Louis Berger

Chicago Region Socioeconomic Forecast

Presentation to CMAP Committees

Chicago Metropolitan Agency for Planning

CMAP
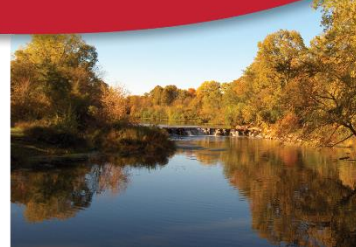
September/October 2016

Project Background

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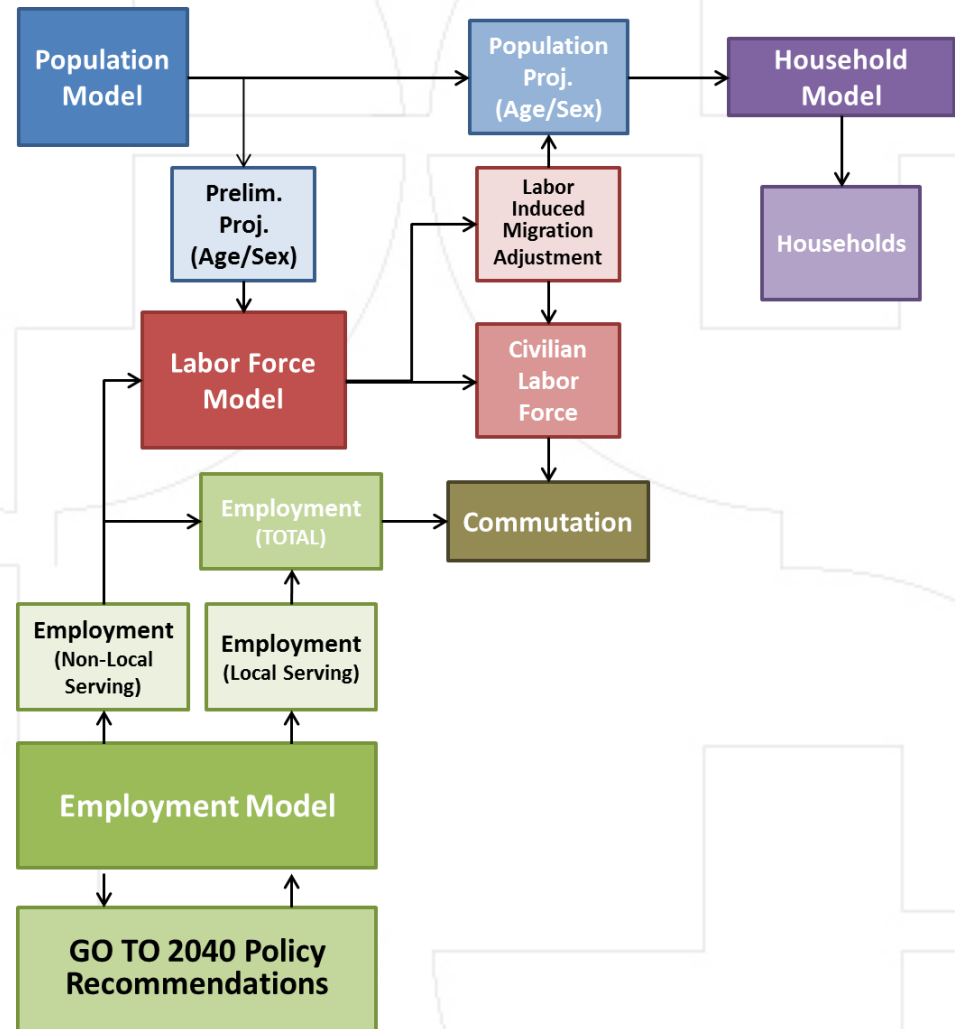
- Louis Berger is developing the regional forecast of population and employment to inform planning efforts

- Forecast estimates the region's population, households, and employment through 2050

- Regional control totals for the 7-County CMAP region will be allocated to subzones

  - *Note:* Outer county forecasts to inform travel demand model

Study Area

- CMAP
- Illinois Outer Counties
- NW Indiana
- SE Wisconsin
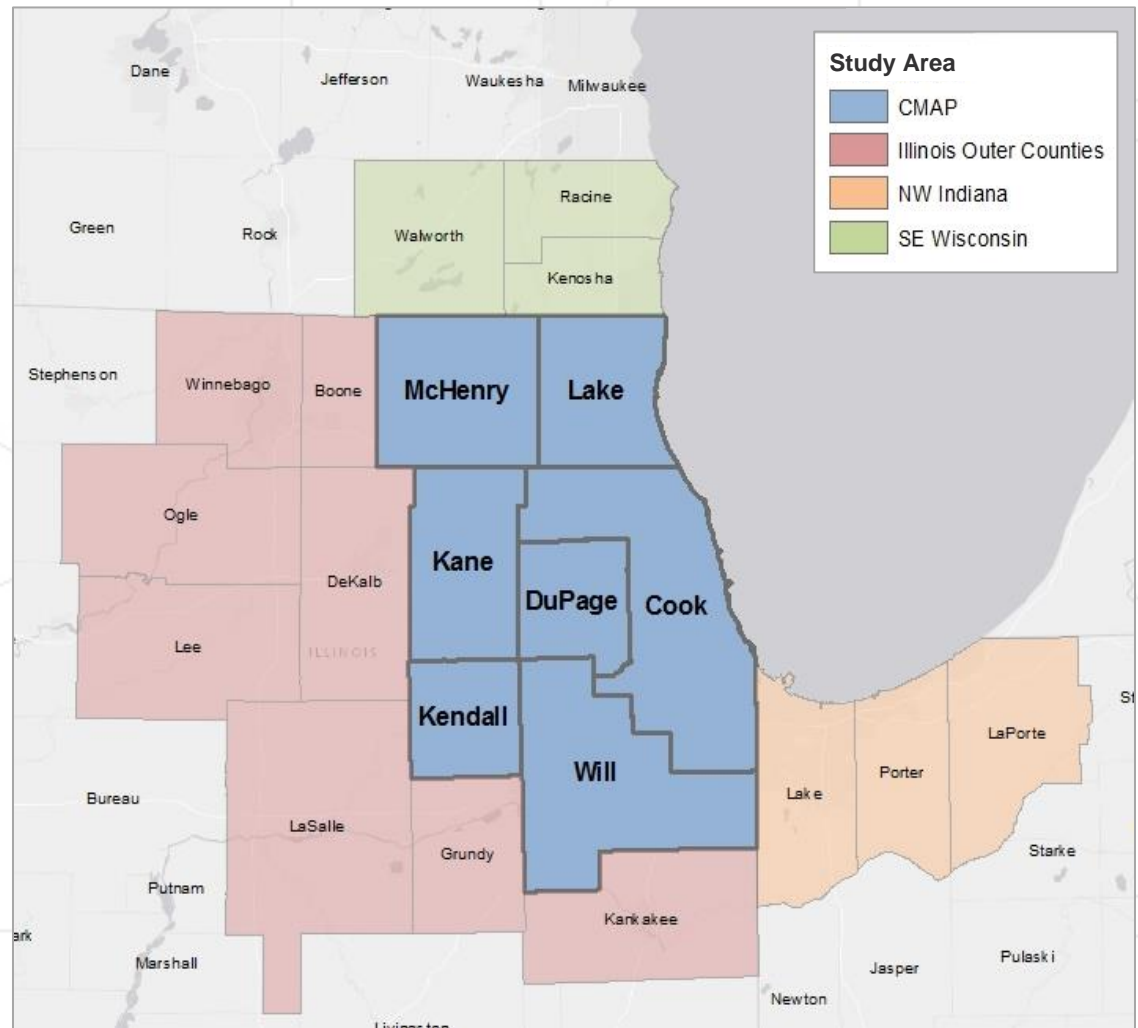
Overview of Methodology

- Economic-demographic model linking regional population and employment

- Population model uses disaggregated cohort component method to utilize age detail

- Employment model harmonizes variety of third-party forecasts to produce consensus outlook

- Labor induced migration adjustment balances labor supply (population) to labor demand (employment)

- Transportation & Education scenario employed from GO TO 2040 recommendations

Outputs

Variable Category	Variable	Model
Employment	• All two-digit NAICS categories	Employment
Households	• Total households • Workers in households • Adults/Children in households • Householder by age • Number of households in income quantiles • By sex and age range	Population/Household
Non-Institutionalized Group Quarters Population	• GQ type • By age and sex range	Population
Institutionalized Group Quarters Population	• By age and sex range	Population
Total Population	• By race/ethnicity	Population

