

The background of the slide is a dark, almost black, surface with numerous water droplets of various sizes scattered across it. The droplets are rendered with realistic lighting, showing highlights and shadows that give them a three-dimensional appearance. Some droplets are large and prominent, while others are small and subtle. The overall effect is clean and modern, with a focus on the theme of water.

WATER AND LAND USE PLANNING CONNECTIONS: PHOENIX AS CASE STUDY

RAY QUAY, FAICP

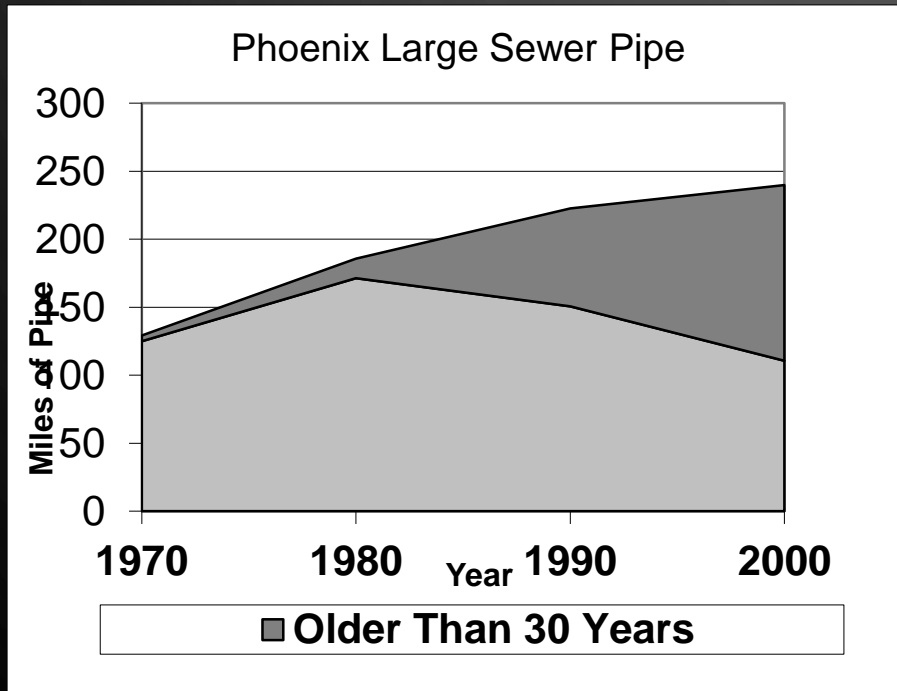
RESEARCH PROFESSIONAL
DECISION CENTER FOR A DESERT CITY
ARIZONA STATE UNIVERSITY

WATER AND LAND USE PLANNING CONNECTIONS

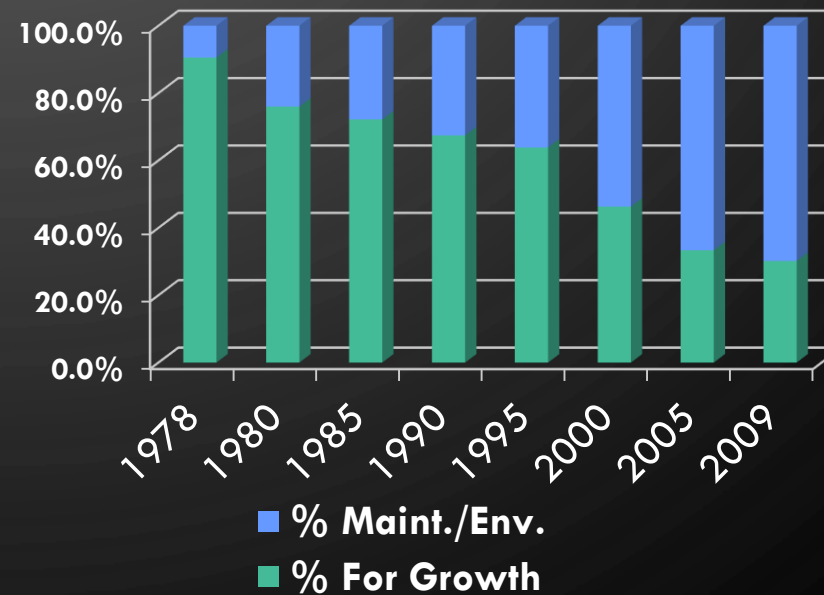
- AGENDA
 - WHY IMPORTANT?
 - TYPES
 - LAND USE: WATER INFRASTRUCTURE
 - LAND USE: DEMAND AND SUPPLY
 - ECONOMY: WATER SUPPLY

WHY IMPORTANT?

- THE FINANCIAL SUSTAINABILITY OF THE UTILITY
 - UTILITIES FINANCES ARE CHANGING
 - MAINTENANCE OF OLDER INFRASTRUCTURE RISING
 - CIP SHIFTING FROM GROWTH TO MAINTENANCE



