Land Use, Housing, and Demographic Analysis

A background report prepared for Richmond 300: A Guide for Growth

September 5th, 2017

VCU
Center for Urban and Regional Analysis
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Final Draft

Land Use, Housing, and Demographic Analysis

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The City of Richmond, Virginia

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This report is background analysis that will be used in conjunction with various other completed studies and reports to help develop the update to the Citywide Master Plan, Richmond 300: A Guide for Growth.

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INTRODUCTION

This land use, housing, and demographic analysis is an initial study of historic data, trends, and future projections intended to help the City of Richmond prepare its Richmond 300 Plan.

While producing a master plan requires consideration of many facts, trends and projections contained in this report, the results of this initial analysis are highlighted below as critical for the 2037 Master Plan:

1. **POPULATION GROWTH**: The population of Richmond was estimated by the U.S. Census Bureau to be 220,289 in 2015, resulting in an annual growth rate of 0.76% from 2000 to 2015.

2. **POPULATION PROJECTIONS:** A 2037 population of 300,000 will result if the growth rate of 2010 to 2015 continues. This future population also results from Richmond growing at the projected rate of the metropolitan area. A 2037 population of 260,000 results from continuation of the 2000 to 2015 trends. A 2.5% annual growth rate yields 340,000 residents in 2037.

3. **SIGNIFICANT LAND AVAILABILITY:** The major factor affecting future development and population growth is availability of land. Richmond cannot physically expand its land area. Initial analysis of Richmond's vacant land and land with low improvement investment provides sufficient land for a wide range of development choices.

4. **FUTURE LAND SUPPLY AND DEMAND:** Land with potential for development over the next 20 years not constrained by environmental factors is approximately 5,100 acres. Land use demand with future development of increasing density is estimated to be between 1,800 to 3,500 acres, depending on population growth.

5. **CITY HOUSEHOLD INCOME GROWTH GREATER THAN SUBURBS:** From 2000 to 2014, the City of Richmond median household income increased at a greater rate than Chesterfield County, Henrico County, and the regional average. These rates are 33%, 24%, 25%, and 27% respectively. Also note that for this period the national consumer price index inflation estimate was 37.5%.

6. **INCOME GROWTH YET CONCENTRATED POVERTY:** Richmond median household income has shown strong growth in Downtown, nearby neighborhoods, and other census tracts, yet pockets of concentrated poverty remain.

7. **SIGNIFICANT POVERTY INCREASE:** The poverty rate of the population increased from 17.4% to 25.5% from 2000 to 2014.

8. **GROCERY STORE MARKET:** Analysis of supply and demand for convenience retail goods in six Richmond neighborhoods showed none of the neighborhoods could support a neighborhood supermarket of average size (44,094 square feet) without additional housing density, but with existing households the Brookland Park, Church Hill/Nine Mile Road, Hull Street, and Midlothian Turnpike areas could support a smaller supermarket of 25,000 square feet.

   With 1,000 more households, a 44,094 square foot supermarket would be feasible in the Midlothian Turnpike trade area and almost feasible in the Brookland Park and Church Hill/Nine Mile Road areas. By adding 5,000 households even the least viable trade areas could support an average-sized supermarket.

9. **EDUCATION, POVERTY, UNEMPLOYMENT CORRELATED:** Low education attainment, high household poverty, and high unemployment are highly correlated and concentrated in specific geographic areas.

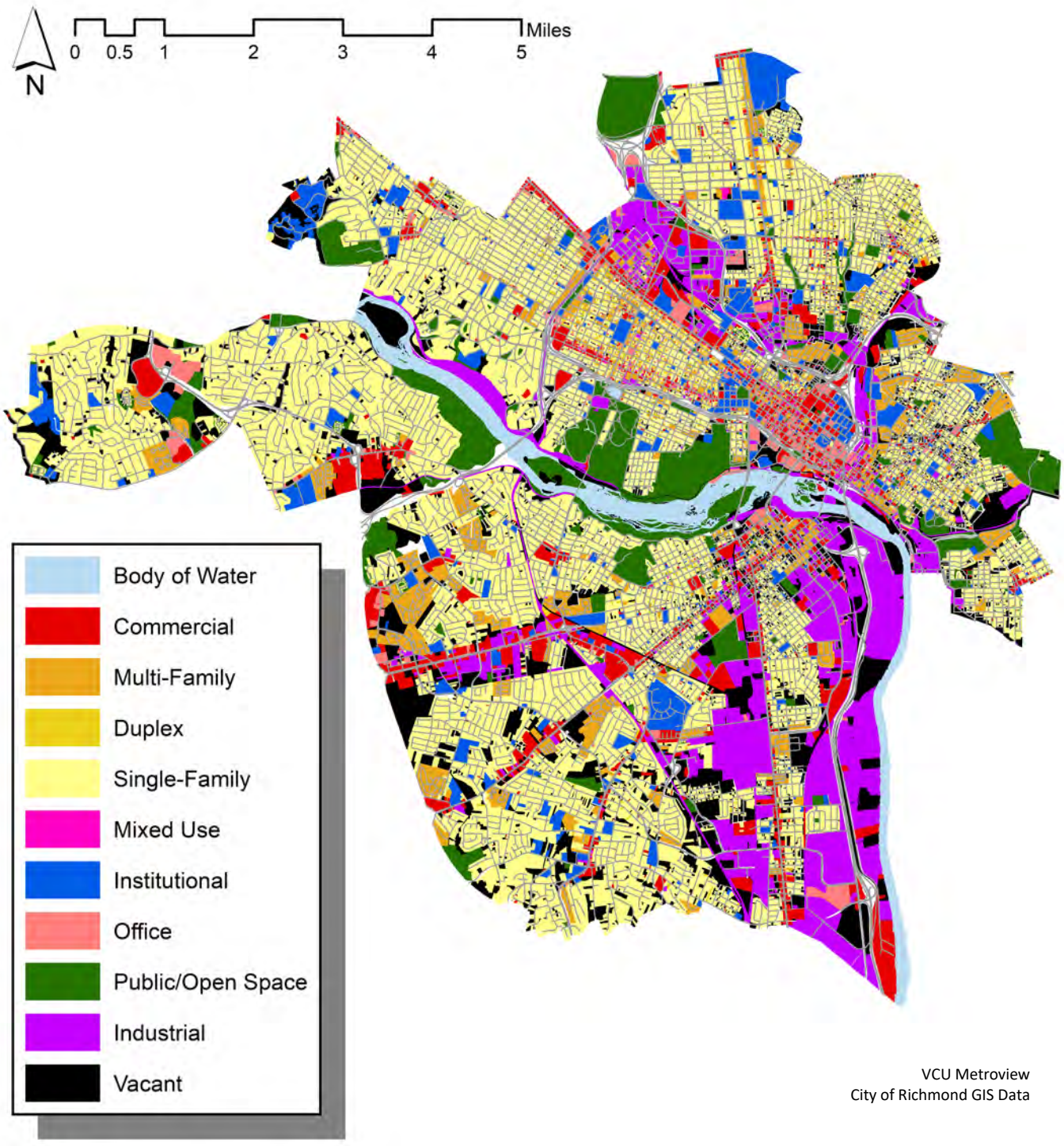
NOTE ON DATA ACCURACY: A major source used for this report is the U.S. Census Bureau. Historic data is usually reported from the census taken and reported every ten years from data collected from the entire population. Recently, the Census Bureau has utilized annual sample surveys to indicate data representative of a larger population. The 2014 and 2015 data in this report is drawn from the annual American Community Survey that follows statistically valid survey techniques. In addition, more detailed data is derived from the five years of 2010-2014 surveys. However, this data has sampling errors, so these numbers are estimates and relying on exact numbers from survey data should be avoided.

- CHAPTER 1 -

EXISTING LAND USE

Existing Land Use

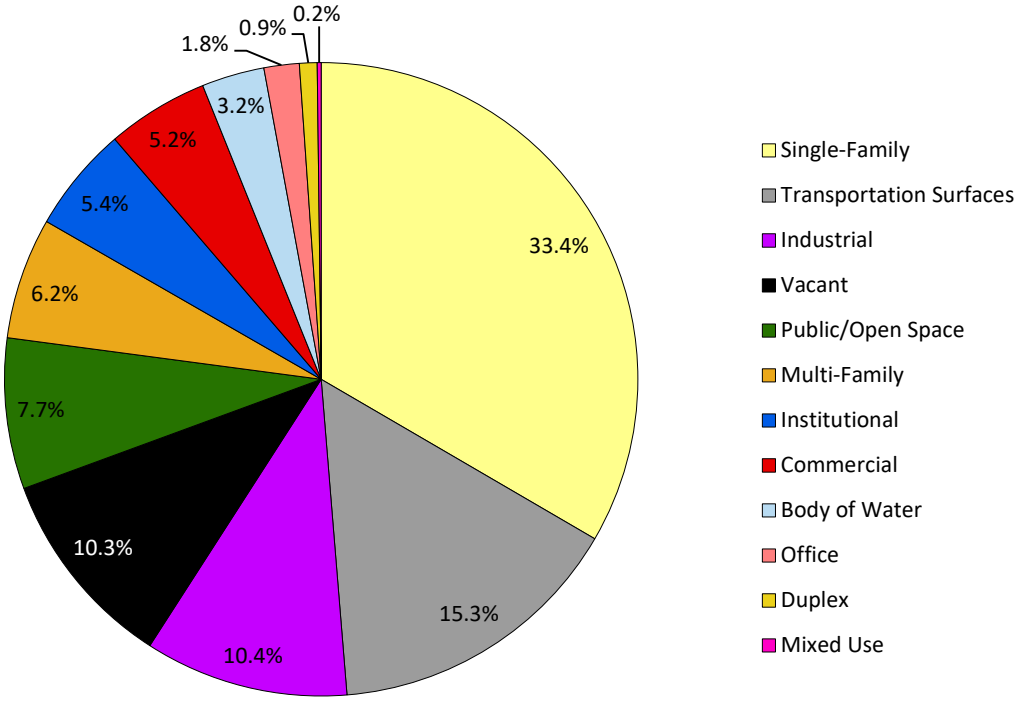
Map 1 - Existing Land Use (2016)



VCU Metroview
City of Richmond GIS Data

Existing Land Use Allocation

Fig. 1 - Land Area by Land Use Type in the City of Richmond



VCU Metroview
City of Richmond GIS Data

Approximately 33% of the land within the city of Richmond is currently being used as single-family residential. Transportation surfaces account for about 15% of the land within the city. The fourth largest portion of land is currently vacant. Finally, mixed use land accounts for only 0.2% of total land in the city.

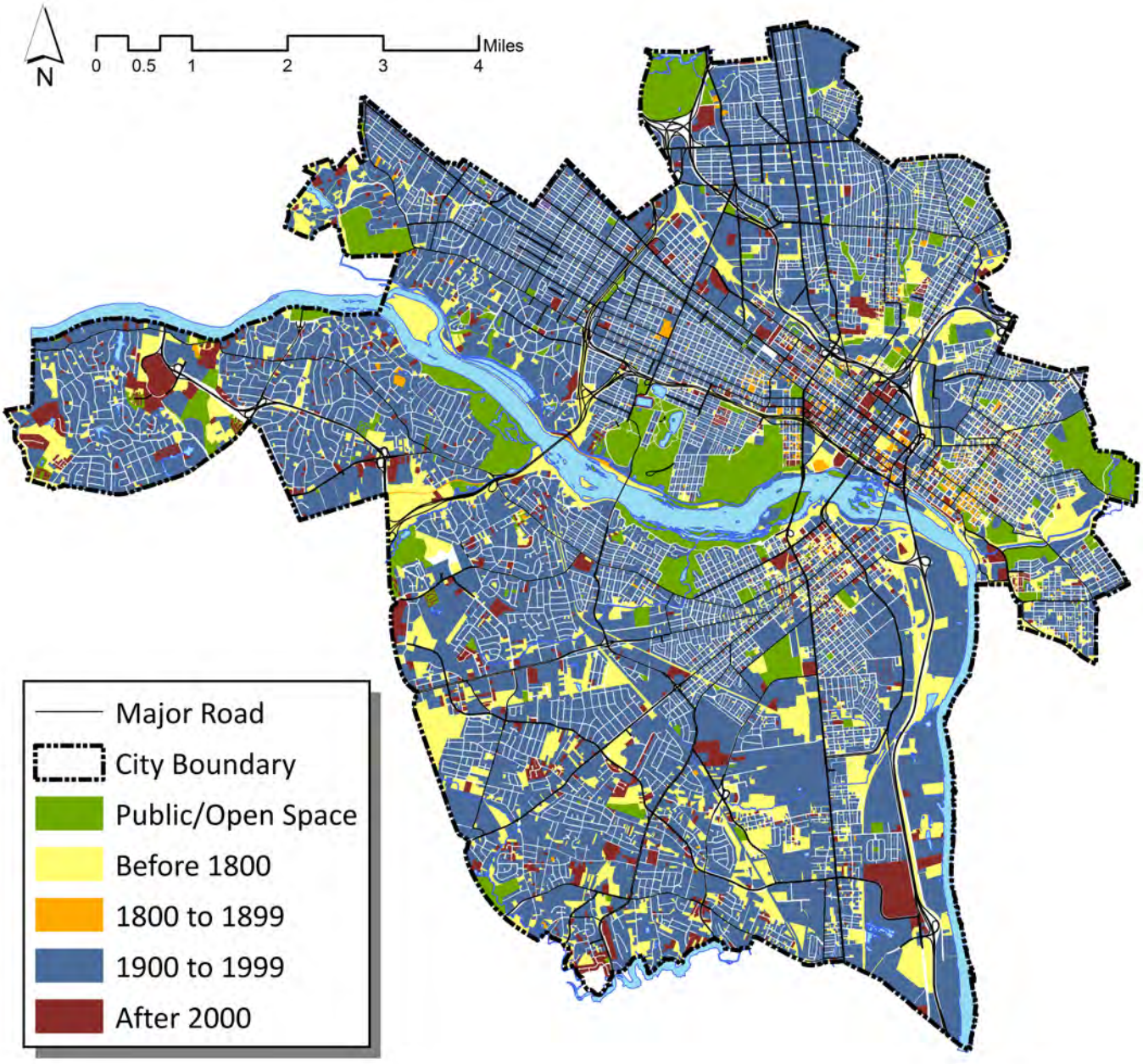
Tab. 1 - Land Area by Land Use Type in the City of Richmond

Land Use	Land Area (Acres)	Percent Composition
Single-Family	13,090.34	33.4%
Transportation Surfaces	6,002.46	15.3%
Industrial	4,066.38	10.4%
Vacant	4,035.87	10.3%
Public/Open Space	3,006.23	7.7%
Multi-Family	2,448.83	6.2%
Institutional	2,122.63	5.4%
Commercial	2,043.99	5.2%
Body of Water	1,263.30	3.2%
Office	706.17	1.8%
Duplex	345.89	0.9%
Mixed Use	68.66	0.2%
Total	**39,200.75**	**100.0%**

VCU Metroview
City of Richmond GIS Data

Historic Development Pattern

Map 2 - Parcel Development by Year (1720-2016)



VCU Metroview
City of Richmond GIS Data

-CHAPTER 2 -

DEMOGRAPHIC STUDY

Population Trends

Fig. 2 - Population Change (1950-2015)

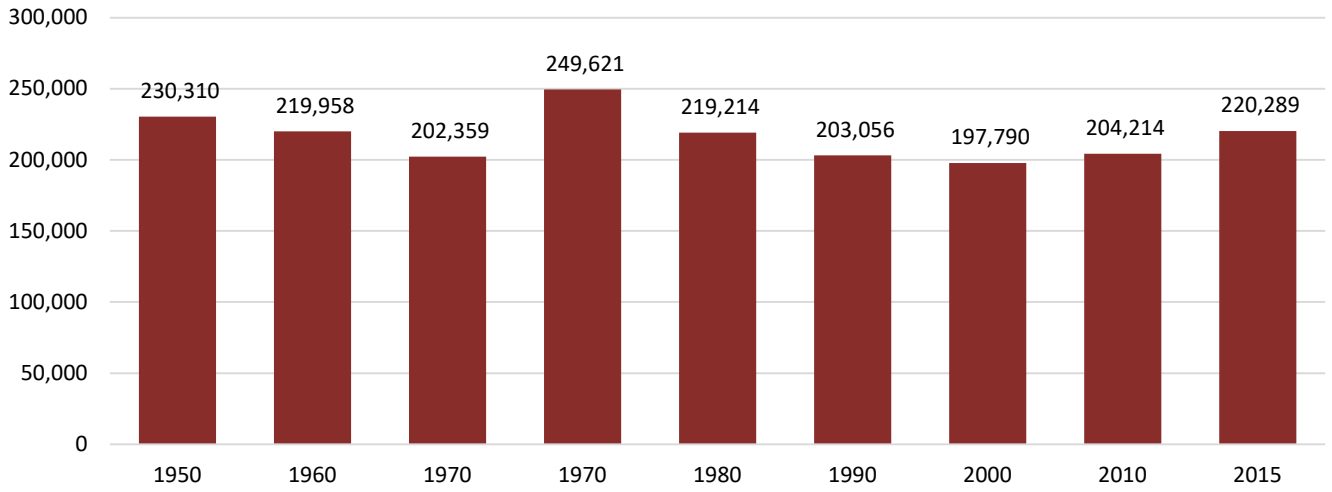
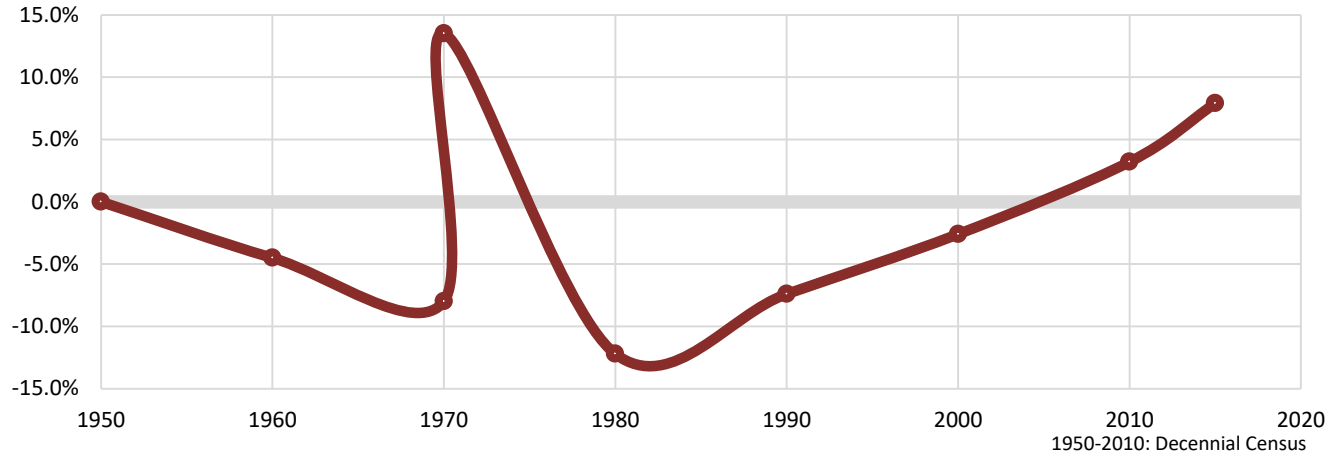


Fig. 3 - Population Percent Change (1950-2015)



1950-2010: Decennial Census
2015: American Community Survey
1970* = Post annexation value

Tab. 2 - Total Population and Population Percentage Change (1950-2015)

Year	1950	1960	1970	1970*	1980	1990	2000	2010	2015
Population	230,310	219,958	202,359	249,621	219,214	203,056	197,790	204,214	220,289
% Change	0.0%	-4.5%	-8.0%	13.5%	-12.2%	-7.4%	-2.6%	3.2%	7.9%

1950-2010: Decennial Census
2015: American Community Survey
* Post annexation value

Population Age Distribution

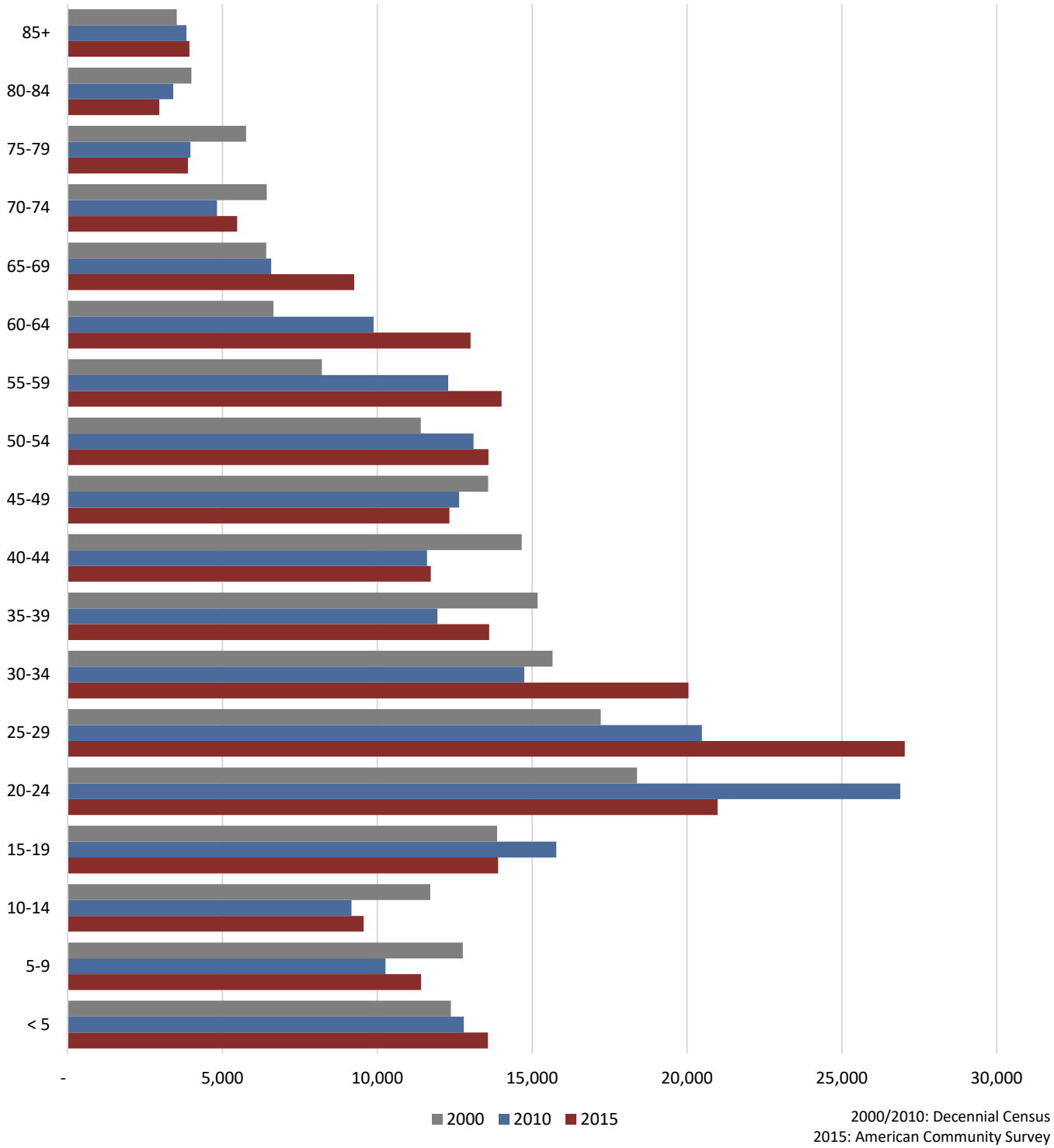
The largest population gains from 2000 to 2010 were in the 20 to 24 and 55 to 64 cohorts. From 2010 - 2015, the 25 to 34-year-old cohorts increased by 31% while the 20 to 24 year cohort declined by 20%. Also, in this latest five-year period, the 55 to 74 cohort increased substantially while ages 0 to 9 showed a smaller gain.

Tab. 3 - Population Age Distribution (2000-2015)

Cohort	2000		2010		2015	
85+	3,522	1.8%	3,839	1.9%	3,934	1.8%
80-84	3,999	2.0%	3,412	1.7%	2,961	1.3%
75-79	5,765	2.9%	3,968	1.9%	3,887	1.8%
70-74	6,430	3.3%	4,822	2.4%	5,472	2.5%
65-69	6,413	3.2%	6,578	3.2%	9,252	4.2%
60-64	6,646	3.4%	9,878	4.8%	13,007	5.9%
55-59	8,208	4.1%	12,285	6.0%	14,015	6.4%
50-54	11,408	5.8%	13,111	6.4%	13,588	6.2%
45-49	13,577	6.9%	12,645	6.2%	12,325	5.6%
40-44	14,663	7.4%	11,603	5.7%	11,723	5.3%
35-39	15,178	7.7%	11,942	5.8%	13,616	6.2%
30-34	15,657	7.9%	14,743	7.2%	20,045	9.1%
25-29	17,214	8.7%	20,483	10.0%	27,030	12.3%
20-24	18,386	9.3%	26,889	13.2%	20,988	9.5%
15-19	13,870	7.0%	15,782	7.7%	13,901	6.3%
10-14	11,713	5.9%	9,170	4.5%	9,559	4.3%
5-9	12,765	6.5%	10,266	5.0%	11,411	5.2%
< 5	12,376	6.3%	12,798	6.3%	13,575	6.2%
Total	**197,790**		**204,214**		**220,289**	

2000/2010: Decennial Census
2015: American Community Survey

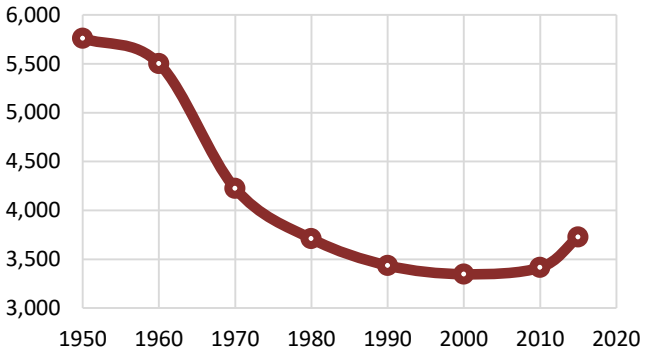
Fig. 4 - Population Age Distribution (2000-2015)



Population Density

Density in Richmond today is well below the levels in 1950, when the city contained 5,761 people per square mile. From 1960 to 2000 it fell to 3,347 people per square mile, the lowest recorded density. Since 2000 there has been a slight rise and in 2015 Richmond contained 3,727 people per square mile.

Fig. 5 - Density per Square Mile (1950-2015)



1950-2010: Decennial Census
2015: American Community Survey

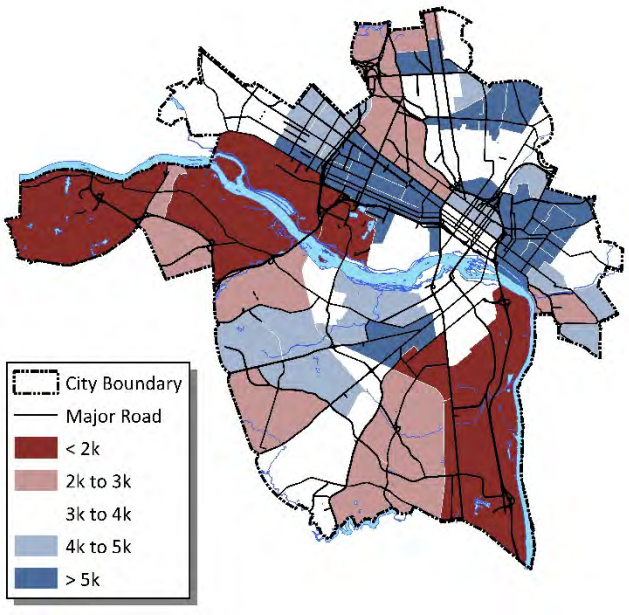
Tab. 4 - Population Density (1950-2015)

Year	1950	1960	1970	1980	1990	2000	2010	2015
Total Population	230,310	219,958	249,621	219,214	203,056	197,790	201,828	220,289
Total Area (sq miles)	40.0	40.0	59.1	59.1	59.1	59.1	59.1	59.1
Population Density per sq mi	**5,758**	**5,491**	**4,224**	**3,709**	**3,436**	**3,347**	**3,415**	**3,727**

1950-2010: Decennial Census
2015: American Community Survey

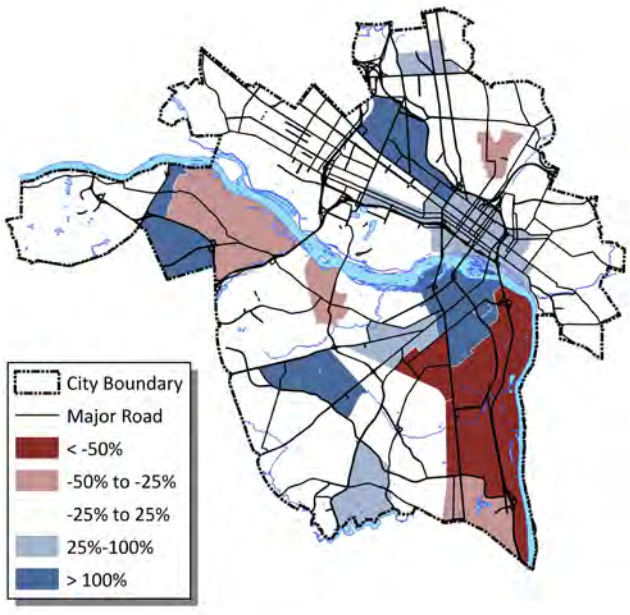
The areas of highest population density in 2014 were in The Fan, Church Hill, and Highland Park areas. Areas of lowest density include Southern Jeff Davis Highway and the western areas of the city.

Map 3 - Population Density per Square Mile (2014)



2014: American Community Survey

Map 4 - Population Change per Square Mile (2000 - 2014)



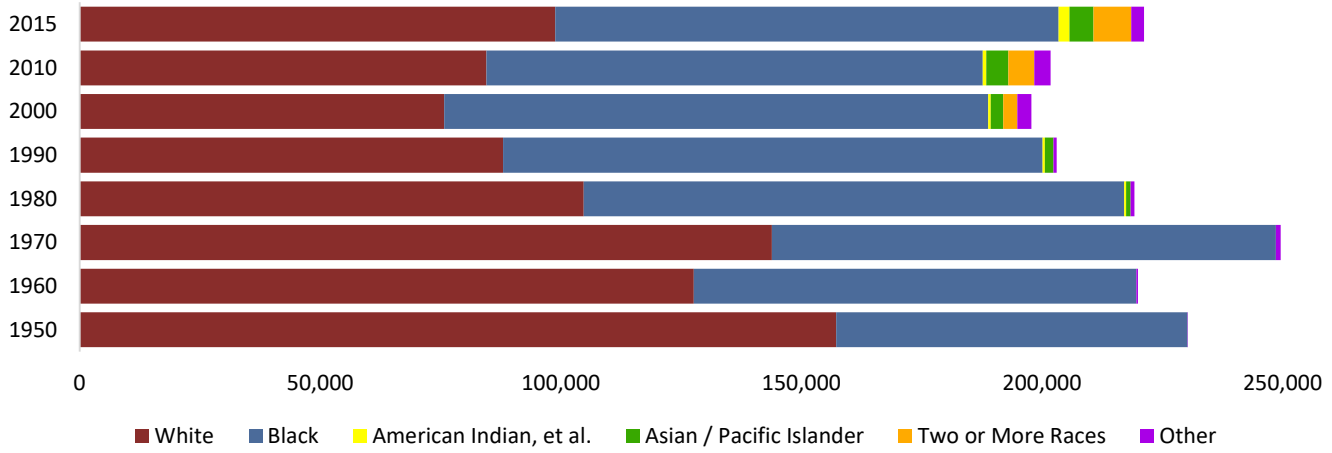
2000: Decennial Census
2014: American Community Survey

Racial Composition

Richmond's population grew between 2010 and 2014 across nearly all racial definitions except for those who self-identify as other. Black and white populations, as they have historically, make up the largest percentages of the population at 47.4% and 44.9%, respectively.

While growth has been the norm across most racial groups since 2010, looking back to 2000 shows a more complex trend. Between 2000 and 2010, the black population fell by nearly 10,000 and, while it gained nearly 1,500 in the ensuing four years, it shows a net loss since 2000. In contrast, the white population has increased steadily since 2000.

Fig. 5 - Racial Composition (1950-2015)



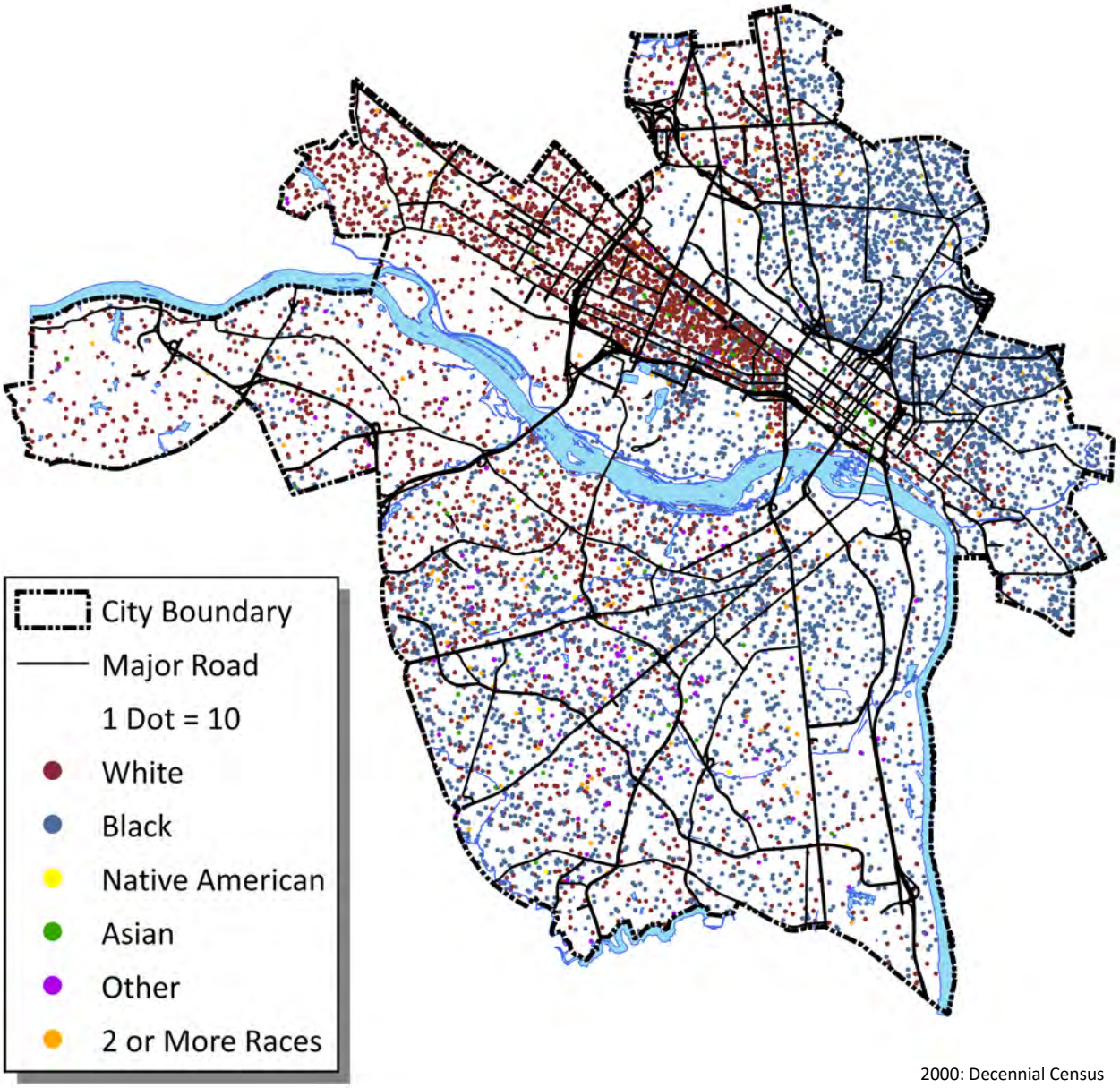
1950-2010: Decennial Census
2015: American Community Survey
* Category not recorded in source

Tab. 5 - Racial Composition (1950-2015)

	1950	1960	1970	1980	1990	2000	2010	2015
White	157,228	127,627	143,842	104,743	88,028	75,744	84,552	98,864
Black	72,996	91,972	104,737	112,357	112,122	113,108	103,148	104,583
American Indian, et al.	*	*	*	357	463	479	725	2,276
Asian / Pacific Islander	*	*	*	976	1,787	2,628	4,569	4,978
Other	86	359	1,042	781	656	2,948	3,427	2,639
Two or More Races	*	*	*	*	*	2,883	5,377	7,853
TOTAL	**230,310**	**219,958**	**249,621**	**219,214**	**203,056**	**197,790**	**201,228**	**220,289**

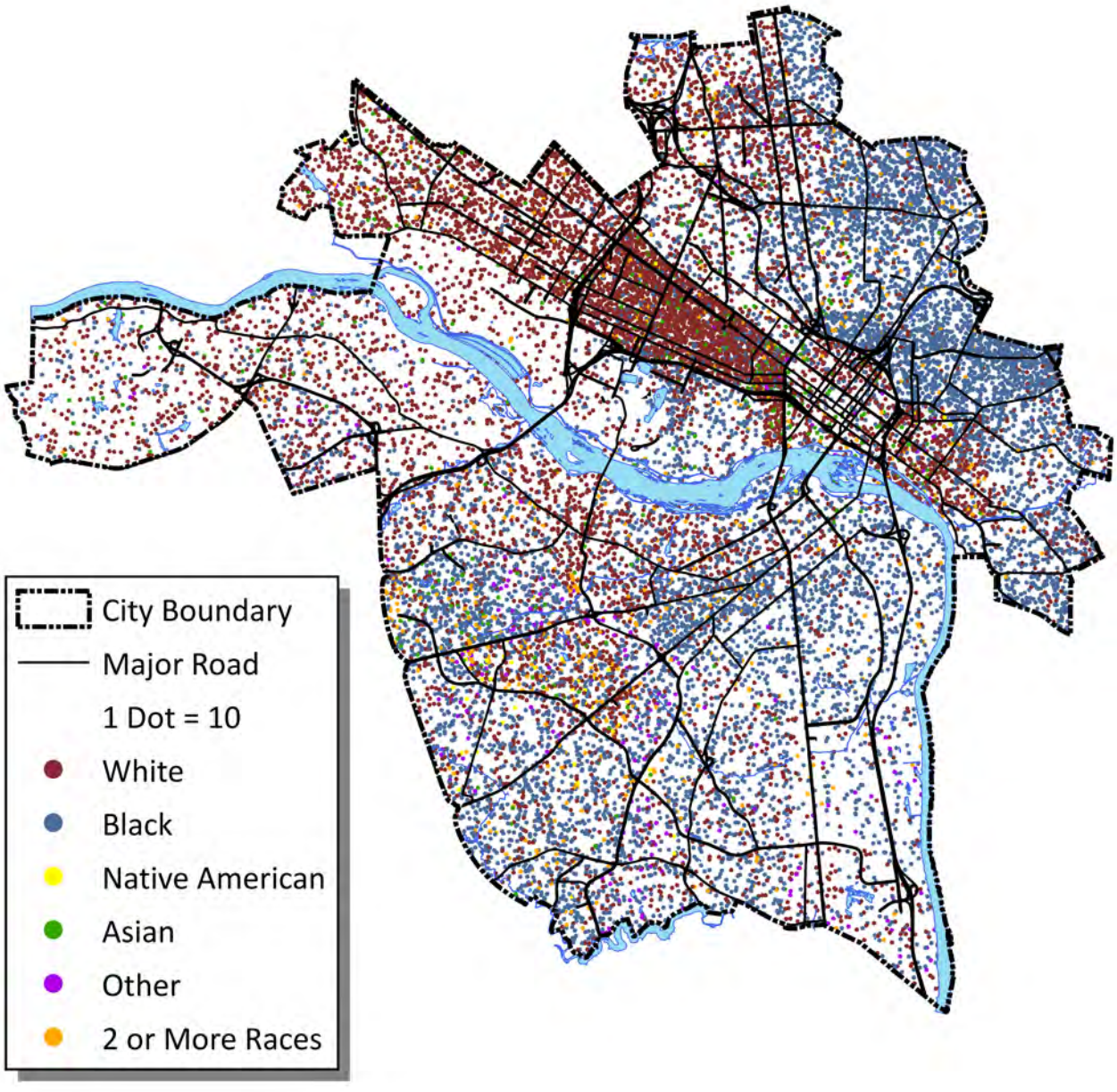
1950-2010: Decennial Census
2015: American Community Survey
* Category not recorded in source

Map 5 - Racial Distribution (2000)



2000: Decennial Census

Map 6 - Racial Distribution (2015)

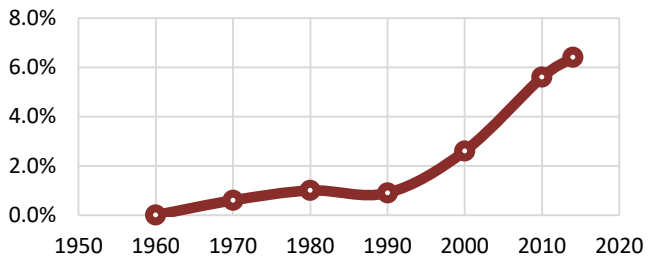


2015: American Community Survey

Hispanic Trend

In 1990, 0.9% of Richmond's population was of Hispanic origin. Since 1990 this has increased to 6.4% of the 2014 population.

