Integrated Water Resource Plan

Baseline Results and Level of Service

October 19th, 2022

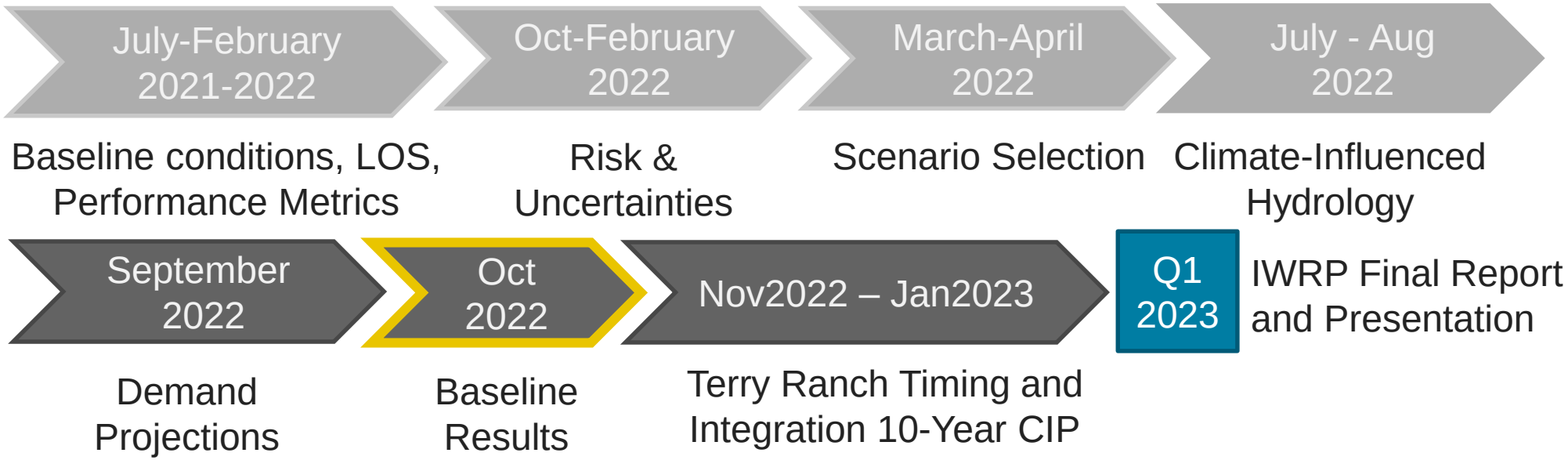
City of Greeley Colorado

Stantec

IWRP Vision Statement

“An actionable and adaptive master plan for Greeley’s water resources that uses modern, defensible methods to develop a roadmap ensuring a reliable water supply for our community through an uncertain future.”

IWRP Timeline



Baseline Evaluation Process

- Set future conditions
  - Baseline Settings
  - Near-term Planning Scenarios
- Simulate range of demands
- Determine which demands result in unsatisfactory performance
  - Planning Level of Service

Planning Scenario Name	Water Supply System	Climate
High Bookend	Reduced Yields *-10%*	*+2°F*
Median	Expected Yields *No Change*	*+2°F*
Low Bookend	Expected Yields *No Change*	*+2°F, +7% Precipitation*
No Climate Change	Expected Yields *No Change*	No Change
Mix and Match	Reduced Yields *-10%*	*+2°F, +7% Precipitation*

Baseline Settings

- Greeley's water rights:
  - Assumed leases are in possession for Greeley
  - All owned water rights are changed for Greeley use
- In-progress projects assumed complete:
  - 10 year CIP
  - Non-Potable Equalizer Pipeline
  - Chimney Hollow Reservoir

Planning Level of Service

- Establishes unacceptable future conditions to justify new projects
- Used for comparative purposes, not intended to be policy

Planning Level of Service

- Potential Planning Level of Service

Performance Criteria	Metric	Acceptability Threshold
Greeley meets critical water needs for public health	Always meet indoor demands	100%

Planning Level of Service

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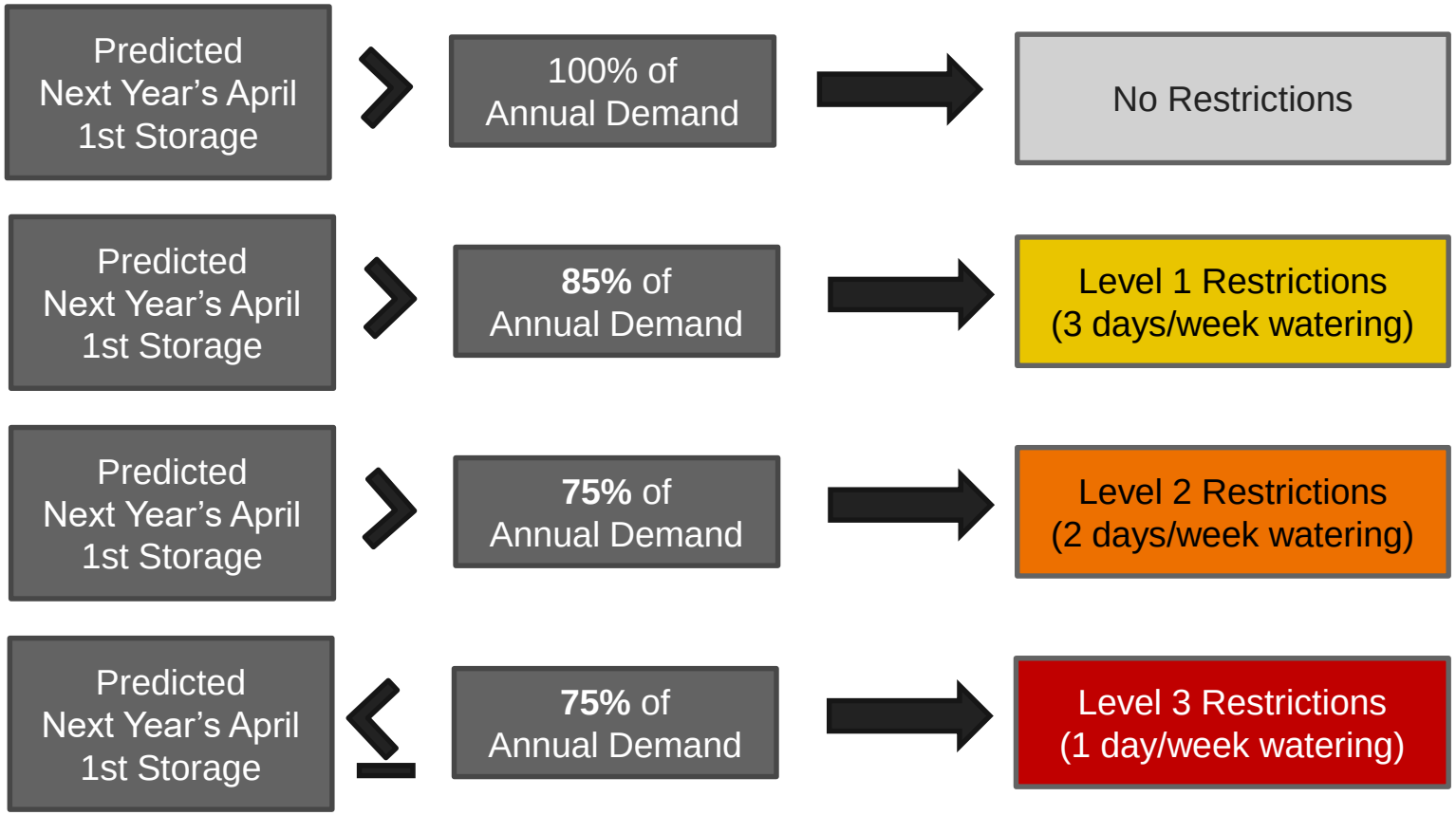
Are Greeley customers being significantly impacted	How often Drought Restrictions levels are used	TBD