Phoenix % CIP Growth vs Maintenance

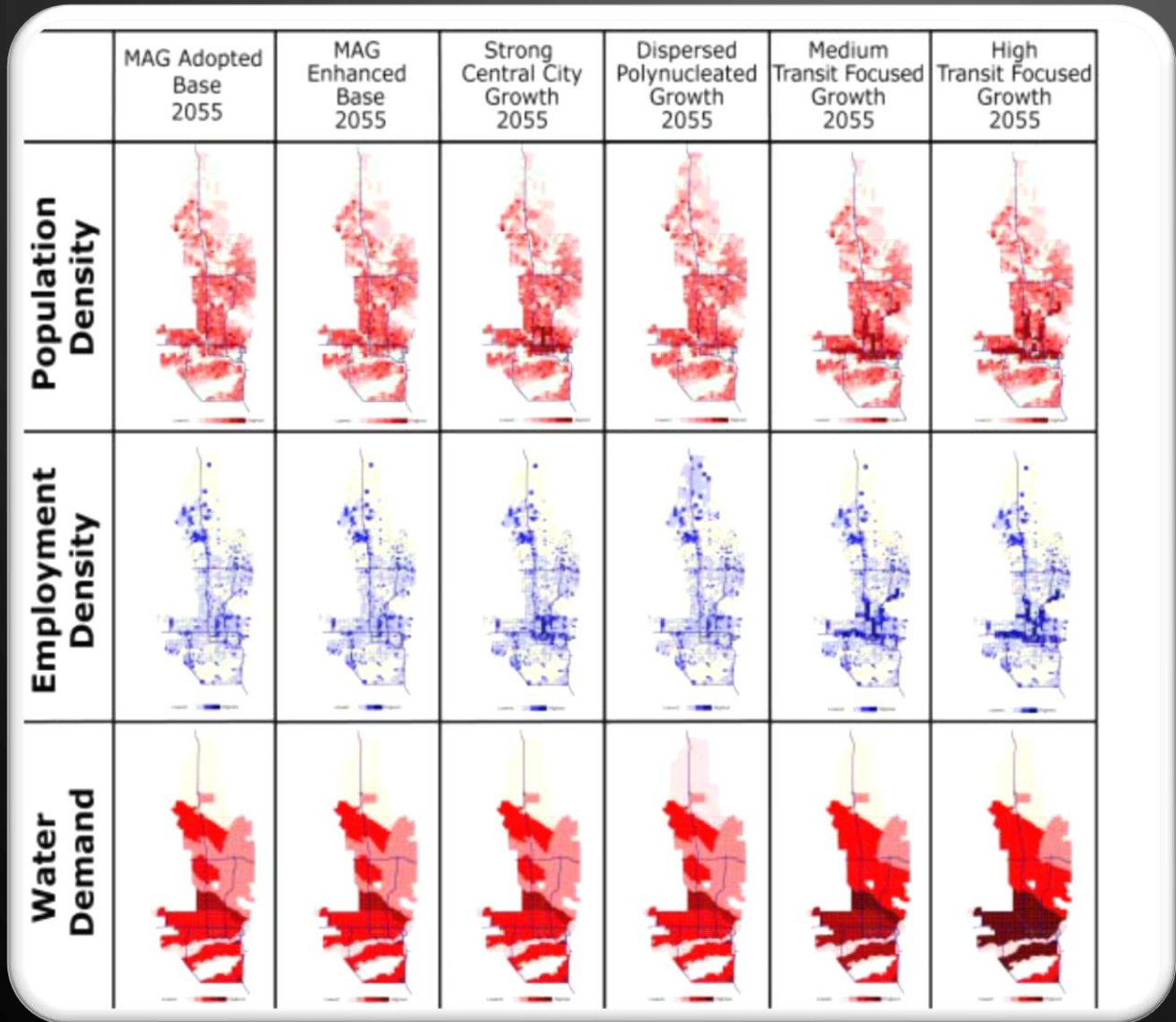


WHY IMPORTANT?

- THE FINANCIAL SUSTAINABILITY OF THE UTILITY
 - UTILITIES FINANCES ARE CHANGING
 - MAINTENANCE OF OLDER INFRASTRUCTURE RISING
 - CIP SHIFTING FROM GROWTH TO MAINTENANCE
 - REVENUES FLAT OR DECLINING BECAUSE OF DECREASING DEMAND
 - MINIMAL FEDERAL OR STATE ASSISTANCE
 - NEED TO BE MORE FINANCIALLY STRATEGIC ABOUT WATER INFRASTRUCTURE AND LAND USE PLANNING
- THE SUSTAINABILITY OF GROWTH AND ECONOMY
 - WATER IS ESSENTIAL FOR EXISTING AND FUTURE LAND USE, YET SUPPLIES ARE LIMITED
 - NEED TO BE MORE STRATEGIC ABOUT DEMAND (LAND USE) AND SUPPLY

LAND USE: WATER INFRASTRUCTURE

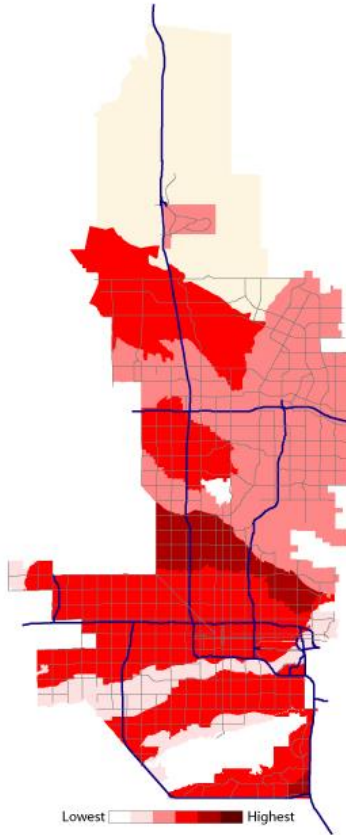
- SOME PLACES HAVE SPATIAL EXPLICIT WATER SUPPLIES
 - SURFACE WATER, GROUNDWATER, EFFLUENT
- SOME PLACES MORE COSTLY TO DELIVER AND COLLECT WATER
 - ELEVATION, LACK OF MAJOR INFRASTRUCTURE, DISTANCE
- JOINT STRATEGIC PLANNING OF LAND USE AND WATER INFRASTRUCTURE
 - WATER PLANNING TO IDENTIFY SPATIAL AND TEMPORAL STRATEGIES
 - GROWTH PLANNING TO SEQUENCE AND MINIMIZE INFRASTRUCTURE



