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ABSTRACT

Based on population growth in Planning District 8, Northern Virginia Community College (NVCC) enrollment for the years 2000 and 2010 were estimated using two models--population-penetration and age-cohort--to estimate enrollments. According to the population-penetration model, it is estimated that during the fall 2000 semester there will be 38,557 students enrolled at NVCC. By fall 2010, there will be 43,680 students enrolled at NVCC. According to the age-cohort model, it is estimated that by 2000, NVCC fall headcount will be 38,432 students, and by fall 2010, there will be 44,970 students enrolled at NVCC. These two models together indicate an annual (fall to fall) growth rate between 1.3% and 1.7% during this period. In addition to population-based projections, estimates for Planning District 8 public high school graduates were computed. Given that during the last 20 years enrollment of non-white students at NVCC has steadily increased, it is highly probable that non-white students will be the majority at NVCC before the year 2005. The estimates in this report are college-wide and do not provide projections for separate campuses. A fundamental assumption inherent in this study is that there will be no major changes in the area economy and the local labor market. (Contains 25 tables and 11 figures.) (VWC)

Population Changes In Planning District 8 And NVCC Enrollments: 2000 - 2010

Research Report No. 1-99

Office of Institutional Research
Northern Virginia Community College

March 1999

Population Changes In Planning District 8 And NVCC Enrollments: 2000-2010

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Population Changes in Planning District 8 and NVCC Enrollments: 2000-2010

Abstract

Based on population growth in Planning District 8, NVCC enrollment for the years 2000 and 2010 were estimated. The Office of Institutional Research (OIR) used two models (population-penetration model and age-cohort model) to estimate the enrollments. According to the population-penetration model, it is estimated that during the Fall 2000 semester there will be 38,557 students enrolled at NVCC. By Fall 2010, there will be 43,680 students enrolled at NVCC. These changes correspond to an overall 13.3% increase in NVCC enrollment from 2000 to 2010. According to the age-cohort model, it is estimated that by 2000, NVCC fall headcount will be 38,432 students. By Fall 2010, there will be 44,970 students enrolled at NVCC (a 17% increase from 2000 to 2010). These two models together indicate an annual (fall to fall) growth rate between 1.3% and 1.7% during this period.

In addition to population-based projections, estimates for Planning District 8 public high school graduates were computed. Based on NVCC historical data, NVCC enrollment of Planning District 8 high school graduates was estimated. During 2000-2010, the enrollment from Planning District 8 high schools will increase by 26% (3,259 students in 2000 to 4,103 students in 2010). Between 2002 and 2006, there will be a significant increase in the enrollment from high school graduates.

During the last twenty years, enrollment of Non-White students at NVCC has steadily increased. Given this trend data, it is highly probable that Non-White students will be the majority at NVCC before the year 2005. It is estimated that in Fall 2005, Non-White students will be approximately 55% of the student population.

The estimates in this report are college-wide and do not provide projections for separate campuses. Rapid changes in particular Planning District 8 jurisdictions will impact some of the campuses more than others. Therefore, it is important that "campus-specific" projections are conducted in the near future.

A fundamental assumption inherent in this study is that there will be no major changes in the area economy and the local labor market. Any change in these and many other economic and political factors will impact enrollment differently than projected in this report. In particular, the proposed 20% reduction in tuition and the classification of District of Columbia residents as in-state students could have an unanticipated impact on NVCC enrollment. These proposed changes were not addressed in this report.

Population Changes in Planning District 8 and NVCC Enrollments: 2000-2010

Executive Summary

This report projects population changes in the Northern Virginia Community College (NVCC) service area from the years 2000 to 2010 and measures the impact of these changes on NVCC enrollments. The Office of Institutional Research (OIR) analyzed the current status and projected changes in population, age groups, high school graduates, and demographic composition in the NVCC service area. The report consists of six parts.

Part I: Current Population Trends in PD8, 1990 through 1997

- In 1997, 25% of Virginia's residents lived in one of the cities or counties in Planning District 8.

- Of the Planning District 8 population in 1997, 54.9% lived in Fairfax County. Prince William County was the second largest jurisdiction and made up 15.1% of the Planning District 8 population.

- During the period between 1990 and 1997, the Planning District 8 population grew by 14.1% as compared to 8.8% in the state of Virginia.

- Between 1990 and 1997, the greatest gain in residents was in Loudoun County (55%) followed by Manassas Park City (26.7%).

Part II: NVCC Enrollment Estimates (Population-Penetration Model), 2000-2010

Population Projections: 2000 – 2010

- The population in Planning District 8 is projected to increase from approximately 1.7 million in 2000 to approximately 2.0 million in 2010, representing a 16.4% growth during this period.

- With the exception of Arlington County, from 2000 to 2010 all the counties in Planning District 8 are projected to experience double-digit growth ranging from 12.1% to 45.7%.

- The cities in Planning District 8 are expected to experience smaller increases ranging from 3% to 7% between 2000 and 2010.

Population Penetration Rates: 2000 – 2010

- The Planning District 8 penetration rate is expected to be 1.86% in 2000 and 1.85% in 2010. The penetration rate is the proportion of students attending NVCC from the total population of a geographic region.

- From 1993 through 1998, the Planning District 8 penetration rate has been decreasing. Currently, it appears that the penetration rate has leveled off. Data does not indicate that any large increase or decrease will happen in the near future. Thus, it is reasonable to assume that the penetration rate will remain constant for the period 2000-2010.

- From 2000 to 2010, the projected penetration rates are assumed to remain constant, for the most part, for all the cities and counties of Planning District 8. For example, Fairfax County in 2000 is expected to have a penetration rate of 1.45% and in 2010 the penetration rate is expected to be 1.44%.

Projected Fall Headcount: 2000 – 2010

- Based on population projections and estimates for penetration rates, it is projected that in Fall 2000 there will be 38,557 students enrolled at NVCC with 32,957 coming from Planning District 8. By Fall 2010, it is expected that 43,680 students will be attending NVCC with 38,080 from Planning District 8. The trend appears to be upward, and the increase is expected to be gradual for this period.

- Between 2000 and 2010 the fall headcount for Planning District 8 is expected to increase 15.5%.

- Between 2000 and 2010, NVCC enrollment from Loudoun County is projected to increase by 44.3% followed by Prince William County with a 30.2% increase for the same period.

Estimated Fall and Annual FTES: 2000 – 2010

- Between 1998 and 2000, the fall FTES will increase by 1,057 (5.9% increase). Annual growth (fall to fall) during this period will be 2.9%. From 2000 to 2005, fall FTES will increase by 1,225 (6.5% growth). The annual increase (fall to fall) during this period will be 1.3%. From these estimates, it appears that an increase in fall FTES will peak in the year 1999 and will continue to increase at a lower rate until 2005.

- For the period 2000 to 2010 the fall FTES will increase by 2,512 (a 13.3% increase). Fall to fall growth for this period will be 1.3%.

- Between 1998 and 2000, the annual FTES will increase by 873 (4.2% increase). Annual growth during this period will be 2.1%. The increase from 2000 to 2005 reflects a 1,409 gain of annual FTES (6.5% growth). The annual increase during this period will be 1.3%.

- For the period 2000 to 2010 the annual FTES will increase by 2,889 (13.3% increase). Annual growth for this period will be 1.3%.

Part III: NVCC Enrollment Projections (Age-Cohort Model), 2000-2010

- Part III examines changes in the age distributions of Planning District 8 residents and their relevance to NVCC enrollment. First, population projections by age group for Planning District 8 were developed for the years 2000 and 2010. Secondly, penetration rates for different age groups were estimated. Finally, using these estimated penetration rates, population projections by age groups were made for the year 2010.

- The total estimated NVCC enrollment did not differ substantially from the population estimate presented in Part II (43,680 vs. 44,970 for Fall 2010 headcount). While the model in Part II predicted a 13.3% increase for 2000-2010, the model in Part III projected a 17% increase for the same period.

- The difference in the headcount estimates in Part II and those reported in Part III is due to the increase of Planning District 8 residents, 19 to 24 years, who impact NVCC enrollment.

- Particular attention was paid to the projections for students less than 25 years and those 30 to 44 years. These groups have historically enrolled at NVCC at higher rates compared to other age groups. Between 2000 and 2010, enrollment of students less than 25 years is expected to increase by 34.8% and enrollment of students between 30 and 44 years is expected to decline by 2.5%.

Part IV: NVCC Enrollment Projections by Public High Schools, 2000-2010

- Part IV examined projections in public school enrollment by Planning District 8 jurisdictions and then evaluated how these changes would affect NVCC enrollment. After projecting public school enrollment for the years 1999-2000 to 2002-2003, projections were made for the number of public high school graduates in Planning District 8. Based on these projections, the number of high school graduates who would come directly to NVCC was estimated.

- Between 1999 and 2003 enrollment in public schools in Planning District 8 is expected to increase by 6.6% or 17,073 students. The expected increase in enrollments will produce a 26% increase in the number of high school graduates during the 2000-2010 time period – an average 2.6% increase per year.

- Given the historical trend, it is assumed that NVCC will maintain its proportion (19%) of high school graduates who come directly to the College. In maintaining this proportion, the number of high school graduates who attend NVCC is expected to increase from 3,259 to 4,103 over the 2000-2010 period.

- The increase in NVCC enrollment will be gradual until it peaks in 2006. In terms of headcount, from 2000-2006, the increase over the current enrollment is 100-200 additional students each year. Most of the projected 26% increase in the number of high school graduates will be between 2000 and 2005. The number of high school

graduates coming to NVCC will peak in 2006 and then level off for the rest of the period.

Part V: NVCC Enrollment Projections by Racial Groups, 2000-2010

- Part V addresses the following two issues: a) what are the possible changes in the racial (White and Non-White) composition of the NVCC student population and b) to what extent these changes will impact NVCC enrollment.

- Data from 1980 through 1998 indicate that the Non-White population at NVCC is growing much faster than the Non-White population of Planning District 8. Past data indicate a significant increase in the NVCC penetration rate for Non-Whites, from 2.43 in 1990 to 4.60 in 2000. Given such a significant change, it is not possible to predict the penetration rate beyond the year 2000.

- As there is no discernable pattern in the penetration rates for Non-Whites from Planning District 8, it is not possible to use this data to project NVCC Non-White headcount.

- NVCC data revealed that since 1990, the percent and number of Non-White students have been increasing steadily, from 25% in Fall 1990 to 43% by Fall 1998. Accordingly, the increase for Non-White students for this period was approximately 2% per fall semester.

- By using the estimated 2% fall semester increase for Non-White students, Non-White students are estimated to be 47% of NVCC headcount by Fall 2000. Based on an estimated 1.5% increase per fall, by Fall 2005 the Non-White headcount is expected to be 22,580 students (55%) and the White headcount is expected to be 18,475 students (45%).

