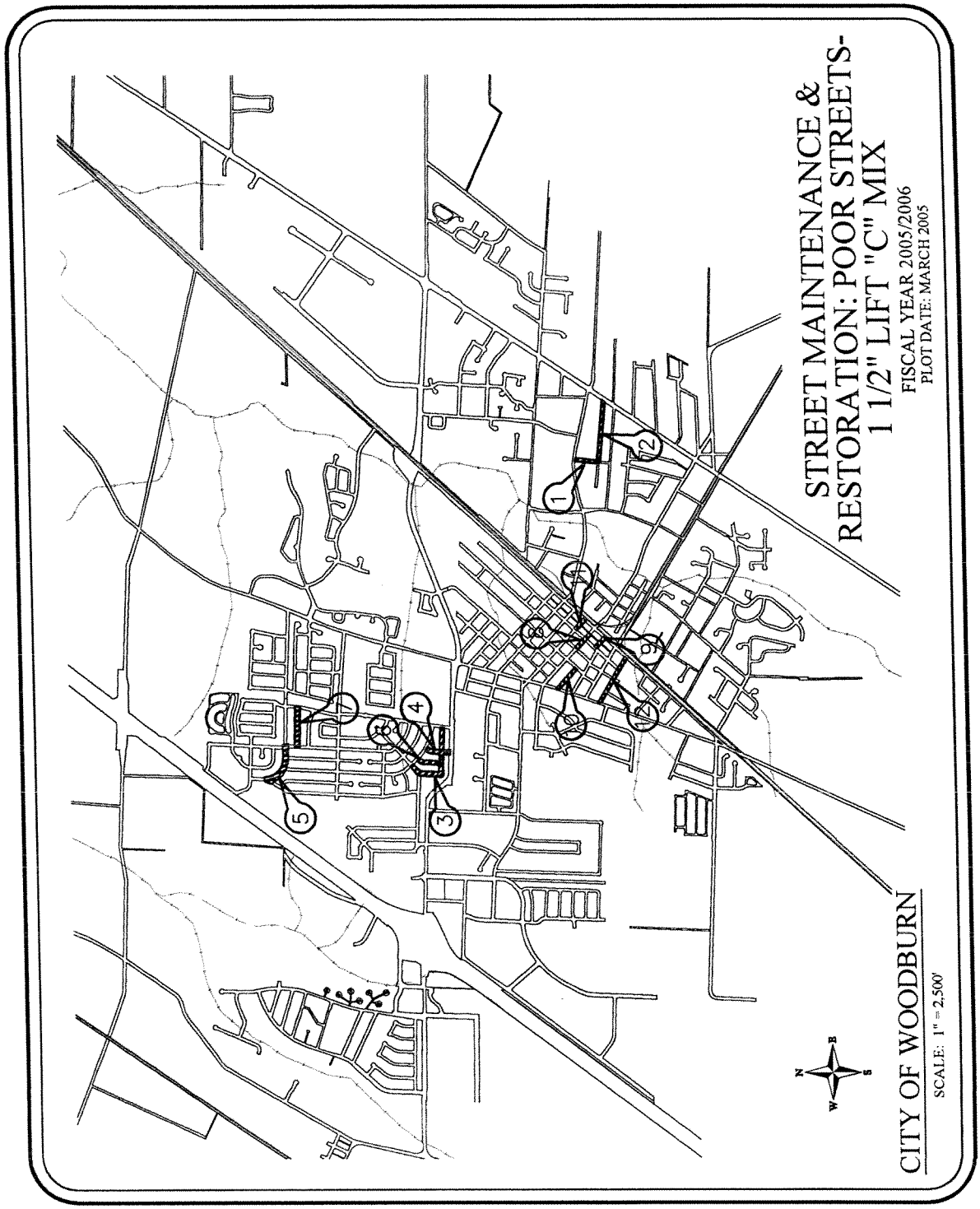
STREET MAINTENANCE &
RESTORATION: POOR STREETS-
1 1/2" LIFT "C" MIX
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
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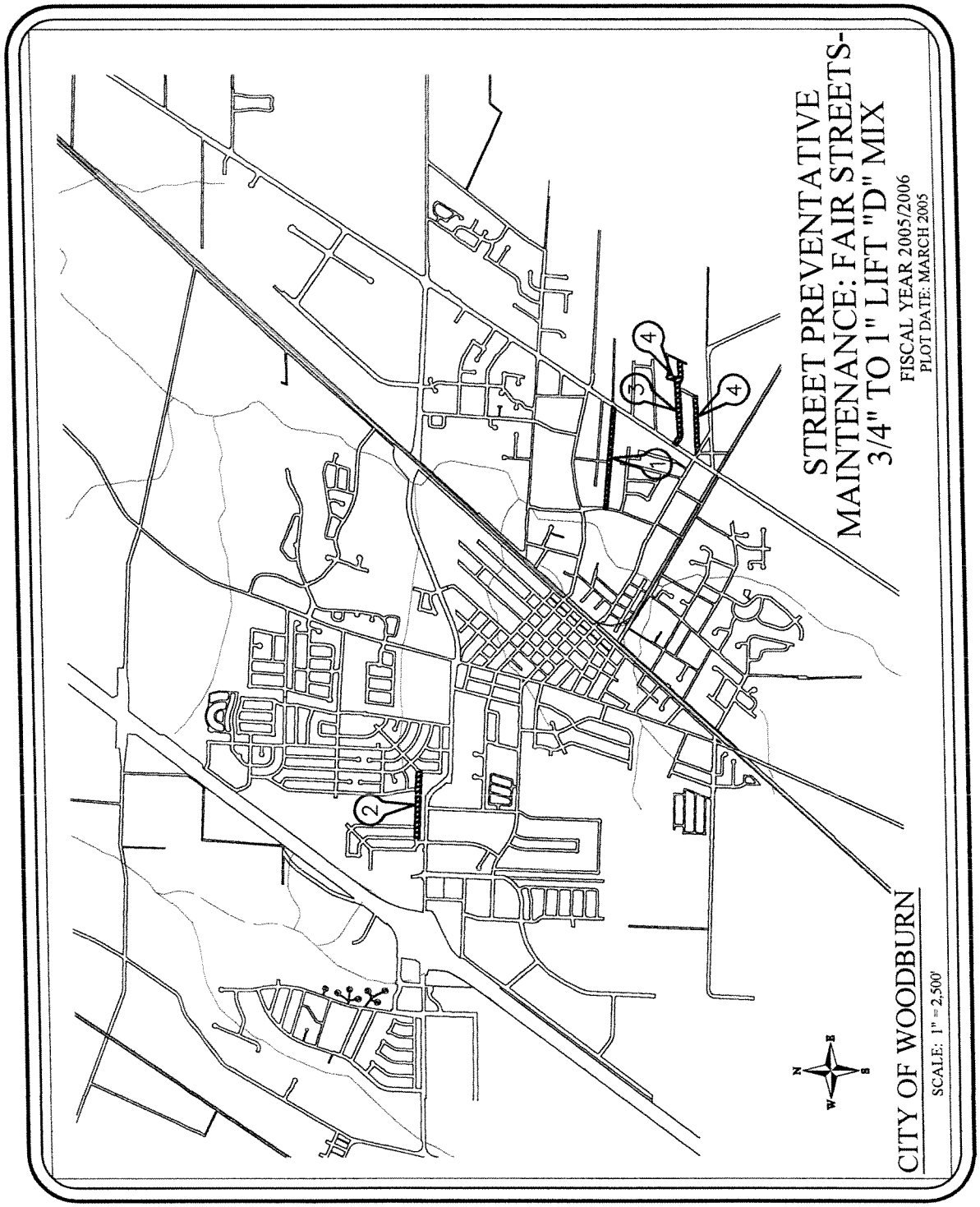
STREET PREVENTATIVE
MAINTENANCE: FAIR STREETS-