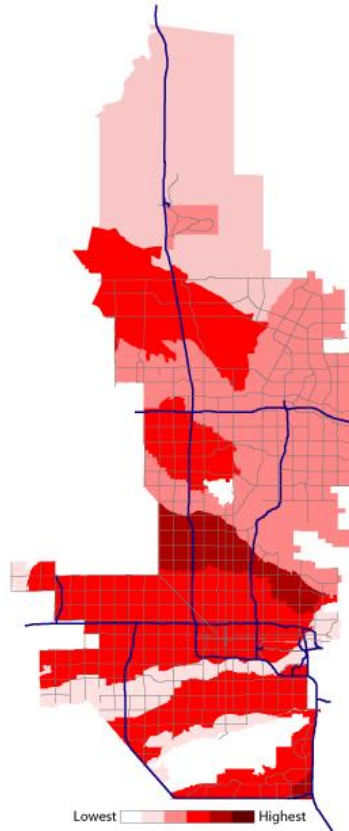
PHOENIX:
WATER AND LAND USE
PLANNING

Water Demand

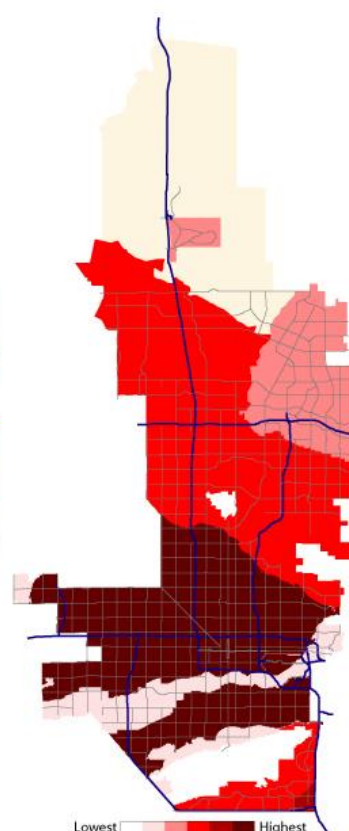
MAG 2003
Forecast



Growth At
Urban Edge



Central City
Growth



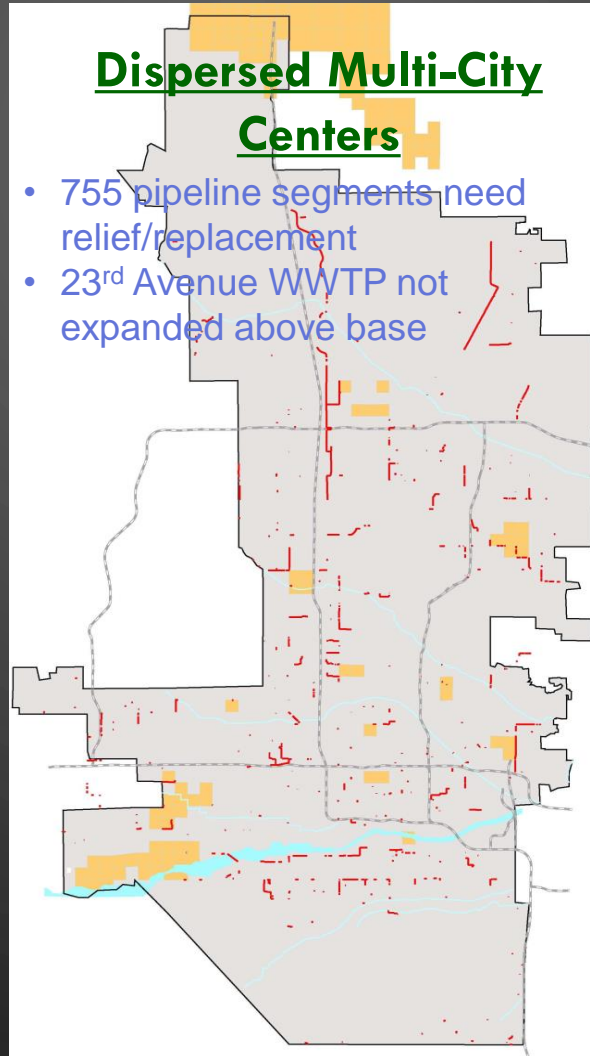
PHOENIX:
WATER AND LAND USE
PLANNING

PHOENIX: WATER AND LAND USE PLANNING

- ANTICIPATORY PLANNING
- LAND USE SCENARIOS
 - COSTS
 - ROBUST FACILITIES
 - CONTINGENCIES

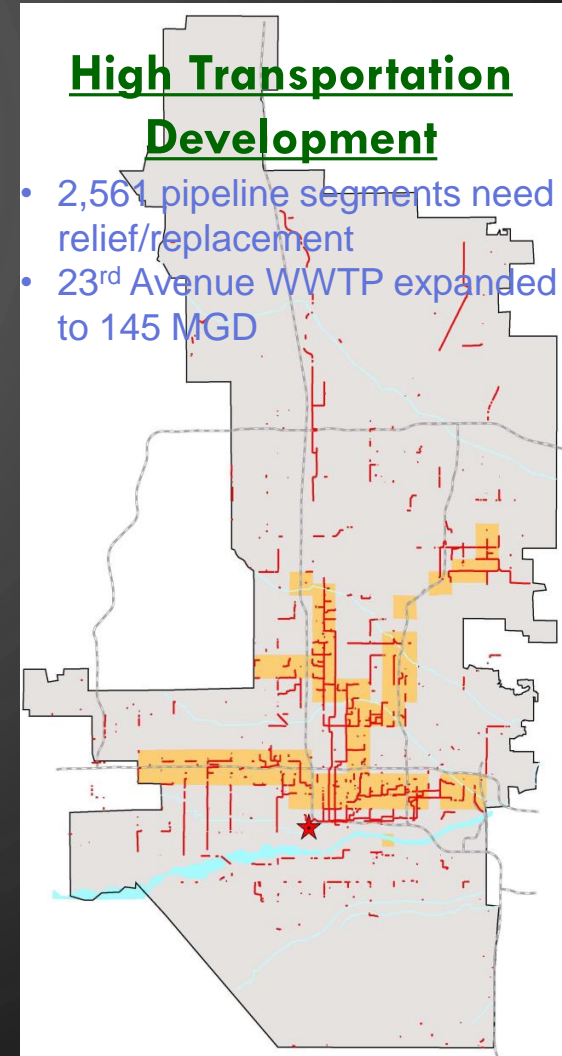
Dispersed Multi-City Centers

- 755 pipeline segments need relief/replacement
- 23rd Avenue WWTP not expanded above base

