# APPENDIX 2: DEMOGRAPHICS:

One of the most important factors in the planning of the new State High was the school board's base assumption that current enrollment will not increase. SCASD utilized four demographic studies to review the possible enrollment projections for the high school. While this sounds impressive, the methods of these studies are discussed below and they all suffer from an inability to cite accuracy. Moreover, they only present projections for 10-15 years - probably for this reason. A new high school building should have a life expectancy of 40-50 years - well beyond the projections' ranges - thus they are not valuable as a significant basis for making an enormous infrastructure investment in a thriving, dynamic community such as the Centre Region.

The purpose of this appendix is not to present a detailed analysis of the demographics but rather to walk the reader through the projections in non-technical language and point out some possible weaknesses and concerns regarding the usefulness of these demographic studies.

The appendix contains the following sections:

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II. The Cohort Component Model
III. SCASD Demographic Sources
IV. The Stewman Demographics Report
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    b. Findings, Forecast Chart, Figure A2-1
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## I. Demographics Basics:

Population projections are calculations that show the future development of a population when certain assumptions are made regarding variables such as fertility, mortality, or migration. A population forecast is a projection in which the assumptions are considered to yield a realistic picture of the probable future population. Two items are used to measure success of a forecast model:

1) Quality: The quality of any projection is determined by the internal validity (i.e. whether the internal variables consistently model relations).
2) Accuracy: The accuracy of a forecast is based on external validity (i.e. accuracy of the predictions)

The ability to accurately predict the future is a difficult task but most projections contain several possible options based on changes to the variables and a "most likely" scenario. While the quality of the methods used may be excellent, the accuracy is mostly based on whether the primary assumptions remain true with the passage of time. Since most assumptions can only be made on historical data, they cannot capture unforeseen events.

## II. The Cohort Component Model:

The Cohort Component Model is the primary model used today to do population projections. This approach consists of segmenting the population into distinct subgroups differently exposed to the risks (fertility, mortality, migration). It is also important to note that this model uses a discrete-time approach. Many good books cover the Cohort Component Model, but the key point is that this approach is still only a model. The accuracy of a prediction usually becomes less accurate as the length of time passes from when the projection was made and the time about which the projection applies. The accuracy of a projection also largely depends on the quality of the input and whether or not assumptions (which are often unpredictable) remain true.

## III. SCASD Demographic Sources:

The SCASD cites four sources of enrollment projections for the high school:

1) Professor Shelby Stewman (PhD) of Stewman Demographics at Carnegie-Mellon University
2) Information Management Systems (IMS)
3) Pennsylvania Department of Education (PDE) Annual Projections
4) Discussions with the Centre Regional Planning Agency (CRPA)

Only three of the four sources listed provided projection models and only two out of the three projections use the Cohort Component Model (Professor Stewman's and IMS). The Cohort Component Model applied by IMS is an inclusive version that considers migration by the survival ratios. The model employed by PDE uses an educational progression/school retention approach, which is based upon retention as a percentage. The discussions with the CRPA did not have a model for enrollment and revolved around

future population growth for the area. It is important to note that CRPA has a projection model for growth but school enrollment is not one of the variables. In summary, only Dr. Stewman's report is a true reflection of a detailed Cohort Component Model as described and employed by demographers. The following sections briefly review each of these sources and discuss the possible issues.

## IV. The Stewman Demographics Report:

### 4a. Overview:

Dr. Shelby Stewman is a demographer and professor at Carnegie-Mellon University. He has done similar reports for at least one school district in Pennsylvania. The work and experience of Dr. Stewman is available at http://www.heinz.cmu.edu/bio/faculty/ss62.html. Dr. Stewman completed the analysis on December 8, 2003. The analysis prepared for the district contained four parts:

1) An overview of four significant demographic and economic processes in the last decade within the school district.
2) The development and analysis of grade specific school district population projections for a ten-year period (2004-2013).
3) The Development and analysis of grade specific school district population projections for ten elementary and two middle schools over the ten year period (2004-2013)
4) A brief discussion of the implications of the analysis in terms of future directions for updating preschool and student population information

### 4b. Findings:

Dr. Stewman conducted detailed research for historical information and possible future trends to develop his variables. He identified that four major demographic and economic processes are important in respect to projecting the expected shifts in student population in the SCASD over the next ten years:

1) (-) A significant decrease in the number of births per year
2) (+) A substantial amount of net in-migration of families with school age children
3) (Reduction of Variability) The leveling off of the Penn State University student population which impacts families since student families with children will be via replacement only
4) (+) A significant growth in housing development

The development of a projection model is not an easy task and a complete understanding of the variables is required to acquire a quality model with accurate projections. A one-for-one count does not exist for these variables and they must be examined as a whole set. For example, a growth of 100 Single Family Dwellings (SFD) does not mean that 200 new children will be entering the district. It is also important to note that a minor error to one of the variables can have a huge impact to the overall model.

