Exploring options for the next regional economic forecast

Overview of the REMI* model

* = Regional Economic Models, Inc https://www.remi.com/

We are leaders in the region to realize equity for all. Diversity, racial equity and inclusion are integrated into how we carry out all our work.

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Outline

- History and role of regional forecasts at PSRC
- Options explored for the next forecast
- REMI Model Overview
- Takeaways from PSRC explorations of REMI
- Summary and next steps

PSRC develops regional socioeconomic forecasts

- Control totals for downstream models and plan assumptions
- Historically produced using in-house models developed and operated by consultants
  - STEP Model – Dick Conway & Associates (1980-2006)
  - ECO Model – ECO Northwest (2012-2018)
- Updated every 3-5 years, with timing fit to major planning cycles

Methodology considerations for the next forecast

- Current model has some areas that could be improved
  - Consistency among variables

- Desire to upgrade capabilities
  - Geographic and demographic detail
  - Add cohort-component methods to population projections
  - Perform what-if analysis

- Expand list of outputs to support additional analysis and downstream model enhancements

- Difficulty of forecasting post-pandemic

Scoping out the options

- Socioeconomic Modeling Webinars in 2021-2022
  - Fall 2021 survey - 15 answered question about regional forecasts
    - 9 used REMI for most recent work
    - 6 other responses:
      - Provided by state office
      - Use in-house model
      - Purchased product (Moody's, IHS Markit, Woods & Pool)

- Chatted with other agencies
    - Other MPOs
    - Regional forecasters
      - PSEF community

- Establish a shortlist to evaluate further

Comparing options on the short list

	In-house ECO model	REMI	Woods & Poole	Moody's
Format	Model	Model	Database	Database
Product	In-house model	Model with 3, 6, or 12 month rental period	1-time purchase of annual product	1-time purchase or annual subscription updated monthly
Cost	Consultant costs of $45K in 2017	23 job sector ($37-41-50K) 70 job sector ($53-58-68)	$900	$125 per variable or $9K subscription

- All have strengths and tradeoffs
  - Costs
  - Static databases versus models with adjustable inputs and outputs
  - Horizon years and geographic detail
  - Availability of needed and desired output variables

Next steps after reviewing the list

- Exploratory purchases
  - Woods & Poole datasets
  - REMI license

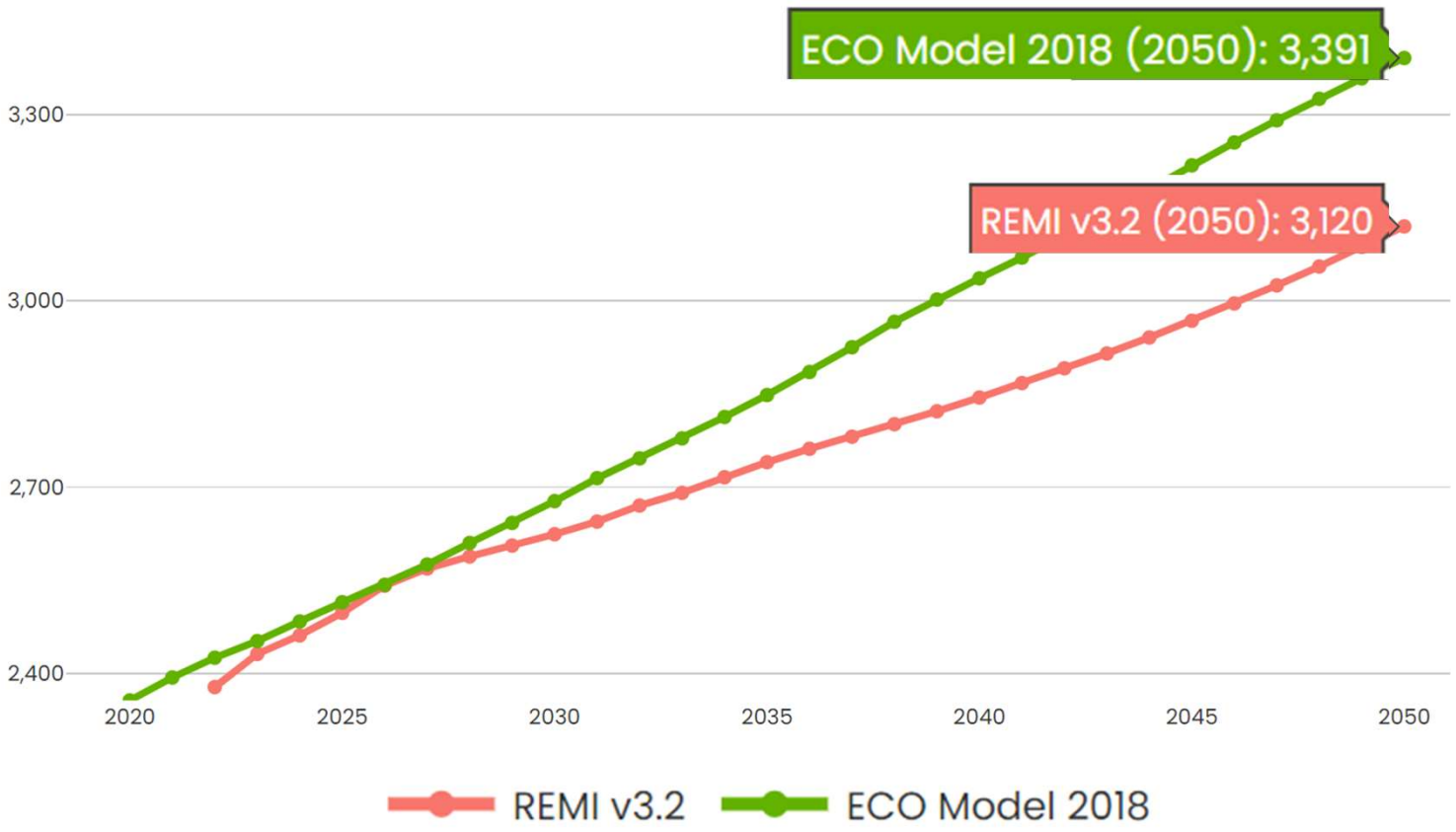
- Diving deeper into REMI:
  - Each county represented
  - Projections out to 2060
  - Can run what-if simulations
  - Extensive input database and available outputs

- Rest of time today
  - Overview of model from REMI staff
  - Takeaways from PSRC's model exploration

REMI Overview (REMI Staff Presentation)

