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FULL REPORT:

Postsecondary Access in Pennsylvania: Factors Associated with Students' Access and Travel Distance to 4-Year Universities

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Office of Administration



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**Research and
Evaluation**

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Abstract

Previous research at the national (Hillman, 2019) and at the state (Henninger-Voss & Herzenberg, 2017) level has identified certain geographical locations as “education deserts” based on their lack of viable postsecondary educational opportunities. Many students who live in these areas of low postsecondary access, especially students who are part of historically underserved groups, often must travel a great distance to attend in-person postsecondary education (Hughes, Karp, Fermin, & Bailey, 2005; Kanno & Cromley, 2013; Perna & Jones, 2013; Lopez-Turley, 2009). The present study closely examined county-wide differences in access to various forms of postsecondary education within Pennsylvania (PA). Additionally, four classes of high school graduates from school years 2013-2017 were followed to their first 4-year postsecondary enrollment. Analyses examined associations between student demographic factors and students’ travel distance to 4-year postsecondary universities within PA. Results showed that the northern region of PA was home to several counties which did not have access to various degree-granting postsecondary options, such as 4-year broad access institutions (BAIs), community college locations, and instructional sites. Conversely, groups of counties with higher levels of postsecondary access were typically found clustered around Allegheny and Philadelphia counties. Additional results showed that student travel distance and access to PA 4-year universities often varied by institution type (PA state institution versus non-state institution) and students’ status as economically disadvantaged, English Learners (EL), and historically underperforming. These results are discussed in relation to previous literature and implications regarding PA’s postsecondary access are considered.



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The Pennsylvania Department of Education (PDE) Evaluation and Research project is an effort that was established through a State Longitudinal Data System (SLDS) Grant from the Institute of Education Sciences (IES), National Center for Education Statistics (NCES), awarded in October 2015. The Research and Evaluation project is an initiative to make full use of the P-16+ system data and other data sources to answer priority questions from the PDE research agenda, to form collaborative research partnerships, and to increase PDE’s capacity to conduct research. Our mission is to evaluate and analyze data to provide insight that can be used to positively impact policy, inform decision making and lead to improved student outcomes.

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The mission of the Department of Education is to ensure that every learner has access to a world-class education system that academically prepares children and adults to succeed as productive citizens. Further, the Department seeks to establish a culture that is committed to improving opportunities throughout the commonwealth by ensuring that technical support, resources, and optimal learning environments are available for all students, whether children or adults.

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...Recent research has suggested that many students around the United States and PA do not have equal access to postsecondary educational opportunities.

Introduction

The mission of the Pennsylvania Department of Education (PDE) is to “...ensure that every learner has access to a world-class education system that academically prepares children and adults to succeed as productive citizens” (PDE, 2019). However, recent research has suggested that many students around the United States and PA do not have equal access to postsecondary educational opportunities. In fact, certain geographical areas around the nation have been identified as “education deserts” because their residents have little to no access to a college education (Hillman, 2016). Worse, research suggests that several underrepresented student groups are more likely to live in education deserts than their peers (Page & Scott-Clayton, 2016; Perna & Jones, 2013). In pursuit of PDE’s mission to provide equitable postsecondary access to all of Pennsylvania’s students, it is essential to better understand how postsecondary access geographically varies across the counties of the Commonwealth.

The current study sought to implement descriptive and inferential analyses to examine potential differences in postsecondary access between PA counties. Data related to college enrollment were examined to determine if PA students tend to enroll at postsecondary institutions within close geographical proximity of the high school from which they graduated. Additionally, variations in college travel distance and college access were examined for all student groups. Lastly, the current study investigated the relationship between postsecondary access and college travel distance.

Postsecondary Access and Geographical Proximity

At its core, college access refers to a student's ability to enroll at and attend a postsecondary institution (Long, 2017; Price, Herzenberg, & Polson, 2018). Previous researchers have discussed how increases in college access are associated with increases in college success and graduation (Page & Clayton, 2016). In turn, college graduation has been linked to higher salaries for graduates (Abel & Deitz, 2014), higher likelihood of voting (Heckman, Humphries, & Veramendi, 2018), and higher rates of volunteering and civic engagement (U.S. Bureau of Labor and Statistics, 2008). Therefore, it is important to better understand college access in PA, including how access varies by geographic region.

Several researchers have studied college access and how it is affected by place, or geographical factors. In fact, Hillman (2016) asserted that geography and proximity, while often overlooked, are integral factors that influence a student's college choice. Nicholas Hillman, a pioneer in research on geographic opportunity and education, found that for many students, various economic, social, and cultural factors influence the location and type of postsecondary institutions that students choose to attend. Regarding geographic opportunity, Sponsler and Hillman (2016) reported that over half of American college students enroll at a postsecondary institution within 20 miles of their home address. Additionally, as postsecondary options nearby students' homes increase, the likelihood that students will apply to a college increases as well (Lopez-Turley, 2009). Although research suggests that geography exerts a significant impact on college enrollment decisions, for many students in the United States, few viable postsecondary options exist within their geographical confines.

These types of geographical areas have been labelled by researchers as "educational deserts," a title which refers to a geographical area that has zero or very limited options for public postsecondary education (Hillman, 2016; Hillman, 2019). In a recent report, Hillman (2019) estimated that 10% of the United States population reside in an education desert. Hillman (2016) stated that many students in educational deserts only have access to a local community college, meaning they do not have geographical access to 4-year degree programs. Further, research suggests that a disproportionate number of underrepresented minority (URM) students live in areas designated as education deserts. Specifically, Hillman (2016) found that areas with higher populations of Hispanic students tended to have fewer nearby postsecondary options, while areas with higher concentrations of White and Asian students tended to have more options.

Expanding on the concept of education deserts, Klasik, Blagg, and Pekor (2018) identified two main types of education deserts: access deserts and match deserts. An educational access desert refers to a geographic area that does not contain adequate public postsecondary options for the population of students. Alternatively, an educational match desert describes a scenario in which there are no nearby institutions whose admissions policies match prospective students' educational achievements and qualifications. Klasik and colleagues (2018) proposed that approximately 12% of American high school students reside in access deserts, while 15% are located in match deserts. As many students value having postsecondary options close to home, the presence of education deserts poses a significant problem.

There are a variety of reasons which help explain why many students prefer to attend college near their home. Research reviewed by Ovink, Kalogrides, Nanney, and Delaney (2018) suggests that many students choose local college options even when they are overqualified for the institution's admissions requirements. These researchers suggest that students may choose to attend local institutions to maintain social and familial obligations, have a lower cost of living (through commuting and options to live at home), or for simple convenience. Several researchers (Klasik, Blagg, and Pekor, 2018; Lopez-Turley, 2009) have also reported that while students take a variety of factors into consideration when choosing a college, students who have experienced economic disadvantage are more likely than their wealthier peers

to attend schools closer to home, even if they are able and qualified to enroll at a more selective college (Ovink, et al., 2018). These findings suggest the variables which influence students' postsecondary choices may be influenced by their background experiences and characteristics.

As previously mentioned, college choice and access have been found to vary by student group status. In their book, *The State of College Access and Completion: Improving College Access for Students from Underrepresented Groups*, authors Laura Perna and Anthony Jones state that although college access and enrollment have improved in recent years for all students, issues of postsecondary access still exist for many underrepresented student groups. Similarly, in a review of previous literature, Page and Scott-Clayton (2016) discussed how changes to affirmative action policies in college enrollment have resulted in diminished postsecondary access for students who identify as part of a racial or ethnic minority group. Additional research has suggested that additional underrepresented student groups, such as English Learners (EL) [Kanno & Cromley, 2013] and special education students (Hughes, Karp, Fermin, & Bailey, 2005) may also have reduced access to postsecondary options. While differences in college access have been extensively studied, considerably less research has focused on issues of postsecondary access in Pennsylvania.

Differences in Postsecondary Access within Pennsylvania

In a report for the Pennsylvania Budget and Policy Center, Henninger-Voss and Herzenberg (2017) described the state of geographical opportunity for students seeking postsecondary education in PA. They reported that 28 out of the Commonwealth's 67 counties (almost 42%) do not host a community college instructional site, depriving PA residents who live in these regions of accessible and affordable postsecondary education. Further, these researchers labelled 15 counties in PA as "education deserts," indicating there are either no public colleges or universities in the region or there is only one broad access (an institution which accepts more than 75% of applicants) public community college. Henninger-Voss and Herzenberg (2017) suggested that this lack of college access significantly contributes to Pennsylvania's high proportion of adults who possess a high school diploma but no postsecondary educational experiences.

In a similar report for the PA Budget and Policy Center, Price (2017) reported that PA's system of state universities ([full list of institutions](#)) are instrumental in providing postsecondary access to PA's students. In fact, it was found that PA's state universities provide graduates with a higher mobility rate than 10 of PA's top private colleges. Price (2017) concluded that although Pennsylvania's state universities have historically been highly accessible to Pennsylvania's low income and working-class students, rising tuition costs are threatening this high rate of accessibility.

In response to this issue of postsecondary access in PA., in 2017, the Pennsylvania Department of Education approved the creation of a rural regional college in northern PA, an area with limited college access (PA Legislative Budget and Finance Committee, 2018). The newly created Northern Pennsylvania Regional College (NPRC) does not have one central campus location; instead, prospective students from nine underserved PA counties may travel to their local high school, library, or other nearby community center for in-person postsecondary instruction (Northern PA Regional College, 2020). While the NPRC and similar institutions increase access to postsecondary options for many students, other students who seek 4-year degree options or an advanced degree may still have limited options in their communities and counties.

Research Aims and Questions

While a significant amount of research has addressed how geography and proximity to postsecondary options may impact access to college education, comparatively few studies have investigated these issues in Pennsylvania. To the authors' knowledge, no study to date has sought to establish a statistical link between county-wide postsecondary access in PA and students' travel distance to college. Lastly, it is important to assess and describe potential issues of equity in access to postsecondary options.

Informed by previous literature on geographical differences in college access, the present study sought to answer the following research questions:

1. Are there county-wide differences between PA students' access to in-state postsecondary education?
2. What is the descriptive breakdown of PA student graduation classes by year? Do 4-year degree-seeking students in PA tend to enroll in postsecondary institutions near the high school from which they graduated? Is their travel distance and travel status (same-county, bordering-county, other-county, bordering-state, other-state) associated with student group membership?
3. What student-level factors are associated with students' county-wide postsecondary access? Do 4-year degree-seeking students have equitable access to postsecondary education?
4. Are students' travel distances to college affected by the level of postsecondary access in their county? Specifically, do 4-year degree-seeking students travel farther to college when there is limited postsecondary access in their county?

Methodology

Participants

To answer research questions #2 through #4, four cohorts of Pennsylvania high school graduates from school years 2013-2014, 2014-2015, and 2015-2016, and 2016-2017 were followed to postsecondary enrollment. To examine relationships between student variables and travel status, travel distance to college, and college access, all participants were PA high school graduates who enrolled at a postsecondary institution. Students in each graduation class were followed to a different point in postsecondary education depending on their entry date, but initial college enrollment data were available for students in each graduating class. All students followed in this study graduated from a public Pennsylvania local educational agency (LEA), Intermediate Unit (IU), or public charter school.

As analyses in the current study included data from students across multiple years, it was necessary to examine potential differences in student variables between graduation classes. Table 1 displays the raw differences in student variables between the 202,147 PA high school graduates who were tracked to a 4-year postsecondary enrollment in any state. Broken down by high school graduation year, Table 1 shows that there were no large differences between graduation classes in terms of student group or geographic location percentages.

Notably, students were excluded from certain analyses if they met specific criteria which rendered measurement of college travel status/distance impossible. Specifically, 4,908 students were excluded

from analyses because they attended either an online-only high school and/or postsecondary institution or their enrollment data were incomplete, creating an inability to identify the location of their high school and/or postsecondary campus. Further, college enrollment data from National Student Clearinghouse (NSC) Student Tracker Services did not always include the specific attendance location (branch campus or instructional site) for students who attended a community college or Pennsylvania State University (PSU). Therefore, the postsecondary attendance location for 76,625 community college and 36,888 PSU students could not be determined and the relevant students were excluded from analyses related to research questions #2 and #4.

TABLE 1: Student Group Differences by High School Graduation Year: Students Who Attended a 4-Year University in Any State

	HS Class of 2014	HS Class of 2015	HS Class of 2016	HS Class of 2017
Overall				
Total	N = 50,608	N = 50,833	N = 49,803	N = 50,903
Gender				
Male	44.4% (22,456)	43.5% (22,103)	43.4% (21,635)	43.0 (21,867)
Female	55.6% (28,152)	56.5% (28,730)	56.6% (28,168)	57.0 (29,036)
Ethnicity				
American Indian/Alaskan Native	0.1% (72)	0.1% (47)	0.1% (56)	0.1 (39)
Asian	4.2% (2,107)	4.5% (2,301)	4.8% (2,421)	4.9 (2,556)
Black	10.3% (5,215)	10.0% (5,101)	10.2% (5,066)	10.5 (5,326)
Hispanic	3.9% (1,985)	4.2% (2,113)	4.5% (2,239)	4.6 (2,327)
Multi-Racial	1.0% (518)	1.2% (626)	1.4% (710)	1.6 (811)
Native Hawaiian/Pacific Islander	0.1% (34)	0.1% (41)	0.1% (29)	0.1 (45)
White	80.4% (40,677)	79.9% (40,604)	78.9% (39,282)	78.2 (39,799)
Historically Underperforming				
Yes	25.0% (12,634)	25.6% (13,012)	26.7% (13,302)	29.0 (14,777)
No	75.0% (37,974)	74.4% (37,821)	73.3% (36,501)	71.0 (36,126)
EL Status				
Yes	0.4% (205)	0.4% (215)	0.4% (216)	0.5% (249)
No	99.6% (50,403)	99.6% (50,618)	99.6% (49,587)	99.5% (50,654)
Special Education Status				
Yes	4.3% (2,171)	4.2% (2,119)	4.5% (2,231)	4.5% (2,297)
No	95.7% (48,437)	95.8 (48,714)	95.5% (47,572)	95.5% (48,606)
Economically Disadvantaged				
Yes	22.0% (11,141)	22.9% (11,620)	23.8% (11,842)	26.2% (13,352)
No	78.0% (39,467)	77.1% (39,213)	76.2% (37,961)	73.8% (37,551)
Geographic Location				
City	12.8 (6,492)	12.2 (6,203)	13.4 (4968)	12.3 (6,283)
Rural	18.2% (9,189)	17.6% (8,952)	17.5% (6486)	17.0% (8,640)
Suburban	49.5% (25,067)	49.4% (25,125)	49.5% (24,730)	49.1% (24,990)
Town	10.8% (5,445)	10.5% (5,355)	10.6% (5,271)	10.3% (5,240)
College Travel Status				
Same County	16.3% (8,235)	15.7% (7,989)	15.6% (7,755)	16.3% (8,283)
Bordering County	21.2% (10,730)	21.1% (10,718)	22.0% (10,941)	22.1% (11,237)
Other County	35.5% (17,978)	35.8% (18,214)	35.1% (17,501)	34.9% (17,776)
Bordering State	12.0% (6,083)	12.8% (6,486)	12.7% (6,332)	12.6% (6,430)
Out of State (non-bordering)	15.0% (7,582)	14.6% (7,426)	14.6% (7,274)	14.1% (7,177)

Procedures and Data File Preparation

The current study relied on several pre-existing data sources. The first research question was answered through analysis of data records from the Middle States Commission of Higher Education's (MSCHE) Institution Directory and from the Integrated Postsecondary Education Data System (IPEDS), created by the National Center for Education Statistics (NCES). Data from IPEDS were used to determine the quantity and type of postsecondary institutions in each Pennsylvania county, including variables such as institution name, type of institution (4-year, degree-granting, etc.), county location, and acceptance rates. Records from the MSCHE were used to examine the quantity and locations of all postsecondary instructional sites affiliated with PA's community colleges and 4-year institutions. Together, records from both data sources provided a descriptive breakdown of county-wide access to various forms of postsecondary education.

Research questions #2 through #4 were answered through the analysis of linked Pennsylvania Information Management Systems (PIMS) datasets and postsecondary data from Student Tracker Services through the NSC. Several variables were created within these files to describe and measure each college-bound student's travel status and distance. PIMS student data provided student demographic information and graduation status for students. NSC records were obtained for all four groups of PA high school graduates (2014, 2015, 2016, and 2017) to track postsecondary enrollment from initial entry, including the name and location of each postsecondary institution attended.

Because the researchers did not have access to students' home addresses, an assessment of college travel distance was performed by measuring the distance between the high school each student graduated from and the first 4-year postsecondary institution at which they enrolled. Each student's travel distance was computed using Google Maps to identify the shortest possible travel distance (in miles) between the student's high school and 4-year postsecondary institution.

Alternatively, students were assigned a travel status based on the county in which they attended high school and the location of their first 4-year postsecondary institution. Based on these factors, students were assigned a travel status of same-county (high school and college are located in the same county), bordering-county (the county in which the student attended high school borders the county in which the student attended college), other-county (the counties are both in PA but do not border each other), bordering-state (the student attended college in a state that borders PA), and other-state (the student attended college in a state that does not border PA). As previously stated, students were removed from analysis related to college travel distance and status if it was impossible to determine their high school or postsecondary location, if they were enrolled in an online-only high school or postsecondary program, or if they attended a community college or PSU.

To answer research questions three and four, four total files containing postsecondary access data were downloaded from the IPEDS Data Center. Each file represented county-level postsecondary access for each high school graduation class, showing county-wide postsecondary access at the time students were seniors in high school and making their college enrollment decisions. Four-year universities and 4-year broad access institutions (BAIs) in each county were totaled and variables were developed to allow associations to be drawn between access, student demographic variables, and travel distance. As in Henninger-Voss and Herzenberg (2017), the present study considered an institution to be broad access if it accepted more than 75% of applicants. Figure 1 displays a visualization of the file creation process for each research question, while Table 2 shows the scope of each research question.

FIGURE 1: Visual Representation of File Creation

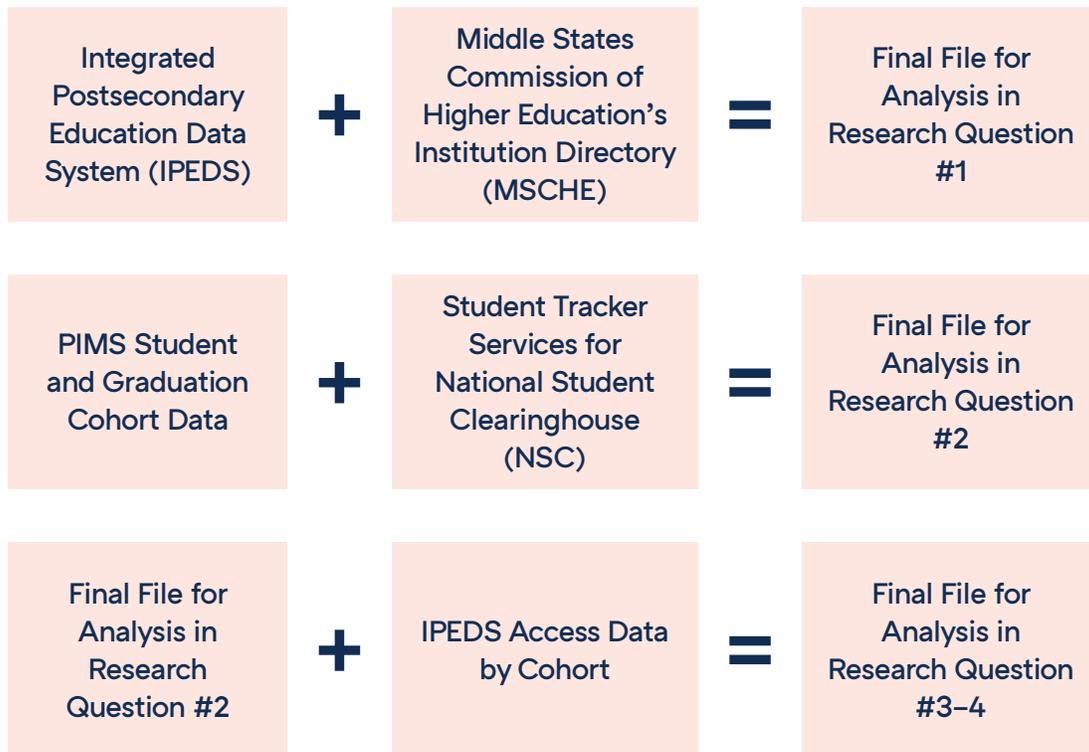


TABLE 2: Scope of Research Questions

	Topic	Student Sample Studied	Notes
Research Question #1:	Descriptive overview of county-wide postsecondary access in PA	N/A	
Research Question #2:	Student group differences in postsecondary travel status/distance	<p>For Travel Status: All 4-year degree-seeking students who graduated from a PA high school between 2014 and 2017, including students who attended an out-of-state institution for certain analyses (excluding online only, community college, and PSU students)</p> <p>For Travel Distance: All 4-year degree-seeking students who enrolled in a PA college between 2014 and 2017 (excluding online-only, community college, and PSU students)</p>	NSC Student Tracker data did not specify specific location data for community college students or PSU students: these students were excluded from analyses related to travel status and distance
Research Question #3:	Student group differences in county-wide postsecondary access	All degree-seeking students who enrolled at any college between 2014 and 2017	All college-bound students from graduation years included: only students' high school county and postsecondary access data were required for analyses
Research Question #4:	Association between students' travel distance and county-wide postsecondary access	All 4-year degree-seeking students who enrolled in a PA college between 2014 and 2017 (excluding online-only, community college, and PSU students)	See notes section for Research Question #2

These data were analyzed using varied analytic methods, including descriptive statistics and Chi-Squares. Results are disaggregated and differentiated by student groups that are of interest to state policymakers, including race/ethnicity, socioeconomic status, gender, EL status, and special education status. The analyses were exploratory in nature, which allowed examination of several individual variables that could be associated with postsecondary access and travel distance. Descriptive statistics were used to explore students' county-wide access to various forms of postsecondary education in PA. Also, chi-square analyses were used to examine how college travel status and distance varies between student groups. In the final phases of analysis, similar techniques were used to examine student group differences in postsecondary access and student travel distance to college.

Results

■ Research Question One: Are there county-wide differences between PA students' access to in-person and in-state postsecondary education?

After implementing the data file creation process depicted in Figure 1, descriptive analyses were conducted on data files obtained from the IPEDS Data Center in 2019. To measure county-wide postsecondary access in PA, all degree-granting postsecondary institutions in PA were counted, assigned to their respective counties, and included in descriptive analysis related to research question #1. This process excluded seminaries and other institutions which prepare students for religious service. More specifically, joint IPEDS and MSCHE data files from 2019 were used to examine (by county) all degree-granting 2 and 4-year campus locations, 4-year instructional sites, community colleges, community college branch campuses, and community college instructional sites. Results from this descriptive analysis can be found in Table 3. It should be noted that acceptance rate data could not be acquired for 8 four-year universities in a variety of counties, preventing determination of broad-access status for those institutions.

TABLE 3. Postsecondary Access (Degree-Granting Institutions Only) per PA County

BA = Broad Access CC = Community College IS = Instructional Site

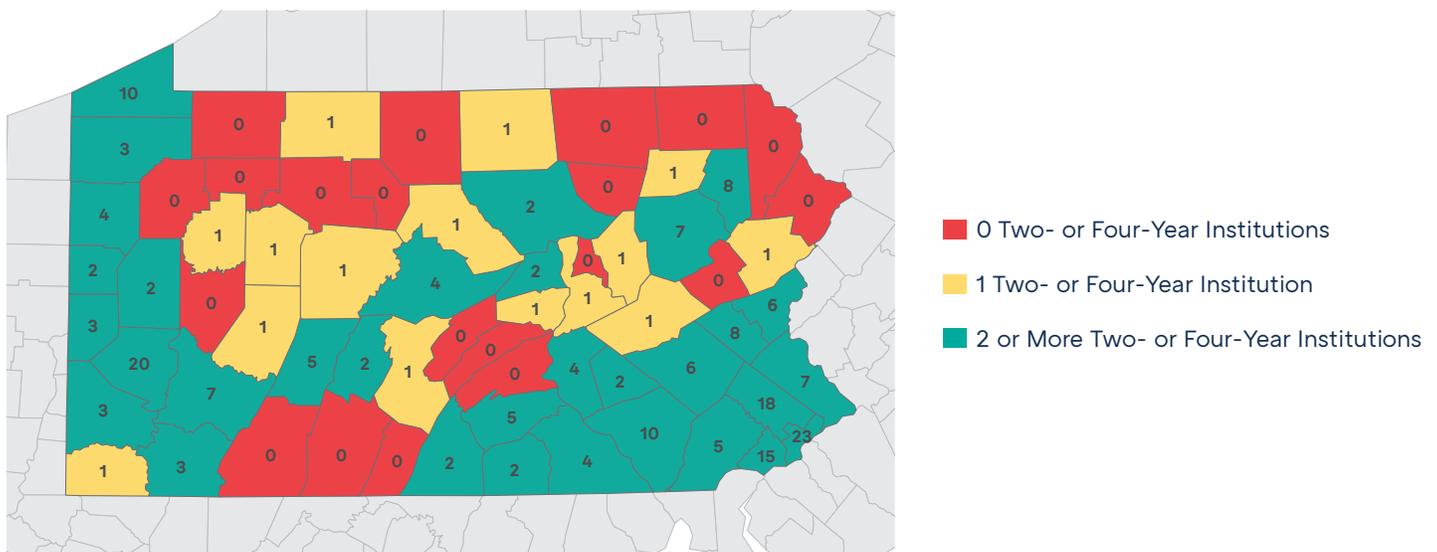
	2 Year*	4 Year	BA 2 Year	BA 4 Year	Non-BA 4 Year	BA 4 Year IS	Non-BA 4 Year IS	CC Main	CC Branch	CC IS
Total in PA	75	144	65	84	52	655	440	18	12	478
Adams	1	1	1	0	1	3	0	0	1	8
Allegheny	10	10	9	5	5	48	40	1	5	16
Armstrong	0	0	0	0	0	6	2	0	0	7
Beaver	1	2	1	1	1	7	6	1	0	16
Bedford	0	0	0	0	0	4	4	0	0	1
Berks	2	4	1	3	1	18	11	1	0	23
Blair	1	1	1	1	0	12	11	0	1	7
Bradford	0	0	0	0	0	4	4	0	0	1
Bucks	4	3	4	3	0	33	19	3	0	17
Butler	1	1	1	0	1	9	10	1	0	12
Cambria	2	3	2	2	1	21	23	1	0	20
Cameron	0	0	0	0	0	1	0	0	0	0
Carbon	0	0	0	0	0	0	0	0	0	6
Centre	2	2	2	2	0	8	9	0	0	1
Chester	0	5	0	2	2	31	26	0	0	22
Clarion	0	1	0	1	0	2	2	0	0	2
Clearfield	0	1	0	1	0	9	3	0	0	7

	2 Year*	4 Year	BA 2 Year	BA 4 Year	Non-BA 4 Year	BA 4 Year IS	Non-BA 4 Year IS	CC Main	CC Branch	CC IS
Clinton	0	1	0	1	0	1	0	0	0	0
Columbia	0	1	0	1	0	5	0	0	0	3
Crawford	2	1	1	0	1	10	2	0	0	2
Cumberland	0	5	0	3	2	14	1	0	0	13
Dauphin	1	3	1	2	0	22	11	1	0	15
Delaware	6	9	3	3	6	21	16	1	0	10
Elk	0	0	0	0	0	5	0	0	0	0
Erie	5	5	5	4	1	21	6	0	0	0
Fayette	2	1	2	1	0	8	3	0	0	8
Forest	0	0	0	0	0	2	0	0	0	0
Franklin	0	2	0	2	0	8	3	0	0	8
Fulton	0	0	0	0	0	1	1	0	0	0
Greene	0	1	0	1	0	2	0	0	0	1
Huntingdon	0	1	0	0	1	4	4	0	0	4
Indiana	0	1	0	1	0	9	4	0	0	7
Jefferson	1	0	1	0	0	5	0	0	0	4
Juniata	0	0	0	0	0	0	0	0	0	1
Lackawanna	2	6	2	4	2	3	7	0	0	2
Lancaster	3	7	3	5	2	22	6	0	1	23
Lawrence	1	1	1	0	1	2	7	0	0	10
Lebanon	1	1	1	1	0	8	3	0	1	12
Lehigh	4	4	4	2	2	9	11	1	0	19
Luzerne	2	5	2	5	0	9	9	1	0	13
Lycoming	0	2	0	1	1	8	2	0	0	0
McKean	0	1	0	0	1	6	0	0	0	2
Mercer	1	3	1	3	0	7	7	0	0	12
Mifflin	0	0	0	0	0	0	4	0	0	1
Monroe	0	1	0	1	0	7	2	0	1	3
Montgomery	5	13	4	7	2	72	32	2	1	27
Montour	0	0	0	0	0	5	2	0	0	0
Northampton	2	4	2	0	3	4	2	2	0	10
Northumberland	1	0	1	0	0	3	1	0	0	5
Perry	0	0	0	0	0	2	0	0	0	2
Philadelphia	5	18	3	6	11	63	77	1	0	18
Pike	0	0	0	0	0	0	0	0	0	1
Potter	0	0	0	0	0	4	0	0	0	1
Schuylkill	0	1	0	1	0	3	4	0	0	13
Snyder	0	1	0	0	1	1	0	0	0	0
Somerset	0	0	0	0	0	11	6	0	0	12
Sullivan	0	0	0	0	0	0	0	0	0	0
Susquehanna	0	0	0	0	0	0	0	0	0	2
Tioga	0	1	0	1	0	1	0	0	0	0
Union	1	1	1	0	1	1	0	0	0	1
Venango	0	0	0	0	0	5	0	0	0	2
Warren	0	0	0	0	0	2	0	0	0	0
Washington	1	2	0	2	0	5	8	0	0	8
Wayne	0	0	0	0	0	0	2	0	0	1
Westmoreland	3	4	3	3	1	17	22	1	0	20
Wyoming	0	1	0	1	0	0	1	0	0	0
York	2	2	2	1	1	21	4	0	1	16

* 2-year institutions may include CC Main or Branch campuses as designated by IPEDS

To better understand how access to various types of postsecondary education varies throughout the Commonwealth, maps showing access by county were created. These maps allow clusters of postsecondary access to be observed in all of Pennsylvania’s 67 counties. For instance, as Figure 2 shows, the majority of counties in the Commonwealth (47) are home to one or more 2-year or 4-year institution, while the remaining 20 counties do not have a 2 or 4-year institution. Counties with the most degree-granting postsecondary institutions are primarily located in the south-eastern region (around Philadelphia County) and in the south-western region, centered around Allegheny County. The 20 counties that are not home to a degree-granting institution are spread around the Commonwealth, but small clusters of these counties are found in the north-eastern, north-western, central, and south-central regions. Interestingly, many counties home to only one postsecondary institution are commonly found near clusters of counties home to zero institutions.

