

THE URBANIZING WEST: LIMITS TO WATER, LIMITS TO GROWTH

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CIVIL & ENVIRONMENTAL ENGINEERING
ARIZONA WATER INSTITUTE**



WATER & LAND USE THE MISSING LINK



WHY HISTORICALLY A DISCONNECT

Water Use – regulated at state & federal levels

- Reacting to crisis, facilitating econ development
- Water & Land – separate commodities, separate property rights

WATER & LAND USE THE MISSING LINK

WHY HISTORICALLY A DISCONNECT

- Land Use – regulated by local government
 - Avoid nuisance, grow & increase tax base
- Water historically not examined in comp. plans
 - Planners & water managers don't interact
- Comprehensive plans typically not followed
 - Too general, different elements conflict
 - Investment decisions – incremental & disconnected
- State & Local interests may be inconsistent

WATER & LAND USE THE MISSING LINK

WHY HISTORICALLY A DISCONNECT

- Significant growth on urban fringe and rural areas
 - with little or no planning capacity
- The regional and local water related impacts of development do not line up
 - Local areas receive benefit of development, but may not bear impact on water resources
- Inadequate willingness/ability to invest in water resources planning or management – at state & local level
- Assumption water will move uphill towards development
 - Just buy the rights and build infrastructure
- Leave it to the experts – water is complicated

...trust us!

Arizona's Management Framework..

