STRATEGIC DATA PROJECT

SDP FELLOWSHIP CAPSTONE REPORT

Applying the Strategic Data Project (SDP) Toolkit for Effective Data Use

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Strategic Data Project (SDP) Fellowship Capstone Reports

SDP Fellows compose capstone reports to reflect the work that they led in their education agencies during the two-year program. The reports demonstrate both the impact fellows make and the role of SDP in supporting their growth as data strategists. Additionally, they provide recommendations to their host agency and will serve as guides to other agencies, future fellows, and researchers seeking to do similar work. *The views or opinions expressed in this report are those of the authors and do not necessarily reflect the views or position of the Center for Education Policy Research at Harvard University.*

Problem Statement

Leaders and policymakers across the United States are focused on ensuring that students who graduate from high school are college and career ready. Across the nation, discussions center around which interventions, curriculum, assessments, programs, and services are most effective toward increasing college readiness. While one agency may be focused on increasing its graduation rate and identifying where students are falling off track, another may be more focused on helping students gain entry into highly selective colleges. This capstone report addresses how the Strategic Data Project (SDP) Toolkit for Effective Data Use (referred to as the SDP Toolkit) can be applied to data within education agencies to better understand how students are performing within the education pipeline and where critical issues must be further explored with educational leaders and policymakers. Analysis of the education pipeline through completion of the SDP College-Going Toolkit allows agencies to better understand:

1. The transition of students from ninth to tenth grade as a critical juncture for students to stay on track toward high school graduation;
2. High school credit accumulation and rigorous course-taking to prepare students to be college and career ready;
3. Transition between high school graduation to college to explore issues such as "summer melt[1]" and other barriers to seamless college enrollment; and
4. Trends of college enrollment, persistence, and undermatch.

We seek to answer the question, "How can analyzing the education pipeline through the application of a standard set of analyses (such as those included in the SDP College-Going Toolkit) provide actionable insights for districts and state agencies of varying size and geographical location?"

[1] Summer melt happens when seemingly college-intending students fail to enroll in college in the fall directly after high school graduation (Castleman et. al., 2013, p. 6).

Literature Review

Ninth- to Tenth-Grade Transition

The transition from ninth to tenth grade has been identified as one of the key junctions in the education pipeline. Cohen and Smerdon (2009) argue "that every high school reform initiative should include a focus on the middle to high school transition and successfully moving students through ninth grade" (p. 177). The simplest definition of off track is that a student has not earned sufficient course credits according to grade level requirements at any given time within the high school trajectory. Because course credit requirements differ from state-to-state and district-to-district, the particular threshold for being off track also differs[2] widely. Typically, however, to be on track at the end of ninth grade, a student needs to earn at least five full-year course credits and have received no failing grades.

Students who are off track as early as the first or second reporting period of the ninth grade have very little chance of graduating high school (Nield, 2009). In high schools with large low income populations, up to 40% of students drop out after the ninth grade (Cohen & Smerdon, 2009). While attendance, behavior, and course performance have been identified as the predictors of dropping out of high school, course failures trump test scores in the prediction of dropout (Balfanz et. al., 2007). Of the factors identified in the literature, the analyses in the SDP College-Going Toolkit focus on credit attainment in courses that students pass by the end of each grade level. These data are usually easier to access and are more reliable than other possible measures of on-track status by the end of ninth grade (CEPR, 2012a).

High School Graduation

In addition to monitoring the on-track indicator from the middle grades through ninth and tenth grade, it is critical to focus on the type of credits students are accumulating once they get to high school. This helps to ensure that students are more prepared for college success at the time they graduate.

[2] This can make tracking off-track students more difficult at the state level; a state agency would have to either set a standard for credit accumulation, or use distinct districts data sets to calculate off-track status within districts.

Controlling for prior academic performance, the College Board demonstrated that students with strong performance on Advanced Placement (AP) exams are more likely to persist in college than peers who did not take an AP exam (Mattern et al., 2009). In addition, scores on AP exams are correlated with first year college GPA, even after controlling for prior academic performance (Shaw et al., 2013). A more recent study reports that taking one AP exam increases chances that a student will enroll in a four-year institution by 171% compared with students who took no AP Exams (Mattern, et. al., 2013).

The evidence is less clear for students who simply enroll in rigorous coursework, although some studies suggest there could still be benefits. Adelman (1999) found that the single best predictor of college graduation is the rigor of high school coursework. While the research does not suggest that taking rigorous coursework causes greater college persistence, the pursuit of rigorous coursework in high school, particularly when paired with college credit accumulation, is associated with higher college enrollment and persistence (Access to Opportunity, 2013).

College-Going: Enrollment Undermatch & Persistence

College enrollment undermatch. Careful preparation is required to assist high school students with college applications and eventual enrollment. Much work goes into helping students translate academic qualifications into college aspirations. Gaining a better understanding of which colleges a student is qualified to attend is critical to appropriately matching students with an academic institution. Therefore, it is essential for educators and policymakers to examine college-going undermatch for highly academically prepared students who attend less selective institutions or do not enroll in college at all (CEPR, 2012b).

Although students across socioeconomic and ethnic groups undermatch, many low-income and/or minority students with high academic qualifications often lack knowledge of and struggle with the college application and enrollment system (Roderick et. al., 2011). Some factors that may lead students to enroll in college with less selectivity than colleges they are capable and eligble to attend include: ACT and SAT exam taking and scores, enrollment in rigorous coursework, visitation to colleges, guidance from educators, and college and financial aid applications (Plank & Jordan, 2001). The SDP College-Going Toolkit analyses identify

undermatched students with data readily available to many school districts by comparing a students' academic performance (i.e., SAT and GPA) to the selectivity of colleges through the Barron's College Rankings (CEPR, 2012b).

To influence the postsecondary outcomes of students, educators must first understand the students' likelihood of enrolling in particular colleges (Roderick et al., 2011). Then as students and families embark on choosing the college that is the best academic and social fit, the colleges identified will maximize a student's chance of college completion as it has been shown that undermatched students persist in college at lower rates than their better-matched peers (CEPR, 2012b).

College persistence. Although the SDP College-Going Toolkit uses the term "College-Going" pathway, college enrollment does not mark the end of the path. The journey continues until all course requirements are completed and a student earns a college degree. Examination of college persistence allows educators to understand college success in the years beyond initial enrollment.

Unfortunately, many students never finish college and earn their degree. Therefore, it is essential to better understand the factors that impact college persistence. A nation-wide study completed by the National Student Clearinghouse (NSC) demonstrates the impact of factors such as enrollment intensity (full-time vs. part-time) and type of starting institution (two-year vs. four-year institutions) on college enrollment, persistence, and degree completion (Shapiro et. al., 2012). Research by Goodman et al. shows that access to four-year colleges, rather than two-year colleges, increases degree completion, especially for low-income students (2015). Other important predictors of college enrollment, persistence, and degree completion from a student's high school trajectory include: access to academically rigorous courses (i.e., AP), high scores on the SAT and ACT exams, and very good course grades (Bowen et al., 2009). A study conducted by the U.S. Department of Education (2001) noted that students who completed a rigorous high school curriculum, including at least one advanced placement class or test, were more likely to remain on track to receive a bachelor's degree (86.6%) compared with students completing only the core curriculum or less (61.9%).

The influence of these factors help educators examine patterns of persistence to the second year of college and identify early indicators of student progress toward college degree attainment. The SDP College-Going Toolkit assists with exploration of college persistence rates at two-and-four year colleges through connecting cohort-based, student-level data from an education agency to historical college enrollment data from the National Student Clearinghouse.

Case Study: Michigan Department of Education (MDE)

Agency Profile

The Michigan Department of Education oversees 905 school districts and more than 3,500 schools across a large range of contexts. In 2013–14, there were approximately 1.5 million students, nearly half of whom (48%) were classified as economically disadvantaged. The state is fairly diverse: 18% African American, 3% Asian, 6% Latino, 3% multiracial and 69% White. The distribution of students within the state, however, is often such that individual schools and districts are not as diverse.

The overarching mission of MDE is that "all students graduate ready for careers, college, and community". The graduation rate in 2013 was 77%, but assessment results call into question the college readiness of many of the graduating students. Only 20% of students met the ACT composite college readiness benchmark and only 17% achieved proficiency status in all subjects on the 11th grade assessment.

To help better integrate data and research and achieve college readiness, MDE launched a strategic research initiative in 2013 that included participation in the Strategic Data Project (SDP). Through the initiative, three fellows joined Cohort 5. Dan Leeds and Shannon Stackhouse Flores are Education Research Consultants in the Office of Evaluation, Strategic Research and Accountability, focusing primarily on achievement gap and educator preparation research.

Policy/Research Question

In the recent shift from being a compliance-oriented organization to being a support-oriented organization, questions related to programming have increased in relevance at MDE. Participating in SDP is one initiative that seeks to use the rich data resources of the state to

answer research questions related to the strategic priorities of the state. The impetus to replicate the College-Going Toolkit has come primarily out of the achievement gap research agenda. To unravel programmatic differences that might contribute to the differences on summative standardized test scores between African American and economically-disadvantaged students and other students, recent research and data work has focused on rigorous course taking patterns. The Toolkit offered the opportunity to apply a set of standard analyses to subsets of state data, and provide a concrete, tangible work product to represent the contribution of the fellowship. In addition to the analyses themselves, the dataset is perhaps the first attempt at MDE to combine disparate data sources into one analysis file.

MDE is fortunate to have, in addition to an in-house accountability unit, a full separate agency—the Center for Educational Performance Information (CEPI) that provides standardized data according to well-defined and documented business rules. The database people at CEPI, however, are quite separate from the daily work of educators and schools, and from the programmatic work carried out by offices within MDE. The role of the SDP Fellows has been to bridge the gap between educational database creation and the use of educational data to inform research questions. Going through the toolkit allowed the recoding, exploring and linking of data in ways not previously conceived.

The specific questions addressed in this toolkit project are:

1. What do college graduation and high school enrollment rates look like by district within the state of Michigan?
2. How do high school graduation and seamless college enrollment compare between students engaged in rigorous coursework and students who are not?
3. How are these patterns different for subgroups?

The issue of rigorous coursework is not directly addressed in the original SDP Toolkit and was accomplished through additional coding, demonstrating the flexibility and usefulness of the toolkit in providing skills and graphics that can be adapted for other purposes.

Project Scope and Timeline

MDE has a strong foundation for data collection, management and sharing through a public web portal. In addition to the robust structure at CEPI, there are strong research

partnerships through the University of Michigan and Michigan State University. However, the full-time in-house dedicated research resources are few. The two fellows were brought in August and September of 2013 and placed over the research areas of educator effectiveness and the achievement gap. As mentioned, this College-Going Toolkit capstone project has evolved out of the achievement gap work. Over the course of the first year of the fellowship, most time was devoted to learning Stata and working with assessment and accountability data to identify gaps. Both fellows were also involved in training of other staff in research and data use, as well as working with and documenting issues with the major state data sources.

During the summer of 2014, two interns from the University of Michigan worked with the CEPI-housed Teacher Student Data Link (TSDL), taking a first pass through the data set with the major goal of putting it into a workable, research-ready data set to later be used by MDE researchers. The TSDL is the primary source of course taking data. It has been in existence for three years and provides linkages between individual students, high school coursework, teachers and grades/credits. Naturally, it is a massive database. There were frequent conversations between CEPI, the interns, the fellows and accountability leadership to understand and provide feedback on the TSDL as this was the first attempt to use to the data for research purposes. The research questions themselves had been generated in conversation with the entire leadership team (all directors and assistant directors) of MDE and reflected the questions of greatest interest to the department as a whole.

