Geography of Opportunity

Mapping the Availability of Broad-Access Institutions

THE INSTITUTE FOR COLLEGE ACCESS & SUCCESS

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This data brief explores the communities where public broad-access institutions (BAIs) in the United States are located.

BAIs play an important role in expanding educational opportunities and promoting upward mobility; however, not all communities have equal access to BAIs[1]. This inequality affects *where* students go to college—it even affects *how* they get there, how much they pay, and *whether* they complete their degrees. This brief considers how geography is linked to major policy issues including tuition and affordability, transportation and technology, college access and choice, along with college completion and workforce development.

Using a "geography of opportunity" lens, this brief presents three new perspectives on BAIs and the communities where they are located. First, it differentiates small-population areas from large-population areas to show how both rural and urban areas face geographic inequalities. Second, it shows how many communities are located on state borders and discusses the implications these cross-border places have on BAIs. And third, it identifies places with only one BAI to showcase the role these anchor institutions play in expanding opportunities in their regions.[2]

This brief considers how geography is linked to major policy issues including tuition and affordability, transportation and technology, college access and choice, along with college completion and workforce development.

Together, these maps and data tables can help researchers and policymakers frame educational opportunity through the lens of geography. This brief builds on TICAS' 2023 "Geography of Opportunity" series, which found the vast majority of undergraduates stay relatively close to home when attending college.[3] In many parts of the country, a single BAI is the only accessible public option nearby. And in other places, there are multiple or even no BAIs nearby. As a result, college choices are greatly shaped by the local options nearby and this brief helps show how geography shapes opportunity.

Data and Measures

All data in this brief are from federal governmental sources. Education data are from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS).[4] Degree-granting institutions located in the United States and participating in federal Title IV financial aid programs in are included in this analysis (n=3,807). Public institutions reporting admission rates of 80 percent or higher in are considered BAIs, consistent with prior research on these institutions.[5] All IPEDS data including enrollments are from the 2021 survey year. Additionally, IPEDS includes a Federal Information Process Series (FIPS) codes for the country where each institution is located, so this is used to link each institution to a corresponding geographic location.

To measure the local area for each college, I used data from Pennsylvania State University's Labor-sheds for Regional Analysis tool.[6] This resource organizes all U.S. counties into commuting zones that share a common economy and labor market. Commuting zones are similar to metropolitan or micropolitan statistical areas because they are clusters of adjacent (and non-overlapping) counties. However, commuting zones offer a significant advantage over metro/micropolitan areas because they include rural counties and cover the entire country rather than its largest population centers.

Table 1 summarizes this information by disaggregating all 623 commuting zones into quantiles based on population sizes.[7] Commuting zones with the smallest population are included in the first (smallest population) quantile. There are 125 commuting zones in this first quantile and they have a total population of 962,756. The average population size in these commuting zones is 7,702 and, perhaps not surprisingly, these smallest-population areas also have the lowest number of BAIs (n=32). The second quantile of commuting zones are approximately four times larger than the first, with a total population over 3.5 million, an average population of 28,506, and a total of 95 BAIs. The third quantile is double the size of the second, where 179 BAIs are located in areas with nearly 8.9 million people with the average commuting zone population of 71,399. These first three quantiles are considered small-population areas for the remainder of this brief. The fourth and fifth quantiles are considered large-population areas. By disaggregating small-population from large-population commuting zones, we are able to see more clearly where BAIs are located relative to their populations and how some similar-sized places have considerably different higher education options nearby.

TABLE 1

Summary of Commuting Zone Population and Number of Public BAIs

	Number of commuting zones	Average commuting zone population	Total commuting zone population	Total public BAIs
SMALLEST POPULATION	125	7,702	962,756	32
SECOND QUANTILE	125	28,506	3,563,281	95
THIRD QUANTILE	124	71,399	8,853,506	179
FOURTH QUANTILE	125	164,570	20,571,259	271
LARGEST POPULATION	124	1,116,368	138,429,600	699
TOTAL	**623**	**276,694**	**172,380,402**	**1,276**

The majority of the U.S. population lives in the fourth and fifth (i.e., largest) quantile, as shown in Table 1. These two quantiles together account for nearly 160 million people and are home to 970 BAIs. The average commuting zone in these large-population commuting zones is 164,570 for the fourth quantile and over 1.1 million for the largest quantile.

From this table, we can calculate the average commuting zone population size per BAI; this number varies across the nation, but on average there is one BAI per 135,000 people.[8] This of course varies by population size and geography, but this fact can provide helpful context for understanding the relationship between BAI locations relative to population size. The following maps and tables describe these commuting zones in more detail, first focusing on small-population commuting zones (those in the first three quantiles in Table 1) and then large-population commuting zones (fourth and fifth quantiles).

Small-Population Commuting Zones

Table 2 shows more details about the smallest-population commuting zones (n=374). These commuting zones account for the majority of land mass in the country, though they account for approximately 8 percent of the population. Approximately 13.4 million people live in these places, which span across 42 states and have an average population size of 35,774.