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Methodology

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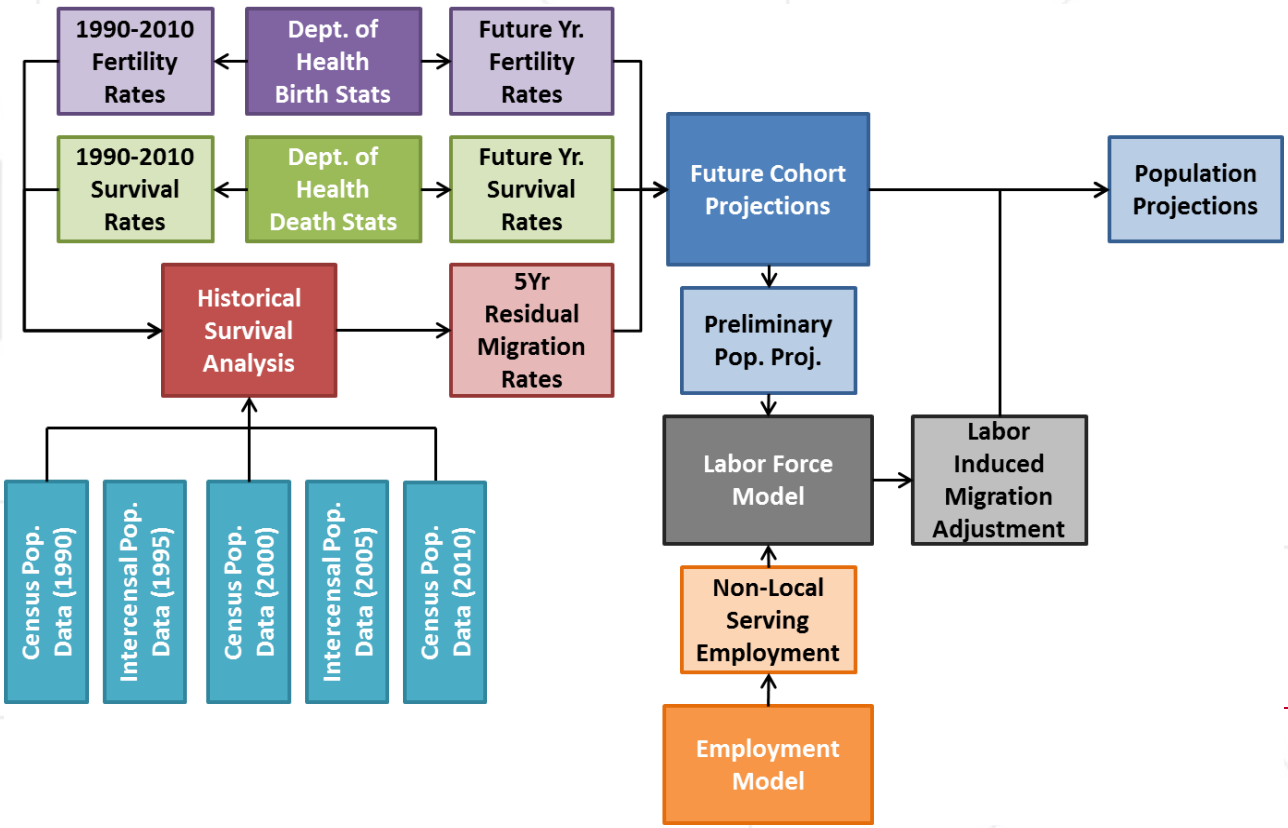
Population Model Methodology

Goal: Produce population projections for 5-year age cohorts out to 2050

Steps:

1. Cohort component method

    - Projected Population (P_1) = Base Population (P_0) + Births – Deaths + Net Migration

2. Fertility rates, mortality rates and historic migration rates determine preliminary population projections

3. Labor induced migration adjustment (discussed in subsequent slides) balances initial labor supply (preliminary population) with labor demand (employment model) to create final population projection
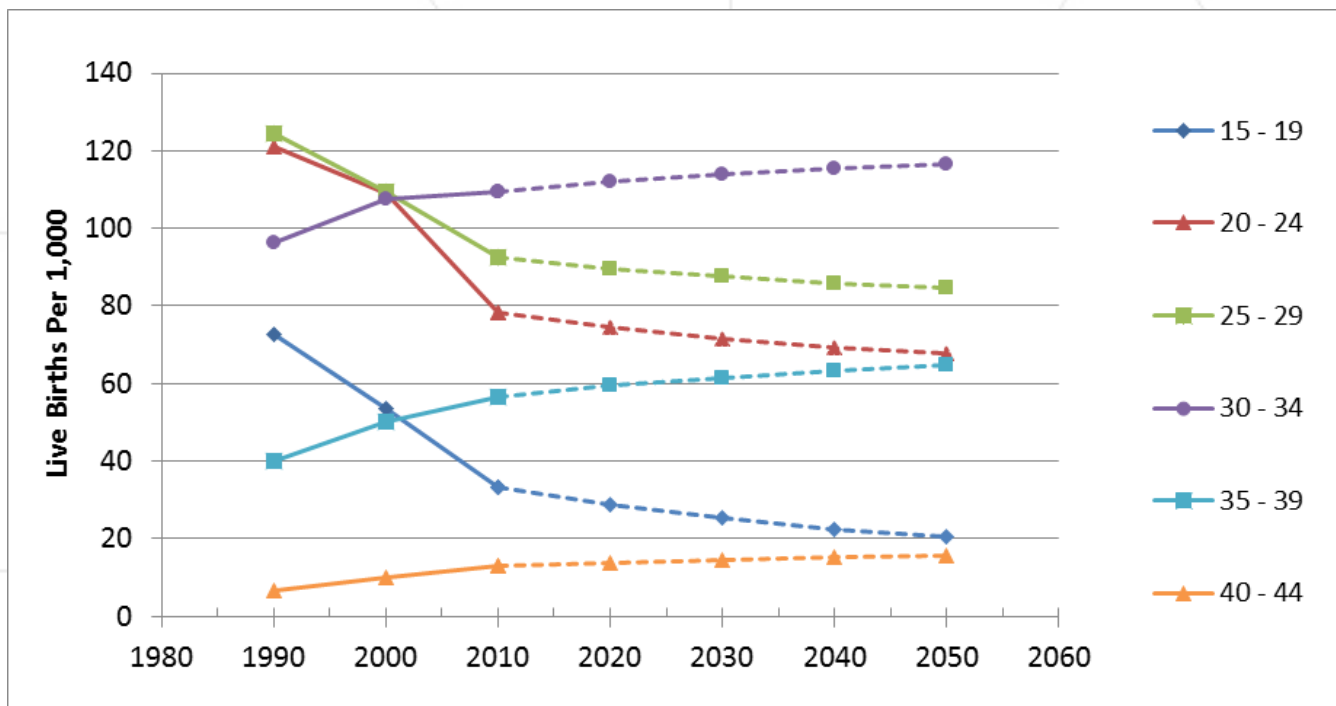
Key Assumptions

Births & Fertility Rates

Past trends for age-specific fertility rates to continue:

