

WAKE COUNTY PUBLIC SCHOOL SYSTEM
WAKE COUNTY, NORTH CAROLINA

LONG-RANGE SCHOOL BUILDING PLAN 2008-09 UPDATE

STUDENT POTENTIAL DISTRIBUTION MODEL

PREPARED AND SUBMITTED BY
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MARCH 20, 2009

OR/Ed. Lab

Background

Beginning in 2004, the Operations Research and Education Laboratory (OR/Ed.) collaborated with the Wake County Public School System (WCPSS), and the planning community of Wake County to create a high resolution land use database which could be used to distribute long-range enrollment system-wide K-12 enrollment projections. Over the next 18 months, OR/Ed. developed the Student Potential Distribution Model (SPDM) to accomplish this distribution. From a fall 2005 baseline, 20-year enrollment projections were distributed according to residential development potential supplied by the 13 county and municipal planning agencies. The final distribution was published on June 16, 2006 (see OR/Ed.'s Technical Description of Phase II – Student Potential Distribution Model) and was used to provide input data for the OR/Ed. optimization algorithm which algorithm produced optimal locations for school sites through the twenty-year forecast window. These optimal locations were used to help construct a comprehensive school building plan for WCPSS and to provide analytical support for the passage of a nearly \$1 billion bond referendum in November 2006.

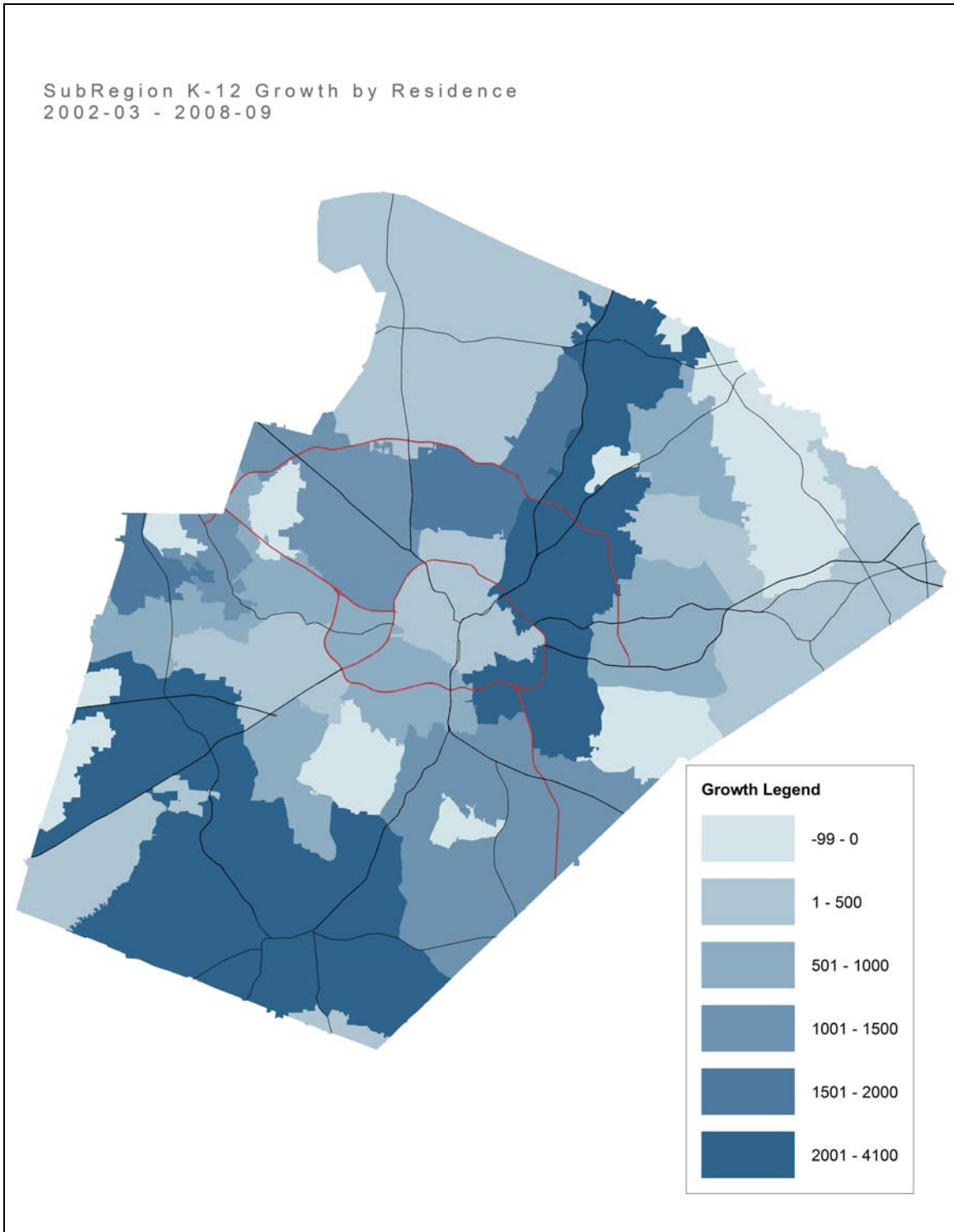
Over the intervening two years, OR/Ed. conducted various off-target analyses, the results of some of which are included in this report. This review provided the opportunity to re-examine several questions posed in the original implementation of the SPDM. As a result, many changes in the data collection methodology and the model itself were made for the current update. This document serves not only to present the 2008-09 Update projections but also to examine some of the statistics generated by the analyses of the last two years and the resulting changes in methodology.

Historical Growth

One of the assumptions of the SPDM is that student population projections are based on physical residence. Historical student data (2002-03 through 2008-09) is collected via the WCPSS geocoded student database and aggregated to Planning Regions. A Planning Region is the fundamental unit of analysis for historical student data, residential land use data collection, residential build-out estimation, and student projections. ***There are 6,323 Planning Regions as of March 4, 2009.*** Although it is possible to examine historical growth trends within a Planning Region, it is much less cumbersome to review student growth by OR/Ed. “subregions”. Most planning jurisdictions have only one subregion equivalent to the long-range Urban Service Area (USA). However, Raleigh, Cary, and the non-urban areas under the jurisdiction of Wake County planning have further divided their USA into smaller geometries, which OR/ED. has defined as subregions. There are 40 subregions, including the non-residential subregions Cary – Z and RDU. *Note: Wake County 7 (Angier area) is a new subregion, formerly under the jurisdiction of Fuquay-Varina.*

Figure 1 shows a subregion map of student growth for the period 2002-03 though 2008-09.

Figure 1 – Subregion Growth



A few subregion growth statistics are summarized below. All values were compiled by OR/Ed. using *geocoded student databases* from school years **2002-03 through 2008-09**. See Appendix A-1 and A-2 for a complete summary by subregion.

- The average annual system-wide growth rate is 4.67%.
- The average over all annual subregion growth rates is 4.99%.
- The minimum average annual subregion growth rate is -3.90%* occurring in the Raleigh – X subregion. (*Note: the average number of students for this subregion is 166.)
- The maximum average annual subregion growth rate is 54.51%* in the Cary – Northwest subregion. (*Note: this subregion grew from 158 students in 2002-03 to 2086 in 2008-09, a total increase of 1220%.)

Distribution of Growth

The SPDM uses a dynamic land use based distribution to disaggregate 20-year K-12 system-wide enrollment projections provided by WCPSS and Wake County Planning. Thus it is beneficial to examine the history of the distribution of among the subregions. Again, these statistics are compiled using *geocoded student databases* from school years **2002-03 through 2008-09**. Also note that a few sparsely populated subregions actually experienced negative growth between 2002-03 and 2008-09.

Based on the average distribution over the six transition periods, the 5 subregions having the largest share of growth were Raleigh – Northeast, Raleigh – Southeast, Apex, Holly Springs, and Fuquay-Varina. Together, these areas account for 9.81% of the growth seen between 2002-03 and 2008-09 and 32.44% of the 2008-09 total student population. It should also be noted that all of these subregions are in the top 11 in terms of student population (as of 2008-09) with Holly Springs as the 11th largest subregion. See Appendix A-3 for a complete listing of subregion growth distributions.

Kindergarten

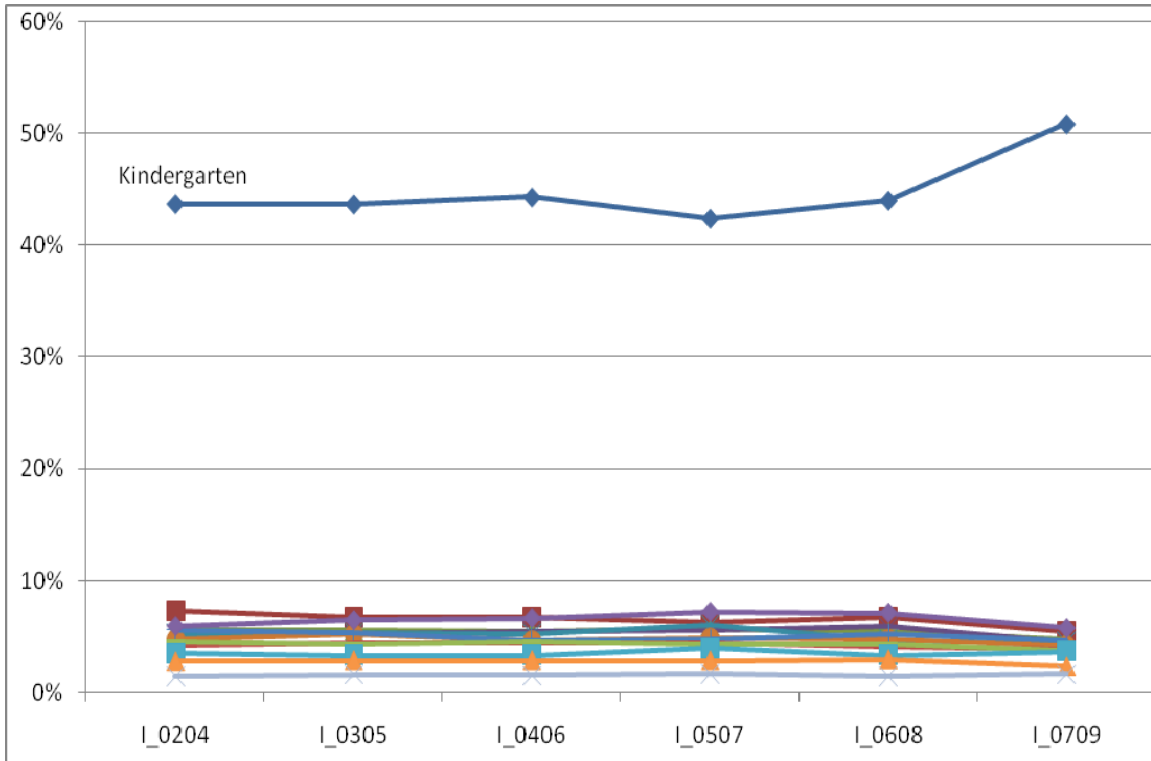
One of the inputs of the SPDM is an analysis of yearly transitions in the student population. Data describing the transitions is collected and analyzed on the USA (not subregion) level. This analysis allows OR/Ed. to model various components of student population dynamics, including the “Incoming” population – students migrating into WCPSS.