Drought Restrictions in Model



Drought Restrictions Planning Level of Service

How Often Are Customers in Watering Restrictions?	
Actual Drought Restriction Use since 2000	2 years in Level 1
Previous Planning Criteria	3 years in Level 1 at end of Drought Period

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Front Range Water Utilities	
Aurora Water	2 in 10 Years any Level
Boulder	No Restrictions in 1 in 20-Year Drought
Colorado Springs Utilities	1 in 10 Years any Level
Denver Water	Historical Use Since 2000: 4 in Level 1, 2 in Level 2
Fort Collins	No Restrictions in 1 in 50-year Drought

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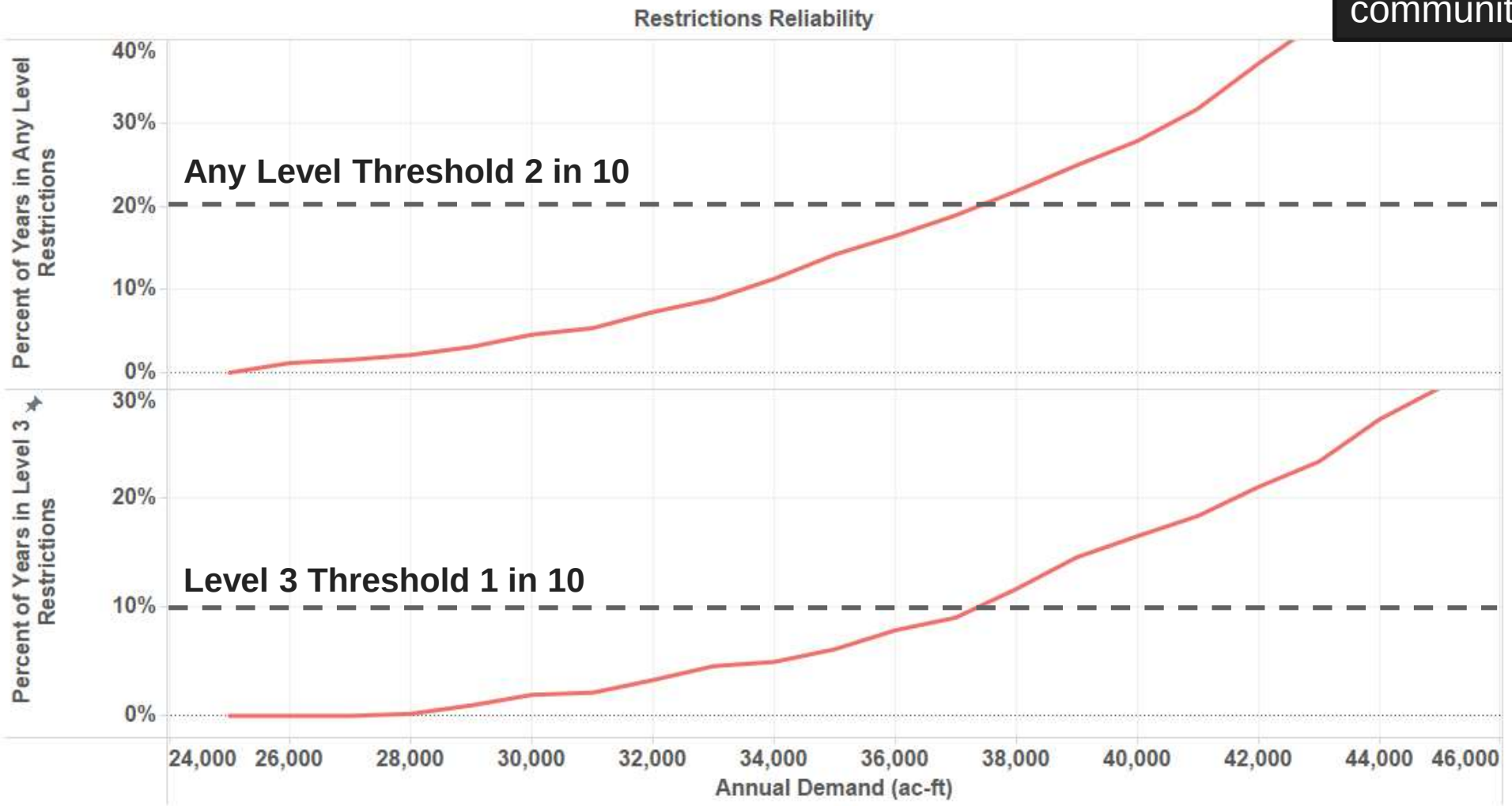
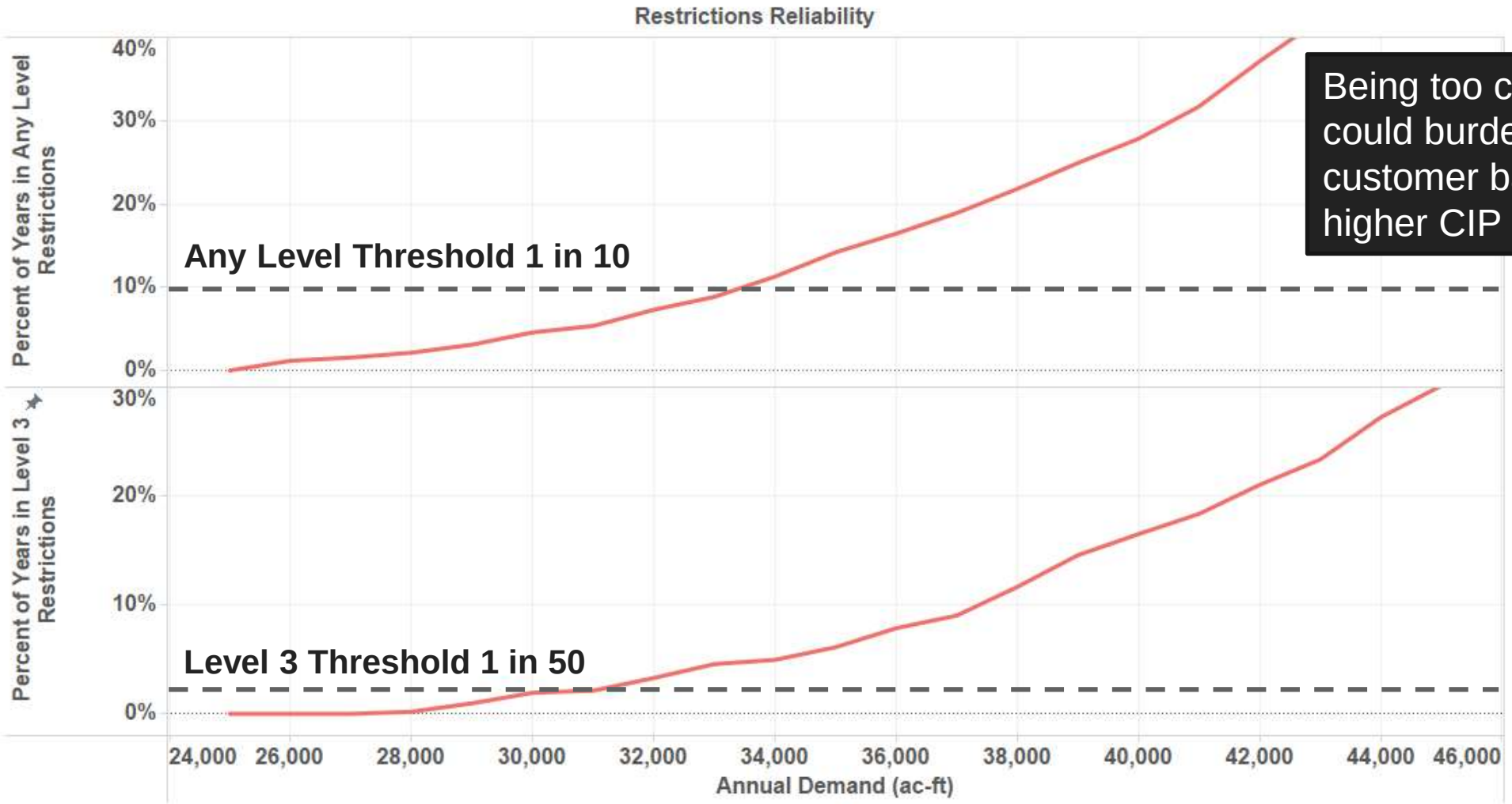
What Level of Service should the IWRP use for planning?

