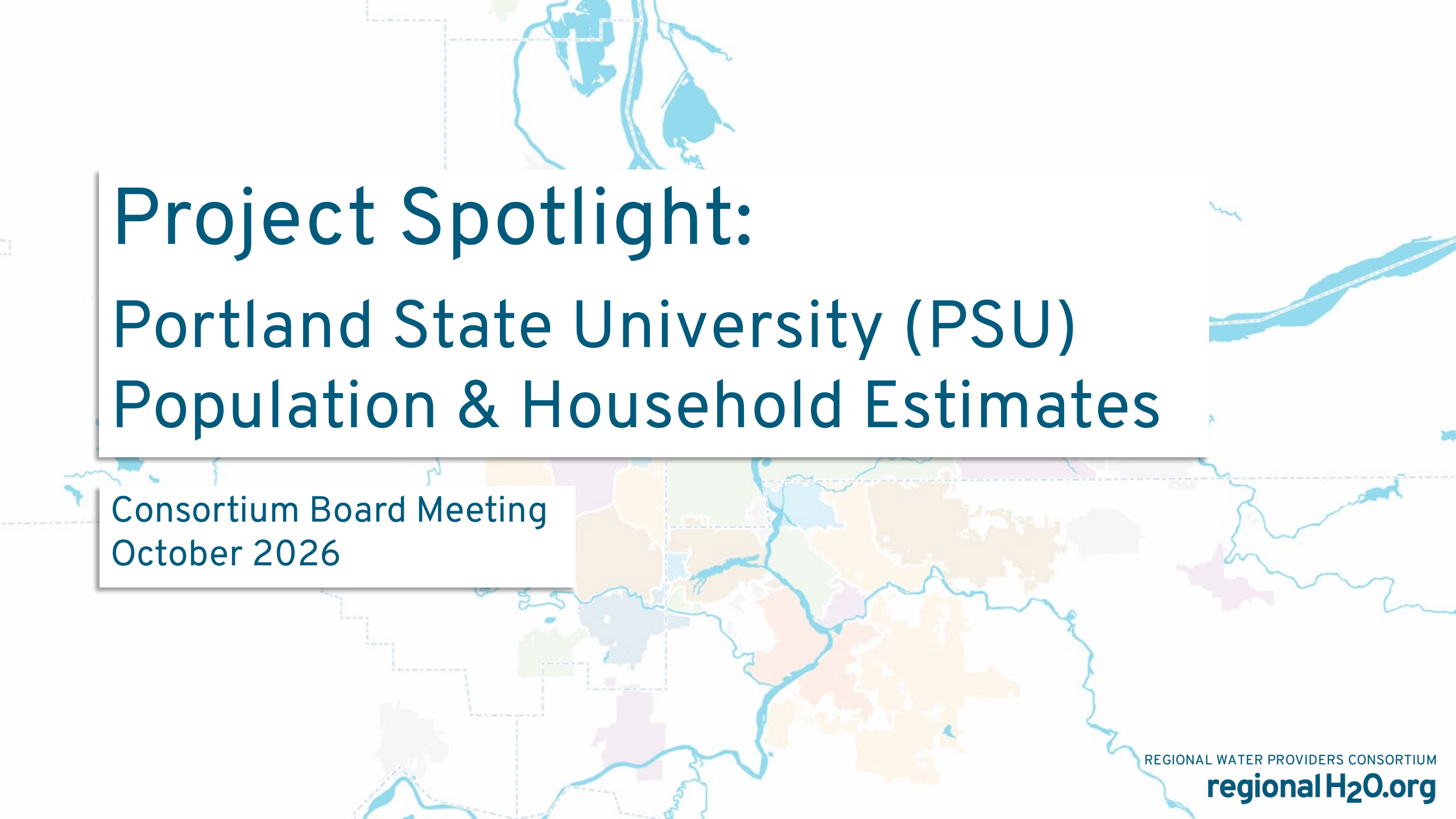




Project Spotlight: Portland State University (PSU) Population & Household Estimates

Consortium Board Meeting
October 2026

Population & Household Estimates - Speakers



Ethan Sharygin

Director
Population Research Center
Portland State University



Emma Martin

Water Resources
Management Analyst
City of Hillsboro



Janine Casey

General Manager
Rivergrove Water District



Ben Beal

Water Resource Modeler
Portland Water Bureau

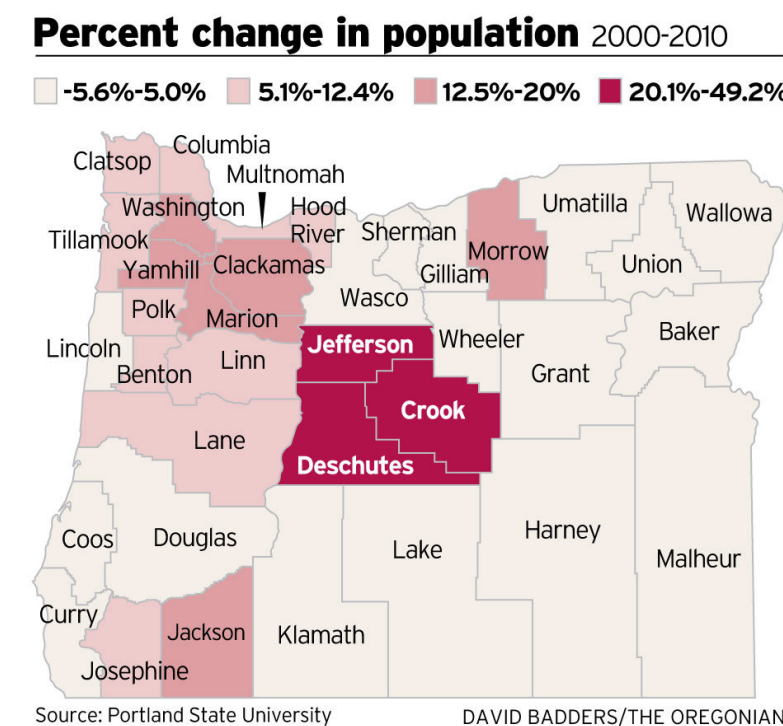
Ethan Sharygin

PSU Population Research Center

Ethan Sharygin is the Director of the Population Research Center at Portland State University, which annually produces population estimates and forecasts, analyzes census data to support policy research and implementation, and represents Oregon in partnerships with the U.S. Census Bureau. His recent work focuses on census data quality and related methodology, including methods for geographic allocation of census microdata and methods of evaluating census coverage and quality. His research also addresses demography-related topics in health research including assignment of race and ethnicity in survey data and implications for health measurement and consequences of disaster including famine and wildfire. Sharygin has a B.A. degree from the University of Washington, an M.P.P. from UC Berkeley, and a Ph.D. in demography from the University of Pennsylvania.

PSUPRC Functions

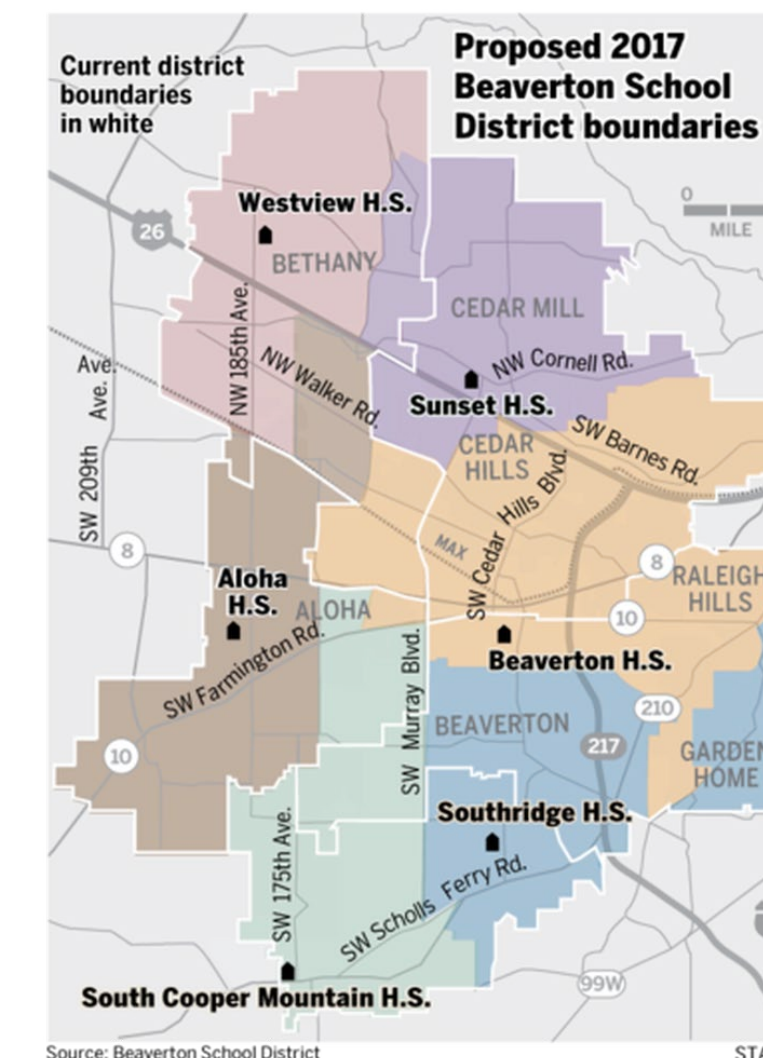
- Since 1965: Provide timely, accurate, and independent population estimates and forecasts to all jurisdictions in the State of Oregon



- Coordinate with Census Bureau on Decennial Census, Estimates, and Projections



- Provide Expertise for Agencies and the Public
 - Data Dissemination
 - Bill Analysis and Agency Compliance
 - Redistricting
 - Sponsored Research – School, Special Districts



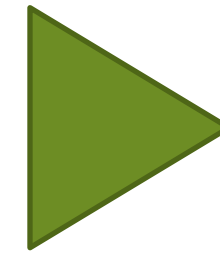
- Graduate Training in Demography & Data Analytics



Timeline

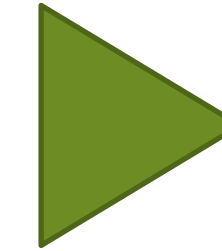
1.