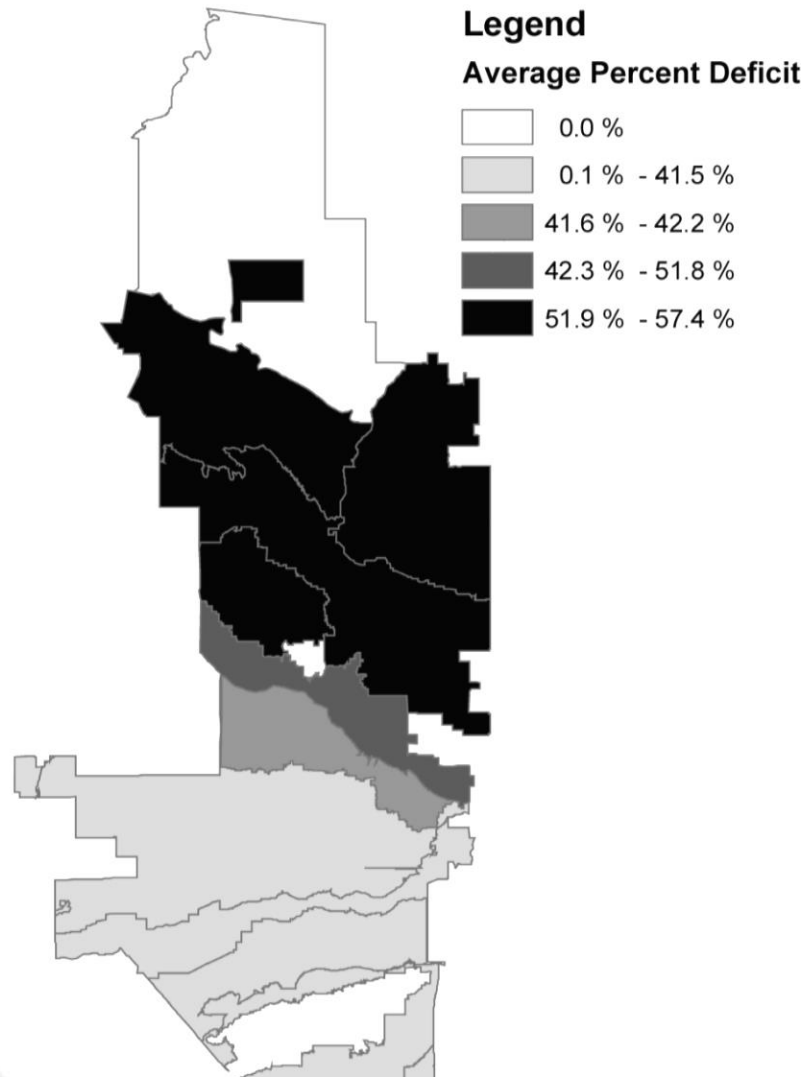


High Transportation Development

- 2,561 pipeline segments need relief/replacement
- 23rd Avenue WWTP expanded to 145 MGD



