

# Teen Science Café Network

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## Year 4 Research Highlights

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# RESULTS

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## Network Trends Over Time

# Growing the Network: 2020 through 2024

Looking at the snapshot of Network at each annual check-in, it becomes clear that this year (2023-24) showed evidence of real growth in Network size, from a combination of training new sites, while also sustaining a core of members.

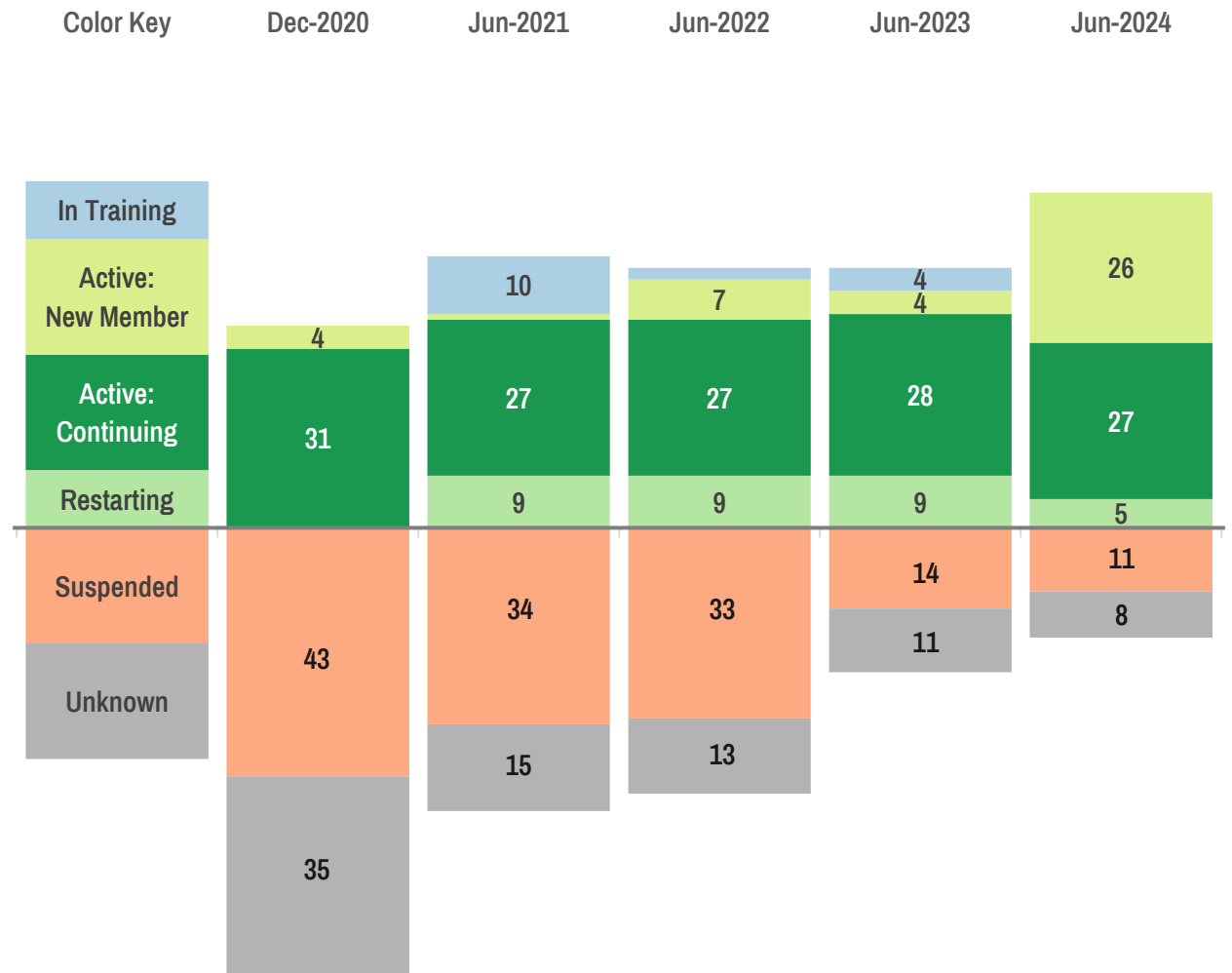
This graphic focuses only on café programs that had not fully ended their efforts. This evidence shows the pattern and results of the Network’s efforts to sustain the existing network and grow new members over the course of the grant period (which began in Q4 2020).

From this view, the efforts to rebuild and develop a new training system were just underway in 2021, and the core number of sites engaged (existing, trainees, or new) stayed relatively stable from 2021-23 – as the program iterated on its training model.

The results from 2023-24 – when the training model had been substantially refined *and* included robust systems (and staff) for engaging core members – show **the strategies are bearing fruit in the form of sustaining, restarting, and newly starting Teen Science Café programs.**

Changes in the total number of TSCN Sites at different status levels over time – colors above the axis indicate programs actively trying to run or remain open.

This graph shows aggregate counts of café programs within the Network in any given year and their status (programs that were permanently ended are removed from this analysis). Where the total size of the bars shrinks, it represents the loss of Café programs through permanent closures.



# Pathways of Network Change: 2023 to 2024

Between 2023 and 2024, the most notable change in the TSCN was the addition of 26 new members, via trainees who started programs and held 3+ Café events with teens by June 2024.

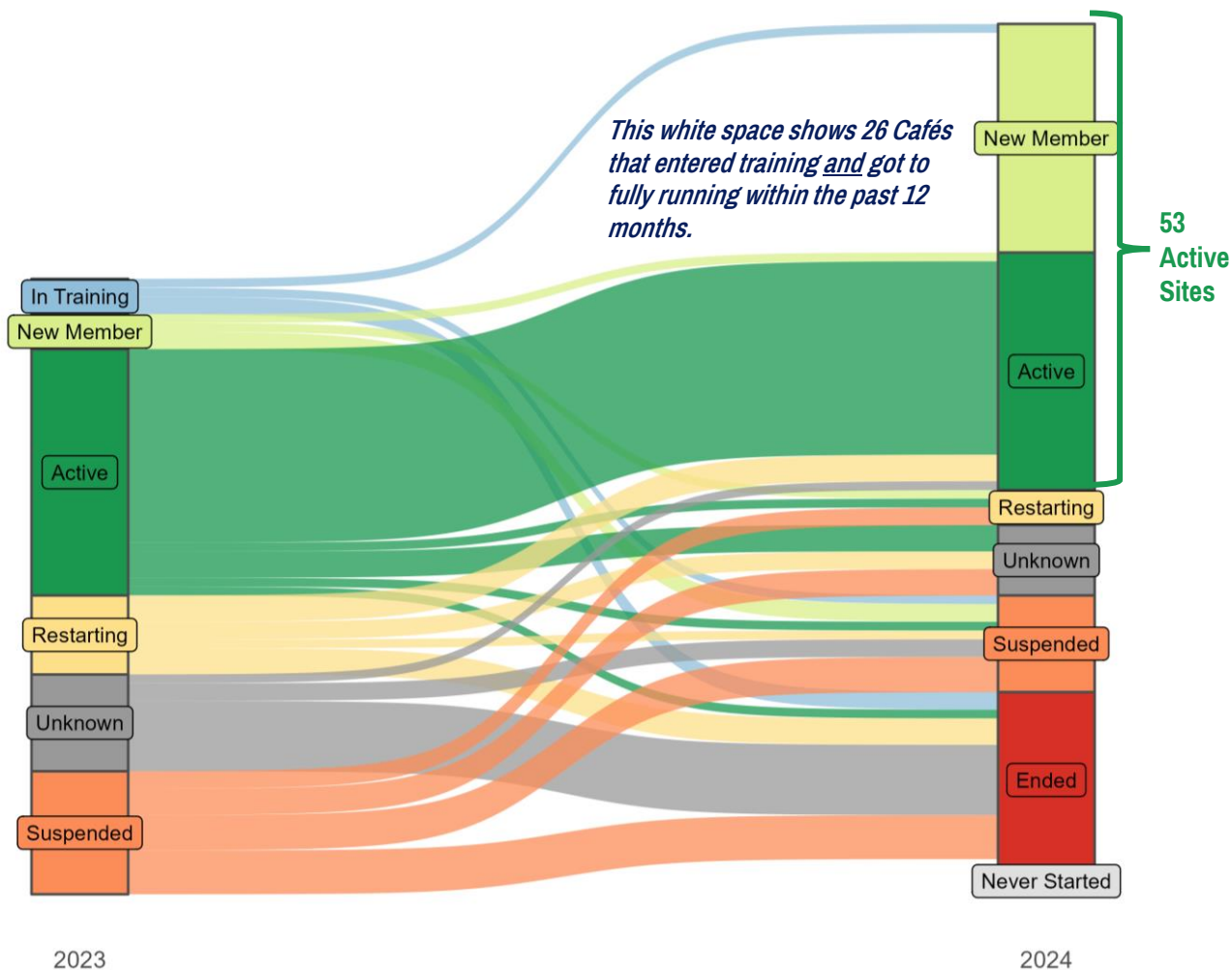
This graphic shows that pathways of growth and adaptation in TSCN are rarely smooth. While a large portion of Active members maintained that status (green pathway), a few lost contact (gray status), reported they had actually paused and were trying to get restarted (yellow status), or even had to pause (orange) or end completely (red).