An interesting trend has surfaced from this analysis: the proportion of kindergarten students in the incoming population has increased significantly over the last six years. See Figure 2. System-wide, in 2003-04, 43.74% of the incoming student population was kindergarteners; for the 2008-09 school year, this proportion had risen to 50.86% with most of the increase occurring over the last two years (Table 1). On a USA level, nearly all populations experienced this increase to some degree, some more than others: Morrisville data indicates kindergarteners accounted for 29.47% of the incoming population in 2003-04 and 44.65% in 2008-09.

Table 1 – By-Grade Proportion of Incoming Students 2007-08 to 2008-09

| K | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.5086 | 0.0544 | 0.0481 | 0.0456 | 0.0447 | 0.0422 | 0.0466 | 0.0383 | 0.0372 | 0.0575 | 0.0367 | 0.0236 | 0.0166 |

Figure 2 – Incoming Students by Grade



Off-Target Analysis

Over the last two years, OR/Ed. has conducted various analyses using the 2006-07 and 2007-08 WCPSS geocodes. For each year the actual Planning Region student count was compared to the 2005 projected count. The results of these analyses have helped OR/Ed. improve the SPDM and data collection methods for the 2008-09 update. Figure 3 shows a map of 2007-08 off-target Planning Regions.

Out of 6130 Planning Regions in the 2007-08 database, 3813 (62.2%) have off-target errors between -5 and 5 students. For the 2008-09 update, OR/Ed. used an off-target threshold of ± 15 to identify Planning Regions for review by planners. 821 Planning Regions out of 6130 fell within these limits and were tagged for review. Table 2 highlights some of the statistics resulting from the 2007-08 off-target analysis.

Note: the 2007-08 actual system-wide enrollment was 2301 students short of the 2005 forecast. The discrepancy has not been accounted for in these results.

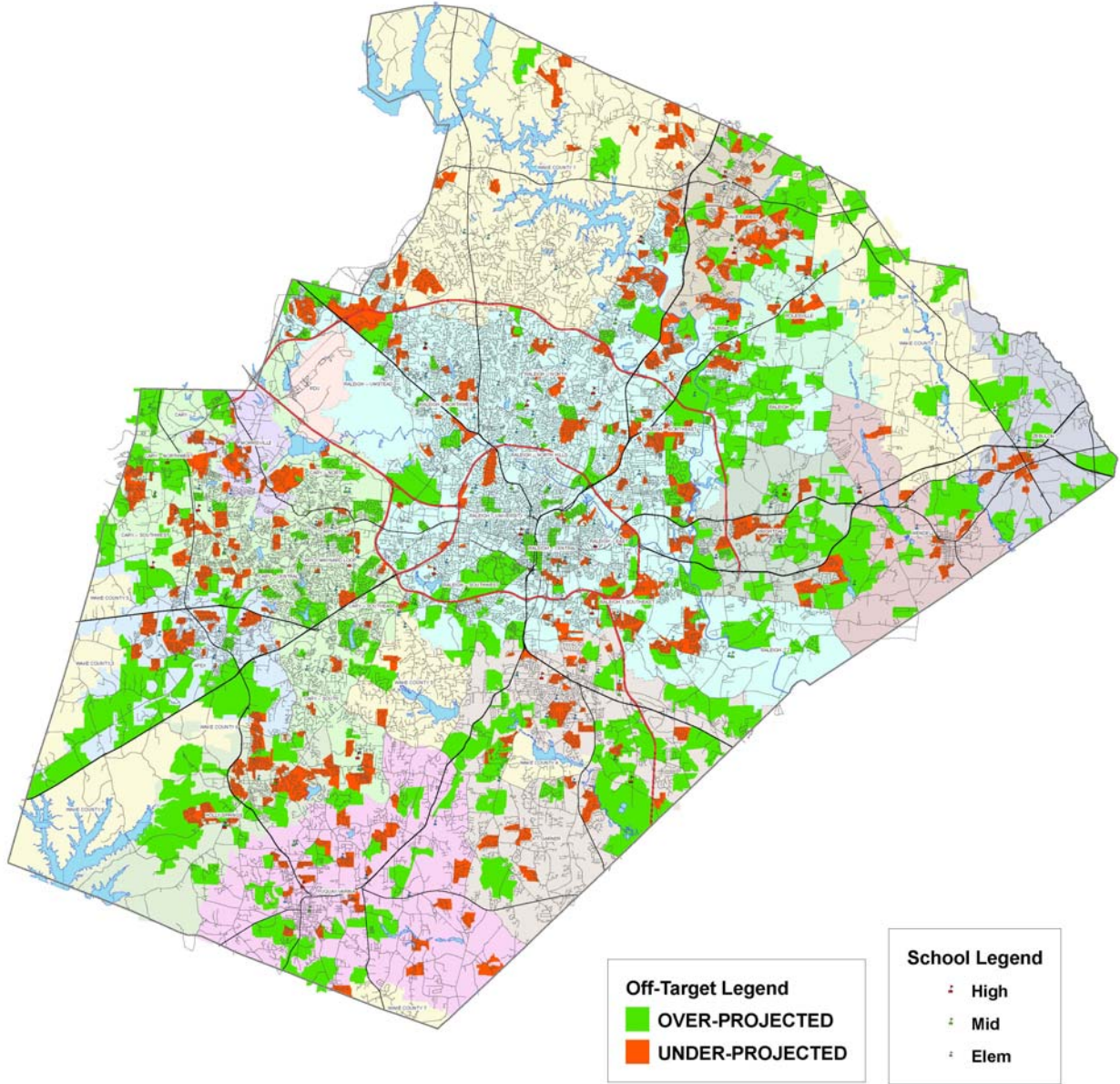
Table 2 – 2007-08 Planning Region Off-Target Statistics

| | |
|--------------------|---------|
| Mean | -0.2585 |
| Standard Deviation | 15.1351 |
| Minimum | -171 |
| Maximum | 159 |

Figure 3 – Off-Target Planning Regions, 2007-08

WCPSS Long-Range School Building Plan Update 2008-09
2007-08 Off-Target Map

MapRegion:adminby:OR/Ed - Jan. 30, 2008



0 1 2 4 6 8 Miles

This map was created by OR/Ed Lab, ITRE @ NCSU Centennial Campus
January 30, 2008

Windshield Survey, July 31, 2008

Several off-target Planning Regions were visited to examine possible causes of missed projections. Results are summarized in Table 3. One characteristic that may account for under-projections is the “lag” between residential build-out and the growth of a school-aged children population.

Table 3 – Findings of Planning Region Windshield Survey

| Planning Region | Off-Target | Comments |
|-------------------------------------|-------------------|---|
| MV 0087.1 | over | Kitts Creek. \$\$\$ Aggressive b/o rate or lag. |
| CA 0198.1 CA 0198.2 | under | The Reserve/High Croft. \$\$\$ Mature development that continues to produce students. Re-evaluate SGP. Possible turnover. |
| HS 0026.0 HS 0014.2 | under | \$\$-\$\$\$ Mature development that continues to produce students. Re-evaluate SGP. Possible turnover. |
| CA 0324.0 | under | Commons. \$\$ Approx. 75% b/o. Re-evaluate b/o rate. |
| RA 0029.0 RA 1664.0 | under | Near Barwell Rd. \$ Continued large-scale development. Re-evaluate SGP and b/o rates. |
| RA 1989.0 RA 2262.0 RA 1375.0 | over | Off Buffaloe near 540. No significant development. Estimate 3-5 years before construction. |

K-12 System-wide Forecast

The SPDM is a distribution – the model distributes a supplied system-wide (county-wide) K-12 forecast according to residential growth potential. This section will classify the forecasts and enrollment totals being used and describe how they made be used in the SPDM and elsewhere.

WCPSS 2008-09 20-day Membership: 137,706. This is usually considered the “official” number for WCPSS. System-wide K-12 forecasts are based on this number.