Declining rates in younger cohorts (15-29) and increasing rates in older cohorts (30-44)
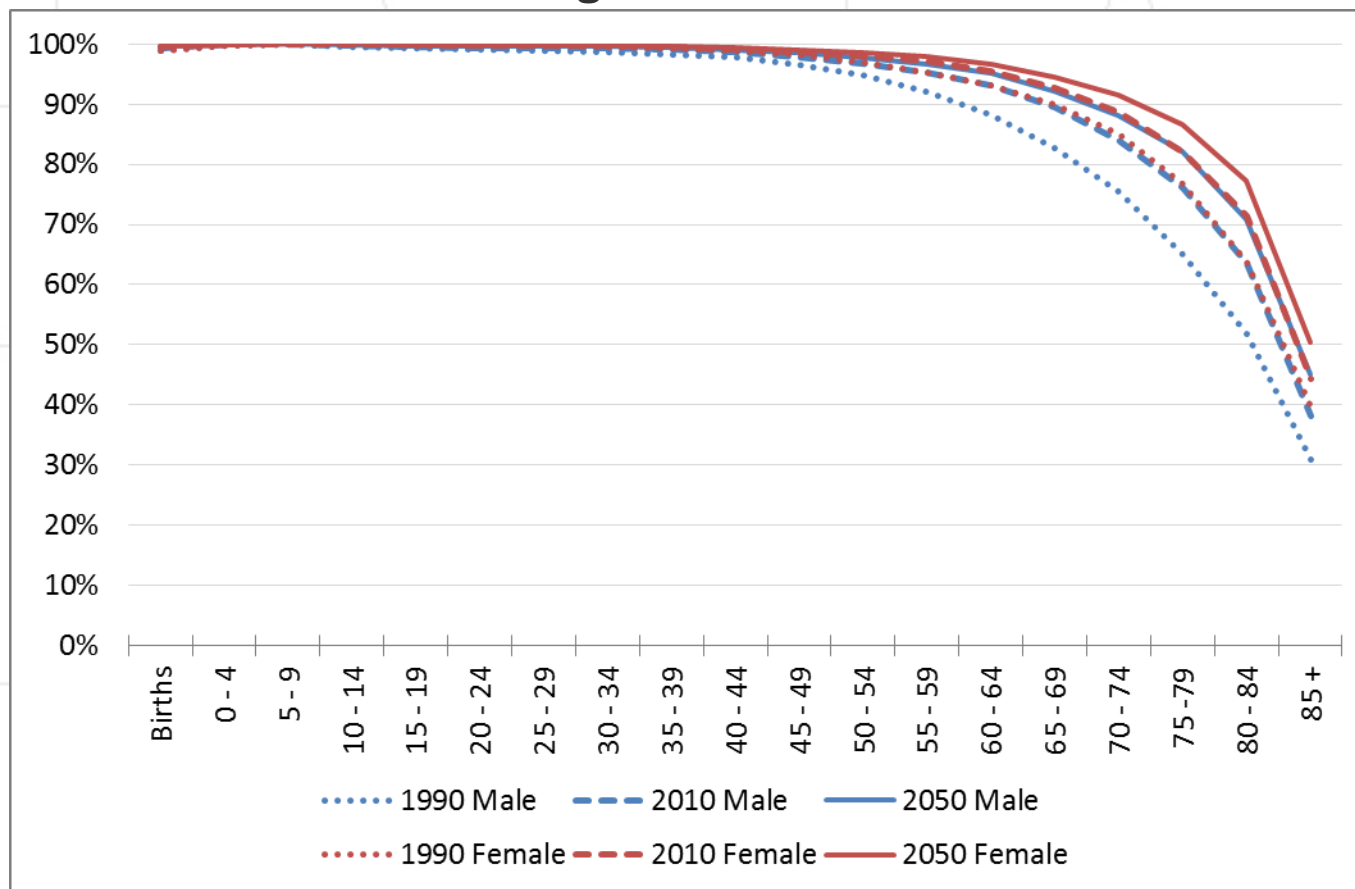
CMAP Region Fertility Rates

Population Model Methodology

Key Assumptions

Deaths and Survival Rates

Survival rate improvements adjusted by Social Security Administration projections

CMAP Region Survival Rates

Population Model Methodology

Key Assumptions

Migration Rates

Model applies range of historical rates (1990-2010)

CMAP Region Net Migration Rates
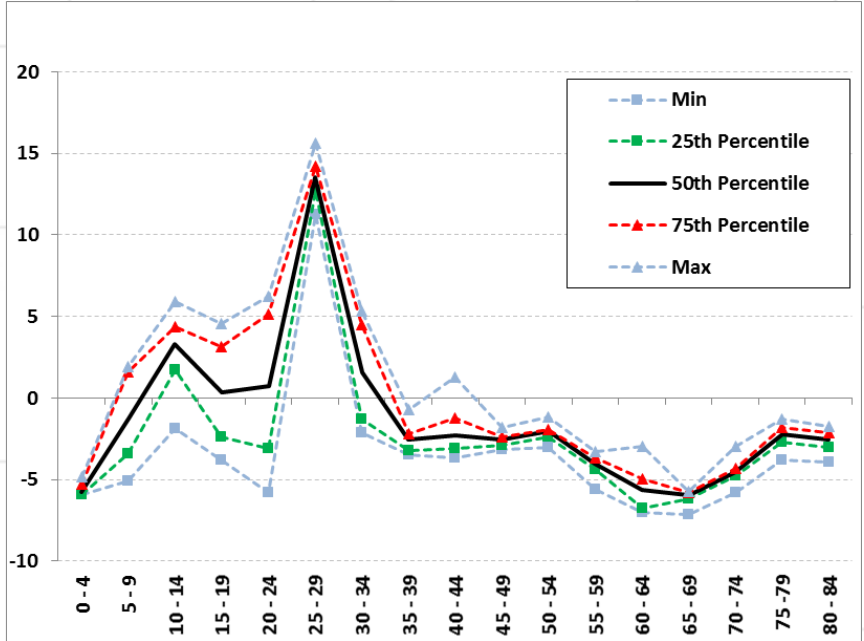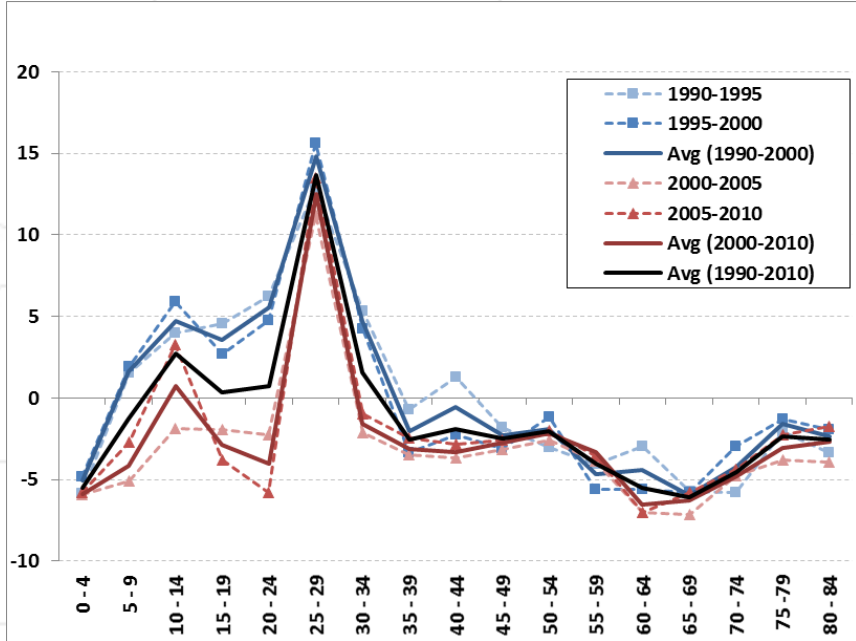
Labor Force Model Methodology

Goal: Produce estimate of labor induced migrants

Steps:

1. Convert population projections into estimates of civilian labor force
2. Reconcile labor demand (from employment model) against labor supply (civilian labor force estimated from population model)
3. Estimate number of labor induced migrants to balance supply and demand
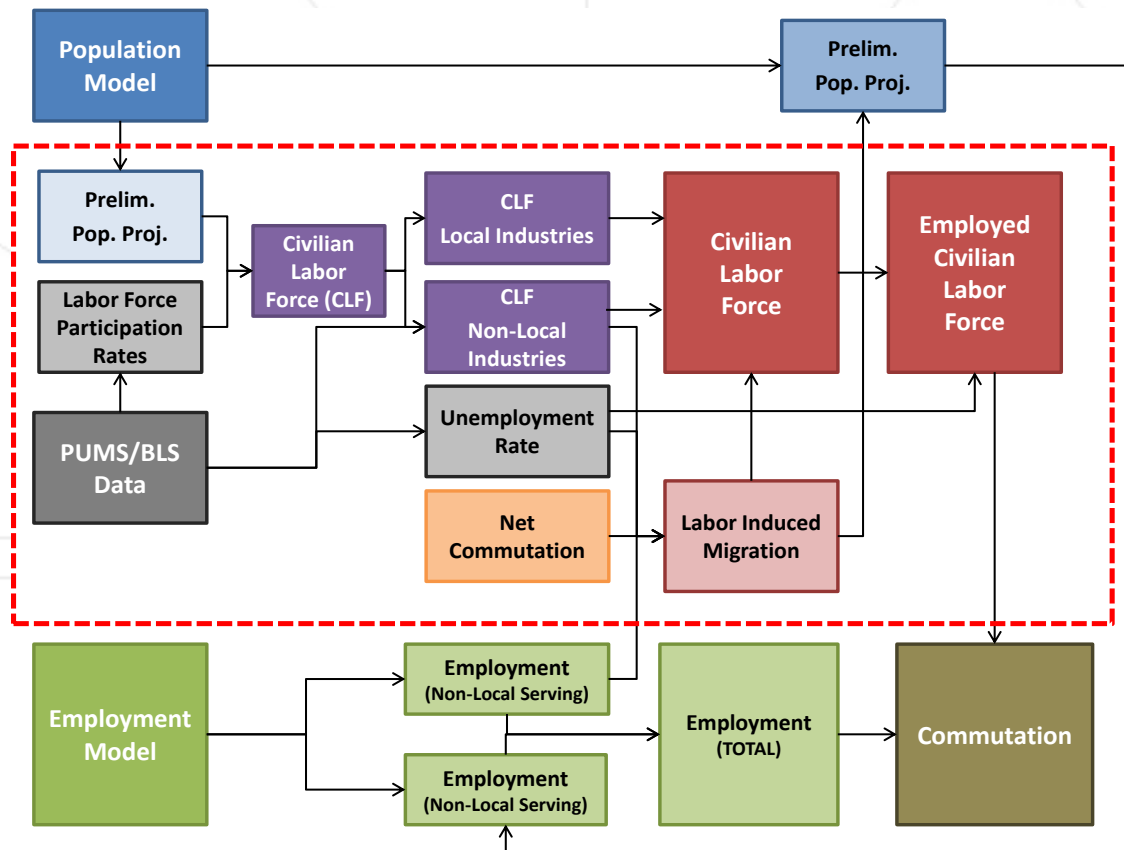
Employment Model Methodology

