Integrating Water & Land Use Planning, a case study

Bradley M. Hill, R.G.

Director, Water Services

FLAGSTAFF WATER SERVICES

CITY OF FLAGSTAFF ARIZONA ESTABLISHED 1882

TEAM FLAGSTAFF

WE MAKE THE CITY BETTER

APA Annual Conference: November 7-9, 2018

Comprehensive Planning

What Tools?

- Going beyond traditional *Supply Augmentation* or *Demand Management*

- 2 Case Studies: City's of Peoria & Flagstaff

  - Land Use Management (Economic Value/gallon of water)

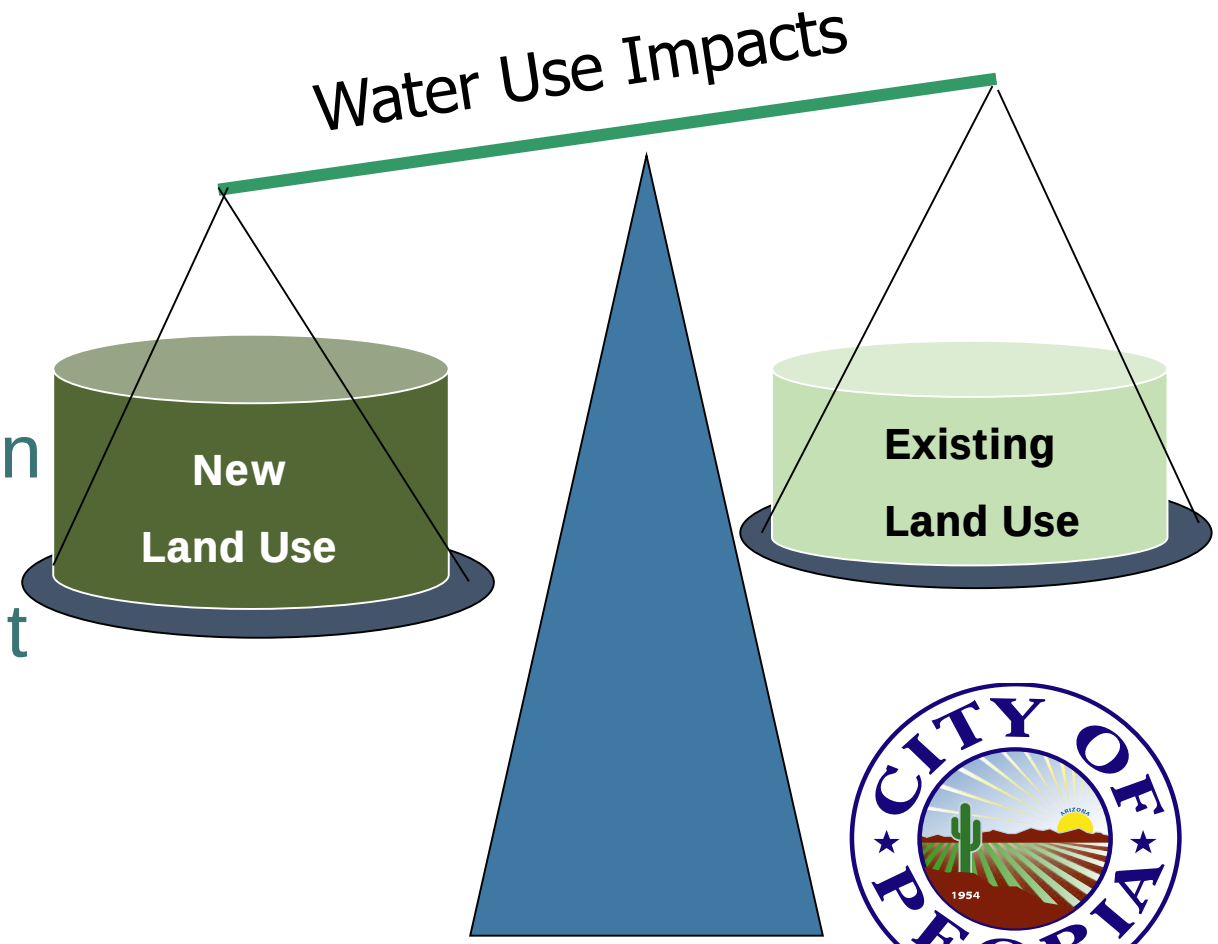
  - Development of Council approved Water Policies
  - How to link growth, land use and water supplies