- Although growth in the Non-White student population is expected, this may not translate into a net gain of total NVCC headcount. With the White student population steadily decreasing, it may be possible that the additional Non-White students will replace the White students.

Part VI: Summary

- Based on population growth in Planning District 8, NVCC enrollment for the years 2000 and 2010 were estimated. Two models (population-penetration model and age-cohort model) were used to estimate the enrollments.

- According to the population-penetration model, it is estimated that by Fall 2000 there will be 38,557 students enrolled at NVCC. By Fall 2010, there will be 43,680 students enrolled at NVCC. These changes correspond to an overall 13.3% increase in NVCC enrollment from 2000 to 2010. According to the age-cohort model, it is estimated that by Fall 2000, NVCC fall headcount will be 38,432 students. By Fall 2010, there will be 44,970 students enrolled at NVCC (a 17%

increase from 2000 to 2010). These two models together indicate an annual (fall to fall) growth rate between 1.3% and 1.7% during this period.

- In addition to population-based projections, estimates for Planning District 8 public high school graduates were computed. Based on NVCC historical data, NVCC enrollment of Planning District 8 high school graduates was estimated. During 2000-2010, the enrollment from Planning District 8 high schools will increase by 26% (3,259 students in 2000 to 4,103 students in 2010). Between 2002 and 2006, there will be a significant increase in the enrollment from high school graduates.

- During the last twenty years, enrollment of Non-White students at NVCC has steadily increased. Given this trend data, it is highly probable that Non-White students will be the majority at NVCC before the year 2005. It is estimated that in Fall 2005, Non-White students will be approximately 55% of the student population.

- The estimates in this report are college-wide and do not provide projections for separate campuses. Rapid changes in particular Planning District 8 jurisdictions will impact some of the campuses more than others. Therefore, it is important that specific campus-focused projections are conducted in the near future.

- A fundamental assumption inherent in this study is that there will be no major changes in the area economy and the local labor market. Any change in these and many other economic and political factors will impact enrollment differently than projected in this report.

POPULATION CHANGES IN PLANNING DISTRICT 8 AND NVCC ENROLLMENTS: 2000-2010

Introduction

Demographic changes in the service area of Northern Virginia Community College (NVCC) are of significant importance as they have a direct and critical impact on enrollment.[1] Understanding the current status and projections of demographic data assists colleges in planning for the future. The Office of Institutional Research (OIR) examined the current status of Northern Virginia Planning District 8 (PD8) population and projected the population growth for 2000 through 2010. Based on these population projections, NVCC enrollment for this period was estimated. NVCC enrollment was also estimated based on changes in different age groups in the PD8 population. In addition, the projections on the number of graduates in PD8 public high schools and their impact on NVCC enrollment were analyzed. The possible changes in the racial composition of NVCC enrollments during 2000-2010 are also addressed in this report. OIR reviewed data from the Census Bureau, county and state agencies in Virginia, PD8 public high schools, and NVCC.

This report consists of six parts (I through VI). Part I presents information on the population growth between 1990 and 1997 by the counties and cities of PD8. Part II presents population projections, estimated headcount, and estimated Full-Time Equivalent Students (FTES) at NVCC for the period between 2000 to 2010.[2] Estimates, which are presented in Part II, are based on a "population-penetration" model, which computes the enrollments using the population growth in PD8 and the changes in the penetration rates. Penetration rate is defined as the proportion of students attending NVCC from the total population within a geographic region. The model in Part II does not take into account the changes in the size of different age groups in the population.

A second model (age-cohort model) which looks at the changes in population by different age groups and computes estimates based on separate penetration rates for different age groups is presented in Part III. Part IV presents high school enrollment projections from 1999 to 2010 and their possible impact on NVCC. Part V looks at changes in the demographic composition (racial distribution) of PD8 residents and their impact on NVCC enrollment patterns. Part VI provides a summary of the entire report, highlighting areas which have significant importance to NVCC.

It has to be noted that the estimates are college-wide and thus do not reveal any potential changes in enrollment on specific campuses. Given the rapid growth in some jurisdictions in the service area, it becomes imperative that in-depth analyses of these jurisdictions are conducted.

A word of caution concerns long term projections. The longer the time period over which the projections are made, the less likely they are to be accurate. Projections for the years 2000-2010 should be used with caution. These projections are presented to provide some general information about possible future trends.

[1] The NVCC service area, or Northern Virginia Planning District 8, consists of the following counties and cities: Arlington County, Fairfax County, Loudoun County, Prince William County, Alexandria City, Fairfax City, Falls Church City, Manassas City, and Manassas Park City.

[2] One FTES is equal to 15 credit hours.

Part I: Current Population Trends in PD8, 1990 through 1997

Part I presents 1997 population information by the counties and cities of PD8 and compares it to the 1990 population. Population figures for this period are presented in Tables 1 and 2, and Figure 1.

PD8 Population in 1990

According to the 1990 Census, 23.7% of Virginia's residents lived in one of the cities or counties in PD8.

- Of all the PD8 jurisdictions in 1990, Fairfax County had the highest number of residents at 818,584 (55.8% of PD8). The second highest populated county was Prince William with 215,686 residents (14.7% of PD8). The least populated county was Loudoun with 86,129 residents (5.8%).

- In 1990, Northern Virginia was seven times more densely populated than the state of Virginia. The most densely populated PD8 jurisdiction was the City of Alexandria with 7,281 persons per square mile. Arlington County was the next largest with 6,605 persons per square mile. In contrast, Loudoun County had the least population density in PD8 with 166 persons per square mile.

PD8 Population in 1997

- The population figure for PD8 was approximately 1.7 million in 1997 and made up 25% of the Virginia population (see Table 1). In 1997, 54.9% of the population lived in Fairfax County. Prince William County was the second largest jurisdiction comprising 15.1% of the PD8 population (252,300 residents).

Table 1: PD8 Population in 1997 by Jurisdiction

Jurisdiction	Population	Percent of PD8
Arlington County	179,500	10.7%
Fairfax County	918,900	54.9%
Loudoun County	133,800	8.0%
Prince William County	252,300	15.1%
Alexandria City	117,100	7.0%
Fairfax City	20,400	1.2%
Falls Church City	9,800	.6%
Manassas City	33,400	2.0%
Manassas Park City	8,500	.5%
Total PD8	1,673,700	100.0%
Virginia	6,734,000	--

Source: Martin, Julia and Donna Tolson, "1997 Virginia Population Estimates," Spotlight on Virginia, 2 (January 1998).

Population Growth Between 1990 and 1997

- During the period between 1990 and 1997, the PD8 population grew by 14.1% as compared to 8.8% in the state of Virginia (see Table 2).

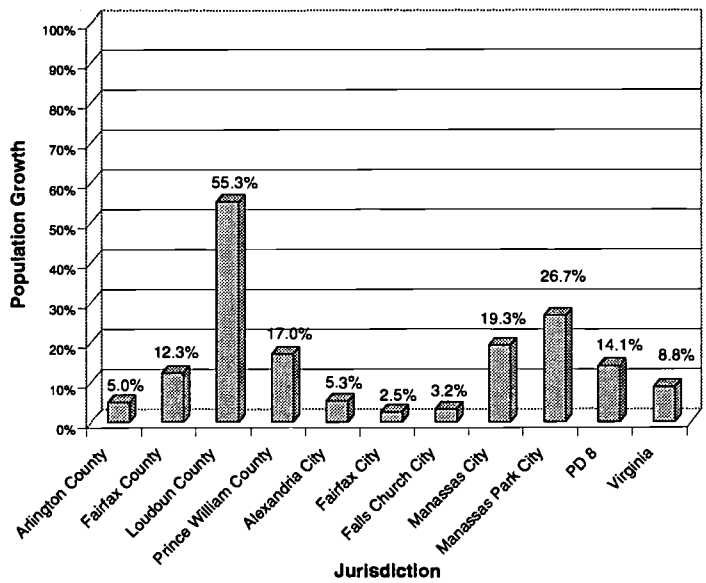
Table 2: Population Growth in PD8 Jurisdictions,[3] 1990-1997

Jurisdiction	1990-1997 Population Growth
Arlington County	5.0%
Fairfax County	12.3%
Loudoun County	55.3%
Prince William County	17.0%
Alexandria City	5.3%
Fairfax City	2.5%
Falls Church City	3.2%
Manassas City	19.3%
Manassas Park City	26.7%
Total PD 8	14.1%
Virginia	8.8%

Source: Martin, Julia and Donna Tolson, "1997 Virginia Population Estimates," Spotlight on Virginia, 2 (January 1998).

- During this period, Loudoun County had the highest growth rate in PD8 (55.3%). Manassas Park City had a growth rate of 26.7%, followed by Prince William County (17.0%) and Fairfax County (12.3%) (see Table 2 and Figure 1).

Figure 1: Population Growth in PD8 Jurisdictions, 1990-1997



[3] Population growth is the percentage change in population between 1990 and 1997.

In summary, PD8 grew by 14.1% from 1990 to 1997, significantly outpacing the growth rate of the state of Virginia (approximately 9%). Counties, which experienced the greatest growth, included Loudoun, Prince William, and Fairfax. Cities experiencing the greatest growth were Manassas and Manassas Park. The growth trends and changes experienced in PD8 from 1990 to 1997 have and will continue to impact NVCC. Future changes in PD8 will also have a great impact on NVCC.

Using two different models, Parts II and III address growth trends in PD8 from 2000 to 2010. Based on these trends, NVCC headcount and FTES are projected.

Part II: NVCC Enrollment Estimates (Population-Penetration Model), 2000 - 2010

While Part I gave an overview of current population trends in PD8, Part II provides information on future trends. Part II provides information on population projections for PD8, estimated headcount, and estimated FTES at NVCC for the period of 2000 through 2010. In addition, estimated increase in NVCC fall headcount from 2000 to 2010 is also presented. Since the projections after 2010 are assumed less accurate, they are not discussed in this report.[4]

Estimates, which are presented in this part of the report, are based on a "population-penetration" model, which computes the NVCC enrollments using the population growth in PD8 and the changes in the penetration rates. This model does not take into account the changes in the size of different age groups in the population. A second model (age-cohort model) which looks at the changes in population by different age groups and computes estimates based on separate penetration rates for different age groups is presented in Part III.

Population Projections: 2000 - 2010

- Table 3 presents population projections for the years 2000 to 2020 by city and county. The population in PD8 is projected to increase from approximately 1.7 million in 2000 to approximately 2.0 million in 2010, which represents a 16.4% growth for the period (see Table 3).

- The population in all PD8 jurisdictions is expected to increase from 2000 to 2010 (see Table 3). With the exception of Arlington County, all counties are projected to experience double digit growth. However, during this period cities are expected to have gains ranging from 2.9% to 7.0%.

