



*Executive Summary*

# WASTEWATER MASTER PLAN

NOVEMBER 2007



**carollo**

Engineers...Working Wonders With Water™

# What is the Purpose of the Wastewater System Master Plan?



The City of Peoria's "Wastewater Master Plan" has been developed to provide for safe and reliable wastewater collection and treatment.

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**GENERAL PLAN  
STATED OBJECTIVE:  
ENHANCE AND  
EXTEND PUBLIC  
WASTEWATER  
SERVICE INCLUDING  
COLLECTION  
AND TREATMENT  
SYSTEMS TO  
URBANIZED AND  
NEWLY DEVELOPING  
AREAS OF THE CITY.**

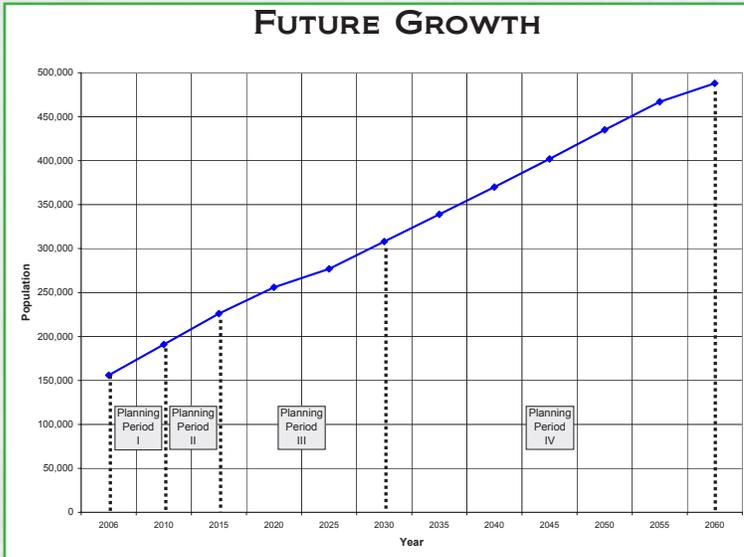
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*Peoria has been experiencing rapid growth over the past 30 years, transitioning from a small agricultural city of 2,500 in 1970 to a city with a population over 140,000 in 2005. Its planning area now extends north to Yavapai County, encompassing 233-square miles exhibiting panoramic vistas with the diverse ecology and topography of the Sonoran Desert.*

*In response to this explosive growth and recent annexations, Peoria is implementing planning strategies to guide future growth, revitalization, and preservation efforts within the City.*