NC DPI 2008-09 Month-One ADM: 136,099 (Revised: 136,057)

WCPSS 2008-09 K-12 geocode total: 138,499. This number represents the total 2008-09 K-12 student population that has been address-matched to a specific location. Of these, 138,467 lie within the county as defined by OR/Ed. Planning Regions. **138,467 is the baseline 2008-09 count used for OR/Ed. projections.**

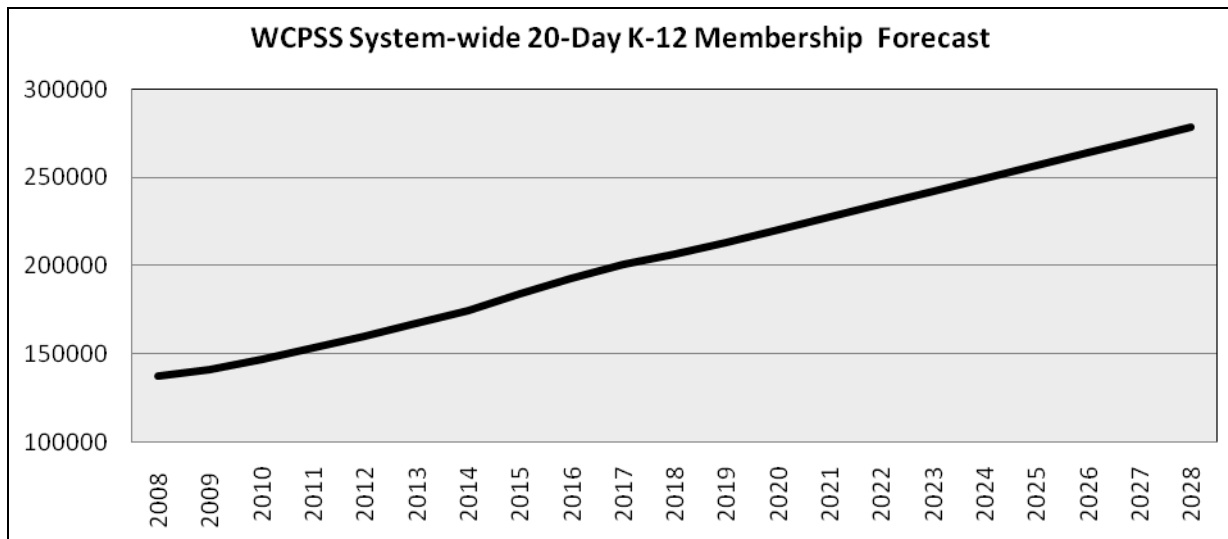
2009-2028 20-Day Membership Forecast

Based on the system-wide total K-12 20-day membership of 137,706, a ten-year membership forecast was supplied to OR/Ed. in December 2008. Additionally, OR/Ed. forecasted membership for the 2019 – 2028 period using linearly trended 2008 – 2018 membership (Figure 4).

Figure 4 – 20-year K-12 Enrollment Forecast

| Actual | Projected - DeJong "Economic Cycle" | | | | | | | | | |
|--------|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| 137706 | 141042 | 146803 | 153477 | 160434 | 167631 | 174601 | 183806 | 192455 | 201100 | 206659 |

| Projected - OR/Ed. | | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| 213071 | 220314 | 227557 | 234801 | 242044 | 249288 | 256531 | 263774 | 271018 | 278261 |



The projected yearly K-12 totals for 2009 – 2028 are used as input for the SPDM. Although grade-level forecasts are provided in the ten-year forecast, the SPDM internally calculates the grade-level distribution over a finer resolution so the provided grade-level breakdowns were not used.

Note: The difference between the 2008 baseline used by OR/Ed. (138,467) and the 2009 forecast (141,042) is 2,575 students compared to the official gain of 3,336 for the same period. This discrepancy resulted in some instability in the SPDM for the 2008 – 2009 and 2009 – 2010 transitions.

Planning Regions and Data Collection

The SPDM uses the Planning Region database for current student demographic data as well as projected residential build-outs. Several modifications were made to the database both in term of geometry and data structure.

Parcel Analysis

One of the goals for the 2008 Update was to streamline the land use data collection process. During the 2005 data collection effort (conducted in conjunction with the CAMPO SE data collection), planners were asked to assign land use codes on at a parcel-level resolution. While the parcel data was somewhat helpful in the compilation of Planning Region residential build-out data, it is not essential as an SPDM input.

To aid planners with reasonably accurate and relevant parcel data, OR/Ed. built on Paul Black's (of Triangle J CoG) ELUSE parcel decision tree first utilized in CAMPO's non-residential parcel analysis, expanding the residential branches to populate the LU_C (Land Use Current) field. This led to a mostly automatic determination of current land use by using a hierarchy of parcel-level land use indicators: TYPE_USE, LAND_CLASS, APA codes, etc. While the original ELUSE was developed with a focus on identifying non-residential land use, modifications made by OR/Ed. focus on residential land uses and provided a baseline (parcel dated July 31, 2008) for current land use. Wherever possible, OR/Ed. transferred 2005 LU_F (Land Use Future) codes. The combination of automatically classified LU_C and legacy LU_F codes significantly reduced parcel-level analysis for planners.

Planning Regions

At the time of publication of the 2005 projections, there were 5,971 Planning Regions. As Wake County continued to develop and WCPSS node geometry changed, Planning Regions were modified accordingly. At the time of these projections, there are 6,323 Planning Regions. Although the current Planning Regions reflect the current status of nodes and parcels as closely as possible, there must be an on-going effort to coordinate WCPSS node changes, parcel edits, and Planning Region changes.

Data Collection

It was an early assumption that the 2008-09 Update data collection process would be streamlined and will require significantly fewer man-hours than the 2005 study. Instead of reviewing all Planning Regions in a jurisdiction, the following update protocol was proposed. Planners were asked to review:

- Off-target Planning Regions. A list was supplied by OR/Ed. of those Planning Regions falling outside a specified “threshold” (2007-08 K-12 student count error > |15| from 2005 projection).
- Those Planning Regions impacted by development undocumented in 2005 or those Planning Regions in which 2005 development plans have significantly altered.
- Those Planning Regions with geometry significantly altered by node modifications. These Planning Regions were also tagged by OR/Ed.

There were other changes in the Planning Region database:

- Planning Region Identification – A new ID protocol was adapted, easing sorting and simplifying parent/child identification.
- Build-out Timeline – OR/Ed. replaced the previous study’s target-year (2010, 2015, etc.) timeline with the following data: BEGIN_YEAR and END_YEAR for anticipated residential development. As before, the final build-out proportion (FINAL_BO) was required. Planning Regions not reviewed in the 2008 Update had the 2005 timeline translated to the new format.

Student Generating Potential (SGP)

For the 2008-09 Update, the calculation of SGP occurred on the subregion geometry. Based on the off-target analyses, it is reasonable that using a finer resolution for this calculation will increase accuracy for subregions such as Raleigh – Southeast. Table 4 contains SGP values for all profiles and subregions.

Table 4 – SGP by Subregion and Residential Profile (*units = students per developed acre*)

| | RR | VL | L | ML | M | MH | H | VH | UH | EXH_RAL |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| APEX | 0.2145 | 0.3152 | 1.4323 | 2.9145 | 2.3857 | 2.8208 | 3.9108 | 3.6477 | 4.8998 | 0.7751 |
| CARY -- CENTRAL | 1.0893 | 0.3491 | 1.1955 | 2.4720 | 2.9182 | 3.8265 | 3.8629 | 1.9430 | 6.0154 | 0.7751 |
| CARY -- MAYNARD LOOP | 0.3288 | 0.3491 | 0.9824 | 1.5194 | 2.5672 | 2.2180 | 3.3613 | 2.5412 | 2.9386 | 0.7751 |
| CARY -- NORTH | 0.3790 | 0.1526 | 1.4352 | 2.2797 | 1.5413 | 1.6927 | 1.6830 | 3.6134 | 4.2628 | 0.7751 |
| CARY -- NORTHWEST | 0.3288 | 0.3402 | 1.5307 | 3.0326 | 1.5933 | 1.4169 | 1.4905 | 6.4171 | 4.9893 | 0.7751 |
| CARY -- SOUTH | 0.1824 | 0.4153 | 1.1853 | 2.3970 | 2.2744 | 2.2601 | 1.7873 | 2.5412 | 4.2628 | 0.7751 |
| CARY -- SOUTHEAST | 0.4223 | 0.3491 | 1.2391 | 2.3946 | 2.2744 | 2.1619 | 2.7578 | 2.5412 | 4.2628 | 0.7751 |
| CARY -- SOUTHWEST | 0.1134 | 0.3491 | 2.2038 | 2.4912 | 5.1472 | 3.0184 | 2.7578 | 2.5412 | 4.2628 | 0.7751 |
| CARY -- TCAP | 0.3288 | 0.3491 | 0.7488 | 1.4672 | 1.5280 | 5.1841 | 2.7578 | 4.5565 | 4.2628 | 0.7751 |
| CARY -- Z | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| FUQUAY-VARINA | 0.2690 | 0.4203 | 0.7592 | 1.9408 | 2.2572 | 3.0060 | 3.2362 | 2.3703 | 3.4409 | 0.7751 |
| GARNER | 0.2995 | 0.3405 | 0.7274 | 1.5506 | 2.8178 | 3.5224 | 2.1518 | 2.8278 | 3.8917 | 0.7751 |
| HOLLY SPRINGS | 0.2987 | 0.4063 | 1.4814 | 2.2052 | 3.5489 | 3.1817 | 2.3182 | 2.3703 | 3.8917 | 0.7751 |
| KNIGHTDALE | 0.4412 | 0.4123 | 0.6788 | 2.4286 | 3.4797 | 4.8383 | 1.3268 | 5.2233 | 3.8917 | 0.7751 |
| MORRISVILLE | 0.1382 | 0.3713 | 1.0740 | 1.9979 | 3.0033 | 2.1386 | 3.0614 | 2.3703 | 6.2517 | 0.7751 |
| RALEIGH -- CENTRAL | 0.6191 | 0.2743 | 0.7598 | 1.4129 | 1.3974 | 3.3499 | 4.1862 | 2.2529 | 3.9631 | 0.7751 |
| RALEIGH -- EAST | 0.6191 | 0.2743 | 0.5408 | 1.3265 | 3.8702 | 3.2683 | 3.3140 | 3.7358 | 3.6457 | 0.7751 |
| RALEIGH -- NORTH | 1.3250 | 0.4361 | 0.8582 | 1.6883 | 2.0957 | 1.8821 | 2.4511 | 1.6865 | 3.6799 | 0.7751 |
| RALEIGH -- NORTH HILLS | 1.9757 | 0.2806 | 0.6869 | 0.8711 | 2.6456 | 2.3555 | 1.2282 | 8.3543 | 4.3868 | 0.7751 |
| RALEIGH -- NORTHEAST | 0.7495 | 0.1823 | 0.7715 | 2.0522 | 3.3048 | 3.7327 | 4.0211 | 4.6850 | 5.8723 | 0.7751 |
| RALEIGH -- NORTHWEST | 0.1621 | 0.2620 | 0.7715 | 1.6822 | 1.4674 | 1.7407 | 1.5720 | 2.0818 | 2.6969 | 0.7751 |
| RALEIGH -- SOUTHEAST | 1.5176 | 0.5253 | 0.9006 | 2.1850 | 4.1922 | 4.7039 | 2.5813 | 2.2529 | 3.6457 | 0.7751 |
| RALEIGH -- SOUTHWEST | 1.3437 | 0.1569 | 0.5454 | 1.4032 | 1.8454 | 1.4236 | 1.9677 | 1.2650 | 3.2824 | 0.7751 |
| RALEIGH -- UMSTEAD | 0.6191 | 0.1847 | 1.4243 | 2.4337 | 2.1260 | 1.8443 | 1.0627 | 2.2529 | 1.6696 | 0.7751 |
| RALEIGH -- UNIVERSITY | 0.6191 | 0.2743 | 0.6794 | 0.7208 | 2.6456 | 1.1533 | 1.0917 | 2.2529 | 3.6457 | 0.7751 |
| RALEIGH -- X | 0.3433 | 0.3592 | 0.7598 | 1.7149 | 2.6456 | 2.3486 | 2.3476 | 2.2529 | 3.6457 | 0.7751 |
| RALEIGH -- Y | 0.1436 | 0.2990 | 0.5004 | 1.7149 | 3.7557 | 2.3486 | 2.3476 | 2.2529 | 3.6457 | 0.7751 |
| RALEIGH -- Z | 0.2306 | 0.2174 | 0.6075 | 1.7149 | 2.6456 | 2.3486 | 2.3476 | 2.2529 | 3.6457 | 0.7751 |
| RDU | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| ROLESVILLE | 0.2083 | 0.4033 | 0.8822 | 2.5132 | 2.6100 | 2.3767 | 2.5268 | 2.3703 | 4.8828 | 0.7751 |
| WAKE COUNTY 1 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE COUNTY 2 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE COUNTY 3 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE COUNTY 4 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE COUNTY 5 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE COUNTY 6 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE COUNTY 7 | 0.1421 | 0.3317 | 0.7510 | 1.7022 | 0.5031 | 2.3767 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| WAKE FOREST | 0.1684 | 0.5078 | 1.0974 | 2.0776 | 1.8559 | 1.7275 | 5.9751 | 3.9865 | 1.6968 | 0.7751 |
| WENDELL | 0.2631 | 0.2803 | 0.9739 | 1.6682 | 0.0000 | 1.1257 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |
| ZEBULON | 0.2346 | 0.2949 | 0.6810 | 1.9486 | 2.0834 | 1.5627 | 2.5268 | 2.3703 | 3.8917 | 0.7751 |