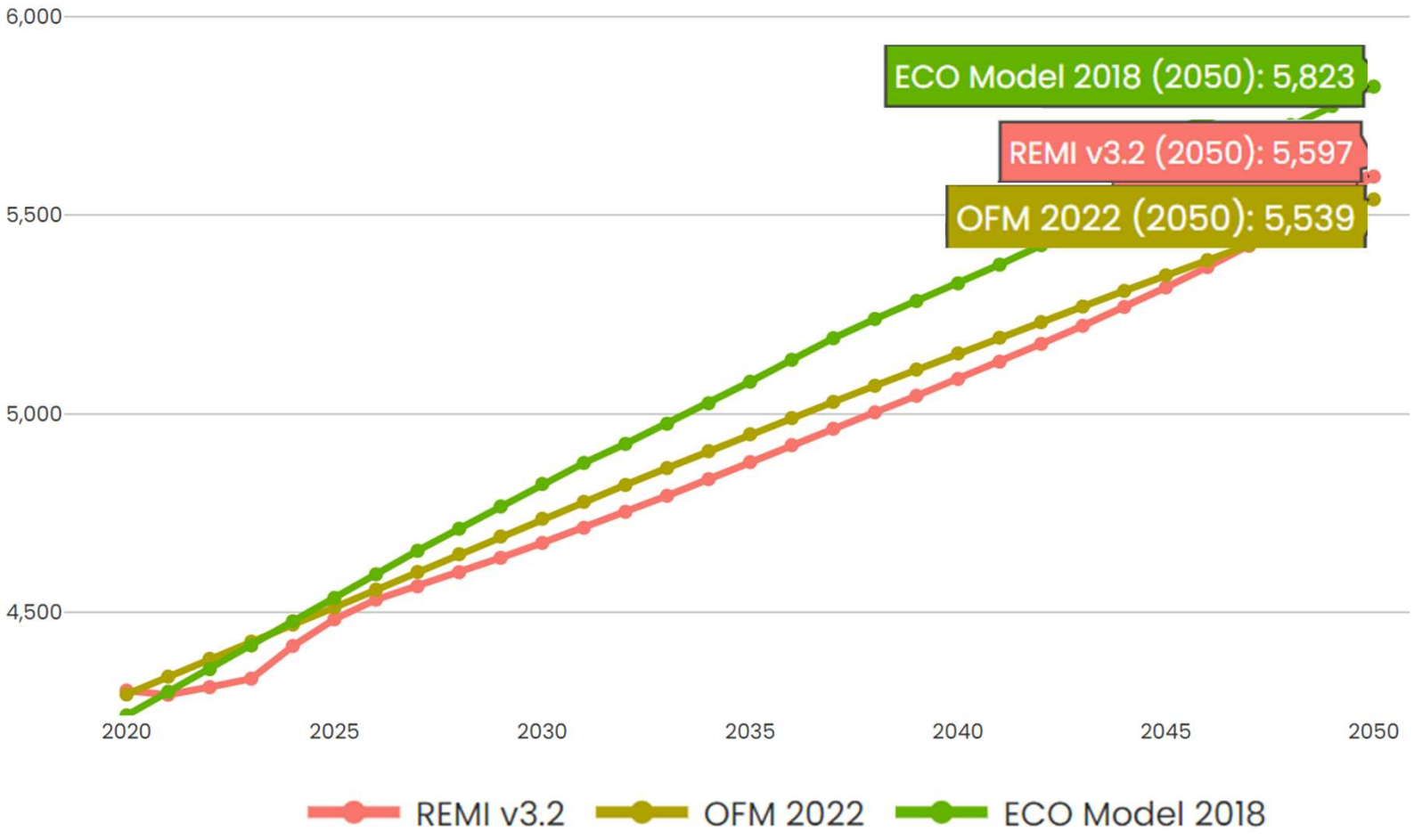
Outputs and Assessment (PSRC Staff Takeaways)

Current REMI output comparisons: employment



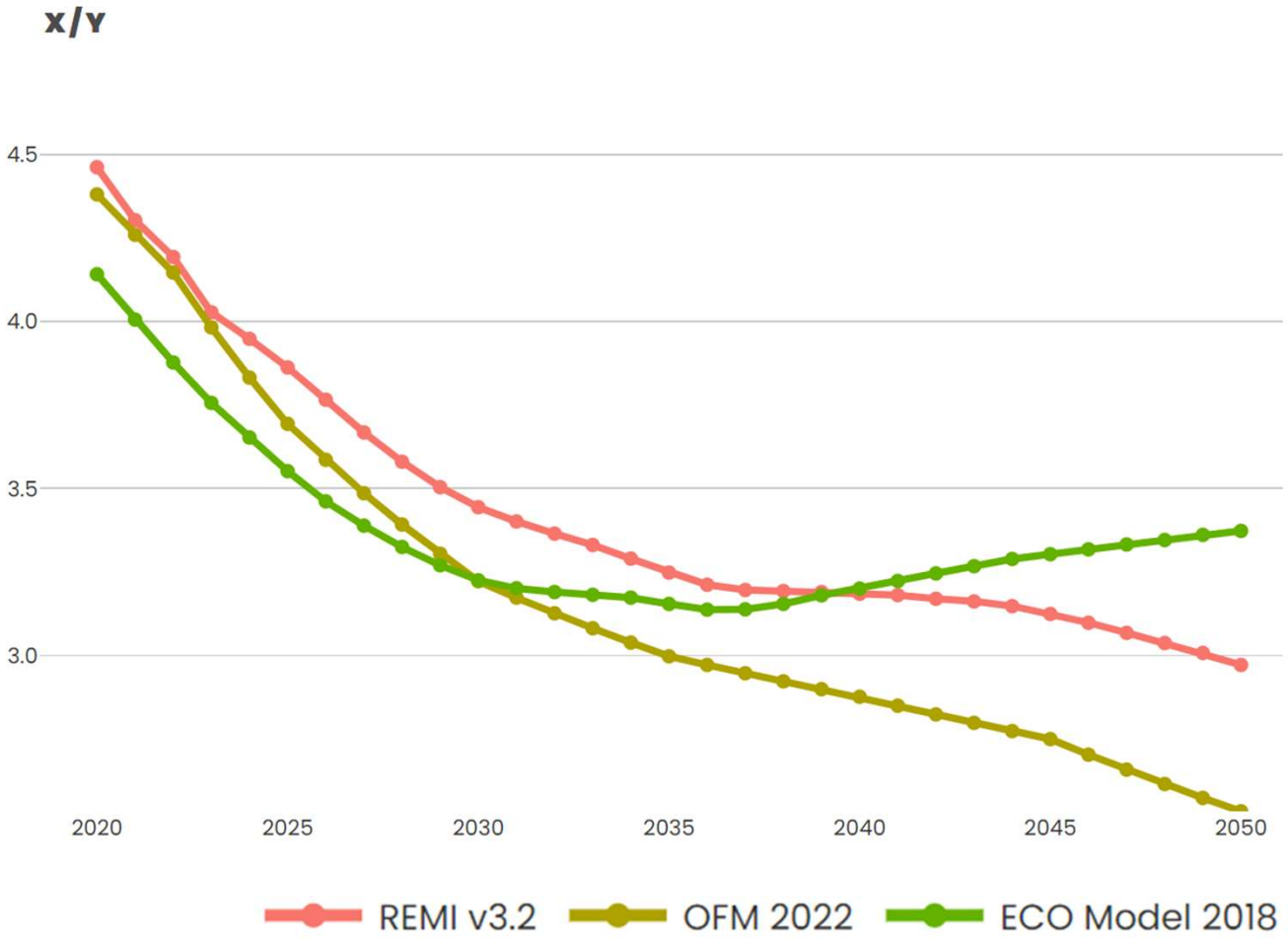
- Fewer jobs in 2050 versus 2018 ECO model outputs
- Possible Factors:
  - Pandemic & recession
  - Flatter national job growth forecasts from BLS