Table 3: Population Projections for PD8, 2000-2020*

Jurisdiction	Year 2000	Year 2005	Year 2010	Year 2015	Year 2020	Gain Between 2000 & 2010
Arlington County	191.0	197.5	201.1	204.4	207.5	5.3%
Fairfax County	954.3	1,011.5	1,069.9	1,133.2	1,206.3	12.1%
Loudoun County	145.9	174.3	212.6	249.9	285.9	45.7%
Prince William County	280.3	329.5	367.2	399.6	428.6	31.0%
Alexandria City	120.0	124.0	127.0	130.0	132.0	5.8%
Fairfax City	21.3	22.3	22.8	22.8	22.8	7.0%
Falls Church City	10.4	10.6	10.7	10.8	10.9	2.9%
Manassas Park City**	45.1	46.5	47.4	48.7	50.0	5.1%
Total PD8	1,768.3	1,916.2	2,058.7	2,199.4	2,344.0	16.4%

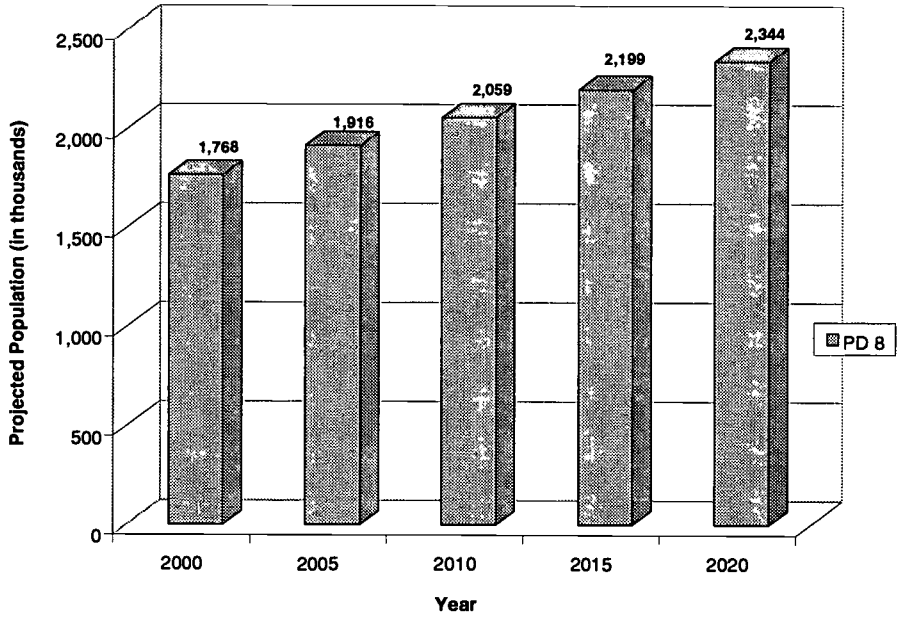
* Figures are in (1,000's).
** Includes City of Manassas.
Source: Northern Virginia Planning District Commission. Northern Virginia Data Book , 4th ed. Virginia: Northern Virginia Planning District Commission, 1998.

- Loudoun County is projected to have the largest gain of 45.7% from 2000 to 2010 (see Table 3). The other two counties with the largest gains are Prince William County (31.0%) and Fairfax County (12.1%).

[4] Estimates for the year 2020 are provided in some of the tables without discussion.

- As Figure 2 shows, the PD8 population is expected to steadily increase from 2000 to 2020. While the increase from 2000 to 2005 reflects an 8.4% growth, the change between 2005 and 2010 is 7.4%. On average, the annual increase in population growth is approximately 1.6% from 2000 to 2010.[5]

Figure 2: Population Projections for PD8, 2000-2020



Population Penetration Rates: 2000 - 2020

- Table 4 presents projected penetration rates for the period 2000 to 2020.[6] The penetration rate is the proportion of students attending NVCC from the total population in a geographic region. Penetration rate was calculated for PD8 and for each jurisdiction separately.

- In 2000, the penetration rate for all of PD8 is projected to be 1.86% and by 2010 estimated to be 1.85%. This means the *proportion* of students from PD8 at NVCC will be relatively constant during this period.

[5] When calculating yearly averages, the denominator of 2 was used for the period of 1998-2000, 5 was used for the periods of 2000-2005 and 2005-2010, and 10 was used for the period of 2000-2010.

[6] The projected penetration rates were calculated by using a "five-year moving average" method.

- The projected penetration rates are also expected to remain relatively constant for each jurisdiction in PD8 from 2000 to 2010 (see Table 4). The projected penetration rate for Fairfax County in 2000 is 1.45% and in 2010 is 1.44%. The same pattern is expected to hold true for the other counties and cities in PD8 for the same period.

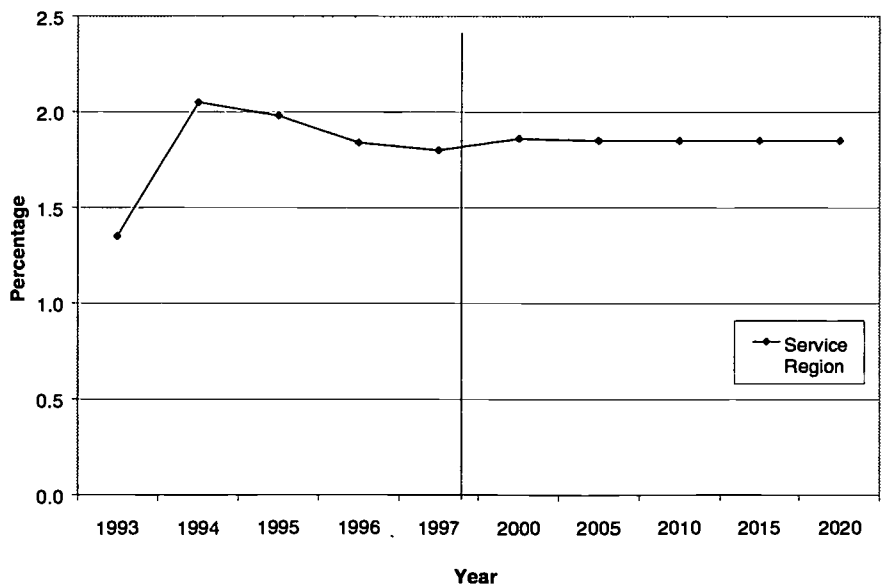
Table 4: Projected Penetration Percentage Rates by PD8 Jurisdiction

Jurisdiction	Year 2000	Year 2005	Year 2010	Year 2015	Year 2020
Arlington County	1.70%	1.69%	1.69%	1.69%	1.69%
Fairfax County	1.45%	1.44%	1.44%	1.44%	1.44%
Loudoun County	1.95%	1.93%	1.93%	1.93%	1.93%
Prince William County	2.05%	2.04%	2.04%	2.04%	2.04%
Alexandria City	3.53%	3.50%	3.50%	3.50%	3.50%
Fairfax City	3.84%	3.75%	3.74%	3.74%	3.74%
Falls Church City	15.38%	15.14%	15.12%	15.12%	15.12%
Manassas Park City*	1.46%	1.47%	1.47%	1.47%	1.47%
Total PD8	1.86%	1.85%	1.85%	1.85%	1.85%

* Includes City of Manassas.

- Figure 3 shows the actual penetration rates from 1993 to 1997 and the projected penetration rates from 2000 to 2010 for the NVCC service region. From 1994 to 1998, the penetration rate declined. This trend was gradual, indicating that the decline will level off or stop. It is reasonable to assume that the rate will remain constant until 2010.

Figure 3: Actual and Projected Penetration Rates, 1993-2020



Projected Fall Headcount: 2000 - 2020

- Table 5 presents estimated NVCC fall headcount by PD8 jurisdictions from 2000 to 2020. The projected fall headcount is computed by applying the penetration rate to the jurisdictions' population.

- From 2000 to 2010, on average, 5,600 students are expected to enroll annually from outside PD8 (see Table 5).[7] In the past, NVCC has enrolled approximately 5,600 students each year from outside of PD8.

- It is projected that in 2000 there will be 38,557 students attending NVCC, with 32,957 residing in PD8 (see Table 5). By 2010, the total student population is projected to be 43,680 students, with 38,080 from PD8 jurisdictions. Thus, from 2000 to 2010, the total student population is expected to increase by 13.3%.

- As Table 5 shows, NVCC enrollment from each PD8 city and county is expected to increase from 2000 to 2020. For example, NVCC is projected to have 2,842 students from Loudoun County in 2000 and 4,102 students in 2010, a 44.3% increase. Similarly, Prince William County is expected to have a 30.2% increase during the same period.

Table 5: Estimated NVCC Fall Headcount, 2000 - 2020 [8]

Jurisdiction	Fall 2000	Fall 2005	Fall 2010	Fall 2015	Fall 2020
Arlington County	3,256	3,332	3,390	3,446	3,498
Fairfax County	13,840	14,605	15,453	16,370	17,427
Loudoun County	2,842	3,365	4,102	4,821	5,516
Prince William County	5,745	6,713	7,480	8,141	8,732
Alexandria City	4,241	4,342	4,443	4,548	4,618
Fairfax City	817	837	854	854	854
Falls Church City	1,600	1,605	1,618	1,633	1,649
Manassas Park City*	658	682	695	714	733
Total PD8	32,957	35,455	38,080	40,687	43,364
Outside PD8	5,600	5,600	5,600	5,600	5,600
Total	38,557	41,055	43,680	46,287	48,964

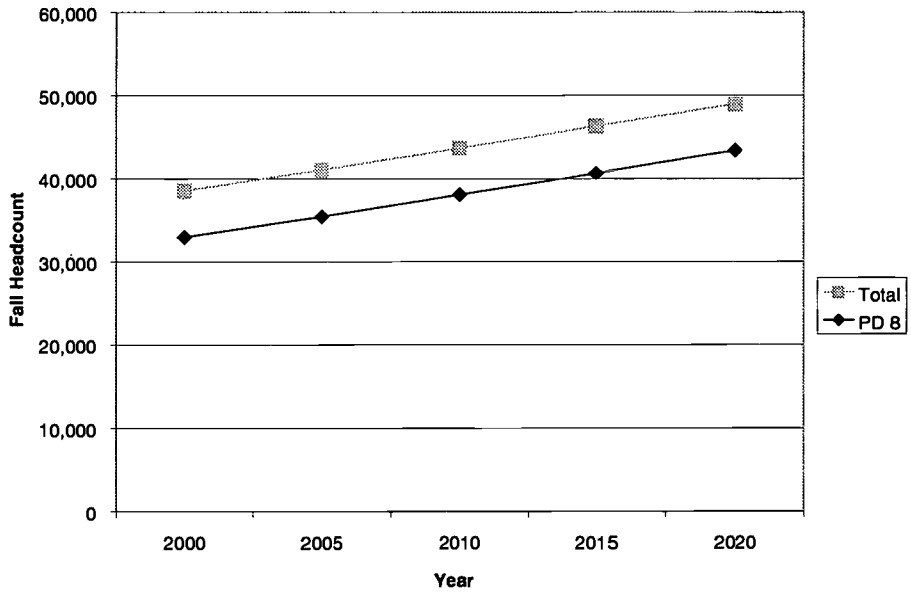
*Includes the City of Manassas.