The summary of the findings from Dr. Stewman highlighted in this section address the projections for the high school and not the middle schools or elementary schools. These projections are taken into account for the overall high school numbers. Dr. Stewman indicated that Scenario IV (Projections with the Full Impact of Growth) was the most likely projection model.

In this scenario, the projections deal with student growth due to new single-family housing and townhouse construction. A ratio of .722 for single-family housing and .284 for townhouses was applied. This means that if the construction of new single-family housing was estimated at 1000 for 2006 then the corresponding growth in enrollment was 722 students. The projections listed on the following page are from Dr. Stewman's report but the summary finding was a decrease of high school enrollment from a high of 2733 in 2006 and a low of 2495 in 2001. Dr. Stewman's summary explanation was that the housing growth is offset by the predicted decrease in birth rate.

**Figure A2-1** provides an overview of the enrollment projections from Dr. Stewman:

Table 18
State College Area School District Forecasts per Grade:
2004-2013 Fertility/Aging/Growth Scenario
[Scenario IV] *

| | K | G1 | G2 | G3 | G4 | G5 | Total K→G5 | G6 | G7 | G8 | Total G6→G8 | G9 | G10 | G11 | G12 | Total G9 → G12 | Total K → G12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2003** | 403 | 473 | 488 | 498 | 487 | 541 | 2890 | 591 | 578 | 636 | 1805 | 683 | 677 | 631 | 633 | 2624 | 7319 |
| **2004** | 377 | 507 | 477 | 488 | 508 | 492 | 2849 | 562 | 632 | 598 | 1792 | 672 | 693 | 682 | 644 | 2691 | 7332 |
| **2005** | 412 | 474 | 512 | 477 | 498 | 512 | 2885 | 510 | 601 | 655 | 1766 | 633 | 682 | 698 | 694 | 2707 | 7358 |
| **2006** | 390 | 520 | 478 | 511 | 487 | 502 | 2888 | 532 | 545 | 623 | 1700 | 692 | 644 | 687 | 710 | 2733 | 7321 |
| **2007** | 421 | 490 | 526 | 478 | 521 | 501 | 2937 | 522 | 569 | 564 | 1655 | 658 | 702 | 650 | 699 | 2709 | 7301 |
| **2008** | 408 | 529 | 494 | 526 | 488 | 525 | 2970 | 520 | 559 | 590 | 1669 | 596 | 668 | 707 | 663 | 2634 | 7273 |
| **2009** | 408 | 513 | 534 | 494 | 537 | 492 | 2978 | 545 | 556 | 580 | 1681 | 625 | 605 | 673 | 719 | 2622 | 7281 |
| **2010** | 408 | 513 | 518 | 533 | 504 | 542 | 3018 | 511 | 583 | 576 | 1670 | 613 | 636 | 610 | 685 | 2544 | 7232 |
| **2011** | 409 | 514 | 518 | 517 | 543 | 508 | 3009 | 562 | 547 | 604 | 1713 | 609 | 623 | 642 | 621 | 2495 | 7217 |
| **2012** | 408 | 514 | 519 | 517 | 527 | 547 | 3032 | 528 | 600 | 565 | 1693 | 638 | 618 | 628 | 655 | 2539 | 7264 |
| **2013** | 408 | 513 | 520 | 518 | 527 | 531 | 3017 | 568 | 565 | 621 | 1754 | 598 | 648 | 623 | 640 | 2509 | 7280 |

| | 2003 | 2008 | 2013 | Δ2008-2003 | Δ2013-2008 | Δ2013-2003 |
|---|---|---|---|---|---|---|
| **K→G5** | 2890 | 2970 | 3017 | +80 | +47 | +127 |
| **G6→G8** | 1805 | 1669 | 1754 | -136 | +85 | -51 |
| **G9→G12** | 2624 | 2634 | 2509 | +10 | -125 | -115 |
| **Total** | 7319 | 7273 | 7280 | -46 | +7 | -39 |