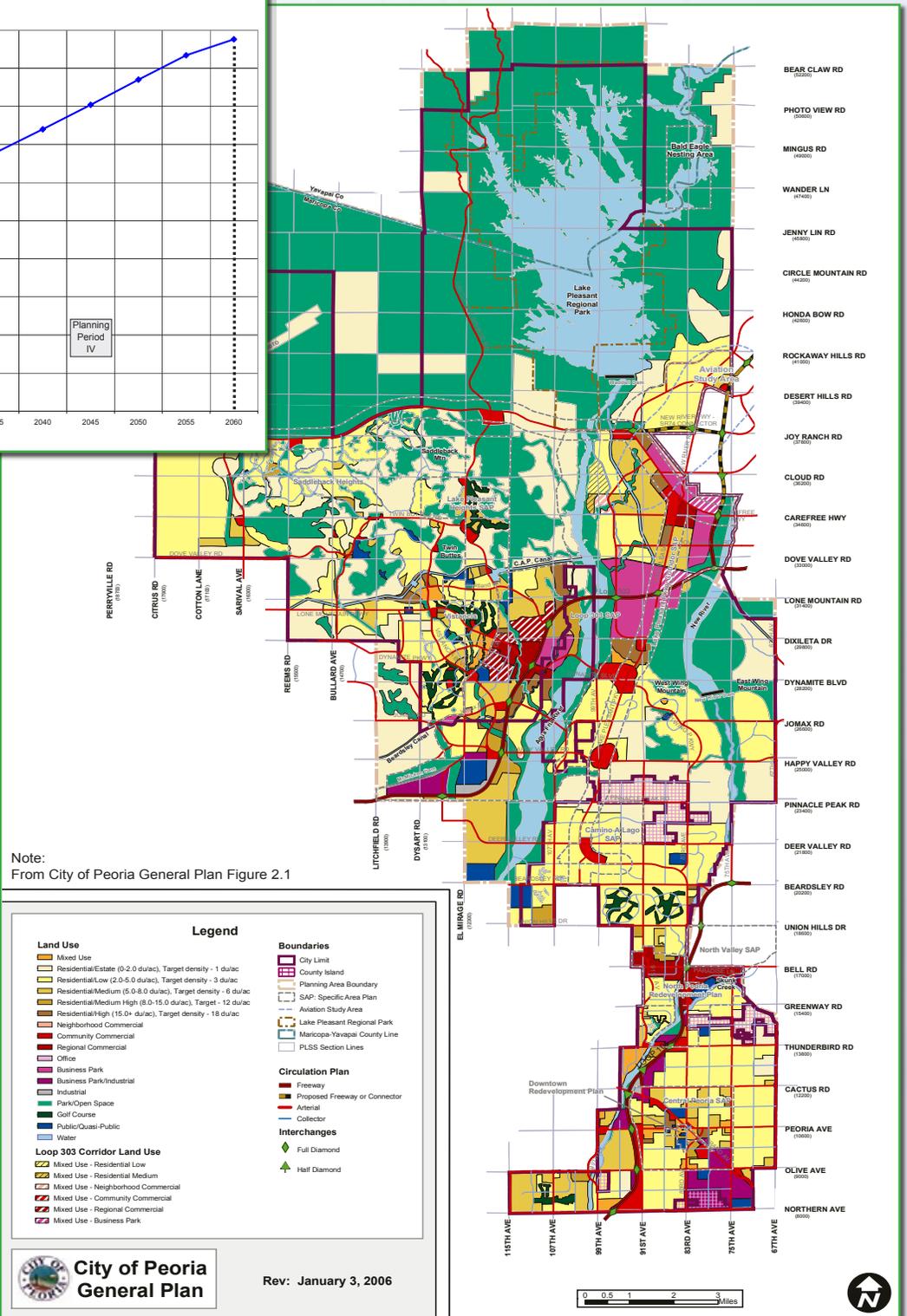


# How is Peoria Expected to Grow?



In November 2005, Peoria published "Growth Trends 2006" which provides a common set of growth assumptions to be used in the City's forecasting models. "Growth Trends 2006" was used as the basis for projecting growth, population, and the development of the wastewater service area.

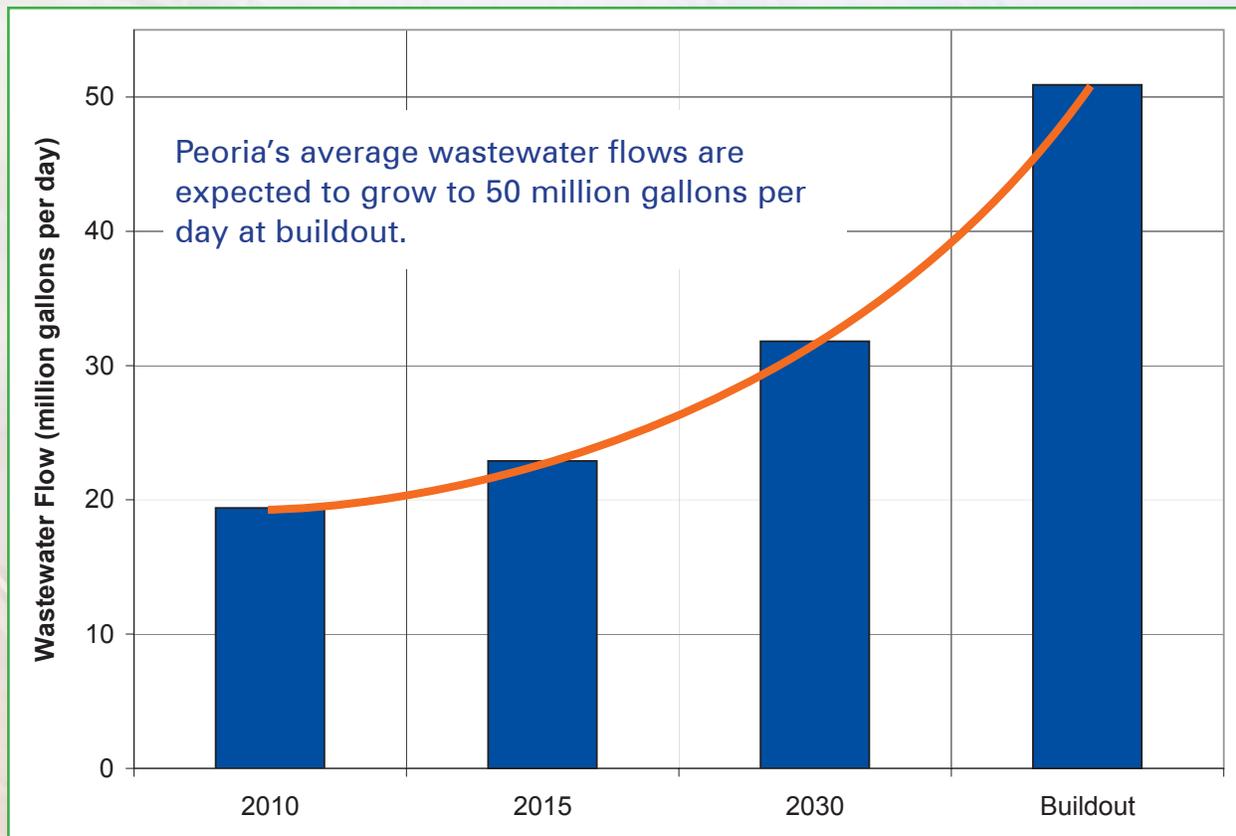
As Peoria continues to grow and develop, future land use may include resorts, master planned communities, college sites, healthcare campuses, major employers, transportation corridors, and transit-oriented development areas.