Population Percentage of Hispanic Origin (1950-2014)



1950-2010: Decennial Census
2014: American Community Survey
* Data not recorded in 1950 census

Tab. 6 - Percent Population of Hispanic Origin (1990-2014)

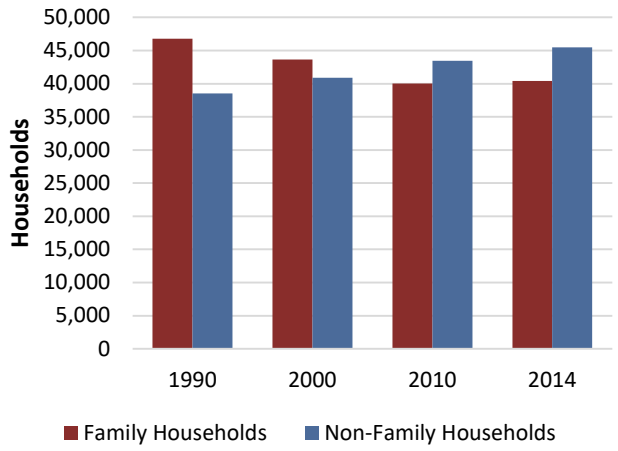
	1950	1960	1970	1980	1990	2000	2010	2014
Population Percentage of Hispanic Origin	*	0.0%	0.6%	1.0%	0.9%	2.6%	5.6%	6.4%

1950-2010: Decennial Census
2014: American Community Survey
* Data not recorded in 1950 census

Household Type

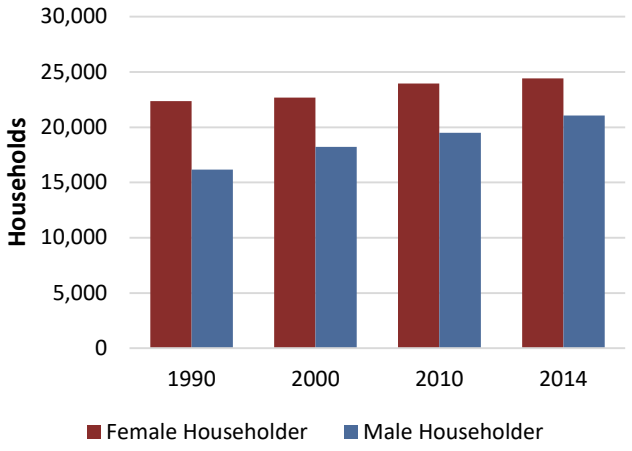
Family households (married couples and single parent with children) have been in decline since 1990, which has led to an increase in non-family households. Single-parent family households remain relatively steady and the primary portion of the drop in family households occurs in the married-couple family. While non-family households steadily rise in the absence of family households, the growth of male householder non-family households outpaces those of female householder, non-family households. Although the growth of male householder non-family households is higher, the total number of female householder non-family households is larger.

Fig. 7 - Family vs Non-Family Households (1990-2014)



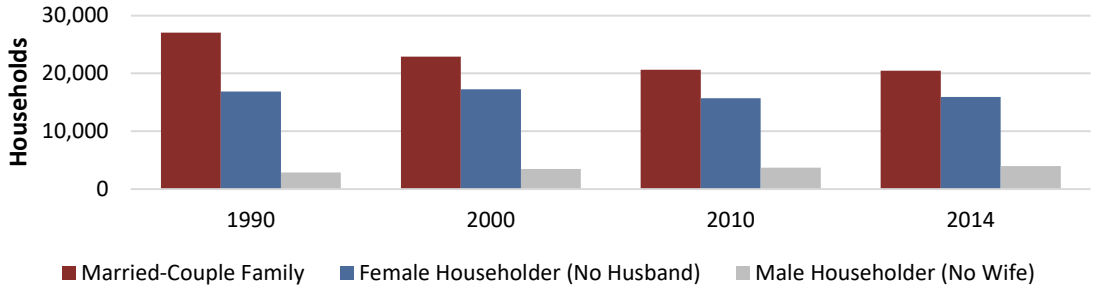
1990-2010: Decennial Census
2014: American Community Survey

Fig. 8 - Non-Family Households by Gender (1990-2014)



1990-2010: Decennial Census
2014: American Community Survey

Fig. 9 - Family Households by Type (1990-2014)



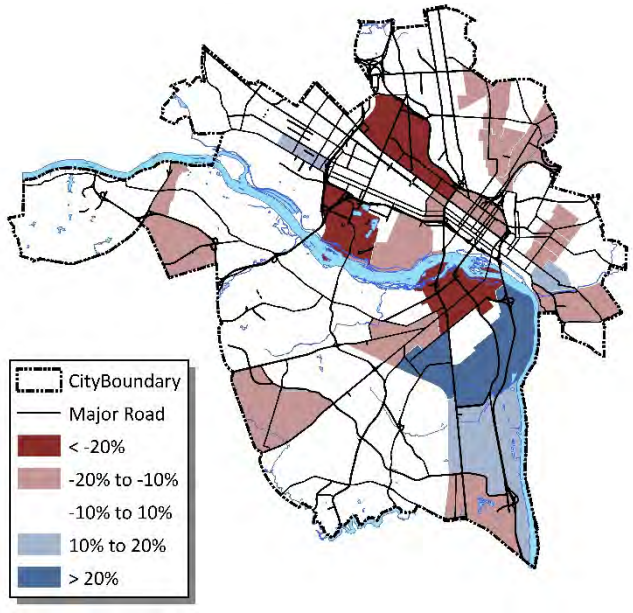
1990-2010: Decennial Census
2014: American Community Survey

Tab. 7 - Household Type (1990-2014)

	1990		2000		2010		2014	
Family households:	46,795	54.80%	43,649	51.60%	40,047	48.00%	40,413	47.00%
Married-couple family:	27,061	31.70%	22,898	27.10%	20,625	24.70%	20,451	23.80%
Other family:	19,734	23.10%	20,751	24.50%	19,422	23.30%	19,962	23.20%
Male householder, with children:	*2,875*	*3.40%*	*3,482*	*4.10%*	*3,693*	*4.40%*	*4,010*	*4.70%*
Female householder, with children:	*16,859*	*19.80%*	*17,269*	*20.40%*	*15,729*	*18.80%*	*15,952*	*18.60%*
Non-family households:	38,542	45.20%	40,900	48.40%	43,451	52.00%	45,500	53.00%
Male householder	16,176	19.00%	18,213	21.50%	19,484	23.30%	21,070	24.50%
Female householder	22,366	26.20%	22,687	26.80%	23,967	28.70%	24,430	28.40%
Total Households	**85,337**		**84,549**		**83,498**		**85,913**	

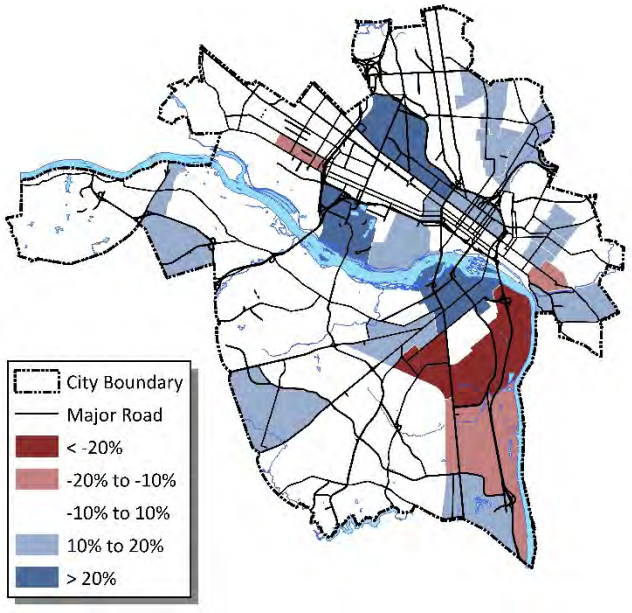
1990-2010: Decennial Census
2014: American Community Survey

Map 7 - Family Household Change (2000-2014)



2000: Decennial Census
2014: American Community Survey

Map 8 - Non-Family Household Change (2000-2014)



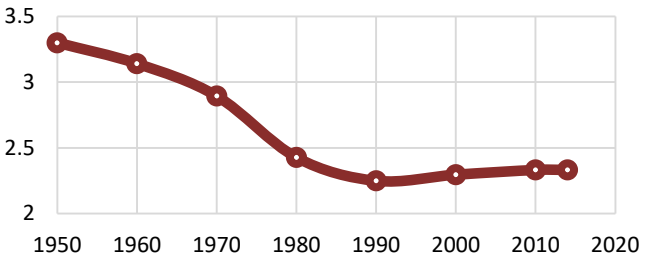
2000: Decennial Census
2014: American Community Survey

The non-family households have increased by over 20% in Manchester, Maymont, Jackson Ward, and Scott's Addition. Family households as a percentage of the total did increase along the census tracts surrounding the southern Route 1 corridor.

Average Household Size

Household size in Richmond saw a steep decline between 1950 and 1990. Over this forty year period average household size dropped 0.9, almost an entire household member. Household size increased by 0.1 from 1990 to 2000 and has held steady at 2.3 members per household since then.

Fig. 10 - Average Household Size (1950-2014)



1950-2010: Decennial Census
2014: American Community Survey

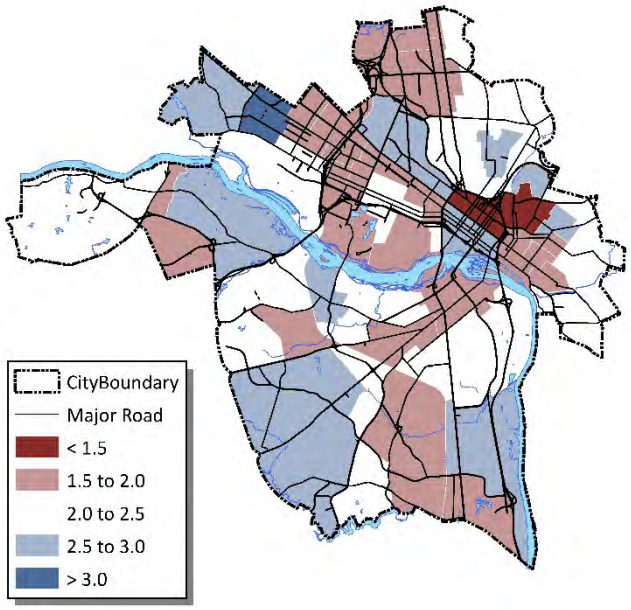
Average household sizes show correlation with changes in family households, particularly in the Manchester, Jackson Ward, Scott's Addition, and other areas where family households are declining. Growth in average household sizes has increased where family households grew in the southern portion of the city, as well as in select areas to the northwest.

Tab. 8 - Average Household Size (1950-2014)

	1950	1960	1970	1980	1990	2000	2010	2014
Average Household Size	3.3	3.1	2.9	2.4	2.2	2.3	2.3	2.3

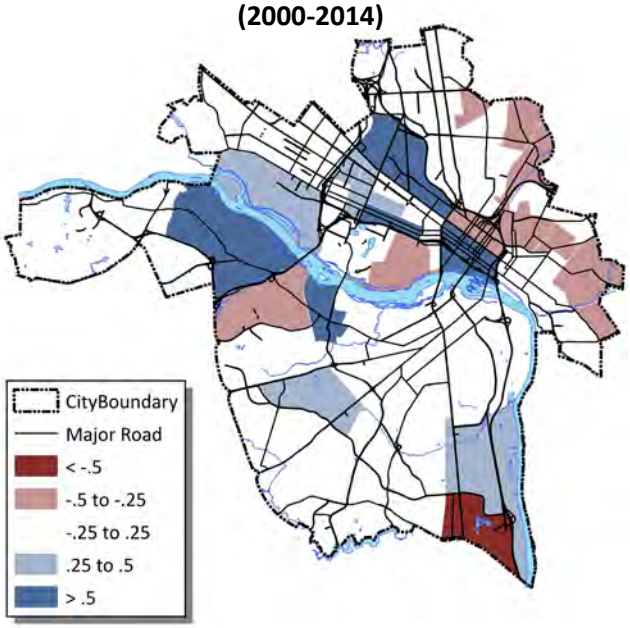
1950-2010: Decennial Census
2014: American Community Survey

Map 9 - Average Household Size (2014)



2014: American Community Survey

Map 10 - Household Size Change by Person (2000-2014)

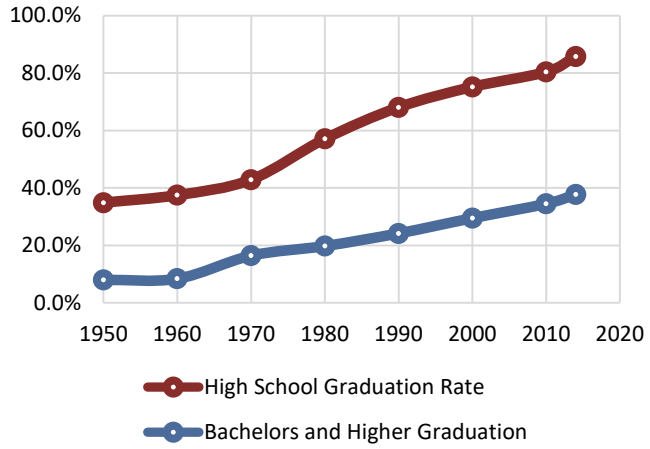


2000: Decennial Census
2014: American Community Survey

Educational Attainment

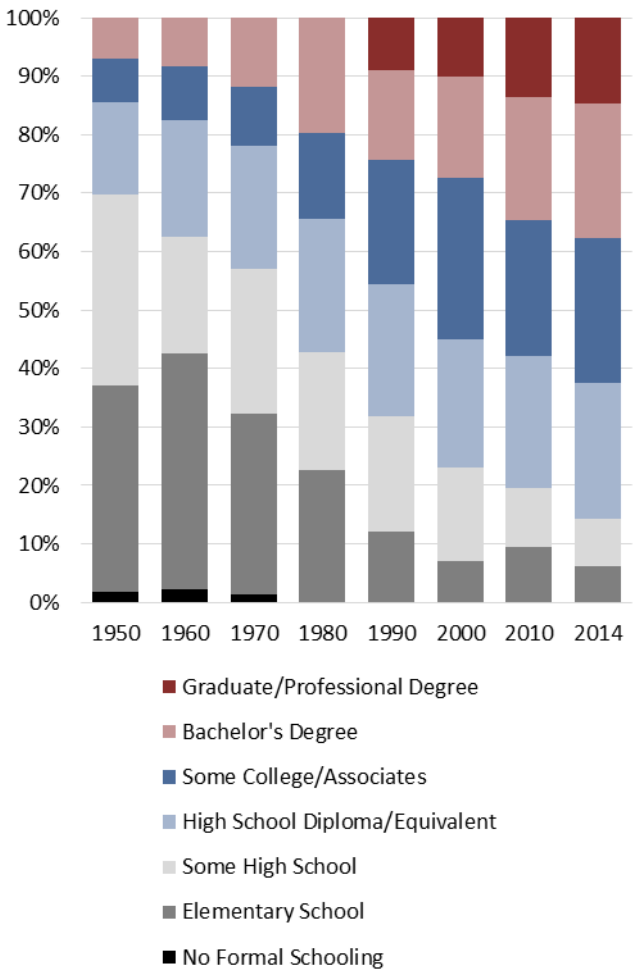
Education attainment rates across all levels have steadily increased since 1970. Between 2000 and 2014 the high school graduation rate increased by 5.4% and, by 2014, 85.8% of Richmond's population were high school graduates. Those with degrees beyond high school have also increased. From 2000 to 2014 those with bachelor's degrees or higher increased 3.2% and accounted for 37.7% of the population.

Fig. 12 - Graduation Rates for High School + and Bachelors + (1950-2014)



1950-2010: Decennial Census
2014: American Community Survey

Fig. 11 - Highest Education Attained by Population Over 25 Years Old (1950-2014)



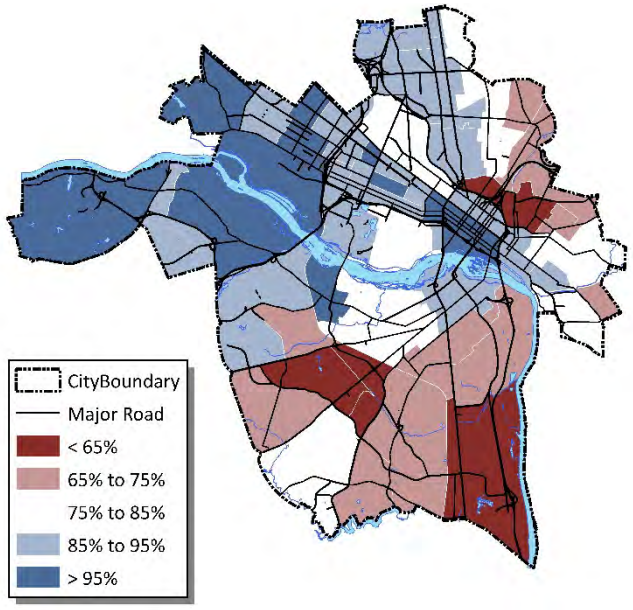
1950-2010: Decennial Census
2014: American Community Survey

Tab. 9 - Highest Education Attained by Population over 25 Years Old

Level	1950	1960	1970	1980	1990	2000	2010	2014
No Formal Schooling	3,035	2,900	1,836	0	0	0	0	0
Elementary School	60,275	53,148	43,576	30,537	16,418	9,859	12,165	9,427
Some High School	55,240	26,405	34,793	27,489	26,524	22,048	13,201	11,913
High School Diploma/Equivalent	26,950	26,185	29,292	30,872	30,256	30,314	29,119	35,106
Some College/Associates	12,810	12,101	14,432	19,682	28,755	38,134	30,155	37,014
Bachelor's Degree	11,875	11,124	16,472	26,770	20,649	23,951	27,049	34,707
Graduate/Professional Degree	*	*	*	*	11,974	13,910	17,601	21,884

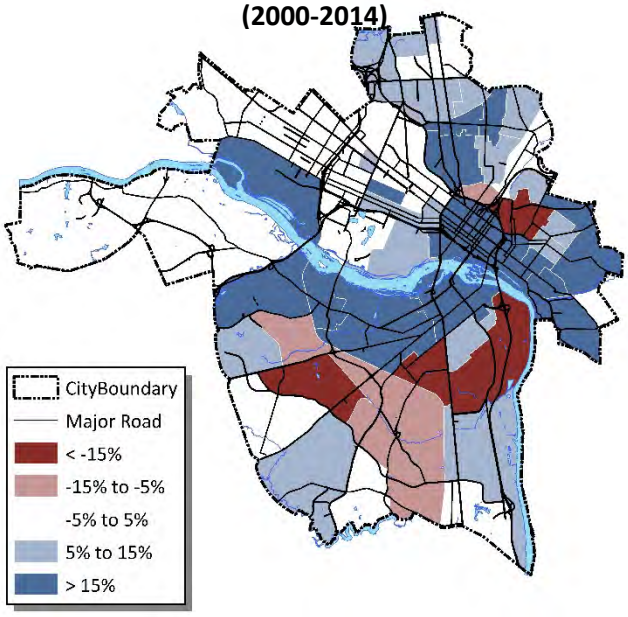
1950-2010: Decennial Census
2014: American Community Survey
* = Data not recorded in source

Map 11 - High School + Graduation Rate (2014)



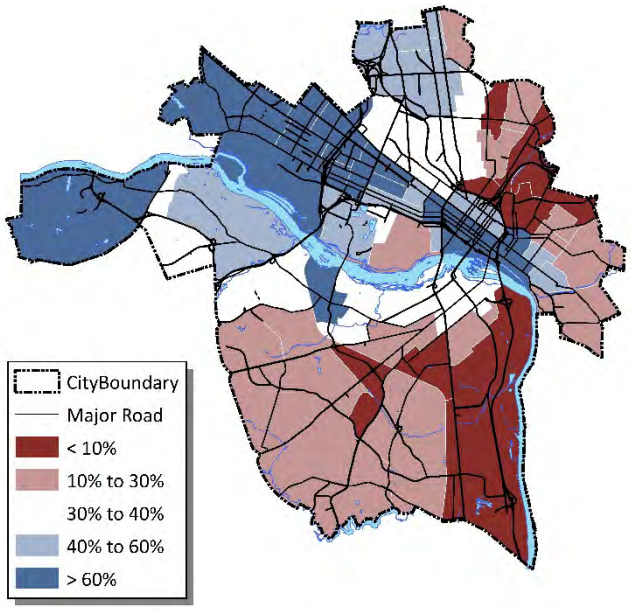
2014: American Community Survey

Map 12 - High School + Graduation Rate Change (2000-2014)



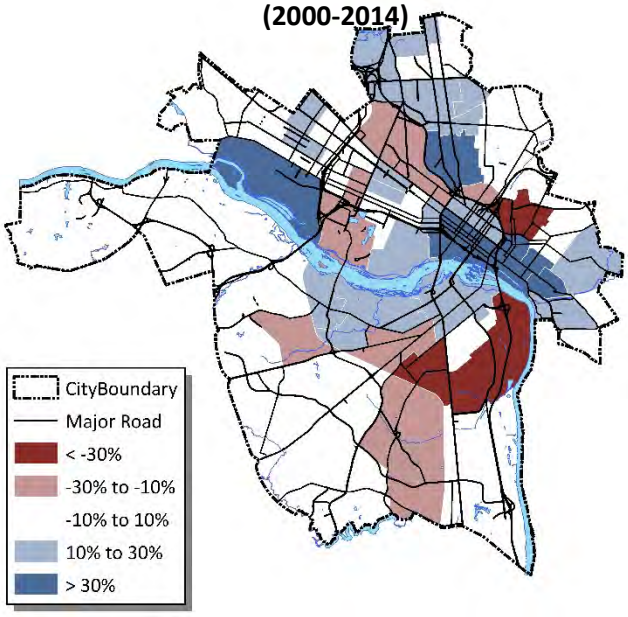
2000: Decennial Census
2014: American Community Survey

Map 13 - Bachelors + Graduation Rate (2014)



2014: American Community Survey

Map 14 - Bachelors + Graduation Rate Change (2000-2014)



2000: Decennial Census
2014: American Community Survey

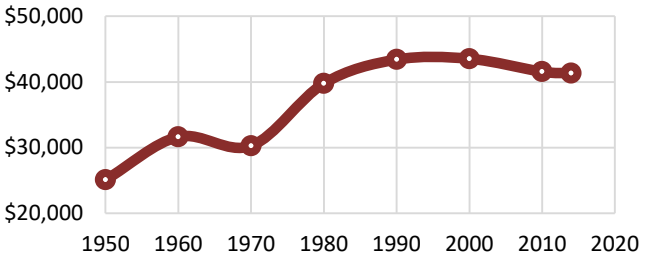
The lowest education graduation rates occurred in the southern portion of the city and to the northeast of downtown. With the exception of the census tract furthest to the southeast along Route 1, these underperforming areas show declining rates of graduation between 2000 and 2014.

High percentage changes in graduation rates for high school diplomas as well as bachelor's degrees are occurring in the Church Hill neighborhood. While rates in this area are low in 2014, the percentage change shows a trend in a positive direction.

Median Income

Richmond's household median income rates have risen considerably since 1970. However, when adjusted for inflation, a different story appears. Real incomes peaked in 2000, and decreased drastically before 2010. But the decrease slowed between the years of 2010 and 2014. Richmond's median household income has increased since 1960, but since 2000 real median household incomes have decreased.

Fig. 13 - Median Income Adjusted for 2016 Inflation (1950-2014)



1950-2010: Decennial Census
2014: American Community Survey

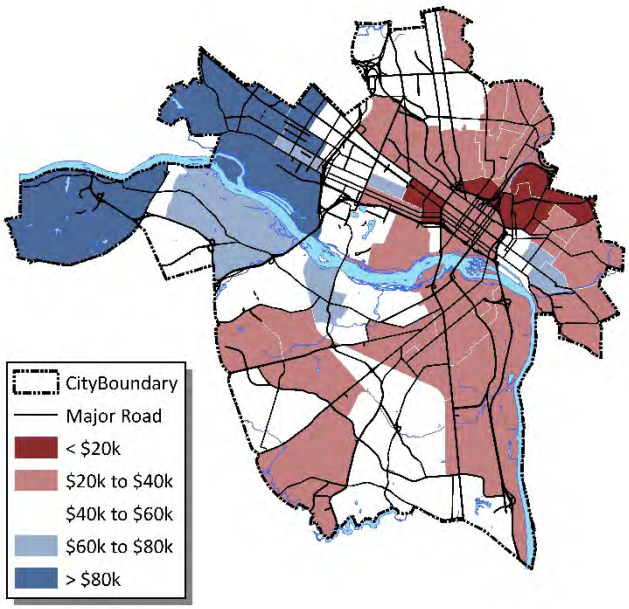
Tab. 9 - Median Household Incomes (1950–2014)

	1950	1960	1970	1980	1990	2000	2010	2014
Median Household Income Adjusted for Inflation (2014)	$25,098	$31,645	$30,268	$39,770	$43,400	$43,528	$41,544	$41,331
Median Household Income	$2,555	$3,889	$4,876	$13,606	$23,551	$31,121	$38,266	$41,331

1950-2010: Decennial Census
2014: American Community Survey

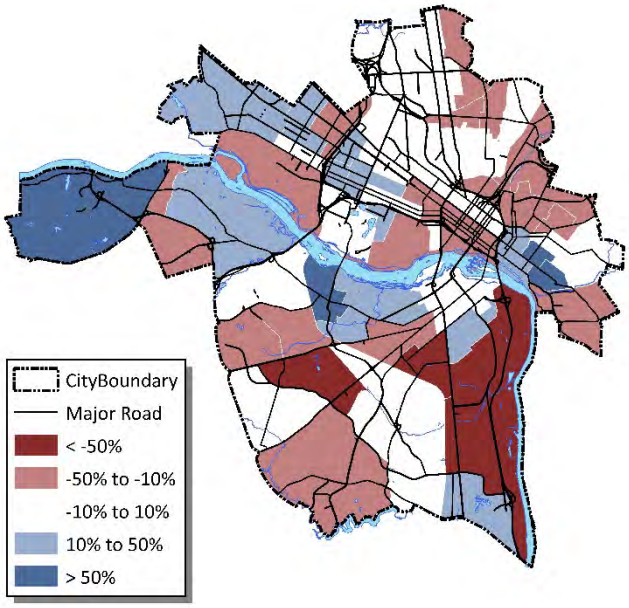
Lowest median household incomes exist in areas of concentrated poverty associated with housing projects to the northeast of downtown as well as immediately to the west. While these represent the lowest household median incomes in 2014, between 2000 and 2014 large areas along Route 1 saw losses of more than 50% of household median income.

Map 15 - Median Household Income (2014)



2014: American Community Survey

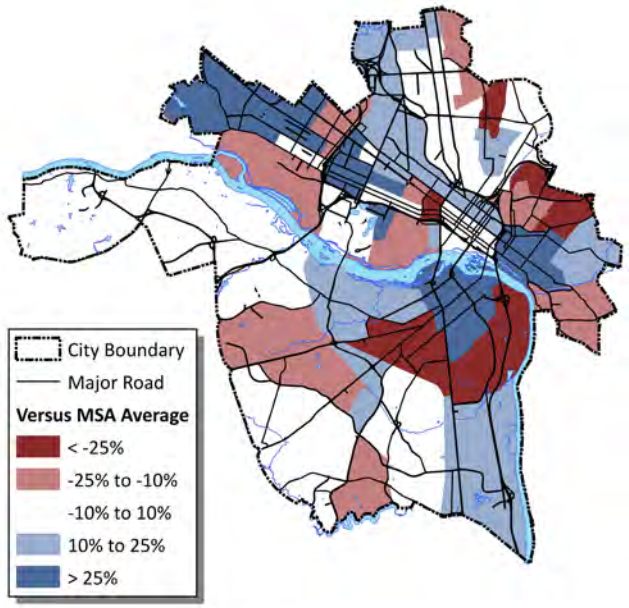
Map 16 - Median Household Income Change Adjusted for Inflation (2000-2014)



2000: Decennial Census
2014: American Community Survey

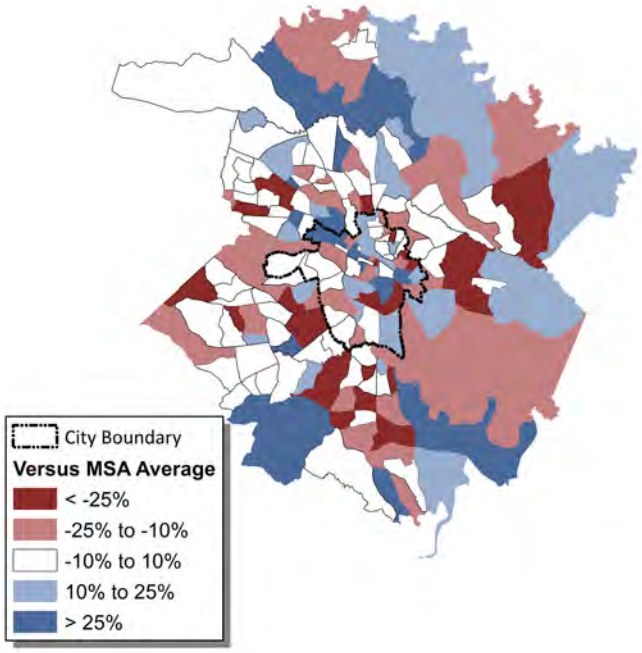
Median household income has risen faster in Richmond than in Chesterfield and Henrico Counties. The Richmond increase from 2000 to 2014 was 33% compared to 25% and 24%, respectively, for Henrico and Chesterfield. Significant income increase in the central areas of the city and significant lag in older suburban areas are apparent.