TABLE 2

Summary of Small-Population Commuting Zones and Number of Public BAIs

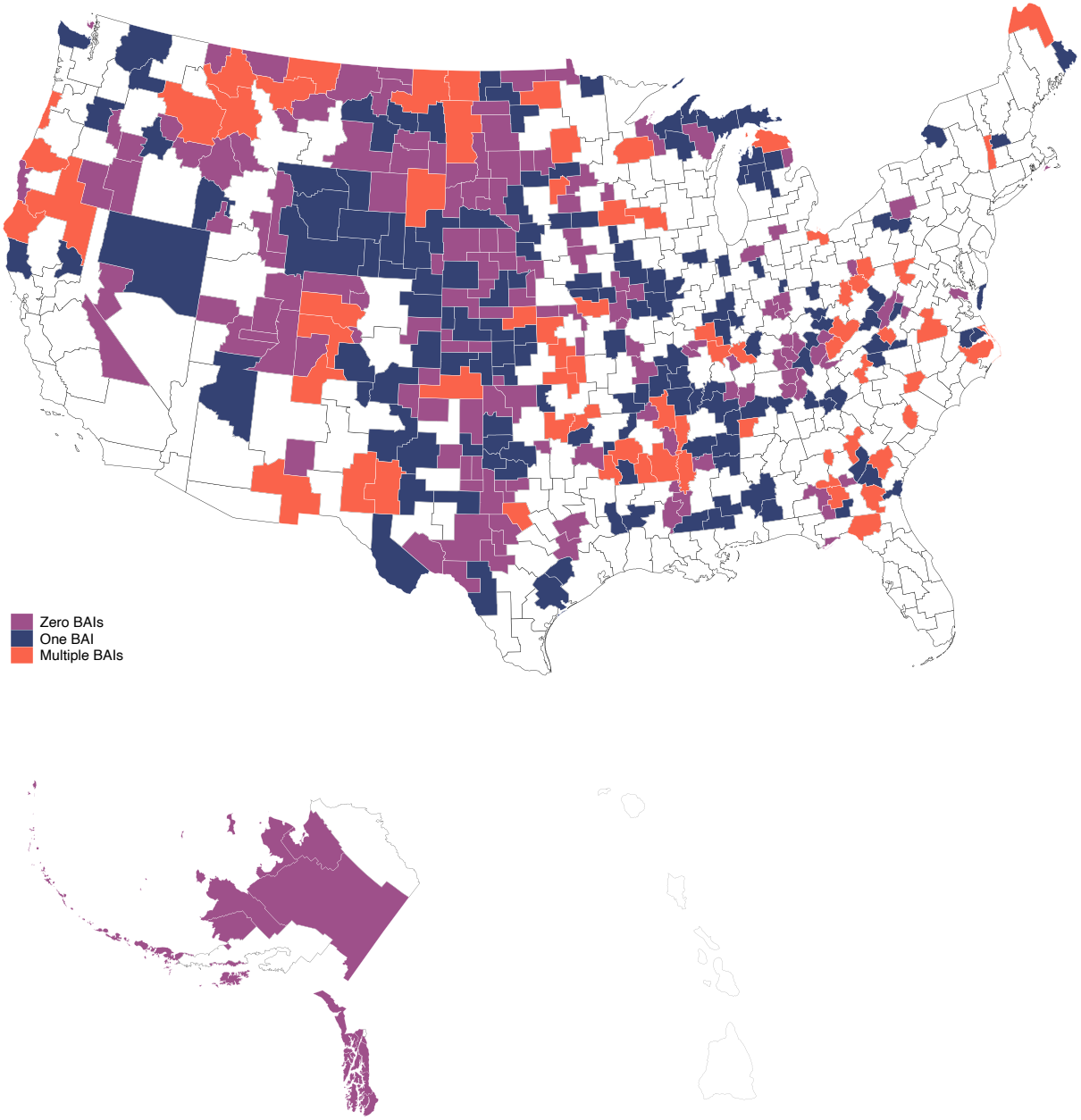
	Zero public BAIs	One public BAI	Multiple public BAIs	Total
NUMBER OF COMMUTING ZONES	157	148	69	374
NUMBER OF STATES	36	38	30	42
AVERAGE COMMUTING ZONE POPULATION	18,132	39,825	67,228	35,774
COMMUTING ZONE POPULATION BY RACE/ETHNICITY				
WHITE	2,067,864	4,215,661	3,306,107	9,589,632
BLACK	214,753	612,574	530,087	1,357,414
AMER. INDIAN/ ALASKA NATIVE	108,803	149,776	187,353	445,932
ASIAN AMERICAN	53,809	95,680	87,015	236,504
NATIVE HAWAIIAN/ PAC. ISLANDER	3,770	6,217	5,030	15,017
HISPANIC	337,803	693,632	406,274	1,437,709
MULTIRACIAL	59,922	120,520	116,893	297,335
TOTAL POPULATION	**2,846,724**	**5,894,060**	**4,638,759**	**13,379,543**

Table 2 also shows 2.8 million people live in small-population commuting zones with zero BAIs, and another 5.9 million live in places with only one BAI. The majority of people living in small-population commuting zones have limited access to BAIs and, when they do, these institutions likely play significant roles in their local communities. As shown in Appendix A, BAIs located in small-population commuting zones (n=306 institutions) tend to also have relatively small enrollments with average of 2,195 undergraduates. In fact, nearly 70 percent of all students attending colleges in small-population commuting zones are enrolled in BAIs. As a result, BAIs play an outsized role in creating opportunities and meeting local educational needs especially in small-population commuting zones.

Figure 1 shows a map of these small-population commuting zones, where purple commuting zones are those with no BAIs (n=157), blue are those with one BAI (n=148), and orange are those with multiple BAIs (n=69). This map and the previous table help contextualize how geography and demographics interact to shape educational opportunities. For example, most people living in small-population commuting zones have no or only one BAI, meaning their college choices are likely constrained. But not all small-population commuting zones are the same; there are small-population commuting zones with multiple local BAIs in 30 different states.

