

# *Socioeconomic Forecast and Model: Survey Results*

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# *Purpose of Survey*

- Discuss official/non-official projections, including levels of geography, the types of variables, data reliability, reasonableness testing, socioeconomic model enhancements.
- Understand the current practices of developing growth forecasts (**baseline**, no-project, plan, policy, official, non-official, etc)

# *Who Responded?*

- Houston-Galveston Area Council (H-GAC)
- Maricopa Association of Governments (MAG)
- Pima Association of Governments (PAG)
- Puget Sound Regional Council (PSRC)
- San Diego Association of Governments (SANDAG)
- Southern California Association of Governments (SCAG)
- Wasatch Front Regional Council (Salt Lake City MPO) (WFRC)

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# Overview of Responded COG/MPOs

COG/MPO	Location (State)	# of Counties	Population (Millions)	Contact
H-GAC	Texas	13	5.5	Dmitry Messen
MAG	Arizona	1	3.7	Rita Walton
PAG	Arizona	1	1	Kristen Zimmerman
PSRC	Washington	4	3.5	Mark Simonson
SANDAG	California	1	3.1	Ed Schafer
SCAG	California	6	18	Simon Choi
WFRC	Utah	5	1.5	Scott Festin
Total	5 States	31	34.1	

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## Q1. Do you develop a baseline forecast?

COG/MPO	Yes	Note
H-GAC	☒	
MAG	☒	
PAG	☒	Used to have one TAZ level forecast dataset. Plan to develop the county projection model and sub county land use allocation model
PSRC	☒	
SANDAG	☒	
SCAG	☒	
WFRC	☒	
Total	7	Baseline/No-Project/Alternative/Plan,

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## Q2. What is a baseline forecast?

COG/MPO	Responses
<b>H-GAC</b>	<ul style="list-style-type: none"> <li>- A regional baseline: most likely without explicit regional policy</li> <li>- A small area: disaggregated land use model (UrbanSim) reflecting historical trend and local general plans</li> </ul>
<b>MAG</b>	<ul style="list-style-type: none"> <li>-A baseline projection: recently approved state and county population projections with most likely economic scenario.</li> <li>-A small area: using multi-level model with disaggregated land use model. Voter-adopted plans/programs incorporated into projections</li> </ul>
<b>PAG</b>	
<b>PSRC</b>	<ul style="list-style-type: none"> <li>- A region forecast: job and population</li> <li>- A small area forecast: current activity levels, recent growth trends, current land use designations, RTP implementation</li> </ul>
<b>SANDAG</b>	<ul style="list-style-type: none"> <li>- A regional baseline is unconstrained by current plans or policies</li> </ul>
<b>SCAG</b>	<ul style="list-style-type: none"> <li>-A regional baseline: most likely with no explicit regional policy</li> <li>-A small area forecast: historical trends, projected county trends, current land use plan, explicit local policies.</li> </ul>
<b>WFRC</b>	<ul style="list-style-type: none"> <li>-Current city land use plans</li> </ul>

## Q3. *Baseline vs. Plan forecast*

	Baseline	Plan
Region/County	Without Explicit Regional Policy (R1)	With Explicit Regional Policy (R2)
TAZ	Without Local Policy (S1)	With Local Policy (S2)

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## Q3. Baseline vs. Plan forecast

COG/MPO	Baseline	Plan
H-GAC	R1 + S2	R1+S2
MAG	R1 + S2	R1+S2
PAG		
PSRC	R1 + S2	R1+S2
SANDAG	R1 + S1	R1+S2
SCAG	R1 + S2	R2+S2
WFRC	R1 + S2	R1+S2
Total	R1+S1 = 1 R1+S2 = 4	R1+S2=5 R2+S2=1

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## Q3. Baseline vs. Plan forecast

COG/MPO	Note
H-GAC	
MAG	
PAG	
PSRC	R2 + S2 (Currently there is no plan forecast. Vision 2040)
SANDAG	R1 + S2
SCAG	R2 + S2
WFRC	
	Housing: SANDAG policy forecast < baseline forecast SCAG policy forecast > baseline forecast

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## Q4-1. How Many Variables?