May 30, 2027
1. Population, housing unit, and household postcensal estimates as of April 1, 2020 and July 1, 2020—July 1, 2026 (PDF, Excel, SHP/DBF)
2. Demographic profiles for the period 2020-2025 (PDF, Excel).



2.

May 30, 2028
1. Population, housing unit, and household postcensal estimates to July 1, 2027.
2. Demographic profiles for the period 2022-2026.
3. Population, housing unit, and household forecasts for each year from 2027-2065 (PDF, Excel).
4. Technical documentation



3.

May 30, 2029
1. Population, housing unit, and household postcensal estimates to July 1, 2028
2. Demographic profiles for the period 2023-2027 (PDF, Excel).
May 30, 2030
1. Population, housing unit, and household postcensal estimates to July 1, 2029;
2. Demographic profiles for the period 2024-2028 (PDF, Excel).
May 30, 2031
1. Population, housing unit, and household postcensal estimates to July 1, 2030;
2. Demographic profiles for the period 2025-2029 (PDF, Excel).

Data & Methods

Regional Land Information System (RLIS):

- *Housing Unit Inventory*

PSUPRC Population Estimates Program:

- *Housing Unit Change Surveys (AHUPS)*
- *Population Estimates (Household & GQ)*

US 2020 Decennial Census:

- *Persons per household (Baseline)*
- *Vacancy rate (Baseline)*
- *Population (Baseline)*

American Community Survey (ACS):

- *Persons per household updates*
- *Vacancy rate updates*
- *Demographic profiles (Geographic Translation)*

STANDARD DEMOGRAPHIC PROFILES

Share age 0-17

Share age 18-59

Share age 60+

Share <HS Graduate

Share HS Graduate or GED

Share Some College or AA

Share BA or Higher

Share below Poverty

Share below 150% of Poverty

Median personal income

Median family income

Median age

Average household size

Share with retirement income

Share receiving SNAP

Share receiving TANF

Share receiving SSI

Share receiving Social Security

Share with interest/dividend or rental income

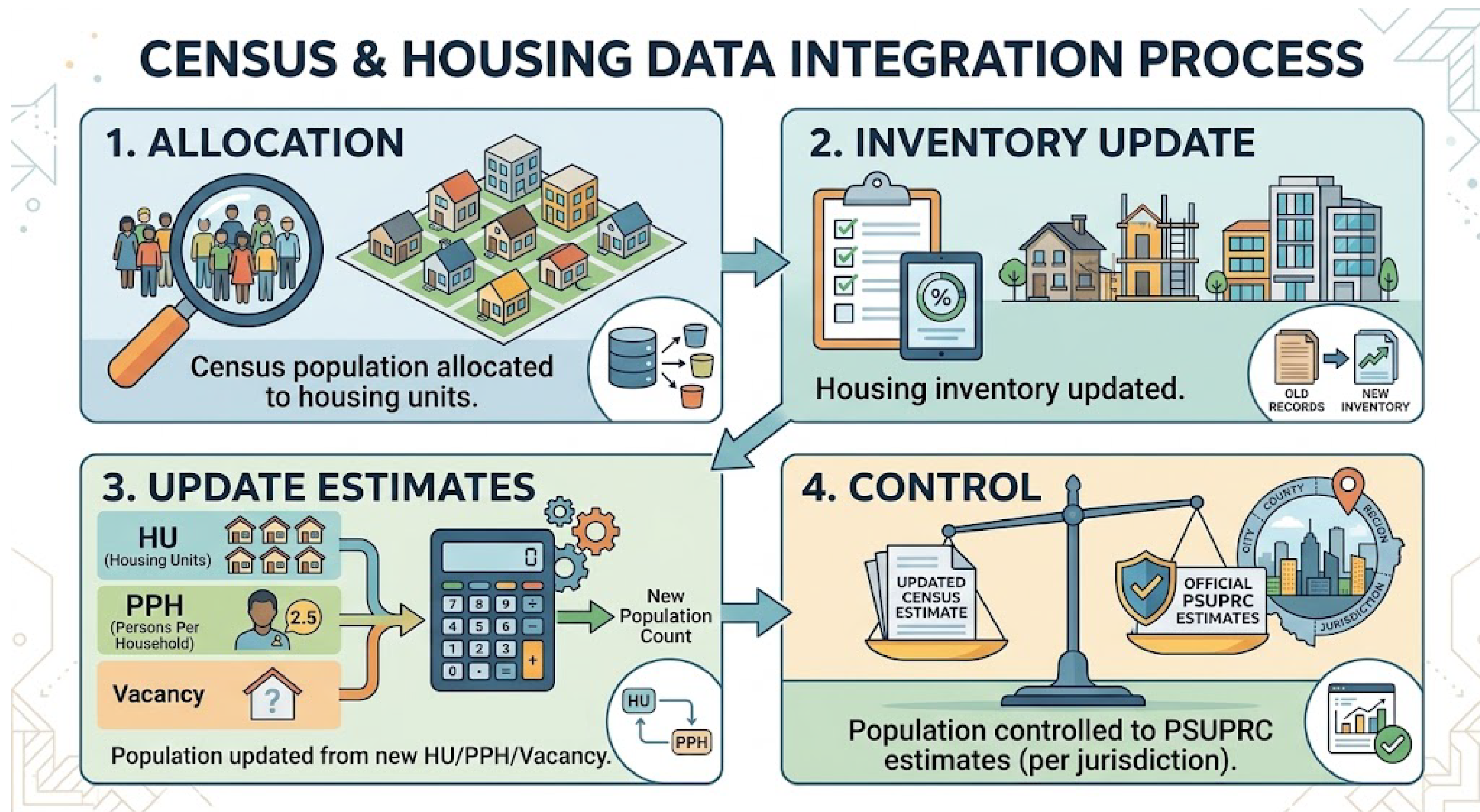
Share with self-employment income

Share with wage or salary income

Share with any earnings

Methods

Population Estimates – Household Population Example



Data Integration:

1. Census population allocated to housing units



2. Housing inventory update



3. Population updated from new HU, PPH, and vacancy (+GQ population change)



4. Population controlled to PSUPRC estimates



5. Population and housing units aggregated by Water Provider area for reporting



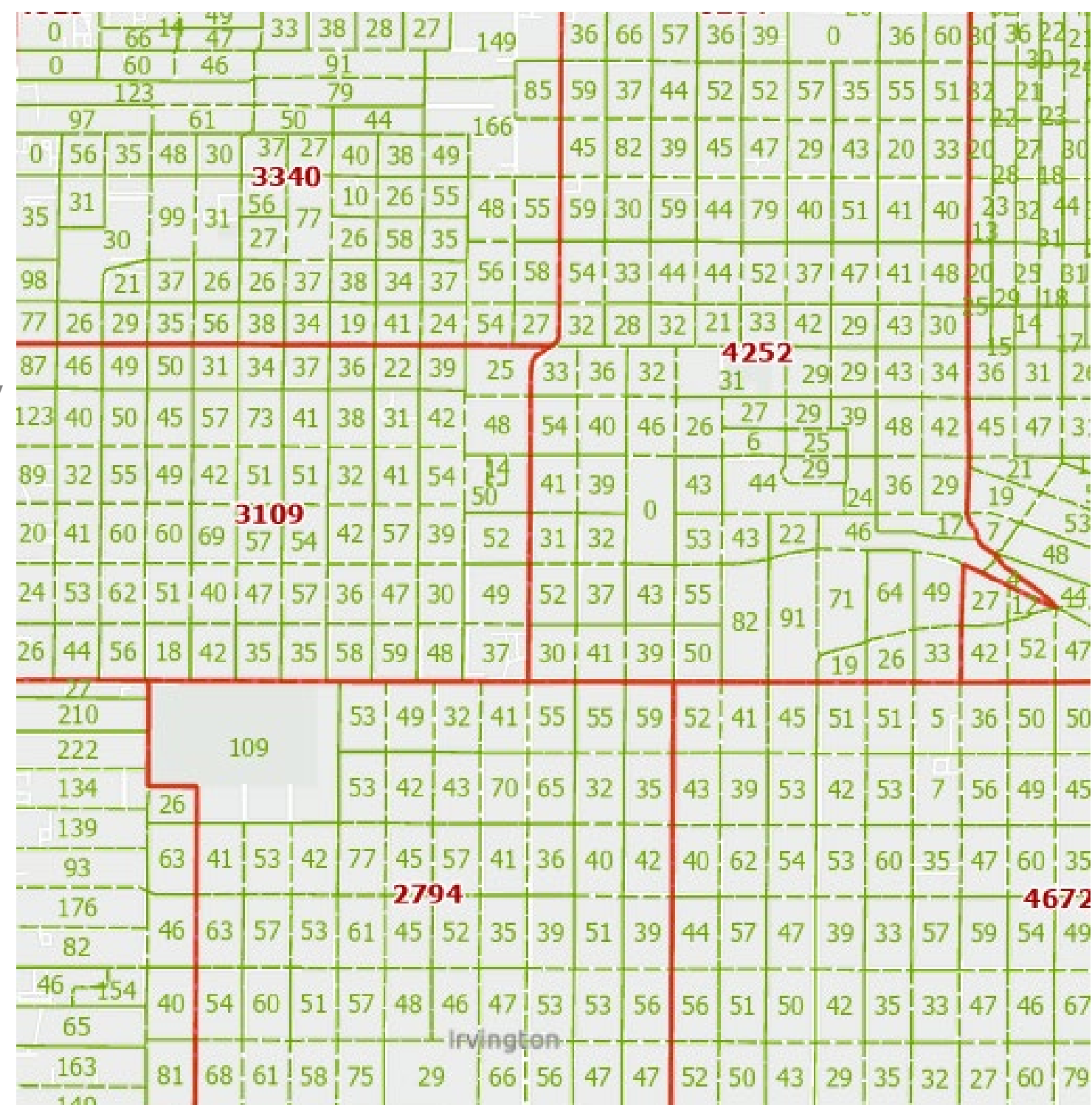
Repeat 2—5 for each year since last decennial census