How often Drought Levels are used

Thresholds consistent with other Front Range communities



How often Drought Levels are used



Being too conservative could burden smaller customer base with higher CIP costs

Proposed Planning Level of Service

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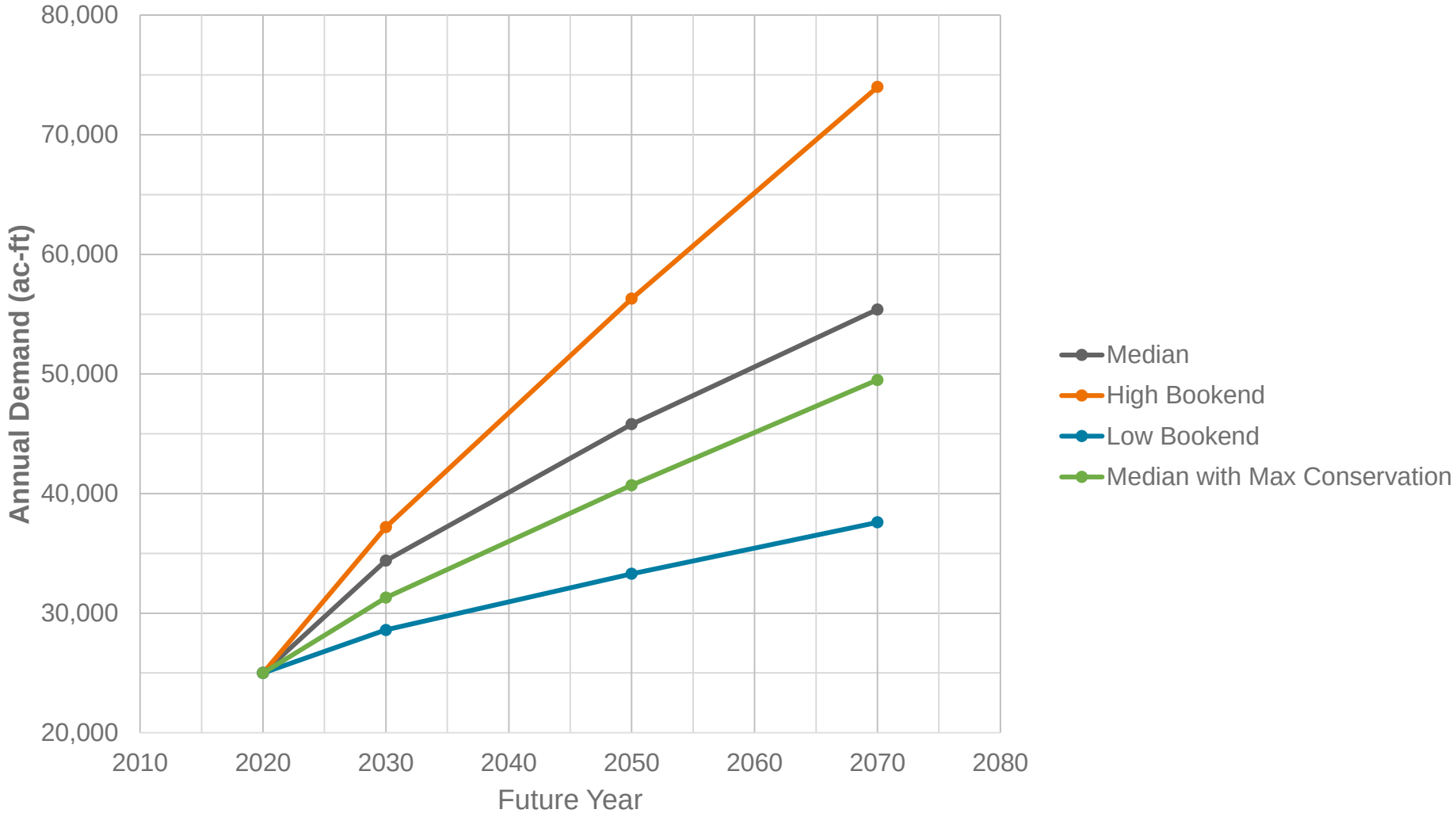
Greeley maintains sufficient emergency reserve	April 1 storage volume always have at least 6 months of indoor demands	100%
Are Greeley customers being significantly impacted	How often Drought Restrictions levels are used	2 in 10 years at Any Level 1 in 10 years at Level 3

Drought Restriction Planning Level of Service

- IWRP uses series conservative assumptions
  - GSM operations
  - Underlying droughts more severe than recent history
- Ultimately will time Terry Ranch, thus is a future Greeley would not experience
- Reflects Front Range water providers planning criteria and experiences
- Balances customer impacts from water restriction and higher rates
- Use of Drought Levels will be monitored as a potential Terry Ranch Trigger

