UTSA
The University of Texas at San Antonio™

INTEGRATED DESIGN PHASE I REPORT

August 2020

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CHAIR: **JoAnn Browning**	*Dean, College of Engineering* *Interim Dean, College of Architecture, Construction & Planning,* *Professor, Civil Engineering*
Taylor Adkins	*Executive Director of Development, College of Engineering*
Ibukun Awolusi	*Assistant Professor, Construction Science*
Saadet Beeson	*Associate Professor, Architecture*
Janis Bush	*Associate Dean for Graduate Studies, College of Sciences,* *Professor & Chair, Environmental Science & Ecology*
Ian Caine	*Associate Professor, Architecture,* *Director, Center for Urban and Regional Planning Research,* *College of Architecture, Construction & Planning Faculty Senator*
Krystel Castillo	*Associate Professor, Mechanical Engineering,* *Director, Texas Sustainable Energy Research Institute*
Debaditya Chakraborty	*Assistant Professor, Construction Science*
Sedef Doganer	*Associate Dean for Design, Inclusion, and Engaged Scholarship, College of Architecture, Construction & Planning,* *Chair, Architecture*
Bill Dupont	*Professor, Architecture,* *Director, Center for Cultural Sustainability*

Roger Enriquez	*Associate Professor, Criminology and Criminal Justice,* *Director, Center for Policy Studies,* *Executive Director, Westside Community Partnership,* *Representing Faculty Senate*
Curtis Fish	*Interim Program Co-Coordinator, Interior Design* *Lecturer, Architecture*
Marcio Giacomoni	*Associate Professor, Civil and Environmental Engineering*
Bailey Greene	*Student, College of Engineering* *Representing Student Government Association*
Albert Han	*Assistant Professor, Urban and Regional Planning*
Sean Kelly	*Dean, Honors College,* *Interim Dean, College of Liberal and Fine Arts,* *Professor, Philosophy*
Dhireesha Kudithipudi	*Professor and Endowed Chair, Electrical and Computer Engineering, Director, AI Consortium*
Elvira Leal	*Assistant Vice President, Strategic Initiatives, Community Relations*
Mark Leung	*Chair and Associate Professor, Management Science & Statistics*
David Matiella	*Former Associate Dean for Undergraduate Programs, College of Architecture, Construction & Planning* *Lecturer, Architecture*
Arturo Montoya	*Associate Professor, Civil and Environmental Engineering*

John Murphy	*Associate Vice Provost for Global Initiatives, Executive Director, International Study Center Urbino, Interim Chair and Professor, Construction Science, Former Dean, College of Architecture, Construction & Planning*
Jianwei Niu	*Associate Dean, University College Professor, Computer Science Interim Director, School of Data Science*
Neda Norouzi	*Assistant Professor, Architecture*
Nathan Richardson	*Chair, Modern Languages and Literatures, Representing Department Chairs Council*
Humberto Saenz	*Assistant Professor, Art & Art History*
Fidel Santamaria	*Professor, Biology*
Can Saygin	*Senior Associate Vice President for Research, Professor, Mechanical Engineering*
Hatim Sharif	*Professor, Civil and Environmental Engineering*
Rebecca Weston	*Associate Dean, Graduate School, Associate Professor, Psychology*
Steve Wilkerson	*Associate Vice Provost & Chief Analytic Officer, Institutional Research & Analysis*

SUMMARY

The UTSA College of Architecture, Construction and Planning (CACP) is a model for engaged learning, career readiness, and industry and community partnerships. To support an infrastructure that allows CACP faculty to build on past success and create new opportunities for growth, innovation, and excellence, UTSA Provost and Senior Vice President for Academic Affairs Kimberly Andrews Espy launched an Integrated Design Initiative in April 2020, to study and recommend multiple potential structures that bring together the disciplines/academic programs currently administered by COE and CACP under one college administrative home.

A 31-member Task Force, chaired by Dean of the College of Engineering and Interim Dean of the College of Architecture, Construction and Planning JoAnn Browning, was charged with a two-phase process:

I. performing research and outreach to study UTSA strengths and opportunities, community needs, and innovative programs at peer institutions, and
II. using those findings to develop notional structures for a new, exciting, bold organizational unit as described above, that enhances the visibility and impact of component programs, and forges innovative partnerships that facilitate growth and success.

The data gathering phase (i.e., “Phase I) spanned from April 2020 to July 2020. During this time, subcommittees of the task force gathered input from the San Antonio community via a charrette and survey, held knowledge cafés with faculty and students, and examined universities and centers and institutes with integrated programs. Phase I data are contained in the following report, and Phase II will be launched in August 2020. Given the pandemic, all meetings and events were held virtually via Teams and Zoom.

INTRODUCTION

INITIATIVE BACKGROUND

The UTSA College of Architecture, Construction and Planning (CACP) is a model for engaged learning, career readiness, and industry and community partnerships. CACP has increased UTSA’s global connectivity as the leader in helping to establish our Urbino campus, hiring internationally-renowned and experienced faculty, and creating sustainability-focused and culturally-responsive programs across UTSA’s disciplines. Moreover, CACP faculty supply a crucial San Antonio workforce and contribute research, scholarship, and artistry that enhance and augment the local built environment. These strengths align with UTSA’s destinations as a model for student success, a great public research university, and an exemplar for strategic growth and innovative excellence while supporting an Hispanic-serving mission and vision.

Architecture, construction and planning are highly interdisciplinary fields, such as seen in integrated project delivery in which all players in the design process collaborate to make decisions, assume risk, and optimize processes through all phases of design, fabrication, and construction. In addition, urban planners also must collaborate with real estate and finance professionals, public policy makers, designers, geologists, ecologists, and sociologists, among others, to properly manage urban development. It follows that CACP faculty may seek to introduce new interdisciplinary elements into the education process to benefit students of the academy and prepare them for collaborative careers.

Currently, architecture programs around the world are recognizing the benefits of introducing interdisciplinary elements in their curricula which can be used to develop innovative designs, while often inspiring the use of nontraditional building materials. Other innovative curricular elements have included computational tools, processes, and theories, geomatics, media studies, design engineering, public affairs and manufacturing. In addition, these programs have explored various administrative structures to maximize synergies and opportunities.

Increasingly, higher education is responding to workforce trends in architecture, engineering, design and construction by creating synergistic programs, such as experiential opportunities that integrate these areas into Senior Design Projects, while also enhancing the uniquely creative design process that is inherent to architecture. UTSA Architecture faculty have empowered students to create elegant design-build projects with innovative technological developments, and at the Urbino campus, engineering, construction, and architecture students work collaboratively on senior design projects that are a closer approximation to realistic integrated design-build projects.

While CACP has a long, rich heritage of excellence, it has been hampered by a larger proportion of administrative burden. The recent introduction of the IRM financial model at UTSA reveals how the administrative burden to support an independent college can hamper program growth and accomplishment by funneling resources away from new faculty positions and other educational needs. The College of Engineering (COE) has the needed administrative resources and services that can be leveraged and augmented to serve all faculty – including development, financial services, student success, and research support structures. Although COE does not face the same constraints in terms of class size and delivery, the faculty and students could benefit from a closer association with architecture, construction, and planning disciplines, such as through the connectivity to cultural, historic design, sustainability policy elements and design aesthetics in the community. The launch of the shared PhD programs between civil engineering, construction science, and architecture is already benefiting from the closer relationship.

To enable CACP faculty to build on past success and create new opportunities for growth, innovation, and excellence, Provost and Senior Vice President for Academic Affairs Kimberly Andrews Espy launched an Integrated Design Initiative in April 2020, to study and recommend multiple potential structures that bring together the disciplines housed in COE and CACP under one college administrative home. The Initiative has the following goals:

- Enhance student success, through promoting transdisciplinary curricular and experiential learning opportunities
- Prepare students for the modern integrated, collaborative workforce
- Take particular, active steps to well prepare our Hispanic, First Gen and other URM students for prosperous futures
- Increase UTSA's ability to successfully compete for extramural funding opportunities to address grand challenges
- Promote cross-cutting collaborations internally with other campus units, potentially through exploring joint faculty appointments or other mechanisms
- Advance external collaborations with industry, non-profits, and other academic institutions, including those committed to HSI partnerships.
- Promote community collaborations, particularly in sustainable, smart, connected cities and infrastructure that also supports our distinctive cultural heritage and future

Task Force Charge and Process

On April 9, 2020, UTSA Provost Kimberly Andrews Espy convened a 31-member task force, chaired by Dean of the College of Engineering and Interim Dean of the College of Architecture, Construction and Planning JoAnn Browning, comprised of UTSA faculty and staff to undertake Phases I and II of a three-phase process:

- **Developing the Vision:**
  - **Phase I**: Inventory the current landscape of academics, research, experiential learning, and workforce development during Phase I, including community needs, strengths and opportunities for growth at UTSA, and peer models of excellence.
  - **Phase II:** Develop notional structures for an organizational unit containing the disciplines of COE and CACP, wherein all component disciplines are ideally positioned to thrive under the new IRM model and forge innovative partnerships that help further their potential for growth and success. The Phase I & II Task Force process will be followed by Academic Affairs outreach to faculty, staff, students and community members prior to a decision on the resultant structure.

- **Implementing the Vision (Phase III):** This phase addresses the college naming and other key matters to support the realization of the selected structure. ***This***

phase is beyond the work of this Task Force, and will include broader membership representation across all impacted disciplines

In Phase I, the Task Force held a series of seven full task force meetings between April 2020 and July 2020, all held virtually due to the pandemic. Additionally, three subcommittees were formed: 1) “Who we are,” subsequently renamed “Identity”; 2) “Community Landscape,” subsequently renamed “Community Engagement,” and 3) “Benchmarking.” Each subcommittee met formally six times and conducted research, as summarized on the following pages.

In addition, all minutes of the full task force meetings have been posted on the Initiative website. As part of each full task force meeting, representatives from the subcommittees reported on their work allowing for members from the other subcommittees to offer suggestions or insights into the process. The task force members agreed it would be beneficial to the process for liaisons to serve on each of the subcommittees, which not only provided transparency but helpful feedback during Phase I.

To further connect with the community and UTSA faculty, staff, and students, an Integrate Design Initiative email account was created and all incoming messages were shared at each full task force meeting.

In Phase II, new subcommittees will be formed, each containing representation from all three Phase I subcommittees. Each will translate the knowledge gained in Phase I into at least two notional models for consideration.

IDENTITY

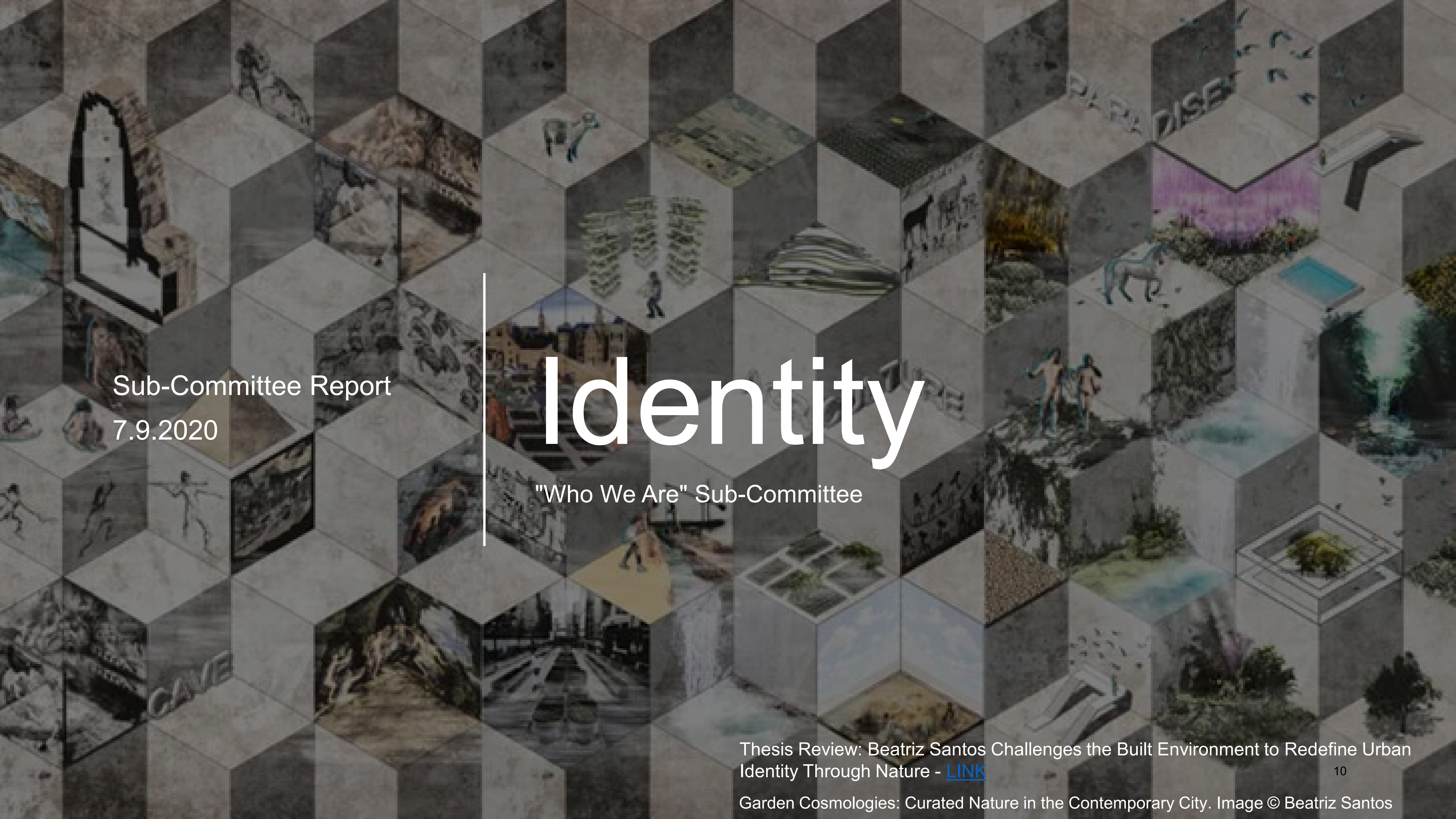
Subcommittee Charge

The Identity Subcommittee was charged with considering "what we do, how we do it and where we are heading," using existing institutional research data and through performing internal outreach.

Methods

Primary methods employed by the Identity Subcommittee included:

1) Conducting three (3) Knowledge Café events for faculty of the College of Architecture, Construction and Planning, College of Engineering and colleagues from other disciplines who have close relationships with CACP and COE.
2) Conducting a Knowledge Café with students from the College of Architecture, Construction and Planning and the College of Engineering.
3) Surveying the research data and academic program success to better understand opportunities and gaps at UTSA.



Sub-Committee Report

7.9.2020

Identity

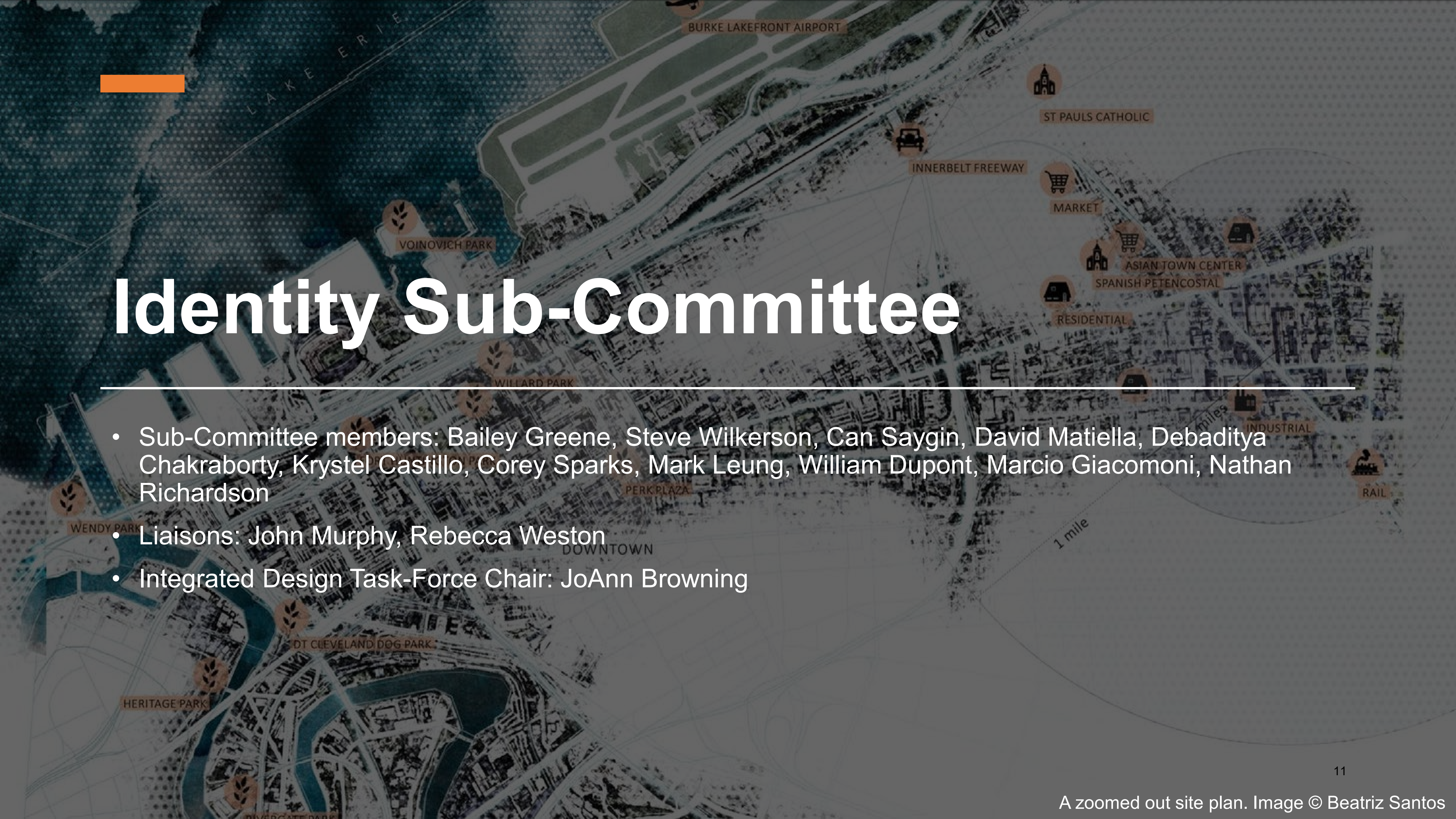
"Who We Are" Sub-Committee

Thesis Review: Beatriz Santos Challenges the Built Environment to Redefine Urban Identity Through Nature - LINK

