

COOPERATIVE FORECASTING

Cooperative Forecasting and Data Subcommittee Meeting
April 2, 2013

Cooperative Forecasting Program

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- Provides consistent local and regional household, population and employment projections based on common assumptions about future growth
 - ▣ Established by COG in 1975
 - ▣ Prepared under the direction of the Planning Directors Technical Advisory Committee (PDTAC)
 - ▣ Reviewed and approved by the COG Board
 - ▣ Official local government projections
- Inputs for transportation, water and air quality modeling by COG and TPB, local government planning, and private sector market analysis
- Major series or “Round” approximately every 4 years, updates typically conducted annually

Annual Updates

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- **COG Board policy** (*since 1992, ISTEA and CAA*) **which permits – but DOES NOT REQUIRE – annual updates (8.1, 8.2, etc.)**
 - ▣ Local governments review and explicitly consider major new transportation facilities to document their likely land use impacts
 - ▣ Annual process also captures local land use and comprehensive plan changes

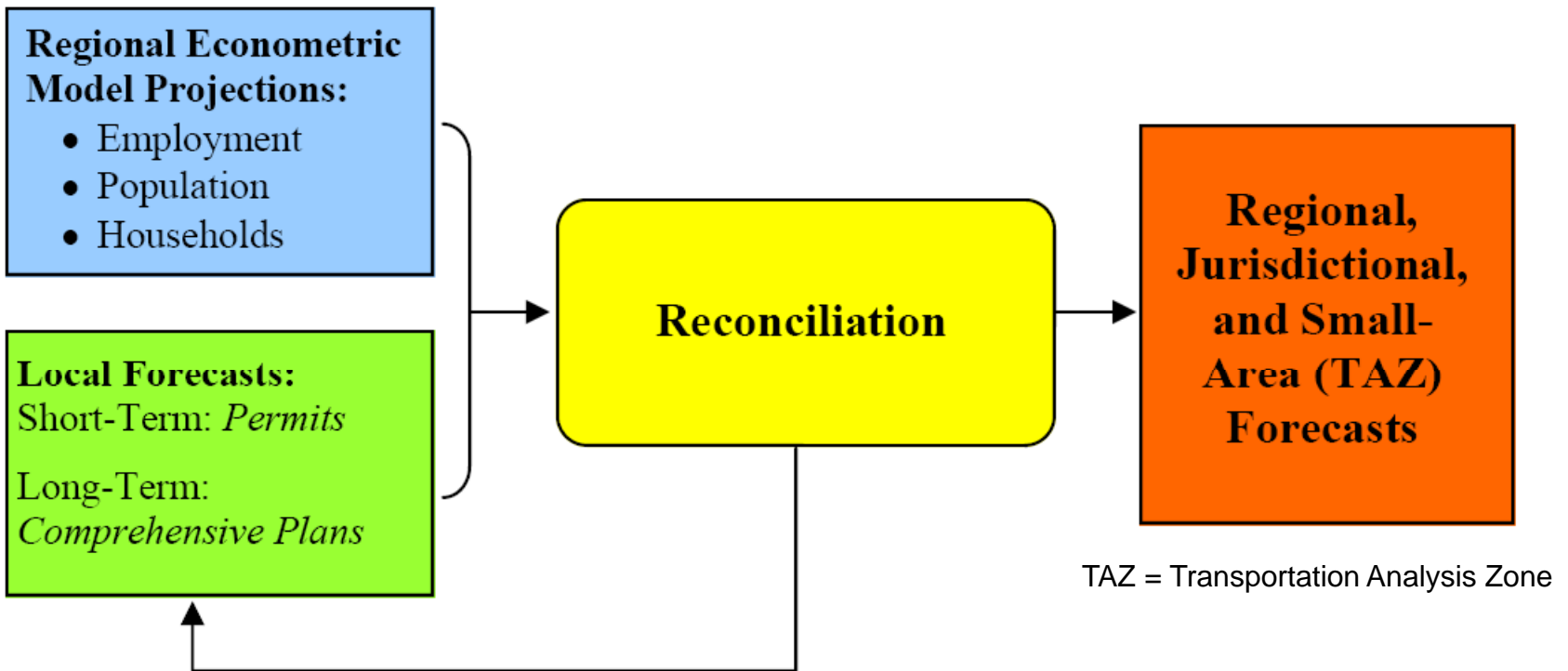
Cooperative Forecasting History

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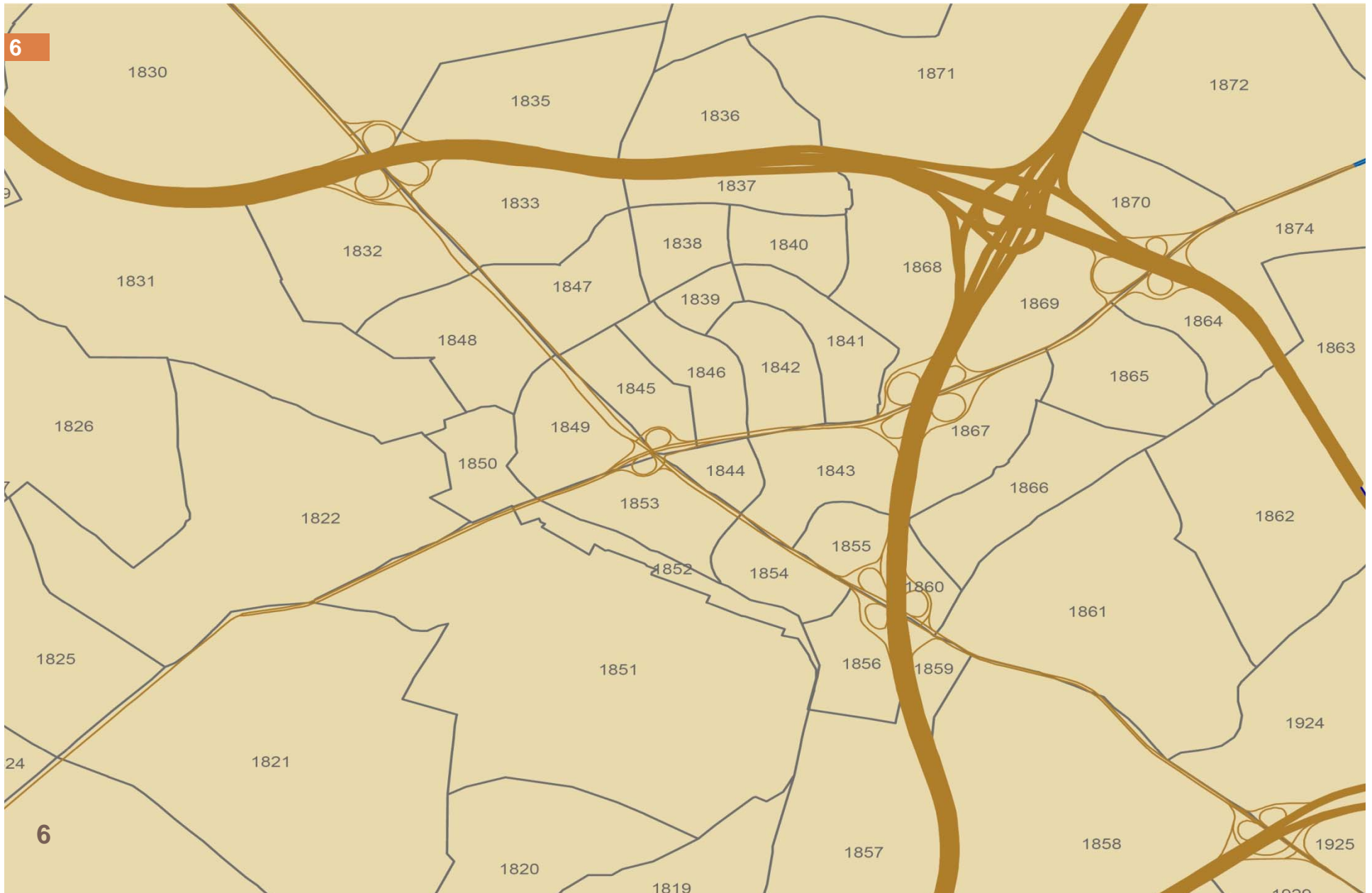
- **ROUND 1 - 1976**
- **ROUND 2 - 1979**
- **ROUND 3 - 1983**
- Round 3.5 - 1985 Update
- **ROUND 4 - 1987**
- Round 4-1 - 1991
- **ROUND 5 - January 1994**
- Round 5.1 - May 1994
- Round 5.2 - 1995
- Round 5.3 - 1996
- Round 5.4 - 1997
- **ROUND 6a - 1998**
- Round 6.1 - 1999
- Round 6.2 - 2000
- Round 6.3 - 2003
- Round 6.4 - *Never Adopted*
- Round 6.4A - 2004
- **ROUND 7.0 - 2005**
- Round 7.0a - 2006
- Round 7.1 - 2008
- Round 7.2 - 2009
- Round 7.2A - 2009
- **ROUND 8.0 - 2010**
- Round 8.0a - 2011
- Round 8.1 - 2012
- Round 8.2 - 2013