Re-distributive

Regulatory

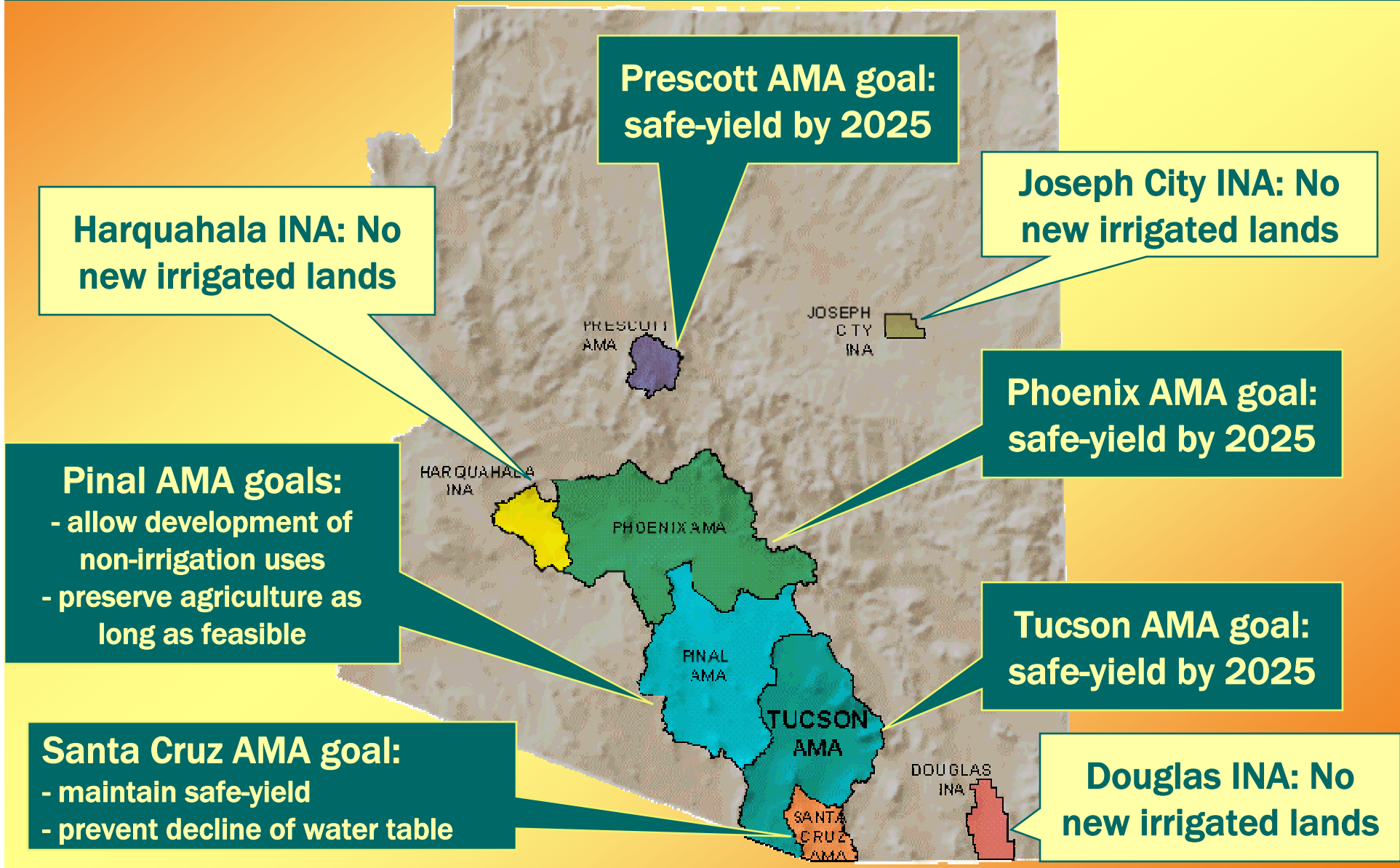
Constituent

Distributive

- Strong Regulatory Approach
- Focus on Management Areas vs Statewide
- Choose State vs Regional/Local Control
- Maintained Groundwater / Surface Water Dichotomy
- Adopted Rights System with Grandfathering

..... & Consequences

Water Management Areas



**Prescott AMA goal:
safe-yield by 2025**

**Joseph City INA: No
new irrigated lands**

**Harquahala INA: No
new irrigated lands**

**Phoenix AMA goal:
safe-yield by 2025**

**Pinal AMA goals:
- allow development of
non-irrigation uses
- preserve agriculture as
long as feasible**

**Tucson AMA goal:
safe-yield by 2025**

**Santa Cruz AMA goal:
- maintain safe-yield
- prevent decline of water table**

**Douglas INA: No
new irrigated lands**

ARIZONA'S WATER MANAGEMENT TOOLS

Active Management Areas

- **Withdrawal Authorities**
- **Demand Management: Conservation Requirements & Use Restrictions**
- **Supply Management: Conversion to Renewable Water Supplies**

SUPPLY MANAGEMENT



ASSURED WATER SUPPLY CRITERIA

- Physical, Legal, & Continuous availability for 100 Years
- Adequate Quality
- Financial Capability
- Consistent with Conservation Targets
- Consistent with AMA Goals
 - Safe-yield in Phoenix, Tucson, Prescott AMAs

ASSURED WATER SUPPLY

Methods of Meeting Goal Requirement

- Use of renewable supplies (either directly or via underground storage and recovery):
 - Surface water
 - Effluent
- Membership in the Central Arizona Groundwater Replenishment District
- Groundwater imported from certain basins
- Dry lot subdivisions of less than 20 lots are exempt