Current REMI output comparisons: population



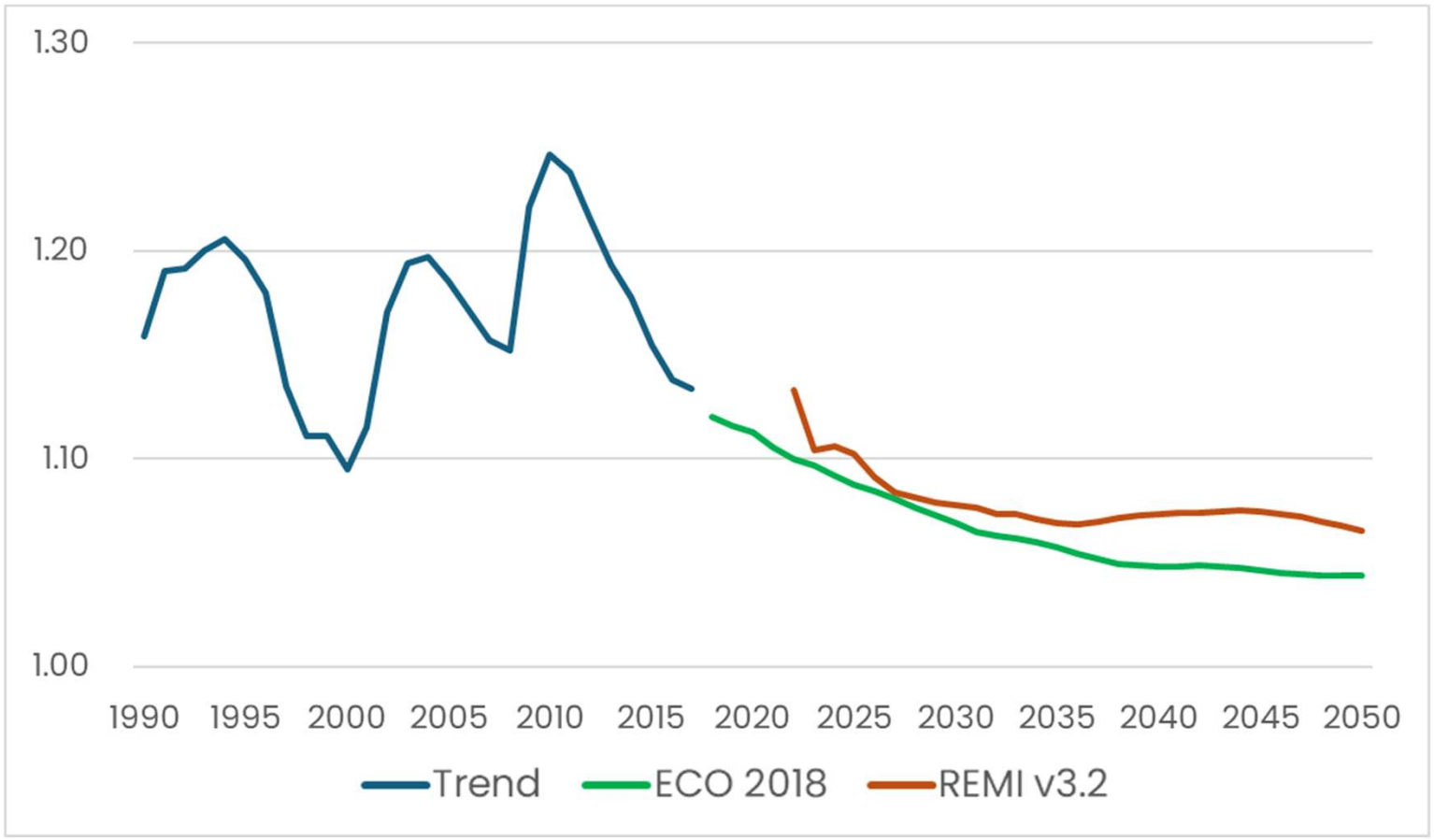
- Population aligns closely with OFM projections, lower than 2018 ECO outputs
- Possible Factors:
  - Lower job projections & less migration
  - Updated national projections from Census

Ratio Check: Working age population / retiree



- Potential support ratio (20-64 / 65+)
- REMI change over time more closely mirrors cohort results from OFM