Garden Cosmologies: Curated Nature in the Contemporary City. Image © Beatriz Santos

Identity Sub-Committee

- Sub-Committee members: Bailey Greene, Steve Wilkerson, Can Saygin, David Matiella, Debaditya Chakraborty, Krystel Castillo, Corey Sparks, Mark Leung, William Dupont, Marcio Giacomoni, Nathan Richardson
- Liaisons: John Murphy, Rebecca Weston
- Integrated Design Task-Force Chair: JoAnn Browning



A zoomed out site plan. Image © Beatriz Santos

Objective / Purpose

- To understand “who we are” as two colleges coming together, to create a critical awareness of our own nature and the way in which we think about ourselves
- Inherently an introspective undertaking and the basic task is metacognitive in nature
  - First step in metacognition - identifying one's own learning style and needs
- To construct a narrative for how we think about ourselves using qualitative and quantitative information

Qualitative Methodology

The Knowledge Cafe

- An internationally recognized format and a conversational process
- Allows participants to share experiences, learn from each other, build relationships and make a better sense of a rapidly changing situation to help improve decision making
- It is a *descriptive* approach toward knowledge discovery rather than a *prescriptive* approach

Knowledge Cafes

Two types of Knowledge cafés emerged:

- Faculty Cafés
  - A series of three conversations with focused discussion topics
- Student Café
  - A single session of student leaders or Knowledge Champions

- Topics for each discussion were decided by the sub-committee

Faculty Knowledge Cafes

- Series of 3 Cafés. 90 minutes
- Dates – June 11th, 18th and 25th
- Attendees
- Three dominant themes emerged, prompted by discussion questions:*
    - **Core strengths**
    - **Added values and synergies of integration**
    - **Future opportunities made possible by integration**

*Consolidated notes

Faculty Knowledge Café Participants	
Albert Han	Matt Hayward
Angela Lombardi	Melinda Utoft
Angelica Docog	Michael Guarino
Armando Araiza	Natasha Arguella
Charles Schmidt	Neda Norouzi
David Kraft	Posie Aagaard
David Matiella	Saadet Beeson
Debbie Howard-Rappaport	Samer Dessouky
Diane Lopez	Sedef Doganer
Emily Johnson	Shannon Heuberger
Esteban Cantu	Shari Salisbury
Greg Griffin	Shelley Roff
Hazem Rashed-Ali	Stephen Temple
James Lewis	Sue Ann Pemberton-Haugh
JoAnn Browning	Tony Ciochetti
John Alexander	Tulio Sulbaran
Marcio Giacomoni	Veronica Rodriguez
Mark Blizard	Vincent Canizaro
Mark Eli	Wassim Ghannoum
	William Dupont

Dominant Theme 1: **Core Strengths**

- Our degree programs and the professions we serve / clear meanings
- The value of the civic learning lab: San Antonio itself
- Our connection to the community
- Our international programs
- Engagement, outreach, design-build, and project leadership in the regional built environment.

*Consolidated notes

Dominant Theme 2: **Added values and synergies of integration**

- Students need interdisciplinary training to be leaders in their domains
- Student exposure across disciplines
- Capitalize on opportunity for multi-disciplinary endeavors
- Incentivize research and new programs building on synergies
- International programs and study abroad
- Integrated process can accelerate innovation
- Integrated design and Equity

*Consolidated notes

Dominant Theme 3: **Future opportunities made possible by integration**

- Excellence and innovation
  - Offer integrated content
- Leadership and collaboration
  - Build leaders
  - Student ambassadors
  - Involvement with industry
  - Involvement with the city itself and civic leadership
- Integrity, inclusiveness, and respect
  - Illuminate equity
  - Teach research ethics
  - Explore all aspects of sustainability: social, environmental, economic, good governance
  - Encourage and support ethical endeavors within the core mission of each discipline

*Consolidated notes

Student Knowledge Cafe

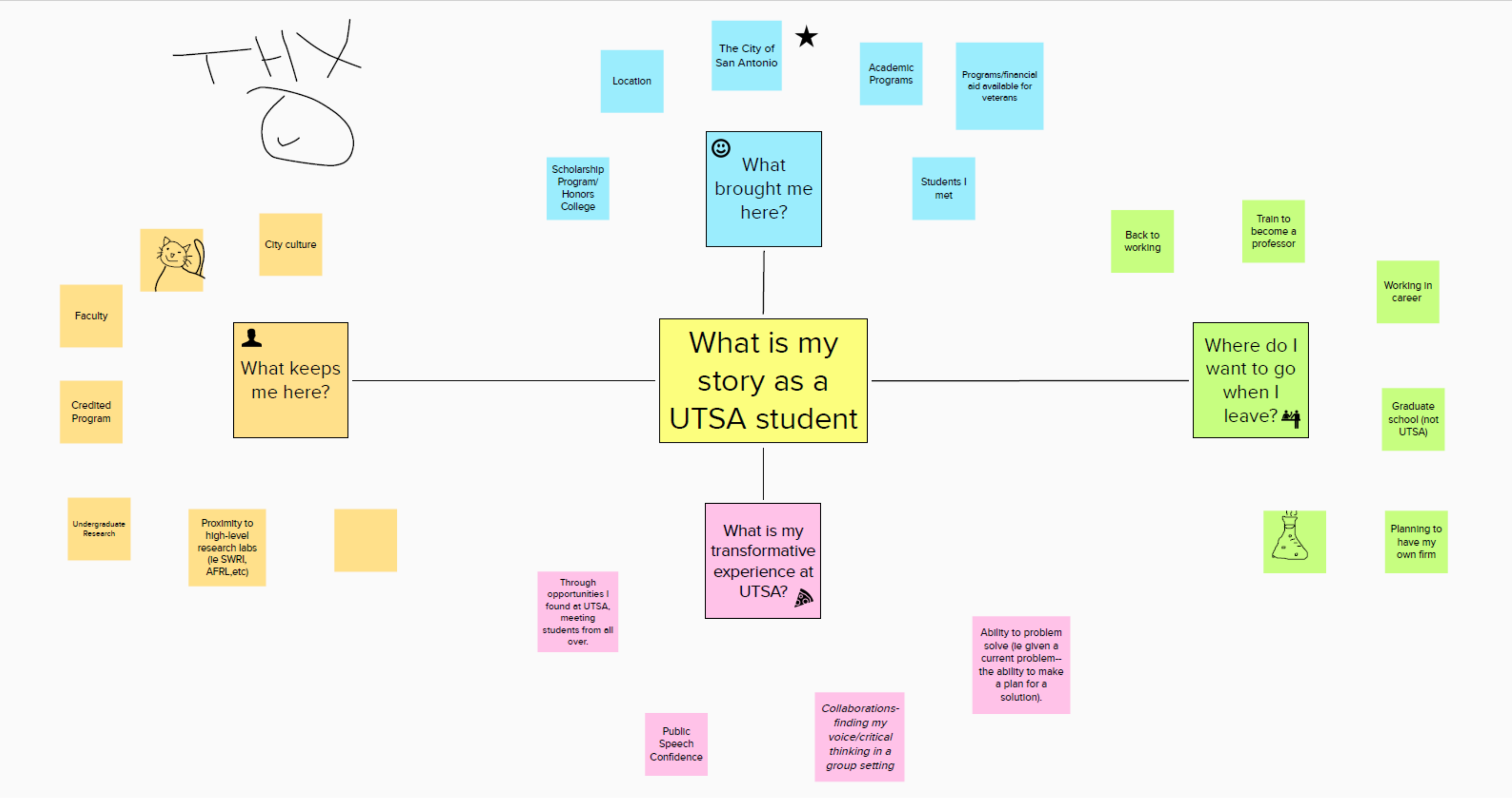
- 90-minute session on Wednesday, June 17th With 20 student participants from each college*
- Introduction from Provost Espy and broad vision from Dean Browning
- Student attendees
- Themes
  - *What brought you here as a student?*
  - *What keeps/has kept you here as a student?*
  - *Where will you be when you leave here and where are you going?*
  - *What has been your transformative educational experience at UTSA?*
  - 12 minutes was spent per question in the break-out groups and mind map creation using Mural app in the break-out groups
- Closing statements and call to action

*Complete Agenda and run of show

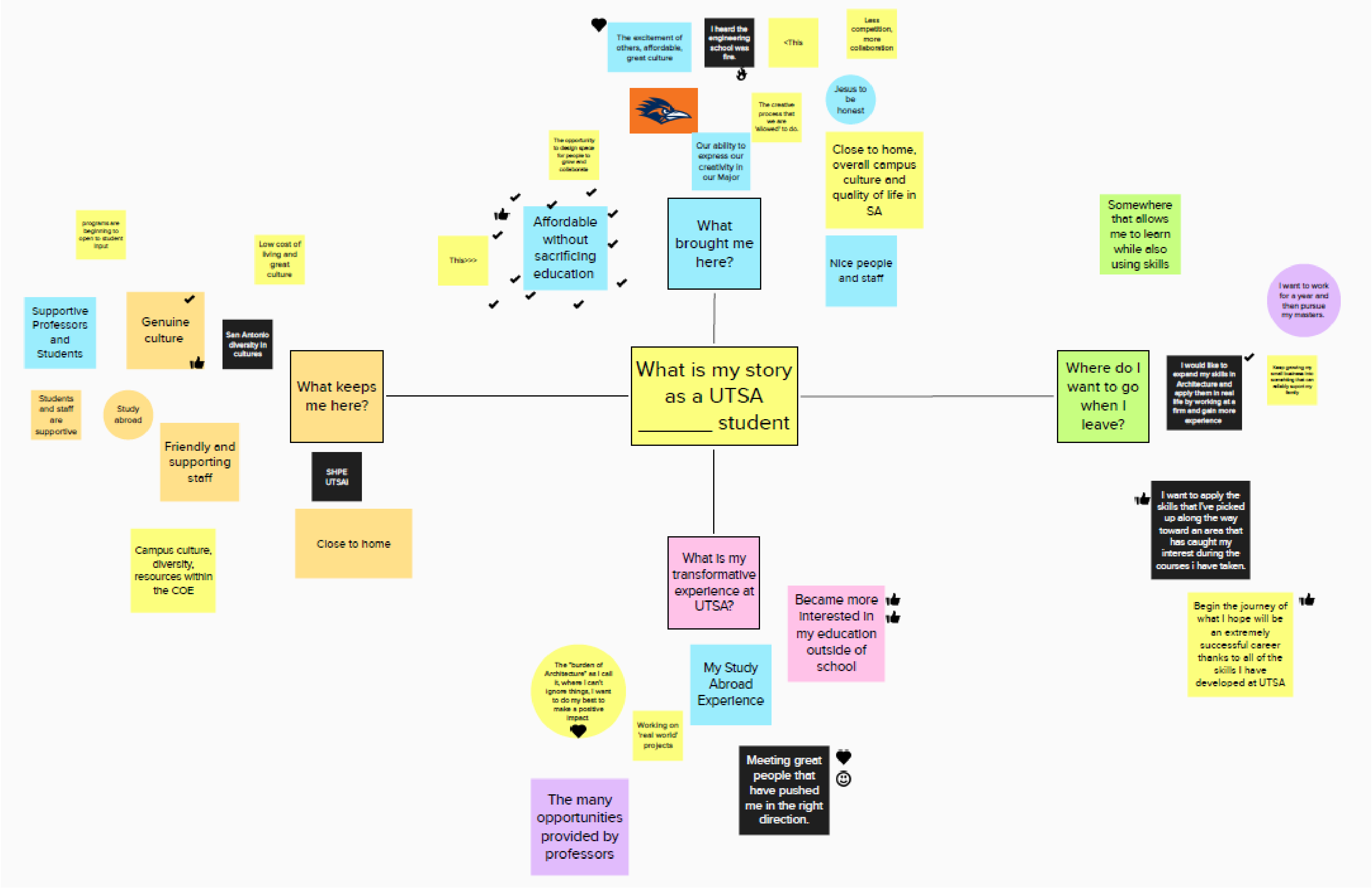
Student Attendees – Knowledge Champions

John Michael Berringer	Architecture
Ethan Donald Glatz	Computer Engineering
Margarita Saldana Vazquez	MS Urban and Regional Planning
Kaitlyn Garcia	Interior Design
Jana Ruth Wentzel	Urban and Regional Planning
Selina Lorraine Angel	Urban and Regional Planning
Christian S Strong	Chemical Engineering
Zayra S Rico	Architecture
Ashley N Larweck	Biomedical Engineering
Amina Alobaidli	Urban and Regional Planning
Erick Galicia	Electrical Engineering
Elizabeth Sadie Monahan	Civil Engineering
Amy Michelle De La Rosa	Interior Design
Michelle Evonne Garza	Urban and Regional Planning
Adnan Shahriar	Mechanical Engineering
Mariafernanda Amaya	Electrical Engineering
Rebecca Brewster Altom	CSM