FIGURE 1

Small-Population Commuting Zones With Zero, One, or Multiple Public BAIs



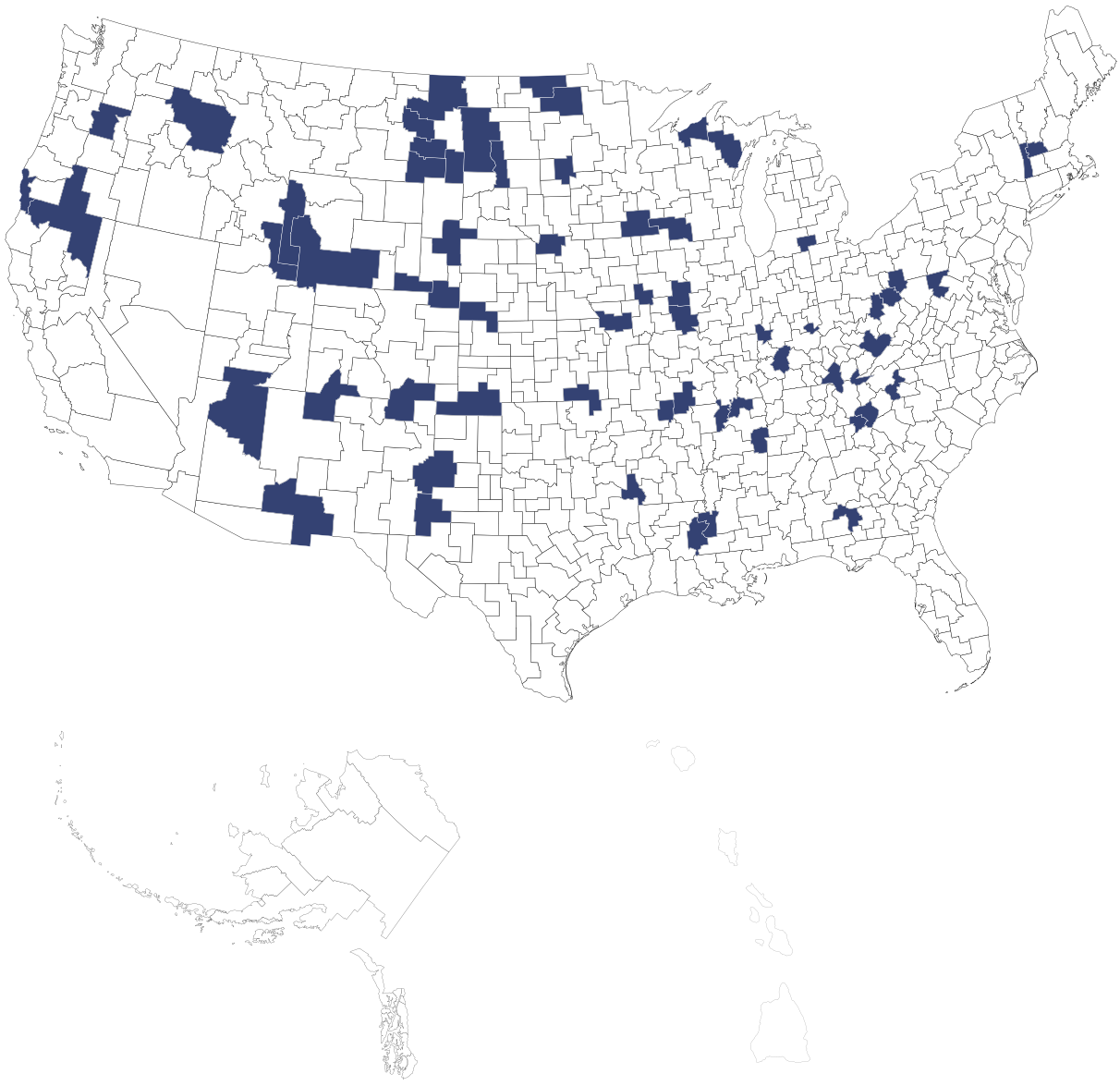
By disaggregating commuting zones by population size and the number of BAIs, we can start to see how higher education markets differ considerably across the nation—even within relatively small-population areas. Despite being similar sizes, some commuting zones have no BAIs, some have only one, and some have multiple. People living in these areas will have different opportunity structures, where opportunities might be richly available to some and nonexistent to others. Researchers are

continuing to understand the causes and consequences of these geographic patterns and the maps presented here aim to help move these—and public policy—conversations forward by considering the implications of these differences, as is done at the end of this brief.[9]

A final consideration when using a geographic lens to understand higher education access and opportunity is by identifying commuting zones that cross state lines. Figure 2 shows which small-population commuting zones are located on state borders. All colleges, and BAIs in particular, operating in these cross-border communities likely draw (or aspire to draw) students from across state lines. There are 63 commuting zones crossing 22 state borders. The average cross-border commuting zone in small-population areas has a population of approximately 45,000. In these cross-border places, there are 77 BAIs enrolling nearly 190,000 students.

FIGURE 2

Small-Population Commuting Zones Crossing State Borders



Large-Population Commuting Zones

Table 3 shows more details about the largest-population commuting zones (n=249). With 159 million people living in these places, these large-population commuting zones account for the majority (92 percent) of the U.S. population. These commuting zones span across 48 states and have an average population size of 638,558.

