

Memorandum

TO: Technical Advisory Committee

FROM: John Bentley, *FAMPO Regional Planner*

DATE: August 8th, 2018

RE: DRAFT – GWRC 2050 Socioeconomic Data Projections

This memorandum provides an outline for 2050 projections for population data, including employment, number of households, and retail employment per jurisdiction. These projections are based off Traffic Analysis Zones (TAZs) created by Cambridge Systematics in their design for the GWRC region. The Cambridge dataset had a base year of 2015 and future years of 2025, 2035 and 2045. The projections involve using percentage growth per jurisdiction and a linear estimate to determine the potential increases in socio-economic aspects of the Region.

2050 Projection Methodology

Socio-economic factors:

2050 Projections – The projections include the four major areas covered by Cambridge Systematics: population, employment, retail employment, and number of households. The data provided by Cambridge was used as a basis to determine the projections for 2050. The data will be presented separately to accurately portray the accompanying growth

- Percentage Growth + Raw Number Projections
 - o Population
 - o Households
 - o Employment
 - o Retail Employment

Methods – This was accomplished by means of percentage change for each individual jurisdiction for each socio-economic factor. A percentage change was calculated between the initial year, 2015, and the next study year, 2025, then scaled up for 2035 and 2045. To forecast the growth rate that was used, the percentage growth for each year was averaged to establish an average growth percentage. To get 2050 projections, the average growth rate per jurisdiction was halved to account for the previous 10-year breaks.

Population

The population aspect provides the best context for the growth within the Region. Figures 1A - C provide the population, growth rate, and a visual difference between the jurisdictions as well as a linear trend line to show the difference between the years and what change may occur in the future.

Figure 1A examines the flat population per jurisdiction and projects to 2050. The predictions were made using half of the average growth rate, as seen in figure 1B.

Figure 1A. Population by Jurisdiction

Jurisdiction	2015	2025	2035	2045	2050
Stafford	142,387	189,725	229,233	266,816	298,071
King George	24,602	33,653	40,505	46,982	52,709
City of Fredericksburg	26,072	29,077	32,507	35,754	37,738
Spotsylvania	128,926	175,522	216,794	253,616	286,002
Caroline	29,788	37,366	43,593	48,592	52,931
GWRC Total	351,775	465,343	562,632	651,760	727,451

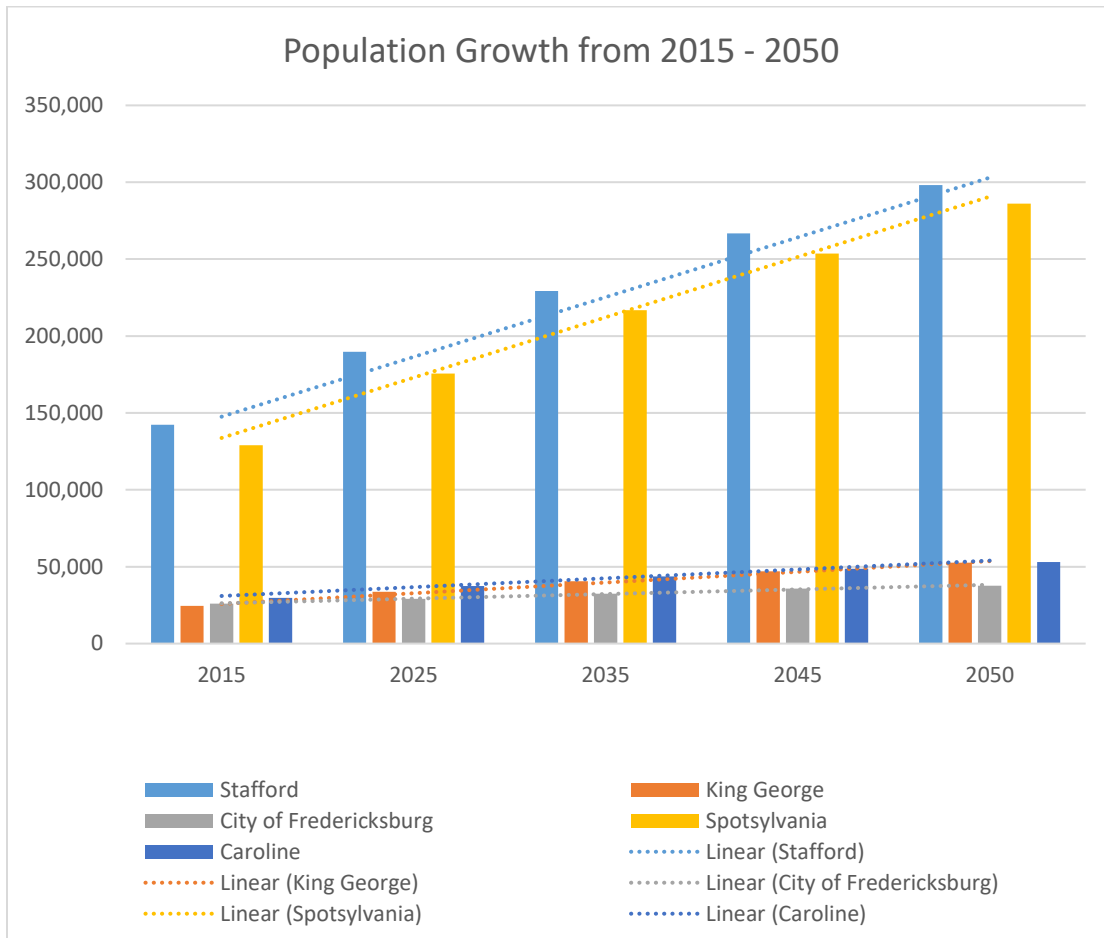
The percentage growth is separated as such in 1B because of the massive differences in rates, where Fredericksburg has around 11% average growth, Spotsylvania County has more than 25%. Combining the averages growth rates for a regional average would not produce an accurate comparison.