The interns' preliminary work found numerous inconsistencies and missing data in the TSDL, particularly within the SCED used to classify courses and correspondence between grades and credits. The issues that they found were relayed back to CEPI for future consideration. Since the TSDL is the only source of course information and one of the few fairly complete sources of data outside of summative state assessment results, there was a desire to attempt to use it to answer questions regardless. The interns cleaned the TSDL to facilitate manipulation. The SDP Fellows then took their work and modified the code to create a file that answered questions about AP course taking. In addition to being a smaller, more manageable subset of the TSDL data, it was assumed that the AP SCED codes would be more accurate than some others, because the course titles and classification of AP courses are so specific.

The immediate impetus for using the AP data was the requirement to produce an AP brief using the TSDL. Portions of the SDP Toolkit code were used to transform and link eighth-grade test scores to the TSDL, and to merge both of these with AP exam information from the College Board. To tie the AP work more closely to the capstone project AP participation was aligned to high school graduation and postsecondary outcomes. Incorporating the postsecondary piece provided an additional benefit as CEPI is in the building stage of a postsecondary database/information map to be used by internal and external researchers. This particular database combines NSC and STARR data, based on business rules used by our partner researchers as well as input from the fellows. The graphs produced by the Toolkit will be an excellent deliverable demonstrating the possible uses of postsecondary data. Results may also be incorporated into the web portal as dashboards. The work also forces the conversation to clarify questions such as: What constitutes a seamless enroller in the CEPI postsecondary data?, where those definitions differ from those in the Toolkit.

Results were graphed in April 2015. A next step will be to gain traction with program offices, particularly the Office of Education Innovation and Improvement (OEII) and possibly the School Reform Office (SRO. Given the experimental nature of the TSDL data and the CEPI postsecondary data, from a data quality perspective, it would be beneficial to partner with a district to see how well the information produced by the state systems matches the information that they have collected locally.

Results and Impact

In addition to running the standard Toolkit analyses, with variations appropriate to Michigan state data, several analyses were modified to incorporate outcomes by AP course participation and passing of AP exams:

- College enrollment by race (AP students only)
- College enrollment by status (using AP participation rather than Economically Disadvantaged status)
- High school graduation by race (AP students only)
- Student progression from ninth grade through college (using AP participation rather than Economically Disadvantaged status)

- Student progression by race (AP students only)

For the Capstone, data from one district were used to conduct the Toolkit analyses.

To make the data more congruent with what CEPI publishes in the MiSchoolData public portal and thus more digestible to users, only one graduation cohort was chosen (2013). AP data was also restricted to 2013. The graphs in this poster are subset of the AP-specific analyses produced.

Rigorous course taking and the college-going pipeline. AP courses are one of three options for enrolling in rigorous courses in Michigan. Students enrolled in at least one AP class graduated on time and enrolled in college within six months of high school[3] at a higher rate than non-AP students (see Appendix A). Compared with the standard Toolkit analyses, the Michigan analysis currently lacks an indicator for persistence into the second year. This might be added in future iterations depending on the interest of the program offices, particularly OEII.

As in most studies of AP course taking, selection bias can impact results: there is certainly a strong bias for stronger and more college-motivated students to take AP courses to begin with.

Seamless college enrollment rates by AP course status. The Toolkit contains code to create a graph comparing college enrollment rates for seamless enrollers by prior achievement (by quartile of eighth-grade test). The code was modified to compare students who enrolled in an AP course with those who did not. As apparent in Appendix B, there is a difference between these two groups at each school, with the percentage of high school graduates enrolling immediately in college six to twelve percentage points lower for students who did not enroll in an AP course their senior year.

College attendance by race among students passing AP tests. Appendix C is an adaptation of the Toolkit analysis for highly qualified students attending college by race. Unlike the previous two figures, the indicator used for this figure was students passing at least one math, science or English language arts (ELA) AP test. When these data are released to districts and the public, cells will be suppressed for any groups with fewer than 10 students. In this sample graph, since no district information is provided, African-American and Hispanic students

[3] "Enrolled within six months" is the MDE/CEPI indicator for seamless college enrollment.

are included despite being minimally represented in the population that passed AP tests. As evident in the figure, there are some racial disparities. By percentage, only 58% of African-American and 50% of Latino AP-passing students enrolled in four-year universities. Additionally, only 12 African-American and six Latino students in the sample district passed any AP tests to begin with, compared with far more White and Latino students.

The impact of this information on stakeholders is yet to be determined, but the overall impact of having been able to go through the Toolkit process using state data is tremendous. In addition to having been the basis for mastery of Stata for the fellow, the range of visualizations and the ability to adapt them as shown in this capstone, provides limitless opportunities for future data presentation within the agency and beyond.

Case Study: Nassau Board of Cooperative Educational Services

Agency Profile

The Nassau Board of Cooperative Educational Services (BOCES) provides cost-effective instructional programs and services to the residents of Nassau County, New York. Situated approximately 20 miles east of Manhattan, Nassau BOCES provides close to 100 different programs and services operating in nearly three dozen locations. The primary beneficiaries of these programs and services are the 56 individual public school districts serving Nassau County. Nassau's public school districts operate over 300 schools and are responsible for educating over 200,000 students. Roughly 44% of Nassau's students are non-White, with 23% eligible for free and reduced-price lunch (FRPL). Although most districts in Nassau County have FRPL rates under 20%, some have rates as high as 90% (NYSED, 2014).

Although Nassau BOCES has been in existence since 1967, the concept of cooperative educational services was created by New York State legislation passed in 1948. The goal of this legislation is to help smaller schools and districts lower costs by pooling resources and sharing expenses. Instead of each district creating separate programs for a limited number of students with similar specialized needs, they can share a centralized program that will be much less costly. Nassau BOCES is the largest of 37 BOCES operating across New York State with more than 4,000 full and part time employees.

In addition to providing instructional services to students, Nassau BOCES also allows districts to share the cost of technology hardware, software and services through the department of Curriculum, Instruction and Technology. One such service is the Instructional Data Warehouse (IDW) which provides a variety of reports and dashboards based on data collected from multiple sources. The IDW has traditionally focused on summative assessments, including Grades 3–8 ELA and math assessments, high school end-of-course Regents exams, and specialized assessments such as the New York State English as a Second Language Achievement Test (NYSESLAT). Fellows Brandi Holten-Bakshi and Jeff Davis, under the supervision of Dr. Valerie D'Aguanno, have partnered with the Strategic Data Project to expand the types of data and analyses provided to member districts.

Policy/Research Questions

Since the early 2000s, the Nassau BOCES Data Warehouse has collected, cleaned, and stored data to send to the New York State Education Department (NYSED) for state reporting purposes. Nassau BOCES has created and currently designs reports from data required to be collected for the state. These reports help member districts make informed curricular and instructional policy decisions.

When Nassau BOCES partnered with SDP in 2013, they sought to transform data usage in education to improve teacher, student and school achievement by using the SDP College-Going Toolkit as a tool to:

- expand existing reports and the types of analyses provided to the member districts,
- build algorithms and clean-up routines to be used with existing data sources,
- connect data to bring disparate systems together, and
- provide robust analyses of student-level data to tell a story, and organize thinking about how to answer policy research questions specific to member district needs.

Questions specific to college-going data have been on the mind of many education leaders and policymakers at the local and state levels in New York. NYSED released the "Where are They Now?" reports in late 2014 as a review of college readiness and postsecondary outcomes in two-and four-year colleges and universities (Wagner, 2014). This report prompted much discussion across Long Island about the pros and cons of using National Student

Clearinghouse (NSC) data to better understand what happens to high school students upon graduation (Hildebrand, 2014).

Conversations between the Nassau BOCES, NYSED, NSC, and local school districts showed the promise of using NSC Student Tracker data to show a fuller, albeit partial, picture of college-bound student data and trends. Many districts pointed out that not all students are correctly matched in the NSC tracker database. NSC provided the following reasons for missing or incomplete data related to college enrollment for high school graduates: 1) not attending a postsecondary institution, 2) not attending a National Student Clearinghouse member institution, 3) invocation of their FERPA rights, and 4) data impurity (Leake-Campbell, 2015). Several districts in Nassau County have responded to these missing data by asking leaders and guidance counselors to directly follow-up with students and families to find where they enrolled and persisted in college.

As a result of college-going analyses by Nassau County local school districts, there has been a shift in the data climate and culture. Many districts became interested in understanding college enrollment and persistence trends connected to the education pipeline with questions such as: What percentage of previous cohorts of high school students seamlessly enrolled in college? Of the high school students who seamlessly enrolled in college, how many of them persisted into a second year of college at a two-or four-year institution? Lastly, what are some indicators of college readiness? Nassau BOCES decided to meaningfully analyze these questions relevant to our member districts by piloting the SDP College-Going Toolkit for Effective Data Use ("SDP Toolkit") with three districts of varying demographics and academic performance.

Project Scope and Timeline

Although the main focus of Nassau BOCES's research was on college enrollment and persistence, disparate districts could benefit from the various analyses along the entire college-going pathway. For this reason, the fellows sought to collect the data needed for all phases of the SDP Toolkit. Nassau BOCES has long been a believer in the principle of guided analysis—using data reports and charts to help guide a user through the story being told by data. In fact, the Nassau BOCES IDW is an excellent reporting tool that provides district administrators and teachers with first-rate analyses of student demographics and assessments. BOCES leadership

felt that the SDP Toolkit would be a wonderful compliment to the IDW by examining the college-going pipeline.

Luckily, much of the data were available directly from the Nassau BOCES IDW. The familiarity BOCES staff had with this data set was extremely helpful in locating many of the necessary data elements required by the Toolkit. Unfortunately, the IDW did not contain *all* data elements needed. Much of the additional data items could only be found in each district's student management system (SMS). It was also unfortunate that Nassau County's public schools are not required to use a unified student management system. At the time of this project, there were five different student management systems in use by Nassau County school districts. Identifying where to obtain additional data elements from all of these systems would be extremely challenging. So, three pilot districts, all using different SMSs, were selected. However, even limiting the pilot to three districts would still require additional help.

The greatest challenge faced by the BOCES team was simply gaining access to any district-controlled data, including SMS databases. The fellows involved in the project did not have the necessary relationships with key stakeholders inside the districts, so they turned to their supervisor Dr. Valerie D'Aguanno, Assistant Director of Curriculum, Instruction and Technology. Dr. D'Aguanno was instrumental in providing the fellows with access to both district data and staff. Due to her relationships with Nassau County public school superintendents, Dr. D'Aguanno was able to help the fellows gain access to the right people inside the school districts. Also contributing to the project was the BOCES Student Management team who helped the two fellows gain valuable insight into the various data systems used by districts, and the BOCES State Reporting team, who helped navigate the guidelines of state reporting and accountability.

An initial introductory meeting was held with administrators from the selected pilot districts to provide an overview of the project. Administrators appointed members of their staff to work with the fellows, who all met for a kickoff meeting one month later. The main objective of this kickoff meeting was to identify all of the data elements that were unavailable from the IDW and to map out where they could be obtained from district data sources. Over the course

of the following few months, both BOCES and district staff worked together to collect and clean these data.

Although the initial goal was to collect as many data elements as possible, the scope of the project changed when it became apparent that both district and BOCES staff had too many other demands on them to meet the aggressive timelines originally set. While the axiom "What gets measured gets done" is usually true, "What gets collected for State accountability gets done above all else" is gospel. The BOCES team re-assessed the project goals and decided to redefine indicators such as "on track to graduation" and "highly qualified students" based on data already being collected by state mandate. Specifically, course credits and GPA proved difficult to come by, and the BOCES team realized that this could be a roadblock when selected analyses were expanded to all districts. Since New York State requires students to pass a series of end-of-course assessments (Regents exams), and these assessments have been collected by BOCES for many years, both Regents credits and SAT scores were used in lieu of course credits and GPA. These adaptions made data collection a bit easier, but required more work to customize the SDP Toolkit model.

