



Augenblick, Palaich  
and Associates, Inc.

# **RETURN ON INVESTMENT IN EARLY COLLEGE HIGH SCHOOLS**

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## Preface

For state policymakers, the idea of over 250 new early college high schools opening across the country by the end of the decade creates a compelling proposition. By investing in schools designed to combine the high school experience with up to two years of college and propel underserved students toward a postsecondary degree in an accelerated timeframe, what financial return can the state expect in terms of a more educated citizenry and increased tax revenues?

Augenblick, Palaich, and Associates, experts in school finance, forecast a very positive answer to that question in this return-on-investment analysis commissioned by Jobs for the Future. APA examines the costs associated with a sample of early college high schools in California, New York, Ohio, and Texas, states that are initiating large numbers of these schools. It then compares the estimated educational and financial benefits for individuals, schools, and the state to those for traditional high schools.

The analysis suggests that in states like California and New York, two states with very different education finance structures, policymakers might expect to yield \$1.33 to \$2.11 more for every dollar invested in early college high schools than in traditional high schools over the course of 15 years, and \$2.51 to \$3.95 more over the course of 25 years. That is without including the return for individuals that, as APA illustrates, could be far greater for graduates of early college high schools earning a Bachelor's degree than for graduates of traditional high schools because they will have paid less college tuition and attained their degrees more quickly.

It is important to note that the oldest early college high schools have had only one graduating class, and most of the 86 now open are in their second or third years. Because of this, APA based many of its estimates on a national, longitudinal database of students' postsecondary outcomes. However, APA also cites and uses actual early data from real early college high schools, which suggest that the projected benefits based on national data are well within reach. Still, these preliminary results must be confirmed by updating the analysis when more complete data are available from a larger sample of early college high schools.

In its judicious analysis, APA offers encouragement to state leaders interested in investing in early college high schools as a strategy for promoting educational attainment. Just as important, it has developed a financial model that any state can use to calculate the return-on-investment for these schools as they mature and, we expect, confirm their early promise with positive outcomes. JFF looks forward to conducting future analyses of the financial impact of early college high schools.

Marlene Seltzer  
Jobs for the Future



## Executive Summary

The early college high school network is dedicated to helping traditionally underserved students successfully move from secondary education deep into postsecondary education. The immediate goal is to have all ECHS students attain their high school diploma and their AA degree (or certification equivalent) by the end of their high school years. In addition, it is hoped that a significant number of these students will go on to complete their BA degree.

Unlike many other comprehensive school reform networks, the ECHS network is strict about its objectives but welcoming of alternative strategies for pursuing those objectives. In fact, the programs offered are significantly different and at the various sites there is great variation in the critical relationships (and the sharing of costs) between and among the partners contributing services. This diversity among ECHS sites is a strength for the network, but it represents a challenge to understanding the financial and policy implications of these efforts. These structural differences, coupled with the relative youth of the ECHS effort, put the network in the position of having to simultaneously generate a financial analysis model and the data necessary to run it.

Augenblick, Palaich and Associates, Inc. (APA) was hired to create a financial analysis model with a focus on the return on investment in ECHS schools. As a part of the project, APA developed a model for analyzing ECHS benefits and costs across K-12 and postsecondary education boundaries, and examined the effectiveness of that model with data available nationally and from ECHS sites in California and New York. While building the model to generate insights on the ECHS return on investment, it became clear that certain student-serving organizations (schools, school districts, and PSE partners) would also be interested in examining the net cost of serving these students. Once the data are available, it will be possible to use the net cost results to generate a “cost to completion” analysis for students participating in ECHS programs. That effort, however, was beyond the scope of this project.

In summary, the ROI model reported in this paper clearly makes the case for the following conclusions:

- Students and families benefit tremendously from participation in ECHS schools;
- ECHS schools generate more benefits for their students and a greater return on investment than comparable traditional high schools; and
- States also benefit from investing in ECHS sites as long as the ECHS cost structure is not too different from the cost structure of a traditional high school. Over both the 15 and 25 year time frames analyzed, a hypothetical state investment in a cohort of students (in California and New York) would be recouped.



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# I. Introduction

The Early College High School (ECHS) Initiative integrates the first two years of college into high school and aims to have all graduates exit, either prepared to continue on to a four-year postsecondary institution or qualified to work in an environment requiring special skills and certification. ECHS sites strive to serve an “at-risk” population of students, i.e., those who are underrepresented in higher education. The exact definition of “at-risk” varies somewhat from site to site, but typically includes the following:

- Students who have not had access to the academic preparation needed to meet college readiness standards;
- Students for whom the cost of college is prohibitive;
- Students of color; and
- English language learners.

The ECHS programs allow students to leave high school with either an Associate of Arts degree or a significant number of college credits. Because they have completed most of the courses typically required for students during their first two years of college, ECHS graduates have an advantage when they enter a four-year university. It is also hoped that an added benefit of this jump-start will increase Bachelor’s degree completion rates. Eighty-six early college high schools, serving over 12,000 students, are now operating in 24 states nationwide. Leaders of the initiative plan to have over 200 schools serving approximately 90,000 students opened nationwide by 2011.

Jobs for the Future (JFF) is one of 14 partners in the Early College High School Initiative. JFF plays an integral role in the implementation and coordination of the initiative by creating and maintaining “a vision, mission, and overall strategy for the Early College High School Initiative” across the nation. Among other responsibilities, JFF gathers and shares data about the early college movement, provides opportunities for networking across partners and regions, and educates national, local, and state audiences about early college high schools. The remaining 13 partners work directly with selected early college high schools, providing start-up and ongoing technical support, guidance, and professional development.

To establish over 200 early college high schools by 2011, strategic planning is needed. An important aspect of this planning is gaining an understanding of the financial return from effectively and efficiently moving students through “early college” programs. JFF retained Augenblick, Palaich, & Associates, Inc. (APA) to help with the technical aspects of this task. APA, a consulting firm with more than 20 years of education policy experience, collected data from selected early college high schools and developed a cost benefit model focused on the return on investment (ROI) for ECHS schools. JFF plans to share the results of APA’s work with interested policymakers and to use the findings to help plan future ECHS expansion.

The sections below describe the following:

- (1) Selected highlights from **ECHS site visits** that illustrate the range of programming and working agreements contained within the ECHS umbrella;

- (2) A description of cost-benefit analyses in general and APA's return on investment and net cost models;
- (3) A preliminary analysis of the return on investment for ECHS sites, built from actual ECHS students results and cost data, national student results data from the NELS data set, and cost data from two states that illustrate the potential of the model; and
- (4) A discussion of the implications of the model results for ECHS initiative planning and for public policy.

## II. ECHS Site Visits

In June of 2005, APA visited seven ECHS sites, two in *California* (Global Youth Charter ECHS and San Joaquin Delta Community College ECHS), one in *Ohio* (Youngstown Early College High School), two in *New York* (Science, Technology and Research High School at Erasmus and LaGuardia Middle College High School), and two in *Texas* (Challenge ECHS and Sanchez ECHS). These visits were conducted in order to gain a better understanding of ECHS schools and to aid in the development of a cost-benefit model estimating the return on investment (ROI) of the program. The visits also allowed APA to examine program elements and their associated costs for each ECHS site. This examination provided a deeper understanding of the flow of funds that support ECHS work.

At each site, APA collected the following types of information: (1) basic descriptive information; (2) desired/actual outcomes, including the ways these are met and barriers to achieving them; (3) information about the design and nature of the programs offered; (4) expenditure information by function; (5) revenue information by source; (6) information about start-up/planning costs; and (7) other pertinent information about desired outcomes and program structure. In conducting the site visits, APA interviewed a variety of individuals at each ECHS school, including the principal, business manager, district office representative, and post-secondary institution partner representative.