And the programs that had reported in 2023 they were trying to get restarted, their fates divided along several routes (the yellow pathways), with some ending or losing contact. More hopefully, a few suspended sites shifted from suspended to restarting, showing signs of a continued rebuild.

The 2024 census found 9 programs improved their status from where they were in 2023; but 26 saw their status decline in some way. **26 programs were added.** There were also 8 programs that had no contact or signs of active programming in 2+ years; these were recategorized as ended.

## Teen Science Café Network: Status Change Pathways in this Program Year

This analysis excludes café programs that were permanently ended in 2023 (last year's network census), focusing only on the set who were still trying to run at the start of this program year. Pathways in the diagram show how each individual program changed its status between June 2023 and June 2024.

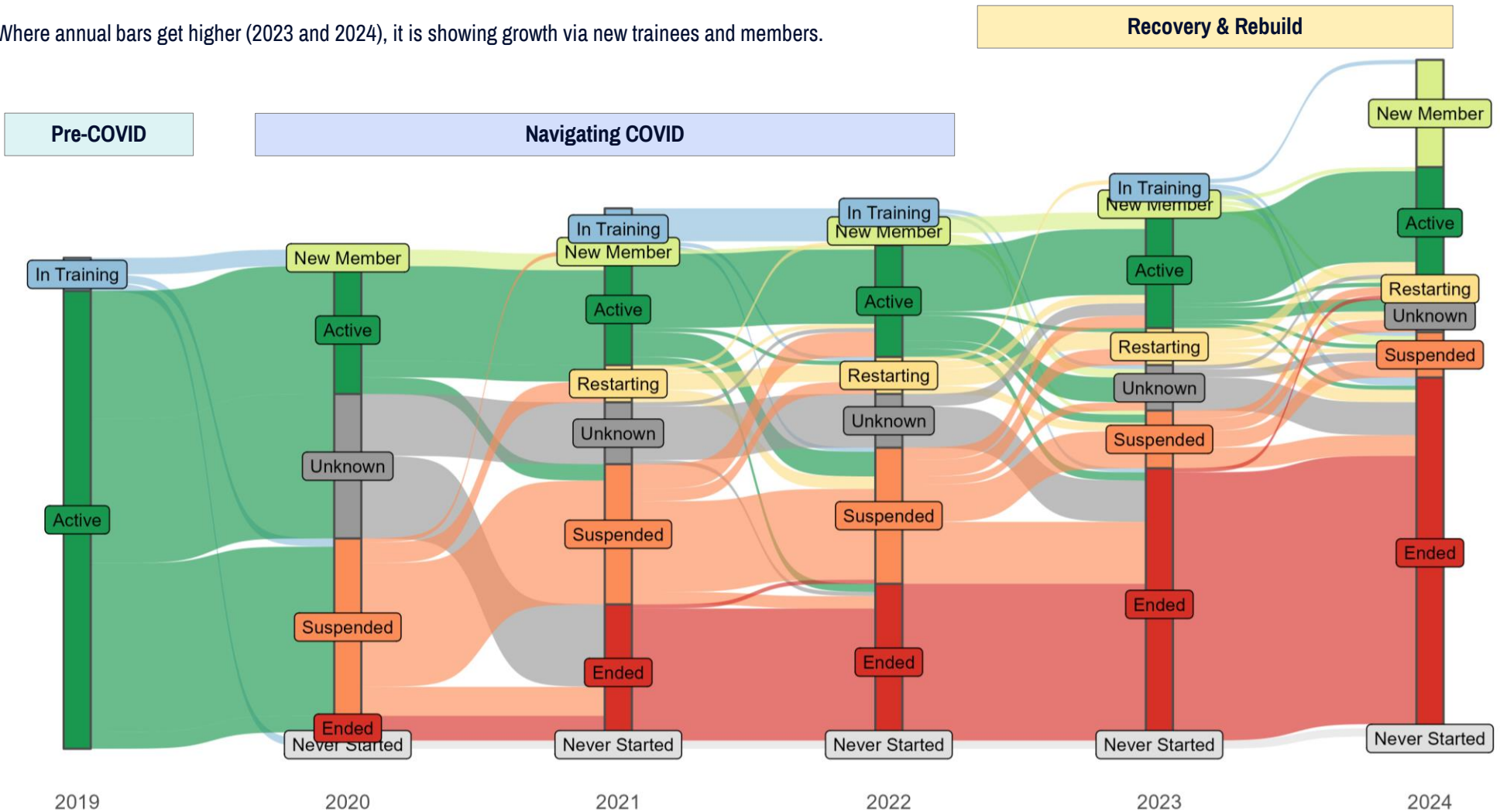


# Historical Analysis: Pathways of Change during COVID

The Network’s journey to navigate COVID was tumultuous; but a reset in 2022 started a period of recovery and rebuilding.

This diagram shows the status of each Café Program in the Network (the bars) at each year’s check-in point (since before the pandemic). The colored tracks between two years trace each individual Café’s journey from year-to-year. Colors that flow consistently (e.g., green-to-green show stable status); colors that flow into a different category, show the branches where various programs evolve and change in their ability to run programs.