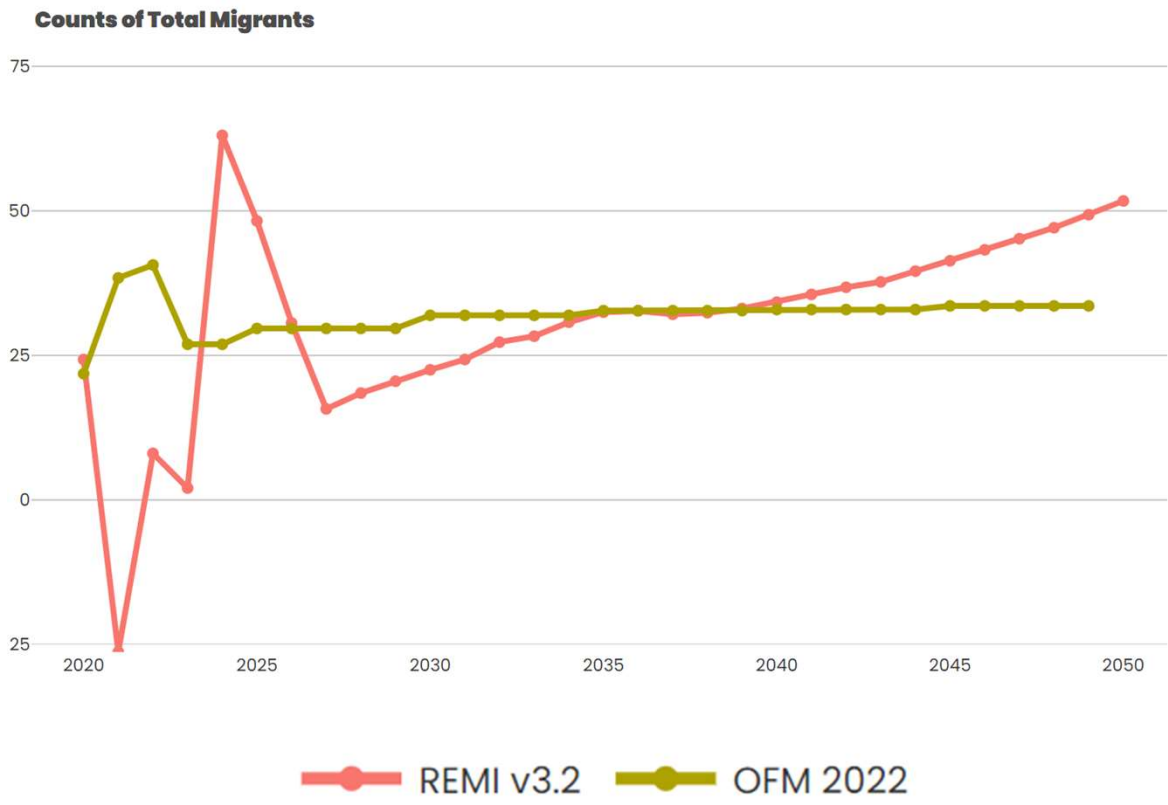
Ratio Check: Working age population / employment



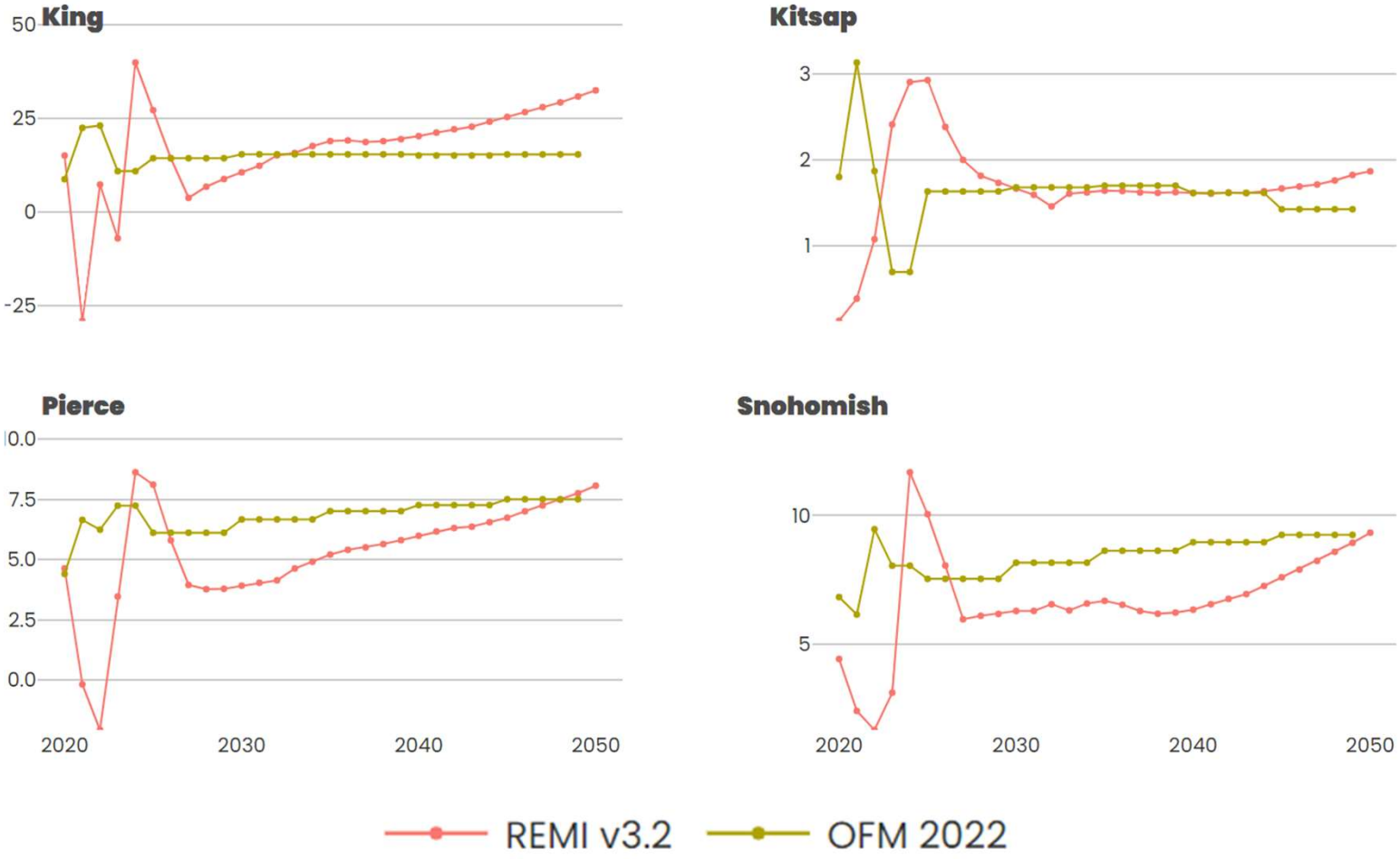
- Focal point in 2018 ECO work
- Current REMI outputs showing similar trajectory

Modifiable Baseline Scenario Inputs

- REMI users can adjust inputs multiple ways
  - Adjust variable or sets of variables, absolute or percent changes
  - Incorporate other forecast products
  - Example: net regional population migration differences