Case Example #1 I joined Peoria in 1997

Land Use Management Policy

Changes in land use may impact the City's water resources portfolio

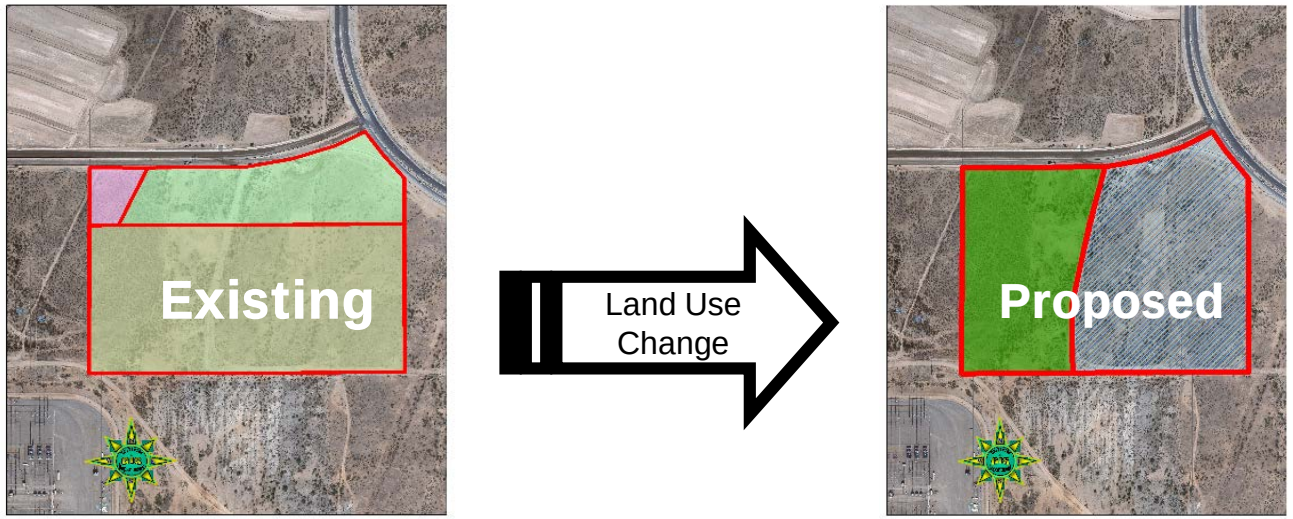
Purpose: is to create a nexus between water supply and land use by developing an objective measurement tool



Economic Value per Gallon

Components (*expressed in terms of $/gallon*)

a. Direct Economic Benefit: annualized tax revenue (e.g., utility revenue, sales tax, etc.)
b. Indirect Economic Benefit: annualized wages, job creation employee purchasing & retention potential
c. Commercial Development: value of buildings, equipment & revenues
d. Cost to the City Cots to support the proposed development (Police, Fire, O & M, etc...)
e. Water Use: net unit of water per type of Existing v. Proposed Land Use category



Economic Value per Gallon

<u>Economic Value/Gallon of Net Water Demand:</u> simply

Revenues – Expenses / Water Use – Reclaimed Water Generated

$$((a+b+c)-d)/(e-r)$$

a & b: direct & indirect economic benefits

c: commercial development revenues/benefits

d: City costs & expenditures

e: water demand net unit of water (gallon)

