Forecasting the District's Growth

FINAL

Results and Methodology

November 2016

Overview

The Office of Planning prepares a long-range forecast of job, household, and population growth approximately every two years for the Metropolitan Washington Council of Governments' (COG) regional transportation planning efforts. This information also serves as the foundation for the forecasts of growth used for the District's Comprehensive Plan.

This report presents the results and methodology for the District of Columbia Office of Planning's (OP) Long Range Cooperative Forecast conducted for the Metropolitan Washington Council of Governments (COG). The forecast is based on data collected starting in July 2015. Citywide draft totals were submitted to COG in October 2015 and the final draft was formally submitted to COG in March 2016. **COG formally approved and adopted the forecasts on November 9, 2016**. The forecast used the best data available and the most appropriate assumptions at the time.

The growth forecast starts with a current base year of 2010 and proceeds in five-year intervals out through 2045. The forecast is sub-divided geographically into Transportation Analysis Zones (TAZ – see Figure 5), which tend to be smaller than US Census tracts, but vary in size depending on the density of the land uses and the street grid. The table in Figure 1 on the following page presents the results of the most recent round of the COG forecast for DC and the surrounding member jurisdictions.

The forecasts for population, households, and jobs presented in Figure 1 show that the District's population is expected to grow over the next 20 years to over 894,000 people by 2035 for a net increase of 222,000 or just over 11,000 per year. Similarly, the number of households will increase by 84,000 to 381,000 total households by 2035. This is an average of approximately 4,175 net new households per year. Finally, the forecast estimates the District will add 180,000 jobs for a total of 978,000 jobs by 2035, for an average annual increase of around 8,995 jobs per year. The forecasts of population and households suggest that the District's average household size will increase from 2.11 to 2.21 people per household.

It is important to point out that the forecasts represent OP's best estimate of the most probable scenario of growth that will actually occur over a 30-year period. The forecast does not represent total demand, but the intersection between demand and the supply's ability to deliver built capacity that can absorb the demand. In general, OP tries to err toward the high side of growth because of the potential negative impacts on overloaded public facilities and infrastructure should growth occur faster than predicted.

Figure 1. Summary of COG 9.0 Cooperative Forecasts (thousands)

	2015	2020	2025	2030	2035	2040	2045	2015-2045	Percent Change	Annual Rate
Population										
DC	672	730	787	842	894	941	987	315	46.9%	1.6%
Region	5,372	5,673	5,956	6,214	6,453	6,665	6,876	1,504	28.0%	0.9%
% DC/Region	12.5%	12.9%	13.2%	13.6%	13.9%	14.1%	14.4%	20.9%		
Employment										
DC	798	846	895	938	978	1,012	1,045	247	31.0%	1.0%
Region	3,152	3,343	3,563	3,767	3,949	4,125	4,291	1,140	36.2%	1.2%
% DC/Region	25.3%	25.3%	25.1%	24.9%	24.8%	24.5%	24.4%	21.7%		
Households										
DC	297	319	341	363	381	396	412	115	38.6%	1.3%
Region	2,009	2,135	2,256	2,371	2,470	2,558	2,651	642	31.9%	1.1%
% DC/Region	14.8%	15.0%	15.1%	15.3%	15.4%	15.5%	15.5%	17.9%		
Jobs/Housing Ratio										
DC	2.69	2.65	2.62	2.59	2.57	2.55	2.54	2.15		
Region	1.57	1.57	1.58	1.59	1.60	1.61	1.62	1.78		
Avg DC Household Size										
	2.11	2.13	2.16	2.18	2.21	2.24	2.27			

Source: WMCOG, DC Office of Planning (March 2016)

To conduct the forecast, OP uses a supply-side method, which relies on the construction of new square footage of non-residential space and residential units. New built space reflects the capacity to absorb net new job and household growth that result from migration to the District spurred by economic growth. To these estimates of growth from new jobs and migration, OP adds growth from net natural increase (births minus deaths). The core assumption of a supply-side forecast is that by definition, growth cannot exceed built capacity. However, over time trends in square feet per job and people per dwelling unit (see Figure 2 and Figure 3) can affect job and population growth within the same built space.