Methodology Overview

Results

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Results – Forecast Scenarios

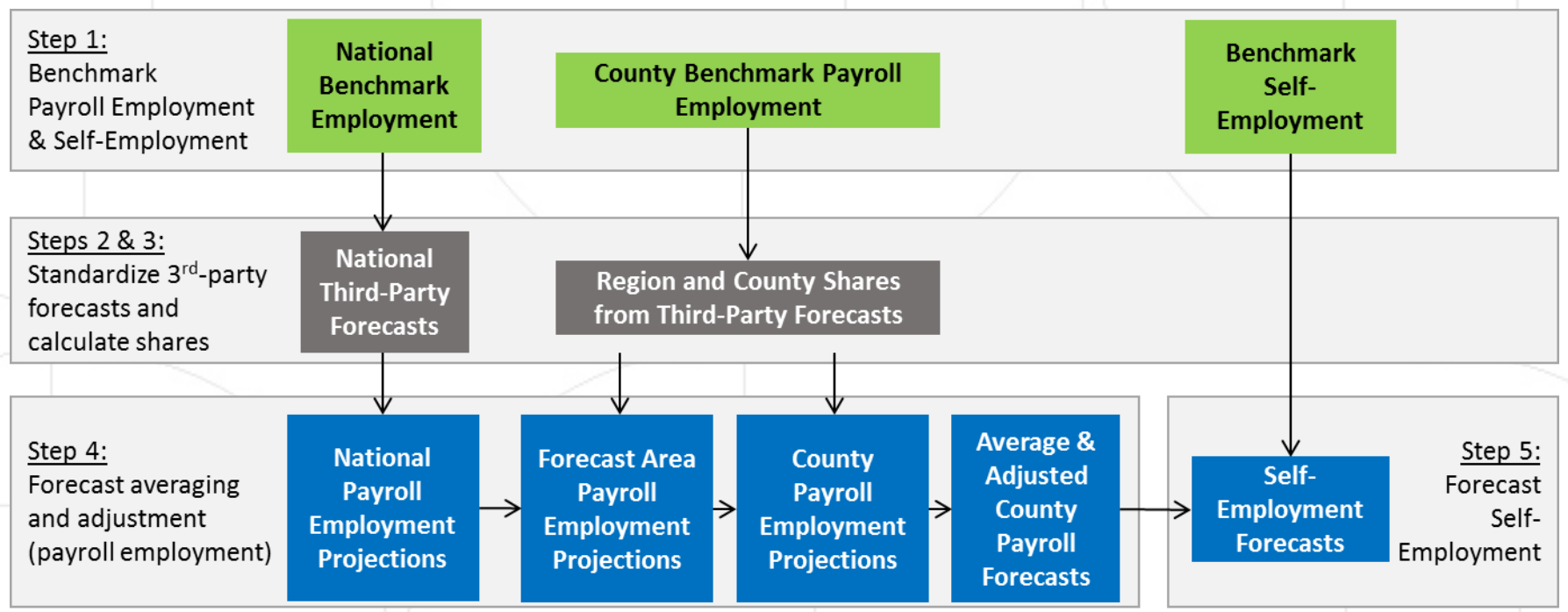CMAP and the Project Team worked together to create two forecast scenarios for the CMAP region and a shift-share-derived forecast. These scenarios are both consistent with recommendations outlined in GO TO 2040:

1. **Transportation Scenario**: Estimate future regional employment impacts resulting from implementation of GO TO 2040 Major Capital Projects and some arterial expansion.
2. **Education Scenario**: Estimate future regional employment impacts resulting from meeting GO TO 2040 educational attainment goals using regression elasticities found in the academic literature
3. **Transportation + Education Scenario**: Combine (1) and (2).
4. **Shift-Share Scenario**: Use national benchmark series to develop a shift-share-derived regional employment forecast (CMAP completed this step)

The following results reflect Scenario #3, Transportation + Education Scenario. CMAP has selected this as the most likely growth scenario for the region.

Results – Population for CMAP Region

- Annual rate of population growth expected to be slower between 2010-2050 as compared to 1990-2010
- Population expected to age over forecast horizon

	1990	2000	2010	2020	2030	2040	2050
CMAP Total	7,300,589	8,146,264	8,431,386	9,019,767	9,617,193	10,215,298	10,784,021

	1990-2010		2010-2050	
	Difference	CAGR	Difference	CAGR
	1,130,797 15%	0.72%	2,352,635 28%	0.62%

Total Population

Age Distribution

Median Age
2010: 35.7
2050: 39.4

2050 Male · 2050 Female · 2010 Male · 2010 Female
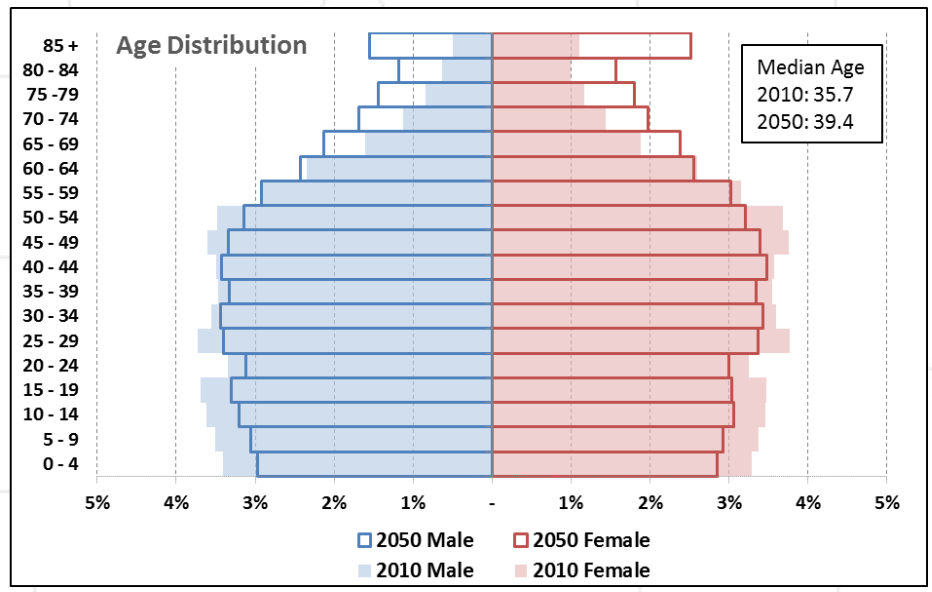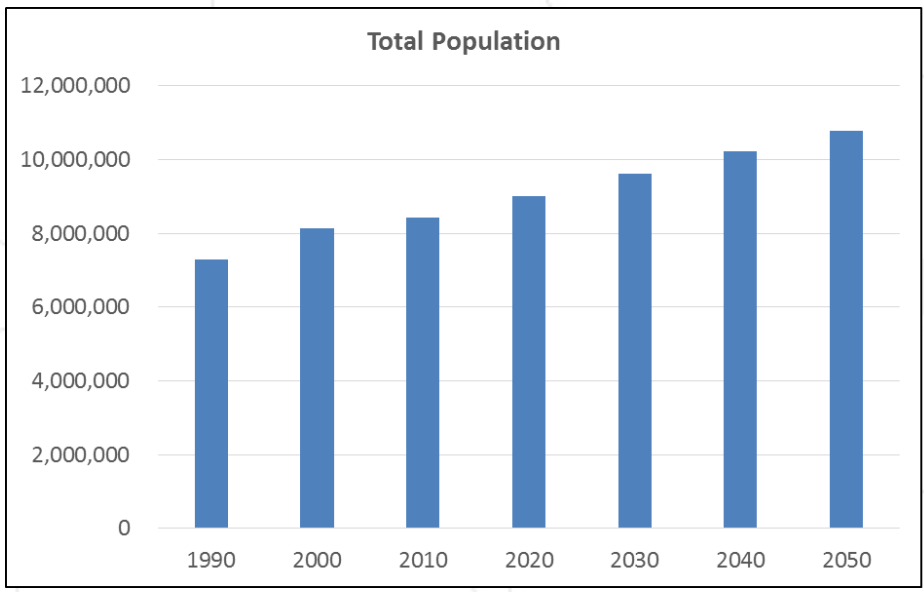
Race and Ethnicity

