

This presentation premiered at WaterSmart Innovations

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Maximizing Conservation Using GIS

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Overview

- ▶ Santa Rosa Utilities Department
- ▶ System Requirements
- ▶ Data, Data, Data
- ▶ GIS Maps
- ▶ Managing the Information

City of Santa Rosa Utilities

Weather

- ▶ Wet winters (30" avg.)
- ▶ Dry, warm summers (70°–90°)

Water and Sewer

- ▶ Water service for over 159,000 residents
- ▶ Over 51,000 connections
- ▶ 7 billion gallons delivered annually
- ▶ Sewer service for over 215,000 residents

Requirements

- ▶ Arc GIS
- ▶ High resolution aerial photography
- ▶ Knowledgeable staff
- ▶ Reliable Data



High Resolution Aerials



$\frac{1}{4}$ ft Resolution



1 ft Resolution

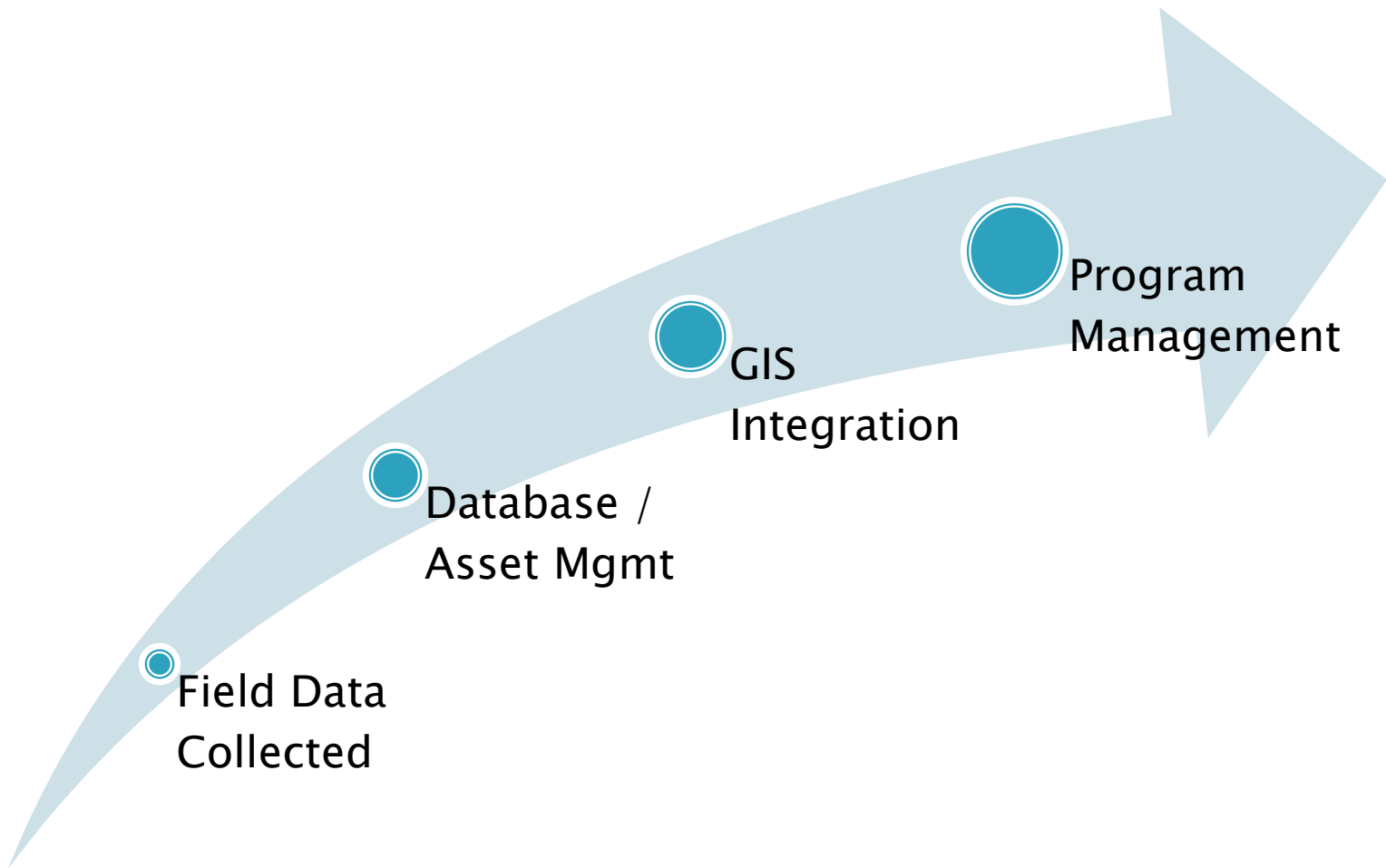
Data, Data, Data

- ▶ Over 10,000,000 data points
 - 1,000,000 data points (address/parcel information)
 - 4,000,000 data points (5 yrs water use)
 - Etc.
- ▶ 40,000 Rebates
 - 1,500,000 data points (Rebate data)