IWRP Projected Demands



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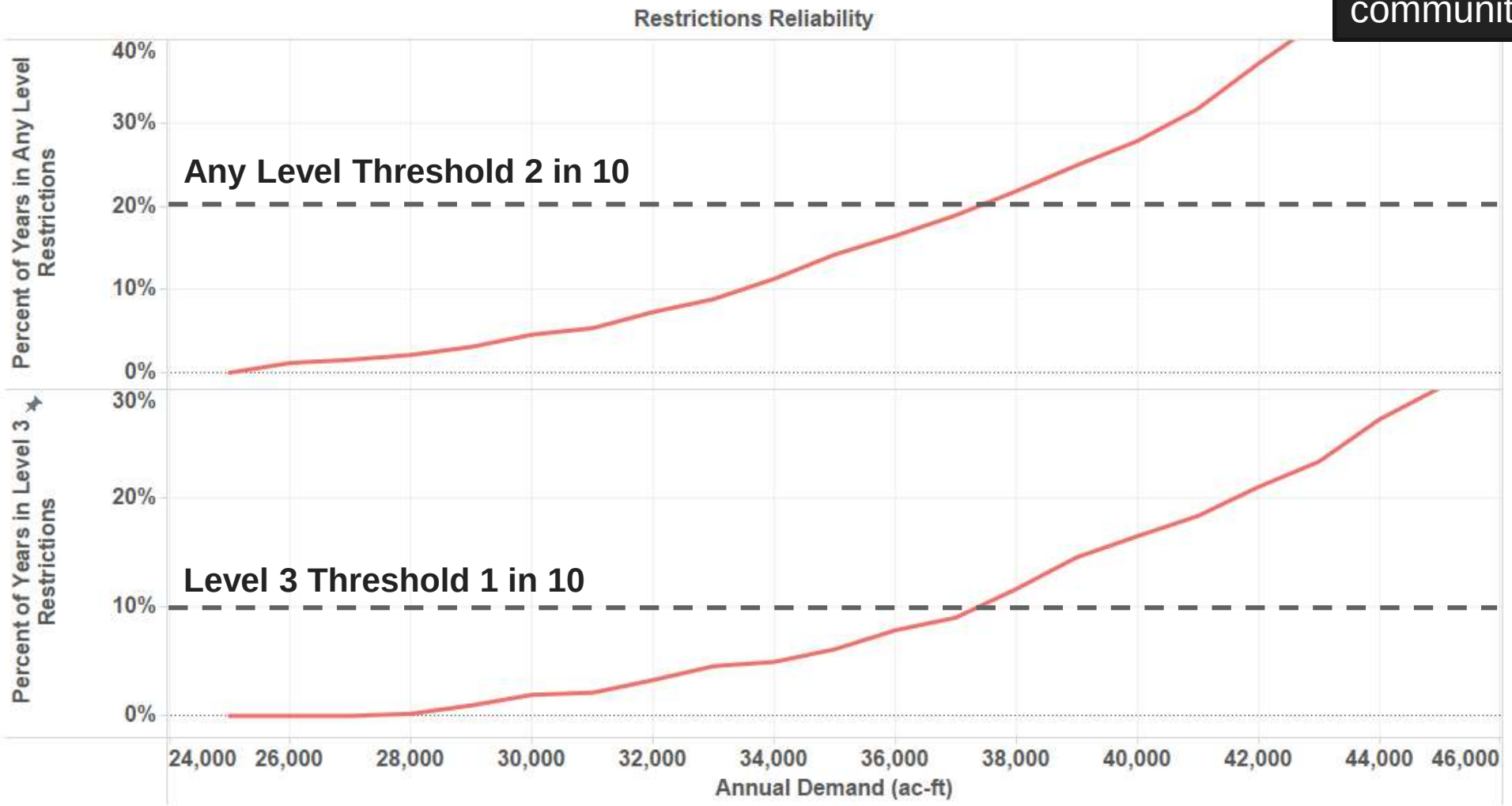
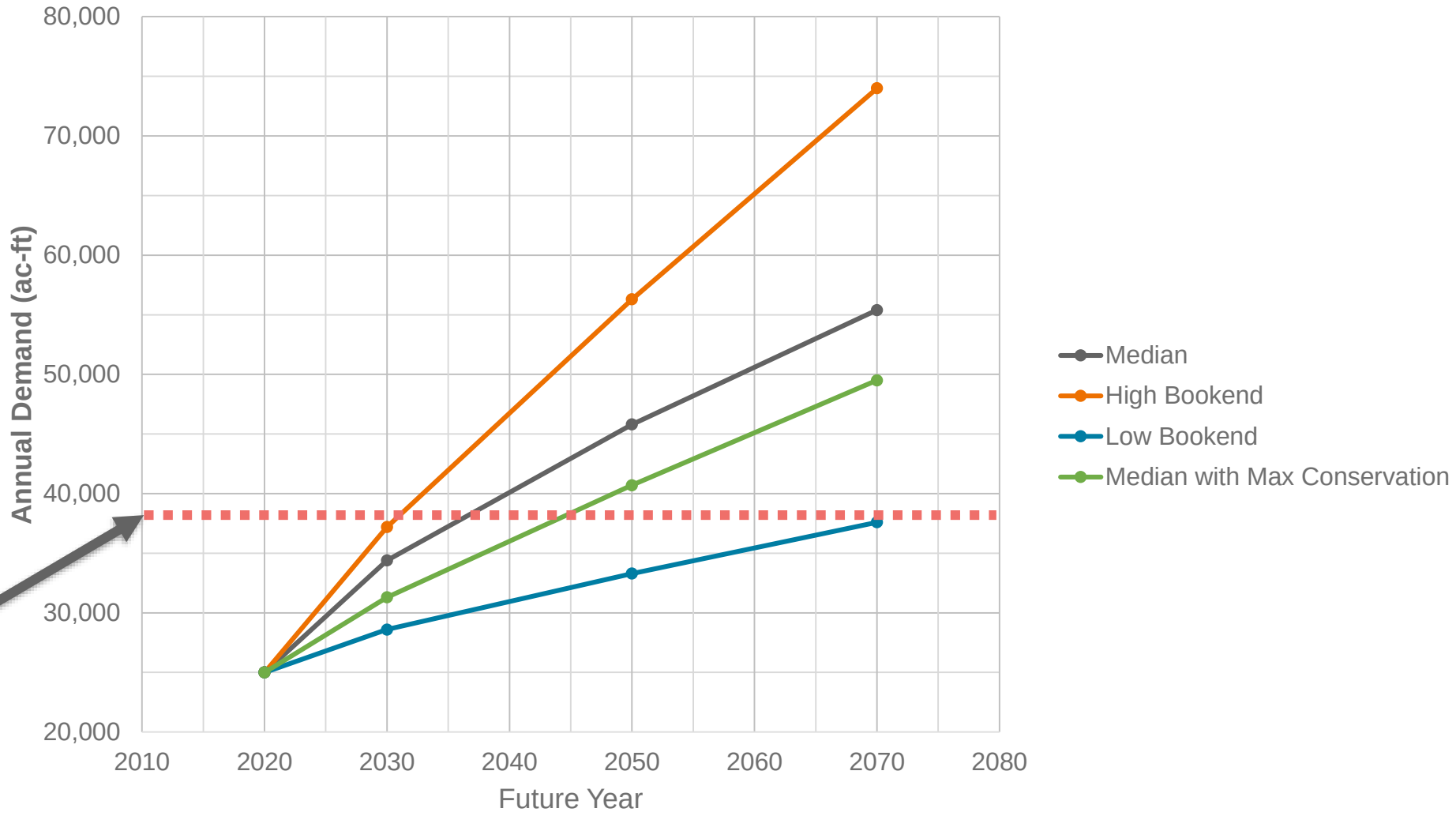