3/4" TO 1" LIFT "D" MIX
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
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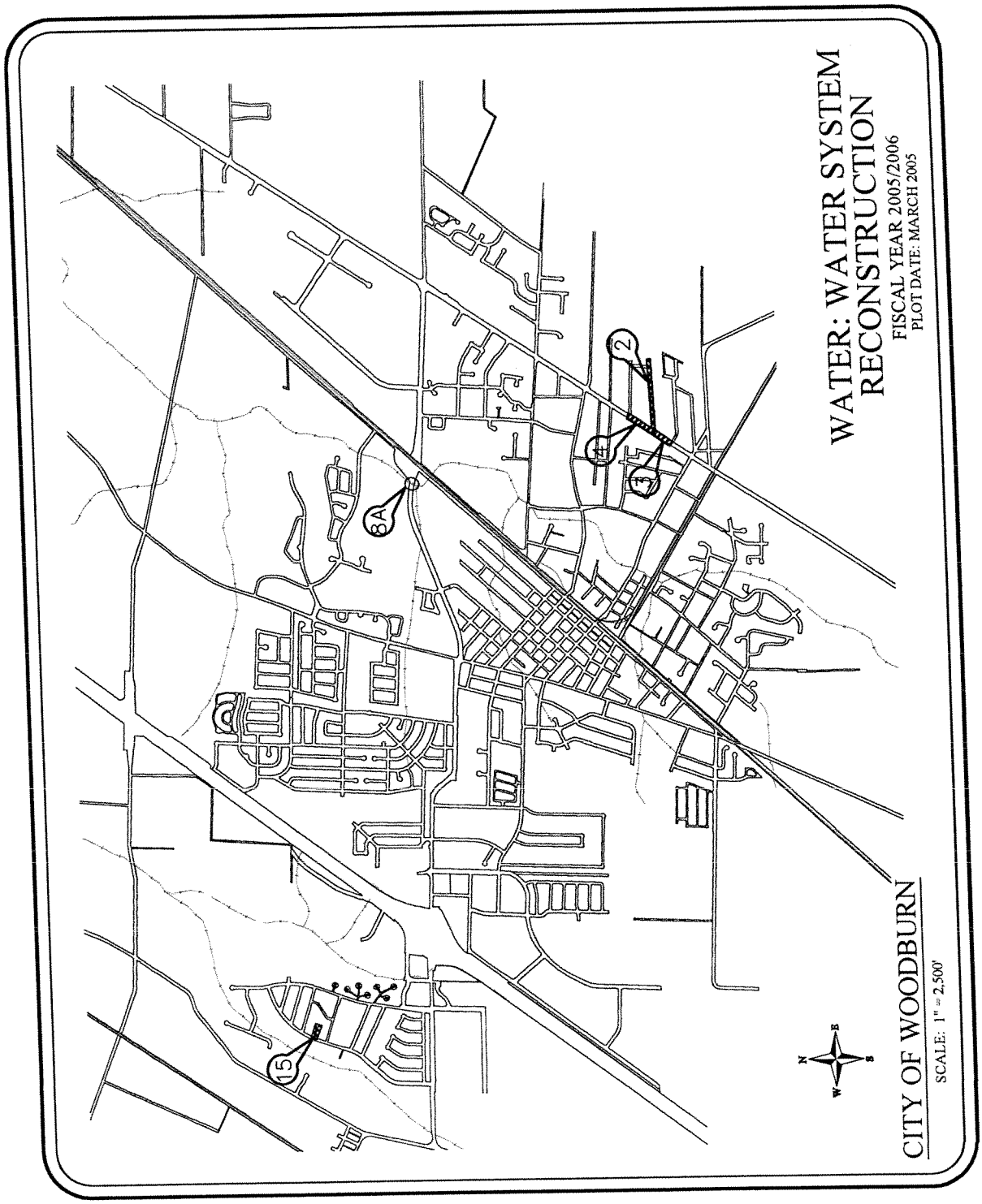
WATER: WATER SYSTEM RECONSTRUCTION
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
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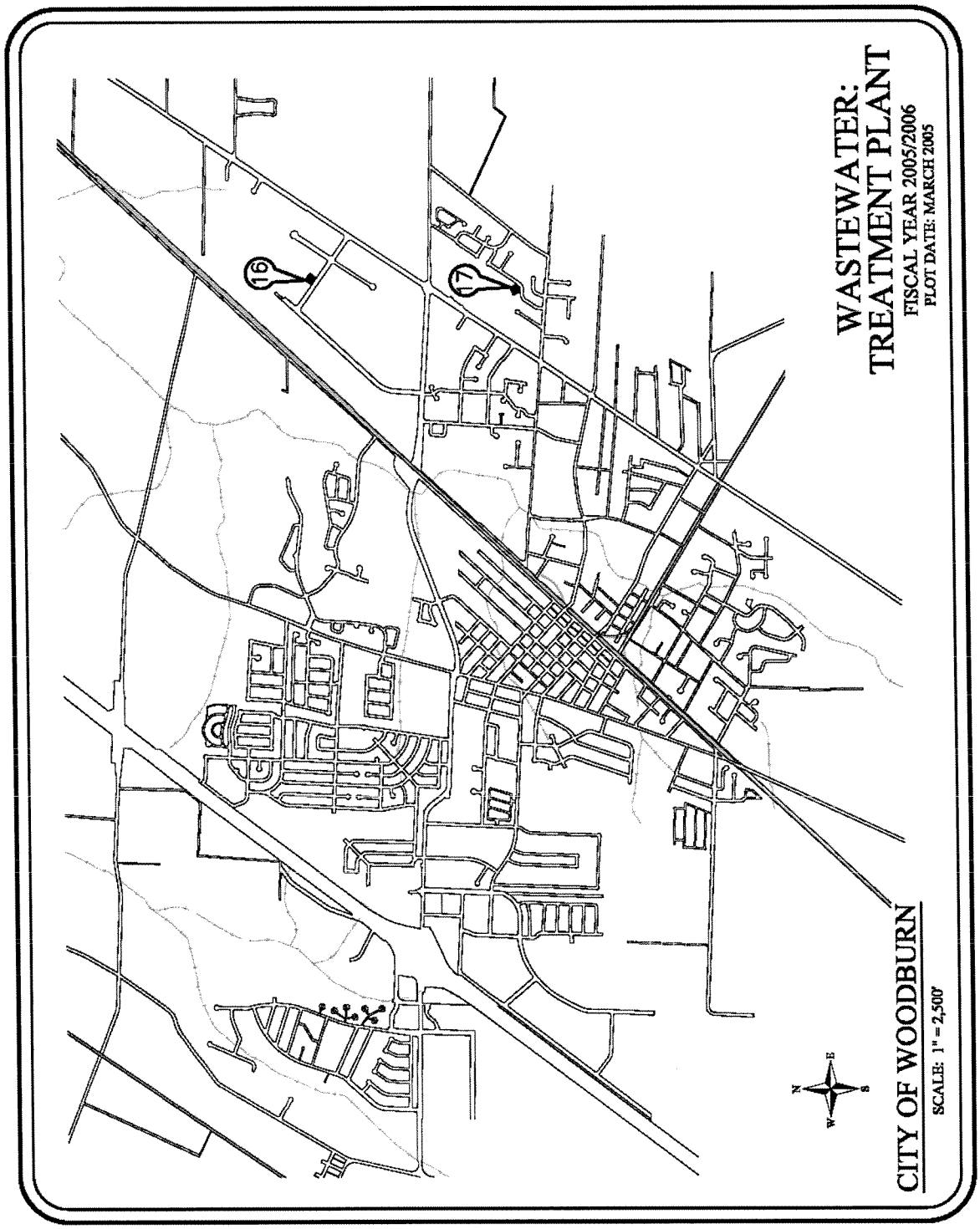