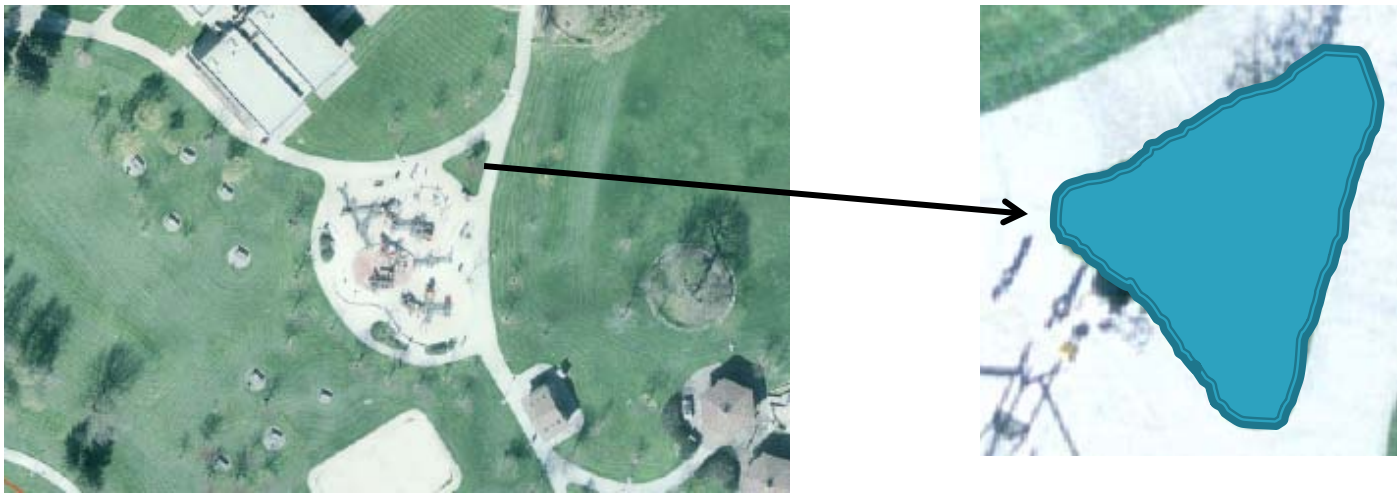
ACCT	APPL	RN	EXPT	INSTALL	HEAR	INS_REQ	INSPECT	PHASE	NEW_NR	NEW_SBU	OLD_SBU	NUPDATE	REBATE	RUPDATE	COST	TOTAL	TOL_PR	PLUM
15040077		2	8					CW	0	0	0			0	0	0	0	
15040077		1	7	03-May-01	Y		03-Dec-01	DI	3	3	3.7	10-May-01	0	10-May-01	0	0	0	BLAC
15040096		1	2	26-Apr-97				HS	0	17	0	28-Aug-97	0	19-Sep-97	0	0	0	HSEL
15040172		1	1	27-Jun-02				DI	2	0	0	05-Jul-02	0	05-Jul-02	0	0	0	ANDY
15040210		1	9	29-Oct-01				DI	2	3.5	4.5	26-Nov-01	0	26-Nov-01	0	0	0	SANT
15040229		1	3	25-Jun-01				DI	1	0	0	05-Jul-01	0	05-Jul-01	0	0	0	ONE
15040248		1	2	18-Mar-00				HS	1	0	0	10-Apr-00	0	10-Apr-00	0	0	0	HSEL
15040267		1	2	26-Jun-01				DI	1	0	0	05-Jul-01	0	05-Jul-01	0	0	0	ONE
15040286		1	4	26-Jun-01				DI	0	9.7	0	29-Oct-01	0	05-Jul-01	0	0	0	ONE
15040362		1	6	08-Nov-97				HS	4	8.3	9.7	08-Jan-98	0	05-Jan-98	0	0	0	HSEL
15040381		1	5	24-Oct-98	Y		28-May-99	HS	3	3.7	4.7	10-Dec-98	0	10-Dec-98	0	0	0	HSEL
15040476		1	6	07-Mar-98	Y		22-Nov-99	HS	5	5.5	6.7	04-Jun-98	0	04-Jun-98	0	0	0	HSEL
15040495		1	1	07-Jun-95	PLB			CW	2	9	10	13-Oct-95	100	13-Jun-95	86.47	0	0	SCHE
15040533		1	2	18-Mar-00				HS	1	2.3	2.7	20-Apr-00	0	20-Apr-00	0	0	0	HSEL