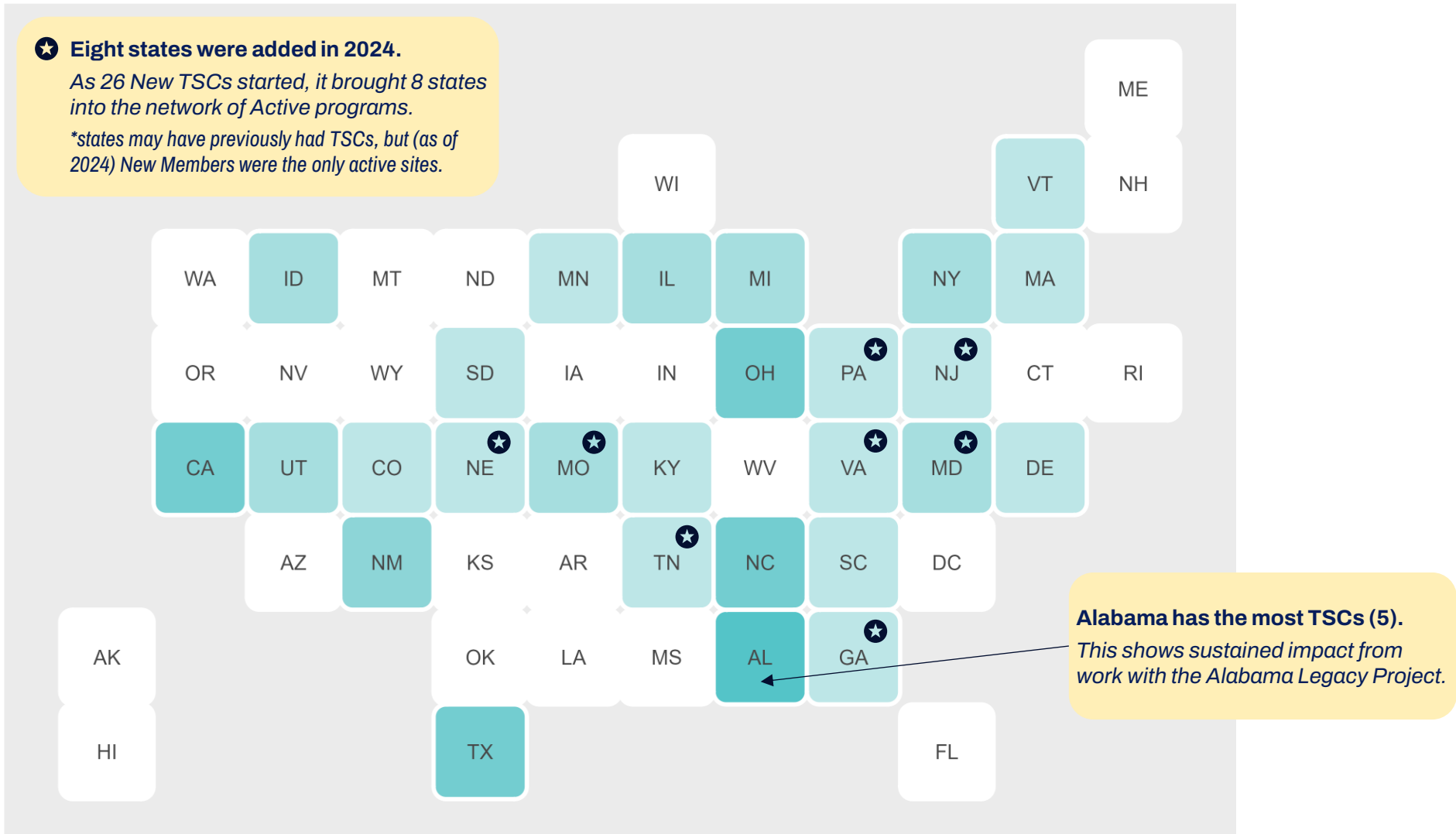
Where annual bars get higher (2023 and 2024), it is showing growth via new trainees and members.



# Current National Reach: 2023-24 Operating Sites

As of June 2024, TSC Programs were operating in 27 U.S. States.

This map only shows sites that were categorized as Active (continuing), Active (new members), Restarting, or In Training. Suspended and Ended programs, as well as those where the current status is Unknown are not included on this map. Darker colors on this map indicate more TSC programs are located there.





# RESULTS

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Status of the Network



# Status of Café Events at Active Sites

The vast majority of café programs held in 2023-24 were in-person. Virtual cafés represented only about 6% of total events held and continue to decline from previous years.

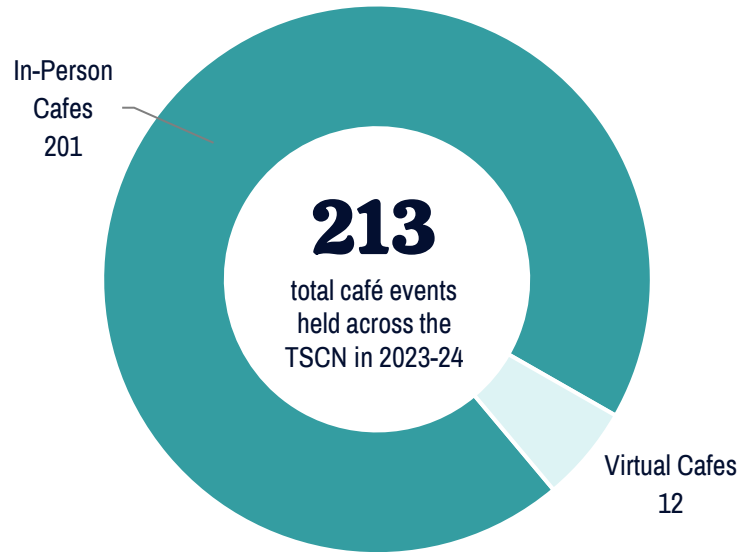
The total number of events reported by a single site ranged widely—one café site reported holding just one café event, while another reported holding 11 events this year. Within this wide range, **TSC sites typically held 4 in-person cafés**. Those that used virtual events typically held 2 in the year.

This year, **the number of sites reporting in-person cafes almost doubled from previous year**. This may be driven by the onboarding of new sites who are holding almost exclusively in-person events. Virtual café events continue to be held, but at fewer active sites compared to last year. Only 2 sites hosted virtual-only programs. Four sites combined virtual with in-person events in the year.

**74% of sites indicated they were planning to remain active and host café events in the coming year (2024-25)**. 24% said they were unsure and most of these uncertain sites were those whom the TSC team had limited contact with (i.e. No Communication), emphasizing the pattern of no contact indicating likely closure.

**213 Teen Science Café events were held in 2023-24, up slightly from previous year.**

Café counts reflect responses from the survey questions “What is the total number of events held at your site this past year?”, and includes recent data collected from the program’s tracking database.



Median number of events held, per site, in 2023-24

**4 in-person cafés**

**Almost all active TSC sites report holding in-person programs in 2023-24.**

Café format reflects responses to the question “Were you able to hold any café events between June 2023 and May/June 2024?” that asked sites to indicate whether their cafés took place in-person, virtually, or both. (n=42 sites)







# Audiences for TSC Members Target for Diversity

**About two-thirds of active TSC programs indicated that they specifically target teen groups that are historically under-represented in STEM for their programs. Targeting efforts sought to include more teens from a wide range of categories.**

Of those sites that reported targeting specific teen groups to diversify participation in STEM, 75% reported that they aim to engage teens from communities with lower socio-economic status in their area.

The next most common target audiences for TSCs was cafés that were interested in targeting participation by girls (69%) and Black or African American teens (63%).

Less common audience segments targeted by café programs to diversify STEM participation included rural, Latino/a/x, urban, and/or Indigenous teens in their communities. Sites that indicated another group included one that made efforts to target teens from migrant households.