# How Much Flow is Generated?

*The City's Geographical Information System (GIS) database was used to evaluate Peoria's projected growth both in time and space. The GIS database contains growth polygons that describe population and land use characteristics.*

*The population and land use characteristics together with flow monitoring data, were used to develop wastewater loads for both commercial and residential land use types.*

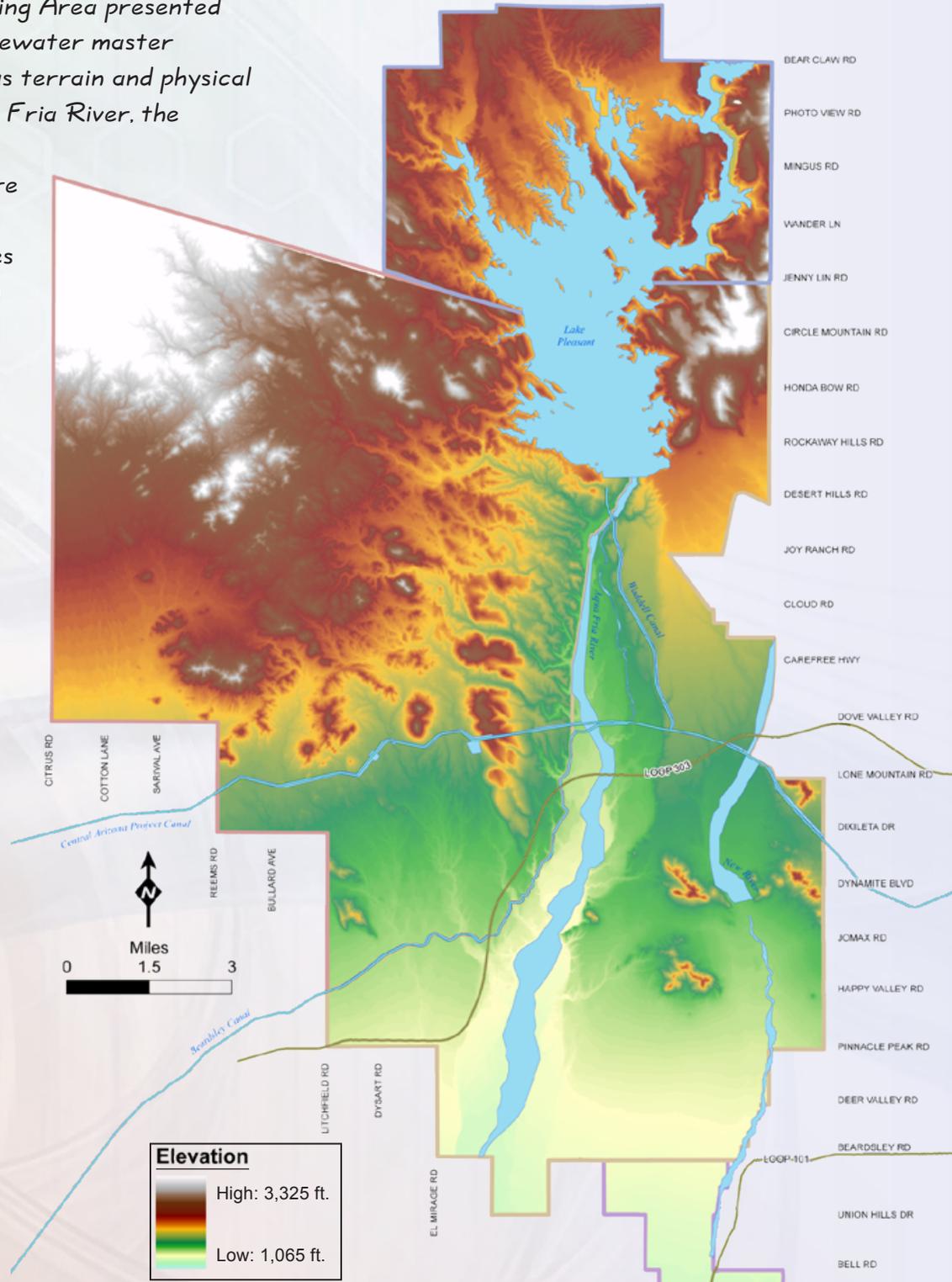