Planner Meetings

Beginning in late August, OR/Ed. visited each planning agency in Wake County and presented the 2008 Planning Region database and documentation. All planners were given several “hands-on” scenarios for reviewing Planning Regions. A list of meeting dates and attendees follows.

Raleigh, August 19, 2008 – Karen Duke, Ken Bowers, Michael Gutekunst, Allison Decker

Wake County, August 25, 2008 – Sharon Peterson, Bryan Coates, Bill Shroyer

Cary, August 27, 2008 – Will Hartye, Bill Moore, Cheron Gilchrist

Holly Springs, September 3, 2008 – Gina Clapp, Beth Trautz, Jeff Jones

Gina raised a question re: the newly changed boundary between HS and FV. Impacted PR will be reviewed after FV visit.

Wake Forest, September 8, 2008 – Chip Russell, Bill Summers

Fuquay-Varina, September 8, 2008 – Michael Sorenson, Lee Ann Billington

Garner, September 11, 2008 – Brad Bass, David Bamford

Morrisville, September 15, 2008 – Ben Hitchings, Rodney Wadkins

Wendell, September 17, 2008 – Teresa Piner, David Bergmark

Zebulon, September 18, 2008 – Mark Hetrick, Julie Wilkins

Apex, September 19, 2008 – Dianne Khin, Will Brown

Dianne raised concerns re: inconsistent subdivision/node/PR geometry. Can nodes be drawn to reduce the chance of future subdivision “phases” going to a different school?

Rolesville, September 23, 2008 – Bryan Hicks, Jacob Reynolds
Knightdale, September 23, 2008 – Michael Frangos, Jeff Triezenberg

Draft 1 Review

Draft 1 of the 2008-09 projections was completed on January 30, 2009. The Planning Region database populated by the Draft 1 projections was made available for planners' review on February 16. Several planning departments used the review period to make changes in the residential build-out data and most of the changes had minimal effect on USA-level totals. The exception is Knightdale and Apex, where changes in profile and build-outs resulted in net shift of about 300 students to Knightdale. The review process was closed on February 28.

Model Modifications

Modifications for the 2008 Update were not restricted to data collection and geometry. Analysis of off-target Planning Regions allowed OR/Ed. to re-examine build-out patterns and student growth, resulting in modifications of the SPDM.

Build-out Timeline

Using the new BEGIN_YEAR and END_YEAR as fixed points, OR/Ed. created unique "logistics" build-out curves for each Planning Region. This curve may be modified by other components of the SPDM, such as a proximity index derived from the distance to known new-growth student attractors like new schools.

Proximity

OR/Ed. recognizes that the dynamics of residential development and student generation are complex and often sensitive to conditions that are not included in the SPDM. However, certain phenomena appear consistently and deserve to be considered, such as the attraction of a new school to residential development. For the 2008-09 Update a *proximity index* has been incorporated on a Planning Region level, measuring network (street) distance to existing and new schools. This index can increase the attraction of students to residential developments that occur near new schools.

Projections: 2009-10 – 2028-29 (FINAL)

The following tables and maps provide a subregion level summary of projections of the 2008-09 SPDM. Complete Planning Region level projections will be provided in shp file format. Select years of projection by subregion are in Table 5.

Table 5 – Subregion Projections

| SubRegion | Actual | Projected | | | | |
|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 2008 | 2013 | 2016 | 2019 | 2022 | 2028 |
| APEX | 8623 | 10554 | 11935 | 13155 | 14446 | 16923 |
| CARY -- CENTRAL | 8832 | 9753 | 10415 | 10765 | 11262 | 12406 |
| CARY -- MAYNARD LOOP | 1655 | 1829 | 1978 | 2045 | 2142 | 2362 |
| CARY -- NORTH | 4998 | 5563 | 5934 | 6158 | 6458 | 7187 |
| CARY -- NORTHWEST | 2086 | 2895 | 3417 | 3824 | 4173 | 4828 |
| CARY -- SOUTH | 4195 | 4730 | 5133 | 5386 | 5679 | 6283 |
| CARY -- SOUTHEAST | 631 | 716 | 801 | 851 | 893 | 991 |
| CARY -- SOUTHWEST | 1415 | 2138 | 2718 | 3055 | 3274 | 3668 |
| CARY -- TCAP | 736 | 830 | 901 | 937 | 985 | 1085 |
| FUQUAY-VARINA | 7899 | 10005 | 11808 | 13203 | 14540 | 16844 |
| GARNER | 8658 | 9817 | 11155 | 13167 | 16007 | 21385 |
| HOLLY SPRINGS | 5480 | 7031 | 8219 | 9145 | 10053 | 11981 |
| KNIGHTDALE | 4124 | 5438 | 7392 | 9635 | 11603 | 15508 |
| MORRISVILLE | 2570 | 3264 | 3648 | 3830 | 4054 | 4613 |
| RALEIGH -- CENTRAL | 2341 | 2834 | 3201 | 3419 | 3659 | 4278 |
| RALEIGH -- EAST | 1935 | 2117 | 2249 | 2342 | 2512 | 2927 |
| RALEIGH -- NORTH | 10484 | 11494 | 12304 | 12906 | 13768 | 15839 |
| RALEIGH -- NORTH HILLS | 3289 | 3603 | 3860 | 4014 | 4225 | 4705 |
| RALEIGH -- NORTHEAST | 13520 | 16063 | 18106 | 19591 | 21402 | 25498 |
| RALEIGH -- NORTHWEST | 6218 | 6920 | 7530 | 7916 | 8351 | 9345 |
| RALEIGH -- SOUTHEAST | 9398 | 11043 | 12255 | 13156 | 14171 | 16672 |
| RALEIGH -- SOUTHWEST | 4653 | 5406 | 5944 | 6289 | 6758 | 8144 |
| RALEIGH -- UMSTEAD | 2509 | 2978 | 3346 | 3649 | 3940 | 4473 |
| RALEIGH -- UNIVERSITY | 1651 | 1811 | 1913 | 1977 | 2079 | 2316 |
| RALEIGH -- X | 149 | 295 | 427 | 547 | 674 | 907 |
| RALEIGH -- Y | 440 | 1302 | 1832 | 2150 | 2424 | 2943 |
| RALEIGH -- Z | 481 | 668 | 838 | 962 | 1079 | 1519 |
| ROLESVILLE | 1133 | 2686 | 4024 | 5005 | 5961 | 6980 |
| WAKE COUNTY 1 | 5685 | 6742 | 7562 | 8195 | 8928 | 10375 |
| WAKE COUNTY 2 | 1104 | 1609 | 2121 | 2640 | 3166 | 4188 |
| WAKE COUNTY 3 | 97 | 143 | 182 | 217 | 248 | 301 |
| WAKE COUNTY 4 | 126 | 167 | 200 | 228 | 252 | 289 |
| WAKE COUNTY 5 | 1407 | 1643 | 1810 | 1928 | 2055 | 2355 |
| WAKE COUNTY 6 | 50 | 71 | 92 | 116 | 150 | 256 |
| WAKE COUNTY 7 | 312 | 392 | 466 | 528 | 588 | 693 |
| WAKE FOREST | 5859 | 7166 | 8115 | 8972 | 10052 | 12256 |
| WENDELL | 2183 | 2988 | 4030 | 5383 | 6355 | 7585 |
| ZEBULON | 1541 | 2925 | 4592 | 5785 | 6434 | 7353 |
| TOTAL | 138467 | 167631 | 192454 | 213070 | 234800 | 278262 |