FIGURE 2. Total Two- and Four-Year Degree Granting Institutions (Main Campus Locations Only) per County



Additionally, as Figure 3 shows, over half (37) of the Commonwealth’s counties have no access to 2-year degree-granting institutions, 12 counties are home to one 2-year institution, and 18 counties are home to two or more 2-year institutions. Clusters of counties which are not home to any 2-year institutions are primarily located in the northern region of PA, including significant clusters in the north-west and north-east regions. There is also a cluster of counties home to one 2-year institution located in the western portion of PA. Lastly, counties with two or more 2-year institutions are primarily found in the south-eastern and south-western regions, with additional small pockets in the north-west and north-east.

Further, Figure 4 shows the number of 4-year institutions in each county. In total, 22 counties do not have a 4-year institution, 21 counties have one 4-year institution, and the remaining 24 counties have two or more 4-year institutions. Counties with two or more degree-granting 4-year institutions are primarily located clustered around Philadelphia and Allegheny counties, while counties with no 4-year institutions are clustered in various areas, including the northern regions, as well as the central and south-central regions. Counties with only one 4-year institution are often found clustered around counties with no 4-year institutions.

Similar maps were also created to examine access to broad access institutions (BAIs) across Pennsylvania. As previously stated, broad access institutions are those which accept more than 75% of student applicants. Figure 5 shows the number of 2 and 4-year BAIs in each PA county. It was found that a total of 23 counties do not have any degree-granting BAIs, 18 counties have only one BAI, and 26 counties have two or more BAIs. Notable clusters of counties that are not home to any degree-granting BAIs are located in the central, south-central, north-west, and north-east regions of the Commonwealth. Counties home to only one BAI are primarily found in the north-central and western regions of PA, typically clustered around counties with no BAIs. Additionally, there are two main clusters of counties that are home to two or more BAIs; these clusters are found in the south-western and south-eastern regions of the Commonwealth.

FIGURE 5. Total 2- and 4-Year Degree-Granting BAIs (Main Campus Locations Only) per County

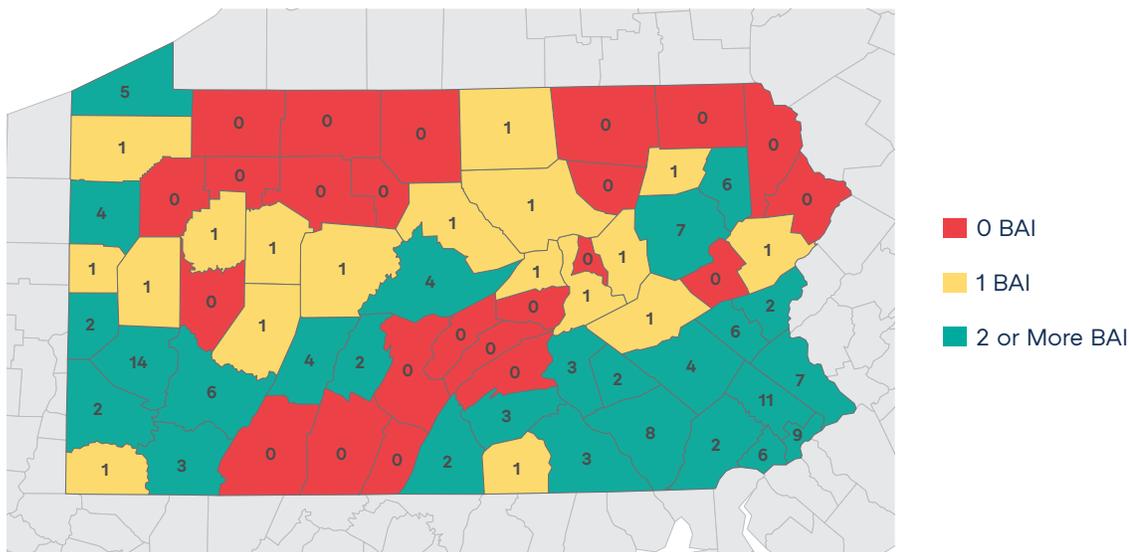
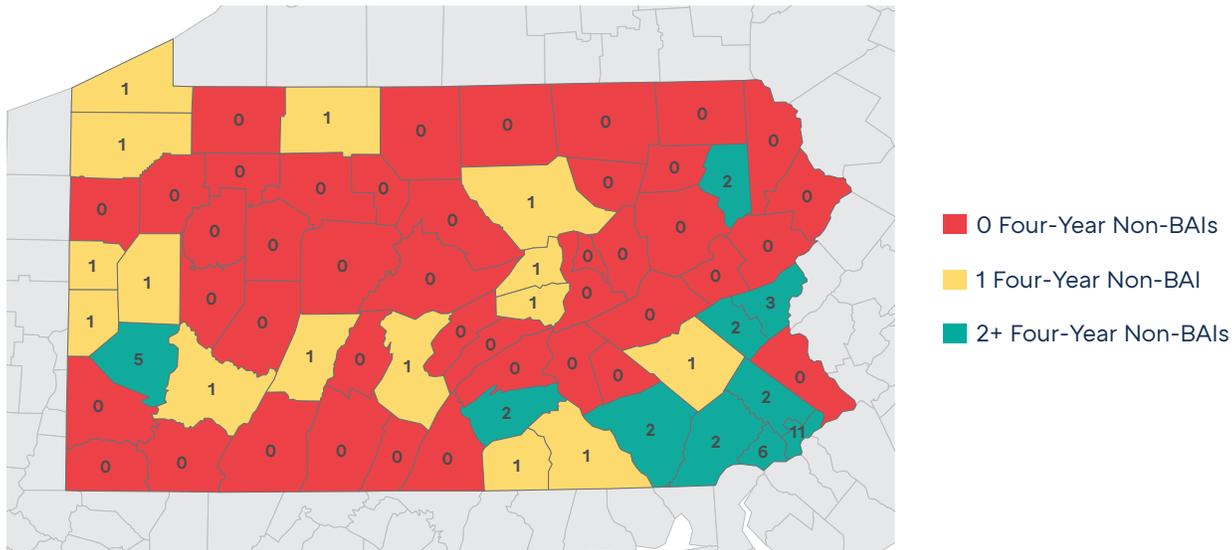


Figure 6 illustrates the number of 2-year BAIs in each county, showing that a total of 38 counties in PA do not have a 2-year BAI. This is contrasted by 13 counties that have one and 16 counties which have two or more 2-year BAIs. As with previous Figures, there are several clusters of counties that are home to no 2-year BAIs. These clusters are primarily located in the south-central, central, north-western, and north-eastern regions of PA. Additionally, the north-west region is home to one notable cluster of counties with one 2-year BAI. Lastly, two clusters of counties that are home to more than one BAI are found in the south-western and south-eastern regions of the Commonwealth.

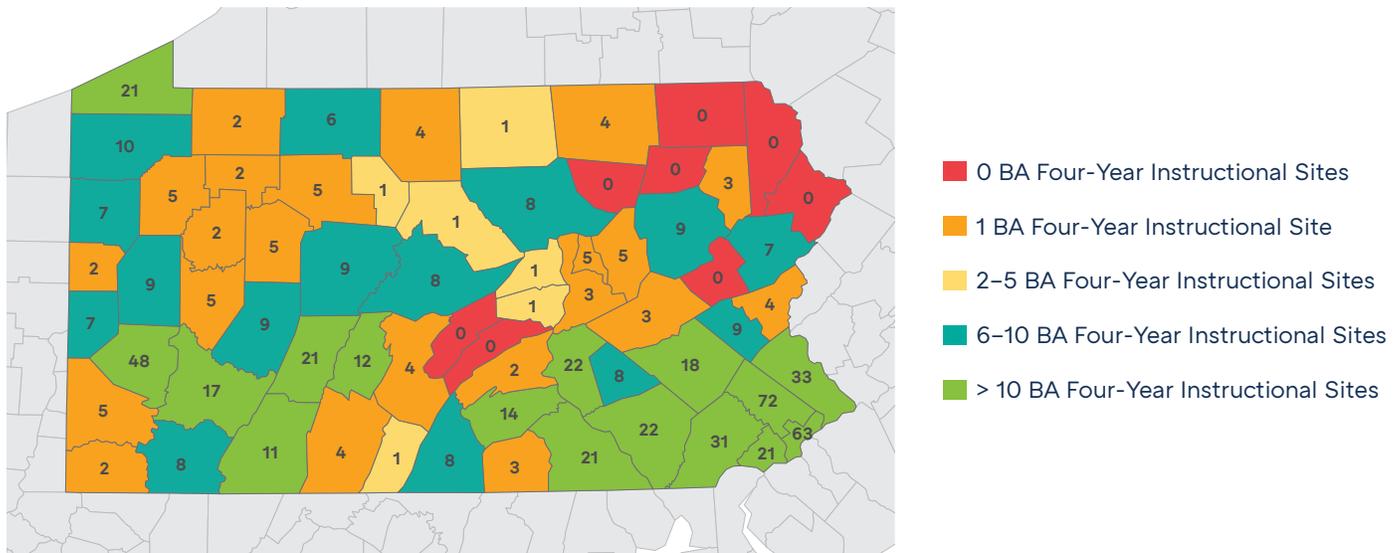
Figure 8 shows the number of 4-year non-BAIs (institutions which accept less than 75% of applicants) in each county. A total of 42 counties had no 4-year non-BAIs, 15 counties had access to one, and the remaining 10 counties had access to two or more. The only major cluster of counties home to two or more 4-year non-BAIs was found in the south-eastern region of the Commonwealth. Counties without access to 4-year non-BAIs were clustered around the state, primarily found in the western, south-western, central, and north-western regions of the state.

FIGURE 8. Total Four-Year Degree Granting non-BAIs (Main Campus Locations Only) per County



Additionally, Figure 9 shows the total number of broad access instructional sites associated with a degree-granting 4-year institution in each county. Descriptive analyses showed that 8 counties do not have a 4-year instructional site and 6 counties have one. Further, 22 counties have between two and five instructional sites and 15 counties have between six and ten instructional sites. Lastly, 16 counties have ten or more 4-year instructional sites. Counties with no 4-year associated instructional sites are primarily located in the north-eastern region, while two counties are clustered in central PA. There is also a notable cluster of counties with one instructional site in the north-central region. Additionally, there is a cluster of 7 counties in the north-west region of the state that has between two and five instructional sites. While counties with between six and ten instructional sites are scattered across the Commonwealth, counties with over ten instructional sites are primarily located in the south-eastern and south-western regions, clustered around Philadelphia and Allegheny counties, respectively.

FIGURE 9. Total Instructional Sites Associated with a Broad Access Four-Year Institution per County



Lastly, county-wide access to community college instruction was examined. Figure 10 shows the number of community college main sites and branch campuses in each county. Most counties in the Commonwealth (48) were not home to a community college main site or branch campus. Thus, 19 counties had one or more community college main sites or branch campuses. These 19 counties were primarily located in the south-eastern and south-western regions of the Commonwealth, clustered around Philadelphia and Allegheny counties, respectively. The remaining 48 counties were located in all other regions of PA, particularly in the northern regions.

FIGURE 10. Total Main Sites and Branch Campuses of PA Community Colleges per County

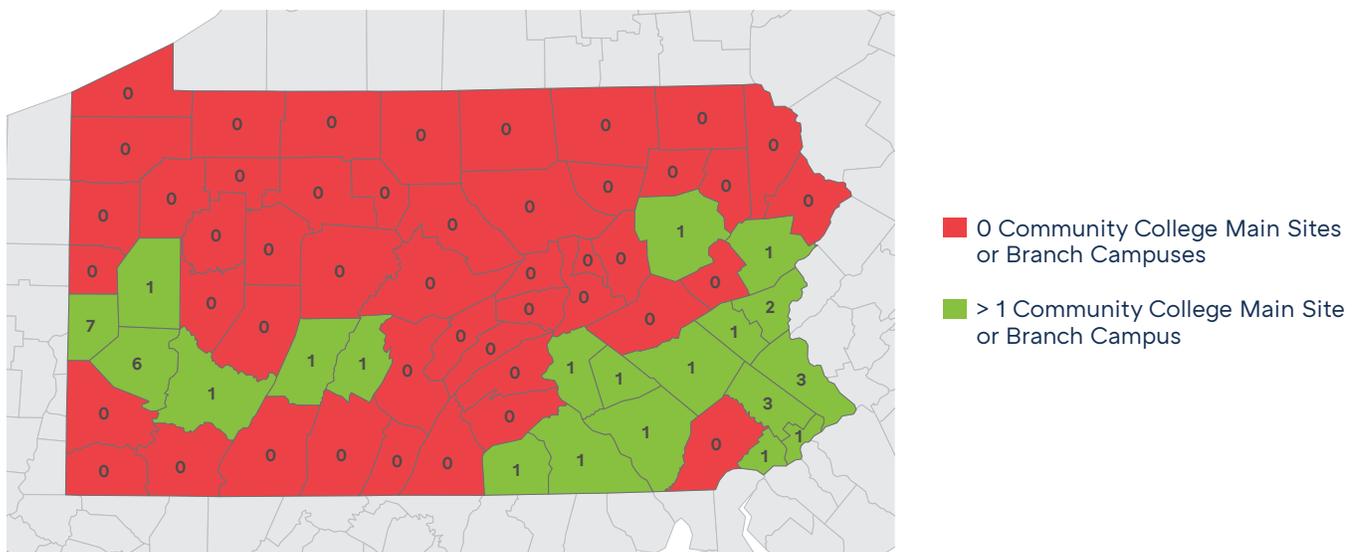
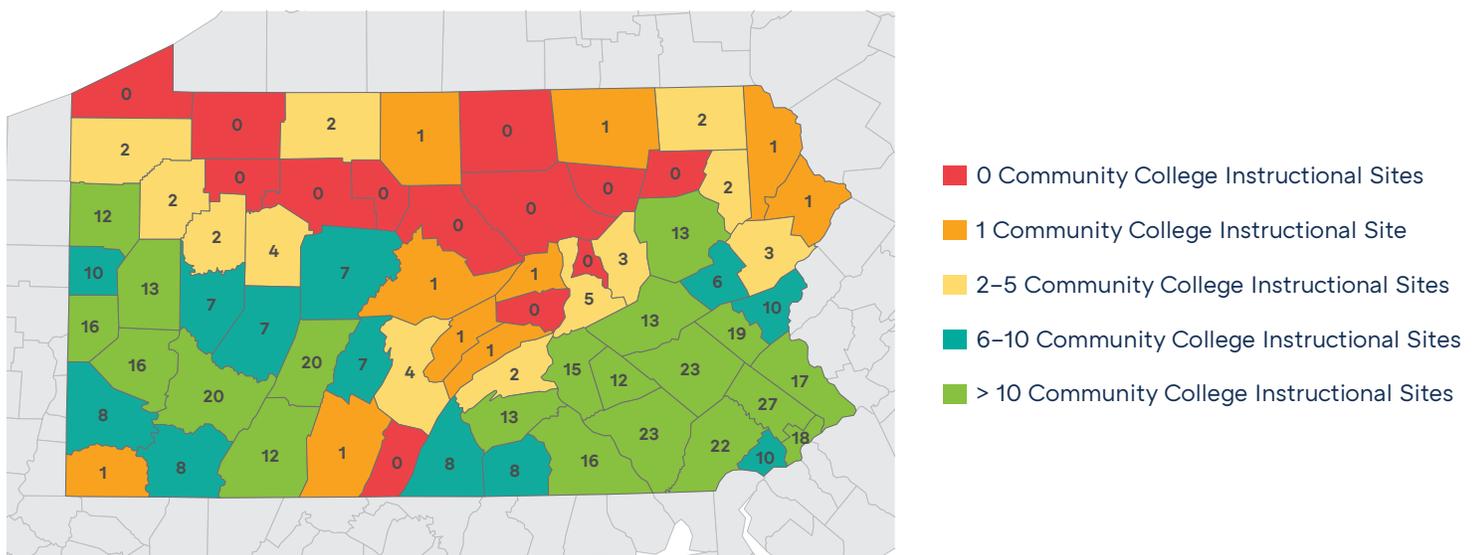


Figure 11 displays the number of community college instructional sites in each county. There were 13 counties in the Commonwealth that did not have any community college instructional sites, while 10 counties were home to only one instructional site. There were 12 counties with between 2 and 5 instructional sites and 12 counties had between 6 and 10 instructional sites. Finally, 20 counties had more than 10 instructional sites. Counties without community college instructional sites were mainly clustered in the northern and north-western regions of PA. A small cluster of counties that had one instructional site were found in central PA, while two notable clusters of counties with between 2 and 5 community college instructional sites were found in the north-western and north-eastern regions of the Commonwealth. Finally, counties with more than 10 instructional sites were clustered in the south-eastern and western regions of PA.

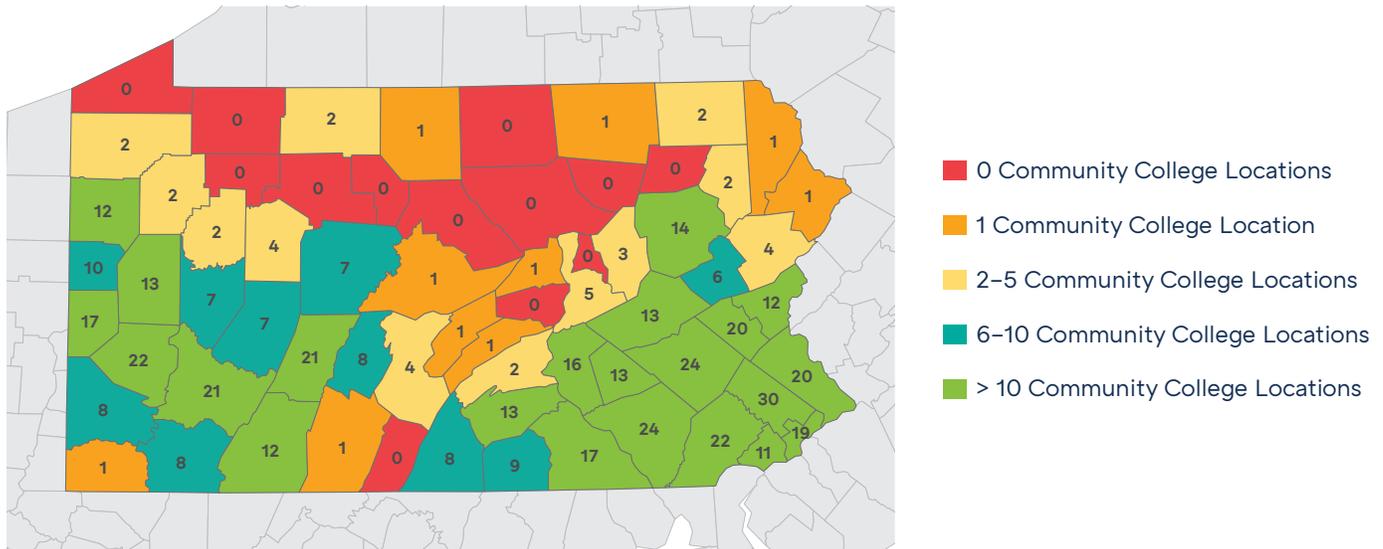
FIGURE 11. Total Community College Instructional Sites per County



Lastly, Figure 12 displays the full community college presence in each county, showing the number of main sites, branch campuses, and instructional sites present in each county. There were 13 counties with no community college presence and 10 counties had only one type of community college location. Further, 12 counties had between 2 and 5 community college locations, while 10 counties had between 6 and 10 locations. Finally, a total of 22 counties had more than 10 community college locations.

Many of the counties without any community college presence were found in the northern regions of the Commonwealth. Counties with only one community college location were spread throughout PA, but a small cluster was found in the central region. Similarly, small clusters of counties with between 2 and 5 locations were found in the north-western and north-eastern regions of PA. Lastly, two large clusters of counties with more than 10 community college locations were located in both eastern and western PA.

FIGURE 12. Total Community College Presence (Main Sites, Branch Campuses, and Instructional Sites) per County



■ Research Question Two (Part One): *For students who attended a 4-year degree-granting institution, what is the description and breakdown of high school graduation classes by year?*

Table 1 depicted the detailed breakdown of student characteristics based on high school graduation year, showing overall similarity between the four student graduation classes. Similarly, Table 4 shows the raw differences in student variables between students who attended any 4-year institution in PA, students who attended any PA state university, students who attended any 4-year non-state PA university, and students who attended all 4-year institutions (inside and outside of PA). As previously stated, students who attended PSU or a PA community college were excluded because it was impossible to determine the exact location of their enrollment. Unlike Table 1, the larger between-group differences shown in Table 4 indicated that it was necessary to examine the associations between student group variables and college travel distance/status individually, by the type of university (state or non-state) students attended.

TABLE 4: County-wide Postsecondary Access by Student Geographic Location: Differences in Percentages by High School Graduation Class

		Students at any PA 4-Year University	Students at any PA State University	Students at any non-State 4-year University	Students at any 4-year Institution (in or out-of-state)
Overall					
	Total	N = 147,253	N = 58,061	N = 89,187	N = 202,147
Gender					
	Male	43.0% (63,328)	42.1% (24,420)	43.6% (38,906)	43.6% (88,061)
	Female	57.0% (83,925)	57.9% (33,641)	56.4% (50,281)	56.4% (114,086)
Ethnicity					
	American Indian/ Alaskan Native	0.1% (156)	0.1% (63)	0.1% (93)	0.1% (214)
	Asian	4.7% (6,876)	1.4% (826)	6.8% (6,050)	4.6% (9,385)
	Black	10.7% (15,760)	13.6% (7,847)	8.8% (7,912)	10.2% (20,708)
	Hispanic	4.4% (6,427)	4.3% (2,523)	4.4% (3,903)	4.4% (8,664)
	Multi-Racial	1.3% (1,980)	1.3% (773)	1.4% (1,207)	1.3% (2,665)
	Native Hawaiian/ Pacific Islander	0.1% (106)	0.1% (30)	0.1% (76)	0.1% (149)
	White	78.7% (115,948)	79.2% (45,999)	78.4% (69,946)	79.3% (160,362)
Historically Underperforming					
	Yes	28.8% (42,352)	31.0% (17,983)	27.3% (24,367)	26.6% (53,725)
	No	71.2% (104,901)	69.0% (40,078)	72.7% (64,820)	73.4% (148,422)
EL Status					
	Yes	0.4% (626)	0.2% (145)	0.5% (481)	0.4% (885)
	No	99.6% (146,627)	99.8% (57,916)	99.5% (88,706)	99.6% (201,262)
Special Education Status					
	Yes	4.3% (6,325)	4.9% (2,817)	3.9% (3,508)	4.4% (8,818)
	No	95.7% (140,928)	95.1% (55,244)	96.1% (85,679)	95.6% (193,329)
Economically Disadvantaged					
	Yes	25.9% (38,145)	27.8% (16,113)	24.7% (22,030)	23.7% (47,955)
	No	74.1% (109,108)	72.2% (41,948)	75.3% (67,157)	76.3% (154,192)
Geographic Location					
	City	13.5% (19,939)	11.9% (6,897)	14.6% (13,040)	12.4% (25,121)
	Rural	18.2% (26,762)	21.5% (12,488)	16.0% (14,273)	17.6% (35,647)

	Students at any PA 4-Year University	Students at any PA State University	Students at any non-State 4-year University	Students at any 4-year Institution (in or out-of-state)
Suburban	47.2% (69,563)	42.6% (24,739)	50.3% (44,822)	49.4% (99,851)
Town	11.4% (16,818)	14.4% (8,360)	9.5% (8,458)	10.5% (21,308)
College Travel Status				
Same-County Attendees	21.9% (32,238)	15.8% (9,176)	25.9% (23,062)	16.0% (32,262)
Bordering-County Attendees	29.6% (43,605)	29.3% (16,997)	29.8% (26,603)	21.6% (43,626)
Other-County Attendees	48.5% (71,410)	54.9% (31,888)	44.3% (39,522)	35.4% (71,469)
Bordering-State Attendees	N/A	N/A	N/A	12.5% (25,331)
Other-State Attendees	N/A	N/A	N/A	14.5% (29,459)
College Travel Distance				
0 – 24.99 Miles	33.5% (49,342)	22.1% (12,796)	41.0% (36,543)	N/A
25 – 49.99 Miles	19.8% (29,099)	22.2% (12,900)	18.2% (16,197)	N/A
50 – 74.99 Miles	13.6% (20,076)	18.4% (10,692)	10.5% (9,384)	N/A
75+ Miles	33.1% (48,736)	37.3% (21,673)	30.3% (27,063)	N/A

Research Question Two (Part Two): Do PA students tend to enroll in postsecondary institutions near the high school they graduated from? Is college travel status and distance affected by student group membership and type of institution attended?

