

## RESEARCH ARTICLE

# Mapping Urbanicity and TRIO Student Support Services Program Availability in the United States

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**ABSTRACT:** A considerable amount of research indicates first-generation college students face significant challenges in college access, transition, persistence, and completion. In response, widening participation in college enrollment through college access and success programming has become a central focus of U.S. education policy. Federal TRIO programs, including Student Support Services (SSS), are especially important because they are designed to support students who are first-generation, low-income, and/or students with disabilities as they navigate higher education. However, few studies to date examine how geography shapes the availability and accessibility of these college access programs, particularly across institutional types and urban contexts. Centering on TRIO SSS programs, this study used a quantitative geospatial descriptive approach to explore the spatial interconnection between SSS program availability, institutional type, and urbanicity in the United States during the 2022–2023 academic year. Findings reveal uneven institutional capacity across geographic and organizational contexts, suggesting that access to SSS is not uniformly distributed across the higher education landscape. These patterns have important implications for outreach coordinators, student affairs administrators, federal college access policy, and the marginalized students served by SSS programs nationwide.

**KEYWORDS:** TRIO programs, college access, geospatial analysis, first-generation college students, student support services

## Mapping Urbanicity and TRIO Student Support Services Program Availability in the United States

TRIO Student Support Services (SSS) programs are federally funded initiatives to bolster college persistence and graduation rates among first-generation

students (FGS), students from low-income families, and students with disabilities (Crawford & Sarcedo, 2025; Office of Postsecondary Education, n.d.-a; U.S. Department of Education, 2014). Although SSS is one of the most established federal programs, little is known about how these federally sponsored programs are regionally dispersed. Two lenses for exploring this are the geography of opportunity (Hillman, 2016) and urbanicity (Milner, 2012). Geography of opportunity refers to how students' place of residence influences and constrains their college selection and attendance choices (Hillman, 2016). To further understand locations within a geography of opportunity, Milner (2012) offers a typology of urbanicity to categorize schools by their community's density and population size. Taken together, the geography of opportunity and urbanicity inform how college students' choices and success are influenced by external spatial factors. In an era marked by a geography of opportunity (Hillman, 2016), this study examines the geographic distribution of SSS programs across institutional types and regions. Although prior research has examined the geography of SSS availability at the state level (Crawford & Sarcedo, 2025), little is known about how federal SSS investments align with regional need across the United States. Therefore, the guiding research question was: How is the geography of opportunity for SSS programs constructed and distributed across institutional and geographic contexts in the 2022–2023 academic year?

## Literature Review

The benefits of higher education include better employment opportunities, higher income rates and earning potential, and increased access to health care (Eather et al., 2022). In pursuit of accessing these benefits, the entire college process can be intimidating for FGS (Kim et al., 2021). Even when FGS take this intimidation head-on, they frequently have less educational inheritance and fewer resources required for postsecondary success than their continuing-generation student peers, which often prevents FGS from attaining their college goals (Fry, 2021). That is, FGS' educational path is greatly impacted by their parents' lack of postsecondary education, and gaps in enrollment, retention, and graduation rates between FGS and continuing-generation students reflect their parents' college experience. As a result of this difference, FGS exhibit different postsecondary enrollment, retention, and completion rates, and FGS tend to differ from continuing-generation students in myriad ways. Demographically, FGS are overrepresented in groups traditionally marginalized in higher education, such as women, nontraditional age students, and members of racially and ethnically minoritized communities (Engle, 2007; Forrest Cataldi et al., 2018; Kim et al., 2021).

FGS also tend to be overrepresented among students from low-income and working-class backgrounds, where one measure of low-income status is eligibility for federal Pell grants (Chaplot et al., 2015). Compounding this, FGS are less likely to have parental financial assistance and have more extracurricular responsibilities, such as jobs and family, which limit their ability to fully engage in college (Engle & Tinto, 2008). Although literature on FGS tends to portray this student population through a deficit-based lens (Sarcedo, 2022), this article takes an asset-based view of FGS and contends that students who hold these identities are socially stigmatized, while postsecondary education is not necessarily set up to support their success. The increased likelihood that FGS will fall short of their collegiate goals is due to systemic and institutional issues, not to any characteristics inherent to this student population. To combat the systemic and institutional obstacles faced by FGS, several protective factors and assets bolster FGS success rates in postsecondary education. Although previous research shows FGS tend to enroll in college with less academic preparation, take more remedial courses, and work longer hours during class (Engle, 2007), this literature is countered by research emphasizing FGS success through academic and

financial support (Adams & McBrayer, 2020). FGS and other underrepresented student groups may also face financial obstacles to their postsecondary success (Chaplot et al., 2015; Walker, 2016), so access to additional funding, including receiving Pell Grants and scholarships, supports student retention and graduation (Crowne, 2022). With key supports in place, FGS can make it to and through higher education.

### **FGS and SSS**

To further support historically underrepresented student populations, such as FGS, in college enrollment, the U.S. federal government enacted legislation and created TRIO programs. Federal TRIO programs were established under the Economic Opportunity Act of 1964 to intentionally support students from disadvantaged backgrounds (Office of Postsecondary Education, n.d.-b). Thanks to this legislative action, seven TRIO programs provide direct services to underrepresented student populations in secondary and postsecondary education, and one provides training for TRIO professionals, for a total of eight TRIO programs (U.S. Department of Education, 2014). The focus of this article is the TRIO program known as SSS, which aims to increase college success as measured through persistence and graduation rates of FGS, students from low-income families, and students with disabilities (Crawford & Sarcedo, 2025; Office of Postsecondary Education, n.d.-a; U.S. Department of Education, 2014).