White · Black · Asian · Other · Hispanic

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Results – Population for CMAP Region

Population Pyramid – CMAP Region

Population Pyramid – CMAP Region

Results – Population for CMAP Region

Population Pyramid – CMAP Region

Population Pyramid, 2020 — Male and Female
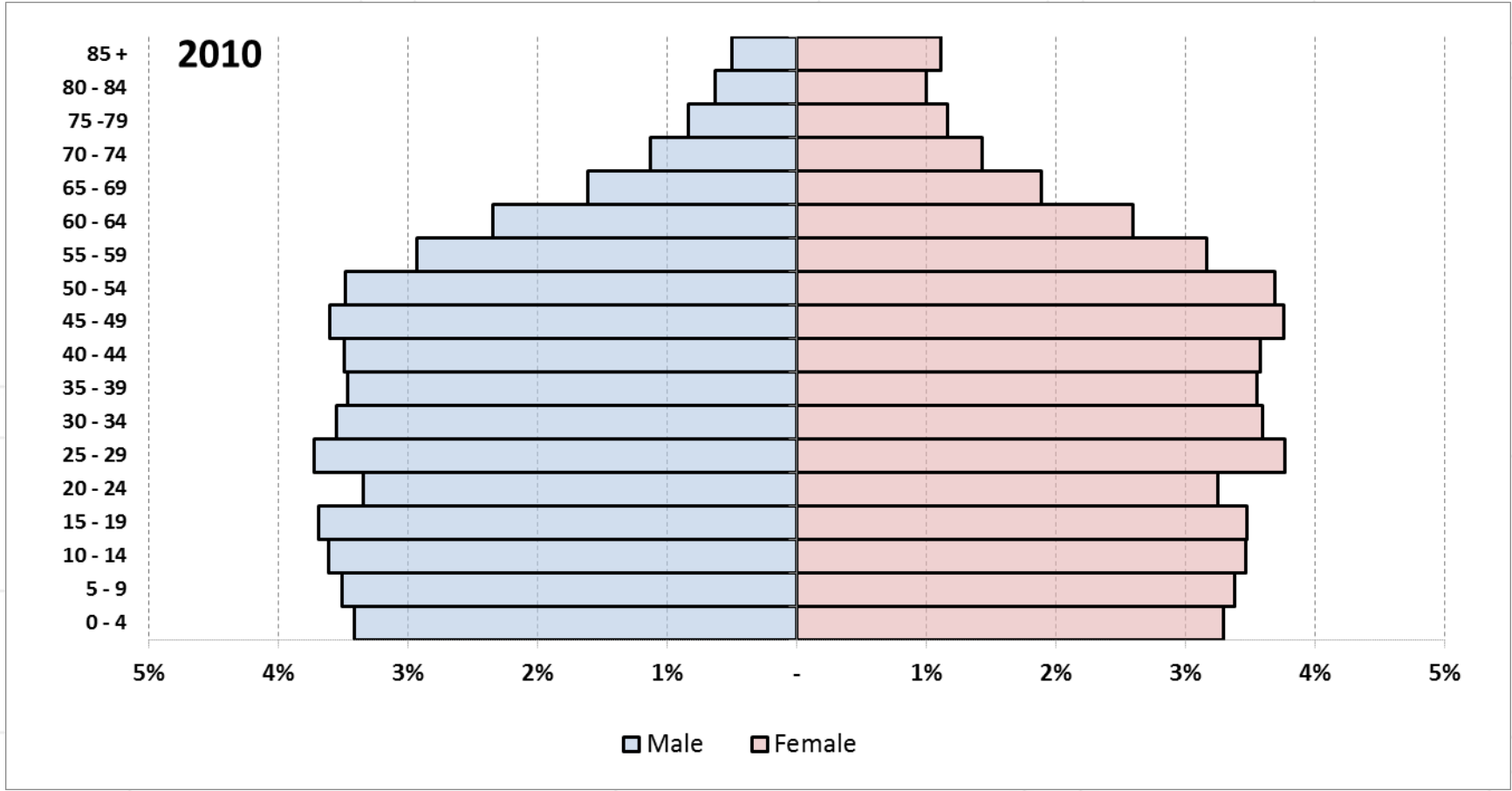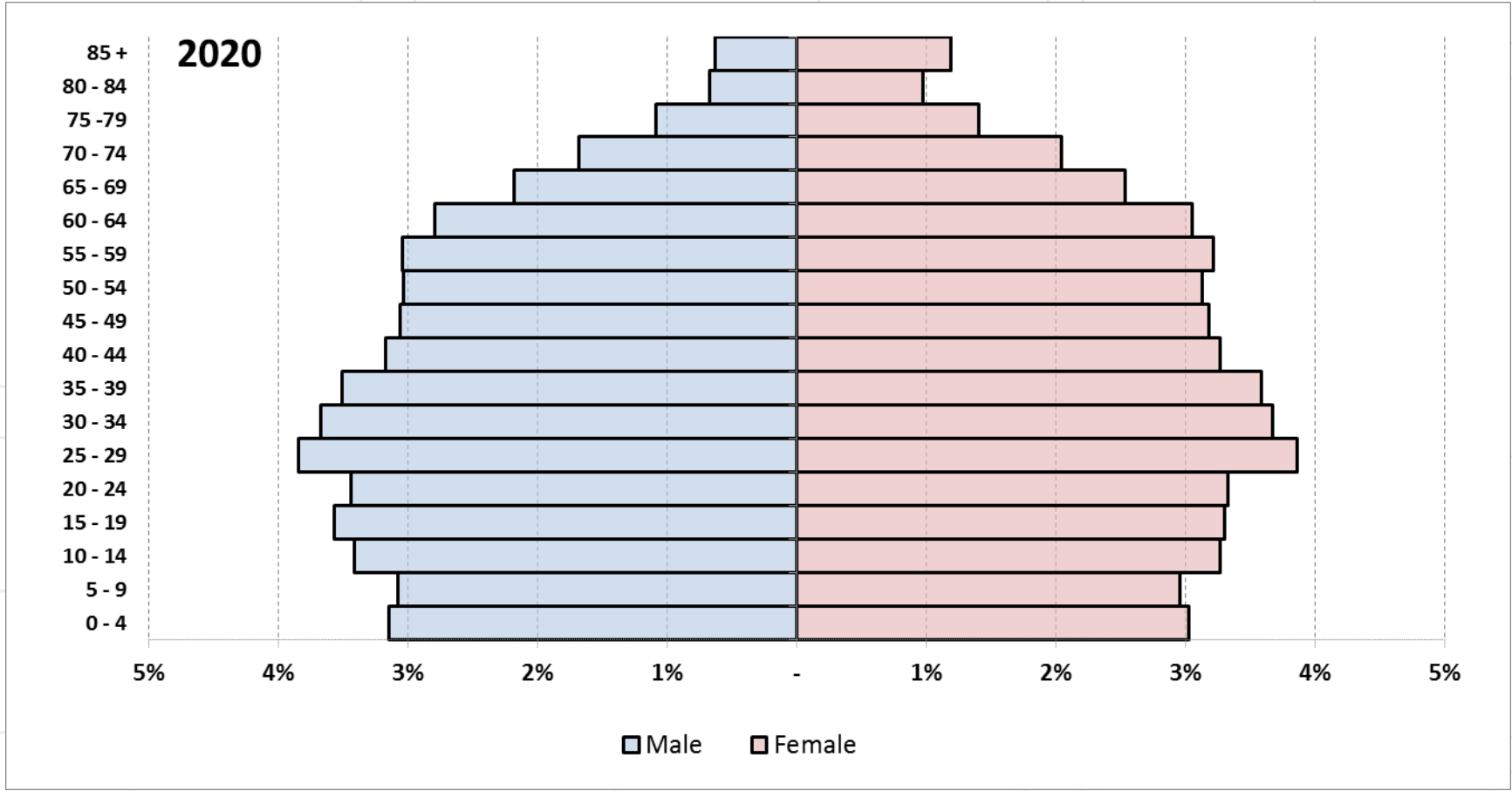
Results – Population for CMAP Region
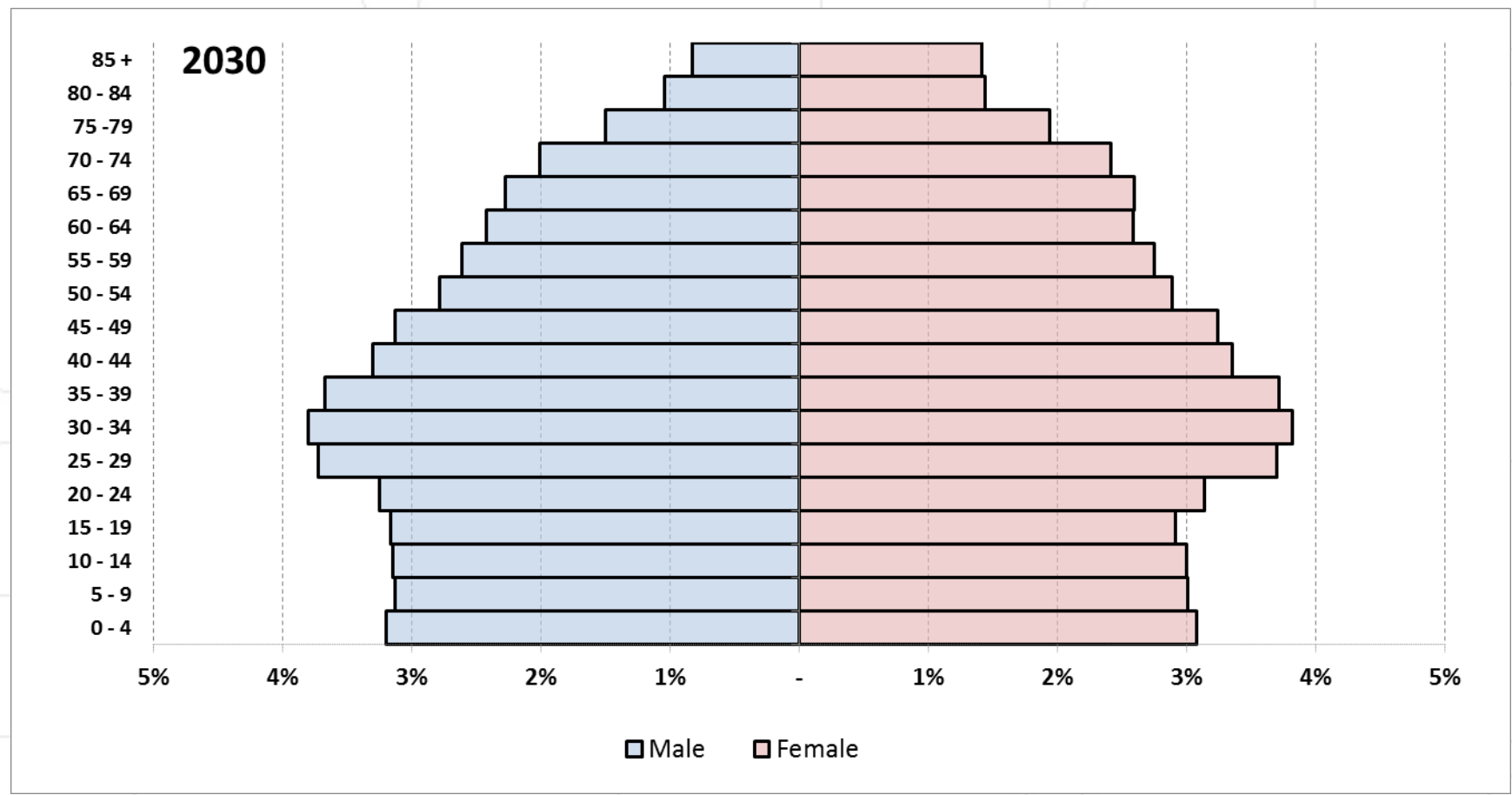
Population Pyramid – CMAP Region