Map 17 - Richmond Median Household Income Change Compared to MSA Average (2000-2014)



2000: Decennial Census
2014: American Community Survey

Map 18 - MSA Median Household Income Change Compared to MSA Average (2000-2014)

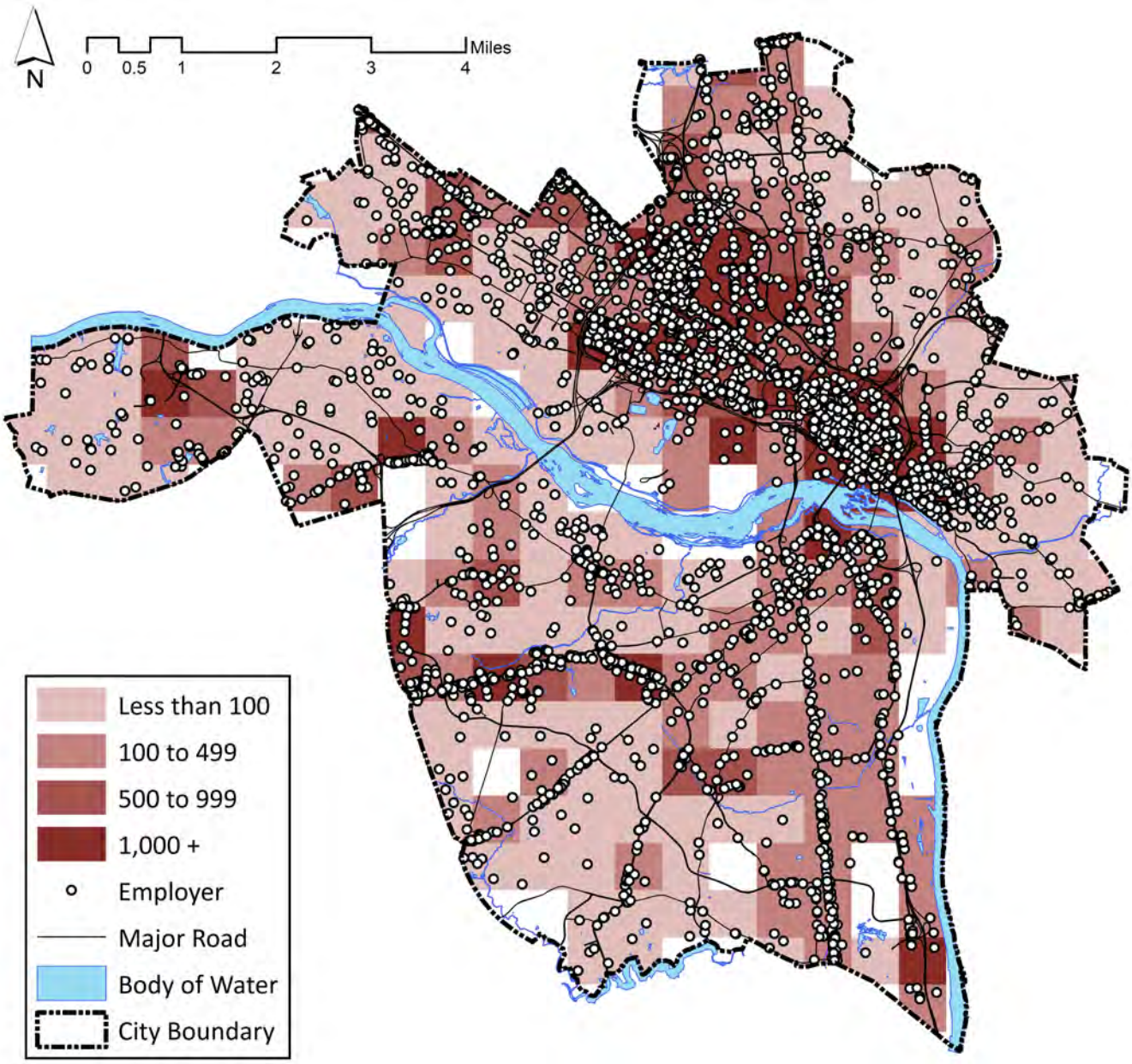


2000: Decennial Census
2014: American Community Survey

City Employment Profile and Location

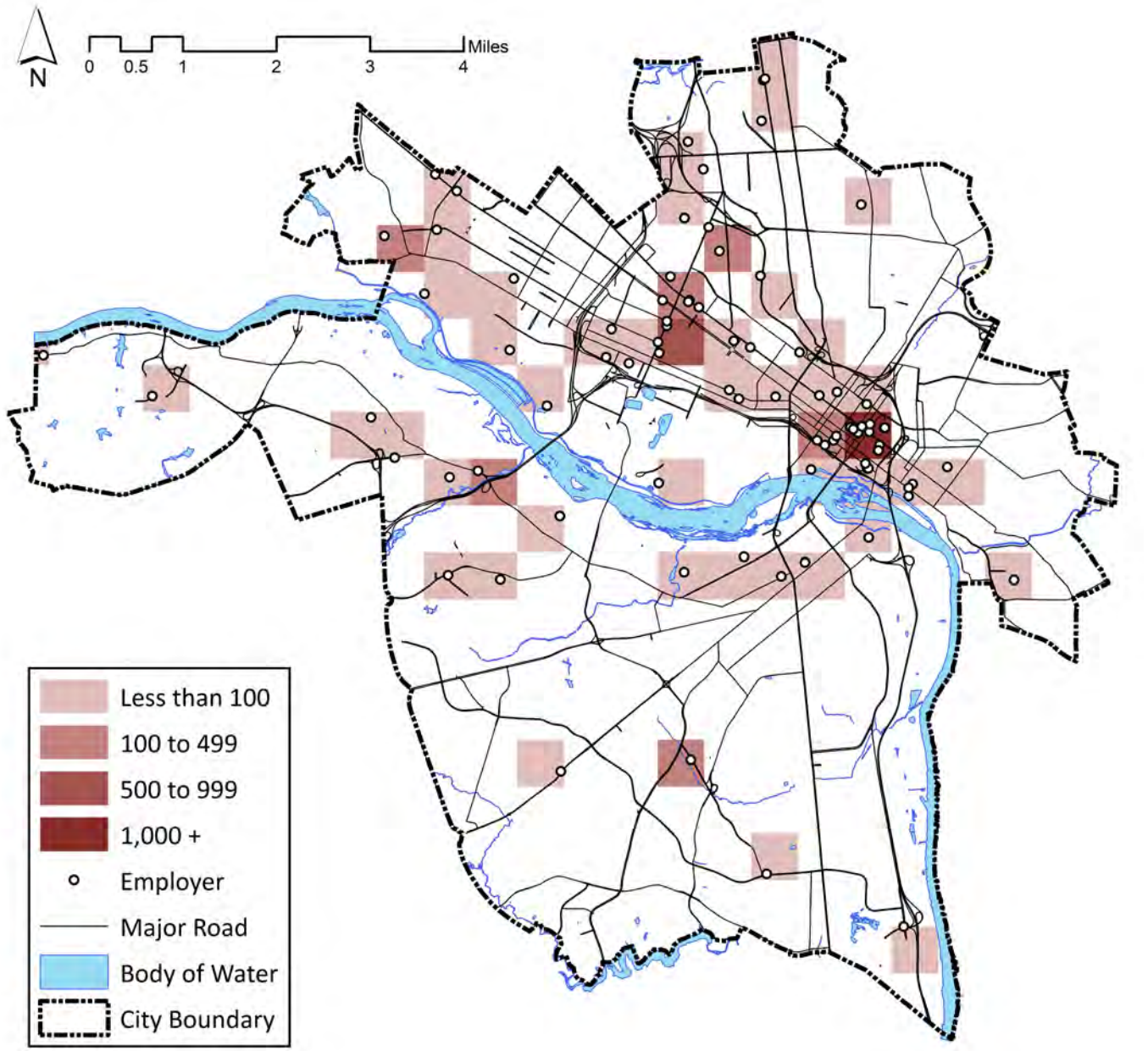
Information from the 2015 Quarterly Census of Employment and Wages was used to map centers of employment for a number of sectors. Employment is aggregated into half-mile grids to show the citywide patterns of employment. Analyzing these maps provides insight to where Richmond works. The North American Industrial Classification System (NAICS) is used for the employment categories on the maps below.

Map 19 - Accommodation and Dining Average Employment [NAICS #72] (2015)



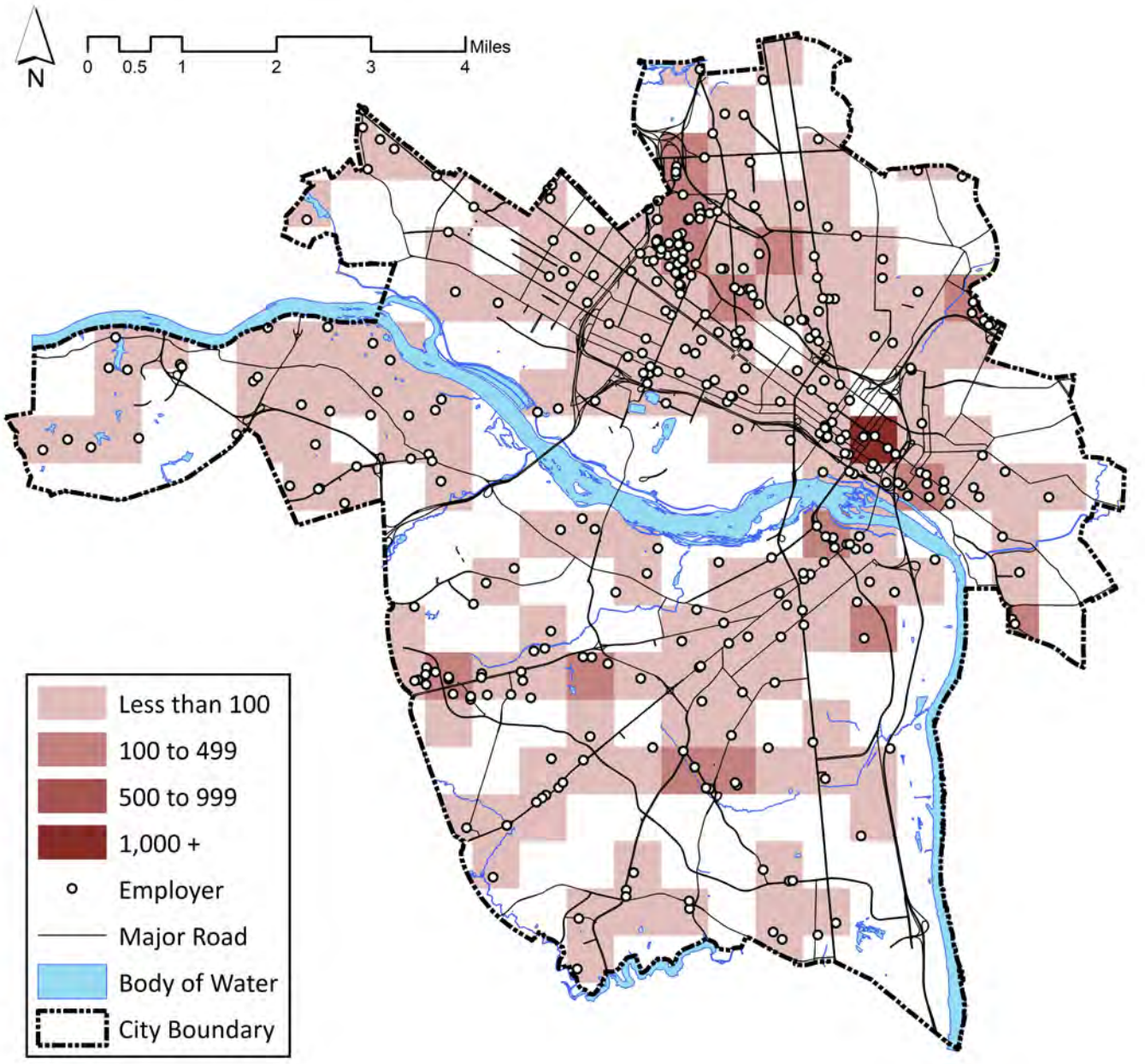
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 20 - Arts, Entertainment, and Recreation Average Employment [NAICS #71] (2015)



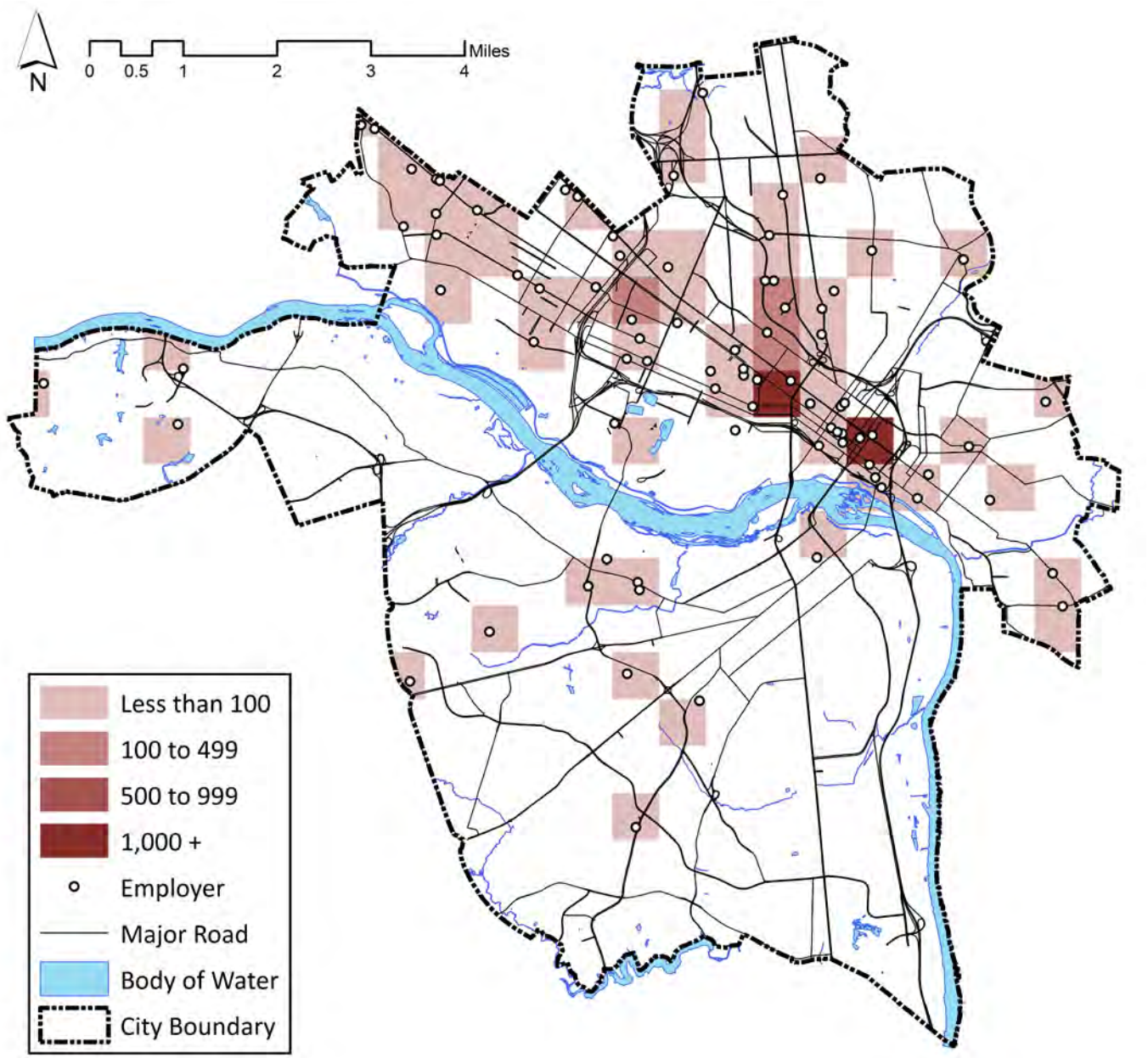
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 21 - Construction Average Employment [NAICS #23] (2015)



2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

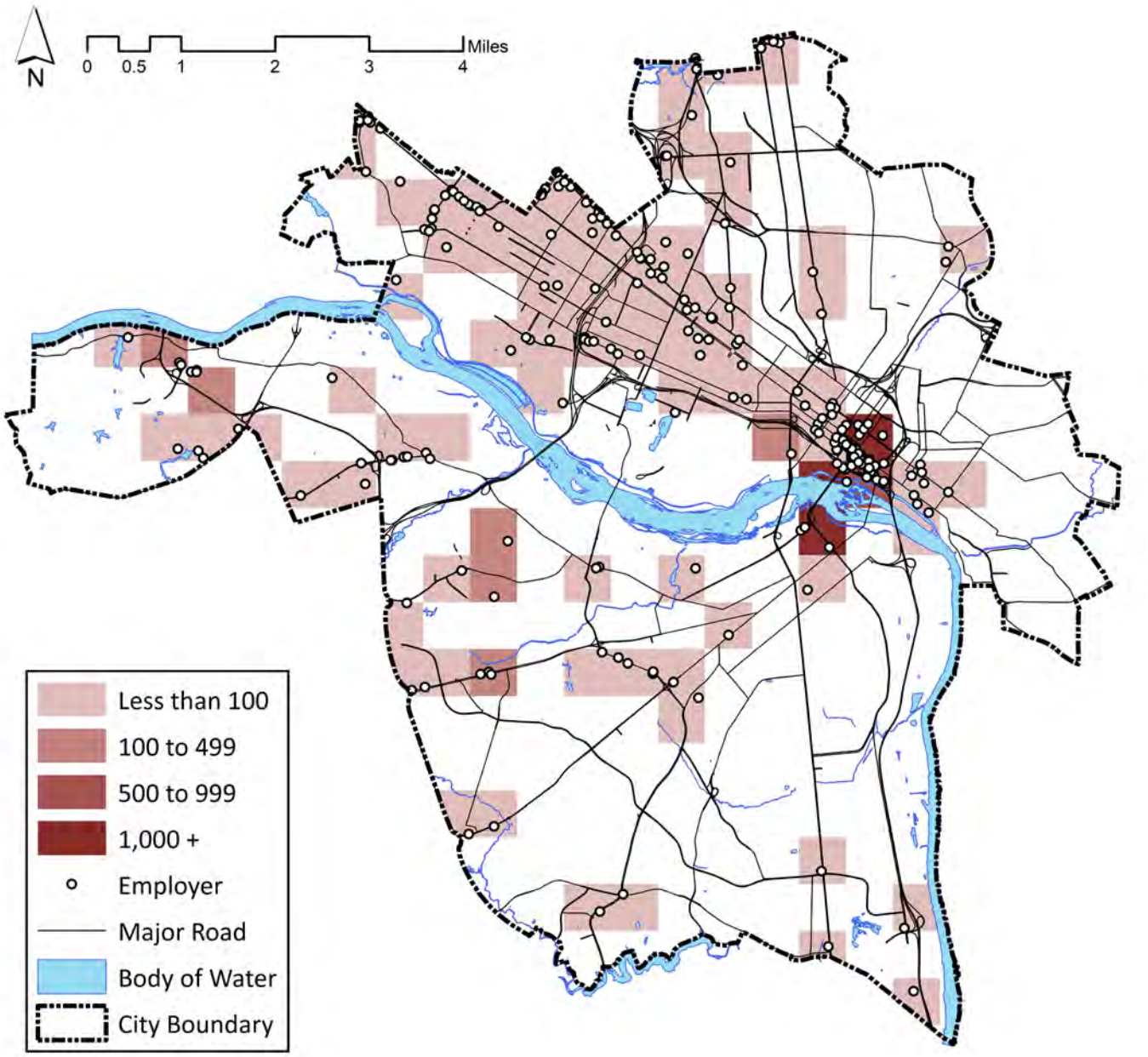
Map 22 – Educational Average Employment [NAICS #61] (2015)



2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

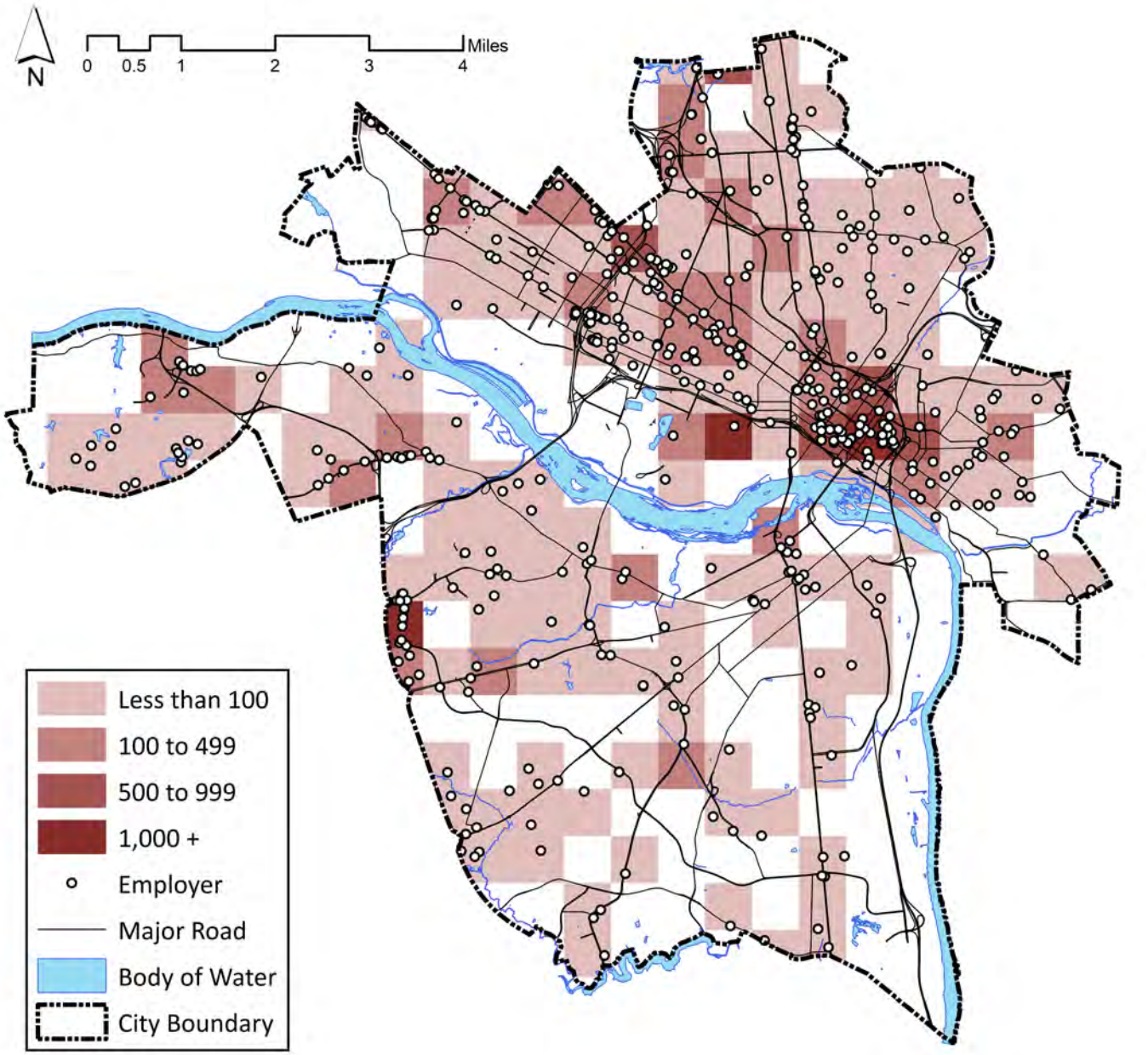
Note: Richmond Public School's Employment is represented by central office.

Map 23 - Finance and Insurance Average Employment [NAICS #52] (2015)



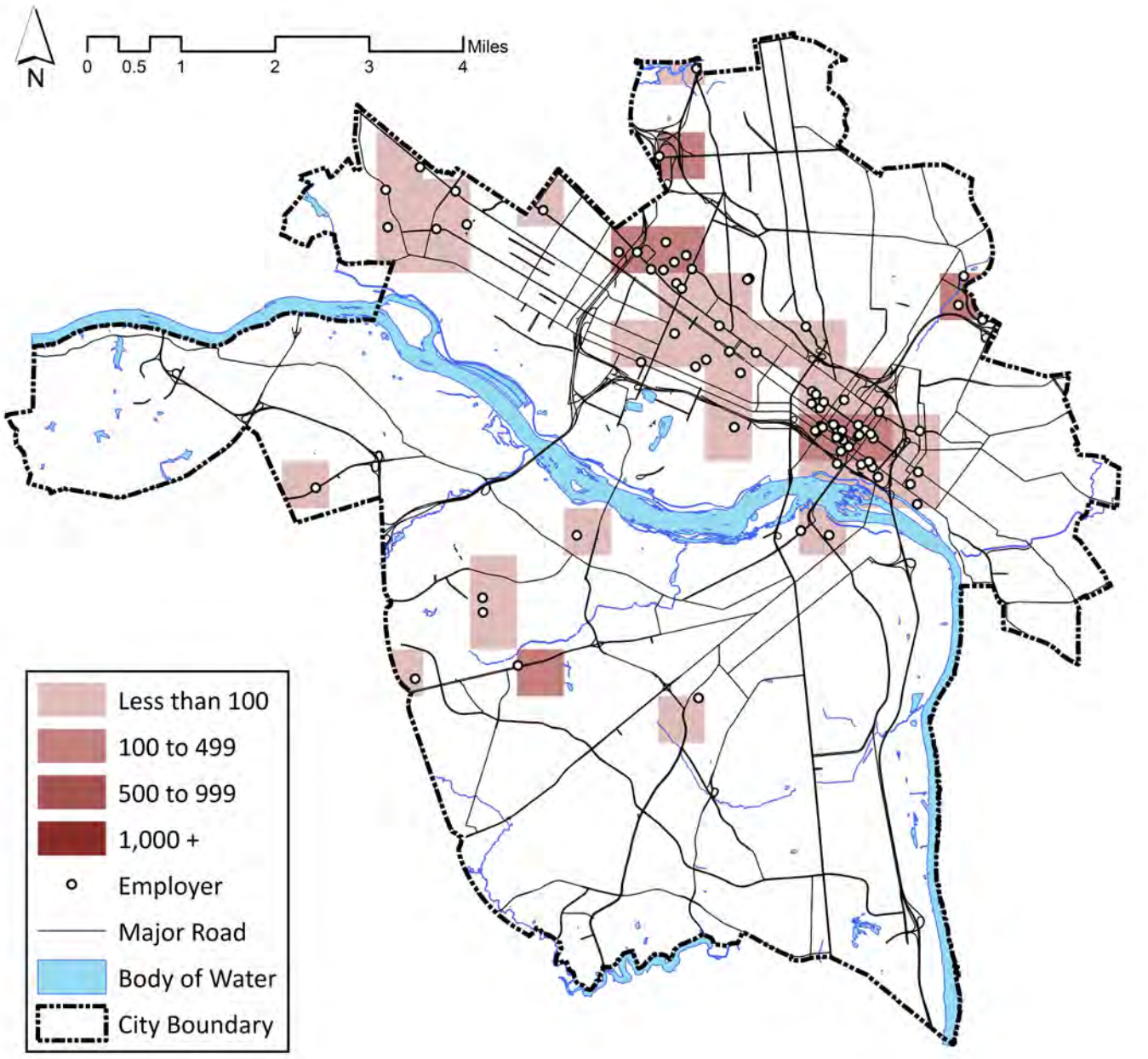
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 24 – Healthcare Average Employment [NAICS #62] (2015)



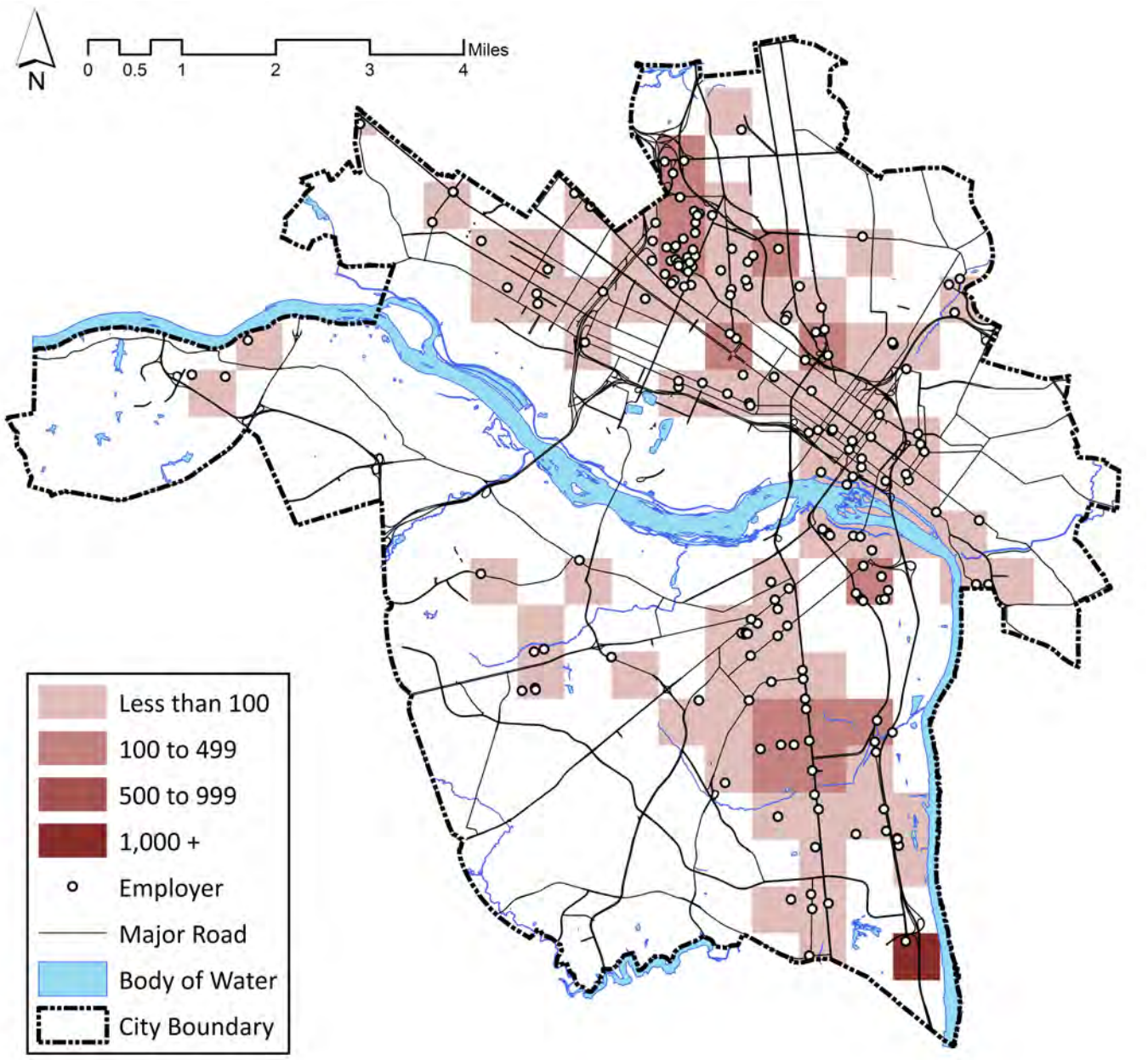
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 25 - Information Technology Average Employment [NAICS #51] (2015)



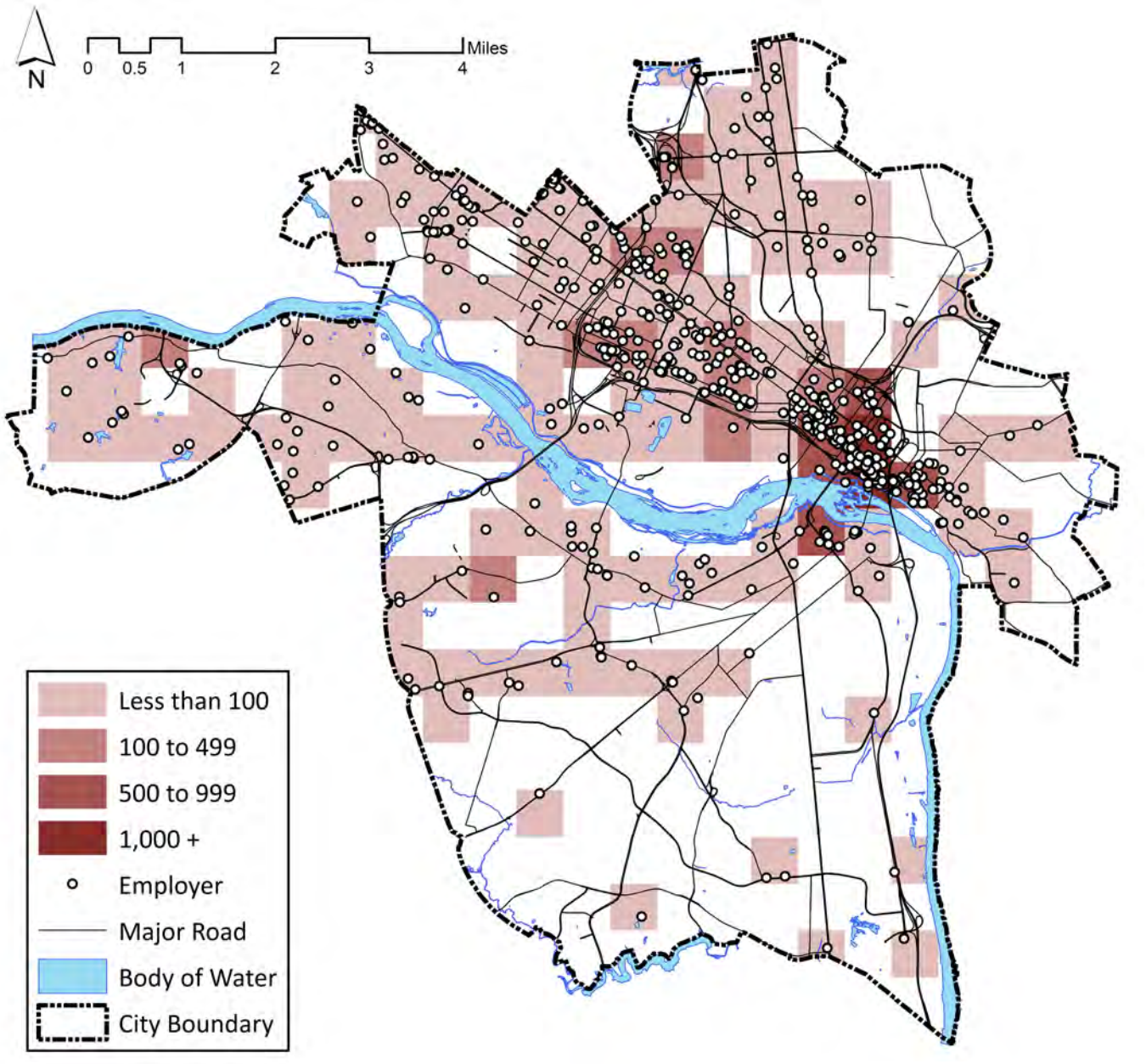
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 26 – Manufacturing Average Employment [NAICS 31-33] (2015)



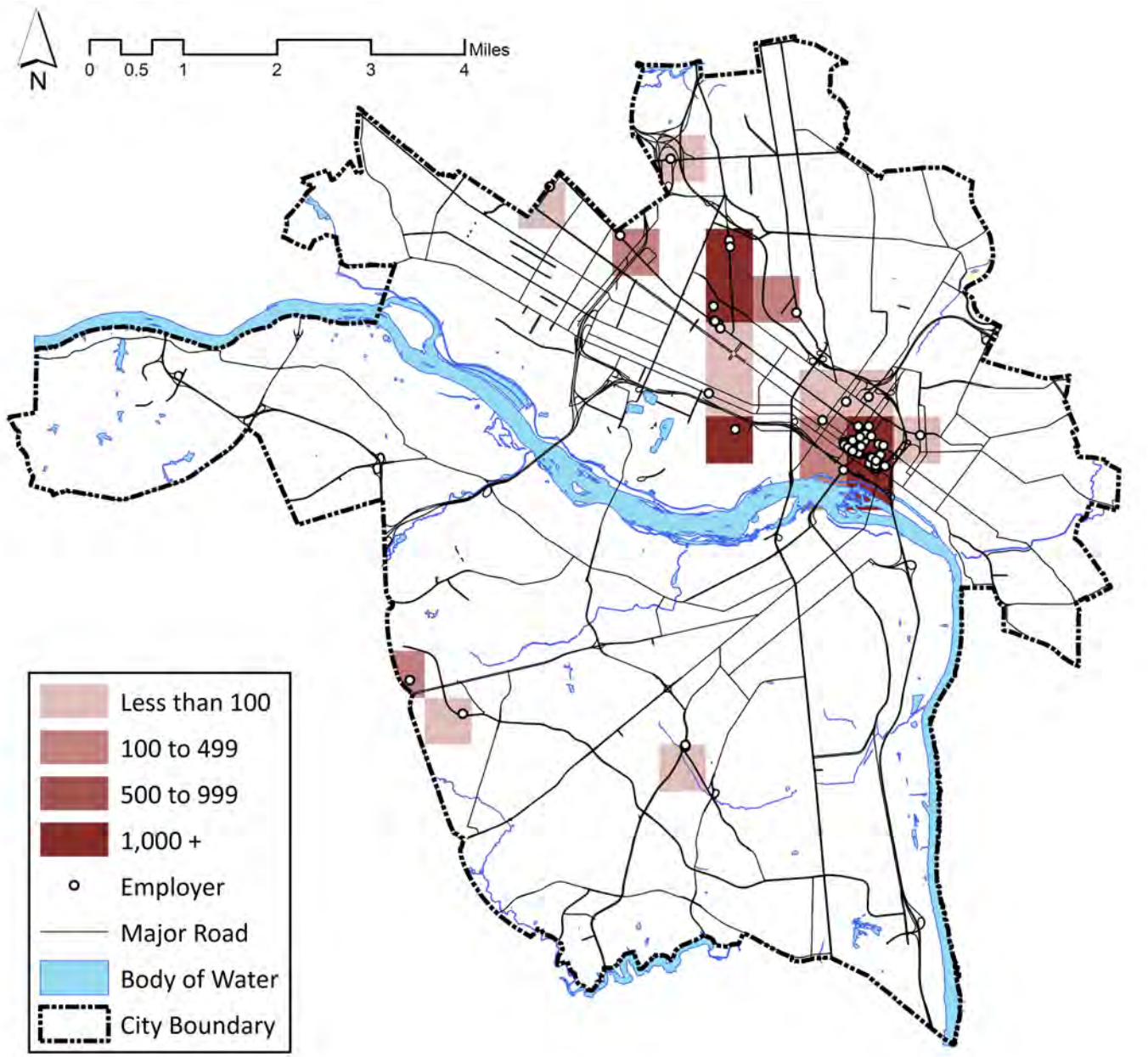
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 27 - Professional, Scientific, and Technical Services Average Employment Map [NAICS #54] (2015)