COG/MPO	Responses
H-GAC	population by age/race, households by age/race/size, employment by 7 sectors
MAG	Population, 7 types of employment, 30 additional variables
PAG	Population and employment etc. 17 additional variables.
PSRC	103
SANDAG	Hundreds (regional level); population/employment/geography by 90 land use categories (subregional level)
SCAG	Hundreds (TAZ level)
WFRC	Population, households, and employment by three sector
Note	Demands for more variables?

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## Q4-2. Local Review?

COG/MPO	Responses
H-GAC	- County forecast reviewed by county representatives. - An open (not formal public) review of small area forecast
MAG	1) Population Technical Advisory Committee 2) MAG Management 3)MAG Regional Council
PAG	Local PopTAC. Multiple opportunities given to local jurisdictions on an individual and on-going basis
PSRC	Multiple opportunities given to local jurisdictions to review draft results of DRAM/EMPAL.
SANDAG	
SCAG	Panel of Experts, subregional or local Review, Input from stakeholders/data users, public outreach, technical committee, policy committee, regional Council.
WFRC	
Note	Transparent and communicative process.

## Q5. Forecast Geography

COG/MPO	Responses
H-GAC	8 counties, 0.25 million 1,000*1,000 ft grid cells. Forecasts for other geographic units are derived.
MAG	1 region, 1 county, 29 municipal planning areas, 148 regional analysis zones, 1,955 socioeconomic analysis zones, 1 acre grid cell.
PAG	Anticipate county, subcounty, and TAZ forecasts
PSRC	1 region, 4 counties, 219 forecast analysis zones, 938 TAZs.
SANDAG	1 region, SGRA (SANDAG geographic reference area) (1,850), LUKEY (parcel of subparcel areas (900,000).
SCAG	1 region, 6 counties, 187 cities, 8,000 CT/TAZs
WFRC	1 region, 2 urbanized areas, 3 urbanized counties, 2 rural counties, 58 cities, 999 TAZs, 150,000 150m*150m grid cells.
Note	Grid cell forecasts. Do you release forecasts at all levels of geography? <sub>12</sub>