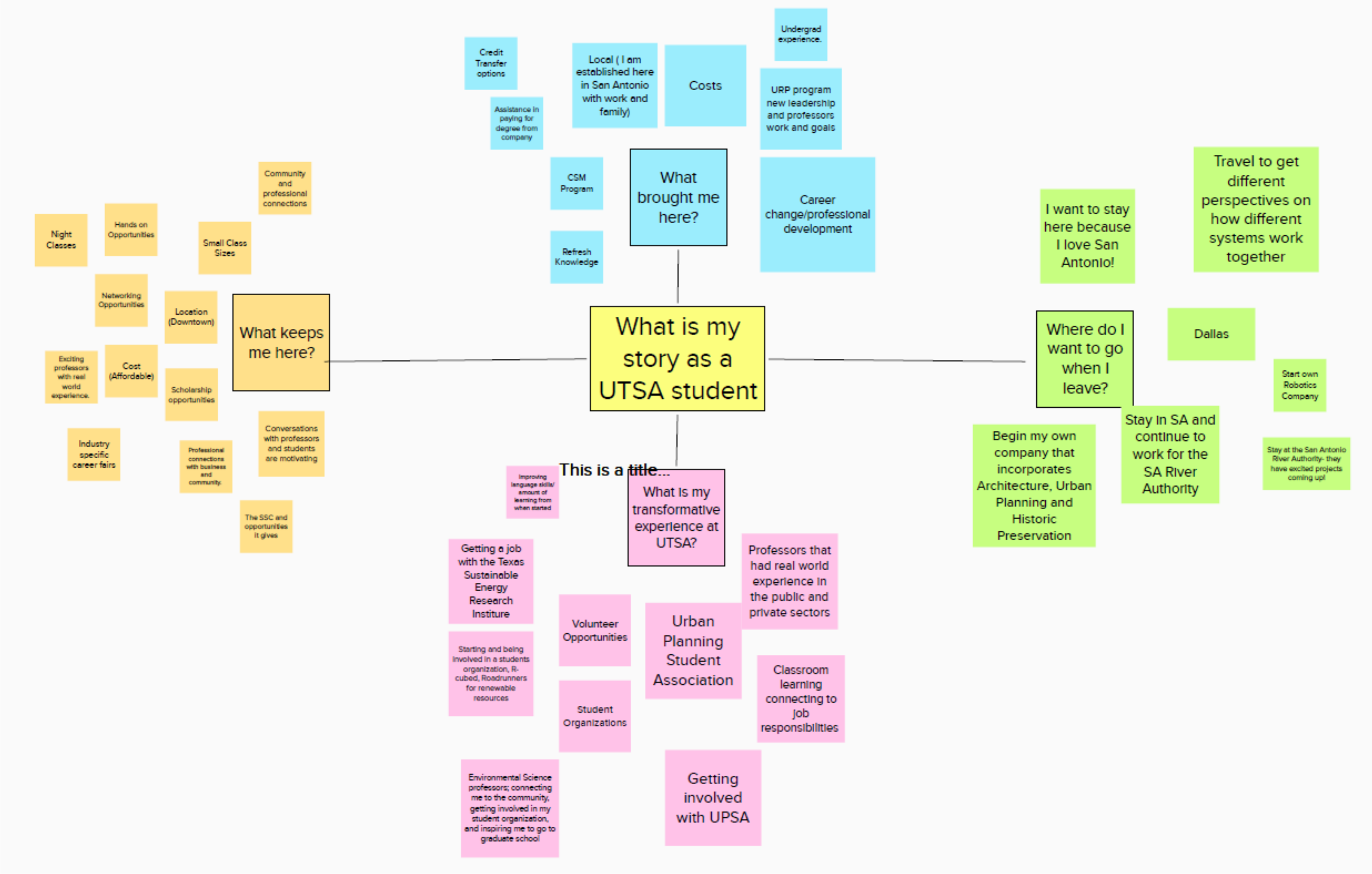
Mind Map Group 1



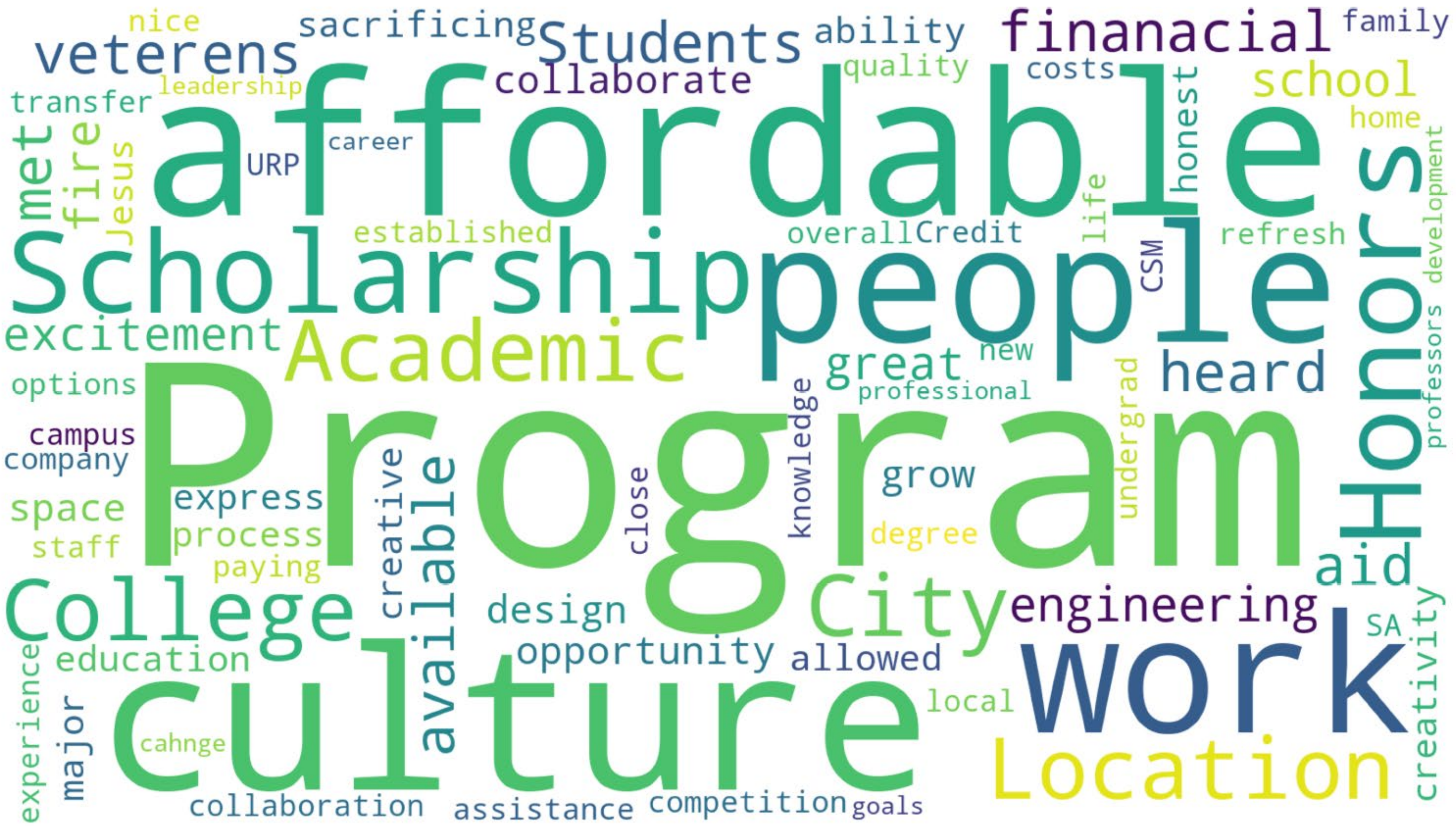
Mind Map Group 2



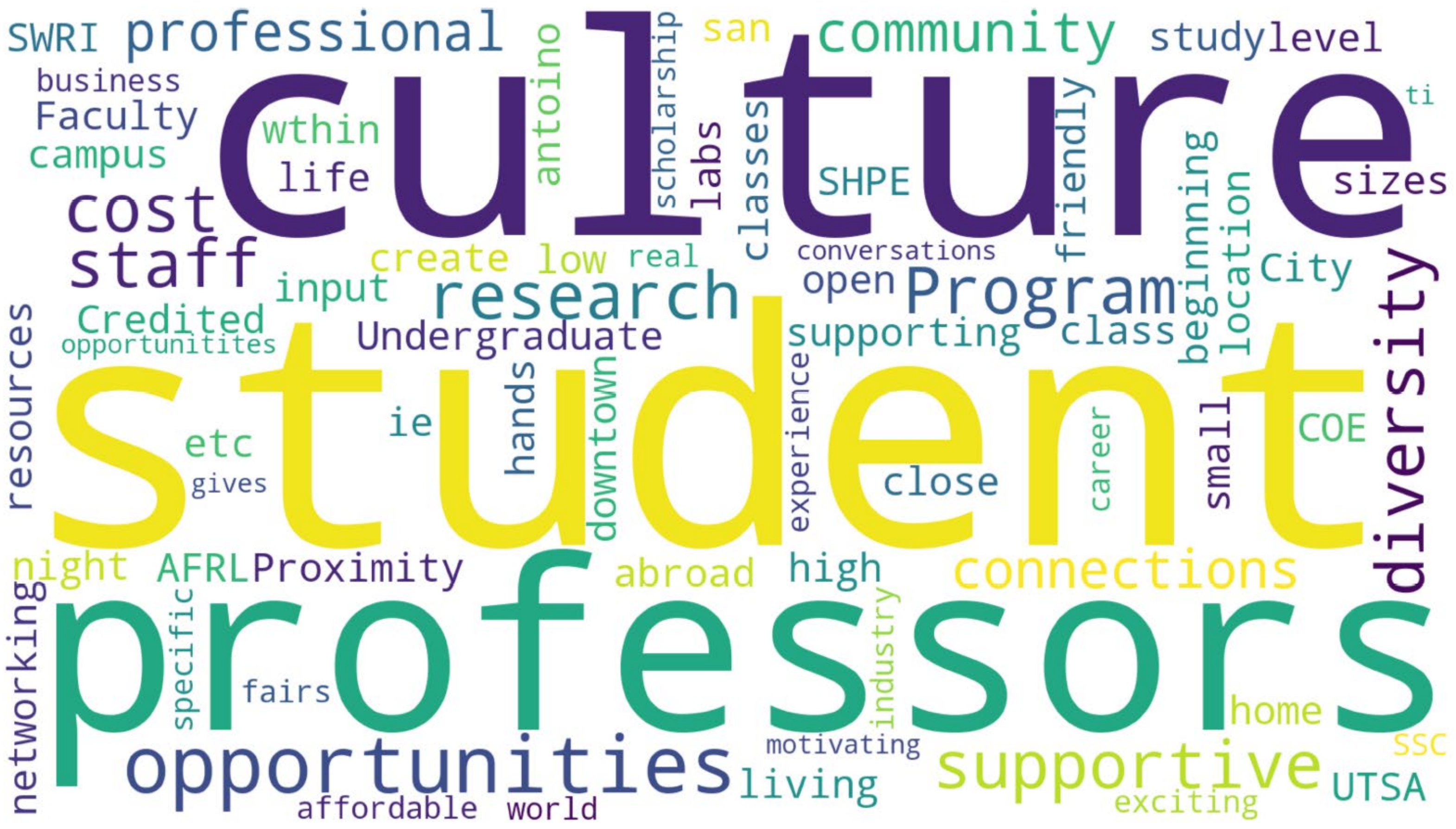
Mind Map Group 3



What brought me here



What keeps me here



Where am I going

What has been my transformational experience at UTSA?

Student Knowledge Cafe

- Call to action
  - Be empowered
  - Be intentional
  - Be empathetic
  - Be a leader

  - Engineer, design, build, and plan the future you want for yourself and for others

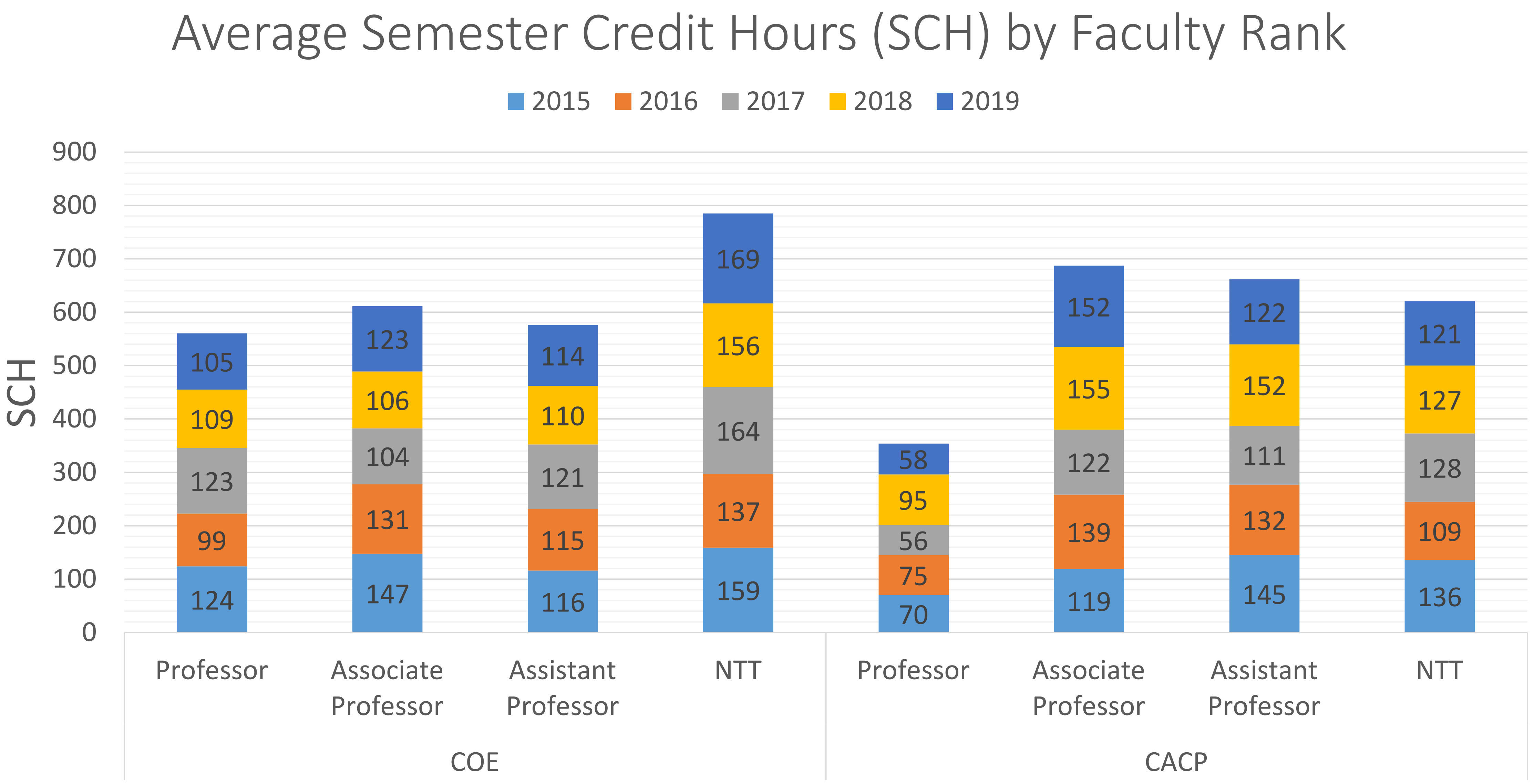
*Complete Agenda and run of show

Quantitative Analysis of IR Data

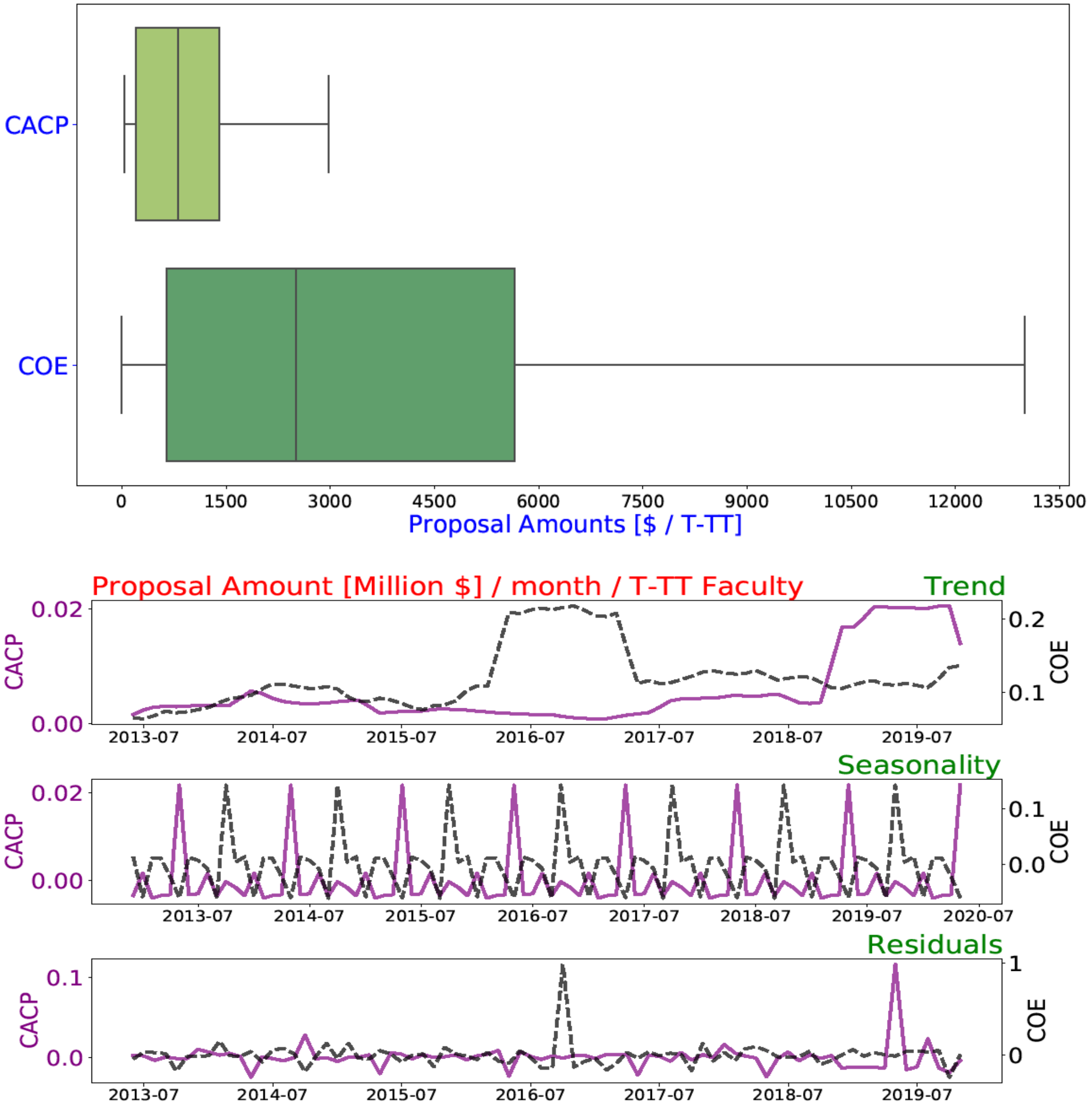
Numbers of Students
Average SCH by Faculty Rank
Research Proposals, Awards, Success Rate, and Expenditures

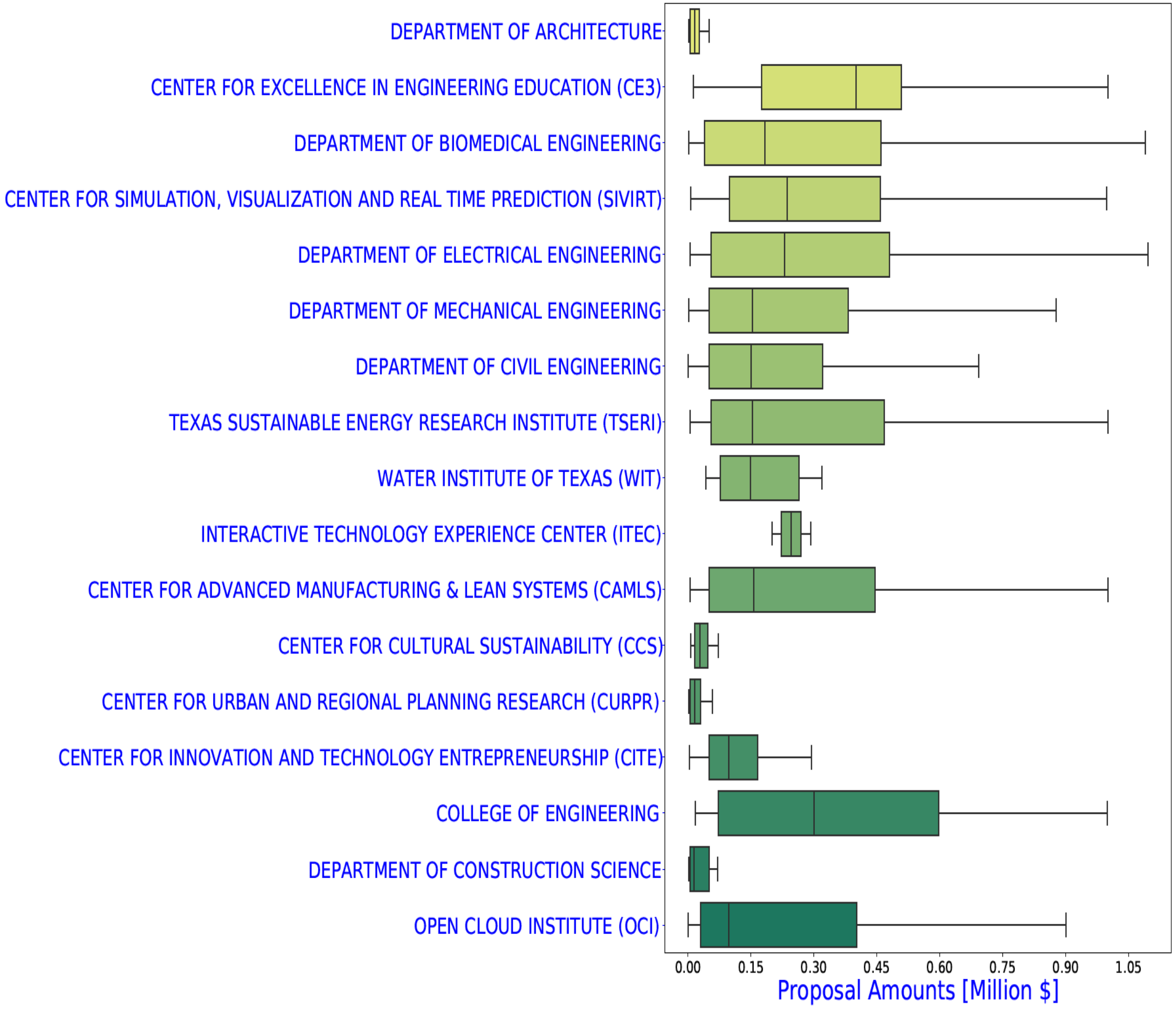
Numbers of Students

FALL 2019 DATA	UTSA	College X	% of UTSA
Total students	32594	4003	12%
Ugrad	27932	3288	12%
M	3300	312	9%
PhD	905	227	25%
T/TT	628	105	17%
Research $	$ 80,700,000	$ 17,579,070	22%
2019 1-yr Retention	77%	78%	1.01
2018 cohort	4482	689	15%
2019 6-yr Grad	51%	54%	1.05
2013 cohort	2686	375	14%