Figure 5 – Projected Subregion Growth

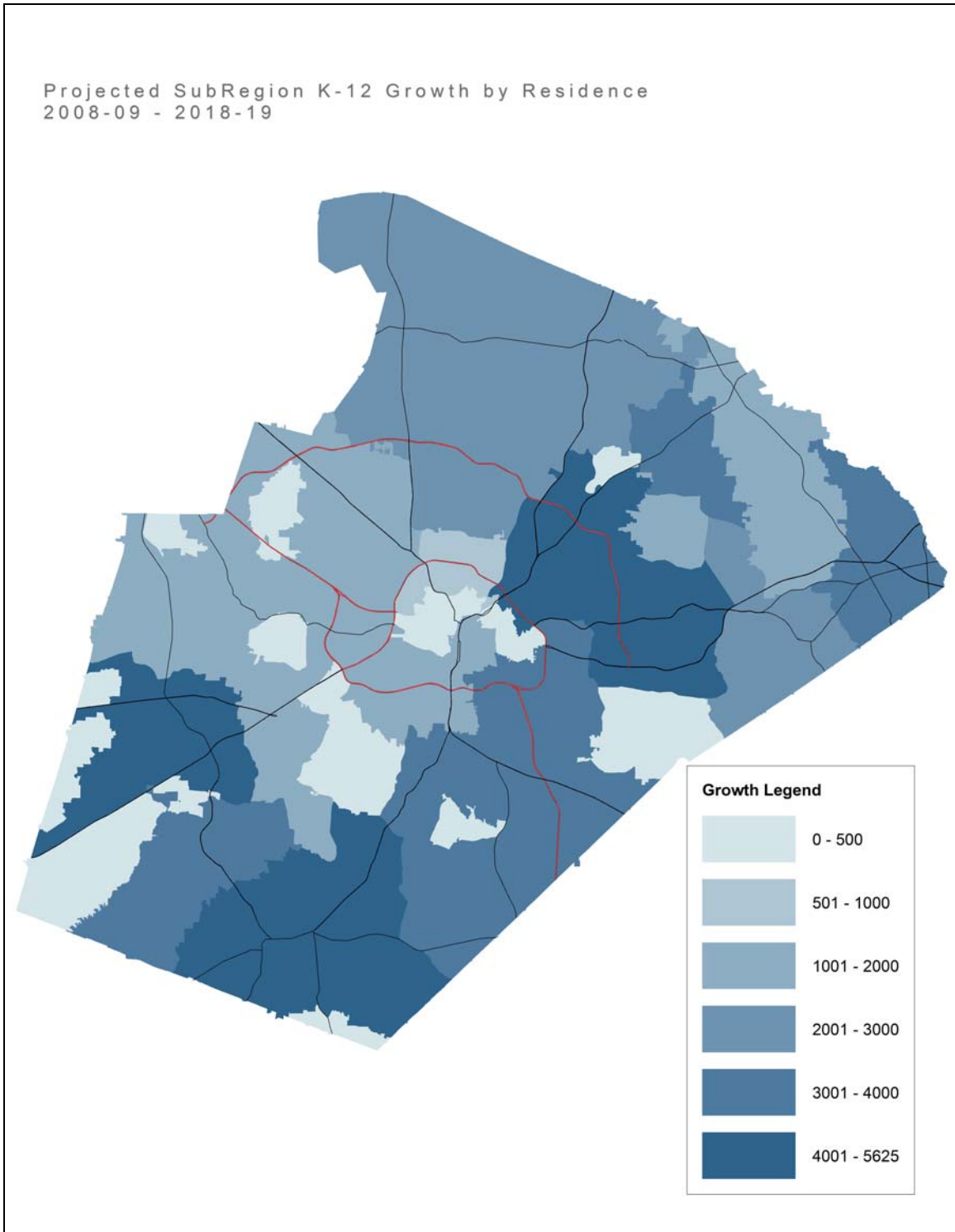


Table 6 – Projected Annual Growth Rates by Subregion

| SubRegion | MAX | MIN | MEAN |
|------------------------|--------------|--------------|--------------|
| APEX | 4.76% | 2.18% | 3.43% |
| CARY -- CENTRAL | 2.80% | 0.56% | 1.72% |
| CARY -- MAYNARD LOOP | 3.39% | 0.53% | 1.80% |
| CARY -- NORTH | 2.60% | 0.59% | 1.83% |
| CARY -- NORTHWEST | 12.51% | 0.51% | 4.32% |
| CARY -- SOUTH | 3.40% | 0.75% | 2.04% |
| CARY -- SOUTHEAST | 4.65% | 0.60% | 2.29% |
| CARY -- SOUTHWEST | 9.83% | 1.21% | 4.93% |
| CARY -- TCAP | 3.91% | 0.69% | 1.97% |
| FUQUAY-VARINA | 6.45% | 2.06% | 3.87% |
| GARNER | 6.97% | 0.70% | 4.64% |
| HOLLY SPRINGS | 6.67% | 2.78% | 4.00% |
| KNIGHTDALE | 12.01% | 1.47% | 6.88% |
| MORRISVILLE | 5.64% | 0.91% | 2.98% |
| RALEIGH -- CENTRAL | 4.87% | 1.21% | 3.07% |
| RALEIGH -- EAST | 2.83% | 0.78% | 2.09% |
| RALEIGH -- NORTH | 2.86% | 0.94% | 2.09% |
| RALEIGH -- NORTH HILLS | 2.86% | 0.42% | 1.81% |
| RALEIGH -- NORTHEAST | 4.64% | 1.73% | 3.23% |
| RALEIGH -- NORTHWEST | 3.48% | 0.98% | 2.06% |
| RALEIGH -- SOUTHEAST | 4.50% | 1.69% | 2.91% |
| RALEIGH -- SOUTHWEST | 3.74% | 1.20% | 2.84% |
| RALEIGH -- UMSTEAD | 4.61% | 1.46% | 2.94% |
| RALEIGH -- UNIVERSITY | 2.64% | 0.42% | 1.71% |
| RALEIGH -- X | 18.25% | 3.31% | 9.56% |
| RALEIGH -- Y | 32.50% | 1.52% | 10.37% |
| RALEIGH -- Z | 9.12% | 0.25% | 5.94% |
| ROLESVILLE | 24.86% | 1.96% | 9.76% |
| WAKE COUNTY 1 | 4.84% | 0.40% | 3.06% |
| WAKE COUNTY 2 | 10.85% | 0.70% | 6.92% |
| WAKE COUNTY 3 | 17.48% | 0.38% | 5.89% |
| WAKE COUNTY 4 | 8.10% | 1.72% | 4.26% |
| WAKE COUNTY 5 | 4.20% | 0.35% | 2.61% |
| WAKE COUNTY 6 | 13.10% | 0.35% | 8.56% |
| WAKE COUNTY 7 | 6.73% | 0.09% | 4.08% |
| WAKE FOREST | 5.30% | 2.62% | 3.76% |
| WENDELL | 11.51% | 0.99% | 6.48% |
| ZEBULON | 18.30% | 1.77% | 8.32% |
| TOTAL | 5.27% | 1.86% | 3.55% |

APPENDIX A – Subregion Growth: 2002-03 – 2008-09

Geocoded WCPSS student data from 2002-03 through 2008-09 was used to analyze subregion growth patterns. Tables A-1 through A-3 summarize these results.