There are several other major qualitative and many more minor methodological assumptions OP makes to create these long-range forecasts. Major factors and assumptions for the most recent forecast initially submitted to COG in October of 2015 include:

Households

- Growth will be robust, but at a slower pace over the forecast period—following: a record absorption of multi-family rental units, decreasing vacancy, and a large pipeline of new units in recent years, all of which represented a period of potential peak production;
- There will be strong private sector job growth causing migration to DC and the region, even with the uncertainty of the federal budget and procurement process;
- The growing perception of the District as a world capital will continue to attract foreign labor;
- The District will experience an expanding number of neighborhoods where rising values allow for the use of more complicated and expensive high-rise construction methods that have the benefit of maximizing site capacity under zoning; and

- Average household sizes will increase as the large numbers of recent millennial arrivals stay in the District to start families and older households seek to down-size, resulting in a turnover in the single-family housing stock.

Population

- There will be a significant net natural increase in population, as the birth rate remains relatively constant (based upon a larger population but gradually declining fertility rates), and the mortality rate declines;
- The District will have an abundance of choices for transportation, entertainment, leisure, education, health, housing, and food, which continue to attract and maintain more people; and
- Improved public school performance and government initiatives such as universal pre-K will continue to attract and retain a greater percentage of families with children.

Employment:

- The national economy will continue to grow slowly in the short run but will pick up speed after 2015;
- After the current Federal instability ends, the District will return to historic patterns of job growth, but with a greater emphasis on private sector jobs;
- New job opportunities will continue to attract young professionals, while retiring baby boomers will attract middle aged workers to fill vacant senior positions;
- Growth in sectors like professional and business services, retail and accommodations and education and health services will continue to dominate job growth in the District;
- Office vacancy will continue to decline, but shifts in telework and hoteling office spaces will reduce the number of gross square feet required per office job; and
- Finally, employment will disperse and grow throughout District neighborhoods as the trend toward retail and commercial ground and second floor uses within multi-family development continues.

To conduct the forecast, the supply-side method is grouped into two slightly overlapping time periods. The first period runs from 2010 through 2035. The second period starts in 2035 and runs through 2045.

Forecasting 2010 - 2035

The forecast for the first period through 2035 is created by tracking development projects of at least ten residential units, or 10,000 square feet of non-residential space that are in various stages of development including:

- **Completed** since 2010 and occupied by 2015;
- **Under Construction** with estimated delivery after 2015 with 100% occupied by 2020;
- **Planned** projects that have received a pre-development approval such as a Planned Unit Development (PUD) or a funding commitment from a District agency. A portion of these projects is expected to be occupied by 2020, and the majority fully occupied by 2025.
- **Conceptual** projects, which have applied for, but not yet received a pre-development approval or a funding commitment from a District agency, and projects where limited information is known. Some of these projects are expected to deliver by 2025, with the rest fully occupied by 2030; and finally
- **New Neighborhoods**, such as McMillan Reservoir, Walter Reed, and others, are large parcels of land that are currently vacant or underutilized/unoccupied that have substantial development capacity, but which also require significant infrastructure investment to reach full occupancy.

Portions of these projects start delivery as early as 2020, but with the majority delivered and fully occupied by 2030 and 2035.

Projects are grouped into dominant land-uses, the type of project (new construction vs. demolition, or change of use), and the net number of units/hotel rooms, and square feet of non-residential space is tracked.

Using the pipeline of development activity as a source of data to forecast growth requires several basic assumptions including:

- Net new supply represents net growth;
- Any vacancy created elsewhere in DC is back filled within the five year increment;
- Growth from smaller projects (that are not tracked by OP) is comparatively small and is canceled out by demolitions of existing buildings;
- Projects within the pipeline that fail to reach completion during a forecast interval are replaced by previously unknown projects that did reach completion within the appropriate time interval. This has proven to be an accurate assumption at the citywide level.

To estimate net new jobs to the District, non-residential land uses are assigned occupancy rates and square feet per job created in order to estimate the total number of permanent jobs located at the development. Figure 2 below is a table of the land uses and the job density for each non-residential use. OP validated these numbers by cross-referencing the square feet per job with the number of jobs and the total amount of square feet of existing uses in the District's major job centers.