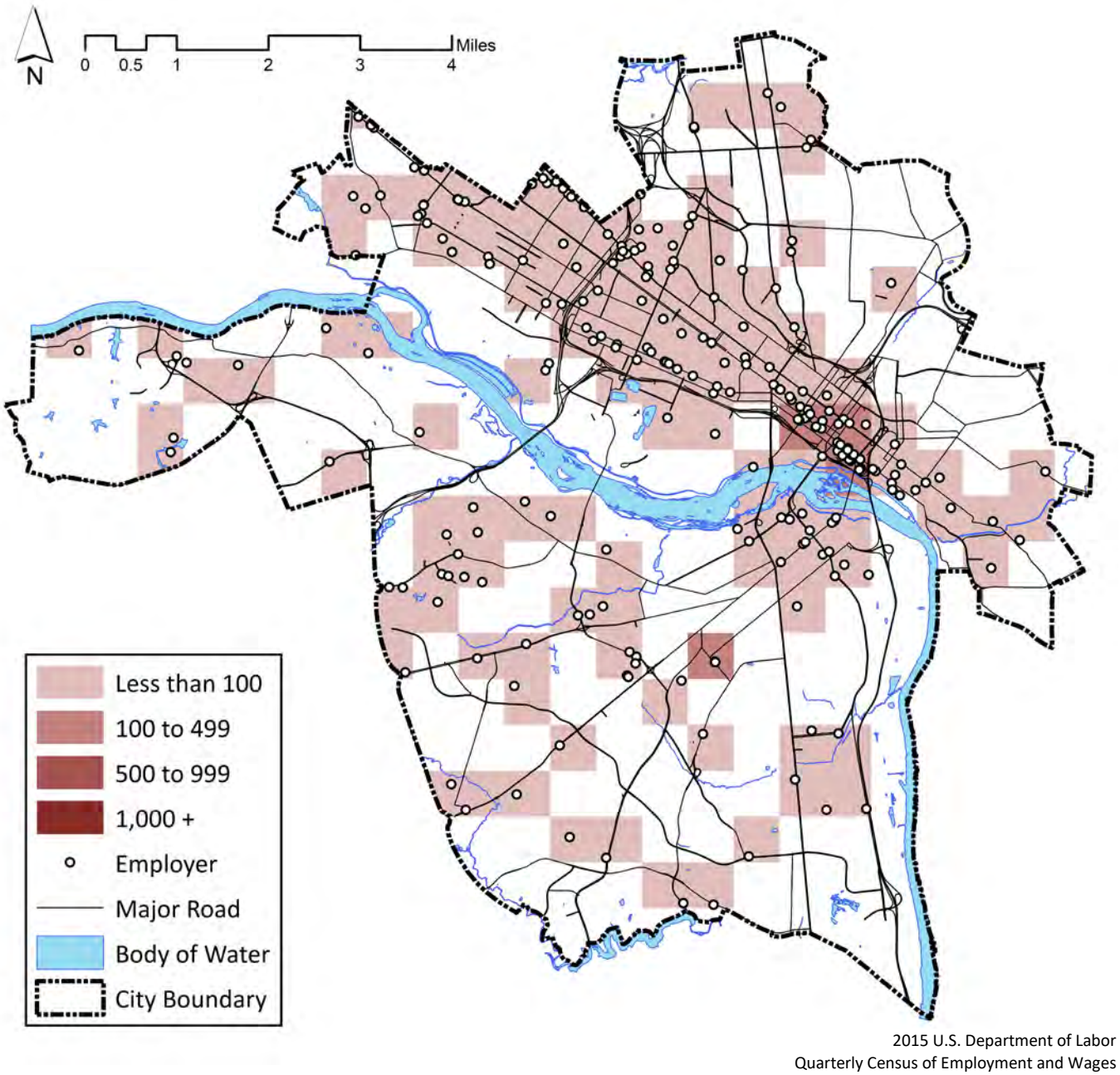
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 28 - Public Administration Average Employment Map [NAICS #92] (2015)



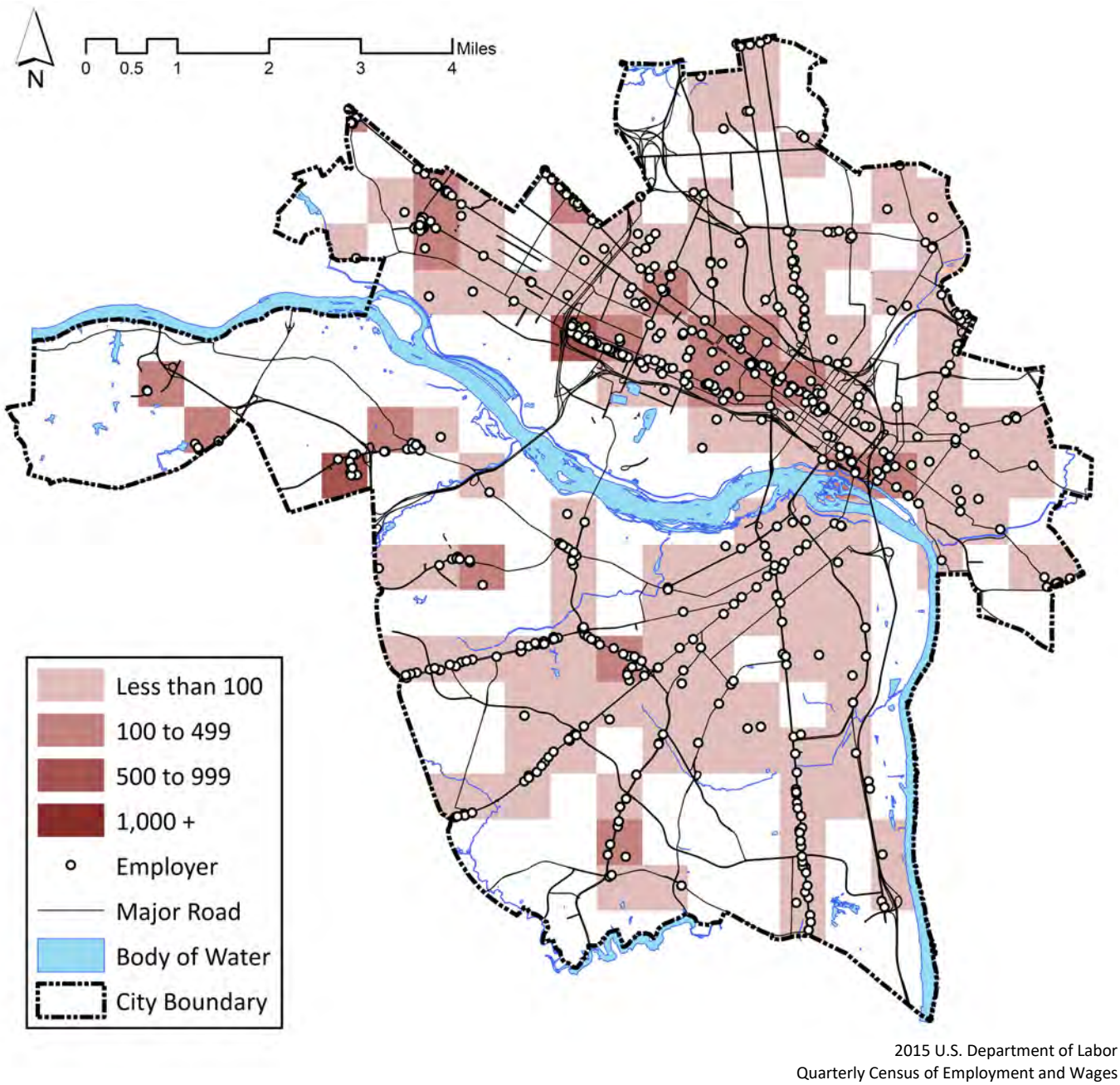
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 29 - Real Estate Average Employment [NAICS #53] (2015)



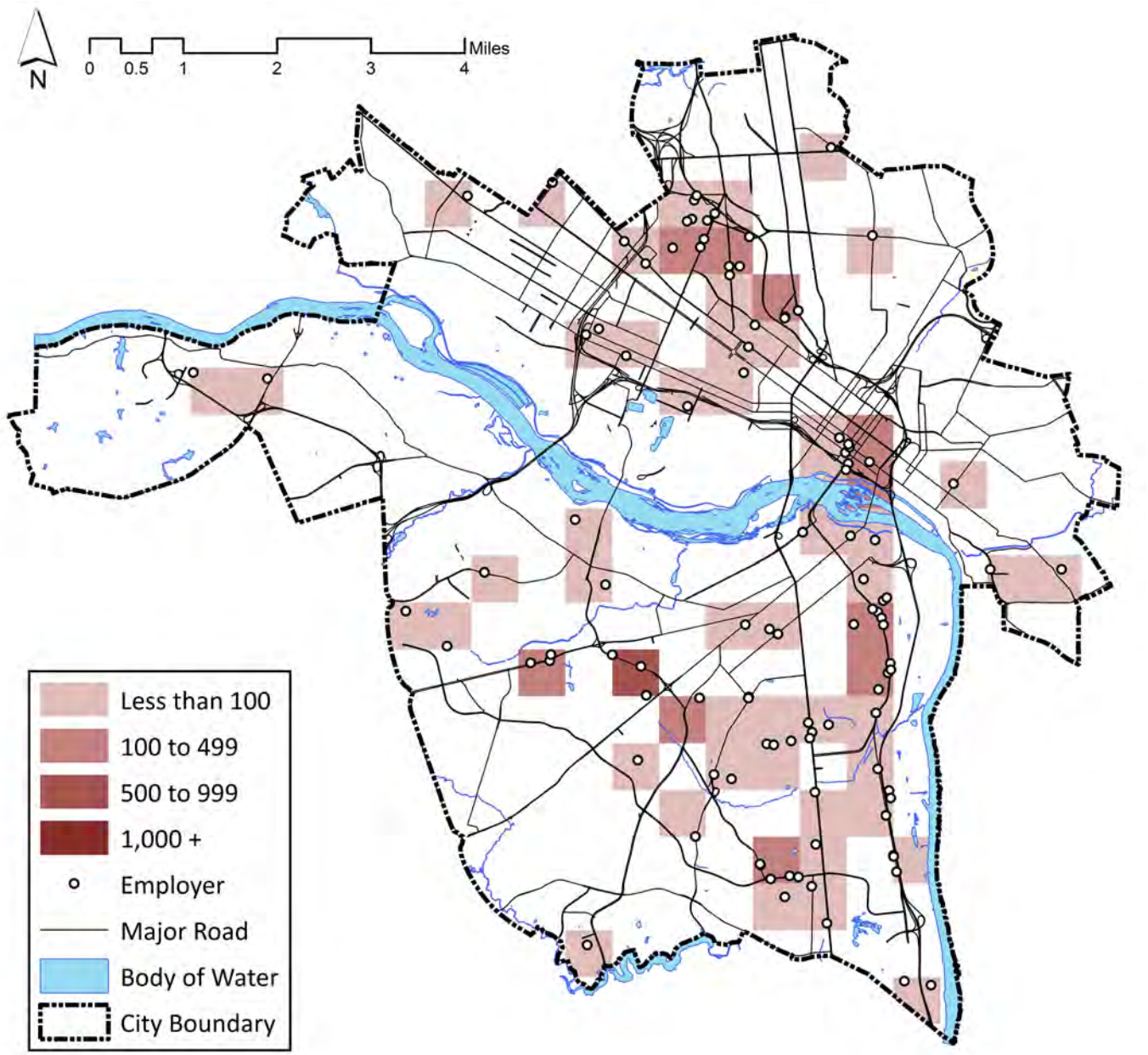
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 30 - Retail Average Employment [NAICS #44-45] (2015)



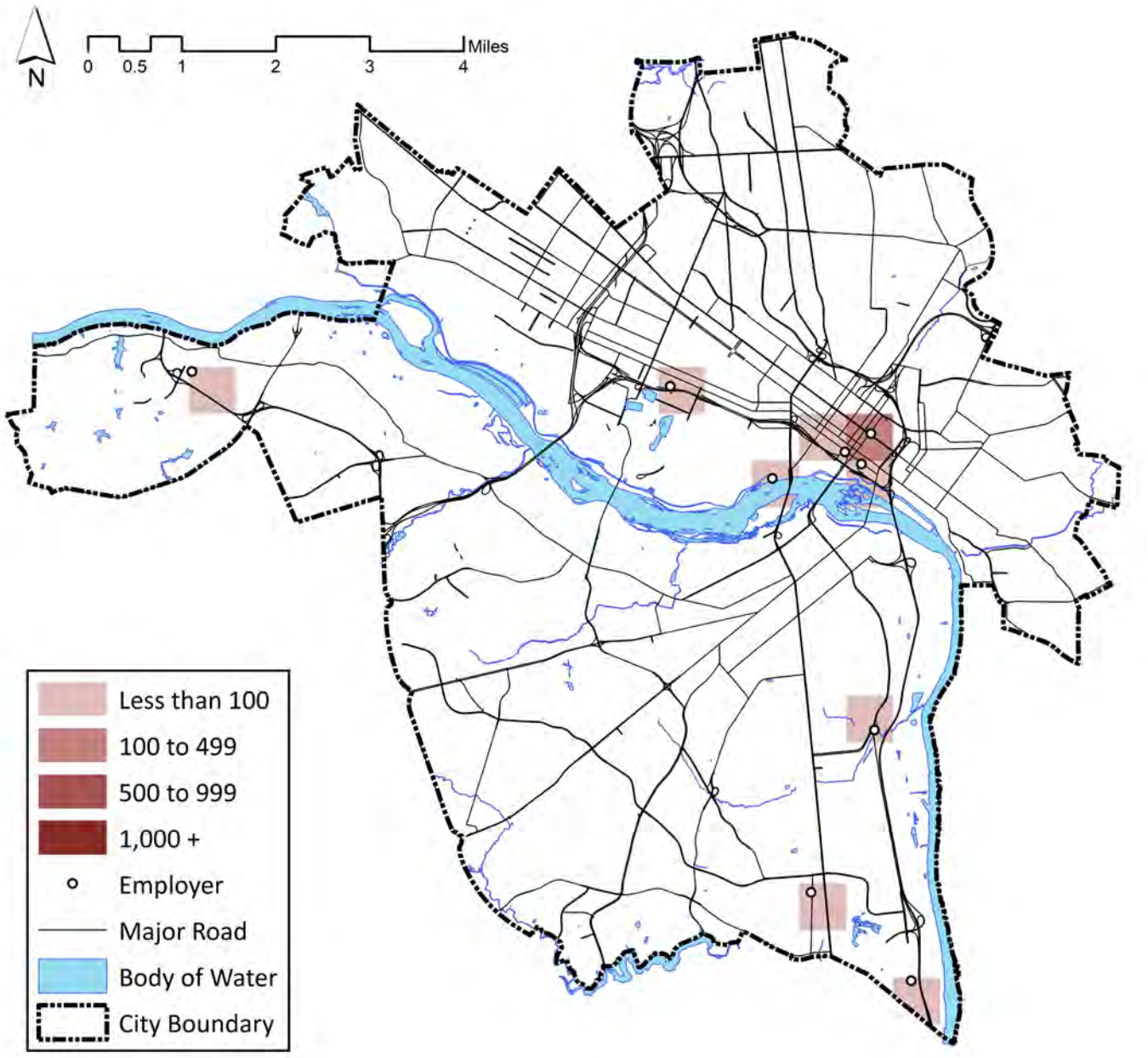
2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 31 - Transportation and Warehousing Average Employment [NAICS #48-49] (2015)



2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Map 32 – Utilities Average Employment [NAICS #22] (2015)

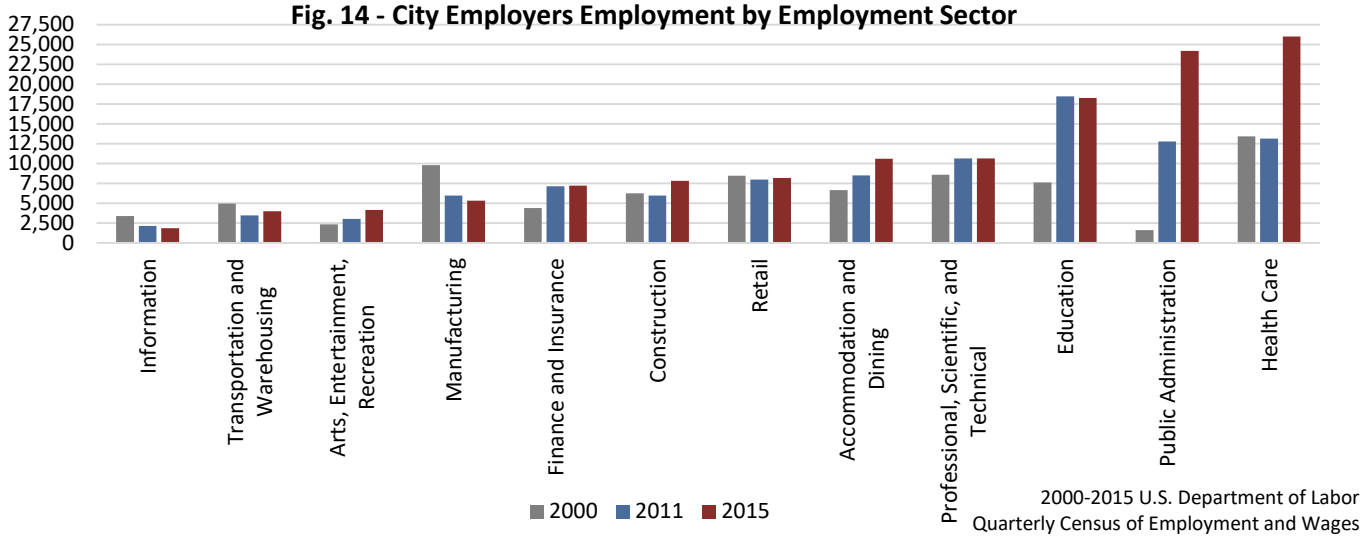


2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Employment, Unemployment, and Labor Participation

The chart below shows total employment by employers in the city from 2000 to 2015. The Health Care sector is the largest employer in the city followed by Public Administration; Education; and Professional, Scientific, and Technical Services. Industries that showed a large loss in employment include Information Services, Manufacturing, and Transportation and Warehousing, while Retail has shown a small loss since 2000.

Fig. 14 - City Employers Employment by Employment Sector



2000-2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

Tab. 10 - City Employers Employment by Sector

Sector	2000	2011	2015	% Change (2000 to 2015)
Information	3,383	2,142	1,866	-81.30%
Transportation and Warehousing	4,951	3,480	4,003	-23.68%
Arts, Entertainment, and Recreation	2,346	3,039	4,154	43.52%
Manufacturing	9,810	5,956	5,341	-83.67%
Finance and Insurance	4,391	7,132	7,215	39.14%
Construction	6,252	5,947	7,805	19.90%
Retail	8,455	7,978	8,191	-3.22%
Accommodation and Dining	6,643	8,520	10,622	37.46%
Professional, Scientific, and Technical	8,589	10,654	10,649	19.34%
Education	7,636	18,480	18,272	58.21%
Public Administration	*	*	24,159	30%**
Health Care	13,439	22,916	25,954	48.22%
Total Employment (including unlisted sectors)	**105,938**	**138,055**	**156,658**	**47.88%**

Note: Year 2000 data maybe significantly undercounted. QCEW data does not count home occupations. Employment data for larger employers may be counted at main office.

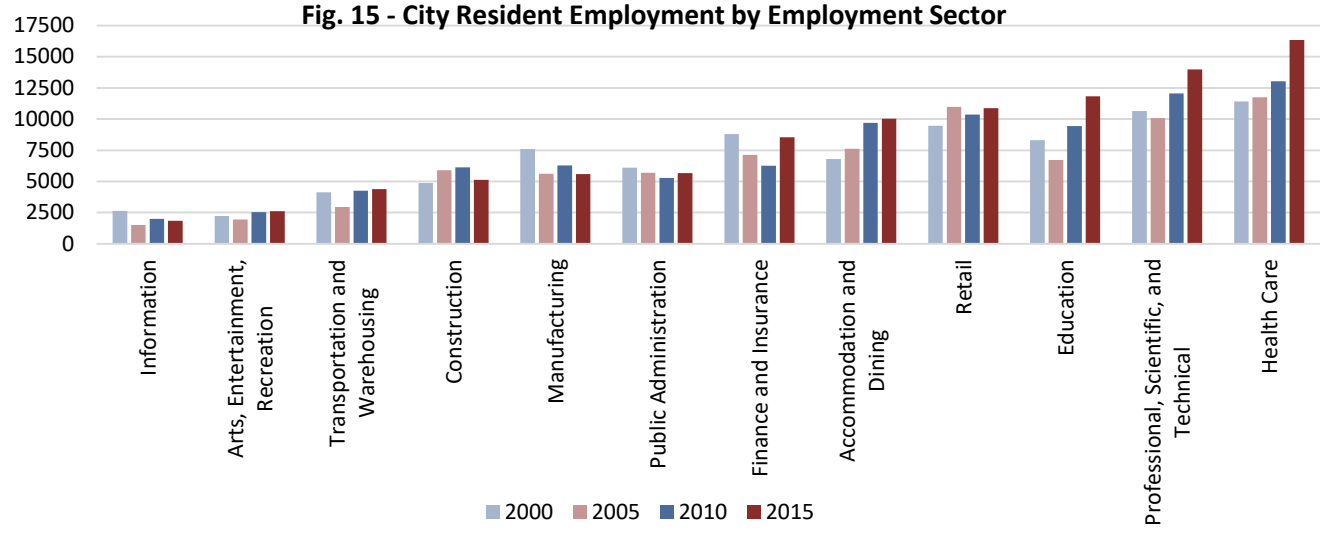
2000-2015 U.S. Department of Labor
Quarterly Census of Employment and Wages

* Data non-reliable

** Derived from the American Community Survey County Business Patterns that reports non-public employment. The change is calculated as the difference between these two data sources as representative of public employment. See calculation in appendix.

The chart below shows total employment of city residents by industry from 2000 to 2015. The Health Care sector is the largest employer of city residents followed by Professional, Scientific, and Technical; Education; and Retail. With the exception of large losses in Information Services and Manufacturing and smaller losses in Public Administration and Finance and Insurance, jobs in these sectors have shown growth.

Fig. 15 - City Resident Employment by Employment Sector



2000/2010: Decennial Census
2005/2014: American Community Survey

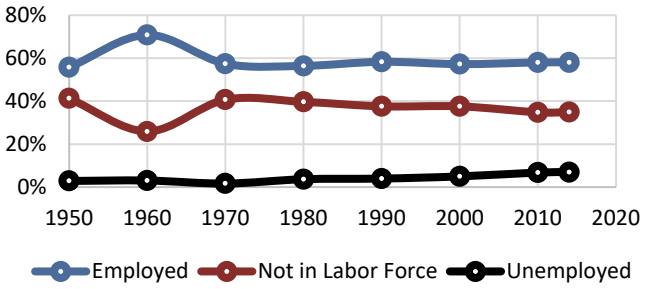
Tab. 11 – City Residents Employment by Sector (2000-2015)

Sector	2000	2005	2010	2015	% Change (2000-2015)
Information	2,639	1,512	1,988	1,840	-30.3%
Arts, Entertainment, Recreation	2,229	1,933	2,534	2,604	16.8%
Transportation and Warehousing	4,130	2,937	4,252	4,387	6.2%
Construction	4,871	5,900	6,123	5,127	5.3%
Manufacturing	7,600	5,612	6,274	5,582	-26.6%
Public Administration	6,105	5,679	5,288	5,669	-7.1%
Finance and Insurance	8,791	7,132	6,250	8,540	-2.9%
Accommodation and Dining	6,802	7,617	9,699	10,035	47.5%
Retail	9,462	10,978	10,359	10,866	14.8%
Education	8,319	6,709	9,430	11,822	42.1%
Professional, Scientific, and Technical	10,642	10,066	12,053	13,976	31.3%
Health Care	11,400	11,736	13,026	16,330	43.2%
Total	**90,745**	**86,082**	**96,569**	**104,547**	**15.2%**

2000/2010: Decennial Census
2005/2015: American Community Survey

The unemployment rate has risen steadily in Richmond since 1970. While the past four years have shown continued growth in unemployment, the trend seems to have slowed, having only grown 0.2% in four years. Employment rates have remained relatively stable since the 1970s, and the rate in 2014 was 58.0%. With the percentage of those employed by the armed forces comprising a small and steady portion of the workforce between 0.1% and 0.3%, the percentage increases in those employed and unemployed draw from those not in the labor force.

Fig. 16 - Employment (1950-2014)



1950-2010: Decennial Census
2014: American Community Survey

Tab. 12 - Employment, Unemployment, and Labor Participation (1960-2014)

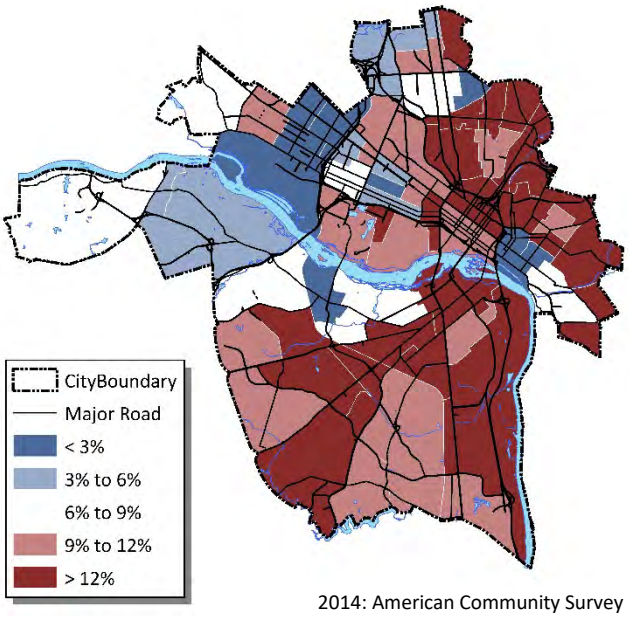
	1950	1960	1970	1980	1990	2000	2010	2014
Unemployed	2.9%	3.1%	1.7%	3.7%	4.0%	5.0%	6.8%	7.0%
Not in Labor Force	41.3%	25.9%	40.7%	39.7%	37.6%	37.6%	34.8%	34.9%
Employed	55.7%	70.8%	57.4%	56.4%	58.3%	57.2%	58.0%	58.0%
Armed Forces	0.1%	0.2%	0.2%	0.2%	0.1%	0.2%	0.3%	0.2%

1950 & 1960 – Age 14+
1970 to 2014 – Age 16+

1950-2010: Decennial Census
2014: American Community Survey

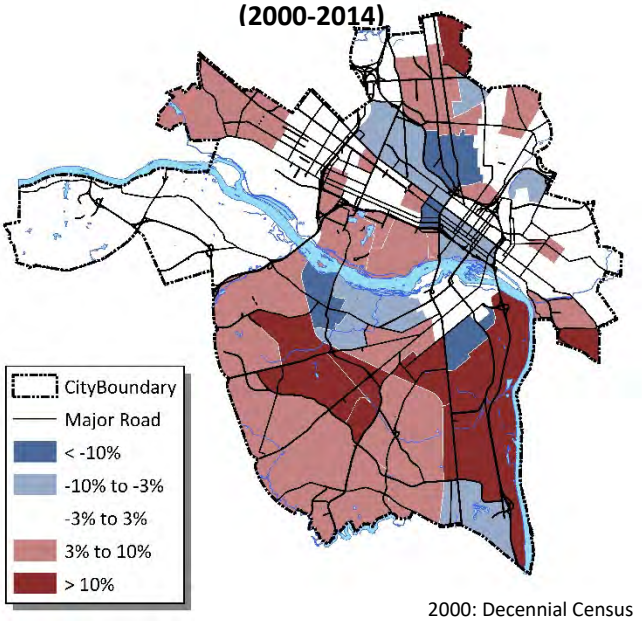
In 2014 the bulk of unemployment occurred in the southern reaches of the city and most areas surrounding Downtown with the exception of Church Hill. The areas to the west and far north side as well as Church Hill showed comparatively little unemployment. Between 2000 and 2014, the unemployment rate grew for the southern part of the city. In contrast, the rate fell for the areas of Westover Hills, Forest Hill, and Scott's Addition.

Map 33 - Workforce Unemployed (2014)



2014: American Community Survey

Map 34 - Workforce Unemployed Change (2000-2014)

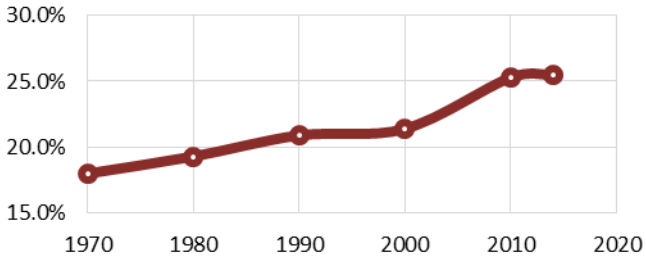


2000: Decennial Census
2014: American Community Survey

Poverty

The total percentage of population below the poverty line has increased drastically in Richmond since 2000. An increase of 8.4% has led to the highest poverty statistics in the observed period, with 25.5% of the population under the poverty line. This rise in poverty coincides with the 2008 housing crash and the stagnation of median incomes in the city, similar to other areas across the country.

Fig. 17 – Percentage of Population Below Poverty Line (1970-2014)



1950-2010: Decennial Census
2014: American Community Survey

Poverty has remained stable in the majority of Richmond with most census tracts exhibiting change within the confines of -10% to 10%. However, this stability is not true for census tracts with public housing that form a horseshoe-shaped geography to the east of Downtown, along Route 1 south of Downtown, and the lower southwest of the city. In these areas the poverty rate has increased by over 20% from 2000 to 2014.

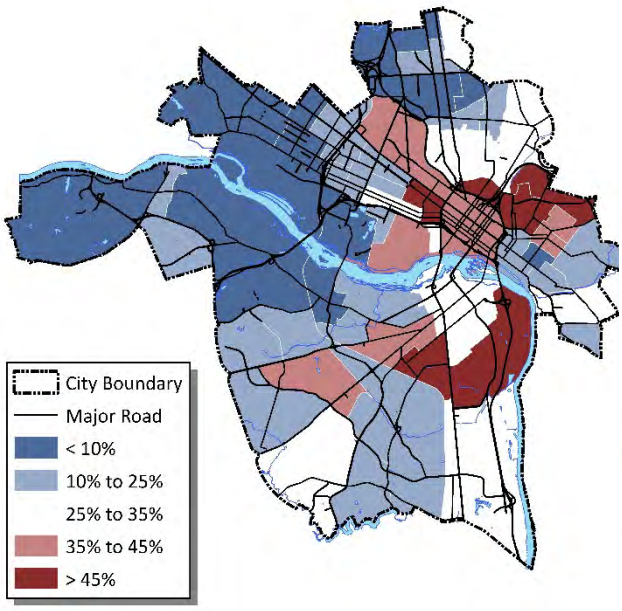
Tab 13 – Individuals Below Poverty Line (1950-2014)

	1950	1960	1970	1980	1990	2000	2010	2014
Population Below Poverty Threshold	*	*	18.0%	19.3%	20.9%	21.4%	25.3 %	25.5%
Poverty Threshold for Individual	*	*	$1,954	$4,190	$6,652	$8,794	$11,139	$12,071
Poverty Threshold for Family of 4	*	*	$7,918	$8,414	13,359	$17,603	$22,314	$24,230

Poverty Thresholds: US Census Bureau
* Data not recorded in source

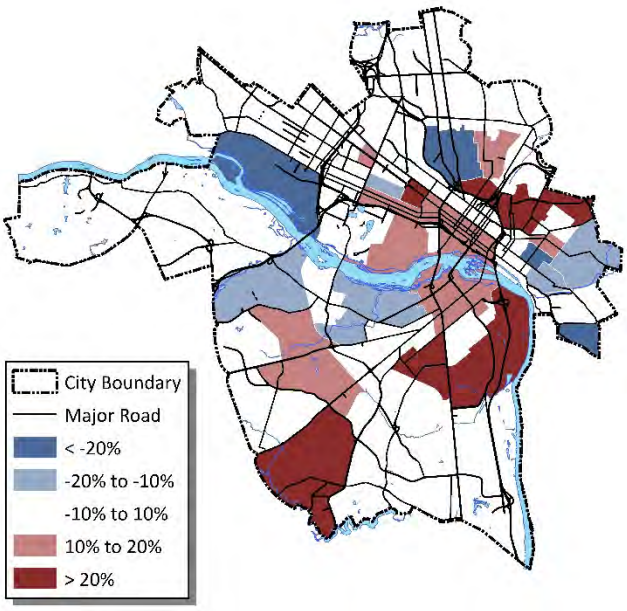
1950-2010: Decennial Census
2014: American Community Survey

Map 35 - Percentage Below Poverty Line (2014)



2014: American Community Survey

Map 36 - Percentage Change in Poverty (2000-2014)



2000: Decennial Census
2014: American Community Survey

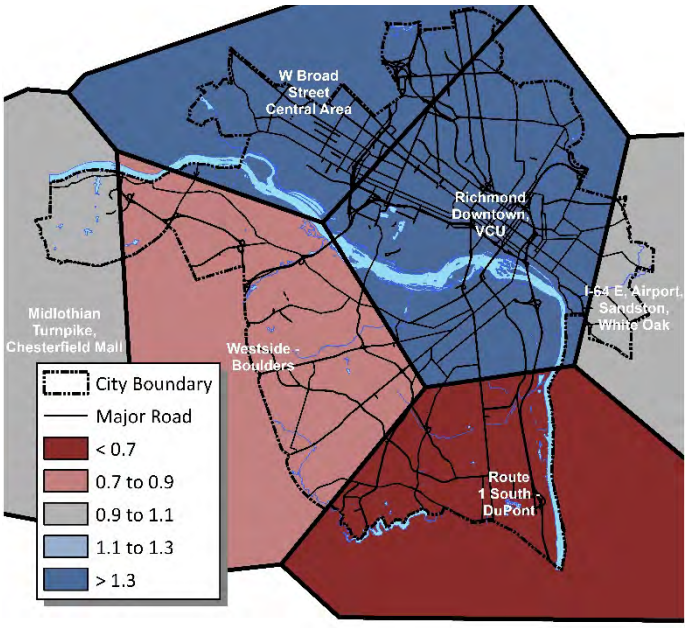
Poverty in Richmond is concentrated. Census tracts surrounding the downtown area, VCU, public housing projects on the north and northeast side, and other areas to the south exhibit percentages of the population in poverty well over 45%.

Jobs / Housing Balance

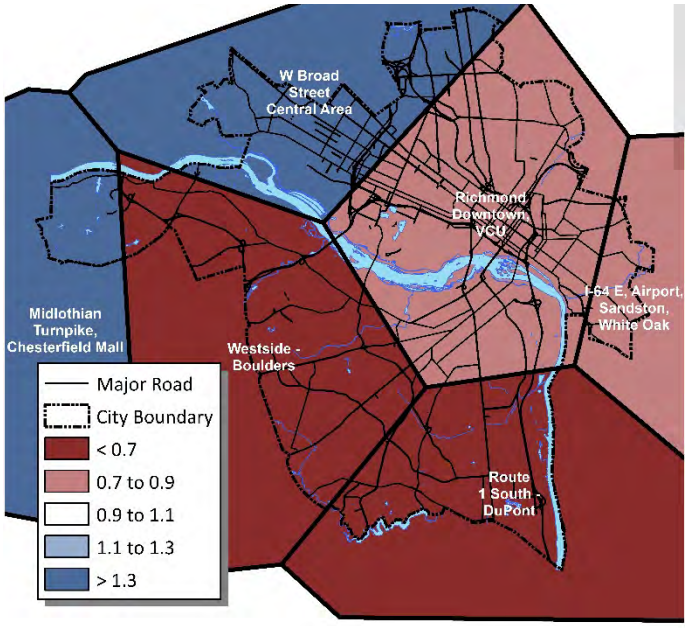
The number of jobs and dwelling units in several major job centers and surrounding residential area are presented below. Downtown, VCU and the West Broad Street corridor to I-195 have over 46,000 more jobs than nearby housing units.

The number of modest wage jobs (lowest 34% of wages) and surrounding affordable housing units (34% of housing units with lowest cost) for several major job centers and surrounding residential area are presented below. Despite the large number of jobs downtown and on West Broad Street, low-cost housing units exceed modest-wage jobs by over 13,000.

Map 37 - All Jobs/Housing Balance (2014)



Map 38 - Low Income Jobs/Housing Balance (2014)



CURA MetroView Data

Note: Thiessen Polygons delineate the geographic area closest to the listed job center.