Methods

Geographic Translation (Demographic Profiles)

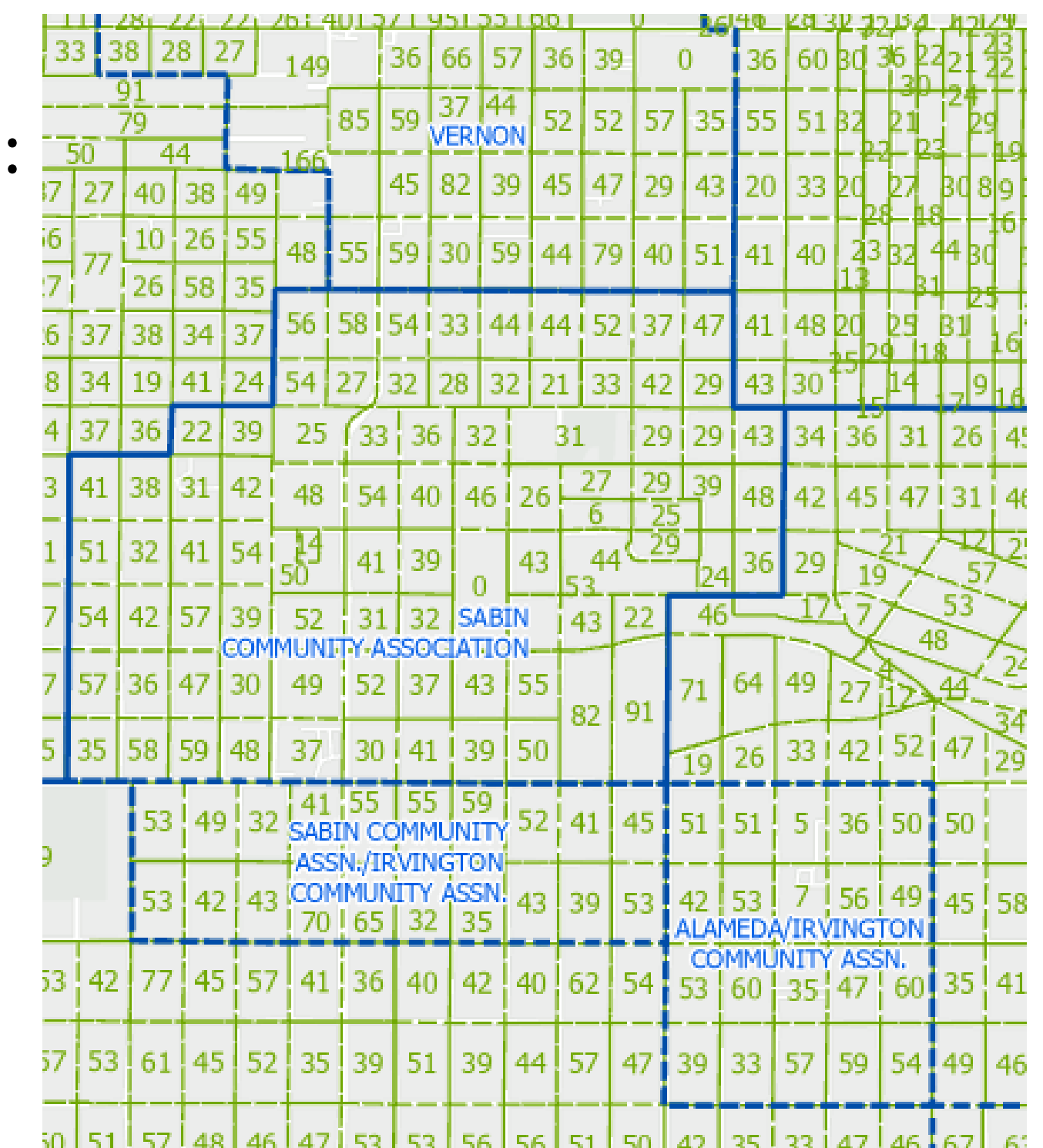
1:m Tract to
Block
Downscaling:

tract proportionally
allocated to
constituent blocks



m:1 Block to
Water Providers:

blocks re-
aggregated to
Water Provider
areas



Emma Martin

City of Hillsboro

Emma Martin is the Water Resources Management Analyst with the City of Hillsboro Water Department and has worked for the Department and the Joint Water Commission for the last six years. Since joining Hillsboro, she has led or supported projects involving water rights, demand forecasting, system planning, source water protection, and regional water supply coordination. Emma is also actively involved in AWWA, having recently served as Chair of the Pacific Northwest Section AWWA Young Professionals Committee, helping to foster leadership and professional development within the water industry.