r: reclaimed water returned for future use

Case Example #2

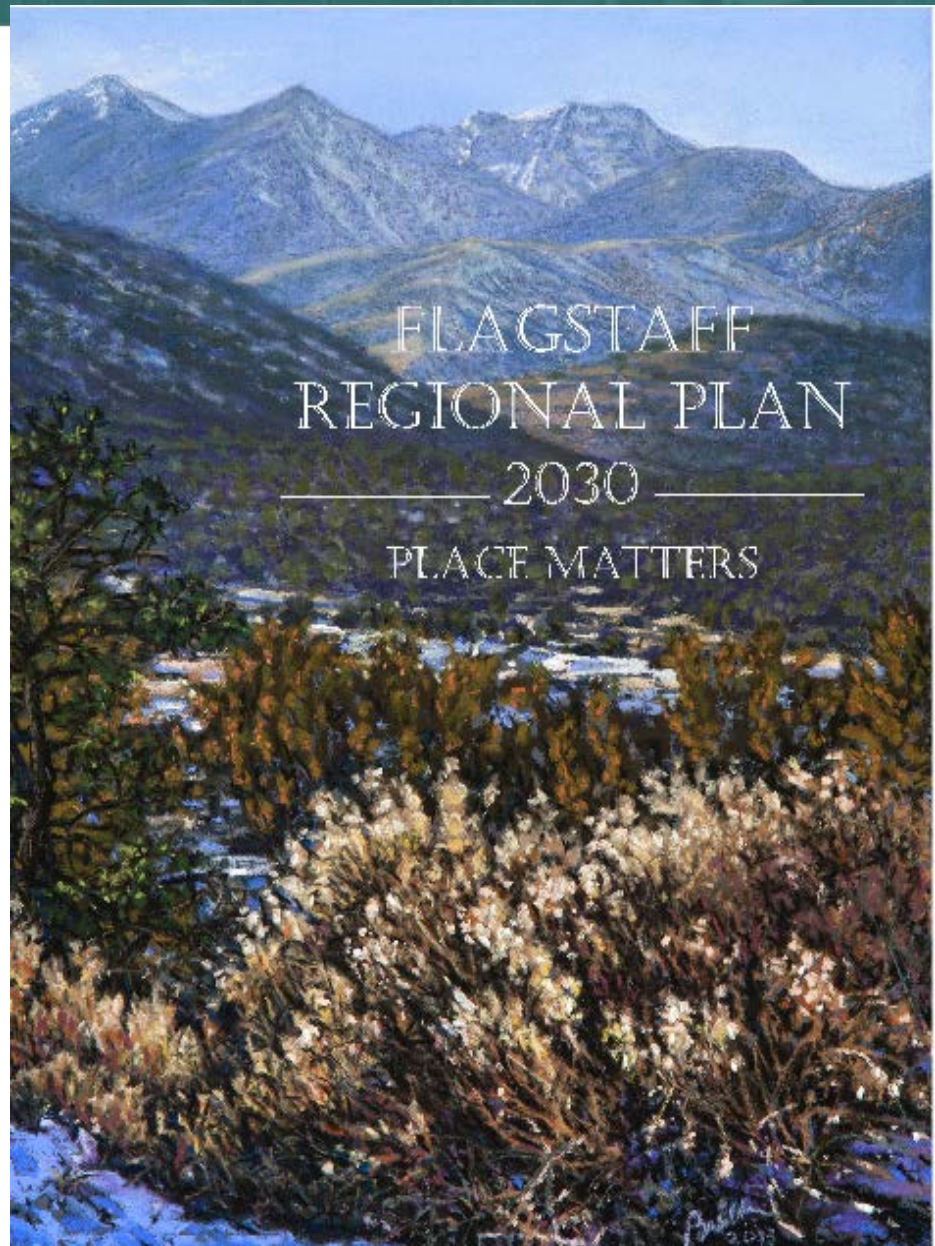
I joined Flagstaff in 2007

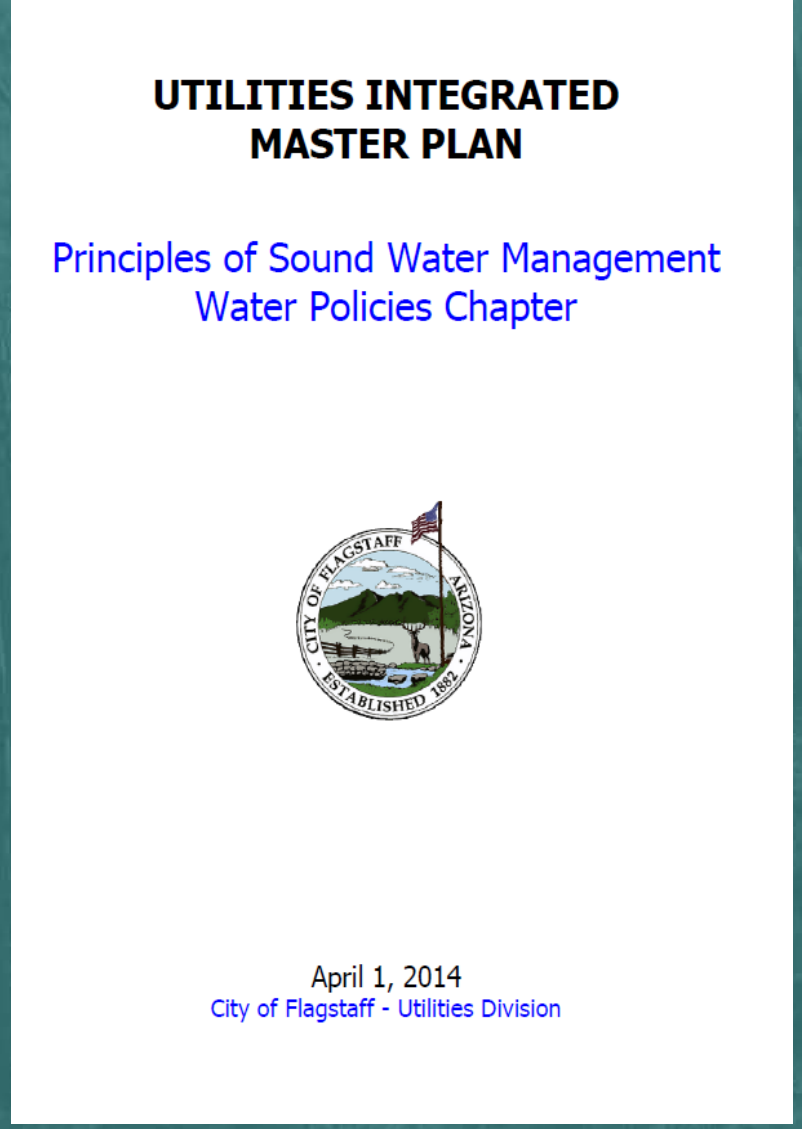
Steps Flagstaff has taken to Bridge the Gap between Land Use Planning and Water Supply

Updated General Plan (Regional Plan)

General Plan includes both a the City and a portion of the County

Voter Approved May 2014





City Specific Water Policies

- Finance
- Water Resource Management
- Reclaimed Water
- Water Conservation
- Stormwater
- Infrastructure
- Master Planning
- Regional Cooperation & Leadership
- Water Security

FLAGSTAFF WATER SERVICES

TEAM FLAGSTAFF
WE MAKE THE CITY BETTER

Water Supplies = Growth

Connectivity between growth & 100-year water supply

JANICE K. BREWER
Governor

SANDRA A. FABRITZ-WHITNEY
Director

ARIZONA DEPARTMENT OF WATER RESOURCES

3550 North Central Avenue, Second Floor
PHOENIX, ARIZONA 85012-2105
(602) 771-8500

April 1, 2013

Bradley Hill, R.G.
City of Flagstaff
211 W. Aspen Ave.
Flagstaff, AZ 86001

Re: Designation of Adequate Water Supply (DWR No. 41-900002.0002) City of Flagstaff

Dear Mr. Hill:

I am pleased to inform you that the Department of Water Resources has approved the application for a Designation of Adequate Water Supply for the City of Flagstaff (Flagstaff). We have enclosed the formal Decision and Order. The Decision and Order includes an itemization of Flagstaff's responsibilities in maintaining the Designation.

Flagstaff's status as a designated water provider demonstrates that Flagstaff is taking a long-term perspective in managing water resources. Flagstaff's commitment to long term planning represents a major contribution to the State's water management goal.

If you have any questions regarding these documents, please contact me at (602) 771-8615.

Sincerely,

Andrew J. Craddock, Manager
Recharge, Assured & Adequate Water Supply Programs

AJC/rbo

Adequate Water Supply Program:

In 2009, City Council authorized City to apply to Arizona Department of Water Resources