Figure 1B. Percentage Population Growth by Jurisdiction

Jurisdiction	2015-2025	2025-2035	2035-2045	Average % growth	Growth Rate used for 2050
Stafford	33.25	20.82	16.40	23.49	11.74
King George	36.79	20.36	15.99	24.38	12.19
City of Fredericksburg	11.53	11.80	9.99	11.10	5.55
Spotsylvania	36.14	23.51	16.98	25.55	12.77
Caroline	25.44	16.66	11.47	17.86	8.93

The linear trend displayed in figure 1C has a clear sharp increase for Stafford and Spotsylvania counties, but Caroline County, King George County, and the City of Fredericksburg have minimal growth projected to 2050 when compared to the other counties.

Figure 1C. Graph of Linear Trends and Jurisdiction Growth



Households

The numbers for Households correspond to the subsequent increases in Population. The same methodology that was used to find the population projections was used for Households and the other aspects. Household numbers, while only at a fraction of the actual population statistic, correspond to some increased in population, although there are some differences present.

As seen in figure 2A, Stafford County was comparable to Spotsylvania County in 2015 in terms of total number of households, but the Cambridge TAZ model predicts that Stafford County is going to greatly surpass Spotsylvania County in terms of total household number. Based on 2050 projections, Stafford County is likely to be the location of the most development in the coming years.

Figure 2A. Number of Households by Jurisdiction

Jurisdictions	2015	2025	2035	2045	2050
Stafford	46,320	73,158	91,936	107,379	125,343
King George	8,959	12,015	13,515	14,867	16,268
City of Fredericksburg	9,283	10,953	12,516	14,190	15,269
Spotsylvania	44,878	58,984	72,974	87,476	98,410
Caroline	11,324	14,187	16,097	17,426	18,790
GWRC Total	120,764	169,297	207,038	241,338	274,080