Maximize Your Data



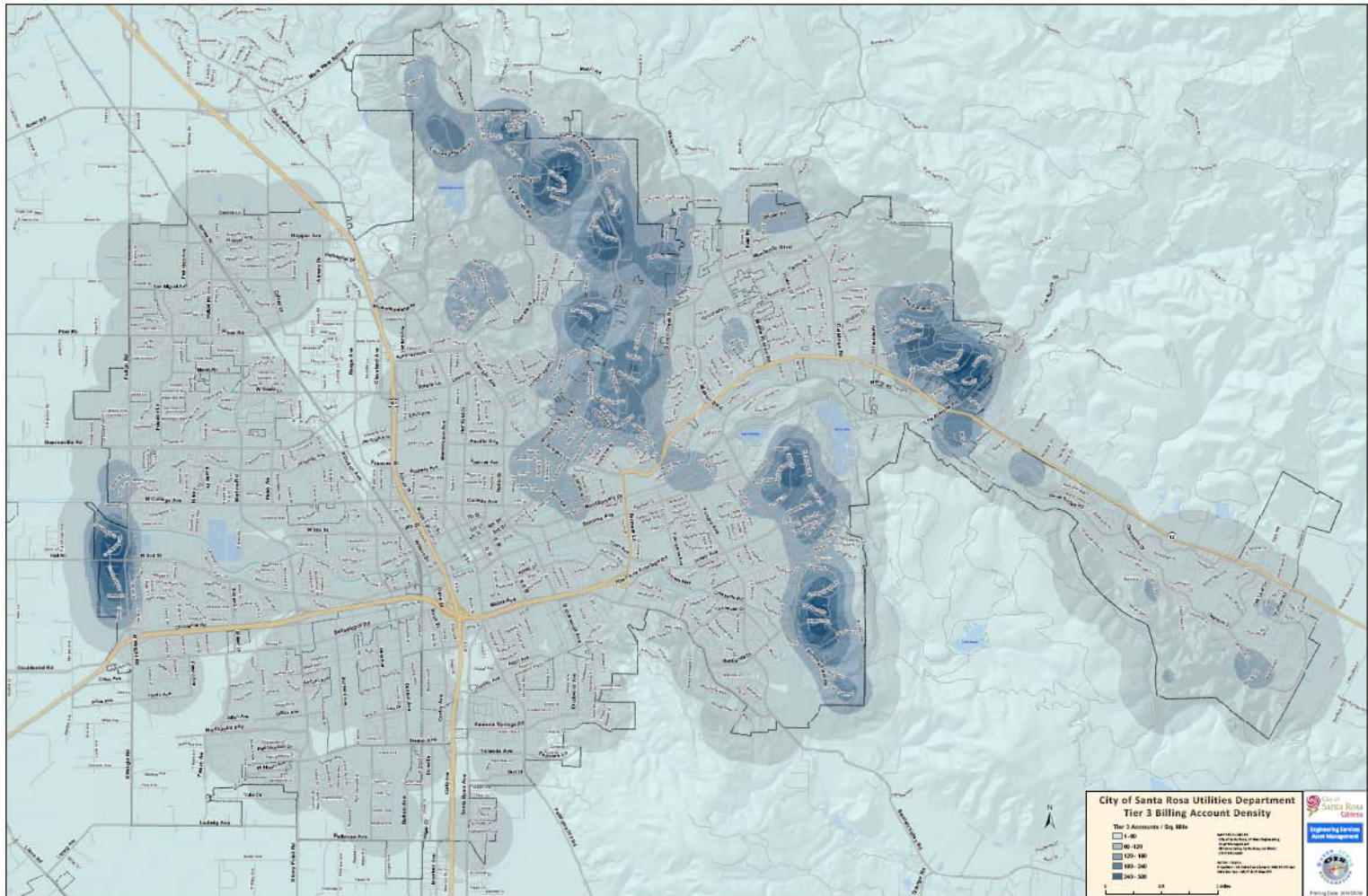
GIS for Billing Data

- ▶ Real-time ETo based irrigation rates
- ▶ GIS for landscape square footages
- ▶ Real Time Water Budget =
$$\{[ETo - EP] \times [(LAh + Lam) \times 0.7]\} \times CF\}$$

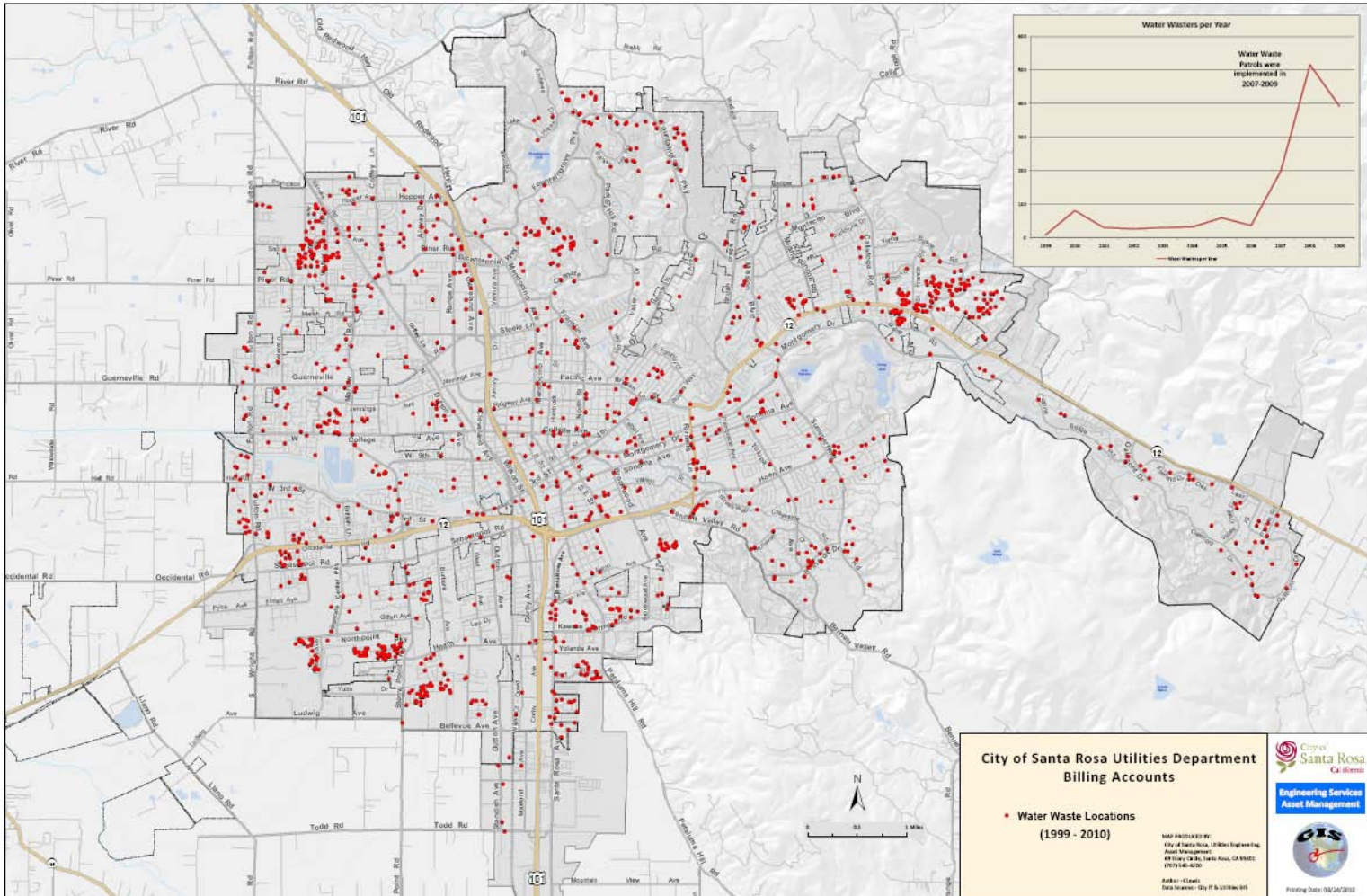


- ETo (Billing Period Reference Evapotranspiration)
- EP (Billing Period Effective Precipitation)
- LAh (landscape area high water use)
- LAm (landscape area moderate and low water use)
- CF (Conversion factor) = 0.623 converts to gallons