The initial phase of this project included application of the SDP Toolkit to our districts' data and analysis of college enrollment and persistence. The long term goal, however, is to incorporate these analyses directly into Nassau BOCES IDW. The SDP Toolkit produces a series of charts using Stata, and while functional and informative, Stata lacks the ability to be run directly by our users on a large scale. In addition, any manipulation of the data (sorting, filtering, etc.) requires coding changes instead of relying on a simpler graphical user interface. Phase two of this project, while not complete at this time, will involve merging the toolkit analysis file into our existing reporting model so that we may provide a more customized experience to our users.

Results and Impact

The results of the SDP Toolkit were shared collaboratively with the three pilot districts. As we previously explained, our three Nassau County pilot districts, which for the purposes of this report will be called District A, B, and C, were very different in terms of race/ethnicity, socioeconomic status, and academic performance. The primary benefit of using the SDP Toolkit

was to have a base codebook with logic for conducting sophisticated education pipeline analyses that brought together multiple tables from our data warehouse. This logic was tweaked to fit Nassau BOCES and New York state business rules.

When we met with the three pilot districts to review gaps and trends in the data for two of their high school graduating cohorts (2009–10 and 2010–11), they were provided with analyses that looked at the education pipeline from ninth- to tenth- grade transition through persistence into the second year of college. Nassau as a whole is one of the highest performing counties in New York State. The on-time high school graduation[4] rate for the 2009–10 graduating cohort was 88% compared to 73% at the state (NYSED, 2015). Despite relatively high on-time graduation rates, there are still some districts in the county that have graduation rates among the lowest the state. However, most of our districts are focused on seamless enrollment[5] and/or college persistence.[6]

In looking at the progression of the 2006–07 and 2007–08 ninth-grade cohorts[7] through on-time graduation to the persistence in the second year of college, approximately 90% of Nassau County students graduated from high school within four years. However, only approximately 71% of these ninth graders seamlessly transitioned to college and 65% persisted into a second year of college (see Appendix D). Approximately 30% of the Nassau County high schools[8] had a seamless enrollment rate lower than the county and 40% had a persistence rate lower than the county.

Of the Nassau County seamless enrollers who persisted into a second year of two-and-four year colleges, 83% who started at a two-year school persisted into a second year and 99% who started at a four-year school persisted into a second year at any college (see Appendix E). Even among the three pilot districts, the persistence rates were higher for students who seamlessly enrolled in a four-year college than a two-year college. Our research using logistic

[4] On-time high school graduation is defined as graduating within four years or less from the start of ninth grade.
[5] Seamless transition into college in this study is defined as enrolling in college by October 1st after graduation from high school.
[6] College persistence in this study is defined as returning to college for a second year.
[7] Ninth grade cohort is defined as students who were enrolled in the high school in ninth grade and were continuously enrolled for all four years.
[8] There are 44 public high school districts in Nassau County. Within the 44 Nassau County districts containing high schools, there are 58 high schools. However, for this analysis, 57 high schools are included.

regression fitted probabilities showed that Nassau County students who seamlessly enrolled in a four-year college had a 95% chance of persisting into the second year; whereas, students who seamlessly enroll in a two-year college had an 80% percent chance of persisting into a second year. An additional key component of this analysis is that students who seamlessly enrolled were persisting in a second year of college and switching between two- and four-year colleges at equal rates in Districts A & B, but District C had a higher percentage of students switching from a four-year to two-year college. No students in District C switched from a two-year to four-year college. For all of the three pilot districts and the County, the data show that seamless enrollers have a greater chance of persisting into a second year of college if they attend a four-year college.

In addition to looking at persistence rates between seamless enrollers at two-year and four-year colleges, we wanted to be able to determine some high school indicators of college readiness. The unmodified version of the SDP Toolkit uses GPA, SAT, and course credits to create the on-track and highly qualified key indicators. As previously explained, we were unable to easily collect GPA and course credits from our pilot districts. As a result, we used the Aspirational Performance Measures (APM)[9] and SAT scores as stand-alone measures of highly qualified[10] and Regents exam credits earned by the end of ninth grade to measure on track[11]. These highly qualified and on-track metrics were used at Nassau BOCES as indicators of college readiness.

[9] Aspirational Performance Measures are used to define college readiness and defined as receiving an 80 or greater on a Math Regents exam and 75 or greater on the ELA Regents exam. New York State Education Department has adopted these APM benchmarks to assess college and career readiness. For additional information on the APM benchmarks, please read this NYSED memo: http://www.p12.nysed.gov/irs/pressRelease/20110614/GradRatesRelease-FINAL.2011.pdf.

[10] Highly qualified is defined as obtaining a cumulative SAT score on the Math and Verbal sections of greater than or equal to 1,100. The combined score of 1,100 falls within the range required for a student to be eligible to attend a four-year competitive institution according to the Barron's Selectivity Index (Barron's, 2014).

[11] On track in ninth grade in this study is defined as receiving at least one Regents credit in science. Most students in enroll in a Regents science course before they complete ninth grade. Generally, students need at least five Regents exam credits, including science, math, Global Studies, ELA, and US History, in order to receive a high school diploma. For more information, please visit the NYSED web page: http://www.p12.nysed.gov/ciai/gradreq/May2015GradReq3columnPathwayNotation.pdf.

Indicator: "On-Track" by the End of Ninth Grade Using Regents Exam Credits Earned. Students who graduated on time and were on track by the end of ninth grade were more likely to seamlessly enroll in college and persist into a second year of college.

- On-time graduates who were on track by the end of ninth grade had an approximately 84% chance of seamlessly enrolling in college. Of those seamless enrollers, there was a 93% chance of persisting into a second year of college.
- On-time graduates who were on track by the end of ninth grade were 27% more likely to seamlessly enroll in college than students who were off track. Of the seamless enrollers, students were 15% more likely to persist into a second year of college than those who were off track.

Using the APM metric to analyze the relationship between this college and career readiness benchmark and being on track by the end of ninth grade, we found:

- 72% of on-time graduates who were on track by the end of ninth grade met the APM target, compared to 10% of on-time graduates who were off track (see Appendix F).
- Students who were on track by the end of ninth grade were 62% more likely to meet Math and ELA APM than the students who were off track.

Indicator: Highly Qualified, Using APM in Math and ELA. Students who graduated on time and met APM, a college and career readiness benchmark, were more likely to seamlessly enroll and persist in any two-or four-year college.

- On-time graduates who seamlessly enrolled in any two-or four-year school and also met APM in both math and ELA had an approximately 87% chance of seamlessly enrolling in college. Of those seamless enrollers, there was a 93% chance of persisting into a second year of college.
- There was an 11% gap between the second year persisters who met APM and those who did not meet APM. 95% of students who met APM persisted into a second year of any college, while only 84% of students who did not meet both APM measures persisted (see Appendix G).

Further, students who graduated on time, seamlessly enrolled in college, and met APM were more likely to seamlessly enroll and persist in four-year colleges specifically. Our data showed that:

- 85% of on-time graduates who met the combined APM target seamlessly enrolled into a four-year college, compared to only 39% of students who did not meet the combined APM target.
- For the students who graduated on time and seamlessly enrolled in college, there was an 11% gap between students who met APM and persisted at a four-year rather than two-year college. Ninety-six percent of students who enrolled into a four-year college and met APM persisted into a second year, compared to only 87% of students who did not meet APM (see Appendix G).
- Students who graduated on time and met APM both in math and ELA were 51% more likely to seamlessly enroll in a four-year rather than a two-year school.

Indicator: Highly Qualified, Using a SAT Threshold of 1,100 or Higher. Highly qualified students who graduated on time were more likely to seamlessly enroll and persist into a second year of college.

- On-time graduates who had a SAT score greater than or equal to 1,100 had an approximately 89% chance of seamlessly enrolling in college. Of those seamless enrollers, there was a 96% chance of persisting into a second year of college.
- Not all highly qualified students went on to attend a competitive four-year institution. Our analysis showed that 10.7% of highly qualified students were not enrolled in college, 2.3% were enrolled at a two-year college, and 1.6% were enrolled at an unranked or less competitive four-year college (see Appendix H). Further investigation is needed to determine possible reasons why these undermatched students did not enroll in a competitive four-year institution.

The purpose of sharing analyses like these was not only to get the conversation started, but to better understand what additional research questions the districts had related to the education pipeline. While there were some overlaps in the questions that our pilot districts

asked, many were specific to the needs of each high school. For example, District C has indicated an interest in the impact of their over-aged or mobile student population on high school graduation. District A would like to investigate the impact of rigorous course taking patterns, such as Advanced Placement and honors classes, on college enrollment. And District B wants to research the predictability of state defined Aspirational Performance Measures on college persistence. In the future, we plan to examine such questions for our pilot districts with the goal of analyzing similar data for all 56 Nassau County districts. Over time, we will also be able to expand the analyses from the 2009–10 and 2010–11 graduating cohorts to look at year-over-year differences between cohorts of students for a given high school as well as move beyond college persistence to look at college completion rates.

In addition to conducting further analyses of the education pipeline for districts, we plan to incorporate a modified version of the SDP Toolkit analyses into our existing reporting structure within the Nassau BOCES Instructional Data Warehouse. Once integrated into our reporting structures, districts will be able to obtain these analyses on their own on an ongoing basis. Districts can then use the analyses to facilitate strategic planning of potential professional development supports and interventions.

Another next step for Nassau BOCES is to enter into their own agreement with the National Student Clearinghouse (NSC) with student-level college enrollment data. Currently, Nassau BOCES receives NSC data from the state for free once a year. By entering into a contract with NSC, Nassau BOCES would be able to provide districts with a timelier snapshot of their students' enrollment and persistence patterns up to three times per year. With each year of new data, we will also be able to examine persistence beyond two years of enrollment in college as well as degree completion.

Case Study: Orange County Public Schools

Agency Profile

Orange County Public Schools (OCPS) is the tenth largest school district in the nation and is the fourth largest in Florida. While the vision of OCPS is to be the top producer of successful students in the nation, the district recognizes that such a lofty goal cannot be

accomplished by OCPS alone. Therefore, the mission of OCPS is to lead its students to success with the support and involvement of families and the community. District-wide, all staff strive to ensure OCPS has an intense focus on student achievement, a high-performing and dedicated team, a safe working and learning environment, efficient operations, and sustained community engagement.

In 2014, OCPS was nominated for and named a co-winner of the 2014 Broad Prize for Urban Education, the largest public education prize in the country. The Broad Prize is bestowed upon urban school districts that demonstrate the greatest overall performance and improvement in student achievement while reducing achievement gaps among low-income and minority students.

OCPS serves more than 192,000 students in the 2014–15 school year. The district includes 184 traditional schools and over 50 additional exceptional student education, alternative, career and technical, and charter schools. Orange County is a diverse community and its public schools reflect that diversity. The racial/ethnic distribution of the OCPS student population includes 37% Hispanic, 30% White, 27% Black, 4% Asian, and 2% Multiracial. OCPS is a highly diverse, high-need urban district with more than 64% of all OCPS students eligible for free or reduced-priced meals. Additionally, students come from 197 countries and speak 168 different languages and dialects. The district strives to provide appropriate academic services to all students, and to make sure that they have the education and skills necessary to be successful.

OCPS is also the second-largest employer in Central Florida, with nearly 23,000 employees, including nearly 14,000 instructional personnel. Fellows Brandon McKelvey and Jennifer Sasser work in the Research, Accountability, and Grants Division and have partnered with the SDP to improve the district's capacity to conduct data analyses related to strategic planning initiatives within OCPS.