- From 2000 until 2010, the estimated NVCC headcount from PD8 residents is expected to increase approximately 3.1% every two years (approximately 512 additional students each year). Figure 4 presents this information, with the bottom line representing estimated fall headcounts for PD8 and the top line representing the total estimated headcount which includes enrollment from outside of PD8.

[7] Based on historical data, the enrollment of 5600 students is a reasonable assumption. Since Fall 1995, there has been little fluctuation in the number of students from outside PD8.

[8] A margin of error exists for these estimates. Due to formula calculations, the estimated fall headcount for individual jurisdictions will not total the PD8 estimated fall headcount.

Figure 4: Estimated NVCC Fall Headcount, 2000 - 2020



Percent Change in Fall Headcount: 2000 - 2010

- Table 6 shows the percentage change in the estimated fall headcount between 2000 and 2010. Between 2000 and 2010 a 13.3% increase in fall headcount at NVCC is projected. However, from PD8 alone, a 15.5% increase in headcount is expected.

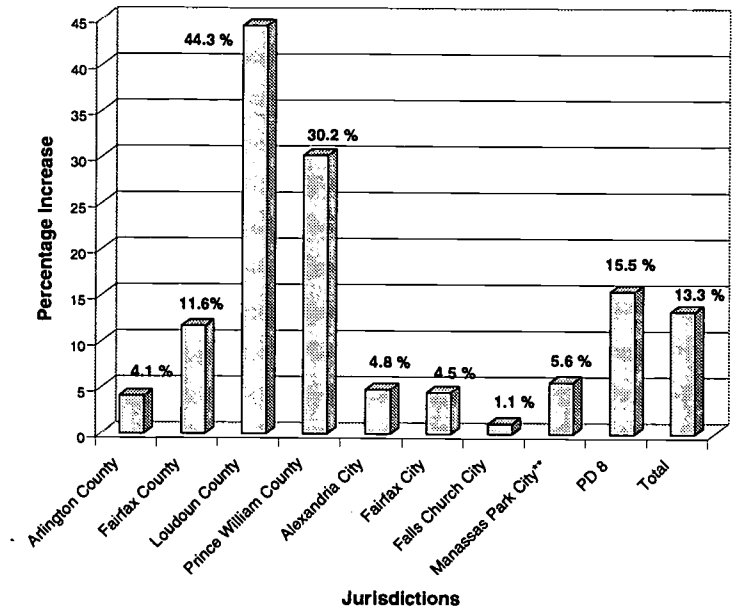
Table 6: Estimated Increase in NVCC Fall Headcount by Jurisdiction, 2000 - 2020

Jurisdiction	Change Between 2000 and 2010	Change Between 2000 and 2020
Arlington County	4.1%	7.4%
Fairfax County	11.6%	25.9%
Loudoun County	44.3%	94.1%
Prince William County	30.2%	52.0%
Alexandria City	4.8%	8.9%
Fairfax City	4.5%	4.5%
Falls Church City	1.1%	3.0%
Manassas Park City*	5.6%	11.3%
Total PD8	15.5%	31.6%
Total	13.3%	27.0%

* Includes the City of Manassas

- During the ten-year period between 2000 and 2010, the percentage of students attending NVCC is expected to increase from all the cities and counties of PD8 (see Figure 5). NVCC enrollment from Loudoun County is projected to have the greatest increase at 44.3% followed by Prince William County with a 30.2% increase.

Figure 5: Estimated Increase in NVCC Fall Headcount by Jurisdiction, 2000 - 2010



Estimated Fall and Annual FTES: 2000 - 2010

- The fall and annual estimated FTES were calculated from the fall headcount projections (see Table 7). Between 1998 and 2000, the fall FTES will increase by 1,057 (5.9% increase). Annual growth (fall to fall) during this period will be 2.9%. As Table 7 indicates, the increase from 2000 to 2005 reflects a 1,225 increase of fall FTES (6.5% growth). The annual increase (fall to fall) during this period will be 1.3%.

- From these estimates, it appears that the largest increase in fall FTES will occur in the year 1999. The FTES will continue to increase at a smaller rate until the year 2005. For the period 2000 to 2010 the fall FTES will increase by 2,512 (13.3% increase). Fall to fall growth for this period will be 1.3%.

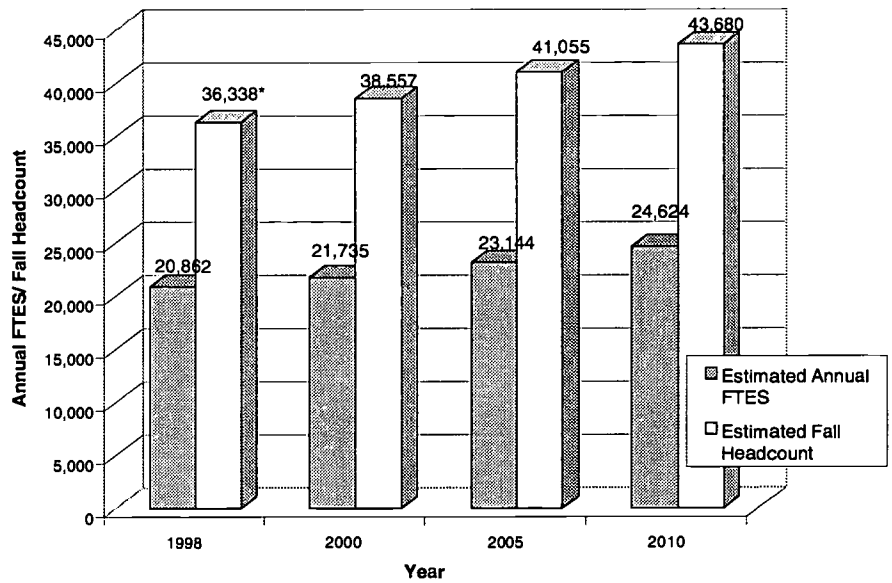
Table 7: Estimated Fall FTES and Annual FTES at NVCC, 2000 – 2020

Year	Fall Headcount	Fall FTES	Annual FTES
2000	38,557	18,900	21,735
2005	41,055	20,125	23,144
2010	43,680	21,412	24,624
2015	46,287	22,690	26,094
2020	48,964	24,002	27,602

- As indicted in Figure 6, between 1998 and 2000, the annual FTES will increase by 873 (4.2% increase). Annual growth during this period will be 2.1%. The increase from 2000 to 2005 reflects a 6.5% growth (1,409 increase of annual FTES).

- For the period 2000 to 2010 the annual FTES will increase by 2,889 (13.3% increase). Annual growth for this period will be 1.3%.

Figure 6: Estimated Fall Headcount and Annual FTES at NVCC, 1998 - 2010[9]



* Actual data

In summary, the populations in all PD8 jurisdictions are expected to grow from 2000 to 2010, resulting in a 16.4% overall growth. The penetration rate during this period is projected to remain fairly constant. Based on estimated population and penetration rates, the total NVCC student population is expected to increase 13.3% from 2000 to 2010. The percentage of students attending NVCC from all PD8 jurisdictions is expected to increase with Loudoun and Prince William counties having the greatest gains. In addition to headcount estimates, fall and annual FTES were estimated. For the period 2000 to 2010, both fall and annual FTES are projected to increase by over 13%.

Estimates and projections in this section do not take into account the changes in the size of different age groups in the PD8 population and how the changes in these age groups will impact NVCC enrollment. Part III provides projections and estimates based on the "age-cohort" model, which incorporates changes in the age distribution of PD8 residents. In addition, the impact of changes in high school graduation rates and racial composition are addressed in Parts IV and V.

[9] While headcount estimates are provided for fall semesters, FTES estimates present annual data.

Part III: NVCC Enrollment Projections (Age-Cohort Model), 2000 - 2010

Part II of the report (population-penetration model) presented enrollment projections based on estimated population and penetration rates. As noted earlier, these estimates did not take into account the changes in the size of age groups. These changes significantly impact NVCC enrollments. In particular, changes in the 18 to 24 year and 30 to 44 year age groups have significant impact on NVCC enrollment. Part III (age-cohort model) presents enrollment estimates, which are based on changes in the size of different age groups in the PD8 population.[10]

First, population projections for PD8, by age group, are presented for the years 2000 and 2010. Secondly, penetration rates for different age groups are estimated. Finally, using estimated penetration rates for different age groups, NVCC enrollment projections were developed for 2000 and 2010 by age groups.

Population Projections by Age Group: 1990 – 2010

- Table 8 presents PD8 population projections and percentage gain by age in 1990, 2000, and 2010. It also includes adjusted population projections for 2010 based on Northern Virginia Planning District Commission (NVPDC) data.[11] Between 2000 and 2010, the percentage gain for all age groups is expected to be 17.9% (see Table 8).

- As Table 8 indicates, the percentage of individuals between 15-19 years is expected to increase by 29% from 2000-2010. Similarly, from 2000 to 2010 the percentage of those between 20 and 24 years is expected to increase by 31.8%.

Table 8: Population Projections for PD8 by Age Group, 1990 - 2010

Age Groups	Year 1990	Year 2000	Year 2010[12]	Adjusted 2010 Projections[13]	Gain Between 2000 and Adjusted 2010
0-4	106,223	98,337	99,994	106,836	8.6%
5-9	97,680	123,256	116,876	124,873	1.3%
10-14	89,216	124,463	112,558	120,260	-3.4%
15-19	90,499	105,114	126,942	135,628	29.0%
20-24	116,137	115,649	142,633	152,392	31.8%
25-29	159,505	138,036	153,439	163,938	18.8%
30-34	151,750	159,360	148,832	159,016	-0.2%
35-44	275,775	343,746	321,156	343,131	-0.2%
45-59	233,519	352,286	438,205	468,188	32.9%
60+	146,105	186,215	266,223	284,439	52.7%
Total	1,466,409	1,746,462	1,926,858	2,058,700	17.9%

Source: Lillywhite, Donald P., and Kirsten Niemann. Virginia Population Projections 2010. Richmond, VA: Virginia Employment Commission State Data Center, 1993.

[10] "NVCC enrollment" refers to the unduplicated fall headcount for the year.

[11] Adjustments were made for the Virginia Employment Commission's 1993 projections to correspond to NVPDC 1998 projections.

[12] In this table, the total population projections differ from those presented in Part II because of the different data sources.

[13] Adjusted to meet the NVPDC projections of 1998.