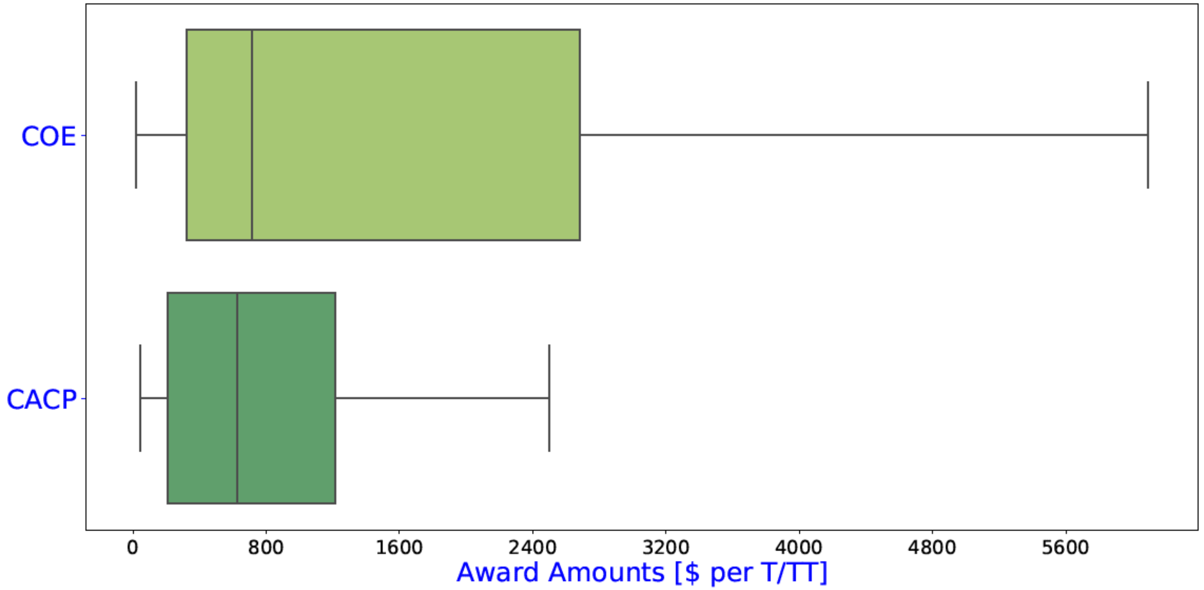

Average Semester Credit Hours (SCH) by Faculty Rank
2015
2016
2017
2018
2019
SCH
900
800
700
600
500
400
300
200
100
0
124
99
123
109
105
147
131
104
106
123
116
115
121
110
114
159
137
164
156
169
70
75
56
95
58
119
139
122
155
152
145
132
111
152
122
136
109
128
127
121
Professor
Associate Professor
Assistant Professor
NTT
Professor
Associate Professor
Assistant Professor
NTT
COE
CACP