Policy/Research Questions

Orange County Public Schools (OCPS) is deeply committed to aligning efforts and resources to meet its goal of intense focus on student achievement. For several years, the district strategic plan emphasized both career and college readiness within the division of

Teaching and Learning. Many of the career and college readiness strategies and initiatives previously included in the OCPS Strategic Plan supported the 2010 reauthorization of the Elementary and Student Education Act, which established the national goal that "every student should graduate from high school ready for college and a career, regardless of their income, race, ethnic or language background, or disability status" (U.S. Department of Education, 2010, p. 3). Through business plans and scorecards, the district monitored career and college readiness strategies and initiatives, and reported progress via metrics such as graduation rates, SAT and ACT participation rates and average scores, and enrollment rates in rigorous coursework. However, the district did not systematically track students' progress beyond high school.

Participation in SDP allowed OCPS district leadership to better understand the data, research, and resources available regarding college-going analyses. The introduction to the SDP College-Going Toolkit generated a desire to pursue access to National Student Clearinghouse (NSC) data to gain an understanding of what happens to high school students following graduation; this data had not previously been used by the district. Conducting analyses to determine the proportion of graduating students attending a postsecondary institution can help monitor how well OCPS prepares students for college. These standardized analyses can also assist school and district leaders to further assess current performance, set goals, and make improved, strategic, and systematic curricular and instructional decisions regarding career and college readiness.

According to Kena et al. (2014), approximately 66% of high school graduates nationwide enroll in college in the following fall. This percentage is significantly lower when considering income and ethnicity. In previous generations, a high school diploma could open doors to skilled jobs; today, a higher education and postsecondary track is essential for a good job and living wage. While graduation rates for OCPS are publicly known and comparative analyses with other large urban districts in Florida are regularly conducted, connecting student-level longitudinal data to corresponding college enrollment data has not been explored or shared yet. Analytic results generated by the SDP College-Going Toolkit would transform practices by allowing OCPS to better inform district and school leaders about college enrollment rates and

identify potential areas for action to increase students' levels of academic achievement, preparedness for college, and postsecondary success.

The school district is currently developing its new five-year strategic plan, OCPS 2020. Career and college readiness has again been identified as a division priority. The college-going analyses will allow leaders at the school and district level to better understand college enrollment and persistence trends within the education pipeline. Questions as to how enrollment rates for two-year and four-year colleges differ across the district will be answered using the SDP Toolkit. Leaders will also be able to investigate any differences that may exist for subgroups when analyzing postsecondary enrollment rates.

Project Scope and Timeline

During the course of the SDP partnership, both fellows in OCPS worked collaboratively to provide support to the district in the areas of research, evaluation, data analysis and strategic planning. While attending the initial SDP workshop in October 2013, OCPS district leaders learned about the work conducted by previous cohort agencies and were eager to engage fellows in replicating analyses included within the SDP College-Going Toolkit for Effective Data Use. Results from these analyses, as well as the research articles and studies provided through the SDP workshops, can be used to inform strategic planning efforts aligned with the preparation of students for postsecondary success. The SDP Toolkit can empower district leaders to more effectively collect, clean, and transform data to conduct college-going analyses that would reveal key trends within OCPS. The analyses and data visualizations provided through the toolkit can offer a new platform for discussions and springboard further research regarding career and college readiness initiatives.

During the first year of the SDP Fellowship (2013–14), considerable time was dedicated by OCPS agency fellows to learning STATA and understanding best practices regarding data management as well as coding practices designed to facilitate shared analysis and transparency. The SDP Toolkit provided a framework for improving the analytical capacity of the agency fellows as well as for increasing their statistical programming knowledge. The skills needed to complete the toolkit were acquired through SDP colleague collaboration in weekly phone calls and webinars, attending a STATA boot camp conducted by an SDP alumnus, and

participation in online STATA courses and SDP workshops. Throughout the first year, OCPS fellows worked with SDP colleagues to work through, modify, and share code among agencies, identify lessons learned through the toolkit using the SDP sample dataset, and understand rules applied to the data so that analyses could be relevant to agency needs.

The SDP Toolkit also helped the fellows identify essential data elements for analysis across the organization. Using the toolkit required the fellows to identify and collect data from multiple databases, including information from locally stored graduation cohort files, the Enterprise Data Warehouse (EDW) and the Student Management System (SMS). Fortunately, most of the data were available directly through the EDW to which the fellows had access. However, the fellows also worked with district leadership to acquire data through the National Student Clearinghouse (NSC). Since these data had not been utilized by OCPS prior to this project, fellows worked for several months with various departments including Finance, Procurement, Legal, and Information, Communication and Technology Services (ICTS) to secure funding, sign contracts, and establish data agreements with NSC.

The second year of the fellowship (2014–15) was dedicated to carrying out the SDP Toolkit with OCPS data to use analyses as part of the district strategic planning process. The fellows met with the superintendent, deputy superintendent, and associate superintendent for Research, Accountability and Grants to discuss the information learned at the SDP workshops, determine the scope of the project, and understand the vision and direction of the work to be conducted. The leadership expressed an interest in further exploring and examining the college-going pipeline, specifically the transition from high school to college

In the first semester, agency fellows identified and collected all data necessary to complete the toolkit. Collecting and cleaning the data proved challenging and took several months to complete. For example, grade point averages were not stored in the OCPS EDW, resulting in a delay and requiring fellows to submit a data request through ICTS to gain access to this information. Additionally, graduation cohort files including graduation codes were not stored in the EDW and had to be merged with other required toolkit data. During the year, the fellows translated the code by replacing SDP variable names and labels with those commonly known and used by other district analysts. This rewriting of code will allow for the analyses to

be replicated within OCPS in the future and more easily understood by educational leaders and agencies across the state of Florida. Several rules and decisions within the SDP code needed to be modified in order to align with district and state reporting and accountability guidelines. Initial analyses were conducted to determine the two- and four-year college enrollment rates of students graduating from OCPS high schools, and seamless enrollment of students who went to college the fall after graduating from high school were also compared to delayed enrollers across the district.

To build OCPS capacity to conduct future analyses, the fellows worked with district leaders to expand the use of STATA within the organization. Additional licenses were purchased for administrators in the Program Evaluation and Accountability, Research, and Assessment (ARA) departments. These departments had primarily used SPSS and a majority of the staff did not use code to conduct and run analyses. Multiple professional development sessions were offered in the spring so that analysts could practice new skills and apply newly acquired knowledge to current projects. The SDP fellows also invited other SDP agencies in the state of Florida to participate in these sessions in order to collaborate and share resources.

At the project's outset, the goal was to complete all of the analyses included within the SDP College-Going Toolkit to better understand college enrollment and persistence of OCPS graduates. The scope of the capstone project was modified, however, when fellows were tasked with additional assignments in the second year to support and facilitate a refresh of the five-year strategic plan for OCPS. As part of the new strategic planning process, fellows facilitated meetings where various stakeholders from the district developed new division priorities by examining research, reviewing data, eliciting and studying stakeholder feedback through a Strengths, Weaknesses, Opportunities, and Threats (SWOT) matrix, conducting a causal analysis using fishbone diagrams and five Whys, and examining district and state comparisons. Ensuring career and college readiness emerged as a priority and focus area for the next five years. SDP fellows provided the working group for this priority with preliminary results from some of the toolkit analyses, as well as research articles and resources provided through the SDP Fellowship. This information allowed the working group to identify high-leverage

strategies for the business plan development and determine metrics for measurable objectives on the district scorecards.

Although all of the analyses within the SDP College-Going Toolkit were not completed, OCPS will be able to use the cleaned data to conduct future analyses regarding career and college readiness that specifically address identified areas of concern through the strategic planning process. The agency fellows will share NSC data with guidance directors and high school guidance departments to identify college-going trends and utilize lessons learned from other SDP cohorts to explore potential best practices and strategies to improve college-going rates.

Results and Impact

The initial goals for completing the SDP College-Going Toolkit in OCPS were to better inform district leaders about college enrollment rates of high school graduates and to identify potential areas for action to increase students' levels of academic achievement and preparedness for college. Conducting these analyses would inform strategic planning efforts to ensure career and college readiness and to move beyond utilizing high school graduation rates as the only indicator of postsecondary preparedness. Deploying the SDP College-Going Toolkit could also provide a greater understanding of college-going rates, as well as identify areas for opportunity to ensure more OCPS graduating seniors successfully enroll in college.

The agency fellows completed analyses of college enrollment rates across all 19 traditional high schools within OCPS. These analyses provided, for the first time, a snapshot of college enrollment to help understand patterns of college-going rates for high school graduates. Information regarding preliminary results was initially shared with the associate superintendent of Research, Accountability, and Grants and was later used during the strategic planning refresh process. Graphs were provided to leadership with district averages of overall enrollment to show trends over time. Additionally, visual depictions of two-year and four-year college enrollment rates for three graduating cohorts were portrayed for each high school using a bar-chart comparison available in the SDP College-Going Toolkit (see Appendix I).

Findings illustrated the extent to which two-year and four-year enrollment rates differed by high school attended. Analyses were run for three high school graduating cohorts

(2010–11, 2011–12 and 2012–13). Across the district, school seamless two-year and four-year college enrollment rates varied drastically: there was a 35 percentage point range between the maximum and minimum high schools for the 2010–11 graduating cohort, and a 31 percentage point range for the 2012–13 graduating cohort. The average percentage of high school seamless enrollers increased slightly from 55% in 2010–11 to 58% in 2012–13 (see Appendix J). Although these percentages fall far below the national averages of 67.5% for the 2010–11 cohort and 66.1% for the 2012–13 cohort, OCPS has steadily decreased the gap each year (Kena et al., 2014).

Additional analyses were run to determine the percentage of OCPS seniors who enrolled at some point during the year (i.e., fall, spring, or the summer semester) following high school graduation. Analyses included the three high school graduating cohorts (2010–11, 2011–12, 2012–13) for which data were available. As with seamless enrollment, a large variation among high schools was found: a range of 29 percentage points between the maximum and minimum high schools for the 2010–11 graduating cohort and a range of 28 percentage points for the 2012–13 graduating cohort. The average percentage of high school enrollers remained the same at 67% from the first to third cohorts, although increased to 68% in the 2011–12 school year. (See Appendix K). The district average for enrollment in the first year after graduation reflected national trends for each of the cohorts and was slightly higher than the national average by approximately one percentage point in 2012–13.

Engaging in the SDP College-Going Toolkit process using district data from OCPS had a powerful impact on fellows and was a valuable learning experience. The process allowed fellows to work with agency colleagues to identify, collect, and clean necessary data. The project also allowed the district to seek and acquire college-going data through the National Student Clearinghouse (NSC). This data had not been accessed previously and is very beneficial for understanding what happens to students after graduation.

Additionally, SDP fellows saw the benefit of learning and utilizing STATA for conducting analyses and therefore encouraged expanded use of this program across the Research, Accountability, and Grants department. Professional development opportunities were provided to OCPS district leaders and analysts on the basics of STATA and using the program effectively

for data management, analysis and graphics. Building the capacity of other staff members to utilize STATA will continue to benefit the district by increasing the sharing of project code, best practices, and reporting outcomes within OCPS.

Results from the initial analyses, as well as research articles and studies provided through the SDP Fellowship, were shared during the strategic planning refresh process and utilized to help guide conversations. A team of stakeholders examined the research, reviewed the available data, and determined that ensuring career and college readiness would be a district priority for the next five years. Lessons learned from other SDP cohorts, coupled with national best practices, allowed the team to identify research-based, high-leverage strategies they will implement to help better prepare students for success after high school.