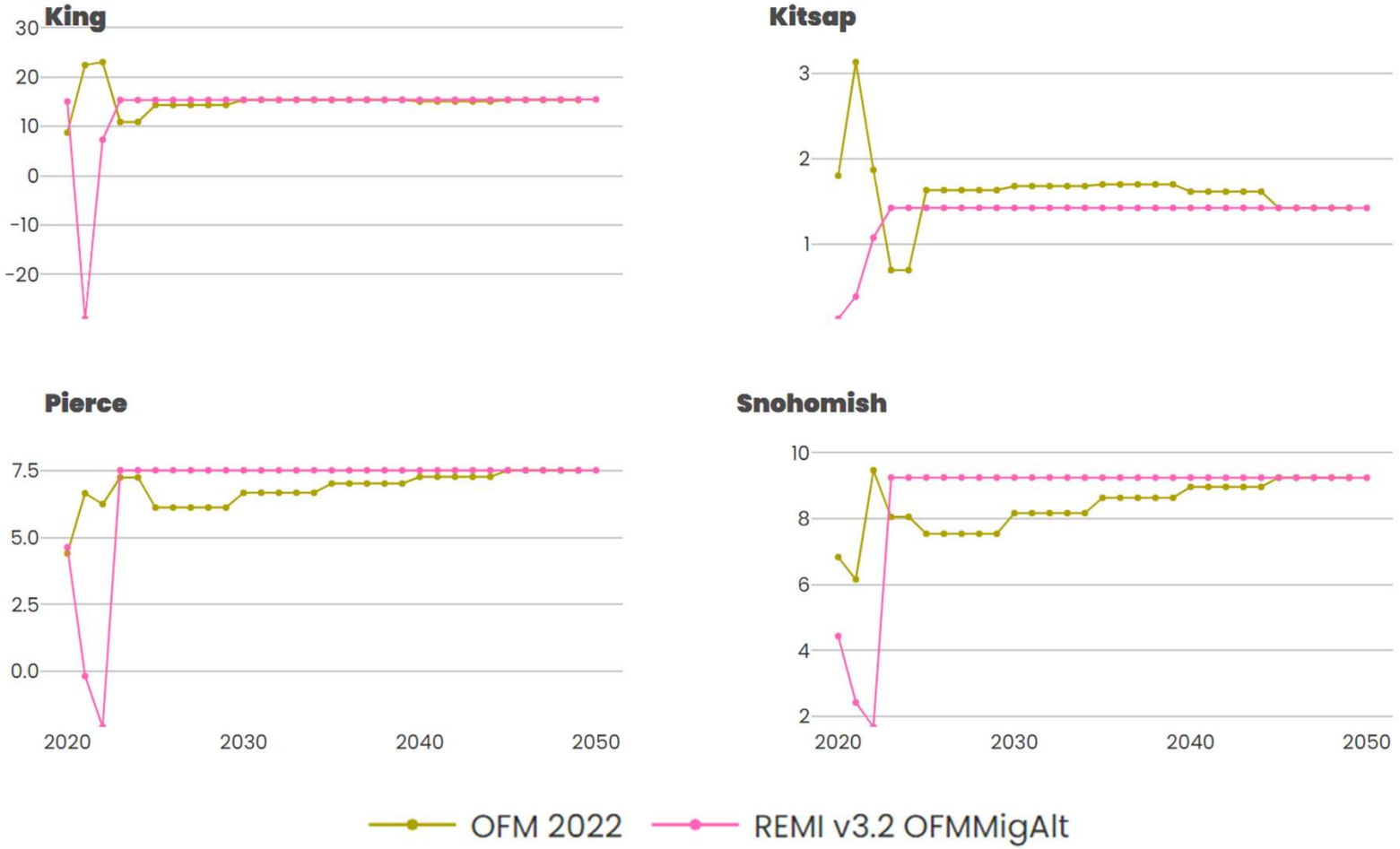


Example: Annual population migration by county



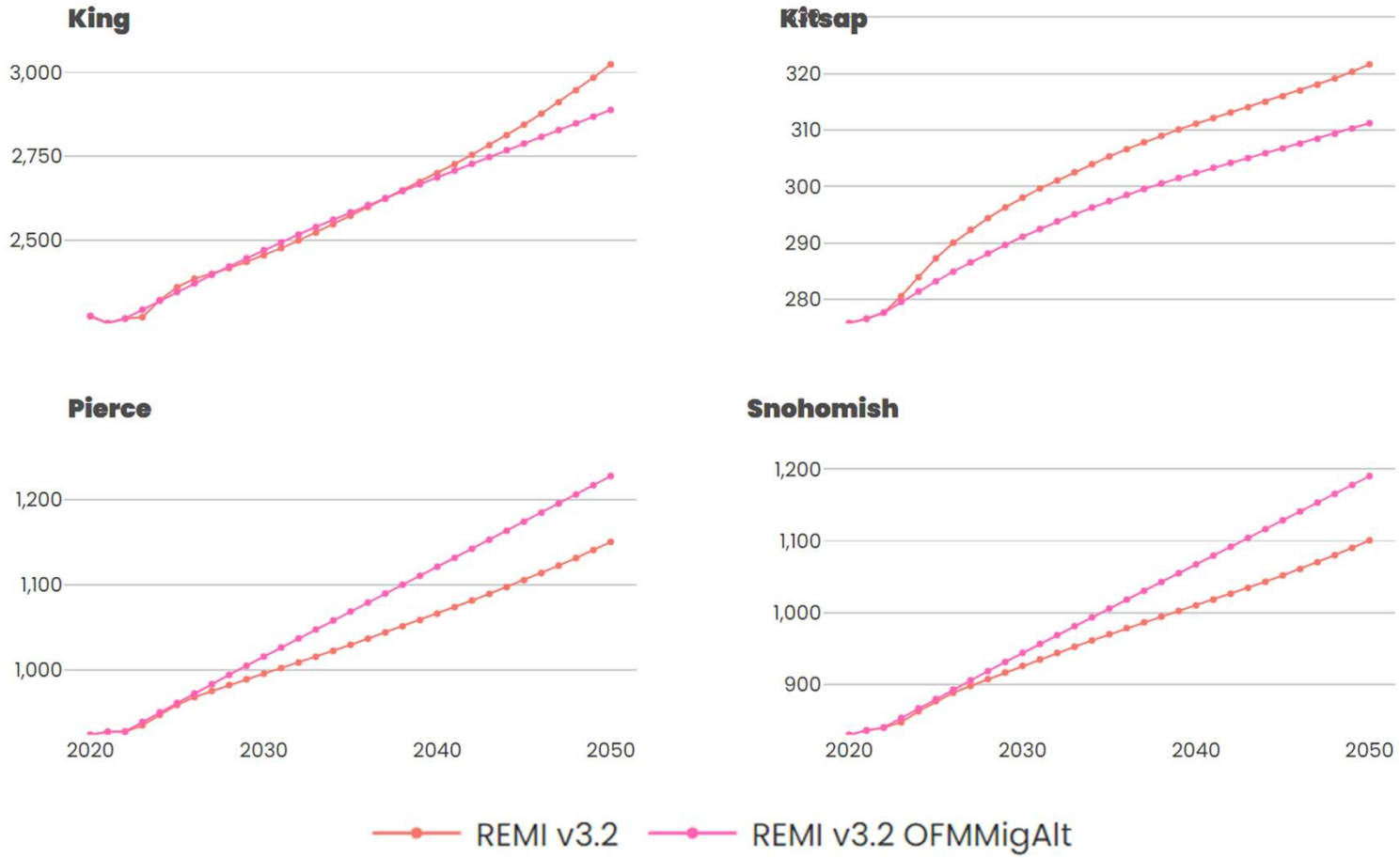
- Migration results vary by county, with REMI higher in King, close in Kitsap, lower in Snohomish and Pierce