SSS programs receive federal funding through a grant competition, after which colleges and universities use grant money to create academic support, advising, and social-emotional development to improve retention and graduation rates for FGS (Office of Postsecondary Education, n.d.-a). Social-emotional development for low-income FGS improves their sense of belonging, which supports their success (Means & Pyne, 2017). To participate in SSS, students must be low-income, as shown by eligibility for Pell Grants, FGS, and/or a disability (U.S. Department of Education, n.d.). SSS and similar programs remain relevant to FGS postsecondary success (Boughan, 1996; Perna, 2015; Quinn et al., 2019). Scholars can infer that SSS programs are successful based on continued federal support and ongoing grant competitions, yet peer-reviewed scholarship on the effectiveness of SSS, such as Mahoney (1998) and Piatt et al. (2025), is typically focused on individual institutions. This limited focus on individual SSS programs reflects the potential limits on program success imposed by an institution's geographic location (Turley, 2009).

### **College Access and the Geography of Opportunity**

Higher education for underrepresented students like FGS affords them lifelong benefits (Eather et al., 2022; Engle, 2007; Fry, 2021), but students' access to particular institutions may be constrained by location (Turley, 2009). That is, college access is shaped and limited by geographic factors, not merely a matter of student aspiration or merit. Scholars such as Turley (2009) and Jabbar et al. (2017) have shown that geography fundamentally shapes educational opportunity and perpetuates systemic inequities in access to higher education. Jabbar et al. (2017) found community college students in Central Texas often pursue local options due to interconnected constraints: family obligations, financial limitations, and transportation challenges. Texas also enrolls a majority of Latinx students (Texas Education Agency, 2025). Beyond Texas, community colleges in the United States enroll nearly half of all college students (Crisp et al., 2016), of which nearly 40% are FGS (American Association of Community Colleges, 2025). College choice among underrepresented students is truncated by their access to schools. Spatial mobility refers to one's ability to move to a preferred school (Mok et al., 2016), and it depends not only on geographic distance but also on associated costs. For low-income families, a

population to which FGS disproportionately belong (Chaplot et al., 2015), the financial and time costs associated with traveling longer distances to schools with enriched programming may be prohibitive (Jabbar et al., 2017). Despite students' willingness to travel 45-80 miles to appropriate institutions, systemic barriers, particularly affecting FGS and low-income students, narrowed their geographic choices (Jabbar et al., 2017). To overcome these spatial and social barriers, marginalized student groups require access to economic means and social capital (Yoon & Barrett DeWiele, 2025). Although earlier research has examined regional differences in access (e.g., Hillman & Weichman, 2016; Means, 2025; Tate, 2008; Turley, 2009), less attention has been paid to how specific programs operate in geographically uneven environments.

### **Spatial Inequities in Educational Policy and Programs**

Policies designed to enhance college access function within preexisting stratified geographical environments. Existing spatial inequities significantly constrain school choice options for students from low-income and racially marginalized neighborhoods, despite official policies that ostensibly endorse choice (Dache-Gerbino, 2017; Yoon & Barrett DeWiele, 2025). Schools located in education deserts are less likely to offer college-readiness programs and advanced curricula (Klasik, 2026; Lee, 2026). For example, Yoon and Barrett DeWiele (2025) showed that college readiness programs, such as academically advanced, gifted and talented, arts specialty, and International Baccalaureate programs, are disproportionately located in affluent, high-status neighborhoods with predominantly White residents. Their research indicated that students living in lower-income or racially marginalized neighborhoods often found these desirable programs either physically distant or absent within a reasonable travel distance. Although educational policies have increased the availability of college-preparatory resources, these opportunities are not distributed equitably; rather, they are shaped by enduring structural inequalities entrenched in historical and contemporary capitalism.

Dache-Gerbino (2017) argued that contemporary spatial inequities reflect centuries of colonial capitalism, slavery, and segregation manifested through residential racial concentration and institutional distribution. These patterns of spatial inequities, as identified by Dache-Gerbino (2017), Yoon and Barrett DeWiele (2025), and Klasik (2026), were not accidental outcomes but rather reflected systemic inequities affecting marginalized groups. Developing a better understanding of the geography of opportunity, educational policy and programming, and spatial inequities holds promise to increase educational outcomes for marginalized student groups. Spatial inequalities in higher education are shaped not only by institutional proximity but also by the uneven geographic distribution of institutional types (e.g., 2-year, 4-year) and classifications. Proximity research demonstrates that students are more likely to aspire to, apply to, and attend colleges in close geographic proximity to their hometowns (Hillman & Weichman, 2016; Means, 2025). However, access to nearby institutions is not evenly distributed.

Colleges, particularly 4-year universities, are more likely to be located near White and affluent communities, whereas students of color and low-income students are more likely to reside in education deserts or areas with many community colleges (Dache-Gerbino, 2018; Turley, 2009). These patterns also extend to institutional classifications, such as minority-serving institutions (MSIs), including Hispanic-serving institutions (HSIs), Historically Black colleges and universities (HBCUs), and Tribal colleges and universities (TCUs), which are unevenly distributed across U.S. regions, often located in education deserts (Hillman & Weichman, 2016). This uneven distribution reveals a broader racialized geography of higher education in the United States, in which access to culturally affirming institutions is contingent on location.