Aggregated Percent Deficit 2035

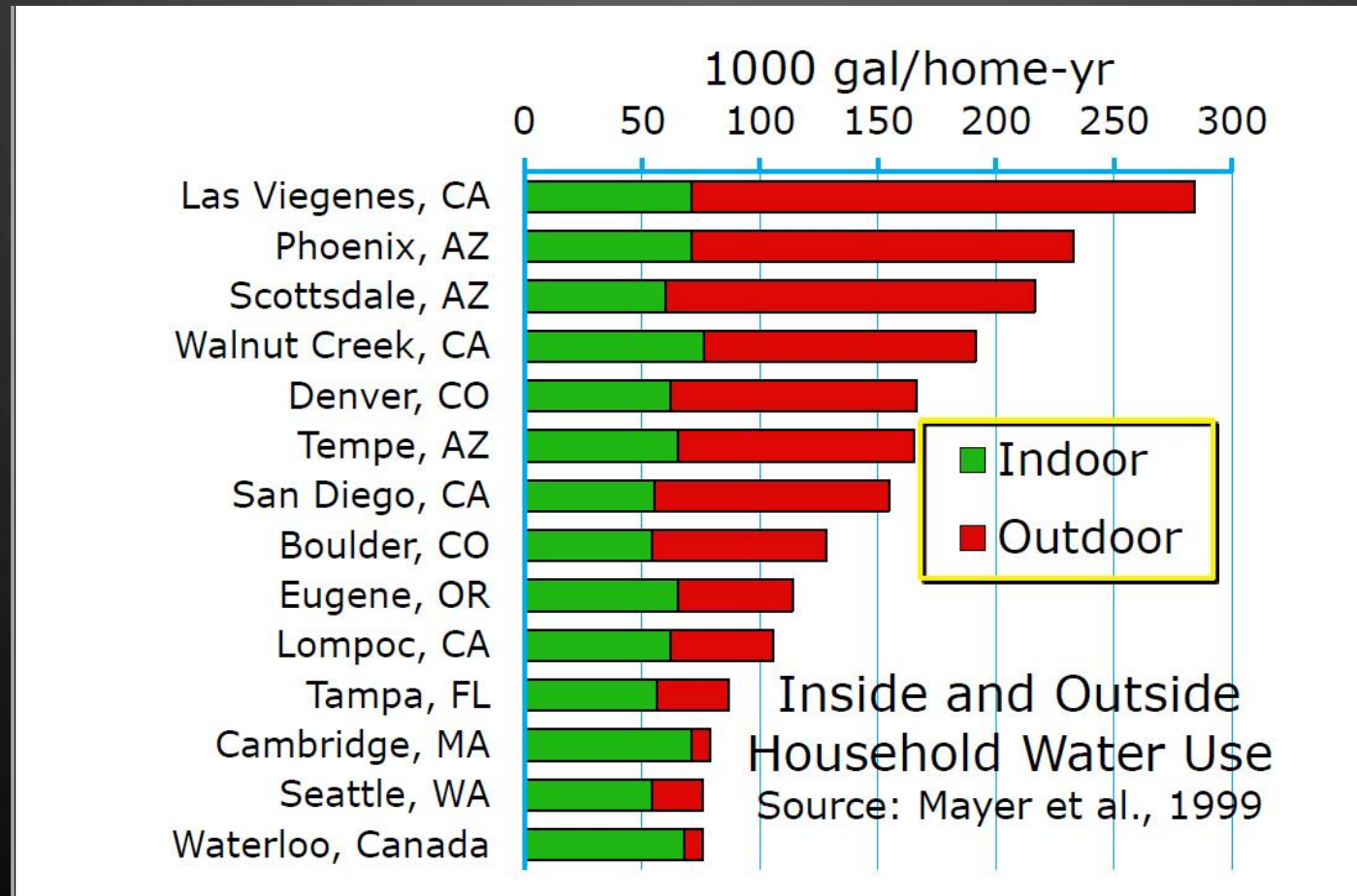


PHOENIX: WATER AND LAND USE PLANNING

- ANTICIPATORY PLANNING
- DROUGHT SCENARIOS
 - SLIGHT, MODERATE, SEVERE
 - AGGREGATED % DEFICIT
 - GROWTH STRATEGIES

LAND USE: WATER DEMAND AND SUPPLY

- ALL ABOUT THE PLANNING LANDSCAPES

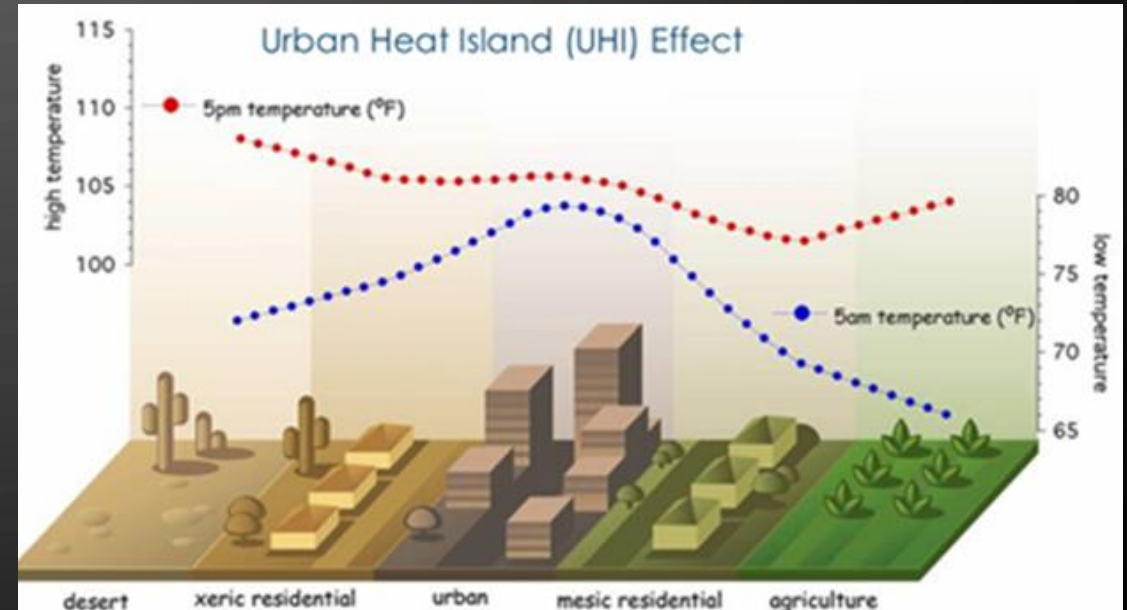
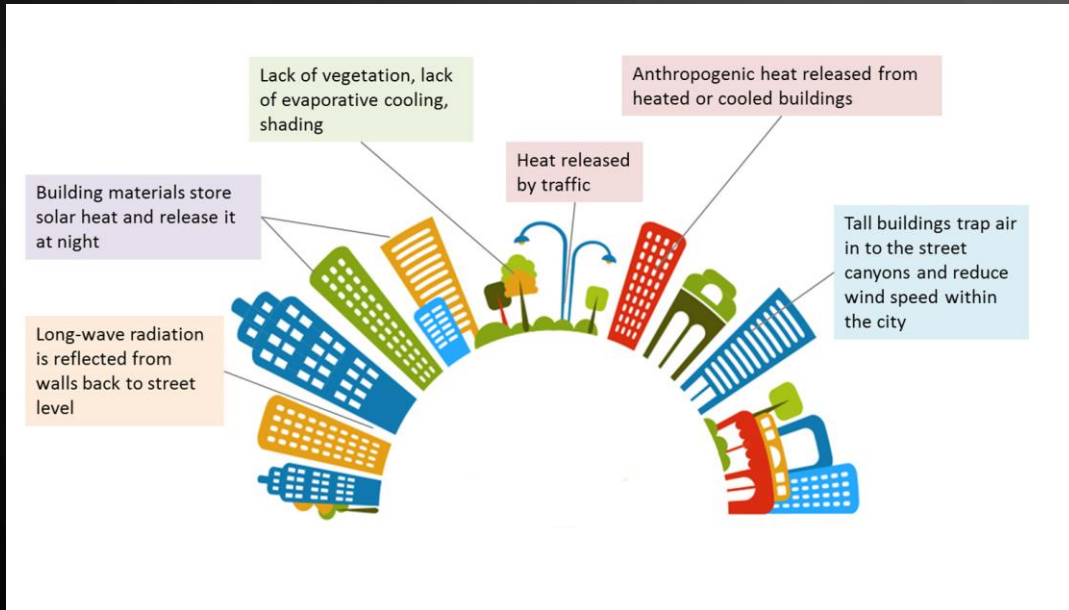


LAND USE: WATER DEMAND AND SUPPLY

- ALL ABOUT THE PLANNING LANDSCAPES
 - DEVELOPMENT PLANNING AND REGULATION
 - BUILDING CODES
 - ZONING
- RESIDENTIAL DENSITY:
 - NON LINEAR AND HIGH VARIANCE
 - SPECIFIC TO CONTEXT OF THE COMMUNITY

LAND USE: WATER DEMAND AND SUPPLY

- HEAT: URBAN HEAT ISLAND AND EXTREME HEAT
 - HIGH INTENSITY LAND USE WITH LOW VEGETATION HEATS UP THE CITY

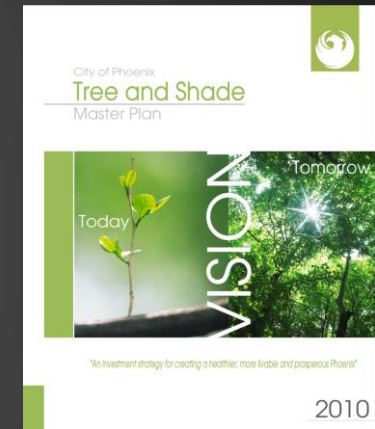


LAND USE: WATER DEMAND AND SUPPLY

- HEAT: URBAN HEAT ISLAND AND EXTREME HEAT
 - HIGH INTENSITY LAND USE WITH LOW VEGETATION HEATS UP THE CITY
 - CLIMATE CHANGE WILL INCREASE MAXIMUM AND LENGTH
 - CURRENT HEALTH ISSUE THAT WILL INCREASE IN IMPACT
 - BUT - COOLING WITH IRRIGATED LANDSCAPES AND WATER FEATURES INCREASES DEMAND
 - STRATEGIC URBAN DESIGN OF LANDSCAPES AND URBAN FORM CRITICAL
 - PRIORITIZE WATER IN MOST VULNERABLE AND HIGH IMPACT
 - STRUCTURAL SHADE ELSEWHERE