Table A-1: Geocode Student Counts by Subregion

| SubRegion | K-12 STUDENT COUNT | | | | | | | mean % |
|------------------------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | |
| APEX | 5914 | 6277 | 6839 | 7556 | 8035 | 8307 | 8623 | 6.52% |
| CARY -- CENTRAL | 8365 | 8421 | 8512 | 8757 | 8930 | 8918 | 8832 | 0.92% |
| CARY -- MAYNARD LOOP | 1615 | 1636 | 1620 | 1666 | 1695 | 1635 | 1655 | 0.43% |
| CARY -- NORTH | 4228 | 4267 | 4376 | 4672 | 4716 | 4841 | 4998 | 2.85% |
| CARY -- NORTHWEST | 158 | 230 | 425 | 620 | 1011 | 1536 | 2086 | 54.51% |
| CARY -- SOUTH | 3676 | 3702 | 3800 | 3988 | 4142 | 4159 | 4195 | 2.24% |
| CARY -- SOUTHEAST | 594 | 571 | 598 | 611 | 633 | 636 | 631 | 1.05% |
| CARY -- SOUTHWEST | 652 | 716 | 799 | 956 | 1063 | 1206 | 1415 | 13.84% |
| CARY -- TCAP | 597 | 590 | 620 | 696 | 749 | 741 | 736 | 3.67% |
| CARY -- Z | 2 | 1 | 1 | 0 | 0 | 0 | 0 | |
| FUQUAY-VARINA | 5462 | 5738 | 6053 | 6575 | 7113 | 7641 | 7899 | 6.36% |
| GARNER | 7393 | 7391 | 7748 | 8251 | 8545 | 8618 | 8658 | 2.70% |
| HOLLY SPRINGS | 2891 | 3117 | 3448 | 4045 | 4595 | 5066 | 5480 | 11.30% |
| KNIGHTDALE | 3148 | 3212 | 3385 | 3705 | 3822 | 4073 | 4124 | 4.64% |
| MORRISVILLE | 1073 | 1303 | 1479 | 1680 | 2049 | 2269 | 2570 | 15.75% |
| RALEIGH -- CENTRAL | 2335 | 2256 | 2202 | 2159 | 2203 | 2233 | 2341 | 0.08% |
| RALEIGH -- EAST | 1695 | 1709 | 1733 | 1805 | 1807 | 1841 | 1935 | 2.25% |
| RALEIGH -- NORTH | 8589 | 8865 | 9373 | 9843 | 10390 | 10354 | 10484 | 3.40% |
| RALEIGH -- NORTH HILLS | 3217 | 3068 | 3278 | 3279 | 3259 | 3256 | 3289 | 0.43% |
| RALEIGH -- NORTHEAST | 9423 | 10181 | 10976 | 12035 | 12831 | 13262 | 13520 | 6.24% |
| RALEIGH -- NORTHWEST | 5104 | 5328 | 5444 | 5944 | 6183 | 6263 | 6218 | 3.39% |
| RALEIGH -- SOUTHEAST | 5581 | 5953 | 6468 | 7207 | 8064 | 8857 | 9398 | 9.10% |
| RALEIGH -- SOUTHWEST | 3729 | 3782 | 4022 | 4233 | 4581 | 4587 | 4653 | 3.80% |
| RALEIGH -- UMSTEAD | 1501 | 1586 | 1702 | 2002 | 2196 | 2350 | 2509 | 9.01% |
| RALEIGH -- UNIVERSITY | 1429 | 1399 | 1410 | 1488 | 1551 | 1577 | 1651 | 2.47% |
| RALEIGH -- X | 192 | 166 | 166 | 168 | 157 | 166 | 149 | -3.90% |
| RALEIGH -- Y | 426 | 421 | 430 | 447 | 467 | 446 | 440 | 0.59% |
| RALEIGH -- Z | 502 | 510 | 494 | 495 | 506 | 489 | 481 | -0.69% |
| RDU | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| ROLESVILLE | 583 | 640 | 663 | 734 | 900 | 1044 | 1133 | 11.87% |
| WAKE COUNTY 1 | 5454 | 5464 | 5602 | 5810 | 5893 | 5943 | 5685 | 0.73% |
| WAKE COUNTY 2 | 1203 | 1186 | 1130 | 1180 | 1139 | 1125 | 1104 | -1.38% |
| WAKE COUNTY 3 | 118 | 126 | 129 | 134 | 120 | 111 | 97 | -2.92% |
| WAKE COUNTY 4 | 137 | 147 | 141 | 147 | 152 | 149 | 126 | -1.09% |
| WAKE COUNTY 5 | 1449 | 1457 | 1489 | 1459 | 1464 | 1433 | 1407 | -0.48% |
| WAKE COUNTY 6 | 49 | 44 | 43 | 55 | 49 | 46 | 50 | 1.18% |
| WAKE COUNTY 7 | 234 | 238 | 273 | 294 | 303 | 299 | 312 | 5.03% |
| WAKE FOREST | 3393 | 3545 | 3949 | 4361 | 5051 | 5528 | 5859 | 9.59% |
| WENDELL | 1790 | 1891 | 1991 | 2112 | 2149 | 2126 | 2183 | 3.40% |
| ZEBULON | 1464 | 1442 | 1425 | 1494 | 1515 | 1533 | 1541 | 0.88% |
| | 105365 | 108576 | 114236 | 122663 | 130028 | 134664 | 138468 | 4.67% |

Table A-2: Geocode Student Growth by Subregion

| SubRegion | ONE-YEAR GROWTH | | | | | | mean |
|------------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | |
| APEX | 363 | 562 | 717 | 479 | 272 | 316 | 452 |
| CARY -- CENTRAL | 56 | 91 | 245 | 173 | -12 | -86 | 78 |
| CARY -- MAYNARD LOOP | 21 | -16 | 46 | 29 | -60 | 20 | 7 |
| CARY -- NORTH | 39 | 109 | 296 | 44 | 125 | 157 | 128 |
| CARY -- NORTHWEST | 72 | 195 | 195 | 391 | 525 | 550 | 321 |
| CARY -- SOUTH | 26 | 98 | 188 | 154 | 17 | 36 | 87 |
| CARY -- SOUTHEAST | -23 | 27 | 13 | 22 | 3 | -5 | 6 |
| CARY -- SOUTHWEST | 64 | 83 | 157 | 107 | 143 | 209 | 127 |
| CARY -- TCAP | -7 | 30 | 76 | 53 | -8 | -5 | 23 |
| CARY -- Z | -1 | 0 | -1 | 0 | 0 | 0 | 0 |
| FUQUAY-VARINA | 276 | 315 | 522 | 538 | 528 | 258 | 406 |
| GARNER | -2 | 357 | 503 | 294 | 73 | 40 | 211 |
| HOLLY SPRINGS | 226 | 331 | 597 | 550 | 471 | 414 | 432 |
| KNIGHTDALE | 64 | 173 | 320 | 117 | 251 | 51 | 163 |
| MORRISVILLE | 230 | 176 | 201 | 369 | 220 | 301 | 250 |
| RALEIGH -- CENTRAL | -79 | -54 | -43 | 44 | 30 | 108 | 1 |
| RALEIGH -- EAST | 14 | 24 | 72 | 2 | 34 | 94 | 40 |
| RALEIGH -- NORTH | 276 | 508 | 470 | 547 | -36 | 130 | 316 |
| RALEIGH -- NORTH HILLS | -149 | 210 | 1 | -20 | -3 | 33 | 12 |
| RALEIGH -- NORTHEAST | 758 | 795 | 1059 | 796 | 431 | 258 | 683 |
| RALEIGH -- NORTHWEST | 224 | 116 | 500 | 239 | 80 | -45 | 186 |
| RALEIGH -- SOUTHEAST | 372 | 515 | 739 | 857 | 793 | 541 | 636 |
| RALEIGH -- SOUTHWEST | 53 | 240 | 211 | 348 | 6 | 66 | 154 |
| RALEIGH -- UMSTEAD | 85 | 116 | 300 | 194 | 154 | 159 | 168 |
| RALEIGH -- UNIVERSITY | -30 | 11 | 78 | 63 | 26 | 74 | 37 |
| RALEIGH -- X | -26 | 0 | 2 | -11 | 9 | -17 | -7 |
| RALEIGH -- Y | -5 | 9 | 17 | 20 | -21 | -6 | 2 |
| RALEIGH -- Z | 8 | -16 | 1 | 11 | -17 | -8 | -4 |
| RDU | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| ROLESVILLE | 57 | 23 | 71 | 166 | 144 | 89 | 92 |
| WAKE COUNTY 1 | 10 | 138 | 208 | 83 | 50 | -258 | 39 |
| WAKE COUNTY 2 | -17 | -56 | 50 | -41 | -14 | -21 | -17 |
| WAKE COUNTY 3 | 8 | 3 | 5 | -14 | -9 | -14 | -4 |
| WAKE COUNTY 4 | 10 | -6 | 6 | 5 | -3 | -23 | -2 |
| WAKE COUNTY 5 | 8 | 32 | -30 | 5 | -31 | -26 | -7 |
| WAKE COUNTY 6 | -5 | -1 | 12 | -6 | -3 | 4 | 0 |
| WAKE COUNTY 7 | 4 | 35 | 21 | 9 | -4 | 13 | 13 |
| WAKE FOREST | 152 | 404 | 412 | 690 | 477 | 331 | 411 |
| WENDELL | 101 | 100 | 121 | 37 | -23 | 57 | 66 |
| ZEBULON | -22 | -17 | 69 | 21 | 18 | 8 | 13 |
| | 3211 | 5660 | 8427 | 7365 | 4636 | 3804 | 5517 |