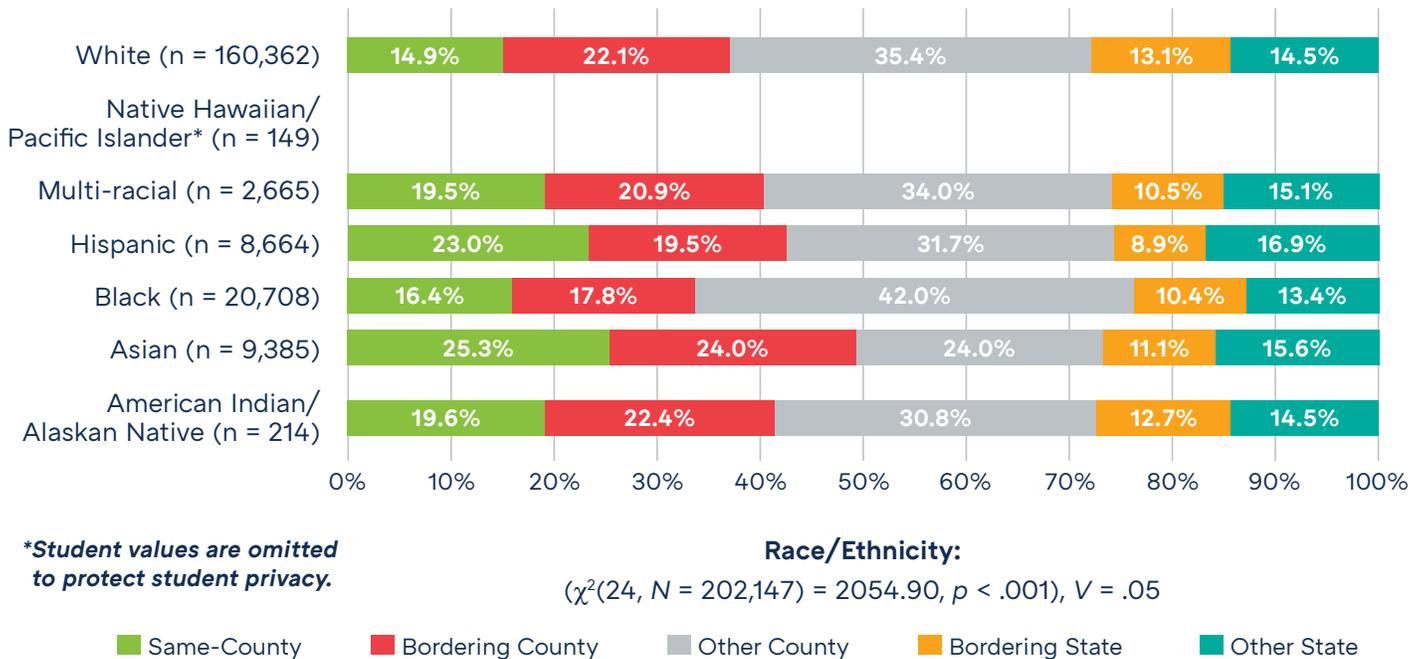
As previously stated, details regarding each student’s home address were unavailable for the purposes of the current research. Therefore, travel status and distance were computed using the location of the high school from which each student graduated as a proxy for their home address. Analyses regarding student travel status assigned students to one of five possible categories based on the location of the high school and the 4-year institution they attended: students who attended college in the same county as their high school (same-county attendees), students who attended college in a county that borders their high school’s county (bordering-county attendees), students who attended college in any other county in PA (other-county attendees), students who attended college in a state that borders PA (bordering-state attendees), and students who attended college in a different, non-bordering state (other-state attendees). This is contrasted by student travel distance, which was measured by calculating the shortest travel distance (measured in miles) between the student’s high school and postsecondary institution. Descriptive statistics of student travel distance showed standard deviations that were often higher than travel means, so a four-level categorical measure was created to assess travel distance (0 – 24.99 miles, 25 – 49.99 miles, 50 – 74.99 miles, and 75 or more miles). For analyses related to travel distance, only students who attended a PA 4-year institution were included.

Student Groups and College Travel Status: PA High School Graduates Attending 4-Year Universities in All States

A student’s travel status as same-county, bordering-county, other-county, bordering-state, or other-state was found to be associated with a variety of variables, including a student’s racial/ethnic identity. Results from chi-square analyses (Figure 13) showed that overall, a higher proportion of students in each racial/ethnic group were other-county attendees, except Asian students who had a slightly higher proportion that attended same-county institutions. Although a higher proportion of students in each racial/ethnic

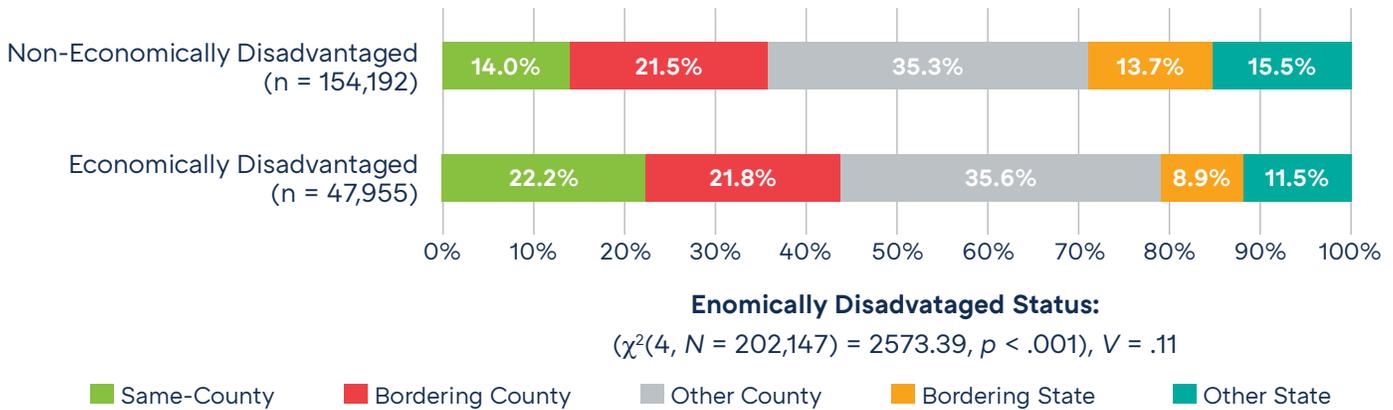
group were other-county attendees, a significantly higher percentage of Black students were other-county attendees (42%) when compared to other student racial/ethnic groups. In total, the difference between proportions was significant for travel status ($\chi^2(24, N = 202,147) = 2054.90, p < .001$) and the association was small ($V = .05$).

FIGURE 13. Student Travel Status by Student Race/Ethnicity: Students at 4-Year Universities in All States



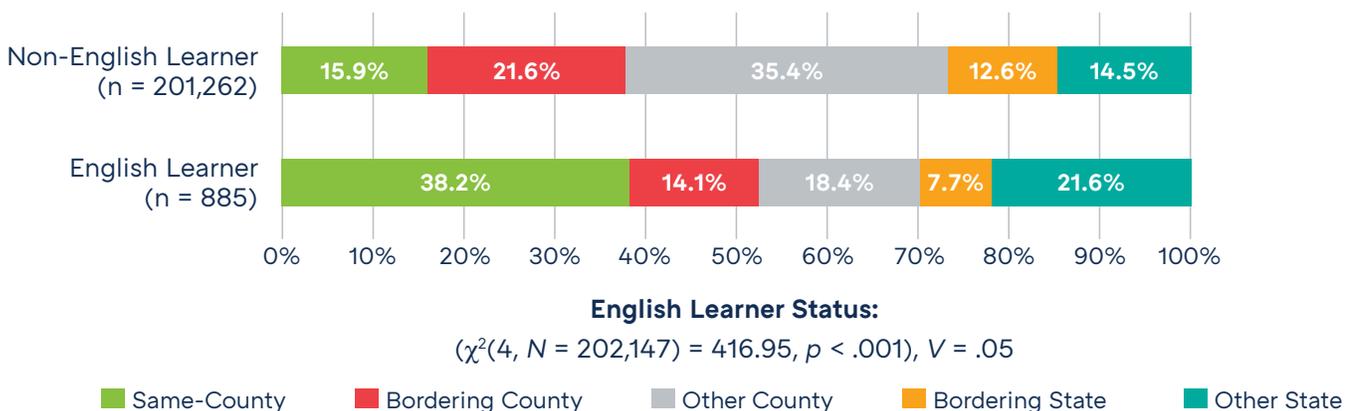
It was also found that students' status as economically disadvantaged was significantly associated with travel status to any 4-year institution. Figure 14 shows that while a high proportion of both non- and economically disadvantaged students attended a 4-year institution as other-county attendees (35.3% and 35.6%, respectively), a higher proportion of students who experienced economic disadvantage attended a 4-year institution as same-county attendees when compared to non-economically disadvantaged students (22.2% versus 14%). Additionally, a higher percentage of non-economically disadvantaged students were bordering-state and other-state attendees when compared to students who experienced economic disadvantage (13.7% versus 8.9% and 15.5% versus 11.5%, respectively). Figure 13 shows that the difference between proportions was statistically significant ($\chi^2(4, N = 202,813) = 2322.96, p < .001$) and the association was small ($V = .11$).

FIGURE 14. Student Travel Status by Economically Disadvantaged Status: Students at 4-Year Universities in All States



Additionally, a student’s EL status was found to be significantly associated with travel status to all 4-year institutions. Figure 15 shows that a significantly larger percentage of non-EL students were other-county and bordering-county attendees compared to EL students (35.4% versus 18.4% and 21.6% versus 14.1% respectively), and a significantly larger percentage of EL students were same-county attendees compared to non-EL students (38.2% versus 15.9%). Figure 14 shows that the differences between proportions were significant ($\chi^2(4, N = 202,147) = 416.95, p < .001$), but the effect was very small ($V = .05$) given the small sample of EL students compared to non-EL students.

FIGURE 15. Student Travel Status by EL Status: Students at 4-Year Universities in All States

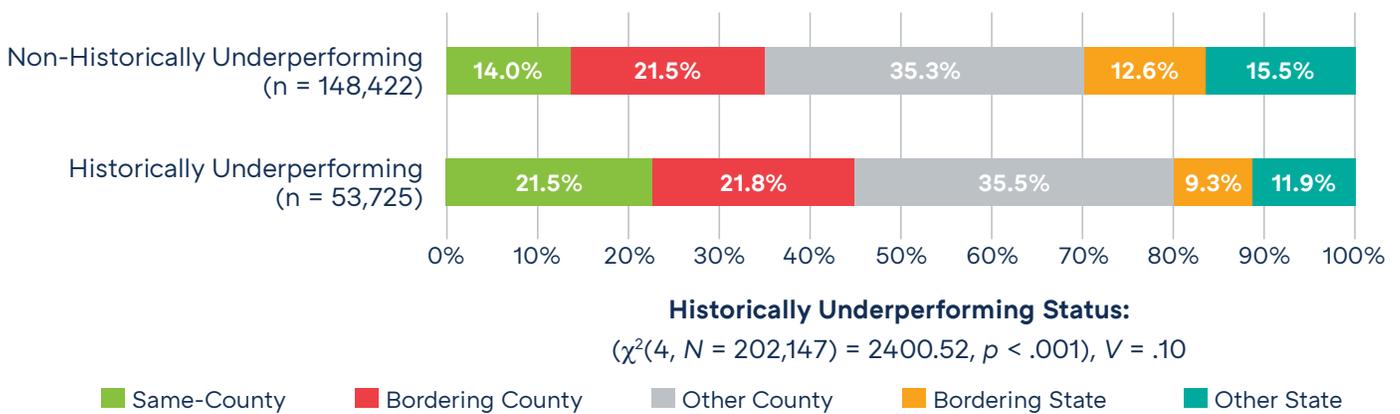


Additionally, a student variable known as historically underperforming was examined for a potential association with student travel status. The historically underperforming status is a combination variable which indicates students who possess one or more of the special education, English Learner (EL), or economically disadvantaged statuses. The results from a chi-square analysis (depicted in Figure 16) showed that students’ status as historically underperforming was associated with the location of their college enrollment. It was found that a similarly high proportion of both non-historically underperforming and historically underperforming students were other-county attendees, but a higher percentage of historically underperforming students were same-county attendees when compared to non-historically

underperforming students (21.5% versus 14%). The difference between proportions was significant, ($\chi^2(4, N = 202,147) = 2400.52, p < .001$) and the association was small ($V = .10$).

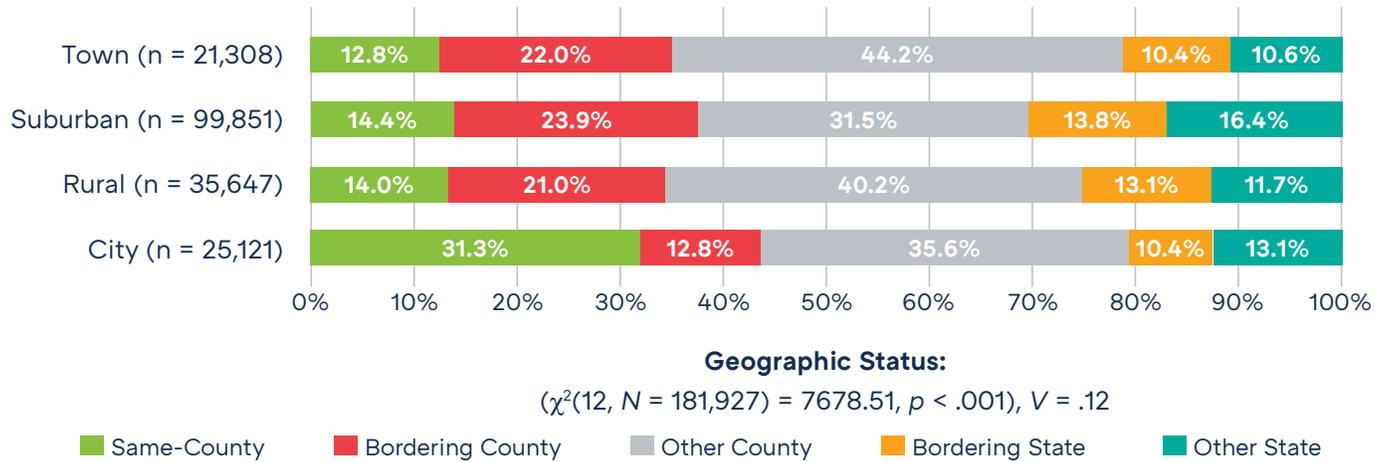
Notably, students' special education status was tested separately for a significant association with student travel status to all 4-year institutions, but no such relationship was found. Given that EL status is represented in the historically underperforming indicator and previously discussed results showed a meaningful association between EL status and travel status, the slight association between travel status and the historically underperforming indicator may be due to significant EL versus non-EL subgroup differences, the small but significant differences between economically disadvantaged and non-economically disadvantaged student groups, and non-significant special education versus special education subgroup differences.

FIGURE 16. Student Travel Status by Historically Underperforming Status: Students at 4-Year Universities in All States



Lastly, a student’s geographic location (city, rural, suburban, or town) in PA at the time of high school graduation was found to be significantly associated with travel status to 4-year institutions in all states. Figure 17 shows that a significantly higher percentage of students from all geographic locations were other-county attendees. However, compared to students from other geographic locations, a significantly higher percentage of students from cities were same-county attendees (31.3%), while a higher percentage of rural students were other-county attendees (40.2%). The difference between proportions was significant ($\chi^2(12, N = 181,927) = 7678.51, p < .001$), but the effect was small ($V = .12$).

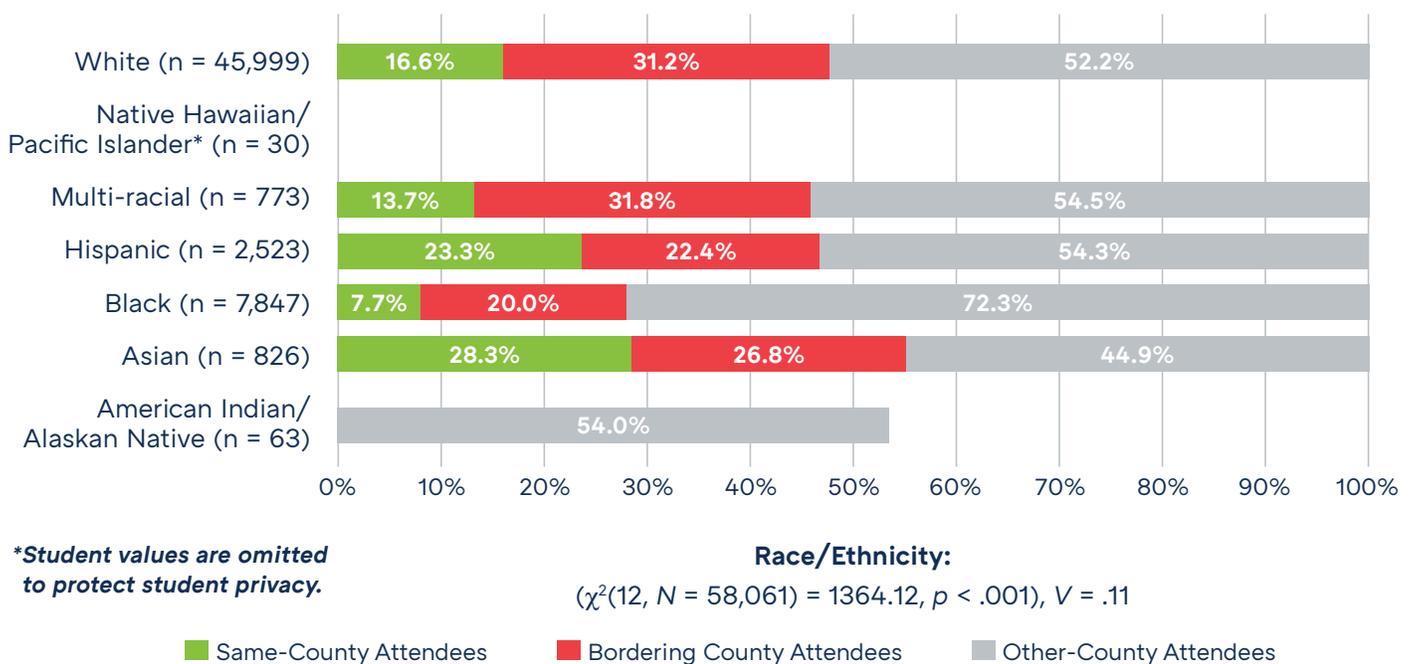
FIGURE 17. Student Travel Status by Geographic Location: Students at 4-Year Universities in All States



Student Groups and College Travel Status: Students at PA State Universities

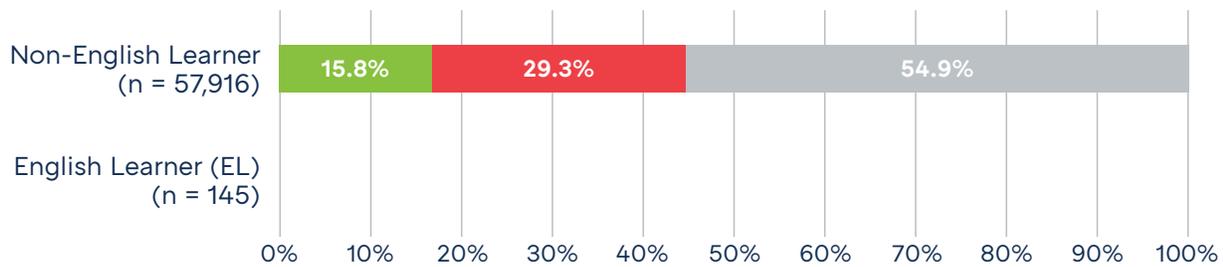
The next phase of analyses sought to examine how student group membership might be associated with college travel status among students who attended one of Pennsylvania’s state institutions (see [Pennsylvania’s State System of Higher Education’s website](#) for a full list of institutions). Out of the 58,061 PA high school graduates who attended a state institution as their first postsecondary enrollment, 15.8% were same-county attendees, 29.3% were bordering-county attendees, and the majority (54.9%) were other-county attendees. As with students attending all 4-year institutions, a student’s race/ethnicity was found to be associated with their travel status. Figure 18 shows a high percentage of all students attending state universities were other-county attendees, regardless of race/ethnicity. In terms of student group differences, a significantly higher percentage of Black students were other-county attendees (72.3%) and a very low percent were same-county attendees (7.7%). The difference between proportions was significant, ($\chi^2(12, N = 58,061) = 1364.12, p < .001$) but the association was small ($V = .11$).

FIGURE 18. Student Travel Status by Student Race/Ethnicity: Students at PA State Universities



Similarly, a student’s English Learner (EL) status was significantly associated with travel status to a PA state institution. While certain values are omitted from Figure 19 to protect privacy, it was found that high percentages of EL and non-EL students attended PA state universities as other-county attendees. However, a significantly higher percentage of English Learners were same-county attendees when compared to non-English Learners. The overall effect was significant ($\chi^2(2, N = 57974) = 60.71, p < .001$), but was very small ($V = .03$), given the small sample size of EL students compared to non-EL students.

FIGURE 19. Student Travel Status by EL Status: Students at PA State Universities



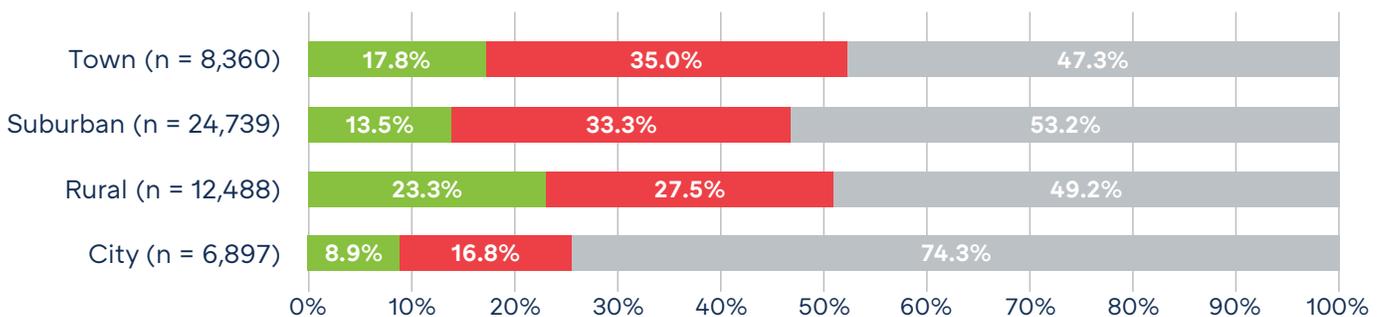
*Certain values related to EL students are under 20; all cells are suppressed to protect student privacy

English Learner Status:
 $(\chi^2(2, N = 58,061) = 57.96, p < .001), V = .03$

Same-County Attendees Bordering County Attendees Other-County Attendees

Finally, a student’s geographic location was found to be significantly associated with college travel status to state universities. Figure 20 shows that regardless of geographic location, high percentages of students attending state universities did so as other-county attendees; however, a significantly higher percentage of students from cities were other-county attendees (74.3%) and a very low percentage were same-county attendees (8.9%), compared to students from other geographical locations. Figure 20 demonstrates that the differences between proportions were significant ($\chi^2(6, N = 52,484) = 1985.26, p < .001$), but the effect was small ($V = .14$).

FIGURE 20. Student Travel Status by Geographic Location: Students at PA State Universities



Geographic Status:
 $(\chi^2(6, N = 52,484) = 1985.26, p < .001), V = .14$

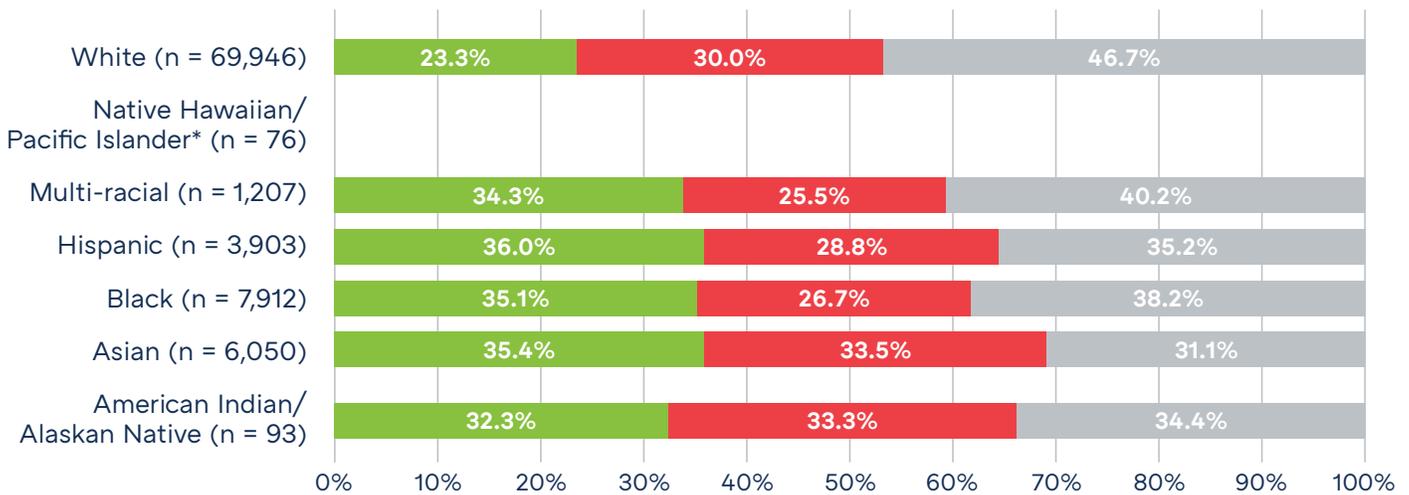
Same-County Attendees Bordering County Attendees Other-County Attendees

Student Groups and College Travel Status: Students at Non-State Universities

Lastly, the college travel statuses of students who attended a 4-year university in PA (that was not a PA state institution) were examined for potential relationships with student group memberships. Of the 89,187 students who enrolled at a non-state institution, 25.9% were same-county attendees, 29.8% were bordering-county attendees, and 44.3% were other-county attendees. Similar to previous analyses, the race/ethnicity of students who attended non-state PA universities was significantly associated with

travel status. Figure 21 shows that a high percentage of all students attending non-state PA institutions (regardless of race/ethnicity) were other-county attendees. A higher percentage of White and Multi-Racial students were other-county attendees at non-state universities (46.7% and 40.2%, respectively) and a significantly smaller percentage of White students were same-county attendees (23.3%). The difference between proportions was significant ($\chi^2(12, N = 89,187) = 1401.31, p < .001$) and the overall effect was small ($V = .09$).

FIGURE 21. Student Travel Status by Student Race/Ethnicity: Students at 4-Year Non-State PA Universities



*Student values are omitted to protect student privacy.

Race/Ethnicity:

($\chi^2(12, N = 89,187) = 1401.31, p < .001$) $V = .09$

Same-County Attendees Bordering County Attendees Other-County Attendees

A similar analysis showed a significant relationship between students' status as economically disadvantaged and their travel status to non-state institutions. Specifically, Figure 22 illustrates how a larger percentage of students who experienced economic disadvantage were same-county attendees when compared to students who did not experience economic disadvantage (37.0% versus 22.2%). Additionally, a higher percentage of students who did not experience economic disadvantage were other-county attendees when compared to students who did experience economic disadvantage (47.3% versus 35.4%). The differences between proportions were significant, ($\chi^2(2, N = 89,187) = 1974.93, p < .001$), but the effect was small ($V = .15$).