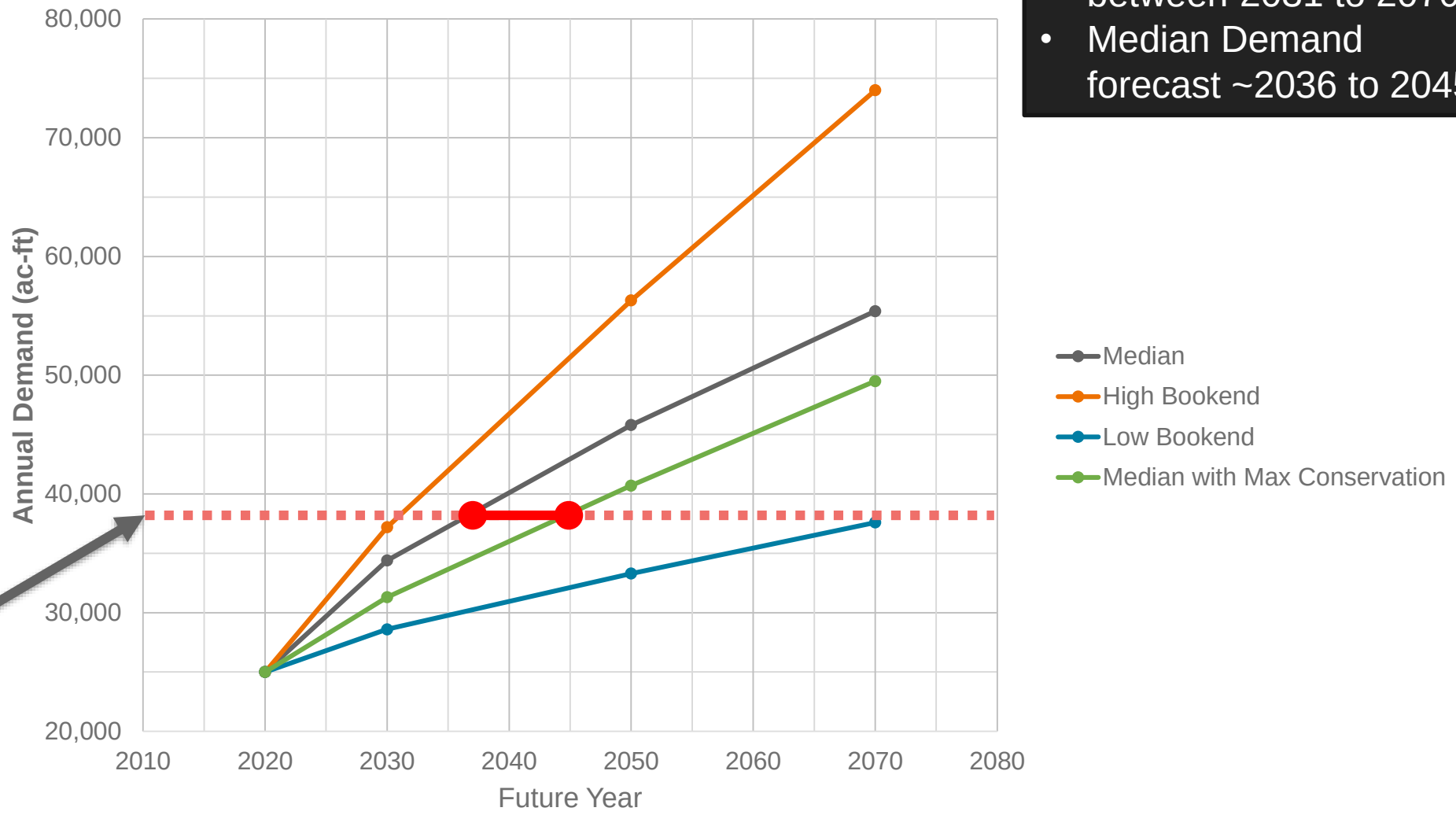
Evaluating Triggers



Max demand that maintains Level of Service under sample Planning Scenario

Evaluating Triggers

- 38,000 ac-ft could occur between 2031 to 2070
- Median Demand forecast ~2036 to 2045



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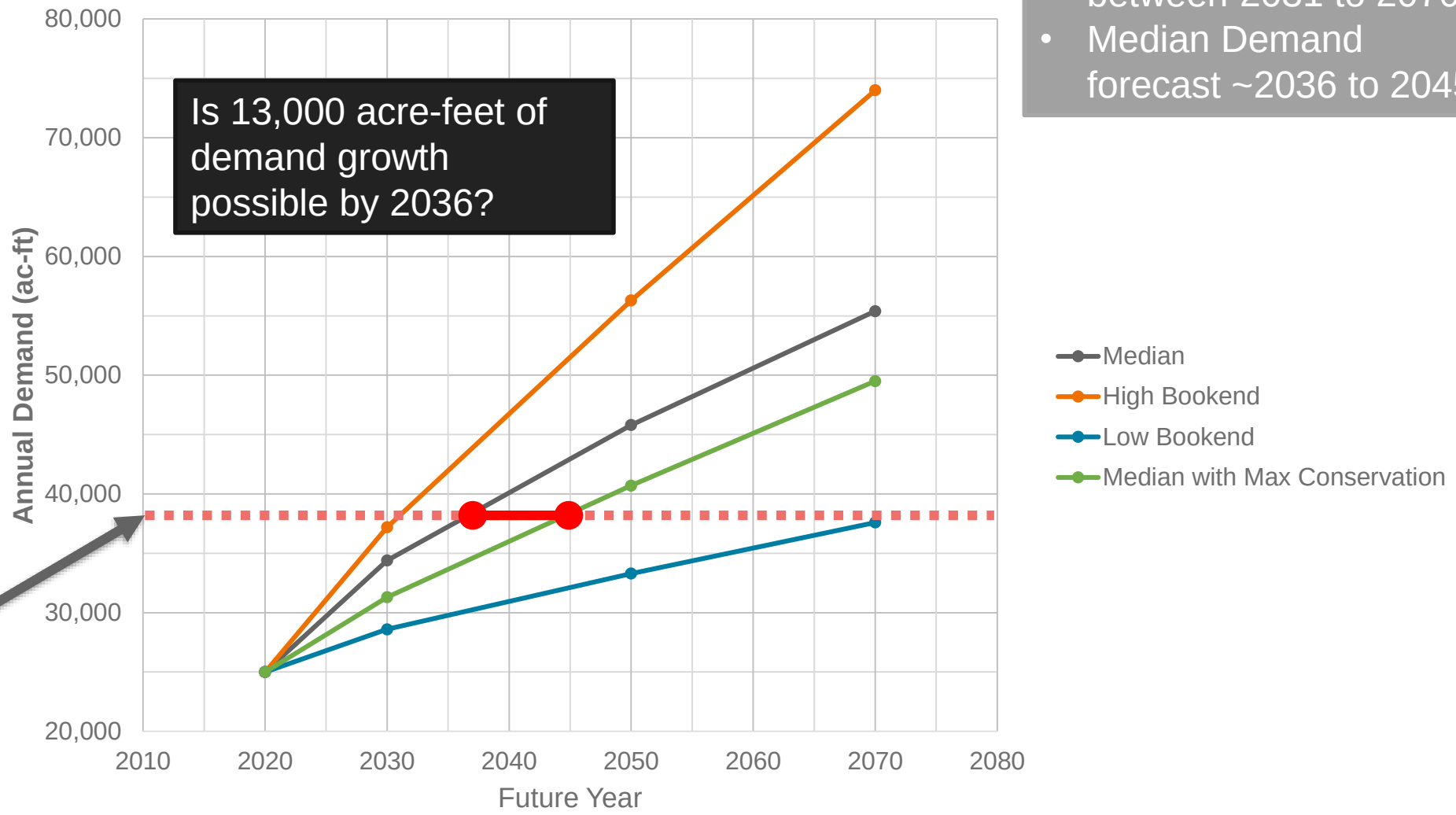