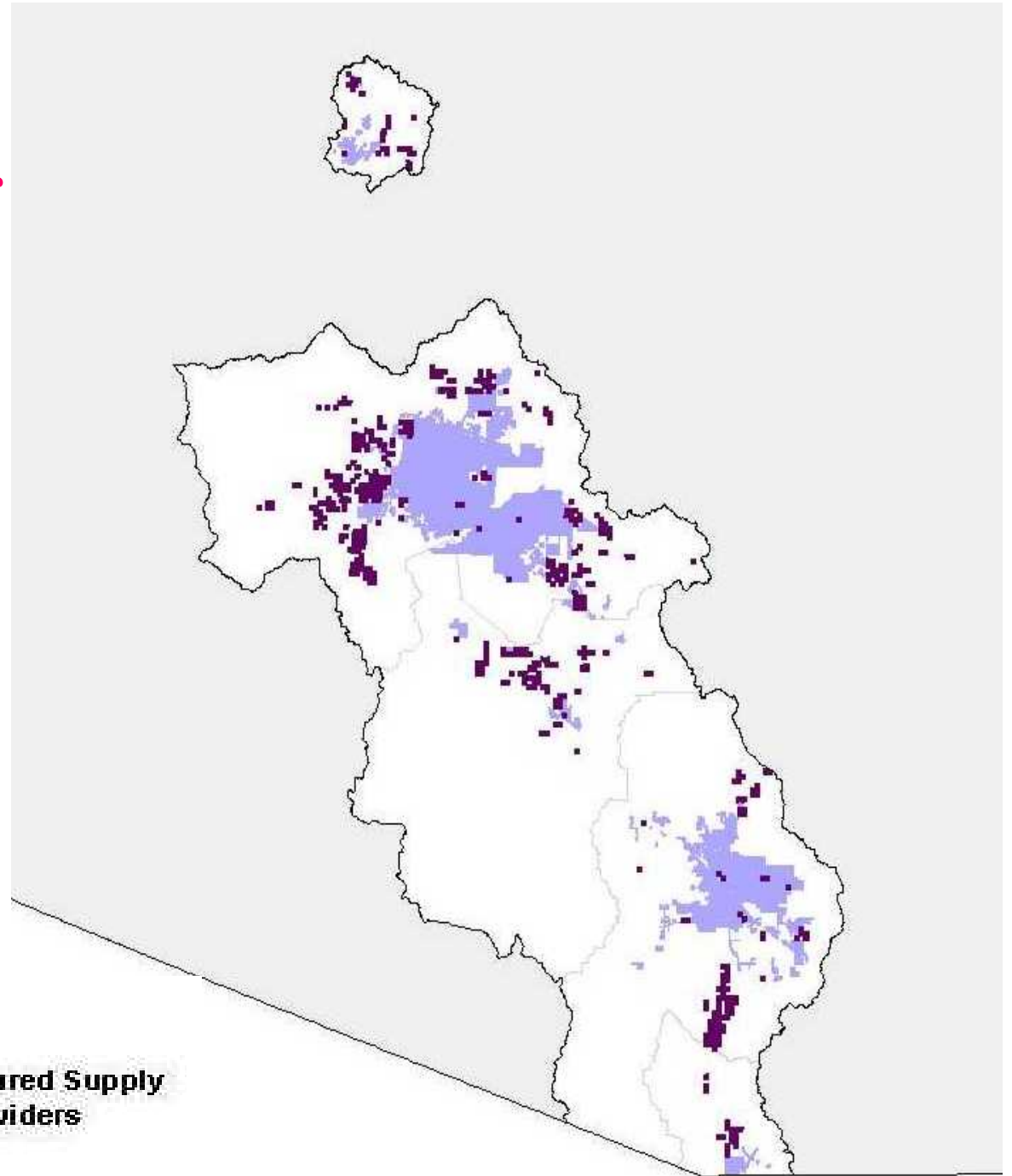
Two means of establishing an Assured Water Supply:

Certificate of Assured Water Supply
(individual subdivision)

Designation of Assured Water Supply
(blanket for water provider)