It was also found that students' EL status was also significantly associated with travel status to non-state PA universities. Figure 23 shows that a significantly higher percentage of EL students were same-county attendees when compared to non-EL students (59% vs. 25.7%) and a significantly higher percentage of non-EL students were other-county attendees when compared to EL students (44.4% versus 18.5%). Figure 22 indicates that the differences between proportions were significant ($\chi^2(2, N = 89,187) = 287.45, p < .001$), but the effect was small ($V = .06$) given the small sample size of EL students.

FIGURE 22. Student Travel Status by Economically Disadvantaged Status: Students at 4-Year Non-State PA Universities

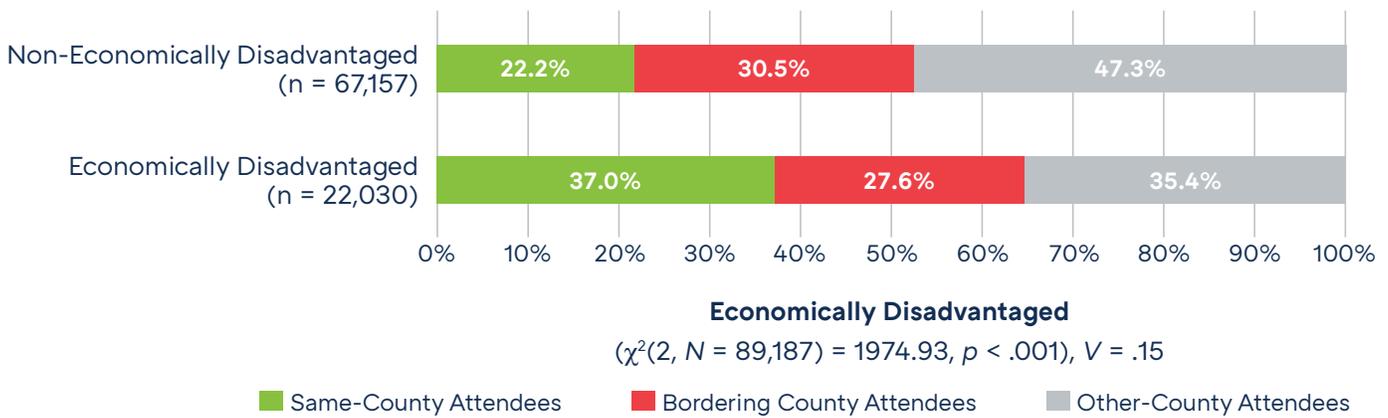
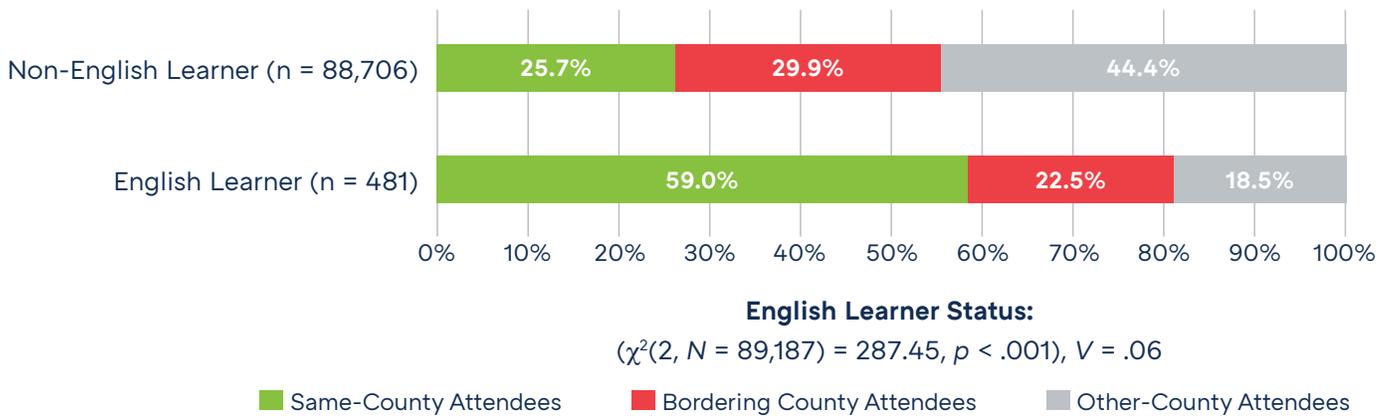


FIGURE 23. Student Travel Status by English Learner Status: Students at 4-Year Non-State PA Universities



The historically underperforming status was also found to be significantly associated with students' travel status to non-state institutions. Results depicted in Figure 24 show a high percentage of students attended non-state PA universities as other-county attendees, regardless of their historically underperforming status. However, a lower percentage of historically underperforming students were other-county attendees when compared to students who were not historically underperforming (35.9% versus 47.5%). Additionally, a higher percentage of historically underperforming students were same-county attendees when compared to non-historically underperforming students (36% versus 22.1%). The differences between proportions were significant ($\chi^2(2, N = 89,187) = 1887.68, p < .001$), but the effect was small ($V = .15$). The special education status variable was not significantly associated with travel status for students attending non-state universities.

Lastly, a student's geographic location was found to be significantly associated with their travel status to a non-state institution. Figure 25 shows that high percentages of students from towns, rural areas, and suburban areas were other-county attendees to non-state universities (64.7%, 57.1%, and 40.8%, respectively), while a significantly higher percentage of students from cities were same-county attendees (55.4%) when compared to students from all other geographic locations. The differences between proportions were significant, ($\chi^2(2, N = 80,593) = 9034.10, p < .001$), and the effect was moderate ($V = .24$).

FIGURE 24. Student Travel Status by Historically Underperforming Status: Students at 4-Year Non-State PA Universities

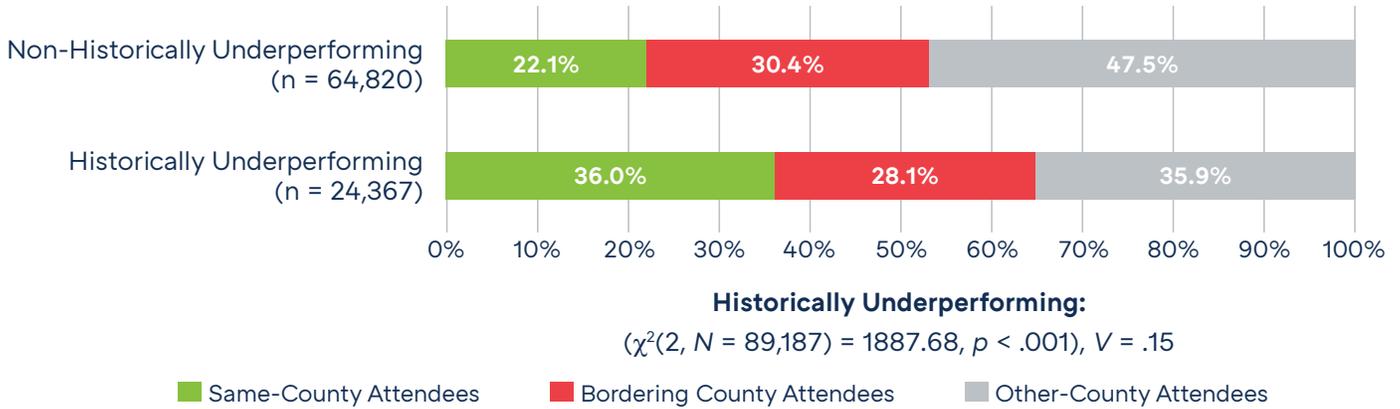
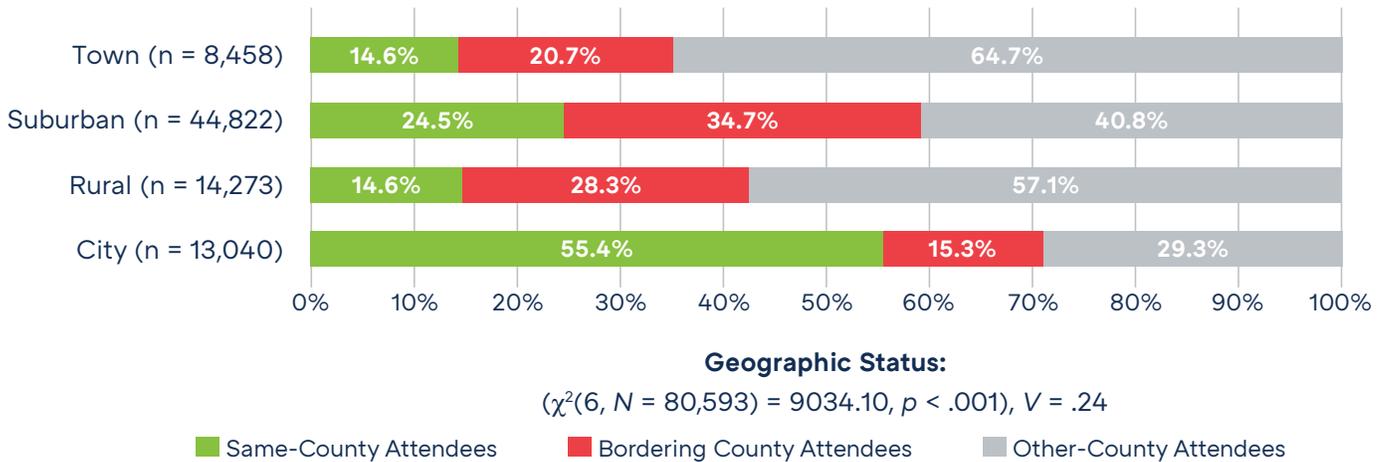


FIGURE 25. Student Travel Status by Geographic Location: Students at 4-Year Non-State PA Universities

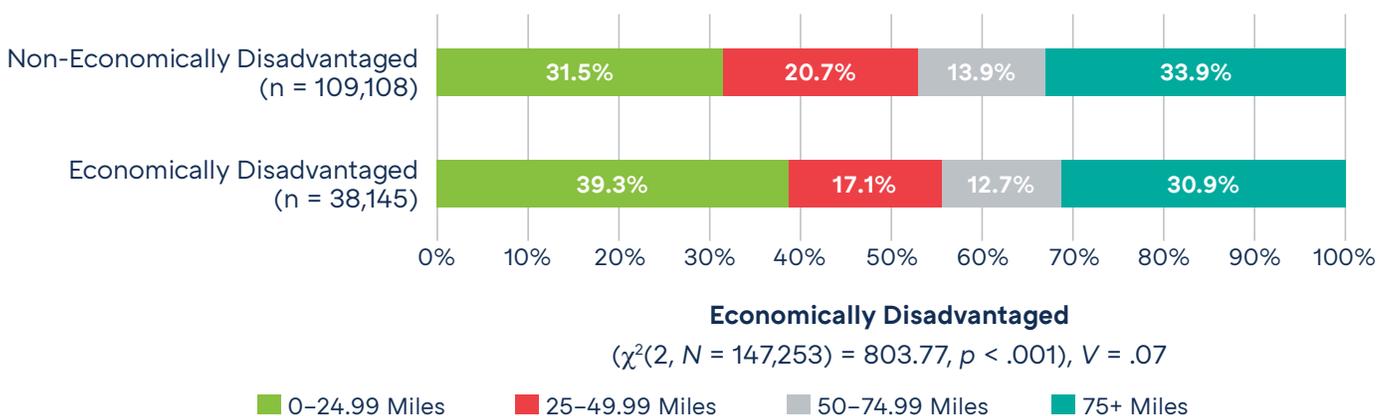


Student Groups and College Travel Distance: Students at All 4-Year Institutions

In addition to the travel status variable which measured student travel distance to college in a categorical manner, a continuous measure was created to measure travel distance in miles. This continuous measure was then used to create a categorical variable by grouping student travel distance into one of four ranges: 0 – 24.99 miles, 25 – 49.99 miles, 50 – 74.99 miles, and 75 or more miles. Several student-level status variables, including gender, race/ethnicity, economically disadvantaged status, EL status, special education status, historically underperforming status, and geographic location were examined in relation to travel distance for students who attended all PA 4-year institutions, state universities, and non-state universities.

Chi-square statistics were used to assess associations between student group variables and travel distances to all PA 4-year universities. First, a significant relationship was found between students' status as economically disadvantaged and postsecondary travel distance. Results depicted in Figure 26 show that regardless of economically disadvantaged status, high percentages of all students traveled either 75 or more miles or between 0 and 24.99 miles. However, a significantly higher percentage of students who experienced economic disadvantage traveled between 0 and 24.99 miles when compared to students who did not experience economic disadvantage (39.3% versus 31.5%). A smaller difference in percentages was observed for students who traveled 75 or more miles: 30.9% of students who experienced economic disadvantage traveled 75 or more miles compared to almost 34% of students who did not experience economic disadvantage. The differences between proportions were significant ($\chi^2(3, N = 147,253) = 803.77, p < .001$), but the effect was small ($V = .07$).

FIGURE 26. Student Travel Distance by Economically Disadvantaged Status: Students at All 4-Year PA Universities



Additionally, results shown in Figure 27 show a significant difference between EL and non-EL students in terms of travel distance to 4-year PA institutions. Specifically, a significantly higher percentage of EL students traveled between 0 and 24.99 miles when compared to non-EL students (63.6% versus 33.4%) and a significantly higher percentage of non-EL students traveled 75 or more miles when compared to EL students (33.2% versus 18.5%). The differences between proportions were significant ($\chi^2(3, N = 147,253) = 255.29, p < .001$), but the effect was small ($V = .04$). While the special education status variable was not significantly associated with traveling distance on its own, results depicted in Figure 27 showed that a significantly higher percentage of students who were historically underperforming traveled between 0 and 24.99 miles when compared to non-historically underperforming students (38.7% and 31.4%). The

differences between proportions were significant ($\chi^2(3, N = 147,253) = 752.26, p < .001$), but the effect was small ($V = .07$).

FIGURE 27. Student Travel Distance by English Learner Status: Students at All PA 4-Year Universities

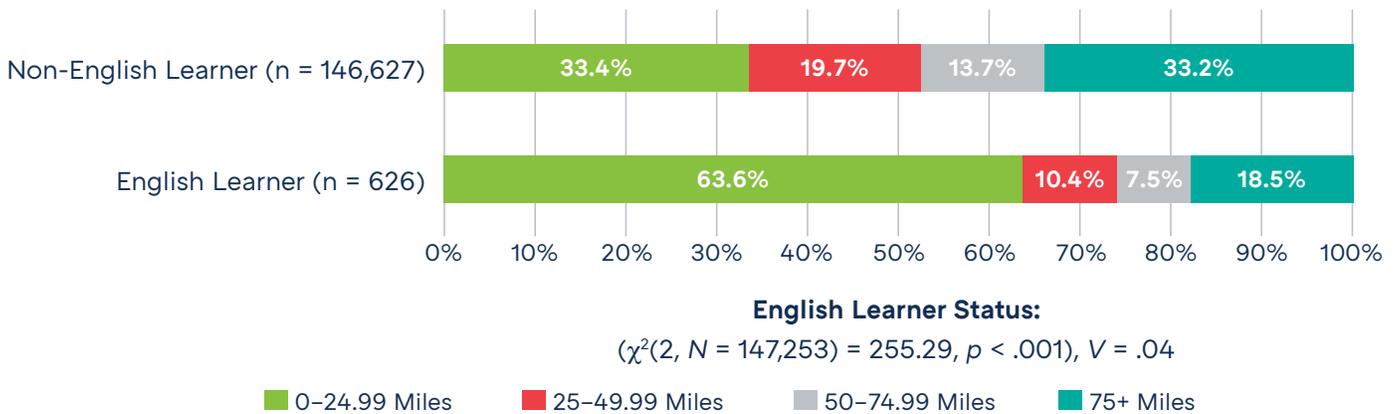
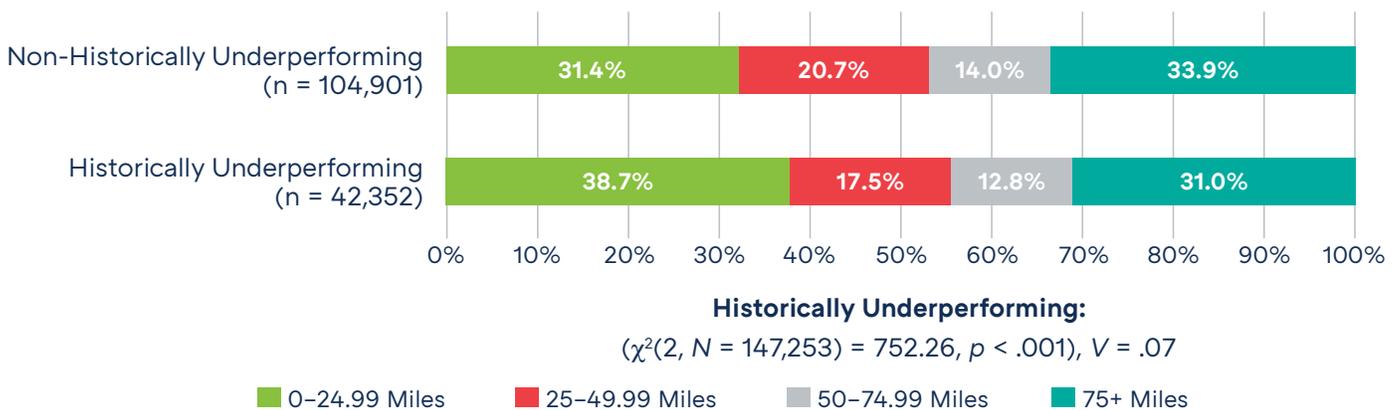
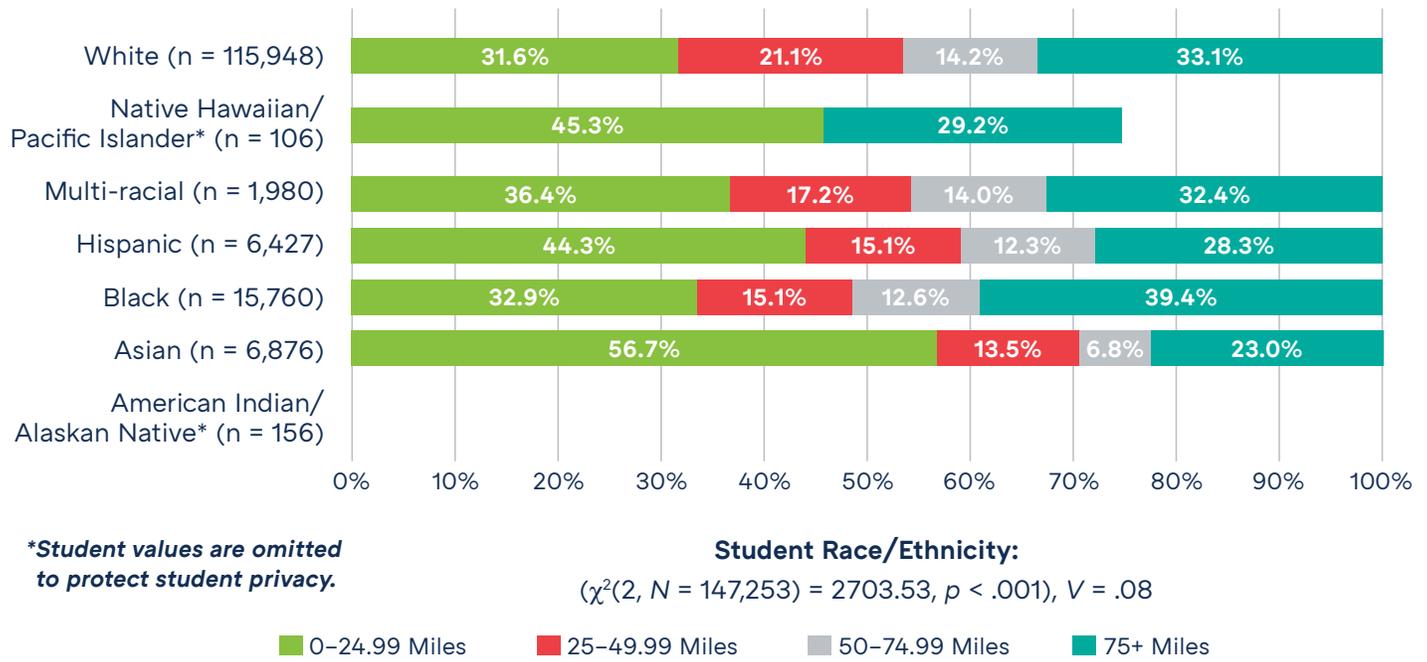


FIGURE 28. Student Travel Distance by Historically Underperforming Status: Students at All PA 4-Year Universities



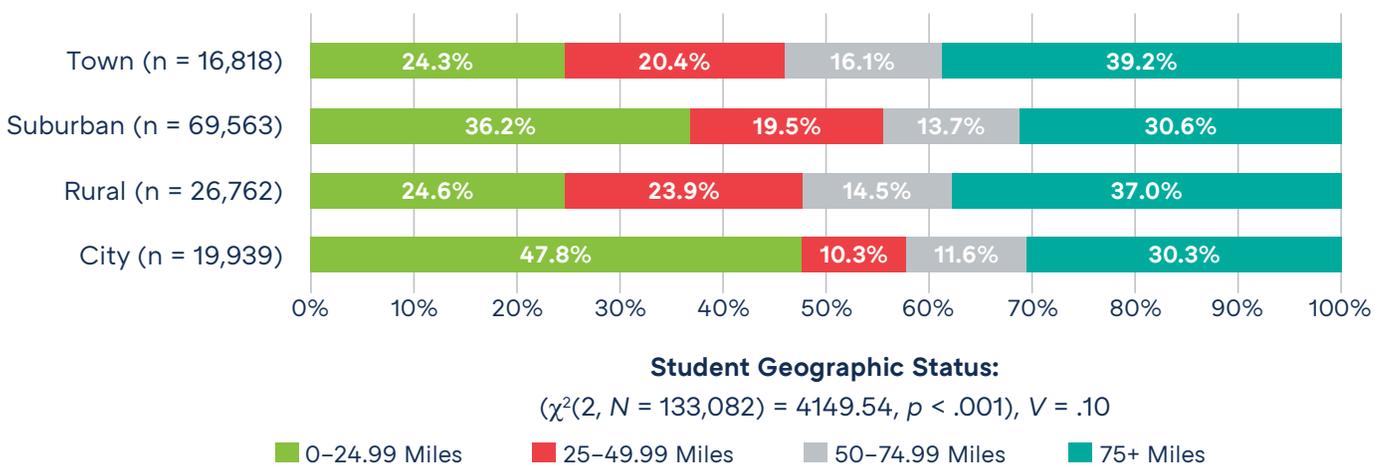
Further, chi-square analyses showed a significant association between student race/ethnicity and students' travel distance to PA 4-year institutions. Regardless of race/ethnicity, high percentages of students traveled between 0 and 24.99 miles and 75 miles or more. Figure 29 shows that a significantly higher percentage of Asian students (56.7%) traveled between 0 and 24.99 miles when compared to all other student racial/ethnic groups. Alternatively, a significantly higher percentage of Black students (39.4%) traveled 75 or more miles when compared all other student racial/ethnic groups. The differences between proportions were significant ($\chi^2(18, N = 147,253) = 2703.53, p < .001$), but the effect was small ($V = .08$).

FIGURE 29. Student Travel Distance by Student Race/Ethnicity: Students at All PA 4-Year Universities



Lastly, a significant association was found between students' geographical location and travel distance to all PA 4-year institutions. Figure 30 shows that a significantly higher percentage of students from cities (47.8%) traveled between 0 and 24.99 miles when compared to suburban students (36.2%), rural students (24.6%), and students from towns (24.3%). Additionally, a significantly higher percentage of students from towns and rural students traveled 75 or more miles (39.2% and 37%, respectively) when compared to suburban students and students from cities (30.6% and 30.3%, respectively). The differences between proportions were significant ($\chi^2(9, N = 133,082) = 4149.54, p < .001$), but the effect was small ($V = .10$).

FIGURE 30. Student Travel Distance and Student Geographic Location: Students at All PA 4-Year Universities



Student Groups and College Travel Distance: Students at State Universities

Similar analyses were used to examine how student group membership was associated with postsecondary travel distance for students who attended a PA state university. A significant association was found between students' status as economically disadvantaged and travel distance to a PA state institution. Figure 31 shows that a significantly higher percentage of students who experienced economic disadvantage traveled 75 or more miles when compared to students who did not experience economic disadvantage (40.7% versus 36%). The differences between proportions were significant ($\chi^2(3, N = 58,061) = 127.64, p < .001$), but the effect was small ($V = .05$), reflecting the small differences between percentages. Results from similar analyses, depicted in Figure 32, show that a significantly higher percentage of EL students traveled between 0 and 24.99 miles to a PA state university when compared to non-EL students (41.4% versus 22%). Similarly, the differences between proportions were significant ($\chi^2(3, N = 58,061) = 43.77, p < .001$), but the effect was small ($V = .03$).

FIGURE 31. Student Travel Distance by Student Economically Disadvantaged Status: Students at PA State Universities

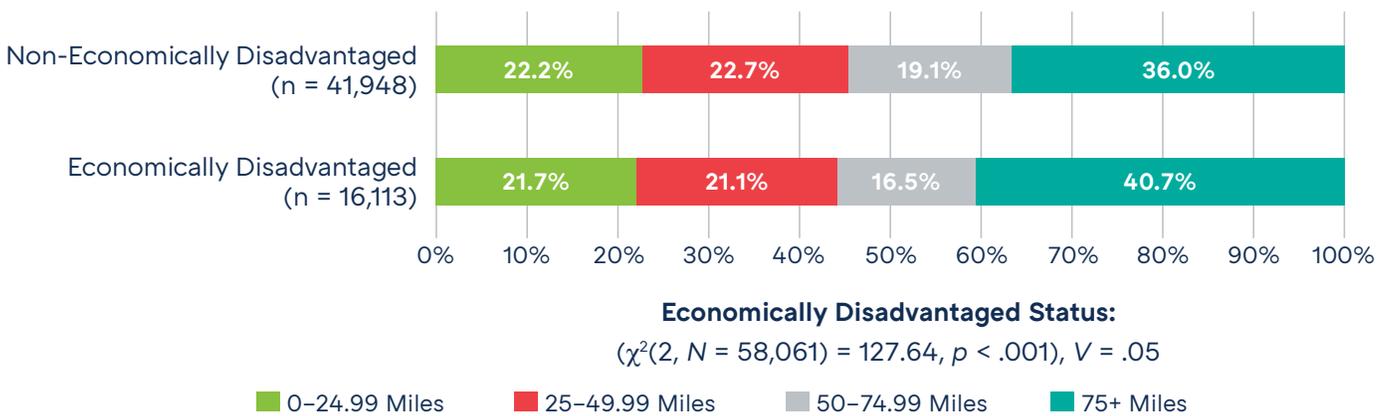
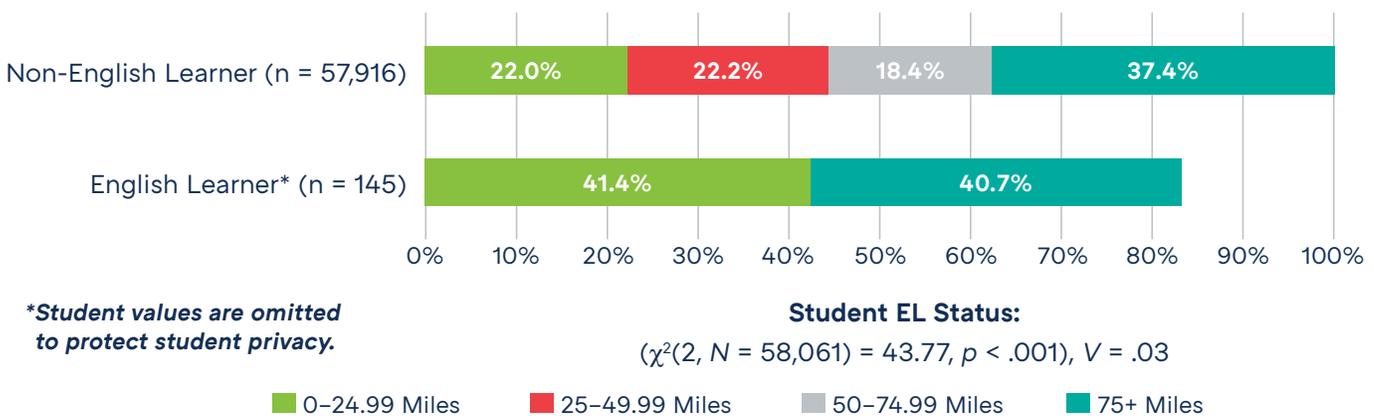


FIGURE 32. Student Travel Distance by Student EL Status: Students at PA State Universities



*Student values are omitted to protect student privacy.