Planning & Water Services Staff communication

Tracking of Preliminary & Final Plats v. Water Supply

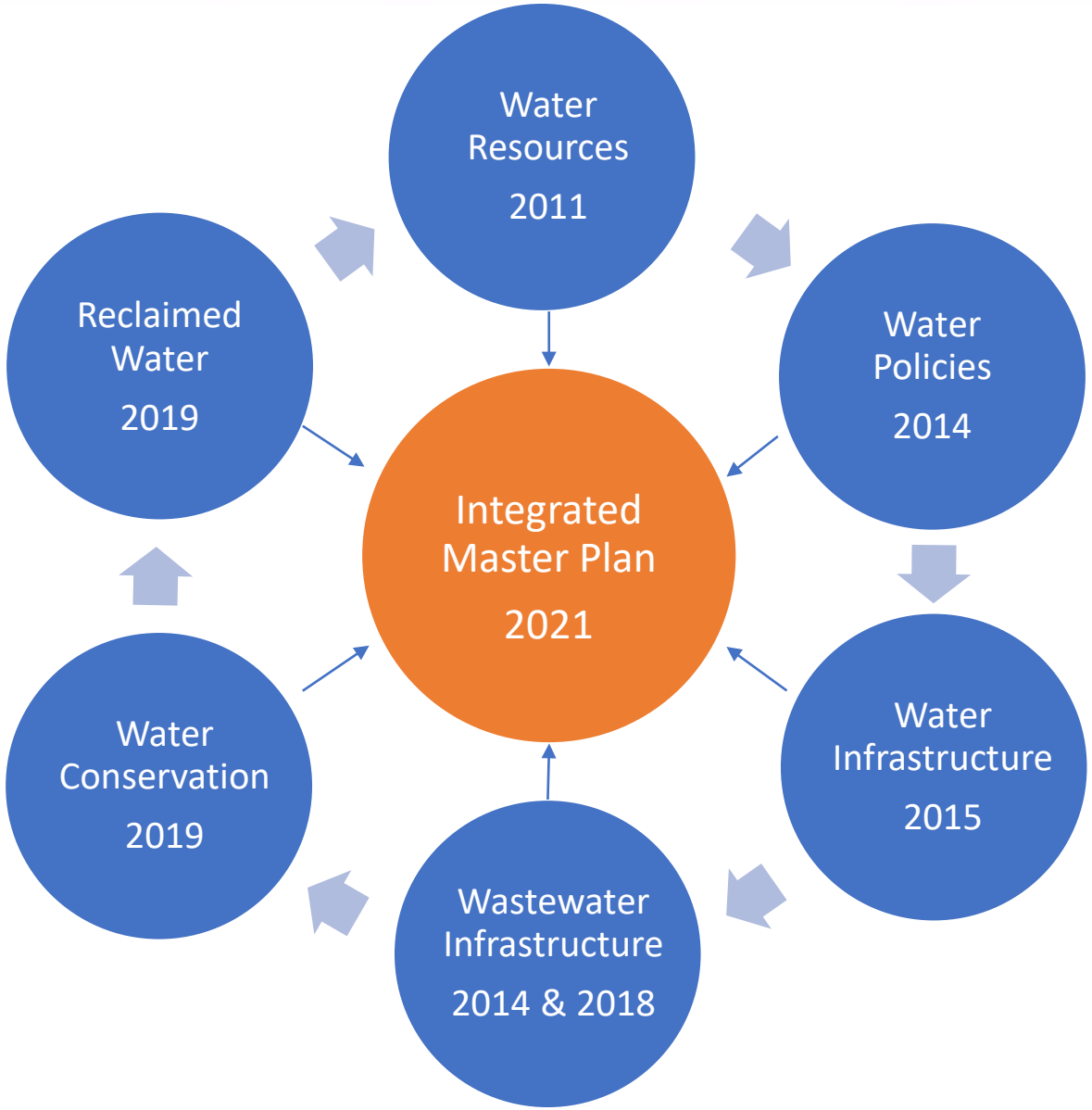
TEAM FLAGSTAFF
WE MAKE THE CITY BETTER

Integrated Master Plan Approach

Water Services Integrated Master Plan

Purpose is to guide future water resources & infrastructure management direction

- *Ensures water supply & infrastructure tie to Flagstaff's General Plan*
- Integrates Council & City Goals, Policies & Plans