WASTEWATER:
TREATMENT PLANT
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
16
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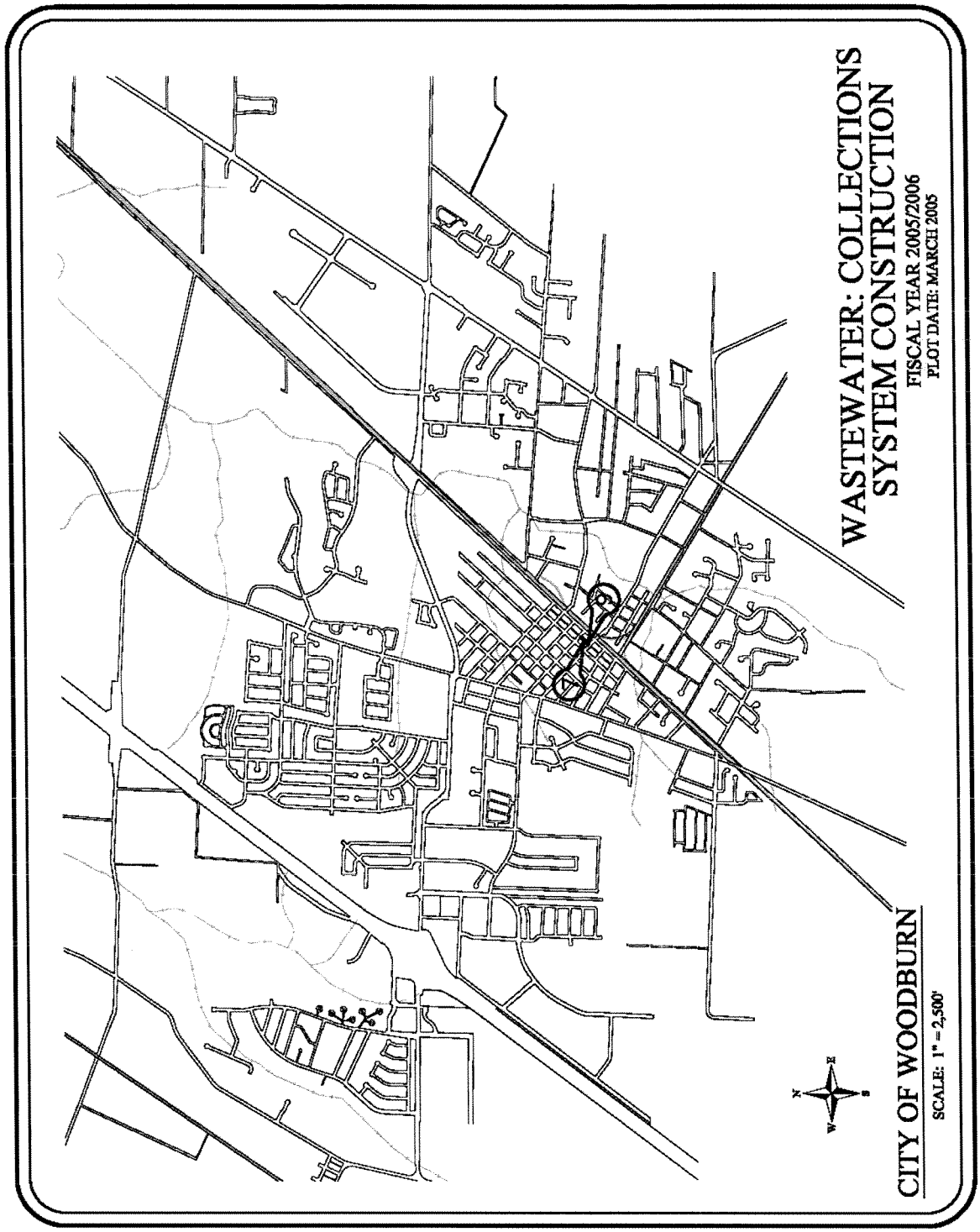
WASTEWATER: COLLECTIONS
SYSTEM CONSTRUCTION
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
N