Cooperative Forecasting Process

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Example of TAZs in Tysons Virginia



Regional Econometric Model Projections

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- **Top Down:** Benchmark projections of future growth are generated from an econometric model that predicts the total amount of growth that the region as a whole can expect over a 30-year forecasting period.
 - For Round 8, regional benchmark projections were generated from a comprehensive econometric model developed by IHS Global Insight, a private sector firm that provides economic forecasting and analysis services to more than 3,800 clients in industry, finance and government.
 - The IHS Global Insight econometric model incorporates nearly 2,000 economic, financial, and demographic factors in generating its projections. Each region of the US is modeled individually and then linked into a national system.
 - The IHS Global Insight model provides 5-to-30 year regional projections for:
 - Employment by industry sector (NAICS)
 - Population by age group
 - Households by household head age group
 - Projections of total regional employment are generated by multiplying IHS Global Insight wage and salary employment projections by a factor developed from US Census data to account for self-employed workers who are not included in the econometric model projections

Econometric Model

2005 to 2040 Job Growth Projections by Industry Sector

Metropolitan Washington (Thousands of Jobs)

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INDUSTRY SECTOR	2005	2040	2005 to 2040 Growth		Share
TOTAL	2,808.4	4,473.8	1,665.4	59%	100%
CONSTRUCTION	174.1	294.8	120.7	69%	7%
MANUFACTURING	59.4	46.4	(13.0)	-22%	----
SERVICE PROVIDING	1,960.8	3,414.8	1,454.0	74%	87%
Transp., Trade, & Utilities	382.4	461.1	78.7	21%	5%
Information	98.3	178.2	79.9	81%	5%
Financial Activities	155.9	189.6	33.7	22%	2%
Professional & Business Svcs	636.9	1,566.9	930.0	146%	56%
Educational & Health Svcs	294.7	510.4	215.7	73%	13%
Leisure & Hospitality	231.2	300.5	69.2	30%	4%
Other Services	161.4	209.7	48.3	30%	3%
GOVERNMENT	614.1	718.3	104.2	17%	6%
Federal Government	339.1	332.8	(6.3)	-2%	0%
State & Local Government	274.9	385.5	110.6	40%	7%
Military	75.9	77.5	1.6	2%	0%

Local Forecasts

- **Bottom Up:** Jurisdictional and small-area TAZ-level employment, household, and population forecasts are prepared independently by local planning staff in each COG member jurisdiction for the 30-year forecasting period.
 - Short-term local forecast are based on:
 - Current construction, building permits, approved development plans, rezoning applications
 - Longer-term local forecasts are based on:
 - Adopted and approved area master plans, jurisdictional comprehensive or general plans, current zoning capacity and past and current trends in market absorption rates.
 - COG staff also provide local planning staff with current small area employment data files and Census data at the Transportation Analysis (TAZ) level to assist in the development of local jurisdiction base year estimates.
 - Local jurisdictions describe their methodology and the assumptions made in preparing their local forecasts as part of the Cooperative Forecasting process

Reconciliation

- **Reconciliation:** Local planners working through COG's Cooperative Forecasting Subcommittee reconcile the regional sum of the independently prepared local forecasts with the regional projections from econometric model.
 - ▣ Subcommittee members carefully review the forecasts of each jurisdiction and have the opportunity to question the reasonableness of methodology and assumptions used to prepare these forecasts.
 - ▣ Assumptions regarding the regional balance of households, workers, jobs and in-commuting from outside the region are reviewed for reasonableness.
 - *In Round 7, an additional 130,000 households were added to the local forecasts*
 - ▣ Reconciliation and modification of the local forecasts continue until the sum of local government forecasts are within about 3 percent of the econometric model projections

Reconciliation of Draft Round 8.2 Forecasts

ROUND 8.0 ECONOMETRIC MODEL RESULTS (1983 MSA)

	<u>2005</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>
TOTAL JOBS	3,145.4	3,231.7	3,656.1	4,045.3	4,428.3
TOTAL POPULATION	4,927.2	5,141.1	5,691.3	6,280.2	6,849.5
TOTAL HOUSEHOLDS	1,845.9	1,917.8	2,150.6	2,379.6	2,604.9