* This scenario adds the direct effect of growth due to new housing. Otherwise, it uses the same parameters as in Scenario III (See Table 16 for the assumptions). As for the additional growth due to new housing the following logic was used. Based on an evaluation that the level of residential development was stable but at a new level (1994→), most of which had not as yet been incorporated by the embedded growth in the baseline retention ratios of Table 10 (See Text for more detail on this conclusion.), we first estimated the expected number of new homes to be built per year. The total number of new housing units expected to be built from 2003-2012 is 2,650 SFD's and 1,100 townhouses. However, using the 1999-2003 period in which the SCASD student population declines by 52, a counter factual analysis suggested that without new housing development, this decline would have been approximately 250 instead of 50; thus, adding 200 students (See Text for more details.) The 1999-2002 baseline period implies about 25% of new housing construction has not been taken into account with the embedded growth. Thus, we have 2,650 (.25) = 663 SFD's and 1,100 (.25) = 286 townhouses to take into account. Data from multiple development projects in the school district and the number of public school students per level in those new homes, were used to estimate an expected new student to new home ratio (.722 for SFD's and .284 for townhouses (See Table 13.), as well as a distribution for these new students as follows: .443, .252, .304 for the elementary, junior and high schools, respectively. This yields an expected 56 additional students per year. Using the distributions above, these result in an additional 25/year at the elementary level and an additional 14/year at the junior and 17/year at the high school levels. For the manner in which these were allocated per year, so as to average these numbers and equalize the additions per grade, as nearly as possible, within each level, see Table 17.

**4c. Issues:**
The projection compiled by Dr. Stewman is comprehensive and includes many variables. He left the SCASD with a detailed document that included a recommendation to ensure the accuracy of predictions:

"Given the volume of mobility of the SCASD, due to large part, from the university context in which it resides, it is more problematic to maintain an on-going micro level census of the population per municipality. For sub-areas where there is a potential for large-scale changes or reversals from current trends, it may be useful to consider strategic targeted "sampling" or canvassing. [our emphasis]. For example, in the Gray's Woods area, it may be useful to be more knowledgeable about the preschool populations and to be aware of the net-migration household characteristics (turnover households vs. new entrants to the area). Since many of these new homes or relatively new homes in this development have school age children in the SCASD, data on those homes and students is already on hand or additional data on sibling preschoolers, for example, may be readily obtained with a "take-home" or mailed form. Since the streets and addresses of the entire housing plan should be fairly readily available, one can then ascertain the size of the remaining "missing data" and strategically target it to fill in the holes. Given the uneven distribution rates of change across elementary school areas and across municipalities, the importance of targeting strategic areas for collecting data is potentially quite important and due to its rather small size, it should also be cost effective"[our emphasis].

The SCASD has not followed up with Dr. Stewman's recommendation, however. When asked at a school board meeting in October, 2006 about his recommendation, the response was that the board was reviewing this recommendation but it was too costly to pursue at this time. What is the impact to the projection of not doing this correctly? This projection model is the most rigorous and includes the most variables but it will also be five years old by the time construction starts and eight/nine years old when the building is complete. Any projection is nothing but a snapshot in time and should be updated/ monitored to ensure accuracy. When the building is complete, the projections only give us information for three or four more years (to 2013).

## V. Information Management Systems:

**5a. Overview:**
IMC is a small for-hire firm that generates enrollment predictions based on births and actual enrollments. IMC uses three variations of the Cohort Survival Method to project enrollments. This method analyzes the survival ratios for students and then projects those ratios into the future. The survival ratio compares how many students are in a particular grade this year against how many students were in the preceding grade the previous year. For example, if there are 100 first graders in 2000-01 and 113 second graders in 2001-02 then the survival ratio for that 2nd grade class is 113%.

The Cohort Component Model applied by IMS is a Cohort Survival version, which looks forward by using historical data and includes the impact of migration by rolling it into the survival ratios. This approach does not take into account information about known items

in the future (i.e. the addition of 200 homes in a new neighborhood). The projection of this model is designed more for the short-term horizon rather than a long-term projection. The work and experience of IMC is available at http://www.enrollpro.com. This analysis is purchased every year by the SCASD from IMC. The Team reviewed the last two reports (2005/2006) prepared by IMC and the projections are dramatically different. The process is documented below but the details are provided only from 2005. The analysis chart shown later in this document compares the two years with the other projection models.

The analysis prepared for the district contained three projection methods:

1) Projection Method I: Uses survival ratios for the past five years in a particular grade. It arrives at a mean value to use in projecting how many students in the previous grade the prior year will become students in that grade that year. This method is the most accurate for schools districts that have not experienced major impacts on their district in recent years (e.g. closing or opening of a private school, re-zoning, a new preschool, etc.).
2) Projection Method II: Uses survival ratio for only the current year to project enrollment. This method may be the most accurate for your school if it has recently experienced a change in its enrollment trends (e.g. the closing of a private school).
3) Projection Method III: Uses the average from Method I and combines that with the one-year ratio used by method II. The resulting ratio emphasizes current trends in your enrollment while tempering that with the trends of the past. This method will best suit districts that have fluctuations in their enrollment due to temporary occurrences but do not expect those occurrences to overwhelmingly impact future enrollment.