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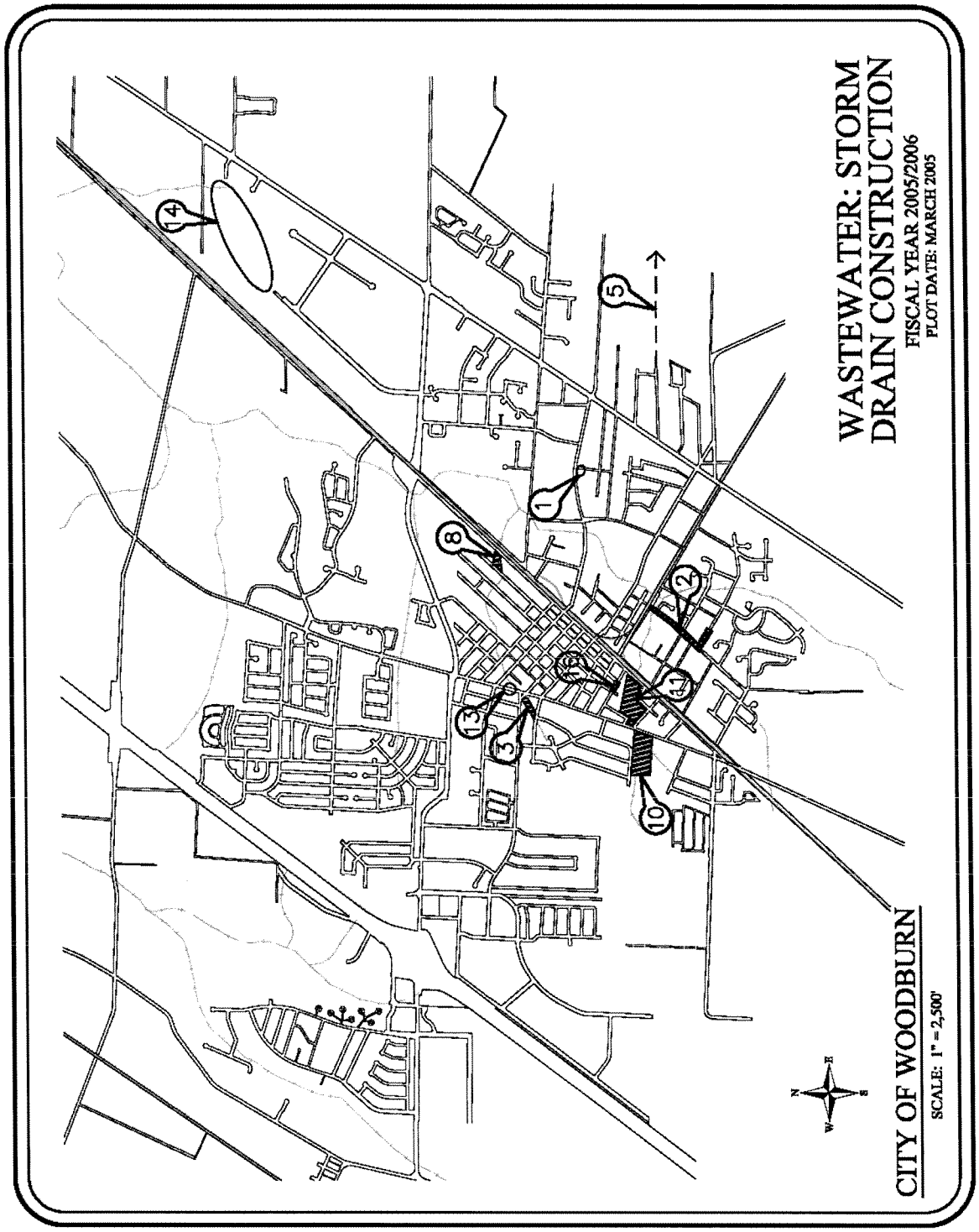
WASTEWATER: STORM
DRAIN CONSTRUCTION
FISCAL YEAR 2005/2006
PLOT DATE: MARCH 2005
CITY OF WOODBURN
SCALE: 1" = 2,500'
N
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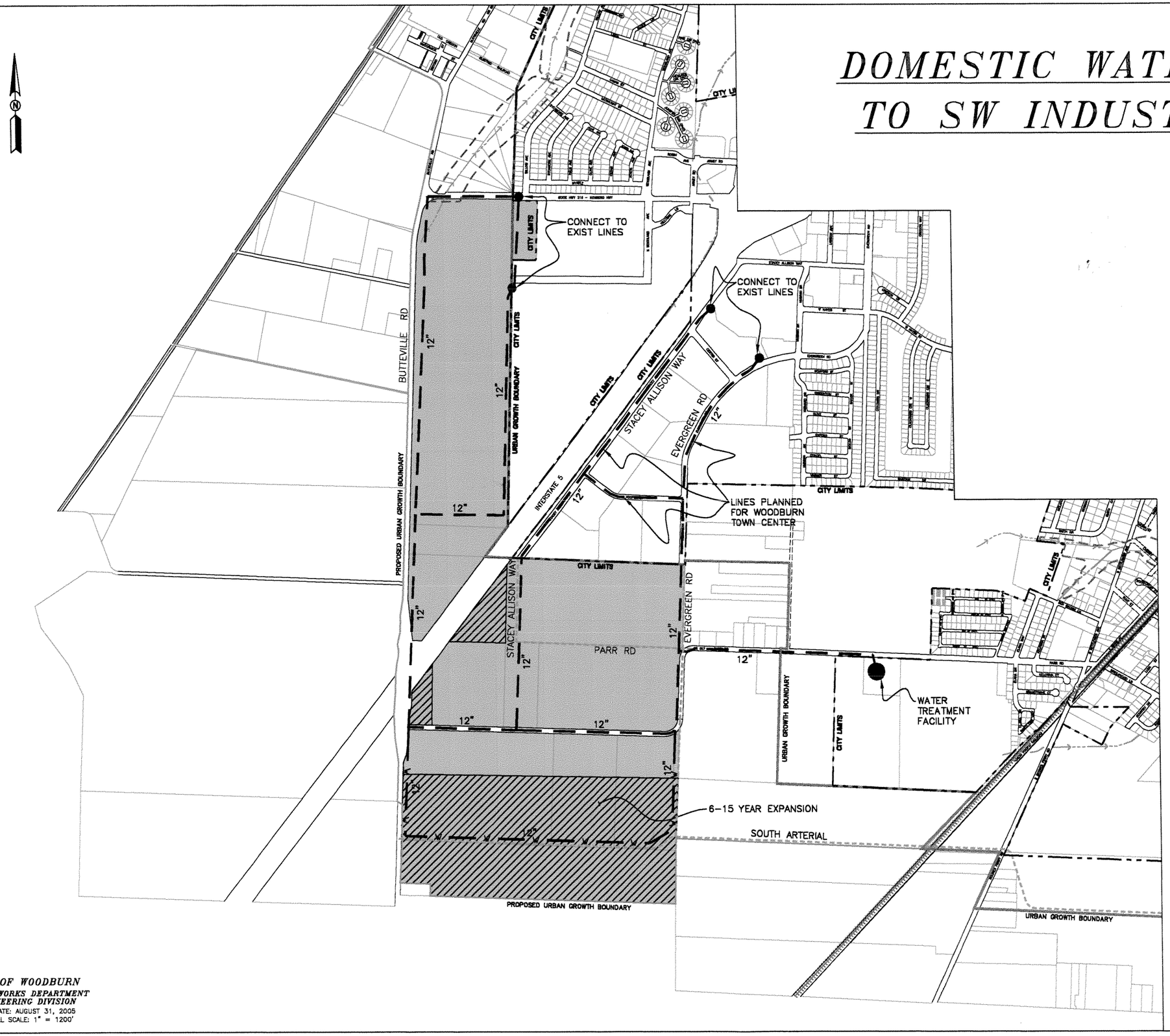
APPENDIX B