TABLE 3

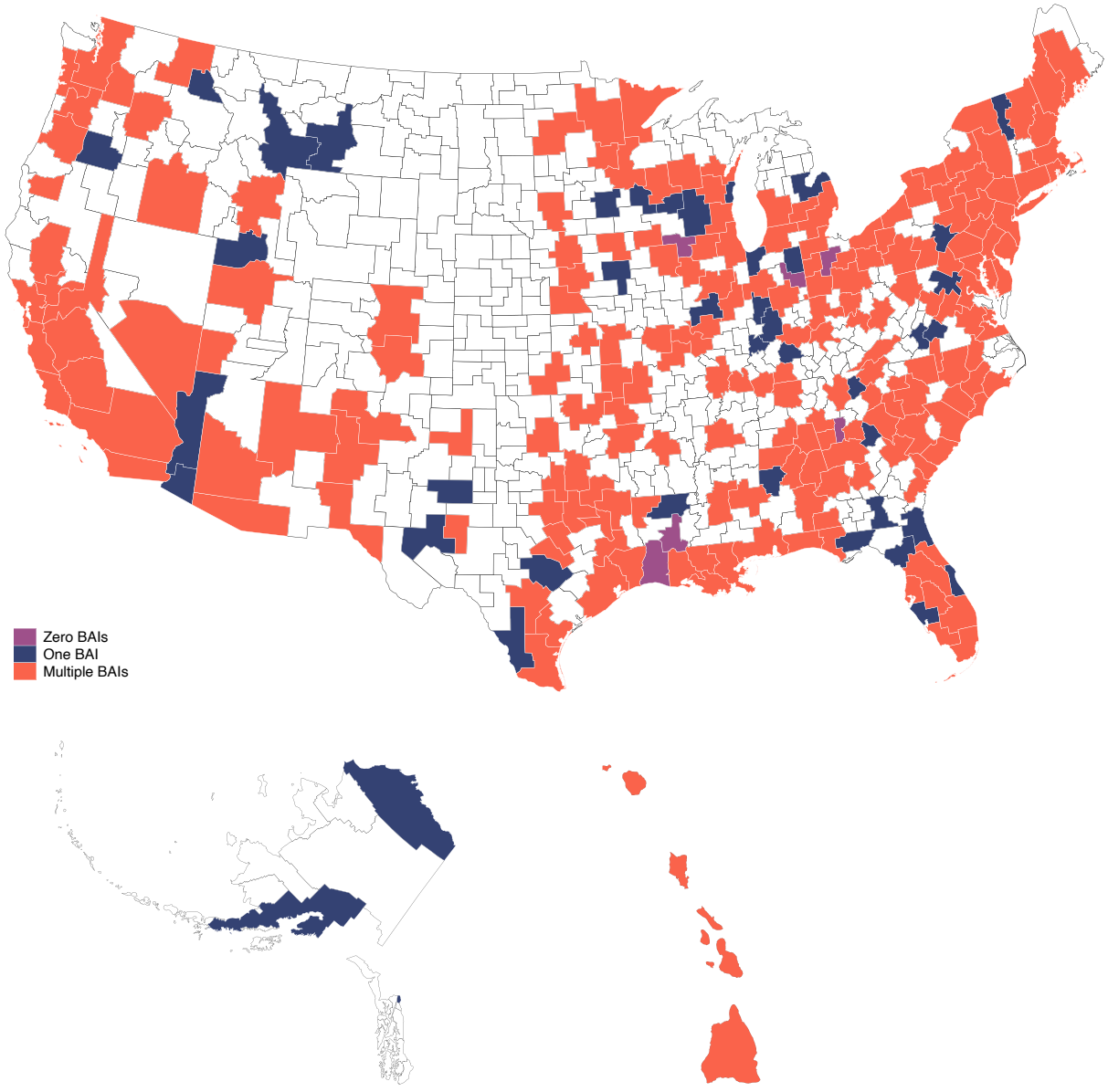
Summary of Large-Population Commuting Zones and Number of Public BAIs

	Zero public BAIs	One public BAI	Multiple public BAIs	Total
NUMBER OF COMMUTING ZONES	6	41	202	249
NUMBER OF STATES	5	23	46	48
AVERAGE COMMUTING ZONE POPULATION	138,539	237,104	734,893	638,558
COMMUTING ZONE POPULATION BY RACE/ETHNICITY				
WHITE	638,780	6,190,990	76,444,521	83,274,291
BLACK	104,212	1,108,057	21,723,219	22,935,488
AMER. INDIAN/ ALASKA NATIVE	7,740	122,158	1,702,267	1,832,165
ASIAN AMERICAN	15,493	493,563	12,151,978	12,661,034
NATIVE HAWAIIAN/ PAC. ISLANDER	1,025	12,715	324,713	338,453
HISPANIC	48,147	1,555,510	31,767,541	33,371,198
MULTIRACIAL	15,838	238,278	4,334,114	4,588,230
TOTAL POPULATION	**831,235**	**9,721,271**	**148,448,353**	**159,000,859**

Table 3 also shows 831,235 people live in large-population commuting zones that have zero BAIs; another 9.7 million live in large-population commuting zones with only one BAI. This means even in the nation's largest-population commuting zones, approximately one in 16 people have zero or only one BAI nearby. Appendix B shows more details about the colleges located in these places. For example, the average BAI located in these large-population places enrolls 6,514 students and, when counting the total number of students attending college in large-population commuting zones, BAIs account for about 60 percent of total enrollments.

