

Sustainability in FIRST

Thoughts on building a FIRST robotics program with continuous improvement, resiliency, and sustainable practices.

Zac Young - Team 2056
2056 Ways To Inspire Conference
October 1, 2016

My Background

Zac Young

BASc, University of Waterloo (2015)

Co-Founder, H2nanO

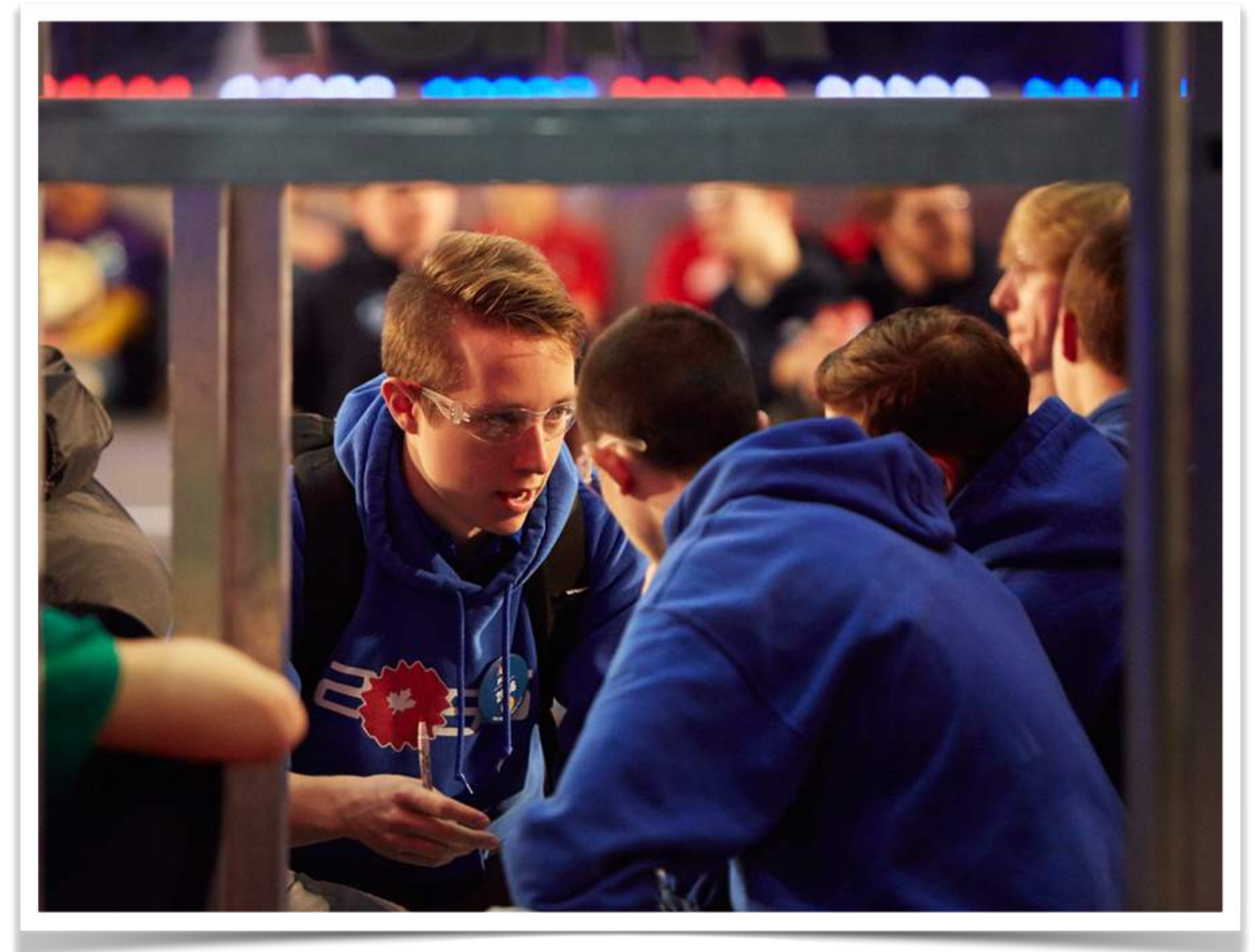
Team 2056:

Student (2007-2010)

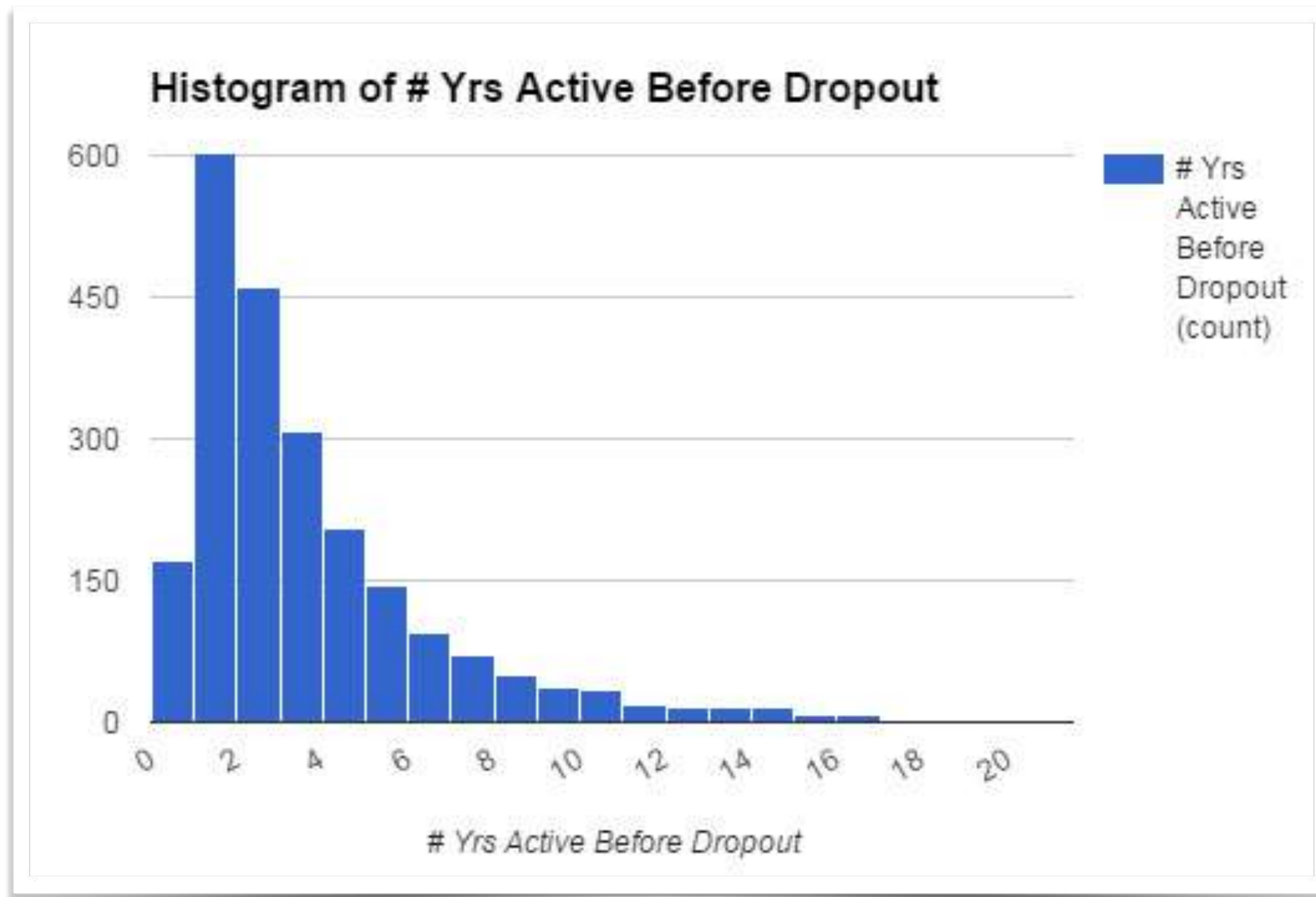
Mentor (2011-2013)