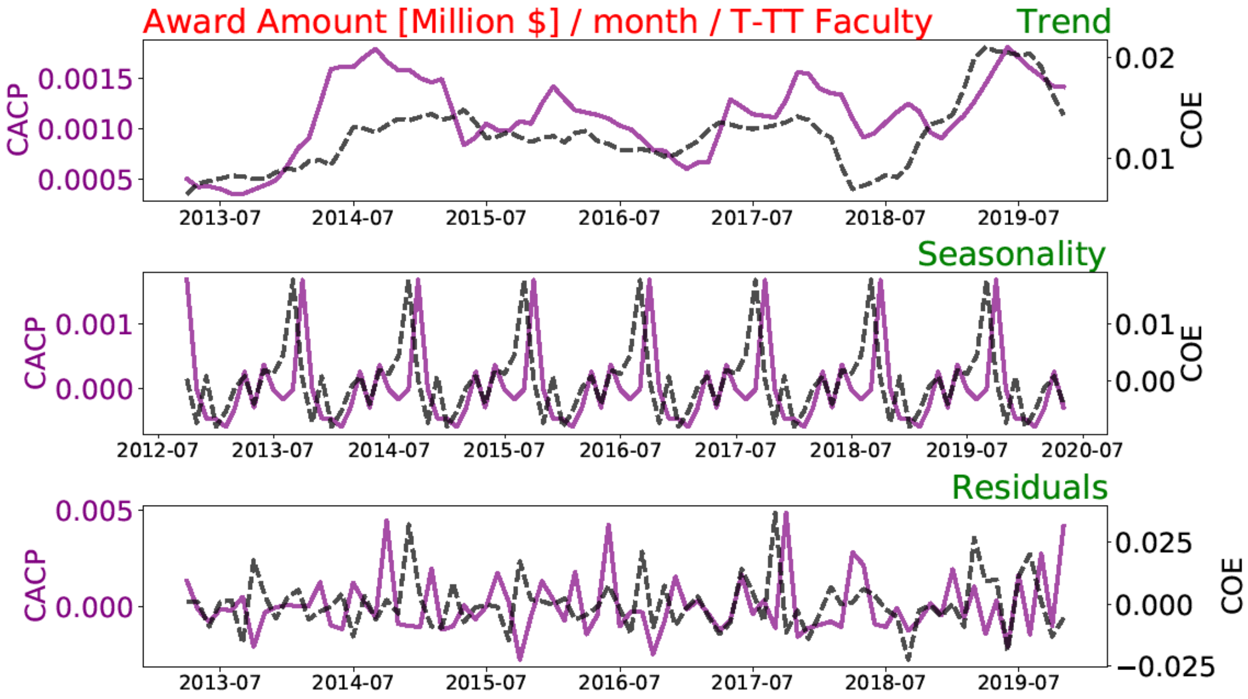
Research Proposal Analysis

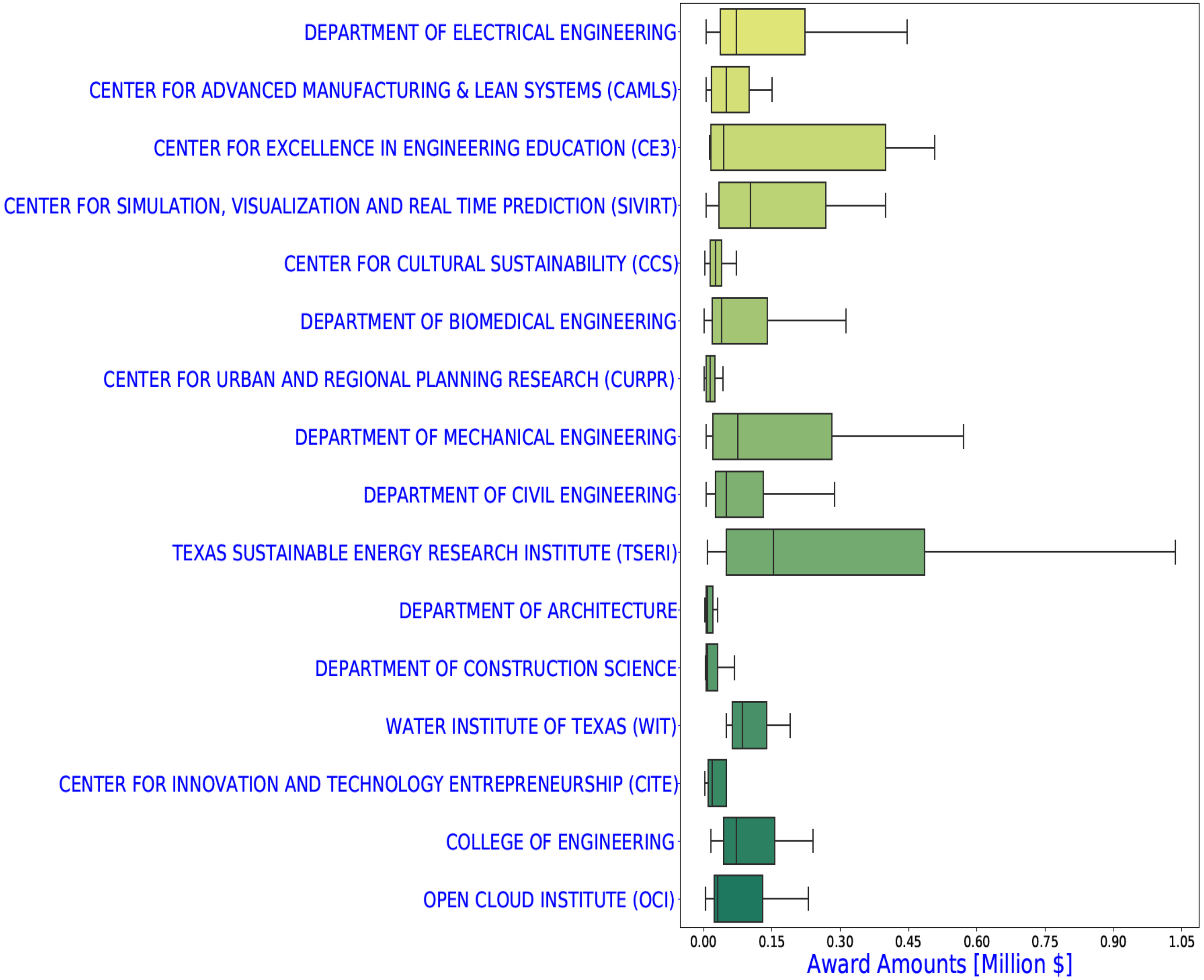


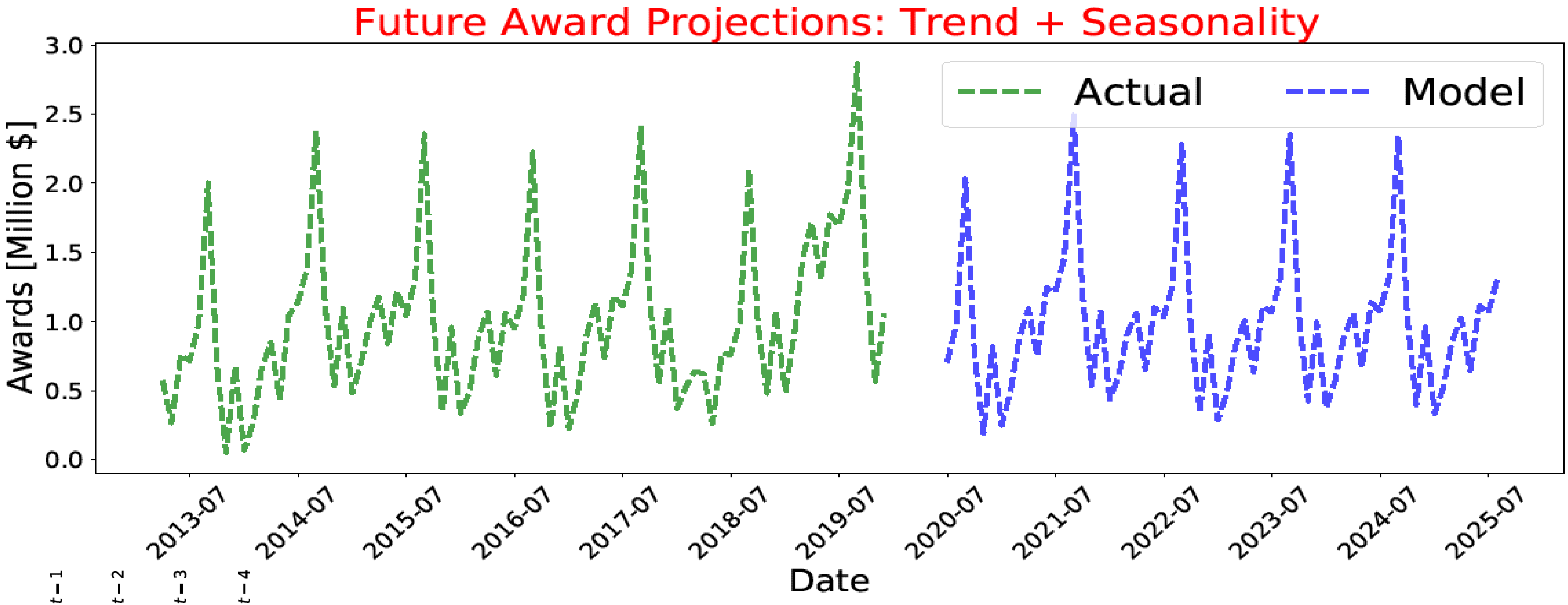


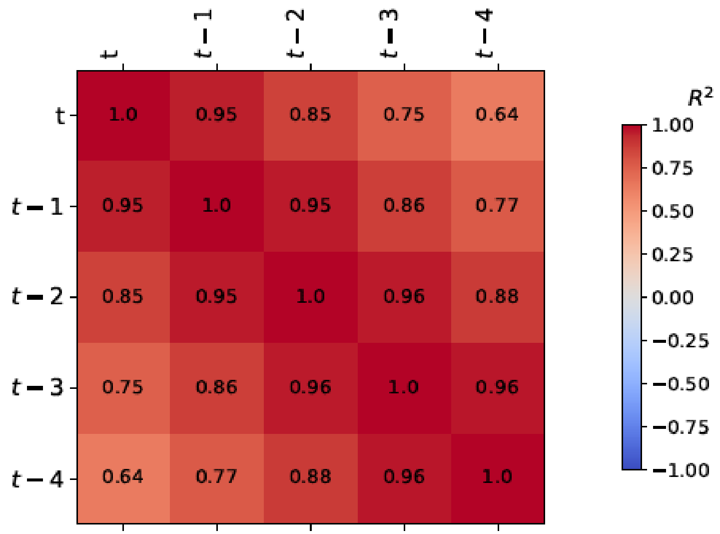
Research Awards Analysis





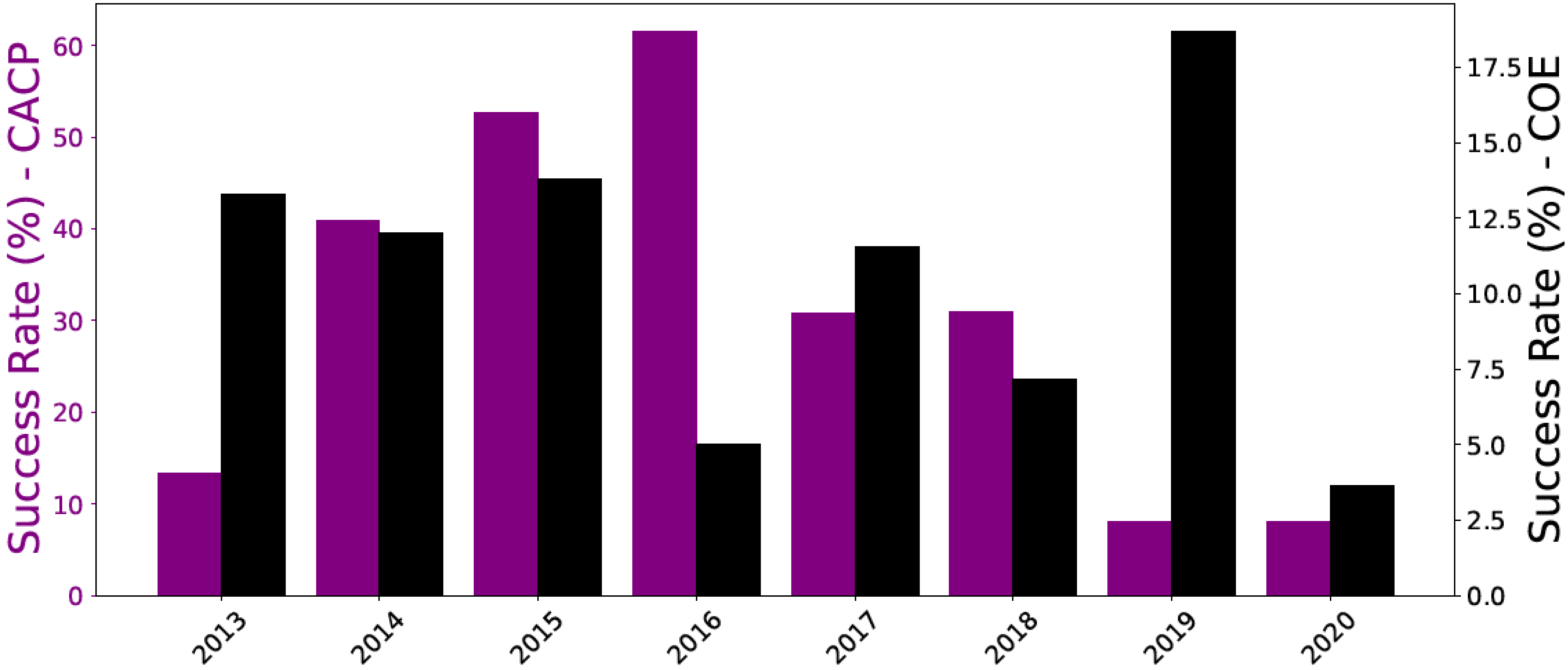




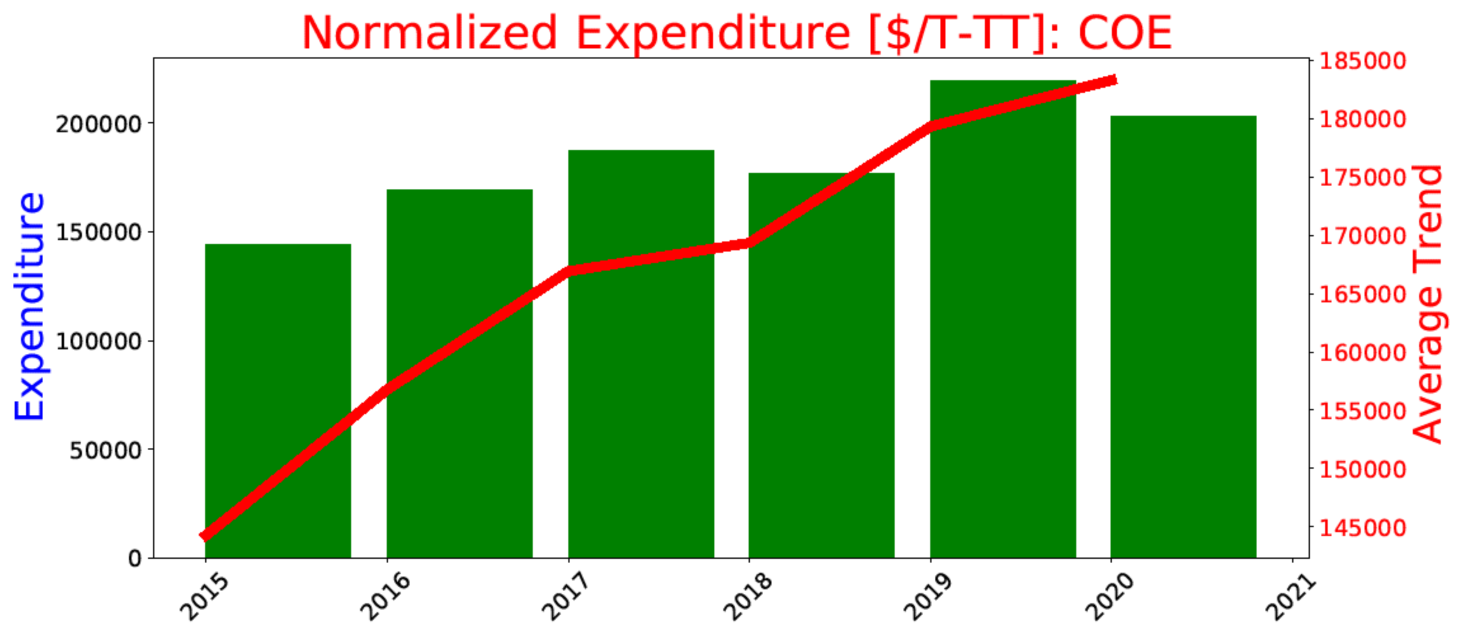


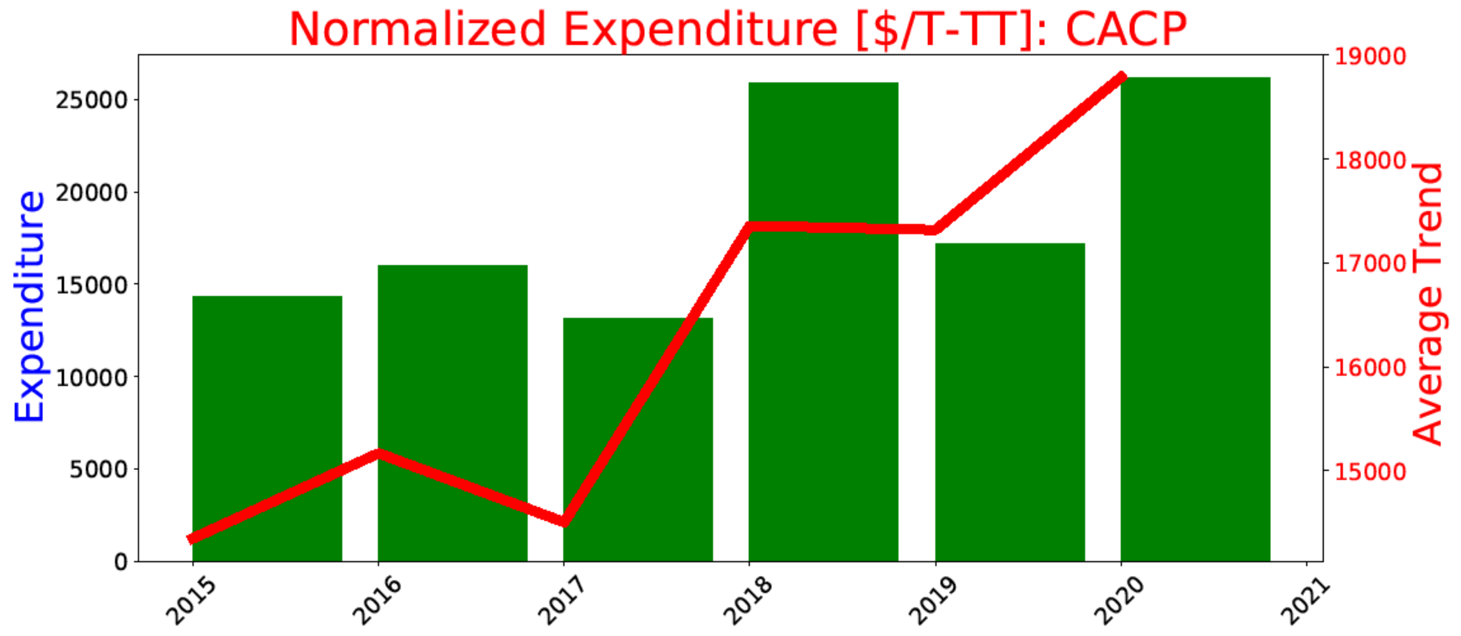
Model details:
Trend: Linear Regression that produced an R^2 of 0.95 on unseen testing data.
Seasonality: Random Forest that produced an R^2 of 1 on unseen testing data.
Residuals: Not predictable from the data that we have. One solution may be to utilize the median of the residuals for future predictions.

Research Proposal vs. Awards Success Rate Analysis

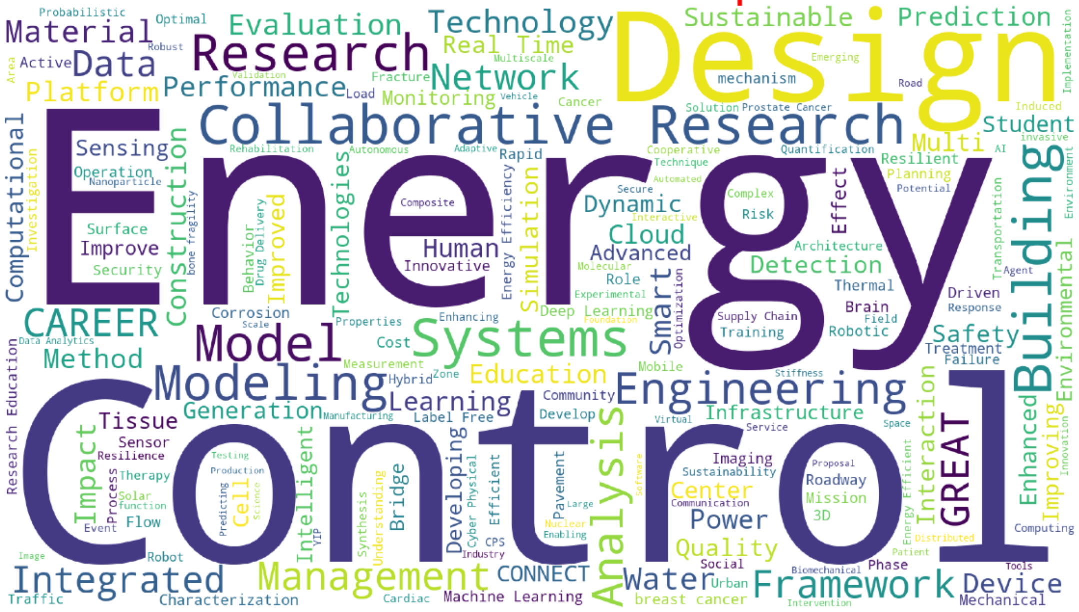


Research Expenditure Analysis

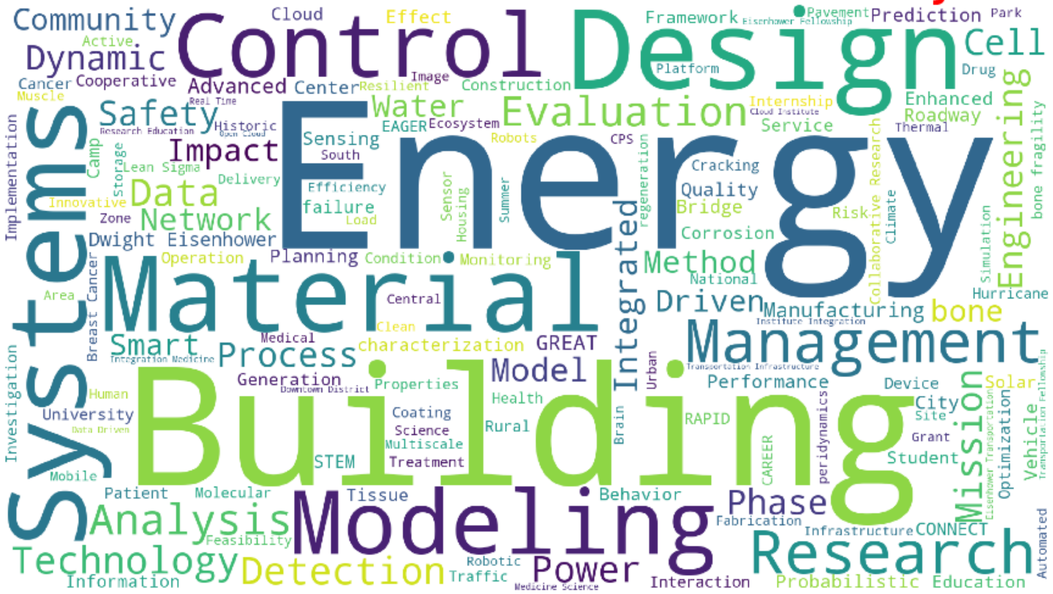




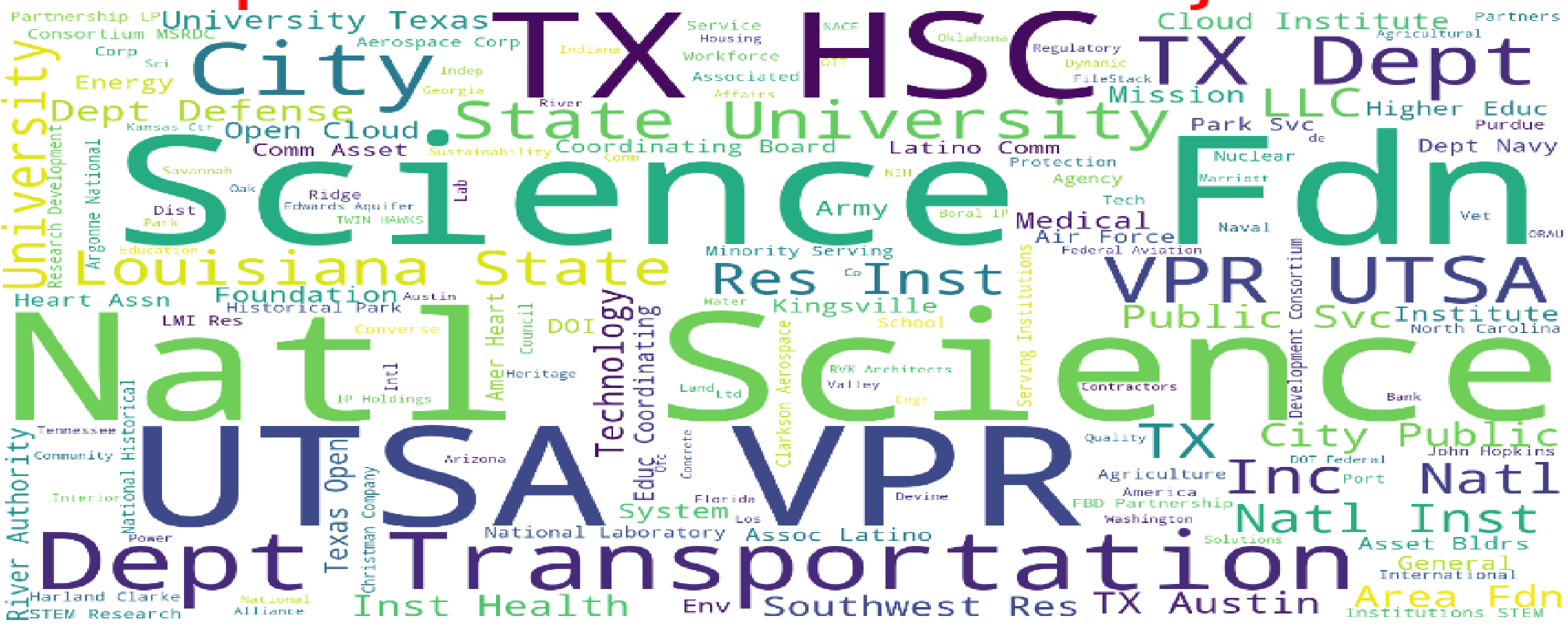
Areas of Research: Proposals



Areas of Research: Awarded Projects



Sponsors: Awarded Projects



Conclusions

- What have we learned that can be brought into the next phase?
  - Culture of each department / domain
  - Opportunity to explore synergies is supported by both faculty and students
  - Opportunities to engage our students across domains can increase their potential and further connects our programs to industries
- How does this influence possible notional models?
  - Provides identifiable areas of potential to justify synergies between domains
  - Helps us to prioritize those synergies

Rendering from the project..Image © Beatriz Santos

COMMUNITY ENGAGEMENT

Subcommittee Charge

The Community Engagement Subcommittee was charged with surveying local/regional needs and identifying gaps.

Methods

Primary methods employed by the Community Engagement Subcommittee included:

1) Analyzing data gathered from the CACP Charrette
2) Conducting a Post-Charrette survey

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Community Engagement Subcommittee

Integrated Design Initiative Phase 1 Report

Community Engagement Subcommittee

- Taylor Adkins
- Saadet Beeson
- Roger Enriquez
- Albert Han
- Dhireesha Kudithipudi
- Elvira Leal
- John Murphy
- Neda Norouzi
- Humberto Saenz
- Fidel Santamaria

Subcommittee Liaisons

- Debaditya Chakraborty
- Sedef Doganer

Task Force Administrators

- JoAnn Browning
- Shannon Heuberger
- Debbie (Howard) Rappaport

Community Representatives | Private Sector | Departments/Programs Advisory Councils | Public Sector

400+ list of contacts

UTSA CACP Charrette
June 10th, 2020
160 + Participants

additional contacts

Community Engagement Survey
July 3rd – July 14th 2020
26.6% response rate (133/500)

Needs and Wants of Stakeholders

UTSA CACP Charrette

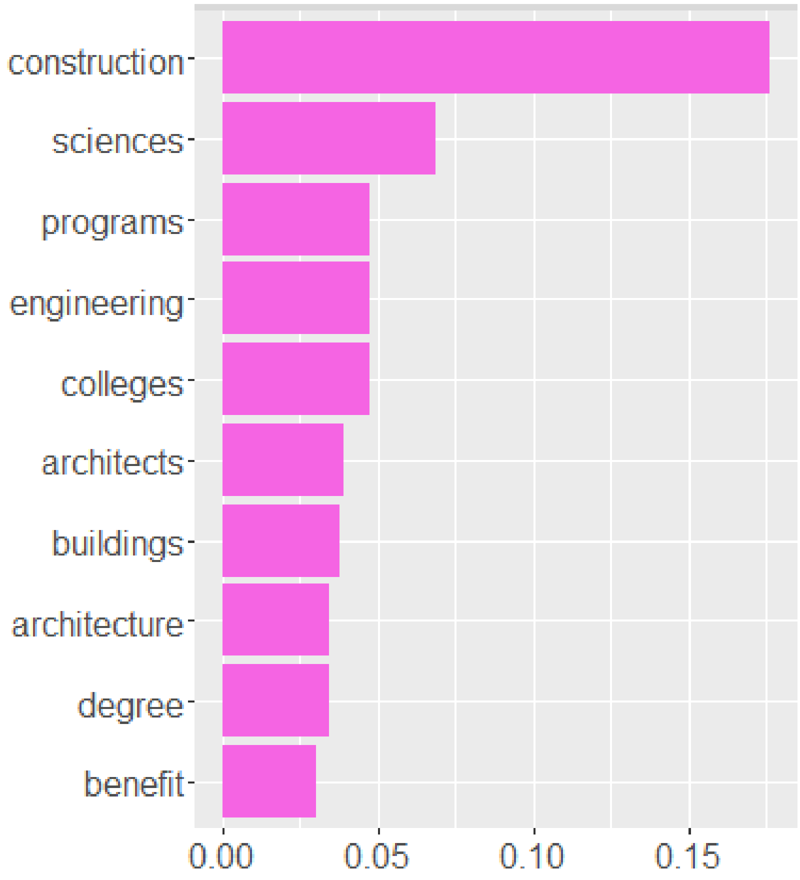
- **Event Date:** June 10th, 2020 via Zoom
- **Questions Asked**
  1. What is the community needs/interest on: (A) Degree Programs, (B) Professional Development
  2. What is the community research needs/interest and partnership opportunities
  3. What can the faculty/staff/students do to help the community?
  4. What faculty/staff/students engagement in teaching, research, and service is most impactful to the community?
- **Collected Data:**

  Text data from notes (15,352 words)
- **Analysis Methods:**

  Topic Modeling for pattern recognition
  Review by the subcommittee members

QUESTION 1:

What is the community needs/interest on: (A) Degree Programs, (B) Professional Development



Topic: Architecture + Construction Science + Engineering

"Likes the combination of architecture and construction science. Students will have the whole picture, solve problems onsite."

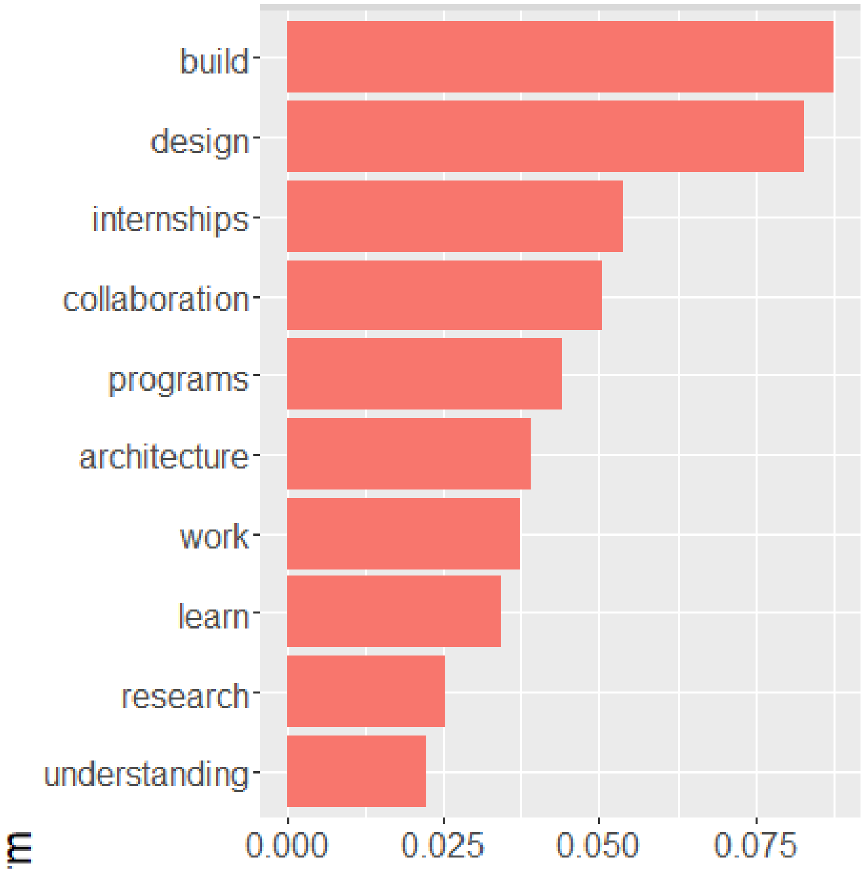
"Give students a glimpse into the real world of how we really work - benefit of combined with engineering - likes the holistic view and benefit of architects as having the advantage of knowing engineers - build teams inside the college and they will be ready with doing collaborative work"

"Power of engineering and engineers are that they are problem solvers. Architect's power is ability to think in a non-linear way."

*Note: Topic modeling result above show how likely it is for each word to appear on the topic.

QUESTION 2:

What is the community research needs/interest and partnership opportunities?



Topic: Internships

"Internship requirement for engineering and architecture degrees. All need to learn what is expected at work. **Bring architecture programs to have the same internship experiences as engineers**.