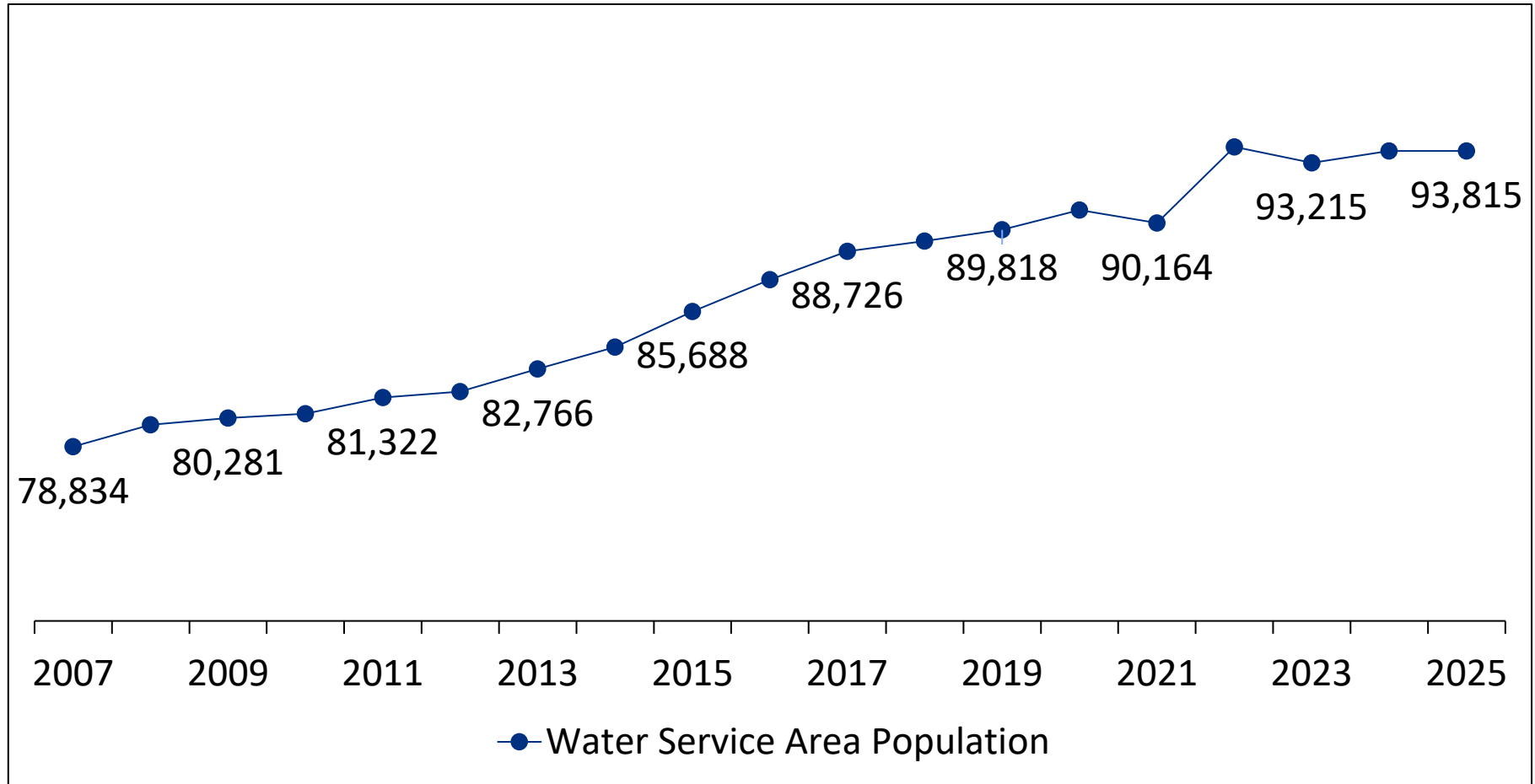


Hillsboro Water and Population Data

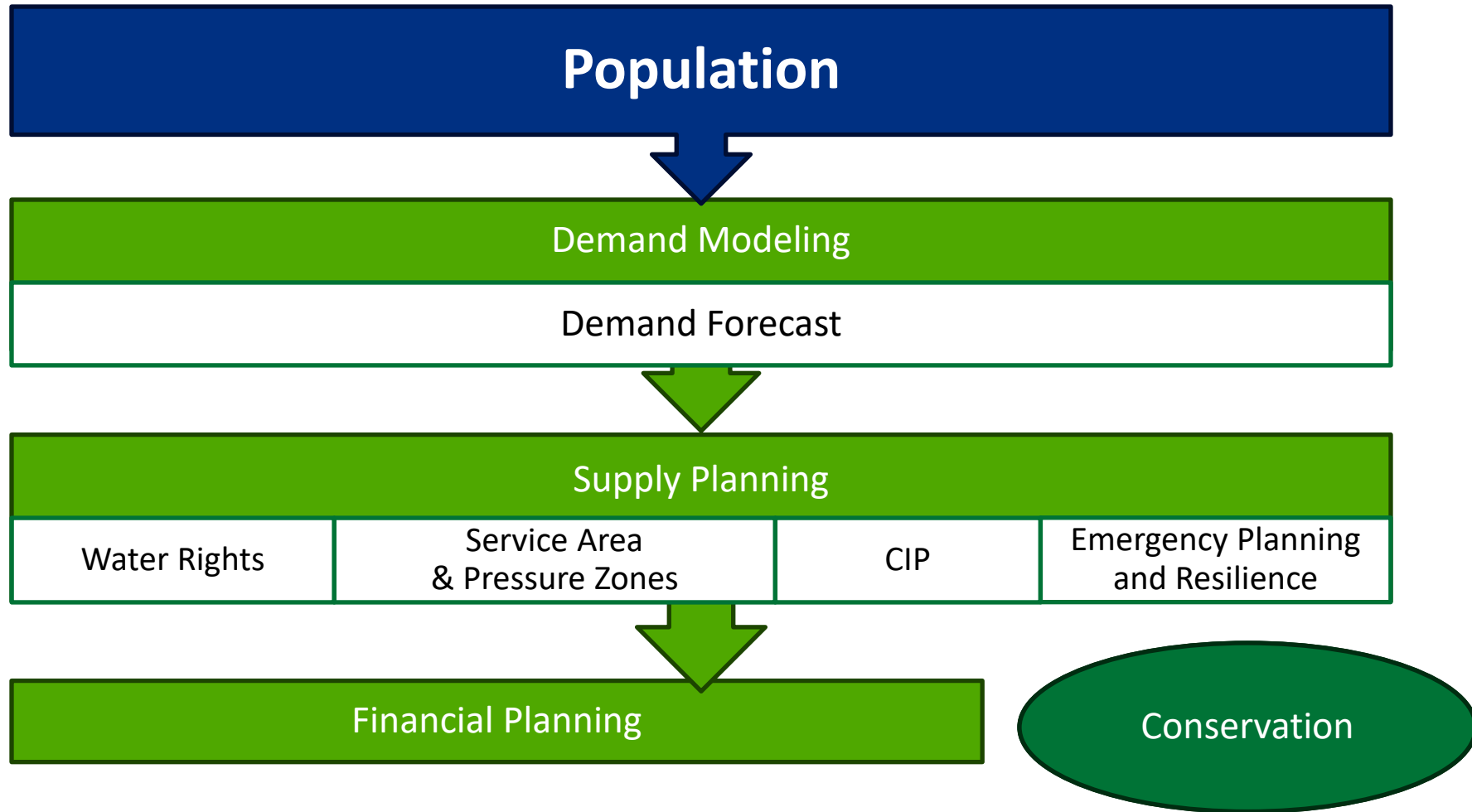
Emma Martin, Water Resources Management Analyst



Hillsboro Water Overview



Population Uses



Water Demand Forecasting

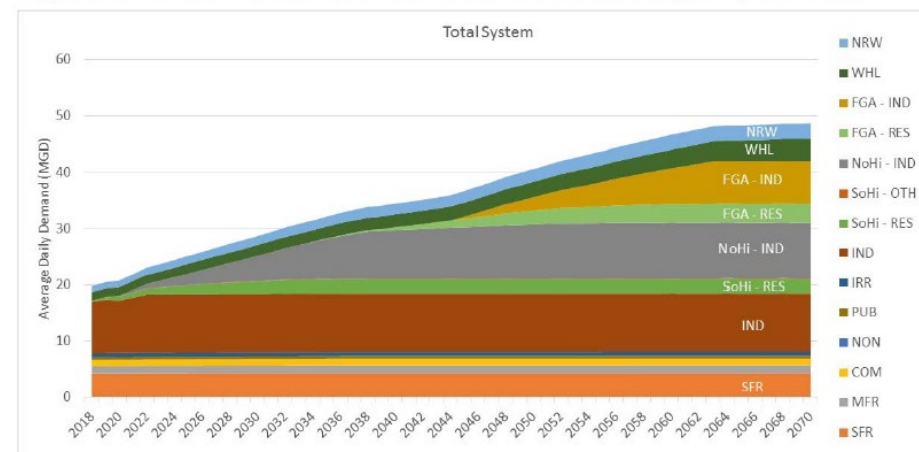
Key Question: How much water will our customers need in the future?

- Modeling → Population growth drives future water demand
- Forecasts support long-term planning
- Utilities estimate:
 - Average Day Demand
 - Maximum Day Demand
 - Peak Hour Demand

Example

- 20,000 new residents = increased residential demand and peak system requirements

Figure ES-1. Total System-wide Demand Forecast (Average Day Demand)

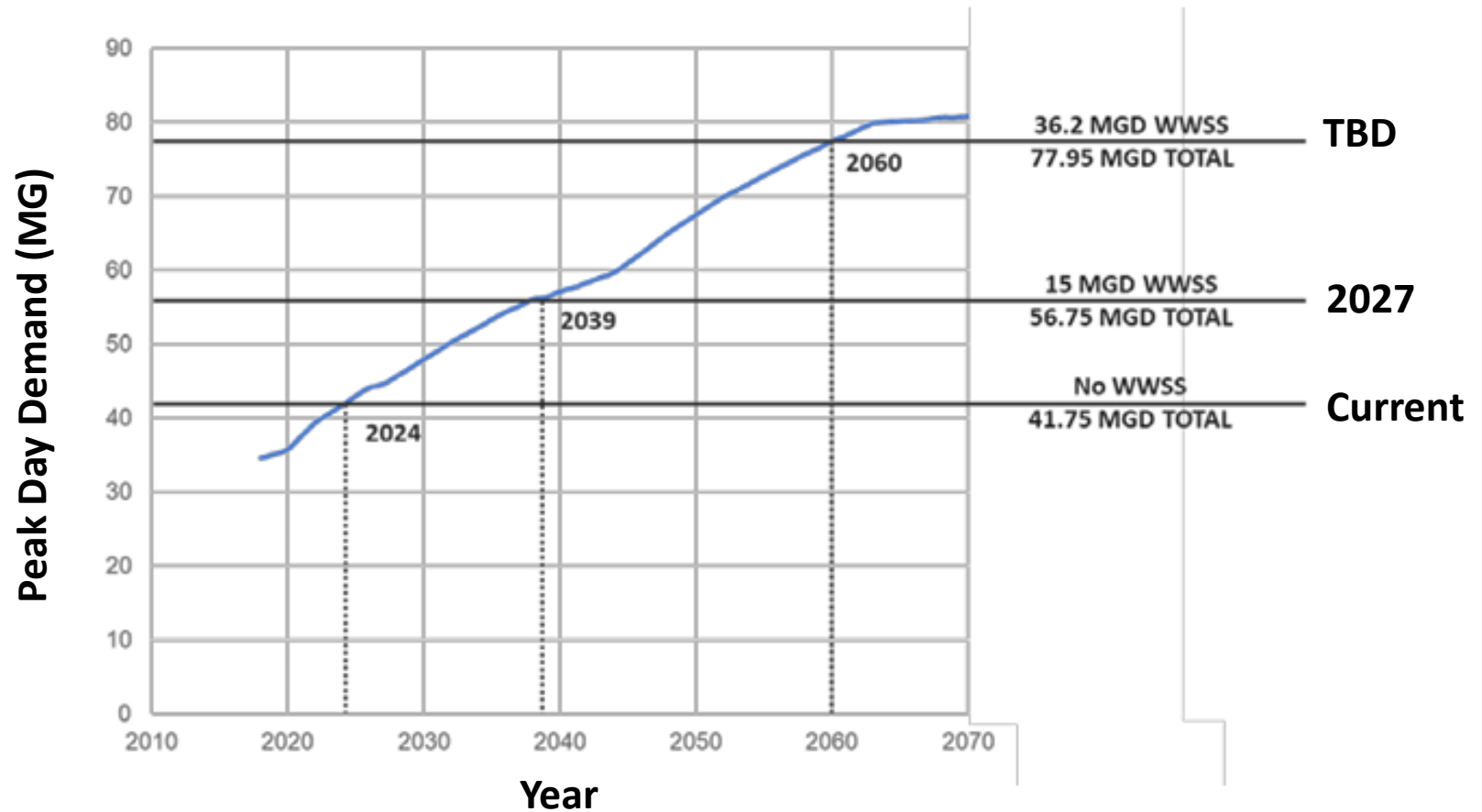


Water Supply Planning

Key Question: Will enough water be available?