Tab . 14 - Job-Housing Balance (All Jobs and Housing Units)

	Job-Housing Analysis (all jobs and housing units)				Housing Type	
Job Center Thiessen Polygon	Jobs	Units	JH_Ratio	JH_Gap	SF	MF
Richmond Downtown, VCU	116,791	71,363	1.64	45,428	25,256	46,107
W Broad Street Central Area	55,392	38,094	1.45	17,298	25,848	12,246
I-64 E, Airport, Sandston, White Oak	32,004	29,569	1.08	2,435	22,549	7,020
Westside - Boulders	30,615	38,091	0.8	-7,476	21,787	16,304
Route 1 South - Dupont	5,870	7,898	0.74	-2,028	5,967	1,931
Midlothian Turnpike, Chesterfield Mall	27,659	30,244	0.91	-2,585	25,316	4,928

CURA MetroView Data
SF – Single-Family Housing Unit
MF – Multi-Family Housing Unit

Tab. 15 - Job-Housing Balance (Lower 34% of Jobs and Housing Units)

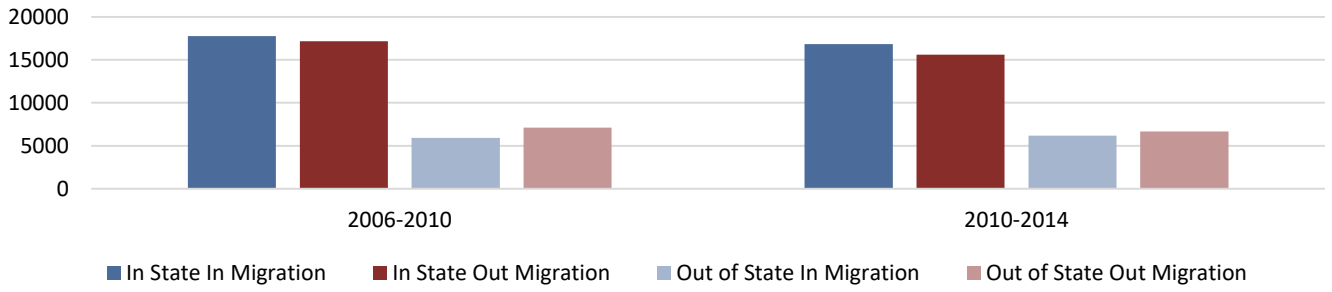
	Job-Housing Analysis (lower 34% jobs and housing units)				Housing Type	
Job Center Thiessen Polygon	Jobs	Units	JH_Ratio	JH_Gap	SF	MF
Richmond Downtown, VCU	33,451	46,620	0.72	-13,169	10,007	36,613
W. Broad Street Central Area	20,868	12,294	1.7	8,574	348	11,946
I-64 E, Airport, Sandston, White Oak	11,025	13,118	0.84	-2,093	6,471	6,647
Westside - Boulders	10,638	17,428	0.61	-6,790	3,106	14,322
Route 1 South - Dupont	1,925	2,236	0.86	-311	309	1,927
Midlothian Turnpike, Chesterfield Mall	12,548	3,903	3.21	8,645	163	3,740

CURA MetroView Data
SF – Single-Family Housing Unit
MF – Multi-Family Housing Unit

In/Out Migration

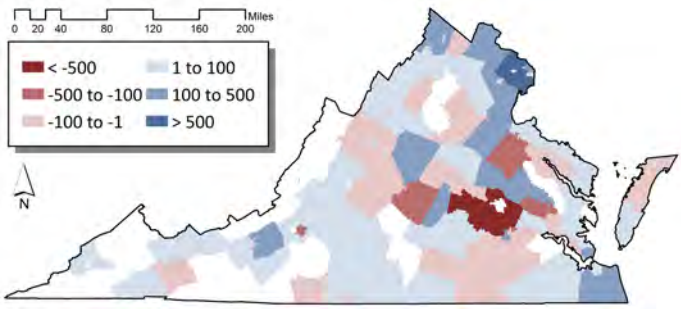
The following two pages display maps and charts related to in-state and out-of-state net migration in Richmond. The highest-ranked locality for in-state net migration for both observed periods, 2006-2010 and 2010-2014, was Fairfax County, VA, which had a positive net migration of 1,000 or more residents per period. Henrico County, VA was the location of the largest net loss of residents in both observed periods. Henrico County gained nearly 2,500 residents per observed five-year period. Chesterfield County, VA gained more than 500 residents from Richmond between 2006 and 2010. However, during 2010-2014, Richmond gained more than 750 net residents from Chesterfield County.

Fig. 18 - Migration In State and Out of State (2006-2014)



2006-2014: Internal Revenue Service SOI Tax Stats - Migration Data

Map 39 – In-State Net Migration (2006-2010)



Map 40 – In-State Net Migration (2010-2014)

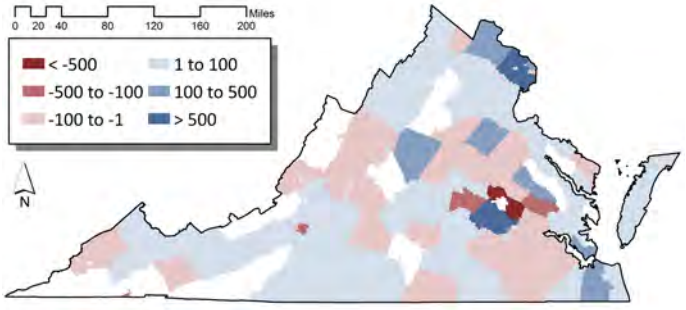


Fig. 19 - Highest 10 In-State Net Migration (2006-2010)

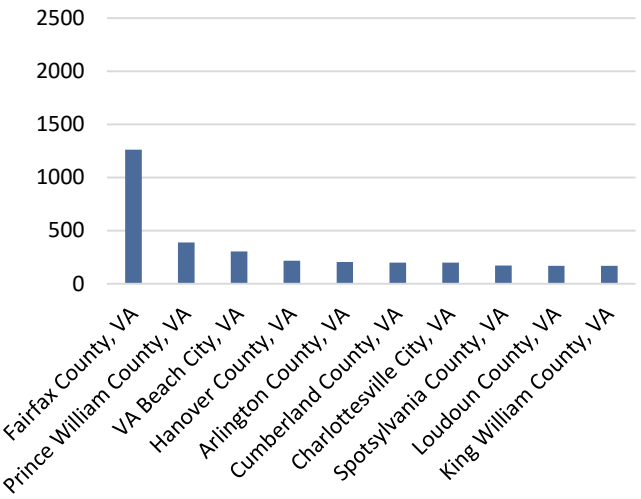


Fig. 20 - Highest 10 In-State Net Migration (2010-2014)

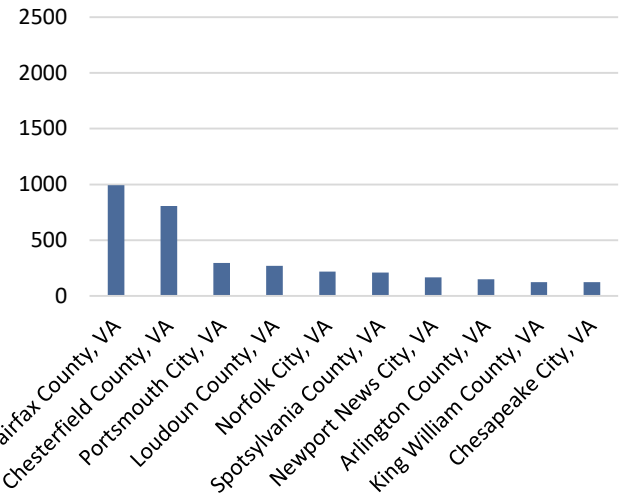


Fig. 21 - Lowest 10 In-State Net Migration (2006-2010)

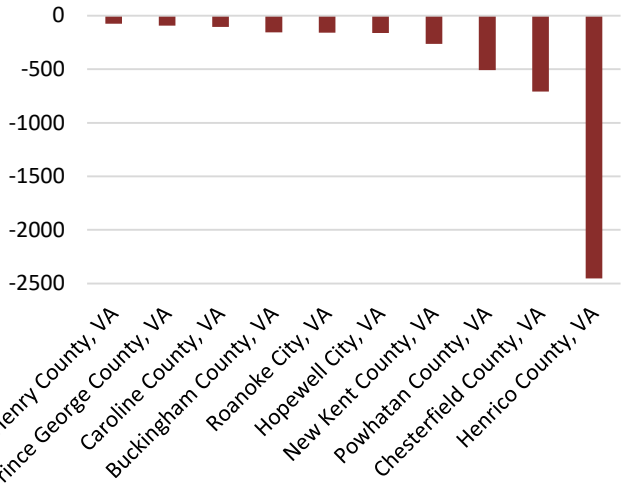
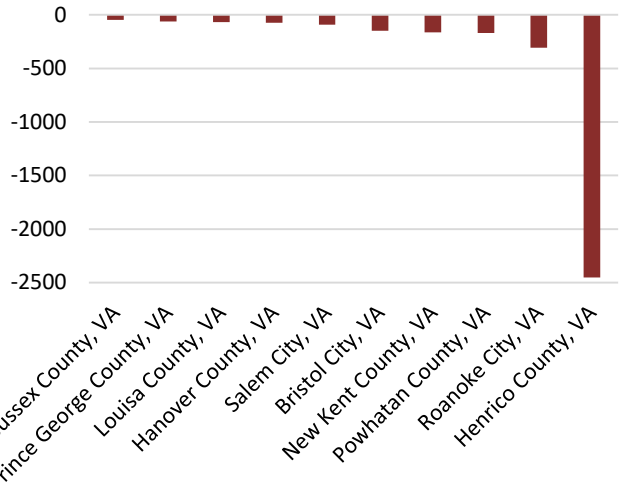
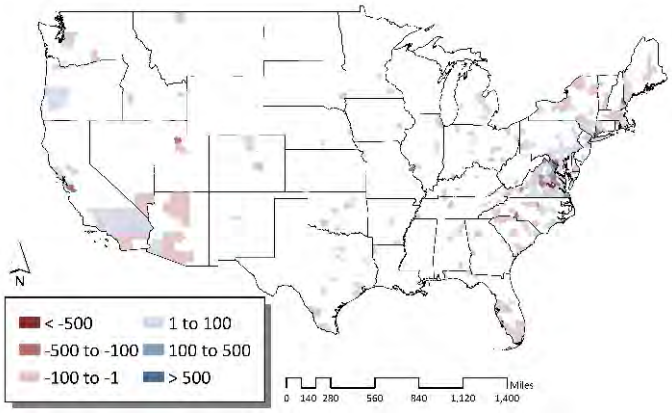


Fig. 22 - Lowest 10 In-State Net Migration (2010-2014)



2006-2014: Internal Revenue Service SOI Tax Stats - Migration Data

Map 41 - National Net Migration (2006-2010)



Map 42 - National Net Migration (2010-2016)

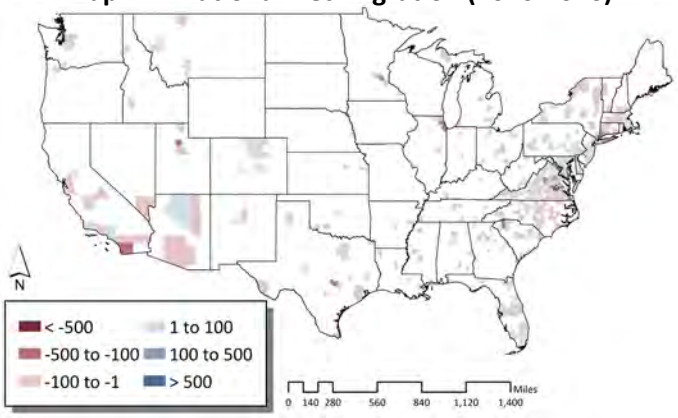


Fig. 23 - Highest 10 Out-of-State Net Migration (2006-2010)

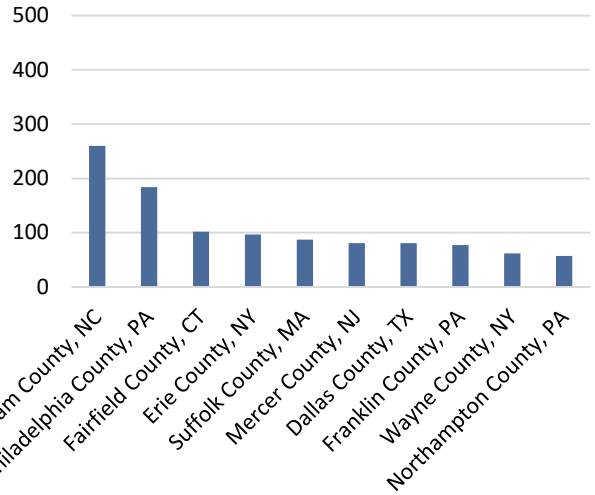


Fig 24 - Highest 10 Out-of-State Net Migration (2010-2014)

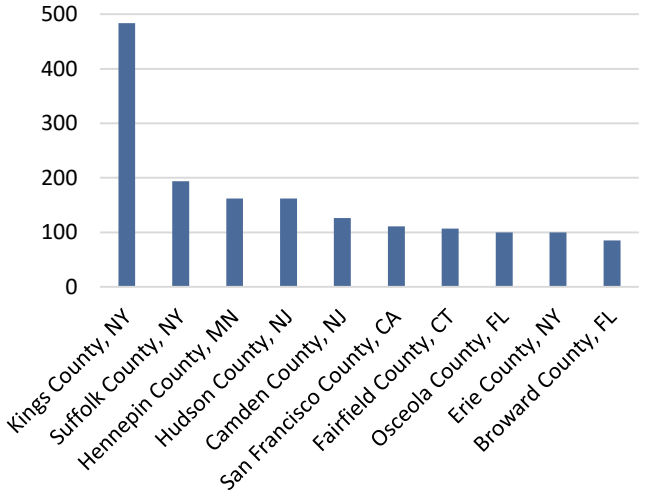


Fig. 25 - Lowest 10 Out-of-State Net Migration (2006-2010)

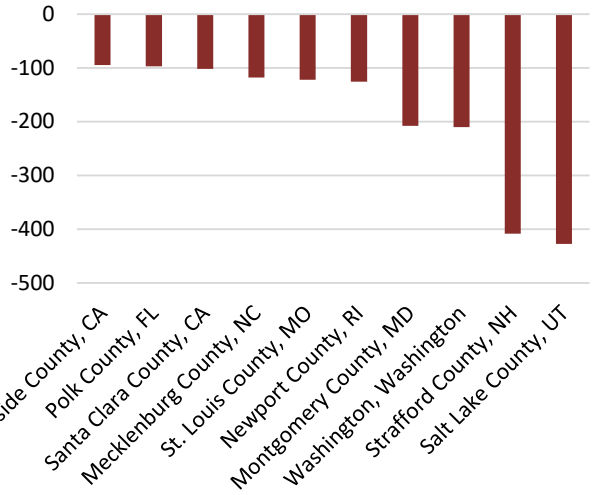
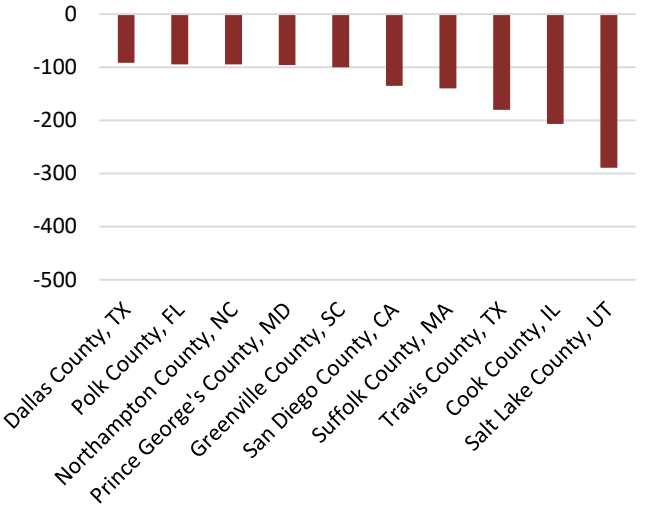


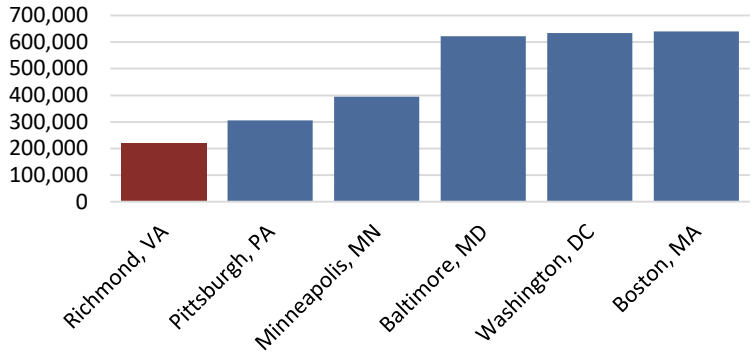
Fig. 26 - Lowest 10 Out-of-State Net Migration (2010-2014)



2006-2014: Internal Revenue Service SOI Tax Stats - Migration Data

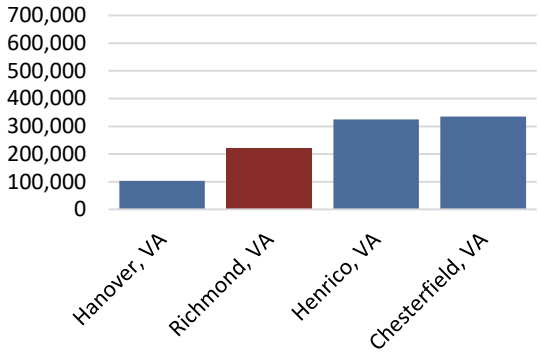
City and County Comparison

Fig. 27 - Comparable Cities Total Population (2014)



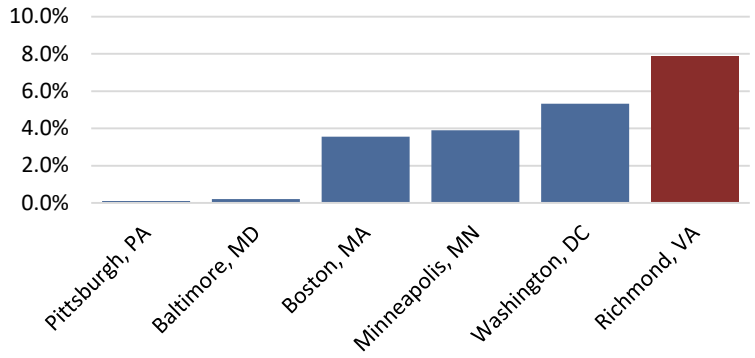
2010: Decennial Census
2014: American Community Survey

Fig. 28 - Local Counties Total Population (2014)



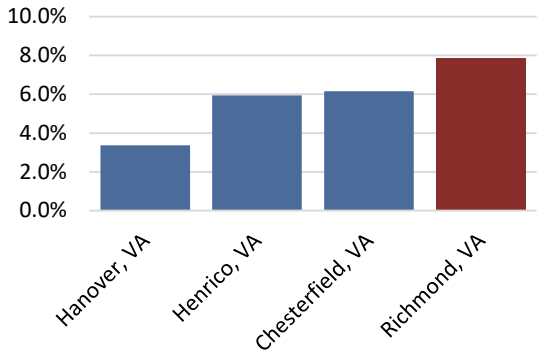
2010: Decennial Census
2014: American Community Survey

Fig. 29 - Comparable Cities Population Growth (2010-2014)



2010: Decennial Census
2014: American Community Survey

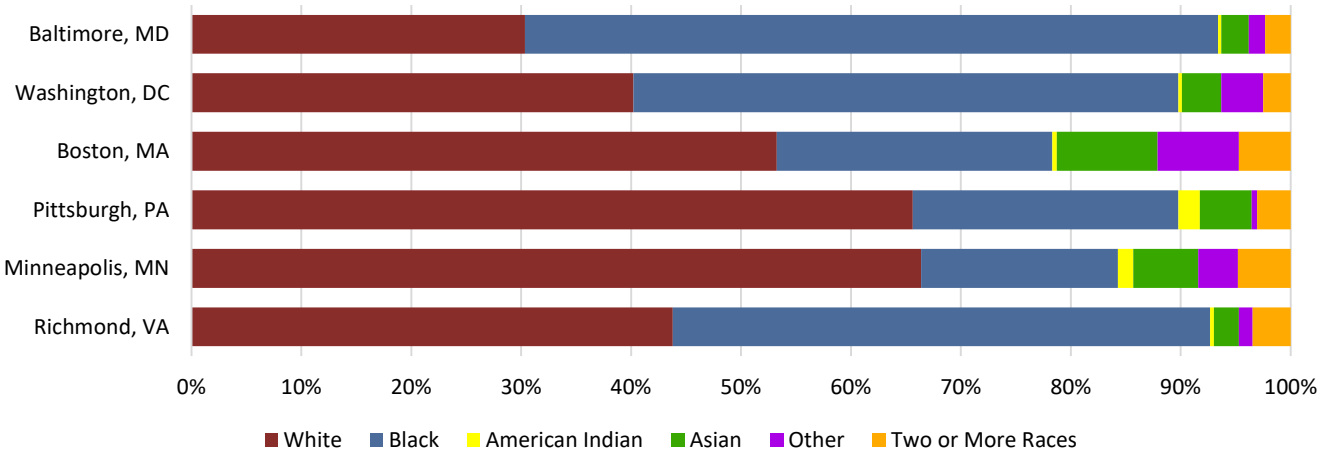
Fig. 30 - Local Counties Population Change (2010-2014)



2010: Decennial Census
2014: American Community Survey

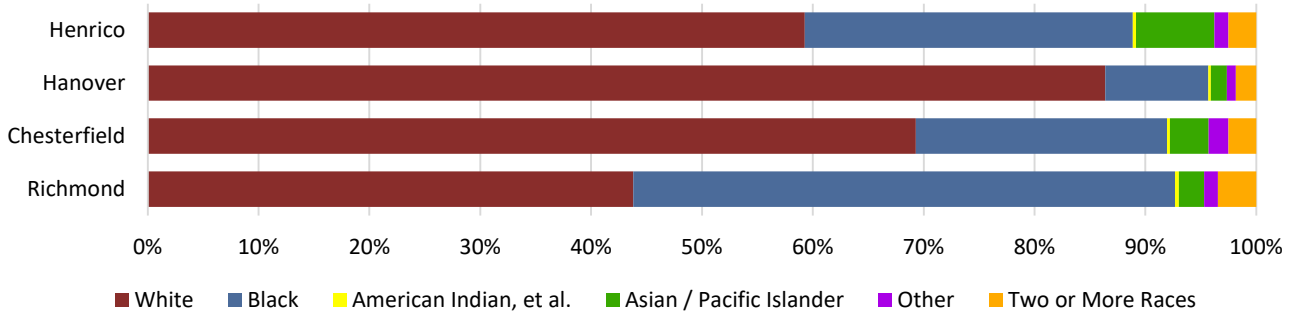
In comparison to a select number of cities with fixed boundaries similarly surrounded by suburban localities, Richmond ranks last in size by population. When compared to these cities, Richmond ranks first in population growth from 2010 to 2014. Also, Richmond's rate of population growth was greater than surrounding counties.

Fig. 31 - Comparable Cities Racial Composition (2014)



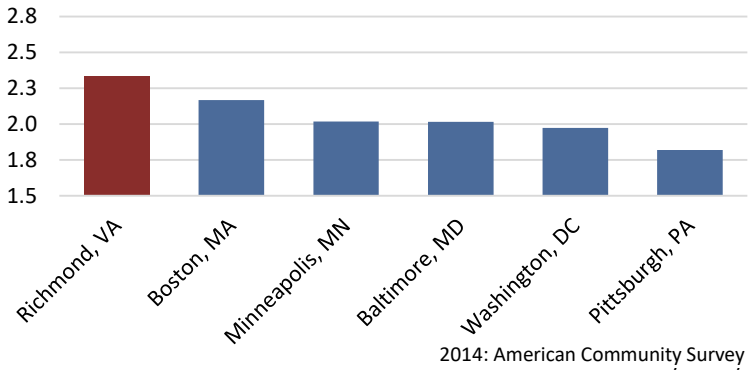
2014: American Community Survey

Fig. 32 - Comparable Counties Racial Composition (2014)



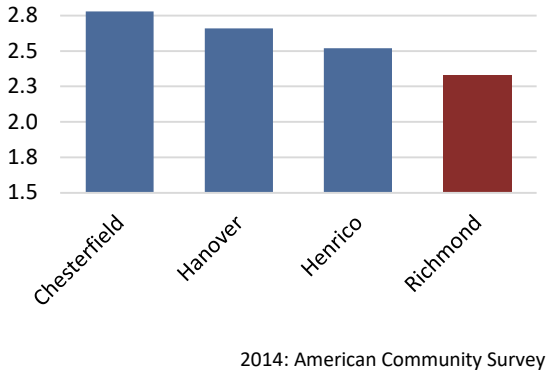
2014: American Community Survey

Fig. 33 - Comparable Cities Average Household Size (2014)



2014: American Community Survey

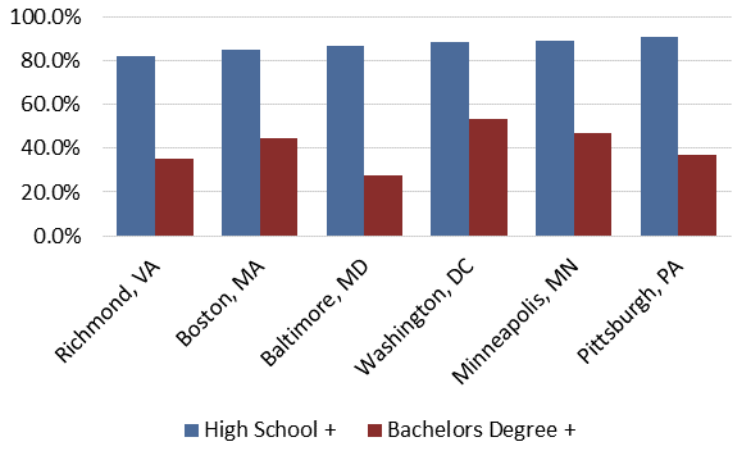
Fig. 34 - Surrounding Counties Average Household Size (2014)



2014: American Community Survey

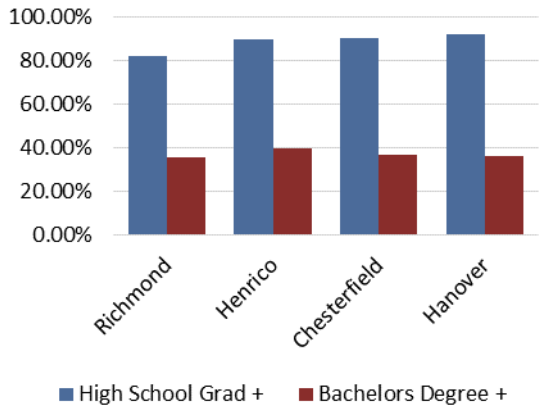
Richmond has a larger average household size than comparable cities and smaller average household size than surrounding counties.

Fig. 35 - Education Over 25 in Comparative Cities by High School Grad + (2014)



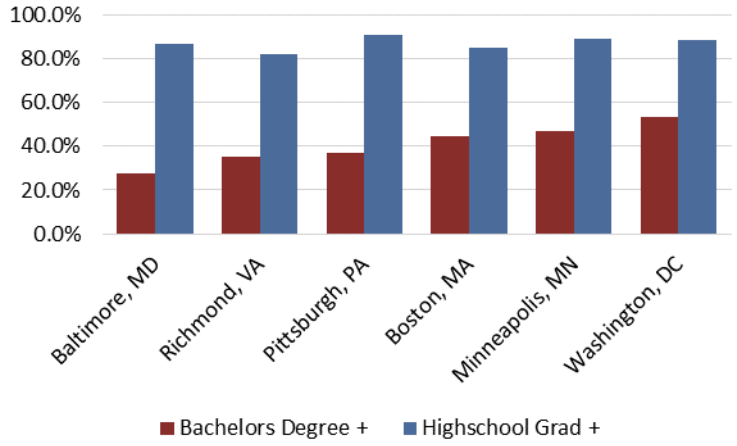
2014: American Community Survey

Fig. 36 - Education Over 25 in Comparative Counties by High School Grad + (2014)



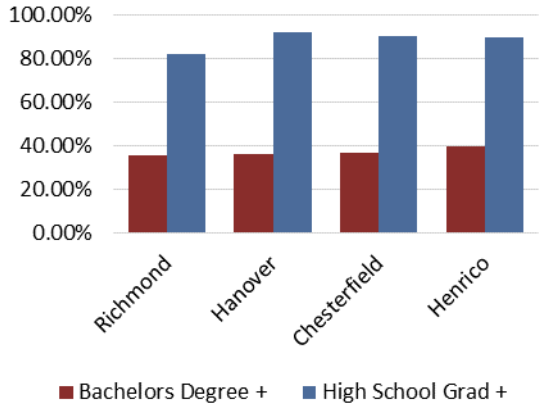
2014: American Community Survey

Fig. 37 - Education Over 25 in Comparative Cities by Bachelor's Degree + (2014)



2014: American Community Survey

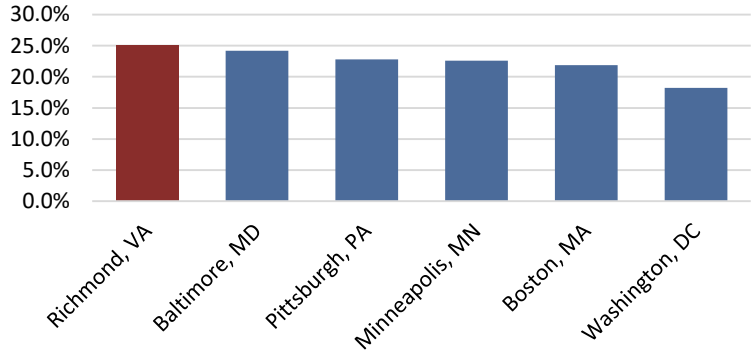
Fig. 38 - Education Over 25 in Local Counties by Bachelors Degree + (2014)



2014: American Community Survey

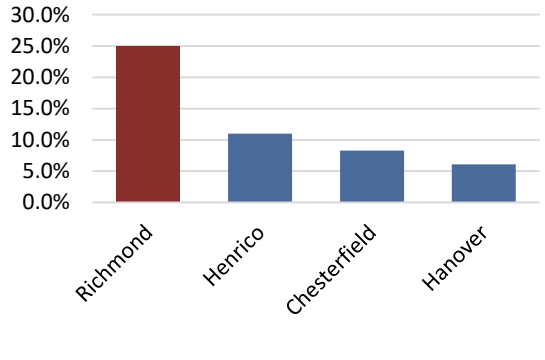
Richmond lags behind all comparable cities and surrounding counties in percentage of residents over the age of 25 who graduated from high school. Richmond lags behind all comparable localities except Baltimore, MD in percentage of residents with a bachelor's degree or more.

Fig. 39 - Comparable Cities Population in Poverty (2014)



2014: American Community Survey

Fig. 40 - Local Counties Population in Poverty (2014)



2014: American Community Survey

Richmond lags behind all comparable cities and surrounding counties in percentage of residents living below the poverty line.

Tab. 16 – Comparable Cities Housing (2015)

City	Occupied Dwelling Units	% Owner Occupied	% Occupied Multi-family Units (3 Units or More)
Washington, DC	273,390	41%	58%
Boston	256,294	34%	67%
Baltimore	242,268	47%	29%
Minneapolis	168,385	48%	42%
Pittsburgh	132,468	48%	30%
Richmond	100,393	42%	37%

2015: American Community Survey

Richmond had approximately 100,393 housing units in 2015 according to the U.S Census Bureau's American Community Survey (ACS). Table 16 presents housing occupancy and multi-family building type data for Richmond and comparable cities.

The U.S. Census 2013 Housing Survey (AHS) reports that 28% of the total housing units in the Richmond Metropolitan Statistical Area, comprised of 18 local governments, are multi-family. Unlike the table above, this data includes duplex units as multi-family. According to estimates from VCU CURA's 2015 MetroView data system, 44% of Richmond's dwelling units are multi-family including duplex units.

Tab. 17 – Surrounding Counties Housing (2015)

Jurisdiction	Multi-Family Type Including Duplexes
Richmond	44%
Richmond MSA	28.8%

2015: American Community Survey

The following expanded list of comparable cities in the southeastern United States presents data on population, land area and density. It should be noted that many cities have significant undeveloped land within the city limits.

Tab. 18 - Regional Comparable Cities (2015)

2015 Rank (Population)	City	State	2015 Estimate	2010 Census	Change
41	Virginia Beach	VA	452,745	437,994	3.37%
42	Raleigh	NC	451,066	403,892	11.68%
61	Lexington	KY	314,488	295,803	6.32%
68	Greensboro	NC	285,342	269,666	5.81%
79	Durham	NC	257,636	228,330	12.83%
86	Norfolk	VA	246,393	242,803	1.48%
88	Winston-Salem	NC	241,218	229,617	5.05%
94	Chesapeake	VA	235,429	222,209	5.95%
97	Baton Rouge	LA	228,590	229,493	−0.39%
102	Birmingham	AL	212,461	212,237	0.11%
115	Montgomery	AL	200,602	205,764	−2.51%
116	Columbus	GA	200,579	189,885	5.63%
123	Mobile	AL	194,288	195,111	−0.42%
125	Huntsville	AL	190,582	180,105	5.82%
132	Newport News	VA	182,385	180,719	0.92%
137	Chattanooga	TN	176,588	167,674	5.32%
166	Alexandria	VA	153,511	139,966	9.68%
180	Savannah	GA	145,674	136,286	6.89%
191	Hampton	VA	136,454	137,436	−0.71%
195	Columbia	SC	133,803	129,272	3.51%
199	Charleston	SC	132,609	120,083	10.43%
214	Lafayette	LA	127,657	120,623	5.83%
98	**Richmond**	**VA**	**220,289**	**204,214**	**7.87%**

2015: American Community Survey
2010: Decennial Census

Table 19 presents data for cities of similar land area (footprint) to Richmond.

Tab. 19 - Similar Footprint, Higher Density (2015)

2015 Rank (Population)	City	State	2015 Estimate	2010 Census	Change
13	San Francisco	CA	864,816	805,235	7.40%
23	Boston	MA	667,137	617,594	8.02%
22	Washington	DC	672,228	601,723	11.72%
37	Long Beach	CA	474,140	462,257	2.57%
29	Baltimore	MD	621,849	620,961	0.14%
46	Minneapolis	MN	410,939	382,578	7.41%
45	Oakland	CA	419,267	390,724	7.31%
56	Anaheim	CA	350,742	336,265	4.31%
55	Honolulu	HI	352,769	337,256	4.60%
63	Pittsburgh	PA	304,391	305,704	−0.43%
64	St. Paul	MN	300,851	285,068	5.54%
60	St. Louis	MO	315,685	319,294	−1.13%
51	Cleveland	OH	388,072	396,815	−2.20%
98	**Richmond**	**VA**	**220,289**	**204,214**	**7.87%**

2015: American Community Survey
2010: Decennial Census

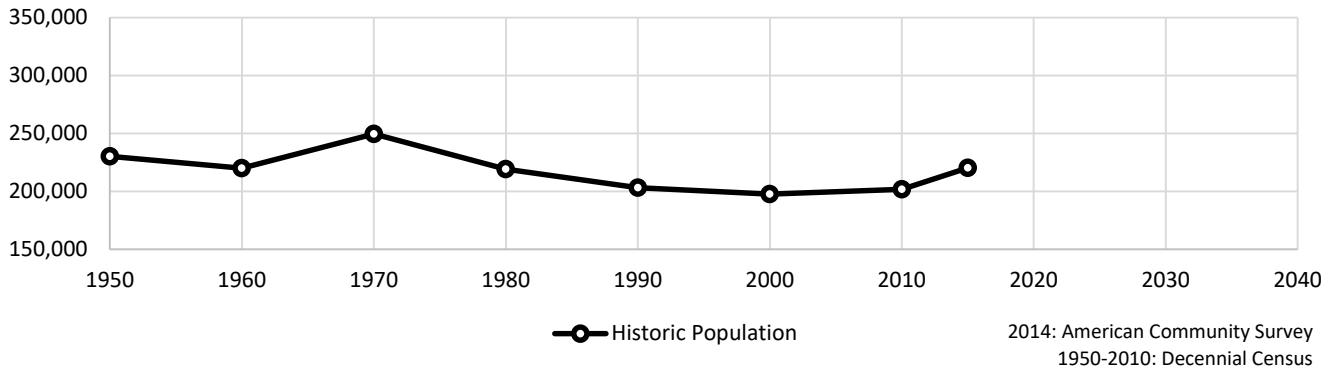
- CHAPTER 3 -

POPULATION PROJECTIONS

HISTORIC POPULATION

In 1950 the population of Richmond was 230,310. Richmond's population declined between 1950 and 1960 by roughly 10,352 residents. This decade of decline was followed by a steep increase in population due to the annexation of part of Chesterfield County in 1970, increasing the population to an all-time high of 249,621 residents. After the annexation through 2000 the city saw a population decline of 51,831 to 197,790 residents, the lowest population level observed. Between 2000 and 2010 the city saw a slight increase in population of 4,008 people for the first time in three decades. The most recent years studied showed rapid growth. Between 2010 and 2015 Richmond added 18,491 residents, the strongest growth in Richmond's recent history.

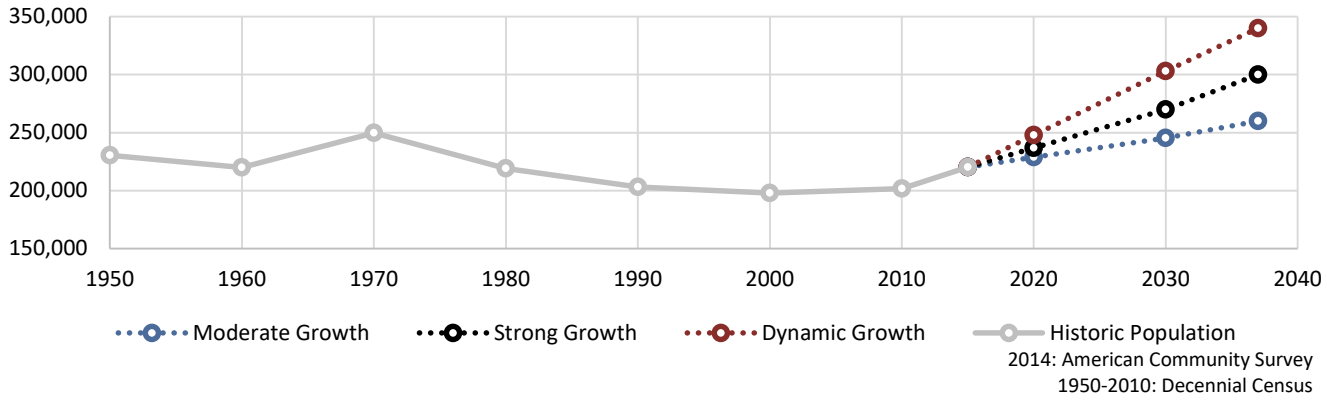
Fig. 41 – Historic Population of Richmond, VA (1950-2015)



TOTAL POPULATION PROJECTIONS

The following analysis will present the development of three population projections for the City of Richmond for the years 2015 to 2037.