Population Pyramid – CMAP Region
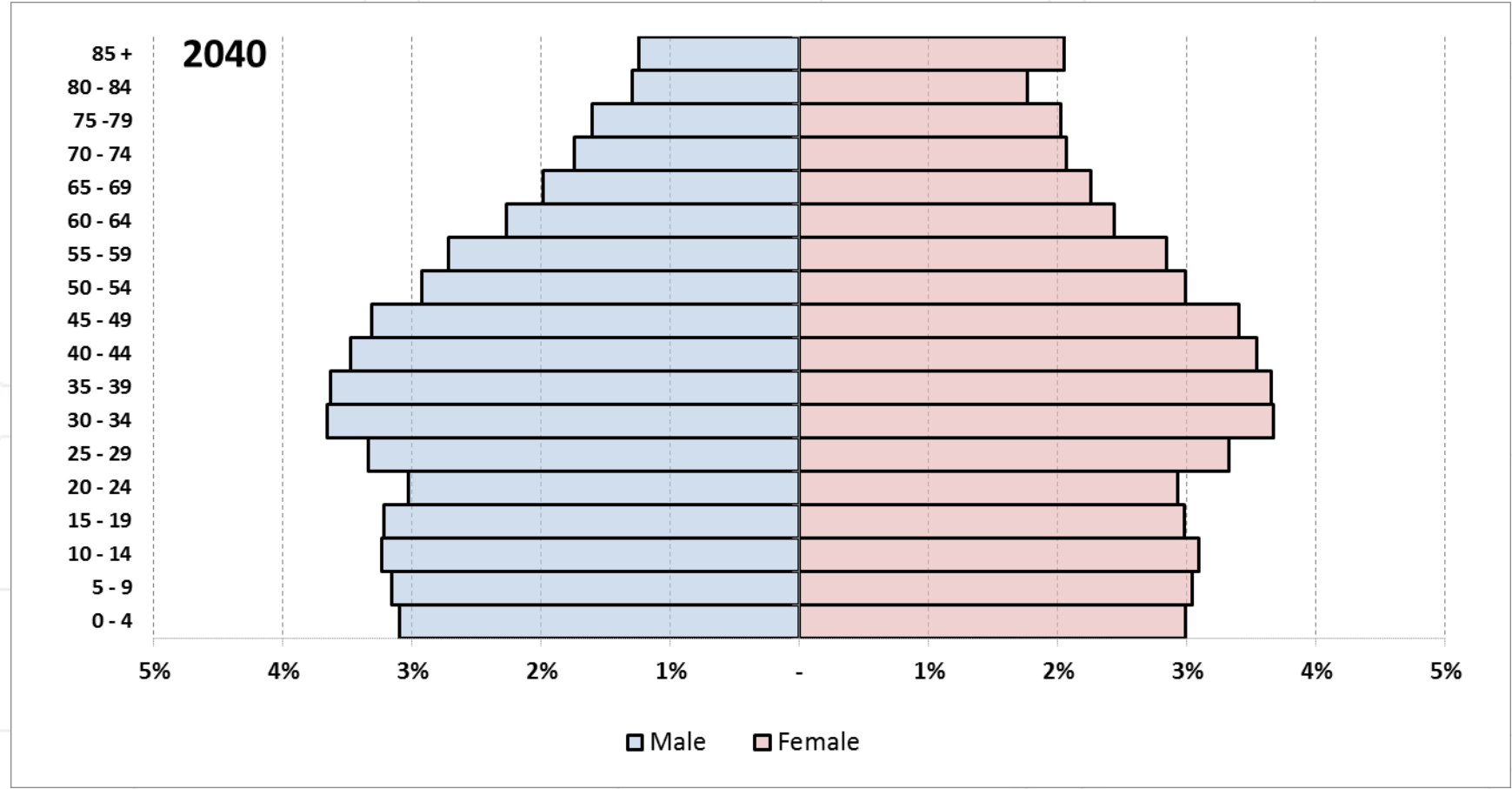
Results – Population for CMAP Region