- Compare demand against:
 - Water supply (water rights and transmission)
 - Treatment capacity
 - Reservoir storage
 - Climate conditions
- Identifies future supply deficits to plan for:
 - New water sources (ASR, Surface, Storage, etc.)
 - In-town reservoir expansions

Figure 4-3. Projected Demands by Year, Baseline Demand Scenario

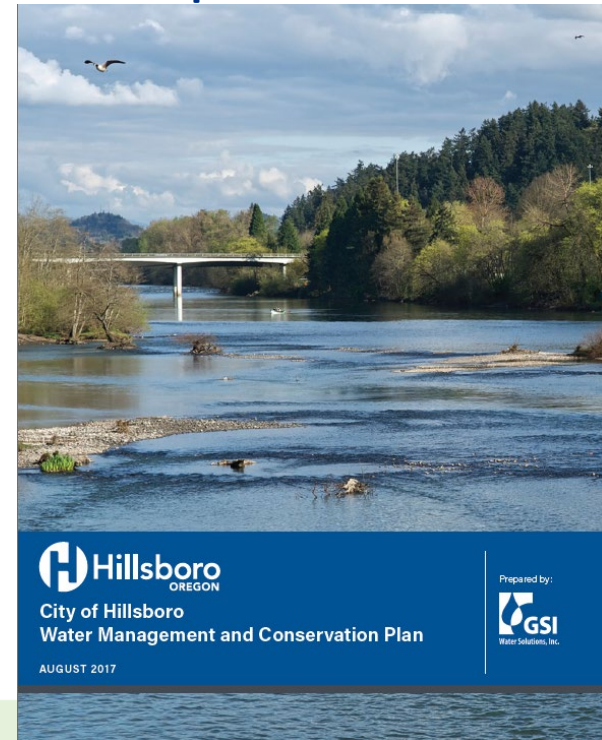


Water Rights Planning

Key Question: Are we legally allowed to use enough water?

Uses Population Data To

- Demonstrates and justifies future municipal need
- Support permit applications
- Support permit extensions
- Support water rights strategies
- Water Management and Conservation Plan (WMCP)
 - 2027 Update in progress



Service Area & Pressure Zone Planning

Key Question: Where will future demand occur?

Uses Population Data To:

- Support decisions about serving future development
- Forecast demand by:
 - Pressure zones
 - Reservoir service area
 - Water Service Area
- Allocate future growth geographically to determine:
 - Localized infrastructure needs (new reservoirs, PZs).
 - Estimates new connections and assess system impacts
 - Supports capacity planning and SDCs

Estimated Population Added per Year by Development Area

2026

Previous
Estimated
Total Population **12,485**

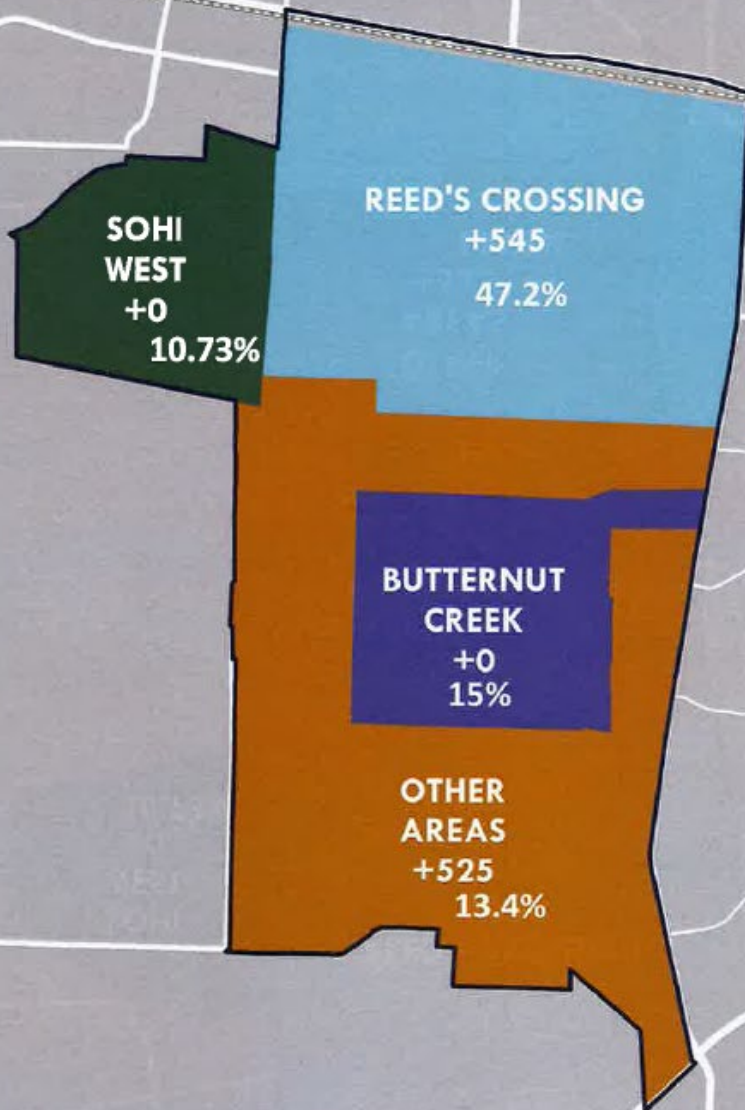
Reed's Crossing **7,410**

Butternut Creek **2,355**

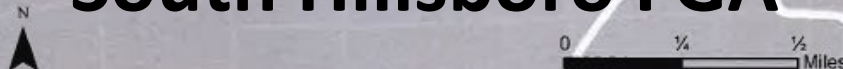
SoHi West **1,685**

Other Areas **2,105**

**SOUTH
HILLSBORO
TOTAL** **13,555**



South Hillsboro FGA



Capital Improvement Planning (CIP)

Key Question: What infrastructure will be needed and when?

Uses Population Data To:

- Determine timing and schedule of infrastructure upgrades, including:
 - Reservoirs & pump stations
 - Transmission mains
 - Treatment facilities

City of Hillsboro
2019 Water Master Plan



June 4, 2019



Prepared by HDR, Inc., 2019

Project Name	Current Size (in)	New Size (in)	Length (ft) Each	Unit Price \$/in/ft or \$000	Schedule and Cost (in thousands of dollars)													Improvement Description	
					Total Project Cost to City	FY 2019	FY 2020	FY 2021	FT 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030		2031-2069
City of Hillsboro Water Projects					\$269,415	\$160	\$6,715	\$6,270	\$6,150	\$7,850	\$3,230	\$2,780	\$2,400	\$5,040	\$10,350	\$4,340	\$1,510	\$212,620	City of Hillsboro City System and Upper System Projects
JWC Projects					\$51,590	\$10,360	\$4,470	\$1,740	\$2,280	\$1,290	\$850	\$880	\$875	\$745	\$770	\$1,630	\$1,510	\$24,190	(City of Hillsboro Participation in JWC projects)
Barney Reservoir JOC Projects					\$1,800	\$0	\$50	\$40	\$40	\$40	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$1,280	(City of Hillsboro Participation in Barney reservoir Projects JWC)
Willamette Water Supply System Projects					\$424,810	\$16,780	\$37,030	\$48,360	\$68,220	\$107,150	\$74,800	\$27,070	\$18,740	\$2,740	\$490	\$340	\$350	\$22,740	(City of Hillsboro Participation in Willamette Water Supply System Projects)
Willamette Intake Facility Projects (RWF 1.0)					\$27,000	\$140	\$780	\$8,370	\$4,210	\$4,100	\$7,000	\$640	\$0	\$0	\$30	\$30	\$30	\$1,670	(City of Hillsboro Participation in Willamette Water Intake Projects)
COH Ops Building Roof Replacement					\$200			\$200											
COH Advanced Meter Infrastructure (AMI) Upgrade					\$3,500			\$500	\$1,000	\$1,000	\$1,000								
COH Scoggins Seismic Improvements					\$7,000			\$700	\$1,000	\$1,000	\$1000				\$350	\$350	\$350	\$2,250	
Total CIP					\$785,315	\$27,440	\$49,045	\$66,180	\$82,900	\$122,430	\$87,930	\$31,420	\$22,065	\$8,575	\$12,040	\$6,740	\$3,800	\$264,750	Total City of Hillsboro CIP

Financial Planning & Rate Studies

Key Question: How will growth affect utility finances?