Figure 2. Non-Residential Land Uses, Job Density, and Occupancy Rates

Land Use	Space Multi-Plier	SqFt per Employee	Occupancy
Office		300	92%
Hotel Rooms	450'/room	1,000	100%
Retail		400	89%
Industrial		500	80%
Public/Institution		830	100%
Hospitality		500	100%
Mixed-Use		500	95%

Source: DC Office of Planning

To estimate the impacts of household migration to the District, residential uses are similarly given occupancy rates to calculate the number of households that will occupy units within the developments. To estimate the population of those households, OP uses US Census data from the American Community Survey (ACS) on average household size by the type and tenure of the unit. The table in Figure 3 provides the occupancy rates and the average household sizes used in OP's forecast.

Figure 3. Residential Occupancy Rates and People per Household

		Persons per Occupied Unit		
	Occupancy	Ownership	Unknown	Rental
Single Family	97%	2.580	2.663	2.746
Multi-Family	95%	1.468	1.651	1.833

Source: US Census, DC Office of Planning

OP then adds an estimate of the impact of natural increase (births minus deaths) on the District's population. OP's State Data Center uses actual births and deaths data by address over the past 5-10 years from the District's Department of Health. As an example of recent changes, births prior to 2009 went from approximately 7,500 per year to over 9,000 per year after 2009. However, births are not keeping pace with the rise in the number of women, especially those between 15 and 44. The continuing shift toward later and later births has significant implications for future population growth.

Natural increase District-wide and for each transportation analysis zone (TAZ) is projected forward to 2045 by applying the actual proportion of the natural increase by area that occurred during the 2010-2014 period in the District, using birth and death records obtained from the District's Department of Health. This analysis resulted in an average of 4,500 net natural increase annually and the proportions by area were kept throughout the forecasted period.

Forecasting 2035 - 2045

The second major stage of the forecast starts with the 2035 interval and runs to the end in 2045. This stage relies on a land use capacity analysis that identifies vacant and underutilized parcels throughout the District that do not have proposed development activity tracked as part of the forecast's first stage. Potential jobs and households are estimated based on the tables in Figures 3 & 4 and assigned to each vacant/underutilized parcel identified, based on the parcel's split of zoning constraints between permitted residential and non-residential uses. For instance, zoning may permit up to a total of 30,000 square feet of residential uses for a specific property, but limit non-residential uses of this property to only 15,000 square feet. In this situation, the forecast would allocate growth to this property equal to 15,000 square feet of non-residential (jobs) and 15,000 square feet of residential (approximately 15 units). The growth is proportionally divided to areas across the District based on remaining capacity, i.e. growth will occur in areas of the city that have the most remaining capacity. OP weights a portion of the growth based on recent land use and infrastructure decisions such as expanded support for housing in high density commercial areas of Central Washington and along street car/transit infrastructure corridors.

> Underutilized parcels are defined as non-historic, privately owned, non-institutional properties with 70 percent or more remaining developable capacity under current zoning and/or Comprehensive Plan Land Use Designation.