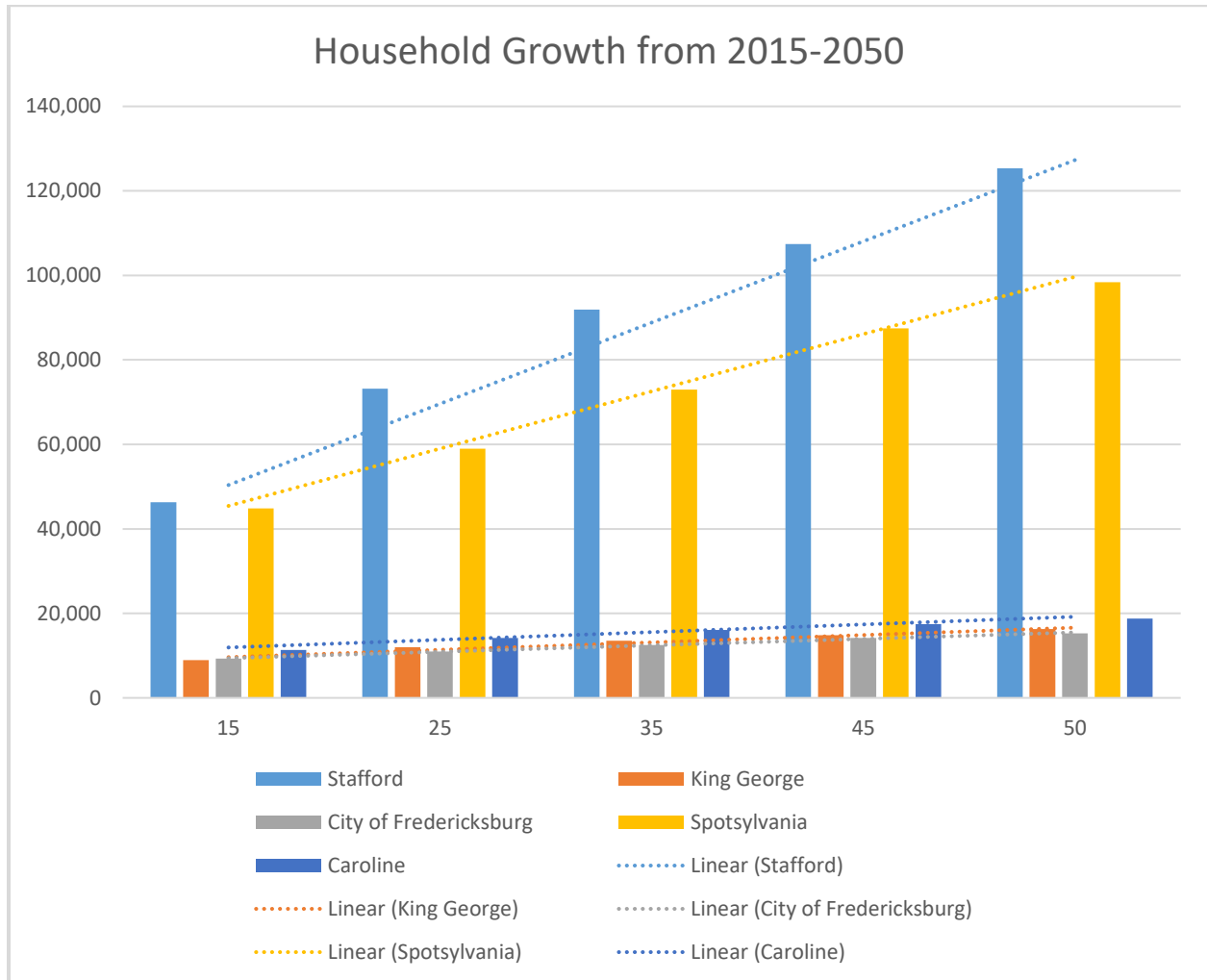
The household growth is naturally going to be higher for Spotsylvania and Stafford counties, but figure 2B shows that the household growth rate will surpass the population growth rate, potentially to account for a likely need in increased commuter housing.

Figure 2B. Percentage Household Growth by Jurisdiction

Jurisdictions	2015-2025	2025-2035	2035-2045	Average % growth	Growth Rate used for 2050
Stafford	57.94	25.67	16.80	33.47	16.73
King George	34.11	12.48	10.00	18.87	9.43
City of Fredericksburg	17.99	14.27	13.37	15.21	7.61
Spotsylvania	31.43	23.72	19.87	25.01	12.50
Caroline	25.28	13.46	8.26	15.67	7.83

The linear trends present in figure 2C present a different picture than in the population trends and statistics seen in figure 1C. The Spotsylvania County trend line was much different than in the population projection. The key importance in this difference is that Spotsylvania and Stafford counties both have high degrees of growth for population, but there is a discrepancy between the population and households, specifically in terms of growth. The growth is quite like the population for Spotsylvania County, but Stafford County has more household growth than population growth by about 5%.