Based on these site visits, the following brief observations delineate the range of factors that should be taken into consideration regarding the costs and benefits of an ECHS school. The observations are organized into the following five general categories: (1) school size, structure, and composition;<sup>1</sup> (2) post-secondary partnership arrangement; (3) curriculum; (4) additional student services; and (5) other noteworthy characteristics.

### ***California***

#### **Global Youth Charter ECHS**

##### School Size, Structure, & Composition

- Serves a student body that is predominantly minority, first-generation college, and average to low performing academically.
- This ECHS site was established as a charter school, with the district serving as the authorizer and governing board. There is a parent and student advisory board.
- Currently serves 42 students, with enrollment projected to grow to 400 students.

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<sup>1</sup> Each of the ECHS sites visited either offered grades 9 through 12 or were expanding to fill these grades. As a consequence, the modeling reported in this paper is based on a four-year high school program. In New York City, the school district and the City University of New York are developing a variation of ECHS that covers grades 6 through 12. The results of these efforts, when available, will have implications for the modeling reported here.

### Post-Secondary Partnership Arrangement

- The school partners with American River Community College.
- Freshmen year of college preparatory courses are offered on the high school campus. Subsequent college courses are taken at the community college campus two days per week.
- Students have access to community college services such as tutoring, reading/writing lab, assessments, counseling, and the library.
- The community college pays for the students' tuition as weekly student credit hours are converted to a per student allocation of approximately \$4,200.
- The district pays the ECHS \$5,934 per pupil minus 5% for administrative costs.

### Curriculum

- The curriculum is project-based, with a focus on community service.

### Services

- Tutoring is provided daily after school.
- Students are able to participate in district sports teams and other extra-curricular activities (band, drama, etc.).

### Other Noteworthy Characteristics

- Completed first full year of operation in the 2004-2005 school year.
- Books were not paid for by the ECHS in the first year but, in the future, will be covered by a Bill & Melinda Gates Foundation grant for the 2005-2006 school year.

## **Middle College High School at San Joaquin Delta College**

### School Size, Structure, & Composition

- Student body (239 students) is ethnically diverse, reflecting the community in which the ECHS is located.

### Post-Secondary Partnership Arrangement

- Partnered with the San Joaquin Delta Community College and is co-located on the community college campus.
- Students attend college in the morning with other college students and high school in the afternoon.
- Students can access and use any of the community college services (i.e., library, counseling, computer lab, cafeteria, and tutoring).
- A Community College Chancellor's Office grant pays for all college books.
- Tuition and fees for the community college are \$3,300 per year. These costs are waived for students (covered by state grants).

- The community college and ECHS have a facilities exchange agreement in which the students use college space at no additional charge, and the college uses the ECHS campus as a satellite program.
- Students cannot participate in district-wide sports and other extra-curricular programs, but they can participate in similar programs offered by the community college and the ECHS.
- Transportation has been covered by the college, but will become an ECHS expenditure beginning with the 2005-2006 school year.

#### Curriculum

- Uses the Advancement Via Individual Determination (AVID) program for all students, which is designed to increase student performance and college eligibility among traditionally underserved student populations.
- The school also offers a before-school remediation program—required for all 9<sup>th</sup> graders and some 10<sup>th</sup> graders.

#### Other Noteworthy Characteristics

- Completed fifth year of operation in the 2004-2005 school year.

### **Ohio**

#### **Youngstown Early College High School**

##### School Size, Structure, & Composition

- The school targets low-performing students, but they must be able to read at least at the 6<sup>th</sup> grade level. The student population is similar to that of traditional schools in the district. Eighty-eight percent of students qualify for free and reduced lunch.
- The school currently serves 138 students, with enrollment projected to grow to 400 students.

##### Post-Secondary Partnership Arrangement

- The ECHS partnership is between Youngstown State University (YSU) and the Youngstown City School District.
- YSU provides tutors through the Foundations of Education Program (helps meet a 15-hour tutoring requirement for each education student). The students also have access to the following university programs: Center for Student Progress, Career Services, the Reading and Study Skills Center, library, dining hall, and an advisor in the College of Arts and Sciences.
- District pays 51% of tuition, as well as all course fees and books. The university pays 49% of tuition. Access Challenge Money (a state grant to help low-income students go to college) is used to cover the university's 49% of tuition.
- The students eat lunch at YSU with support from the Knowledge Works Foundation, which pays the difference between the actual cost for lunch and the federal reimbursement.

- YSU provides facilities space to the ECHS site for free.

#### Services

- The school offers a mentoring program for students and workshops for parents on how to support the academic success of their high school students.

#### Other Noteworthy Characteristics

- Completed first full year of operation in the 2004-2005 school year.

### ***New York***

## **Science, Technology and Research High School at Erasmus**

#### School Size, Structure, & Composition

- The school opened in 2003 and is located in the fabled Erasmus Hall building near the Brooklyn College campus.
- Currently serves over 200 students with enrollment projected to grow to 400 students. The student body is predominantly African-American and Hispanic.

#### Post-Secondary Partnership Arrangement

- The Science, Technology and Research Early College High School (STAR) is co-sponsored by Brooklyn College.
- STAR students take their college-level courses at Brooklyn College. They will earn enough college credits to enter college as advanced freshmen or sophomores.

#### Services

- The Gateway Institute for Pre-College Education, a program designed to increase the number of black and Hispanic students who become scientists and doctors, is a big supporter of the school. The group provides summer programs, college tours, and laboratory internships.
- A study center is available to students three days a week.
- A Saturday prep academy assists students who fall behind academically.
- The school also offers chess, writing, and computer clubs, as well as student government activities.
- Students can play on sports teams with the other schools housed in the Erasmus facility.

## **LaGuardia Middle College High School**

#### School Size, Structure, & Composition

- The Middle College High School (serving approximately 500 students) is a fully integrated part of LaGuardia Community College and was started in the mid-1970s as an alternative to the traditional high school curriculum.

- The student body reflects the diversity of students that attend LaGuardia Community College, with many potential first-generation college-going students.
- Designed for students who might not reach their full academic potential in a traditional high school setting and who would benefit from exposure to life on a college campus.

#### Post-Secondary Partnership Arrangement

- The school is jointly administered by LaGuardia Community College and the New York City Board of Education.
- The Middle College High School at LaGuardia receives support funding from the City University of New York. The bulk of this funding supports additional staff members like early college seminar leaders.
- Middle College High School students are a part of the college community and can avail themselves of all the resources offered by LaGuardia Community College. They have access to computer labs, campus clubs, college courses and the library.
- Upon graduation from Middle College, most students transfer to LaGuardia where they continue their education.

#### Curriculum

- Interdisciplinary focus.
- Middle College students are required to complete either a full- or part-time cooperative education internship during their time at the school. The purpose of the internships is to enhance the students' career choices and instill in them an understanding of the work environment.

#### Services

- Career guidance counseling offered.
- Active support for students in academic subjects.

## **Texas**

### **Challenge ECHS**

#### School Size, Structure, & Composition

- Challenge ECHS is a district charter school and has been operating for three years. It serves grades 9-12.
- The school currently serves over 200 students, with enrollment projected to grow to 400. These students are 87% first-generation college students and score well on the SAT-9 test.

#### Post-Secondary Partnership Arrangement

- It is co-located with a campus of the Houston Community College.

- Courses can be taken on the college campus or at the high school with either college faculty or high school faculty.
- Tuition is waived by the Houston Community College Board of Trustees. State legislation passed allowing reimbursement from the state for this cost. However, students pay a one-time \$25 college registration fee.
- There is a \$10 rental fee for college textbooks that must be paid by the students.

### Curriculum

- There is no set curriculum; instead, students create a personalized education plan. This plan can include a “double block” of classes in the same subject area in order to make up for deficiencies in that subject.
- The school provides special education and ELL services to students.