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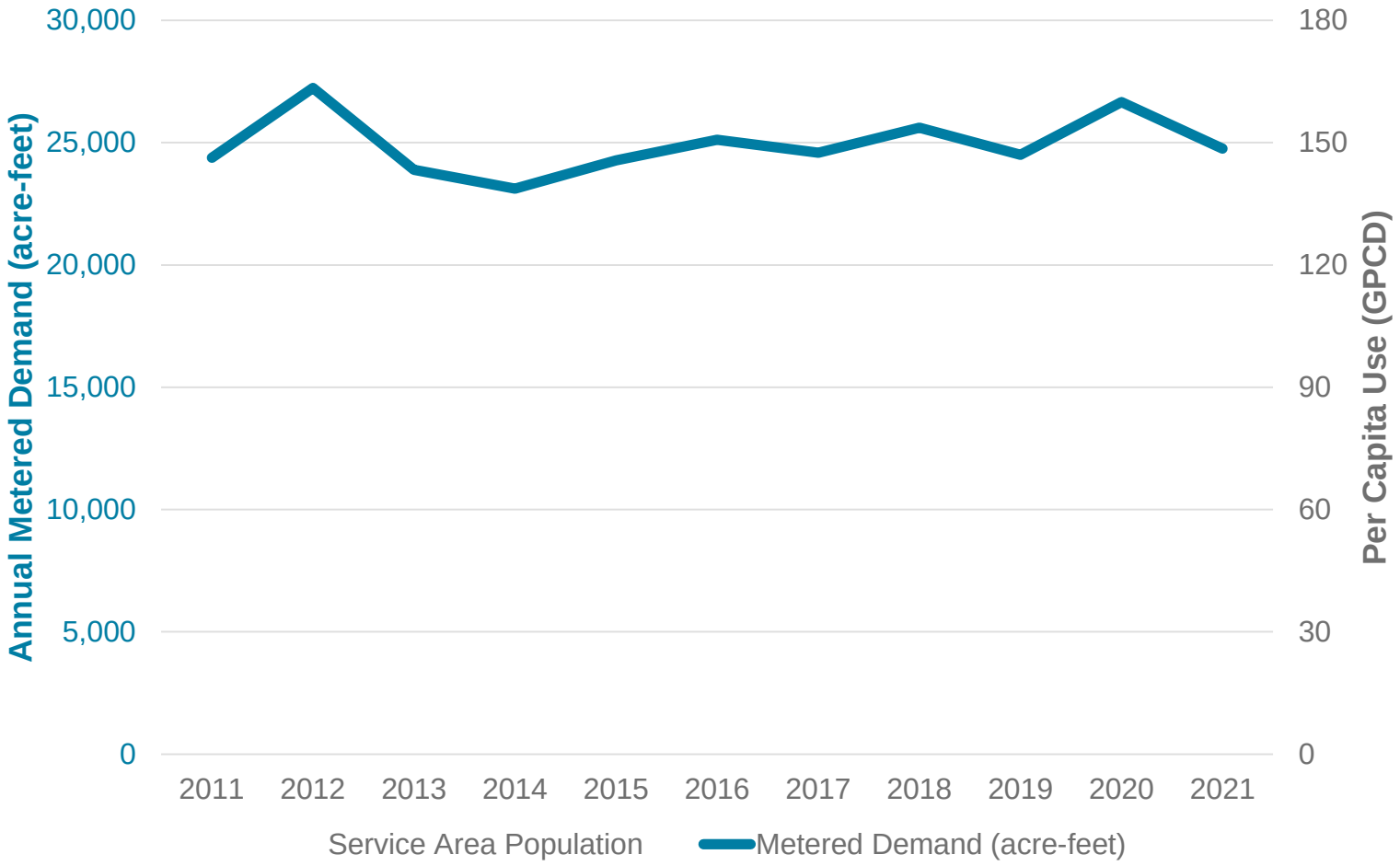
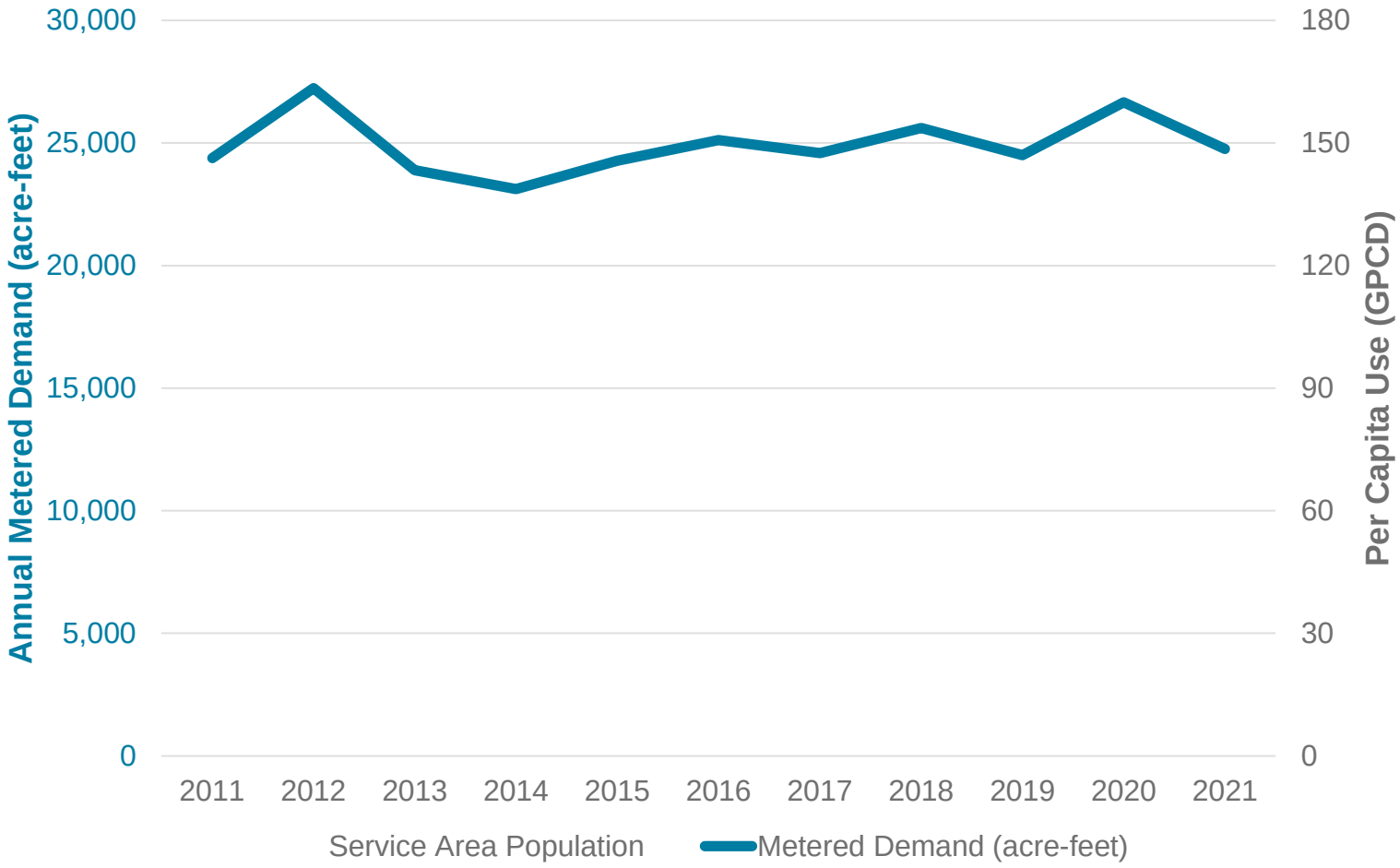
Recent Trends – Metered Demands



- Negligible growth in demands
- Variation due to hot and dry summers (2012, 2020) greater than 10-year change
- Trends extend into mid-2000s