Example: Annual population migration adjusted



- With future year migration assumptions adjusted

Example: Total population with migration adjusted



- REMI by county, before and after adjusting county-level migration projections
- Method used by other REMI users

Missing details: Residential

- REMI produces Total Population only:
  - No split to Group Quarters and Household population
  - No projection of Households

- Investigating downstream models or post-processing
  - REMI does include population breakouts (military, college, prisoner, Age 65+) that could support a GQ Pop model
  - HAPT Methodology (already vetted and in use)

Exhibit 14. Methodology overview for calculating total projected housing needs

Establishing Housing Targets for Your Community (Book 1)
https://deptofcommerce.box.com/s/chqj8wk1esnnranyb3ewzgd4w0e5ve3a

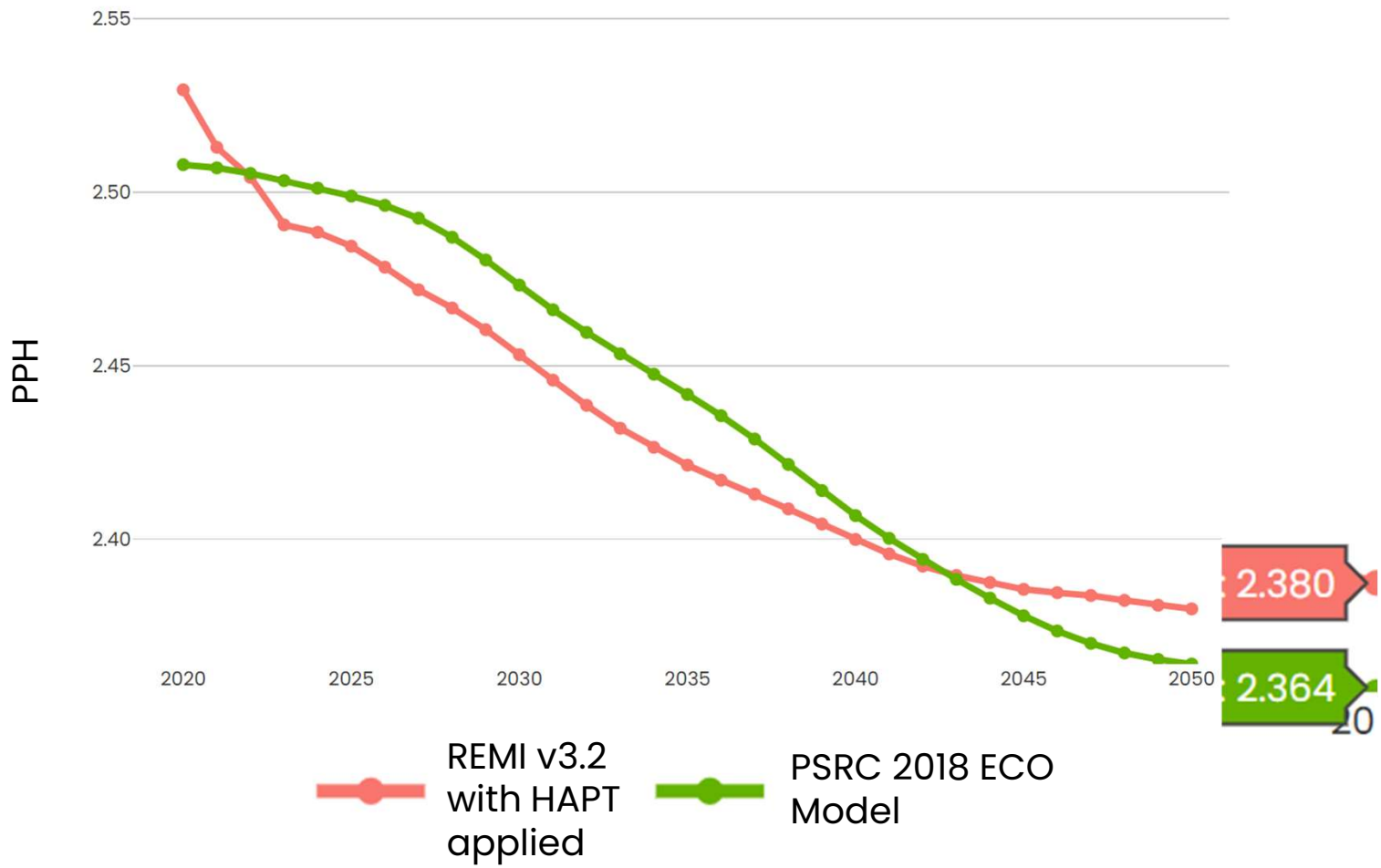
Testing the HAPT Methodology

Exhibit 19. Steps to calculate projected household size by county

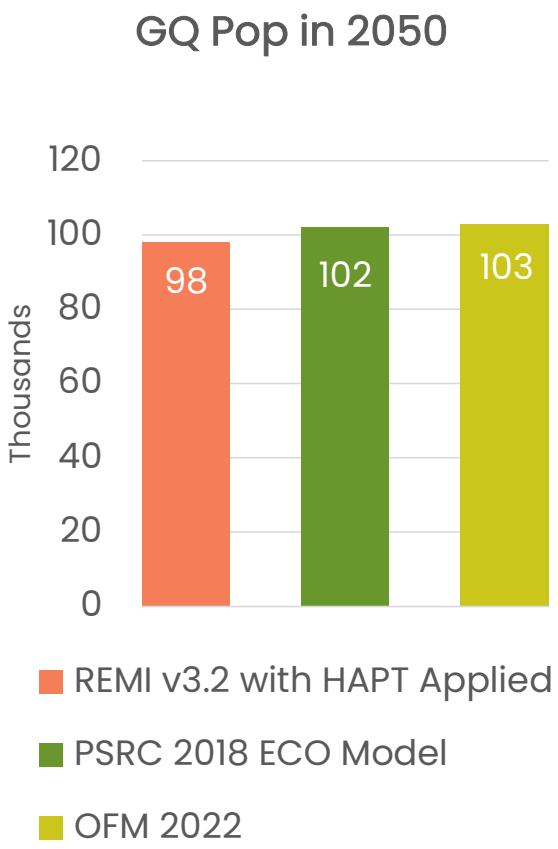
	Calculation	Geography	Source
A	Baseline household size, 2020 (Household population / occupied housing units)	County	Census 2020
B	For each age group: Percent of population that live in housing units, 2020 (Household population / Total population)	Washington State	ACS 2016-2020 5-year estimates
C	For each age group: Percent of household population that are householders, 2020 (Householders / Household population)	Washington State	ACS 2016-2020 5-year estimates
D	Estimated population by age group, 2020	County	OFM GMA Projections - Population by age and sex, five-year age groups
E	Projected population by age group, 2050	County	OFM GMA Projections - Population by age and sex, five-year age groups