### Services

- Services such as tutoring, advising, Princeton Review test preparation (\$150 fee for this, with school aid available for those who cannot pay), and summer classes are available.
- The school is developing an external internship program.
- Service-learning, cultural events, “life-fitness,” and social skills are highlighted in the program to prepare students socially and academically for success in college.

## **George I. Sanchez ECHS**

### School Size, Structure, & Composition

- The school is a charter school sponsored by the Association for the Advancement of Mexican Americans (AAMA) aimed at dropout recovery.
- The school has been operating for 30 years but only recently incorporated an ECHS orientation into the school’s academic program.
- Most students are drawn from the local neighborhood. The majority are Hispanic, and many are first-generation Americans. A significant number of students are parents themselves. Students at the school are seriously at-risk – some are just off probation, some are drug users, some are gang members, some are homeless, most are very poor, and many are English language learners.
- Currently serves 60 students, with enrollment projected to grow to 500 students.

### Post-Secondary Partnership Arrangement

- The Houston Community College is the ECHS post-secondary partner.
- Students may take courses at the college or at the high school. Courses are taught by both high school and college faculty.
- Cooperation between high school and college faculty is fostered through joint professional development.

## Services

- There are many support services available through the high school and through the local non-profit community center that operates on site. Services include child care, counseling, tutoring, reading, writing and language workshops, and parenting classes.
- Additionally, there are significant human services adjacent to the school site. A substance abuse treatment center and a homeless shelter are located next door. A full-time homelessness coordinator is available at the shelter.

## Other Noteworthy Characteristics

- Flexible scheduling is used to accommodate student needs and schedules.
- Basketball and volleyball are available as extra-curricular activities.
- The school provides transportation services with its own bus.
- The program is supported through district funds and outside grant money.

After the site visits, we concluded that a uniform ECHS model was not up and running across the country. While each site shared overall ECHS goals, the sites differed in terms of number and types of students served, actual programming offered, the relationship with the post-secondary education partner, the breadth and sequence of the college courses offered, and the sources of revenue available to pay for the initiative. We used the information collected from this diverse group of ECHS sites to understand the costs and benefits faced by early college high schools and to develop the ROI model presented in the following sections.

In addition, after the site visits, we shared our work to date at the national ECHS conference in November 2005 and asked a variety of people to review the model we developed. Several very practical questions regarding planning for future ECHS sites emerged from these discussions. The following questions were then added and addressed in this study:

- What increase in ROI can be achieved by a 10% increase in students at the AA degree level? Students at the BA degree level?
- Does school size influence the ROI that can be achieved?
- Does the number of schools influence the ROI that can be achieved?

Answers to these questions are addressed in the final section of this report.

### III. Cost-Benefit Analysis & Return on Investment

Cost-Benefit Analysis (CBA) uses financial estimates to provide the equivalent money value of a project in order to determine whether, on balance, the project is worth the cost of investment. According to CBA, a worthwhile project is one for which the value of the benefits exceeds the value of the costs. In the field of education, CBA is often expressed as a “rate of return analysis.”

The methodologies used in Cost-Benefit and Return on Investment analyses are similar – both require the determination of costs and benefits and use that data to calculate the return. However, the results in the calculations are expressed differently and lend themselves to alternative presentations. The results from return on investment (ROI) analyses are always presented in numeric form (as a rate or percentage). The analysis of rate of return or return on investment (ROI) must begin with a tabulation of all the costs and all the benefits associated with the program during a given time period.<sup>2</sup> The ROI calculation is as follows:

$$\text{Program ROI} = [(total\ benefit - total\ costs)/total\ costs] \times 100$$

In order to complete this calculation, two important estimates must be made. First, the total financial benefit of the program must be estimated. Second, the total investment made to develop, produce, and deliver the program must be determined. Total benefits include money saved (including additional social costs avoided), money made, and anything that adds directly or indirectly to the bottom line. Total costs include development costs, personnel costs, overhead, supplies and materials.

In the case of identifying costs and benefits and calculating a ROI for the ECHS initiative, benefits are identified in terms of quantifiable benchmarks (student attendance, student persistence, graduation rates, and college credits and degrees), and costs are calculated in terms of the costs of running the ECHS and providing the postsecondary and other additional services. Finally, it is important for any CBA analysis to be calculated using a common unit of measurement – in this case benefits and costs described in dollars.

The ROI rate for an ECHS site does not, by itself, create an intuitive understanding of the situation being studied. This return rate gains more meaning when compared to that of a second alternative program or investment. Comparing the ROI rate for ECHS to the rate for other high school reform programs is beyond the scope of the current project. However, the ROI for ECHS can be compared with the results of a traditional high school – i.e., what the results would be if no ECHS existed. For the ECHS sites studied, the costs and benefits that would occur in the absence of the ECHS can be estimated using the averages for traditional secondary schools. The marginal benefits and costs of ECHS can then be considered by comparing the benefits and costs that would otherwise occur.

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<sup>2</sup> For example, see Stiefel, L., Iatarola, P., Fruchter, N. and Berne, R., “The Effects of Size of Student Body on School Costs and Performance in New York City High Schools,” Institute for Education and Social Policy; New York University; New York, New York, 1998.

## ***The Benefits of ECHS***

The main goals of the early college high school are that students graduate with a high school diploma and up to two years of college credit (this can be in the form of an AA degree, a special certification, or a certain number of credits toward a core college curriculum). To measure the differential in success between the ECHS and traditional high schools, one therefore needs to examine the following:

- Dropouts;
- Student persistence;
- Graduation rates; and
- College credits and degrees.

These measures are being collected in the ECHS Student Information System (SIS) by intermediaries that work closely with ECHS sites across the country and with JFF. Key data elements found within the SIS data system at the student level include the following: (1) ECHS graduation rate; (2) degrees received; (3) number of years to graduation; (4) number of years to AA degree; (5) number of college credits at graduation; (6) college enrollment of ECHS graduates; and (7) number of AA and four-year college degrees earned after leaving the ECHS. In the next several years, the ECHS network hopes that all of the above data elements will become available and then can be used to calculate the benefits of the ECHS.

To translate these measures into financial benefits, (i.e., increased earnings) the measures need to be converted into single linear dimensions expressed in dollars. APA believes the earnings differential for different levels of academic achievement (such as a high school diploma, AA degree and BA degree) best embodies the indicators listed above. Not only do earning power differences translate into dollars, but they also reflect a student's persistence towards attending high school, graduating, enrolling in college, and achieving a degree. In addition to examining earning differentials between different academic milestones, another factor which is important is the amount of time it takes a student to reach these academic milestones. The time-to-completion factor is particularly critical to the calculation of a program's cost.

Existing studies estimate the increased annual earnings for different levels of academic attainment.<sup>3</sup> APA used measures of expected earnings based on educational attainment to determine the benefits for the student, the ECHS site, the district, the post-secondary partner, and the state. In this analysis, benefits are summed across 15- and 25-year periods. Some benefits measured would have also occurred as a result of a traditional high school program and, thus, cannot be attributed exclusively to the ECHS Initiative. To calculate the benefits attributed specifically to the ECHS, the outcomes expected in the absence of ECHS must be calculated. The difference in benefits between the ECHS site and the traditional school determines the "marginal" benefit of the ECHS program.

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<sup>3</sup> For example, the College Board's "Education Pays: Update 2005." Baum, S. and Payea, K., "Education Pays: Update 2005," Trends in Higher Education Series, The College Board, Washington, DC, 2005.

## The Costs of ECHS

When this project was originally conceived, APA thought that a single model of costs would fit all early college high schools. However, APA’s seven site visits across the nation identified the existence of distinct ECHS cost structures. To understand how the costs vary, APA analyzed the variations in cost structures across ECHS sites (see below).