Although students' special education status was not significantly associated with travel distance to state institutions, students' status as historically underperforming was significantly associated with travel distance. Figure 33 shows that a significantly higher percentage of historically underperforming students traveled 75 miles or more when compared to non-historically underperforming students (40.3% versus 36%). The differences between proportions were significant ($\chi^2(3, N = 58,061) = 114.29, p < .001$), but the effect was small ($V = .04$) due to the small differences between percentages. Additionally, students' race/ethnicity was found to be significantly associated with their travel distance to PA state institutions. Figure 34 shows that a significantly higher percentage of Black and Hispanic students traveled 75 or more miles (53.5% and 40.7%), when compared to students in all other racial/ethnic groups. The differences between proportions were significant ($\chi^2(18, N = 58,061) = 1357.80, p < .001$), but the effect was small ($V = .09$).

FIGURE 33. Student Travel Distance by Student Historically Underperforming Status: Students at PA State Universities

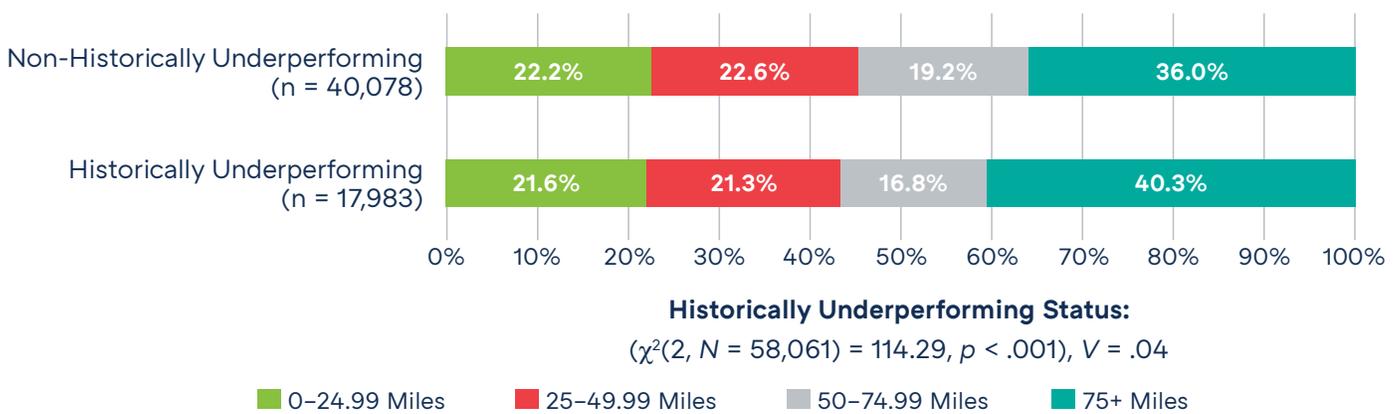
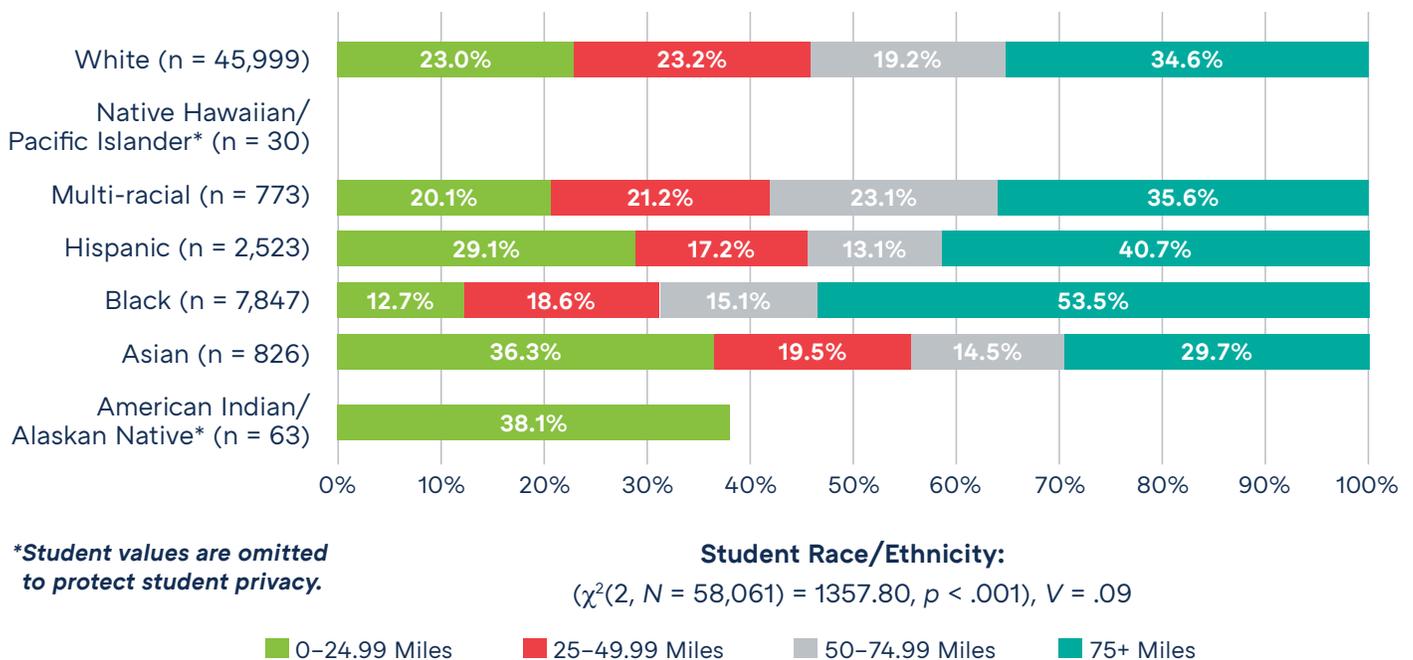
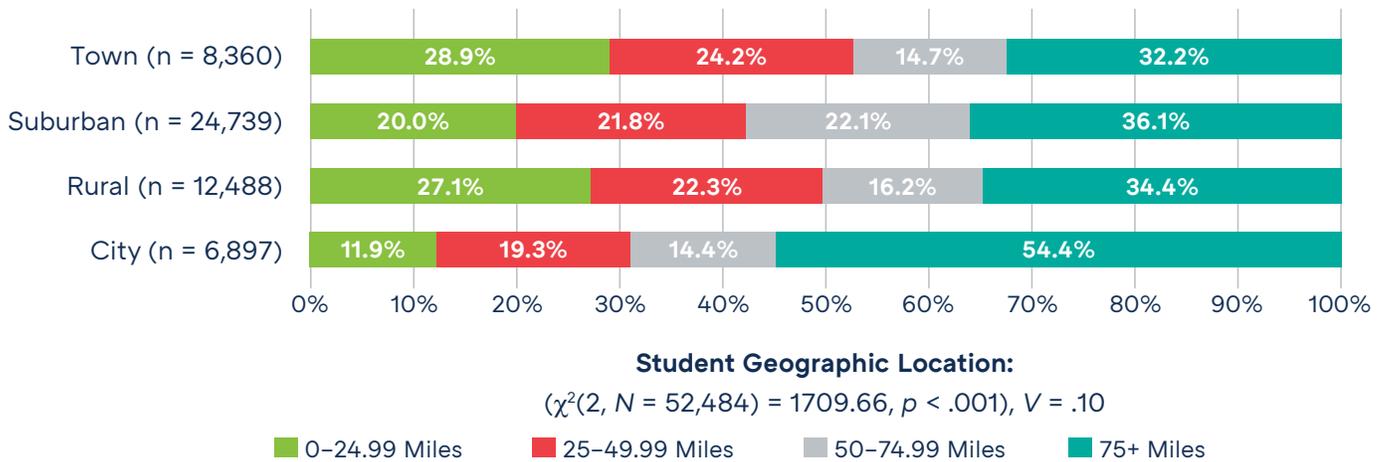


FIGURE 34. Student Travel Distance by Student Race/Ethnicity: Students at PA State Universities



Lastly, results depicted in Figure 35 showed a significant association between students' geographic location and travel distance to PA state institutions. Results showed that a significantly higher percentage of students from cities traveled 75 or more miles to state institutions (54.4%), but a significantly lower percentage of students from cities traveled between 0 and 24.99 miles to state institutions (11.9%). The differences between proportions were significant ($\chi^2(9, N = 58,061) = 1709.66, p < .001$), but the effect was small ($V = .10$).

FIGURE 35. Student Travel Distance by Student Geographic Location: Students at PA State Universities



Student Groups and College Travel Distance: Students at Non-State Institutions

Lastly, student group membership was examined for associations with travel distance for students who attended a 4-year institution in PA that was not a PA state institution. First, analysis featured in Figure 36 showed that a significantly higher percentage of students who experienced economic disadvantage traveled between 0 and 24.99 miles to a non-state institution when compared to students who did not experience economic disadvantage (52.1% versus 37.3%). Additionally, a significantly higher percentage of students who did not experience economic disadvantage traveled 75 or more miles when compared to students who did experience economic disadvantage (32.5% versus 23.7%). The differences between proportions were significant ($\chi^2(3, N = 89,187) = 1582.57, p < .001$), but the effect was small ($V = .13$).

FIGURE 36. Student Travel Distance by Student Economically Disadvantaged Status: Students at 4-Year Non-State PA Universities



Results depicted in Figure 37 showed that a significantly higher percentage of EL students traveled between 0 and 24.99 miles to a non-state institution when compared to non-EL students (70.3% versus 40.8%). Additionally, a significantly higher percentage of non-EL students traveled 75 or more miles when compared to EL students (30.4% versus 11.9%). The differences between proportions were significant ($\chi^2(3, N = 89,187) = 146.43, p < .001$), but the effect was small ($V = .04$). Similar to previous analyses, students' special education status was not significantly associated with travel distance to non-state PA 4-year institutions. However, results depicted in Figure 38 showed that a significantly higher percentage of historically underperforming students traveled between 0 and 24.99 miles when compared to non-historically underperforming students (51.4% versus 37.1%). Also, it was found that a significantly higher percentage of non-historically underperforming students traveled 75 or more miles to non-state institutions when compared to historically underperforming students (32.7% versus 24.1%). The differences between proportions were significant ($\chi^2(3, N = 89,187) = 1554.00, p < .001$), but the effect was small ($V = .13$).

FIGURE 37. Student Travel Distance by Student EL Status: Students at 4-Year Non-State PA Universities

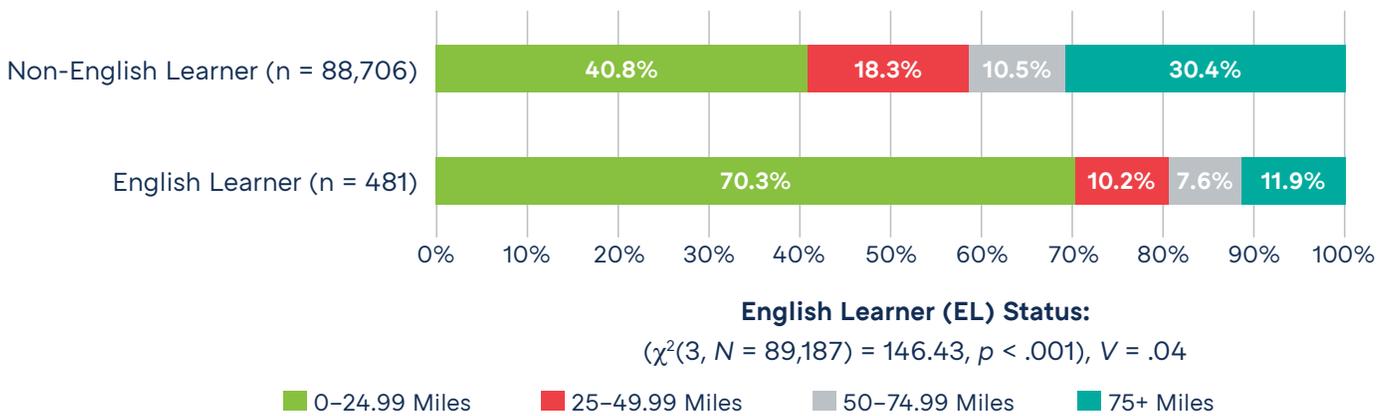
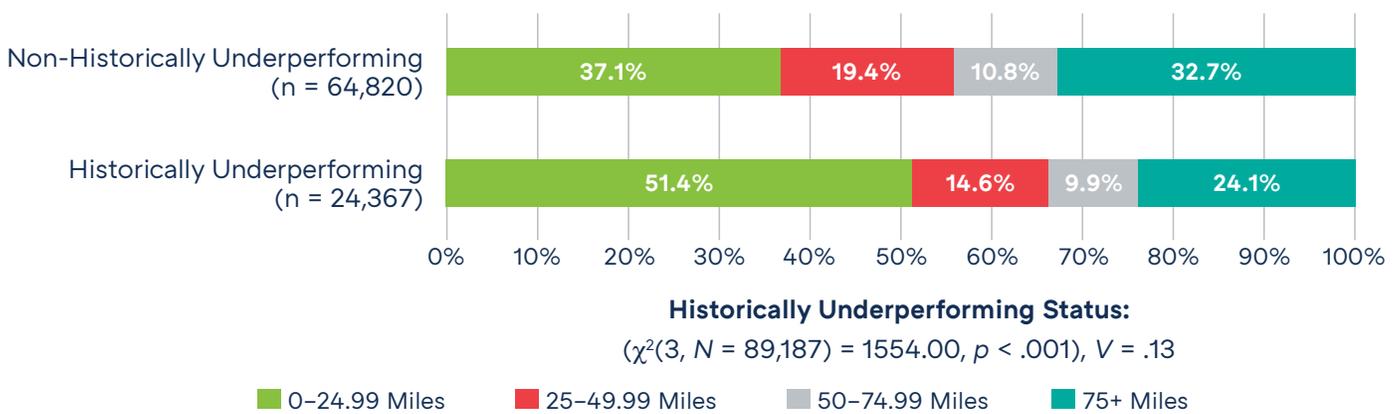
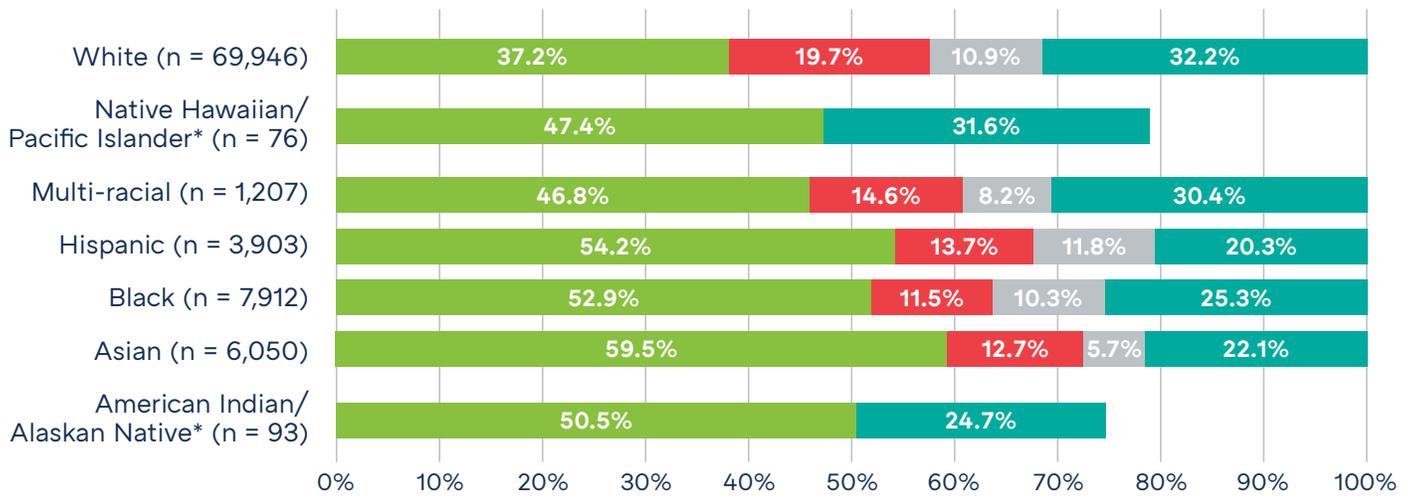


FIGURE 38. Student Travel Distance by Student Historically Underperforming Status: Students at 4-Year Non-State PA Universities



Additionally, results from a similar chi-square showed a significant association between students' race/ethnicity and travel distance to 4-year PA non-state institutions. Results shown in Figure 39 indicated that despite racial/ethnic group membership, high percentages of all students traveled between 0 and 24.99 miles. However, a significantly higher percentage of Asian, Hispanic, and Black students traveled between 0 and 24.99 miles (59.5%, 54.2%, and 52.9%, respectively) when compared to White students (37.2%). The differences between proportions were significant ($\chi^2(18, N = 89,187) = 2209.63, p < .001$), but the effect was small ($V = .09$).

FIGURE 39. Student Travel Distance by Student Race/Ethnicity: Students at Non-State PA 4-Year Universities



*Student values are omitted to protect student privacy.

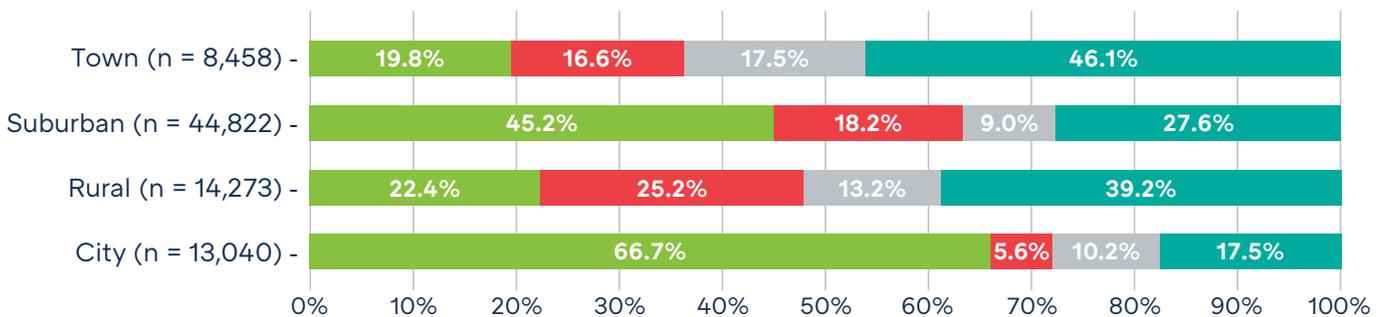
Student Race/Ethnicity:

$(\chi^2(18, N = 89,187) = 2209.63, p < .001), V = .09$

0-24.99 Miles 25-49.99 Miles 50-74.99 Miles 75+ Miles

Lastly, a significant association was found between students’ geographic location and travel distance to non-state institutions. Results shown in Figure 40 found that a significantly higher percentage of students from towns and rural students traveled 75 or more miles to a non-state institution (46.1% and 39.2%, respectively) compared to students from suburban and city schools (27.6% and 17.5%). Additionally, a significantly larger percentage of students from city schools traveled between 0 and 24.99 miles (66.7%) when compared to students attending schools in all other geographic locations. The differences between proportions were significant ($\chi^2(9, N = 80,593) = 8359.22, p < .001$), but the effect was small ($V = .19$).

FIGURE 40. Students’ Travel Distance by Student Geographic Location: Students at 4-Year Non-State PA Universities



Student Geographic Location:

$(\chi^2(9, N = 80,593) = 8359.22, p < .001), V = .19$

0-24.99 Miles 25-49.99 Miles 50-74.99 Miles 75+ Miles

■ Research Question Three: Are there differences in county-wide 4-year postsecondary access between student groups?

Using data elements collected and organized to answer research questions #1 and #2, student group differences by county-wide postsecondary access were examined. To measure each student’s county-wide access, the number of 4-year institutions in each PA county were totaled and students were assigned to a county based on the location of their final high school on record. From this continuous measurement of county-wide access, categorical variables were created to measure county-wide access to 4-year and 4-year BAIs. Frequency distributions were used to create three categories of county-wide access to 4-year institutions (low, medium, and high), while five categories were used to denote access to 4-year BAIs (0 BAIs, 1 BAI, 2 BAIs, 3 BAIs, and more than 3 BAIs). Access to 4-year postsecondary institutions was measured at four different times; county-wide postsecondary access data from the IPEDS Data Center was used for school years 2013-2014, 2014-2015, 2015-2016, and 2016-2017 to corresponded with the years when each high school class graduated.

Table 5 displays the raw differences in student factors and shows how students’ county-wide access to 4-year postsecondary education, including access to 4-year BAIs, fluctuated over the specified school years. In line with previous analyses, 4-year BAIs were those that accepted more than 75% of student applicants. Analyses in this section examined associations between students’ group memberships and the number of 4-year postsecondary options in their county (county-wide postsecondary access). All degree-seeking students with a valid high school location on record were included in analyses related to research question #3.

TABLE 5: Student Group Demographic Breakdown by High School Graduation Class: All Degree-Seeking Students who had a Valid High School Location

	HS Class of 2014	HS Class of 2015	HS Class of 2016	HS Class of 2017
Overall				
Total	N = 82,444	N = 80,766	N = 78,630	N = 78,308
Gender				
Male	46.3% (38,199)	45.6% (36,801)	45.8% (36,011)	45.5% (35,637)
Female	53.7% (44,245)	54.4% (43,975)	54.2% (42,619)	54.5% (42,671)
Ethnicity				
American Indian/Alaskan Native	0.1% (107)	0.1% (85)	0.1% (98)	0.1% (77)
Asian	4.2% (3,473)	4.5% (3,684)	4.9% (3,823)	4.9% (3,828)
Black	11.8% (9,731)	11.7% (9,429)	11.5% (9,064)	11.5% (9,024)
Hispanic	5.7% (4,685)	6.1% (4,923)	6.3% (5,014)	6.6% (5,206)
Multi-Racial	1.1% (913)	1.3% (1,072)	1.6% (1,239)	1.7% (1,309)
Native Hawaiian/Pacific Islander	0.1% (59)	0.1% (64)	0.1% (53)	0.1% (67)
White	77.0% (63,476)	76.2% (61,519)	75.5% (59,339)	75.1% (58,797)
Historically Underperforming				
Yes	31.1% (25,611)	32.1 (25,936)	32.4 (25,506)	34.1% (26,733)
No	68.9% (56,833)	67.9 (54,840)	67.6 (53,124)	65.9% (51,575)
EL Status				
Yes	1.1% (937)	1.2% (954)	1.3% (1,004)	1.3% (1,049)

	HS Class of 2014	HS Class of 2015	HS Class of 2016	HS Class of 2017
No	98.9% (81,507)	98.8% (79,822)	98.7% (77,626)	98.7% (77,259)
Special Education Status				
Yes	6.8% (5,575)	7.0% (5,624)	7.1% (5,603)	7.0% (5,489)
No	93.2% (76,869)	93.0% (75,152)	92.9% (73,027)	93.0% (72,819)
Economically Disadvantaged				
Yes	26.7% (22,033)	27.9% (22,510)	28.1% (22,116)	30.1% (23,544)
No	73.3% (60,411)	72.1% (58,266)	71.9% (56,514)	69.9% (54,764)
Geographic Location				
City	14.3% (11,816)	14.0% (11,285)	14.0% (11,000)	13.7% (10,695)
Rural	16.6% (13,663)	16.3% (13,129)	16.6% (13,020)	16.1% (12,606)
Suburban	49.0% (40,400)	49.0% (39,575)	49.2% (38,675)	48.6% (38,090)
Town	10.3% (8,451)	10.0% (8,051)	9.9% (7,809)	9.6% (7,479)
County Access to 4-Year Institutions				
Low Access	28.3% (23,310)	28.6% (23,136)	28.0% (22,039)	27.6% (21,643)
Medium Access	37.1% (30,618)	37.1% (29,959)	37.4% (29,369)	37.8% (29,562)
High Access	34.6% (28,516)	34.3% (27,681)	33.6% (27,222)	34.6% (27,103)
County Access to 4-Year BAIs				
0 BAIs	22.9% (18,917)	16.7% (13,483)	19.6% (15,395)	12.9 (10,118)
1 BAI	36.9% (30,433)	25.6% (20,641)	27.4% (21,512)	36.7% (28,726)
2 BAIs	13.6% (11,205)	25.6% (20,681)	14.8% (11,611)	11.9% (9,283)
3 BAIs	18.1% (14,928)	3.9% (3,158)	18.2% (14,301)	12.1% (9,513)
More than 3 BAIs	8.5% (6,961)	28.2% (22,813)	20.1% (15,811)	26.4% (20,668)

County-wide Access to PA 4-Year Institutions and Student Group Membership

Chi-square analyses were used to examine the relationship between county-wide postsecondary access and student group membership in each high school graduation class. Analyses were conducted separately for each high school graduation class to accurately study county-wide postsecondary access when students were seniors in high school and making their final college enrollment decisions. In addition, frequency distributions were used to develop a measure of students' county-wide postsecondary access to 4-year PA universities based on three levels (low access, medium access, or high access).

First, a significant association between students' status as economically disadvantaged and access to 4-year universities was found in all graduation classes. Overall, a higher percentage of students who experienced economic disadvantage had high county-wide access to 4-year institutions, while lower percentages of students who did not experience economic disadvantage had high access. Additionally, across all graduation years, a slightly higher percentage of non-economically disadvantaged students had low postsecondary access when compared to students who experienced economic disadvantage. Table 6 displays the differences in percentages between students who did and did not experience economic disadvantage for all high school graduation classes.

TABLE 6: County-wide Postsecondary Access by Student Economically Disadvantaged Status: Differences in Percentages by High School Graduation Class

	Low Access	Medium Access	High Access
2014 Graduating Class ($\chi^2(2, N = 82,444) = 1305.11, p < .001, V = .13$)			
Economically Disadvantaged (<i>n</i> = 22,033)	25.6% (<i>n</i> = 5,645)	30.1% (<i>n</i> = 6,622)	44.3% (<i>n</i> = 9,766)
Non-Economically Disadvantaged (<i>n</i> = 66,041)	29.2% (<i>n</i> = 17,665)	39.7% (<i>n</i> = 23,996)	31.1% (<i>n</i> = 18,750)
2015 Graduating Class ($\chi^2(2, N = 80,776) = 1173.24, p < .001, V = .12$)			
Economically Disadvantaged (<i>n</i> = 22,510)	24.5% (<i>n</i> = 5,510)	32.1% (<i>n</i> = 7,215)	43.4% (<i>n</i> = 9,785)
Non-Economically Disadvantaged (<i>n</i> = 58,266)	30.3% (<i>n</i> = 17,626)	39.0% (<i>n</i> = 22,744)	30.7% (<i>n</i> = 17,896)
2016 Graduating Class ($\chi^2(2, N = 78,630) = 993.03, p < .001, V = .11$)			
Economically Disadvantaged (<i>n</i> = 22,116)	25.4% (<i>n</i> = 5,614)	31.5% (<i>n</i> = 807)	43.1% (<i>n</i> = 9,529)
Non-Economically Disadvantaged (<i>n</i> = 56,514)	29.1% (<i>n</i> = 16,425)	39.6% (<i>n</i> = 6,973)	31.3% (<i>n</i> = 17,693)
2017 Graduating Class ($\chi^2(2, N = 78,308) = 2207.24, p < .001, V = .17$)			
Economically Disadvantaged (<i>n</i> = 23,544)	24.2% (<i>n</i> = 5,700)	29.2% (<i>n</i> = 6,865)	46.6% (<i>n</i> = 10,979)
Non-Economically Disadvantaged (<i>n</i> = 54,764)	29.1% (<i>n</i> = 15,943)	41.4% (<i>n</i> = 22,697)	29.5% (<i>n</i> = 16,124)

Additionally, significant associations between county-wide access to 4-year institutions and students' EL status were found in all student graduation classes. Overall, a significantly higher percentage of EL students had high levels of county-wide access when compared to non-EL students. Additionally, a significantly higher percentage of non-EL students had low levels of county wide access when compared to EL students. Table 7 shows the differences in percentages between EL and non-EL students for all high school graduation classes.