- Individuals 60 years and older are expected to increase by 52.7% between 2000 and 2010. For the same period, the percentage of those between 45 and 59 years is expected to increase by 32.9% (see Table 8).

- The percentages of individuals between 30 to 34 years and those between 35 to 44 years are expected to decline by 0.2% from 2000 to 2010.

- Particular attention was paid to the projections and percentage change for those between the ages of 15 to 24 years and between 30 to 44 years. Historically, NVCC has drawn proportionally more students from these age groups compared to other age groups (see Table 9). In the past five years, students between 18 and 24 years made up 42 - 44% of the NVCC student population. Those between 30 and 44 years were approximately 30% of the NVCC student population.

Table 9: Proportion of NVCC Fall Headcount by Age Group, Fall 1993 - Fall 1998

Age Groups	Fall 1993	Fall 1994	Fall 1995	Fall 1996	Fall 1997	Fall 1998
18-24	43.2%	42.2%	42.1%	42.5%	42.5%	43.7%
25-29	18.7%	18.5%	18.5%	18.3%	17.8%	17.1%
30-44	29.1%	29.7%	29.7%	29.1%	29.2%	28.8%
45-59	8.2%	8.8%	8.9%	9.3%	9.6%	9.4%
60+	0.8%	0.8%	0.8%	0.8%	0.9%	1.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: OIR records

- For the period 2000 to 2010, the percentage of PD8 residents, ages 15 to 24 years, is expected to increase by 30.5%. For the same time period, PD8 residents, ages 30 to 44 years, are expected to decrease by 0.2% (see Table 10).

Table 10: Population Projections for PD8 by Age Group, 1990 - 2010

Age Groups	Year 1990	Year 2000	Year 2010	Adjusted 2010 Projections	Gain Between 2000 and Adjusted 2010
15-24	206,636	220,763	269,575	288,020	30.5%
30-44	427,525	503,106	469,988	502,146	-0.2%

Source: Lillywhite, Donald P., and Kirsten Niemann. Virginia Population Projections 2010. Richmond, VA: Virginia Employment Commission State Data Center, 1993.

NVCC Enrollment Projections by Age Groups: 2000 - 2010

Using PD8 population projections for 2000 and 2010 by age group, NVCC enrollment estimates were made. The estimates took into account the changes in the age distribution of the PD8 population. Changes in the age distribution of the PD8 population do impact the enrollment of different age groups at NVCC. When there is a change in the size of a particular age group in the PD8 population, NVCC enrollment from that age group changes accordingly (i.e., if the population of PD8 residents between 30-44 years decreases, then the NVCC enrollment for this group will also decline).

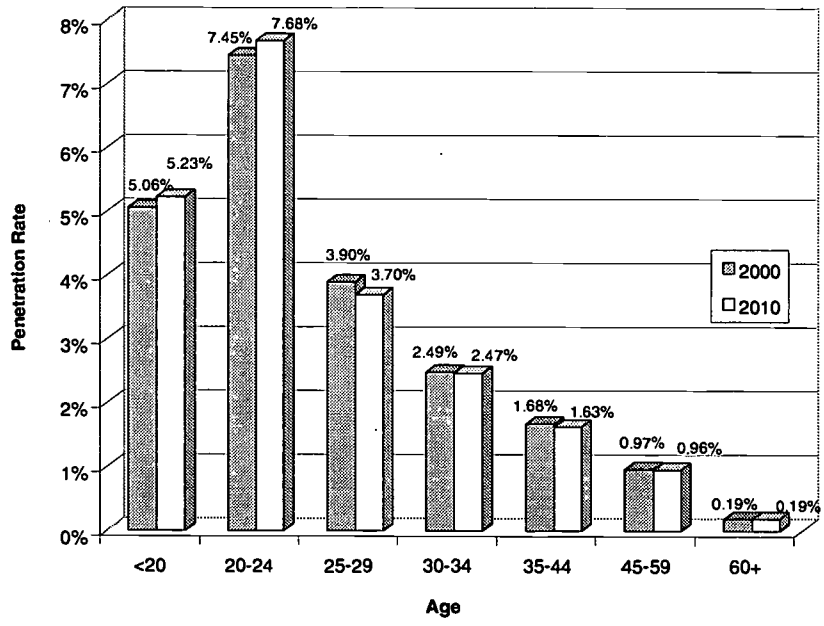
- In order to estimate the NVCC enrollment by age group, first, penetration rates by age group were calculated. Table 11 presents the actual penetration rate for 1990 and the projected penetration rates for 2000 and 2010 for different age groups. In 1990, two age groups had the highest penetration rates, 5.39% for those younger than 20 years, and 7.90% for those between 20 and 24 years. This trend is expected to continue in 2000 and 2010.[14]

Table 11: Penetration Rates by Age Group for PD8, 1990 - 2010

Age Group	Year 1990	Year 2000	Year 2010
<20	5.39%	5.06%	5.23%
20-24	7.90%	7.45%	7.68%
25-29	3.50%	3.90%	3.70%
30-34	2.45%	2.49%	2.47%
35-44	1.57%	1.68%	1.63%
45-59	0.94%	0.97%	0.96%
60+	0.18%	0.19%	0.19%

- Age groups younger than 20 years and those between 20 and 24 years are expected to have increased penetration rates from the year 2000 to 2010. However, these increases are not large. During this same period, penetration rates for the remaining age groups are expected to decrease or remain stable (see Figure 7).

Figure 7: Penetration Rates by Age Group for PD8, 2000 - 2010



[14] Given the 1990 population numbers and NVCC fall headcount by age group, 1990 penetration rates for each age group in PD8 were calculated. Similarly, penetration rates for each age group in 2000 were projected using estimates of population and headcount (see Table 11). Using the averages of the 1990 and 2000 penetration rates, penetration rates for 2010 were calculated.

- Table 12 presents NVCC enrollment projections by age group for 2000 and 2010. These estimates were calculated by using penetration rates and population projections for different age groups.

- Based on penetration rates for different age groups, it is estimated that between 2000 and 2010, NVCC enrollment from PD8 residents will increase by 19.9%. However, the total NVCC enrollment (from both inside and outside PD8) will increase by 17% during this period.

- According to this model, fall headcount for the year 2010 will be 44,970 students. Of these students, 39,370 will be enrolling from PD8.

- As Table 12 depicts, for the period 2000 to 2010, enrollment for most age groups will increase. The exceptions are the 30 to 34 year and 35 to 44 year age groups. Both of these groups will decline in enrollment. Enrollment of students younger than 20 years and between 20 and 24 years is expected to grow 33.4% and 35.7%, respectively, for this period.

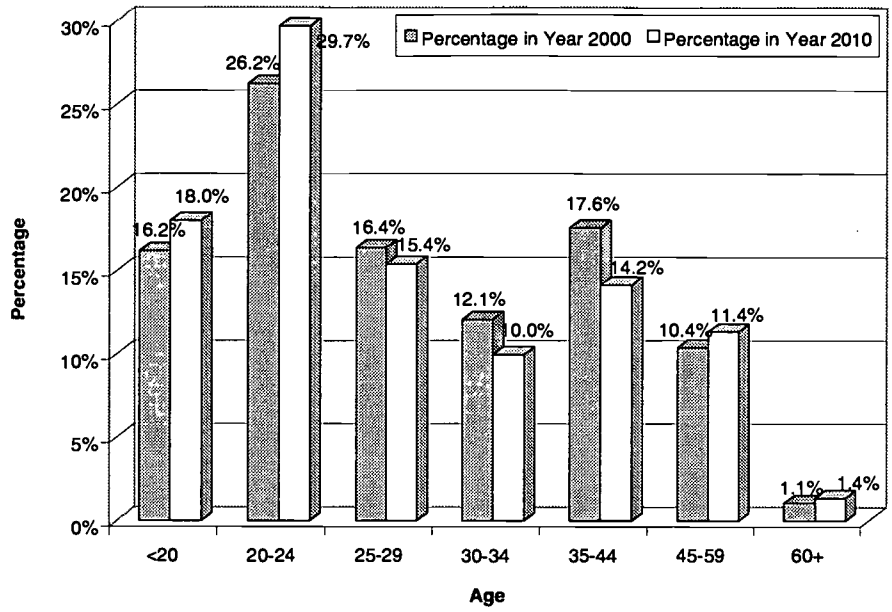
- Some of the age groups will experience a large percentage increase from 2000 to 2010. However, given the relatively small size of these age groups, their impact on the total NVCC enrollment will be comparatively low. For example, the number of students 60 years and older will increase by 53% during this time period, but this percentage increase will add only 186 students to NVCC enrollments.

Table 12: NVCC Fall Headcount by Age Group, 2000 - 2010

Age Group	Fall 2000	Fall 2010	Gain Between 2000 and 2010
<20	5,319	7,093	33.4%
20-24	8,616	11,696	35.7%
25-29	5,383	6,066	12.7%
30-34	3,968	3,928	-1.0%
35-44	5,775	5,576	-3.4%
45-59	3,417	4,471	30.8%
60+	354	540	52.5%
PD8 Total	32,832	39,370	19.9%
Outside PD8	5,600	5,600	0.0%
Total	38,432	44,970	17.0%

- Table 12 presents information on how the size of the different age groups will change between 2000 and 2010. Figure 8 presents information on how the proportion of each age group from PD8 will change between 2000 and 2010. The proportion of students between 20 and 24 years will be 26.2% of the NVCC student population in 2000, and by 2010 will increase to 29.7%. Students less than 20 years will have the second highest proportional increase from 16.2% to 18.0% (see Figure 8).

Figure 8: Percentage of NVCC Fall Headcount by Age Group, 2000 and 2010



- Table 13 presents NVCC enrollment estimates for two age groups that have accounted for the greatest proportion of students over the past five years. Individuals less than 25 years and between 30 to 44 years have historically made up a greater proportion of NVCC students.

- Between 2000 and 2010, enrollment of students less than 25 years is expected to increase by 34.8% (4,854 students) (see Table 13).

- According to Table 13, enrollment of students between 30 and 44 years is expected to decline by 2.5% (239 students) from 2000 to 2010.

- Given the changes in these two age groups, the result will be a net increase of 4,615 students (19.5%) between 2000 and 2010.

Table 13: NVCC Fall Headcount by Specific Age Group, 2000 - 2010

Age Group	Fall 2000	Fall 2010	Gain Between 2000 and 2010
<25	13,935	18,789	34.8%
30-44	9,743	9,504	-2.5%
Total	23,678	28,293	19.5%

In summary, the purpose of this section was to determine if there will be changes in the composition of various age groups in the NVCC service area. Secondly, if changes do occur in the size of specific age groups, will these changes impact NVCC enrollment. Using separate penetration rates for these age groups, NVCC enrollment for 2010 was estimated. By incorporating changes in the age distribution of the population, total

NVCC enrollment is estimated to be 44,970 students for 2010 (see Table 12). According to these estimates, NVCC headcount for 2000 through 2010, is expected to increase by 19.9% from PD8 and 17% in total (both inside and outside of PD8) (see Table 12). Special attention was paid to two age groups: individuals between 15-24 years and individuals between 30-44 years. While the size of the first group increased, the size of the second group decreased from 2000-2010.