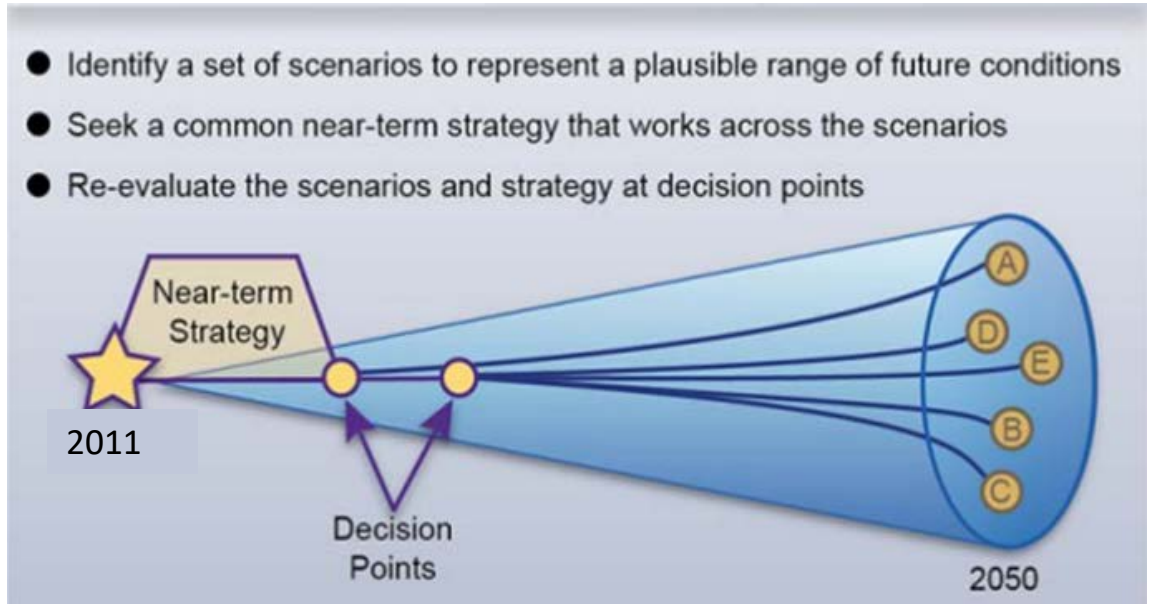


Integrated Master Planning Approach

Scenario Planning: Find a robust solution(s) to address the broadest range of potential futures

Decision points change with…

- Comprehensive Plan land use