FIGURE 3

Large-Population Commuting Zones With Zero, One, or Multiple Public BAIs

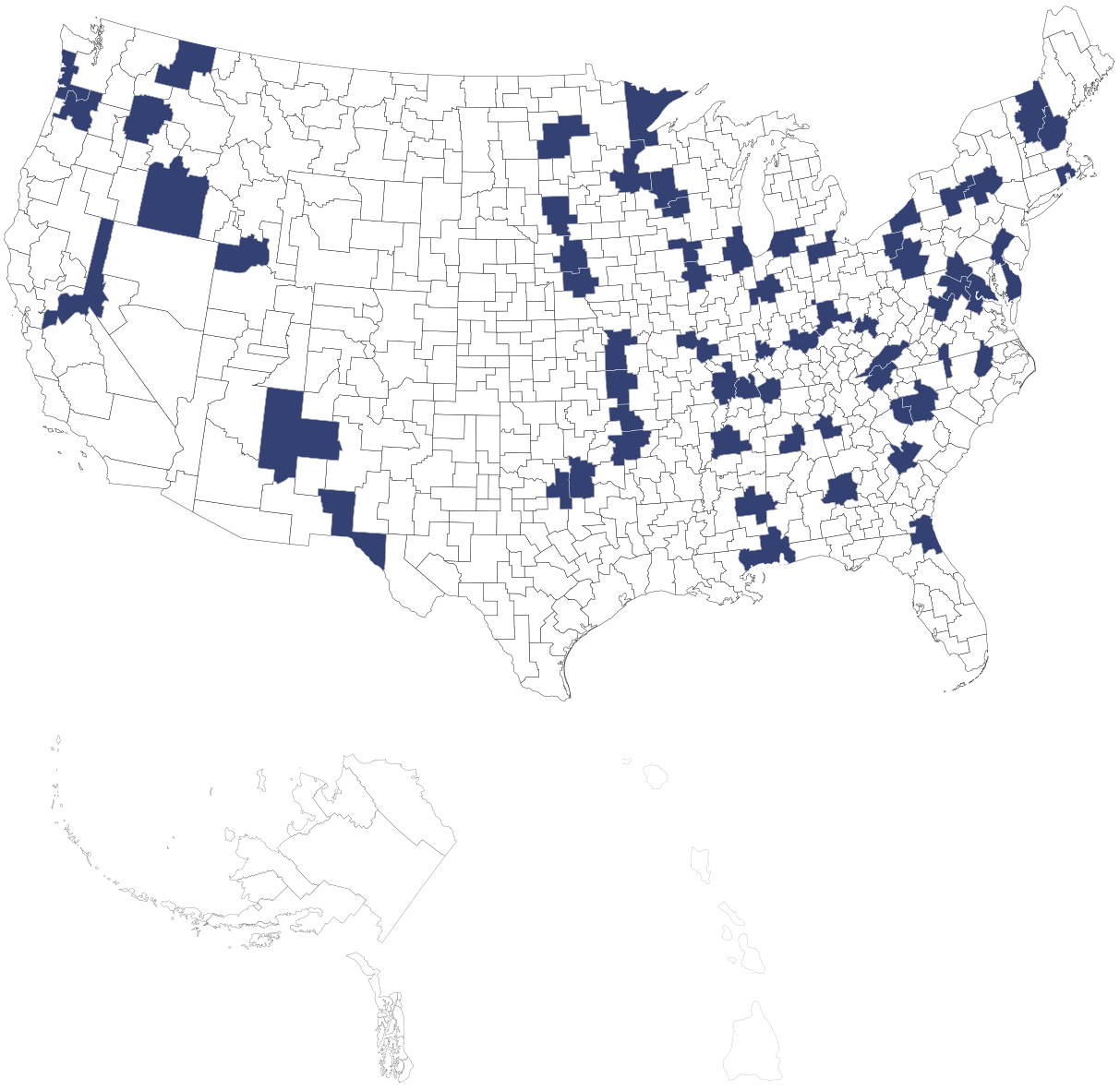


The map above (Figure 3) shows large-population commuting zones with the zero, one, or multiple BAIs. Large-population commuting zones with multiple BAIs (n=202) span across 46 states; the average population size in these commuting zones is approximately 735,000, considerably larger than the places with zero or only one BAI.

Figure 4 shows large-population commuting zones (n=65) that cut across state borders. These commuting zones span across 30 state lines and a total of 249 BAIs are located in these places. Approximately 1.3 million students are enrolled in BAIs located in large-population commuting zones crossing state lines.

FIGURE 4

Large-Population Commuting Zones Crossing State Borders



Viewing Policy and Research Through the Lens of Geography

Commuting zones are a promising unit of geography to help researchers and policymakers view higher education in new ways. This data brief shows local areas can differ from one another, even when they are located in the same state. It also shows some places cross state lines and even places with large populations sometimes have few (or no) BAIs. And just the opposite, there are many small-population places where having a BAI nearby serves as an anchor institution providing opportunities for education and employment for local economies.

Researchers and policymakers are exploring these issues and building new ideas around the geography of opportunity, where there is growing consensus that opportunities are unequal depending on where one lives and policy solutions likely differ depending on geography.[10] What follows are additional considerations for research and policy to center geography into more discussions around educational opportunity.

COLLEGE ACCESS AND CHOICE

Many research and policy conversations are built on a framework that assumes students shop around far and wide for college.[11] As shown in TICAS' Geography of Opportunity series from 2023, most students stay close to home and for good reason.[12] And as a result, the location of a college greatly shapes whether and where students attend. When students search for a college, most choosing from a highly localized marketplace—typically within just 20 miles from home. This varies greatly by students' socioeconomic status, where higher-income students and those attending more selective institutions tend to travel furthest.[13] But for most students, choices are determined by what colleges are nearby and those local opportunities vary considerably across the country. Policy solutions focused on getting better information to help students shop for better "matched" institutions is a common strategy for expanding access and choice.[14] While these efforts are politically popular and can be done on the cheap, information alone is "not enough to influence the choices of students."[15] This is because geography—and where a college is located—is the dominant force shaping access and choice for the majority of today's college students. Researchers have been moving in the direction of understanding how proximity, distance, community ties, travel time, and a host of other geography-based factors shape college choices.[16] Policy strategies framed around geography will center the importance of place and how local contexts shape opportunities.