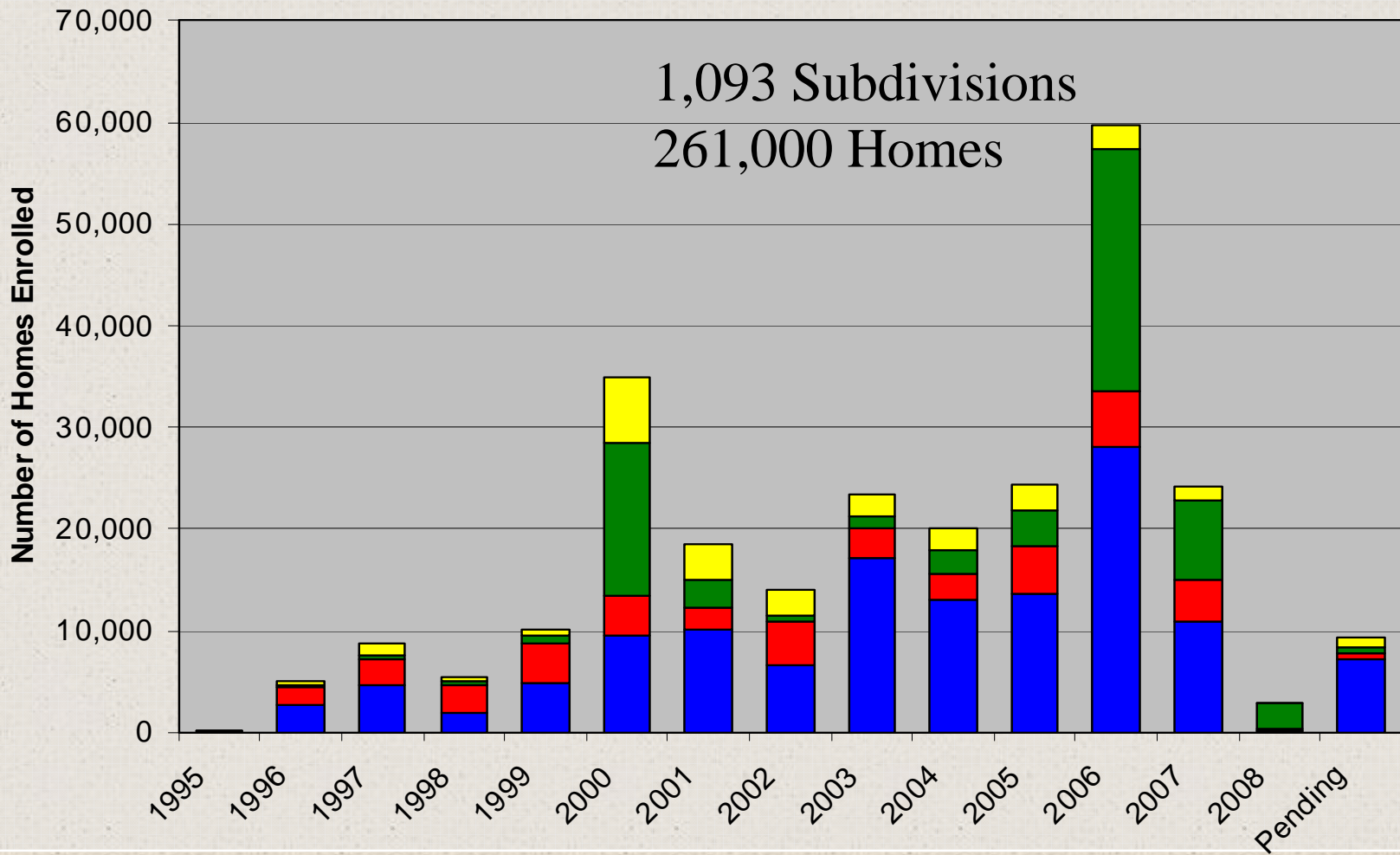
Certificates of Assured Water Supply Issued

- Arizona
- Non-AMA Area
- Sections Issued Certificates of Assured Supply
- Designation of Assured Supply Providers
- Active Management Areas