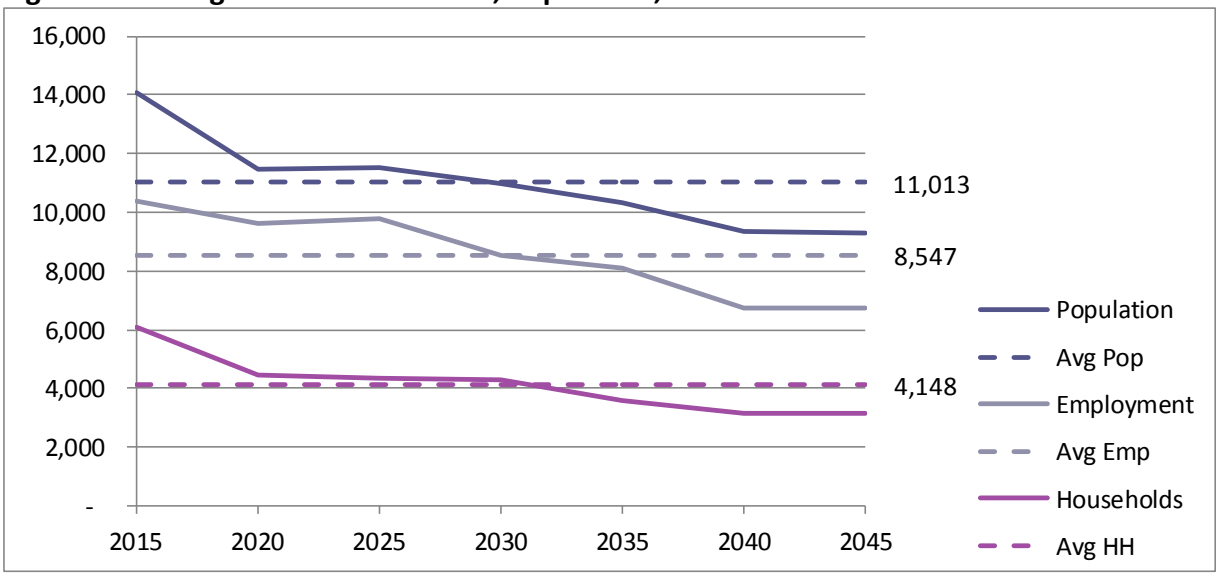
To allocate the underutilized capacity between the remaining forecast intervals, OP applies a decreasing marginal trend over the forecast period. This approach is consistent with COG's overall methodology given increasing uncertainty of the assumptions over time. The decreasing marginal trend results in a portion of growth allocated to New Neighborhoods and vacant/underutilized capacity during the 2025-2035 period and the remainder evenly split over the 2035-2040 and 2040-2045 intervals. Figure 4 of this report illustrates how this decreasing marginal trend allocates household, population and job growth over time and the average growth for each category for the whole 30-year forecast.

Review and Validation

OP takes several steps to review and validate the forecast. First, OP starts by reviewing the decreasing marginal trend mentioned above and shown in Figure 4 and compares it to historic growth patterns. The chart in Figure 4 shows that during the interval between 2010 and 2015 the District's population grew at an average annual rate of 14,000 residents per year and the forecast estimates the population growth will slow to approximately 11,400 per year between 2015 and 2020. The recent release of the US Census annual estimate of population growth for 2016 is almost precisely in this range. The US Census estimated that in 2016 the District grew by 10,793 residents. For historical context, OP's

forecasted annual growth of 11,013 per year between 2015 and 2045 is higher than any other 30-year period in the city's history except for the 30-year time period ending in 1950 when the city grew 12,154 people per year.

Figure 4. Average Annual Household, Population, and Job Growth Rates: 2015 - 2045



Source: DC Office of Planning

Second, OP reviews national factors and competitive regional supply to validate that the proposed growth is not likely to be either significantly slower or faster. The District has sustained very rapid household and population growth for over ten years and substantial job growth over the past twenty years through several national recessions and September 11 attacks. This suggests that continued growth is likely. However, the national economy is recovering making other metropolitan areas more competitive, the city is becoming more expensive, and millennials, which have represented 73% of our recent growth, have reached their peak population as a national cohort. In addition, a growing percentage of future development projects will require complicated land assembly and the redevelopment of existing built space. Finally, there is significant potential for regional competition spurred by:

- The Department of Defense's Base Realignment and Closure initiative (BRAC), which is moving defense contracting jobs out of Crystal City;
- Tyson Corner's long-range plan, which is adding significant capacity, orienting the landscape toward a more pedestrian urban form and adding the Silver Line as a transportation alternative; and
- Montgomery County's Purple line, which will reduce Central Washington's competitive advantage as the major intersection of the Washington Metropolitan Area Transit Authority (WMATA) system network;

These locations have the potential to create significant competitive supply of commercial and housing space and capture a portion of the District's forecasted growth over the next 30 years. Other factors