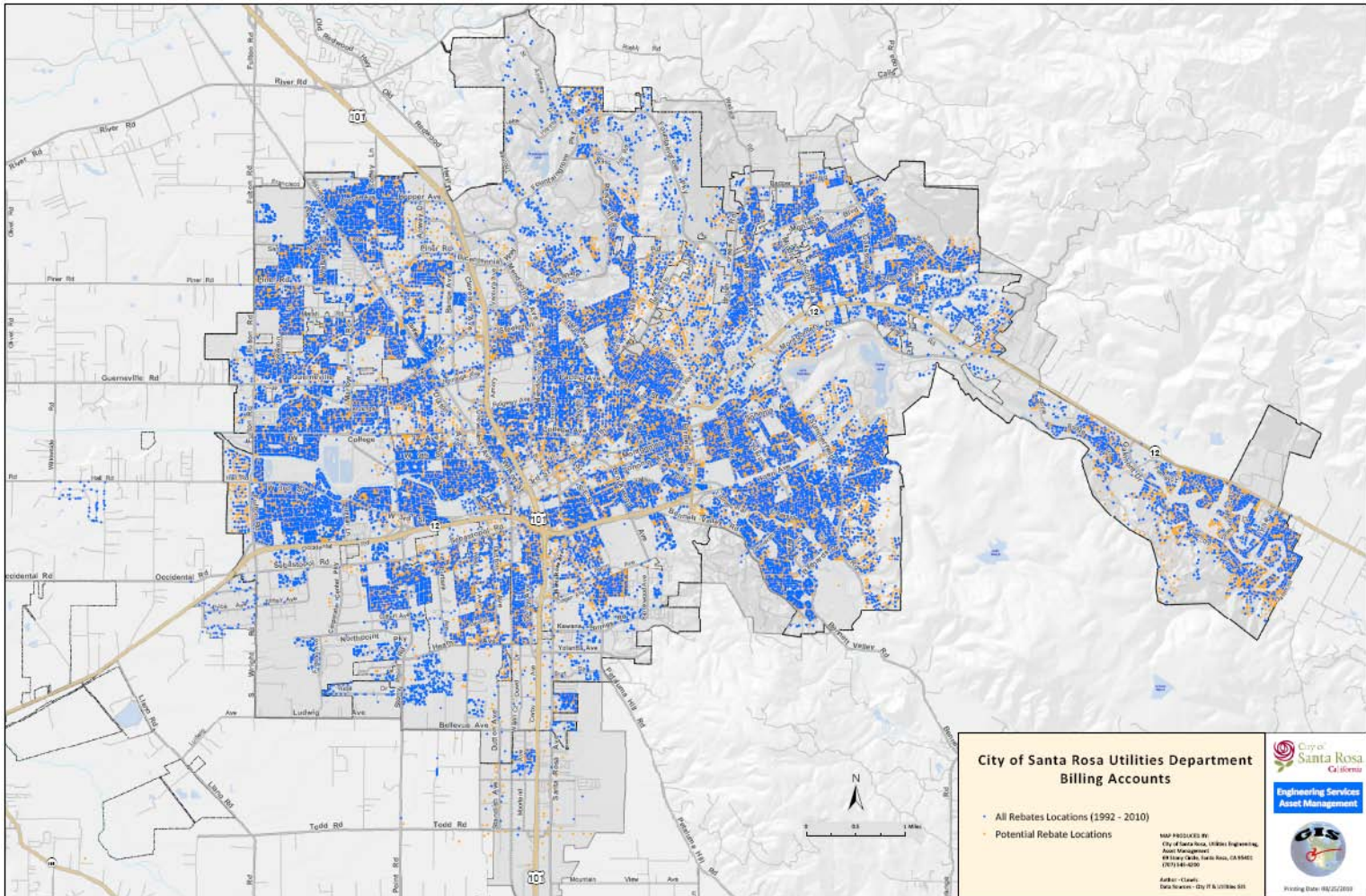
High Water Use Accounts



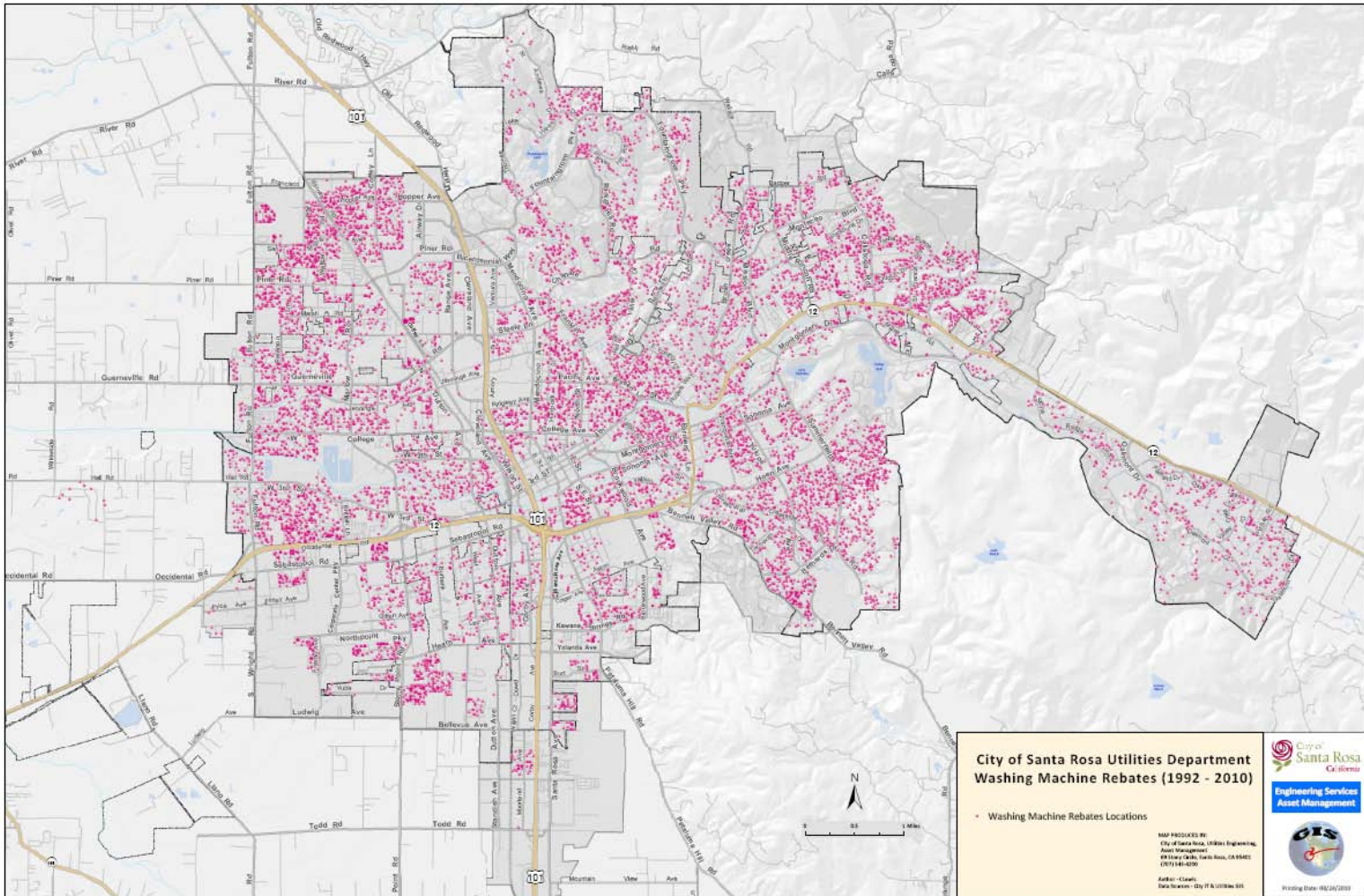
Water Waste Accounts



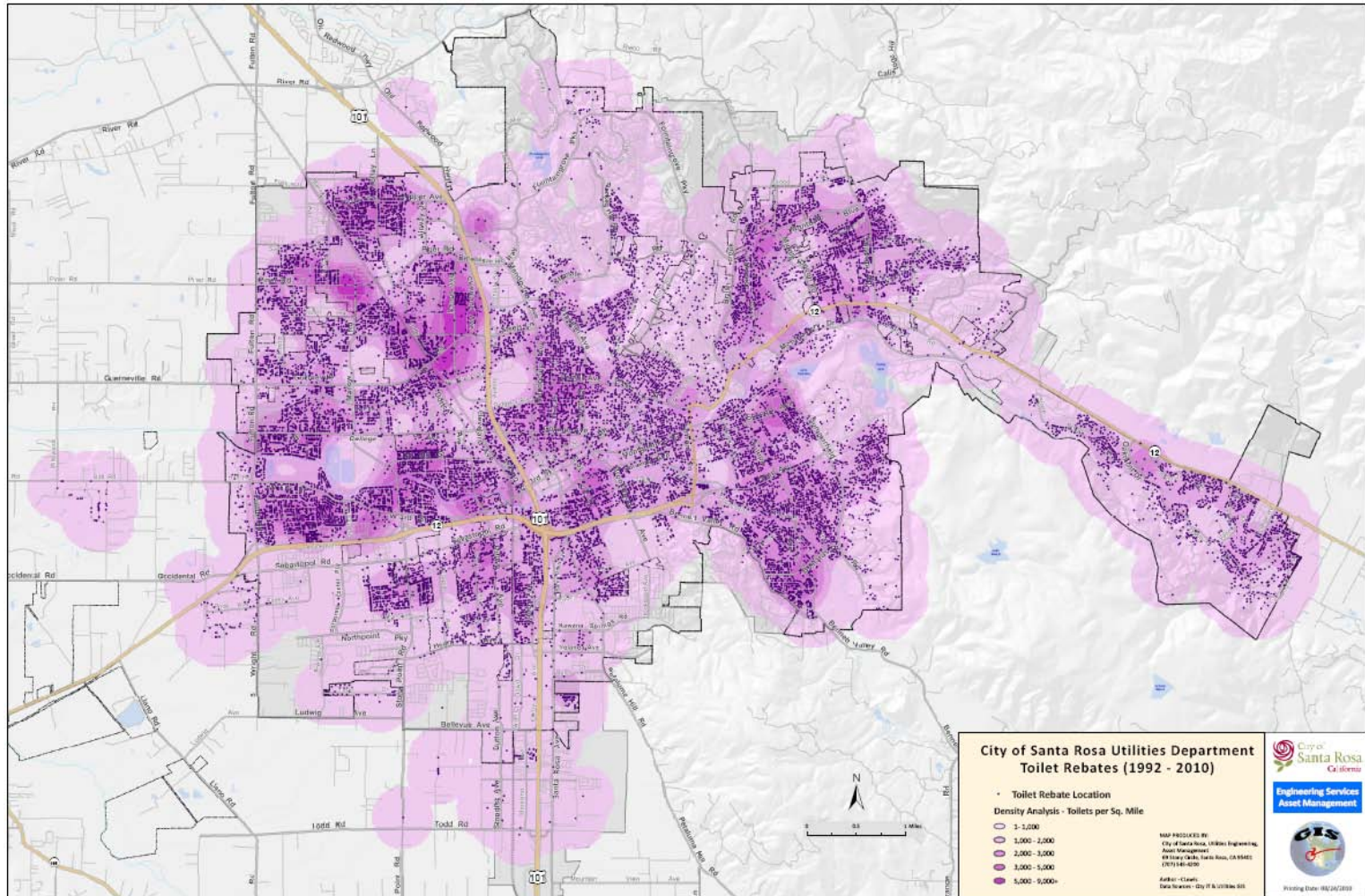
All Rebates and Incentives



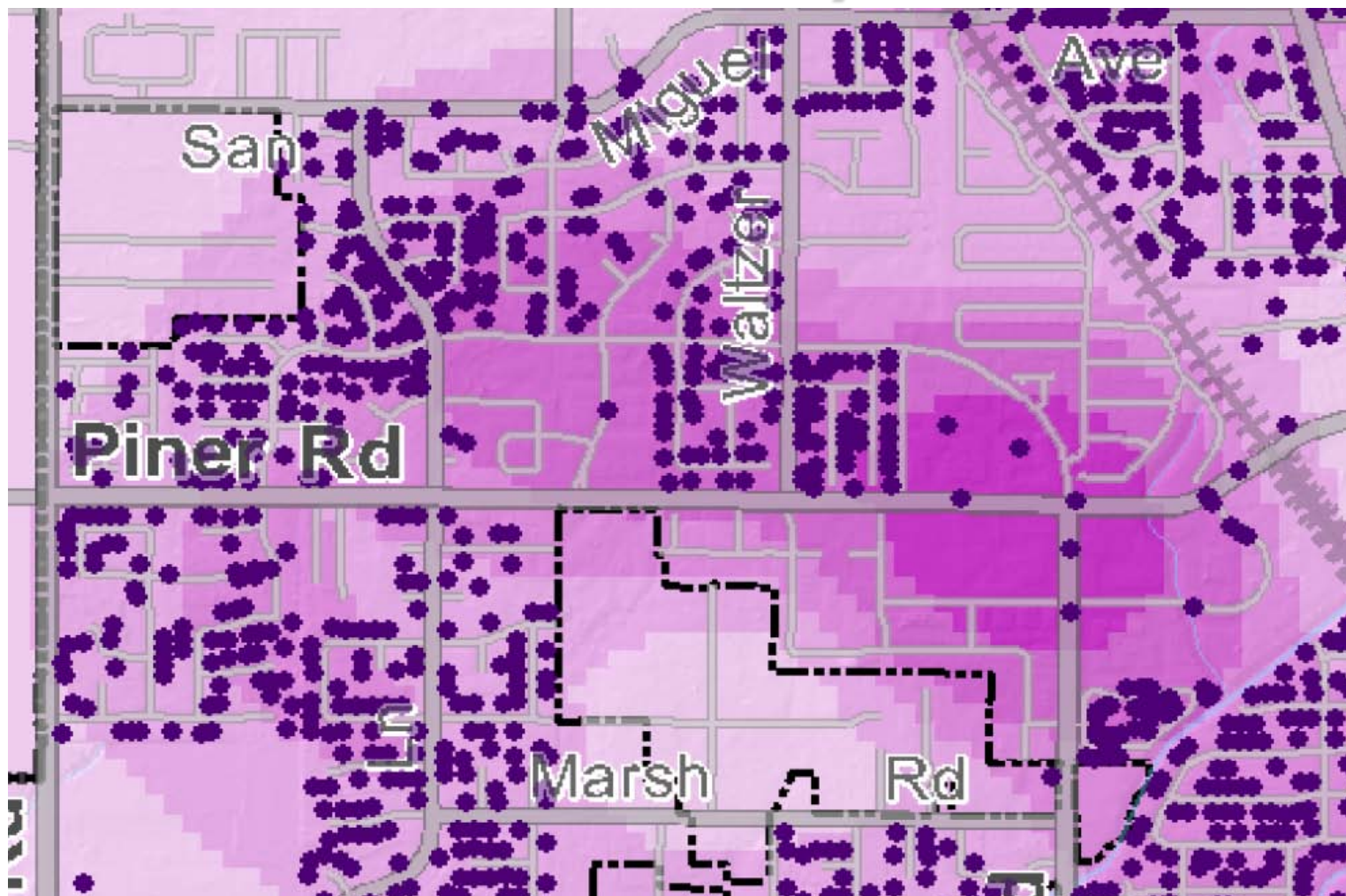