## Theoretical and Conceptual Frameworks

This study examines spatial disparities in the distribution of SSS programs using a theoretical framework that combines geography of opportunity (Hillman, 2016) with a typological understanding of urbanicity (Milner, 2012). Geography of opportunity refers to the range of choices students have for selecting and attending institutions of higher education, as constrained by where they live (Hillman, 2016). Milner's (2012) typology of urbanicity offers a way to categorize school districts based on their community's density and population size. When combined, these frameworks offer a lens through which to view how institutional capacity to assist historically underprivileged college students is shaped by external spatial influences. When thinking about schools and schooling, the place of education within the larger social space should be taken seriously. The geography of opportunity paradigm has been extended to the realm of education (e.g., Green, 2015).

Within education, the geography of opportunity emphasizes that students' postsecondary pathways are impacted by both the geographic distribution of opportunity resources and individual goals or institutional qualities (Green, 2015; Hillman, 2016); it views educational access as spatially structured. According to Hillman (2016), one of the most important, yet frequently disregarded aspects of college opportunity is the location of universities and educational resources. Research shows that students are more likely to attend college if one is located near their hometown (Means, 2025; Turley, 2009). Thus, the variety of viable postsecondary alternatives available to students is shaped by institutional availability, geographic proximity, and regional resource concentration. As a result, assessments that ignore spatial context risk attributing differences in college persistence and access to institutional or individual deficiencies rather than more pervasive structural injustices. Geography serves as a policy-relevant mechanism that shapes institutional support ecosystems within federally funded college support programs such as SSS. Differential access to academic advising, financial literacy tools, and persistence interventions, all essential for student success, especially for historically underrepresented student populations, may result from the unequal distribution of support services throughout areas. Geographical limitations are especially important for FGS, low-income, and racially minoritized student populations, whose college decision-making processes are more sensitive to spatial proximity and resource availability (Hillman, 2016; Turley, 2009).

To understand how federal equity initiatives interact with local opportunity structures to shape institutional support capacity, it is helpful to look at the spatial distribution of TRIO programs. In support of this viewpoint, Milner's (2012) urbanicity paradigm provides a sophisticated typology for understanding patterns of educational opportunities across geographic contexts. Milner questions the conventional binary divisions between "urban" and "nonurban" education, contending these divisions frequently obscure significant differences in structural inequity, resource distribution, and demographic makeup. Rather, Milner conceptualizes urbanicity as a continuum with three categories: urban-intensive, urban-emergent, and urban-characteristic. Urban-intensive refers to large, densely populated metropolitan areas with school district populations over 1 million (e.g., Los Angeles and Houston); thus, support services are expected to serve an immense number of people and their schools. Even though they are found in cities with populations of fewer than 1 million, urban emergent environments face comparable challenges due to population growth, changing demographics, and limited institutional capacity (e.g., Denver and Seattle).

Urban-like issues such as changing educational demands and demographic diversity are increasingly shaping urban-like environments, which may encompass suburban or rural areas (e.g., Idaho Falls, Idaho, and Cedar Park, Texas). A more accurate analysis of the distribution of institutional support programs across diverse

geographic locations is made possible by applying Milner's (2012) typology. This approach views urbanicity as a structural condition that shapes institutional opportunity landscapes, rather than merely a demographic descriptor. Urbanicity categories enable a multifaceted understanding of how spatial context affects the availability of college support infrastructure when paired with the geography-of-opportunity perspective. The current analysis conceptualizes the distribution of SSS programs as a measure of spatially mediated opportunity structures in higher education by incorporating these frameworks. Potential regional disparities in institutional support capability can be found by mapping program availability with urbanicity classifications. By changing the analytical focus from specific student traits to the broader organizational and spatial factors that influence access to federally funded persistence resources, this method extends prior research (e.g., Crawford & Sarcedo, 2025; Dache-Gerbino, 2018; Means, 2025). In the end, a more thorough understanding of how policy interventions are experienced differently across institutional and geographical contexts is achieved by analyzing SSS through the combined lenses of geography of opportunity and urbanicity.

## Methods

This study examined how the presence and funding intensity of federal TRIO SSS correspond to state-level educational and economic indicators, using a quantitative, geospatial descriptive approach to map and characterize patterns across the United States. The study used data from the SSS grantee award list published by the U.S. Department of Education for the 2022–2023 academic year (Office of Postsecondary Education, n.d.-c). The dataset included information on the 1,162 funded programs, including the institutions awarded grants, total award amounts, numbers of participants served, and TRIO program types. Institutional characteristics pertaining to its type (e.g., 2-year, 4-year) and classification (e.g., HSI or HBCU) were gathered from the Carnegie Classification of Institutions of Higher Education (American Council on Education, n.d.). Urbanicity classifications were assigned using Milner's (2012) urban typology framework, operationalized with 2022 annual population estimates from the U.S. Census Bureau (2023).