Uses Population Data To:

- Forecast water sales
- Support rate studies
- Evaluate debt capacity
- Revenue forecasting

Conservation Planning

Key Question: Are conservation programs working?

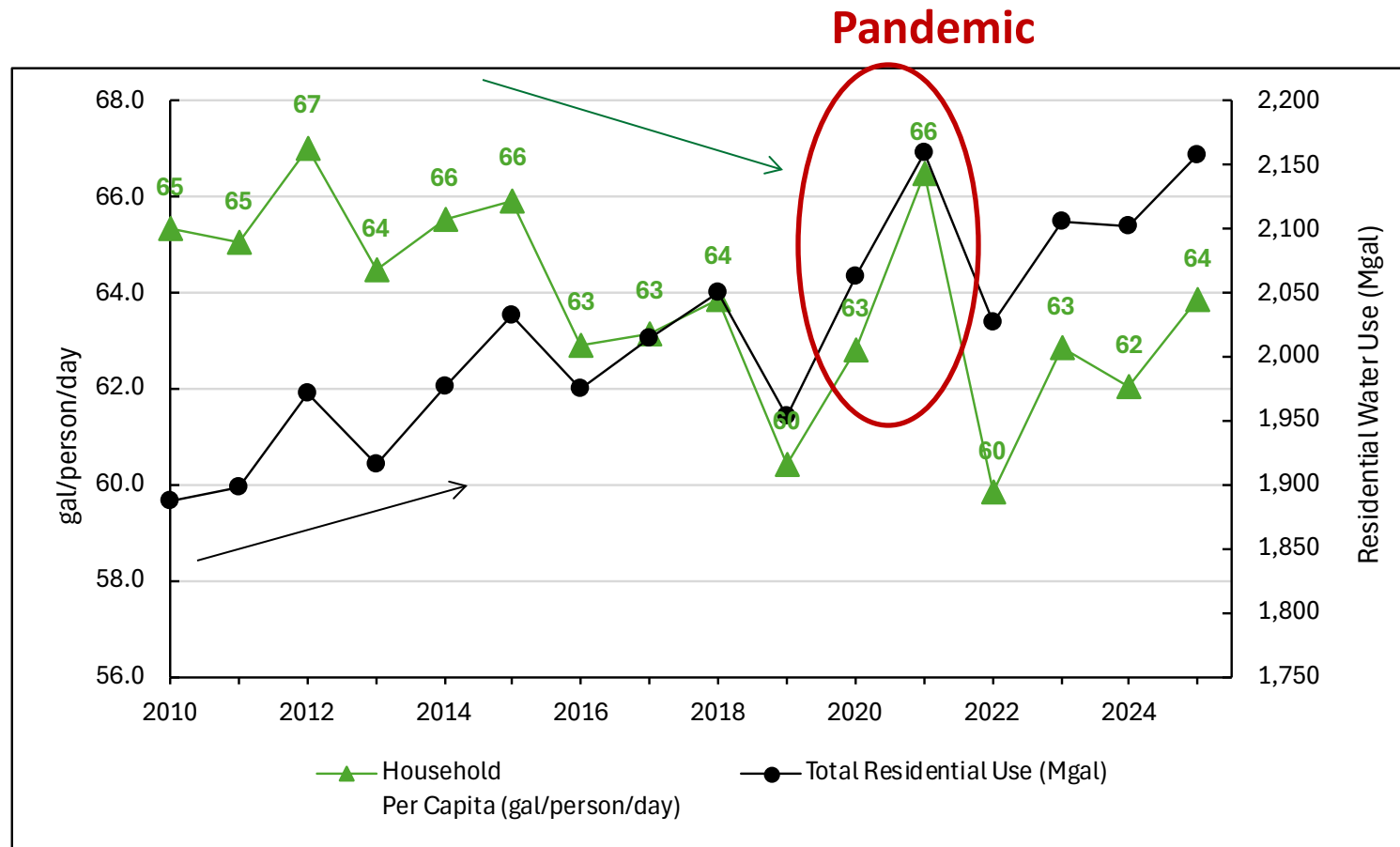
Uses Population Data To

- Track per-capita water use.
- Separate growth impacts from conservation impacts.
- Evaluates conservation effectiveness
- Separates growth from efficiency gains

Example:

- Population increases 20%, but total demand remains unchanged.
 - Indicates reduced per-capita consumption.

Per Capita Water Use vs Total Use



Per Capita Water Use vs Total Use

Smart Water Meter Rebate

Washing Machine Rebate

High-Efficiency Toilet (HET) Rebate

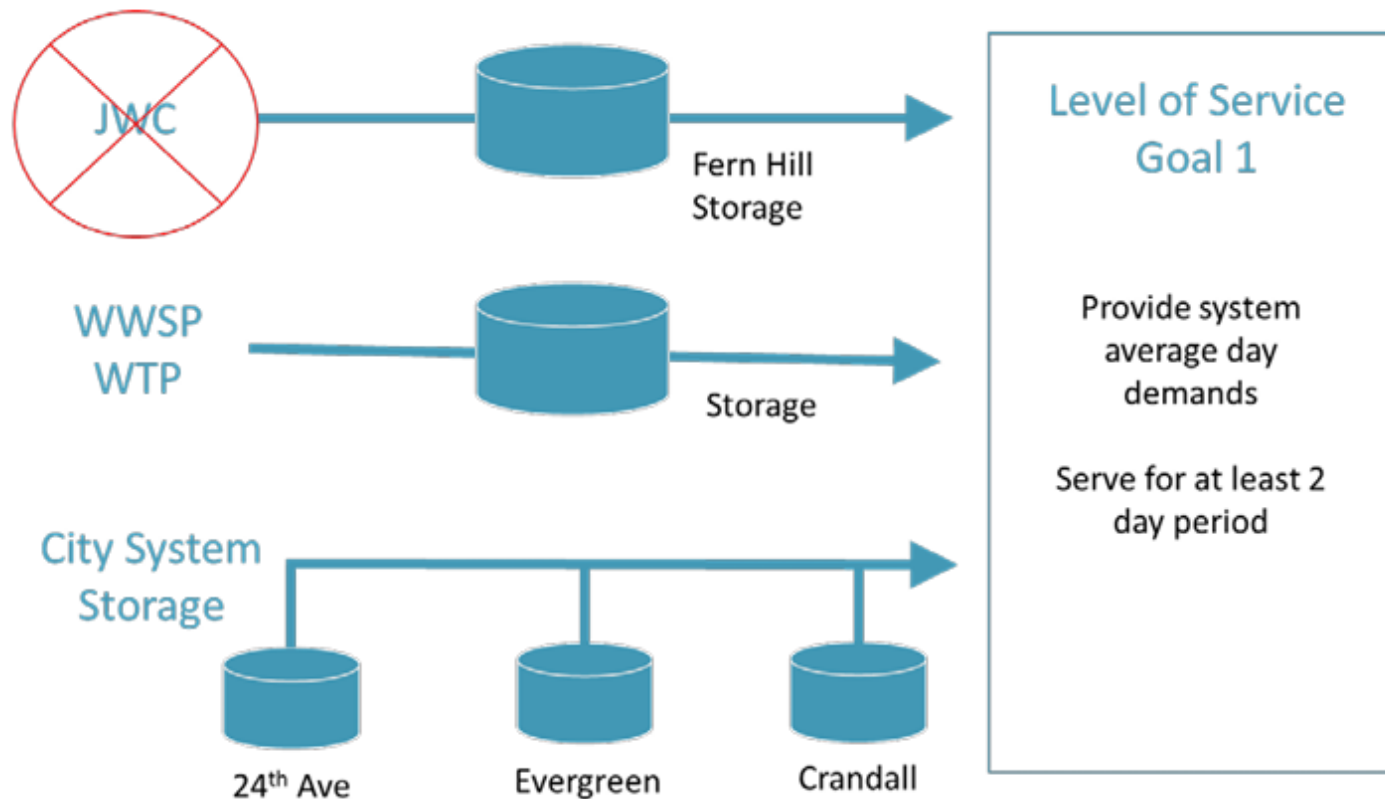
WaterSense Labeled Irrigation Controller Rebate

Emergency & Resiliency Planning

Key Question: Can we serve customers during emergencies?