We identified five potential categories of cost variation: student, ECHS site, district, post-secondary education (PSE) partner, and the state. Table 1 illustrates the five categories and the key elements that create the possible cost structure variation. A discussion of each category follows.

<b>Family/Student</b>	<b>ECHS Site</b>	<b>District</b>	<b>PSE Partner</b>	<b>State</b>
Students and families may incur costs for textbooks or post-secondary institution fees, but typically pay nothing or very little.	Variations: <ul style="list-style-type: none"> <li>• Population served</li> <li>• Formal structure</li> <li>• Academic program</li> <li>• Ancillary programs</li> <li>• Grade levels</li> </ul>	Variations: <ul style="list-style-type: none"> <li>• Type of school</li> <li>• Location of classes</li> <li>• Pay structure for teachers</li> <li>• District transportation</li> <li>• Indirect costs</li> </ul>	Variations: <ul style="list-style-type: none"> <li>• Coverage of tuition costs</li> <li>• Direct services</li> <li>• Capital costs</li> <li>• Indirect costs</li> </ul>	Variations: <ul style="list-style-type: none"> <li>• ECHS policy in place</li> <li>• Concurrent/dual enrollment policy in place</li> </ul>

Costs incurred by the student (or the student’s family) are rather minimal and vary little across sites. Except for some incidental charges such as textbook rental/purchase and/or a small, one-time fee for postsecondary registration, the student usually pays nothing or very little to attend the ECHS and the ECHS-offered post-secondary classes.

The cost structure for the ECHS site varies by the student population served, the academic program offered, the formal structure of the school, and the ancillary programming provided. For example, we visited an ECHS in Houston (G. I. Sanchez) that serves a student body with relatively high incidences of pregnancy, drugs, homelessness, and gang activity. As compared to a school that serves a less “at risk” population, the school incurs significantly higher costs because it offers additional ancillary programming. APA also found that the following major governance-related decisions have a significant impact on ECHS site costs: how the school is organized (charter, conversion, school-within-school, etc.); what grades are served; the number, scope, and governance of ancillary services offered; and whether the school is co-located on the PSE site.

The costs for the district vary according to the type of school, the location of classes, the pay structure for teachers, district transportation demands, and indirect costs associated with the ECHS. For example, in New York City, the district, while

recognizing that additional funding should follow certain special needs students, has decided to fund new small schools in essentially the same manner throughout the district.<sup>4</sup> In contrast, Houston funds schools differently depending on the school's governance structure. The Challenge High School has access to additional funding streams as a "district charter," while the "community chartered" G. I. Sanchez Charter High School does not have access to this funding. In Youngstown, Ohio, the school district contribution (51% of the college cost) is determined by state guidelines. The additional costs to the district of operating the Middle College High School at San Joaquin Delta College in Stockton, California, are minimal, as the school is co-located on the site of the community college and pays a small amount per year to reside there. Its cost is much less than it would be if it were operated as a district school.

The cost variations for the PSE partner depend on its arrangement with the ECHS, particularly in relation to who pays the capital and postsecondary direct and indirect costs incurred by the program. For example, in Youngstown, the university picks up a large portion of the tuition and provides in-kind contributions to the ECHS, including the space for high school classes. However, at San Joaquin Delta in California, where the school district contribution is minimal, the community college estimated its additional costs to be approximately 15%.

The costs to the state depend upon whether or not the state has an ECHS or dual/concurrent policy that either encourages or provides fiscal support for ECHS sites. For example, the state of Ohio has legislation to support dual and concurrent enrollment and provides supplemental funding for ECHS sites. The state of Texas provides an Early College High School Expansion Grant Program through the Texas Education Agency to a limited number of districts and charters that provide ECHS options. In contrast, the state of New York has neither a policy directly supporting ECHS initiatives nor one directly supporting dual and concurrent enrollment. In New York it is up to an individual school district and its post-secondary partner to fashion policy in this area. For example, New York City, through a collaboration between the New York City Department of Education and the City University of New York, created the College Now program to support dual enrollment options.

For all these categories of costs, a distinction must be drawn between the additional costs incurred due to ECHS and those costs that would have occurred anyway. For example, per student payments from the school district are not, in this analysis, costs of producing ECHS benefits since they would have been incurred without ECHS. As discussed above, ECHS-specific costs will be identified by subtracting the cost of a traditional high school from the ECHS costs.

### ***The ECHS Cost Model***

APA has developed an estimation model, using constant dollars, which has equations for determining ROI for students, the ECHS site, the school district, the PSE

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<sup>4</sup> An important exception to this "equal funding" practice has been made for small schools that existed prior to 2003. Small schools that existed prior to 2003 were granted "save harmless" funding status and were allowed to keep their historically agreed to funding structure. In addition, this practice applies to operating expenditures only. Facilities funding is excluded and may vary depending on whether the ECHS site is housed in a district building or a postsecondary facility.

partner, and the state. The students, ECHS, district, and state each have different benefits and costs associated with ECHS. Accordingly, the resulting ROI calculation for each entity is different.

Further, the model provides net cost equations for the organizations providing services, i.e., the ECHS site, the school district, the PSE partner, and the state. These net cost equations could be used to undertake a “cost to completion” analysis of ECHS schools in the future. The estimation model also provides a ROI comparison between the ECHS and a comparably sized traditional high school.

At this time, the necessary data for running all of APA’s equations for the various entities (student, ECHS site, district, PSE partner and the state) are not available. Therefore, the model described here and the results reported in the following section will focus on the analysis for the student/family, the ECHS site, and the state. The analysis for each level will also be compared to results for a traditional high school.

The ROI equation for students and families is as follows:

$$\textbf{Student ROI} = \frac{\textbf{[(total student benefit – total student costs)]}}{\textbf{total student costs}} \times 100$$

Major ECHS benefits for students include increased attendance, persistence, and graduation – expressed in terms of added future earnings, with relatively low marginal financial cost. As a consequence, the ROI for students is likely to be very high.

The ECHS site ROI is solely about managing the marginal costs and cumulating student benefits. As the number of students completing additional degrees (or certifications) increases, so does the ROI for the ECHS site. The ROI can be calculated in the following manner.

$$\textbf{ECHS site ROI} = \frac{\textbf{[(total ECHS site benefit – total ECHS site cost)]}}{\textbf{total ECHS site costs}} \times 100$$

When considering the interest of the state, a long-term return on investment analysis seems appropriate. From the state perspective, the net costs start out negative but should approach zero in the early years and turn positive over time. As ECHS graduates move into the workforce and earn a higher income, the state should realize an increase in tax revenue. This increase in revenue will help the state offset the marginal amount of money it invested in ECHS students via the K-12 and post-secondary education funding systems as well as any state subsidies for dual and concurrent enrollment and/or direct support for ECHS schools.

## IV. Example of the ROI Model in Action

The effectiveness of any model is determined by how well it forecasts the future, given actual data from ECHS and traditional high school sites. A straightforward evaluation of the effectiveness of this ROI model was, however, limited by an overall lack of data needed to run the model for multiple sites (schools, postsecondary systems and states) and the fact that no single location has all the data needed to run the model. This meant that APA was forced to create composite data sets to illustrate how the model could be used. The results presented in this section are illustrative of the return on investment attributable to the ECHS approach to high school reform. Which composite data sets were used in each comparison is described at the end of this introductory section. What follows immediately is description of what data were needed, what data were available, and how the composite data sets were put together.

Though the ECHS network is in the process of establishing a student information system that will eventually collect the needed data, the set of results data needed to test the model described above does not exist.<sup>5</sup> The only “hard” data that exist today are certain pieces of information from certain ECHS sites. For example, some data on AA and college credit attainment exist from certain veteran Middle College High Schools, which did not originally share the ECHS goal of AA degree attainment. Two ECHS sites have reported the percentages of their students that have achieved an AA degree. Finally, several ECHS sites have their financial data well organized, but many others do not.