Drive Coach (2014)

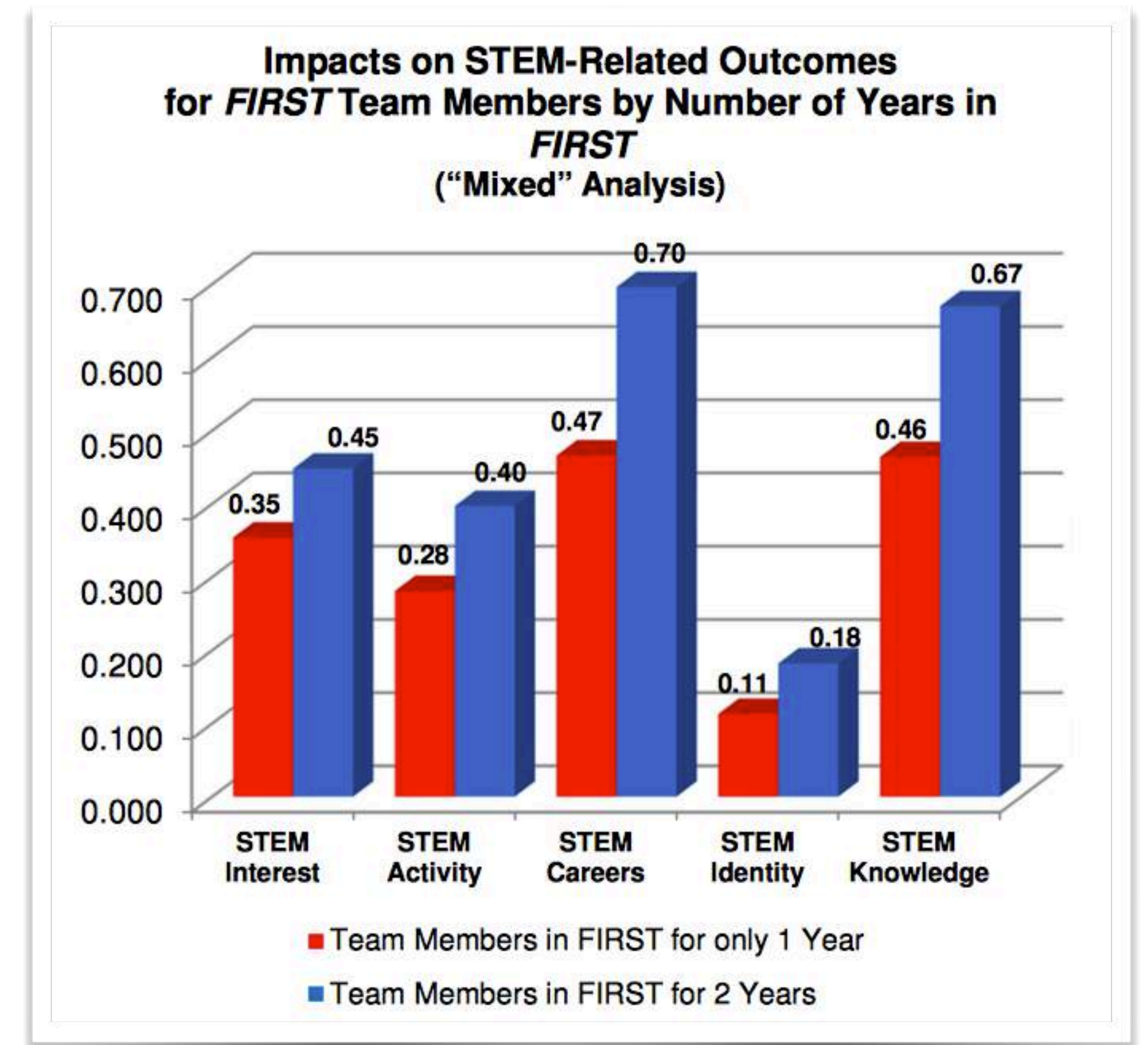
Board Member (2015-2016)