Figure 2C. Graph of Linear Trends and Jurisdiction Growth



Employment

The employment projections and statistics provide a better context for the growth in this region and determine how much of the region will be affected by continued commuters to Northern Virginia.

Figure 3A gives the overall numbers for each jurisdiction, with Stafford County reaching approximately 100,000 employed persons by 2050.

Figure 3A. Employment by Jurisdiction

Jurisdiction	2015	2025	2035	2045	2050
Stafford	52,622	64,294	77,189	91,108	100,260
King George	19,714	23,184	26,601	29,980	32,230
City of Fredericksburg	33,826	41,466	48,688	55,417	60,388
Spotsylvania	51,072	58,495	66,149	82,635	89,873
Caroline	12,484	13,524	16,735	20,257	22,049
GWRC Total	169,718	200,963	235,362	279,397	304,799

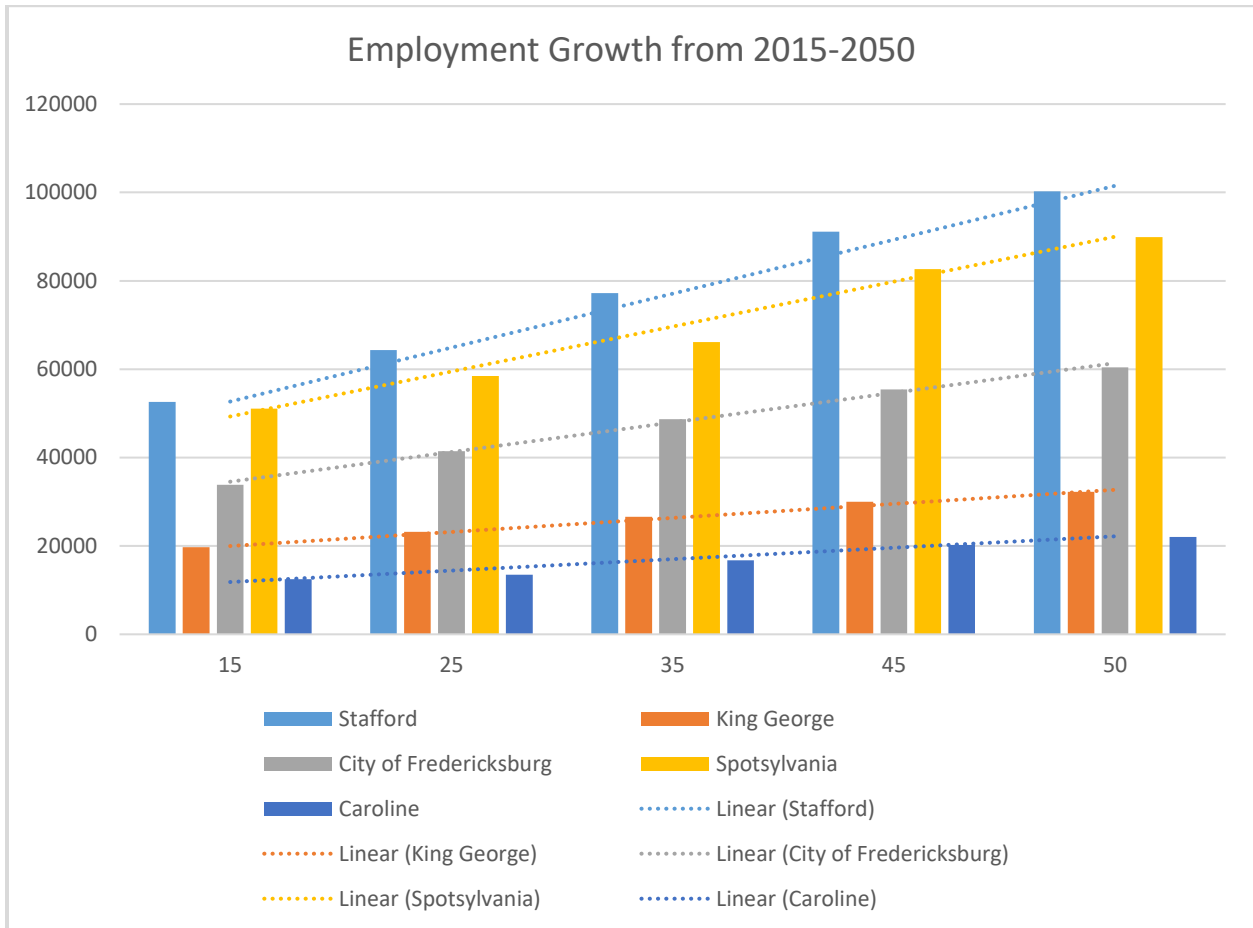
One noticeable aspect of figure 3B is that the growth rates used for the 2050 employment do not keep with the growth present in both population and households. This could be attributed to the constant outflow of commuters from this region where many may not be working within the confines of county boundaries. The percentage growth rate used for 2050 was much closer together than in figures 1B and 2B.