While these efforts are politically popular and can be done on the cheap, information alone is "not enough to influence the choices of students."

TUITION AND AFFORDABILITY

A major under-explored area of policy research is around the role of tuition reciprocity agreements, where students are charged in-state tuition even if they reside in a different state. This brief found dozens of commuting zones that cross state lines and researchers should explore how many of these places have tuition reciprocity agreements for public BAIs.[17] If a college does not have a reciprocity agreement, this could be preventing the institution from recruiting students who already live in the same commuting zone but would be charged out-of-state tuition. These agreements can also help reduce college expenses for students who live on the other side of a state border from where the nearest BAI is located. These borders can also provide researchers with useful discontinuities to study the effects of various policy interventions (e.g., financial aid programs, free college initiatives, etc.) available for residents of cross-state commuting zones.

TRANSPORTATION AND TECHNOLOGY NEEDS

Transportation is one of the major issues facing small-population commuting zones where a college might be far away. If transportation infrastructure is lacking or costs are prohibitive, then these might turn prospective students away from college. Even in large-population commuting zones, questions about whether public transit, parking, and other basic transportation needs weigh heavy on students' minds and can shape opportunities.[18] Data presented in this brief can help identify places with large populations but few BAIs. With this information, researchers, urban planners, and higher education leaders can assess how transportation infrastructure and costs are working to support college access. For example, 57 percent of the nation's community colleges have bus stops within walking distance to campus.[19] Extending bus routes could greatly expand college access while also reducing costs—time, money, and inconvenience—preventing students from attending and succeeding in college. Similarly, educational technology and internet service in particular are major issues in rural places where many BAIs are located. Ensuring broadband access, stable internet connectivity, and affordable technology options are particularly important in remote places but also urban centers with high population density.[20] This technological infrastructure is necessary for meeting students' basic educational needs including accessing course materials, registering for classes, applying for financial aid, and communicating with instructors. These needs exist regardless of whether courses are delivered online or face-to-face. Online instruction is no panacea for improving educational access in remote places; in fact, it can worsen educational outcomes.[21] Even the most well-designed online programs have been found to have poorer outcomes or higher costs than face-to-face instruction.[22] Regardless of whether courses are online or face-to-face, a college's technological infrastructure will

This technological infrastructure is necessary for meeting students' basic educational needs including accessing course materials, registering for classes, applying for financial aid, and communicating with instructors.

affect students' daily routines and can shape their educational decisions and outcomes. Building and maintaining capacity for transportation and technology in geographic regions, especially those with few BAIs, can have significant impacts on college students' experiences as well as college access and success.