To use the model to estimate ECHS’ return on investment described below, APA was forced to create composite data sets for ECHS student results and expenditures, as well as comparable student results and expenditures for the “traditional” high school. For student results, APA used three different estimates. The first estimate relied on average student attainment data taken from the National Educational Longitudinal Study (NELS).<sup>6</sup> The NELS data set contains variables that gauge a student’s level of college qualification. The categories include not qualified, minimally qualified, somewhat qualified, and very/highly qualified. These categorical variables were created using SAT and/or ACT scores, high school GPA, and an assessment of the nature of the student’s high school curriculum, among other variables. In the NELS data set, the level of college qualification is positively related to the rate at which students enroll in and complete a postsecondary education, controlling for background characteristics such as race and income background.

To generate estimates of education attainment levels for the traditional high school and the ECHS school, APA (in consultation with Jobs for the Future) used the NELS data set to answer the question, what are the actual high school and college attainment levels for students from the two lowest SES quintiles? These percentages

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<sup>5</sup> The incomplete data situation exists because the initiative is too young to have consistent results on AA and BA attainment rates. ECHS sites are beginning to collect this information, but regular secondary schools rarely collect this information about their graduates. Further, though it would be interesting to disaggregate the results data by socio-economic status or racial/ethnic group, that information by degree attained by graduates is rarely found.

<sup>6</sup> The National Educational Longitudinal Study (NELS) traces the education outcomes of approximately 25,000 students who started 8<sup>th</sup> grade in 1988.

became the estimates of education attainment for the traditional high school. APA believes this is a reasonable assumption given the income composition of the student population that ECHS targets. The NELS data set was also used to answer the question, what should be the appropriate attainment levels for ECHS schools? Given the college orientation of ECHS' instruction and curricula, APA assumed that students would be prepared/qualified for college by high school graduation, since they were already earning college credit as part of the high school curriculum. We created estimates of ECHS student attainment levels by using the attainment levels from the NELS data set for the college qualified. Education attainment level estimates used to compare an ECHS school and a traditional high school based on national data are reported in the first two columns of Table 4 below.

Second and third estimates of ECHS student education attainment levels are based on actual data from two veteran middle college high schools that joined the ECHS network early and aspire to the ECHS student outcomes. The two schools are the Harbor Teacher Prep Academy at Los Angeles Harbor College and the Middle College High School at LaGuardia Community College. Seventy percent of the first cohort graduating from Harbor Teacher Prep Academy earned AA degrees. Sixty-seven percent of the first cohort graduating from the Middle College High School at LaGuardia Community College earned AA degrees. The remaining attainment figures were extrapolated from these two ECHS actual AA degree attainment rates by using the NELS "college qualified" attainment percentages to develop the California and New York ECHS percentages reported in the last two columns of Table 4 below.

APA consulted several sources to reach an estimate about the time it would take for students to move through the education system.<sup>7</sup> APA used the same estimates whether the student attended an ECHS site or a traditional high school for the high school dropout category (3 years in the system) and for attaining the high school diploma (4.5 years in the system). Above these two levels, the time to attainment diverges in the following ways: for some college, the average ECHS students needed 4.5 years, while the traditional student needed 6 years; for the AA degree, the average ECHS students needed 5 years while the traditional student needed 7 years; and for the BA degree, the average ECHS students needed 7 years, while the traditional student needed 8.5 years.

The length of time that has passed since attaining the education goal is also a very important factor in the ROI analysis. While the costs for an individual or cohort of individuals are fixed once they complete their educations, annual benefits continue to accrue over the years. APA ran the analysis for two different time frames, the first at 15 years from the time a student entered as a high school freshman (or when the student is approximately 29 years of age), and the second at 25 years from the time the student entered as a high school freshman (or when the student is approximately 39 years of age).

To estimate costs, APA relied on information collected from the site visits in California and New York. Cost estimates for California were obtained from the state

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<sup>7</sup> Sources include the NELS data set, Clifford Adelman's *Answers in the Toolbox*, and tables from the City University of New York's Office of Institutional Research and Assessment on system retention and graduation rates.

reports on expenditures in the Lodi Public Schools and from information collected during the visit to the Middle College High School at San Joaquin Delta College. In New York, cost estimates were obtained from New York City's Department of Education reports on public schools, City University of New York's estimates of expenditures for the ten sites for which CUNY itself is the intermediary, and from information collected during the visit to Middle College/Early College at LaGuardia Community College. Middle College/Early College at LaGuardia Community College opened as a middle college in 1974 and began converting to an early college with the goal of an AA degree for its students in 2002. It has had two "pilot" graduating classes. CUNY opened its first of 10 6-12 early college schools in 2005, and so it will be at least 5 years before there is data on graduation rates.<sup>8</sup>

Individual estimates of effective state tax rates were used to determine the amount of state revenue that could be derived from additional earned student income. The effective state tax rates for California and New York were taken from the state tax structure website at *Governing.com*. Finally, the same numbers of students (400) were assumed to attend both the ECHS and the traditional high school. A summary of the model's underlying assumptions are provided in the tables found in Appendix 1.

Also as part of the model, APA also created a determination of net **costs** at the site, district, PSE partner, and state levels. The fiscal relationship between the state and the school district is relatively easy to determine, as is the relationship between the ECHS site and the school district. Dollar transfers and other cost-sharing arrangements between the PSE partner and the ECHS site, on the other hand, are difficult to identify and vary significantly from site to site. As a consequence, although the mechanics of the net cost calculation is built into the model for each service delivery level (and could later be used in a "cost to completion" analysis), the data were not available to create accurate estimates, and therefore, the calculations are not presented in this paper.

The **returns on investment results** reported in the remainder of this section include the following:

- (1) Results for individual students reaching different education attainment levels for the ECHS and the traditional high school routes;
- (2) Results for ECHS sites compared to traditional high schools using national NELS-based estimates for education attainment levels and California cost structure data; and
- (3) The analysis for two states, California and New York, uses actual AA degree attainment results from an ECHS school in each state to modify the NELS

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<sup>8</sup> It is important to note that the CUNY cost estimates include serving students in grades 6 through 8. To compare New York results to the typical ECHS grade configuration used across the country in the hypothetical illustrations of the model, APA only used the portion of the CUNY estimates for grades 9 through 12. Thus readers should understand that the cost estimates are based on a hypothetical derived from schools that are not yet up and running with full grade span implemented. We chose to use these cost estimates because there will be at least 10 ECHSs in NYC using this cost model. In addition, the LGA Middle College Early College did not begin with an ECHS, AA attainment goal in mind, and has different fiscal constraints and costs built into its model. Long term with real data and full ECHS implementation, we anticipate that the costs of both models will begin to converge.

education attainment profile, the cost and tax structures from the respective states, and assumes that each of the two states has 4,000 students attending ECHS sites that produce a student achievement profile similar to the two original ECHS sites.

## **Results**

### **The Student and His or Her Family**

The students participating in ECHS schools are the long-term winners when their participation is analyzed from a ROI perspective. The benefits part of the analysis is undertaken in terms of annual earnings of a student earning a BA, AA, some college, and a high school diploma relative to the earnings of a high school dropout. The College Board regularly estimates the increased annual earnings for different levels of academic attainment.<sup>9</sup> Drawing from the latest update, the annual earnings values used here are as follows: the difference in earnings between a high school dropout and a person with a high school diploma is \$9,200 per year; the difference in earnings between the high school dropout and a person with some college is \$14,100 per year; the difference in earnings between the high school dropout and a person with an AA degree is \$16,000 per year; and the difference between the high school dropout and a person obtaining a BA is \$28,300 per year.