CITY OF WOODBURN

MAPS OF PUBLIC FACILITIES PROJECTS TO SERVE UGB EXPANSION AREAS

DOMESTIC WATER SERVICE TO SW INDUSTRIAL AREA



LEGEND

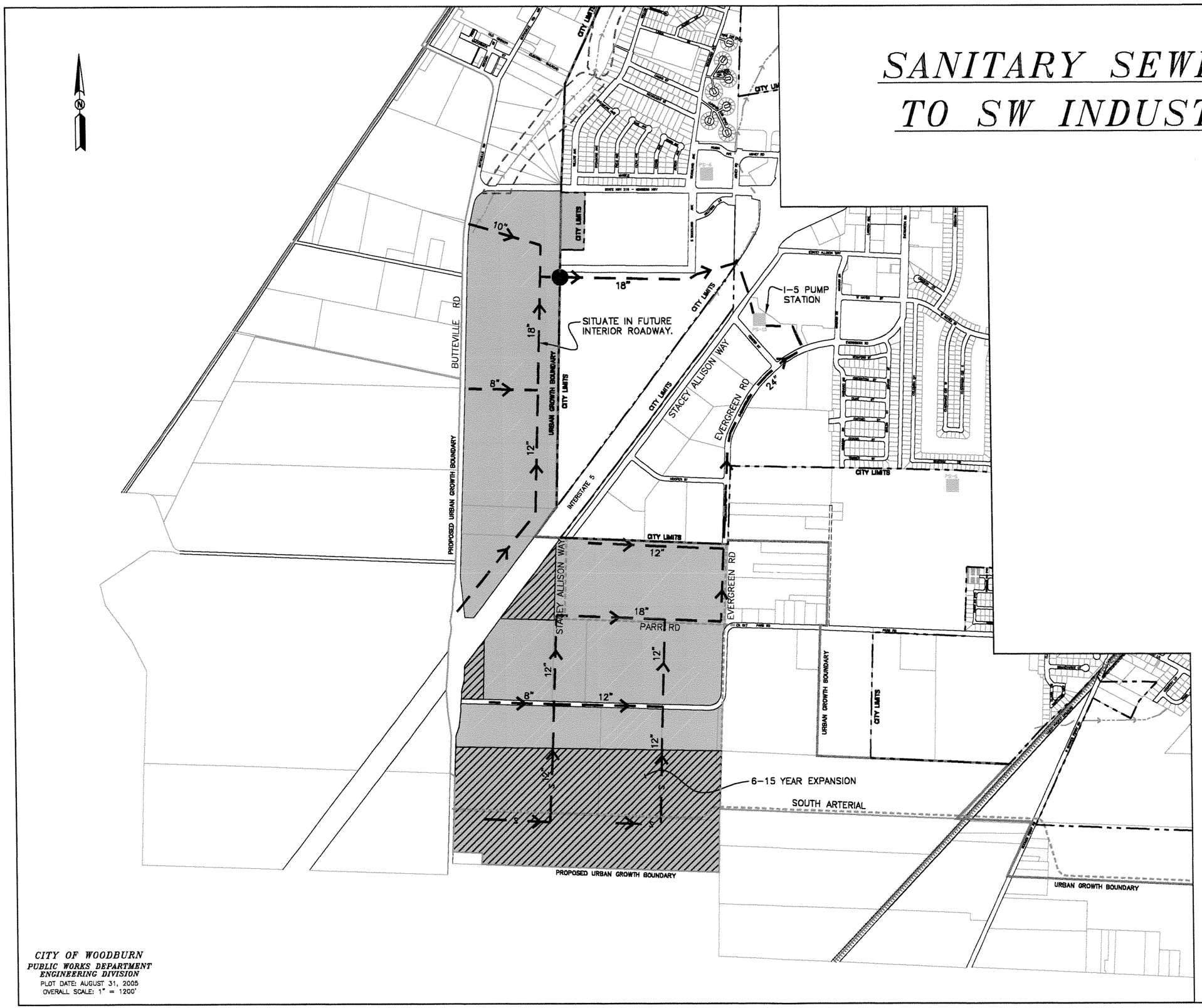
— — — PIPES NECC. TO SERVE 0-5 YEAR WINDOW

—— W —— PIPES NECC. TO SERVE 6-15 YEAR WINDOW

(SEE TABLE FOR PROJECT COSTS)

CITY OF WOODBURN
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
PLOT DATE: AUGUST 31, 2005
OVERALL SCALE: 1" = 1200'

SANITARY SEWER SERVICE TO SW INDUSTRIAL AREA



LEGEND

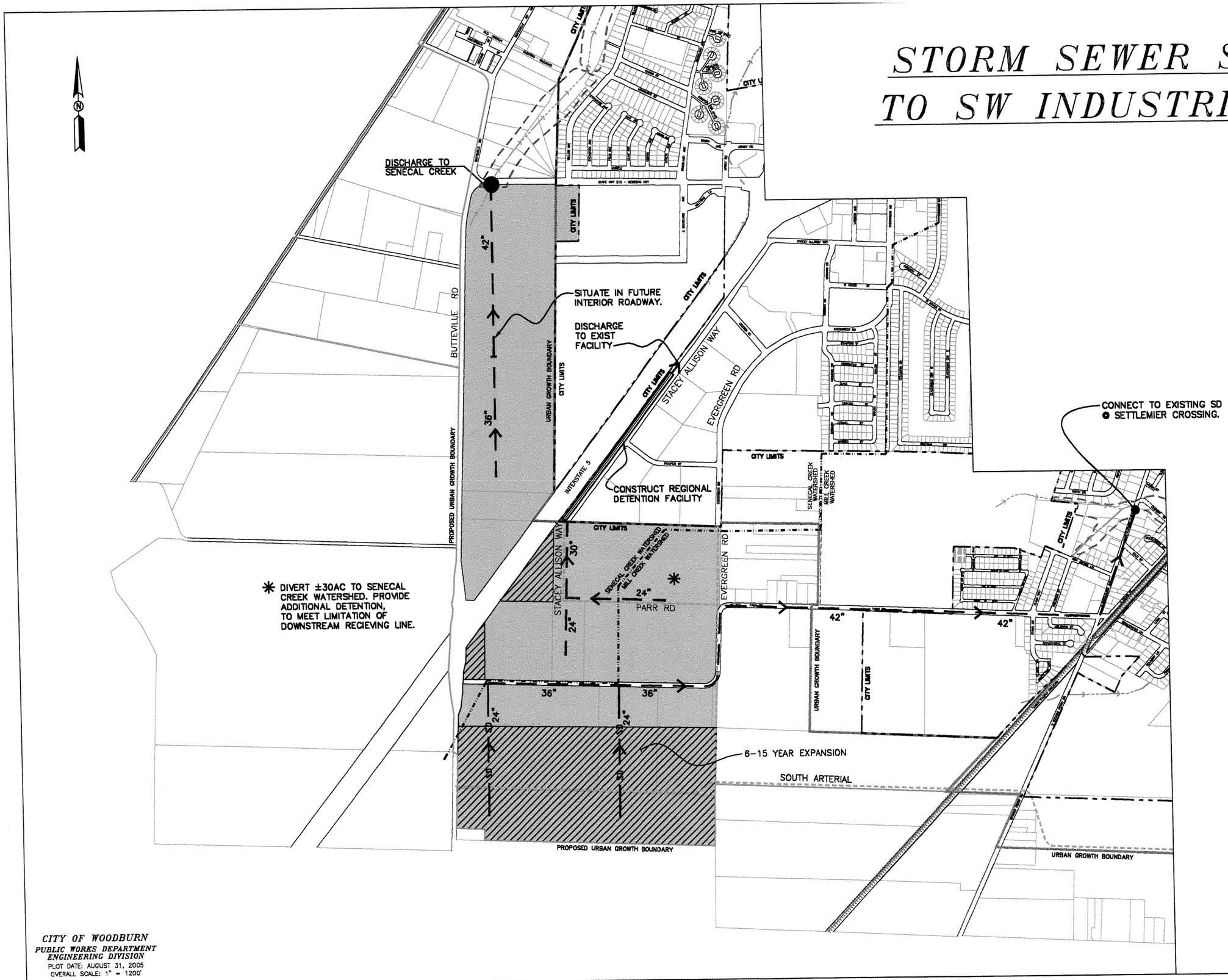
— — — PIPES NECC. TO SERVE 0-5 YEAR WINDOW

—— S —— PIPES NECC. TO SERVE 6-15 YEAR WINDOW

(SEE TABLE FOR PROJECT COSTS)

CITY OF WOODBURN
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
PLOT DATE: AUGUST 31, 2005
OVERALL SCALE: 1" = 1200'