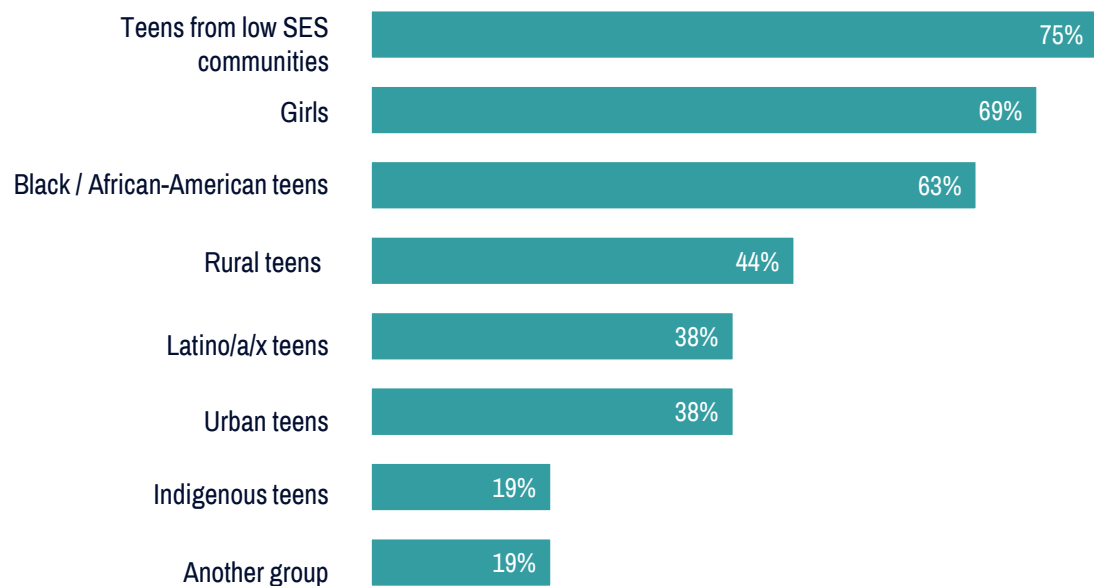
**64% of TSC sites indicated that they specifically target teen groups that are traditionally under-represented in STEM fields.**

Data analysis from survey question “Does your program specifically target teens from groups that are traditionally under-represented in STEM fields?” (n=25)



**Adult leaders report that teens from low socio-economic communities are the group they most frequently aim to engage, followed by girls.**

Count of responses to question “Which of the following groups of teens does your café endeavor to work with?” Respondents could indicate more than one group (n=16)





# RESULTS

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## Successes & Challenges

# TSCN Member Successes in 2023-24

**About half of TSC sites reported that their teen leadership group was a source of pride and success this year. This was followed by strong teen attendance and engagement and the development of community partnerships.**

The successes seen in teen leadership and attendance are notable as highlights, as data in past years found that reestablishing teen leadership during and in the wake of the pandemic had proven difficult for many sites.

Successes in building solid teen leadership also contributed to gains not just in stronger teen engagement but in other categories including their ability to recruit high-quality speakers and host cafés with popular topics (n=5). The development of community partnerships often led to sites’ ability to further develop new/more programming (n=4).

Seven sites described the importance of securing resources such as staff and funding, that supported their programming efforts, or in one case, enabled them to relaunch their program. This underscores the critical nature of staffing for a program to run.

**Teen leadership was the most frequent success reported by Adult Leaders this year.**

Coded analysis from survey responses to the question “Describe one big success your Teen Science Café program had this year.” An individual response could fall under multiple categories. (n=25)

(n=25)	Area of Success	Examples (in their words)
11	<b>Teen Ownership / Leadership</b>	“Teen Science leaders demonstrated improved agency and efficacy around organizing and marketing the cafes.”
8	<b>Strong Attendance / Engagement</b>	“Our one program this year had high attendance and engagement from teens.”
8	<b>Strong Community Partnership</b>	“We partnered with both [the local Art Museum] and the [local university] STEM Center to plan cafes this year.”
7	<b>Secured Resources</b> (e.g., staffing and funding)	“...we hired a new staff who will act as the adult leader for the program who has a lot of past experience working with teens!”
5	<b>Great Speakers / Topics</b>	“We had a diverse group of presenters and some interesting topics that engaged students in topics they don't normally hear about.”
4	<b>New (More) Programming</b>	“We also held our first summer course, which was decided by the [local university], but facilitated through [our] Teen Cafe program. Most of our other programs are just a single day, few hour events, and this was a weeklong course.”
1	<b>Relaunched Program</b>	“Our library system received a grant from Toyota, and some of the that funding helped us re-launch our STEAM Cafes with paid teen internships.”



# TSCN Member Challenges in 2023-24

**The most common challenge faced by café programs this year was low attendance and participant engagement. Some of this was related to scheduling and venue issues.**

Teen participation remained the perennial challenge this year (n=7), as has been seen each year post-pandemic. Some sites connected this issue with other difficulties they were experiencing such as having to plan around school schedules or last-minute emergencies (n=5), event logistics like transportation, planning, activities, or time (n=5), or challenges with venues (n=2).

In addition to teen participation, a few TSC sites were still struggling with teen leadership (n=4). Specifically, they were dealing with issues of program buy-in/ownership and attrition by graduating seniors (n=4).

TSC sites were also with challenged by limited resources such as staff and funding (n=4) and various organizational issues (n=4).

**Low attendance and teen engagement was the most common challenge TSC sites experienced this year.**

Coded analysis for the responses to the question “Describe one challenge that your Teen Science Café struggled with this year.” Individual responses could be coded for multiple different themes. (n = 28)

(n=28)	Area of Challenge	Examples (in their words)
7	<b>Low Attendance / Engagement</b>	“We struggled with getting attendance as high as we would like and to attract new people.”
5	<b>Program Scheduling</b>	“It was a challenge navigating the unpredictable changes in the school schedule.”
5	<b>Other Logistics Issues</b>	“Developing and integrating hands-on activities into the cafes for large audiences.”
2	<b>Venue Challenges</b>	“Our library branch flooded in the summer of '23 and still has not been able to reopen due to the extensive damage. We had to host all the cafes at a newer branch that is less centrally located than our downtown branch...”
4	<b>Teen Leadership Issues</b>	“Some of our teens who worked with me for 4 years have now graduated as they were seniors and heading off to college...”
4	<b>Limited Resources</b> (e.g., staffing and funding)	“One challenge this year was finding the time and funding to do more than a single one-day event.”
4	<b>Organizational Challenges</b>	“I experiences staff turn over...and it was challenging to keep it all going myself.”

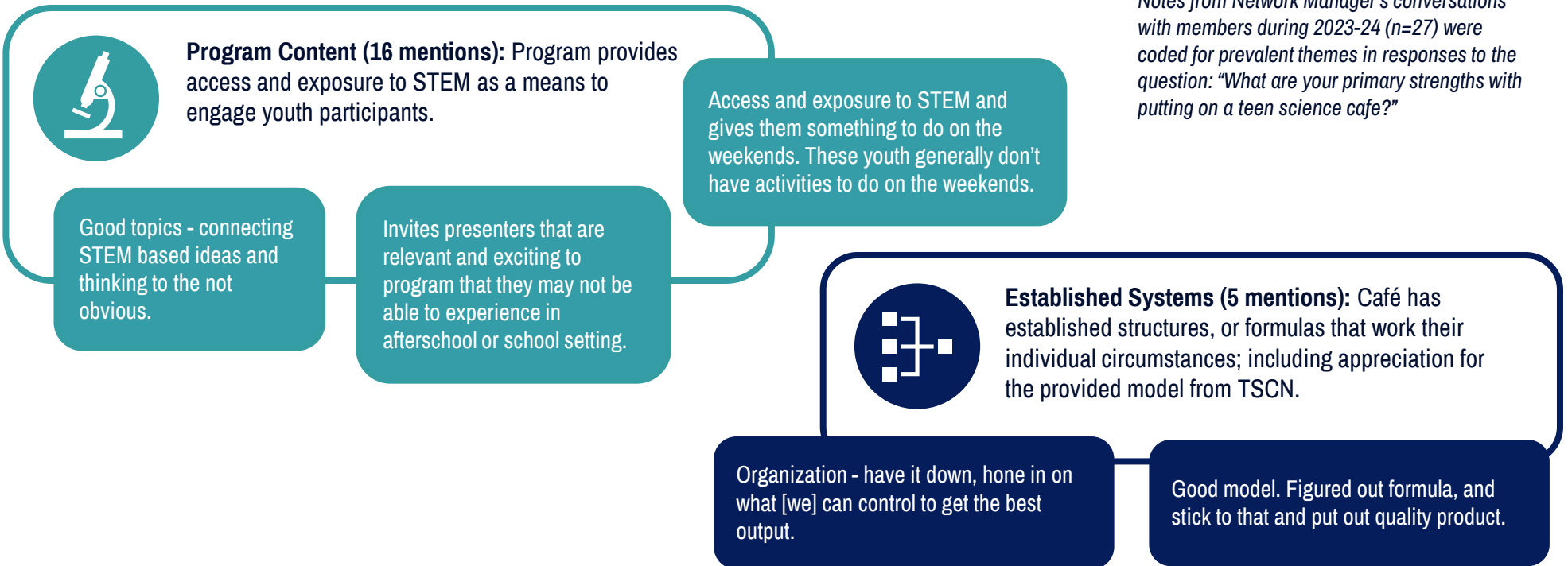
# Program Strengths: Program Design Elements