**5b. Findings:**

The IMC analysis uses enrollment data from five years back and births from ten years back. The overall accuracy of the projections by IMC in 2005-2006 ranged from a difference of -15.50% to +3.72. As this analysis is not nearly as detailed when compared to the Stewman analysis, little more can be added except to present the summary chart. The owner of IMC (Robert Dickinson) was clear in discussions that his report is a quick summary analysis of readily available data. The projections listed on the this page are from the IMC report but the summary finding was a decrease of high school enrollment from a high of 2733 in 2006 and a low of 2495 in 2001. The three methods produced results that were close so only one is presented, Method III.

**Figure A2-2** provides an overview of the enrollment projections from IMC

## State College Area Schools

Table 10 - Enrollment Projected Ten Years
Method 3

| GRADE | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 |
|---|---|---|---|---|---|---|---|---|---|---|
| K | 419 | 436 | 466 | 481 | 498 | 0 | 0 | 0 | 0 | 0 |
| 1 | 560 | 499 | 520 | 555 | 573 | 594 | 0 | 0 | 0 | 0 |
| 2 | 452 | 559 | 498 | 519 | 554 | 572 | 593 | 0 | 0 | 0 |
| 3 | 487 | 465 | 575 | 512 | 534 | 570 | 588 | 610 | 0 | 0 |
| 4 | 506 | 494 | 471 | 583 | 519 | 541 | 578 | 596 | 618 | 0 |
| 5 | 497 | 506 | 494 | 471 | 583 | 519 | 541 | 578 | 596 | 618 |
| 6 | 531 | 524 | 533 | 521 | 496 | 614 | 547 | 570 | 609 | 628 |
| 7 | 549 | 557 | 550 | 559 | 547 | 520 | 644 | 574 | 598 | 639 |
| 8 | 598 | 560 | 568 | 561 | 570 | 558 | 530 | 657 | 585 | 610 |
| 9 | 686 | 652 | 611 | 619 | 612 | 622 | 609 | 578 | 716 | 638 |
| 10 | 651 | 688 | 654 | 612 | 620 | 613 | 623 | 610 | 579 | 718 |
| 11 | 692 | 654 | 691 | 657 | 615 | 623 | 616 | 626 | 613 | 581 |
| 12 | 684 | 693 | 655 | 692 | 658 | 616 | 624 | 617 | 627 | 614 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 9-12 | 2713 | 2687 | 2611 | 2580 | 2505 | 2474 | 2472 | 2431 | 2535 | 2551 |

**5c. Issues:**
The projection compiled by IMC is a limited projection model when placed in comparison with the work conducted by Dr. Stewman. The issue with this projection is the limited number of inputs/variables used (enrollments and births only). In summary, this model does not take into account all of the variables and events that could change enrollment.

## VI. Pennsylvania Department of Education:

**6a. Overview:**
The Pennsylvania Department of Education (PDE) is the statewide government agency that supports education and enforces requirements. The enrollment projection model used by the PDE is patterned after projection models called educational progression or school retention. Projection models of this nature are based on the concept that students progress routinely from one grade to another and that any internal policies and external factors that influenced grade progression in the past will continue to influence the progression of students from grade to grade in the future.

The PDE projection model uses enrollment data reported annually by all local education agencies to the Division of Data Services on the Public School Enrollment Report (ESPE). Resident live birth data is provided by the Pennsylvania Department of Health. Grade progression is determined by calculating retention rates for grades 2 to 12 using the most recent five years of enrollment data. Retention rates for kindergarten are determined by births five years earlier and for first grade from births six years earlier. These rates are evaluated to determine if a pattern is discernable, or if any retention rates are unusual. If a pattern is found, the pattern is continued in making the projections. Unusual retention rates are discarded and the average of the remaining rates is used in making the projections. Non-graded elementary and secondary students are prorated across grades before retention rates are calculated. Because of prorating, the number of students shown in various grades will differ from the number of students reported. The total number of students may also differ slightly.

One again, the approach employed by PDE is not a Cohort Model. The work of PDE is available at http://www.pde.state.pa.us/k12statistics. The analysis is provided by PDE to the SCASD every year.

**6b. Findings:**
The projections provided by PDE are considered by many school districts to have limited accuracy and this is why many districts choose to purchase reports from independent companies like IMC. The PDE projections show a dramatic decrease in student enrollment between now and 2013 (a low of 2251 in 2013).