Fig. 42 – Historic and Projected Population of Richmond, VA (1950-2037)



2037 POPULATION PROJECTIONS

1. Moderate Growth: 260,000 - Assuming continuation of the Richmond 2000 to 2015 annual growth rate of 0.76%

2. Strong Growth: 300,000 - Assuming 2010 to 2015 growth rate and growth equal to the regional annual growth rate of 1.5%

3. Dynamic Growth: 340,000 - Assuming an accelerated annual growth rate of 2.5%

The methodology to develop these projections is presented below.

1. Population Projection 1 - Moderate Growth: This population projection assumes continuation of the recent 15-year trend of attracting people of college age, young adults, and members of the Baby Boomer generation; and continued out-migration of families with young children.

Richmond 2000 Census Population: 197,790

Richmond 2015 ACS Population Estimate: 220,289

2000 – 2015 growth rate = (220,289 – 197,790)/197.790 = 11.38% or 0.76% per year

Richmond Population 2037 = Pop 2015 x (1 + 22 years x 0.76% per year)

= 220,289 x 1.17

= 258,000

Round to 260,000

2. Population Projection 2 - Strong Growth: This projection assumes that Richmond will become increasingly attractive to young, working, and older adults with increased in-migration. Job growth will increase, yet some families with young children will move out of the city, yielding a negative net migration for children 0 to 4 years old.

This projection assumes the rate of population growth will be the same as the Richmond regional growth (RRPDC localities). The Richmond annual regional growth rate of 1.5% projected by UVA Weldon Cooper Center for Public Service in 2012 is used.

Tab. 20 – Strong Growth Rate

Jurisdiction	2020	2040	Population Increase	% Increase	Annual %
RRPDC Region	1,151,229	1,496,955	345,726	30.0%	1.5%
Virginia	8,811,512	10,530,228		19.5%	

Richmond Population 2037 = Pop 2015 x (1 + 22 years x 1.5% per year)

= 220,289 x 1.33

= 293,000

Comparing this to a population projection using the 2010 to 2015 Richmond estimated population growth and assuming this rate continues:

Richmond 2010 Census Population: 204,214

Richmond 2015 ACS Population Estimate: 220,289

2010 – 2015 growth rate = (220,289 – 204,214)/204,214

= 7.87% or 1.57% per year

Richmond Population 2037 = Population 2015 x (1 + 22 years x 1.57% per year)

= 220,289 x1.35

= 297,000

Round to 300,000

3. Population Projection 3 - Dynamic City Growth This projection assumes strong growth of families with children, young and old adults, and dynamic job growth within the city.

Assume a more aggressive population growth rate of 2.5% for 22 years.

Therefore the 2037 projected population is 1 + (2.5% x 22) x 220,289 = 341,448;

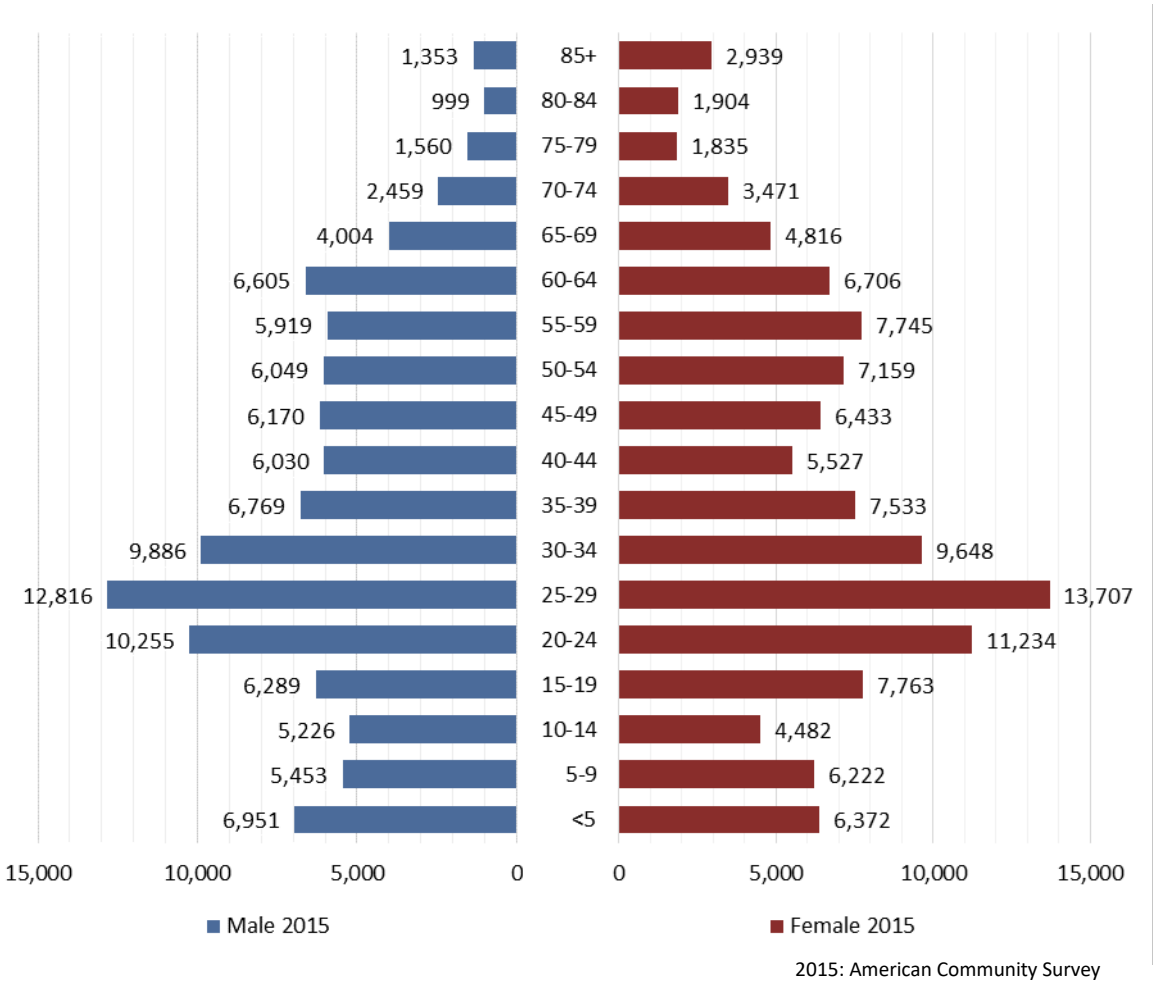
Round to 340,000.

COHORT COMPONENT POPULATION PROJECTIONS

While a projection of total future population is useful for many discussions and analysis about the future, it is even more helpful to understand the changing number of residents of different ages. An increase or decrease within different generations or smaller age groups will significantly affect housing markets, government services and private market demand. For example, the recent increase in young adults from age 20 to 29 has increased the demand for multi-family housing.

For this reason, population projections by five-year groupings, called cohorts, have been prepared for males, females, and totals for the year 2037. First, the 2015 age group profile is presented in the graph below.

Fig. 43 – Cohort Population Pyramid (2015)



2015: American Community Survey

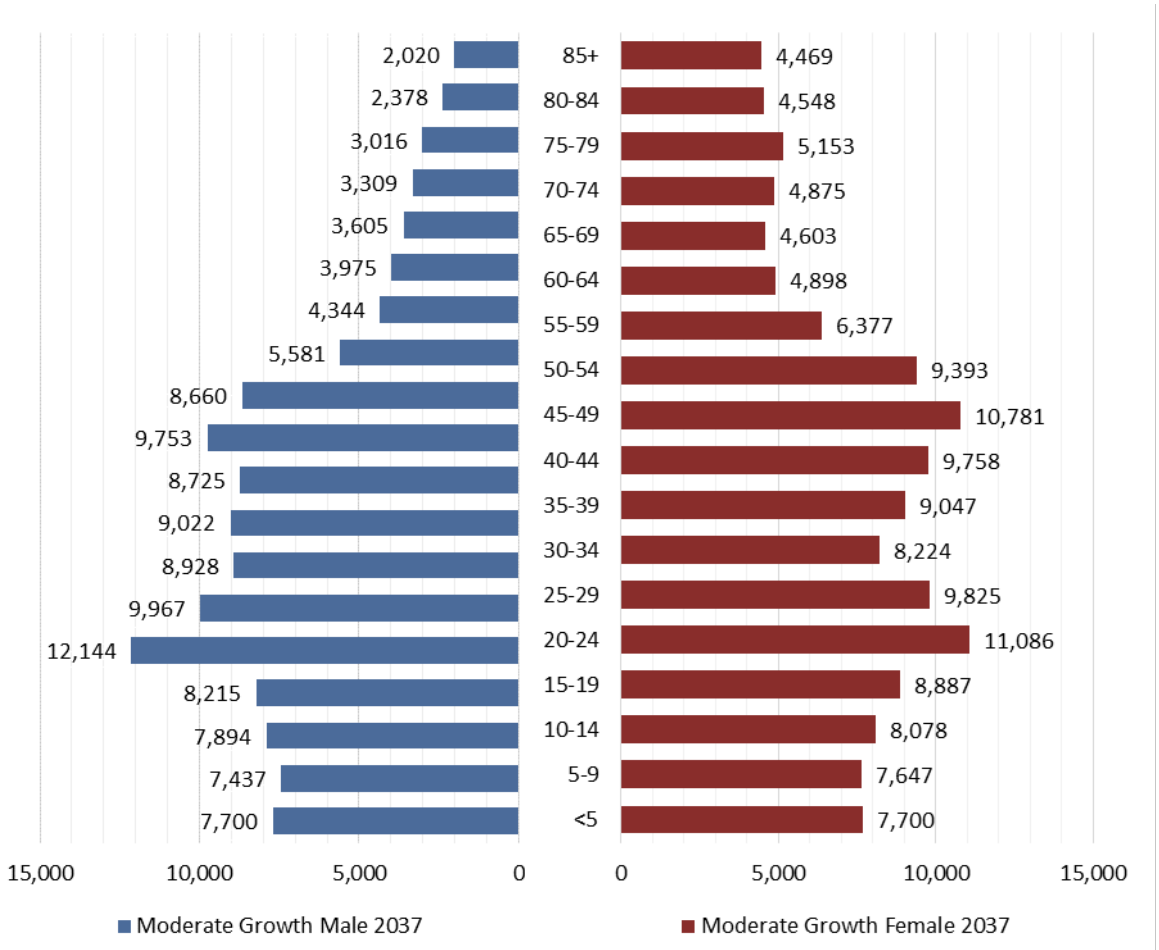
This data source is the 2015 U.S. Census American Community Survey (ACS). The greater number of residents in the age cohorts between 20 and 34 and 50 to 64 is apparent. These population bubbles result from the large Millennial and Baby Boomer generations.

Presented below are three population projections including detailed five-year cohort projections. The methodology to produce these age grouping forecasts is complex. Birth and death rates specific to Richmond were obtained from the Virginia Health Department and applied in a computer projection model.

The population heavily depends on the pattern of in-migration and out-migration. No detailed data is available on migration in and out of Richmond. Therefore, net migration was first estimated by calibrating the computer model by calculating the net migration from 2000 to 2015 from the natural growth from 2000 to 2015

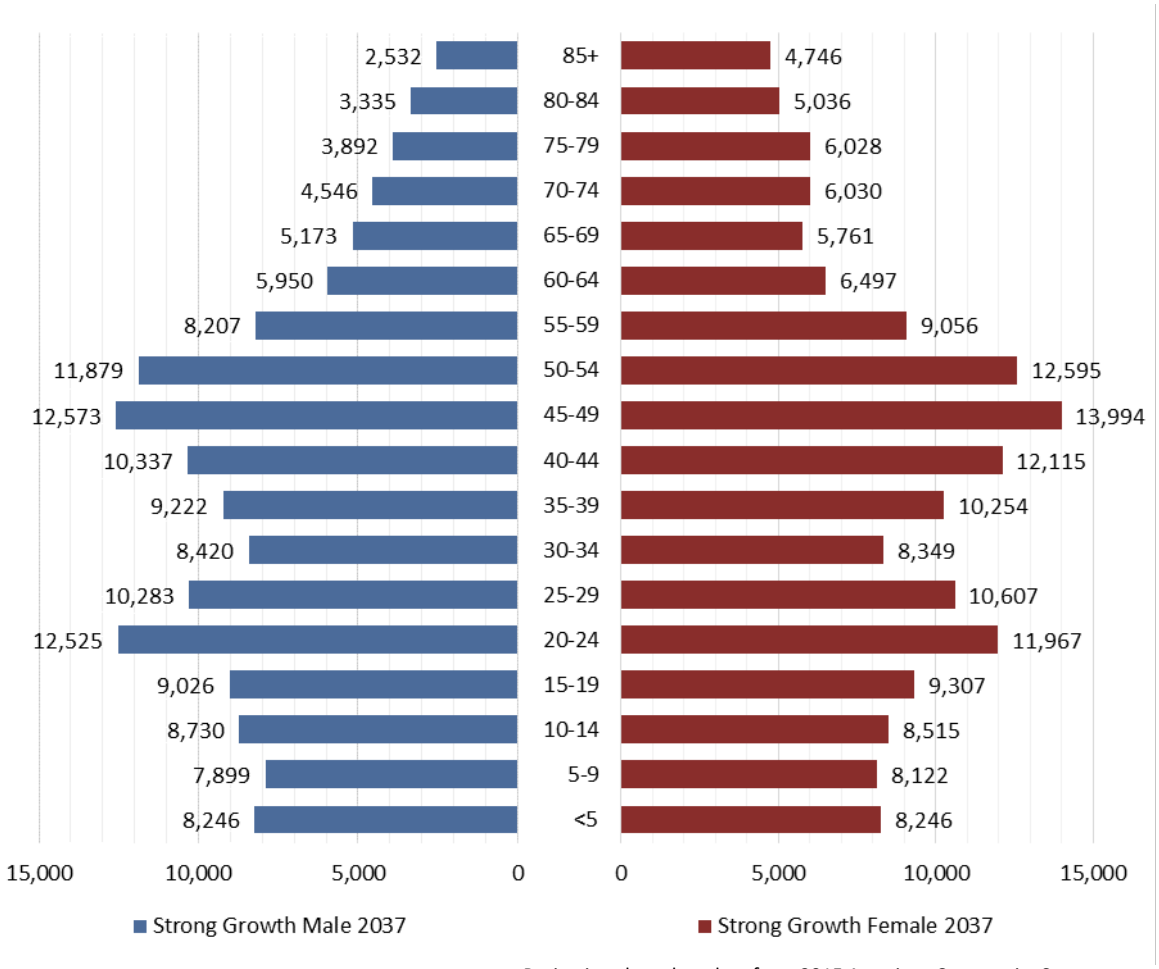
and comparing to the ACS. Then, significant adjustments were made to this first estimate based on the known population trends and development and population assumptions represented in the three projections.

Fig. 44 – Cohort Population Pyramid Moderate Growth (2037)



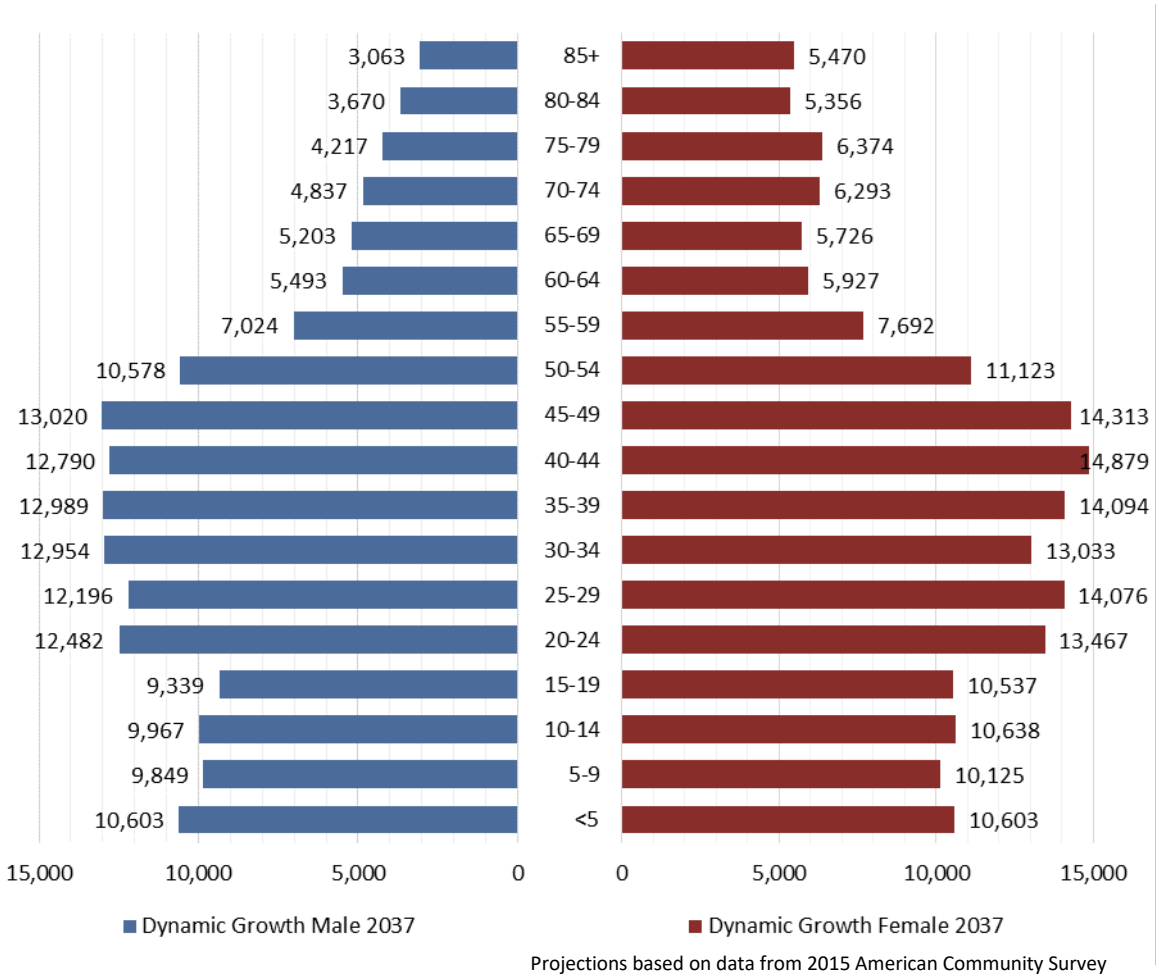
Projections based on data from 2015 American Community Survey

Fig. 45 – Cohort Population Pyramid Strong Growth (2037)



Projections based on data from 2015 American Community Survey

Fig. 46 – Cohort Population Pyramid Dynamic Growth (2037)



Projections based on data from 2015 American Community Survey

These population projections will be used in the projection of housing-type demand and land-use demand in this report.

- CHAPTER 4 -

HOUSING UNIT PROJECTIONS

Housing Unit Projections

Housing type projections assist in developing land use projections for the 2037 moderate, strong, and dynamic population forecasts. These projections are based on the 5-year component population projections, several research sources and CURA research judgment. The National Association of Home Builders conducts surveys to understand generational housing type preferences. CURA adjusted these survey findings to reflect the economic realities of the Richmond housing market. In addition, CURA applied an adjustment factor based on the ratio of existing multi-family to single-family units in Richmond compared to surrounding counties. This change reflected the greater attraction of the city for multi-family housing. This model predicts the total number of single-family and multi-family units for future residential land use projections. For this analysis, single-family units include single-family homes and townhouse units.

The current ratio of single-family housing units to multi-family housing units in the City of Richmond is 56.1% to 43.9%. Of the total existing residential units, 56,335 are single-family and 44,058 are multi-family units. With stronger growth and population increase in the city, the percentage of share of multi-family units is estimated to climb. However, the aging of the Millennial generation into child-bearing years will drive a demand for single-family units.

Moderate Growth Projection

The Moderate Growth housing projections illustrate housing demand with a total population of 260,000 in 2037. With a total of 8,179 single-family units and 4,748 multi-family units, The population increase of 39,711 new residents will require 12,928 additional housing units. Negative demand in many of the cohorts with smaller average household sizes and strong growth in the Millennial cohort groups that have higher average household sizes reduces the need for new housing units.

Tab. 21 - 2037 Moderate Growth New and Existing Single-Family and Multi-Family Units

	Single-Family	Multi-Family	Total Units
Existing Housing	56,335	44,058	100,393
New Demand	8,179	4,748	12,928
Total	**64,514**	**48,806**	**113,321**

Fig. 47 - 2037 Moderate Growth Single-Family vs. Multi-Family Unit Preference by 5-Year Cohort

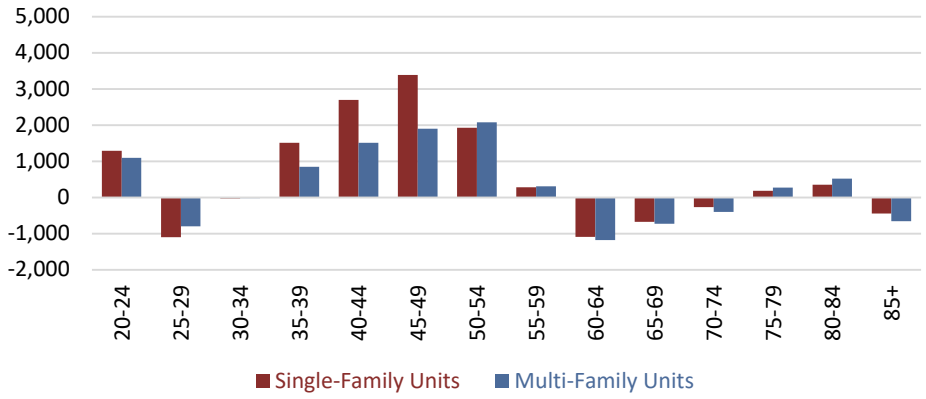
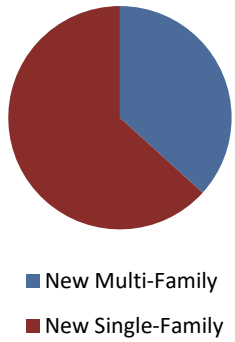


Fig. 48 - 2037 Moderate Growth New Housing Demand



Strong Growth Projection

The Strong Growth housing projections show housing demand with a total population of 300,000 in 2037. While the Moderate Growth projection shows growth in only slightly more than half of the cohort groups, the Strong Growth projection shows growth in all but three. The 35-49 cohort will primarily drive the demand for new single-family homes, but this will be tempered by an increase in the senior population that increasingly prefers multi-family housing. Because of this increase in the senior population, multi-family units will achieve an increase of 2.5% of the housing ratio. With a total of 15,804 single-family units and 17,866 multi-family units, the population increase of 79,711 new residents will require 33,669 additional units.

Tab. 22 - 2037 Strong Growth New and Existing Single-Family and Multi-Family Units

	Single-Family	Multi-Family	Total Units
Existing Housing	56,335	44,058	100,393
New Demand	15,804	17,866	33,669
Total	**72,139**	**61,924**	**134,062**

Fig. 49 - 2037 Moderate Growth Single-Family vs. Multi-Family Unit Preference by 5-Year Cohort

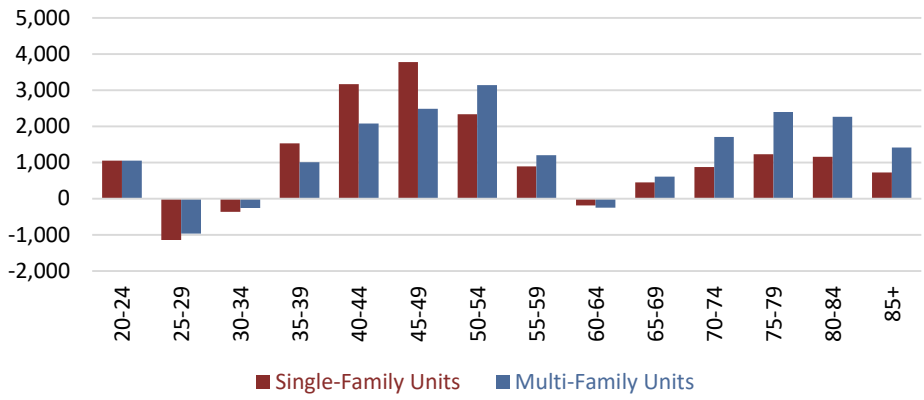
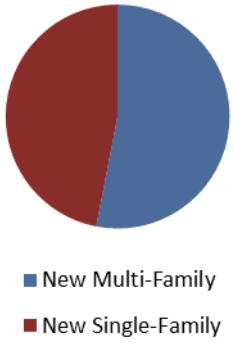


Fig. 50 - 2037 Strong Growth New Housing Demand



Dynamic Growth Projection

The Dynamic Growth housing projection shows housing demand with a total population of 340,000 in 2037. This projection shows increased housing demand across all cohorts save one. With such a large population growth, multi-family units will see an increase of 3.7% of the housing ratio. With a total of 22,518 single-family units and 27,086 multi-family units, the population increase of 119,711 new residents will require 49,605 additional units.

Tab. 23 - 2037 Dynamic Growth New and Existing Single-Family and Multi-Family Units

	Single-Family	Multi-Family	Total Units
Existing Housing	56,335	44,058	100,393
New Demand	22,518	27,086	49,605
Total	**78,853**	**71,144**	**149,998**

Fig. 51 - 2037 Dynamic Growth Single-Family vs. Multi-Family Unit Preference by 5-Year Cohort

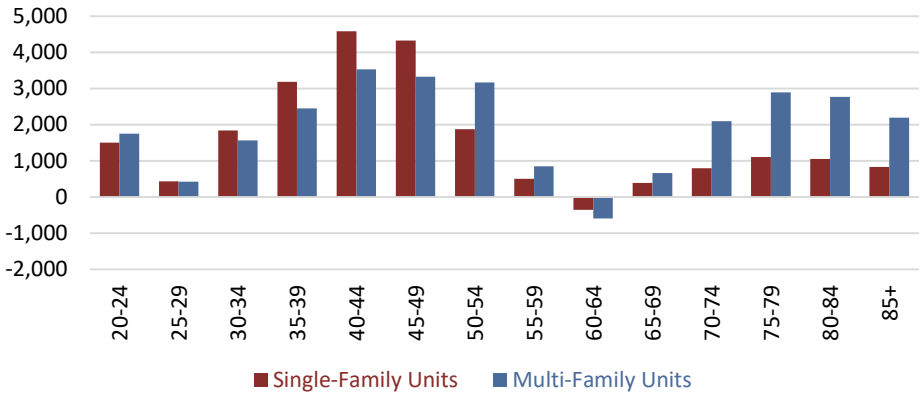
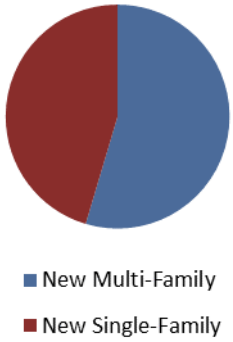


Fig. 52 - 2037 Dynamic Growth New Housing Demand



- CHAPTER 5 -

LAND USE DEMAND PROJECTIONS

Future Land Use Projections

The preparation of three land use demand forecasts, consistent with the three population projections for 2037, will provide basic information to consider along with the land use supply analysis in the preparation of the land use plan. Future land use demand will be estimated from an analysis of past development patterns, general knowledge of current market conditions, and detailed housing projections. These analyses create the unconstrained land demand which is adapted through consideration of land supply and location constraints to yield the modified land demand.

Consistent with population projections for the year 2037 of 260,000 residents, 300,000 residents, and 340,000 residents, three projections are developed below.

Future land use demand can be estimated from housing and employment projections. Given the projected population increase by the year 2037, residential land needed to support this population can be calculated from basic assumptions about housing type and density. Since employment projections are not available, the remaining categories of land use are projected proportional to population and modified through knowledge of market conditions, land use supply, and development patterns.

PROJECTION 1 - Moderate Growth: 260,000 Resident

Housing Demand: Analysis in the housing projection section of this report forecasts 12,928 additional housing units by 2037. This is estimated to be 4,748 multi-family units and 8,179 single-family, and townhouse units (hereafter termed single-family).

Residential Land Demand: The residential land use demand will depend on the density of future residential development. Assuming 25 dwelling units per acre (du/acre) for urban multi-family (range usually 20 – 50 du/acre) and 8 dwelling units per acre for single family (range usually 4 – 18 du/acre).

Private sector land markets result in inflated land prices if demand for land meets or exceeds supply. Therefore, it is necessary to increase the projected demand by a market factor to prevent artificially raised land prices. After application of a market factor of 1.25, the land demand is:

Multi-family land demand = 4,748/25 x 1.25 = 240 acres

Single-family land demand = 8,179/8 x 1.25 = 1,300 acres

This forecast will be used as an input to the following projection technique.

Land Use Projection: The land area devoted to various land uses in 2015 is projected to the year 2037 in direct proportion to the percentage population increase of the moderate level projection of 260,000. This is an increase of approximately 40,000 residents over the estimated 2015 population of 220,289: an increase of 18%. A market factor is applied to increase land supply above the projected demand to prevent private sector inflation of land prices. Significant land area modifications are applied to fit Richmond's constrained city limits and historic land use intensities as shown in the last column of the table below.

Major assumptions for this projection are as follows:

- Development density increase over 2015
- Significant increase in mixed use commercial and office use
- 25% of multi-family residential incorporated in mixed land use
- Most additional commercial and office uses will redevelop existing sites
- Industrial land significantly constrained
- Higher density townhouse development on redevelopment sites

Tab. 24 - Projection 1 Land Use Demand Calculations						
Land Use	2015 Land Area	2037 Land Area*	Market Factor	Unconstrained Land Area	Unconstrained Demand**	Modified Land Demand
Single-Family	13,450	8,179	1.25	-	1,300	1,100
Multi-Family	2,450	4,748	1.25	-	240	180
Industrial	4,070	4,800	1.25	6,000	1,930	100
Commercial	2,040	2,410	1.25	3,010	970	70
Office	700	830	1.25	1,040	340	50
Mixed-Use	70	80	1.25	100	30	80
Public/Open Space	3,010	3,550	1	3,550	540	100
Institutional & Government	2,120	2,500	1	2,500	380	50
Other	6,250	7,350	1	7,350	1,100	80
Vacant	4,040					
TOTAL	38,200				Rounded to:	1,800 acres

*Initial unconstrained land projection of 18% land area increase (2037 population projection/2015 population = 260,000/220,289 = 1.18 = 18% increase)

**This is the difference between unconstrained land area and the 2015 land area

PROJECTION 2 - Strong Growth: 300,000 Residents

Housing Demand: 15,804 multi-family; 17,866 single-family; total new housing units by 2037 is 33,669

Residential Land Demand: Assuming an average density of 30 dwelling units per acre for multi-family housing, an average density of 10 dwelling units for single-family housing, and a market factor of 1.20, the land demand is:

Multi-family land demand = 17,866/30 x 1.20 = 710 acres

Single-family land demand = 15,804/10 x 1.20 = 1,900 acres

This housing forecast will be used as an input to the following projection technique.

Land Use Projection: This projection assumes an increase of approximately 80,000 residents over the estimated 2015 population of 220,289: an increase of 36%. A market factor will be applied to increase land supply above the projected demand to prevent private sector inflation of land prices. Significant land area modifications will be applied to fit Richmond's constrained city limits and historic land use intensities as shown in the last column of the table below.

Major assumptions for this projection are as follows:

- Development density increase over 2015
- Residential use development at increased density
- Higher density townhouse development on redevelopment sites
- Office development principally in multi-story or mixed-use buildings
- Significant increase in mixed-use commercial and office use
- 25% of multi-family residential incorporated in mixed-use development
- Most additional commercial, institutional, government, and office uses will redevelop existing sites
- Industrial land significantly constrained – land projected for intense industrial; warehouse space to develop elsewhere

Tab. 25 - Projection 2 Land Use Demand Calculations						
Land Use	2015 Land Area	2037 Land Area*	Market Factor	Unconstrained Land Area	Unconstrained Demand**	Modified Land Demand
Single-Family	13,450	15,804	1.20	-	1,900	1,500
Multi-Family	2,450	17,866	1.20	-	710	530
Industrial	4,070	5,500	1.25	6,900	2,830	150
Commercial	2,040	2,770	1.25	3,470	1,430	80
Office	700	950	1.25	1,190	490	70
Mixed-Use	70	90	1.25	120	50	150
Public/Open Space	3,010	4,010	1	4,010	1,000	150
Institutional & Government	2,120	2,880	1	2,880	760	100
Other	6,250	8,500	1	8,500	2,250	160
Vacant	4,040					
TOTAL	**38,200**				**Rounded to:**	**2,900 acres**

* Initial unconstrained land projection of 36% land area increase (2037 Population Projection/2015 population = 300,000/220,289 = 1.36 = 36% increase)

**This is the difference between unconstrained land area and the 2015 land area

PROJECTION 3 Dynamic Growth: 340,000 Residents

Housing Demand: 27,086 multi-family; 22,518 single-family; total new housing units by 2037: 49,605

Residential Land Demand: Assuming an average density of 40 dwelling units per acre for multi-family housing, an average density of 14 dwelling units per acre for single-family housing, and a market factor of 1.15, the land demand is:

Multi-family land demand = 27,086/40	x 1.15	= 780 acres
Single-family land demand = 22,518/14	x 1.15	= 1,850 acres

This forecast will be used as an input to the following projection technique.

Land Use Demand: Significant land area modifications will be applied to fit Richmond's constrained city limits and historic land use intensities as shown in the last column of the table below.