TABLE 7: County-wide Postsecondary Access by Student English Learner (EL) Status: Differences in Percentages by High School Graduation Class

	Low Access	Medium Access	High Access
2014 Graduating Class ($\chi^2(2, N = 82,444) = 225.92, p < .001, V = .05$)			
English Learner (EL) (<i>n</i> = 937)	8.6% (<i>n</i> = 81)	38.0% (<i>n</i> = 356)	53.4% (<i>n</i> = 500)
Non-English Learner (EL) (<i>n</i> = 81,507)	28.5% (<i>n</i> = 23,229)	37.1% (<i>n</i> = 30,262)	34.4% (<i>n</i> = 28,016)
2015 Graduating Class ($\chi^2(2, N = 80,776) = 288.33, p < .001, V = .06$)			

	Low Access	Medium Access	High Access
English Learner (EL) (n = 954)	6.8% (n = 65)	37.6% (n = 359)	55.6% (n = 530)
Non-English Learner (EL) (n = 79,822)	28.9% (n = 23,071)	37.1% (n = 29,600)	34.0% (n = 27,151)
2016 Graduating Class ($\chi^2(2, N = 78,630) = 252.70, p < .001, V = .06$)			
English Learner (EL) (n = 1,004)	8.4% (n = 84)	37.4% (n = 376)	54.2% (n = 544)
Non-English Learner (EL) (n = 77,626)	28.3% (n = 21,955)	37.3% (n = 28,993)	34.4% (n = 26,678)
2017 Graduating Class ($\chi^2(2, N = 78,308) = 306.96, p < .001, V = .06$)			
English Learner (EL) (n = 1,049)	7.2% (n = 75)	36.5% (n = 383)	56.3% (n = 591)
Non-English Learner (EL) (n = 77,259)	27.9% (n = 21,568)	37.8% (n = 29,179)	34.3% (n = 26,512)

There were also significant associations between students' special education status and county-wide access to 4-year institutions in all student graduation classes. Overall, a slightly higher percentage of special education students had high county-wide access to 4-year institutions when compared to non-special education students. Additionally, across all graduation classes, a significantly higher percentage of non-special education students had low levels of county-wide access when compared to special education students. Table 8 displays the differences in percentages between special education and non-special education students for all high school graduation classes.

TABLE 8: County-wide Postsecondary Access by Student Special Education Status: Differences in Percentages by High School Graduation Class

	Low Access	Medium Access	High Access
2014 Graduating Class ($\chi^2(2, N = 82,444) = 104.78, p < .001, V = .04$)			
Special Education (n = 5,575)	22.4% (n = 1,251)	41.3% (n = 2,303)	36.3% (n = 2,021)
Non-Special Education (n = 76,869)	28.7% (n = 22,059)	36.8% (n = 28,315)	34.5% (n = 26,495)
2015 Graduating Class ($\chi^2(2, N = 80,776) = 131.34, p < .001, V = .04$)			
Special Education (n = 5,624)	22.0% (n = 1,240)	39.6% (n = 2,228)	38.4% (n = 2,156)
Non-Special Education (n = 75,152)	29.1% (n = 21,896)	36.9% (n = 27,731)	34.0% (n = 25,525)
2016 Graduating Class ($\chi^2(2, N = 78,630) = 130.16, p < .001, V = .04$)			
Special Education (n = 5,603)	21.6% (n = 1,211)	39.2% (n = 2,198)	39.2% (n = 2,194)
Non-Special Education (n = 73,027)	28.5% (n = 20,828)	37.2% (n = 27,171)	34.3% (n = 25,028)

	Low Access	Medium Access	High Access
2017 Graduating Class ($\chi^2(2, N = 78,308) = 97.74, p < .001, V = .04$)			
Special Education (<i>n</i> = 5,489)	21.9% (<i>n</i> = 1,203)	40.2% (<i>n</i> = 2,204)	37.9% (<i>n</i> = 2,082)
Non-Special Education (<i>n</i> = 72,819)	28.1% (<i>n</i> = 20,440)	37.5% (<i>n</i> = 27,358)	34.4% (<i>n</i> = 25,021)

Similarly, there were significant associations between students' historically underperforming status and access to 4-year institutions in all graduation classes. Across all graduation classes, a significantly higher percentage of students who were historically underperforming had high levels of postsecondary access when compared to non-historically underperforming students. Also, a slightly higher percentage of non-historically underperforming students had low and medium access to 4-year postsecondary institutions when compared to students who were historically underperforming. Table 9 displays the differences in percentages between historically underperforming and non-historically underperforming students for all high school graduation classes.

TABLE 9: County-wide Postsecondary Access by Student Historically Underperforming Status: Differences in Percentages by High School Graduation Class

	Low Access	Medium Access	High Access
2014 Graduating Class ($\chi^2(2, N = 82,444) = 1120.07, p < .001, V = .12$)			
Historically Underperforming (<i>n</i> = 25,611)	25.0% (<i>n</i> = 6,397)	32.2% (<i>n</i> = 8,242)	42.8% (<i>n</i> = 10,972)
Non-Historically Underperforming (<i>n</i> = 56,833)	29.7% (<i>n</i> = 16,913)	39.4% (<i>n</i> = 22,376)	30.9% (<i>n</i> = 17,544)
2015 Graduating Class ($\chi^2(2, N = 80,776) = 1165.94, p < .001, V = .12$)			
Historically Underperforming (<i>n</i> = 25,936)	24.1% (<i>n</i> = 6,250)	33.4% (<i>n</i> = 8,668)	42.5% (<i>n</i> = 11,018)
Non-Historically Underperforming (<i>n</i> = 54,840)	30.8% (<i>n</i> = 16,886)	38.8% (<i>n</i> = 21,291)	30.4% (<i>n</i> = 16,663)
2016 Graduating Class ($\chi^2(2, N = 78,630) = 996.82, p < .001, V = .11$)			
Historically Underperforming (<i>n</i> = 25,506)	24.8% (<i>n</i> = 6,320)	32.9% (<i>n</i> = 8,384)	42.3% (<i>n</i> = 10,802)
Non-Historically Underperforming (<i>n</i> = 53,124)	29.6% (<i>n</i> = 15,719)	39.5% (<i>n</i> = 20,985)	30.9% (<i>n</i> = 16,420)
2017 Graduating Class ($\chi^2(2, N = 78,308) = 2000.90, p < .001, V = .16$)			
Historically Underperforming (<i>n</i> = 26,733)	23.8% (<i>n</i> = 6,354)	31.1% (<i>n</i> = 8,309)	45.1% (<i>n</i> = 12,070)
Non-Historically Underperforming (<i>n</i> = 51,575)	29.7% (<i>n</i> = 15,289)	41.2% (<i>n</i> = 21,253)	29.1% (<i>n</i> = 15,033)

Similar analyses showed a significant association between students' race/ethnicity and access to 4-year institutions. Across all graduation classes, Black and Asian students were more likely than all other student racial/ethnic groups to have high county-wide access to 4-year institutions, while White students were more likely than all other groups to have low levels of county-wide access. Table 10 displays the differences in percentages between student racial/ethnic groups for all high school graduation classes.

TABLE 10: County-wide Postsecondary Access by Student Racial/Ethnic Groups: Differences in Percentages by High School Graduation Class

	Low Access	Medium Access	High Access
2014 Graduating Class			
$(\chi^2(12, N = 82,444) = 7976.59, p < .001), V = .22$			
American Indian/Alaskan Native (n = 107)	29.0% (n = 31)	27.1% (n = 29)	43.9% (n = 47)
Asian (n = 3,473)	9.0% (n = 314)	33.6% (n = 1,166)	57.4% (n = 1,993)
Black (n = 9,731)	11.7% (n = 1,137)	18.8% (n = 1,834)	69.5% (n = 6,760)
Hispanic (n = 4,685)	17.3% (n = 809)	46.6% (n = 2,185)	36.1% (n = 1,691)
Multi-Racial (n = 913)	22.3% (n = 204)	36.7% (n = 335)	41.0% (n = 374)
Native Hawaiian/Pacific Islander (n = 59)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 63,476)	32.8% (n = 20,794)	39.4% (n = 25,049)	27.8% (n = 17,633)
2015 Graduating Class			
$(\chi^2(12, N = 80,776) = 7833.93, p < .001), V = .22$			
American Indian/Alaskan Native (n = 85)	31.7% (n = 27)	27.1% (n = 23)	41.2% (n = 35)
Asian (n = 3,684)	9.1% (n = 334)	33.6% (n = 1,240)	57.3% (n = 2,110)
Black (n = 9,429)	11.9% (n = 1,123)	19.5% (n = 1,833)	68.6% (n = 6,473)
Hispanic (n = 4,923)	17.3% (n = 854)	48.8% (n = 2,400)	33.9% (n = 1,669)
Multi-Racial (n = 1,072)	23.2% (n = 249)	35.9% (n = 385)	40.9% (n = 438)
Native Hawaiian/Pacific Islander (n = 64)	42.2% (n = 27)	**** (n = ****)	**** (n = ****)
White (n = 61,519)	33.4% (n = 20,522)	39.1% (n = 24,059)	27.5% (n = 16,938)
2016 Graduating Class			
$(\chi^2(12, N = 78,630) = 7397.35, p < .001), V = .22$			
American Indian/Alaskan Native (n = 98)	28.6% (n = 28)	37.7% (n = 37)	33.7% (n = 33)
Asian (n = 3,823)	9.3% (n = 358)	34.5% (n = 1,318)	56.2% (n = 2,147)
Black (n = 9,064)	11.3% (n = 1,026)	19.8% (n = 1,794)	68.9% (n = 6,244)
Hispanic (n = 5,014)	17.9% (n = 898)	47.1% (n = 2,360)	35.0% (n = 1,756)
Multi-Racial (n = 1,239)	22.8% (n = 282)	35.6% (n = 441)	41.6% (n = 516)

	Low Access	Medium Access	High Access
Native Hawaiian/Pacific Islander (n = 53)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 59,339)	32.8% (n = 19,426)	39.4% (n = 23,404)	27.8% (n = 16,509)
2017 Graduating Class ($\chi^2(12, N = 78,308) = 7495.10, p < .001, V = .22$)			
American Indian/Alaskan Native (n = 77)	**** (n = ****)	**** (n = ****)	**** (n = ****)
Asian (n = 3,828)	8.8% (n = 335)	35.8% (n = 1,371)	55.4% (n = 2,122)
Black (n = 9,024)	11.7% (n = 1,053)	19.3% (n = 1,740)	69.0% (n = 6,231)
Hispanic (n = 5,206)	17.0% (n = 887)	48.9% (n = 2,543)	34.1% (n = 1,776)
Multi-Racial (n = 1,309)	23.6% (n = 309)	31.9% (n = 418)	44.5% (n = 582)
Native Hawaiian/Pacific Islander (n = 67)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 58,797)	32.3% (n = 19,014)	39.9% (n = 23,443)	27.8% (n = 16,340)

*Sample for one or more cells was too low to report (less than 20); therefore, all cell counts for applicable rows were suppressed.

Lastly, a significant association between students' geographic location and access to 4-year institutions was found in all graduation classes. Overall, students from cities were more likely than students from all other geographic locations to have high county-wide access to 4-year institutions. Additionally, across all graduation classes, students from towns and rural geographic locations were more likely than students from cities and suburban areas to have low access to 4-year institutions. Table 11 displays the differences in percentages between students' geographical location for all high school graduation classes.

TABLE 11: County-wide Postsecondary Access by Student Geographic Location: Differences in Percentages by High School Graduation Class

	Low Access	Medium Access	High Access
2014 Graduating Class ($\chi^2(6, N = 74,330) = 28408.16, p < .001, V = .44$)			
City (n = 11,816)	7.1% (n = 837)	27.5% (n = 3,253)	65.4% (n = 7,726)
Rural (n = 13,663)	57.6% (n = 7,884)	36.1% (n = 4,923)	6.3% (n = 856)
Suburban (n = 40,400)	12.3% (n = 4,967)	46.0% (n = 18,587)	41.7% (n = 16,855)
Town (n = 8,451)	76.0% (n = 6,420)	21.9% (n = 1,850)	2.1% (n = 181)
2015 Graduating Class ($\chi^2(6, N = 72,040) = 27013.93, p < .001, V = .43$)			
City (n = 11,285)	7.3% (n = 828)	28.4% (n = 3,205)	64.3% (n = 7,252)
Rural (n = 13,129)	58.2% (n = 7,649)	35.3% (n = 4,633)	6.5% (n = 847)

	Low Access	Medium Access	High Access
Suburban (n = 39,575)	12.5% (n = 4,930)	46.2% (n = 18,296)	41.3% (n = 16,349)
Town (n = 8,051)	76.0% (n = 6,115)	21.8% (n = 1,762)	2.2% (n = 174)
2016 Graduating Class ($\chi^2(6, N = 70,504) = 26291.49, p < .001, V = .43$)			
City (n = 11,000)	6.6% (n = 722)	28.3% (n = 3,119)	65.1% (n = 7,159)
Rural (n = 13,020)	57.8% (n = 7,532)	35.4% (n = 4,599)	6.8% (n = 889)
Suburban (n = 38,675)	12.7% (n = 4,904)	45.8% (n = 17,711)	41.5% (n = 16,060)
Town (n = 7,809)	75.8% (n = 5,920)	21.9% (n = 1,710)	2.3% (n = 179)
2017 Graduating Class ($\chi^2(6, N = 68,870) = 25499.53, p < .001, V = .43$)			
City (n = 10,695)	7.2% (n = 765)	27.5% (n = 2,948)	65.3% (n = 6,982)
Rural (n = 12,606)	56.8% (n = 7,164)	36.5% (n = 4,594)	6.7% (n = 848)
Suburban (n = 38,090)	11.9% (n = 4,550)	46.4% (n = 17,651)	41.7% (n = 15,889)
Town (n = 7,479)	74.5% (n = 5,569)	23.2% (n = 1,735)	2.3% (n = 175)

Access to Broad Access 4-Year Institutions and Student Group Membership

Similar analyses were used to examine county-wide access to 4-year broad access institutions (BAIs) among various student groups. Chi-square tests showed a significant association between students' economically disadvantaged status and county-wide access to 4-year BAIs in all high school graduation classes. Table 12 shows that although access to more than three BAIs increased significantly from 2014 to 2015 for both groups, a significantly higher percentage of students who experienced economic disadvantage had access to more than three BAIs when compared to non-economically disadvantaged students. While the percentage of students without access to 4-year BAIs fluctuated across graduation years regardless of economic disadvantage status, a slightly higher percentage of non-economically disadvantaged students had no access to 4-year BAIs when compared to students who experienced economic disadvantage.

TABLE 12: County-wide 4-Year BAI Access by Student Economically Disadvantaged Status: Differences in Percentages by High School Graduation Class

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2014 Graduating Class					
$(\chi^2(4, N = 82,444) = 7742.10, p < .001), V = .31$					
Economically Disadvantaged (n = 22,033)	17.3% (n = 3,807)	30.3% (n = 6,687)	11.7% (n = 2,577)	18.3% (n = 4,037)	22.4% (n = 4,925)
Non-Economically Disadvantaged (n = 60,411)	25.0% (n = 15,110)	39.3% (n = 23,746)	14.3% (n = 8,628)	18.0% (n = 10,891)	3.4% (n = 2,036)
2015 Graduating Class					
$(\chi^2(4, N = 80,776) = 2150.92, p < .001), V = .16$					
Economically Disadvantaged (n = 22,510)	13.7% (n = 3,081)	23.2% (n = 5,221)	19.0% (n = 4,287)	5.0% (n = 1,130)	39.1% (n = 8,791)
Non-Economically Disadvantaged (n = 58,266)	17.8% (n = 10,402)	26.5% (n = 15,420)	28.1% (n = 16,394)	3.5% (n = 2,028)	24.1% (n = 14,022)
2016 Graduating Class					
$(\chi^2(4, N = 78,630) = 2834.43, p < .001), V = .19$					
Economically Disadvantaged (n = 22,116)	17.3% (n = 3,827)	23.7% (n = 5,243)	14.7% (n = 3,261)	12.6% (n = 2,771)	31.7% (n = 7,014)
Non-Economically Disadvantaged (n = 56,514)	20.5% (n = 11,568)	28.7% (n = 16,269)	14.8% (n = 8,350)	20.4% (n = 11,530)	15.6% (n = 8,797)
2017 Graduating Class					
$(\chi^2(4, N = 78,308) = 2931.11, p < .001), V = .19$					
Economically Disadvantaged (n = 23,544)	11.1% (n = 2,604)	30.7% (n = 7,236)	11.0% (n = 2,591)	8.1% (n = 1,915)	39.1% (n = 9,198)
Non-Economically Disadvantaged (n = 54,764)	13.7% (n = 7,514)	39.2% (n = 21,490)	12.3% (n = 6,692)	13.9% (n = 7,598)	20.9% (n = 11,470)

Similarly, students' EL status was significantly associated with access to 4-year BAIs in all graduation classes. Table 13 shows that a significantly higher percentage of EL students had access to more than three BAIs (across all graduation years) when compared to non-EL students. The percentage of EL students with access to more than three BAIs increased by 14% between the 2014 and 2015 graduating class, then fluctuated slightly from 2015 to 2017. Additionally, the percentages of non-EL students with access to one 4-year BAI fluctuated throughout the graduation classes, but was highest in the 2014 graduating class and lowest in the 2017 graduating class.

TABLE 13: County-wide 4-Year BAI Access by Student English Learner (EL) Status: Differences in Percentages by High School Graduation Class

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2014 Graduating Class ($\chi^2(4, N = 82,444) = 879.68, p < .001, V = .10$)					
EL (n = 937)	12.4% (n = 116)	20.1% (n = 188)	12.1% (n = 113)	21.1% (n = 198)	34.3% (n = 322)
Non-EL (n = 81,507)	23.1% (n = 18,801)	37.1% (n = 30,245)	13.6% (n = 11,092)	18.1% (n = 14,730)	8.1% (n = 6,639)
2015 Graduating Class ($\chi^2(4, N = 80,776) = 286.28, p < .001, V = .06$)					
EL (n = 954)	8.2% (n = 77)	11.5% (n = 110)	24.6% (n = 235)	7.4% (n = 71)	48.3% (n = 461)
Non-EL (n = 79,822)	16.8% (n = 13,406)	25.7% (n = 20,531)	25.6% (n = 20,446)	3.9% (n = 3,087)	28.0% (n = 22,352)
2016 Graduating Class ($\chi^2(4, N = 78,630) = 371.74, p < .001, V = .07$)					
EL (n = 1,004)	12.0% (n = 120)	14.4% (n = 145)	18.8% (n = 189)	12.5% (n = 125)	42.3% (n = 425)
Non-EL (n = 77,626)	19.7% (n = 15,275)	27.5% (n = 21,367)	14.7% (n = 11,422)	18.3% (n = 14,176)	19.8% (n = 15,386)
2017 Graduating Class ($\chi^2(4, N = 78,308) = 392.71, p < .001, V = .07$)					
EL (n = 1,049)	**** (n = ****)				
Non-EL (n = 77,259)	13.1% (n = 10,104)	36.9% (n = 28,492)	11.7% (n = 9,075)	12.2% (n = 9,407)	26.1% (n = 20,181)

*Sample for one or more cells was too low to report (less than 20); therefore, all cell counts for applicable rows were suppressed.

Although there was a significant association between students' special education status and county-wide access to 4-year BAIs in all high school graduation classes, the differences in access between groups were small. Table 14 shows that across all graduation years, a slightly higher percentage of non-special education students had access to zero BAIs when compared to special education students. Additionally, although access to more than three BAIs significantly increased for both groups between 2014 and 2015 and slightly decreased afterward, there were similar rates of access across all years. Specifically, the percentage of access to more than three 4-year BAIs increased by almost 24% (from 7.2% from 30.9%) for

special education students and 19.5% (from 8.5% and 28%) for non-special education students between the 2014 and 2015 graduating class. Access to more than three BAIs was slightly lower for both groups in 2016 and 2017.

TABLE 14: County-wide 4-Year BAI Access by Student Special Education Status: Differences in Percentages by High School Graduation Class

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2014 Graduating Class					
$(\chi^2(4, N = 82,444) = 42.68, p < .001, V = .02)$					
Special Education (n = 5,575)	20.6% (n = 1,146)	39.6% (n = 2,207)	14.8% (n = 823)	17.8% (n = 995)	7.2% (n = 404)
Non-Special Education (n = 76,869)	23.1% (n = 17,771)	36.7% (n = 28,226)	13.5% (n = 10,382)	18.2% (n = 13,933)	8.5% (n = 6,557)
2015 Graduating Class					
$(\chi^2(4, N = 80,776) = 233.97, p < .001, V = .05)$					
Special Education (n = 5,624)	12.3% (n = 689)	21.4% (n = 1,206)	32.1% (n = 1,807)	3.3% (n = 183)	30.9% (n = 1,739)
Non-Special Education (n = 75,152)	17.0% (n = 12,794)	25.9% (n = 19,435)	25.1% (n = 18,874)	4.0% (n = 2,975)	28.0% (n = 21,074)
2016 Graduating Class					
$(\chi^2(4, N = 78,630) = 138.67, p < .001, V = .04)$					
Special Education (n = 5,603)	15.2% (n = 846)	25.0% (n = 1,402)	17.1% (n = 958)	21.6% (n = 1,212)	21.1% (n = 1,185)
Non-Special Education (n = 73,027)	19.9% (n = 14,549)	27.6% (n = 20,110)	14.6% (n = 10,653)	17.9% (n = 13,089)	20.0% (n = 14,626)
2017 Graduating Class					
$(\chi^2(4, N = 78,308) = 165.91, p < .001, V = .05)$					
Special Education (n = 5,489)	8.9% (n = 491)	33.6% (n = 1,844)	15.3% (n = 838)	13.3% (n = 727)	28.9% (n = 1,589)
Non-Special Education (n = 72,819)	13.2% (n = 9,627)	36.9% (n = 26,882)	11.6% (n = 8,445)	12.1% (n = 8,786)	26.2% (n = 19,079)

Additionally, students' historically underperforming status was significantly associated with county-wide access to 4-year BAIs in all high school graduation classes. Table 15 shows that across all graduation years, a significantly higher percentage of historically underperforming students had access to more than three BAIs when compared to non-historically underperforming students. Additionally, a slightly higher percentage of non-historically underperforming students had no access to 4-year BAIs when compared to historically underperforming students.

TABLE 15: County-wide 4-Year BAI Access by Student Historically Underperforming Status: Differences in Percentages by High School Graduation Class

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2014 Graduating Class ($\chi^2(4, N = 82,444) = 6260.56, p < .001, V = .28$)					
Historically Underperforming (n = 25,611)	18.1% (n = 4,631)	31.9% (n = 8,167)	12.2% (n = 3,137)	18.1% (n = 4,631)	19.7% (n = 5,045)
Non-Historically Underperforming (n = 56,833)	25.1% (n = 14,286)	39.2% (n = 22,266)	14.2% (n = 8,068)	18.1% (n = 10,297)	3.4% (n = 1,916)
2015 Graduating Class ($\chi^2(4, N = 80,776) = 1791.45, p < .001, V = .15$)					
Historically Underperforming (n = 25,936)	13.5% (n = 3,494)	22.8% (n = 5,924)	21.6% (n = 5,594)	4.7% (n = 1,216)	37.4% (n = 9,708)
Non-Historically Underperforming (n = 54,840)	18.2% (n = 9,989)	26.8% (n = 14,717)	27.5% (n = 15,087)	3.6% (n = 1,942)	23.9% (n = 13,105)
2016 Graduating Class ($\chi^2(4, N = 78,630) = 2394.55, p < .001, V = .18$)					
Historically Underperforming (n = 25,506)	16.8% (n = 4,279)	24.1% (n = 6,151)	15.1% (n = 3,846)	14.2% (n = 3,626)	29.8% (n = 7,604)
Non-Historically Underperforming (n = 53,124)	20.9% (n = 11,116)	28.9% (n = 15,361)	14.7% (n = 7,765)	20.1% (n = 10,675)	15.4% (n = 8,207)
2017 Graduating Class ($\chi^2(4, N = 78,308) = 2642.25, p < .001, V = .18$)					
Historically Underperforming (n = 26,733)	10.7% (n = 2,866)	31.3% (n = 8,358)	11.7% (n = 3,119)	9.0% (n = 2,412)	37.3% (n = 9,978)
Non-Historically Underperforming (n = 51,575)	14.1% (n = 7,252)	39.5% (n = 20,368)	12.0% (n = 6,164)	13.7% (n = 7,101)	20.7% (n = 10,690)

Similar analysis showed that student race/ethnicity was significantly associated with access to 4-year BAIs in all graduation classes. Table 16 shows that percentages of county-wide access by student race/ethnicity varied by graduation class. Across all graduation years, a significantly higher percentage of Black students had access to more than three BAIs when compared to all other student racial/ethnic groups. Additionally, the percentages of Asian and Black students with access to more than three BAIs increased by 23.6% and 20.6% (respectively) between the 2014 and 2015 graduating class and remained high with slight fluctuations thereafter. White students had the lowest access to more than three BAIs across all years with a high percentage having access to only one BAI.