Longevity: Challenging, Impactful

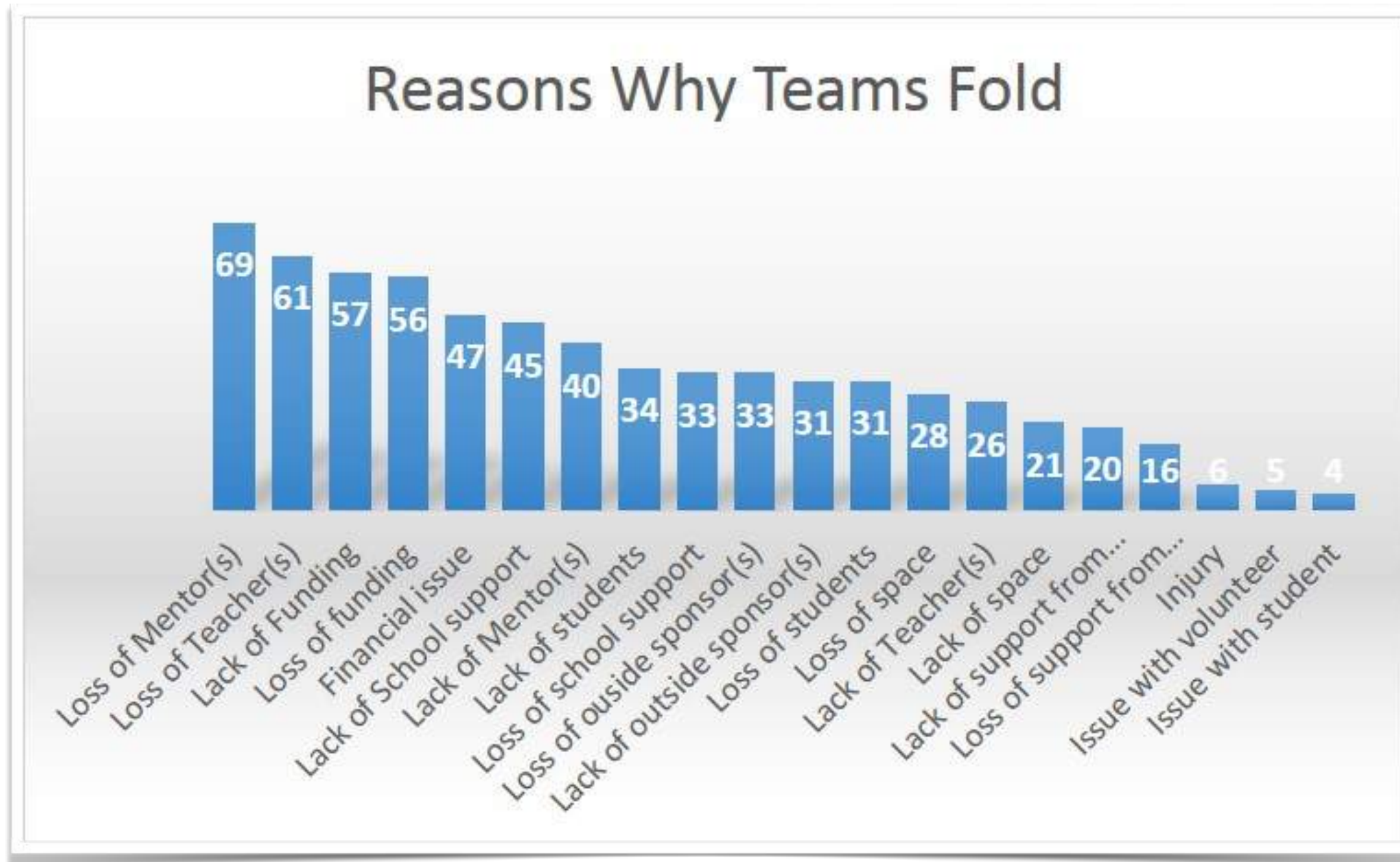


Source: (O'Donnell, 2016)



Source: (Brandeis University, 2016)

Reasons For Folding



Source: (Team 1389, 2014)

- Reasons for folding are mostly independent of student enrolment
- Leading causes focus in three key areas:
 - Loss of team leadership
 - Inadequate funding
 - Lack of support from board or community

Building Lasting Impacts

"We are changing culture, we are trying to change the world.