**Figure A2-3** provides an overview of the enrollment projections from PDE

Revised: 09/2005 (2004 Enrollments)

Enrollment Projections
Prepared by the Pennsylvania Department of Education
(717) 787-2644

State College Area SD 1-10-14-800-2

| YEAR | K | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000-2001 | 388 | 491 | 550 | 547 | 543 | 581 | 597 | 616 | 604 | 619 | 614 | 633 | 624 | 7407 |
| 2001-2002 | 412 | 494 | 493 | 532 | 574 | 532 | 582 | 643 | 638 | 635 | 655 | 629 | 628 | 7447 |
| 2002-2003 | 375 | 498 | 500 | 503 | 541 | 580 | 571 | 611 | 663 | 675 | 650 | 638 | 646 | 7451 |
| 2003-2004 | 404 | 473 | 489 | 497 | 487 | 541 | 593 | 579 | 637 | 691 | 682 | 636 | 634 | 7343 |
| 2004-2005 | 397 | 475 | 471 | 485 | 502 | 490 | 560 | 622 | 604 | 701 | 682 | 693 | 642 | 7324 |
| PROJECTIONS | | | | | | | | | | | | | | |
| 2005-2006 | 422 | 461 | 474 | 468 | 490 | 502 | 506 | 587 | 646 | 642 | 692 | 681 | 697 | 7268 |
| 2006-2007 | 401 | 503 | 460 | 471 | 473 | 490 | 519 | 530 | 609 | 687 | 634 | 691 | 685 | 7153 |
| 2007-2008 | 433 | 478 | 502 | 457 | 476 | 473 | 506 | 544 | 550 | 647 | 678 | 633 | 695 | 7072 |
| 2008-2009 | 420 | 516 | 477 | 499 | 462 | 476 | 489 | 530 | 565 | 585 | 639 | 677 | 637 | 6972 |
| 2009-2010 | 428 | 501 | 515 | 474 | 505 | 462 | 492 | 512 | 550 | 601 | 577 | 638 | 681 | 6936 |
| 2010-2011 | 436 | 510 | 500 | 512 | 479 | 505 | 477 | 515 | 532 | 585 | 593 | 576 | 642 | 6862 |
| 2011-2012 | 445 | 520 | 509 | 497 | 518 | 479 | 522 | 500 | 535 | 566 | 577 | 592 | 579 | 6839 |
| 2012-2013 | 454 | 530 | 519 | 506 | 503 | 518 | 495 | 547 | 519 | 569 | 559 | 576 | 595 | 6890 |
| 2013-2014 | 463 | 541 | 529 | 516 | 512 | 503 | 535 | 518 | 568 | 552 | 562 | 558 | 579 | 6936 |
| 2014-2015 | 472 | 551 | 540 | 525 | 522 | 512 | 520 | 560 | 538 | 604 | 545 | 561 | 561 | 7011 |

Various Grade Groupings of the Enrollment Projections

| YEAR | K-4 | K-5 | K-6 | K-7 | K-8 | K-9 | K-12 | 5-8 | 6-8 | 7-8 | 6-9 | 7-9 | 7-12 | 8-12 | 9-12 | 10-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004-2005 | 2330 | 2820 | 3380 | 4002 | 4606 | 5307 | 7324 | 2276 | 1786 | 1226 | 2487 | 1927 | 3944 | 3322 | 2718 | 2017 |
| 2009-2010 | 2423 | 2885 | 3377 | 3889 | 4439 | 5040 | 6936 | 2016 | 1554 | 1062 | 2155 | 1663 | 3559 | 3047 | 2497 | 1896 |
| 2014-2015 | 2610 | 3122 | 3642 | 4202 | 4740 | 5344 | 7011 | 2130 | 1618 | 1098 | 2222 | 1702 | 3369 | 2809 | 2271 | 1667 |
| 2004-2005 to 2014-2015 | | | | | | | | | | | | | | | | |
| Change | 280 | 302 | 262 | 200 | 134 | 37 | -313 | -146 | -168 | -128 | -265 | -225 | -575 | -513 | -447 | -350 |
| Percent | 12.0 | 10.7 | 7.8 | 5.0 | 2.9 | 0.7 | -4.3 | -6.4 | -9.4 | -10.4 | -10.7 | -11.7 | -14.6 | -15.4 | -16.4 | -17.4 |

Notes:
1. Excludes students in full-time out-of-district special education, comprehensive AVTSs, charter schools, state-owned schools, consortium-operated alternative high schools, and juvenile correctional institutions.
2. Enrollment projections beyond five years are subject to errors in the lower grades resulting from inconsistencies between actual and projected live births and should be reviewed closely.
3. Four year old kindergarten students, if any, added to K enrollments.
4. Elementary and secondary ungraded students were distributed among the grades. Therefore, enrollments by grade may differ from those reported by the local education agencies.