Part III introduced comprehensive projections and estimates based on an analysis of age groups (age-cohort model). The total estimated NVCC enrollment increased by 1290 more students for the year 2010 when compared to the estimates presented in Part II. The difference in the headcount estimates in Part II and those reported in this section is due to the disproportionate changes in the size of some age groups (specifically those between 19 and 24 years) which have direct and significant impact on NVCC enrollments. Part III also demonstrated that the age distribution of the student population changed between 2000 and 2010. Part IV, similarly, provides comprehensive projections based on the impact of PD8 public school enrollment and public high school graduate trends on NVCC.

Part IV: NVCC Enrollment Projections by Public High Schools, 2000-2010

Part IV examines projections in public school enrollment for the years 1999-2000 to 2002-2003, by PD8 jurisdictions (see Table 14). Based on the public school enrollment projections, the number of high school graduates in PD8 was projected from 2000 to 2010 (see Table 15). For these same years, the number of high school graduates directly entering NVCC was also projected (see Table 17).

Projections in Public School Enrollment: 1999-2000 to 2002-2003

Table 14 presents projected enrollments in PD8 public schools for the years 1999-2000 to 2002-2003. These figures reflect all enrolled students from grades K through 12 for each year.

Table 14: Projected Enrollment in PD8 Public Schools, 1999–2000 to 2002-2003

Jurisdiction	Year 1999-2000	Year 2000-2001	Year 2001-2002	Year 2002-2003	Number Change 1999-2003	% Change 1999-2003
Arlington Co	18,678	19,007	19,414	19,838	1,160	6.2 %
Fairfax Co	140,988	142,276	143,645	145,289	4,301	3.1 %
Loudoun Co	27,265	29,633	32,189	34,573	7,308	26.8 %
PW Co.	50,998	52,170	53,388	53,900	2,902	5.7 %
Alexandria	10,509	10,679	10,989	11,237	728	6.9 %
Falls Ch City	1,484	1,461	1,428	1,418	- 66	-4.5 %
MA City	6,435	6,630	6,883	7,056	621	9.7 %
MA Pk City	1,894	1,945	1,984	2,013	119	6.3 %
Total PD8	258,251	263,801	269,920	275,324	17,073	6.6 %

Source: Spar, Michael. "Fall membership Projections for Virginia's Public School Divisions, 1992-2002," Weldon Cooper Center for Public Service, (February 1998): 1-23.

- Between 1999 and 2003, enrollment in PD8 public schools is expected to increase by 6.6 % or 17,073 students (from 258,251 to 275,324). Enrollment in all county and city schools, with the exception of Falls Church City, is expected to increase.

- The greatest percentage increase is expected in Loudoun County schools (27%) followed by Manassas City schools (10%). The greatest increase in the number of students is also expected to be in Loudoun County (7,308) followed by Fairfax County (4,301).

- Fairfax County public schools will, however, continue to have the largest public school population. Over 50% of the public school population in PD8 will be in Fairfax County (For projections in public school enrollment by grade for the years 1999-2000 to 2002-2003 see Appendix A).

Projected Public High School Graduates

The projections for public school enrollment were used to estimate the number of high school graduates for PD8 through 2010.[15] Table 15 depicts projected high school graduation in PD8 based on the methodology outlined in Footnote 15. PD8 is projected to have a 26% increase in the number of high school graduates between 2000 and 2010.

- From 2000 to 2010, high school graduates in Manassas Park City are projected to increase by 93%, Alexandria City by 82%, Loudoun County by 81% and Manassas City by 63%.

- The number of public high school graduates in Arlington County, Prince William County and Manassas Park City are projected to peak in 2006. Fairfax County and Manassas City are projected to peak in 2008. Loudoun County is projected to peak in 2009 and Alexandria City in 2010 (see Table 15).

Table 15: Projected Number of PD8 High School Graduates, 2000 - 2010

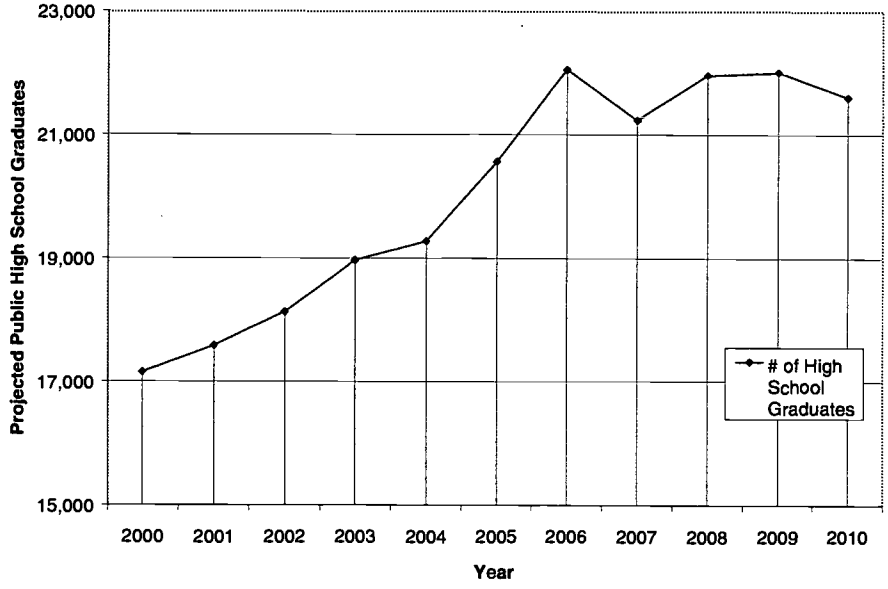
County	Year 2000	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010
Arl. Co	1,112	1,145	1,107	1,175	1,200	1,372	1,605	1,373	1,455	1,516	1,513
Fairfax Co	10,298	10,473	10,075	10,636	10,781	11,043	11,471	11,157	11,541	11,458	11,199
Loudoun Co	1,529	1,629	1,857	2,071	2,126	2,424	2,702	2,746	2,802	2,836	2,764
PW Co.	3,116	3,264	3,946	3,944	3,833	4,203	4,785	4,369	4,445	4,459	4,322
Alex. City	540	505	531	520	651	689	694	774	825	928	985
Falls Ch. City	137	134	114	142	120	135	142	124	149	103	101
MA City	334	329	396	374	451	536	474	519	585	538	546
MA Park City	85	101	101	104	109	158	179	171	159	170	164
Total PD8	17,151	17,580	18,127	18,966	19,271	20,560	22,052	21,233	21,961	22,008	21,594

Source: Spar, Michael. "Fall membership Projections for Virginia's Public School Divisions, 1992-2002," Weldon Cooper Center for Public Service, (February 1998): 1-23.

- Figure 9 is a line graph of projections of PD8 public high school graduates from 2000-2010. While the number of high school graduates in Virginia is expected to peak in 2007-2008, projections for PD8 reveal that public high school graduation will peak approximately one year earlier, in 2006 (see Figure 9).

[15] The number reflected as the projected enrollment in 12th grade for 1999-2000 to 2002-2003 (Appendix A Tables A1 to A4) became the projected number of graduates for 2000, 2001, 2002, and 2003 in Table 15. For the years 2004 to 2010, the expected year of graduation for each grade was calculated from Appendix A, Table A4, 5th grade through 11th grade, (e.g., 11th graders were assumed to graduate in 2004, 10th graders in 2005 and so on). The projected enrollment for each grade 5-11th then became the number of graduates for the year in which the students were expected to graduate.

Figure 9: Projected Public High School Graduates From PD8, 2000 - 2010



Projected Public High School Graduates at NVCC: 2000 - 2010

Table 16 shows the number of PD8 high school graduates, and the number of those graduates who came directly to NVCC for the years 1993 – 1997.

Table 16: PD8 High School Graduates at NVCC, 1993 - 1997

Year	PD8 High School Graduates	PD8 High School Graduates at NVCC	Percentage at NVCC
1993	13,979	2,839	20.3%
1994	13,998	2,707	19.3%
1995	14,256	2,502	17.5%
1996	14,168	2,670	18.8%
1997	14,875	2,845	19.1%

Source: OIR Report No. 4-98

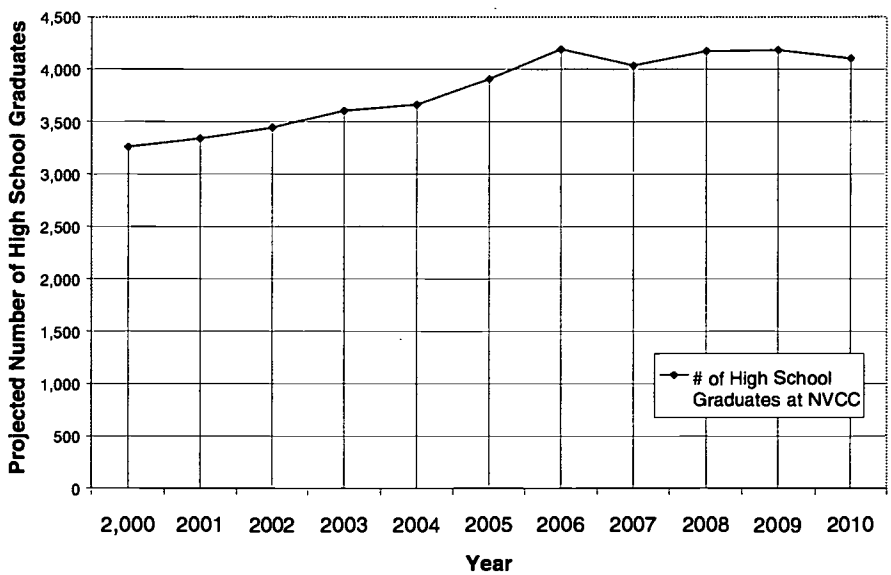
- For the years 1993 - 1997, NVCC drew, on average, 19% of the PD8 public high school graduates. In terms of student headcount, the trend indicates that since 1995 the enrollment of PD8 graduates at NVCC has steadily increased by approximately 100-200 students per year until 1997. Assuming that this proportion (19%) remains constant, the number of high school graduates coming to NVCC directly from high school was projected for 2000 - 2010 (see Table 17).