We build more than just robots;

We build people, we build communities, we build infrastructure."

- Team 1114, 2012 Chairman's Video

"To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology leaders."

- FIRST Vision

What We Will Discuss

Sustainable systems and practices for:

Students

Team Leadership and Mentors

Fundraising and Community

Key Outcome: How FIRST programs can use reinforcing practices for long-term success.

Students

Ideas for creating a sustainable cycle of student growth and leadership.



Student Generations

- Old FIRST programs are actually quite youthful
- As of 2016, Team 2056 has only graduated 2.5 generations of students
- An ideal program will mature to provide students with a full 4-year growth plan



Growth Programming

Year 1 (Gr. 9)
New Member

Exploration of team
Personal maturation
Basic skills
Role shadowing

Year 2 (Gr. 10)
Junior Member

Sub-team focus
Adding responsibility
Secondary skills
Role shadowing

Year 3 (Gr. 11)
Senior Member

Project managing
Independent work
Advanced skills
Role leading

Year 4 (Gr. 12)
Team Leader

Sub-team managing
Leading work
Teaching skills
Team building



Knowledge Transfer



The Mentor To Student Division

- The measure of “student built” robots is a fallacy
- FIRST succeeds where the student to mentor path is a continuum
- Effective teams will move the balance of skills and leadership from mentors to senior students
- Mentorship should come from all levels