TABLE 16: County-wide 4-Year BAI Access by Student Racial/Ethnic Group: Differences in Percentages by High School Graduation Class

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2014 Graduating Class					
$(\chi^2(24, N = 82,444) = 19589.64, p < .001), V = .24$					
American Indian/Alaskan Native (n = 107)	**** (n = ****)				
Asian (n = 3,473)	16.6% (n = 575)	28.1% (n = 978)	21.1% (n = 734)	11.7% (n = 405)	22.5% (n = 781)
Black (n = 9,731)	6.3% (n = 613)	26.8% (n = 2,610)	10.8% (n = 1,042)	15.6% (n = 1,521)	40.5% (n = 3,945)
Hispanic (n = 4,685)	15.7% (n = 736)	29.2% (n = 1,370)	16.1% (n = 753)	17.5% (n = 819)	21.5% (n = 1,007)
Multi-Racial (n = 913)	16.9% (n = 154)	38.9% (n = 355)	17.3% (n = 158)	18.5% (n = 169)	8.4% (n = 77)
Native Hawaiian/Pacific Islander (n = 59)	**** (n = ****)	44.1% (n = 26)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 63,476)	26.5% (n = 16,807)	39.5% (n = 25,060)	13.4% (n = 8,488)	18.8% (n = 11,991)	1.8% (n = 1,130)
2015 Graduating Class					
$(\chi^2(24, N = 80,776) = 7979.59, p < .001), V = .15$					
American Indian/Alaskan Native (n = 85)	23.5% (n = 20)	**** (n = ****)	23.5% (n = 20)	**** (n = ****)	35.3% (n = 30)
Asian (n = 3,684)	7.0% (n = 259)	12.0% (n = 442)	33.1% (n = 1,218)	1.8% (n = 67)	46.1% (n = 1,698)
Black (n = 9,429)	3.7% (n = 352)	16.4% (n = 1,549)	17.3% (n = 1,634)	1.5% (n = 131)	61.1% (n = 5,763)
Hispanic (n = 4,923)	12.2% (n = 598)	20.9% (n = 1,031)	33.4% (n = 1,645)	6.4% (n = 313)	27.1% (n = 1,336)
Multi-Racial (n = 1,072)	13.5% (n = 145)	27.9% (n = 299)	21.6% (n = 232)	**** (n = ****)	35.4% (n = 379)
Native Hawaiian/Pacific Islander (n = 64)	**** (n = ****)	34.4% (n = 22)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 61,519)	19.7% (n = 12,097)	28.1% (n = 17,286)	25.8% (n = 15,926)	4.3% (n = 2,619)	22.1% (n = 13,591)
2016 Graduating Class					
$(\chi^2(24, N = 78,630) = 8195.55, p < .001), V = .16$					
American Indian/Alaskan Native (n = 98)	**** (n = ****)	33.7% (n = 33)	**** (n = ****)	**** (n = ****)	**** (n = ****)
Asian (n = 3,823)	9.9% (n = 379)	20.7% (n = 793)	15.0% (n = 572)	25.8% (n = 985)	28.6% (n = 1,094)
Black (n = 9,064)	6.4% (n = 583)	16.3% (n = 1,472)	12.8% (n = 1,164)	12.9% (n = 1,167)	51.6% (n = 4,678)
Hispanic (n = 5,014)	19.4% (n = 971)	19.0% (n = 952)	23.0% (n = 1,151)	15.9% (n = 796)	22.7% (n = 1,144)
Multi-Racial (n = 1,239)	15.2% (n = 188)	26.2% (n = 324)	12.1% (n = 150)	18.8% (n = 234)	27.7% (n = 343)
Native Hawaiian/Pacific Islander (n = 53)	**** (n = ****)	43.4% (n = 23)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 59,339)	22.3% (n = 13,247)	30.2% (n = 17,915)	14.4% (n = 8,562)	18.7% (n = 11,089)	14.4% (n = 8,526)

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2017 Graduating Class ($\chi^2(24, N = 78,308) = 8788.99, p < .001, V = .17$)					
American Indian/Alaskan Native (n = 77)	**** (n = ****)	33.8% (n = 26)	**** (n = ****)	**** (n = ****)	39.0% (n = 30)
Asian (n = 3,828)	2.9% (n = 111)	26.3% (n = 1,006)	13.9% (n = 533)	12.3% (n = 471)	44.6% (n = 1,707)
Black (n = 9,024)	2.5% (n = 223)	21.1% (n = 1,901)	12.1% (n = 1,091)	5.6% (n = 501)	58.7% (n = 5,308)
Hispanic (n = 5,206)	4.1% (n = 211)	34.6% (n = 1,801)	22.8% (n = 1,189)	12.2% (n = 635)	26.3% (n = 1,370)
Multi-Racial (n = 1,309)	9.2% (n = 121)	34.3% (n = 449)	8.7% (n = 113)	10.6% (n = 139)	37.2% (n = 487)
Native Hawaiian/Pacific Islander (n = 67)	**** (n = ****)	50.7% (n = 34)	**** (n = ****)	**** (n = ****)	**** (n = ****)
White (n = 58,797)	16.0% (n = 9,438)	40.0% (n = 23,509)	10.8% (n = 6,345)	13.2% (n = 7,757)	20.0% (n = 11,748)

*Sample for one or more cells was too low to report (less than 20); therefore, all cell counts for applicable rows were suppressed.

Lastly, a significant association was found between students' geographic location and access to 4-year BAIs in all graduation classes. Table 17 shows that across all graduation years, a higher percentage of students from cities had access to more than three BAIs when compared to students from all other geographic locations. On the other hand, across all graduation years, a significantly higher percentage of students from towns and rural students had no access to 4-year BAIs when compared to students from towns and suburban students.

TABLE 17: County-wide 4-Year BAI Access by Student Geographic Location: Differences in Percentages by High School Graduation Class

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
2014 Graduating Class ($\chi^2(12, N = 74,330) = 19589.64, p < .001, V = .45$)					
City (n = 11,816)	11.8% (n = 1,400)	11.4% (n = 1,333)	7.4% (n = 877)	18.0% (n = 2,127)	51.4% (n = 6,079)
Rural (n = 13,663)	37.2% (n = 5,080)	47.3% (n = 6,457)	3.5% (n = 483)	12.0% (n = 1,643)	0.0% (n = 0)
Suburban (n = 40,400)	14.8% (n = 5,970)	40.9% (n = 16,515)	20.8% (n = 8,419)	23.5% (n = 9,496)	0.0% (n = 0)
Town (n = 8,451)	45.0% (n = 3,801)	45.3% (n = 3,825)	3.7% (n = 309)	6.0% (n = 516)	0.0% (n = 0)
2015 Graduating Class ($\chi^2(12, N = 72,040) = 24616.02, p < .001, V = .34$)					
City (n = 11,285)	11.6% (n = 1,314)	12.2% (n = 1,370)	8.0% (n = 904)	5.4% (n = 607)	62.8% (n = 7,090)
Rural (n = 13,129)	33.9% (n = 4,450)	37.1% (n = 4,875)	17.8% (n = 2,331)	4.4% (n = 580)	6.8% (n = 893)
Suburban (n = 39,575)	6.3% (n = 2,512)	22.7% (n = 8,968)	36.5% (n = 14,456)	4.8% (n = 1,888)	29.7% (n = 11,751)

	0 BAIs	1 BAI	2 BAIs	3 BAIs	More than 3 BAIs
Town (n = 8,051)	45.0% (n = 3,622)	39.8% (n = 3,211)	12.2% (n = 980)	0.0% (n = 0)	3.0% (n = 238)
2016 Graduating Class ($\chi^2(24, N = 70,504) = 28599.05, p < .001, V = .37$)					
City (n = 11,000)	18.9% (n = 2,082)	7.5% (n = 817)	7.8% (n = 860)	2.7% (n = 302)	63.1% (n = 6,939)
Rural (n = 13,020)	36.2% (n = 4,720)	34.7% (n = 4,517)	8.8% (n = 1,143)	12.7% (n = 1,651)	7.6% (n = 989)
Suburban (n = 38,675)	9.9% (n = 3,846)	24.5% (n = 9,485)	22.6% (n = 8,714)	28.0% (n = 10,815)	15.0% (n = 5,815)
Town (n = 7,809)	47.5% (n = 3,699)	38.5% (n = 3,009)	3.4% (n = 267)	7.9% (n = 620)	2.7% (n = 214)
2017 Graduating Class ($\chi^2(24, N = 68,870) = 27449.57, p < .001, V = .36$)					
City (n = 10,695)	6.3% (n = 674)	21.2% (n = 2,264)	7.8% (n = 838)	4.7% (n = 504)	60.0% (n = 6,415)
Rural (n = 12,606)	30.3% (n = 3,826)	45.2% (n = 5,704)	3.5% (n = 440)	16.4% (n = 2,062)	4.6% (n = 574)
Suburban (n = 38,090)	1.5% (n = 553)	36.5% (n = 13,928)	18.8% (n = 7,154)	15.1% (n = 5,755)	28.1% (n = 10,700)
Town (n = 7,479)	45.0% (n = 3,362)	40.3% (n = 3,016)	3.2% (n = 240)	11.5% (n = 861)	0.0% (n = 0)

*Sample for one or more cells was too low to report (less than 20); therefore, all cell counts for applicable rows were suppressed.

■ Research Question Four: Are students' travel distances to PA 4-year universities associated with the level of postsecondary access in their county?

Results from previous descriptive analyses found associations between various geographic locations within PA and amounts of postsecondary access (research question #1), established links between travel distance to college and student group membership (research question #2), and detailed associations between students' demographic characteristics and their postsecondary access at the county level (research question #3). This phase of analysis sought to examine how county-wide differences in postsecondary access in PA might be related to students' travel distance to 4-year institutions and 4-year BAIs in Pennsylvania.

Table 18 displays descriptive statistics between student variables for the 147,253 students included in this phase of analysis. All students in the following analyses attended a 4-year institution in PA. Students' county-wide access to 4-year institutions and 4-year BAIs was examined to establish potential associations with students' travel distance to college. Three separate phases of analyses were conducted to examine the association between county-wide postsecondary access and travel distance for students at all 4-year universities in PA, students at PA state universities, and students at non-PA state universities.

TABLE 18: Student Demographic Breakdown by High School Graduation Class: Students Attending a 4-Year PA University

		HS Class of 2014	HS Class of 2015	HS Class of 2016	HS Class of 2017
Overall					
	Total	N = 36,839	N = 36,920	N = 36,198	N = 37,296
Gender					
	Male	43.6% (16,052)	42.9% (15,840)	43.1% (15,589)	42.5% (15,847)
	Female	56.4% (20,787)	57.1% (21,080)	56.9% (20,609)	57.5% (21,449)
Ethnicity					
	American Indian/Alaskan Native	0.1% (52)	0.1% (35)	0.1% (39)	0.1% (30)
	Asian	4.3% (1,568)	4.5% (1,654)	4.9% (1,774)	5.0% (1,880)
	Black	10.6% (3,935)	10.5% (3,887)	10.7% (3,886)	10.9% (4,052)
	Hispanic	3.9% (1,420)	4.3% (1,572)	4.6% (1,673)	4.7% (1,762)
	Multi-Racial	1.0% (363)	1.2% (460)	1.5% (535)	1.7% (622)
	Native Hawaiian/Pacific Islander	0.1% (26)	0.1% (23)	0.1% (23)	0.1% (34)
	White	80.0% (29,475)	79.3% (29,289)	78.1% (28,268)	77.5% (28,916)
Historically Underperforming					
	Yes	26.7% (9,833)	27.7% (10,237)	29.1% (10,540)	31.5% (11,742)
	No	73.3% (27,006)	72.3% (26,683)	70.9% (25,658)	68.5% (25,554)
EL Status					
	Yes	0.3% (128)	0.4% (142)	0.5% (166)	0.5% (190)
	No	99.7% (36,711)	99.6% (36,778)	99.5% (36,032)	99.5% (37,106)
Special Education Status					
	Yes	4.1% (1,514)	4.1% (1,515)	4.5% (1,633)	4.5% (1,663)
	No	95.9% (35,325)	95.9% (35,405)	95.5% (34,565)	95.5% (35,633)
Economically Disadvantaged					
	Yes	23.8% (8,770)	25.0% (9,214)	26.1% (9,458)	28.7% (10,703)
	No	76.2% (28,069)	75.0% (27,706)	73.9% (26,740)	71.3% (26,593)
Geographic Location					
	City	13.8% (5,076)	13.3% (4,909)	13.6% (4,912)	13.5% (5,042)
	Rural	18.7% (6,880)	18.2% (6,733)	18.3% (6,631)	17.5% (6,518)
	Suburban	47.6% (17,547)	47.1% (17,402)	47.2% (17,075)	47.0% (17,539)
	Town	11.5% (4,231)	11.5% (4,262)	11.6% (4,187)	11.1% (4,138)
County Access to 4-Year Unis.					
	Low Access	30.3% (11,166)	31.3% (11,539)	30.6% (11,063)	30.0% (11,189)
	Medium Access	36.2% (13,333)	35.9% (13,258)	36.0% (13,061)	36.0% (13,429)
	High Access	33.5% (12,340)	32.8% (12,123)	33.4% (12,074)	34.0% (12,678)
County Access to BA 4-Year Unis.					
	0 BAI Unis	24.0% (8,832)	19.1% (7,061)	21.5% (7,772)	14.8% (5,533)
	1 BAI Uni	36.6% (13,484)	25.2% (9,292)	27.2% (9,840)	36.7% (13,669)
	2 BAI Unis	12.6% (4,654)	24.5% (9,061)	14.3% (5,182)	11.4% (4,254)
	3 BAI Unis	18.7% (6,879)	4.3% (1,576)	17.3% (6,275)	11.8% (4,414)
	More than 3 BAI Unis	8.1% (2,990)	26.9% (9,930)	19.7% (7,129)	25.3% (9,426)

County-wide Postsecondary Access and College Travel Distance: Students at All 4-Year PA Universities

Similar to the analyses included in the previous section, all analyses in this phase were conducted individually for each high school graduation class. This was to reflect how county-wide access to various forms of postsecondary education changed over the years included in the study. Similar to techniques used to answer research question #3, frequency distributions were used to give all students one of three statuses (low access, medium access, or high access) depending on their county-wide access to 4-year universities. Frequency distributions were also used to create a categorical variable (with four levels) for travel distance to PA institutions. Several chi-squares were used to examine the relationship between travel distance to PA institutions and county-wide access to 4-year universities and 4-year broad access universities.

First, analysis showed a significant association in all high school graduation classes between county-wide access to 4-year universities and travel distance to PA 4-year institutions. Overall, a significantly higher percentage of students with low county-wide access traveled 75 or more miles, while a lower percentage of students with high access traveled 75 or more miles. Also, a significantly higher percentage of students with high county-wide access traveled between 0 and 24.99 miles to a PA 4-year institution, compared to a lower percentage of students with low access. Table 19 shows the differences in percentages between students' county-wide access for all high school graduation classes.

TABLE 19: County-wide 4-Year BAI Access by Student Geographic Location: Differences in Percentages by High School Graduation Class

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2014 Graduating Class				
$(\chi^2(6, N = 36,839) = 1640.64, p < .001), V = .15$				
Low Access (n = 11,166)	23.8% (n = 2,652)	22.2% (n = 2,480)	15.3% (n = 1,709)	38.7% (n = 4,325)
Medium Access (n = 13,333)	28.8% (n = 3,843)	22.6% (n = 3,007)	13.7% (n = 1,832)	34.9% (n = 4,651)
High Access (n = 12,340)	46.7% (n = 5,767)	14.3% (n = 1,756)	12.3% (n = 1,517)	26.7% (n = 3,300)
2015 Graduating Class				
$(\chi^2(6, N = 36,920) = 1554.32, p < .001), V = .15$				
Low Access (n = 11,539)	22.8% (n = 2,636)	22.5% (n = 2,595)	15.1% (n = 1,741)	39.6% (n = 4,567)
Medium Access (n = 13,258)	29.9% (n = 3,965)	22.0% (n = 2,922)	13.7% (n = 1,810)	34.4% (n = 4,561)
High Access (n = 12,123)	45.8% (n = 5,554)	14.4% (n = 1,749)	12.4% (n = 1,503)	27.4% (n = 3,317)
2016 Graduating Class				
$(\chi^2(6, N = 36,198) = 1591.46, p < .001), V = .15$				
Low Access (n = 11,063)	23.3% (n = 2,574)	21.8% (n = 2,417)	15.3% (n = 1,696)	39.6% (n = 4,376)
Medium Access (n = 13,061)	29.9% (n = 3,910)	23.0% (n = 3,004)	13.6% (n = 1,774)	33.5% (n = 4,373)
High Access (n = 12,074)	46.4% (n = 5,602)	14.4% (n = 1,734)	12.5% (n = 1,510)	26.7% (n = 3,228)

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2017 Graduating Class ($\chi^2(6, N = 37,296) = 1909.32, p < .001, V = .16$)				
Low Access (n = 11,189)	23.5% (n = 2,622)	22.8% (n = 2,555)	14.6% (n = 1,633)	39.1% (n = 4,379)
Medium Access (n = 13,429)	30.2% (n = 4,049)	22.7% (n = 3,060)	13.9% (n = 1,866)	33.2% (n = 4,454)
High Access (n = 12,678)	48.7% (n = 6,168)	14.3% (n = 1,820)	11.7% (n = 1,485)	25.3% (n = 3,205)

Similar analyses found a significant association between county-wide access to 4-year BAIs and students' travel distance to all 4-year PA universities in all graduation classes. Table 20 shows that there were similarities between percentages throughout the graduation classes; in all graduation classes, the percentage of students with access to more than three BAIs who traveled between 0 and 24.99 miles was significantly higher than students with all other levels of access. Additionally, the percentage of students with access to zero BAIs who traveled 75 or more miles was higher than students with all other levels of access in all graduation classes.

TABLE 20: Student Travel Distance to all PA 4-Year Institutions by County Access to 4-Year BAIs: Differences in Percentages by High School Graduation Class

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2014 Graduating Class ($\chi^2(6, N = 36,839) = 1626.44, p < .001, V = .12$)				
0 BAIs (n = 8,832)	21.4% (n = 1,887)	25.4% (n = 2,241)	16.1% (n = 1,425)	37.1% (n = 3,279)
1 BAI (n = 13,484)	31.1% (n = 4,197)	20.4% (n = 2,754)	13.1% (n = 1,763)	35.4% (n = 4,770)
2 BAIs (n = 4,654)	35.4% (n = 1,649)	18.4% (n = 855)	13.0% (n = 607)	33.2% (n = 1,543)
3 BAIs (n = 6,879)	43.1% (n = 2,968)	16.9% (n = 1,164)	14.7% (n = 1,011)	25.3% (n = 1,736)
More than 3 BAIs (n = 2,990)	52.3% (n = 1,561)	19.7% (n = 229)	13.7% (n = 252)	33.3% (n = 948)
2015 Graduating Class ($\chi^2(6, N = 36,920) = 1862.22, p < .001, V = .13$)				
0 BAIs (n = 7,061)	17.8% (n = 1,259)	23.9% (n = 1,682)	17.5% (n = 1,238)	40.8% (n = 2,882)
1 BAI (n = 9,292)	28.7% (n = 2,666)	21.3% (n = 1,976)	16.2% (n = 1,507)	33.8% (n = 3,143)
2 BAIs (n = 9,061)	32.6% (n = 2,950)	21.1% (n = 1,911)	12.7% (n = 1,152)	33.6% (n = 3,048)
3 BAIs (n = 1,576)	37.8% (n = 596)	13.0% (n = 205)	9.2% (n = 145)	40.0% (n = 630)
More than 3 BAIs (n = 9,930)	47.2% (n = 4,684)	15.0% (n = 1,492)	10.2% (n = 1,012)	27.6% (n = 2,742)
2016 Graduating Class ($\chi^2(6, N = 36,198) = 2452.05, p < .001, V = .15$)				
0 BAIs (n = 7,772)	18.5% (n = 1,435)	22.4% (n = 1,744)	20.2% (n = 1,571)	38.9% (n = 3,022)

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
1 BAI (n = 9,840)	27.6% (n = 2,717)	21.3% (n = 2,100)	13.0% (n = 1,276)	38.1% (n = 3,747)
2 BAIs (n = 5,182)	41.6% (n = 2,157)	18.9% (n = 980)	15.4% (n = 796)	24.1% (n = 1,249)
3 BAIs (n = 6,275)	34.8% (n = 2,185)	23.3% (n = 1,465)	8.1% (n = 504)	33.8% (n = 2,121)
More than 3 BAIs (n = 7,129)	50.4% (n = 3,592)	12.1% (n = 866)	11.7% (n = 833)	25.8% (n = 1,838)
2017 Graduating Class ($\chi^2(6, N = 37,296) = 2326.28, p < .001, V = .14$)				
0 BAIs (n = 5,533)	15.9% (n = 880)	26.0% (n = 1,438)	17.0% (n = 939)	41.1% (n = 2,276)
1 BAI (n = 13,669)	29.5% (n = 4,026)	21.9% (n = 2,996)	14.3% (n = 1,949)	34.3% (n = 4,698)
2 BAIs (n = 4,254)	41.8% (n = 1,778)	14.3% (n = 610)	17.8% (n = 756)	26.1% (n = 1,110)
3 BAIs (n = 4,414)	34.2% (n = 1,510)	20.6% (n = 909)	7.4% (n = 325)	37.8% (n = 1,670)
More than 3 BAIs (n = 9,426)	49.3% (n = 4,645)	15.7% (n = 1,482)	10.8% (n = 1,015)	24.2% (n = 2,284)

Postsecondary Access and College Travel Distance: Students who Attended a State University

A second phase of analyses examined the association between students' travel distance and county-wide postsecondary access for students who attended one of Pennsylvania's state universities. Chi-square analyses showed a significant association between travel distance to state universities and county-wide access to 4-year institutions in all high school graduation classes. Across graduation classes, a significantly higher percentage of students with high county-wide access to 4-year institutions traveled 75 or more miles to a state university, while a lower percentage of students with low access traveled 75 or more miles. Additionally, a lower percentage of students with high access to 4-year institutions traveled between 0 and 24.99 miles, while a higher percentage of students with low access traveled between 0 and 24.99 miles to a state university. Table 21 shows the differences in percentages between students' county-wide access to 4-year institutions for all high school graduation classes.

TABLE 21: Student Travel Distance to all PA State Universities by County Access to 4-Year PA Institutions: Differences in Percentages by High School Graduation Class

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2014 Graduating Class ($\chi^2(6, N = 15,129) = 353.58, p < .001, V = .11$)				
Low Access (n = 5,526)	26.7% (n = 1,477)	21.7% (n = 1,198)	18.2% (n = 1,003)	33.4% (n = 1,848)
Medium Access (n = 5,361)	20.9% (n = 1,119)	24.6% (n = 1,318)	15.2% (n = 817)	39.3% (n = 2,107)
High Access (n = 4,242)	13.6% (n = 577)	21.1% (n = 897)	23.9% (n = 1,012)	41.4% (n = 1,756)

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2015 Graduating Class				
$(\chi^2(6, N = 14,763) = 373.53, p < .001), V = .11$				
Low Access (n = 5,598)	27.4% (n = 1,532)	21.4% (n = 1,200)	17.4% (n = 976)	33.8% (n = 1,890)
Medium Access (n = 5,047)	22.8% (n = 1,149)	23.4% (n = 1,183)	15.0% (n = 757)	38.8% (n = 1,958)
High Access (n = 4,118)	13.9% (n = 573)	19.4% (n = 798)	24.3% (n = 999)	42.4% (n = 1,748)
2016 Graduating Class				
$(\chi^2(6, N = 14,167) = 297.25, p < .001), V = .10$				
Low Access (n = 5,168)	27.7% (n = 1,432)	20.6% (n = 1,066)	17.4% (n = 897)	34.3% (n = 1,773)
Medium Access (n = 4,987)	22.4% (n = 1,116)	24.8% (n = 1,242)	15.1% (n = 751)	37.7% (n = 1,878)
High Access (n = 4,012)	15.0% (n = 600)	21.2% (n = 850)	23.1% (n = 928)	40.7% (n = 1,634)
2017 Graduating Class				
$(\chi^2(6, N = 14,002) = 212.90, p < .001), V = .09$				
Low Access (n = 5,175)	27.8% (n = 1,438)	21.9% (n = 1,135)	16.4% (n = 848)	33.9% (n = 1,754)
Medium Access (n = 4,822)	22.8% (n = 1,101)	24.1% (n = 1,161)	16.1% (n = 775)	37.0% (n = 1,785)
High Access (n = 4,005)	17.0% (n = 682)	21.3% (n = 852)	23.2% (n = 929)	38.5% (n = 1,542)

Results also showed a significant association between travel distance to state universities and students' access to 4-year BAIs; significant associations were found in all high school graduation classes. Table 22 shows that in most graduation years, although a high percentage of all students traveled 75 or more miles to PA state institutions, a slightly higher percentage of students who had county-wide access to more than three BAIs traveled 75 or more miles to state institutions when compared to students with all other levels of access. Additionally, a lower percentage of students with access to more than three BAIs traveled between 0 and 24.99 miles when compared to students with all other levels of access.

TABLE 22: Student Travel Distance to all PA State Universities by County Access to 4-Year PA BAIs: Differences in Percentages by High School Graduation Class

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2014 Graduating Class				
$(\chi^2(12, N = 15,129) = 1041.29, p < .001), V = .15$				
0 BAIs (n = 3,870)	15.8% (n = 612)	27.2% (n = 1,051)	19.6% (n = 758)	37.4% (n = 1,449)
1 BAI (n = 6,044)	30.0% (n = 1,812)	18.3% (n = 1,107)	16.6% (n = 1,006)	35.1% (n = 2,119)
2 BAIs (n = 1,536)	12.8% (n = 197)	25.4% (n = 389)	17.7% (n = 272)	44.1% (n = 678)
3 BAIs (n = 2,624)	20.1% (n = 527)	26.8% (n = 704)	24.4% (n = 639)	28.7% (n = 754)
More than 3 BAIs (n = 1,055)	2.4% (n = 25)	15.4% (n = 162)	14.8% (n = 157)	67.4% (n = 711)

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2015 Graduating Class				
$(\chi^2(12, N = 15,129) = 685.64, p < .001), V = .12$				
0 BAIs (n = 3,267)	19.1% (n = 628)	28.5% (n = 930)	17.4% (n = 567)	35.0% (n = 1,142)
1 BAI (n = 4,185)	29.6% (n = 1,239)	20.3% (n = 849)	18.7% (n = 784)	31.4% (n = 1,313)
2 BAIs (n = 3,455)	27.4% (n = 945)	15.9% (n = 549)	15.3% (n = 532)	41.4% (n = 1,429)
3 BAIs (n = 464)	**** (n = ****)	**** (n = ****)	**** (n = ****)	54.5% (n = 253)
More than 3 BAIs (n = 3,392)	12.9% (n = 439)	21.9% (n = 743)	22.1% (n = 751)	43.1% (n = 1,459)
2016 Graduating Class				
$(\chi^2(12, N = 14,167) = 439.40, p < .001), V = .10$				
0 BAIs (n = 3,402)	18.1% (n = 613)	27.5% (n = 937)	17.7% (n = 602)	36.7% (n = 1,250)
1 BAI (n = 4,196)	26.5% (n = 1,114)	17.4% (n = 728)	19.2% (n = 806)	36.9% (n = 1,548)
2 BAIs (n = 1,834)	30.9% (n = 567)	20.5% (n = 376)	16.5% (n = 302)	32.1% (n = 589)
3 BAIs (n = 2,249)	23.7% (n = 534)	25.2% (n = 566)	12.3% (n = 277)	38.8% (n = 872)
More than 3 BAIs (n = 2,486)	12.9% (n = 320)	22.1% (n = 551)	23.7% (n = 589)	41.3% (n = 1,026)
2017 Graduating Class				
$(\chi^2(12, N = 14,002) = 1163.37, p < .001), V = .17$				
0 BAIs (n = 2,380)	16.1% (n = 384)	31.1% (n = 740)	15.8% (n = 376)	37.0% (n = 880)
1 BAI (n = 5,455)	25.8% (n = 1,409)	20.1% (n = 1,098)	19.7% (n = 1,072)	34.4% (n = 1,876)
2 BAIs (n = 1,633)	37.0% (n = 605)	14.1% (n = 231)	17.5% (n = 285)	31.4% (n = 512)
3 BAIs (n = 1,739)	37.9% (n = 659)	17.9% (n = 311)	7.1% (n = 123)	37.1% (n = 646)
More than 3 BAIs (n = 2,795)	5.9% (n = 164)	27.4% (n = 768)	24.9% (n = 696)	41.8% (n = 1,167)

*Sample for one or more cells was too low to report (less than 20); therefore, all cell counts for applicable rows were suppressed.

Postsecondary Access and College Travel Distance: Students at a 4-Year Non-State PA University

A third and final phase of analyses showed a significant association in all high school graduation classes between access to 4-year PA universities and travel distance to non-state institutions. Overall, a significantly higher percentage of students with low county-wide postsecondary access traveled 75 or more miles to a non-state institution, while a lower percentage of students with high access traveled 75 or more miles. Also, a significantly higher percentage of students with high county-wide postsecondary access traveled between 0 and 24.99 miles, while a significantly lower percentage of students with low access traveled the same distance. Table 23 shows the differences in percentages between students' county-wide access to 4-year institutions for all high school graduation classes.