MEMBER LAND ENROLLMENT

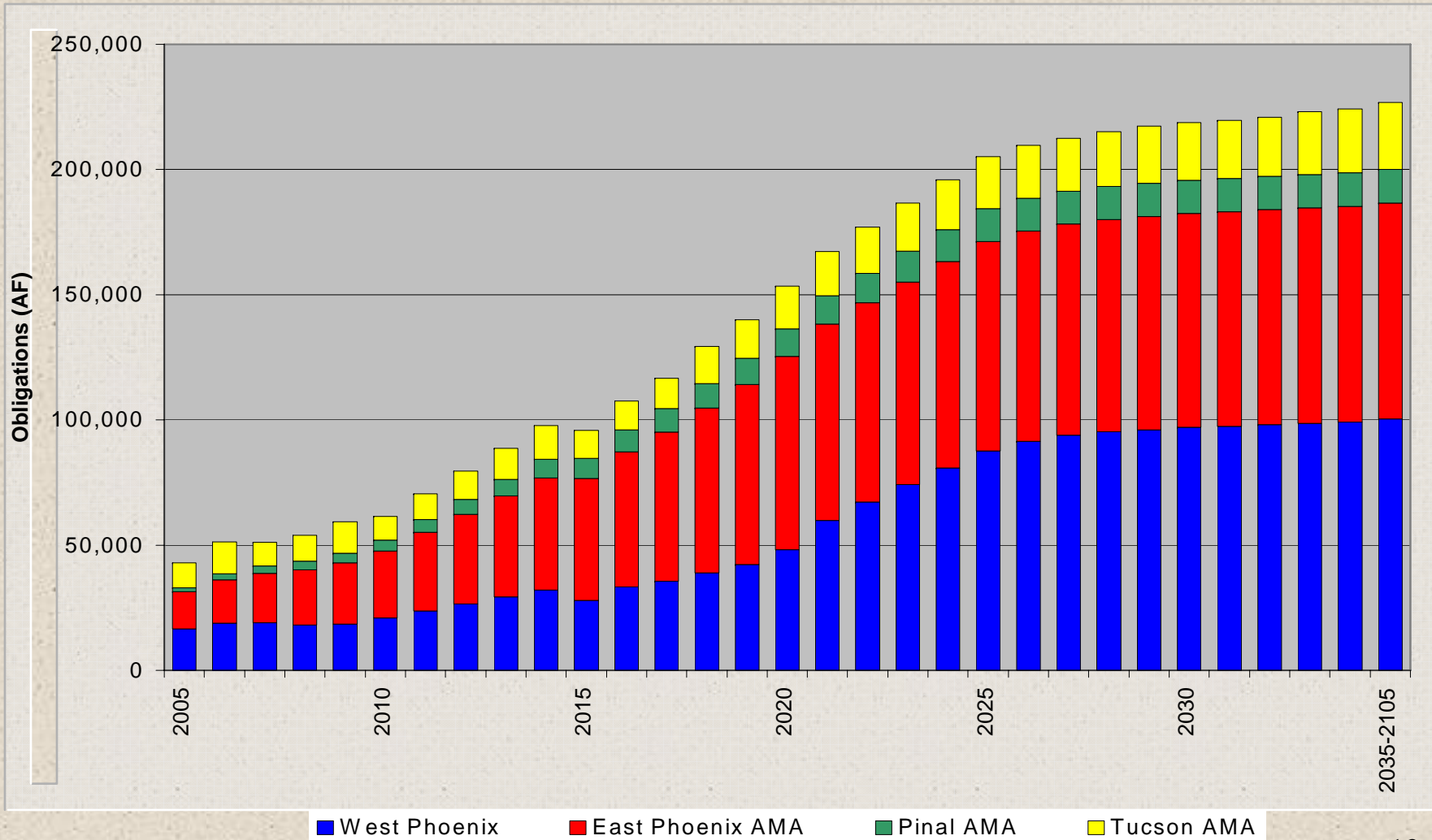
As of February 28, 2008



■ West Phx AMA
 ■ East Phx AMA
 ■ Pinal AMA
 ■ Tucson AMA

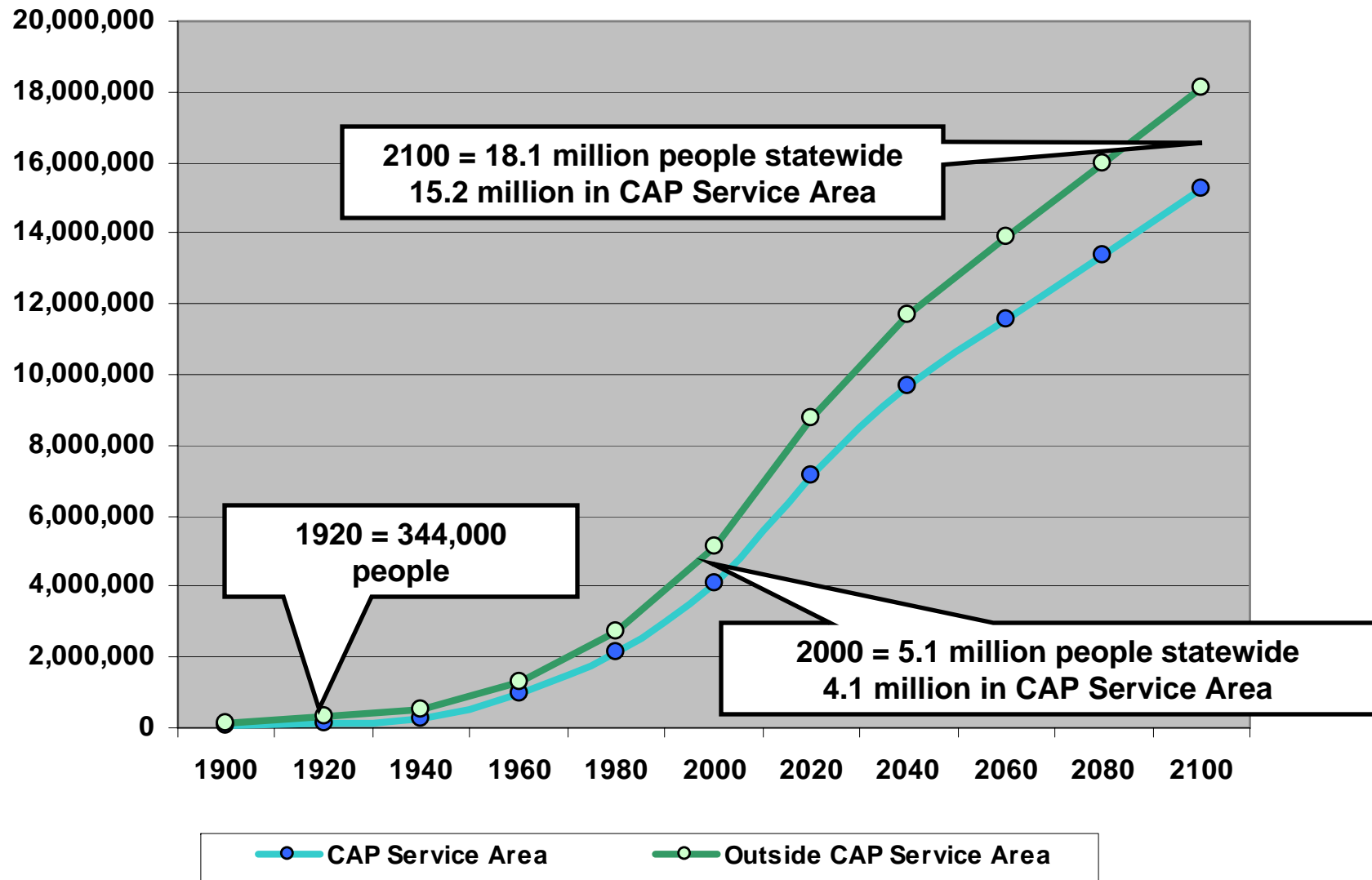
Slide from: Cliff Neal, CAGR

PROJECTED OBLIGATIONS



Slide from: Cliff Neal, CAGR D

Population Estimates and Projections 1900 to 2100



SOURCE: U.S. Census Bureau 1900 to 2000; Arizona Department of Economic Security 2010 to 2050 (April 2006 Projections); Global Institute of Sustainability 2060 to 2100 (June 2006)

AZ Water Management Policy



Program Design Considerations

- What are Water Mgmt Goals & Objectives
- What Actions Do We Want To Affect
 - Location & type of development, Uses, Supplies
- How Can Those Actions Be Influenced
 - Investments, Behaviors & Actions
- What Tools Do We Have Available

AZ Supply Management Programs

<i>Re-distributive</i>	<i>Regulatory</i>
<i>Constituent</i>	<i>Distributive</i>

- Secure Supplies for New Development
- Who is the Decision-Maker?
- Developers, Landowners, Local Govt.
- Water Providers Make Investments
- Need for State Control
- Required Mechanism to Meet Rules - GRD