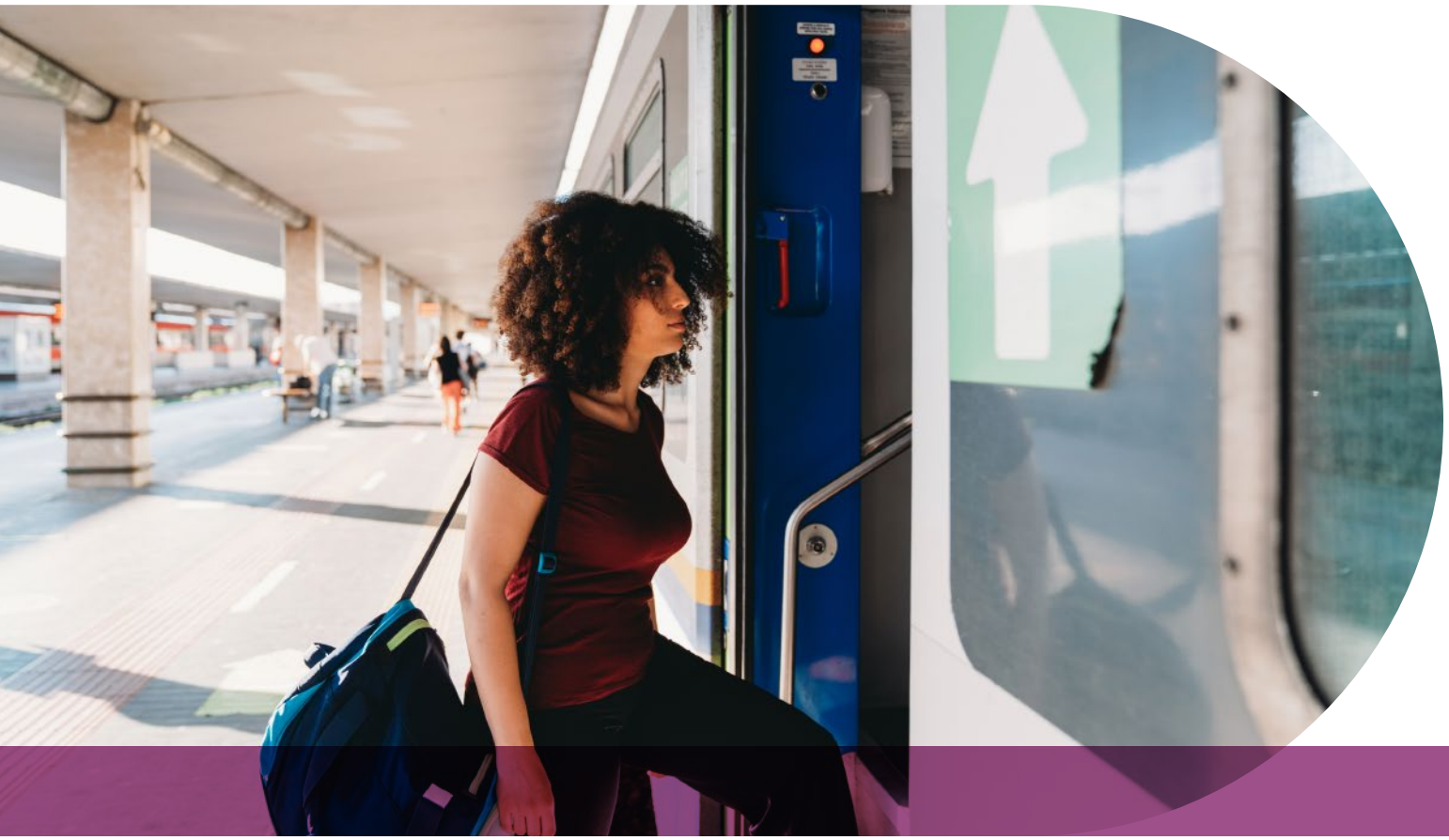
COLLEGE COMPLETION

The financial resources available at a college have considerable impacts on whether students complete their credential.[23] When institutions have capacity to meet students' financial needs and when they have adequate staffing for instruction and students support services, graduation rates tend to improve. Ensuring BAIs have enough resources to support students through college is a critical step for promoting college completion. In addition to the financial resources of BAIs, researchers could learn much more about students' trajectories into and through college. There is relatively little research on where students go after completing college, yet questions about the return on investment, so-called "brain drain," and the public benefits of education are only receiving more attention from policymakers. States could conduct analyses linking K–12 data systems with higher education and workforce data to see the geographic pathways to and through college. Documenting and monitoring these pathways could help state policymakers identify—and ultimately fill—gaps between local labor market supply and demand. Similarly, such analysis can help colleges understand their own market share both in terms of where institutions draw students from, where students go after leaving, and whether institutions have sufficient funding to meet these needs.

Ensuring BAIs have enough resources to support students through college is a critical step for promoting college completion.

Conclusion

This brief provided an overview of where public BAIs are located relative to their local populations. It shows how college opportunities can vary greatly depending on where people live. Some places have no BAI located nearby—many of these places have small populations, but a non-trivial amount also have relatively large populations. At the same time, some places have only one BAI while others have several. The range is wide and each local context will require different policy solutions for addressing any inequalities that may exist. This brief outlined some of the potential policy and research areas that hold promise, and it offered a promising framework—geography of opportunity—to help researchers and policymakers imagine new ways of thinking about college access, affordability, basic needs, and student success. The tables and maps in this are designed to help spark conversations that get at many of the root causes behind educational inequality. Many of these inequalities are rooted in unequal opportunity structures and this brief helps explore those structures in more detail. Further research is needed, especially case studies of local places, to gain even deeper insight about the causes and consequences of geographic inequality in higher education.



APPENDIX A

Characteristics of Public BAIs Located in Small-Population Commuting Zones

	Zero BAIs	One BAI	Multiple BAIs	Total
NUMBER OF COMMUTING ZONES	157	148	69	374
NUMBER OF BAIS	n/a	148	158	306
AVERAGE ENROLLMENT SIZE	n/a	2,140	2,247	2,195
TOTAL ENROLLMENT	n/a	316,787	354,951	671,738
TOTAL ENROLLMENT BY RACE/ETHNICITY				
WHITE	n/a	223,574	240,535	464,109
BLACK	n/a	31,326	44,869	76,195
AMER. INDIAN/ ALASKA NATIVE	n/a	5,393	9,676	15,069
ASIAN AMERICAN	n/a	4,243	6,525	10,768
NATIVE HAWAIIAN/ PAC. ISLANDER	n/a	538	672	1,210
HISPANIC	n/a	41,190	36,350	77,540
MULTIRACIAL	n/a	10,523	16,324	26,847

This table shows the number of small-population commuting zones with zero, one, or multiple public BAIs. It also shows the total number of BAIs and how many students attend BAIs, disaggregated by race/ethnicity. For example, column 1 shows there are 157 small-population commuting zones with zero BAIs and therefore no BAI enrollment information is available for these places. Column 2 shows there are 148 small-population commuting zones with only one public BAI and, in these places, there are a total of 316,787 students attending BAIs. Column 3 shows the 69 small-population commuting zones with multiple BAIs. These 69 commuting zones have a total of 158 BAIs and they enroll 354,951 students.

APPENDIX B

Characteristics of Public BAIs Located in Large-Population Commuting Zones

	Zero BAIs	One BAI	Multiple BAIs	Total
NUMBER OF COMMUTING ZONES	6	41	202	249
TOTAL INSTITUTIONS	n/a	41	929	970
AVERAGE ENROLLMENT SIZE	n/a	7,898	6,453	6,514
TOTAL ENROLLMENT	n/a	323,826	5,994,495	6,318,321
TOTAL ENROLLMENT BY RACE/ETHNICITY				
WHITE	n/a	202,771	2,768,145	2,970,916
BLACK	n/a	32,281	814,255	846,536
AMER. INDIAN/ ALASKA NATIVE	n/a	1,537	38,572	40,109
ASIAN AMERICAN	n/a	14,144	416,027	430,171
NATIVE HAWAIIAN/ PAC. ISLANDER	n/a	536	17,113	17,649
HISPANIC	n/a	59,543	1,669,834	1,729,377
MULTIRACIAL	n/a	13,014	270,549	283,563

This table shows the number of large-population commuting zones with zero, one, or multiple public BAIs. It also shows the total number of BAIs and how many students attend BAIs, disaggregated by race/ethnicity. For example, column 1 shows there are six large-population commuting zones with zero BAIs and therefore no BAI enrollment information is available for these places. Column 2 shows there are 41 large-population commuting zones with only one public BAI and, in these places, there are a total of 323,826 students attending BAIs. Column 3 shows the 202 large-population commuting zones with multiple BAIs. These 202 commuting zones have a total of 929 BAIs and they enroll 5.99 million students.