The most common theme during member conversations with the Network Manager was that cafés see the strength of their work in the programs they deliver – that they are successfully providing access and exposure to STEM to youth participants.

As can be seen in the excerpts from manager notes (below), the delivery of programs rich in STEM content for audiences who can benefit from it of key importance.

A far less common, but notable theme, in the responses from TSCN members were 5 adult leaders who described an area of strength as being that they had established structures and systems that were working well. While some were talking about the guidance and models from TSCN, others were talking about how they had figured out “what works” for their site, and are able to keep things running smoothly because of these systems and routines developed.

*Notes from Network Manager’s conversations with members during 2023-24 (n=27) were coded for prevalent themes in responses to the question: “What are your primary strengths with putting on a teen science café?”*





# Program Strengths: Teen Leaders & Attendees

**For a handful of sites, when discussing the unique strengths of their programs, the teens were a key focus – either describing high levels of engagement from teens (particularly teen leaders) or describing success with maintaining attendance.**

The excerpts from conversations with the Network Manager (below) highlight some of the ways that adult leaders described strengths of their programs that were centered on teens. The descriptions of teen engagement were particularly notable for examples of programs that have been really successful at creating programs for-teens and by-teens.

Maintaining attendance wasn't the most commonly mentioned strength – most adult leaders focused on “higher level” concepts (see other pages) when they talked about the strengths of their program. However, the sites who talked about this clearly recognized that this fundamental piece – getting and maintaining robust participation from teens over time – is a success to be proud of and celebrate.

Kids were enthusiastic and engaged - kids are excited and want the next cafe.



**Attendance (4 mentions):** Sites sustaining teen participants- new and/or returning.

Advocacy element - every cafe is geared to understand how some issue affects the community is perpetuated. Then the Teens Leaders present to local government. Virtual Epidemiologist speak- learn how vaccines produced and how RD prioritizes vaccine development. Went to city council and talked about how COVID could affect their community. A lot of the communities don't understand it and how it led to medical hesitancy.

**Teen Leaders / Engagement (6 mentions):** Enthusiasm, excitement, or commitment from teen participants as shown by above-and-beyond participation; often referencing teen leaders (but not exclusively).



Teens are just great - communicate well and are passionate about the program. Realize [the program] is not their priority, but still put some time into it.

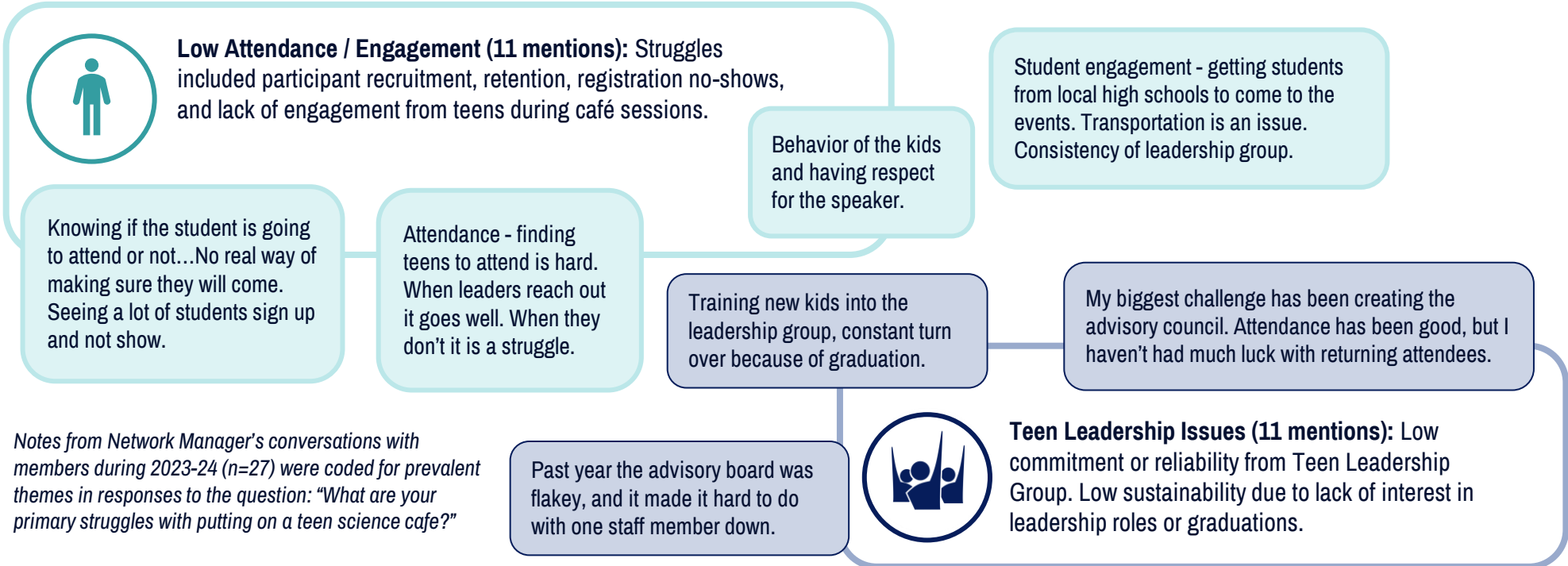
Audience size and retention. Fair number come for the service and extra credit hours, but they are still having a positive impact on that.

# Program Struggles: Teen Leaders & Attendance

**While teens were an area of strength for some sites, issues with teens – whether leaders or general attendees – were the most frequently mentioned issue overall in the conversations with adult leaders.**

The comments from the meeting notes that fell into these two themes illustrate the effort and barriers (often out of their control) that face adult leaders in creating this teen-led and teen-serving experience. Teen leaders are a lynchpin of the model, but for 11 of the sites in the conversations, there were significant struggles with engaging teens in this role.

Further, as described on the prior page, getting attendance at sessions is a major element of the model. And when it is a struggle, as it was for 11 of the adult leaders in these conversations, it is a major barrier for a TSC program site to feel successful. A sub-theme in the conversations in this category was the issue of “no shows” – teens who sign up to attend, but ultimately don’t come. While we don’t have quantified data on this, there is a sense among many that this is more of an issue post-pandemic than it was in the past.