For future planning, it will be advantageous for OCPS to complete all of the analyses within the College-Going Toolkit using the dataset and STATA code that were created. District leadership should develop research questions that specifically address areas of concern identified through the strategic planning process so that analyses can focus on the efforts and strategies being implemented. Analyses could also be replicated for additional graduating cohorts as data become available to determine the effectiveness of implemented strategies.

Data and reports received from the National Student Clearinghouse also need to be shared with school and district guidance departments so that multiple stakeholders engage in identifying college-going trends and strategies are implemented on a larger scale to help more students successfully enroll seamlessly in two-year and four-year colleges. Further analysis should also be conducted to determine the relationship, if any, between students who intend to go to college as measured through the senior exit survey and those who seamlessly enroll in the fall. A deeper understanding of the differences between high school graduates who attend two-year or four-year colleges immediately after graduation and those who do not would provide meaningful insight regarding strategies the district could implement to help more students successfully transition to postsecondary pathways.

Lessons Learned

This section reflects the lessons learned by the four agencies that participated in this capstone project—MDE, Nassau BOCES and OCPS. While many of us learned similar lessons,

each agency has chosen to share their most important lesson learned from replicating the Toolkit. We hope that these lessons learned can be helpful to other agencies when embarking on a similar journey.

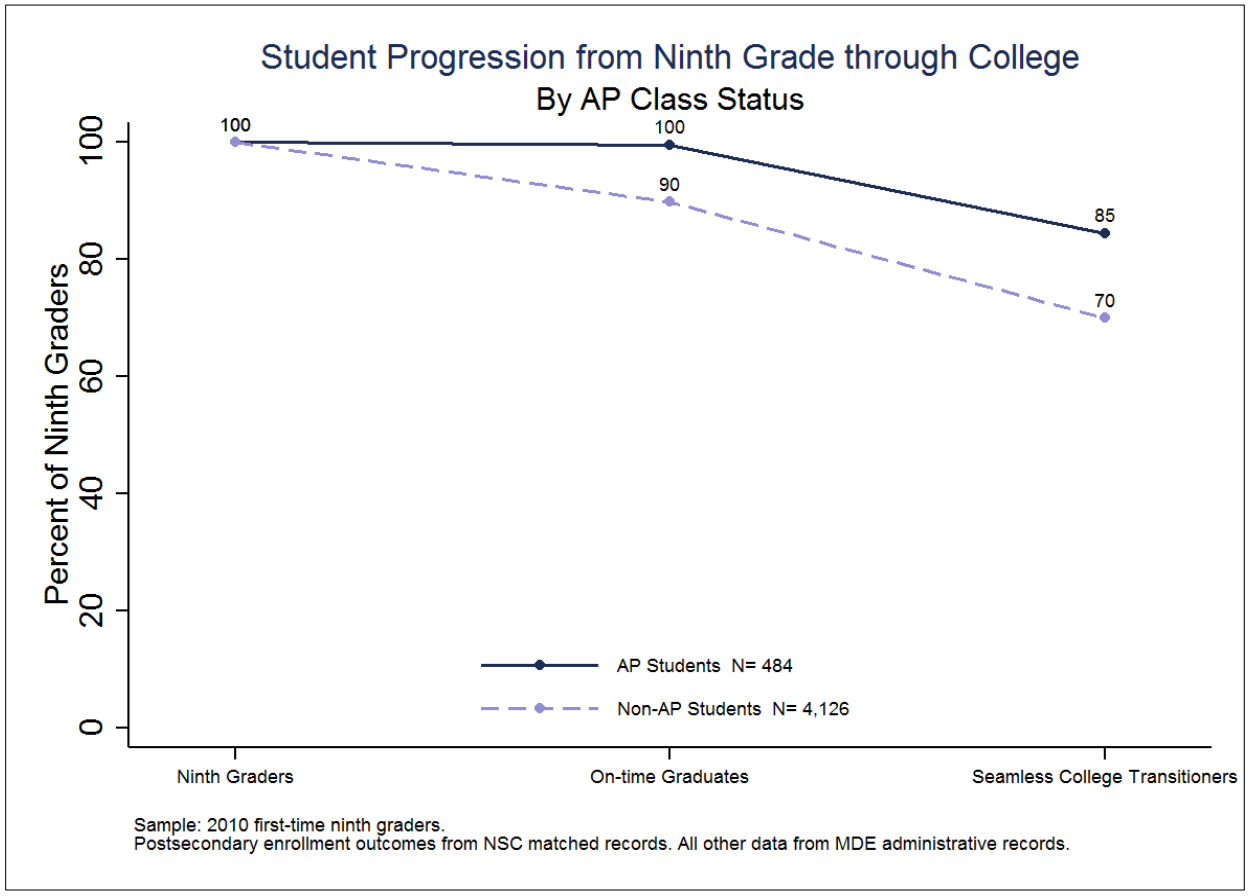
- **Decide which data are absolutely necessary and save more challenging data for future analysis**. Not all aspects of the SDP Toolkit may be relevant to every agency. Nassau BOCES began with data that were critical and easier to collect such as enrollment, demographics and state test scores. NSC data were also very critical for looking at college enrollment and persistence. For data that are not available, find suitable alternatives. Otherwise, the related analyses will need to be removed from the Toolkit. In cases where the data are not available immediately, develop a plan for how to collect them in the future. If it is not possible to collect these data, seek alternative data that are an appropriate substitute. For example, since course credits were not available, Nassau BOCES used aggregate end of course assessment credits for the on-track indicator.
- **Organization of data may differ for each agency and lead to challenges with implementation of the SDP Toolkit**. Aligning OCPS data with the information in the data specification guide and STATA code was challenging because of differences in variable values, data types, and data element location. OCPS used the SDP Identify: Data Specification Guide to identify elements required to analyze student achievement and postsecondary attainment. It is essential for analysts working through the SDP College-Going Toolkit to review the SDP Data Specification Guide in detail so that the standard set for variable names, values, and definitions can be matched and modified to district and state data specifications. Using the 5 W's of Data Collection to guide efforts really helped the agency identify *why* data were being collected, *what* data were needed, *when* the data was needed, *where* the data were stored, and *who* owned or was responsible for the data. OCPS also discovered that data were organized differently through a different table structure, decision rules were not always applicable, and code was not always appropriate to the needs of the district. The fellows, coupled with the

support of SDP colleagues, modified and shared code to address these aspects within the toolkit in order for it to run effectively.

- **Engage stakeholders early in the process**. Engaging stakeholders at MDE (in this case, leadership in the program offices and above) throughout the process of the toolkit and capstone was somewhat difficult. It was difficult to get buy-in for such a massive project without a true understanding of what the output is going to be. It is somewhat of a Catch 22, however, because it is difficult to simulate the impact of the output without actually going through the process. Without strong backing to undertake the project, it is difficult to prioritize and find time to complete it. This may have been less of an issue in capstone projects less data intensive than recreating the toolkit, but is certainly a consideration for other fellows trying to complete this particular capstone.

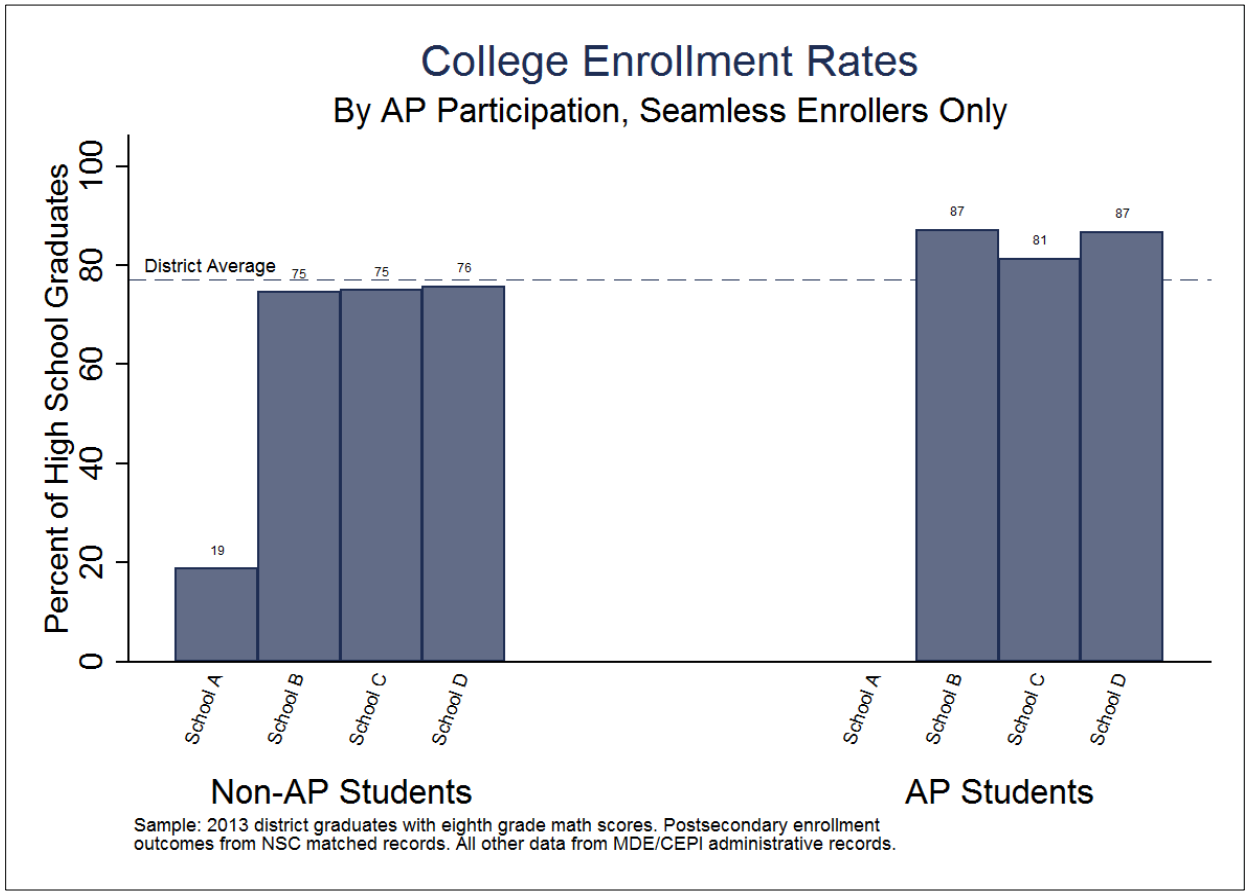
Appendix A: MDE District Progression from Ninth Grade through College by AP Participation Status

This first graph shows the progression of ninth graders through high school graduation and seamless college enrollment, defined in Michigan as enrolling within six months of graduation. Compared with the standard Toolkit analyses, the Michigan analysis currently lacks an indicator for persistence into the second year. The sample for the graph is 2010 first-time ninth graders.