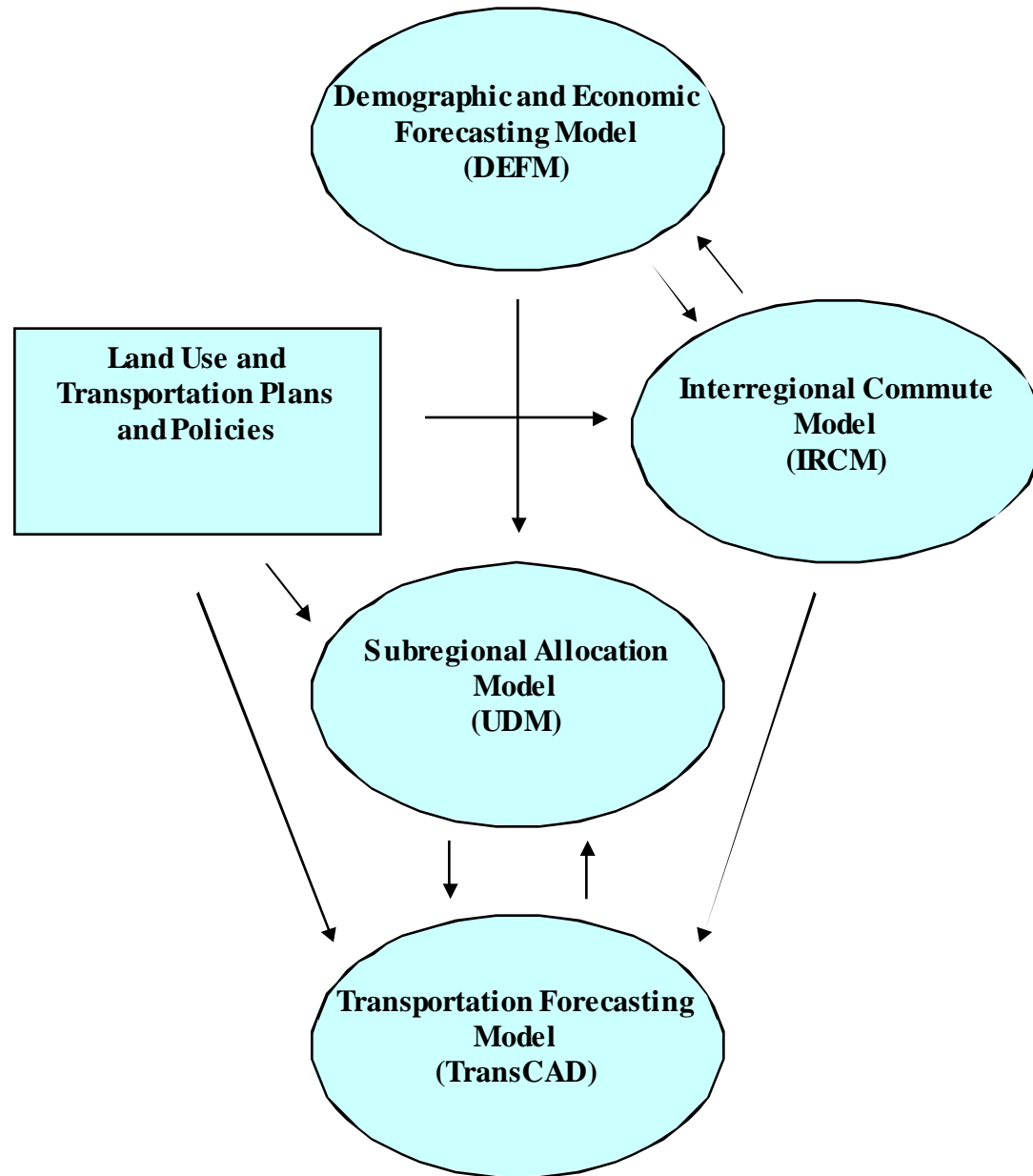
# Q6. Forecast Horizon? Forecast Year Intervals? Frequency of the Update?

COG/MPO	Horizon	Forecast Year Intervals	Frequency
H-GAC	30	1 Year	Varies
MAG	25	5-10 Year	3-5
PAG	30	5 Year	
PSRC	30-35	1 year	3-4
SANDAG	25-30	5 year	3-5
SCAG	30-35	5 Year	3-4
WFRC	25	1 Year	3
Note	25-35	1-5	3-5