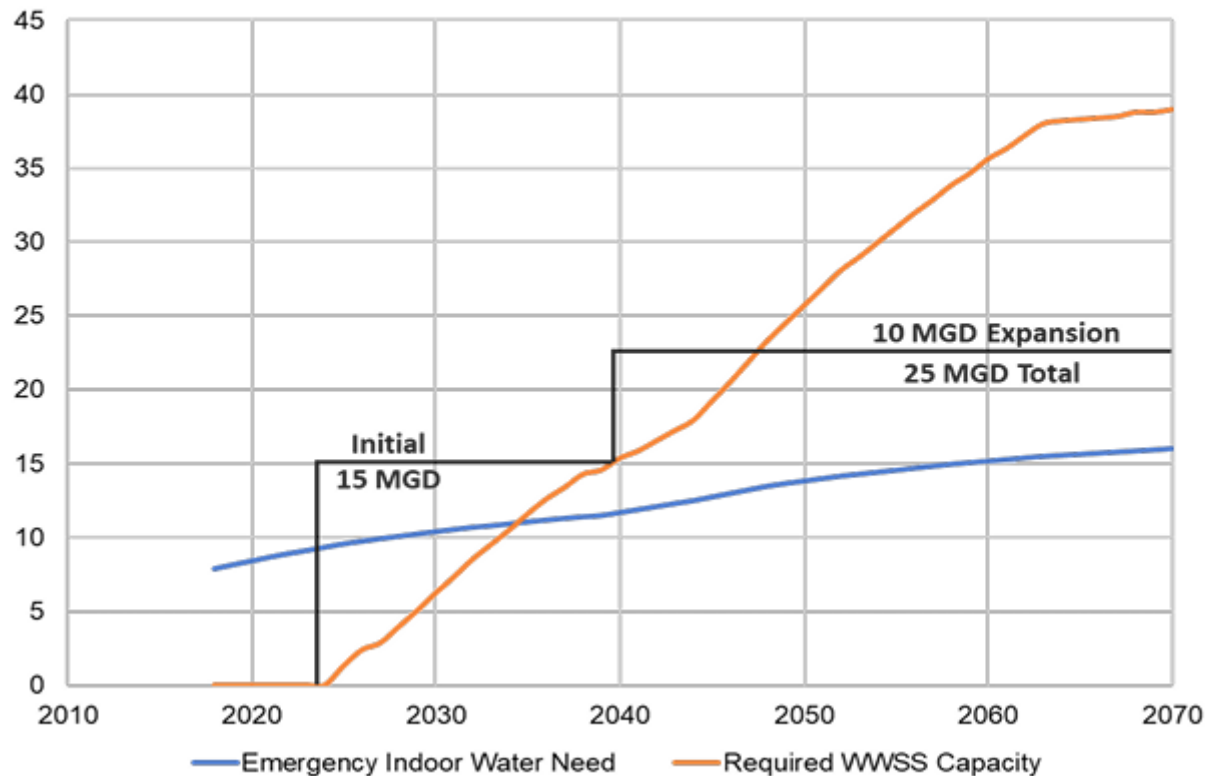
Uses Population Data To:

- Plan emergency storage requirements.
- Estimate emergency water needs.
- Evaluate drought vulnerability.
- Estimates demand needed for emergencies



Level of Service Goal No. 1 – Have sufficient supply and storage to meet system average day demands for at least 2 days, with the largest source out of service.

Figure 4-4. Comparison of WWSS Capacity Requirements to Emergency Indoor Water Needs, Baseline Demand Scenario



Emergency indoor water need = minimum month demand for Hillsboro customers, excluding irrigation and industrial demands.

Janine Casey

Rivergrove Water District

Janine Casey is the General Manager of Rivergrove Water District. She leads a dedicated team that provides clean, safe, and dependable water to a community of over 4,200 residents every day. With more than 30 years in public service, she is dedicated to ensuring that every household, school, and business has access to water they can trust. To Janine, water is a vital lifeline, not a service. Partnering with residents and local groups, she fosters community-driven water stewardship centered on sustainability, transparency, and safety.



- **Importance of Infrastructure Planning**
 - **Safeguarding Public Health & Safety**
 - **Optimizing Resources**
 - **Supporting Growth & Demand**
 - **Managing Costs & Financial Stability**



- **Resiliency Planning**
 - **Guarding Water Quality**
 - **Combating Extreme Weather & Disasters**
 - **Mitigating Cyber & Physical Threats**
 - **Managing Aging Infrastructure**



- **Regional Water Providers Consortium Partnership**
 - **Collective Action**
 - **Sharing Resources**
 - **Unified Voice**

Ben Beal

Portland Water Bureau

Ben Beal is a Water Resource Modeler at Portland Water Bureau. He specializes in water demand forecasting, hydrologic and water quality modeling, and long-term water supply planning. He develops and applies data-driven models to support utility planning and operational decision-making.

Portland Demand Model

Leveraging Population Forecasts

Benjamin Beal
Water Resources Modeler
Portland Water Bureau

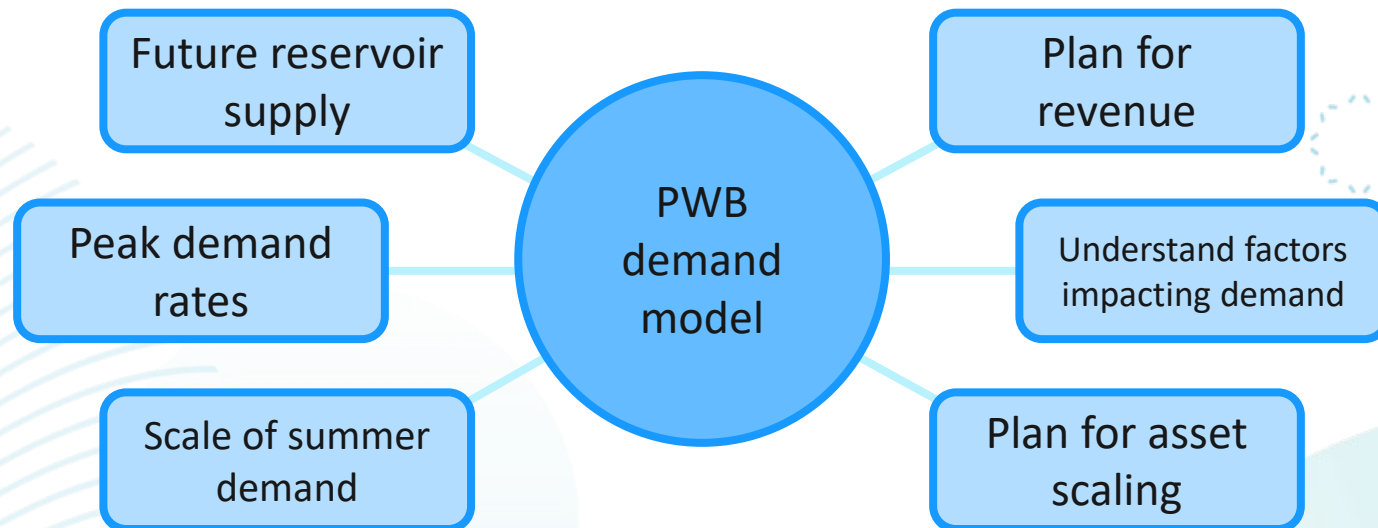


Outline

- Purpose of a long-term forecast model
- Role of PSU's long term population forecasts
- How population forecasts inform the demand model
- Planning for uncertainty
- Adapting to a changing forecast

Purpose of model

- **As a water provider, demands drive the scope and scale of infrastructure, water availability, and revenue.**