Figure 3B. Percentage Employment Growth by Jurisdiction

Jurisdiction	2015-2025	2025-2035	2035-2045	Average % growth	Growth Rate used for 2050
Stafford	22.18	20.06	18.03	20.09	10.045
King George	17.60	14.74	12.70	15.01	7.51
City of Fredericksburg	22.59	17.42	13.82	17.94	8.97
Spotsylvania	14.53	13.08	24.92	17.51	8.76
Caroline	8.33	23.74	21.05	17.71	8.85

One of the major aspects that stands out within the trend line and the graphical representation in figure 3C is that Fredericksburg has a much higher employment rate than both population and households, which is attributed to the size of the city and the high retail density and job locations.

Figure 3C. Graph of Linear Trends and Jurisdiction Growth



Retail Employment

The retail employment statistics are like the standard employment numbers with Stafford and Spotsylvania counties leading in terms of overall retail employees, and Fredericksburg slightly behind.

Figure 4A shows the overall number of retail employees for each respective jurisdiction, and while it is a separate field, the retail employment numbers are factored into the overall employment numbers, as seen in figures 3A – 3C.

Figure 4A. Retail Employment by Jurisdiction

Jurisdiction	2015	2025	2035	2045	2050
Stafford	13,700	17,433	21,523	25,847	28,896
King George	4,110	4,955	5,754	6,478	7,010
City of Fredericksburg	11,045	13,046	14,646	15,908	16,942
Spotsylvania	20,044	22,297	24,920	27,771	29,365
Caroline	4,494	5,200	5,887	6,540	6,976
GWRC Total	53,393	62,931	72,730	82,544	89,189