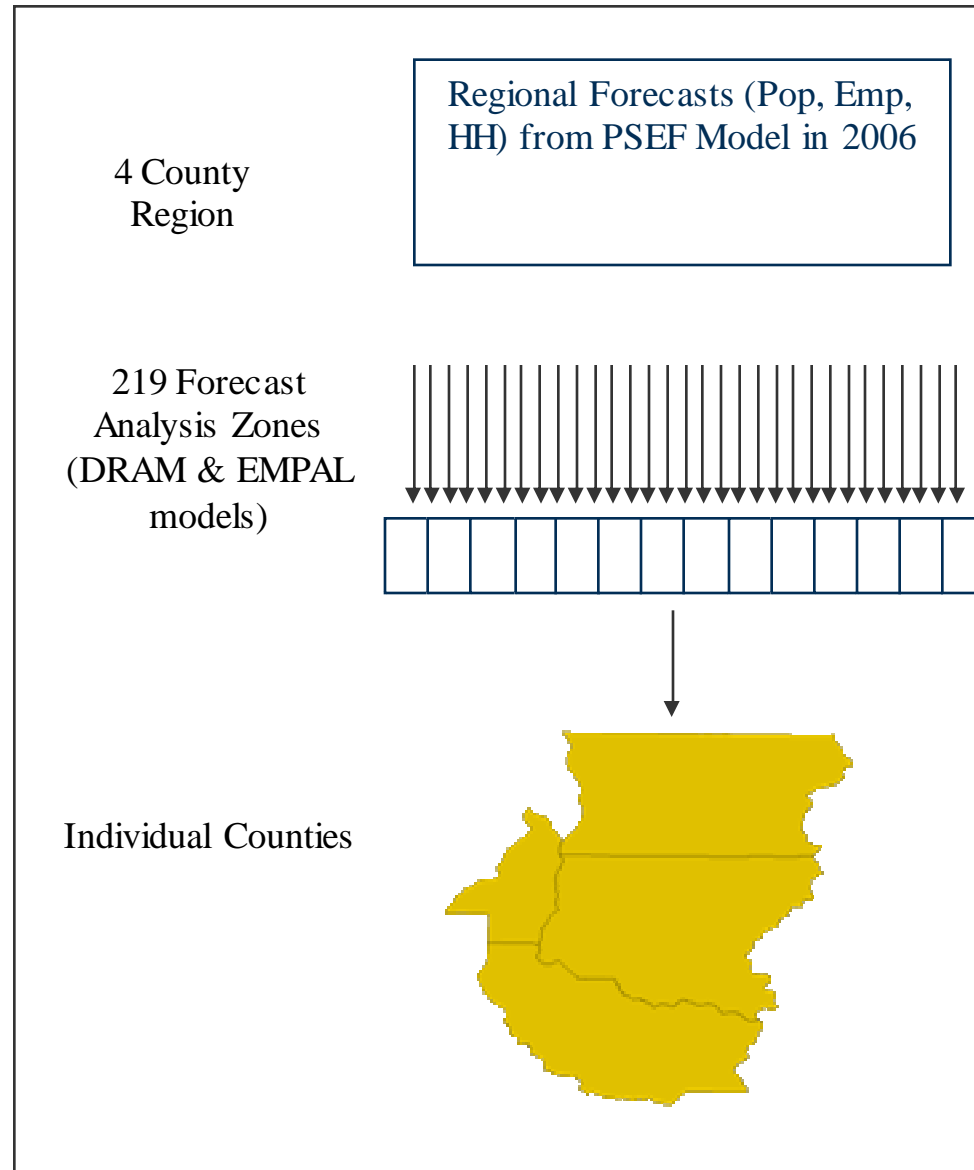
## Q7. Forecast Process

COG/MPO	Responses
H-GAC	1) county level population and employment forecasts for 2005-2035. (multi-step trends-based model) 2) county controls are distributed into smaller areas. (UrbanSim)
MAG	See <a href="http://www.mag.maricopa.gov/detail.cms?item=7375">http://www.mag.maricopa.gov/detail.cms?item=7375</a>
PAG	Plan to use POPGROUP and SAM-IM.
PSRC	Plan to use DRAM/EMPAL (not regional model) to develop “official” county forecasts (see attached)
SANDAG	See attached
SCAG	See Attached
WFRC	1) County level population, households, and employment forecasts for 2005-2030 by the GOPB. 2) county controls are distributed into smaller areas and adjusted by the results of UrbanSim