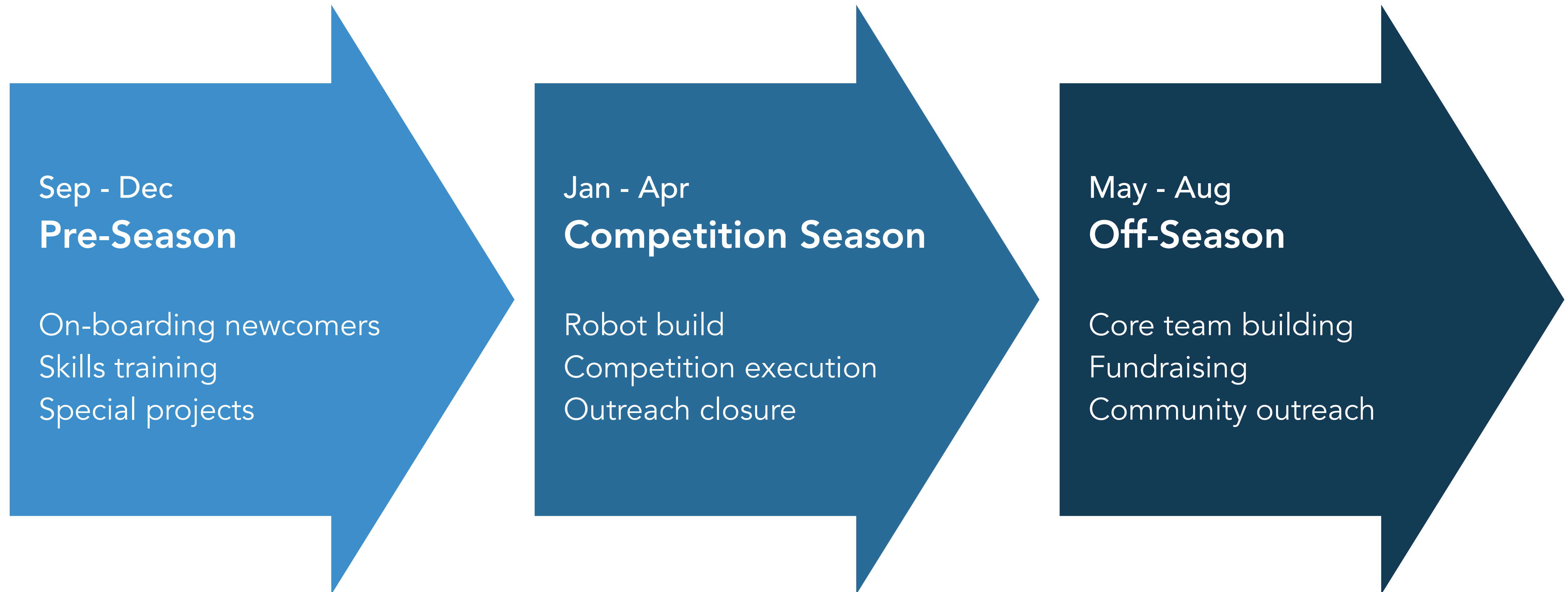
Direction

Instruction

Execution

Observation

365 Day Seasons



Curriculum Integration

Exploring Computer Technology

TEJ101

This exploratory course introduces students to concepts and skills in computer technology, which encompasses computer systems, networking, interfacing, and programming, as well as electronics and robotics. Students will develop an awareness of related environmental and societal issues and will begin to explore secondary and postsecondary pathways leading to careers in the field.

CREDIT: 1

TYPE: Open

GRADE: 9

- Incorporating robotics into class hours and curriculum can extend learning, build student interest and contextualize concepts
- Not reserved for technical education courses; this can apply to any STEM related course

Feeder Programs

- LEGO and VEX robotics programs provide an accessible pre-training for students
- Students entering FRC with basic design skills have greater opportunity to develop
- Teaching fundamentals teaches leadership and management skills



Team Leadership

Establishing distributed, resilient leadership
and sustainable turnover.



Evolving Team Leadership



- Resilient teams build leadership structures that can share the load and be replaced
- Teams that remain reliant on key mentors are vulnerable

Mentorship Development

- FRC mentors must also be trained:
 - Alumni mentors must develop teaching and management skills
 - Professionals must gather experiential FRC knowledge
 - All must become acquainted with team culture and find their role

New Mentor

Junior Mentor

Senior Mentor

Team Management

Transparency and Oversight

- A board or committee for team oversight can open high level decision making to a diverse group of stakeholders
- Establishing transparency and evaluation mechanisms early provides clarity
- As team matures, growth can be sustained if the team operations open and standard activities can be transferred to new hands
- Strong communication networks help team leadership to work effectively

(Re)defining Leadership Roles

- Accountability and responsibility should be negotiated
- Respect team roles, both in meeting commitments and relinquishing control
- As teams grow, leaders must ensure their mindset scales with the program