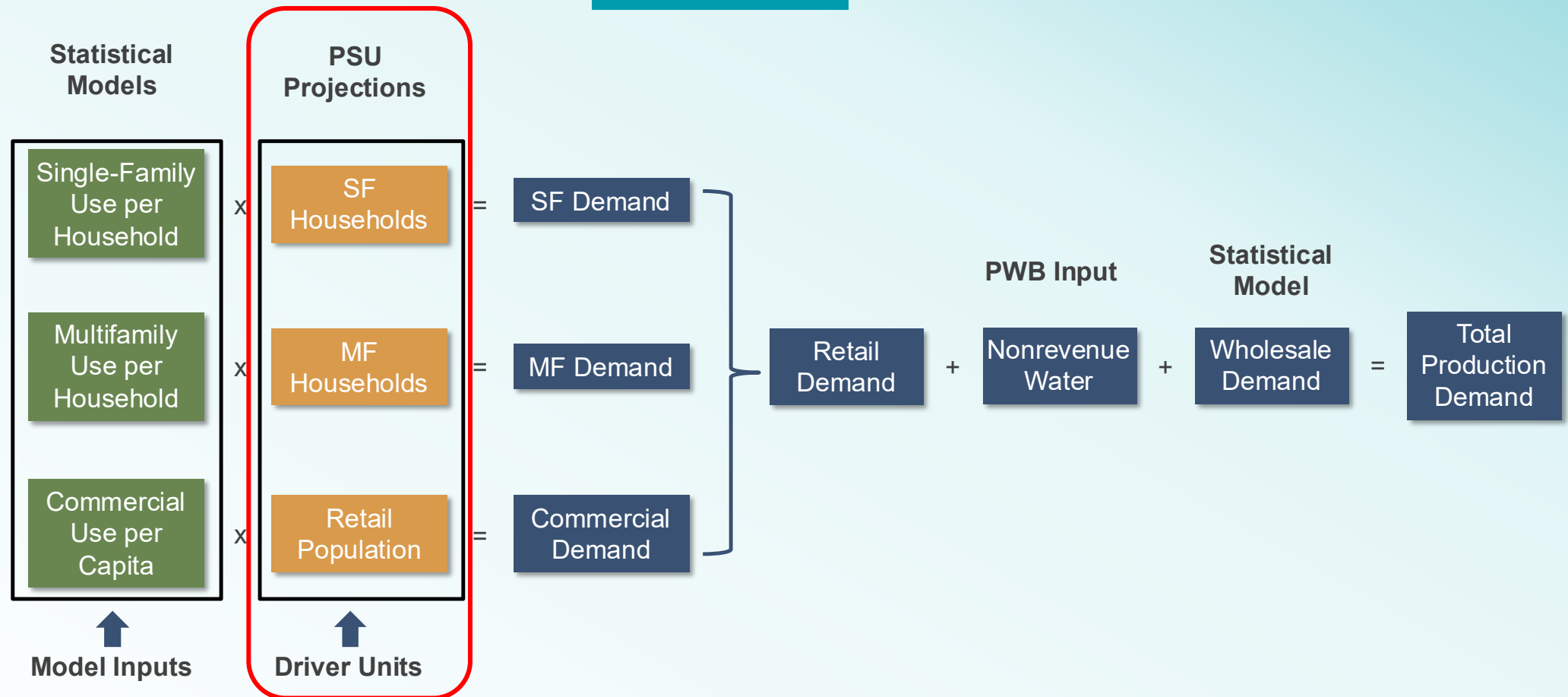


Role of PSU's population forecasts

Components of a “rate of use” model



How PSU forecasts inform PWB demand model

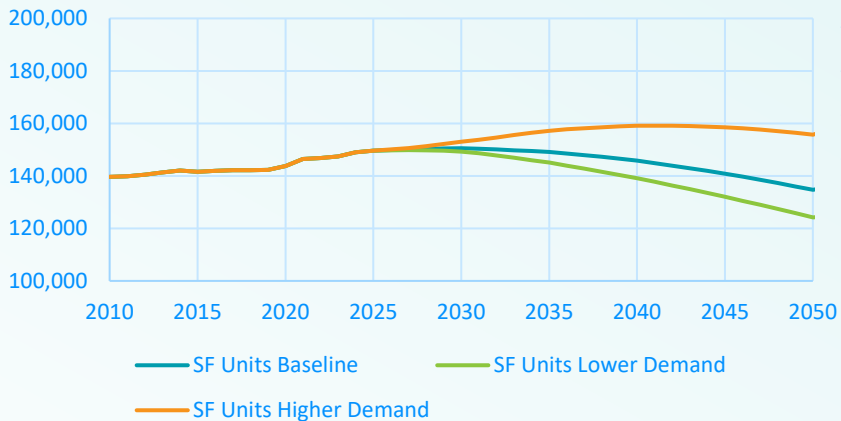


Planning for uncertainty

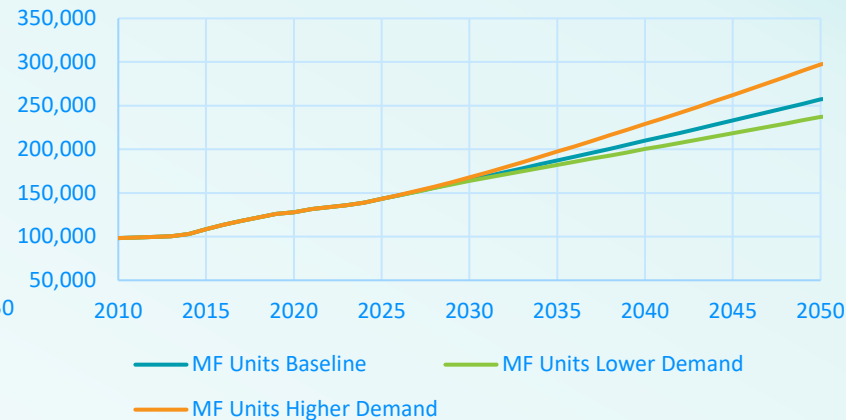


Uncertainty in Driver Units

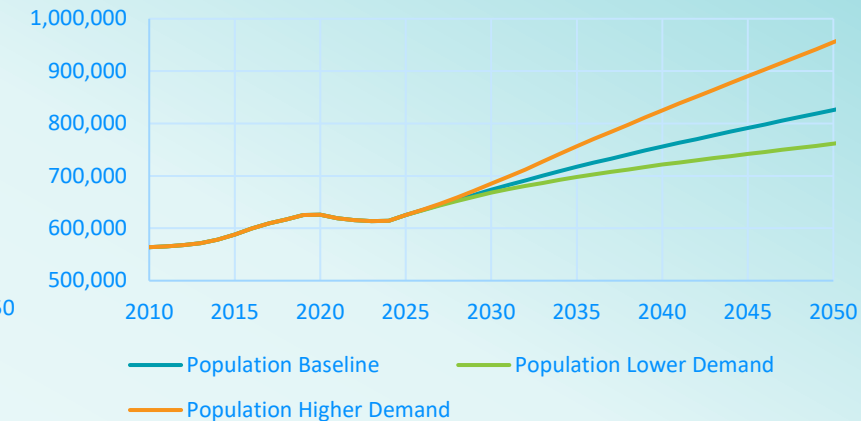
Single Family Forecast



Multi Family Forecast



Total Population Forecast



- Incoming/outgoing migration may have a range of +6000 / -3000 persons per year.
- This generates an asymmetrical difference in high/low demand drivers

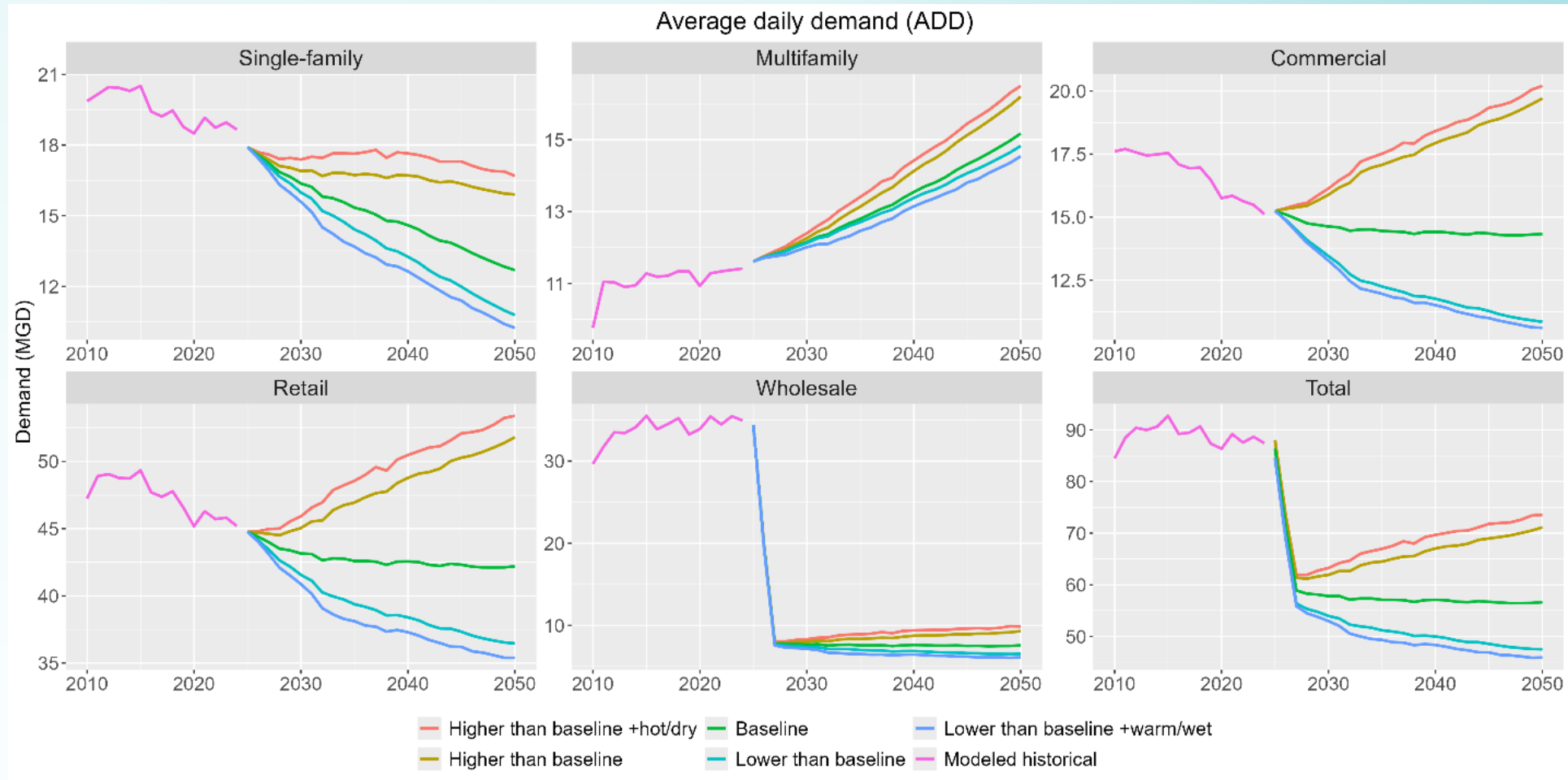
- We do not consider changes to density (persons per unit)
- We do not consider changes to vacancy (percent of occupied units)

Adapting to a changing forecast



- Forecasting populations in the Portland area are under continuous improvement:
 - New forecast intervals (about every 5 years) – This can completely alter the long-term forecast
 - New estimates for previously forecast years – This updates the “starting point” of forecasts
- What if analysis in driver units:
 - What if city planners invest heavily in building additional multifamily or commercial properties
 - What if uncertainty in population growth increased/decreased over time (high/low demand)

Planning for multiple futures



Thanks!



Benjamin Beal



Benjamin.beal@portlandoregon.gov



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or other auxiliary aids or services, contact **503-823-7770, Relay: 711**.
Traducción e Interpretación | Biên Dịch và Thông Dịch | 口笔译服务
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