# Strategic Planning

The City's Northern Planning Area presented unique challenges for wastewater master planning due to mountainous terrain and physical obstacles such as the Agua Fria River, the Central Arizona Project (CAP) Canal, and the future Loop 303 freeway. To address these challenges and define the City's vision for growth in this area, strategic planning sessions were held with staff from the Utilities, Public Works, Finance, Engineering and Planning departments.

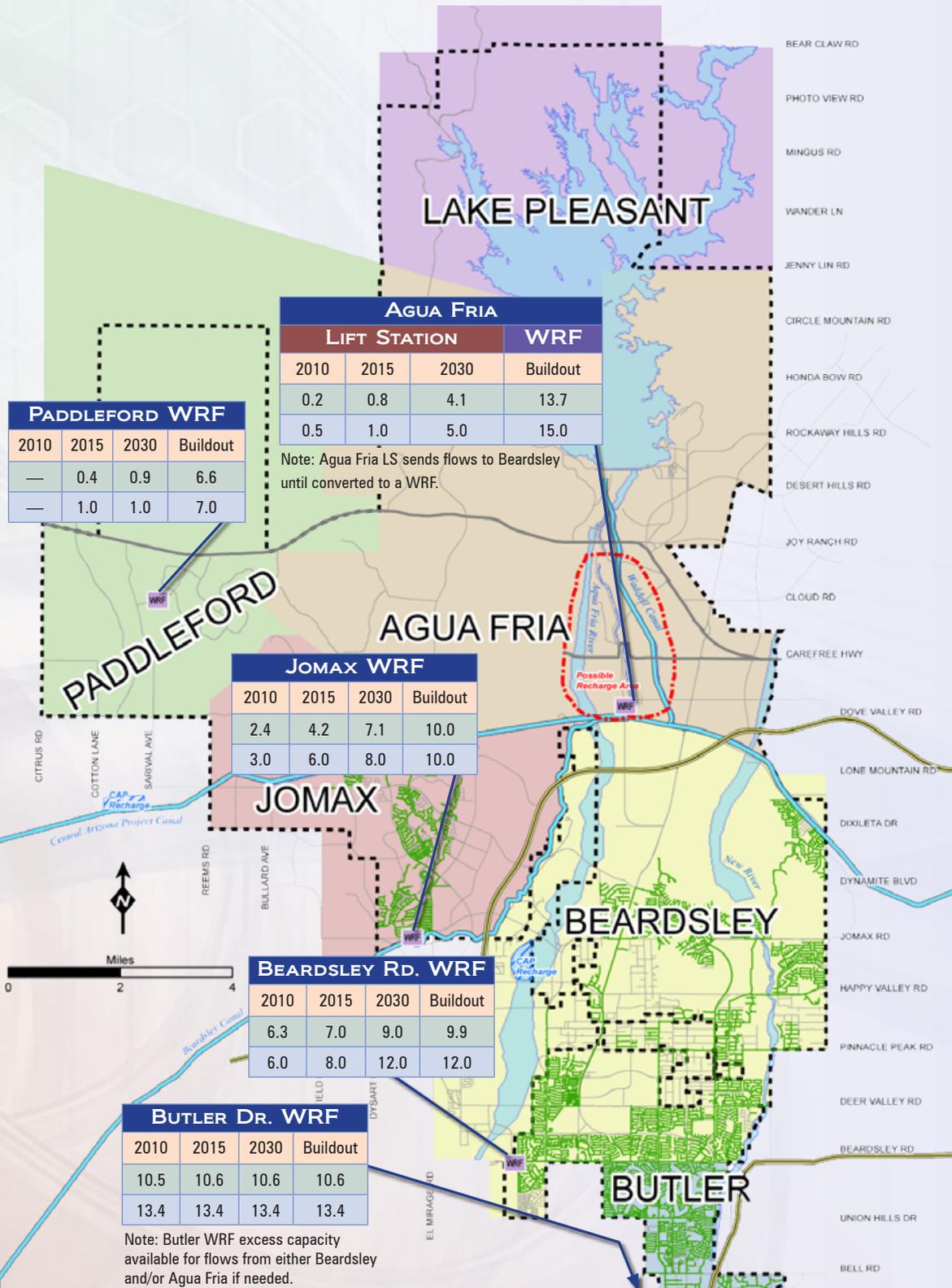
These workshops established:

- ◆ A consensus on buildout populations and wastewater flows.
- ◆ Future capacity of existing water reclamation facilities (WRF).
- ◆ A philosophy of planning for large regional treatment facilities rather than multiple smaller facilities.
- ◆ Practical effluent management strategies.
- ◆ WRF service areas.
- ◆ Triggers for WRF expansion.



# Strategic Planning

At buildout, it is estimated that the City could be operating up to 5 wastewater reclamation facilities. Four of these will be treating flows generated in the northern planning area with a combined treatment capacity of 44 million gallons per day.

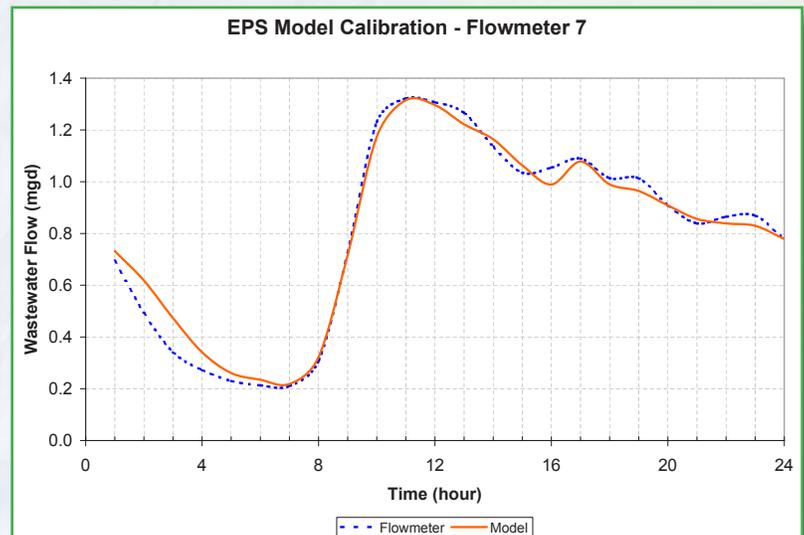


# How To Plan The Future Wastewater System

The City currently operates two water reclamation facilities, Jomax and Beardsley. The Butler WRF is under construction and is expected to be fully operational in July of 2008. The Paddleford WRF is part of an existing agreement for the Saddleback Heights development. Depending upon commercial and residential development, a fifth facility may be required to provide wastewater service north of the CAP Canal, along Lake Pleasant Parkway and along State Route 74.