- Water Conservation Strategic Plan
- Climate Action & Adaptation Plan
- Reclaimed Water Master Plan
- "One Water" concept?



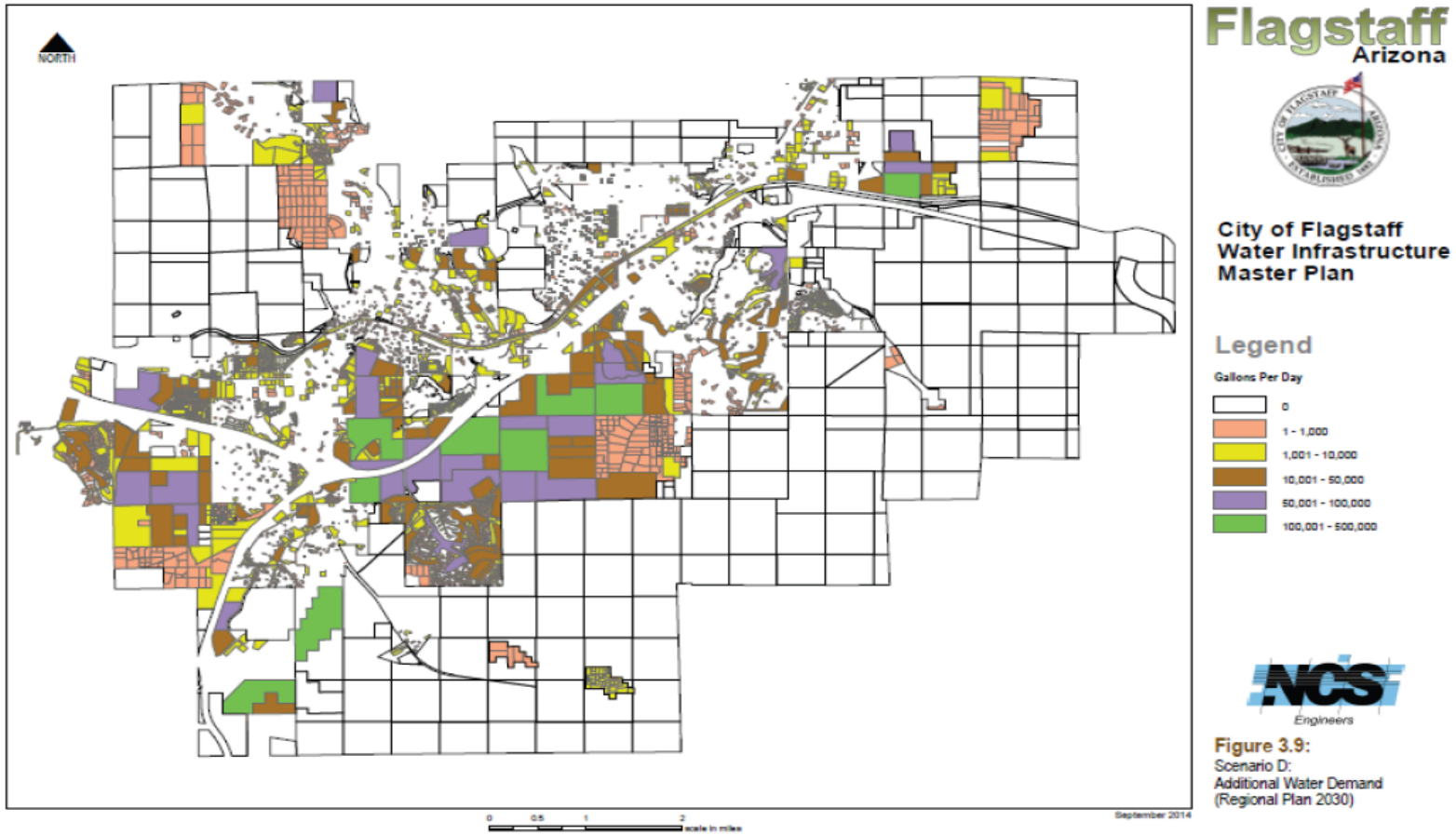
Undeveloped Lands & their identified Land Use