DRAFT ROUND 8.2 - Sum of Local Jurisdiction Forecasts

	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>
TOTAL JOBS	3,148.8	3,620.4	4,085.7	4,485.4
TOTAL POPULATION	5,267.2	5,888.6	6,467.9	6,922.7
TOTAL HOUSEHOLDS	1,959.5	2,219.8	2,460.8	2,654.9

Absolute and Percentage Difference: Draft Round 8.2 and the Round 8.0 Econometric Model (Round 8.2 minus Model Results)

	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>
TOTAL JOBS	-82.9 -2.6%	-35.7 -1.0%	40.4 1.2%	57.1 1.3%
TOTAL POPULATION	126.1 2.5%	197.3 3.5%	187.7 3.0%	73.2 1.1%
TOTAL HOUSEHOLDS	41.7 2.2%	69.2 3.1%	81.2 3.4%	50.0 1.9%

For Reconciliation Purposes:

The sum of the local government employment, population, and household forecasts for each forecast year should be within about three percent of the regional econometric model projections

Consistency with Transportation Plans

- **Consistency with Transportation Plans:** Federal Air Quality Conformity Regulations require use of the latest planning assumptions derived from the estimates of current and future population and employment. The assumptions for land development and use must also be consistent with the future transportation system alternatives being analyzed.
- TPB staff annually brief the members of the Cooperative Forecasting Subcommittee on major transportation projects anticipated for inclusion in the CLRP and work with local planning staff to see that these major transportation improvements are taken into consideration in the preparation of local forecasts.

Consistency with the TPB Constrained Long Range Plan (CLRP)

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- ▣ In many Rounds the Cooperative Forecasts have been updated and modified to take into account for major transportation projects:
 - In Round 6.2, the local forecasts for the NoMa area in the District were increased in conjunction with the addition of the New York Ave Metrorail Station to the CLRP
 - In Round 6.4A, the local forecasts of Montgomery and Prince George's County were increased and the District of Columbia's local forecasts were decreased in conjunction with the addition of the Inter-County Connector (ICC) to the CLRP
 - In Round 7.2A, the local forecasts for Light Rail Purple Line corridor connecting Silver Spring and New Carrollton were increased
 - In Rounds 7 and 8, the local forecasts of Fairfax County and Loudoun County began to include increased development around planned Metrorail Silver Line stations in Fairfax and Loudoun County as the Silver Line proceeded through various stages of approval
 - In Round 8.2, significant increases in households and population were added to Fairfax County forecasts to reflect the recently adopted Plan for Tysons

How Accurate Have the Household and Population Forecasts Been?

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Households					
Jurisdiction:	Round 4.1 1990 Base Year	Round 4.1 2010 Forecast Year	Forecast % Growth	Actual % Growth	Actual Growth 1990 - 2010
District of Columbia	259,300	264,800	2%	3%	7,400
Arlington Co., VA	81,400	96,000	18%	21%	16,700
City of Alexandria, VA	56,400	72,100	28%	21%	11,700
Montgomery Co., MD	280,000	371,000	33%	29%	81,000
Prince George's Co., MD	262,900	337,000	28%	16%	41,100
Fairfax Co., VA	259,600	448,200	73%	54%	139,900
Loudoun Co., VA	31,000	77,400	150%	237%	73,600
Prince William Co., VA	64,500	142,700	121%	129%	83,300
Frederick Co., MD	53,100	92,500	74%	60%	31,700
Charles Co., MD	33,600	58,500	74%	52%	17,400
Total	1,381,800	1,960,000	42%	36%	503,800
Population					
Jurisdiction:	Round 4.1 1990 Base Year	Round 4.1 2010 Forecast Year	Forecast % Growth	Actual % Growth	Actual Growth 1990 - 2010
District of Columbia	628,300	627,700	0%	-4%	-26,600
Arlington Co., VA	167,000	178,800	7%	24%	40,600
City of Alexandria, VA	111,100	135,000	22%	26%	28,900
Montgomery Co., MD	710,000	820,000	15%	37%	261,600
Prince George's Co., MD	718,400	840,900	17%	20%	145,000
Fairfax Co., VA	825,800	1,028,400	25%	32%	265,700
Loudoun Co., VA	89,800	210,900	135%	248%	222,500
Prince William Co., VA	277,000	390,200	41%	64%	177,100
Frederick Co., MD	149,100	243,600	63%	57%	84,300
Charles Co., MD	103,800	161,500	56%	39%	40,800
Total	3,780,300	4,637,000	23%	33%	1,239,900

Round 4.1 Forecasts were adopted in 1991 Revised Tables 3/25/13 – Corrected for calculation error in Forecast % Growth and Actual % Growth columns – Presentation to Transportation Planning Board – 3/20/13

How Accurate Have the Employment Forecasts Been?