Endnotes

1 McClure, K; Orphan, C.; & Crisp, G. (2022). Unlocking Opportunity: Toward a Counter-Narrative of Broadly Accessible Institutions. In (G. Crisp, K. McClure, & C. Orphan, Eds.) Unlocking Opportunity Through Broadly Accessible Institutions, Routledge Press. See also Chetty, R.; Friedman, J.; Saez, E.; Turner, N.; & Yagan, D. (2017). Mobility Report Cards: The Role of Colleges in Intergenerational Mobility. National Bureau of Economic Research, working paper 23618 http://www.nber.org/papers/w23618

2 Harris, M. & Holley, K. (2016). Universities as Anchor Institutions: Economic and Social Potential for Urban Development. In (L. Perna, Ed.) Higher Education: Handbook of Theory and Research, Vol. 31, pp. 393-439. Supplee, L. & Orphan, C. (2023). The "People's Universities" Over Time: Tracing the Histories and Evolutions of Regional Comprehensive Universities as Anchor Institutions Between 1970 and 2000. The Review of Higher Education, 46(4), 517–546. https://doi.org/10.1353/rhe.2023.a900571

3 See TICAS Geography of Opportunity series here: https://ticas.org/college-value/geography-of-opportunity/

4 U.S. Department of Education, NCES IPEDS download page, all IPEDS data are from the 2021 collection: https://nces.ed.gov/ipeds/datacenter/DataFiles.aspx?gotoReportId=7&fromIpeds=true&sid=5727de31-3c95-4cd2-a549-85676a21dc29&rtid=7

5 Crisp, G.; Horn, C.; Kuczynski, M.; Zhou, Q.; & Cook, E. (2019). Describing and Differentiating Four-Year Broad Access Institutions: An Empirical Typology. The Review of Higher Education, 42(4). https://doi.org/10.1353/rhe.2019.0069

6 Fowler, C. & Jensen, L. (2020). Bridging the Gap Between Geography Concept and the Data We Have: The Case of Labor Markets in the USA. Environment and Planning A: Economy and Space, 52(7), 1395–1414. https://doi.org/10.1177/0308518X20906154 and Labor-Sheds for Regional Analysis https://sites.psu.edu/psucz/ 2010 shape files.

7 Population data are restricted to 15- to 55-year-olds to focus on people near college age or in the labor force.

8 Take the total population (172,380,402) divided by the number of BAIs (1,276) to get 135,094 people per BAI.

9 See for example Tate, W. (2008). "Geography of Opportunity": Poverty, Place, and Educational Outcomes. Educational Researcher, 37(3), 397–411. http://dx.doi.org/10.3102/0013189X08326409; Turley, R. (2009). College Proximity: Mapping Access to Opportunity. Sociology of Education, 82(2), 126–146. http://dx.doi.org/10.1177/003804070908200202; Dache-Gerbino; A. (2018). College Desert and Oasis: A Critical Geographic Analysis of Local College Access. Journal of Diversity in Higher Educa-

tion, 11(2), 97–116 https://psycnet.apa.org/doi/10.1037/dhe0000050; Puente, M. (2023). Reframing Education Deserts as Places of Desire: A Case Study of Rural Latinx Students' College Opportunities. In (T. Hallmark, S. Ardoin, & D. Means, Eds.) Race and Rurality: Considerations for Advancing Higher Education Equity.

10 Ibid. See also Toutkoushian, R.; Mayfield, S.; & Jelks, S. (2024). Destiny Unbound: A Look at How Far From Home Students Go To College. Research in Higher Education. https://doi.org/10.1007/s11162-024-09790-x

11 See for example Hoxby, C. (2004). College Choices: The Economics of Where to Go, When to Go, and How to Pay for It. National Bureau of Economic Research. Hoxby, C. & Turner, S. (2015). What High-Achieving Low-Income Students Know About College. American Economic Review, 105(5), 514–517. https://doi.org/10.1257/aer.p20151027

12 See Geography of Opportunity series here: https://ticas.org/college-value/geography-of-opportunity/

13 Ibid.

14 For example, Dillon, E. & Smith, J. (2017). The Determinants of the Match Between Student Ability and College Quality. Journal of Labor Economics, 35(1), https://www.journals.uchicago.edu/doi/full/10.1086/687523

15 Baker, D., Cellini, S., Scott-Clayton, J.; & Turner, L. (2021). Why Information Alone is Not Enough to Improve Higher Education Outcomes. Brookings Brown Center on Education Policy https://www.brookings.edu/articles/why-information-alone-is-not-enough-to-improve-higher-education-outcomes/

16 See Hallmark, T.; Ardoin, S.; Means, D. (2024). Race and Rurality: Considerations for Advancing Higher Education Equity. Routledge https://www.routledge.com/Race-and-Rurality-Considerations-for-Advancing-Higher-Education-Equity/Hallmark-Ardoin-Means/p/book/9781032581613; Crisp, G., McClure, K., & Orphan, C. (2022). Unlocking Opportunity Through Broadly Accessible Institutions. Routledge, https://www.routledge.com/Unlocking-Opportunity-through-Broadly-Accessible-Institutions/Crisp-McClure-Orphan/p/book/9780367564223; Hillman, N. (2017). Geospatial Analysis in Higher Education Research. In Paulsen, M. (Ed.). Higher Education: Handbook of Theory and Research, vol. 32. https://doi.org/10.1007/978-3-319-48983-4_11

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