converted to gallons per day

TEAM FLAGSTAFF
WE MAKE THE CITY BETTER

City of Flagstaff Water Infrastructure Master Plan

Figure 1: Scenario D (High Density Scenario) Additional Water Demand



- Calculate Build-Out water needs
- Calculate Peak Day demand
- Track when new facilities need to be constructed
- Size production facilities
- Size distribution system
- Size collections system

FLAGSTAFF WATER SERVICES

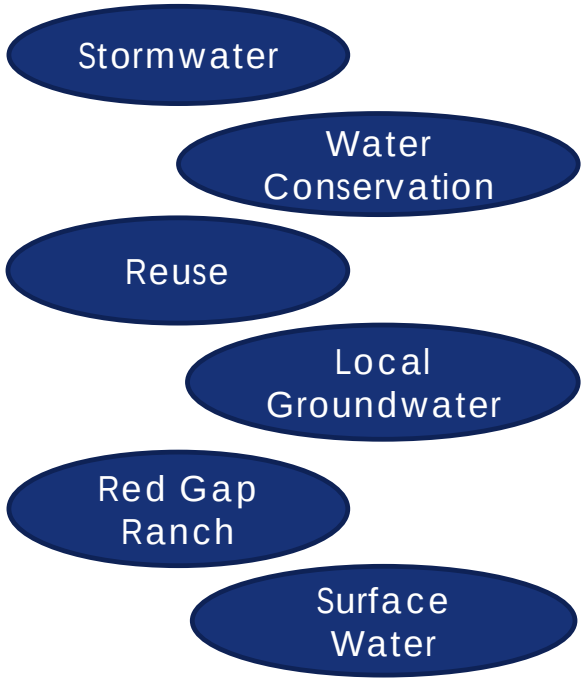
Integrated Water Resources Planning

Objectives of a “One Water” approach

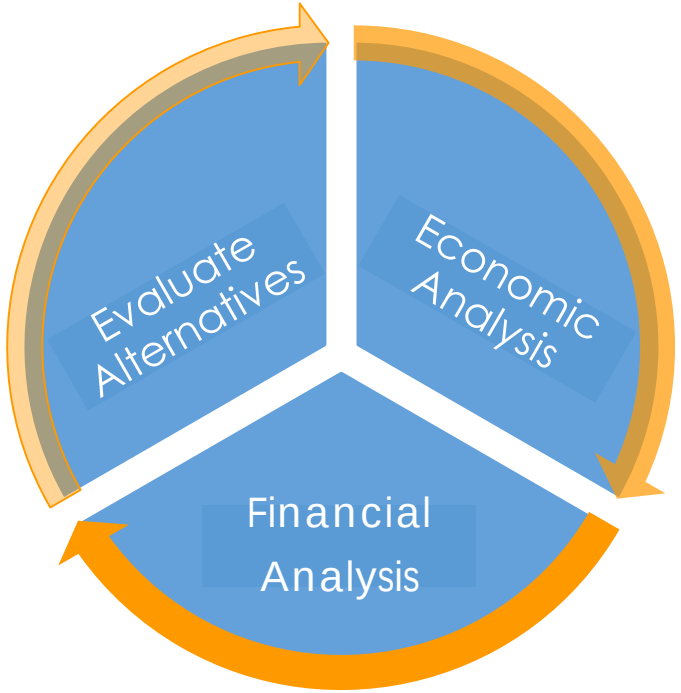
1) Integrate management of resources and city-wide policies
2) Balance environmental, economic, and societal goals
3) Improve health of local watersheds
4) Improve water supply reliability
5) Implement, monitor and maintain a reliable wastewater system
6) Increase climate resilience
7) Increase community awareness and advocacy for sustainable water

Integrated Water Resources Planning

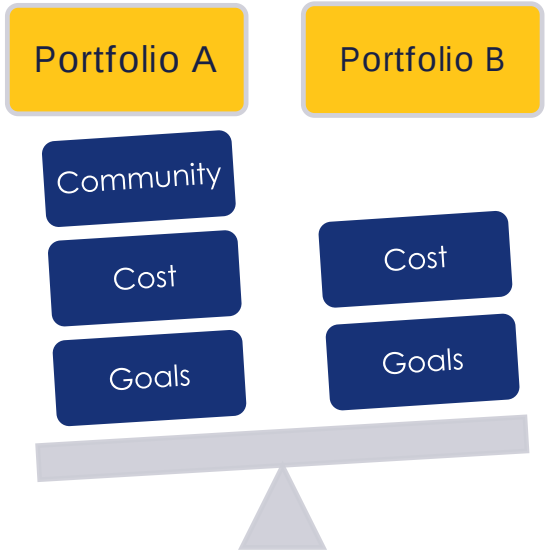
Step 1. Project Alternatives



Step 2. Studies & Analysis Updated Water Resources Master Plan

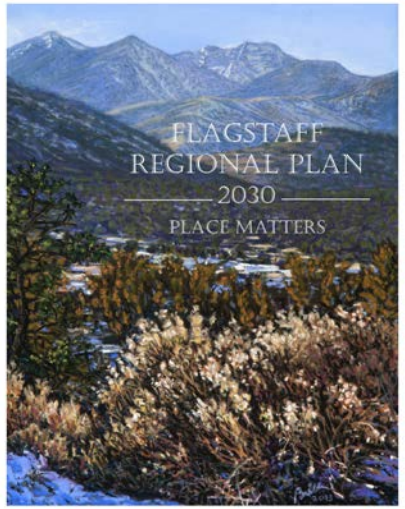


Phase 3. Community Input & Decision



2016 → 2020 → 2020-2021

Timeline



Goal:
Updated
Plan in 2021

JACOBS Red Gap Ranch Feasibility Study & Concept Design

Update Water Resources Master Plan

Water Conservation Strategic Plan

Public Involvement

Carollo Cost-Benefit Update & Economic Analysis

Advanced Water Treatment Feasibility Study

Reclaimed Water Master Plan

Jan 2017 | Jul 2017 | Jan 2018 | Jul 2018 | Jan 2019 | Jul 2019 | Jan 2020 | Jul 2020 | Jan 2021 | Jul 2021

Phase 1 → Phase 2 →

Public engagement opportunities

QUESTIONS?

Brad Hill, R.G. – Director, Water Services
&
Erin Young, R.G. Water Resources Manager

FLAGSTAFF WATER SERVICES

CITY OF FLAGSTAFF ARIZONA ESTABLISHED 1882

TEAM FLAGSTAFF
WE MAKE THE CITY BETTER