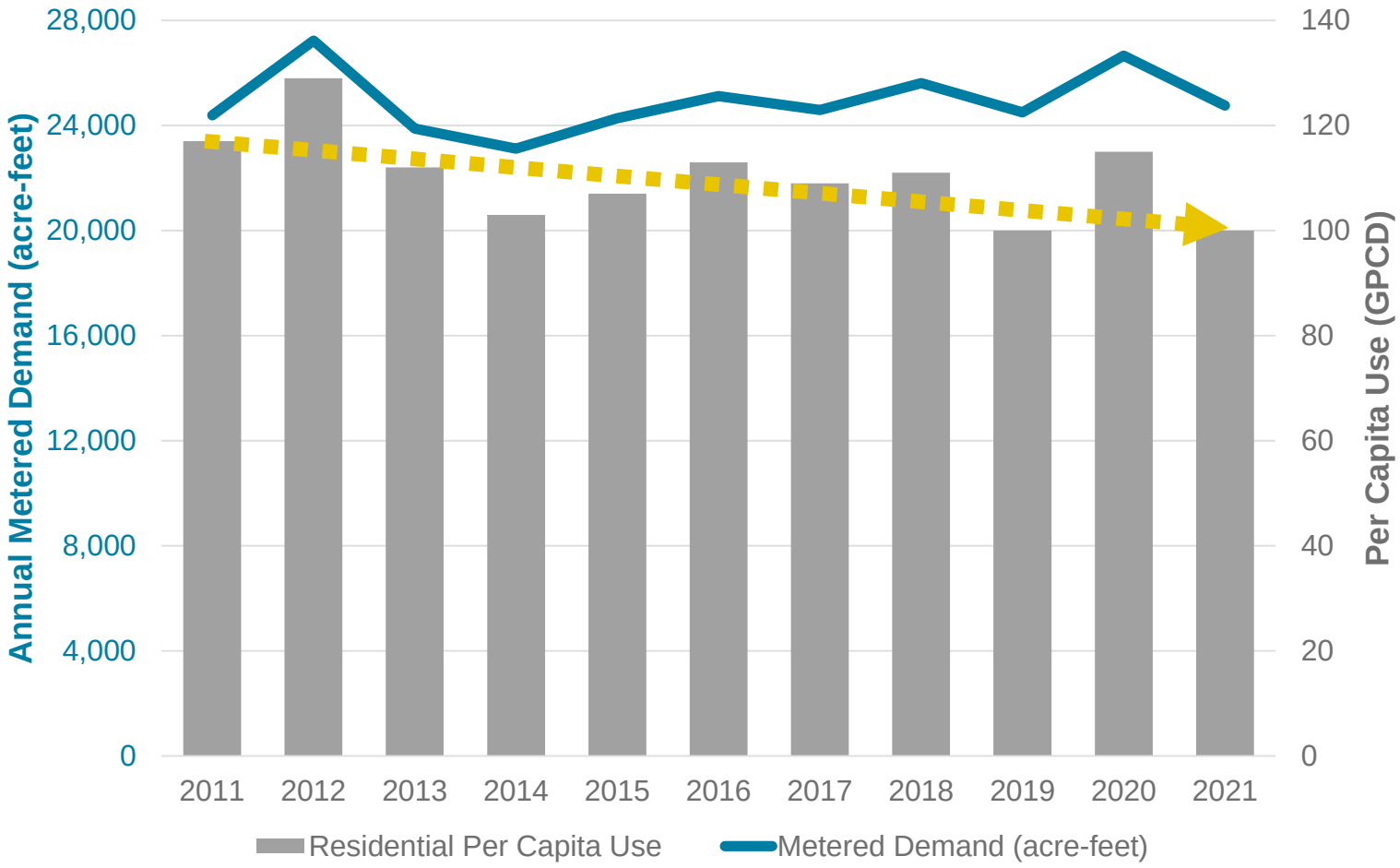
Recent Trends – Population Growth



Population served increased by ~30,000 people, or 25%

Year	Population Served
2011	122,089
2012	123,989
2013	124,143
2014	127,619
2015	131,097
2016	134,476
2017	135,826
2018	143,073
2019	147,208
2020	149,512
2021	151,546

Recent Trends – Per Capita Use



Per capita water use continues to decrease

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Recent Trends – Planning Challenges

- Population growth decoupled from water demand growth
- Passive conservation primary driver of per capita water use decrease
- When will per capita water use stop decreasing?
- Trend observed throughout Front Range (and region)

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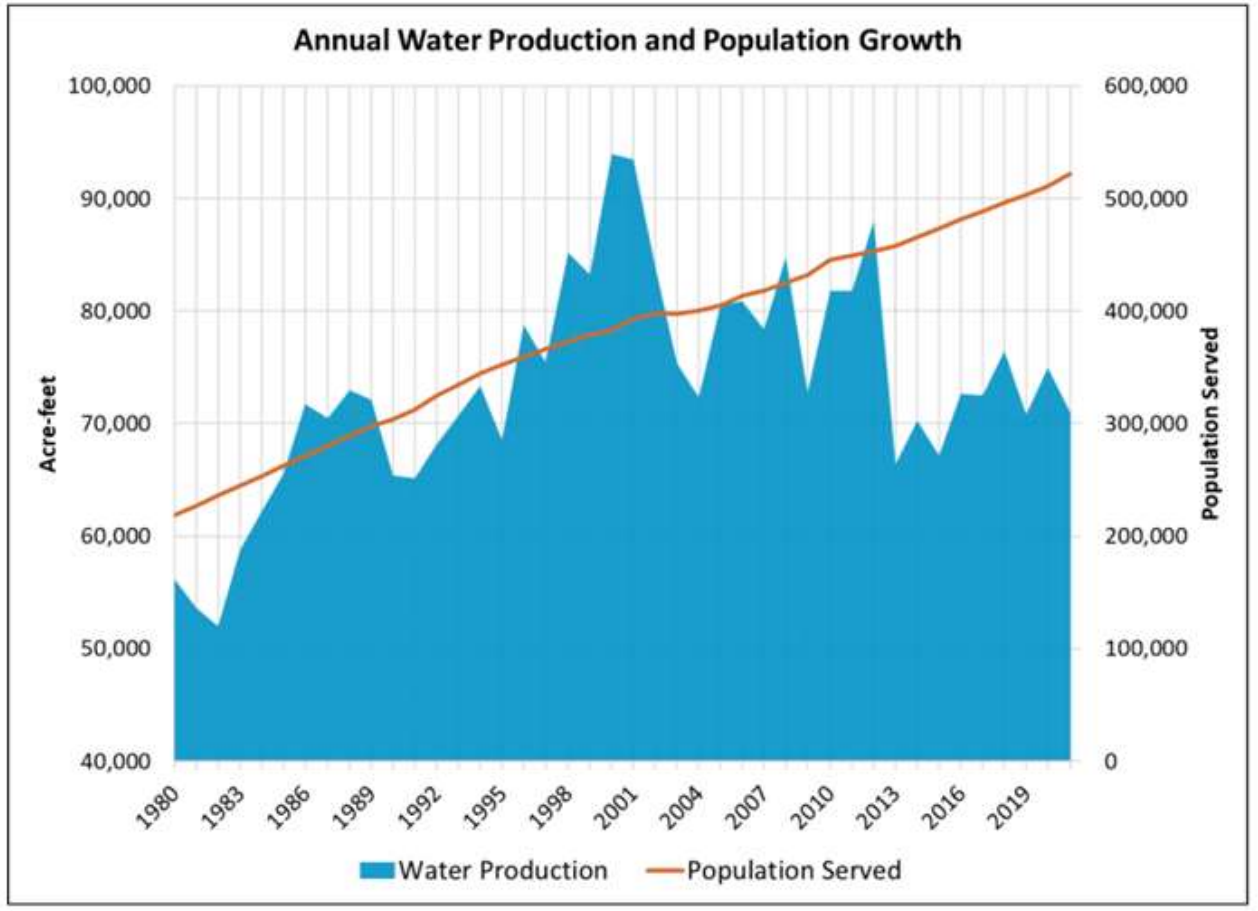
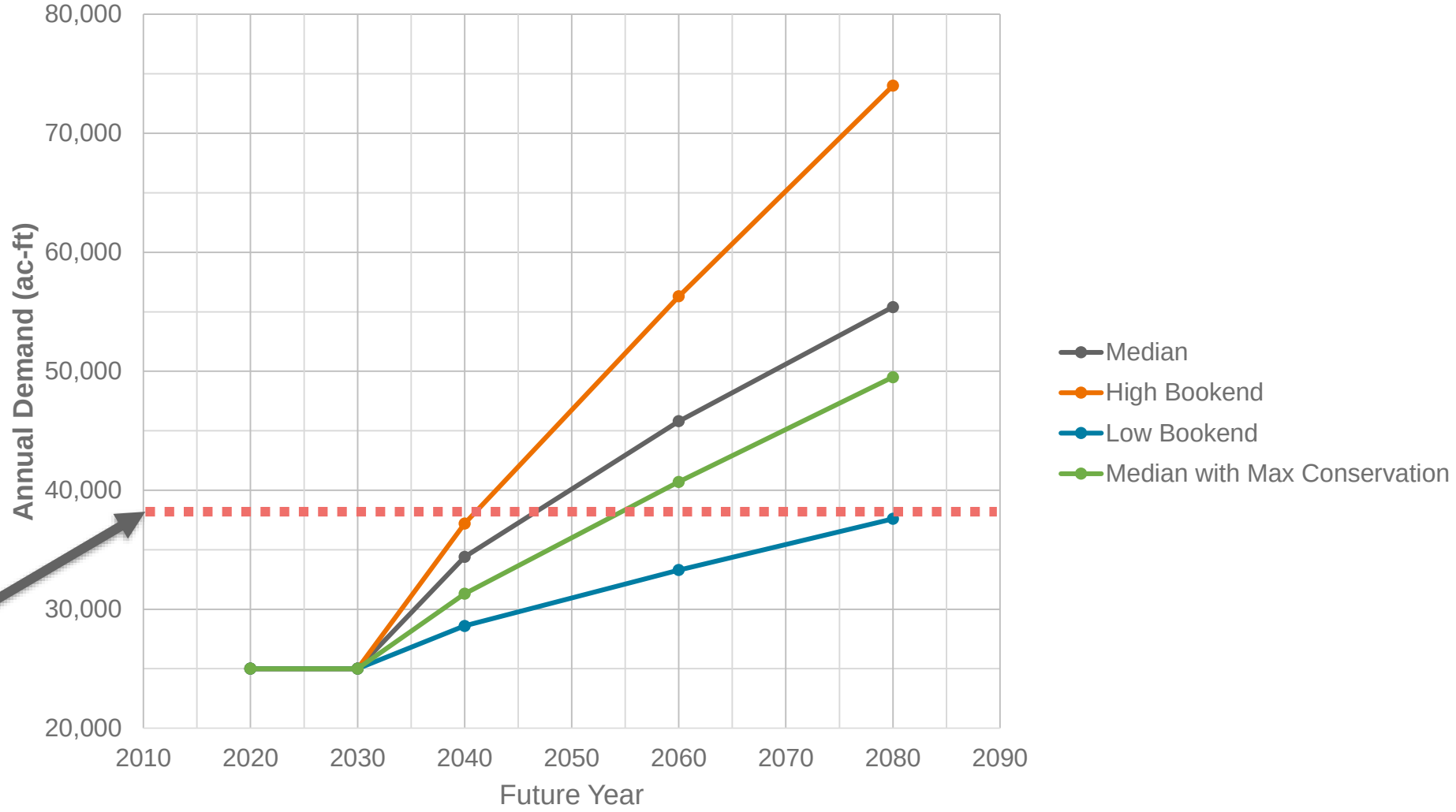
Colorado Springs Utilities Observed Demands and Population