## Flow Monitoring

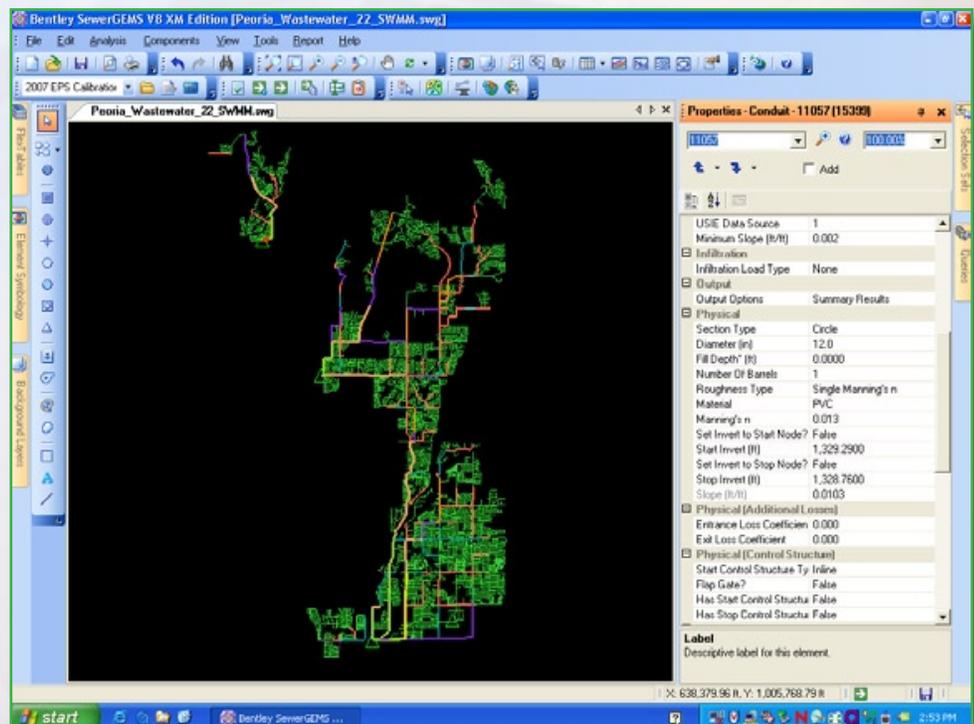
A flow monitoring study was used to estimate flow in each collection basin in the City's existing system. The data was used to develop diurnal patterns which represent the magnitude and timing of wastewater flow in each collection basin.



## GIS/Wastewater System Hydraulic Model

Peoria's investment in its GIS, together with the new hydraulic wastewater system model developed for this master plan, provides the tools for future wastewater system planning and evaluation.

These planning tools will assist Peoria in developing practical and cost effective infrastructure solutions.



# Wastewater System Master Plan

The wastewater system was master planned in phases for the facilities needed to keep pace with development. The interim phase capital improvements were developed with an eye to the future, such that these facilities can be integrated with future infrastructure.

## Key Elements of the Year 2030 Master Plan:

- Development of new lift stations north of the CAP Canal.
- Expansion of the Beardsley Road Water Reclamation Facility to 12 million gallons per day.
- Expansion of the Jomax Water Reclamation Facility to 8 million gallons per day.
- The possible construction and operation of the Paddleford Water Reclamation Facility.



# Reclaimed Water Management



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**USE OF RECLAIMED WATER RESOURCES  
CAN HELP MEET THE CITY'S ASSURED  
WATER SUPPLY REQUIREMENTS.**

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The City has several opportunities to beneficially reuse treated effluent, namely:

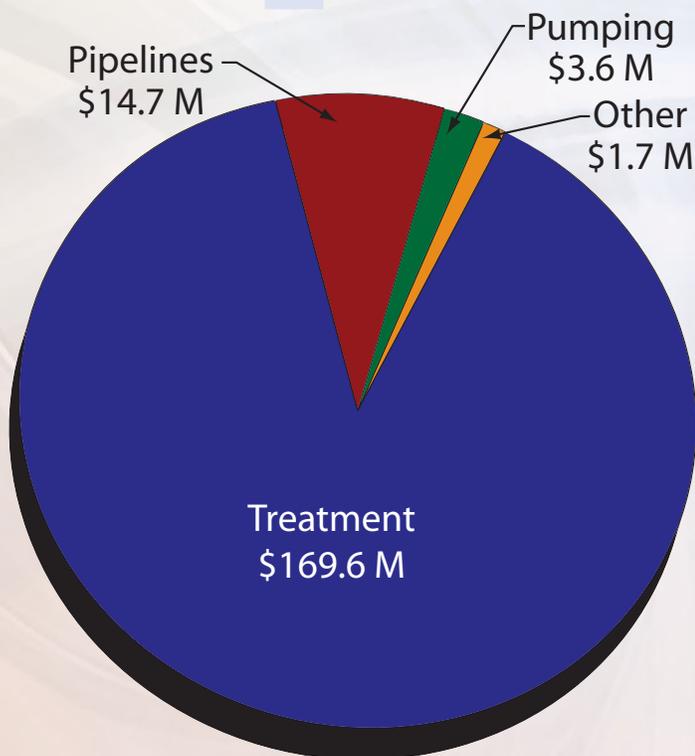
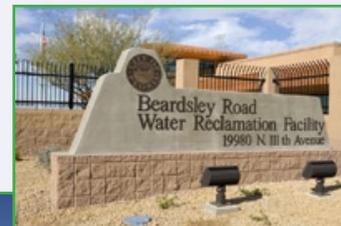
- ◆ Direct reuse of reclaimed water for landscape and golf course irrigation.
- ◆ Recharging reclaimed water for aquifer sustainability.
- ◆ Reclaimed water exchange for renewable potable surface water supplies.

Developing adequate recharge facilities for the reclaimed water estimated to be generated in the northern planning area will be a challenging task for the City, but one that must be actively and aggressively pursued.

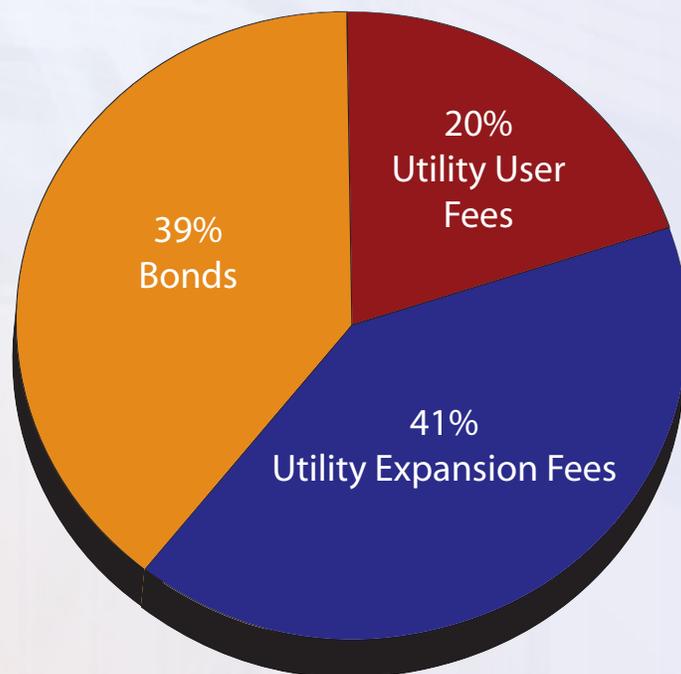


# How Much will the Wastewater Infrastructure Cost?

The wastewater master planning process has identified a 10-year infrastructure improvement program through 2017 totaling \$190 million.



FY 2008 to FY 2017  
CIP Infrastructure Costs



10 Year CIP Funding Sources

# Acknowledgements

The Project Team wishes to extend its appreciation and gratitude to all City staff members who contributed their time and expertise to the success of this wastewater master plan project, particularly the:

- ◆ Utilities Department
  - Engineering Division
  - Environmental Division
  - Treatment Plant Operations
  - Field Operations
  - Water Resources and Conservation Divisions
  - Utilities Geographic Information Systems
- ◆ Public Works Department
- ◆ Finance Department
- ◆ Community Development Department



WELCOME TO  
**PEORIA**



MASTER PLAN COMPLETED BY:  **carollo**