STORM SEWER SERVICE TO SW INDUSTRIAL AREA



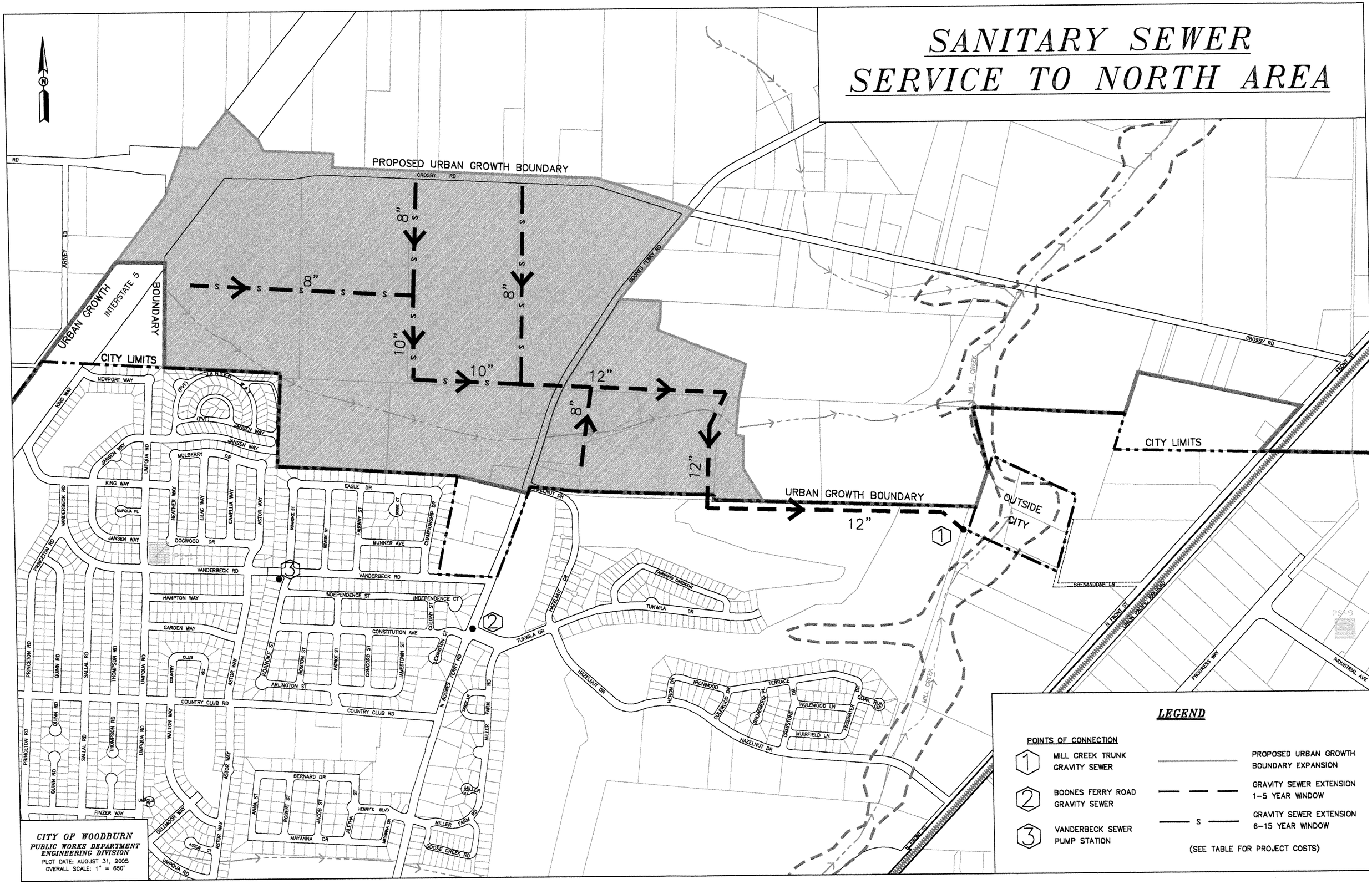
LEGEND

- BASIN BOUNDARY
- PIPES NECC. TO SERVE 0-5 YEAR WINDOW
- SD — PIPES NECC. TO SERVE 6-15 YEAR WINDOW

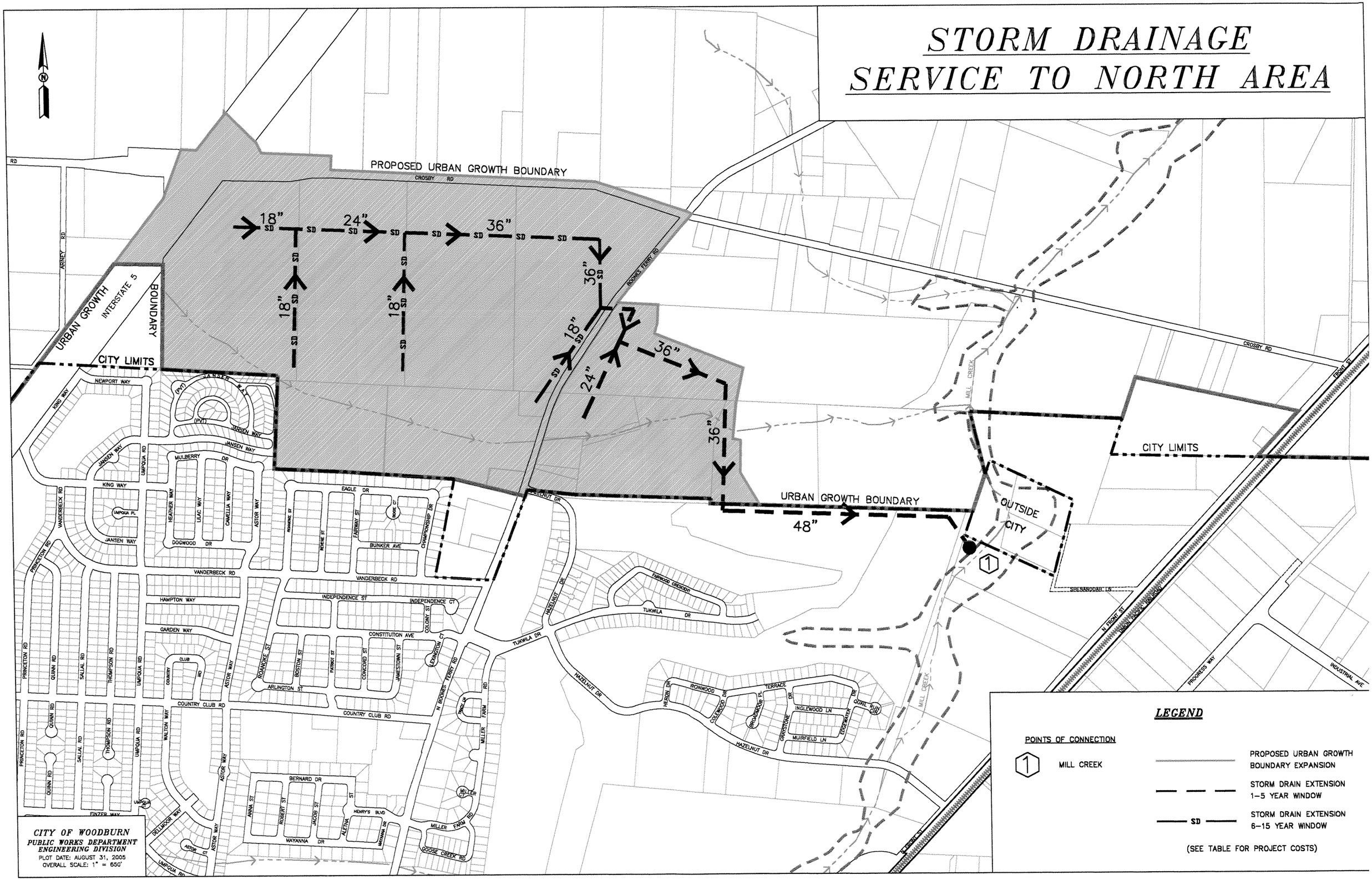
(SEE TABLE FOR PROJECT COSTS)