Population Pyramid – CMAP Region
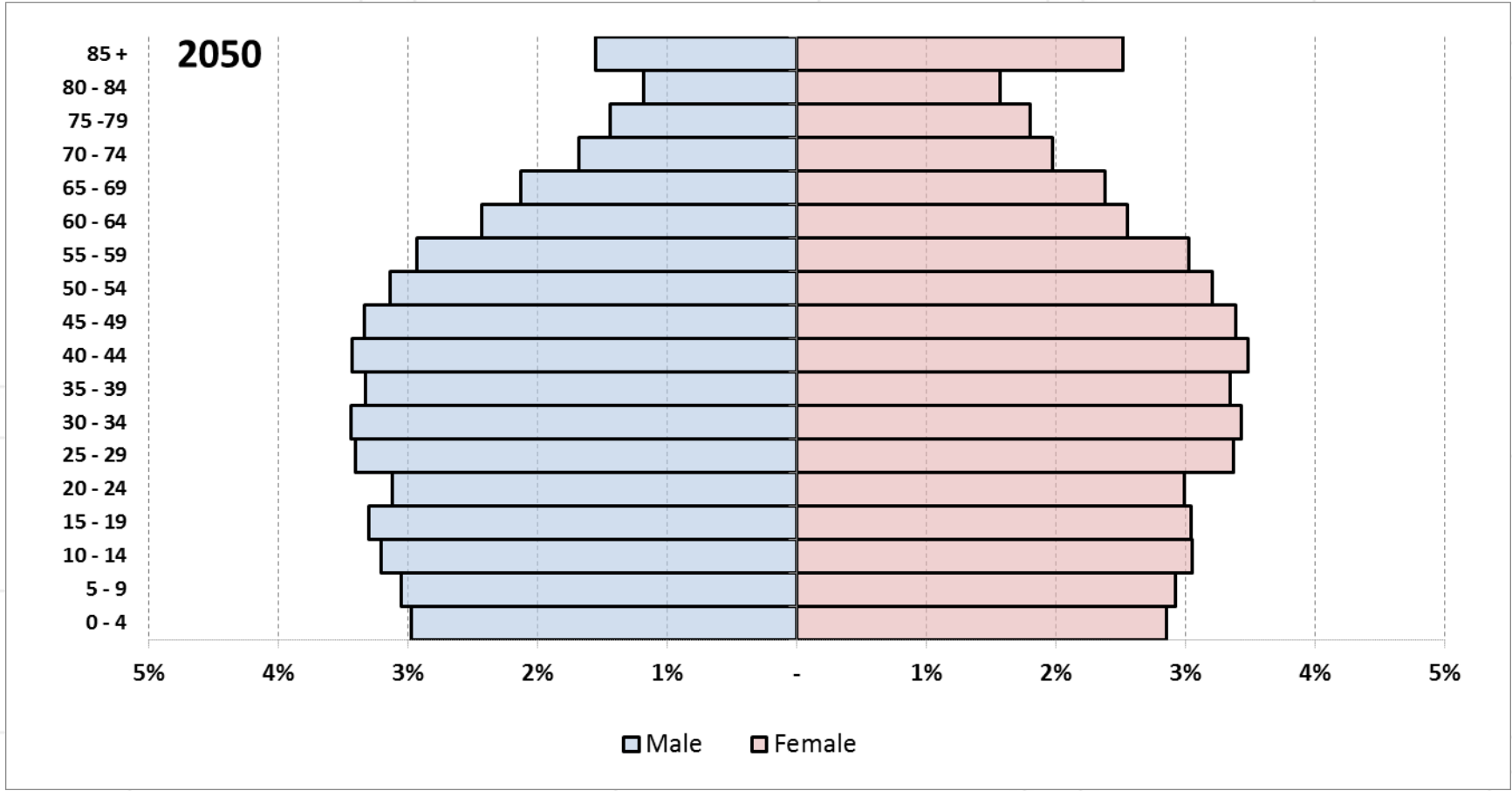
Results – Households for CMAP Region
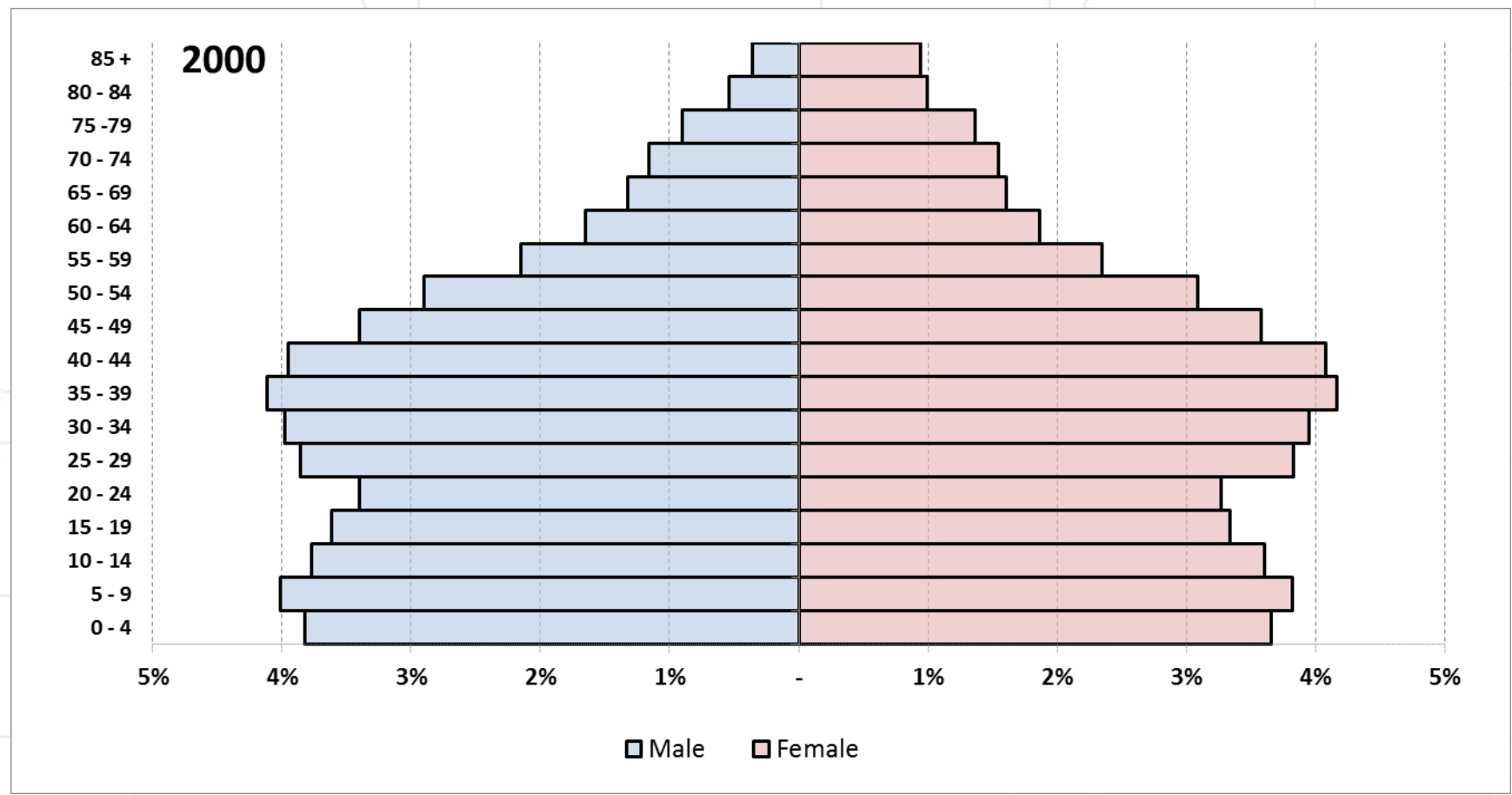
- Growth in households projected to rise at slightly higher rate than historical trends
- Declines in average household size expected to continue

	1980	1990	2000	2010	2020	2030	2040	2050	1980-2010 Difference	CAGR	2010-2050 Difference	CAGR
Households	2,498,766	2,633,148	2,925,723	3,088,156	3,412,829	3,727,764	3,987,248	4,223,827	589,390 24%	0.71%	1,135,671 37%	0.79%
Avg. HH Size	2.81	2.72	2.73	2.68	2.60	2.53	2.51	2.50	(0.12) -4%	-0.15%	(0.18) -7%	-0.17%

CMAP Region Household Formation (Headship) Rates by Age

CMAP Region Forecast Households and Average HH Size

- Total wage and salary employment forecasted to reach over 5 million by 2050

- While growth in basic industries fell during the Great Recession, employment growth in local serving industries held steady

Forecasted Wage & Salary Employment

(stacked bar chart showing Total Basic Industries and Total Local Serving Industries for 1990, 2000, 2010, 2020, 2030, 2040, 2050, with values ranging from about 3,500,000 in 1990 to about 5,000,000 in 2050)

■ Total Basic Industries   ■ Total Local Serving Industries

Forecasted W&S Employment: Basic & Local Industries

(line chart with Basic Industry Employment on left axis and Local Serving Industry Employment on right axis, plotting Total Basic Industries and Total Local Serving Industries from 1990 to 2050)

—●— Total Basic Industries   —●— Total Local Serving Industries

Results – Employment for CMAP Region

- Employment growth from 2010-2050 more robust as compared to 1990-2010
- Strongest growth between 2010-2050 expected in Construction; Professional/Technical Services; Administrative/Waste Services; and Accommodation/Food Services
- Declines projected in Manufacturing and Educational Services