"Create a **partnership opportunity with internships which is a win-win for industry, students, and community**"

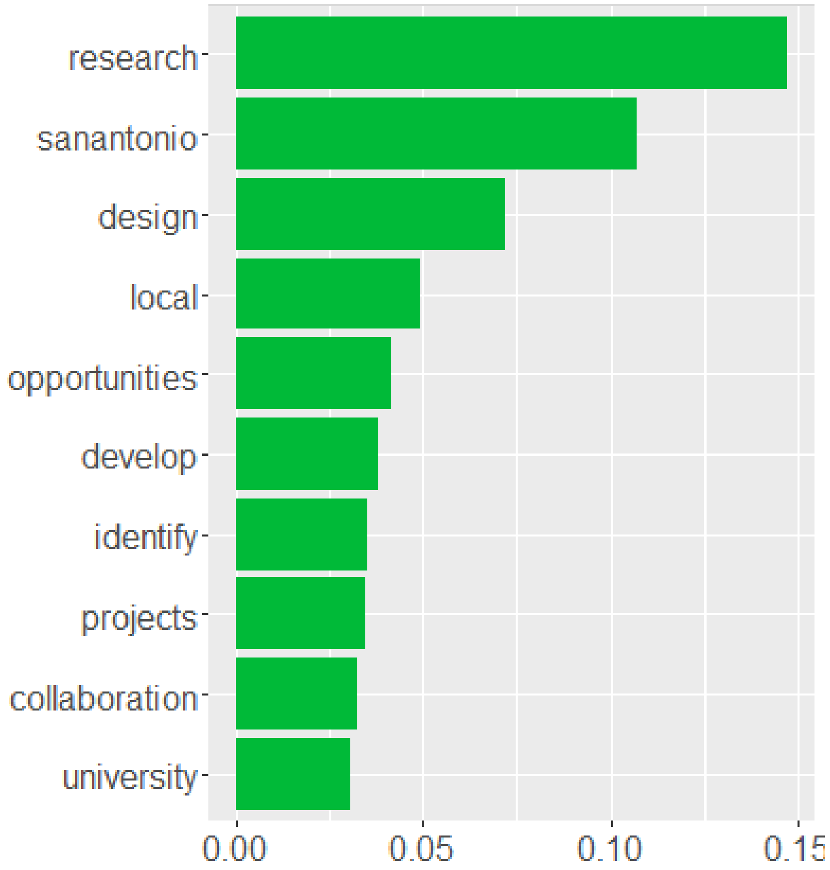
"More internships and partnership in studio work is helpful."

"Real hands-on experience and internship."

"Most of the attendees need more interns – not enough coming out of UTSA; ads have gone out to the students but not a lot of response

QUESTION 2:

What is the community research needs/interest and partnership opportunities?



Topic: Research

"**Design build projects** and opportunities within academic research to **collaborate with different organizations nationally** to bring outside expertise into San Antonio/"

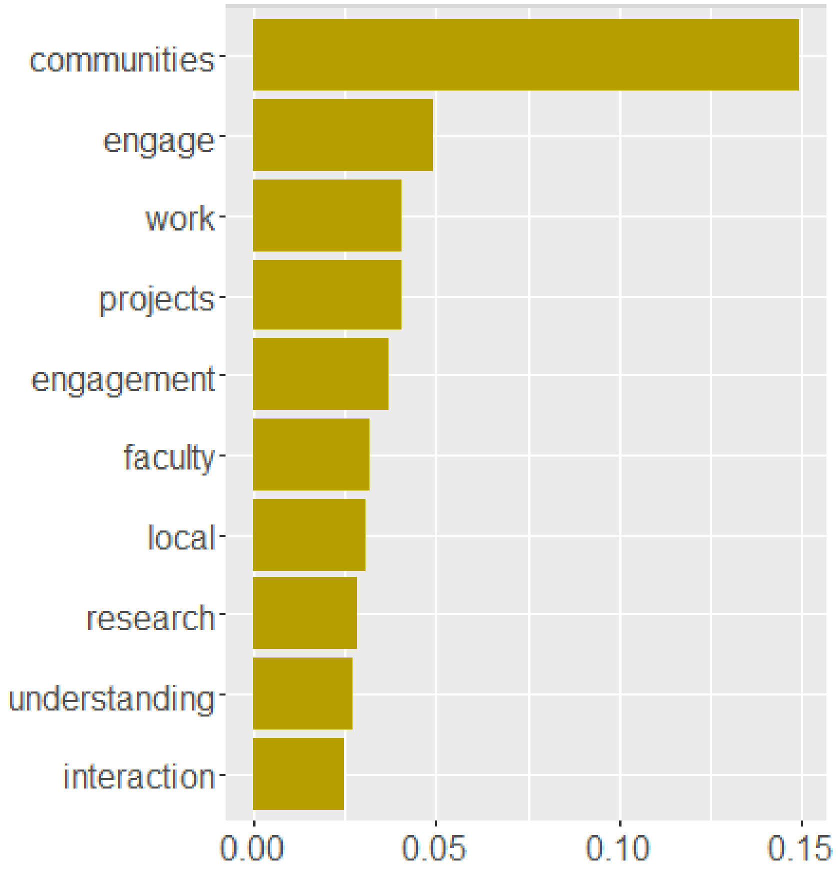
"Want San Antonio to stand out with top notch research facilities that would **establish San Antonio as a research hub**."

"Collaboration for a richer research program that helps prioritize local issues"

"Community outreach efforts -- **research impacts technology as well as important social issues.**"

"San Antonio is unique and having **local knowledge** is valuable for research"

QUESTION 3:
What can the faculty/staff/students do to help the community?



Topic: Community and Engagement

"**Do community engagement research** - dive into micro history of communities - sensitivity to communities past traumas – especially in communities of color - demolition and gentrification can be traumatic"

"The communities that need the most engagement are the ones that…lack the infrastructure. **Infrastructure plays a critical role in engagement**"

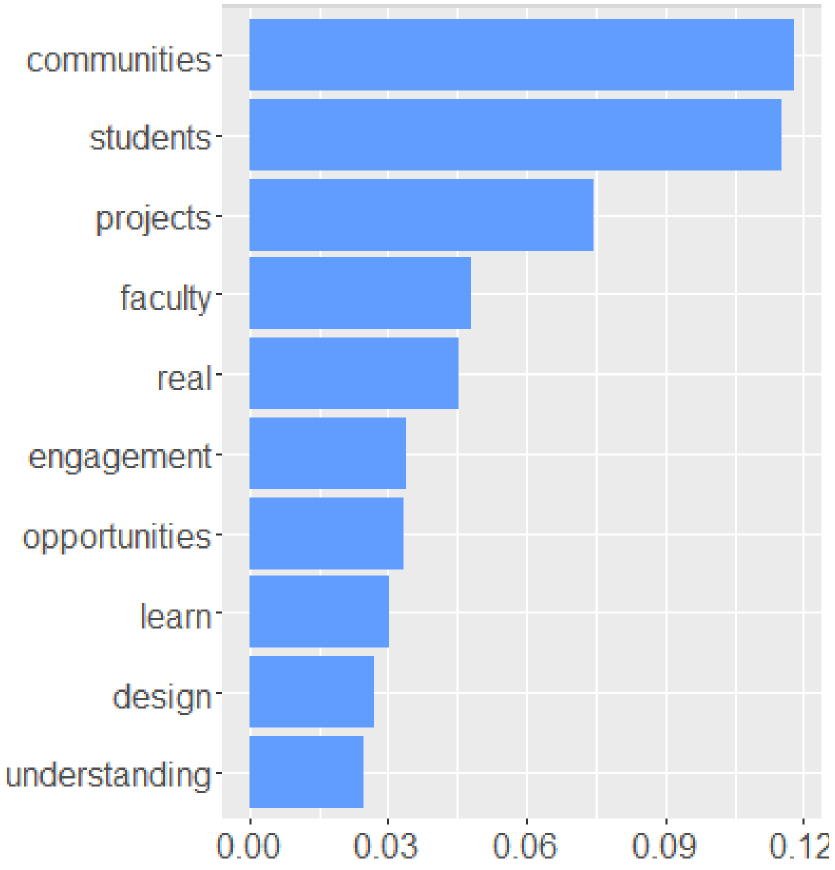
"**Go out to communities and engage them by using research expertise**"

"Community engagement can create a stronger link to the community… **Create loyalty to the community**"

"**Engage professional community** to bring their technology into classrooms"

QUESTION 3:

What can the faculty/staff/students do to help the community?



Topic: Students

“Are students trained to conduct **community input sessions**? A good skill would be able to do community engagement research”

“Preparing students for modern workforce… designers and architects’ **understanding of local values** - projects belong to community”

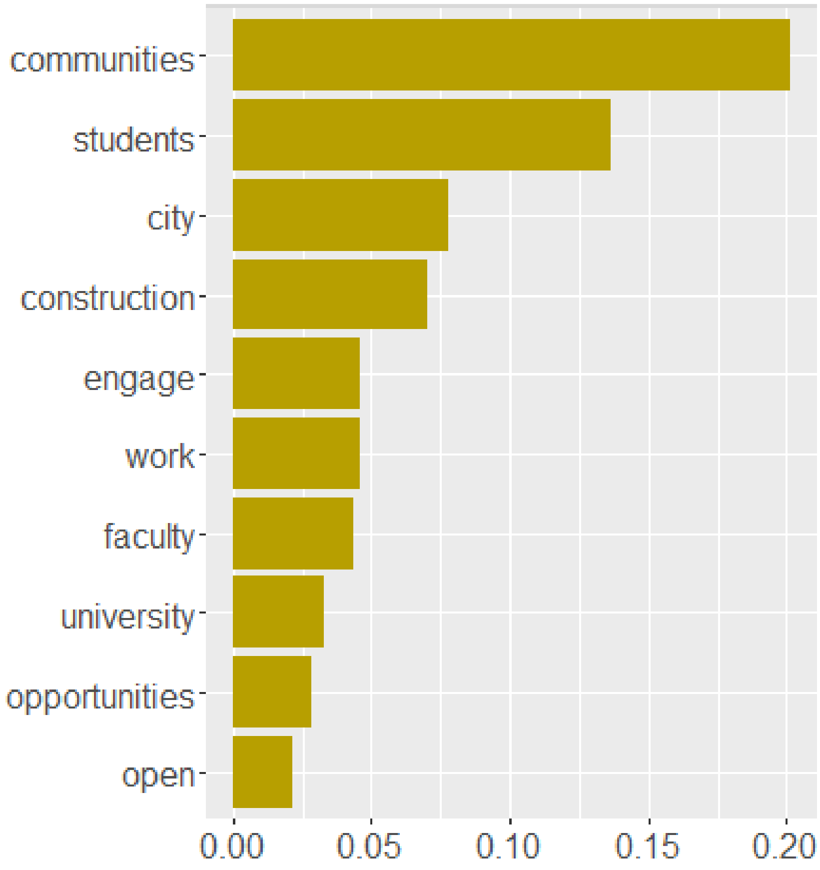
“Keep **a line of communication** open between UTSA Students/communities”

“Different communities mean different issues/concerns; make sure students understand that; have students go out and have events out in the community”

“Faculty need to educate students in such a way that the students are aware of how efficiently they can serve the community”

QUESTION 4:

What faculty/staff/students engagement in teaching, research and service is most impactful to the community??



Topic: Communities

"Already connecting with community, like SAISD, but this needs to be increased; **we are building our communities, impacting where we live and work**"

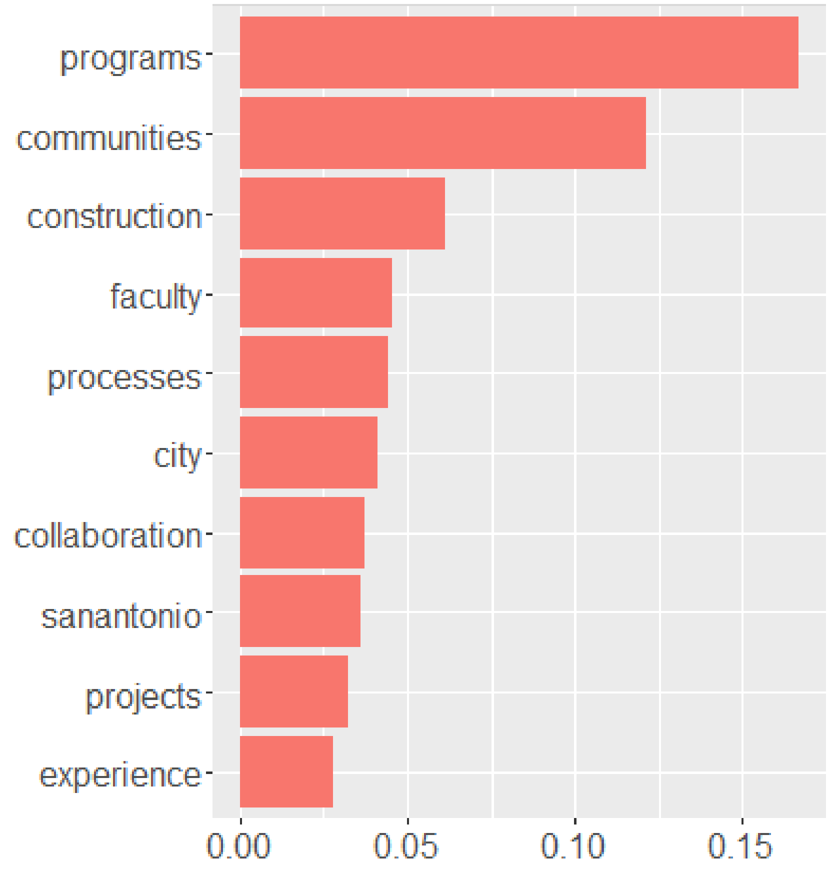
"**Students collaborating with faculty to help communities with constructing small projects**"

"Focus where the need is more. **Engage with communities that have been historically marginalized**"

"**Real engagement happens when the university opens its doors to the community** and shares the knowledge they have."

QUESTION 4:

What faculty/staff/students engagement in teaching, research and service is most impactful to the community??



Topic: Programs

"**Interdisciplinary programs to solve real problems** – with city of San Antonio as the client – would be great way for academia to have direct contribution to improving quality of life in the community"

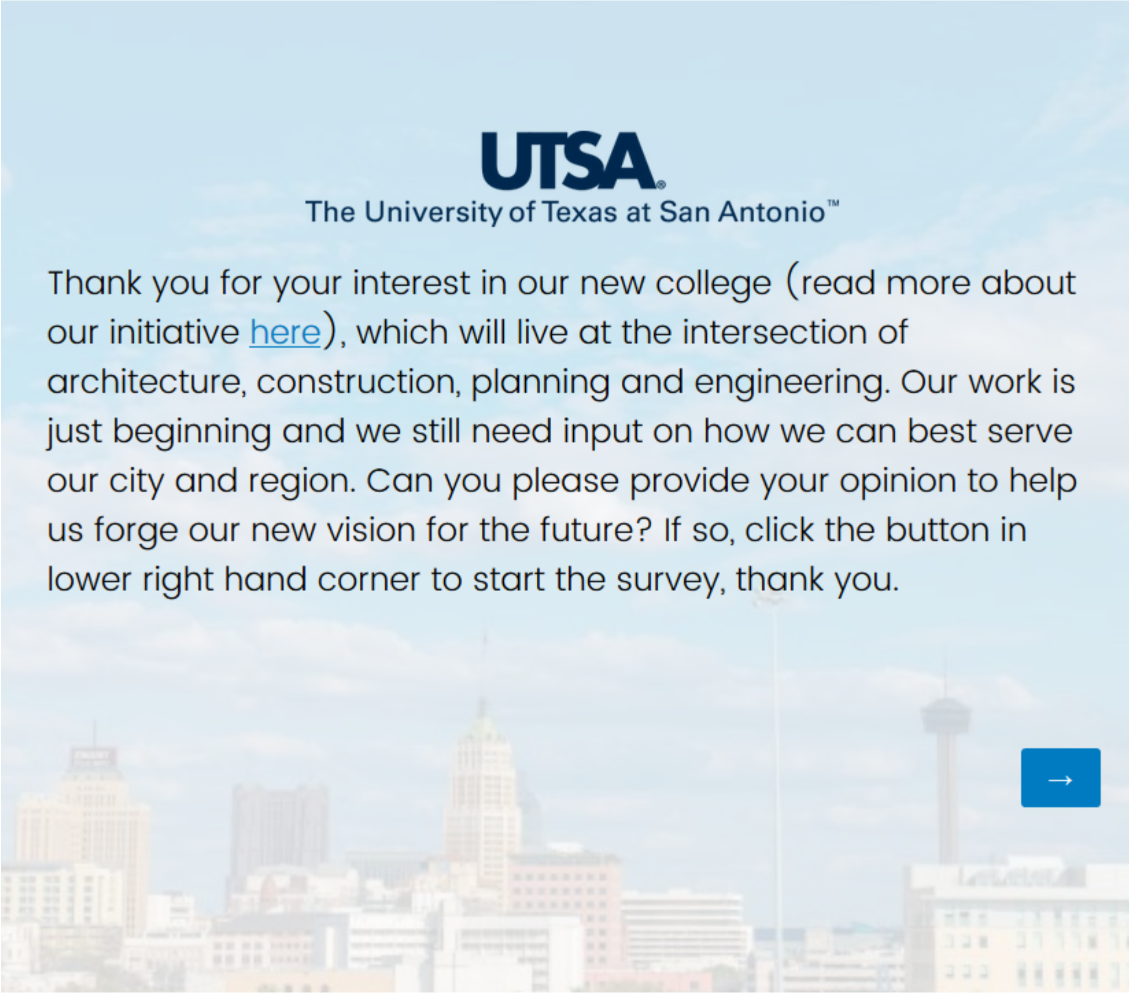
"**Formalize the linkage between prep programs,** UTSA programs, etc. will attract more students if they could see the tract or link."

"**Being able to communicate what the program is doing and how the program is beneficial.** Market the profession and what we are doing and what we can do to help the community."