PHOENIX HEAT PLANNING

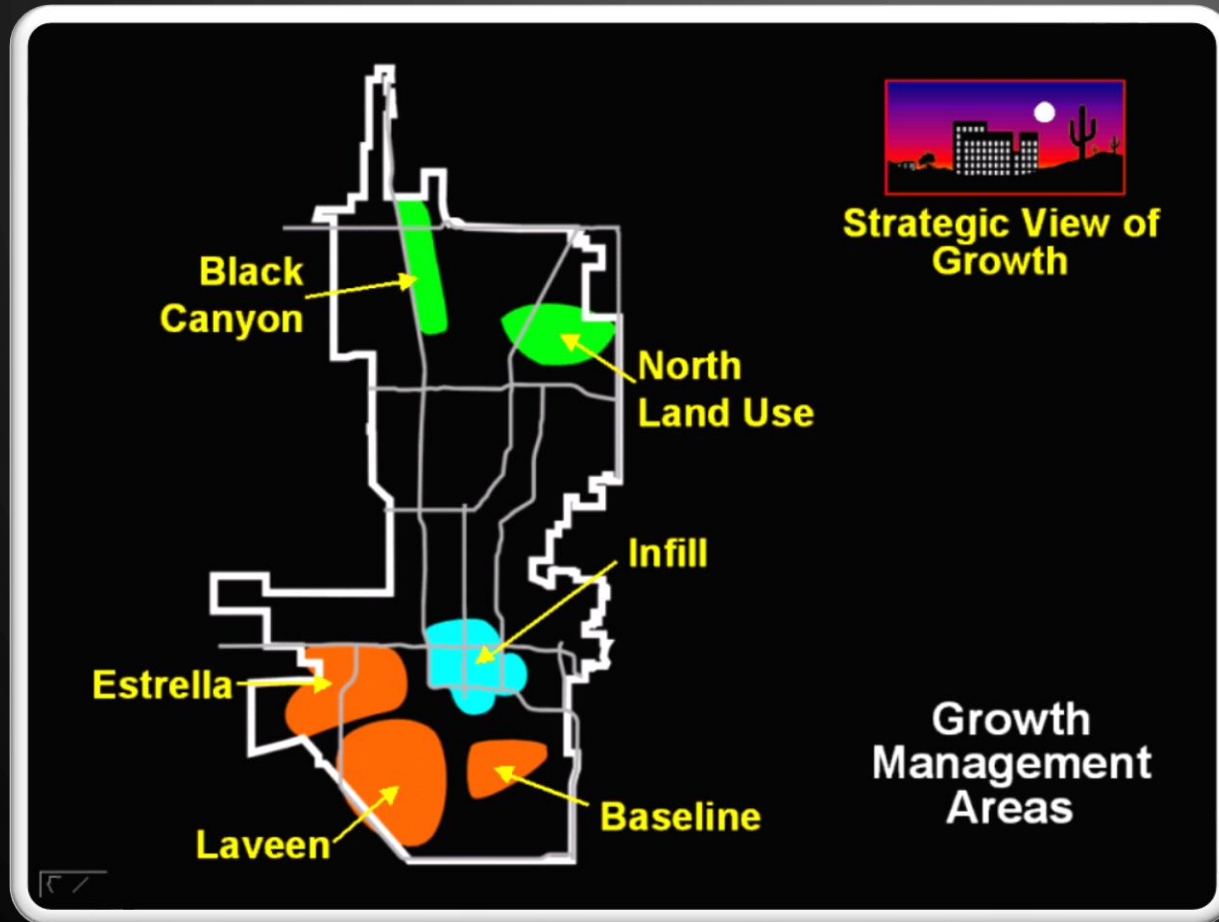
- LAND USE AND WATER PLANNING
 - DOWNTOWN ZONING AND URBAN FORM STANDARDS
 - TREE AND SHADE PLAN
 - WALKABLE URBAN CODE
 - TRANSIT STOP PLANNING
 - PUBLIC HOUSING DESIGN
 - HEAT READY PLAN (FUTURE)
 - CAPITAL PROJECTS HEAT AND WATER REVIEW
 - PRIVATE SECTOR DEVELOPMENT HEAT INCENTIVES



ECONOMY: WATER SUPPLY

- WATER IS ESSENTIAL TO CURRENT AND FUTURE LAND USE
 - ABILITY TO MEET CURRENT AND FUTURE DEMAND UNDER STRESS
 - AVAILABILITY OF WATER SUPPLY TO MEET GROWTH DEMANDS
- IMAGE OF WATER SITUATION
 - ECONOMIC DEVELOPMENT
 - BOND RATINGS

PHOENIX STRATEGIC VIEW OF GROWTH



- GROWTH AREAS

- IDENTIFIED WATER AND WASTEWATER NEEDS AND ISSUES
- LAND USE STRATEGIES FOR MANAGING GROWTH TO MAXIMIZE FINANCIAL SUSTAINABILITY