Growth

Management

Tasks & Execution

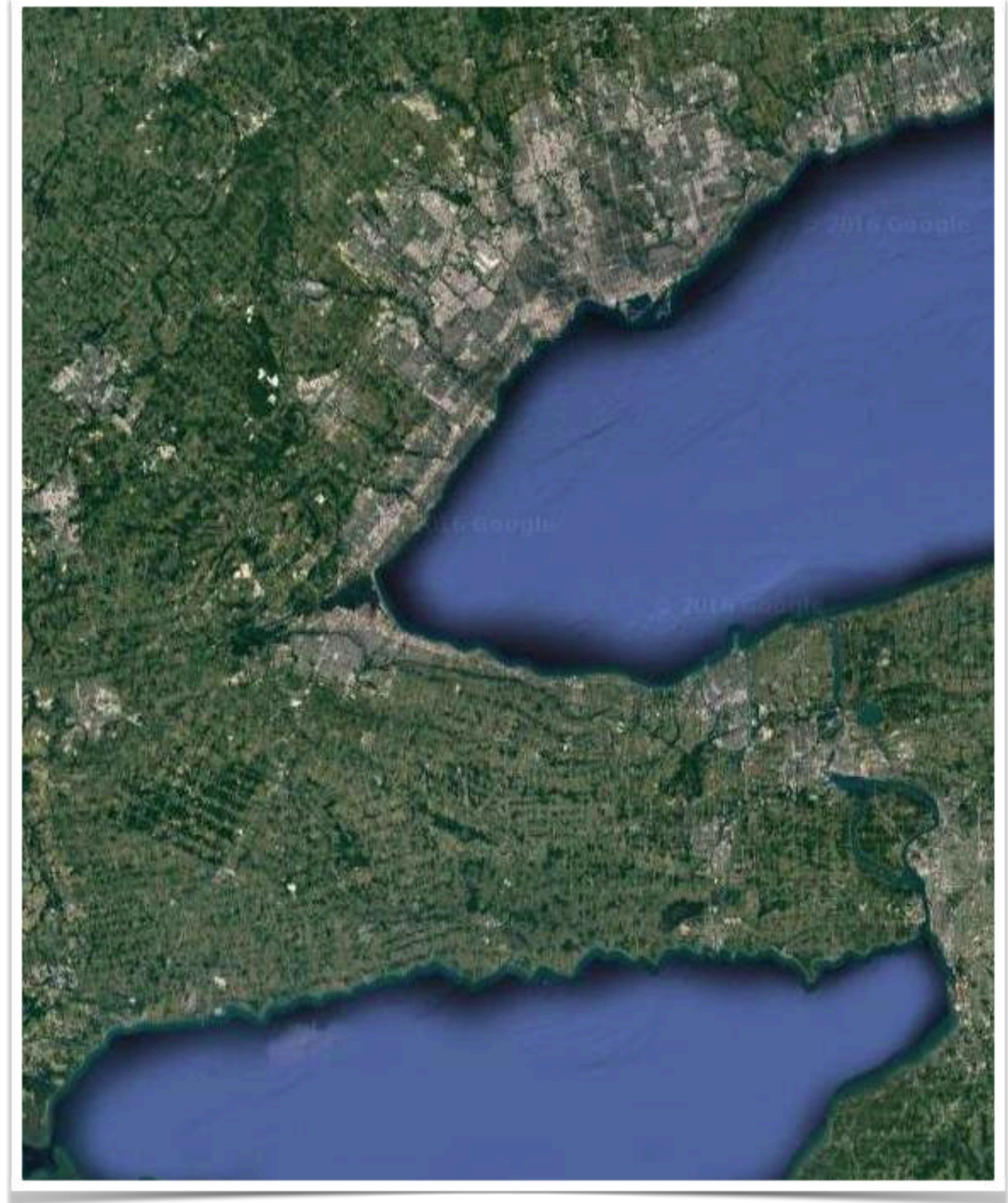
Adding Support

- Set cultural expectations for parental buy-in
- Sponsor mentors create internal champions for added support
- Clearly defined roles, especially for recurring annual activities are best
- Opening the team to involve parents and sponsors provides reliable support base



Fundraising and Community

Building a solid foundation to provide the perpetual support needed for students and mentors.



Sponsor Development

Stage 1 Engagement

Networking
Student outreach
Characterization

Stage 2 First Contribution

Funds or in-kind
Introduction to FIRST
Growing support

Stage 3 Retainment

Recurring commitment
Impact reporting
Relationship building

Stage 4 Integration

Team directing
Evangelizing
Co-campaigning

Sponsor Engagement

Sponsorship Packages:

- Add multimedia, student written letter, tour invitation
- Give graded funding asks and clear outcomes

Level	Bronze \$200 to \$1000	Silver to \$4500	Gold to \$6000	Title Over \$6000
Link to your website from Logo on our Website Name on 100 Team T-shirts	✓	✓	✓	✓
Name and Logo on Pit Screens at Competitions		✓	✓	✓
Company Logo or Name on Robot (space dependent)			✓	✓
Company name included in Team name and on Letter Head				✓

- The first commitment may only be attending a meeting or competition; intake can be a process built over time
- Share with a sponsor what is in it for them! We provide talented students and a culture of promoting STEM in the community

Sponsor Retainment

Sponsor Visits:

- Host lunch and learns, robot demos, and thank-you events
- Ask to learn from them, both mentors and site visits

Competition Invitations:

- The #1 way to impress is to show them the excitement of a competition and the scale of the program

Co-Outreach for Funding and Community:

- Invite sponsors to help fundraising and add them to outreach events where possible; leverage your partnership to do more



Financial Tracking and Planning

- Robust financial reporting and forecasting improves ability to set funding targets
- Transparency in fund allocation can be used to build sponsor and school confidence in resource allocation
- Setting funding goals and targeted raises can provide a clearer sponsorship or board funding outcome
- Long term planning for program growth is important; adding large program infrastructure can be difficult in a single year of raising

Strategic Thinking

- FIRST program objectives seem obvious but their means are not
- Setting milestones and key metrics for the team adds maturity and leadership buy-in
- Sharing long-term goals gives sponsors and administrators a roadmap to measure against
- Big picture change takes planning

Team Mission

5-10 Year Goals

2-3 Year Plans

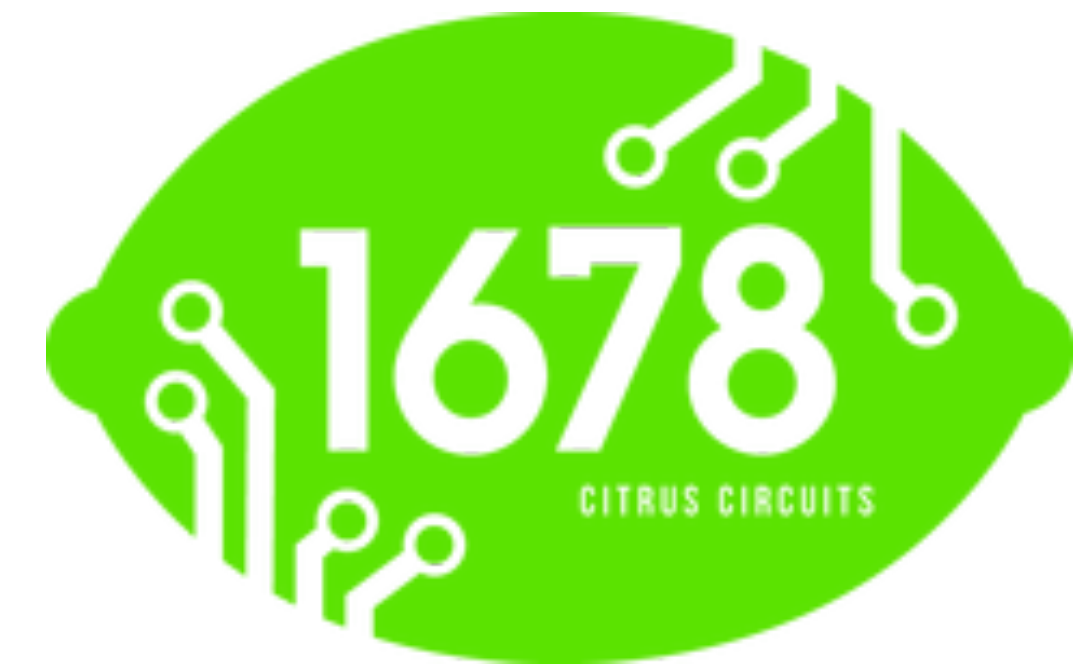
Season Objectives

Community Outreach

- Community outreach is not to just an exercise: do work with a purpose!
- A higher degree of focus, but a greater depth of impact outweighs a broad and unremarkable program
- Use your outreach to fuel team excellence, and it will reward with a more sustainable team
- Do it for the right reasons, not just to win the Chairman's Award



Visibility and Brand Development



FIRST Community Networks

- Large scale cultural change is easier with many actors
- Inter-team collaboration on major board and community initiatives leverages the capacity of all
- Gives new teams support network and means to access bigger impact activities
- Community outreach in a vacuum helps no-one; multi-team initiatives are just as valuable for awards!



Thanks!

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