F	Estimated 2020 household population by age group (B*D)	County	Calculation
G	Projected 2050 household population by age group (B*E)	County	Calculation
H	Modeled number of households by age group, 2020 (C*F)	County	Calculation
I	Modeled number of households by age group, 2050 (C*G)	County	Calculation
J	Modeled average household size, 2020 (F/H)	County	Calculation
K	Modeled average household size, 2050 (G/I)	County	Calculation
L	Ratio of modeled average household size 2050 to modeled average household size 2020 (K/J)	County	Calculation
M	Final projected average household size, 2050 (A*L)	County	Calculation

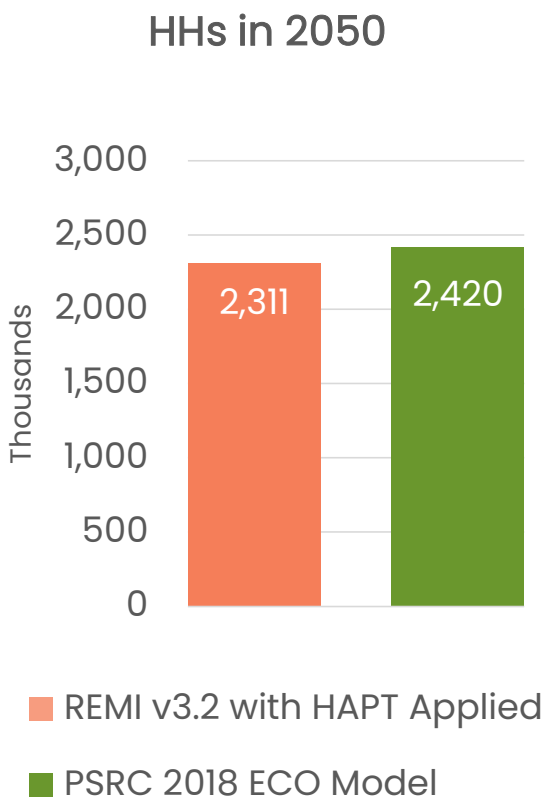
- Swap in updated 2023 ACS inputs
- Use REMI pop by age and sex

REMI w HAPT: Ave HH Size comparable with 2018 REF



REMI w HAPT: GQ Pop and HH comparisons





- Resulting GQ Pop within 4-5K of 2018 REF and 2022 OFM projections
- Given the difference in population projections HHs are lower

Employment data also needs adjustment

- REMI inputs and outputs use broader BEA definition
  - Wage & Salary plus Proprietor employment
    - Includes both part-time and full-time jobs
    - Sole proprietorships and the number of general partners.
      - Includes categories such as independent contractors
      - Active during any portion of the year
  - Total impact: 25-30% higher, varies by aggregate sector
  - Current approach: apply REMI growth rates by sector to PSRC Total Employment estimates

https://www.bls.gov/opub/mlr/2022/article/jobs-jobs-jobs-whats-an-analyst-to-do.htm

Summary impressions to date

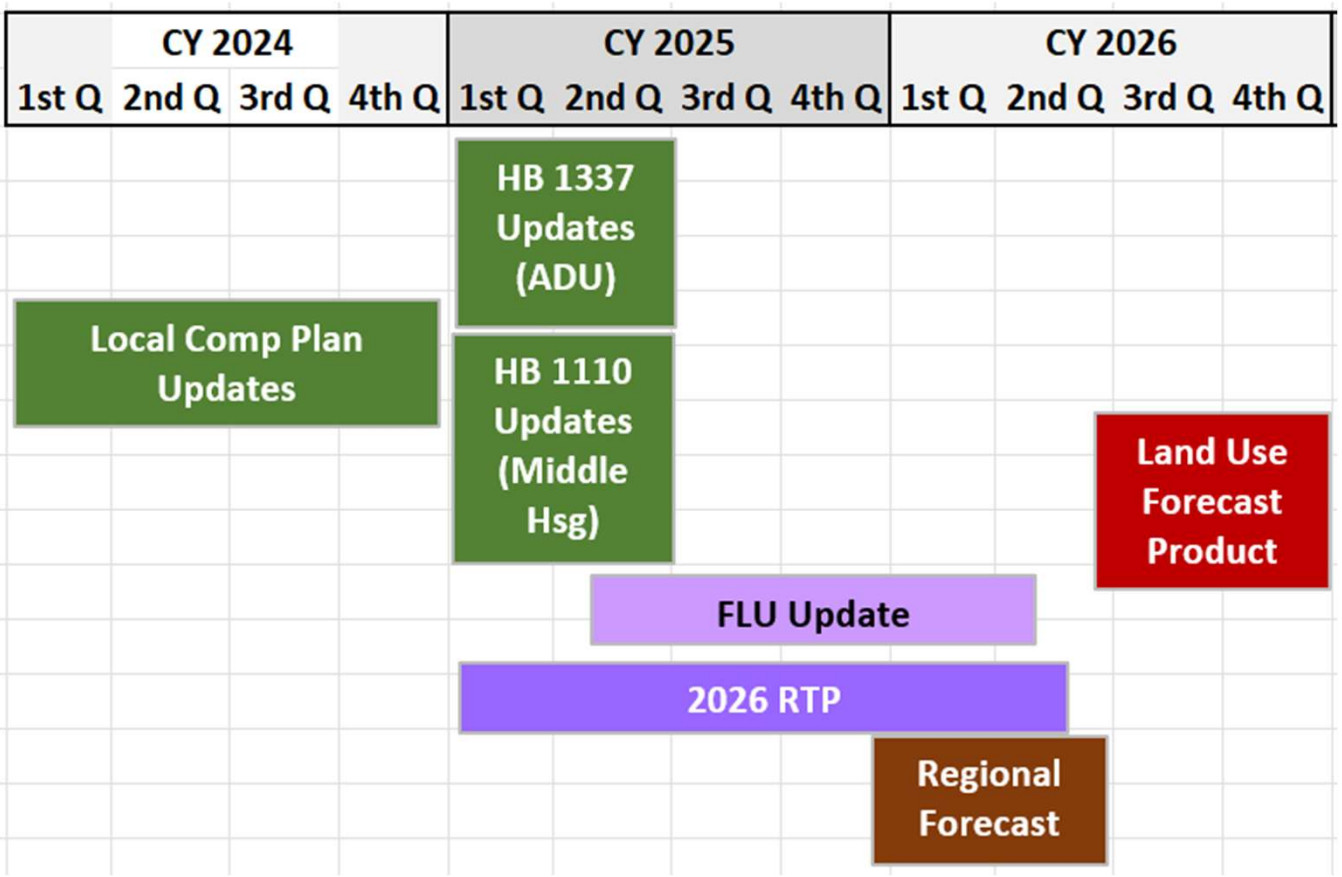
- Proven option with external staff expertise and support
  - Frequent choice of PSRC peers
  - Support helps mitigate the “black box” aspect