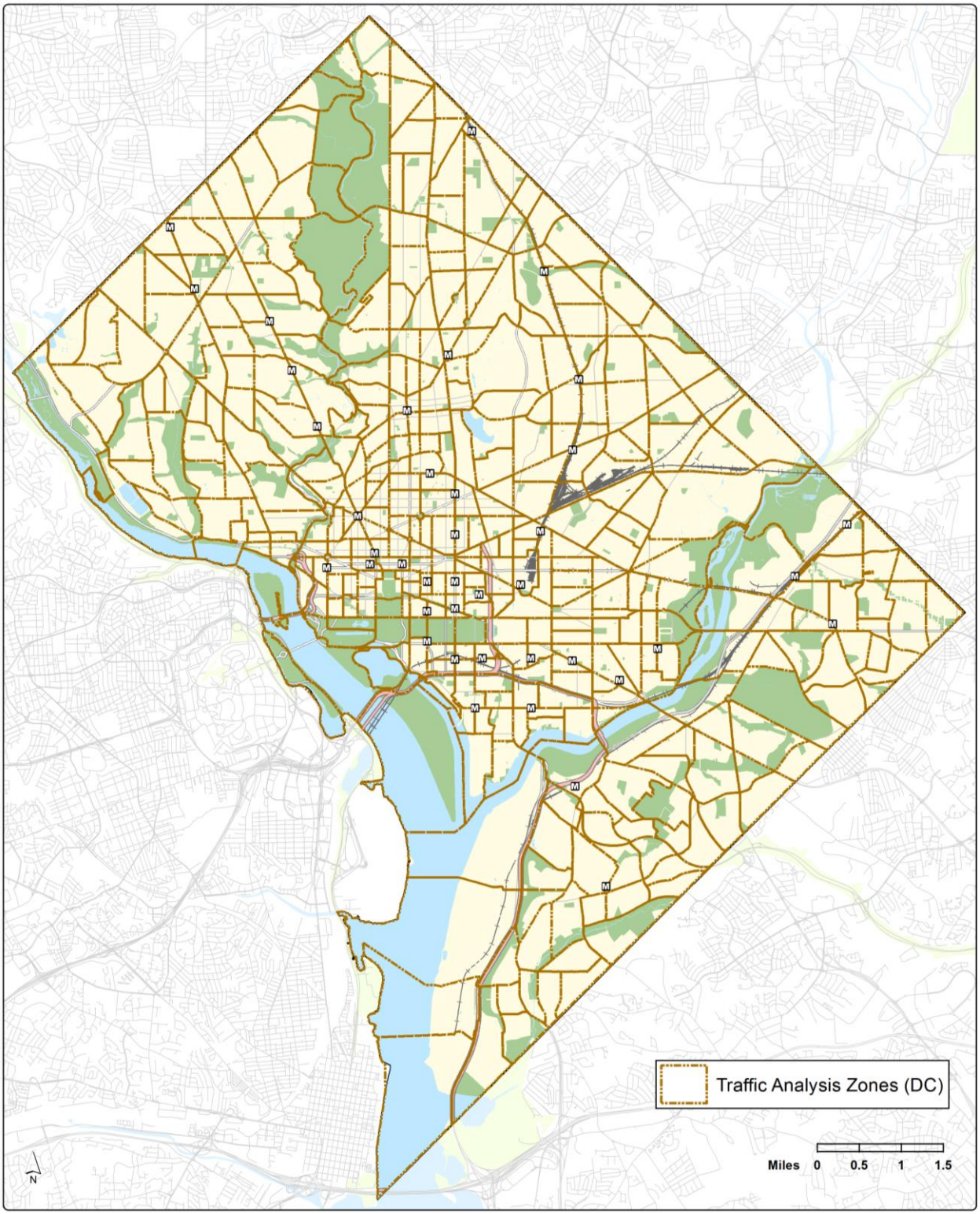
that OP monitors closely and that have the ability to slow the District's rate of growth over the forecast period include:

- Federal employment and procurement instability;
- General Services Administration (GSA) campus security requirements;
- The District's bond cap limiting its ability to finance infrastructure;
- Issues associated with WMATA's performance and the public's perception of the metro system as an attractive transportation alternative; and
- The cost of housing limiting the types of households who could afford to live in the District.

Third and final, OP works with COG to review the forecast and how it fits into their regional econometric growth model. COG is tasked with reviewing the forecasts of all member jurisdictions and ensuring their quality and consistency within the regional context. Discussions with COG resulted in only a minor change to the number of jobs in the 2010 base year due to differences in methodology.

In conclusion, OP considered all of the data and qualitative assessment and is confident that the growth forecasts represent the most probable (optimistic) scenario for continued significant growth over the next 20 to 30 years. To account for the risk factors noted above, OP will be developing a more conservative scenario focusing on the next 15 years of growth for analytical reference and comparison.

Figure 5. Traffic Analysis Zone (TAZ) Boundaries within the District of Columbia



Source: DC Office of Planning