CITY OF WOODBURN
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
PLOT DATE: AUGUST 31, 2005
OVERALL SCALE: 1" = 1200'

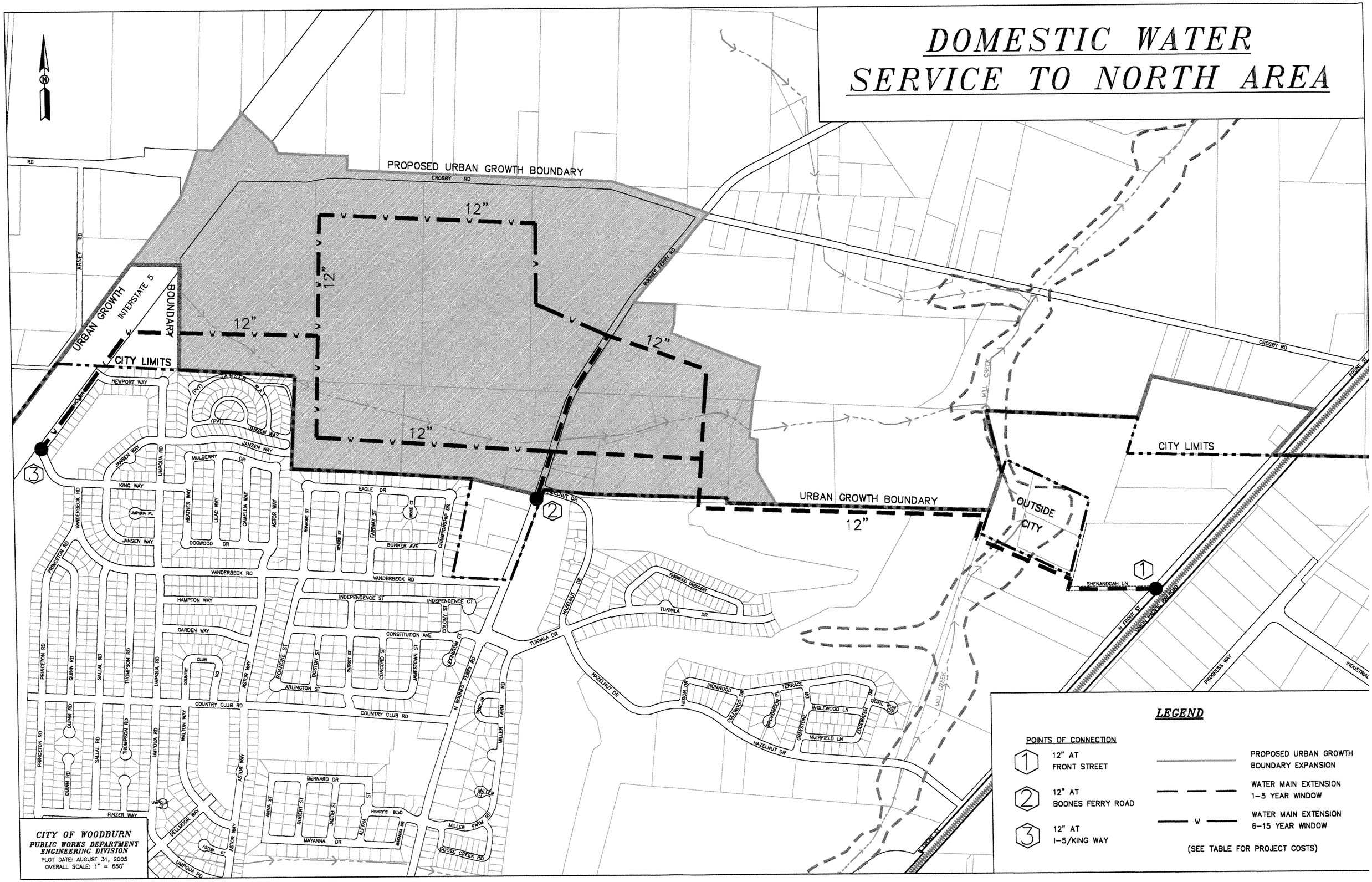
SANITARY SEWER SERVICE TO NORTH AREA



STORM DRAINAGE SERVICE TO NORTH AREA



DOMESTIC WATER SERVICE TO NORTH AREA



APPENDIX C

CITY OF WOODBURN

ANALYSIS OF PUBIC FACILITIES TO SERVE UGB STUDY AREAS

REGION No. 1

GENERAL:

- Approximately *655* AC total areas. For evaluation purposes, this region was divided into 360 AC of Residential and 240 AC of Commercial/Industrial, *55 acres have been excluded from the total for flood plain riparian areas.*
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system can be looped to the adjacent existing system without requiring any additional distribution line between systems.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (2.93 MGD).
- Estimated cost of construction of distribution infrastructure is $4.48 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region would be expected to require construction of a new lift station in the Northern most point at an estimated cost of $600,000.
- The new lift station would then require a new *gravity line to Boones Ferry Road* at an estimated cost of $400,000.
- Estimated new collections systems cost is $5.10 million and will generate an approximate load of 1.05 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage appears adequate to handle outfall(s) to both fingers of Senecal Cr. to service this area, approximate 300 cfs.
- Estimated new collections systems cost is $4.17 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	$4,480,000
Sanitary Sewer	$6,100,000
Storm Sewer	$4,170,000
Total	$14,750,000

REGION No. 2

GENERAL:

- Approximately *675* AC total area. For evaluation purposes this region was divided into 440 AC of Residential and 210 AC of Commercial/Industrial. *25 acres have been excluded from the total for flood plain riparian areas.*
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system will require extension of the existing distribution system by approximately 1300LF of 12-inch dia. main looped to the adjacent existing system at a cost of $180,000.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (3.3 MGD).
- Estimated cost of construction of distribution infrastructure is $5.02 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region would require construction of a new gravity system to connect to the existing system at the North end of Boones Ferry Rd *and/or the Mill Creek Interceptor.*
- From the Boones Ferry Rd. connection point, approximately 4000 LF of collector will have to upsized to the Goose Cr. connection of the parallel westerly reliever at a cost of $500,000.
- Estimated new collections systems cost is $5.78 million and will generate an approximate load of 1.19 cfs
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage appears adequate to handle outfall(s) to upper Mill Cr. to service this area, approximately 325 cfs.
- Estimated new collections systems cost is $4.17 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	$ 5,200,000
Sanitary Sewer	$ 6,280,000
Storm Sewer	$ 4,170,000
Total	$15,650,000