This allowed institutions to be systematically classified across Milner's (2012) three categories of urbanicity. To operationalize urbanicity, this study adapted Milner IV's (2012) urban education typology, which conceptualizes educational environments across three contextual frames: urban intensive, urban emergent, and urban characteristic. Following Milner's contextual definitions, municipal population thresholds were established to assign each institution's surrounding community; urban intensive institutions were classified as those located in municipalities with populations of 1,000,000 or greater. Cities were classified as urban emergent if they had populations between 999,999 and 200,000, reflecting Milner's description of sizeable cities that experience many of the same educational and social challenges as urban-intensive contexts, but with lower population density and complexity. Finally, institutions in municipalities with populations below 200,000 were classified as urban characteristic because Milner uses this category to describe suburban, rural, and smaller-community settings that may exhibit challenges associated with urban education despite lacking the population size and density of major cities (U.S. Census Bureau, 2023).

Although Milner recognizes one million people as a defining characteristic of urban intensive environments, he refrains from establishing exact numerical limits for the three classifications. Consequently, population thresholds were established to convert Milner's conceptual differentiations into a uniform classification framework applicable nationwide. Numerical analyses were conducted using R version 4.4.1 (R Core Team, 2024) within the RStudio IDE (Posit Software, 2025). The distribution of

SSS funding across states is noticeably skewed, so we report the median in our figures and tables as a more robust measure of central tendency than the mean. Visualizations were created using the R packages *ggplot2* (Wickham, 2016) and *biscale* (Prener et al., 2025).

## Data Analysis

We employed a spatially contextualized descriptive analysis to examine patterns in SSS funding distribution across states, institutional types, and urbanicity classifications. For institutional types, our study looked at various MSIs, which are diversified schools and universities that serve historically underrepresented student populations, and predominantly White institutions (PWIs). PWIs are not MSIs but enroll a majority of White students and have traditionally centered on White, middle-class values and practices (Cabrera et al., 2016; Von Robertson et al., 2016). Since 1964, HBCUs have educated a substantial number of Black undergraduates. Predominantly Black institutions (PBIs) historically were not HBCUs but now enroll high numbers of Black students. HSIs enroll at least 25% Latinx students, while Asian American and Native American Pacific Islander-serving institutions (AANAPISIs) serve high concentrations of Asian American and Pacific Islander students. Native American-serving nontribal institutions (NASNTIs) and TCUs serve Indigenous and Native communities and are often based on tribal sovereignty and community-based education.

Similarly, Native Hawaiian-serving institutions (NHSIs) include institutions with 10% or higher Native Hawaiian student populations. Rather than modeling spatial dependence or distance-based accessibility, our approach focused on identifying geographic concentration, distributional variation, and funding disparities across institutional contexts. Descriptive statistics were generated for total funding, median funding by state, and funding per participant. Because funding allocations were positively skewed across states and institutional types, median values were reported as a more robust measure of central tendency. To examine equity in resource allocation, we calculated funding per participant by dividing total institutional award amounts by the number of participants served. This metric provides a standardized indicator of program-level resource intensity (see Table 1).

## Spatial Visualization

Geographic distributions of SSS programs and median funding allocations were visualized using R (version 4.4.1). Choropleth maps were constructed to illustrate state-level variation in program concentration and median funding levels. These visualizations allow for identification of regional clustering and geographic disparities in federal resource distribution. Bivariate maps were constructed to simultaneously represent median funding levels and Pell grant percentages across states.

**Table 1:** Average SSS Funding per Participant Across Institutional Type in the 2022–2023 Academic Year

| Institutional type | Median funding | Avg funding per participant | Total participants | Total funding |
|--------------------|----------------|-----------------------------|--------------------|---------------|
| ANNH               | \$293,417      | \$1,745                     | 2,866              | \$5,000,517   |
| HBCU               | \$293,810      | \$1,752                     | 9,365              | \$16,407,189  |
| AANAPISI           | \$275,097      | \$1,750                     | 7,030              | \$12,302,180  |
| PWI                | \$288,127      | \$1,765                     | 162,179            | \$286,294,611 |
| PBI                | \$268,497      | \$1,813                     | 3,482              | \$6,312,895   |
| HSI                | \$270,104      | \$1,700                     | 16,174             | \$27,497,524  |
| NHSI               | \$297,851      | \$1,722                     | 2,099              | \$3,615,315   |
| TCU                | \$294,724      | \$1,835                     | 1,551              | \$2,845,896   |
| AANAPISI/HSI       | \$261,888      | \$1,819                     | 288                | \$523,776     |
| MSI                | \$261,872      | \$1,637                     | 320                | \$523,743     |

These types of maps were chosen because they simplify the presentation of quantitative information across geographic regions, allowing for the identification of regional clustering and geographic disparities in federal resource distribution with relative ease. Although this study does not employ advanced geospatial modeling techniques (e.g., spatial autocorrelation, kernel density estimation, or accessibility modeling), it adopts a geographically informed framework consistent with spatial equity scholarship to examine how federal educational investments are distributed across institutional and regional contexts.