- Modifiable inputs
  - Adjust the baseline scenario (examples include Met Council)
  - Can use for “what if” analysis

- Rich input and output datasets using updated industry standard products
  - BLS & US Census forecasts versus an extended Fair Model
  - Expanded model outputs to support model R&D and future year analysis

- Factors for considerations
  - Need for exogenous processes for variables not part of the dataset

Working calendar: next set of regional projections



LUV timed to use inputs from the products of the current planning cycle:

- VISION
- Growth Targets
- Comp plans (FLU)
- Transportation plan

Next steps

- Respond to today's feedback and any follow-up questions
- Deeper technical dive with REMI staff?
  - Is there interest?
- Continue to put REMI through its paces
- Return at an upcoming LUTAC with more on PSRC direction

Thank You &
Reach Out with Questions and Comments

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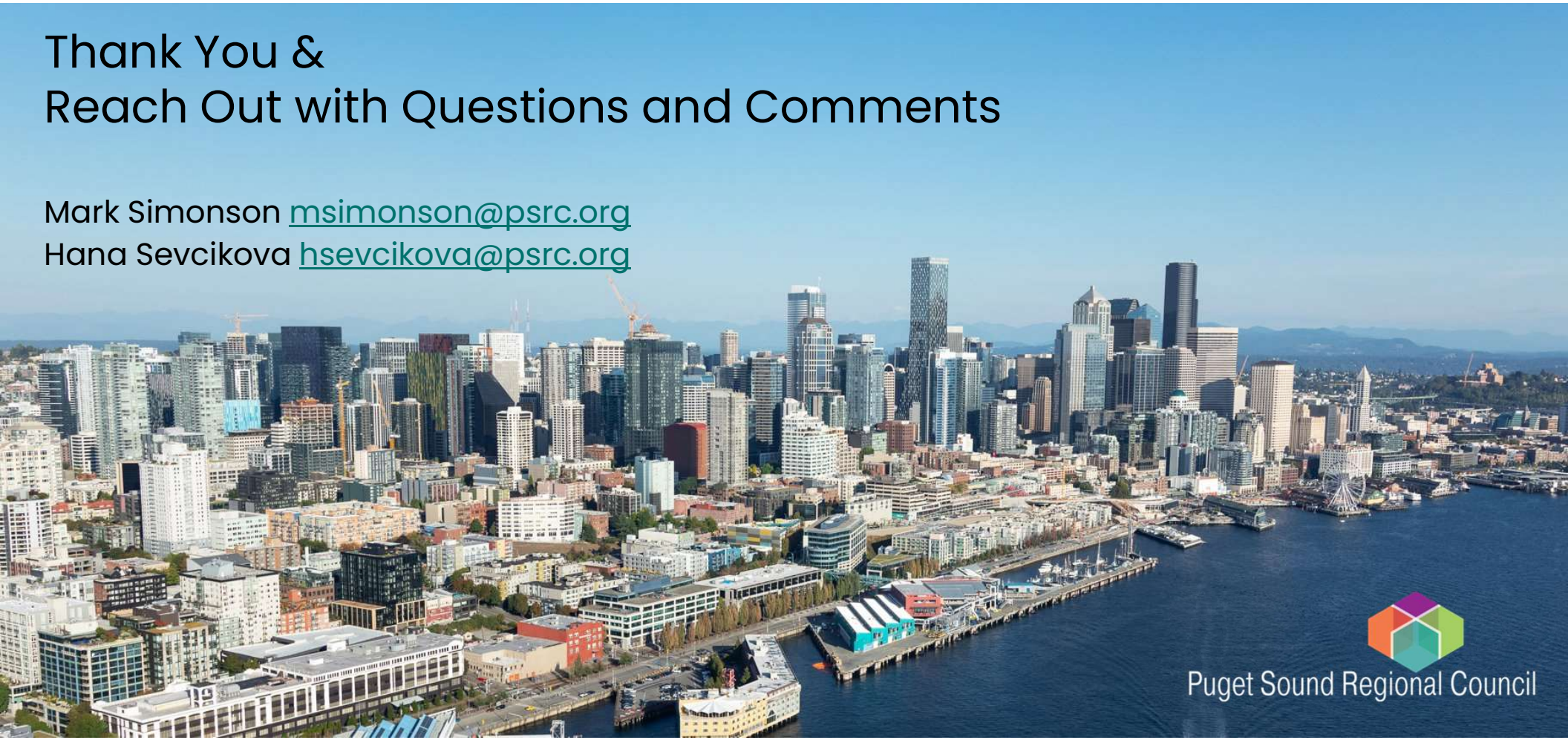

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