Sources:
1. Public School Enrollment Report (ESPE)
2. Resident Live Birth file, 2003, supplied the Division of Health Statistics, Pennsylvania Department of Health. The Department of Health specifically disclaims responsibility for any analyses, interpretations or conclusions.

| Grades | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| 9-12 | 2712 | 2697 | 2653 | 2538 | 2497 | 2396 | 2314 | 2299 | 2251 | 2271 |

## 6c. Issues:

Once again, the projections by PDE are from a limited projection model when placed in comparison with the work conducted by Dr. Stewman. This model does not take into account all of the variables and events that could change enrollment. Even PDE lists the following items as limitations of their model:

**Internal policy changes that can affect the accuracy of projections**

- Policy on how old a child must be before being admitted into kindergarten and first grade
- Policy on when and how a student is evaluated for special education services
- Policy on how many students the area vocational-technical school is to receive
- Policy on who provides full-time special education programs
- Policy on scholastic retention and acceleration

**External factors that can affect the accuracy of projections**

- The opening or closing of a non public school
- A significant increase or decrease in new home building
- A shift in migration patterns

**Other considerations**

- Enrollment projections for school districts with less than 1,000 students tend to be less reliable.
- Actual live birth data for the most recent year are added annually. However, enrollment projections beyond five years are subject to errors in the lower grades resulting from inconsistencies between actual and projected live births and should be reviewed closely.

## VII. Discussions with the Centre Regional Planning Agency:

### 7a. Overview:

The Centre Regional Planning Agency (CRPA) provides professional advice and technical expertise to elected and appointed officials of this region. In 2003, CRPA began an ambitious project intended to provide policymakers with an estimate of the potential for future growth in the Centre Region's six municipalities during the next three decades. The "Growth Forecasting Project," involved a detailed, parcel-by-parcel evaluation of 151 square miles of land located in the Borough of State College and the Townships of College, Ferguson, Halfmoon, Harris, and Patton located in Centre County, Pennsylvania. The goals of the project were to predict the location, type, and timing of growth likely to occur in the community to the year 2030.

The information developed as a result of the Growth Forecasting Project offers valuable insights about the possibilities for future development in the community and provides an open dialog about the implications - both positive and negative - of this anticipated growth. To be sure, no one knows what the future holds. There are many economic, political, and social variables that influence the location and timing of future development. The Growth Forecasting Project should not be viewed as "the only" future scenario for the Centre Region

No projection model was produced by the CRPA in relation to school enrollment and it is not known how the SCASD used this data to draw conclusions on school enrollment. The work of CRPA is available at http://cog.centreconnect.org/crpa-mpo/. The SCASD meets with the CRPA once a year to discuss trends.

**7b. Findings:**

State College and the surrounding areas are growing and this can be attributed to four main drivers:

**Quality of Life**

- *Modern Maturity* magazine named State College as one of the country's top 10 college towns for retirees and one of the 50 best retirement communities in general
- In 1998, *Money* magazine rated State College #1 for water quality, cost-of-living, and rate of job growth.
- World-class fishing, Broadway-caliber shows, 7000 acres of State Game Lands and 11,000 acres of State Forest Lands are accessible by car or bicycle within minutes from the Centre Region.
- Standard & Poor's School Evaluation Service ranks SCASD well above average in PSSA and SAT participation and combined scores.

**Economic Factors**

- The area's unemployment rate is consistently one of the lowest in the Commonwealth.
- University communities are typically sheltered from downturns in the economy.
- Home values remain high (Highest in 2006 was $1.25M and the average was $199,330) and moderately priced homes do not remain on the real estate market for any substantial period of time.

**Penn State**

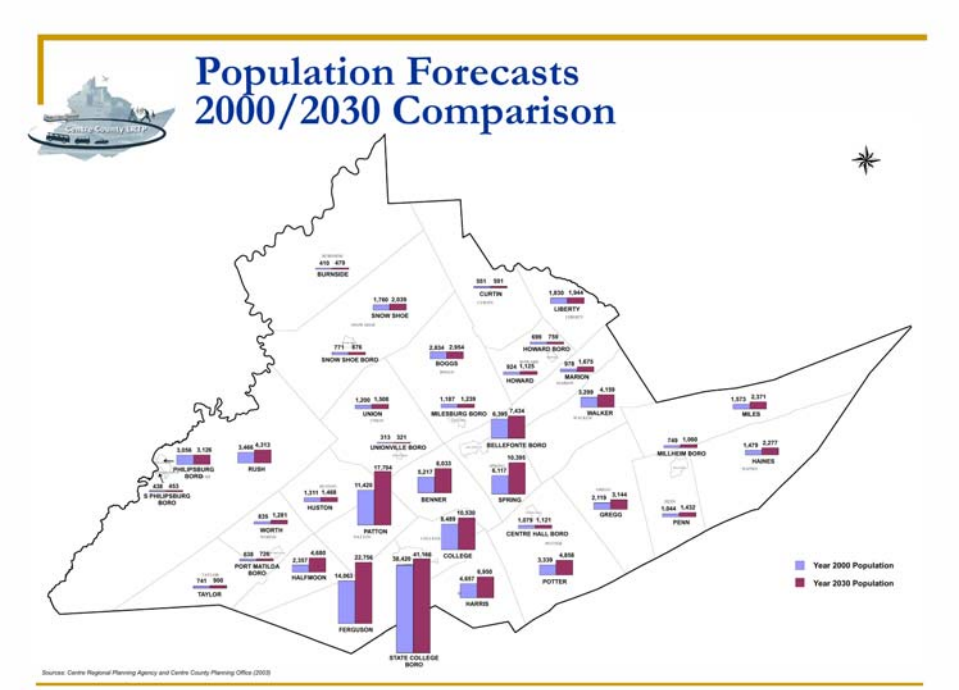
- The University Park Campus has enrollment of approximately 42,000 and exerts a tremendous influence on the economic climate of Central Pennsylvania.
- The proximity to Penn State has fostered the Centre Region's growing reputation as an incubator of high tech companies.
- Penn State's reputation as a pre-eminent research university will continue to bring research dollars to the Region, supporting both university growth and related business expansions.