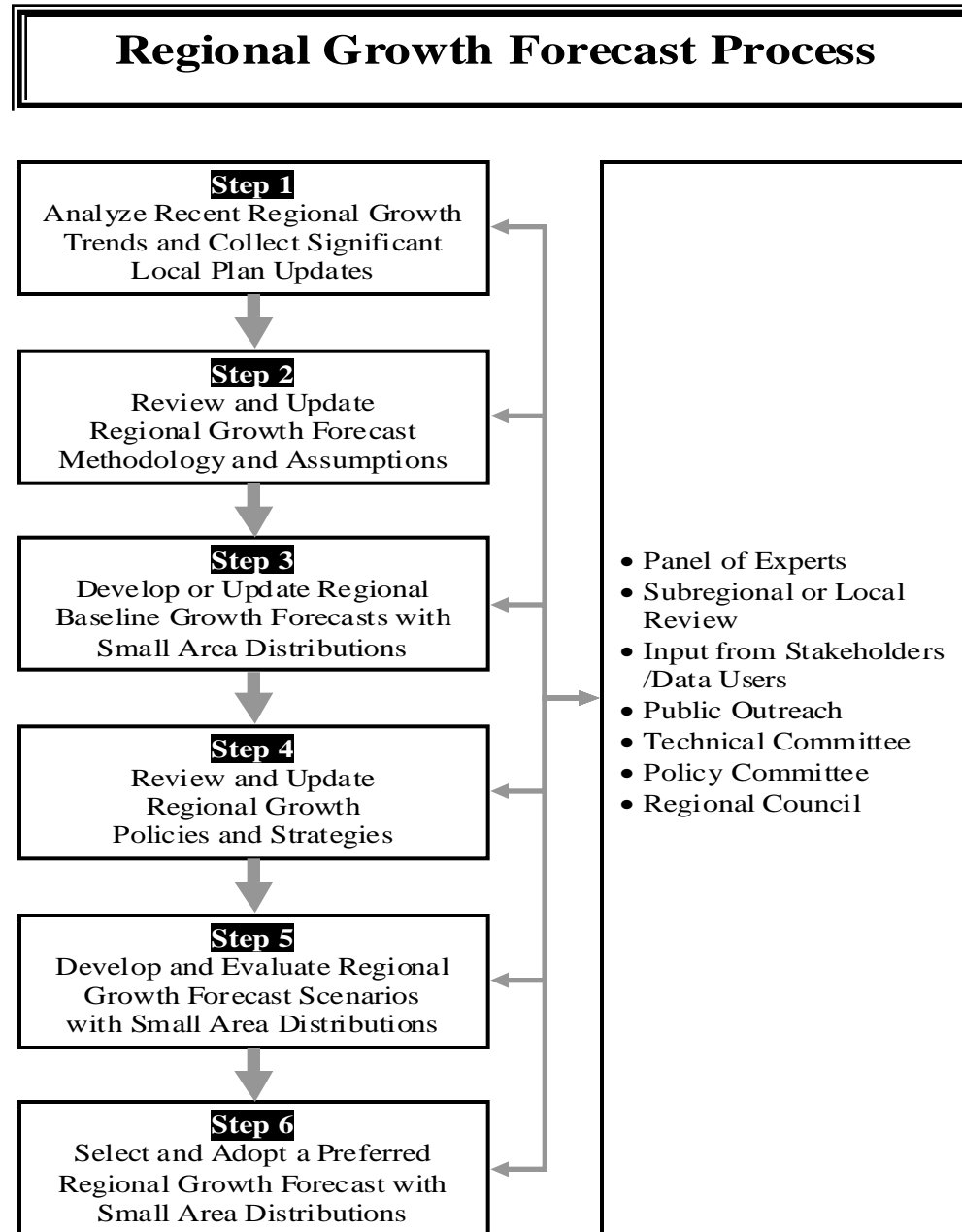
# Q7. Forecast Process: SANDAG



# Q7. Forecast Process: PSRC



# Q7. Forecast Process: SCAG



## Q8. Uses of the Forecast

	H-GAC	MAG	PAG	PSRC	SANDAG	SCAG	WFRC
Transportation (RTP)	√	√	√	√	√	√	√
Air Quality (AQMP)	√	√	√	√	√	√	√
Housing (RHNA)					√	√	
Economic Growth						√	
Others (Infrastructure, Financial, Utility, School District, Private)		√	√	√	√		√

# Q9. Forecasts Used for No-Build Scenario of the Transportation Plan

COG/MPO	Responses
H-GAC	There is no separate “no build” forecast. No build scenario has no impact on the demographic forecast. (“people will be here no matter what” assumption)
MAG	There is no separate “no build” forecast. Plan forecast incorporates all funded projects.
PAG	N/A
PSRC	There is no “no build” forecast
SANDAG	Plan forecast (constrained by current plans and policies)
SCAG	Baseline forecast (local plans and policies with no explicit regional policy)
WFRC	N/A