Table A-3: Geocode Student Proportion of Growth by Subregion

| SubRegion | PROPORTION OF GROWTH | | | | | | mean |
|------------------------|----------------------|---------|---------|---------|---------|---------|---------------|
| | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | |
| APEX | 0.1130 | 0.0993 | 0.0851 | 0.0650 | 0.0587 | 0.0831 | 0.0840 |
| CARY -- CENTRAL | 0.0174 | 0.0161 | 0.0291 | 0.0235 | -0.0026 | -0.0226 | 0.0101 |
| CARY -- MAYNARD LOOP | 0.0065 | -0.0028 | 0.0055 | 0.0039 | -0.0129 | 0.0053 | 0.0009 |
| CARY -- NORTH | 0.0121 | 0.0193 | 0.0351 | 0.0060 | 0.0270 | 0.0413 | 0.0235 |
| CARY -- NORTHWEST | 0.0224 | 0.0345 | 0.0231 | 0.0531 | 0.1132 | 0.1446 | 0.0652 |
| CARY -- SOUTH | 0.0081 | 0.0173 | 0.0223 | 0.0209 | 0.0037 | 0.0095 | 0.0136 |
| CARY -- SOUTHEAST | -0.0072 | 0.0048 | 0.0015 | 0.0030 | 0.0006 | -0.0013 | 0.0002 |
| CARY -- SOUTHWEST | 0.0199 | 0.0147 | 0.0186 | 0.0145 | 0.0308 | 0.0549 | 0.0256 |
| CARY -- TCAP | -0.0022 | 0.0053 | 0.0090 | 0.0072 | -0.0017 | -0.0013 | 0.0027 |
| CARY -- Z | -0.0003 | 0.0000 | -0.0001 | 0.0000 | 0.0000 | 0.0000 | -0.0001 |
| FUQUAY-VARINA | 0.0860 | 0.0557 | 0.0619 | 0.0730 | 0.1139 | 0.0678 | 0.0764 |
| GARNER | -0.0006 | 0.0631 | 0.0597 | 0.0399 | 0.0157 | 0.0105 | 0.0314 |
| HOLLY SPRINGS | 0.0704 | 0.0585 | 0.0708 | 0.0747 | 0.1016 | 0.1088 | 0.0808 |
| KNIGHTDALE | 0.0199 | 0.0306 | 0.0380 | 0.0159 | 0.0541 | 0.0134 | 0.0287 |
| MORRISVILLE | 0.0716 | 0.0311 | 0.0239 | 0.0501 | 0.0475 | 0.0791 | 0.0505 |
| RALEIGH -- CENTRAL | -0.0246 | -0.0095 | -0.0051 | 0.0060 | 0.0065 | 0.0284 | 0.0003 |
| RALEIGH -- EAST | 0.0044 | 0.0042 | 0.0085 | 0.0003 | 0.0073 | 0.0247 | 0.0082 |
| RALEIGH -- NORTH | 0.0860 | 0.0898 | 0.0558 | 0.0743 | -0.0078 | 0.0342 | 0.0554 |
| RALEIGH -- NORTH HILLS | -0.0464 | 0.0371 | 0.0001 | -0.0027 | -0.0006 | 0.0087 | -0.0006 |
| RALEIGH -- NORTHEAST | 0.2361 | 0.1405 | 0.1257 | 0.1081 | 0.0930 | 0.0678 | 0.1285 |
| RALEIGH -- NORTHWEST | 0.0698 | 0.0205 | 0.0593 | 0.0325 | 0.0173 | -0.0118 | 0.0312 |
| RALEIGH -- SOUTHEAST | 0.1159 | 0.0910 | 0.0877 | 0.1164 | 0.1711 | 0.1422 | 0.1207 |
| RALEIGH -- SOUTHWEST | 0.0165 | 0.0424 | 0.0250 | 0.0473 | 0.0013 | 0.0174 | 0.0250 |
| RALEIGH -- UMSTEAD | 0.0265 | 0.0205 | 0.0356 | 0.0263 | 0.0332 | 0.0418 | 0.0307 |
| RALEIGH -- UNIVERSITY | -0.0093 | 0.0019 | 0.0093 | 0.0086 | 0.0056 | 0.0195 | 0.0059 |
| RALEIGH -- X | -0.0081 | 0.0000 | 0.0002 | -0.0015 | 0.0019 | -0.0045 | -0.0020 |
| RALEIGH -- Y | -0.0016 | 0.0016 | 0.0020 | 0.0027 | -0.0045 | -0.0016 | -0.0002 |
| RALEIGH -- Z | 0.0025 | -0.0028 | 0.0001 | 0.0015 | -0.0037 | -0.0021 | -0.0007 |
| RDU | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0003 | 0.0000 |
| ROLESVILLE | 0.0178 | 0.0041 | 0.0084 | 0.0225 | 0.0311 | 0.0234 | 0.0179 |
| WAKE COUNTY 1 | 0.0031 | 0.0244 | 0.0247 | 0.0113 | 0.0108 | -0.0678 | 0.0011 |
| WAKE COUNTY 2 | -0.0053 | -0.0099 | 0.0059 | -0.0056 | -0.0030 | -0.0055 | -0.0039 |
| WAKE COUNTY 3 | 0.0025 | 0.0005 | 0.0006 | -0.0019 | -0.0019 | -0.0037 | -0.0007 |
| WAKE COUNTY 4 | 0.0031 | -0.0011 | 0.0007 | 0.0007 | -0.0006 | -0.0060 | -0.0005 |
| WAKE COUNTY 5 | 0.0025 | 0.0057 | -0.0036 | 0.0007 | -0.0067 | -0.0068 | -0.0014 |
| WAKE COUNTY 6 | -0.0016 | -0.0002 | 0.0014 | -0.0008 | -0.0006 | 0.0011 | -0.0001 |
| WAKE COUNTY 7 | 0.0012 | 0.0062 | 0.0025 | 0.0012 | -0.0009 | 0.0034 | 0.0023 |
| WAKE FOREST | 0.0473 | 0.0714 | 0.0489 | 0.0937 | 0.1029 | 0.0870 | 0.0752 |
| WENDELL | 0.0315 | 0.0177 | 0.0144 | 0.0050 | -0.0050 | 0.0150 | 0.0131 |
| ZEBULON | -0.0069 | -0.0030 | 0.0082 | 0.0029 | 0.0039 | 0.0021 | 0.0012 |

APPENDIX B – Transition Matrices by USA: 2007-08 – 2008-09

Geocoded WCPSS student data from 2002-03 through 2008-09 was used to calculate the 2008 SPDM transition matrices. A *uniform average of 5 years* of this historical transition data was used in the 2008 SPDM; only the 2007-08 to 2008-09 transition matrices are presented here.

Definitions for each of these matrices follow.

| APEX | | | | | | | | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------|--------|
| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | OUTGOING | INCOMING | |
| KI | 0.0230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | KI | 0.0684 | 0.5423 |
| 1 | 0.9770 | 0.0256 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.0551 | 0.0526 |
| 2 | 0 | 0.9744 | 0.0148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0.0714 | 0.0381 |
| 3 | 0 | 0 | 0.9852 | 0.0066 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0.0592 | 0.0465 |
| 4 | 0 | 0 | 0 | 0.9934 | 0.0015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0.0576 | 0.0359 |
| 5 | 0 | 0 | 0 | 0 | 0.9985 | 0.0032 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.0579 | 0.0366 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9968 | 0.0072 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0.0580 | 0.0534 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9928 | 0.0033 | 0 | 0 | 0 | 0 | 0 | 7 | 0.0461 | 0.0389 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9967 | 0.0086 | 0 | 0 | 0 | 0 | 8 | 0.0537 | 0.0320 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9914 | 0.0534 | 0 | 0 | 0 | 9 | 0.0790 | 0.0549 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9466 | 0.0377 | 0 | 0 | 10 | 0.0769 | 0.0305 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9623 | 0.0263 | 0 | 11 | 0.0967 | 0.0229 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9737 | 1.0000 | 12 | 0.9935 | 0.0153 |

| CARY | | | | | | | | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------|--------|
| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | OUTGOING | INCOMING | |
| KI | 0.0186 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | KI | 0.0711 | 0.4805 |
| 1 | 0.9814 | 0.0261 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.0734 | 0.0633 |
| 2 | 0 | 0.9739 | 0.0119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0.0813 | 0.0502 |
| 3 | 0 | 0 | 0.9881 | 0.0058 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0.0730 | 0.0422 |
| 4 | 0 | 0 | 0 | 0.9942 | 0.0029 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0.0675 | 0.0510 |
| 5 | 0 | 0 | 0 | 0 | 0.9971 | 0.0048 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.0997 | 0.0384 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9952 | 0.0042 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0.0593 | 0.0459 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9958 | 0.0053 | 0 | 0 | 0 | 0 | 0 | 7 | 0.0642 | 0.0414 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9947 | 0.0077 | 0 | 0 | 0 | 0 | 8 | 0.0792 | 0.0402 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9923 | 0.0618 | 0 | 0 | 0 | 9 | 0.0752 | 0.0640 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9382 | 0.0225 | 0 | 0 | 10 | 0.0753 | 0.0341 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9775 | 0.0176 | 0 | 11 | 0.0773 | 0.0321 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9824 | 1.0000 | 12 | 0.9896 | 0.0166 |

| FUQUAY-VARINA | | | | | | | | | | | | | | | | |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------|--------|
| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | OUTGOING | INCOMING | |
| KI | 0.0245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | KI | 0.0738 | 0.5536 |
| 1 | 0.9755 | 0.0300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.0983 | 0.0524 |
| 2 | 0 | 0.9700 | 0.0327 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0.0749 | 0.0381 |
| 3 | 0 | 0 | 0.9673 | 0.0129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0.0591 | 0.0365 |
| 4 | 0 | 0 | 0 | 0.9871 | 0.0046 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0.0564 | 0.0516 |
| 5 | 0 | 0 | 0 | 0 | 0.9954 | 0.0036 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.0902 | 0.0413 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9964 | 0.0106 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0.0487 | 0.0326 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9894 | 0.0149 | 0 | 0 | 0 | 0 | 0 | 7 | 0.0836 | 0.0389 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9851 | 0.0244 | 0 | 0 | 0 | 0 | 8 | 0.0962 | 0.0294 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9756 | 0.1560 | 0 | 0 | 0 | 9 | 0.1431 | 0.0508 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8440 | 0.0449 | 0 | 0 | 10 | 0.1103 | 0.0389 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9551 | 0.0552 | 0 | 11 | 0.1063 | 0.0199 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9448 | 1.0000 | 12 | 0.9678 | 0.0159 |

GARNER

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| KI | 0.0321 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9679 | 0.0405 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9595 | 0.0311 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9689 | 0.0127 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9873 | 0.0032 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9968 | 0.0017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9983 | 0.0153 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9847 | 0.0103 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9897 | 0.0256 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9744 | 0.2155 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7845 | 0.0757 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9243 | 0.0279 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9721 | 1.0000 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.0929 | 0.5153 |
| 1 | 0.0962 | 0.0475 |
| 2 | 0.0841 | 0.0475 |
| 3 | 0.0897 | 0.0383 |
| 4 | 0.0863 | 0.0528 |
| 5 | 0.0835 | 0.0398 |
| 6 | 0.1008 | 0.0429 |
| 7 | 0.0832 | 0.0429 |
| 8 | 0.0802 | 0.0406 |
| 9 | 0.1459 | 0.0567 |
| 10 | 0.1301 | 0.0436 |
| 11 | 0.1148 | 0.0207 |
| 12 | 0.9684 | 0.0115 |

HOLLY SPRINGS

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| KI | 0.0161 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9839 | 0.0313 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9688 | 0.0047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9953 | 0.0048 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9952 | 0.0048 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9952 | 0.0053 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9947 | 0.0000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0000 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0125 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9875 | 0.0984 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9016 | 0.0368 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9632 | 0.0383 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9617 | 1.0000 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.0543 | 0.5880 |
| 1 | 0.0588 | 0.0536 |
| 2 | 0.0529 | 0.0437 |
| 3 | 0.0366 | 0.0601 |
| 4 | 0.0345 | 0.0404 |
| 5 | 0.0690 | 0.0372 |
| 6 | 0.0537 | 0.0251 |
| 7 | 0.0533 | 0.0350 |
| 8 | 0.0669 | 0.0284 |
| 9 | 0.0758 | 0.0372 |
| 10 | 0.0842 | 0.0219 |
| 11 | 0.0874 | 0.0164 |
| 12 | 0.9787 | 0.0131 |