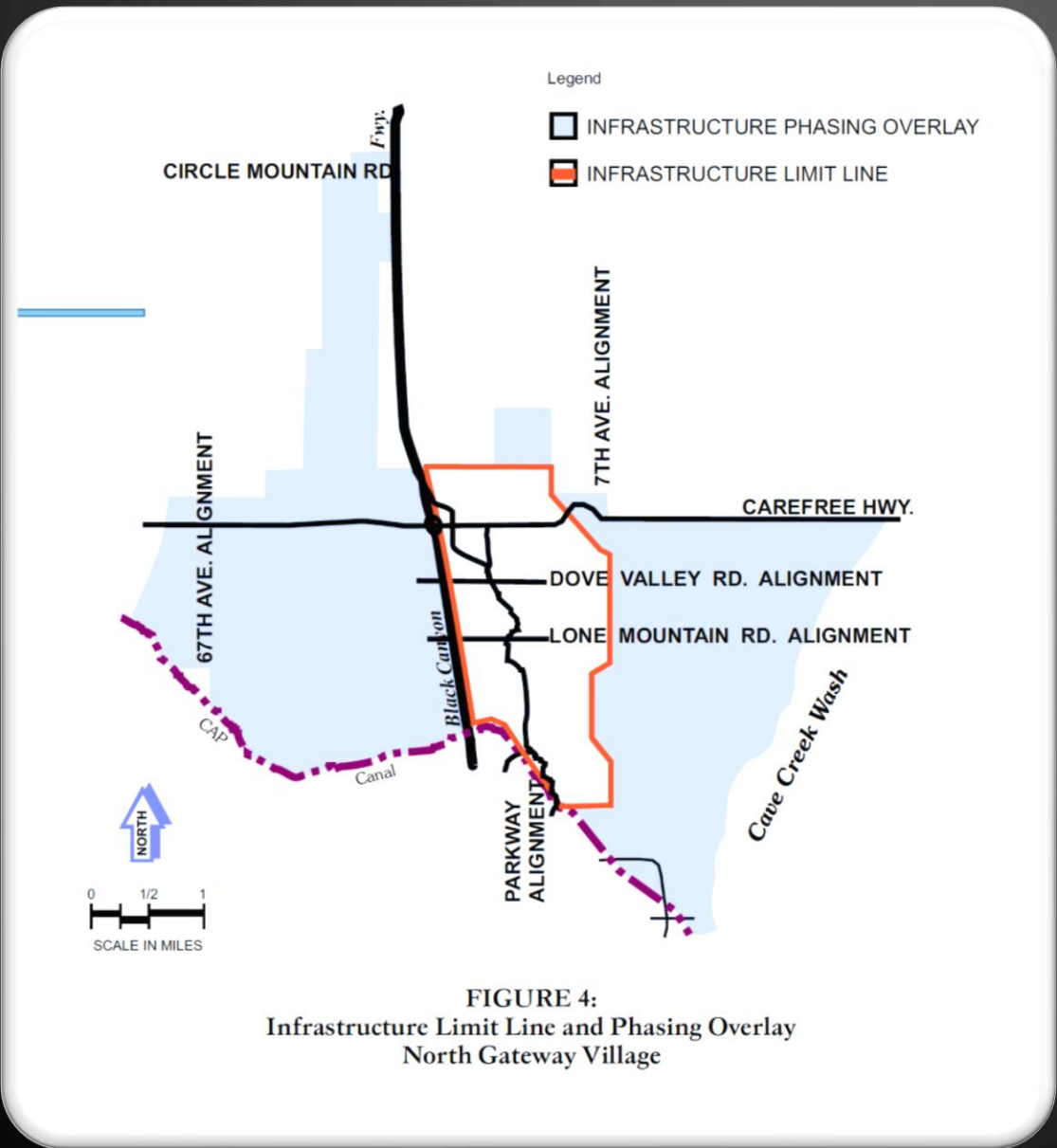
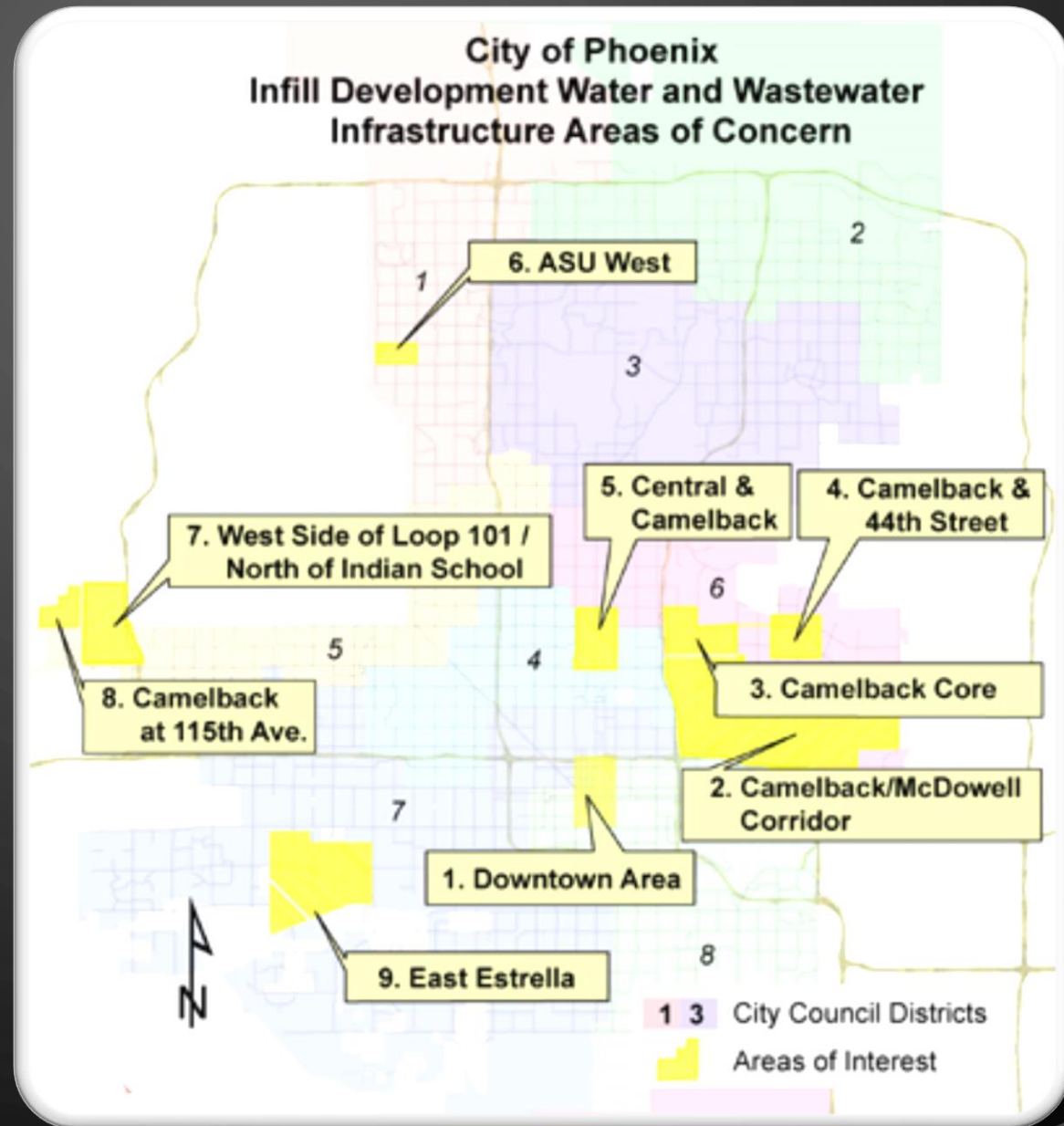