**Access**

- The Centre Region is within 200 miles of Philadelphia and Pittsburgh and within a day's drive of four of the country's largest metropolitan areas.
- The completion of Interstate 99, the Western Inner Loop (Blue Course Drive), and the future Eastern Inner Loop will further enhance accessibility to, from, and within the Centre Region.
- University Park Airport provides dozens of daily direct flights to and from four major airport hubs and expansion of services is anticipated in the near future.
- High-speed Internet access affords opportunities for home occupations and telecommuting.

In summary, the CRPA expects this region to grow and has created projections for the amount and location of this growth and a visual representation of the population is provided below.

**Figure A2-4** provides an overview of the population growth by location




The CRPA summarized the following information in Centre Region Growth Forecast 2003-2030:

The population of Centre Region according to the US Census was 79,406 in 2000. The population is expected to grow to 85,689 in 2010, 91,972 in 2020, and 98,255 in 2030. By this estimate, the community grows by almost 25% between 2000 and 2030.

**The percentage population growth by municipalities is listed below:**
Ferguson (50%)
Patton (40%)
Harris (45%)
Halfmoon (83%)
College (19%)
State College Borough (4%)

**Housing unit growth by municipalities is listed below**:
Ferguson (~2760 units)
Patton (~1900 units)
Harris (~800 units)
Halfmoon (~700 units)
College (~750 units)

**State College Borough (~600 units)**

Office/Industrial and retail growth in the Centre County Region is expected to grow from 800,000 square feet to 1,400,000 square feet (75%).

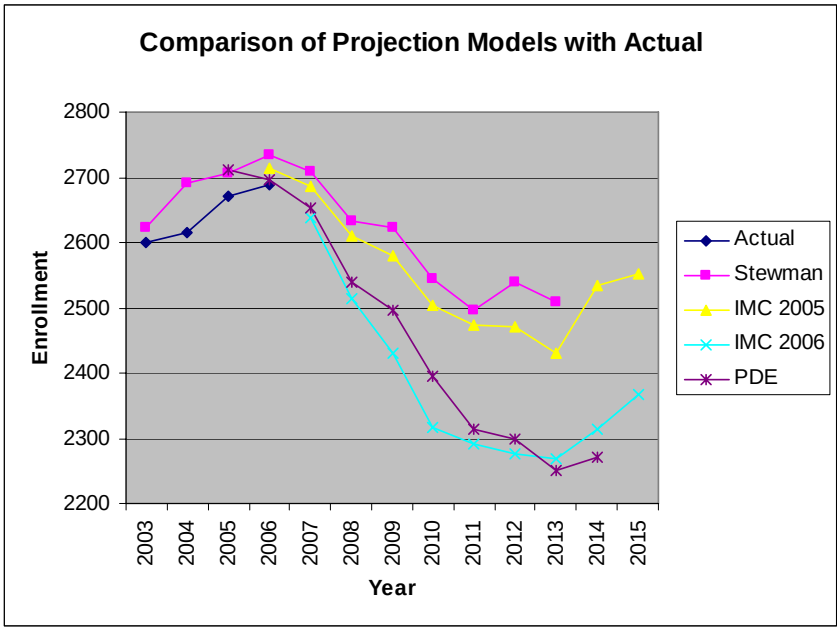
**7c. Issues:**

The bottom line is that the region is growing. This brings up questions about some of the previous projections because migration is not directly taken into account. Limited comment can be provided on the work by the CRPA, as it does not address the relationship between growth and enrollment.