KNIGHTDALE

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| KI | 0.0588 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9412 | 0.0496 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9504 | 0.0424 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9576 | 0.0129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9871 | 0.0109 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9891 | 0.0035 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9965 | 0.0140 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9860 | 0.0167 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9833 | 0.0308 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9692 | 0.2840 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7160 | 0.1320 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8680 | 0.0636 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9364 | 1.0000 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.1282 | 0.5148 |
| 1 | 0.0829 | 0.0499 |
| 2 | 0.0660 | 0.0624 |
| 3 | 0.0518 | 0.0499 |
| 4 | 0.0836 | 0.0421 |
| 5 | 0.0863 | 0.0406 |
| 6 | 0.0747 | 0.0452 |
| 7 | 0.0566 | 0.0312 |
| 8 | 0.0903 | 0.0437 |
| 9 | 0.1816 | 0.0562 |
| 10 | 0.1349 | 0.0281 |
| 11 | 0.1194 | 0.0234 |
| 12 | 0.9426 | 0.0125 |

MORRISVILLE

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| KI | 0.0365 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9635 | 0.0095 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9905 | 0.0049 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9951 | 0.0169 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9831 | 0.0120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9880 | 0.0067 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9933 | 0.0152 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9848 | 0.0000 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0153 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9847 | 0.1288 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8712 | 0.0201 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9799 | 0.0396 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9604 | 1.0000 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.1312 | 0.4465 |
| 1 | 0.0944 | 0.0628 |
| 2 | 0.0856 | 0.0514 |
| 3 | 0.0825 | 0.0571 |
| 4 | 0.1170 | 0.0428 |
| 5 | 0.0970 | 0.0428 |
| 6 | 0.1429 | 0.0728 |
| 7 | 0.1079 | 0.0371 |
| 8 | 0.1267 | 0.0471 |
| 9 | 0.0959 | 0.0499 |
| 10 | 0.0802 | 0.0471 |
| 11 | 0.0982 | 0.0257 |
| 12 | 1.0000 | 0.0171 |

RALEIGH

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| KI | 0.0412 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9588 | 0.0426 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9574 | 0.0262 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9738 | 0.0156 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9844 | 0.0065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9935 | 0.0072 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9928 | 0.0119 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9881 | 0.0174 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9826 | 0.0154 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9846 | 0.2124 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7876 | 0.1116 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8884 | 0.0363 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9637 | 1.0000 | 0 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.0913 | 0.4641 |
| 1 | 0.0980 | 0.0550 |
| 2 | 0.0934 | 0.0481 |
| 3 | 0.0936 | 0.0506 |
| 4 | 0.0870 | 0.0484 |
| 5 | 0.0941 | 0.0418 |
| 6 | 0.0823 | 0.0515 |
| 7 | 0.0890 | 0.0429 |
| 8 | 0.0949 | 0.0420 |
| 9 | 0.1580 | 0.0760 |
| 10 | 0.1265 | 0.0349 |
| 11 | 0.1380 | 0.0286 |
| 12 | 0.9662 | 0.0160 |

ROLESVILLE

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| KI | 0.0104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9896 | 0.0625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9375 | 0.0000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 1.0000 | 0.0000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 1.0000 | 0.0294 | 0 | 0 | 0 | 0 | 0.229 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9706 | 0.0105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9895 | 0.0164 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9836 | 0.0000 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0000 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.1690 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8310 | 0.0685 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9315 | 0.0000 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 1.0000 | 0 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.0769 | 0.5029 |
| 1 | 0.0680 | 0.0457 |
| 2 | 0.1000 | 0.0457 |
| 3 | 0.0941 | 0.0400 |
| 4 | 0.1169 | 0.0229 |
| 5 | 0.0865 | 0.0571 |
| 6 | 0.0896 | 0.0514 |
| 7 | 0.0833 | 0.0400 |
| 8 | 0.0920 | 0.0343 |
| 9 | 0.1235 | 0.0514 |
| 10 | 0.1098 | 0.0629 |
| 11 | 0.0508 | 0.0229 |
| 12 | 0.9630 | 0.0229 |

WAKE COUNTY (NON-URBAN AREAS)

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| KI | 0.0261 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9739 | 0.0231 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9769 | 0.0073 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9927 | 0.0134 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9866 | 0.0016 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9984 | 0.0016 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9984 | 0.0065 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9935 | 0.0000 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0099 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9901 | 0.0841 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9159 | 0.0116 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9884 | 0.0257 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9743 | 1.0000 | 0 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.0918 | 0.5472 |
| 1 | 0.0845 | 0.0419 |
| 2 | 0.1159 | 0.0515 |
| 3 | 0.0953 | 0.0419 |
| 4 | 0.0849 | 0.0381 |
| 5 | 0.1206 | 0.0362 |
| 6 | 0.0510 | 0.0276 |
| 7 | 0.0464 | 0.0334 |
| 8 | 0.1009 | 0.0305 |
| 9 | 0.0867 | 0.0734 |
| 10 | 0.0822 | 0.0334 |
| 11 | 0.0544 | 0.0276 |
| 12 | 0.9884 | 0.0172 |

WAKE FOREST

| | KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| KI | 0.0344 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.9656 | 0.0305 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0.9695 | 0.0207 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0.9793 | 0.0050 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0.9950 | 0.0070 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0.9930 | 0.0048 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9952 | 0.0053 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9947 | 0.0099 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9901 | 0.0142 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9858 | 0.1281 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8719 | 0.0735 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9265 | 0.0279 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9721 | 1.0000 |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.1092 | 0.4803 |
| 1 | 0.0982 | 0.0712 |
| 2 | 0.0977 | 0.0597 |
| 3 | 0.0864 | 0.0549 |
| 4 | 0.0711 | 0.0452 |
| 5 | 0.0889 | 0.0539 |
| 6 | 0.0998 | 0.0472 |
| 7 | 0.0795 | 0.0356 |
| 8 | 0.1000 | 0.0423 |
| 9 | 0.0938 | 0.0452 |
| 10 | 0.1146 | 0.0241 |
| 11 | 0.0876 | 0.0269 |
| 12 | 0.9865 | 0.0135 |

| WENDELL | | | | | | | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| KI | 0.0178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1 | 0.9822 | 0.0793 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2 | 0 | 0.9207 | 0.0286 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3 | 0 | 0 | 0.9714 | 0.0062 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4 | 0 | 0 | 0 | 0.9938 | 0.0062 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 5 | 0 | 0 | 0 | 0 | 0.9938 | 0.0063 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9937 | 0.0000 | 0 | 0 | 0 | 0 | 0 | | |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0065 | 0 | 0 | 0 | 0 | | |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9935 | 0.0147 | 0 | 0 | 0 | | |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9853 | 0.2819 | 0 | 0 | | |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7181 | 0.1356 | 0 | | |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8644 | 0.0891 | 0 | |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9109 | 1.0000 | |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.1244 | 0.4784 |
| 1 | 0.0787 | 0.0663 |
| 2 | 0.0591 | 0.0663 |
| 3 | 0.1011 | 0.0346 |
| 4 | 0.0588 | 0.0692 |
| 5 | 0.0966 | 0.0288 |
| 6 | 0.0698 | 0.0288 |
| 7 | 0.0373 | 0.0403 |
| 8 | 0.0685 | 0.0375 |
| 9 | 0.1902 | 0.0605 |
| 10 | 0.1571 | 0.0375 |
| 11 | 0.1293 | 0.0259 |
| 12 | 0.9167 | 0.0259 |

| ZEBULON | | | | | | | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| KI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| KI | 0.1053 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1 | 0.8947 | 0.0885 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2 | 0 | 0.9115 | 0.0316 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3 | 0 | 0 | 0.9684 | 0.0882 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4 | 0 | 0 | 0 | 0.9118 | 0.0242 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 5 | 0 | 0 | 0 | 0 | 0.9758 | 0.0087 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6 | 0 | 0 | 0 | 0 | 0 | 0.9913 | 0.0000 | 0 | 0 | 0 | 0 | 0 | | |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.0154 | 0 | 0 | 0 | 0 | | |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9846 | 0.0000 | 0 | 0 | 0 | | |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0000 | 0.3586 | 0 | 0 | | |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.6414 | 0.1250 | 0 | | |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8750 | 0.0543 | 0 | |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9457 | 1.0000 | |

| | OUTGOING | INCOMING |
|----|----------|----------|
| KI | 0.0865 | 0.4978 |
| 1 | 0.0424 | 0.0448 |
| 2 | 0.0594 | 0.0224 |
| 3 | 0.0727 | 0.0404 |
| 4 | 0.0534 | 0.0404 |
| 5 | 0.0873 | 0.0538 |
| 6 | 0.0648 | 0.0807 |
| 7 | 0.0714 | 0.0404 |
| 8 | 0.0561 | 0.0359 |
| 9 | 0.1989 | 0.0717 |
| 10 | 0.1028 | 0.0404 |
| 11 | 0.1238 | 0.0135 |
| 12 | 0.9556 | 0.0179 |

Transition Matrix Definitions:

Transition matrices are calculated over the USA geometry for the six transition periods from 2002-03 – 2003-04 to 2007-08 – 2008-09.

The Existing Matrix: An existing student is defined as one who is in the school system for two consecutive years. The existing probability matrix is a 13x13 matrix with non-zero elements along the diagonal and just below the diagonal. The main diagonal is the probability that a student does not advance a grade. The diagonal just below the main is the probability that a student advances a grade. For this matrix, it was only considered whether or not a student advanced one grade (not whether a student advanced more than one grade).

The Outgoing Matrix: An outgoing student is defined as one who resides in the school system in one year but is no longer in the school system the following year. The outgoing probability matrix is a 13x13 matrix with elements along the diagonal (for simplicity, the spreadsheet only shows the values in a column). The outgoing probability for a particular grade is calculated by taking the ratio of students within that grade that left the system to the total number of students in that grade (existing + outgoing students).

The Incoming Matrix: An incoming student is defined as one who does not reside in the school system in one year but does in the following year. The incoming student matrix is actually a distribution, not a probability matrix. It is computed by taking the ratio of the total number of incoming students within a grade to the total number of students.