		1990	2000	2010	2020	2030	2040	2050	1990-2010 Difference	CAGR	2010-2050 Difference	CAGR
	Total Wage & Salary Employment	**3,524,503**	**4,002,634**	**3,689,872**	**4,260,468**	**4,456,914**	**4,710,024**	**4,999,618**	**165,369**	**5%**	**0.23%**	**1,309,745**	**35%**	**0.76%**
NAICS												
11	Agriculture, Forestry, Fishing and Hunting	4,849	4,278	2,789	3,293	3,423	3,601	3,872	(2,061)	-42%	-2.73%	1,083	39%	0.82%
21	Mining, Quarrying, and Oil and Gas Extraction	2,176	1,649	1,120	1,310	1,376	1,444	1,467	(1,056)	-49%	-3.27%	347	31%	0.68%
22	Utilities	25,531	15,843	10,369	11,883	11,670	11,433	10,892	(15,162)	-59%	-4.41%	523	5%	0.12%
23	Construction	156,233	179,821	119,852	158,045	174,559	204,460	253,451	(36,381)	-23%	-1.32%	133,599	111%	1.89%
31-33	Manufacturing	610,164	561,902	355,690	356,208	323,977	302,637	284,879	(254,474)	-42%	-2.66%	(70,811)	-20%	-0.55%
42	Wholesale Trade	230,159	233,111	194,978	212,068	215,545	217,721	213,170	(35,181)	-15%	-0.83%	18,193	9%	0.22%
48-49	Transportation and Warehousing	150,860	187,434	162,776	179,461	174,412	169,496	163,645	11,916	8%	0.38%	869	1%	0.01%
51	Information	95,305	108,513	73,821	77,544	79,008	80,852	82,078	(21,484)	-23%	-1.27%	8,257	11%	0.27%
52	Finance and Insurance	224,085	238,757	215,274	225,396	240,776	261,198	276,601	(8,811)	-4%	-0.20%	61,328	28%	0.63%
53	Real Estate and Rental and Leasing	57,400	66,245	56,360	60,822	58,547	56,856	58,186	(1,040)	-2%	-0.09%	1,826	3%	0.08%
54	Professional and Technical Services	216,896	303,593	270,587	347,735	370,046	401,436	449,883	53,691	25%	1.11%	179,296	66%	1.28%
55	Management of Companies and Enterprises	63,903	64,991	74,976	83,676	80,689	79,035	76,704	11,073	17%	0.80%	1,728	2%	0.06%
56	Administrative and Waste Services	195,461	301,544	272,113	384,426	466,582	563,037	655,796	76,652	39%	1.67%	383,683	141%	2.22%
61	Educational Services	70,441	85,706	120,533	131,618	127,580	124,881	116,740	50,091	71%	2.72%	(3,793)	-3%	-0.08%
62	Health Care and Social Assistance	281,500	364,717	448,993	527,822	570,562	607,356	640,133	167,493	60%	2.36%	191,140	43%	0.89%
92	Government	337,862	381,542	401,273	473,383	489,656	500,442	511,681	63,411	19%	0.86%	110,408	28%	0.61%
	Total Basic Industries	**2,722,827**	**3,099,646**	**2,781,503**	**3,234,691**	**3,388,407**	**3,585,884**	**3,799,179**	**58,676**	**2%**	**0.11%**	**1,017,677**	**37%**	**0.78%**
	Basic Share of Total Employment	77%	77%	75%	76%	76%	76%	76%					
44-45	Retail Trade	404,221	419,057	386,519	411,778	415,471	425,685	445,876	(17,702)	-4%	-0.22%	59,357	15%	0.36%
71	Arts, Entertainment, and Recreation	35,226	53,486	56,273	65,705	66,543	66,439	65,502	21,047	60%	2.37%	9,229	16%	0.38%
72	Accommodation and Food Services	215,743	258,700	291,751	364,810	401,122	443,479	496,200	76,008	35%	1.52%	204,449	70%	1.34%
81	Other Services, except Public Administration	146,487	171,745	173,827	183,484	185,371	188,537	192,860	27,340	19%	0.86%	19,033	11%	0.26%
	Total Local Serving Industries	**801,677**	**902,988**	**908,370**	**1,025,777**	**1,068,507**	**1,124,140**	**1,200,438**	**106,693**	**13%**	**0.6%**	**292,069**	**32%**	**0.70%**

Basic Industries (rows 11 through Government); *Local Industries* (rows 44-45 through 81)

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Comparison: Current to Prior CMAP Forecasts

		2010	2020	2030	2040	2010-2040		
						Difference		CAGR
Total Population	Prior Forecast*	8,363,468	9,202,474	9,973,562	10,744,650	2,381,182	28%	0.84%
	Current Forecast	8,431,386	9,019,767	9,617,193	10,215,298	1,783,912	21%	0.64%
	%Δ Prior/Current				5.2%			
Wage & Salary Employment	Prior Forecast*	3,802,984	4,197,936	4,592,887	4,987,839	1,184,855	31%	0.91%
	Current Forecast	3,689,872	4,260,468	4,456,914	4,710,024	1,020,152	28%	0.82%
	%Δ Prior/Current				5.9%			

*2020 and 2030 are interpolated
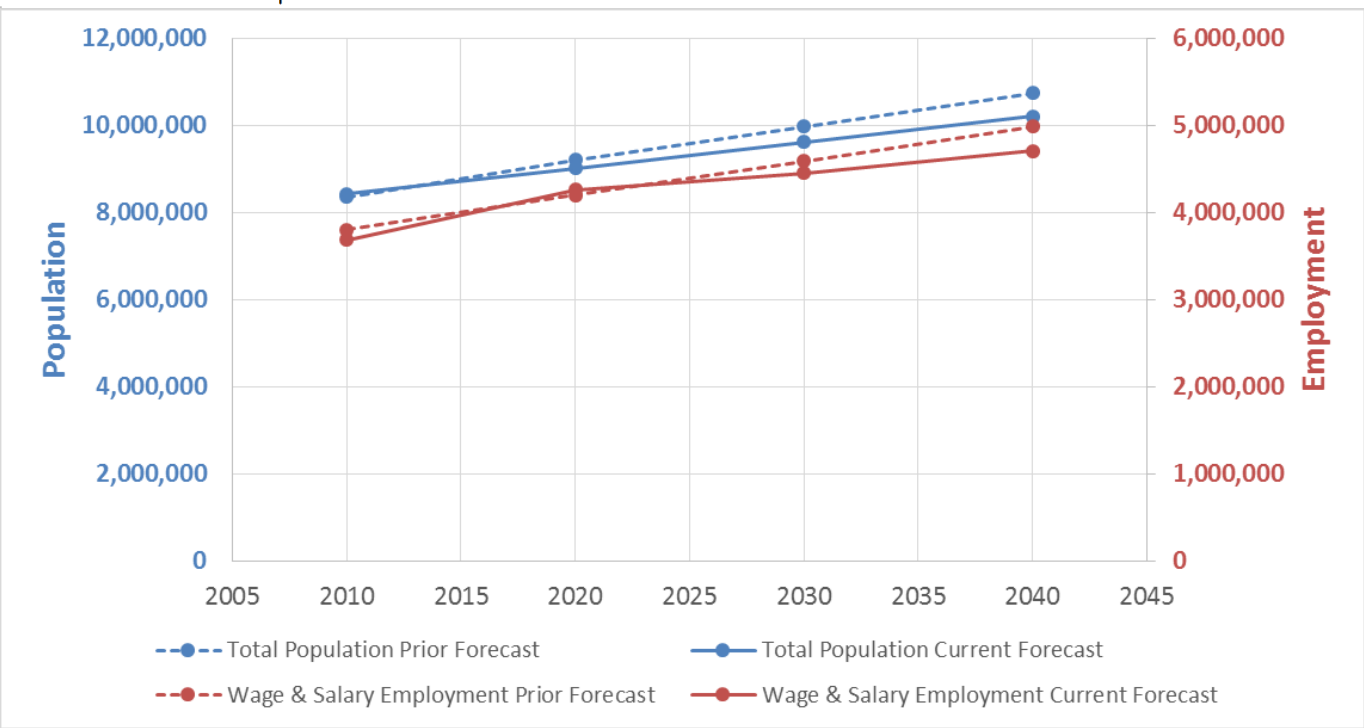
Next Steps

- Allocation to subzones based on land use, economic, and planning factors

- Committee discussion and review September-February

- Stakeholder workshops:

  – Policies and factors in the beta local allocation tool: November

  – Initial results: February

Questions?

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