### Limitations

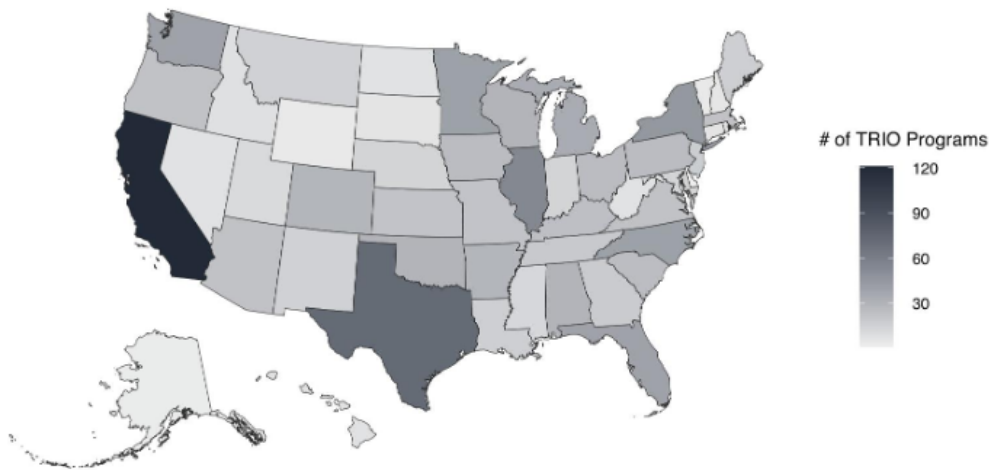
Data collection from publicly available sources creates some limitations. Because SSS funding data comes from 2022–2023, our findings have limited generalizability for other periods and may not capture trends that have evolved over time. Within this data, various entries were representative of entire campuses rather than the individual branches of campuses with SSS programs. Additionally, some data sources were incomplete, so potentially relevant variables were unavailable for our analysis. For example, the data extracted from the Carnegie classification of institutions of higher education (American Council on Education, n.d.) included information on student access level and earnings classification. However, over 20% of almost 4,000 universities in the database were missing this information. As a result, the analysis may not fully capture the relationship between funding allocation and the socioeconomic or academic profiles of students served across institutions. Lastly, the descriptive approach this study uses limits the ability to draw causal inferences about the underlying mechanisms linking TRIO program availability, funding, and student outcomes.

## Findings

For the 2022–2023 academic year, 1,162 SSS programs were awarded funds. PWIs made up 905; MSIs included 107 HSIs, 50 HBCUs, 38 AANAPISIs, 20 PBIs, 16 NASNTIs, 12 NHSIs, and 10 TCUs. Some institutions have dual or overlapping designations, including 2 AANAPISI/HSIs and 2 colleges self-labeled as MSIs. There were no exclusions in the dataset; all institutions awarded federal grants were included in this manuscript. This study used federal dataset tracking tools and official institutional designations found on their websites to find institutions' MSI classifications. Because federal MSI eligibility changes every year based on shifts in enrollment demographics and the low-income student thresholds in Titles III and V of the Higher Education Act, this study used federal data sheets and official institutional research and university administrative websites to verify compliance in real time and obtain detailed designation data.

This multi-step screening process identifies schools that meet more than one government requirement for serving underrepresented student groups and records their dual-status profiles. Accordingly, these institutions were treated as double designation institutions and labeled in their own categories because that is how the school was categorized. Using Milner's (2012) urbanicity framework, 875 institutions were classified as urban characteristic, 237 as urban emergent, and 50 as urban intensive. Regarding institutional type, the dataset also showed a higher number of 4-year institutions ( $n = 660$ ) than 2-year institutions ( $n = 502$ ). Among 2-year colleges, the majority were public institutions ( $n = 499$ ), with only a few private institutions ( $n = 3$ ), highlighting the community college sector's strong public orientation. Similarly, 515 public schools were 4-year institutions compared to only 145 private institutions. Overall, a clear geographic pattern emerged, with a higher concentration of SSS programs located in the West, Southwest, and Midwest (see Figure 1), with California ( $n = 121$ ), Texas ( $n = 72$ ), and Illinois ( $n = 54$ ) having the highest number of SSS programs. Although PWIs with SSS programs are distributed across most of the United States, the same is not true for all institutional types. For example, relevant HCBUs are centered in the U.S. Southeast, whereas relevant NASNTIs are only in Alaska, Hawaii, New Mexico, and Oklahoma. The distributions of SSS programs in public 2-year and 4-year institutions across the United States both resemble the overall distribution of SSS programs. On the other hand, many states in the western half of the United States lack SSS programs for private institutions.

**Figure 1:** Frequency of SSS Programs Across the United States in the 2022–2023 Academic Year



**Note.** Values represent the number of TRIO Student Support Services programs per state during the 2022–2023 academic year, not the number of institutions; a single institution may host multiple programs. Program counts and award data were drawn from the Office of Postsecondary Education (n.d.-a); institutional characteristics were drawn from the Carnegie Classification of Institutions of Higher Education (American Council on Education, n.d.). Figure created in R version 4.4.1 (R Core Team, 2024) using ggplot2 (Wickham, 2016).

Comparisons across institutional control (public vs. private) and levels of institution (2-year vs. 4-year) reveal that the median TRIO SSS funding for private 2-year institutions was over \$55,000 more than any other classification for the 2022–2023 academic year, albeit with only three institutions in this category (see Table 2). Across institutional types, median funding ranged from approximately \$260,000 to \$300,000 (see Table 1). Although total funding varied substantially by institutional category, average funding per participant remained relatively stable, ranging from \$1,700 to \$1,800 across most categories. Notable deviations from this range were observed among MSIs, which fell below the interval, and PBIs, TCUs, and AANAPISI/HSIs, which exceeded it. The median funding for urban characteristic institutions is approximately \$30,000 higher than for urban emergent and urban intensive institutions (see Table 3). However, the average funding per participant remained consistent across the different urbanicity classifications.