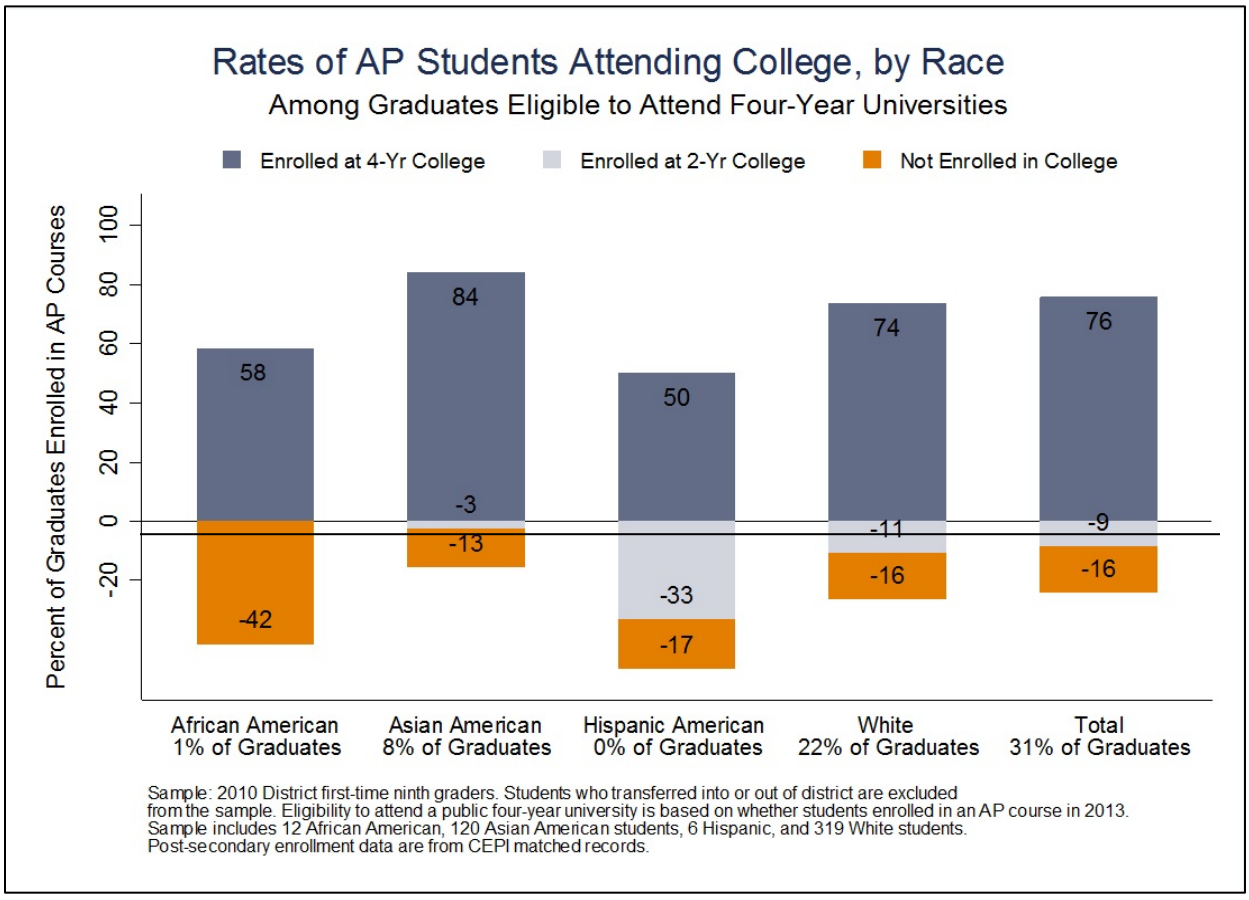
Appendix B: MDE District Progression from Ninth Grade through College by AP Participation Status

The Toolkit contains code to create a graph comparing college enrollment rates for seamless enrollers by prior achievement (by quartile of eighth-grade test). The code was modified to compare students who enrolled in an AP course with those who did not. The sample for the graph is 2013 high school graduates.



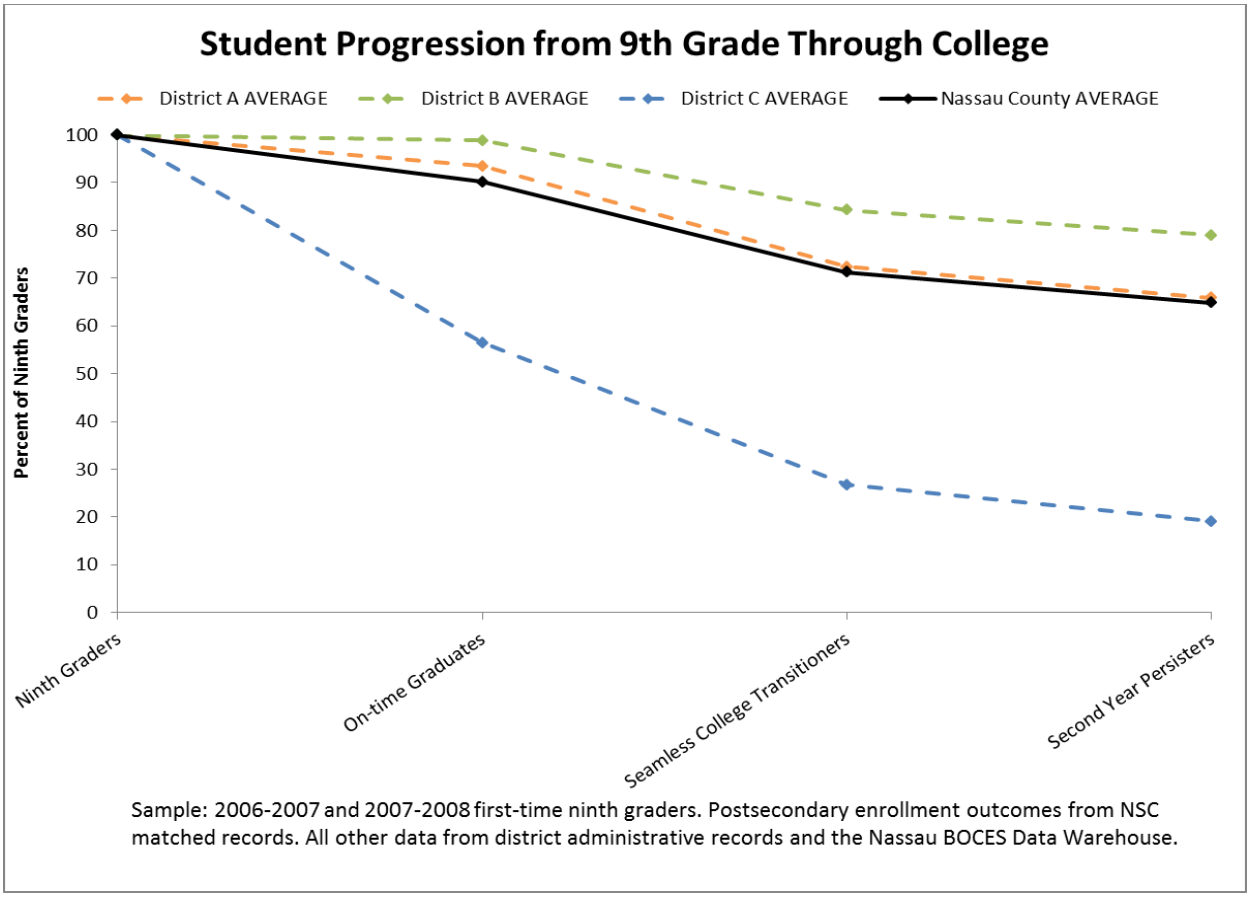
Appendix C: MDE District College Enrollment Rates for Students Passing AP Exams, by Race

Appendix C is an adaptation of the Toolkit analysis for highly qualified students attending college by race. Unlike the previous two figures, the indicator used for this figure was students passing at least one math, science or ELA AP test. The sample for the graph is 2010 first-time ninth graders.



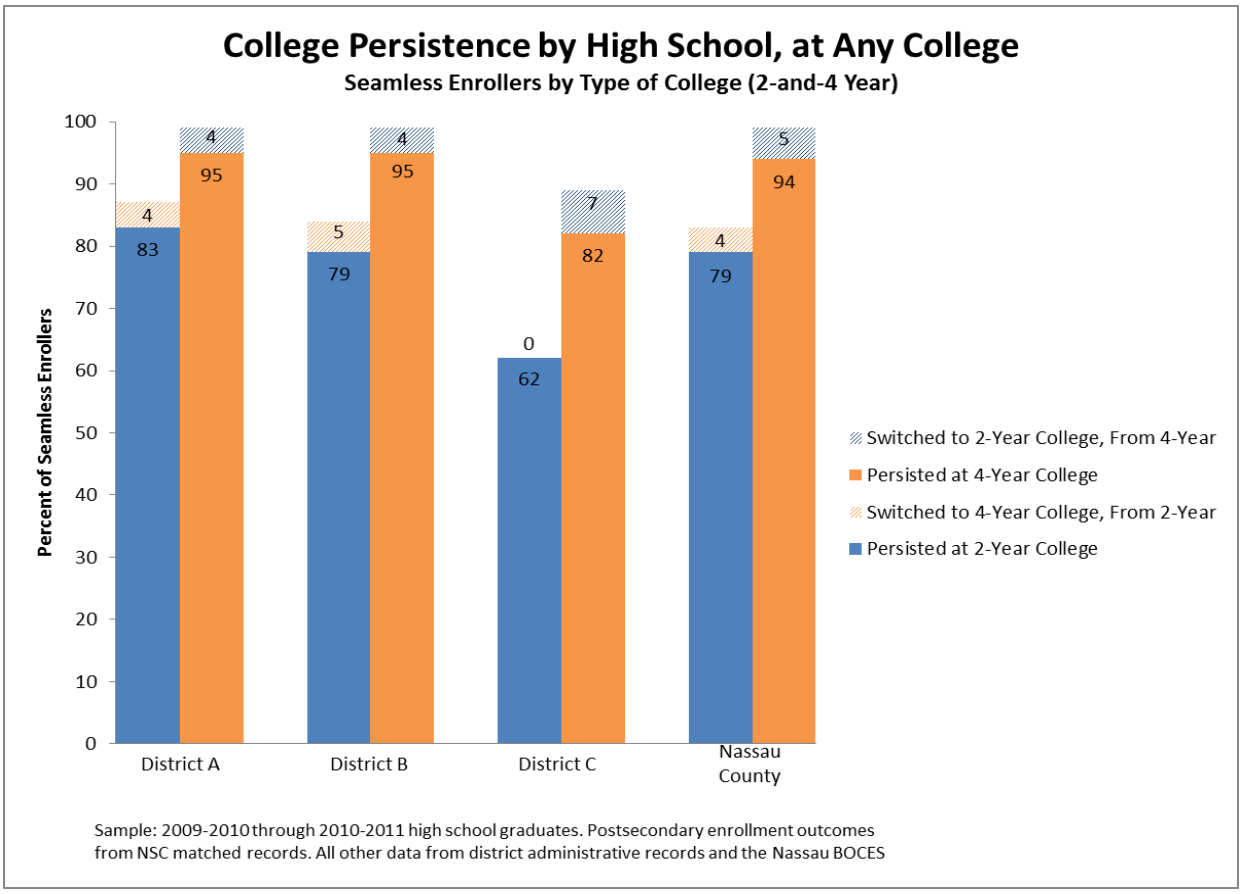
Appendix D: Nassau County Student Progression from Ninth Grade through College

This waterfall graph examines the progression of ninth graders through high school graduation, seamless college enrollment, and persistence into a second year of college. Included are lines for three pilot districts in Nassau County as well as a comparison to the county average. The included population represents 2006–2007 and 2007–2008 first-time ninth graders.