TABLE 23: Student Travel Distance to all PA Non-State Universities by County Access to 4-Year PA Institutions: Differences in Percentages by High School Graduation Class

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
2014 Graduating Class				
$(\chi^2(6, N = 21,709) = 2924.48, p < .001), V = .26$				
Low Access (n = 5,640)	20.8% (n = 1,175)	22.8% (n = 1,282)	12.5% (n = 706)	43.9% (n = 2,477)
Medium Access (n = 7,971)	34.2% (n = 2,724)	21.2% (n = 1,688)	12.7% (n = 1,015)	31.9% (n = 2,544)
High Access (n = 8,098)	64.1% (n = 5,190)	10.6% (n = 859)	6.2% (n = 505)	19.1% (n = 1,544)
2015 Graduating Class				
$(\chi^2(6, N = 22,154) = 2958.45, p < .001), V = .26$				
Low Access (n = 5,941)	18.6% (n = 1,104)	23.5% (n = 1,395)	12.8% (n = 765)	45.1% (n = 2,677)
Medium Access (n = 8,208)	34.3% (n = 2,814)	21.2% (n = 1,738)	12.8% (n = 1,053)	31.7% (n = 2,603)
High Access (n = 8,005)	62.2% (n = 4,981)	11.9% (n = 951)	6.3% (n = 504)	19.6% (n = 1,569)
2016 Graduating Class				
$(\chi^2(6, N = 22,030) = 2831.63, p < .001), V = .25$				
Low Access (n = 5,895)	19.4% (n = 1,142)	22.8% (n = 1,351)	13.6% (n = 799)	44.2% (n = 2,603)
Medium Access (n = 8,074)	34.6% (n = 2,794)	21.8% (n = 1,762)	12.7% (n = 1,023)	30.9% (n = 2,495)
High Access (n = 8,061)	62.0% (n = 5,001)	11.0% (n = 884)	7.2% (n = 582)	19.8% (n = 1,594)
2017 Graduating Class				
$(\chi^2(6, N = 23,294) = 3128.40, p < .001), V = .26$				
Low Access (n = 6,014)	19.7% (n = 1,184)	23.6% (n = 1,420)	13.1% (n = 785)	43.6% (n = 2,625)
Medium Access (n = 8,607)	34.3% (n = 2,948)	22.1% (n = 1,899)	12.6% (n = 1,091)	31.0% (n = 2,669)
High Access (n = 8,673)	63.2% (n = 5,486)	11.2% (n = 968)	6.4% (n = 556)	19.2% (n = 1,663)

Lastly, a significant association was found in all graduation classes between travel distance to non-state institutions and students' access to 4-year BAIs. Table 24 shows that a significantly higher percentage of students with no access to BAIs traveled 75 or more miles compared to students with access to more than three BAIs. Additionally, a significantly higher percentage of students with access to more than three BAIs traveled between 0 and 24.99 miles when compared to students with all other levels of access.

TABLE 24: Student Travel Distance to all PA Non-State Universities by County Access to 4-Year PA BAIs: Differences in Percentages by High School Graduation Class

	0-24.99 Miles	25-49.99 Miles	50-74.99 Miles	75+ Miles
2014 Graduating Class ($\chi^2(12, N = 21,709) = 2478.81, p < .001, V = .20$)				
0 BAIs (n = 4,962)	25.7% (n = 1,275)	24.0% (n = 1,190)	13.4% (n = 667)	36.9% (n = 1,830)
1 BAI (n = 7,439)	32.1% (n = 2,385)	22.1% (n = 1,646)	10.2% (n = 757)	35.6% (n = 2,651)
2 BAIs (n = 3,118)	46.7% (n = 1,452)	14.9% (n = 466)	10.7% (n = 335)	27.7% (n = 865)
3 BAIs (n = 4,255)	57.4% (n = 2,441)	10.8% (n = 460)	8.7% (n = 372)	23.1% (n = 982)
More than 3 BAIs (n = 1,935)	79.4% (n = 1,536)	3.5% (n = 67)	4.9% (n = 95)	12.2% (n = 237)
2015 Graduating Class ($\chi^2(12, N = 22,154) = 3315.64, p < .001, V = .22$)				
0 BAIs (n = 3,794)	16.6% (n = 631)	19.8% (n = 752)	17.7% (n = 671)	45.9% (n = 1,740)
1 BAI (n = 5,107)	27.9% (n = 1,427)	22.1% (n = 1,127)	14.2% (n = 723)	35.8% (n = 1,830)
2 BAIs (n = 5,604)	35.8% (n = 2,004)	24.3% (n = 1,361)	11.0% (n = 620)	28.9% (n = 1,619)
3 BAIs (n = 1,112)	53.3% (n = 593)	8.6% (n = 95)	4.2% (n = 47)	33.9% (n = 377)
More than 3 BAIs (n = 6,537)	64.9% (n = 4,244)	11.5% (n = 749)	4.0% (n = 261)	19.6% (n = 1,283)
2016 Graduating Class ($\chi^2(12, N = 23,294) = 3757.70, p < .001, V = .24$)				
0 BAIs (n = 4,370)	18.8% (n = 822)	18.5% (n = 807)	22.2% (n = 969)	40.5% (n = 1,772)
1 BAI (n = 5,644)	28.4% (n = 1,603)	24.3% (n = 1,372)	8.3% (n = 470)	39.0% (n = 2,199)
2 BAIs (n = 3,348)	47.5% (n = 1,590)	18.0% (n = 604)	14.8% (n = 494)	19.7% (n = 660)
3 BAIs (n = 4,026)	41.1% (n = 1,651)	22.3% (n = 899)	5.6% (n = 227)	31.0% (n = 1,249)
More than 3 BAIs (n = 4,642)	70.5% (n = 3,271)	6.7% (n = 315)	5.3% (n = 244)	17.5% (n = 812)
2017 Graduating Class ($\chi^2(12, N = 23,294) = 3518.42, p < .001, V = .22$)				
0 BAIs (n = 3,153)	15.7% (n = 496)	22.1% (n = 698)	17.9% (n = 563)	44.3% (n = 1,396)
1 BAI (n = 8,214)	31.9% (n = 2,617)	23.1% (n = 1,898)	10.7% (n = 877)	34.3% (n = 2,822)
2 BAIs (n = 2,621)	44.8% (n = 1,173)	14.4% (n = 379)	18.0% (n = 471)	22.8% (n = 598)

	0–24.99 Miles	25–49.99 Miles	50–74.99 Miles	75+ Miles
3 BAIs (n = 2,675)	31.7% (n = 851)	22.4% (n = 598)	7.6% (n = 202)	38.3% (n = 1,024)
More than 3 BAIs (n = 6,631)	67.6% (n = 4,481)	10.8% (n = 714)	4.8% (n = 319)	16.8% (n = 1,117)

Discussion

The present study examined county-wide postsecondary access in Pennsylvania through the lens of several variables, including student group membership and college travel distance. Across four research questions, a number of statistically significant findings were identified. Findings related to each research question will be discussed in turn.

■ **Research Question One:** *Are there county-wide differences between PA students' access to in-person and in-state postsecondary education?*

Through use and analysis of the most recently available IPEDS data (school year 2019-2020), all degree-granting postsecondary institutions in Pennsylvania (excluding seminaries and other schools which prepare students for clergy life) were totaled and assigned to their hosting counties. It was found that Pennsylvania is home to 75 degree-granting 2-year institutions and 144 degree-granting 4-year institutions. A vast majority (87%) of 2-year locations were considered broad-access institutions (BAIs), meaning they accepted more than 75% of student applicants. Using the same metric, approximately 58% of Pennsylvania's 4-year institutions were considered broad access.

Results showed meaningful geographical differences between types of postsecondary access in Pennsylvania. In fact, several patterns emerged which showed varying levels of access depending on the type of postsecondary access that was measured. For instance, in terms of access to 2 and 4-year institutions, it was found that counties clustered around Philadelphia County (in the south-east region) and Allegheny County (in the south-west region) were likely to have higher amounts of postsecondary access than all other geographic regions in PA. Additionally, for 2 and 4-year postsecondary options, counties with no or minimal access were typically located in the northern regions of the Commonwealth.

In total, 22 counties (almost 33%) had no access to degree-granting 4-year options, while 37 counties (55%) had no access to a degree-granting 2-year institution (including community colleges). Using 2019-2020 PA Census data approximations, it was calculated that a total of 896,329 (7%) PA residents reside in counties with no access to 4-year postsecondary options, while 2,655,497 residents (21%) do not have county-wide access to a 2-year degree-granting institution (including community colleges). Further, a total of 31 counties (home to 1,833,681 residents) had no access to 4-year BAIs, while 38 counties (home to 2,862,362 residents) had no access to a degree-granting 2-year BAI.

Results showed meaningful geographical differences between types of postsecondary access in Pennsylvania. In fact, several patterns emerged which showed varying levels of access depending on the type of postsecondary access that was measured.

Similar patterns emerged when considering county-wide access to community college main campuses, branch campuses, and instructional sites. Counties with high access to community college campuses were primarily found in the eastern and western areas of the state, while counties with little to no access were typically located in the northern regions. Similar findings showed that northern PA had more counties with no or limited access to community college instructional sites than other regions, especially the western and eastern areas.

Previous research on postsecondary access in PA (Hillman, 2016) found that 28 counties had no access to a community college instructional site. Through use of the most recently available data from the Middle States Commission on Higher Education (MSCHE), the current research found that only 13 counties have no access to a community college instructional site, while 10 counties have access to one. In total, 1,120,173 PA residents (or approximately 8.8% of PA's population) live in this collection of 23 counties and therefore have limited county-wide access to community college opportunities.

Overall, findings indicate that there are meaningful differences in postsecondary access across the various regions of Pennsylvania. Although variations in access exist depending on the type of postsecondary institution, in general, the northern regions of PA have less access to postsecondary options than counties in other regions, especially the south-eastern and western areas. This finding supports the overall conclusion of Hillman (2016) who concluded that “many parts of northern Pennsylvania are already a higher education desert.” However, since Hillman (2016) reached this conclusion, the total number of counties with no access to a community college instructional site has reduced by approximately 46%, indicating meaningful progress towards a more equitable distribution of postsecondary access in Pennsylvania.

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■ **Research Question Two:** *Do PA students tend to enroll in postsecondary institutions near the high school from which they graduated? Is travel distance to PA 4-year institutions associated with student group membership and type of institution attended?*

In addition to investigating how postsecondary access varied by geographical location in PA, the current study also sought to examine how student group variables might be associated with students' travel status and distance to 4-year institutions in PA. To measure associations between travel status and student variables for all PA high school graduates who enrolled in postsecondary education, students were given one of five travel statuses depending on the location of their high school and postsecondary institution: same-county, bordering-county, other-county, bordering-state, or other-state. Finally, student travel distance was defined as the shortest possible travel distance (in miles) between a student's final high school on record and the first PA 4-year institution they chose to attend after graduating high school. From this measurement, frequency distributions were used to create a categorical travel distance variable which grouped students as having traveled between 0 and 24.99 miles, between 25 and 49.99 miles, between 50 and 74.99 miles, or 75 miles or more.

To ensure variations in effects were not lost, the researchers examined the relationship between travel status and student variables for all students who attended a 4-year institution (in-state and out-of-state),

while analyses related to travel distance only included students who attended 4-year universities in PA (state and non-state institutions). Results showed that travel status to 4-year universities varied by the type of institution attended. First, descriptive statistics showed that of all students who enrolled at any 4-year institution (in-state or out-of-state), 16% did so as same-county attendees, 21.6% were bordering-county attendees, and 35.4% were other-county attendees. Further, 12.5% were bordering-state attendees and the remaining 14.5% were other-state attendees. Additionally, for students who attended a 4-year PA university, 48.5% did so as other-county attendees, 21.9% were same-county attendees, and 29.6% were bordering-county attendees. For students who attended a PA state university, 54.9% were other-county attendees, 15.8% were same-county attendees, and 29.3% were bordering-county attendees. Lastly, for students who attended a 4-year non-state PA university, 44.3% were other-county attendees, 25.9% were same-county attendees, and 29.8% were bordering-county attendees. Importantly, for students attending PA institutions, between 45.1% and 55.7% of students attended a 4-year college as same-county or bordering-county attendees, indicating that approximately half of Pennsylvania's 4-year degree-seeking students choose to pursue their degree relatively close to home.

Results from chi-square analyses also revealed that college travel status was significantly associated with students' group membership. Notably, these associations showed subtle differences between the type of institution attended. It was found that among all students who enrolled at PA 4-year institutions and state universities, a higher percentage of Black students were other-county attendees when compared to students of other racial/ethnic groups, but a higher percentage of White students were other-county attendees among students who enrolled at non-state universities. Additionally, a higher percentage of students who experienced economic disadvantage were same-county attendees when enrolled at all PA four-year institutions and non-state universities. Similarly, high percentages of students from towns and rural students were other-county attendees among students who enrolled at non-state institutions and all institutions, but high percentages of students from cities were other-county attendees among students attending a PA state university.

Another notable finding was that higher percentages of English Learners (EL) were same-county attendees when compared to non-EL students. This general tendency for EL students to stay close to home is supported by findings from Kanno (2018) who found that several factors interact to reduce EL students' access to four-year postsecondary options, including limited experience with the college admission process and students' lack of confidence in their English proficiency.

Interestingly, while a higher percentage of students considered historically underperforming were same-county attendees when enrolled at non-state institutions, the effect of the historically underperforming status was not significantly related to travel status for students enrolled at state universities. These findings offer partial support for the results of previous literature (Hughes, Karp, Fermin, & Bailey, 2005; Kanno & Cromley, 2013) which found that students from various underrepresented groups may have lower levels of access to postsecondary education and must travel farther than their peers to pursue college education.

Concerning travel distance to 4-year degree-granting universities, descriptive analyses showed that PA students traveled (on average) 72.53 miles to all PA 4-year universities, 78.19 miles to PA state universities,

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and 68.85 miles to non-state PA institutions. Further, it was found that 50% of 4-year degree seekers traveled 45 miles or less to their 4-year college campus. Chi-square analyses showed several significant effects related to travel distance and student group membership. Similar to travel status, results varied by institution type.

For students at all 4-year PA universities, students who did not experience economic disadvantage traveled to college significantly farther than their counterparts. This same significant association was found among non-EL students and non-historically underperforming students. It was also found that for students at all PA 4-year universities, rural students traveled significantly farther than suburban students and students from cities, while Black students traveled significantly farther than any other student racial/ethnic group.

Interestingly, certain associations found in relation to all PA 4-year universities were reversed for students who attended PA state universities. Specifically, it was found that students who experienced economic disadvantage, students who were EL, and students who were historically underperforming traveled significantly farther than their peers to state universities. Additionally, Black students and students from cities traveled significantly farther to state universities than all other student race/ethnicity and geographical groups, respectively.

Lastly, analyses showed that travel distance to non-state universities was also significantly associated with student group membership. Similar to previous findings, it was found that students who experienced economic disadvantage, EL students, and historically underperforming students traveled significantly closer to home than their counterparts. It was also found that White students traveled significantly farther to non-state institutions than Hispanic, Asian, and Black students. Lastly, students from towns traveled significantly farther to non-state universities than students from cities, rural students, and suburban students.

Overall, findings related to travel distance to 4-year institutions varied by the type of institution (all PA universities, state universities, and non-state universities). While historically underperforming and economically disadvantaged students traveled farther than their peers to state universities, they tended to stay closer to home when attending non-state universities. Black students traveled the farthest to state universities, while White students traveled farthest to non-state PA universities. Lastly, rural students and students from towns traveled farthest when attending non-state universities, but students from cities traveled farthest when attending state universities. These findings support the conclusions of various researchers (Henninger-Voss & Herzenberg, 2017; Hillman, 2019) who found that students who live in more rural areas often have less access to postsecondary options and must travel a considerable distance for postsecondary opportunities. These findings show that student travel distance to 4-year institutions in PA is a complex topic which significantly varies depending on student group membership and the type of institution that students choose to attend.

While EL, historically underperforming, and economically disadvantaged students traveled farther than their peers to state universities, they tended to stay closer to home when attending non-state universities.

■ **Research Question Three:** *What student level factors are associated with students' county-wide postsecondary access? Do 4-year degree-seeking students have equitable county-wide access to postsecondary education?*

Because access data was gathered from IPEDS at the county level, the researchers were able to use the data collection techniques involved in answering research question #1 to further examine students' county-wide access to postsecondary options. For this phase of analyses, county-wide postsecondary access, or the number of 4-year degree-granting postsecondary institutions in a student's county, was measured at four different points in time (school years 2013-2014, 2014-2015, 2015-2016, and 2016-2017) to accurately measure students' postsecondary access when they were seniors in high school.

Results showed that student group membership was significantly associated with postsecondary access in all high school graduation classes. Regarding access to all 4-year universities, chi-square analyses showed that higher percentages of students who experienced economic disadvantage, students who were EL, special education, and historically underperforming had high levels of county-wide postsecondary access when compared to their counterparts. Results also showed that higher percentages of Black and Asian students had high levels of county-wide access to 4-year institutions when compared to other student racial/ethnic groups. Additionally, higher percentages of students from cities had high levels of 4-year postsecondary access, while a higher percentage of rural students and students from towns had low access.

Similar results showed that higher percentages of students who experienced economic disadvantage and students who were EL, students who received special education services, and historically underperforming students had access to more than three broad access 4-year institutions in their county. Additionally, higher percentages of Black and Hispanic students had access to more than three BAIs, while a higher percentage of White students had no county-wide access to BAIs. Lastly, a higher percentage of students from cities had access to more than three BAIs when compared to students in other geographic locations.

The current results related to student group membership and postsecondary access revealed that when access is measured at the county level, students in various underrepresented groups (Black and Hispanic students, historically underperforming students, EL students) had relatively high access to 4-year postsecondary options in PA. These findings are at odds with the conclusions of other researchers (Perna and Jones, 2013; Page & Scott-Clayton, 2013) who found that students from underserved groups are likely to have poor geographical access to postsecondary options.

It should be noted that while students from various underserved groups were found to have relatively high county-wide access to 4-year postsecondary options, previous research at the state (Miller et al., 2019) and federal level (United States Department of Education, 2016) has reported that underserved students, especially Black and Hispanic students, are not as likely to enroll in 4-year postsecondary institutions when compared to White and Asian students. Therefore, despite the current findings which suggest

The current results related to student group membership and postsecondary access revealed that when access is measured at the county level, students in various underrepresented groups (Black and Hispanic students, historically underperforming students, EL students) had relatively high access to 4-year postsecondary options in PA.

that historically underserved students have high levels of county-wide access to 4-year postsecondary institutions, current enrollment statistics find students from these groups often lag behind their peers in terms of college enrollment (NCES, 2021). While the current findings are limited to county-wide access for 4-year degree-seeking students, they indicate that historically underserved students in Pennsylvania generally have high county-wide access to 4-year institutions.

■ **Research Question Four: Are students' travel distances to 4-year PA universities affected by the level of postsecondary access in their county?**

The final phase of analyses examined relationships between a student's level of county-wide access to 4-year universities and 4-year BAIs and their travel distance to 4-year PA universities. Similar to methods used to answer research question #3, postsecondary access was measured separately for each high school graduation class to reflect students' level of access when they were seniors in high school. Chi-square analyses examined the association between county-wide access and travel distance for students who enrolled at all 4-year universities, those who attended state institutions, and those who attended non-state institutions.

Results showed that in all graduation classes and for enrollment at PA 4-year non-state institutions, students with low levels of county-wide access to 4-year institutions traveled significantly farther to college than students with medium and high levels of access. On the other hand, students with high county-wide access to 4-year institutions were more likely to travel 75 or more miles to state institutions when compared to their peers. Additionally, when the relationship between access to BAIs and travel distance was examined, the associations varied by type of institution attended. For students who attended any 4-year university or non-state university in PA, it was found that students with access to more than three BAIs traveled significantly closer to home than students with no county-wide access to BAIs. On the other hand, for students who attended a state university, students with access to more than three BAIs traveled significantly farther than other students. These findings support the overall conclusions of Price, Herzenberg, & Polson (2018) who reported that PA's state universities are an integral part of Pennsylvania's postsecondary ecosystem, providing affordable and accessible college access to PA's students.

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Limitations and Suggestions for Future Research

The present study's methodology was limited in certain ways. First, students' home addresses were not available to the researchers to calculate travel distance to college. Although the researchers used the address of students' final high school as a proxy for their home address, the college travel calculations would have been more accurate if students' home addresses were available for use. Second, a variety of students had to be removed from all analyses related to travel status and distance because the researchers were unable to determine the location of their postsecondary destination. Specifically,

students who enrolled at a PA community college or Penn State University (PSU) were omitted from these analyses because NSC Student Tracker data did not always specify which community college or PSU branch campus (or instructional site) a student attended, leading to an inability to determine how far the student traveled to pursue postsecondary education. Lastly, the researchers measured access at the county level, which allowed for intuitive descriptive observations while answering research question #1. However, other researchers (Hillman, 2019) chose to study postsecondary access through the use of commuting zones, which use cross-county, connected geographic areas to help assess college travel behaviors. Some variation in understanding travel behaviors may have been lost by choosing to measure access at the county level.

There are several opportunities for future researchers who choose to study postsecondary access and college travel behaviors in Pennsylvania. As previously mentioned, future researchers could examine access by commuting zones within PA to determine if and how geographical postsecondary access at this level has changed since Hillman's (2016) report. However, college access alone does not necessarily predict college enrollment or completion. Therefore, future researchers should attempt to uncover a potential link between students' level of postsecondary access and their likelihood of college enrollment and success. Lastly, through use of different data sources, future researchers should study issues of access among a wider variety of college students, including students who chose to attend 2-year universities and community colleges.

Indeed, as postsecondary access in PA continues to grow, more students, regardless of geographical place and circumstance, will have the opportunity to participate in postsecondary education and enjoy its many benefits.

Conclusion

The present study sought to examine postsecondary access across Pennsylvania to determine if any PA students live in what Klasik, Blagg, and Pekor (2018) called "postsecondary access deserts." While results showed that students in 13 PA counties do not have access to a community college instructional site, later phases of analyses revealed that, in some scenarios, students from historically underserved student groups have higher percentages of county-wide access to 4-year postsecondary options when compared to their peers. Results from this study also revealed that many PA students choose to stay close to home while pursuing their 4-year degree, but students' travel behaviors are significantly associated with various student-level factors and chosen institution type. Similarly, results showed that students' travel behaviors were significantly influenced by their levels of county-wide postsecondary access and varied by the type of institution that was attended.

Results from this study highlight the geographical areas where Pennsylvania's postsecondary options are lacking, but also show that PA's underserved students generally have high levels of county-wide access to 4-year college programs. While access alone does not equate to college success, several researchers (Long, 2017; Page & Clayton, 2016) have discussed how increasing college access is of paramount importance. Indeed, as postsecondary access in PA continues to grow, more students, regardless of geographical place and circumstance, will have the opportunity to participate in postsecondary education and enjoy its many benefits.

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Appendix A

Glossary of Terms

1. **Bordering-County Attendee:** One of five levels of the variable “travel status.” Describes students who attended a post-secondary institution in a PA county that bordered the county from which they graduated high school.
2. **Bordering-State Attendee:** One of five levels of the variable “travel status.” Describes students who attended a post-secondary institution in one of the six states that border Pennsylvania: Delaware, Ohio, Maryland, New Jersey, New York, or West Virginia.
3. **Broad Access Institution (BAI):** As defined by Henninger-Voss and Herzenberg (2017), the term BAI describes any post-secondary campus site which accepts more than 75% of applicants.
4. **College Travel Distance:** Measured in miles, describes the total distance (in miles) between the high school from which a student graduated and the first 4-year postsecondary institution listed in the National Student Clearinghouse (NSC) records.
5. **Historically Underperforming Status:** Refers to students who met the Pennsylvania Information Management System (PIMS) criteria for one or more of the following status variables: economically disadvantaged, English Learner (EL), and special education.
6. **Integrated Postsecondary Education Data System (IPEDS):** Created by the National Center for Data Statistics (NCES), describes [a publicly available data source found here](#) that provided the current study with the county-wide postsecondary access data needed to answer research questions one, three, and four.
7. **Middle States Commission of Higher Education (MSCHE) Institution Directory:** Describes [a publicly available data source found here](#), which the current study used to count totals and note locations of community college and 4-year associated instructional sites.
8. **Other-County Attendee:** One of five levels of the variable “travel status.” Describes students who attended a post-secondary institution that was in a different, non-bordering county to the county in which they graduated high school.
9. **Other-State Attendee:** One of five levels of the variable “travel status.” Describes students who attended a post-secondary in a state that does not border Pennsylvania.
10. **Pennsylvania Information Management System (PIMS):** Describes a collection of PA’s longitudinal educational data templates. Templates used in the present study include PIMS Student and PIMS Graduation Cohort.
11. **Postsecondary Access:** Refers to the number of degree-granting postsecondary campuses (of various types) in PA counties.
12. **Same-County Attendee:** One of five levels of the variable “travel status.” Describes students who attended a post-secondary institution located in the same PA county as the high school from which they graduated.

Appendix B

All High School Graduation Classes Combined: Students at PA State Universities and 4-Year Non-State Universities Included in Travel Distance Analyses

	% (n)
Overall	
Total	147,253
Gender	
Male	43.0% (63,328)
Female	57.0% (83,925)
Ethnicity	
American Indian/Alaskan Native	0.1% (156)
Asian	4.7% (6,876)
Black	10.7% (15,760)
Hispanic	4.4% (6,427)
Multi-Racial	1.3% (1,980)
Native Hawaiian/Pacific Islander	0.1% (106)
White	78.7% (115,948)
Historically Underperforming	
Yes	28.8% (42,352)
No	71.2% (104,901)
EL Status	
Yes	0.4% (626)
No	99.6% (146,627)
Special Education Status	
Yes	4.3% (6,325)
No	95.7% (140,928)
Economically Disadvantaged	
Yes	25.9% (38,145)
No	74.1% (109,108)
Geographic Location	
City	13.5% (19,935)
Rural	18.2% (26,762)
Suburban	47.2% (69,563)
Town	11.4% (16,818)
Institution Type	
PA State Universities	39.4% (58,061)
Non-State Universities	60.6% (89,192)
Travel Status	
Same-County	21.9% (32,238)
Bordering-County	29.6% (43,605)
Other-County	48.5% (71,410)

Appendix C

Descriptive Breakdown of All High School Graduation Classes Combined: Students who Enrolled at a PA 4-Year Institution, PA Community College, or Out-of-State Institution

		% (n)
Overall		
	Total	320,158
Gender		
	Male	45.8% (146,648)
	Female	54.2% (173,510)
Ethnicity		
	American Indian/Alaskan Native	0.1% (367)
	Asian	4.6% (14,808)
	Black	11.6% (37,248)
	Hispanic	6.2% (19,828)
	Multi-Racial	1.5% (4,533)
	Native Hawaiian/Pacific Islander	0.1% (243)
	White	75.9% (243,131)
Historically Underperforming		
	Yes	32.4% (103,786)
	No	67.6% (216,372)
EL Status		
	Yes	1.2% (3,944)
	No	98.8% (316,214)
Special Education Status		
	Yes	7.0% (22,291)
	No	93.0% (297,867)
Economically Disadvantaged		
	Yes	28.2% (90,203)
	No	71.8% (229,955)
Geographic Location		
	City	14.0% (44,796)
	Rural	16.4% (52,418)
	Suburban	49.0% (156,740)
	Town	9.9% (31,790)

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- POL PK-20 Policy
- ECE Early Childhood Education
- K12 K-12 Education
- PSE Postsecondary Education
- WRK Workforce
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