**Table 2:** *SSS Funding and Participation Metrics Across Institutional Classification for the 2022–2023 Academic Year*

| Institutional control | Level  | Median funding | Avg funding per participant | Total participants | Total funding |
|-----------------------|--------|----------------|-----------------------------|--------------------|---------------|
| Private               | 2-year | \$348,402      | \$2,010                     | 485                | \$975,076     |
| Private               | 4-year | \$279,441      | \$1,821                     | 21,508             | \$39,164,232  |
| Public                | 2-year | \$275,105      | \$1,776                     | 87,369             | \$155,129,154 |
| Public                | 4-year | \$292,898      | \$1,730                     | 95,992             | \$166,055,184 |

When considering funding levels relative to the percentage of students receiving Pell grants, there is also a regional discrepancy. Many states in the northern half of the United States have higher median funding levels than those in the southern half. Conversely, states in the southern half have a high percentage of Pell grant recipients. Areas with higher median funding and higher levels of Pell Grant recipients are mostly located in the eastern half of the United States, including states such as New Hampshire, Virginia, and Arkansas. The only state in the western half with median funding and Pell Grant recipient levels above the 50th percentile across states is Nevada (see Figure 2).

**Table 3:** *Average SSS Funding per Participant Across Urbanicity Definitions for the 2022–2023 Academic Year*

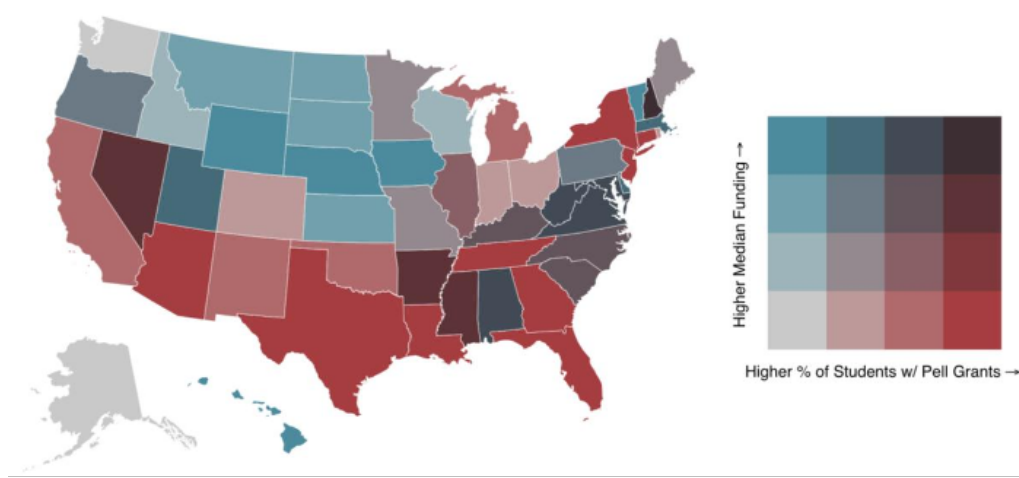
| Urbanicity           | Median funding | Avg funding per participant | Total participants | Total funding |
|----------------------|----------------|-----------------------------|--------------------|---------------|
| Urban characteristic | \$294,380      | \$1,755                     | 156,846            | \$275,325,070 |
| Urban emergent       | \$261,888      | \$1,778                     | 40,242             | \$71,540,726  |
| Urban intensive      | \$261,888      | \$1,749                     | 8,266              | \$14,457,850  |

## Discussion

True college access, defined not only by enrollment but also by proximity to essential institutional support systems, varies significantly across urban landscapes, where enduring disparities in postsecondary retention infrastructure are intrinsically linked to geography (Dache-Gerbino, 2018; Tate, 2008). For historically underprivileged students, the spatial interaction between institutional type and regional location can either worsen or lessen place-based disadvantages. This study builds on previous work examining SSS distribution at the state level by extending the analysis to the national landscape (Crawford & Sarcedo, 2025). It also extends research on a geography of opportunity for college retention (Hillman & Weichman, 2016; Klasik, 2026; Lee, 2026) by examining the distribution of federal SSS programming across different institutional sectors and levels of urbanicity. This study investigated how federal equity resources are positioned to reduce local educational disparities and whether they unintentionally perpetuate a rigid geography of opportunity that isolates students by examining the landscape of these funded

programs. Our findings suggest a geography of opportunity, both geographically and institutionally. The institutional distribution of SSS programs revealed a distinct structural divide between institutional type, designation, and urban classifications. Concerning institutional type, findings show that SSS programming is unevenly distributed between 2- and 4-year institutions, reflecting two different but equally vital approaches to student equity. The high concentration of SSS programs at 4-year institutions represents a powerful mechanism for long-term retention, especially for historically marginalized student populations.

**Figure 2:** Relationship Between Median Funding for SSS Programs and Pell Grant Recipient Percentage by State for the 2022–2023 Academic Year



**Note.** Breaks for the colored legend are placed at the 25th, 50th, and 75th quantiles of these attributes across states. For median funding, breaks are at ~\$275k, \$294k, and \$330k. For Pell grant recipient percentage, breaks are at 25.15%, 29%, and 33.075%.