Source: 2022 Colorado Springs Utilities Water Use Efficiency Plan

Evaluating Triggers

What happens if there is minimal demand change until 2030?



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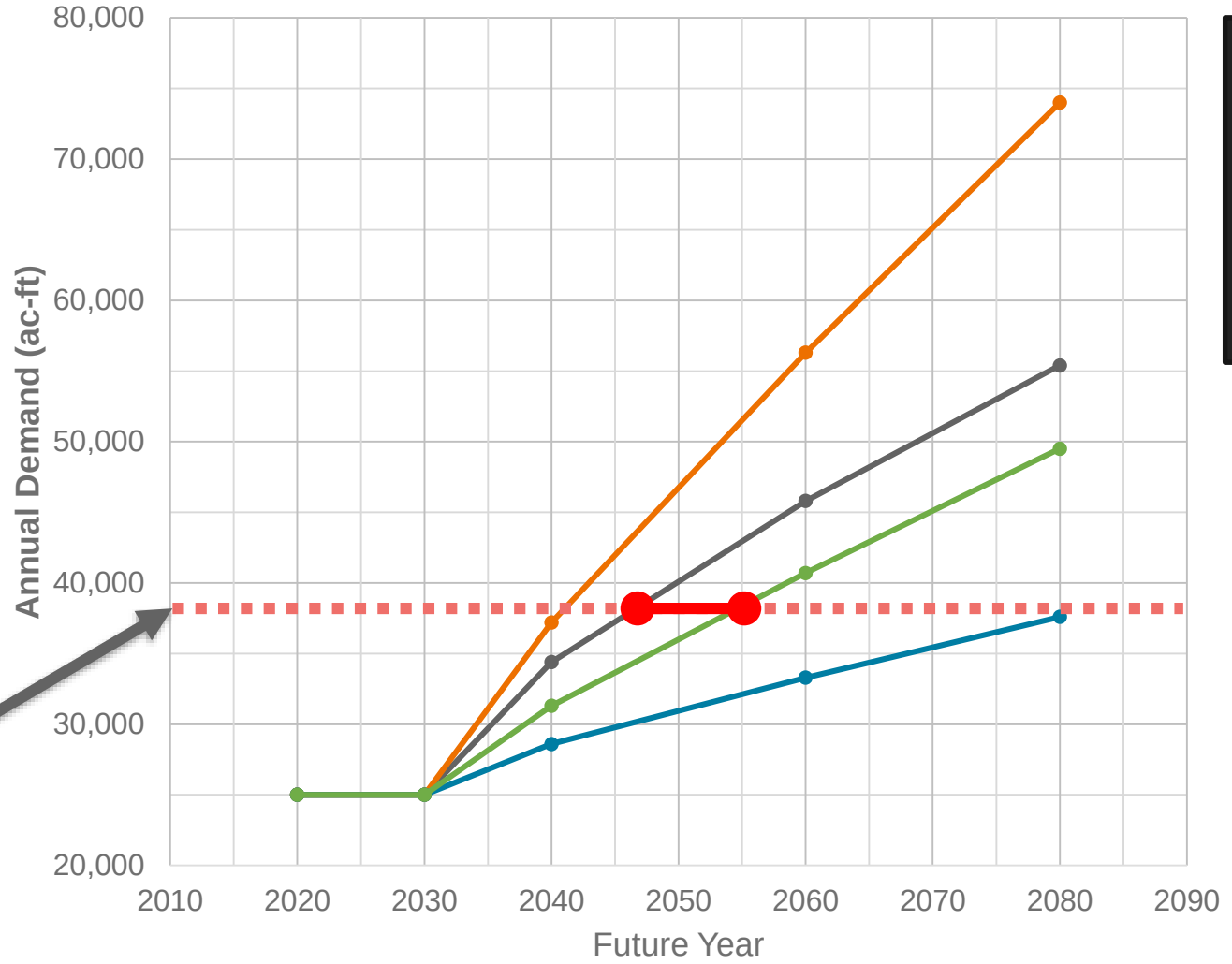

Max demand that maintains Level of Service under sample Planning Scenario

- 38,000 ac-ft would not occur under median scenario until 2047
- If additional conservation is used, may not occur until 2055

IWRP Will Define System Conditions to Trigger Terry Ranch

- Current system is not at risk of failure
- Potential CIP Projects are independent of demand
  - Acquiring/changing water rights
  - Improving Non-Potable Demand System
  - Initial Terry Ranch Infrastructure
- System Conditions for Triggers
  - Annual demands
  - Use of drought restrictions
- System Conditions to Monitor
  - Per capita use
  - Indoor vs. outdoor use
  - Change in 20-year temperature mean compared to 1980-2000
  - Change case outcomes

Questions?