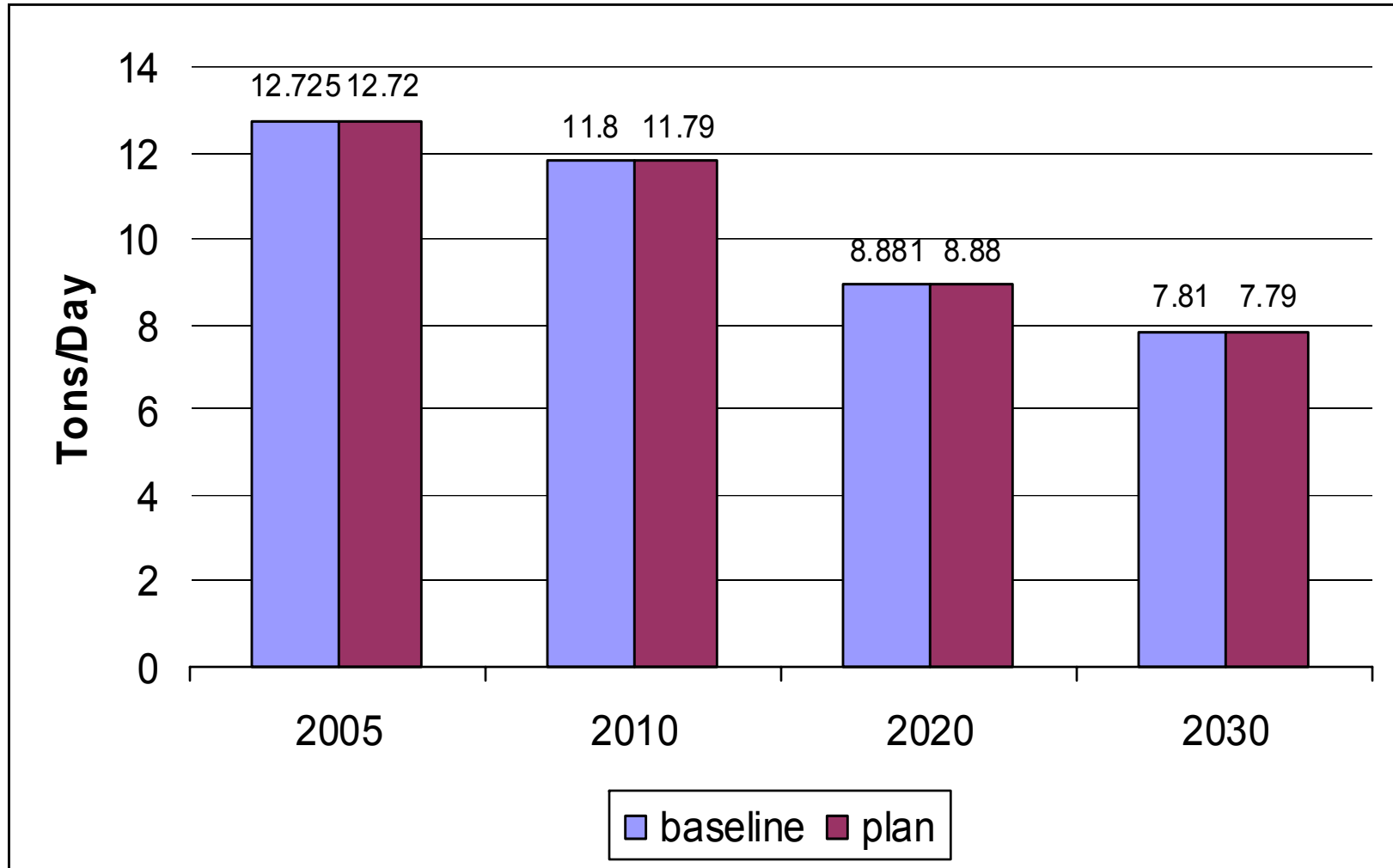
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## **Q10. Forecasts Used for Emission Budget for the Air Quality Conformity**