Table 2 presents the total benefits for a student in each of the four categories of education attainment above the high school dropout level for both 15 and 25 years after entering high school as a freshman. As shown in the table, the total benefits for all categories of students completing a BA degree are significantly higher than for a student completing an AA degree, which is, in turn, higher than students completing a high school diploma. In the 25-year time frame, for example, the benefits for earning a BA degree in an ECHS setting (\$509,400) is 2.84 times greater than the benefits for earning a high school diploma (\$179,400), because of the positive annual difference in earning power experienced by a person with a BA degree. In contrast, students in a traditional high school have to spend more time in school and less time in the workforce than an ECHS student to earn the same degree. For students in a traditional high school earning a BA degree, this results in an earnings differential compared to the ECHS student of nearly \$71,000 before adjusting for inflation.

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<sup>9</sup> These figures are taken from the graph on page 2 of the College Board's "Education Pays: Update 2005." Baum, S. and Payea, K., "Education Pays: Update 2005," Trends in Higher Education Series, The College Board, Washington, DC, 2005.

<b>TABLE 2</b>				
<b>Comparison of Individual Student's Total Benefits Relative to a High School Dropout by Time Period and ECHS Participation</b>				
	<b>15 Year Time Frame</b>		<b>25 Year Time Frame</b>	
	<b>ECHS</b>	<b>Traditional</b>	<b>ECHS</b>	<b>Traditional</b>
Total Benefits for a Student Completing a BA Degree	\$226,400	\$155,650	\$509,400	\$438,650
Total Benefits for a Student Completing an AA Degree	\$160,000	\$128,000	\$320,000	\$288,000
Total Benefits for a Student Completing Some College	\$133,950	\$126,900	\$274,950	\$267,900
Total Benefits for a Student Completing a HS Diploma	\$87,400	\$87,400	\$179,400	\$179,400

Table 3 shows the return on investment for individual students by level of education attainment, using California's public education and postsecondary cost structure. Two conclusions can be drawn from Table 3. The first is that higher rates of return are inversely associated with BA, AA and some college attainment levels. This is due to the fact that significantly lower costs associated with some college and the AA degree creates a higher return on investment when compared to the BA degree.<sup>10</sup> The second is that *all students participating in an ECHS program benefit dramatically compared to students moving through a traditional high school program*. The benefit and cost results for individual students reaching the five levels of education attainment are then combined according to the percentages presented in Table 4 and used to build the analysis of school sites. It is important to note that BA, AA and some college costs and benefits are different in the ECHS and in the traditional high school due to the different number of years needed to reach a given education attainment level.

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<sup>10</sup> This fact helps when trying to understand why students in this age group sometimes report that they would prefer entering the workforce to continuing their education.

<b>TABLE 3</b>				
<b>Comparison of an Individual ECHS Student's Return on Investment to a Traditional Student's Using California's Education Costs* by Time Period</b>				
	<b>15 Year Time Frame</b>		<b>25 Year Time Frame</b>	
	<b>ECHS</b>	<b>Traditional</b>	<b>ECHS</b>	<b>Traditional</b>
ROI for Students Completing a BA Degree	1,380%	499%	3,230%	1,587%
ROI for Students Completing an AA Degree	3,625%	857%	7,351%	2,054%
ROI for Students Completing Some College	4,960%	1,260%	10,287%	2,771%

\* An ECHS student's return on investment will vary depending on the public postsecondary education costs in the student's state of residence.

### **The ECHS Site**

Table 4 presents the different estimates used in the ROI analysis for students reaching the five education attainment goals. The first two columns are based on NELS national averages obtained for low-income student populations and would be expected to reflect the high school student population found in California's and New York's larger school districts.<sup>11</sup> Average years needed to complete education attainment levels are shown in parentheses for the NELS estimates and are used throughout the analysis. The NELS national averages are used for the ECHS versus traditional school site comparisons. For the analysis of the two states, the final two columns are used as estimates of ECHS education attainment, while the NELS national estimate continues for the traditional school.

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<sup>11</sup> These estimates are based on data from the National Educational Longitudinal Study (NELS) that traces the education outcomes of approximately 25,000 students who started 8<sup>th</sup>-grade in 1988. The NELS data set contains variables that gauge students' level of college qualification. The level of college qualification is positively related to the rate at which students enroll in and complete a postsecondary education, controlling for background characteristics such as race and income background. Students were only counted as attending college if they went to a degree granting two- or four-year college; postsecondary vocational schools were not included. However, if they enrolled in a certificate program at a two-year college they would be included in the some college category.

<b>TABLE 4</b>				
<b>Composition of Student Body Reaching a Specified Level of Education Attainment by Type of Estimate and School Type</b>				
	<b>NELS-Based National Estimates</b>		<b>State Estimates</b>	
	<b>ECHS School</b>	<b>Traditional School</b>	<b>ECHS School</b>	<b>Traditional School</b>
Percentage of Students Completing a BA Degree	28% (7 years)	10% (8.5 years)	28%	28%
Percentage of Students Completing an AA Degree	20% (5 years)	10% (7 years)	42%	39%
Percentage of Students Completing Some College	29% (4.5 years)	26% (6 years)	7%	10%
Percentage of Students Completing High School	15% (4.5 years)	25% (4.5 years)	15%	15%
Percentage of Students Dropping Out	8% (3 years)	29% (3 years)	8%	8%
Total (Students)	100% (400)	100% (400)	100% (400)	100% (400)

To calculate the return on investment at the school site, the benefits and the costs must be aggregated across students. To aggregate the benefits across students, APA multiplied the NELS-based national education attainment percentages identified in Table 4 with the school site student count and the appropriate projected annual increase in earnings. The aggregated results for the ECHS and traditional high school site using the NELS-based estimates for the 15- and 25-year time frames are presented in Table 5. Overall, ECHS sites generated more benefits than comparable traditional site, \$25.3 million in the 15-year time frame. Also, as expected, the longer time frame significantly increased the benefits.

<b>TABLE 5</b>		
<b>Comparison of Individual School Site's Total Benefits &amp; Costs for NELS-Based National Estimates Using California's Education Costs by Time Period (in Millions)</b>		
	<b>NELS-Based National Estimates</b>	
	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>
<b>ECHS Site</b>		
Total Benefits	\$59.5	\$125.3
Total Costs	\$15.2	\$15.2
<b>Traditional High School Site</b>		
Total Benefits	\$34.2	\$74.9
Total Costs	\$13.1	\$13.1

Table 5 also presents the aggregate costs for the comparison sites. The costs include an estimate of the state and local K-12 expenditures per pupil, plus added postsecondary and other state costs. Additional costs can be added to either the ECHS or the traditional high school site to reflect additional personnel, materials, facilities costs, and more. When ECHS schools start recording their expenditures and revenues in the format suggested by Michael Webb (2004), identifying these costs will be easier.

The aggregate costs are the same across the 15- and 25-year time frames because the costs of servicing the cohort of students moving through the school and PSE systems ends after the students end their relationship with the ECHS site and complete their degrees. The costs of ECHS sites are somewhat higher than those of traditional high schools. This is a reflection of the additional resources needed by the sites, including the PSE partners' contributions.

Table 6 presents the calculated ROI for ECHS and traditional high school sites, using the NELS-based national attainment estimates. In each case, the ECHS school has a return on investment that is greater than the comparable return for the traditional high school. Also, the longer the time frame considered, the greater the return on investment. The bottom row of the table summarizes the difference in return on investment of the ECHS site when compared with the traditional high school for each dollar invested in the program.