Table 17: Projected Number of PD8 High School Graduates at NVCC, 2000 - 2010

County	Fall 2000	Fall 2001	Fall 2002	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010
Arl. Co	215	221	227	238	242	258	277	266	275	276	271
Fairfax Co	1,773	1,817	1,874	1,961	1,992	2,125	2,279	2,194	2,270	2,275	2,232
Loudoun Co	267	274	282	296	300	320	344	331	342	343	337
PW Co.	711	728	751	786	798	851	913	880	910	912	895
Alex. City	134	137	141	148	150	160	172	165	171	171	168
Falls Ch. City	68	70	72	75	77	82	88	85	88	88	86
MA City	78	80	83	86	88	94	100	97	100	100	98
MA Park City	13	13	14	14	15	16	17	16	17	17	16
Total PD8	3,259	3,340	3,444	3,604	3,662	3,906	4,190	4,034	4,173	4,182	4,103

- As shown in Table 17, the projected NVCC enrollment from PD8 high school graduates will be 3,259 students in the year 2000. The number of high school graduates is estimated to increase by approximately 26% from 2000 – 2010 (3,259 to 4,103 students). The majority of the increase (20%) will be between 2000 - 2005, which translates into an average 4% annual increase (100 to 200 students). The trend will continue until the year 2006, at which time the enrollment numbers from the PD8 high schools will peak (see Figure 10). After 2006 the trend levels off for the rest of the period.

Figure 10: Projected Number of PD8 Public High School Graduates at NVCC, 2000 - 2010



In summary, enrollment in PD8 public schools is expected to increase between 1999-2003. The expected increase in enrollments will produce an increase in the number of high school graduates during the 2002 - 2006 time period. Given the historical trend, it is assumed that NVCC will maintain its proportion (19%) of high school graduates who come directly to NVCC. In maintaining this proportion, the number of high school graduates who attend NVCC is expected to increase by approximately 26% over the period 2000 - 2010. This translates into a 2.6% increase per year on average. The increase is gradual until it peaks in 2006. In terms of headcount, from 2000 - 2006, the increase is approximately 100-200 students each year.

Part V: NVCC Enrollment Projections by Racial Groups, 2000 - 2010

Part II of this report (based on the population-penetration model) provided estimates of student headcount for 2000-2010. These estimates, however, did not take into account the possible changes in the racial composition of the PD8 population. These changes will impact NVCC enrollment. In this section, changes in the racial composition of the PD8 population and their impact on NVCC enrollment are addressed.

The growth of the Non-White community in PD8 has profoundly impacted enrollment at NVCC in the past. Population and penetration rates for the Non-White population have increased steadily in the last 20 years. As a result, a continued growth of Non-White students at NVCC is anticipated.

This section addresses two questions: a) what are the possible changes in the racial (White and Non-White) composition of the NVCC student population, and b) to what extent will these changes impact NVCC enrollment? In order to address these issues, OIR examined the population growth from 1990 to 2010 by race and calculated 1990 and 2000 penetration rates for White and Non-White students.[16] An estimated NVCC fall headcount by White and Non-White students for 2000 through 2005 is also included.

The Proportion of White/Non-White Residents in PD8: 1990 - 2010

- As Table 18 indicates, the Non-White population in PD8 is expected to grow from an estimated 19.2% of the population in 1990, to 19.8% in 2000, to 22.4% by 2010.

- The White population in PD8 will continue to make up a greater proportion of the total population. However, from 1990 to 2010 this proportion is expected to drop from 80.8% in 1990 to 77.6% in 2010 (see Table 18).

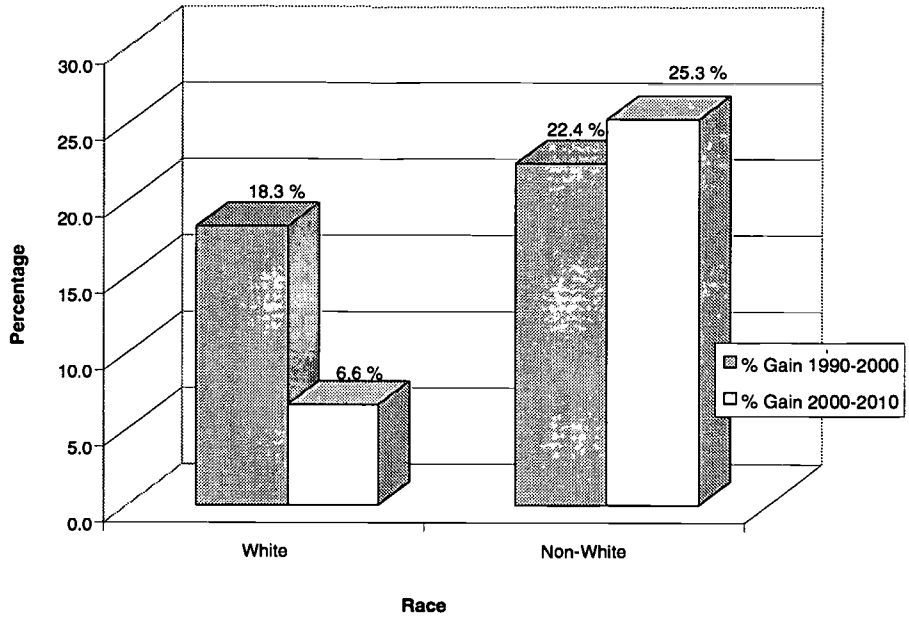
Table 18: Proportion of White/Non-White Residents in PD8, 1990 - 2010

Race	Year 1990		Year 2000		Year 2010	
	Num	%	Num	%	Num	%
White	1,184,501	80.8	1,401,524	80.2	1,494,594	77.6
Non-White	281,908	19.2	344,938	19.8	432,264	22.4
Total	1,466,409	100.0	1,746,462	100.0	1,926,858	100.0

Source: Lillywhite, Donald P., and Kirsten Niemann. Virginia Population Projections 2010. Richmond, VA: Virginia Employment Commission State Data Center, 1993.

[16] Due to data limitations, a more detailed breakdown of the Non-White category into different racial/ethnic groups was not possible.

Figure 11: Percentage Change of PD8 White and Non-White Population, 1990 - 2010



- The percentage of White residents in PD8 is expected to increase by 18.3% from 1990 to 2000. The percentage of White residents in PD8 will continue to increase during the 2000-2010 period, but at a smaller percentage rate (6.6%) (see Figure 11).

- As Figure 11 shows, the growth for Non-White PD8 residents from 1990 to 2000 is expected to be 22.4% (from 281,908 to 344,938 residents). In addition, Non-White residents are expected to increase by 25.3% during the period of 2000 to 2010 (from 344,938 residents to 432,264 residents).

PD8 Penetration Rates for White/Non-White Population: 1990 - 2000

- As seen in Table 19, the penetration rate for Whites will decrease from 1.97 in 1990 to 1.22 in 2000.

- It is expected that the penetration rate for Non-Whites will significantly increase from 2.43 in 1990 to 4.60 in 2000. With the data currently available, there is no indication when this increase will slow down (see Table 19).

Table 19: PD8 Penetration Rates, by Race, 1990 and 2000

Race	Year 1990*	Year 2000**
White	1.97%	1.22%
Non-White	2.43%	4.60%

* Actual
** Estimated

Projected Fall Headcount by Race: 2000 - 2005

In this section, population penetration rates were not used to estimate NVCC enrollment. Instead of using penetration rates, the NVCC enrollment estimates from Part II were used for the analysis in this section. This was due to the following: a) there appears to be very little relationship between the PD8 Non-White population growth and the NVCC Non-White enrollment growth and b) the Non-White penetration rate does not follow any predictable pattern.

- To estimate the number of White and Non-White students at NVCC, OIR examined the growth trends in these two groups since 1990. Historical data for NVCC revealed that since 1990 the percent and number of Non-White students have been increasing steadily (see Table 20). In Fall 1990, 25% of the student body was Non-White. By Fall 1998, 43% of the student body was Non-White (an increase of 18%). Accordingly, the increase for Non-White students for this period was approximately 2% per fall semester. Conversely, with the proportion of Non-White students increasing since 1990, the proportion of White students steadily decreased from 75% in Fall 1990 to 57% in Fall 1998.

Table 20: Proportion of White/Non-White Students at NVCC, 1990 – 2000

Race	Fall 1990	Fall 1992	Fall 1994	Fall 1996	Fall 1998	Fall 2000*
	%	%	%	%	%	%
White	75	71	65	61	57	53
Non-White	25	29	35	39	43	47

*Estimated

- While the total projected headcount for 2000 and 2005 was taken from Part II of this report, the White and Non-White breakdown in Table 21 was based on the average 2% change per fall semester. Based on this trend, for Fall 2000, Non-White headcount is expected to be 47% of the projected NVCC headcount or 18,122 students and White headcount is expected to be 53% or 20,435 students.

- Based on a conservative assumption of a 1.5% average increase per fall semester, for 2005 the Non-White and White student headcount is expected to be 55% (22,580 students) and 45% (18,475 students) respectively.

- Between 2000 and 2005, it is expected that the White student population will drop by 9.6% and the Non-White student population will grow by 24.6%. For both groups combined the headcount is expected to increase 6.5% from 2000 to 2005 (see Table 21).

Table 21: Estimated Proportion of White and Non-White Students at NVCC, 2000 and 2005

Race	Fall 2000		Fall 2005		% Gain
	Num	%	Num	%	%
White	20,435	53	18,475	45	-9.6
Non-White	18,122	47	22,580	55	24.6
Total	38,557	100	41,055	100	6.5

In summary, although growth in the Non-White student population is expected, this may not translate into a net gain of total NVCC headcount. With the White student population steadily decreasing, it may be possible that the additional Non-White students will replace the White students who are not enrolling at NVCC. It also should be noted that the increase in the Non-White population at NVCC can not continue indefinitely. At some point in time, NVCC will have saturated the Non-White market and enrollment of Non-Whites will level off. However, OIR projections indicate that current trends in White and Non-White population growth will continue until at least 2005. Given current trends, NVCC will most likely become a Non-White majority institution between 2000 and 2005.

Part VI: Summary

This report examined the changes in population in the NVCC service area from 2000 to 2010 and measured the impact of these changes on NVCC enrollment. In addition, the impact of expected increases in high school graduates, and the anticipated changes in the demographic composition of PD8 are also analyzed. In conducting this study, the Office of Institutional Research (OIR) analyzed data from the Census Bureau, county and state agencies in Virginia, PD8 public high schools, and NVCC.

Part I presented information on current population trends in PD8. In 1997, 25% of Virginia's residents lived in one of the cities or counties in PD8. Of this population, 54.9% lived in Fairfax County. Prince William County was the second largest municipality with 15.1% of the population. Between 1990 and 1997, the PD8 population grew by 14.1% as compared to 8.8% in the state of Virginia.

As presented in Part II, between 2000 and 2010, the population in PD8 is projected to increase from approximately 1.7 million to approximately 2.0 million (16.4% growth). The penetration rate, defined as the proportion of students attending NVCC from the total population within a geographic region, is projected to remain fairly constant from 2000 to 2010. Specifically, the PD8 penetration rate is expected to be 1.86% in 2000 and 1.85% in 2010.