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Jurisdiction:	Employment				
	Round 4.1 1990 Base Year	Round 4.1 2010 Forecast Year	Forecast % Growth	Actual % Growth	Actual Growth 1990 - 2010
District of Columbia	718,200	886,000	23%	9%	65,300
Arlington Co., VA	214,600	263,600	23%	4%	8,700
City of Alexandria, VA	97,300	145,200	49%	9%	8,700
Montgomery Co., MD	455,000	670,000	47%	12%	55,100
Prince George's Co., MD	311,800	473,000	52%	10%	30,800
Fairfax Co., VA	401,300	625,400	56%	69%	278,700
Loudoun Co., VA	33,800	98,300	191%	325%	109,900
Prince William Co., VA	75,500	142,900	89%	90%	68,100
Frederick Co., MD	53,100	117,500	121%	86%	45,600
Charles Co., MD	33,500	43,000	28%	86%	28,700
Total	2,394,100	3,464,900	45%	29%	699,600

Round 4.1 Forecasts were adopted in 1991 Revised Tables 3/25/13 – Corrected for calculation error in Forecast % Growth and Actual % Growth columns – Presentation to Transportation Planning Board – 3/20/13

**Draft Round 8.2 Household Forecasts
(Thousands)**

JURISDICTION	2010	2040	2010 to 2040	
			Number	% Change
District of Columbia	266.7	339.9	73.2	27.4%
Arlington County	98.1	128.6	30.6	31.2%
City of Alexandria	68.1	94.9	26.8	39.3%
Central Jurisdictions	432.9	563.4	130.5	30.1%
Montgomery County	361.0	460.2	99.1	27.5%
Prince George's County	304.0	379.3	75.3	24.8%
Fairfax County	386.1	505.3	119.2	30.9%
City of Fairfax	8.4	10.3	1.9	23.0%
City of Falls Church	5.1	7.9	2.8	54.9%
Inner Suburbs	1,064.7	1,363.0	298.3	28.0%
Loudoun County	104.6	165.3	60.7	58.0%
Prince William County	130.8	207.8	77.0	58.9%
City of Manassas	12.5	17.1	4.6	36.5%
City of Manassas Park	4.5	5.0	0.5	11.7%
Calvert County	32.0	40.3	8.3	25.8%
Charles County	51.0	85.9	35.0	68.6%
Frederick County	84.8	119.5	34.7	40.9%
Stafford County	41.8	87.7	45.9	109.9%
Outer Suburbs	462.0	728.5	266.6	57.7%
Baltimore Area Jurisdictions	371.4	453.6	82.2	22.1%
Fredericksburg Area Jurisdictions	50.7	86.4	35.7	70.5%
Other Jurisdictions	88.0	142.7	54.7	62.2%
TPB Model Region Total	2,469.6	3,337.6	868.0	35.1%

**Draft Round 8.2 Employment Forecasts
(Thousands)**

JURISDICTION	2010	2040	2010 to 2040	
			Number	% Change
District of Columbia	783.5	982.6	199.2	25.4%
Arlington County	223.3	308.8	85.6	38.3%
City of Alexandria	102.9	167.6	64.7	62.9%
Central Jurisdictions	1,109.6	1,459.1	349.5	31.5%
Montgomery County	510.3	715.1	204.9	40.1%
Prince George's County	342.6	497.7	155.1	45.3%
Fairfax County	622.9	877.1	254.2	40.8%
City of Fairfax	20.4	25.6	5.2	25.6%
City of Falls Church	11.4	18.3	6.9	60.5%
Inner Suburbs	1,507.5	2,142.8	626.3	41.5%
Loudoun County	145.3	283.2	138.0	94.9%
Prince William County	115.4	240.8	125.4	108.6%
City of Manassas	23.6	32.2	8.6	36.5%
City of Manassas Park	4.5	5.1	0.6	12.6%
Calvert County	35.2	49.0	13.8	39.2%
Charles County	62.2	83.1	20.9	33.6%
Frederick County	98.7	114.9	16.2	16.4%
Stafford County	46.7	84.2	37.5	80.4%
Outer Suburbs	531.6	892.6	360.9	67.9%
Baltimore Area Jurisdictions	618.7	801.7	183.0	29.6%
Fredericksburg Area Jurisdictions	87.8	141.9	54.1	61.6%
Other Jurisdictions	105.5	141.2	35.7	33.8%
TPB Model Region Total	3,960.8	5,570.2	1,609.4	40.6%