KEY TAKEAWAYS FROM THE CHARRETTE

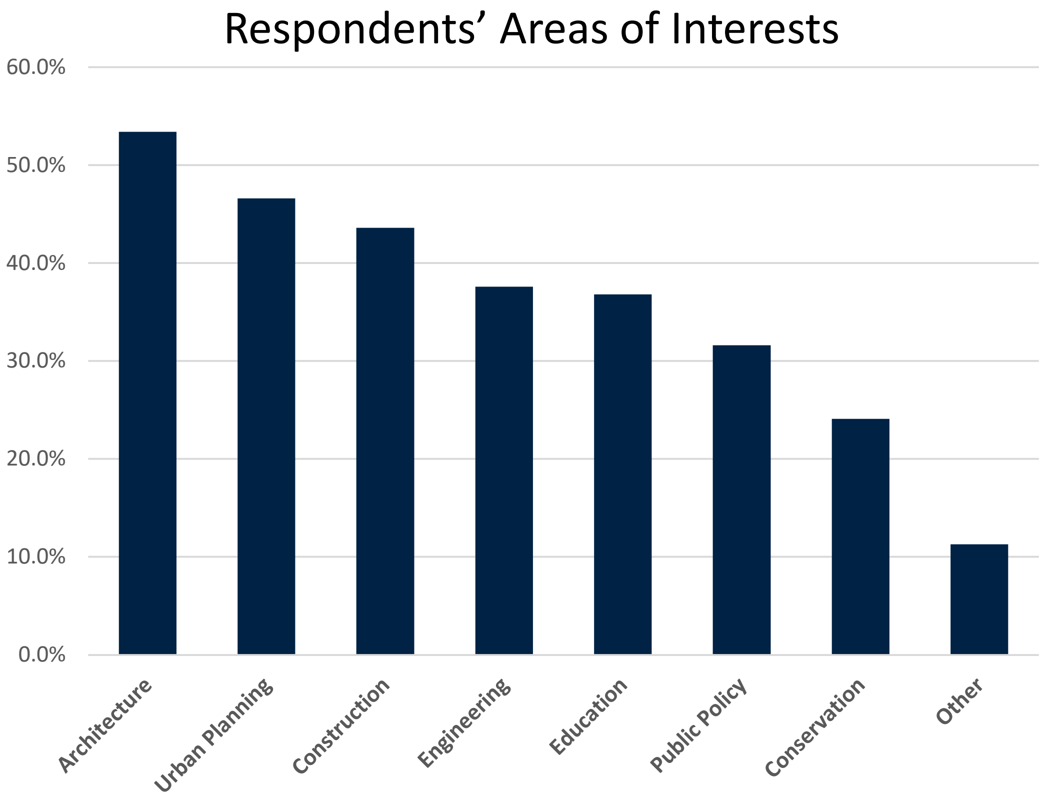
- Work with and for the San Antonio communities, especially that are disenfranchised and marginalized.
- Enhance communications among faculty, students, communities, and public/private sectors
- Promote interdisciplinary collaboration/partnership to enhance research and teaching
- Provide real-world, hands-on learning experience to students by partnering with industries and communities (studios, study-work program, internships)

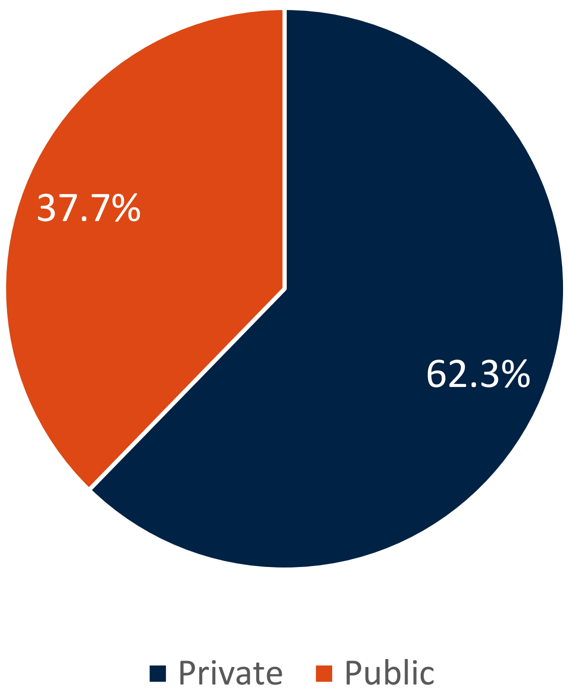
Community Engagement Subcommittee Online Survey

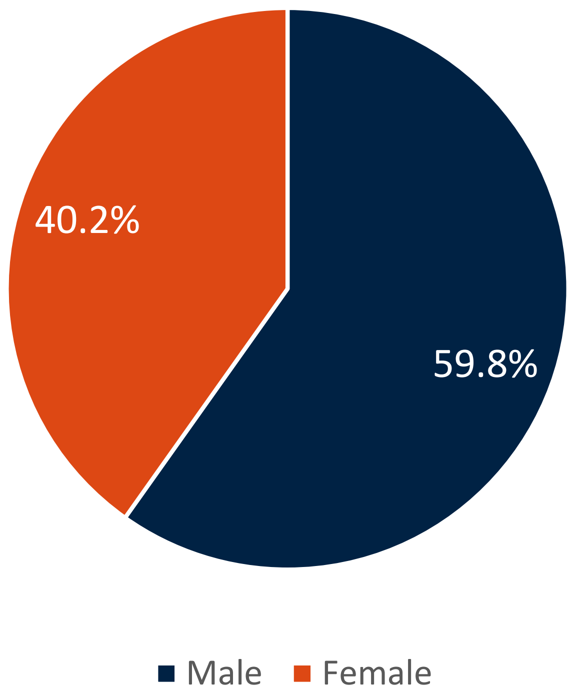


- **Delivery Method:** Online (Qualtrics)
- **Survey Period:** July 3rd to July 14th, 2020
- **Response Rate:** 26.6% (133/500)
- **Survey Questionnaire:**
  The questionnaire was developed based on the findings from the Charrette.
- **Note:**
  The objective of this survey was to collect inputs from external stakeholders outside UTSA. Therefore, responses from UTSA faculty/staff were not included in our analysis. The inputs from the internal stakeholders including faculty, student, and staff were collected via Knowledge Café organized by the Identity subcommittee.

Survey Respondents







- 86.4% of the respondents live less than 40 miles from UTSA campus
- 25.4% of the respondents (29) were affiliated with UTSA
  - Alumni (23), Advisory Board (17), Other (6), Faculty (1, non-UTSA)

QUESTION 1: Improving Quality of Life

How important is it for the new college to help local industries to develop innovative materials, processes or structures that improve the lives of people?

Choice	Count	Percent
Extremely Important	57	50.9%
Very Important	38	33.9%
Moderately Important	15	13.4%
Slightly Important	2	1.8%

▪ **Fostering partnerships with private and public sectors** to enhance teaching, research and employment opportunities with a focus on the local community.	52.6%
▪ **Incorporating data analytics and other emerging technologies to enhance public understanding and find solutions** to grand challenges in the fields of architecture, construction, planning and engineering.	37.6%
▪ **Designing secure and environmentally friendly systems** (e.g., construction, energy, water and materials) that are friendlier to our planet.	30.8%
▪ Focusing on research that can be **transitioned to commercial or non-profit organizations or to communities for actual deployment in the real world**	25.6%
▪ Other (please describe)	3.8%

QUESTION 2: Research Needs of the Community

How important is it for the new college to undertake research that takes into account the needs of the community?

Choice	Count	Percent
Extremely Important	53	50.5%
Very Important	41	39.0%
Moderately Important	9	8.6%
Slightly Important	2	1.9%

• **Transforming technology and processes that promote sustainable consumption of resources**, by planning, designing, building and maintaining climate-resilient structures, and enhanced energy efficient buildings	42.1%
• **Promoting compact development** that allows for aging in place to mitigate sprawl while preserving community's culture and addressing housing affordability.	33.8%
• **Working in a interdisciplinary manner motivated by discovery and helping society to mitigate inequalities** in the fields of architecture, construction, planning and engineering.	33.1%
• **Innovating with emerging technologies** like artificial intelligence, self-driving vehicles, and smart grids to spur economic development and improve quality of life.	28.6%
• Other (please describe)	5.3%

QUESTION 2.1: Research on Equitable Development

How important is it for the new college to undertake research that takes into account the needs of the community?

Choice	Count	Percent
Extremely Important	24	25.8%
Very Important	33	35.5%
Moderately Important	25	26.9%
Slightly Important	7	7.5%
Not at all Important	4	4.3%

• **Establish teaching and training after-school "ambassador" program for high school students in underserved communities** to spark an interest in architecture, engineering, construction and planning.	27.1%
• **Focus on a historically marginalized community and build a test bed** where creative and practical solutions that enhance livability can be applied.	24.8%
• **Perform local studies of housing, transportation and infrastructure and analyze the outcomes with an equity lens.**	18.8%
• Train future architecture, engineering, construction and planning professionals **to be advocates for disenfranchised communities in need of support.**	12.8%
• Other (please describe)	1.5%

QUESTION 3: Student Learning – Marketable Skills

How important is it for the new college to help students develop “marketable-skills” like work ethic, leadership and communication skills?

Choice	Count	Percent
Extremely Important	77	77.0%
Very Important	19	19.0%
Moderately Important	4	4.0%
Slightly Important		

• Developing project leadership skills for **project management, strategic decision-making, and team building**.	48.1%
• Fostering in students the ability to **express ideas and articulate their rationale when communicating** concepts in architecture, construction, planning and engineering using visual media and in written communication.	45.1%
• Exposing students to common **ethical issues regarding financial, business, management and relationship decisions** in architecture, construction, planning and engineering.	38.3%
• Inculcating in students an appreciation of **cultural diversity and social equity** in the workplace and beyond.	15.8%
• Other (please describe)	3.8%

QUESTION 4: Student Learning – Technical Skills

How important is it for the new college to help students develop "technical-skills" like software training and certificates?

Choice	Count	Percent
Extremely Important	37	37.4%
Very Important	37	37.4%
Moderately Important	21	21.2%
Slightly Important	4	4.0%

• Offer training on **collecting, analyzing, and visualizing data using virtual and augmented reality** in architecture, construction, planning and engineering applications.	39.8%
• Incorporate **geographic information systems** software training across various applications.	29.3%
• Provide training for students **on industry specific software packages** (please describe)	27.8%
• Offer **discipline specific cutting-edge certificates** and micro-masters to students (please describe)	11.3%
• Other (please describe)	4.5%

QUESTION 5: Continuing Education

How important is it for the college to create continuing education opportunities for professionals in need of software or industry related certificates?

Choice	Count	Percent
Extremely Important	23	24.5%
Very Important	30	31.9%
Moderately Important	28	29.8%
Slightly Important	9	9.6%
Not at all important	4	4.3%

• **Offer short courses on emerging topics** that award continuing education credits to professionals on Saturdays.	30.8%
• **Develop online undergraduate and graduate courses** that do not require any on-campus classes tailored for working professionals.	24.1%
• **Provide training on collecting, analyzing, and visualizing data** using virtual and augmented reality in architecture, construction, planning and engineering applications.	14.3%
• Provide workshops for **industry specific software packages**.	9.8%
• Other (please describe)	3.0%

QUESTION 6: Experiential Learning

Is it important for the new college to be engaged in experiential learning programs that provide opportunities to get real-world experience?

Choice	Count	Percent
Extremely Important	52	55.3%
Very Important	36	38.3%
Moderately Important	6	6.4%
Slightly Important		

• **Partner with local firms** to work on actual projects in class while utilizing a workshop style format.	42.9%
• Establish **mentoring and/or shadowing opportunities** where students can acquire first-hand experience of the profession.	38.3%
• Create **co-op opportunities** where students can apply academic training, test skills and get a head start on a career.	38.3%
• Offer opportunities to take **field trips and site visits** of relevance to architecture, construction, planning and engineering disciplines.	19.5%
• Other (please describe)	1.5%

QUESTION 7: Student Career Development: Networking

Should creating a venue for networking opportunities for industry and students be important for the new college?

Choice	Count	Percent
Extremely Important	33	35.1%
Very Important	33	35.1%
Moderately Important	19	20.2%
Slightly Important	8	8.5%
Not at all Important	1	1.1%

• Encourage **students to join, or create, student chapters of professional groups** and mingle with local chapters while making use of UTSA campus to host meetings.	37.6%
• **Hosting open house events** to introduce our students to employers.	28.6%
• Organizing **discipline-specific alumni receptions** (e.g., tailgates, cookouts, mixers) to gain insights about job market.	24.8%
• Other (please describe)	9.0%

Text Inputs from the Survey

Architecture

Categories		Summary
Research	Innovative/community-engaged research (Q2.2, Q2.3)	▪ Developing our community as a Design Destination for both Architecture and Interior Design ▪ More effort should be designated for affordable housing ▪ Collaboration for the private sector with Engineering, Architecture and Interior Design students. ▪ Data driven sustainability decisions should be used in the fields. ▪ Developing integrated design studios between architecture, planning and engineering students to display professional collaboration. ▪ Assistance for AREs. Larger summer internship program by involving local businesses and governmental entities. ▪ Free online courses for the community ▪ Revolutionizing architectural education embracing the needs of diverse communities
	Community's Needs and Wants (Q2.5, Q2.6)	▪ More in-depth knowledge of engineering and construction in architecture, Master Builder. ▪ Collaboration between private sector, educators and students. ▪ Multi disciplinary graduate level courses between architecture, engineering and planning ▪ Incorporating new sustainable technologies to the aging individuals' homes ▪ Creating joint projects involving the City and local businesses in design and development of an aging in place community.
	Promoting Equitable Development (Q2.23, Q2.24)	▪ Rather than study alone, implementing the ideas ▪ Outreach and engaging with underserved communities ▪ Reach out to minorities in high school ▪ After school ambassador program for underserved high school students.
Career Development	Connecting Students and Industries (Q2.21, Q2.22)	▪ Engaging future employers with future employees ▪ Students should meet local leaders and attend area lectures ▪ Having a way for professionals to see the students in action ▪ Use Architectural Alumni Association to bring former CACP students to mentor or network with current CACP students ▪ Faculty should be committed and dynamic to aggressively lead students into their surrounding professional community.

Text Inputs from the Survey

Architecture

<table>
<tr><th colspan="3">Categories</th><th>Summary</th></tr>
<tr><td rowspan="4">Teaching</td><td rowspan="2">Student Development</td><td>Marketable Skills
(Q2.8, Q2.9)</td><td>▪ Giving the equal chance of both office and construction environment to the students
▪ Speaking with valued uncommon vocabulary and distancing ourselves from the abilities of the common man
▪ Strengthening students’ communication skills
▪ Recognizing and teaching our students the value of our diverse society
▪ Emphasizing ethics
▪ Communicating using the technical software
▪ Collaboration and round table discussions between fields
▪ Increasing student interaction with professionals in order to understand the dynamics of a diverse workplace
▪ Joint course work on the of the AEC profession,</td></tr>
<tr><td>Technical (Scientific) Skills
(Q2.11, Q2.12)</td><td>▪ Revit, Sketchup, Autodesk, AutoCAD, Microstations, Primavera and Microsoft Scheduling,
▪ Understand project management software such as Procore, Timberline, and BIM360
▪ ProE, TraneTrace, HVAC, AFT Fathom, sustainability software, Civil 3D
▪ We need to be sure to teach the programs that most of Corporate America is using</td></tr>
<tr><td colspan="2">Continuing Education Program
(Q2.14, Q2.15)</td><td>▪ Provide workshops for industry specific software packages
▪ Providing training on collecting, analyzing, and visualizing data using virtual and augmented reality in architecture, construction, planning and engineering applications
▪ BIM and visualization</td></tr>
<tr><td colspan="2">Experiential Learning
(Q2.17, Q2.18)</td><td>▪ Involving students in real world design and construction projects
▪ Valuing education outside of academia
▪ Working with a professional that one admires
▪ Internships
▪ Broadening Summer Internship programs as well as offer mentorship programs with local firms.</td></tr>
</table>

Text Inputs from the Survey

Construction Science/Management

Categories		Summary
Research	Innovative/community-engaged research (Q2.2, Q2.3) Community's Needs and Wants (Q2.5, Q2.6)	▪ Partnerships with local private and public community should lead the climate action planning and environmentally friendly aspects of development, design, and construction ▪ Research and develop products and techniques that will lower costs of construction and reduce time to completion. ▪ Fact based, interdisciplinary operations the best way to approach problem solving and change management ▪ Redevelopment of existing structures: need to have research and implementation projects to lead the way to better pursuit of this aspect of sustainable planning and design/construction
	Promoting Equitable Development (Q2.23, Q2.24)	▪ Make the education/training program more accessible to the underserved communities through ambassador program in high schools and online programs. ▪ Partner with local nonprofit organizations ▪ Enhance partnership/collaboration with the communities

Text Inputs from the Survey

Construction Science/Management

<table>
<tr><th colspan="3">Categories</th><th>Summary</th></tr>
<tr><td rowspan="4">Teaching</td><td rowspan="2">Student Development</td><td>Marketable Skills (Q2.8, Q2.9)</td><td>▪ Workforce development
▪ Real world issue/applications, time in situ, OJT, etc. all point toward better professional preparation and marketability.
▪ Interdisciplinary activity preparedness should be part of college experience.
▪ Fundamental preparedness regarding speaking and writing skills.
▪ Articulate financial and practical aspects (yet not overlook innovation) of designs and inherent ability to effect connection between people and place
▪ Inter team communications and group dynamic management important skill set</td></tr>
<tr><td>Technical (Scientific) Skills (Q2.11, Q2.12)</td><td>▪ Technical skills more and more important, and bar being raised: AI, VR, GIS, broad band and cloud applications.
▪ There is and should be a constant evolution of new technology applications to assist in the planning, design and construction professions.
▪ Graduates must be up to date.</td></tr>
<tr><td colspan="2">Continuing Education Program (Q2.14, Q2.15)</td><td></td></tr>
<tr><td colspan="2">Experiential Learning (Q2.17, Q2.18)</td><td>▪ Forma COOPs are effective
▪ Service learning projects can give application experience and OJT
▪ Real time engagement with city or county
▪ Industry based and integrated final projects
▪ Internships, shadow days, ACE mentoring program</td></tr>
<tr><td>Career Development</td><td colspan="2">Connecting Students and Industries (Q2.21, Q2.22)</td><td>▪ Business social events to learn soft skills
▪ Education to high school students regarding opportunities in the built environment, especially to first generation students.</td></tr>
</table>

Text Inputs from the Survey

Urban Planning

Categories		**Summary**
Research	Innovative/community-engaged research (Q2.2, Q2.3)	▪ Incorporate emerging processes, technologies, methods, and policies into research ▪ Enhance engagement/partnership with public, private sectors, non-profit organizations and communities when conducting research. ▪ Focus on the following topics in planning: Social justice and equity, climate change, environmental challenges, public transportation, natural resource management ▪ Keep URP as a broad multidisciplinary discipline.
	Community's Needs and Wants (Q2.5, Q2.6)	▪ Innovate the built environment to improve the quality of life (housing, environment, transportation, food system) ▪ Address housing affordability, environmental justice, public health, and transportation (public transit, active transportation, and autonomous vehicle) ▪ Advocate for the disenfranchised and marginalized communities in San Antonio ▪ Address inequities through an inclusive interdisciplinary collaboration among various disciplines ▪ Enhance partnership and collaboration among various planning constituents.
	Promoting Equitable Development (Q2.23, Q2.24)	▪ Make the education/training program more accessible to the underserved communities through ambassador program in high schools and online programs. ▪ Partner with local nonprofit organizations ▪ Enhance partnership/collaboration with the communities

Text Inputs from the Survey

Urban Planning

Categories			Summary
Teaching	Student Development	Marketable Skills (Q2.8, Q2.9)	▪ Real-life instruction on ethical issues in development ▪ Engaging with public and private sector as well as local professional chapters (APA) ▪ Effective communication and writing skills ▪ Understanding of cultural diversity, social equity, and real world implications of their profession ▪ Collaboration and teamwork
		Technical (Scientific) Skills (Q2.11, Q2.12)	▪ GIS, Revit, low-tech and high-tech learning ▪ Collecting, analyzing, and visualizing data attuned to specific urban problems ▪ Communication skill with data ▪ Data collection using emerging technologies (IoT, augmented mobile devices)
	Continuing Education Program (Q2.14, Q2.15)		▪ GIS, Design Justice, ▪ Vocational training broader than design-oriented subjects (env. planning, public engagement) ▪ Develop online courses tailored for working professionals (planners, elected officials) ▪ Accessible and affordable upskilling/reskilling programs ▪ Multidimensional, interdisciplinary, up-to-date programs
	Experiential Learning (Q2.17, Q2.18)		▪ Create co-op, internship (project-based internships), and apprenticeship opportunities and mentorship programs to provide real-world learning experience. ▪ Create opportunities to apply knowledge to real world environment in class ▪ Enhance study abroad experience to promote cultural enrichment and personal development ▪ Incorporate diversity and social justice into experiential learning
Career Development	Connecting Students and Industries (Q2.21, Q2.22)		▪ Encourage students to interact with professionals at job sites and offices ▪ Organize more networking events, symposia/lectures from local professionals, interdisciplinary collaboration events, and job site/office visits for students to network with professionals. ▪ Create more mentorship opportunities to support student’s career development.