*Notes from Network Manager's conversations with members during 2023-24 (n=27) were coded for prevalent themes in responses to the question: "What are your primary struggles with putting on a teen science cafe?"*

# Program Struggles: Limited Resources & Funds

**The other major struggle that arose in conversations with the Network Manager was adult leaders having to deal with limited resources – primarily a lack of funding, but also staffing challenges (which is, indirectly, an issue of funding).**

10 of the 27 conversations held by the Network Manager with adult leaders this year surfaced comments about struggling to secure sufficient resources to support their TSC program. This emerged as a lack of funding for direct expenses (like food or transportation), as well as issues with having sufficient staffing or time availability among existing staff.

This report will explore data about funding in more detail in the next section, exploring preliminary conversations about the cost of cafes and the differences of what expenses are included within it.

One adult leader, in these conversations, talked about a larger institutional issue of trying to find the connection of the program with their organization, its leaders, and its mission. This was a rare topic to be explored, which may be specific to this particular site. In the next section, we also explore data about mission-fit.



## Limited Resources (10 mentions):

Difficulty securing resources, like funding and staffing, to run the program.

Bandwidth - more time to think about longer term plans for the program and have more time to work with teens and speakers to get to the point of hands-on activities and growth opportunities for them.

Funding because [we] want to feed the students and have to rent space.

Funding, trying to provide transportation. Serve underrepresented students, accessing transportation, meals, entrance fees.



## Organizational Challenges (1 mention):

Issues aligning or fitting host institutional priorities.

More internal than external, finding the right balance with the priorities of the institution, adult leader, and the young people matching those together. Look at the institutional priorities, think through topics, own priorities is connected to community and thinking about implications of the science, not just science for science's sake. Want social connection to that. Who is the right speaker.



# RESULTS

## Needs & Network Support



# TSCN Contribution to Organizational Priorities

The TSCN contributes to organizations in three major ways – promoting STEM discovery, teen empowerment, and community relationships.

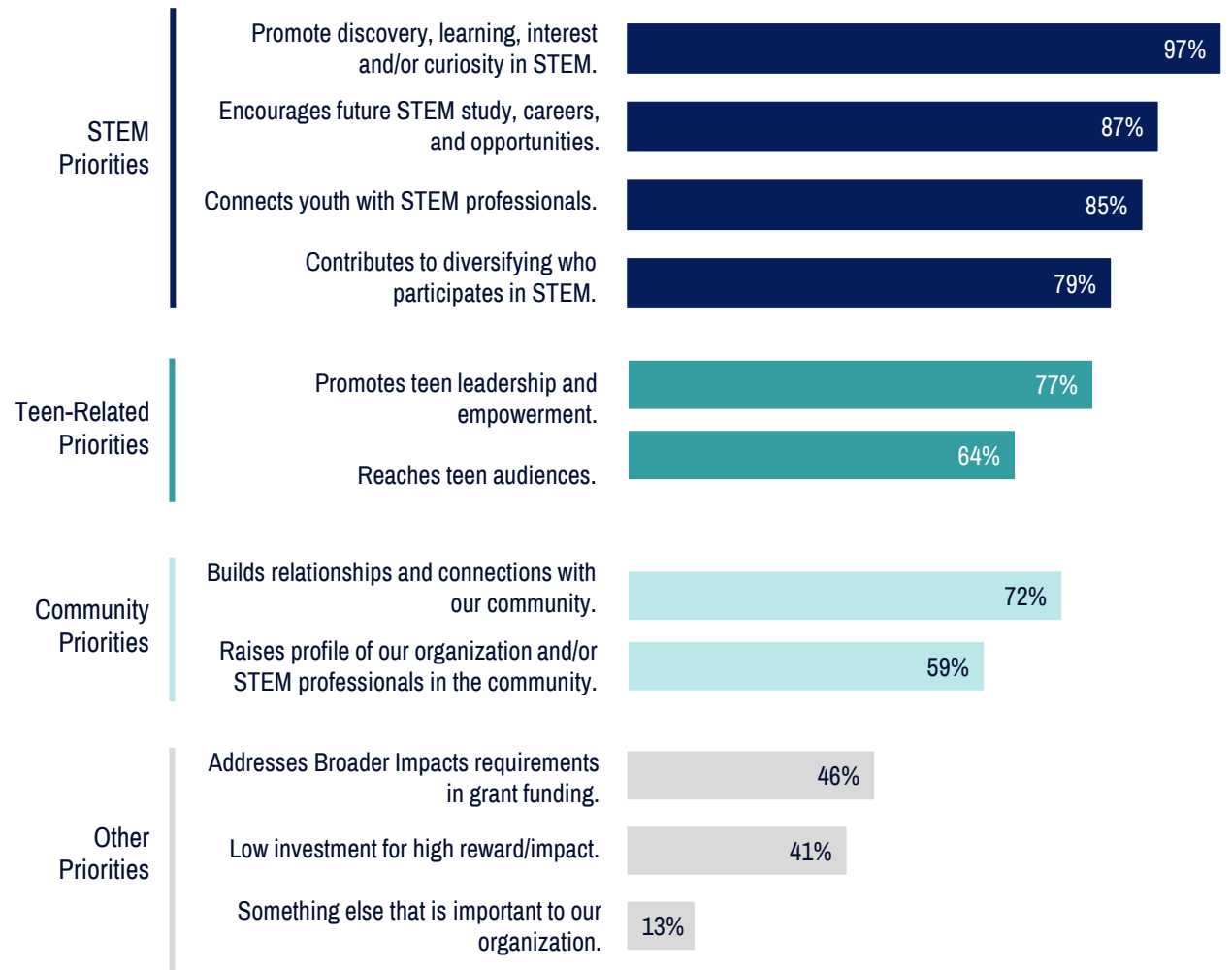
The group of statements that related to an organization’s STEM priorities were the most universal for TSC sites, with each of these items being selected by almost 80% of active TSCN sites. The tie to organizational mission of promoting discovery in STEM was almost universal across sites. These data are fairly consistent with priorities expressed last year.

Within teen priorities, 77% of organizations related to the program’s value in promoting teen leadership, and 64% identified the benefit as helping them expand reach to teen audiences. However, promoting teen leadership was not quite as resonant with this year’s larger pool of responding TSC members as it was in 2023.

In community priorities, 72% felt it helped them build community connections and 59% said it promoted their profile. Fewer adult leaders connected to instrumental values such as broader impacts in grant funding or feeling like the program was a low investment for the impact received.

Almost all respondents reported that their teen science café program contributes to their organization’s priority of promoting STEM curiosity and learning.






Count of responses to question “What benefits or value does a Teen Science Café program contribute to priorities that your organization care most about?” Respondents could select more than one option (n=39).



# Organizational Mission-Fit: Member Conversations

Five main themes emerged in TSC members’ responses describing how they saw the TSC model fitting with their organizations’ missions.

Coded analysis of responses to the question “How does TSC fit with the organization’s mission?” Themes were coded from recorded interview notes. Individual responses could be coded for multiple different themes. (n = 30 adult leaders)

	Mentioned (n=30)	Specific Concepts Visitors Learned
	12	<b>Build Interest in STEM</b> Encourages curiosity or engagement with STEM. Builds personal connections to STEM with the intention of inspiring informed citizens.
	10	<b>Broaden Access to STEM</b> Program helps to reach underserved communities. Showcases a diversity of people who do STEM work.
	10	<b>Career Development</b> Build awareness of STEM careers and prepare participants for future education in STEM.
	6	<b>Youth Development / Leadership</b> Encourages growth in soft skills like confidence and leadership. Help develop ambassadors (to STEM) in their communities.
	8	<b>Other Institutional Priorities</b> Aligns with the strategic goals, initiatives, or priorities of the host institution. Supports various functions at the host institution.