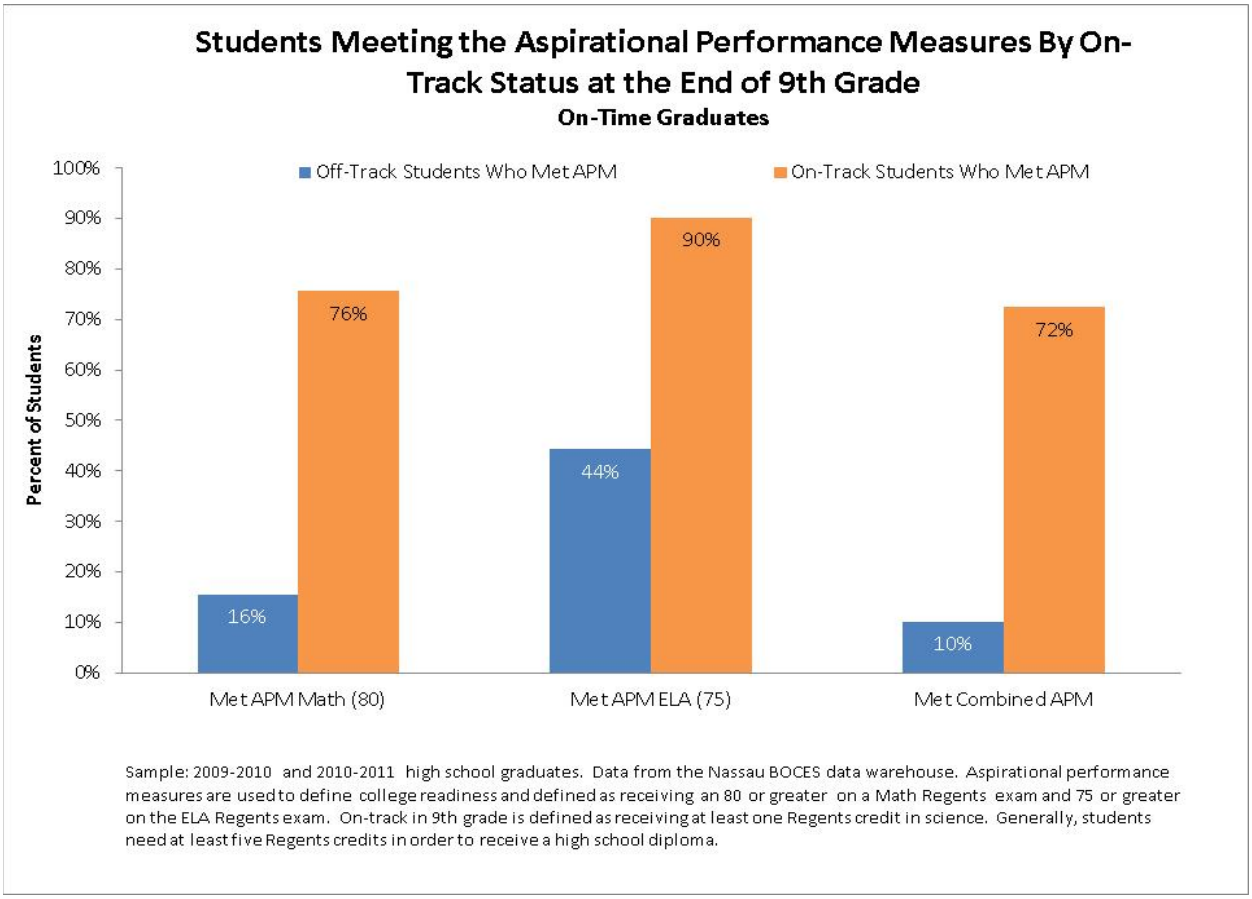
Appendix E: Nassau County College Persistence by High School at any College

This column graph examines both two-year and four-year college persistence for three Nassau County pilot districts as well as a comparison to Nassau County. The included population represents seamless college enrollers from the 2009–2010 and 2011–2012 on-time high school graduating classes. Lightly shaded areas depict students who switched from two-year colleges to four-year colleges and vice-versa. Solid columns indicate students who persisted in the same type of institution, but not necessarily the same institution.



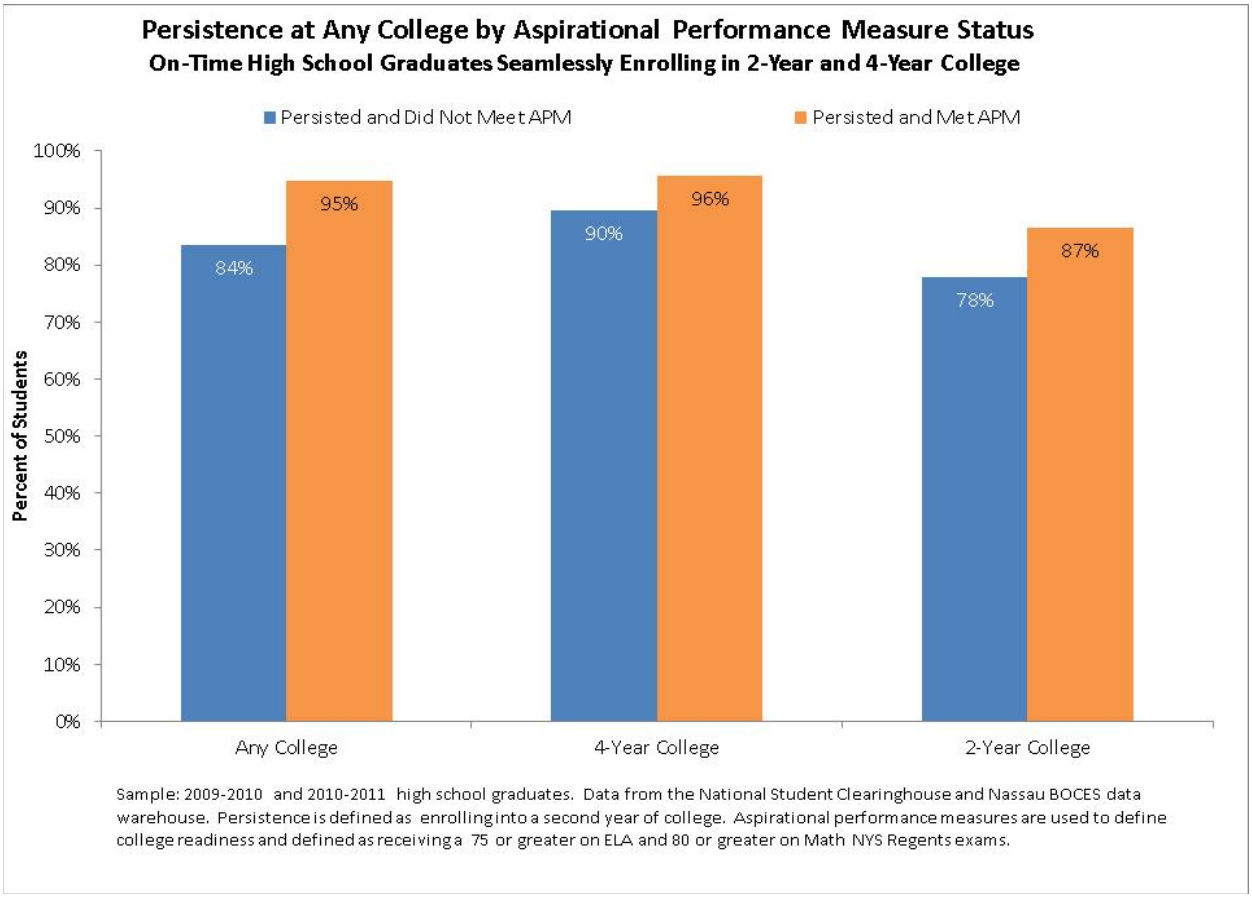
Appendix F: Nassau County Students Meeting the Aspirational Performance Measures by On-Track Status at the End of Ninth Grade

This column graph compares ninth grade on-track status to Aspirational Performance Measures on end-of-course New York State Regents examinations. Students are considered on track for high school graduation if they pass a science Regents exam by the end of ninth grade. Aspirational Performance Measures are used to describe college readiness and are defined as scoring at least 80 on a math Regents exam and a 75 on the ELA Regents exam. The population on this chart includes 2009–2010 and 2010–2011 on-time high school graduates.



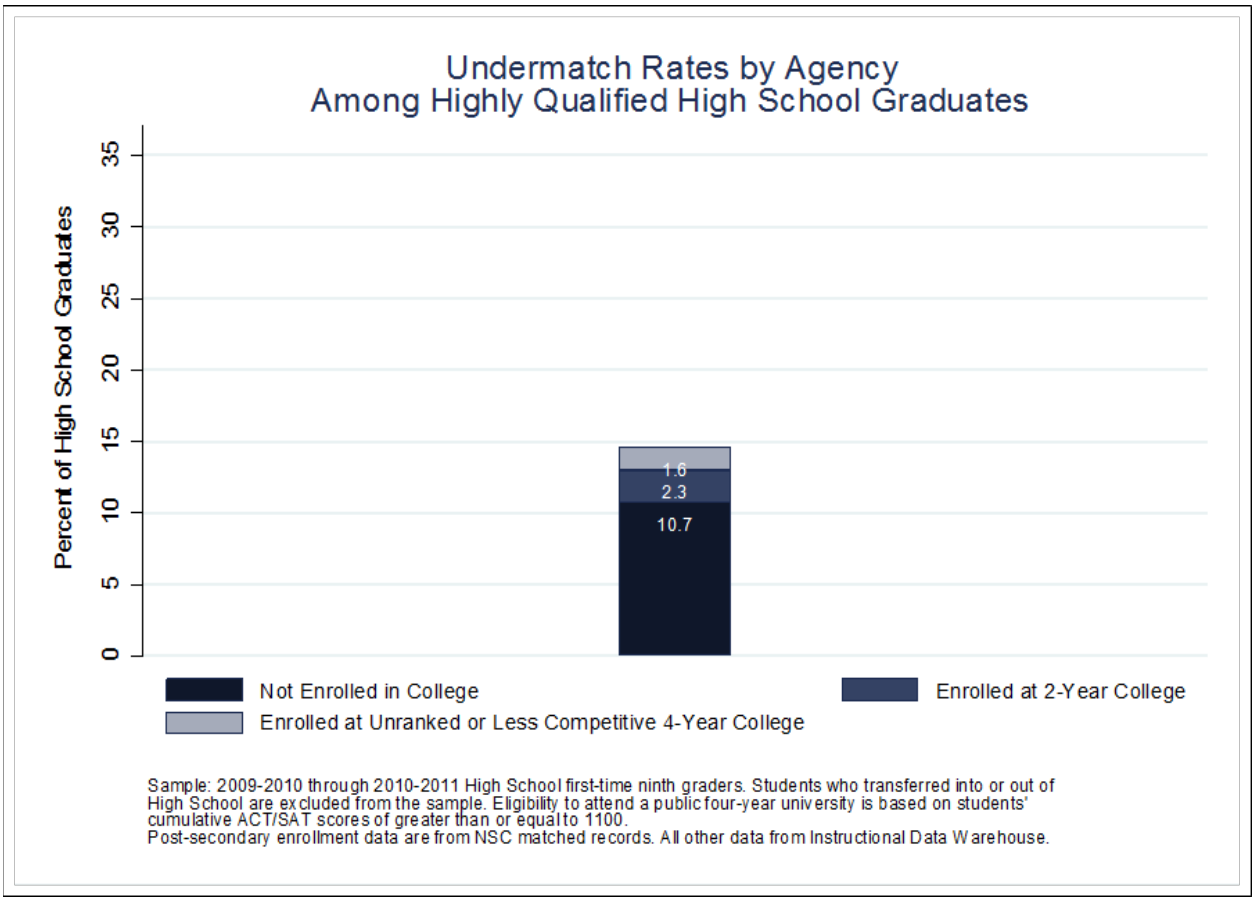
Appendix G: Nassau County Persistence at any College by Aspirational Performance Measure Status

This column graph examines Aspirational Performance Measures and seamless college enrollment for students attending any college, two-year colleges and four-year colleges. Aspirational Performance Measures are used to describe college readiness and are defined as scoring at least 80 on a Math Regents exam and a 75 on the ELA Regents exam. The population on this chart includes 2009–2010 and 2010–2011 on-time high school graduates.