REGION No. 3

GENERAL:

- Approximately *330* AC total area. For evaluation purposes this region was divided into 100 AC of Residential and *230* AC of Commercial/Industrial.
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system will require extension of the existing distribution system by approximately 400LF of 12-inch dia. main looped to the adjacent existing system at a cost of $60,000.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (1.6 MGD).
- Estimated cost of construction of distribution infrastructure is $2.09 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region would require construction of a new gravity system to connect to the existing system at Industrial Pump Station on Industrial Way.
- From the connection point, approximately *1200* LF of collector will have to upsized to the Industrial Way Pump Station at a cost of *$265,000.*
- Estimated new collections systems cost is $2.25 million and will generate an approximate load of 0.5 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage is adequate to handle outfall of only a small portion to upper Mill Cr. The bulk of the region would require construction of approximately *1400* LF of 78-inch dia. pipeline Easterly to *natural tributary* to the Pudding River at a cost of *$521,000*, approximately 167 cfs.
- Estimated new collections systems cost is $1.62 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	$ 2,150,000
Sanitary Sewer	*$ 2,515,000*
Storm Sewer	*$ 2,141,000*
Total	*$ 6,806,000*

REGION No. 4

GENERAL:

- Approximately 343 AC total area. For evaluation purposes this region was determined to be all Residential and no Commercial/Industrial.
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system will require extension of the existing distribution system by approximately 1100LF of 12-inch dia. main looped to the adjacent existing system at a cost of $154,000.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (1.88 MGD).
- Estimated cost of construction of distribution infrastructure is $3.1 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region would require construction of a new lift station, off Hwy. 211 then a 5000 LF of force main to the WWTP at a cost of $1.5 million.
- Estimated new collections systems cost is $3.70 million and will generate an approximate load of 0.75 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage is inadequate to handle outfall. Runoff would, therefore, require construction of approximately *2000* LF of 78-inch dia. pipeline Easterly to the Pudding River at a cost of *$745,000*, approximately 170 cfs.
- Estimated new collections systems cost is $2.68 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	*$ 3,254,000*
Sanitary Sewer	$ 5,200,000
Storm Sewer	*$ 3,425,000*
Total	*$11,879,000*

REGION No. 5

GENERAL:

- Approximately *431* AC total area. For evaluation purposes this region was assigned into *431* AC of Commercial/Industrial and no Residential.
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system will require extension of the existing distribution system by approximately 3600LF of 12-inch dia. main looped at a cost of $500,000.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (1.24 MGD).
- Estimated cost of construction of distribution infrastructure is $2.20 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region will require construction of a new lift station in the Northwest corner of the region at an estimated cost of $350,000.
- The new lift station would then require a new force main of approximately 4800 LF to connect to the existing gravity collection system at the Mill Cr. trunk line off of Cleveland St. at an estimated cost of $750,000.
- Estimated new collections systems cost is $2.16 million and will generate an approximate load of 0.50 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage is inadequate to handle outfall. Runoff, therefore, requires construction of approximately 4500 LF of 84-inch dia. pipeline Easterly to the Pudding River at a cost of $2.0 million, approximately 216 cfs.
- Estimated new collections systems cost is $1.55 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

Cost Estimate Summary:

Water Improvements	$ 2,700,000
Sanitary Sewer	$ 3,260,000
Storm Sewer	$ 3,150,000
Total	$ 9,110,000

REGION No. 6

GENERAL:

- Approximately 191AC total area. For evaluation purposes this region was assigned into *189* AC of Residential and no Commercial/Industrial, *2 acres have been excluded from the total for flood plain riparian areas.*
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system will require extension of the existing distribution system by approximately 5000LF of 12-inch dia. main looped at a cost of $600,000.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (1.09 MGD).
- Estimated cost of construction of distribution infrastructure is $1.7 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region will require construction of a new lift station along the Southerly finger of Mill Cr. and behind Shalimar trailer park at a cost of $350,000.
- The new lift station would then require a new force main of approximately 1800 LF to connect to the existing gravity collection system at Bridlewood Ln. and Brown St. at an estimated cost of $250,000.
- Estimated new collections systems cost is $2.04 million and will generate an approximate load of 0.40 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage appears adequate to handle outfall(s) to South Mill Cr. to service this area, approximately 95 cfs.
- Estimated new collections systems cost is $1.47 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	$ 2,300,000
Sanitary Sewer	$ 2,640,000
Storm Sewer	$ 1,470,000
Total	$ 6,410,000

REGION No. 7

GENERAL:

- Approximately 510 AC total area. For evaluation purposes this region was divided into 380 AC of Residential and 130 AC of Commercial/Industrial.
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system will require extension of the existing distribution system by approximately 6100 LF of 12-inch dia. main looped at a cost of $700,000.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (2.87 MGD).
- Estimated cost of construction of distribution infrastructure is $4.1 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- This region will require construction of 1000 LF of new gravity sewer line to connect to the existing system at the South end of Harvard St. at a cost of $80,000.
- The existing gravity collection system at Harvard St. would require being upsized for approximately 3300 LF to I-5 pump station at an estimated cost of $250,000.
- Estimated new collections systems cost is $4.77 million and will generate an approximate load of 1.0 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- A new collection system would connect to the existing system on the West end of Parr Rd. and require upsizing the existing collector to a *84*-inch dia. line at a cost of *$1.7 Million*, approximately 255 cfs.
- Estimated new collections systems cost is $3.44 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	$ 4,790,000
Sanitary Sewer	$ 5,100,000
Storm Sewer	*$ 5,140,000*
Total	*$15,030,000*

REGION No. 8

GENERAL:

- Approximately *755* AC total area. For evaluation purposes this region was divided into 457 AC of Residential and *298* AC of Commercial/Industrial.
- Flow rates for water; sewer and storm distribution and collection systems are based on zoning densities appropriate to the assigned land use and Master Plan consumption/contribution rates.
- When and where practical topographic geography was considered in gravity systems.
- This region was analyzed independent of other proposed regions.
- The analysis is based on all CIP projects, identified in the current Master Plan Documents, have been completed.

WATER DISTRIBUTION SYSTEM:

- A new distribution system can be looped to the adjacent existing system without requiring any additional distribution line between systems.
- Flow rates were based upon Master Plan use rates per capita and 2-hour fire durations (3.5 MGD).
- Estimated cost of construction of distribution infrastructure is $5.62 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

SANITARY SEWER SYSTEM:

- A new collection system would connect to the existing system on the West end of S. Woodland Ave. flowing to I-5 pump station.
- Existing collector would require upsizing to a 24-inch dia. line at a cost of $250,00.
- Estimated new collections systems cost is $6.42 million and will generate an approximate load of 1.32 cfs.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

STORM SEWER SYSTEM:

- Natural drainage appears adequate to handle outfall(s) to both fingers of Senecal Cr. to service this area. Approximately 375 cfs.
- Estimated new collections systems cost is $4.63 million.
- Analysis indicates the existing system (i.e. current 2004 service area) will support the improvements, estimated costs are shown below in the summary.

COST ESTIMATE SUMMARY:

Water Improvements	$5,620,000
Sanitary Sewer	$6,670,000
Storm Sewer	$4,630,000
Total	$16,920,000