Eligible SSS students at PWIs, including low-income, FGS, and disabled students, frequently encounter identity-based, socioeconomic, and cultural barriers that hinder their college adjustment (Engle, 2007; Forrest Cataldi et al., 2018; Fry, 2021; Kim et al., 2021). However, the cultivation of counterspaces within these campus climates offers vital microcommunities within the existing campus milieu that foster a sense of belonging (Means & Pyne, 2017) and make the broader institutional environment manageable (Adams & McBrayer, 2020; Mahoney, 1998; Von Robertson et al., 2016). Thus, having SSS programs may serve as a critical anchor, allowing students to successfully navigate the retention pipeline in these more institutionally selective spaces.

Conversely, the presence of SSS programs at community colleges may support the foundational mission of these institutions as democratic engines of access whose core purpose is to serve minoritized postsecondary students by providing a clear pathway to an associate degree or facilitating an upward transfer to a 4-year institution (Crisp et al., 2016). Given that these institutions serve as a primary point of entry for many minoritized students (American Association of Community Colleges, 2025), equipping them with SSS funding is essential to facilitate workforce success and upward transfer mobility into 4-year spaces. SSS programs provide a space for historically marginalized students to build a sense of community that is undeniably important for their college retention. The institutional distribution of SSS programs is

also uneven across institutional types. Numerically, 77.9% of all funded SSS programs are housed within PWIs, leaving 22.1% of SSS grants spread across all MSI designations combined. In the context of higher education equity outcomes, this is a massive systemic issue given that TRIO programs were built to sustain FGS, low-income students, and students with disabilities. Although students in these populations attend PWIs, a substantial portion are enrolled at MSIs. Moreover, arguing that MSIs do not care enough to secure SSS grant funding is overly simplistic and deficit-based. Rather, federal funding frameworks heavily favor PWIs because they have the infrastructure, administrative capacity, and personnel to write grant applications and demonstrate success in federal programming. For instance, because competitive federal grant infrastructure rewards institutional capacity, federal dollars end up being hoarded by wealthier PWIs that already boast massive expenditures per student, rather than being concentrated at the broad-access campuses (Hillman, 2020).

In other words, federal funding appears to reward institutional wealth rather than student-need density. Although the vast majority of SSS programs are housed within PWIs, there is still a substantial footprint across various MSIs. The SSS programming data show that over half of the grants awarded to MSIs go to HSIs, which aligns with the demographic concentration of students in the United States. California (Ed-Data, 2026) and Texas (Texas Education Agency, 2025) have over half of their K-12 student enrollment identified as Hispanic. Yet even within MSIs, there is a hierarchy of visibility: HSIs received the most funds compared to other MSIs, such as TCUs or AANAPISIs. This hierarchy of visibility could indicate which MSIs have achieved sufficient institutional critical mass to secure federal recognition, or that these institutions enroll the most students. Enrollment numbers are important because, as structural economic models of higher education finance demonstrate, equity funding is treated as a competitive marketplace, historically wealthy entities, consequently favoring institutions with capital while systematically starving smaller institutions (Barr, 2001).

Although institutional selectivity and type are imperative, SSS programming was also found to be unevenly distributed across geographical regions. Findings indicate that most SSS programs are in the West, Southwest, and Midwest portions of the United States. Unsurprisingly, the states boasting the highest concentration of programmatic infrastructure, namely California ( $n = 121$ ), Texas ( $n = 72$ ), and Illinois ( $n = 54$ ), represent some of the nation's largest and most demographically significant K-12 public school pipelines. California (Ed-Data, 2026) and Texas (Texas Education Agency, 2025) serve dense, intersecting populations of SSS-eligible students, with many urban-intensive locations. Given the large numbers of TRIO-eligible students in these states, it is reasonable that they would also have a substantial number of SSS programs. Thus, the concentration of these programs could reflect not only the size and diversity of each state's student population but also the continued need for structured interventions to support students' persistence and completion in higher education. Although these programs are heavily concentrated in highly populated states, their distribution remains uneven when examined through the lens of urbanicity. The findings also show that SSS funding is heavily concentrated in institutions that possess elements of urban environments, specifically those classified as urban characteristic, but the urban environments most densely populated in resources, people, and structural challenges host a fraction of these programs. Roughly 75% of SSS programs are awarded to institutions in urban-characteristic environments, as compared to approximately 21% for urban emergent and 4% for urban intensive. This disparity is driven by the geographical distribution of higher education supply, meaning if institutions are not structurally located within these concentrated urban centers, federal funding, which is tied to campus boundaries, will not reach these spaces.

This spatial imbalance suggests that even within high-need states, federal retention capital is not reaching the densest, resource-constrained, urban-intensive environments, representing a critical geographic barrier to college access and completion. Centering proximity is particularly vital because empirical literature demonstrates unequal geographic access to college-preparatory resources and institutions that structurally isolate historically marginalized students from equitable education and educational opportunities (Adams & McBrayer, 2020; Cabrera et al., 2016; Green, 2015; Yoon & Barrett DeWiele, 2025). Increasing college opportunities via institutions and spatial resources has a significant impact on access and enrollment for minoritized students. Klasik (2026) highlights that students living in education deserts face disadvantages in accessing college-preparatory materials and opportunities, which could partly explain their lower progression along the college-enrollment pathway. One key finding is that high schools located in education deserts offer fewer advanced course opportunities, specifically fewer Advanced Placement and International Baccalaureate courses.