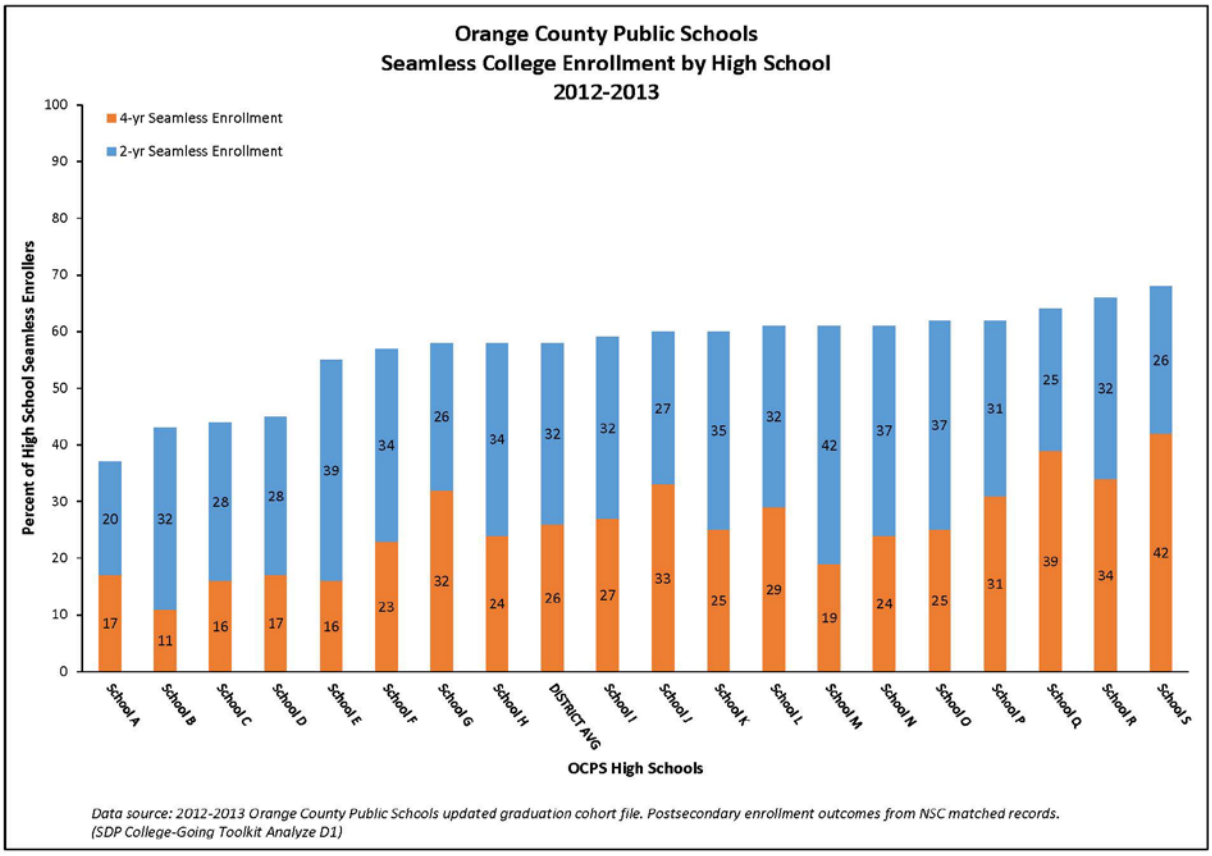
Appendix H: Nassau County Undermatch Rates by Agency among Highly Qualified High School Graduates

This stacked column chart shows the undermatch rate of highly qualified students in the 2009–10 and 2010–11 graduating cohorts who did not enroll in college, enrolled at a two-year college, or enrolled at an unranked or less competitive four-year college. A student is undermatched if they achieved a 1,100 or higher on the SAT and did not enroll in a college considered to be competitive or higher according the to the Barron's Selectivity Index.



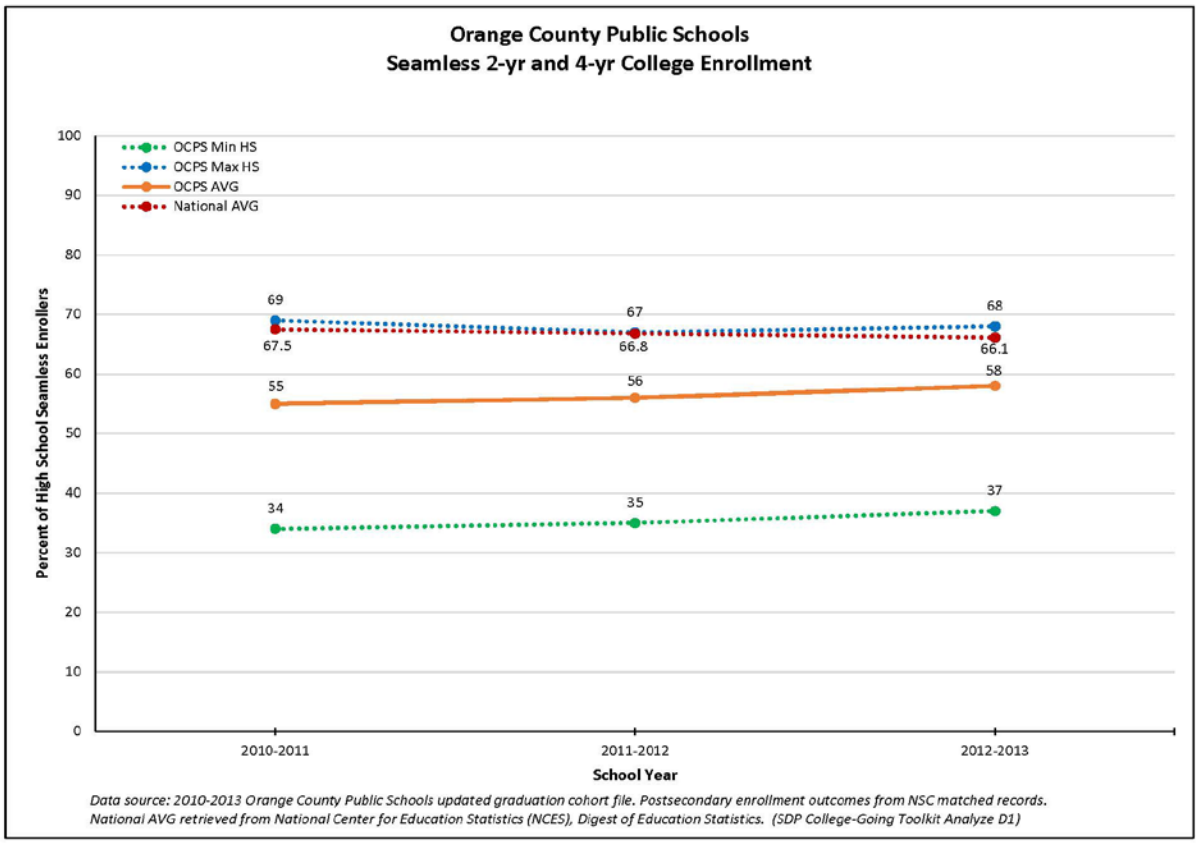
Appendix I: Orange County Public Schools College Enrollment by School

This graph provides an agency snapshot of two-year and four-year seamless college enrollment for students graduating in the 2012–13 cohort across high schools within Orange County Public Schools. The district average seamless college enrollment rate is also included in the graph.



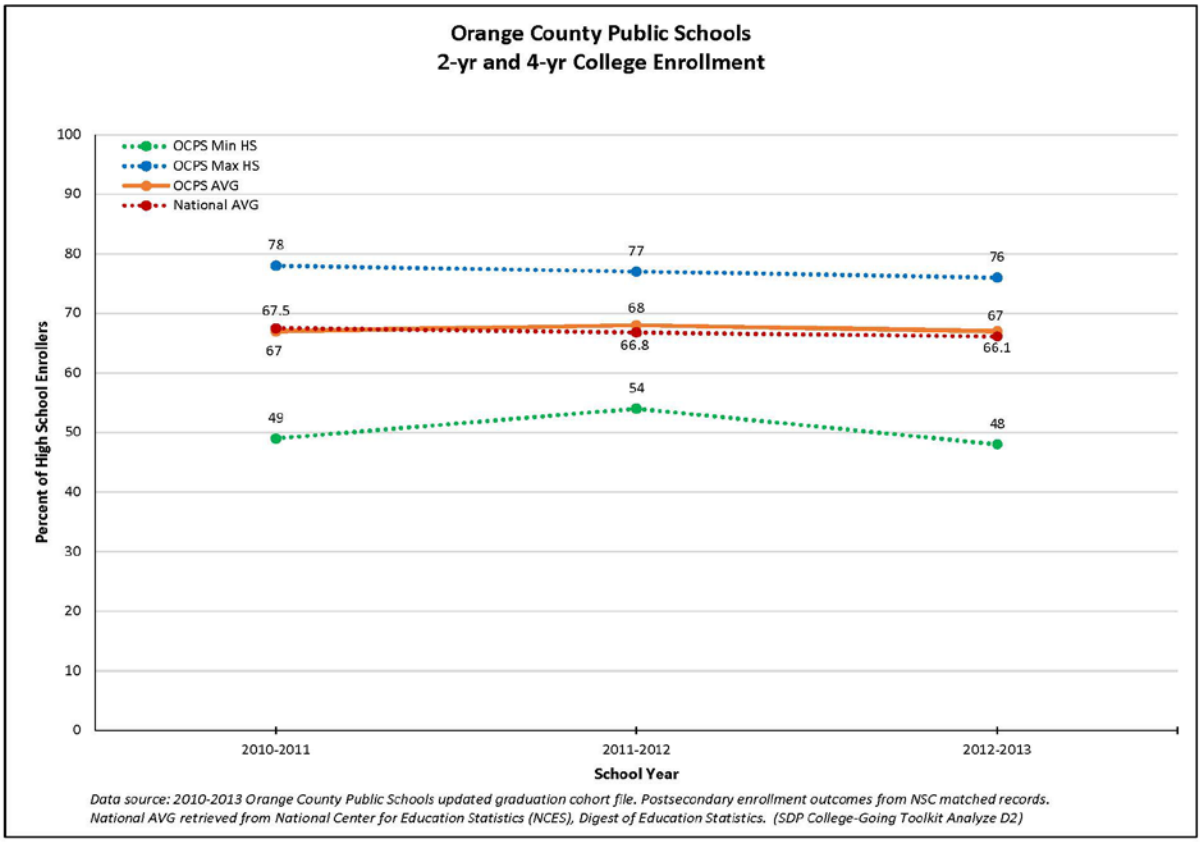
Appendix J: Orange County Public Schools Seamless College Enrollment

The district averages for seamless two-year and four-year seamless college enrollment is provided in this graph for three high school graduating cohorts (2010–11, 2011–12, 2012–13). The high school with the highest percent of seamless enrollers (OCPS HS Max) and the lowest percent of seamless enrollers (OCPS Min HS) are represented. Additionally, national averages retrieved from the National Center for Education Statistics (NCES), Digest of Education Statistics, were included within the graph.



Appendix K: Orange County Public Schools College Enrollment for First Year

The district averages for two-year and four-year college enrollment is provided in this graph for three high school graduating cohorts (2010–11, 2011–12, 2012–13). The percentage of OCPS seniors that enrolled at some point during the year, i.e. fall, spring, or the summer semester, following high school graduation are included in this analysis. The high school with the highest percent of enrollers (OCPS HS Max) and the lowest percent of enrollers (OCPS Min HS) are represented. Additionally, national averages retrieved from the National Center for Education Statistics (NCES), Digest of Education Statistics, were included.



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