COG/MPO	Responses	Timing Issue between transportation plan and air quality plan
H-GAC	Baseline forecast	Yes
MAG	Baseline forecast	No
PAG	Baseline forecast	
PSRC	Baseline forecast	
SANDAG	Plan forecast (constrained by current plans and policies)	No
SCAG	Baseline forecast	Yes
WFRC	Baseline forecast	No

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# Ozone Emission Analysis (tons/day) for NOx: SSAB-Imperial County (2004 RTP)



## ***Q11. Do you develop a plan forecast, adding more jobs to a baseline forecast?***

COG/MPO	Yes/No	Note
H-GAC	No	
MAG	No	
PAG	No	
PSRC	No	
SANDAG	No	In the past we have included assumptions consistent with our “Prosperity Strategy” (increased productivity) that impacted income and output directly and employment indirectly.
SCAG	Yes	A plan forecast contains an explicit economic growth strategy associated with the “extra” private sector investment.
WFRC	No	

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# Q12. Do you develop “one” baseline forecast for any planning purposes?

COG/MPO	Yes/No	Note
H-GAC	Yes	
MAG	Yes	
PAG	Yes	This is the intention, but is subject to change.
PSRC	Yes	
SANDAG	Yes	
SCAG	No	We use both baseline and plan forecast for planning purposes.
WFRC	Yes	

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## **Q13. How do you validate historical and the base year socioeconomic data? (continued)**

COG/MPO	Note
H-GAC	In simulation modeling framework, validation should apply mostly to parameter estimation. We use most recent imagery, appraisal, and real estate data.
MAG	Below the county level we work with the most recent land use image data, our residential completion database, and local planners to verify the accuracy of the data. In addition, a number of reliable sources (both governmental and private) are used to ensure the reliability and validity of the demographic and economic data used in modeling.
PAG	Reference to Census, local agencies building permits, subscribe to the local university land use inventory and economic forecasting projects, input from local planners and jurisdictional representatives
PSRC	Census data , in-house database of geocoded covered employment records, gross estimates of acres of land available, parcel layers, and a grid cell coverage of the region.

## ***Q13. How do you validate historical and the base year socioeconomic data?***

COG/MPO	Note
SANDAG	Through our GIS program, we are constantly editing and “ground truthing” our subregional forecast input data. In addition, we regularly update the regional data to include any historical adjustments (i.e., intercensal population estimates, revised employment estimates).
SCAG	We have used county/jurisdictional level “official” socioeconomic estimates released by the state agency. Below the jurisdictional level, we work with the most recent land use image data, public and private sources, and local planners to allocate the county/jurisdictional level socioeconomic estimates
WFRC	We compare county totals with state agency (Utah Population Estimates Committee) county totals. We don’t have any comparison below the county level.
Note	Census, state official estimates, land use image data, land use inventory, appraisal and real estate data, building permits, local planners, geocoded employment data, public & private data sources, active use of GIS.

# **Q14. How do you test the “reasonableness” of the forecast? (continued)**

COG/MPO	Note
H-GAC	If anybody questions our small area forecast (too high or too low), we ask to provide either evidence for why development cannot occur in this particular place or evidence that we don't have the existing development in our forecast.
MAG	The regional projections are reviewed and analyzed by knowledgeable public and private sector users of this data. Throughout the modeling process, a careful and thorough review of the current and base data – along with the development conditions. We look at past growth and known development plans at a regional level, analyze the model results, and focus review both changing characteristics and conditions as well as final outcomes. We meet several times with member agencies staff to have them review the inputs and implementation of community general plans to assure that they make sense. We look at growth rates, map the changes over time, use extensive knowledge of the area, etc. In short, the modeled outcomes face two tests, one of appropriateness and one of reliability.

# Q14. How do you test the “reasonableness” of the forecast? (continued)

COG/MPO	Note
PAG	Your sample answer is representative.
PSRC	We rely heavily on external staff review, primarily drawn from staff that regularly attend our monthly Regional Technical Forum and are consistent users of PSRC data, to review our forecasts for inconsistencies with plans, current trends, previous forecasts, etc. We compare new draft forecasts with trend data and previous forecasts to add context.
SANDAG	For our regional forecasts, we assemble a technical advisory committee to review our assumptions and the forecast outputs for reasonableness. For our subregional forecast, the forecast is vetted through our jurisdictions to ensure political acceptance.