Based on the population-penetration model of Part II, it is projected that by Fall 2000 there will be a total of 38,557 students attending NVCC. Of this number, 32,957 students will be coming from PD8. By Fall 2010, it is expected that this number will increase to 43,680 students, with 38,080 residing in PD8 (15.5% increase for PD8 residents and a 13.3% overall increase from 2000 to 2010). This headcount trend appears to be upward, with expected gradual increases during the period. It appears that the average fall to fall increase will result in approximately 500 additional students each year.

Part II also presented both fall and annual FTES based on fall headcount. By the year 2000, the fall FTES will increase to 18,900 (a 5.9% increase from 1998). By 2005, fall FTES will increase to 20,125 (a 6.5% increase from 2000). Similarly, by 2010, the fall FTES is expected to increase to 21,412 (a 13.3% increase from 2000).

The annual FTES is expected to increase to 21,735 by the year 2000 (a 4.2% increase from 1998). By 2005, annual FTES is expected to increase to 23,144 (a 6.5% growth from 2000). Likewise, by 2010, the annual FTES is expected to increase to 24,624 (a 13.3% gain from 2000). This translates to an increase of 290 FTES each year for this period.

Part III (age-cohort model) examined changes in the age distributions of PD8 residents and their impact on NVCC enrollment. Both PD8 population projections and penetration rates by age group were developed for the years 2000 to 2010. Using these penetration rates, NVCC enrollment projections by age group were made for the year 2010.

PD8 residents between 15 and 19 years of age are expected to increase by 29.0% between 2000 and 2010. Similarly, from 2000 to 2010, PD8 residents between 20 and 24 years of age are expected to increase by 31.8%. However, there is expected to be a

decline of 0.2% of residents between 30 to 34 years and 35 to 44 years of age during this period.

NVCC penetration rates for most of the age groups are expected to remain stable from 2000 to 2010. Due to increases in the population size of some of the age groups in PD8, there will be a corresponding increase in NVCC enrollment. In particular, most of the age groups are expected to experience gains in NVCC enrollment with the exception of the 30 to 44 year age groups. Accordingly, the overall NVCC enrollment will increase by 17.0% from 2000 to 2010 due to the enrollment increases of these specific age groups.

In Part II, the population-penetration model projected the total NVCC enrollment to be 43,680 students for the year 2010. However, the age-cohort model, presented in Part III, estimated the total NVCC enrollment to be 44,970 students for 2010. The difference in the headcount estimates from Part II to those reported in Part III is due to the increase in 19 to 24 year PD8 residents, which significantly impacts NVCC enrollment.

Part IV of the report examined projections in public school enrollment (K through 12) for PD8 jurisdictions from 1999-2003. Based on the public school enrollment estimates, OIR projected the number of high school graduates in PD8 for the years 2000 to 2010. For the same years, OIR also projected the number of high school graduates who would come directly to NVCC.

Between 1999 and 2003, enrollment in PD8 public schools (grades K through 12) is expected to increase by 6.6% or 17,073 students. Estimates indicate that PD8 is projected to have a 26% increase in the number of high school graduates between 2000 and 2010. Projections for PD8 reveal that public high school graduation will peak in 2006.

Data show that approximately 19% of the PD8 public high school graduates enrolled at NVCC each year from 1993 to 1997. Assuming that this proportion remains constant, the number of high school graduates coming to NVCC directly from high school was projected for the period of 2000 through 2010. This number is projected to increase from 3,259 students in the year 2000 to 4,103 students in the year 2010 (a 26% increase). The increase is gradual until it peaks at 2006. Between 2000 and 2006, the annual increase is projected to be approximately 100 - 200 students.

Section V of the report projected changes in the racial composition of PD8 and evaluated how these changes could affect NVCC enrollment. Data from 1980 through 1998 indicated that the Non-White population at NVCC grew much faster than the Non-White population of PD8.

The penetration rate for Non-Whites will increase from 2.43 in 1990 to 4.60 in 2000. There is no indication when this drastic increase will slow down. As there is no discernable pattern on these penetration rates, it is not possible to use the PD8 population estimates for Non-Whites to project NVCC Non-White headcount.

Without using the penetration rates, NVCC headcount estimates for White and Non-White students were made using historical data. Since 1990 the percent and number of Non-White students have been increasing steadily. In Fall 1990, 25% of the student body was Non-White. By Fall 1998, 43% of the student body was Non-White (an 18%

increase). The average percentage increase for Non-White students during this period was 2% per fall. While the total projected headcount for 2000 and 2005 was derived from penetration rates, the White and Non-White breakdown was estimated for 2000 using a 2% average increase (fall to fall).

Based on this trend, by Fall 2000, Non-White headcount is expected to be 47% of the NVCC headcount. By Fall 2005, based on a 1.5% per fall average increase, Non-White headcount is expected to be 55% (22,580 students) and White headcount is expected to be 45% (18,475 students).

OIR projections indicate that current trends in White and Non-White population growth will continue until at least 2005. Given current trends, NVCC will most likely become a Non-White majority institution between 2000 and 2005.

In brief, this report indicates that during the next ten years there will be significant population growth in some PD8 jurisdictions. This growth, in turn, will increase the NVCC enrollment. The NVCC rate of enrollment increase will be less than 2% per year. However, some of the campuses will experience a higher rate of growth than others. In addition, the age distribution of the NVCC student population is expected to change during this period. Similarly, the racial composition will continue to change.

A fundamental assumption inherent in this study is that there will be no major changes in the area economy and the local labor market. Any change in these and many other economic and political factors will impact enrollment differently than projected in this report. In particular, the proposed 20% reduction in tuition and the classification of District of Columbia residents as in-state students could have an unanticipated impact on NVCC enrollment. These proposed changes were not addressed in this report.

Appendix A

Table A1: Projections in Public School Enrollment
1999-2000
By Grade

County	< 4th	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total
Arl. Co.	6,626	1,535	1,406	1,369	1,289	1,265	1,551	1,312	1,213	1,112	18,678
Fairfax Co.*	43,659	11,443	11,068	10,562	10,627	10,388	11,531	10,506	10,906	10,298	140,988
Loud. Co.	9,333	2,251	2,235	2,171	2,141	2,017	2,140	1,855	1,593	1,529	27,265
Pr. Will. Co.	15,674	4,266	4,177	4,018	3,947	4,038	4,540	4,119	3,103	3,116	50,998
Alex City	4,085	865	837	781	741	723	645	685	607	540	10,509
Falls Ch City	373	128	107	120	120	110	142	113	134	137	1,484
Ma. City	2,202	543	515	467	530	486	466	516	376	334	6,435
Ma. Park City	637	147	172	138	152	131	177	147	108	85	1,894
PD 8	82,589	21,178	20,517	19,626	19,547	19,158	21,192	19,253	18,040	17,151	258,251

* Includes City of Fairfax

Source: Spar, Michael. "Fall membership Projections for Virginia's Public School Divisions, 1992-2002," Weldon Cooper Center for Public Service, (February 1998): 1-23.

Table A2: Projections in Public School Enrollment
2000-2001
By Grade

County	< 4th	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total
Arl. Co.	6,695	1,584	1,493	1,383	1,355	1,292	1,495	1,393	1,172	1,145	19,007
Fairfax Co.*	43,787	11,421	11,446	11,100	10,618	10,625	11,225	11,091	10,490	10,473	142,276
Loud. Co.	10,039	2,421	2,398	2,457	2,307	2,251	2,247	2,069	1,815	1,629	29,633
Pr. Will. Co.	15,392	4,338	4,343	4,217	4,073	4,033	4,642	4,116	3,752	3,264	52,170
Alex City	4,068	965	861	810	775	714	672	670	639	505	10,679
Falls Ch City	363	93	132	115	125	124	120	141	114	134	1,461
Ma. City	2,279	525	552	519	491	504	492	488	451	329	6,630
Ma. Park City	634	169	147	174	147	140	173	152	108	101	1,945
PD 8	83,257	21,516	41,372	20,775	19,891	19,683	21,066	20,120	18,541	17,580	263,801

* Includes City of Fairfax

Source: Spar, Michael. "Fall membership Projections for Virginia's Public School Divisions, 1992-2002," Weldon Cooper Center for Public Service, (February 1998): 1-23.

Table A3: Projections in Public School Enrollment
2001-2002
By Grade

County	< 4th	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total
Arl. Co.	6,900	1,555	1,541	1,469	1,370	1,358	1,527	1,343	1,244	1,107	19,414
Fairfax Co.*	44,342	11,196	11,425	11,479	11,159	10,616	11,481	10,797	11,075	10,075	143,645
Loud. Co.	10,780	2,594	2,579	2,636	2,612	2,425	2,508	2,173	2,025	1,857	32,189
Pr. Will. Co.	15,365	4,245	4,416	4,385	4,275	4,163	4,636	4,208	3,749	3,946	53,388
Alex City	4,140	990	960	832	803	747	663	698	625	531	10,989
Falls Ch City	333	97	96	142	120	129	136	119	142	114	1,428
Ma. City	2,394	536	534	557	546	467	511	515	427	396	6,883
Ma. Park City	635	165	168	149	186	136	184	148	112	101	1,984
PD 8	84,889	21,378	21,719	21,649	21,071	20,041	21,646	20,001	19,399	18,127	269,920

* Includes City of Fairfax
Source: Spar, Michael. "Fall membership Projections for Virginia's Public School Divisions, 1992-2002," Weldon Cooper Center for Public Service, (February 1998): 1-23.

Table A4: Projections in Public School Enrollment
2002-2003
By Grade

County	< 4th	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total
Arl. Co.	7,057	1,572	1,513	1,516	1,455	1,373	1,605	1,372	1,200	1,175	19,838
Fairfax Co.*	44,969	11,034	11,199	11,458	11,541	11,157	11,471	11,043	10,781	10,636	145,289
Loud. Co.	11,484	2,618	2,764	2,836	2,802	2,746	2,702	2,424	2,126	2,071	34,573
Pr. Will. Co.	15,421	4,119	4,322	4,459	4,445	4,369	4,785	4,203	3,833	3,944	53,900
Alex City	4,205	966	985	928	825	774	694	689	651	520	11,237
Falls Ch City	316	86	101	103	149	124	142	135	120	142	1,418
Ma. City	2,473	560	546	538	585	519	474	536	451	374	7,056
Ma. Park City	637	162	164	170	159	171	179	158	109	104	2,013
PD 8	86,562	21,117	21,594	22,008	21,961	21,233	22,052	20,560	19,271	18,966	275,324

* Includes City of Fairfax
Source: Spar, Michael. "Fall membership Projections for Virginia's Public School Divisions, 1992-2002," Weldon Cooper Center for Public Service, (February 1998): 1-23.

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