Draft Round 8.2 Forecast - Tysons

2010			2040			2010 to 2040 Growth		
Households	Population	Employment	Households	Population	Employment	Households	Population	Employment
8,342	17,122	86,304	37,670	74,319	151,925	29,328	57,197	65,621

- In Round 8.2, forecast 2040 households and population totals for the Tysons area were increased by 20,700 households and 43,000 persons compared to the previous Round 8.1 forecasts*
- These increases were added to the Cooperative Forecasts to reflect the recently adopted Fairfax County Plan for Tysons that significantly increased the planned residential density around the Tysons Metrorail Silver Line stations*

Typical Schedule for a Cooperative Forecasting Round Update

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- **May/June 2012** – Announcement of the schedule for the Cooperative Forecasting Round update
- **September 2012** - Local jurisdictions submit a Letter of Intent (from the Planning Director) to update the Cooperative Forecasts for their jurisdiction
- **October 2012** - Preliminary local jurisdictional totals are due to COG Staff by the October Cooperative Forecasting meeting
- **November/December 2012** – Preliminary “sum of local jurisdictional totals” are reconciled with the benchmark econometric regional projections and reviewed by the Cooperative Forecasting Subcommittee and Planning Directors Technical Advisory Committee
- **January 2013** - The Planning Directors Technical Advisory Committee approves the final reconciled local jurisdictional totals and recommends that the COG Board approve the use of the updated Cooperative Forecasts in the TPB Constrained Long Range Plan (CLRP) Update and Air Quality Conformity Analysis
- **February 2013** - Round 8.2 TAZ level forecasts are due to COG staff by February 1, 2013. COG Board approves Round 8.2 as inputs for TPB’s CLRP Update and Air Quality Conformity Analysis. After the COG Board action, TAZ level forecasts are transmitted to Transportation Planning Staff
- **July 2013** – The COG Board formally adopts Round 8.2 Forecasts as the official growth forecasts for the region and the TPB adopts the updated CLRP upon determination that the updated CLRP conforms with established regional air quality mobile emissions budgets

Is the Future Growth in the Cooperative Forecasts Inevitable?

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- **The Cooperative Forecasts are the “most probable” projections based on existing trends and current local plans and policies, and not necessarily an inevitable or preferred future growth end state**
 - Changes in long-term global and national macro-economic conditions, as well changes in federal government spending and policies, will affect both the overall level and pace of future growth in the region
 - The top-down regional econometric model and benchmark projections of future growth for a 30-year period are updated approximately every 3 to 4 years and begin a new Cooperative Forecasting Round
 - Trends can change as different demographic cohorts in the population age and express different preferences and lifestyles from previous generations
 - Periodic Census Data and Household Travel Surveys provide a means to examine how these preferences and lifestyles are changing over time and are used to update the Cooperative Forecasts and TPB Travel Models
 - State and Local governments can also change their current plans and policies through investments in infrastructure, changes in existing land use plans and zoning, and new economic development strategies
 - These changes are captured in the annual Cooperative Forecasting updates

Scenario Analysis

- Scenario Analysis provides a means of analyzing the uncertainty associated with possible future shifts in existing trends and the implications of possible changes in current plans and policies

- COG and TPB have used scenario analysis for:
 - Cooperative Forecasting high and low growth scenarios (*Rounds 1 to Round 4*)
 - “An Analysis of Land Use and Transportation Relationships using Hypothetical Scenarios and Planning Analysis Tools” (1994) – Analyzed 7 land use and 7 transportation scenarios
 - Regional Mobility and Accessibility Study (2006) – Analyzed 5 integrated land use and transportation scenarios
 - TPB Scenario Study – CLRP Aspirations Scenario (2010) – A comprehensive alternative land use and transportation scenario that built off the 2008 CLRP
 - CLRP Aspirations Scenario Update (*April, 2013*) – Updates the prior CLRP Aspirations Scenario to a Round 8.1 and 2012 CLRP baseline, and analyzes the CLRP Aspirations Scenario with the Version 2.3 TPB travel demand forecasting model and a more detailed transportation analysis zone (TAZ) structure