There were five main themes in how adult leaders described the program’s fit with their institutions’ missions – with the potential for STEM-related impacts on teens dominating the ideas raised.

Responses to the question about mission-fit of the program within their organization hit on three distinct angles of STEM impacts that resonate for institutions: (1) generally building engagement with STEM, (2) broadening access to and diversity of people interested in STEM, and (3) supporting the potential development of STEM career awareness and interest.

The other core theme (for 6 of the adult leaders) was the idea of broader youth development and leadership. While these responses could raise STEM themes, the element of developing youth leaders, mindsets, and skills was the centerpiece. This connection resonates with the founding of the TSCN, which was built on the principles of the field of positive youth development.

Beyond these topics, 8 adult leaders noted more general interests and priorities of the institution that the TSC could fulfill. These responses tended to be more focused on the benefit to the institution than to the teens.

*Example excerpts are shared on the next page.*

# In Their Words: Excerpts about TSC Mission-Fit

Excerpts of responses to the question “How does TSC fit with the organization’s mission?”

Responses are from notes taken by the TSCN Network Manager during conversations with members during 2023-24.

## Building STEM Interest & Access

Outreach, bringing opportunities to those underserved in STEM areas.

Work with 6-12 graders prioritize under rep youth build pathways to STEM and more scientifically informed citizens.

Natural history, nature, and science museum - reach other audiences - bringing nature and science to everybody and hit the age group hard to get in the door. Different base of visitors to the museum.

Develop a love of STEM in underserved communities. Cafe allows the students to guide their own learning in STEM and learn how STEM touches almost every aspect of their life.

Make science and technology accessible to all - exposing teens to science and researchers, and the teens act as ambassadors to the community on behalf of the museum and the research do there.

Core mission - create a more science literate population. Youth initiative division middle and high school students. Short-term engagement opportunity. Used for exposure [to] work, interested in them coming to the museum. Use it share information in longer program that they could be interested in.

## Youth Development & STEM Careers

One of the goals is to increase the number of stem professional who come out of the school. Introduce the kids to different opportunities. Industry jobs and university speakers. Give kids idea of what jobs are out there.

Mission and vision make sure students are connecting with STEM professionals. This was a perfect opportunity for folks to go through facilities.

Youth development - allows to think of the whole child - out of school, live skill development, building core values, social responsibility and healthy living. Strive to allow them to have relevant input, implications on their community and global community, think about others and themselves. How can they better their mental health and interpersonal skills.

## Other Institutional Priorities

[Program name] has folded in seamlessly with the work of the Museum Engagement Team, which works to develop programming for K-12 & family audiences.

# Challenges Facing TSC Sites

While recruiting teen leaders continued to be some level of challenge to most TSC sites, securing funding and staffing for their program was reported as being very challenging for 43% of respondents.

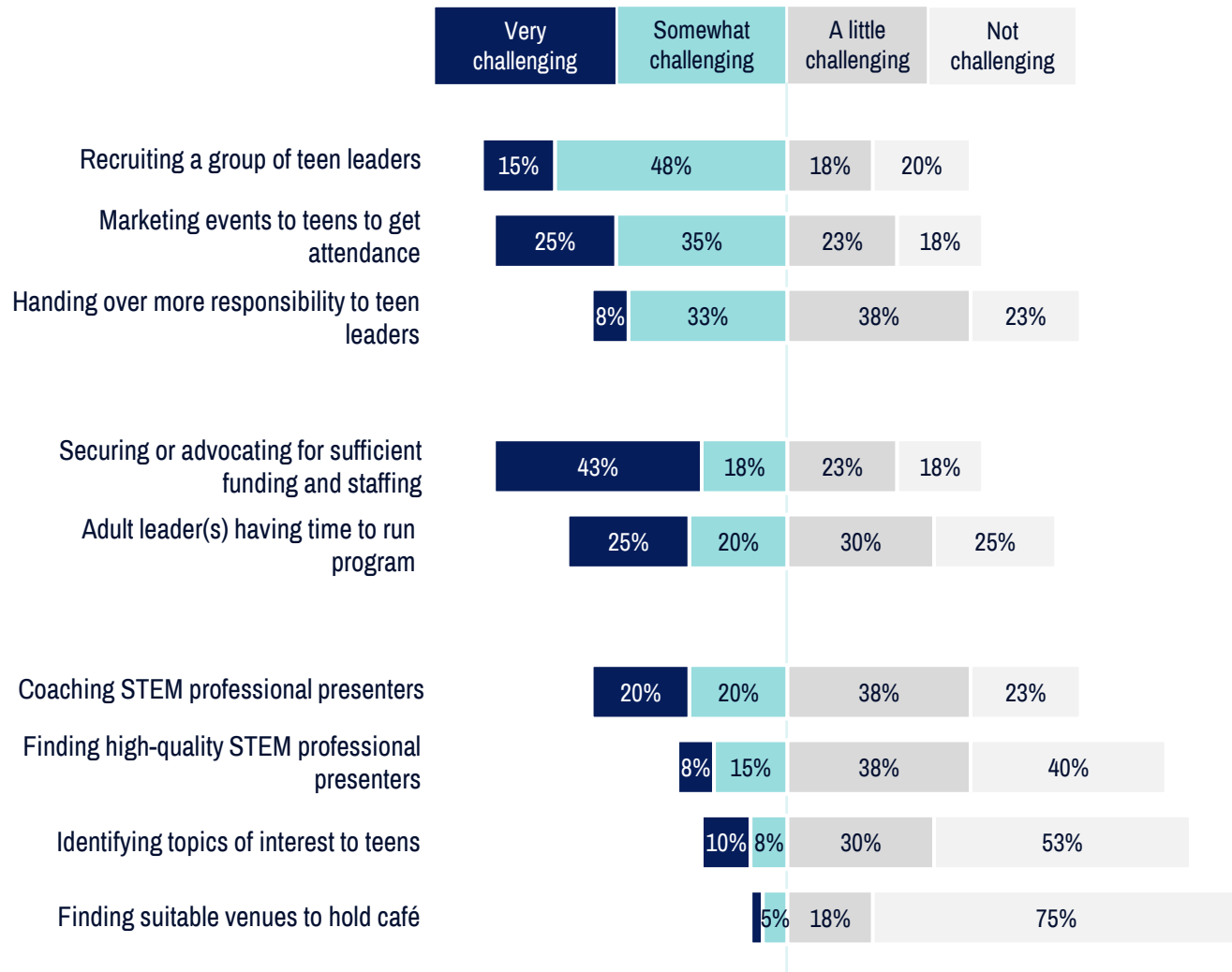
Within teen engagement issues, 63% of sites reported recruiting teen leaders as very or somewhat challenging and an almost equal amount said marketing events to promote attendance presented difficulties (60%). Only 41% of sites indicated challenges delegating responsibilities to teens with only 8% noting this was very challenging.

But 61% of TSC sites were facing issues of securing program funding and/or staffing, with 43% reporting this as a very challenging issue. Carving out adult leader time to run the program also presented a challenge for 55% of sites. This suggests that making the case to institutional leaders could be an area for Network support.

Around program topics, 40% of sites found coaching STEM professionals a challenge. Other difficulties such as finding STEM experts (23%), identifying topics (18%), and finding venues for their events (8%) were less of a concern.

This year, TSC sites described challenges related to teen engagement, resources, and programming logistics.

Count of responses to question “What would you say tends to be the most challenge aspects of running a Teen Science Café program at your organization?” Respondents could select more than one option (n=40).