Major assumptions for this projection are as follows:

- Significant development density increase over 2015
- All residential uses develop at increased density
- Higher-density townhouse development on redevelopment sites
- Office development will principally be in multi-story or mixed-use buildings
- Significant increase in mixed-use commercial and office use
- 25% of multi-family residential incorporated in mixed-use development
- Most additional commercial, institutional, government, and office uses will redevelop existing sites
- Industrial land significantly constrained – land projected for intense industrial; warehouse space to develop elsewhere

Tab. 26 - Projection 3 Land Use Demand Calculations						
Land Use	2015 Land Area	2037 Land Area*	Market Factor	Unconstrained Land Area	Unconstrained Demand**	Modified Land Demand
Single-Family	13,450	22,518	1.15	-	1,850	1,600
Multi-Family	2,450	27,086	1.15	-	780	600
Industrial	4,070	6,280	1.25	7,850	3,780	200
Commercial	2,040	3,140	1.25	3,930	1,890	100
Office	700	1,080	1.25	1,350	650	100
Mixed-Use	70	110	1.25	140	70	300
Public/Open Space	3,010	4,640	1.00	4,640	1,630	200
Institutional & Government	2,120	3,260	1.00	3,260	1,140	150
Other	6,250	9,620	1.00	9,620	3,380	240
Vacant	4,040					
TOTAL	**38,200**				**Rounded to:**	**3,500 acres**

* Initial unconstrained land projection of 54% land area increase (2037 projected population/2015 population = 340,000/220,289 = 1.54 = 54% increase)

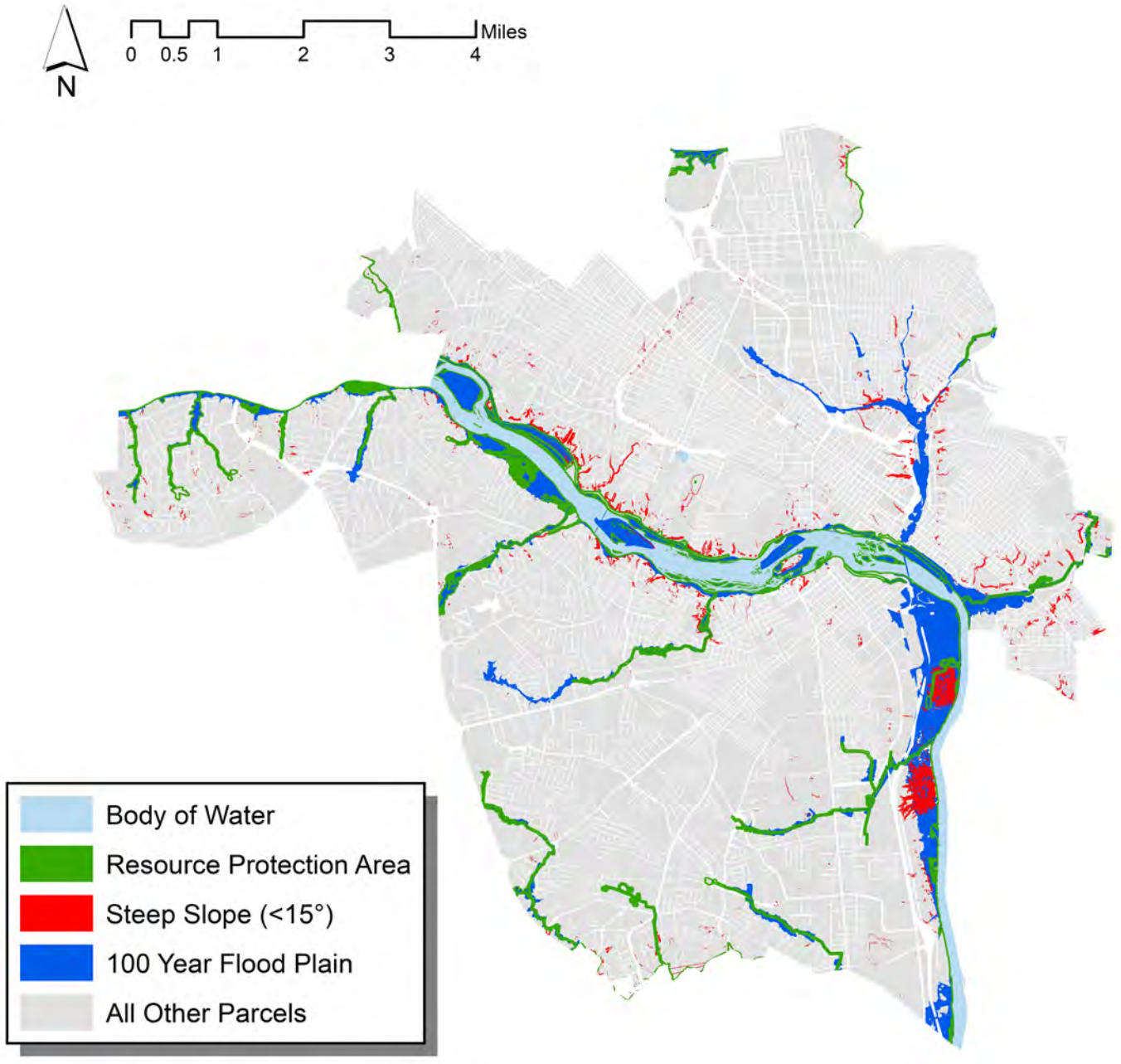
**This is the difference between unconstrained land area and the 2015 land area

- CHAPTER 6 -

LAND DEVELOPMENT SUPPLY

Constraints to Development

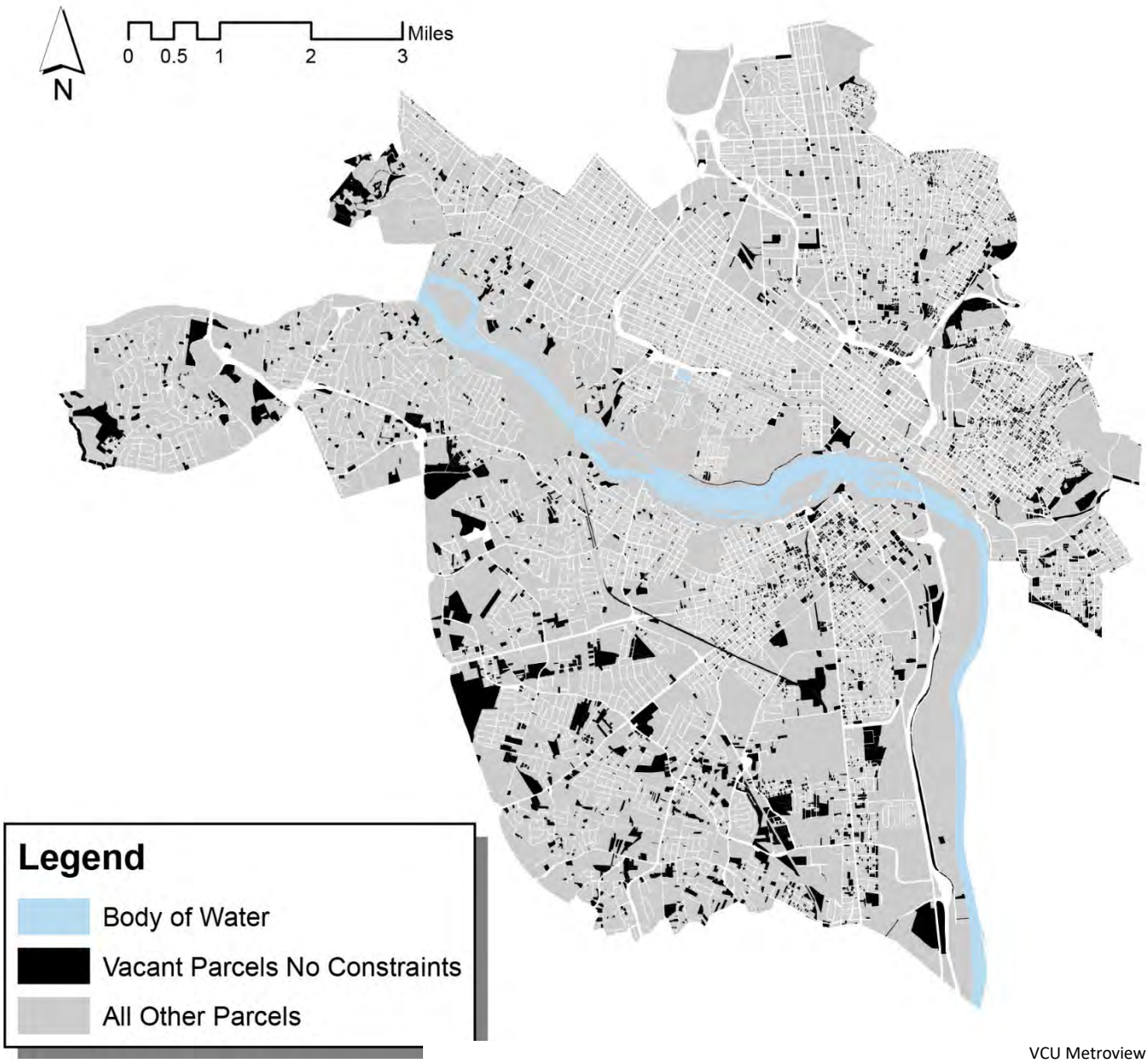
Map 43 - Environmental and Other Development Constraints (2016)



VCU Metroview
City of Richmond GIS Data

Vacant Parcels

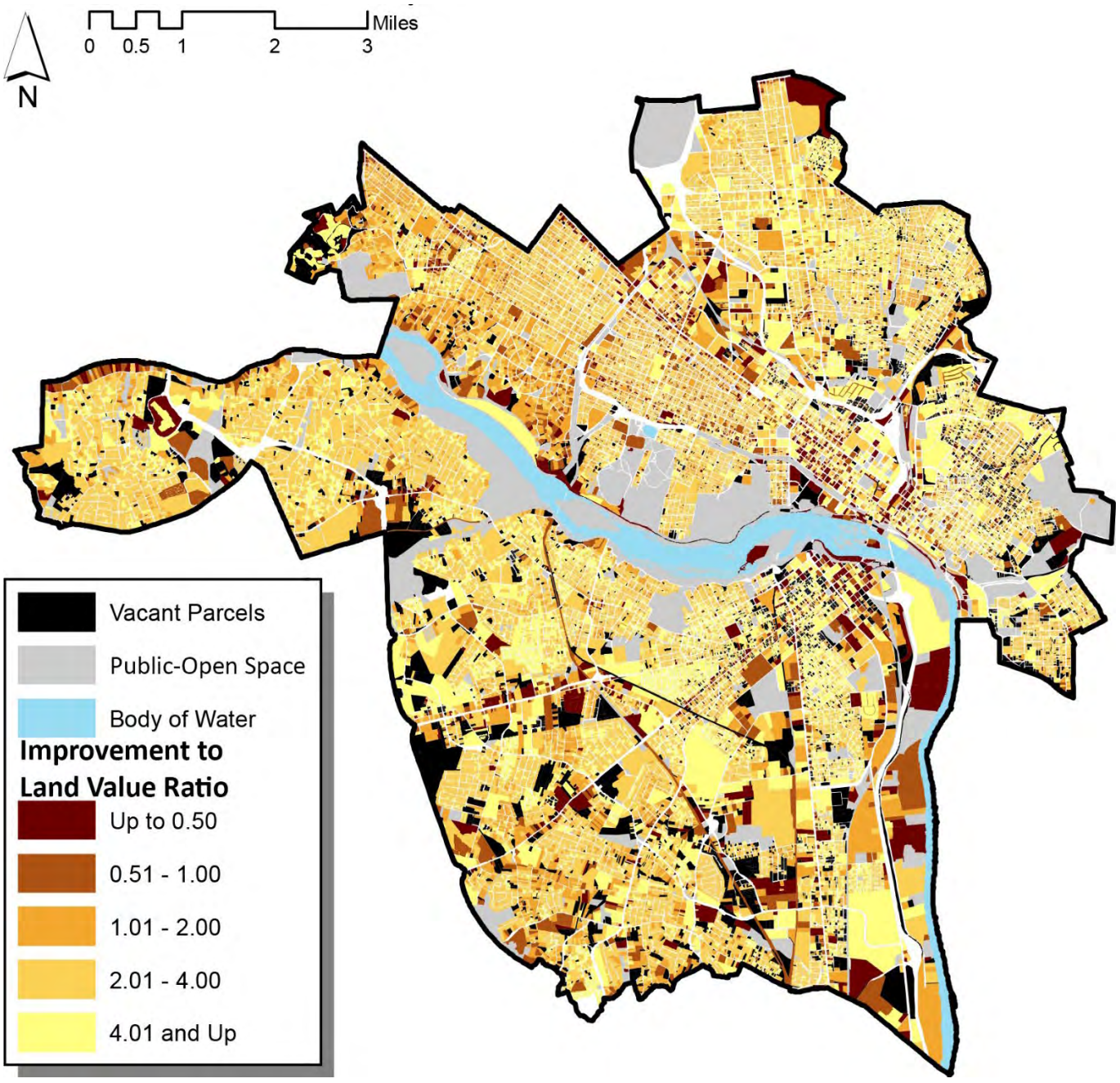
Map 44 - Vacant Parcels with No Development Constraints Map (2016)



VCU Metroview
City of Richmond GIS Data

Improvement to Land Value

Map 45 - Development Potential Ratio Map (2016)

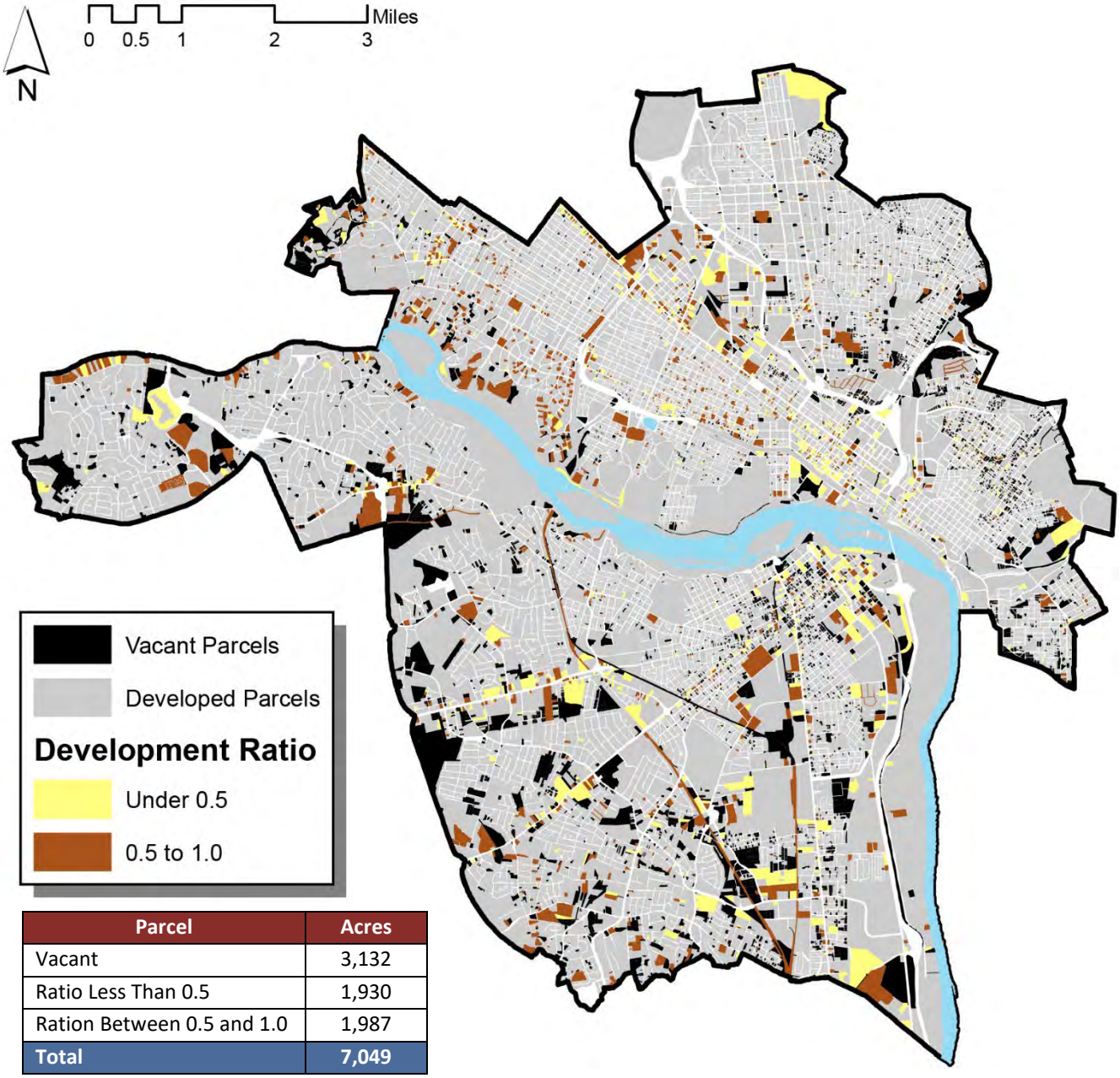


VCU Metroview
City of Richmond GIS Data

The Development Potential Ratio Map represents the ratio of improvement value to land value. Property with a low improvement to land value ratio has potential for future redevelopment. The lower the ratio, the more likely the private market can redevelop the property to a higher-value land use.

Development Potential

Map 46 - Development Potential Map



Parcel	Acres
Vacant	3,132
Ratio Less Than 0.5	1,930
Ration Between 0.5 and 1.0	1,987
Total	**7,049**

The Development Potential Map illustrates vacant parcels and parcels with an assessed improvement value divided by land value of 1.0 or less. Land area subject to environmental development constraints of the 100-year floodplain and steep slopes over 15 degrees (measured at parcel centroid) are not included in this map and table. The map and table illustrate land available for future development and redevelopment depending on the future economics of land development.

- CHAPTER 7 -

MARKET ANALYSIS

Introduction

Food deserts are areas in which there is a lack of fresh and healthy food options within a reasonable, convenient distance. Normally, these food deserts are full of fast food restaurants and convenience-type stores but are lacking grocery stores or supermarkets.

Some typical methods traditionally used to try and eliminate these deserts are: improvements to the business climate, more participation in WIC or SNAP programs, increased public transit in order to take people to the food, increased education about healthy food choices in public schools, and partnering with nonprofits to affect policy change at a state or federal level. Although these solutions are being implemented in various cities all over the world, there seems to be a gap in implementation policy surrounding density models—attracting new supply by increasing the density of demand. Adding housing units in a neighborhood would effectively increase demand within the area, and, in theory, could make these fresh-food deserts more attractive to grocers. The opportunity to address food deserts within a city is particularly relevant when updating the comprehensive plan, as this is the prime opportunity to rethink neighborhoods.

This analysis investigates six neighborhoods within the City of Richmond that are labeled as food deserts. In each neighborhood, quantitative analyses provide estimates of how many additional households (and, in turn, additional income) are required to economically support a neighborhood grocery store of 44,094 square feet[1] or 25,000 square feet[2].

The analyses showed that four of six neighborhoods may support a single grocery store of 25,000 square feet with current populations. An increase of 1,000 households earning the regional median household income would allow almost all trade areas to support a smaller footprint supermarket. However, few operators of supermarkets of that size exist, and most operators would want to see a larger market than what may barely support one store. Although none of the neighborhoods in question could support a 44,094 square foot grocery store with current populations, three neighborhoods currently have around 80 percent of the minimum potential demand.

If each neighborhood is to be able to fully economically support a store of 44,094 square feet, they would need to increase the amount of demand in their trade areas by increasing the number of households (and by extension, housing density). Around 1,000 additional households earning the regional median household income would create the demand needed to support a single grocery store in the Midlothian Turnpike trade area, and 2,000 additional households would push the Brookland Park and Church Hill trade areas over the demand threshold.

[1] The median gross leasable area of U.S. neighborhood supermarkets according to *Dollars and Cents of Shopping Centers/The SCORE 2008* (Urban Land Institute).
[2] The estimated size of a smaller footprint, urban neighborhood supermarket.

Fulton Hill, with the lowest level of demand in its trade area, would require an additional 4,000 households to support an average-sized supermarket.

One implication of these findings is the possibility of density, or additional housing units within a trade area, as a potential solution for food deserts. However, this assumes a store in a single neighborhood is supported solely by residents and commuters driving through the neighborhood. If one assumes instead that some customers will drive from adjacent neighborhoods—effectively extending the boundaries of a trade area—the number of additional households in a single neighborhood that are required to support a grocery store of 44,094 square feet would fall (potentially below the demand threshold required to support a single store).

Market Analyses

A market analysis is a mathematical tool used to calculate market potential. It is critical to determine the current market for food in each trade area to ascertain whether locating a grocery store within the neighborhood is possible without densification. The purpose of these market analyses is to determine the balance of food supply and food demand within each trade area.

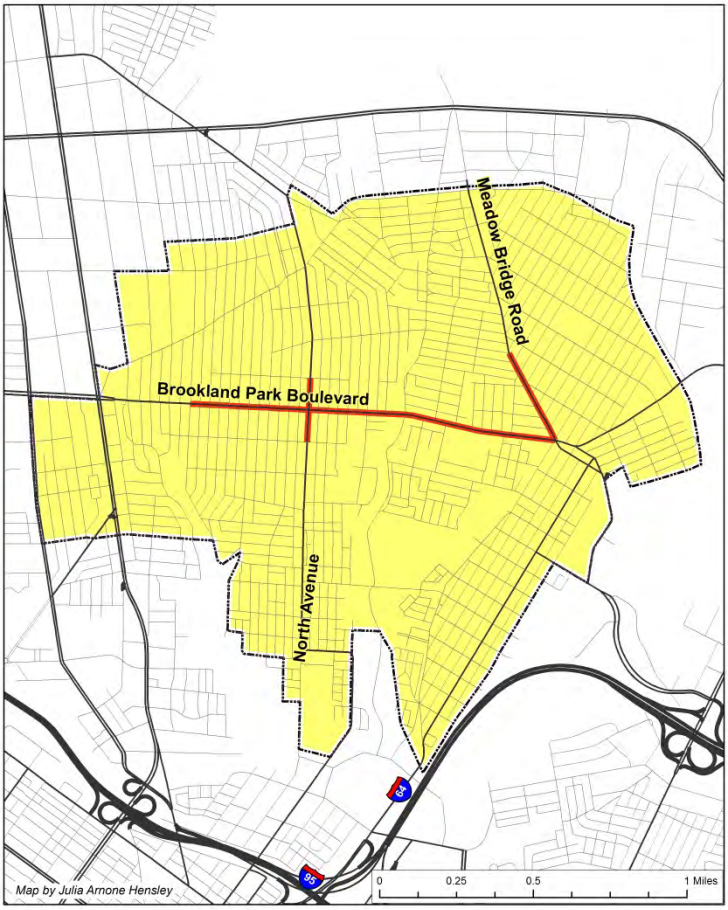
Each of the six neighborhoods evaluated in this report is unique and required detailed analysis of geography, demographics, income, and area retail supply and demand. To do so, convenience trade areas were mapped out for each neighborhood using GIS. These convenience trade areas approximate the distance an individual is willing to travel for convenience grocery items, such as milk or eggs. Distance, block groups, and travel time were used as factors to determine the convenience trade areas within each neighborhood. Block groups heavily influenced trade area boundaries in order to reflect income data accordingly. More details on the methodology utilized to draw trade areas can be found in the technical appendix.

The market analyses determine the number of potential grocery stores that are able to locate in each trade area with households at their present levels and are detailed in the discussion of each neighborhood. These calculations were also conducted to see how the addition of 1,000 households or 5,000 households would impact total demand in each trade area. The purpose of this was to measure the impact of increasing population, or densification, on market potential—to see if the addition of households would increase unmet demand to a level that may attract a supermarket operator.

Brookland Park Boulevard

Brookland Park Boulevard runs east-to-west through the northern section of Richmond. Although there are many convenience store options, the area lacks a nearby healthy, affordable grocery option. Residents without cars must travel a considerable distance by public transit to the closest grocery store. Otherwise, they are left to one of more than 15 convenience stores within the trade area. The average annual daily traffic count (ADT)[3] for Brookland Park Boulevard was broken into two segments: from Chamberlayne Avenue to the Richmond-Henrico Turnpike (8,900 vehicles) and from the Richmond-Henrico Turnpike to Dill Avenue (7,300 vehicles).

Map 47 - Brookland Park Boulevard Convenience Trade Area



Trade Area

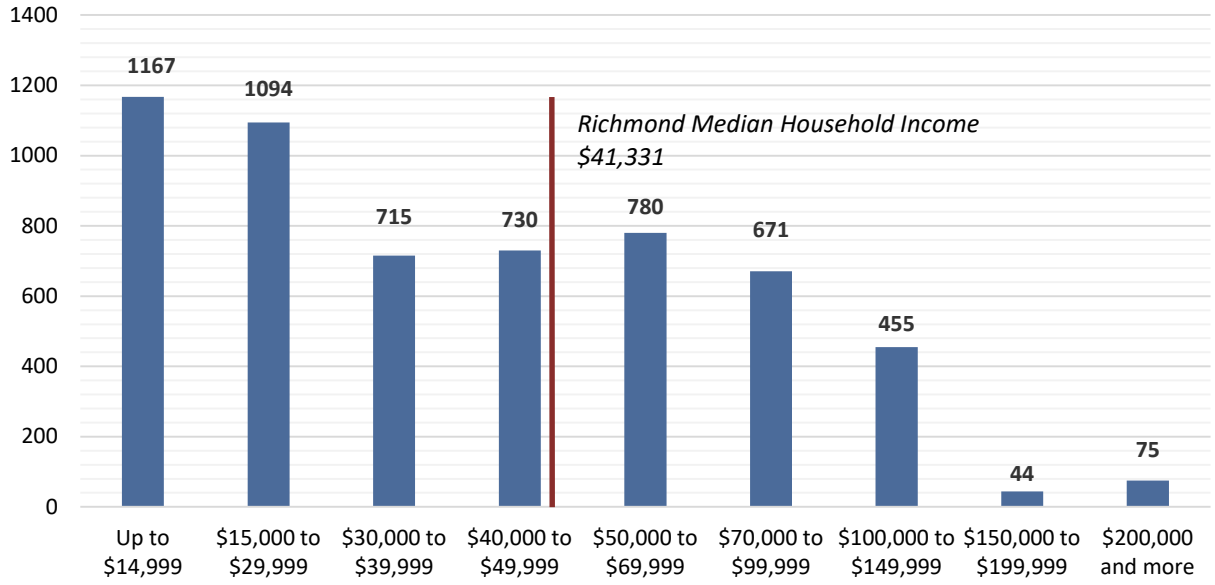
The Brookland Park Boulevard convenience trade area extends north of the Boulevard to Ladies Mile Road, and encompasses the Ginter Park Terrace, Brookland Park, and Providence Park neighborhoods. The trade area also includes the neighborhoods of Green Park and Northern Barton Heights to the south, and is surrounded by block groups to the east, west, and south. The convenience trade area totals 2.48 square miles as shown in Map 47.

Income Analysis

Approximately 52% of households within the Brookland Park trade area earn below the City of Richmond median household income of $44,331[4]. The median household income within the trade area falls within the $30,000 to $39,999 income range. Fig. 53 details the income distribution in the Brookland Park convenience trade area.

[3] Virginia Department of Transportation, 2015. Accessible at http://www.virginiadot.org/info/ct-trafficcounts.asp.
[4] 2010-2014 American Community Survey 5-year Estimates

Fig. 53 - Brookland Park Boulevard Households by Income



Market Analysis

With the current number of households, the Brookland Park convenience trade area could support 0.8 grocery stores of 44,094 square feet and 1.3 grocery stores of 25,000 square feet. Put simply, the area currently meets about 80 percent of the demand required to support a single, average-sized supermarket, and exceeds the demand threshold to support a smaller supermarket. An additional 1,000 households[5] would allow the area to support 0.9 stores of 44,094 square feet. The additional demand from adjacent neighborhoods could make such a store viable. Adding 5,000 households to the trade area would push potential demand well above that needed to support a single supermarket. See Table 27 for a comparison of how the addition of households to the trade area impacts potential demand and the number of supportable stores.

Tab. 27 - Brookland Park Boulevard Number of Potential Grocery Stores

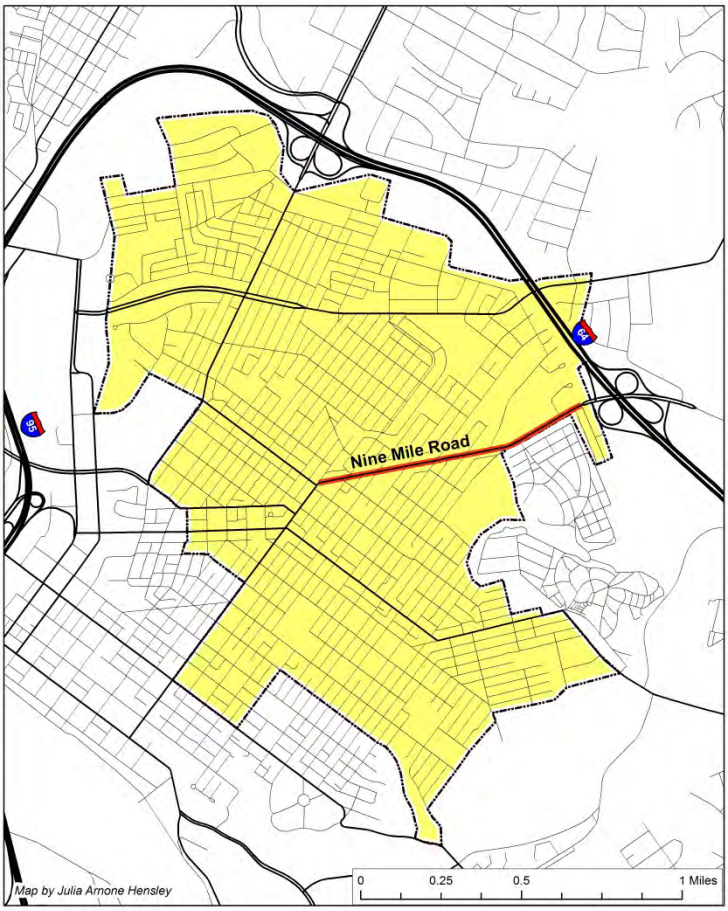
	Store Size	
	44,094 sq ft	25,000 sq ft
Current number of households	0.8	1.3
With additional 1,000 households	0.9	1.6
With additional 5,000 households	1.6	2.8

[5] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

Church Hill/Nine Mile Road

Church Hill is located in the eastern section of the city. Nine Mile Road runs west from the Henrico County line into the Fairmount neighborhood, intersecting with 25th Street and Fairmount Avenue. The area directly surrounding Nine Mile Road has over 25 convenience stores. Two stores qualify as supermarkets but are located on opposite edges of the neighborhood. The ADT of Nine Mile Road from 25th Street to the eastern city line is 8,800 vehicles per day, which is the smallest ADT figure of all the study areas.

Map 48 - Church Hill/Nine Mile Convenience Trade Area



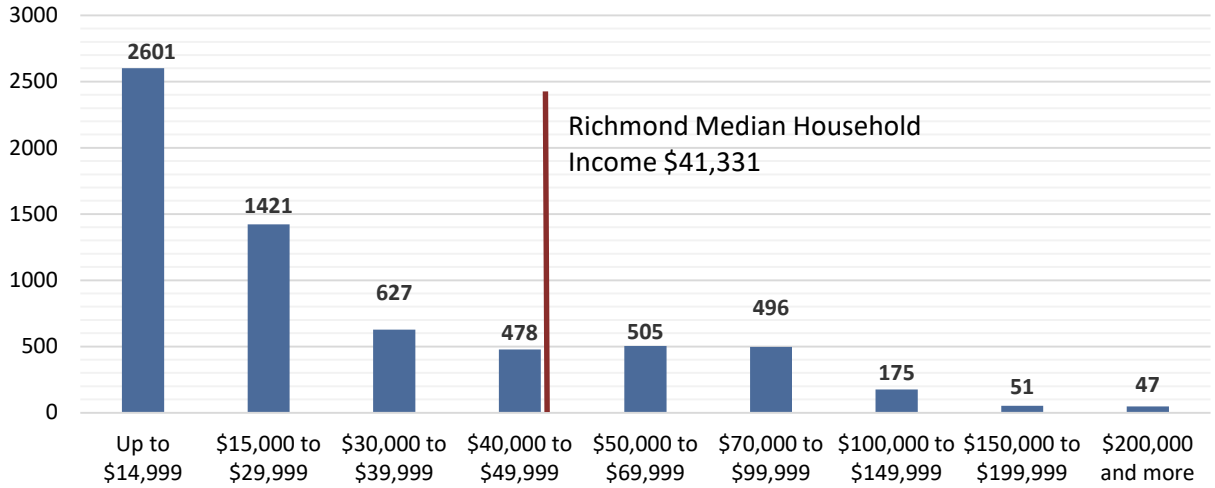
Trade Area

The Church Hill/Nine Mile convenience trade area extends north of Nine Mile Road to include the Whitcomb, Eastview, Mosby Court, Fairfield, Fairmount, East End, Peter Paul, Woodville, and Creighton neighborhoods. It also follows block group boundaries for income purposes. The trade area is further limited by I-64 to the north and northeast. The trade area extends south into the Church Hill and Oakwood neighborhoods, but it avoids Oakwood Cemetery. The trade area continues to follow block groups to the south and west, excluding the Richmond City Jail and courthouse. Map 48 illustrates the boundaries of the trade area. It is relatively large at 2.02 square miles.

Income Analysis

Approximately 73% of households within the Church Hill/Nine Mile trade area earn below the City of Richmond median household income. The median household income within the trade area falls within the $15,000 to $29,999 income range. See Fig. 54 for a detailed breakdown of household income in the trade area.

Fig. 54 - Church Hill/Nine Mile Households by Income



Market Analysis

At the current household levels, the Church Hill/Nine Mile convenience trade area meets the demand threshold to support a smaller 25,000 square foot supermarket, and it has around 80 percent of the demand needed to support a larger 44,094 square foot store. An additional 1,000 households[6] would push the area to 90 percent of the 44,094 square foot supermarket threshold, and it may be possible that including potential demand from adjacent neighborhoods would make a 44,094 square foot store viable. An additional 5,000 households would increase demand to well above the threshold needed to support an average-size supermarket. See Tab. 28 for a summary of these numbers.

Tab. 28 - Church Hill/Nine Mile
Number of potential grocery stores

	Store Size	
	44,094 sq ft	25,000 sq ft
Current number of households	0.8	1.3
With additional 1,000 households	0.9	1.6
With additional 5,000 households	1.6	2.8

[6] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

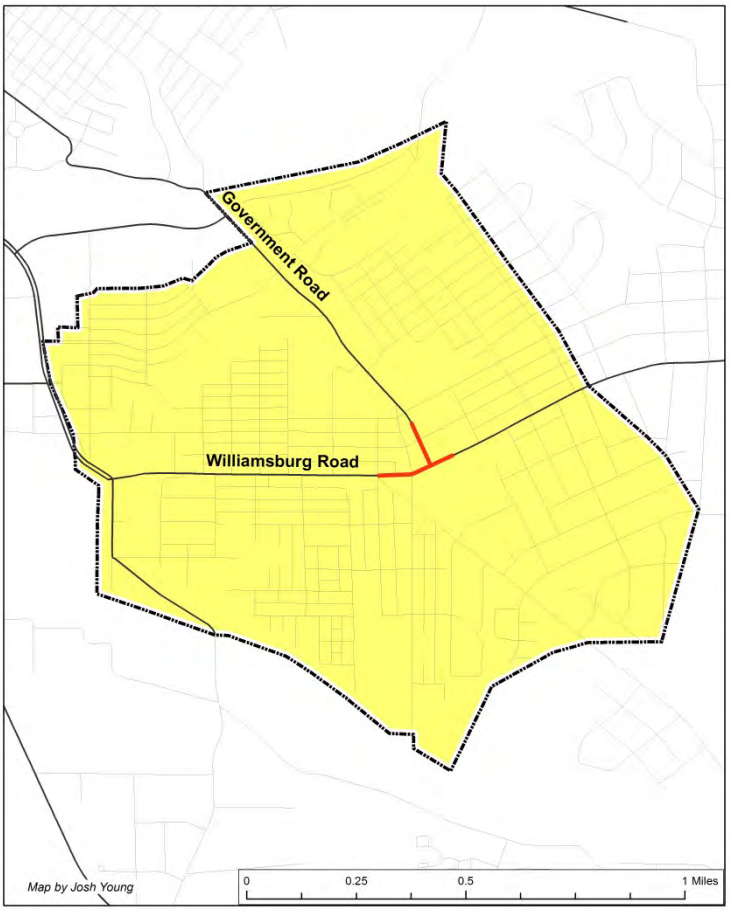
Greater Fulton

Greater Fulton is located on steep grades in the eastern section of the city. It is primarily residential and includes pockets of lower-income housing. The ADT for Williamsburg Road from Hatcher Street to Government Road is 9,400. The ADT from Government Road to the eastern city line is 10,000 vehicles.

Trade Area

At 1.27 square miles, the Greater Fulton trade area is the smallest of the six study areas. Given that it is not significantly denser in housing or income than any other trade area, potential demand is also lower. A grocery store is located east of the trade area off of Charles City Road, but it is difficult to access via public transportation. This trade area is constrained by steep grades and infrastructure, such as rail lines.

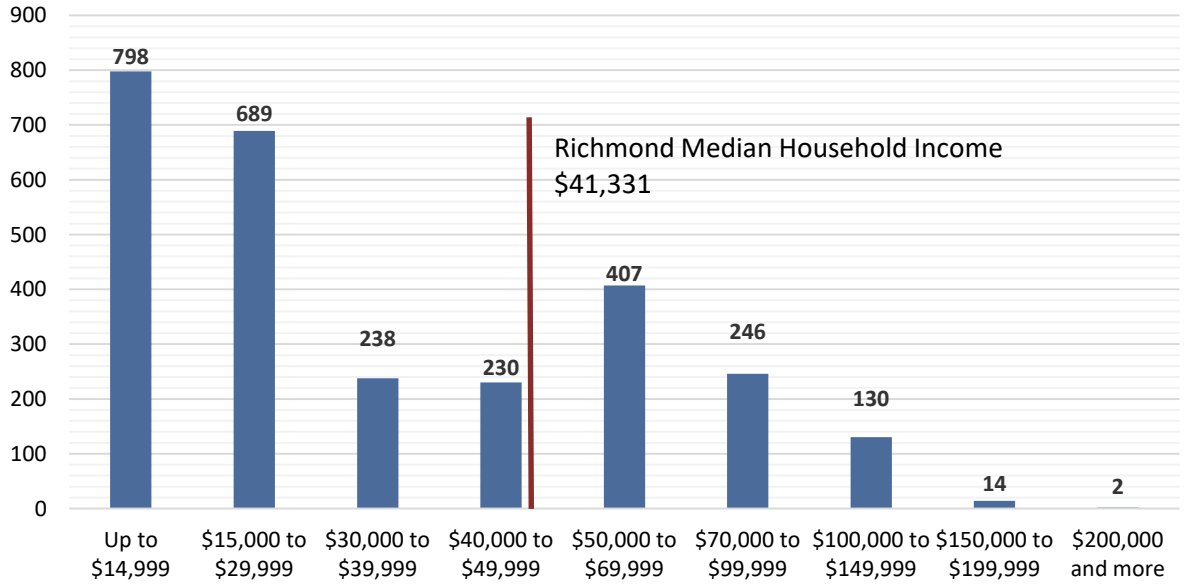
Map 49 – Greater Fulton Convenience Trade Area



Income Analysis

Approximately 63% of households within the Greater Fulton trade area earn below the City of Richmond median household income. The median household income within the trade area falls within the $15,000 to $29,999 income range. Fig. 54 breaks down income distribution in the Greater Fulton convenience trade area.