Moreover, this can also affect college search activities, such as college fairs or college visits. Klasik (2026) also found that rural high schools tend to receive far less attention from college recruiters, and even when events do occur, the range and relevance of information and opportunities are limited compared to those available in more college-rich areas. This limitation can restrict students' ability to develop a strong academic profile, which is critical for competitive college applications, especially at highly selective institutions. Clearly, distance is a major factor in students' college decision-making processes. For example, community college students in two large cities in central Texas report that economic factors such as in-state tuition and staying close to home reduce housing, transportation, and other living expenses (Jabbar et al., 2017). Thus, when communities have a concentration of local colleges, especially a mix of 2-year and 4-year institutions, students benefit from greater educational opportunities that fit a wider range of academic interests, financial constraints, and personal circumstances (Hillman, 2016).

A demonstrated geography of opportunity for SSS programs in the United States evinces a lived manifestation of racial and economic stratification. College deserts often coincide with predominantly Black and Latinx residential zones characterized by higher poverty rates and urban underdevelopment (Hillman, 2016). In these college deserts, access to postsecondary institutions is limited (Klasik, 2026). For instance, schools in these areas are less likely to offer academically advanced courses (Lee, 2026). Thus, the lack of proximate, well-resourced postsecondary institutions limits educational opportunities for residents, constraining their upward mobility. This spatial reality reflects colonial legacies where marginalized groups are systematically denied access to institutions of socioeconomic advancement because college oases, which are where there is a high concentration of higher education institutions, are populated predominantly by White and wealthy communities (Dache-Gerbino, 2017). This spatial inequity perpetuates "moral geographies of injustice," in which residents are spatially and socially excluded from elite educational pathways (Dache-Gerbino, 2017, p. 370). Collectively, our findings indicate that the intersections of institutional type and designation, urbanicity, and the physical location of higher education institutions demonstrate a rigid geography of opportunity that heavily influences college retention among historically minoritized student populations. The distribution of SSS programming is not neutral; it creates a landscape of vital academic, financial, emotional, and cultural support that is bounded by ZIP Code and institutional type. When federal retention dollars are disproportionately concentrated away from those in need, geography functions as a systemic barrier that compounds existing educational inequities. For historically marginalized students, this means that the path to a degree, which is becoming a requirement for most entry-level jobs, involves not only navigating academic and socioeconomic hurdles but also the

physical landscape and institutional wealth and support structures that are unevenly distributed. The findings from our study support the view that college retention is not only a function of college access but also a spatial phenomenon.

### Implications

For outreach coordinators and student affairs administrators negotiating the structurally stratified postsecondary landscape, this study's descriptive and geographic findings provide crucial insights. Institutional practitioners are constrained by the physical realities of their local education markets because they have little systemic control over where colleges were historically constructed, or which campuses receive competitive federal grants. However, by purposefully revamping their enrollment management and student recruiting pipelines, practitioners can actively combat these geographical limitations. Outreach coordinators in high-resource regional clusters should systematically expand their recruitment footprints into nearby education deserts and under-resourced areas, given that SSS infrastructure serves as a proven mechanism for increasing college persistence and completion. Practitioners can use their institutional capital to address regional access gaps and expand channels for higher social mobility by purposefully establishing recruiting pipelines in nearby urban-intensive areas or rural zones without a local SSS presence.

Our results also highlight the need for higher education scholars to adopt a spatial lens when examining federal college admissions and retention policies. Future research must examine how the physical location of college preparatory resources functions as a structural precursor to educational equity, or a lack thereof, for historically marginalized populations. The documented unevenness across urbanicity types confirms that a rigid geography of opportunity bounds the postsecondary pipeline. Future studies must critically examine the regional distribution of the larger federal TRIO pipeline, including programs beyond SSS. Researchers should go beyond the extensively studied precollege programs such as Upward Bound and conduct thorough geographic analyses of interventions that have received less attention. To ascertain whether federal retention capital is geographically positioned to reach the students who most need it, it is crucial to map the geographic configurations of other TRIO programs such as McNair Postbaccalaureate Achievement or Upward Bound-Veterans programs, which are highly competitive and structurally designed to prepare a limited pool of minoritized undergraduates for graduate education.

### Conclusion

The geography of opportunity across SSS programs in the United States shows that when the physical distance to an SSS-equipped institution is too great, students residing in urban-intensive environments are effectively severed from localized federal retention infrastructure, turning geographic sorting into a mechanism of exclusion. However, this study is not intended to frame SSS as a flawless singular panacea for closing postsecondary gaps. Although SSS programs function as vital safety nets, these spaces can also introduce unexpected challenges and dilemmas, making students feel hyper-visible or segregated from the broader campus culture (Means & Pyne, 2017; Whiteside, 2026). Nevertheless, SSS programs remain an indispensable foundation for the academic survival of historically marginalized undergraduates. Given the lack of an alternative, large-scale, federally funded mandate engineered exclusively to protect and graduate low-income, FGS, and disabled students, SSS infrastructure must be defended as a vital component of higher education policy to bolster the success of minoritized students.

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