## VIII. Comparison of High School Enrollment Projections:

The summary figures provided below are for clarification and an easy snapshot of the projections.

**Figure A2-5** provides a visual overview of the projections and the raw data in table format




| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actual | 2601 | 2616 | 2670 | 2688 | - | - | - | - | - | - | - | - | - |
| Stewman | 2624 | 2691 | 2707 | 2733 | 2709 | 2634 | 2622 | 2544 | 2495 | 2539 | 2509 | - | - |
| IMC 2005 | - | - | - | 2713 | 2687 | 2611 | 2580 | 2505 | 2474 | 2472 | 2431 | 2535 | 2551 |
| IMC 2006 | - | - | - | | 2638 | 2514 | 2430 | 2317 | 2291 | 2276 | 2268 | 2314 | 2367 |
| PDE | - | - | 2712 | 2697 | 2653 | 2538 | 2497 | 2396 | 2314 | 2299 | 2251 | 2271 | - |

As one can see, the projections can vary by quite a bit depending on the model used and the degree of research employed.

**IX. New High School Assumptions and Projection Issues:**

Based on these projections, the SCASD has decided that the enrollment for the new high school will not exceed the current enrollment. At the November 28, 2006 SCASD meeting, the Facilities Manager stated after a long discussion that the new high school was not designed to accommodate growth. The proposed building will accommodate 2600 students and around 350 staff members. The obvious question for many readers may be: "Why are we spending $100M for a school that has no potential for growth". The purpose of this section is not to answer that question but rather to highlight possible issues. We should review some important points:

- The SCASD states they have four separate sources to confirm the fact that enrollment is decreasing. This is not an accurate statement, as only two out of the four sources appear to have any relevance and validity.

- The two models that used the Cohort approach are dramatically different in the amount of research, detail, and cost ($10K vs. $185). The IMC projection seems best for a short-range snapshot and the Stewman project is best for long-range planning.

- Dr. Stewman was very clear that he could not project possible dramatic changes to the demographics in the district and he recommended the use of strategic surveys as a way to update the model and insure accuracy of the predictions. The board has not acted upon this recommendation and the reason provided was cost. In Dr. Stewman's recommendation, he was clear that this would not be an expensive process.

- None of the projections go beyond the year 2015 and again, are only based on historical data regarding birth rates – not potential future changes in the birth rate.

- None of the projections can predict dramatic changes to the region. Events like the opening of I-99, a new business that brings 1000 employees, or the addition of college programs are not included in any projections.

- The Stewman report is the most comprehensive and is based on the notion that we would have no change in PSU enrollment. Penn State's enrollment is variable and increasing, which is just one contradiction of Dr. Stewman's basic assumption. While Dr. Stewman has excellent methods, again, the level of accuracy is only based on whether the assumptions made hold true – which is not entirely the case for this prediction.

It is important to note several items not taken into account for any of these projections. The actual impact could be large and should be noted even if it may not be entirely possible to quantify the impact at this time.

**9a. Possible Items of Impact:**

- The addition of the Law School at Penn State
- The completion of the I-99 corridor
- The approval of housing development for Circleville Farms
- The approval of Geisinger Health Clinic in the Centre Region
- The recent expansion of the Regional Growth Boundary
- The policy change to allow more PSU freshman to enter University Park

**9b. Conclusion and Recommendations:**

The team is not professing expert knowledge in demographics, however, it does provide important issues for consideration based on business expertise and experience in utilizing this type of statistical information. From an analysis of the demographic projections used by the district, the Team makes the following recommendations:

- SCASD should employ another demographer to conduct an independent study using the most recent information. This analysis should use the full Cohort Component Model and would provide a second valid opinion.

- SCASD should follow the recommendations provided by Dr. Stewman to conduct target sampling. When you hire an expert and use them as a basis for a $100M decision, it makes sense to follow the expert's recommendations to maintain the validity of the projection.

- SCASD should develop a simple program to track enrollment and compare projection accuracy as a way to monitor for possible events causing enrollment changes as the district proceeds with the multiple facility upgrades in the remainder of the District Wide Master Plan.

The proposed design of the school will not allow for additions on the building. This large school - with an enormous financial investment, should provide an option for growth. Schools are long-term investments and it is simply unrealistic to assume that there will always be 2700 students in this high school over the next 30-50 years. The expense of accommodating even minor incremental increases will be extreme and potentially politically and fiscally difficult. The school board may therefore be pressured to fit as many students as possible in the building - for as long as possible - to avoid having to construct another school building.

While demographic studies can be helpful in the short-term, they cannot accurately predict the long-range future. Making a $100 million investment with few options for change in our dynamic and growing community just doesn't make sense.