FIGURE 4:
Infrastructure Limit Line and Phasing Overlay
North Gateway Village

NORTH BLACK CANYON CORRIDOR

INFRASTRUCTURE LIMIT LINE

INFILL AREAS OF CONCERN AND PLANNING



The background is a dark, gradient grey with several realistic water droplets of various sizes scattered across the surface, primarily concentrated in the top-left and bottom-right corners.

THANKS!
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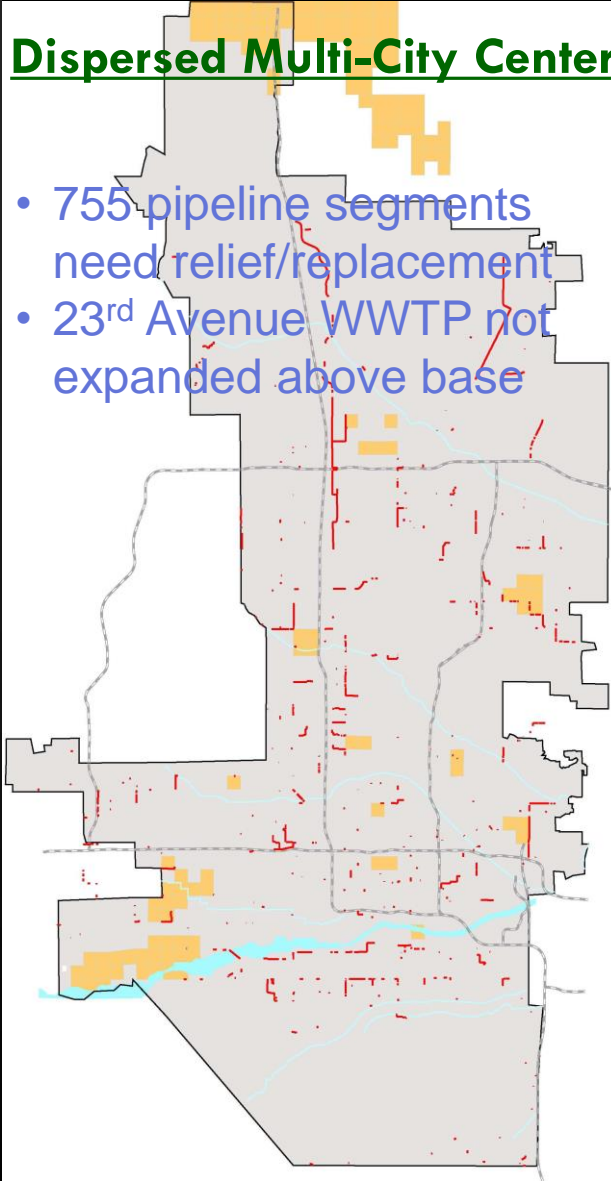


ALTERNATIVE GROWTH SCENARIOS

- General Plan • 751 pipeline segments need relief/replacement
- 23rd Avenue WWTP not expanded

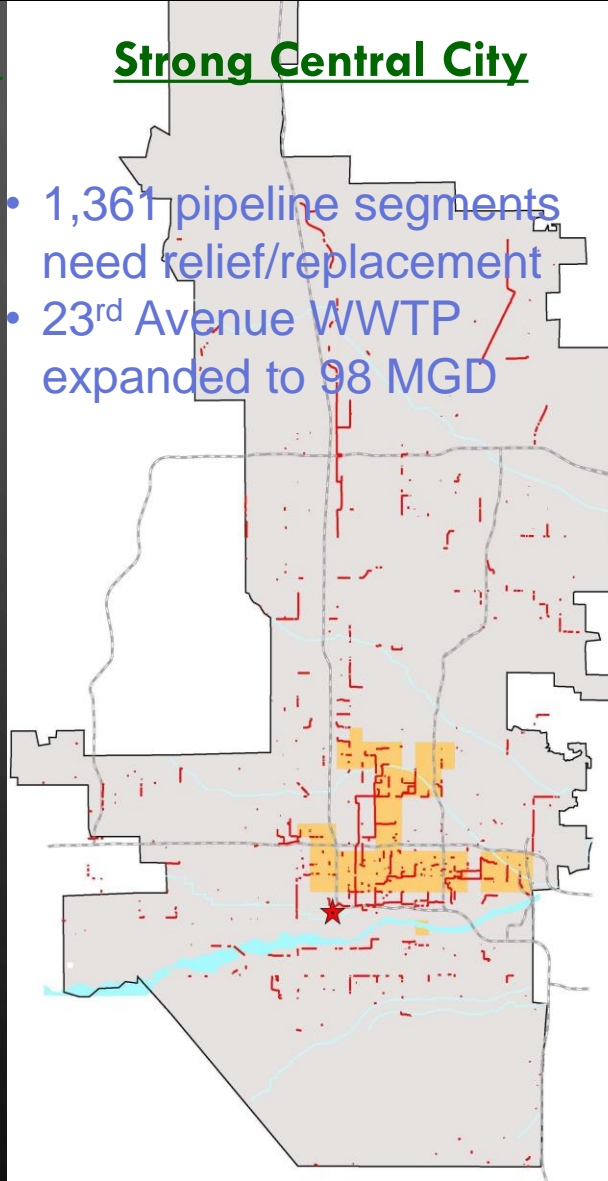
Dispersed Multi-City Centers

- 755 pipeline segments need relief/replacement
- 23rd Avenue WWTP not expanded above base



Strong Central City

- 1,361 pipeline segments need relief/replacement
- 23rd Avenue WWTP expanded to 98 MGD



High Transportation Development

- 2,561 pipeline segments need relief/replacement
- 23rd Avenue WWTP expanded to 145 MGD