Clothes Washer Rebates



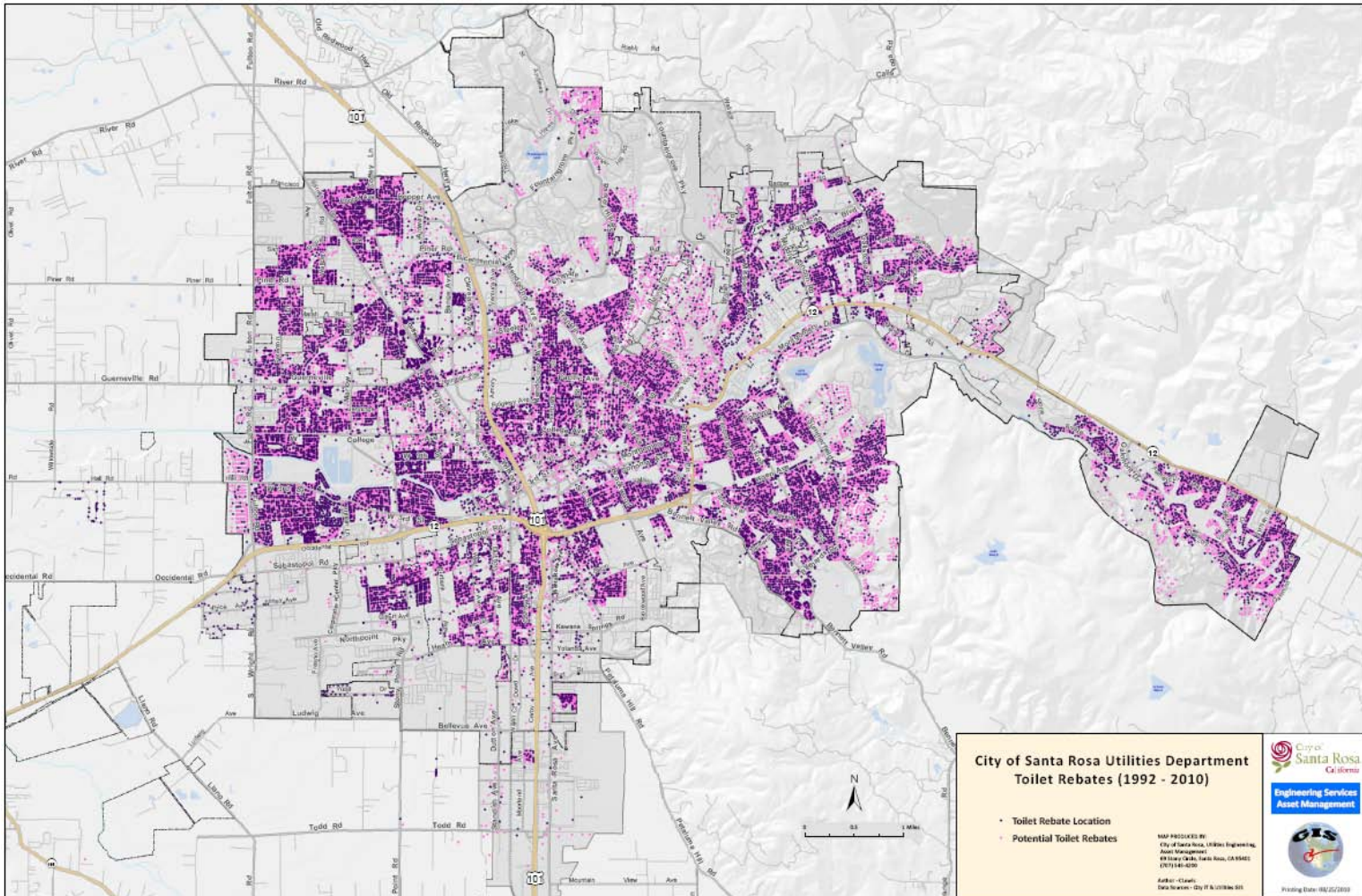
Toilet Rebates



Account vs. Quantity



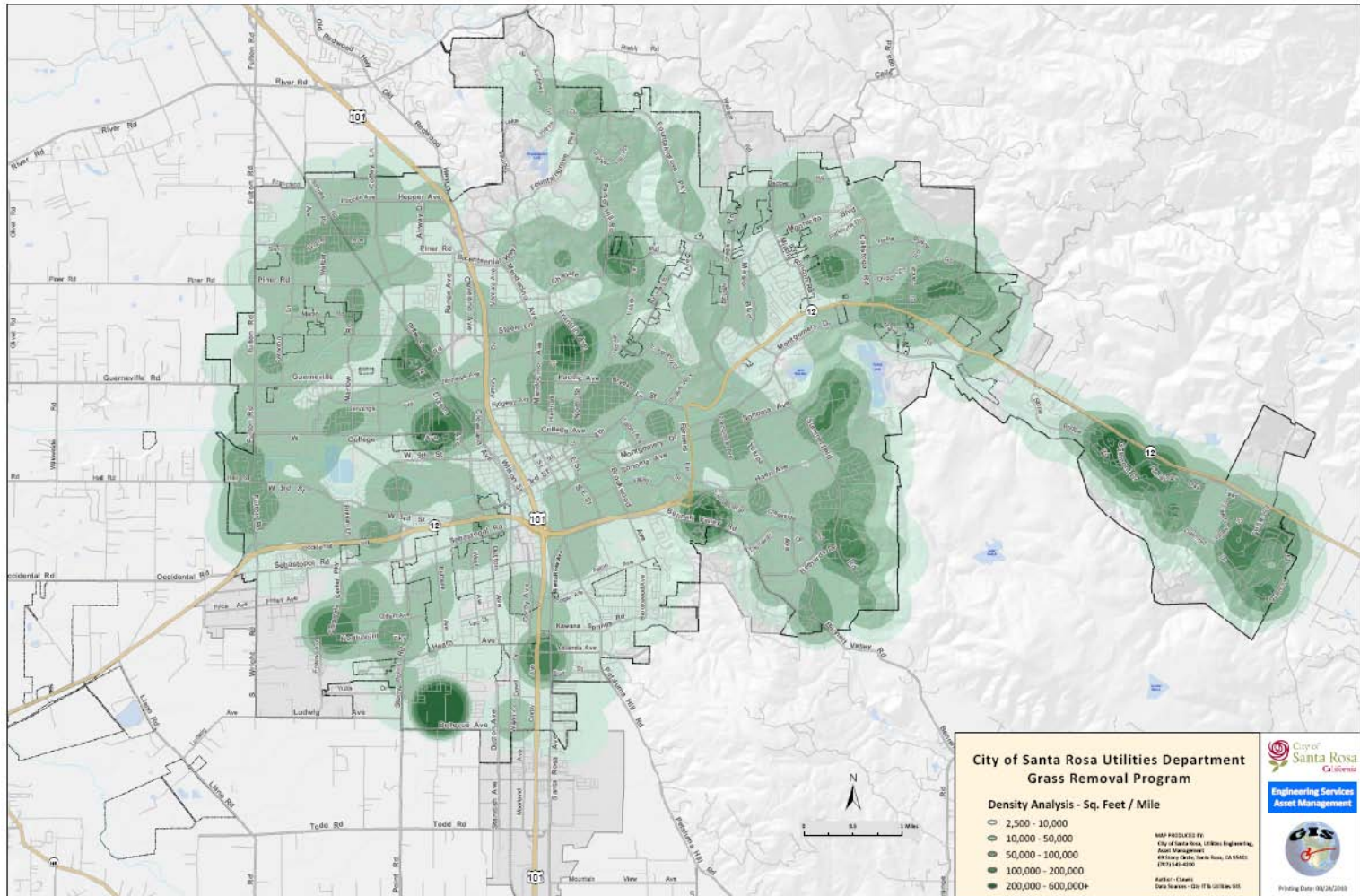
Potential High-Flow Toilets



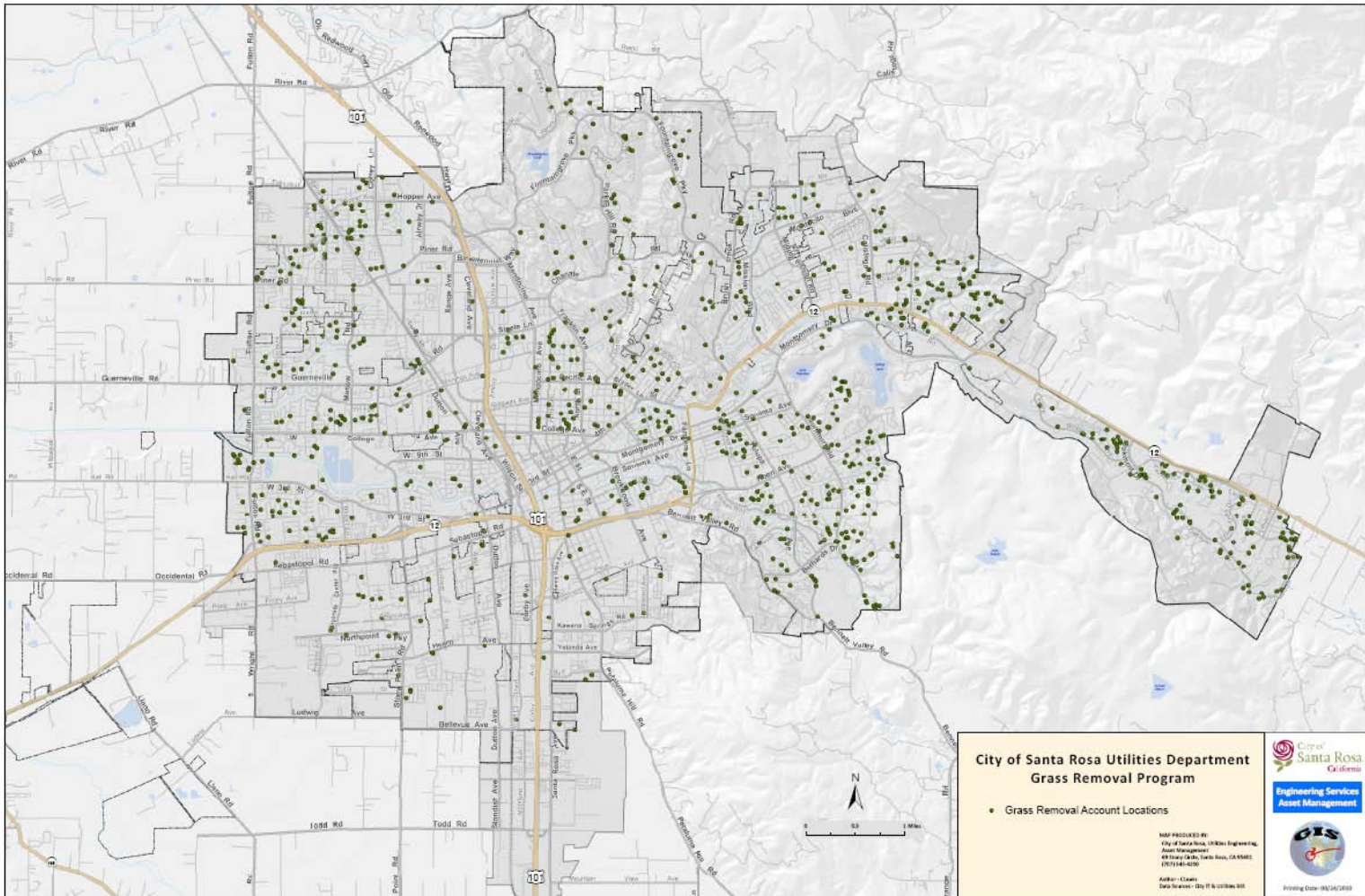