# Program Funding: Sources & Budgets

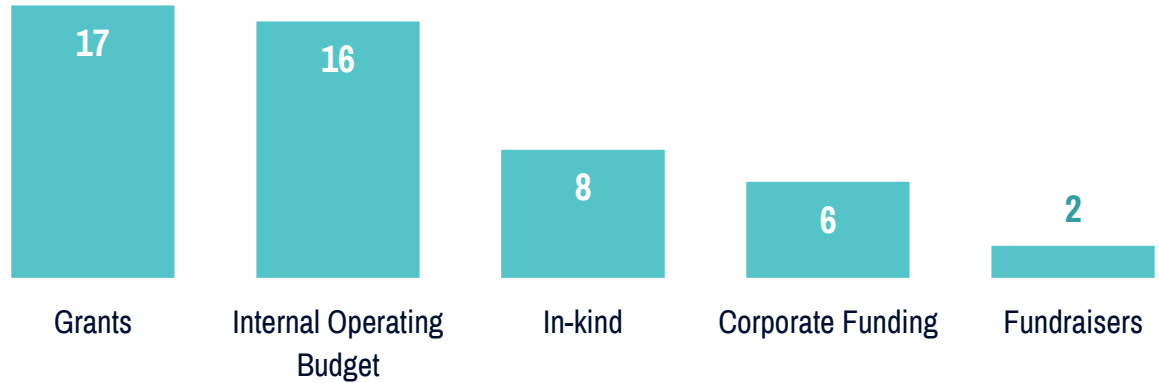
Café programs’ descriptions of how they were funded tended to be roughly split between coming from grants (including stipends provided by TSCN) and those running on operating funds from their host institution.

Conversations with members began to shed some light on the funding structures in the Network. In open-ended conversations about how programs were funded, there a mix of relying on grants versus those written into operating budgets (although some were in both categories). Corporate funders were less common. It is worth noting, **one adult leader reported paying for their program out of their own pocket.**

Only about one-third of the programs gave any kind of budget estimates, and those varied wildly. Some provided per-café costs, while some offered an annual budget (see right). A key difference in estimates were that most sites only seemed to include direct costs – food, space rental, etc. But others factor in the full cost of staff time (see the \$20k budget). This may be an important factor to consider in future research, in order to more clearly quantify the real cost of starting a TSC program.

**Grants and hosts’ operating budgets were the most common sources of funding.**

Coded analysis for the responses to the question “How is your café funded?” Themes were coded from recorded interview notes. Individual responses could be coded for multiple different themes. (n = 28)



**TSCN members operate with budgets ranging from \$400 to \$20,000 each year.**

Some TSCN Members provided estimates of their program’s costs (per session and/or per year). Responses were analyzed to better understand the budgets TSC’s operate within. (n = 11)





# Interest in Opportunities for Community-Building

Although TSC sites responded favorably to a variety of ways to connect with the Network, the greatest interest was for an in-person TSCN conference, followed by interest in a searchable database of Café programs.

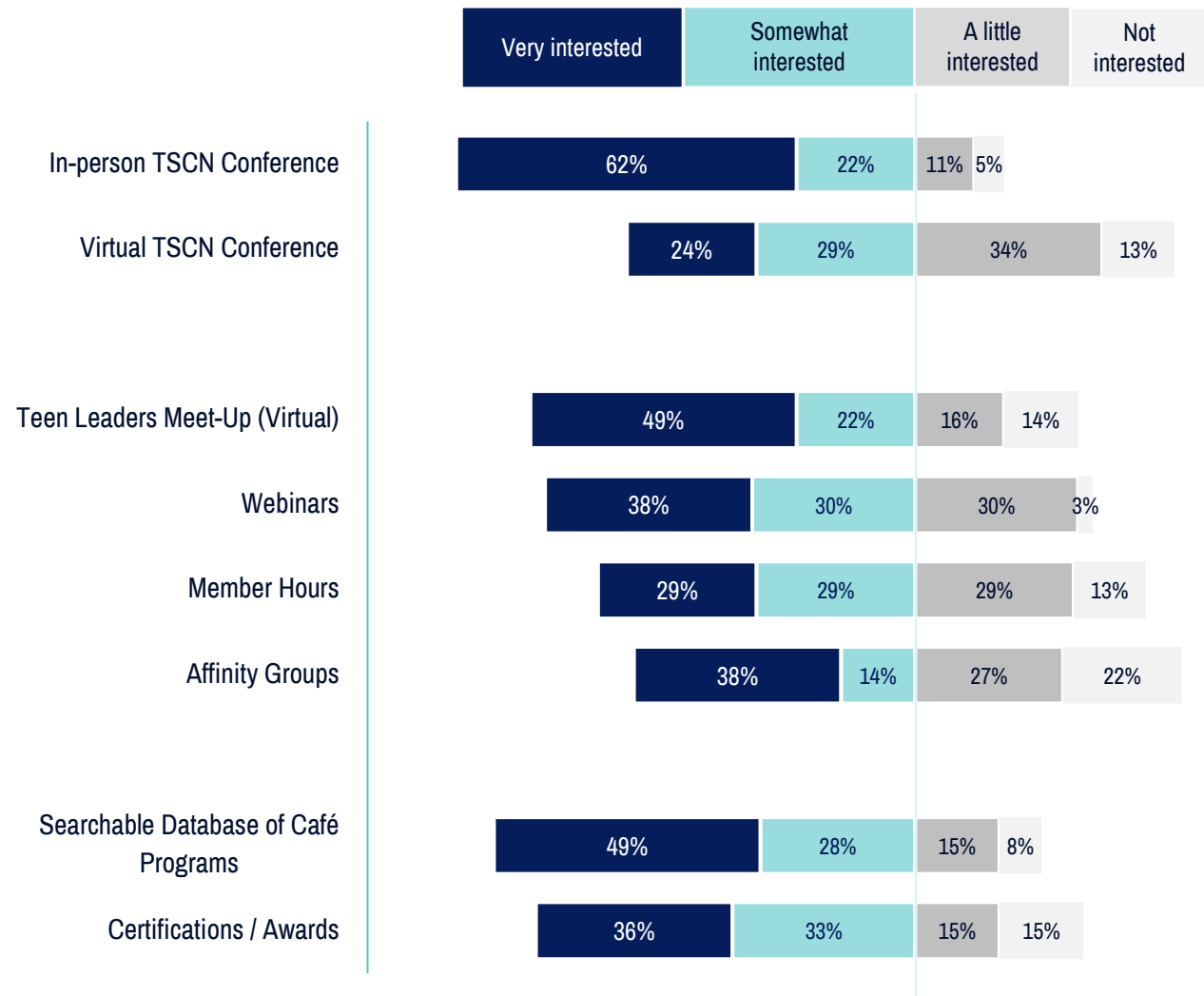
84% of TSC sites indicated being “somewhat” or “very interested” in attending an in-person TSCN conference. A virtual conference was less appealing, in comparison. Given the success of the first conference in many years, these data suggest that continuing to arrange that in-person gathering would be high-value for many.

Options for other virtual meetings were also viewed positively, but less enthusiastically than a conference, including meet-ups for teen leaders (70%) and webinars (68%). While member hours garnered more cumulative interest (58%), sites indicated stronger interest in affinity groups, with 38% indicating very interested.

TSC sites continued to report high interest a searchable database of café programs (77% very or somewhat interested). They were somewhat less interested in professional development certifications, awards or recognition (69%).

**TSC sites were most interested in participating in an in-person conference.**

Survey participants rated their interest in participating in to support their teen science café program. The rating scale ranged from 1 (Not interested) to 4 (Very interested). Distribution of responses are presented below (n=40).





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