Fig. 54 - Fulton Hill Households by Income



Market Analysis

At current household levels, the Greater Fulton convenience trade area cannot support a supermarket of average or smaller size. With an additional 1,000 households[7], the area approaches 90 percent of demand needed to support a 25,000 square foot supermarket, the remainder of which could potentially be met by households in adjacent neighborhoods. An additional 5,000 households would push the trade area beyond the needed demand to support single supermarket of 44,094 square feet. Tab. 29 outlines these scenarios.

Tab. **29 –** Greater Fulton:
Number of potential grocery stores

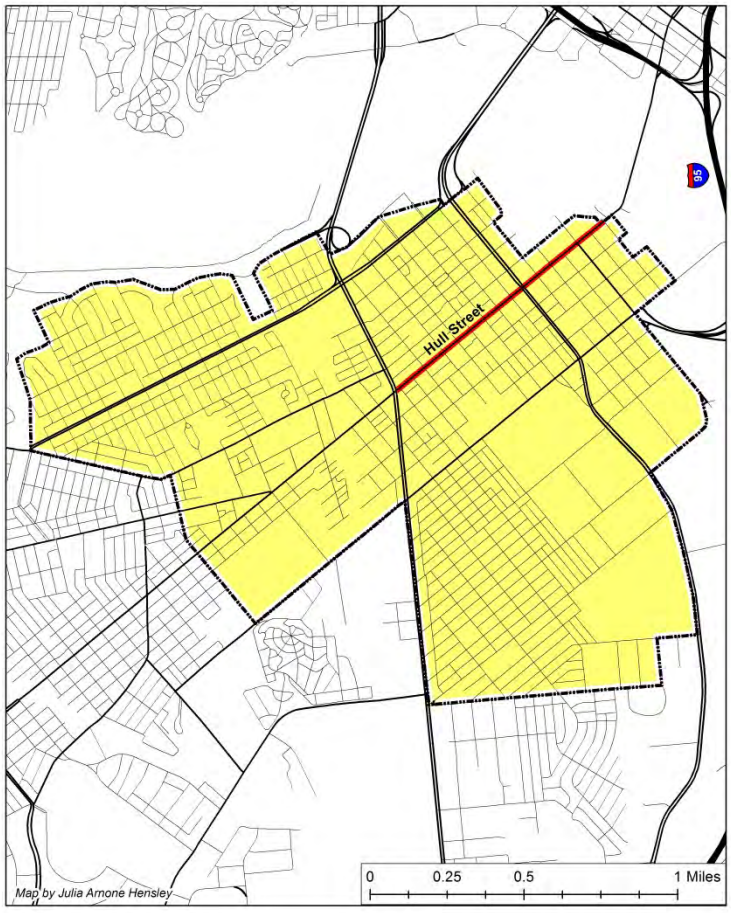
	Store Size	
	44,094 sq ft	25,000 sq ft
Current number of households	0.3	0.6
With additional 1,000 households	0.5	0.9
With additional 5,000 households	1.2	2.1

[7] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

Hull Street

Hull Street is located in the southern part of the city and is one of the more heavily trafficked streets in the six study areas. The ADT for Hull Street is cut into two segments: from 1st Street to Commerce Road (20,000 vehicles) and from Commerce Road to Cowardin Avenue (14,000 vehicles). No grocery stores operate in the trade area.

Map 50 - Hull Street
Convenience Trade Area



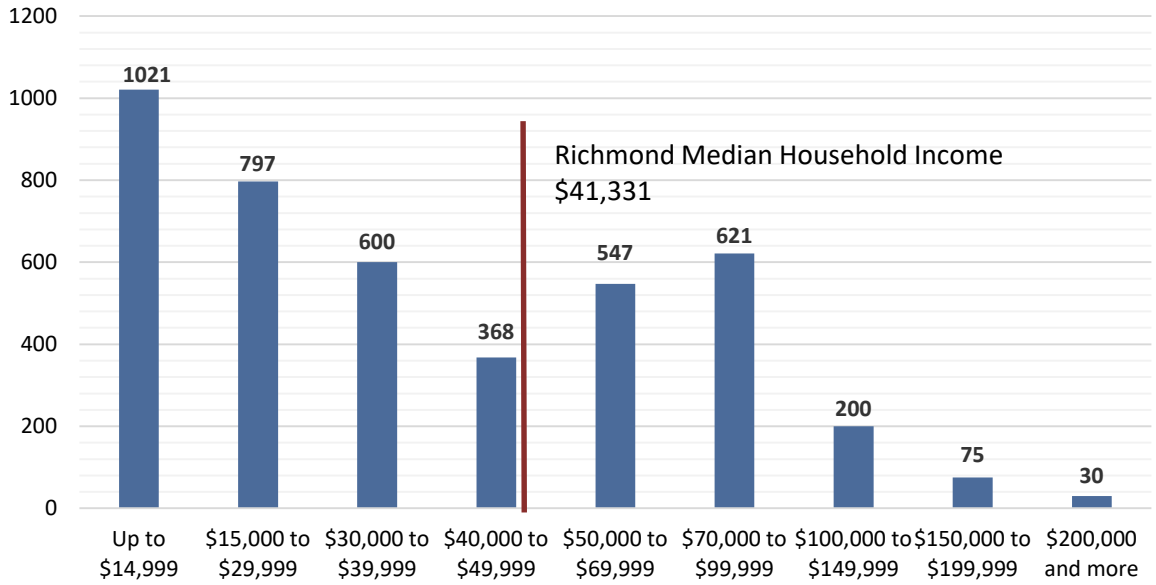
Trade Area

The Hull Street trade area follows the residential areas along the river to the north and extends as far southwest as Forest Hill Avenue. This trade area directly follows block groups to form the western and southern boundaries. It includes the neighborhoods of Swansboro, Woodland Heights, Blackwell, and Manchester. Map 50 illustrates the trade area boundaries. It encompasses 2.34 square miles.

Income Analysis

Approximately 57% of households within the Hull Street trade area earn below the City of Richmond median household income. The median household income within the trade area falls within the $30,000 to $39,999 income range. See Fig. 55 for a summary of household incomes in the trade area.

Fig. 55 - Hull Street Households by Income



Market Analysis

At current household levels, the Hull Street convenience trade area could support a smaller supermarket of 25,000 square feet. With an additional 1,000 households[8], the trade area reaches 70 percent of the demand needed for a 44,094 square foot supermarket. The addition of 5,000 households would allow the trade area to support at least one average-sized supermarket or two smaller supermarkets (see Tab. 30).

Tab. 30 - Hull Street
Number of potential grocery stores

	Store Size	
	44,094 sq ft	25,000 sq ft
Current number of households	0.6	1.0
With additional 1,000 households	0.7	1.3
With additional 5,000 households	1.4	2.5

[8] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

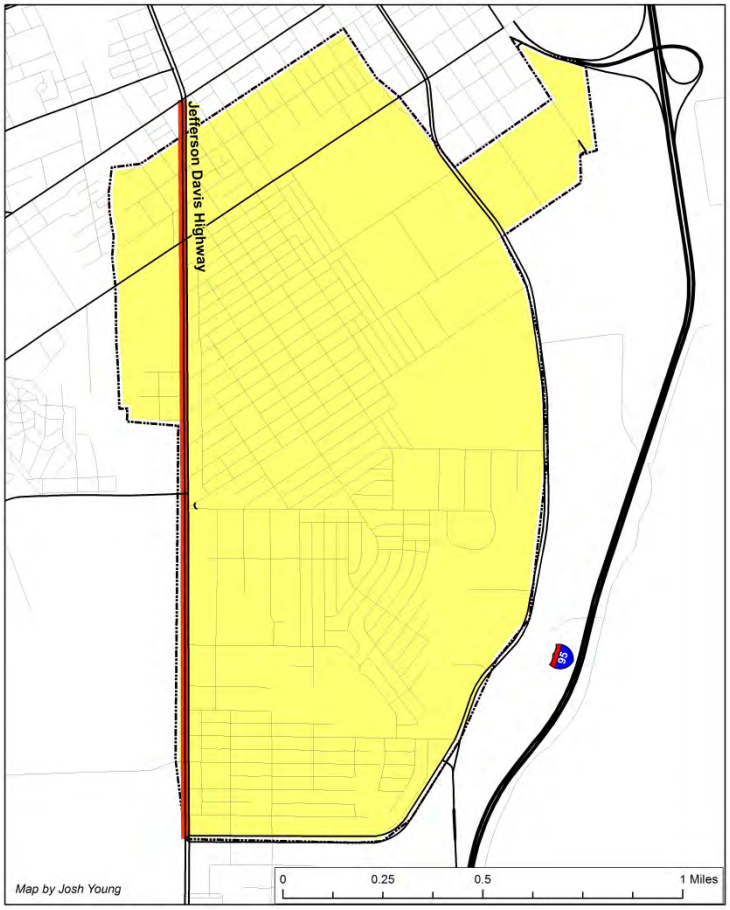
Jefferson Davis Highway

Jefferson Davis Highway is home to mostly industrial and heavy commercial uses. The corridor itself does not contain many residential buildings, but residents in the surrounding neighborhoods lack convenient access to a grocery store. The ADT for Jefferson Davis Highway from Bellemeade Road northwards to Hopkins Road is 13,000. From Hopkins Road to Hull Street, the ADT is 18,000.

Trade Area

The Jefferson Davis convenience trade area totals 1.71 square miles, making it the second smallest trade of the six investigated. It overlaps the Hull Street trade area to the north from Decatur Street south to Harwood Street. The trade area is shown in Map 50.

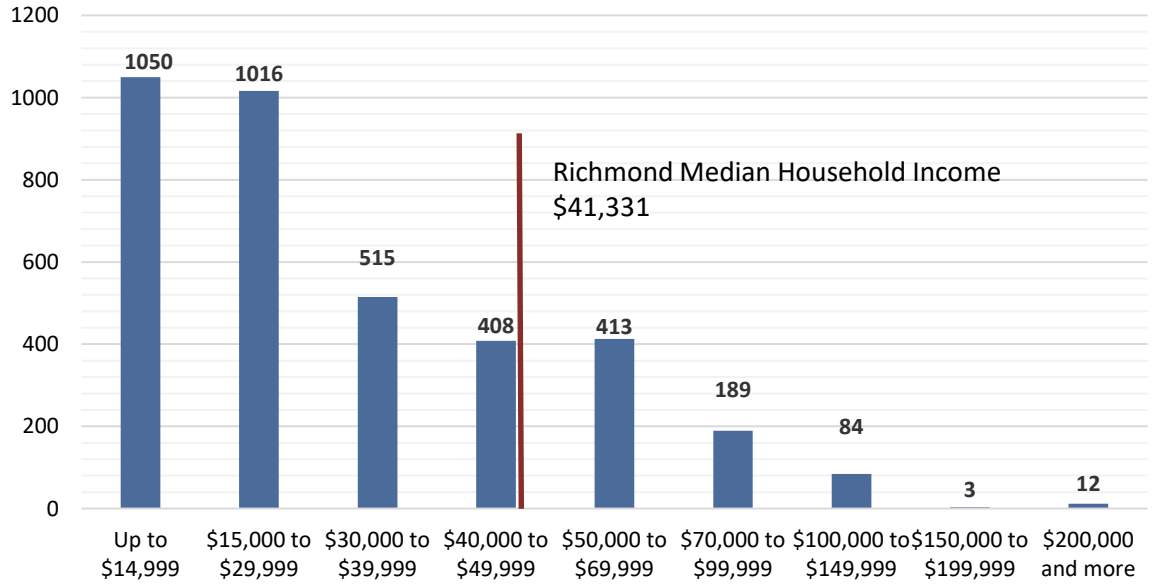
Map 50 - Jefferson Davis Highway Convenience Trade Area



Income Analysis

Approximately 70% of households within the Jefferson Davis trade area earn below the City of Richmond median household income. The median household income within the trade area falls within the $15,000 to $29,999 income range. Fig. 56 details the income of all block groups in the trade area.

Fig. 56 Jefferson Davis Highway Households by Income



Market Analysis

At the current number of households, the Jefferson Davis trade area could support 0.4 grocery stores of 44,094 square feet and 0.8 stores of 25,000 square feet. With an additional 1,000 households[9], the area could support a single store of 25,000 square feet. An additional 5,000 households would create the demand needed for a supermarket of 44,094 square feet. See Tab. 31 for further details.

Tab. 31 - Jefferson Davis Highway
Number of potential grocery stores

	Store Size	
	44,094 sq ft	25,000 sq ft
Current number of households	0.4	0.8
With additional 1,000 households	0.6	1.1
With additional 5,000 households	1.3	2.2

[9] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

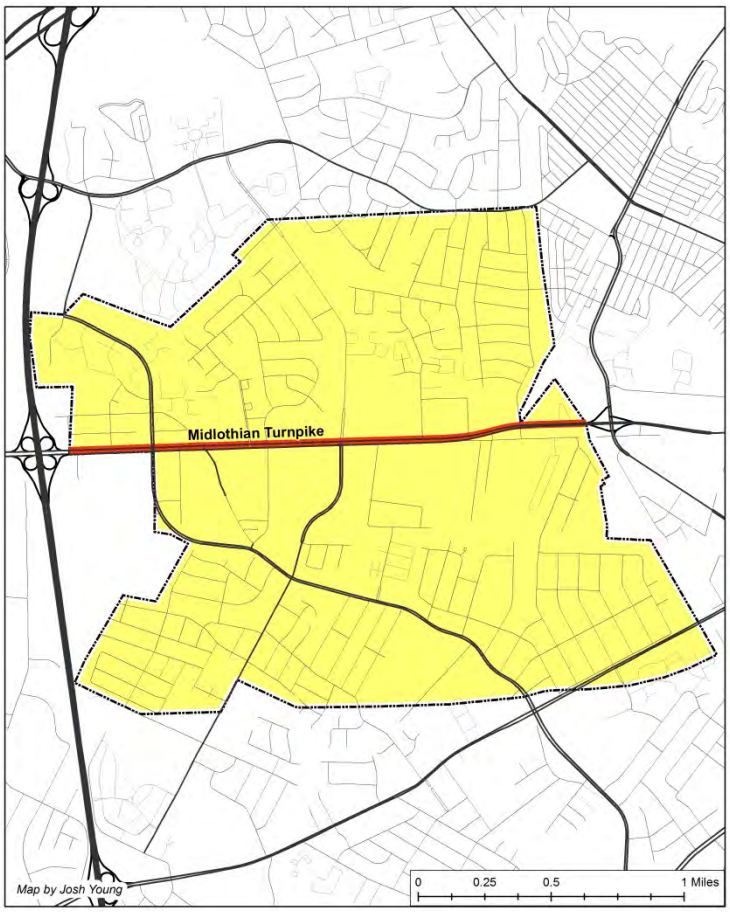
Midlothian Turnpike

Midlothian Turnpike is the most trafficked street of the six study areas. The ADT for Midlothian Turnpike is broken into two segments: from Chippenham Parkway to Carnation Street (51,000) and from Carnation Street to Belt Boulevard (26,000). Multiple grocery stores sit just outside the Midlothian Turnpike trade area boundary.

Trade Area

The Midlothian Turnpike convenience trade area extends to the north and south of the corridor. It includes the neighborhoods of Beaufont, Westover, and much of the residential area south of the Turnpike. The trade area follows block groups along the perimeters. It is the largest trade area of the six determined, measuring 3.27 square miles (see Map 52).

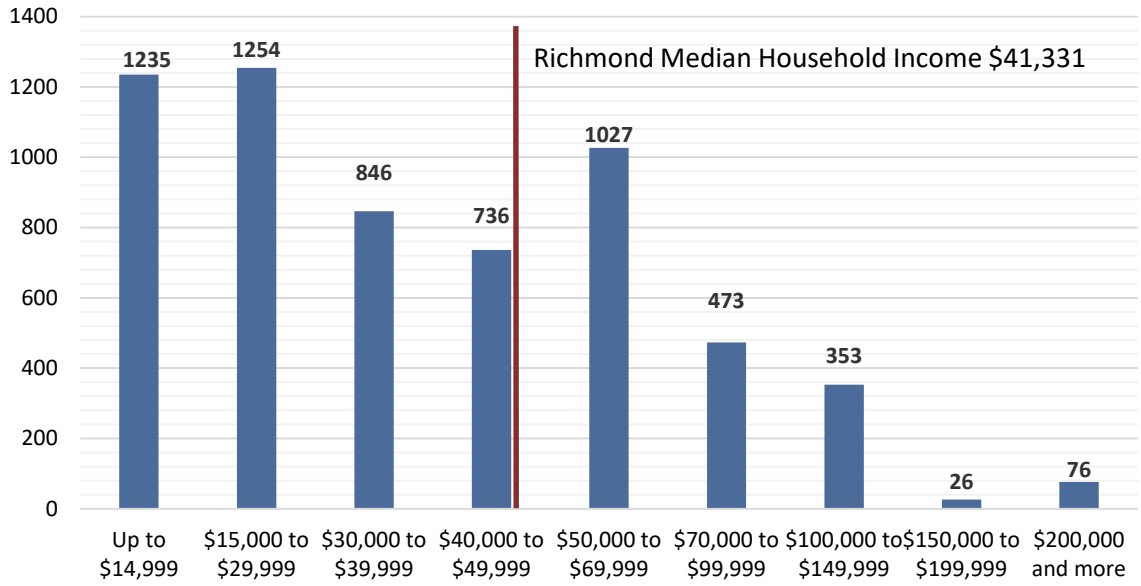
Map 52 - Midlothian Turnpike Convenience Trade Area



Income Analysis

Approximately 55 percent of households within the Midlothian Turnpike trade area earn below the City of Richmond median household income. The median household income within the trade area falls within the $30,000 to $39,999 income range. Fig. 57 details the income makeup of all block groups in the trade area.

Fig. 57 - Midlothian Turnpike Households by Income



Market Analysis

Given current household numbers, the Midlothian Turnpike convenience trade area has sufficient potential demand to support a supermarket of 25,000 square feet and about 80 percent of potential demand needed to support a supermarket of 44,094. Adding 1,000 households[10] would push the trade area to the approximate level of demand required to support an average-sized supermarket. With an additional 5,000 households, the trade area could support 1.6 average-sized supermarkets and nearly 3.0 smaller supermarkets. See Tab. 32 for a breakdown of these figures.

Tab. 32 - Midlothian Turnpike
Number of potential grocery stores

	Store Size	
	44,094 sq ft	25,000 sq ft
Current number of households	0.8	1.4
With additional 1,000 households	1.0	1.7
With additional 5,000 households	1.6	2.9

[10] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

Market Analyses Conclusion

As shown in Table 33, most neighborhoods may support a 25,000 square foot grocery store given existing household incomes and densities, the Fulton Hill and Jefferson Davis Highway trade areas being exceptions. With an additional 1,000 households[11], the Jefferson Davis Highway trade area would also be able to support a grocery store of 25,000 square feet. The Fulton Hill trade area would have around 80 percent of the potential demand needed to support a small grocer.

In order to support a supermarket of 44,094 square feet—the median area of neighborhood supermarkets—all six trade areas would need to add more than 1,000 households earning the regional median household income. However, the Brookland Park and Greater Fulton trade areas could support an average-sized supermarket with the addition of 1,000 households and added potential demand from adjacent neighborhoods.

Adding 5,000 households would allow almost all trade areas to support a 44,094 square foot supermarket. Fulton Hill would have about 90 percent of the necessary potential demand to support an average-sized supermarket. This level of density would support more than two grocery stores of 25,000 square feet in all trade areas except Fulton Hill and Jefferson Davis.

Tab. 33 - Potential Grocery Stores: All Trade Areas

	Current number of households		With additional 1,000 households		With additional 5,000 households	
Trade areas	Store Size		Store Size		Store Size	
	44,094 sq ft	25,000 sq ft	44,094 sq ft	25,000 sq ft	44,094 sq ft	25,000 sq ft
Brookland Park	0.8	1.3	0.9	1.6	1.6	2.8
Church Hill/Nine Mile	0.8	1.3	0.9	1.6	1.6	2.8
Fulton Hill	0.3	0.6	0.5	0.9	1.2	2.1
Hull Street	0.6	1.0	0.7	1.3	1.4	2.5
Jefferson Davis	0.4	0.8	0.6	1.1	1.3	2.2
Midlothian Turnpike	0.6	1.4	1.0	1.7	1.6	2.9

Increasing potential demand by increasing housing density remains a long-term solution, but a potential solution nonetheless. Density-oriented housing policies paired with increases in household incomes could create the demand needed to attract developers and grocery store operators to often-overlooked urban markets in a shorter timeframe. Alternatively, with modest increases in housing density smaller footprint stores represent a viable commercial opportunity in many neighborhoods.

[11] Additional households are assumed to earn the regional median household income of $59,677 (2010-2014 ACS 5-year Estimates).

APPENDIX

Tab. 10 – Notes and Calculations

Public administration employment percent change from 2011 to 2015 is estimated using QCEW data and the ACS County Business Patterns data that generally reports business employment not including public administration and other public employment. The difference between the total employment for Richmond reported in these data sources for 2011 and 2015 is generally assumed to represent public employment.

Public employment in 2015 divided by public employment in 2011 = (119,124 - 37,534) / (109,283 - 28,772) = 30%. This change is assumed to also represent public administration.

Detailed Population Projection Tables

Tab. 34 - Moderate Growth Cohort Population Projection

						Males	Females	Total Population
Age	Male Death Rate	Female Death Rate	Birth Rate	Male Net Migration	Female Net Migration	124,653	135,347	260,000
Under 5	0.0150021	0.012767	0	-0.04800399	-0.0237789	7,700	7,700	15,400
5 to 9 years	0.0006094	0.0005325	0	0.01	0.00503046	7,437	7,647	15,084
10 to 14	0.0017658	0.0008254	0.007428	0.04463429	0.10334623	7,894	8,078	15,972
15 to 19	0.0048404	0.0010856	0.205015	0.7	0.5	8,215	8,887	17,102
20 to 24	0.0075637	0.0018643	0.369709	0.01	0.01	12,144	11,086	23,230
25 to 29	0.0089551	0.0030967	0.379888	0.01	0.01	9,967	9,825	19,792
30 to 34	0.0098506	0.004009	0.415934	-0.05	-0.05	8,928	8,224	17,151
35 to 39	0.0146374	0.0078382	0.2411	-0.05	-0.05	9,022	9,047	18,069
40 to 44	0.0212619	0.0144303	0.056535	0.01	0.01	8,725	9,758	18,483
45 to 49	0.0355879	0.0225706	0.003305	-0.01698856	0.0112733	9,753	10,781	20,533
50 to 54	0.0571827	0.0327322	0	-0.08367052	-0.0804253	8,660	9,393	18,052
55 to 59	0.0848964	0.0446588	0	0	0	5,581	6,377	11,957
60 to 64	0.0968134	0.0578863	0	0	0	4,344	4,898	9,243
65 to 69	0.1426746	0.0819057	0	0	0	3,975	4,603	8,577
70 to 74	0.1859857	0.1180507	0	0	0	3,605	4,875	8,480
75 to 79	0.247553	0.1424356	0	0	0	3,309	5,153	8,462
80 to 84	0.3671212	0.2604325	0	0	0	3,016	4,548	7,564
85 years	0.6390178	0.5610695	0	0	0	2,378	4,469	6,847

Adjustments made for cohort net migration ages 15-39 to account for strong college age in-migration.

Tab. 35 - Strong Growth Cohort Population Projection

						Males	Females	Total Population
Age	Male Death Rate	Female Death Rate	Birth Rate	Male Net Migration	Female Net Migration	142,775	157,225	300,000
Under 5	0.015002143	0.012767029	0	-	-	8,246	8,246	16,493
5 to 9 years	0.000609385	0.000532549	0	0.059553499	0.005030465	7,899	8,122	16,021
10 to 14	0.001765825	0.000825378	0.007428398	0.044634291	0.103346227	8,730	8,515	17,245
15 to 19	0.004840448	0.001085557	0.205015275	0.6	0.55	9,026	9,307	18,332
20 to 24	0.007563666	0.001864261	0.369709495	0.01	0.01	12,525	11,967	24,492
25 to 29	0.00895511	0.00309675	0.379887802	-0.05	-0.05	10,283	10,607	20,890
30 to 34	0.009850612	0.004009005	0.415934252	0.05	0.06	8,420	8,349	16,769
35 to 39	0.014637405	0.007838235	0.241100131	0.06	0.06	9,222	10,254	19,476
40 to 44	0.021261877	0.0144303	0.056535147	0.071205448	0.07	10,337	12,115	22,453
45 to 49	0.035587938	0.022570592	0.003305317	0.01	0.011273297	12,573	13,994	26,567
50 to 54	0.057182677	0.03273218	0	0	0	11,879	12,595	24,474
55 to 59	0.084896415	0.044658771	0	0.04	0.04	8,207	9,056	17,264
60 to 64	0.096813384	0.057886316	0	0.03	0.03	5,950	6,497	12,447
65 to 69	0.142674617	0.081905733	0	0.01	0.01	5,173	5,761	10,933
70 to 74	0.185985667	0.118050733	0	0	0	4,546	6,030	10,576
75 to 79	0.247553047	0.14243557	0	0	0	3,892	6,028	9,919
80 to 84	0.367121198	0.260432454	0	0	0	3,335	5,036	8,371
85 years	0.639017788	0.561069519	0	0	0	2,532	4,746	7,278

Tab. 36 - Dynamic Growth Cohort Population Projection

						Males	Females	Total Population
Age	Male Death Rate	Female Death Rate	Birth Rate	Male Net Migration	Female Net Migration	160,274	179,726	340,000
Under 5	0.013501929	0.011490326	0	-	-	10,603	10,603	21,206
5 to 9 years	0.000548446	0.000479294	0	0.059553499	0.1	9,849	10,125	19,974
10 to 14	0.001589242	0.00074284	0.007428398	0.044634291	0.103346227	9,967	10,638	20,605
15 to 19	0.004356403	0.000977002	0.205015275	0.6	0.6	9,339	10,537	19,876
20 to 24	0.006807299	0.001677834	0.369709495	0.2	0.19	12,482	13,467	25,948
25 to 29	0.008059599	0.002787075	0.379887802	0.1	0.1	12,196	14,076	26,272
30 to 34	0.008865551	0.003608104	0.415934252	0	0	12,954	13,033	25,987
35 to 39	0.013173664	0.007054411	0.241100131	0	0	12,989	14,094	27,083
40 to 44	0.019135689	0.01298727	0.056535147	0	0	12,790	14,879	27,669
45 to 49	0.032029144	0.020313533	0.003305317	0	0	13,020	14,313	27,332
50 to 54	0.051464409	0.029458962	0	0	0	10,578	11,123	21,702
55 to 59	0.076406773	0.040192894	0	0.05	0.05	7,024	7,692	14,717
60 to 64	0.087132046	0.052097685	0	0.04	0.04	5,493	5,927	11,420
65 to 69	0.128407155	0.07371516	0	0.02	0.02	5,203	5,726	10,928
70 to 74	0.1673871	0.10624566	0	0	0	4,837	6,293	11,130
75 to 79	0.222797742	0.128192013	0	0	0	4,217	6,374	10,592
80 to 84	0.330409078	0.234389209	0	0	0	3,670	5,356	9,026
85 years	0.575116009	0.504962567	0	0	0	3,063	5,470	8,533

Adjustment to migration rates, College age increase, and 2015 small cohort of 10-14

Housing Projection Methodology

The Residential Preference Projections that serve as the basis for Residential Land Use Projections are generally based on three sources:

- 5-Population Cohort Projections created by CURA
- A National Association of Home Builders (NAHB) Housing Preference Survey
- Adjustment factors from CURA researchers

What follows is a detailed look at the methodology behind the Residential Preference Projections.

CURA used the 5-year cohort component method to develop three projections for population in the year 2037. These three projections – the Moderate Growth Projection, the Strong Growth Projection, and the Dynamic Growth Projection – predict population totals of 260,000, 300,000, and 340,000 respectively. These projections are summations of individual projections for 5-year cohorts based on current cohort size, survival rates, birth rates, and net migration rates. The number of net new residents per 5-year cohort equals the 2015 ACS cohort totals subtracted from the projected 2037 cohort values. This projection difference serves as the basis for residents that will require additional residential units by 2037.

While only the cohort groups from 20 to 85+ (the Millennials, Generation Xers, and Baby Boomers) will be homeowners/renters in 2037, the generation after the Millennials must also be considered. To account for the cohort groups age 0-19, their totals were summed and a bell-curve distribution applied to them as dependents to the cohorts age 20-59. This distribution ensures that all of the new population is accounted for in residential projections.

The total numbers of households were determined by a bell curve assignment of an average household size to all cohort groups age 20 to 85+, with all values averaging to the 2015 average household size value for Richmond. The estimate of new households then results from dividing the number of residents in each cohort by the average household size assigned for each cohort.

Half of the equation is complete. But what will be the breakdown between single-family and multi-family units? A publication by the NAHB entitled “Housing Preferences of the Boomer Generation” is helpful. This resource breaks down the housing type preferences of generations by a percentage for single-family (single-family detached, single-family attached) and multi-family (multi-family apartment or condo, manufactured [mobile] home, other) units. This binary ratio serves as the basis for housing type preference.

However, this NAHB data reflects national trends, and while the preferences are valuable they do not reflect the reality of the market in Richmond. For this reason, adjustment factors were applied to multi-family preferences to reflect the urban nature of Richmond. Adjustment factors were applied for three reasons:

1. the existing multi-family to single-family ratio of Richmond is higher than that of the region;
2. there is a trend towards denser development with increased population growth rates; and
3. For economic and locational reasons, housing preference does not always equate to housing selection.

Adjustments were made as follows: Richmond has a much higher share of multi-family units to single-family units when compared to surrounding counties at a city to regional ratio of 1.9, and this became the baseline adjustment factor. This trend towards denser habitation in the city limits will only grow in relation to population. For this reason the Moderate Growth Projection retains the 1.9 adjustment factor, while the Strong Growth Projection was assigned an adjustment factor of 2.1 and the Dynamic Growth Projection an adjustment factor of 2.3. The final adjustment factor focuses on the cohorts between the ages of 20 to 29. Although these cohorts may prefer a single-family home, their financial ability to purchase or even rent is often limited. For this reason cohort 20-24 were given an added 0.4 adjustment factor, while those age 25-29 were given an added adjustment factor of 0.2. These adjustment factors increase preference for multi-family housing to be more reflective of Richmond's current multi-family to single-family unit ratio, and serve as the final portion of the projection formulas:

Multi-Family Unit Projection Formula = [(2037 Cohort Group X – 2015 Cohort Group X)/Avg. HH Size] * (NAHB Preference % * Adjustment Factor)

Single-Family Unit Projection Formula = [(2037 Cohort Group X – 2015 Cohort Group X)/Avg. HH Size] * [1-(NAHB Multi-Family Preference % * Adjustment Factor)]

These formulas yield total new housing units for multi-family and single-family and when summed create the total new demand for each unit type.

Detailed Housing Projection Tables

Tab. 37 - Moderate Growth Housing Unit Projection

Cohort	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Total/Avg
2037 Population	25,070	21,344	18,240	19,012	19,448	23,724	20,851	13,822	8,758	6,009	4,734	4,215	4,301	2,751	260,000
2015 Population	21,489	26,523	19,534	14,302	11,557	12,603	13,208	13,664	13,311	8,820	5,930	3,395	2,903	4,292	220,289
Difference	4,766	-3,993	-109	7,080	12,631	15,861	10,013	1,344	-4,553	-2,811	-1,196	820	1,398	-1,541	39,711
Avg. Household Size	2	2.1	2.5	3	3	3	2.5	2.3	2	2	1.8	1.8	1.6	1.4	2.2
New Households	2,383	-1,902	-44	2,360	4,210	5,287	4,005	584	-2,277	-1,405	-664	455	874	-1,100	12,767
Single-Family Demand	81%	81%	81%	82%	82%	82%	74%	74%	74%	74%	70%	70%	70%	70%	76%
Adjusted Single-Family Demand	54%	58%	62%	64%	64%	64%	48%	48%	48%	48%	40%	40%	40%	40%	51%
Single-Family Vacancy Adjusted Demand	55%	59%	63%	65%	65%	65%	49%	49%	49%	49%	41%	41%	41%	41%	52%
New Single-Family Units	1,290	-1,105	-27	1,513	2,699	3,389	1,928	281	-1,096	-676	-267	183	351	-442	8,179
Multi-Family Demand	19%	19%	19%	18%	18%	18%	26%	26%	26%	26%	30%	30%	30%	30%	24%
Multi-Family Adjustment Factor	2.3	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Adjusted Multi-Family Demand	44%	40%	36%	34%	34%	34%	49%	49%	49%	49%	57%	57%	57%	57%	46%
Multi-Family Vacancy Adjusted Demand	46%	42%	38%	36%	36%	36%	52%	52%	52%	52%	60%	60%	60%	60%	49%
New Multi-Family Units	1,093	-797	-17	848	1,512	1,899	2,078	303	-1,181	-729	-398	273	523	-659	4,748

Tab. 38 - Strong Growth Housing Unit Projection

Cohort	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Total/Avg
2037 Population	24,492	20,890	16,769	19,476	22,453	26,567	24,474	17,264	12,447	10,933	10,576	9,919	8,371	7,278	300,000
2015 Population	21,489	26,523	19,534	14,302	11,557	12,603	13,208	13,664	13,311	8,820	5,930	3,395	2,903	4,292	220,289
Difference	4,211	-4,425	-1557	7,591	15,729	18,797	13,682	4,808	-864	2,113	4,646	6524	5,468	2,986	79,711
Avg. Household Size	2	2.1	2.5	3	3	3	2.5	2.3	2	2	1.8	1.8	1.6	1.4	2.2
New Households	2,106	-2,107	-623	2,530	5,243	6,266	5,473	2090	-432	1,057	2581	3625	3417	2,133	33,359
Single-Family Demand	81%	81%	81%	82%	82%	82%	74%	74%	74%	74%	70%	70%	70%	70%	76%
Adjusted Single-Family Demand	50%	54%	58%	60%	60%	60%	43%	43%	43%	43%	34%	34%	34%	34%	46%
Single-Family Vacancy Adjusted Demand	51%	55%	59%	62%	62%	62%	44%	44%	44%	44%	35%	35%	35%	35%	47%
New Single-Family Units	1,055	-1,140	-362	1,526	3,162	3,779	2,335	892	-184	451	874	1227	1157	722	15,494
Multi-Family Demand	19%	19%	19%	18%	18%	18%	26%	26%	26%	26%	30%	30%	30%	30%	24%
Multi-Family Adjustment Factor	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Adjusted Multi-Family Demand	48%	44%	40%	38%	38%	38%	55%	55%	55%	55%	63%	63%	63%	63%	51%
Multi-Family Vacancy Adjusted Demand	50%	46%	42%	40%	40%	40%	57%	57%	57%	57%	66%	66%	66%	66%	54%
New Multi-Family Units	1,050	-967	-261	1004	2,081	2,487	3,138	1198	-248	606	1707	2398	2261	1411	17,866

Tab. 39 - Dynamic Growth Housing Unit Projection

Cohort	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Total/Avg
2037 Population	25,948	26,272	25,987	27,083	27,669	27,332	21,702	14,717	11,420	10,928	11,130	10,592	9,026	8,533	340,000
2015 Population	21,489	26,523	19,534	14,302	11,557	12,603	13,208	13,664	13,311	8,820	5,930	3,395	2,903	4,292	220,289
Difference	6,515	1,805	8509	16,894	24,338	22,955	12,607	3,109	-1,891	2,108	5,200	7197	6,123	4,241	119,711
Avg. Household Size	2	2.1	2.5	3	3	3	2.5	2.3	2	2	1.8	1.8	1.6	1.4	2.2
New Households	3,258	860	3404	5,631	8,113	7,652	5,043	1352	-946	1,054	2889	3998	3827	3,029	49,163
Single-Family Demand	81%	81%	81%	82%	82%	82%	74%	74%	74%	74%	70%	70%	70%	70%	76%
Adjusted Single-Family Demand	46%	50%	54%	57%	57%	57%	37%	37%	37%	37%	28%	28%	28%	28%	41%
Single-Family Vacancy Adjusted Demand	47%	51%	55%	58%	58%	58%	38%	38%	38%	38%	28%	28%	28%	28%	42%
New Single-Family Units	1,503	431	1842	3,183	4,586	4,325	1,876	503	-352	392	796	1102	1054	835	22,518
Multi-Family Demand	19%	19%	19%	18%	18%	18%	26%	26%	26%	26%	30%	30%	30%	30%	24%
Multi-Family Adjustment Factor	2.7	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Adjusted Multi-Family Demand	51%	48%	44%	41%	41%	41%	60%	60%	60%	60%	69%	69%	69%	69%	56%
Multi-Family Vacancy Adjusted Demand	54%	50%	46%	43%	43%	43%	63%	63%	63%	63%	72%	72%	72%	72%	59%
New Multi-Family Units	1,755	429	1562	2448	3,527	3,326	3,166	849	-594	662	2093	2897	2773	2195	27,086

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