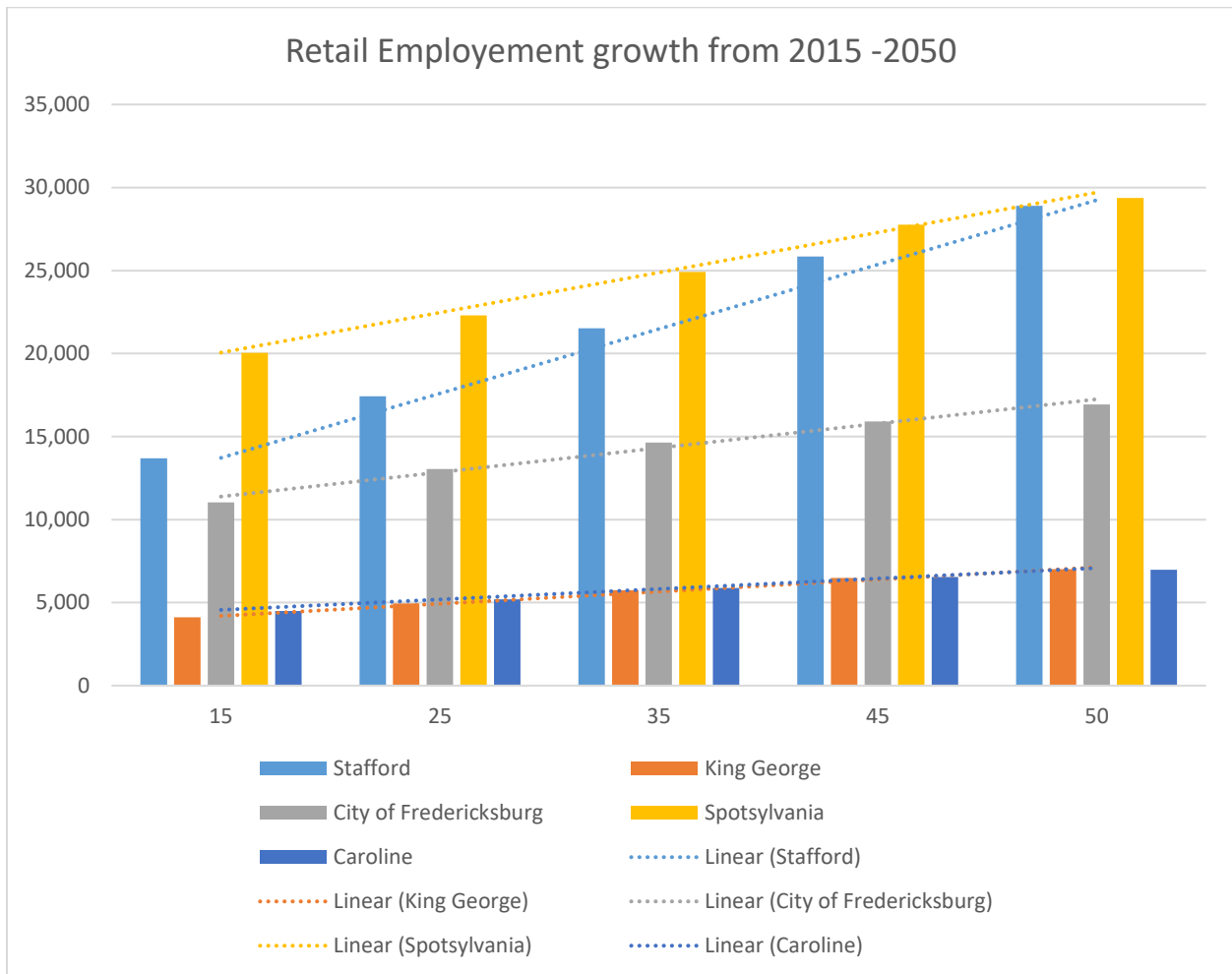
While the total employment numbers show Spotsylvania County leading in terms of employees, the overall growth is much different. Figure 4B shows that the retail employment growth was minimal compared to the other jurisdictions in the region, in actuality it had the lowest with an average growth of 11.48%.

Figure 4B. Percentage Retail Employment Growth by Jurisdiction

Jurisdiction	2015-2025	2025-2035	2035-2045	Average % growth	Growth Rate used for 2050
Stafford	27.25	23.46	20.09	23.60	11.80
King George	20.56	16.13	12.58	16.42	8.21
City of Fredericksburg	18.12	12.26	8.62	13.00	6.50
Spotsylvania	11.24	11.76	11.44	11.48	5.74
Caroline	15.71	13.21	11.09	13.34	6.67

The retail employment linear trend per county can be seen in Figure 4C. Spotsylvania County, while having an overall higher retail employment, has a much lower growth rate. By 2050, Stafford County has almost the same retail employment as Spotsylvania County.

Figure 4C. Graph of Linear Trends and Jurisdiction Growth



Results and Recommendations

The projections for 2050 follow similar conventions as was done by Cambridge Systematics for the projections to 2045, but while the additional 5-year estimates are accurate to a degree, there are factors that may not be accounted for, such as future roadways developments that have not yet been planned or designed. There is also a discrepancy between the employment statistics and the household and population statistics.

The population and household statistics were mainly consistent, with Spotsylvania and Stafford counties having the highest growth, and overall numbers that far exceed totals within the other jurisdictions in the region. One difference in the datasets is Fredericksburg’s numbers in the retail employment and standard employment. Fredericksburg has an above average overall growth and total number of employed persons.