<b>TABLE 6</b>		
<b>Comparison of Individual School Site's Return on Investment for NELS-Based National Estimates Using California's Education Costs by Time Period</b>		
	<b>NELS-Based National Estimates</b>	
	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>
ROI for ECHS School	292%	725%
ROI for Traditional High School	153%	454%
ECHS Return Difference from the Traditional High School	\$1.39 per dollar committed	\$2.71 per dollar committed

Given the student results profile used along with the California cost structure, this means that for every dollar invested in an ECHS site in the 15-year time frame, one \$1.39 more is returned than a similar dollar invested in a traditional high school. In the 25-year time frame, this difference in return grows to \$2.71. The results presented for the NELS-based national estimates are informative and show that the return on investment in ECHS schools is substantial.

## **The State**

Examining similar results across states helps to answer the question, when might the state expect to recover its investment in ECHS? This analysis also examines the factors that can influence the length of time it takes for a state to recover its investment. To set up the benefits side of this analysis, the NELS-based estimates for student attainment results will be used for the traditional high school. For the ECHS site in California, the education attainment estimates used are found in the third column of Table 4. For the ECHS site in New York, the education attainment estimates used are found in the fourth column of Table 4. On the cost side, the analysis will use the respective cost structures estimated for the states of California and New York.

Tables 7 and 8 are very similar to Tables 5 and 6 and show the differences in benefits associated with the student attainment levels identified by the two ECHS sites. Differences in costs reported are driven by the different cost structures of the two states. The cost structure in New York being significantly higher (\$7 to \$9 million more) than in California.

<b>TABLE 7</b>				
<b>Comparison of Individual School Site's Total Benefits &amp; Costs by State and Time Period (in Millions)</b>				
	<b>California</b>		<b>New York</b>	
	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>
<b>ECHS Site</b>				
Total Benefits	\$61.2	\$129.3	\$60.9	\$128.7
Total Costs	\$15.5	\$15.5	\$24.4	\$24.4
<b>Traditional High School Site</b>				
Total Benefits	\$33.3	\$74.9	\$33.3	\$74.9
Total Costs	\$13.4	\$13.4	\$21.3	\$21.3

<b>TABLE 8</b>				
<b>Comparison of Individual School Site's Return on Investment by State and Time Period</b>				
	<b>California</b>		<b>New York</b>	
	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>
ROI for ECHS School	295%	733%	150%	428%
ROI for Traditional High School	146%	454%	56%	251%
ECHS Return Difference from the Traditional High School	\$1.49 per dollar committed	\$2.79 per dollar committed	\$.94 per dollar committed	\$1.77 per dollar committed

Again, as shown in Table 8, in each case the ECHS site's return on investment is greater than the comparable return for the traditional high school. For every dollar invested in ECHS, the state realizes a significant return on its investment. This greater return compared to the traditional high school ranges from \$.94 per committed dollar in New York in the 15 year time frame, to \$2.79 per committed dollar in California in the 25 year time frame.

In order to calculate comparable results, APA assumed that both states would serve 4,000 students. These hypothetical "results" are presented to illustrate the types of state finance questions that this model can address. Table 9 presents the return on

investment results for our hypothetical state data. Not surprisingly, the highest return on investment is recorded for the ECHS sites in California in the 25-year time frame. Results presented in this table show that the return for ECHS sites in New York is lower than in California, though the returns for both states are very positive for ECHS sites individually and in comparison to traditional high schools. The New York results are driven by the fact that the costs associated with the New York ECHS site and traditional high school are significantly higher than those found in California schools.

<b>TABLE 9</b>				
<b>Comparison of a State's Return on Investment by State and Time Period</b>				
	<b>California</b>		<b>New York</b>	
	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>
ROI for ECHS School	462%	1,086%	254%	648%
ROI for Traditional High School	251%	691%	121%	397%
ECHS Rate of Return Difference from the Traditional High School	\$2.11 per dollar committed	\$3.95 per dollar committed	\$1.33 per dollar committed	\$2.51 per dollar committed

Table 10 presents a second way of evaluating the effectiveness of ECHS sites in a state. By calculating the marginal costs and marginal revenues generated by the ECHS sites relative to the traditional high school, the model can help determine the number of years it would take for a state to recoup the marginal dollar amount it invested. This calculation is based on the cumulated benefits and costs across sites in the state, and on the state's effective tax rate. In California, the effective tax rate used was 8.2%; in New York, the effective tax rate used was 6.7%. An economic multiplier, an estimate of the additional economic activity generated by each additional dollar of earnings introduced into the states, is also used. The rate of 40% was chosen because it was one of the most conservative multipliers used in similar studies.

<b>TABLE 10</b>				
<b>Comparison of Individual State's Marginal Costs, Expected Revenues and % of Costs Covered by Revenues by State and Time Period (in Millions)</b>				
	<b>California</b>		<b>New York</b>	
	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>	<b>15 Year Time Frame</b>	<b>25 Year Time Frame</b>
Marginal Cost to the State of Moving a Cohort of ECHS Students Through ECHS Schools	\$19.9	\$20.1	\$30.2	\$30.2
Marginal Revenues Received by the State as a Result of Moving a Cohort of ECHS Students Through ECHS Schools	\$32.0	\$62.4	\$25.9	\$50.5
Percentage of Marginal Costs Covered by Marginal Revenues	161%	309%	86%	167%

Table 10 answers several questions in which state-level policy makers have an interest. First, the marginal revenues received by the states are positive across the two time periods. Second, in California, if additional ECHS sites would have similar education attainment profiles to the Harbor Teacher Prep Academy, the state would generate enough state tax revenue from the graduates of this cohort to cover the ECHS investment within the 15-year time frame. In New York, if additional ECHS sites would have similar education attainment profiles to the Middle College High School, the state would generate enough state tax revenue from the graduates of the cohort to cover the ECHS investment in just over the 15-year time frame. This means that the state of California would recoup its marginal costs approximately 6 years after the cohort enters the workforce, while the projections for the state of New York show the breakeven point approximately 12 years after the cohort enters the workforce.

## V. Model Implications for ECHS Planning

As previously indicated, discussions with reviewers and with ECHS network members led to questions about how the model could help the ECHS network plan its expansion to over 200 sites. The most important use of this model is to influence policy making at the state level. A simple, elegant and comparative analysis is needed to demonstrate to state leaders the return on investment for a program like ECHS. Since ECHS requires an additional upfront investment, policy makers need to know whether funding this program will create a positive return on that investment for the state. Further, they need to know when the state will begin to realize the benefit. The model developed here can be tailored to a state specific context and can generate the answers to these key questions.

State policy can be instrumental in encouraging or discouraging the development of ECHS programs. A review of policies in California, New York, Ohio and Texas shows that supportive policies in this area include fostering school autonomy and decentralization, charter schools, alternative uses of the senior year of high school, and dual and concurrent enrollment, as well as providing direct support for ECHS initiatives.

In a state like Texas, where the policy environment is positive, aspiring ECHS innovators have a relatively clear path to follow to create an ECHS school. In New York, where state policy is largely silent, it falls to individual districts and their partner postsecondary institutions to decide whether or not to encourage the development of ECHS sites. New York City, Rochester, and several community colleges have taken up the challenge but receive little direct state financial support. In general, incentives and direction provided by the state can influence local leaders of post-secondary institutions, charter school authorizers, and school districts to consider and approve ECHS proposals.

At the ECHS planning level, the model developed in this paper can also help ECHS advocates understand the implications for certain design targets. A variety of practical questions can be addressed. For instance, what increase in ROI can be achieved by a 10% increase in either the number of students attaining their AA degree or the number of students attaining their BA degree? To answer this question, an assumption must be made about the student education attainment level from which the 10% is drawn. Using the NELS-based national estimates, the assumption is that the 10% increase comes from the pool of students who would have received their high school diploma. Table 11 shows the results for these changes using a 15-year time frame.