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## **Q14. How do you test the “reasonableness” of the forecast?**

COG/MPO	Note
SCAG	We use the forecast error measures (e.g., mean absolute percent error, mean algebraic percent error) to measure the forecast error using the historical and projected socioeconomic data. We communicate with the stakeholders by indicating that the smaller area, longer forecast horizon, smaller population size, and the lower growth rates would result in more forecast errors than the larger area, shorter forecast horizon, larger population size, and the higher growth rates
WFRC	Projections are subject to review by local entities at the city and TAZ level at the land use input stage, the preliminary data stage, and the final draft stage. We rely on staff expertise and <u>elected officials</u> for reasonableness checks.
Note	Checking evidence, statistical test, internal review, external review (expert review, local jurisdictions, regional agencies, elected officials), technical committee, policy committee, multiple communications with local jurisdictions.

## **Q15. Current efforts of socioeconomic forecast model enhancements (continued)**

COG/MPO	Note
H-GAC	1) a disaggregated simulation cohort-component model with explicit migration module; 2) more details and specifics to our UrbanSim model; 3) integrate UrbanSim with TDM.
MAG	1) consider and produce outcomes reflecting the interrelationships of growth between Maricopa County and surrounding counties. 2) MAG is underway with a major modeling initiative. MAG has retained the Paul Waddell and his colleagues at the University of Washington's CUSPA to update and migrate the MAG Socioeconomic Model to up-to-date software and newer modeling methodologies and tools.
PAG	Recently purchased POPGROUP and HOUSEGROUP and hope to develop county-wide forecasts over the summer. Similarly with SAM-IM. Currently working with MAG in the development of AZ-SMART.

## ***Q15. Current efforts of socioeconomic forecast model enhancements***

COG/MPO	Note
PSRC	1) Employment projection by NAICS 2)replace DRAM/EMPAL with UrbanSim
SANDAG	Develop a PECAS model that will directly link to regional econometric forecasting model. Thus, the new model relationships will insure that land use constraints are captured by the regional model.
SCAG	At the county level, we upgraded the migration module of the cohort-component model to better reflect the demographic processes. We are in the process of developing a timeline of implementing PECAS and UrbanSim for the small area forecast
WFRC	The latest forecast was done using UrbanSim. We are still experimenting and tweaking UrbanSim and considering upgrading to the OPUS platform.

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## **Q16. Basic characteristics of the “official” forecast (continued)**

COG/MPO	Note
H-GAC	H-GAC Board adopts the control totals. Sub-county forecast is not “official”.
MAG	The Regional Council approves the official projections of total resident population, population in households, population in group quarters, housing units and employment by five land use types: (retail, office, industrial, public and other) in 10 years increments for a 25 year forecast horizon at the Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) level of geography. The small area forecast at the Socioeconomic Analysis Zone level is not “official”
PAG	We historically developed one forecast. We hope to provide a handful of different land use scenario forecasts for the next RTP process
PSRC	Forecasts are not officially adopted.

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## **Q16. Basic characteristics of the “official” forecast**

COG/MPO	Note
SANDAG	The Board of Directors adopts the current plans and policies forecasts for planning purposes. Other agencies (such as the County Water Authority and the Air Quality District) adopt the forecast for their use.
SCAG	The regional council adopts the official forecast of four major variables (population, households, housing units, and employment) in a five year increment at the subregional level for thirty year forecast horizon. The small area forecast below the county level is not “official”, but advisory.
WFRC	The Regional Council adopts the projections of population, households, and employment at the city level. County level numbers are from the Governor’s Office of Planning and Budget. TAZ level projections are maintained by the staff.

# *How to Develop the Successful Forecast?*

- Technical
- Communicative
- Organization
- Change agent

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# *Thank You*

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If you have any questions regarding this presentation  
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