WATER & LAND USE

What Role For General Plans



Water Resources Element

- Growing Smarter/Plus requires a water resources element from municipalities over 2,500 unless under 10,000 and with a growth rate of less than 2%, and counties with pops greater than 125,000
- 4 counties and 23 communities outside of AMAs qualify
- Over 50,000 pop, due at end of 2002 (2); under 50,000, end of 2003 (21)

WATER & LAND USE

What Role For General Plans



Water Resources Element Requirements

- Identify known legally and physically available supplies
- Identify demand resulting from growth projected in general plan
- Identify how demand will be served by currently available supplies or a plan to obtain additional necessary water supplies - (all from existing data):

Conclusions:

- Outside of AMAs, water elements have limited impact

AZ Water Provider Plans



HB 2277 - 2005 Legislative Session

- Water Supply Plan - sources, service area, historic & projected demands. Due 1/07 year later for small
- Drought Preparedness Plan - response actions & public information
- Water Conservation Plan - measures to reduce loss, increase efficiency, consider rate structure
- Report Water Use - starting May 2007 for 2006

Water Adequacy - Strengthening AZ's Statewide Program



HB 2693 / SB 1575 - 2007 Legislation

- Outside AMA County Supervisors may, by unanimous vote, adopt an ordinance prohibiting final plat approval if adequacy not demonstrated to ADWR, city must follow
- Potential exemptions to:
 - County may allow water hauling - indication on deed
 - ADWR Director may allow 20 years for water supply development
 - ADWR director can exempt if significant capital investment
- City can adopt own ordinance if County does not
- Water Providers in jurisdiction eligible for water supply development fund if jurisdictions adopt ordinance

Adequate Water Supply Approaches



Hierarchy of Approaches

- Do Nothing - Buyer Beware
- Buyer Informed - Subsequent Buyers?
- Public Notice - Comment/Protest Right?
- Require Demonstration of _____ Year Supply
- Require Renewable Supply & Replacement of Mined Groundwater (Safe-Yield?)
- Local Area Sustainability for _____ Years
- Recovery from Previous Aquifer Depletion²¹

Adequate Water Supply Approaches



California

- **SB 221 (2001) - Effective 1/2002**
 - Apply to subdivision > 500 units
 - Developer must demonstrate 20 yr supply
 - Must consider normal & dry years
 - Water provider must verify adequacy
- **SB 610 (2001) - Proj. subject to CEQA**
 - Requires water supply assessment

Adequate Water Supply Approaches



Nevada

- State Engineer reviews all subdivisions. Approval guarantees adequate water
- Utilities must secure permanent water rights to provide continuous & adequate supplies.
- Utility plans reviewed by Nevada Public Utilities Commission or by So NV Water Authority for Las Vegas area
- Cities & Counties have no explicit authority to adopt stricter standards

Adequate Water Supply Approaches

Colorado

- Counties Required to Establish Adequacy Requirements for Subdivisions
- State Engineer reviews for consistency
 - opinion is advisory only
 - El Paso County - requires 300 year supply
 - Denver Basin allocated based on 100 years
- State Engineer also review for “material injury”

Adequate Water Supply Approaches

Colorado - 2008 Legislation (HB 1141)

- **Local Govt. shall not approve development unless applicant demonstrates adequate supply**
 - Applies to development over 50 lots
 - Local govt has sole discretion to determine adequacy
 - Local govt can require for smaller developments
 - Includes consideration of hydrologic variability & conservation

Adequate Water Supply Approaches

New Mexico

- (1995 & 2002 Statutes)
 - Counties required to establish adequacy standards for subdivisions in unincorporated areas
 - Most cities may adopted their own standards
 - Albuquerque efforts undermined by County

Adequate Water Supply Approaches



Texas

- **SB 1323 (1999)**
 - TNRCC guidance on certifying sufficient water for subdivision's maximum future demand
 - County & Municipality **MAY** require certificate
- **SB 1**
 - A new provider can not be started unless adjacent providers refuse service