<b>TABLE 11</b>		
<b>Comparison of Modified Student Attainment Profile on School Site's Total Benefits, Costs, &amp; ROI for NELS-Based National Estimates Using California's Education Costs for 15 Year Time Period (in Millions)</b>		
	<b>NELS-Based National Estimates</b>	
	<b>10% More AA Degrees</b>	<b>10% More BA Degrees</b>
<b>ECHS Site</b>		
Original Total Benefits	\$61.2	\$61.2
Original Total Costs	\$15.5	\$15.5
<b>ECHS Site – Modified Student Attainment Profile</b>		
Total Benefits	\$64.1	\$66.8
Total Costs	\$15.7	\$16.0
<b>ROI Comparison</b>		
Original ECHS Site	295%	295%
Modified ECHS Profile	309%	317%

The results show that increasing by 10 percent the number of students earning their AA degree, instead of a high school diploma, yields a 14 percent change in the marginal rate of return. This is to be expected given the marginally higher annual earning power of a person with an AA degree relative to a person with a high school diploma (\$6,900 per year). Moving an additional 10% of students from completing a high school diploma to earning their BA degree, however, has a more significant impact on the ECHS site's overall rate of return, a 22 percent change in the rate of return, attributable to the \$19,200 increase in annual earning power.

Other planning questions that the model can help address include the following: (1) does school size influence the ROI that can be achieved? and (2) do the numbers of schools in a district or a state influence the ROI? The analysis shows that, when more students participate in ECHS schools, the return on investment goes up relative to participation in traditional high schools. In general, therefore, the more students participating in ECHS schools and the more ECHS schools per state for a fixed student population, the greater the overall return on investment.

## VI. Conclusion

The ECHS initiative is dedicated to helping traditionally underserved students successfully move from secondary education deep into postsecondary education. The immediate goal is to have all ECHS students attain their high school diploma and their AA degree (or certification equivalent) by the end of their high school years. In addition, it is hoped that a significant number of these students will go on to complete their BA degree.

Unlike many other comprehensive school reform networks, especially those at the elementary level, the ECHS initiative is strict about its objectives but welcoming of alternative strategies for pursuing those objectives. As a consequence, this reform network has attracted a diverse set of education leaders and practitioners who have initiated a wide range of programs under the ECHS umbrella. The programs offered at the various sites visited for this study are significantly different, and there is great variation in the critical relationships between and among the partners contributing ECHS services.

Understanding the financial implications of ECHS programs is difficult, because different sites implement their programs differently and each site has both secondary and postsecondary institutions participating. Each of the participating institutions has its own particular goals for participation. In addition, the ECHS effort is only beginning to collect the data that is needed for financial planning models. This puts the initiative in the position of having to create a financial analysis model and to collect the data to run the analysis simultaneously.

APA was hired to create a financial analysis model with a focus on the return on investment in ECHS schools. As a part of the project, APA visited a variety of ECHS sites, developed a model for analyzing ECHS benefits and costs across K-12 and postsecondary education boundaries, and examined the effectiveness of that model with data available from ECHS sites in California and New York. In the course of building the model to generate insights on the ECHS return on investment, it was clear that certain student-serving organizations (schools, school districts, and PSE partners) would also be interested in examining the net cost of serving these students. Both return on investment and net cost analyses are built into the current model. Once the data are available, it will be possible to use the net cost results to generate a “cost to completion” analysis for students participating in ECHS programs. Due to a lack of data that effort was not undertaken as part of this project.

In summary, the ROI model reported in this paper makes the case for the following conclusions:

- Students and families benefit tremendously from participation in ECHS schools;
- ECHS schools generate more benefits for their students and a greater return on investment than comparable traditional high schools; and
- States also benefit from investing in ECHS sites as long as the ECHS cost structure is not too much greater than the cost structure of a traditional high school. Over the 15- and 25-year time frames reported in this paper, both sample states recouped their initial investment in the cohort of students.

APA believes that the approach described in this paper to analyzing ECHS benefits and costs will help ECHS organizations across the country demonstrate the significant value which these programs offer to all parties concerned, especially to students and their families. The insight generated from this analysis should contribute to the expansion of the number of ECHS sites across the nation.

## Appendix 1: Critical Assumptions

<b>TABLE A</b>		
<b>Critical Student/Family Assumptions Used in the ECHS Return on Investment Model</b>		
	<b>NELS-Based National Estimates</b>	<b>State Estimates: California and New York</b>
<b>Student/Family Level Assumptions</b>		
<b>Common Assumptions Across Estimates</b>		
Increased annual earnings for additional education attainment	All additional earnings are reported relative to the earnings of a high school dropout. The differentials include the following: \$28,300 for a BA degree; \$16,000 for a AA degree, \$14,100 for some college, and \$9,200 for a high school diploma.	
Time spent by students in the education systems	For ECHS students, on average, dropouts spend 3 years in high school, high school diploma recipients earn their diploma in 4.5 years, "some college" recipients spend 4.5 years, AA diploma recipients earn their degree in 5 years, and BA diploma recipients earn their degree in 7 years. For traditional students, on average, dropouts spend 3 years in high school, high school diploma recipients earn their diploma in 4.5 years, "some college" recipients spend 6 years, AA diploma recipients earn their degree in 7 years, and BA diploma recipients earn their degree in 8.5 years. Once a student leaves school, it is assumed that they enter the workforce at a salary commensurate with their education attainment level.	
Direct costs picked up by students	For ECHS students, costs are assumed to be minimal, at \$250 per year per student. For the BA, students pay regular in-state tuition. For traditional students, costs are assumed to be minimal in high school at \$250 per year per student. Beyond high school, students pay regular in-state tuition for community and 4-year colleges.	
<b>Estimate Specific Assumptions</b>		
PSE tuition, fees and books	Cost structure based on California costs: \$5,500 per year for CSU system, \$3,600 per year for CC.	California costs equal \$5,500 per year for CSU system, \$3,600 per year for CC. New York costs equal \$6,500 per year for CUNY system, \$1,700 per semester for CC.

<b>TABLE B</b>		
<b>Critical ECHS Site Assumptions Used in the ECHS Return on Investment Model</b>		
	<b>NELS-Based National Estimates</b>	<b>State Estimates: California and New York</b>
<b>ECHS/Traditional High School Assumptions</b>		
<b>Common Assumptions Across Estimates</b>		
Existence of a state student weighting system	Though the model is built to accommodate a student weighting system, no weights were assumed for at-risk, English language learners (ELL) or special education.	
Avoiding certain remedial and anti-social behaviors	Though the model is built to estimate the savings earned by avoiding several categories of costly behaviors, including remedial courses and encounters with the juvenile justice system, no students were so identified.	
Other annual local costs assumed	\$80,000 per year for facilities and other costs above the accumulating costs per student.	
Years to completed education attainment	Same as time spent by students in the education systems specified in Table A for ECHS and traditional students.	
<b>Estimate Specific Assumptions</b>		
Students attending grade 9 through 12	400	400
ECHS expenditure per pupil	\$7,500	\$7,500 is used in California; \$11,900 is used in New York.
Traditional high school expenditure per pupil	\$6,700	\$6,700 is used in California; \$10,700 is used in New York.

<b>TABLE C</b>		
<b>Critical State Assumptions Used in the ECHS Return on Investment Model</b>		
<b>State Estimates: California and New York</b>		
<b>State Assumptions</b>		
<b>Common Assumptions Across states</b>		
Students assumed to participate in ECHS statewide	4,000 students attending 10 schools.	
State economic multiplier	An additional 40% on every dollar added to the state's economy.	
Rate of return reported	Rates of return are reported for ECHS sites and traditional high schools.	
Other annual state costs assumed	\$150,000 per year for other costs above the accumulating costs per student and per site.	
<b>State Specific Assumptions</b>		
State effective tax rate	California is 8.6%	New York is 6.7%

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