Neighborhood View



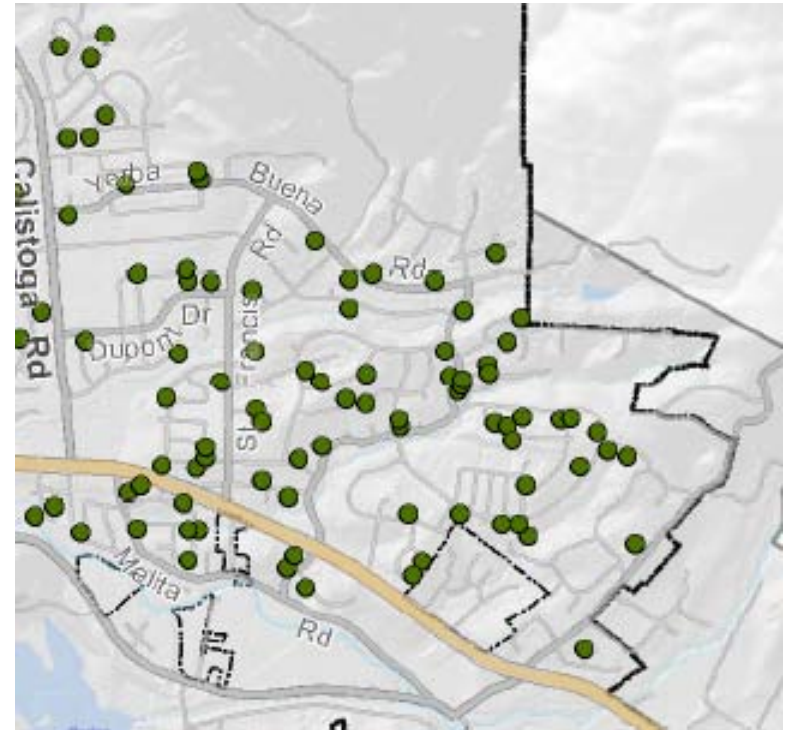
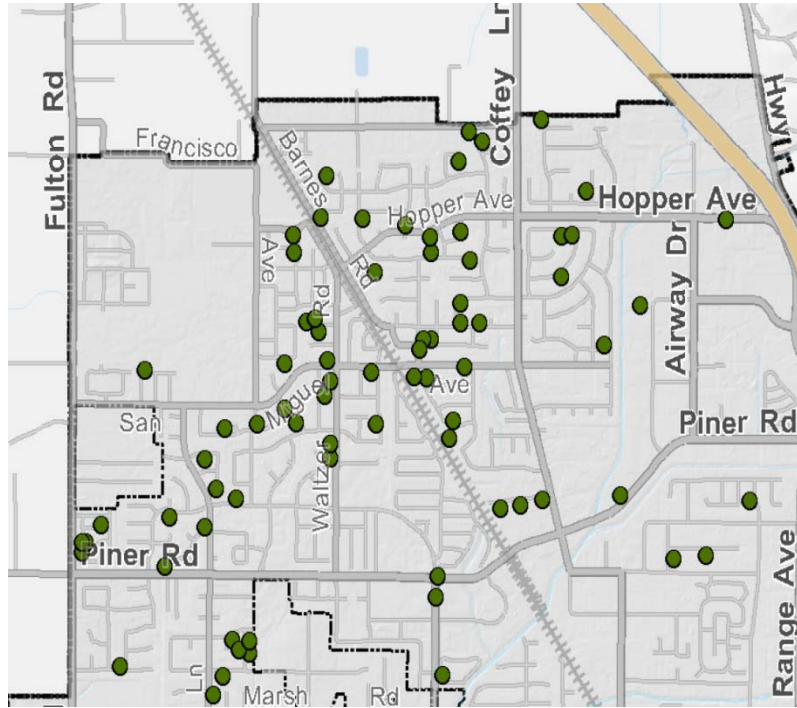
Quantity of Grass Removed



Grass Removal Locations



Cluster Effect



Maps as a Management Tool

- ▶ Participation Levels
 - Total volume
 - Regional
 - Trend analysis
- ▶ Allocation of Funds
 - Distribution in Service Area
- ▶ Targeted Efforts
 - High water use, water wasters, etc.
- ▶ Superior Graphical Representation
 - Board and Council

Future Maps/Tools

- ▶ Density analysis
 - Quantity of water use throughout service area
- ▶ Location analysis
 - Highest tier each account reached
- ▶ Year by year analysis
 - Arc GIS “peel back tool”

Questions