Text Inputs from the Survey

Engineering

Categories		Summary
Research	Innovative/community-engaged research (Q2.2, Q2.3)	▪ Focus on climate change & sustainable practices that are data informed ▪ Create opportunities to students to engage local communities and work with local firms to provide more hands on experience for problem solving (e.g., OJT) ▪ Address inequities and broaden representation of minority and socioeconomically disadvantaged communities
	Community's Needs and Wants (Q2.5, Q2.6)	▪ Accommodating growing population while addressing important socioeconomic (e.g., housing affordability, aging-in-place), environmental issues (e.g., natural resource conservation), and transportation (e.g., active transportation) ▪ AEC (Architecture, Engineering, and Construction) needs to better reflect the needs of communities they serve by diversifying the workforce. ▪ Develop innovative, affordable air conditioning technology by working with the industry (e.g., CPS Energy) ▪ Take interdisciplinary approach and utilize emerging technologies to solve multifaceted problems. Partner with local companies and colleges in the process.
	Promoting Equitable Development (Q2.23, Q2.24)	▪ Reflect on our history on segregation and inequity in San Antonio and its impact on today and tomorrow ▪ Enhance access to education and other opportunities to disenfranchised and marginalized communities.

Text Inputs from the Survey

Engineering

<table>
<tr><th colspan="3">Categories</th><th>Summary</th></tr>
<tr><td rowspan="4">Teaching</td><td rowspan="2">Student Development</td><td>Marketable Skills (Q2.8, Q2.9)</td><td>Effective communication skills for the engineering students (e.g., public speaking, articulating ideas, and professional writing)
Critical thinking skills
Financial and managerial literacy for engineers (e.g., project and financial management)
Ethics</td></tr>
<tr><td>Technical (Scientific) Skills (Q2.11, Q2.12)</td><td>Computer software skills: Revit, Sketchup, Autodesk, AutoCAD, BIM, GIS, Microstations, Primavera and Microsoft scheduling, ProE, TraneTrace HVAC, AFT Fathom, sustainability software, Civil 3D; project management software such as procore, timberline, Solidworks
Data science using emerging technology (IoT, Virtual and augmented reality)
Balance of quantitative and qualitative analysis skills</td></tr>
<tr><td colspan="2">Continuing Education Program (Q2.14, Q2.15)</td><td>Subject matter topics relevant to our community, and emerging technology (short courses)
Create more hybrid (modality), online classes to make education more accessible to professionals</td></tr>
<tr><td colspan="2">Experiential Learning (Q2.17, Q2.18)</td><td>Create more discipline-specific internships, and hands-on experiential learning opportunities.
Study abroad program to enhance students' global exposure
Create virtual experiential learning program</td></tr>
<tr><td>Career Development</td><td colspan="2">Connecting Students and Industries (Q2.21, Q2.22)</td><td>Create more networking opportunities to connect students to professionals (e.g., seminars and guest lectures)</td></tr>
</table>

Text Inputs from the Survey

Education and Public Policy

<table>
<tr><th colspan="3">Categories</th><th>Summary</th></tr>
<tr><td rowspan="3">Research</td><td colspan="2">Innovative/community-engaged research
(Q2.2, Q2.3)</td><td>▪ Secure and Environmentally friendly systems
▪ Improve the livelihood for generations to come
▪ Building relationships with public and private school systems
▪ Promote opportunities for student life after high school</td></tr>
<tr><td colspan="2">Community's Needs and Wants
(Q2.5, Q2.6)</td><td>▪ Healthier World and Healthier Life Span</td></tr>
<tr><td colspan="2">Promoting Equitable Development
(Q2.23, Q2.24)</td><td>NA</td></tr>
<tr><td rowspan="4">Teaching</td><td rowspan="2">Student Development</td><td>Marketable Skills
(Q2.8, Q2.9)</td><td>NA</td></tr>
<tr><td>Technical (Scientific) Skills
(Q2.11, Q2.12)</td><td>▪ Revit, Sketchup, Autodesk, AutoCAD, Microstations, Primavera and Microsoft Scheduling
▪ Understand project management software such as Procore, Timberline, and BIM360
▪ ProE, TraneTrace, HVAC, AFT Fathom, sustainability software, Civil 3D
▪ We need to be sure to teach the programs that most of Corporate America is using</td></tr>
<tr><td colspan="2">Continuing Education Program
(Q2.14, Q2.15)</td><td>▪ Online classes are attractive for the convenience of busy schedules
▪ Short courses on emerging topics that award CE credits enhance professional portfolio
▪ CE courses help meet the demand of a fast-changing world</td></tr>
<tr><td colspan="2">Experiential Learning
(Q2.17, Q2.18)</td><td>NA</td></tr>
<tr><td>Career Development</td><td colspan="2">Connecting Students and Industries
(Q2.21, Q2.22)</td><td>NA</td></tr>
</table>

Text Inputs from the Survey

Education and Public Policy

Categories		Summary
Research	Innovative/community-engaged research (Q2.2, Q2.3)	▪ Developing our community as a Design Destination for both Architecture and Interior Design ▪ More effort should be designated for affordable housing ▪ Collaboration for the private sector with Engineering, Architecture and Interior Design students. ▪ Data driven sustainability decisions should be used in the fields. ▪ Developing integrated design studios between architecture, planning and engineering students to display professional collaboration. ▪ Assistance for AREs. Larger summer internship program by involving local businesses and governmental entities. ▪ Free online courses for the community ▪ Revolutionizing architectural education embracing the needs of diverse communities
	Community's Needs and Wants (Q2.5, Q2.6)	▪ More in-depth knowledge of engineering and construction in architecture, Master Builder. ▪ Collaboration between private sector, educators and students. ▪ Multi disciplinary graduate level courses between architecture, engineering and planning ▪ Incorporating new sustainable technologies to the aging individuals' homes ▪ Creating joint projects involving the City and local businesses in design and development of an aging in place community.
	Promoting Equitable Development (Q2.23, Q2.24)	▪ Rather than study alone, implementing the ideas ▪ Outreach and engaging with underserved communities ▪ Reach out to minorities in high school ▪ After school ambassador program for underserved high school students.

CONCLUSION

- **CACP Charrette**: Important areas of innovation in research and teaching
  - Foster community-engaged, interdisciplinary research
  - Enhance partnership with industry partners and public sector
  - Train students with important marketable and technical skills
- **Community Engagement Survey:**
  - Research
    - Research based on partnership with private and public sectors
    - Data analytics/technologies to enhance public understanding and find solutions
    - Emphasis on social justice and equity design, planning, and development
    - Designing secure, sustainable environmental systems
    - Research with real-world application and implications
  - Teaching
    - More emphasis on marketable skills (e.g., communication, management, advocacy)
    - Technical Skills (e.g., data analytics, visualization, technical certificates, continuing education)
  - Career Development
    - Provide more networking opportunities
    - Internship, field trip, workshop, shadowing
    - Connect students with future employers

NEXT STEPS

- Expand the scope of community engagement to national and international communities
  - Research and teaching beyond local communities (e.g., study abroad programs)
- Identify and address the missing pieces from Phase 1 by coordinating with other subcommittees

BENCHMARKING

Subcommittee Charge

The Benchmarking Subcommittee was charged with considering other structural models that promote interdisciplinary and collaborative curricula with minimized administrative burden.

Method

Primary methods employed by the Benchmarking Subcommittee included researching transdisciplinary models of research, teaching and learning at the college and institute level. The Subcommittee noted that integrated design models are more widely found outside the United States. However, the subcommittee narrowed down their research to U.S., Canadian, and European models for the Phase I report.

Integrated Design Initiative Task Force

Benchmark Subcommittee Report

Committee Members

Ibukun Awolusi	**Sean Kelly**
Janis Bush	**David Matiella**
Ian Caine	**Arturo Montoya**
Sedef Doganer	**Jianwei Niu**
Curtis Fish	**Hatim Sharif**
Albert Han	**Rebecca Weston**

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Introduction

This subcommittee sought to identify academic and administrative models that successfully promote transdisciplinary research and teaching among the disciplines of architecture, construction science, engineering, and urban planning. The following report describes these efforts and highlights several key findings: First, academic units that integrate the various engineering subdisciplines with architecture, construction science, and/or urban planning are rare in North America (read more here). Of these, three were sufficient in size to warrant in-depth consideration: The Ohio State University, McGill University, and Washington State University. The report also highlights several programs at Arizona State University, which has developed an innovative, transdisciplinary academic model that focuses on the topic of sustainability.

The subcommittee did find that integrated academic models are more common outside of North America. Limited financial data and differences in administrative structures limited our ability to develop these case studies. Still, at the organizational level, these models remain relevant and can inspire new thinking for the larger Task Force. So this report presents abbreviated descriptions and organizational diagrams for the University of Strathclyde Glasgow (UK), University College London (UK), and TU Darmstadt (Germany) (read more here).

Finally, the most compelling transdisciplinary work involving the disciplines of architecture, construction science, engineering, and urban planning is taking place within university-based Research Institutes. The report therefore provides multiple examples, highlighting one leading Research Institute from each of the following areas: Sustainability and the Environment, Resilience and Infrastructure, Urbanism and Urban Science, Construction and Material Science, Community Design and Outreach, Energy and Environment.

Section I: College Models

McGill University

Rationale for Inclusion: McGill University is one of the few examples in North America of a College of Engineering which houses a School of Architecture.

Mission/Vision Statement:

"The mission of McGill University is the advancement of learning and the creation and dissemination of knowledge, by offering the best possible education, by carrying out research and scholarly activities judged to be excellent by the highest international standards, and by providing service to society."

General Information: McGill is a public university in Canada that was founded in 1821. It ranks 30th among universities in the world[1]. Enrollment in the Fall of 2019 was 40,153; with 27,260 undergraduate and 10,160 graduate students. Additionally, there were 738 postdoctoral and 1,247 residents and fellows. There are 1,707 tenure/tenure-track faculty, 153 endowed teaching and research chairs, and 195 active fellows of the Royal Society of Canada. Unrestricted revenue funds were $920.0M. Total research expenditures (including affiliated hospitals) was $566.6M, of which 51% ($295.9M) was federal, 17% ($94M) was Provincial, 16% ($88.4M) not-for-profits, and 8% was industry ($44M). There are 11 faculties and 14 schools and other academic units.

McGill's five key objectives as outlined in their 2017-2022 Strategic Academic Plan[2] are 1) to be open to the world, 2) expand diversity, 3) lead innovation, 4) connect across disciplines and sectors, and 5) connect with communities. There are seven *Research Excellence Themes* delineated: 1) develop knowledge of the foundations, applications, and impacts of technology in the Digital Age, 2) understand the potential of the human brain and nervous system, 3) design and create sustainable materials, technologies, landscapes, and communities, 4) advance biomedical and health sciences for healthy populations, 5) strengthen public policy and organizations, and create a deeper understanding of society and social transformation, 6) explore Earth's biological and physical systems and the universe, and 7) examine fundamental questions about humanity, identity, and expression.

The Faculty of Engineering:

The Faculty of Engineering has six departments, two schools, and four institutes located on one campus.

[1] Center for World University Rankings. 2020. https://cwur.org/2019-2020/McGill-University.php
[2] McGill University Strategic Academic Plan https://www.mcgill.ca/provost/article/mcgill-university-strategic-academic-plan-2017-2022

Enrollment: There are ten major programs, with a total of 3,392 undergraduate and 1,103 graduate students enrolled (Fall 2019). A table and schematic diagram of the enrollments for the various programs, departments, and schools are illustrated in Table 1. Ninety-three percent (4,392) of the enrolled students were from engineering programs; seven percent (331) were in architecture programs. A closer look at engineering enrollments shows that the Electrical Engineering program had the highest enrollment (1,160; 25% of the total), followed by Mechanical Engineering (749; 16%). In the Knowlton School of Architecture, the program with the highest enrollment was the Bachelor of Science in Architecture (163; 3%; see Table 1).

Degrees Conferred: Data for degrees conferred was not complete; however based on the data obtained, the Bachelor of Engineering in Electrical awarded the most degrees (137, 20%; Figure 1). The Faculties of Engineering offers a total of 21 master's level degrees (Figure 2). The doctoral program in Electrical Engineering had the highest number of degrees awarded at the doctoral level (101; 15%; Figure 3). In the Architecture and Planning programs, the Bachelor of Science in Architecture had the greatest number of degrees awarded (25; 4%; Figure 1).

Personnel: Table 2 shows the distribution of tenure/tenure track faculty, non-tenure/adjunct faculty, and staff among the departments and schools. There are a total of 145 faculty with the Faculty of Engineering, with 85% within Engineering (46; 32% in Electrical & Computer Engineering) and 15% within Architecture & Planning (17; 12%). The School of Architecture has the highest number (23; 36%) of non-tenure faculty. The number of staff follows a similar trend to that of the tenure track faculty with 29% (19) staff members serving Electrical and Computer Engineering (Table 2).

Faculty Overview: According to McGill's Office of the Provost and Vice-Principal Budget overview[3], the

> "Faculty of Engineering is committed to maintaining a body of faculty members who are renowned leading-edge researchers, and supporting researchers with cutting-edge facilities and support services. Engineering is working to establish an inclusive and diverse community of students, faculty and staff to create an environment that attracts a high quality and diverse body of students from across the world."

FY2017 Achievement[4].

- Approval of the undergraduate Bachelors of Engineering program in Bioengineering by MEES, with admission of the first class of 30 students in September 2016
- Provided more than $82,000 in funding over the past academic year to support student activities and help them in their personal/professional development
- The Faculty maintains active leadership in the University in terms of diversity initiatives in support of recruitment and retention of women in the Faculty and student body

FY2017 Challenges[5].

- Growth in student numbers in the Faculty has not been accompanied by a commensurate level of **resources** support including **budgets**, support personnel, equipment, and space
- New accreditation process has become an excessive burden to the Faculty
- Workshops remain a major challenge with respect to safety, equipment renewal, labour issues, and training of students in support of engineering programs

[3] McGill 2017, Office of the Provost and Vice Principal (Academic) June 2017 Montreal, Quebec, Canada. https://www.mcgill.ca/budget/files/budget/budget_book_fy2018_final_20170905.pdf
[4]Ibid.
[5]Ibid.

Table 1. Number and percent of total enrollments and degrees conferred for various programs in various departments and schools for the Faculty of Engineering at McGill University

Department/School - Degrees	Enrollment (2019)		Degrees Conferred	
	Count	Percent	Count	Percent
ENGINEERING				
Bioengineering				
BEng in Bioengineering	204	4	8	1
MEng in Biological and Biomedical Engineering	42	1		
MEng in Biomedical Engineering				
MEng in Bioresource Engineering	101	2		
PhD in Biological and Biomedical Engineering	70	1		
PhD in Biomedical Engineering	11	0		
PhD in Bioresource Engineering	63	1		
Chemical Engineering				
BEng in Chemical Engineering	350	7	39	6
MEng in Chemical Engineering	35	1		
PhD in Chemical Engineering	63	1	29	4
Civil Engineering & Applied Mechanics				
BEng in Civil Engineering	407	9	72	11
MS in Civil Engineering	70	1		
MEng in Civil Engineering				
MEng (Thesis) in Civil Engineering				
MEng in Environmental Engineering				
PhD in Civil Engineering	55	1	27	4
Electrical & Computer Engineering				
BEng in Electrical Engineering	1,160	25	137	20
BEng in Computer Engineering				
BEng in Software Engineering				
MS in Electrical and Computer Engineering	117	2		
MEng in Electrical and Computer Engineering				
PhD in Electrical and Computer Engineering	160	3	101	15
Mechanical Engineering				
BS in Mechanical Engineering	749	16	63	9
MS in Mechanical Engineering	107	2		
MEng in Mechanical Engineering				
MEng in Aerospace Engineering				
PhD in Mechanical Engineering	115	2	65	10
Mining & Materials Engineering				
BS in Materials Engineering	359	8	19	3
BS in Mining Engineering			14	2
MS in Mining and Materials Engineering	44	1		
MEng in Mining and Materials Engineering				
MEng (Thesis) in Mining and Materials Engineering				
PhD in Mining and Materials Engineering	110	2	64	9

Department/School - Degrees	Enrollment (2019)		Degrees Conferred	
	Count	Percent	Count	Percent
ARCHITECTURE AND PLANNING				
School of Urban Planning				
Master of Urban Planning	48	1		
PhD in Urban Planning, Policy, and Design	5	0	8	1
The Peter Guo-hua Fu School of Architecture				
B.Sc. in Architecture	163	3	25	4
M.Arch. (Professional) in Architecture	90	2		
Master of Architecture (Post-professional)				
PhD in Architecture	25	1	6	1
Other Interdisciplinary Programs				
Global Manufacturing and Supply Chain Management				
Master's in Manufacturing Management				
Total	**4,723**	**100**	**677**	**100**

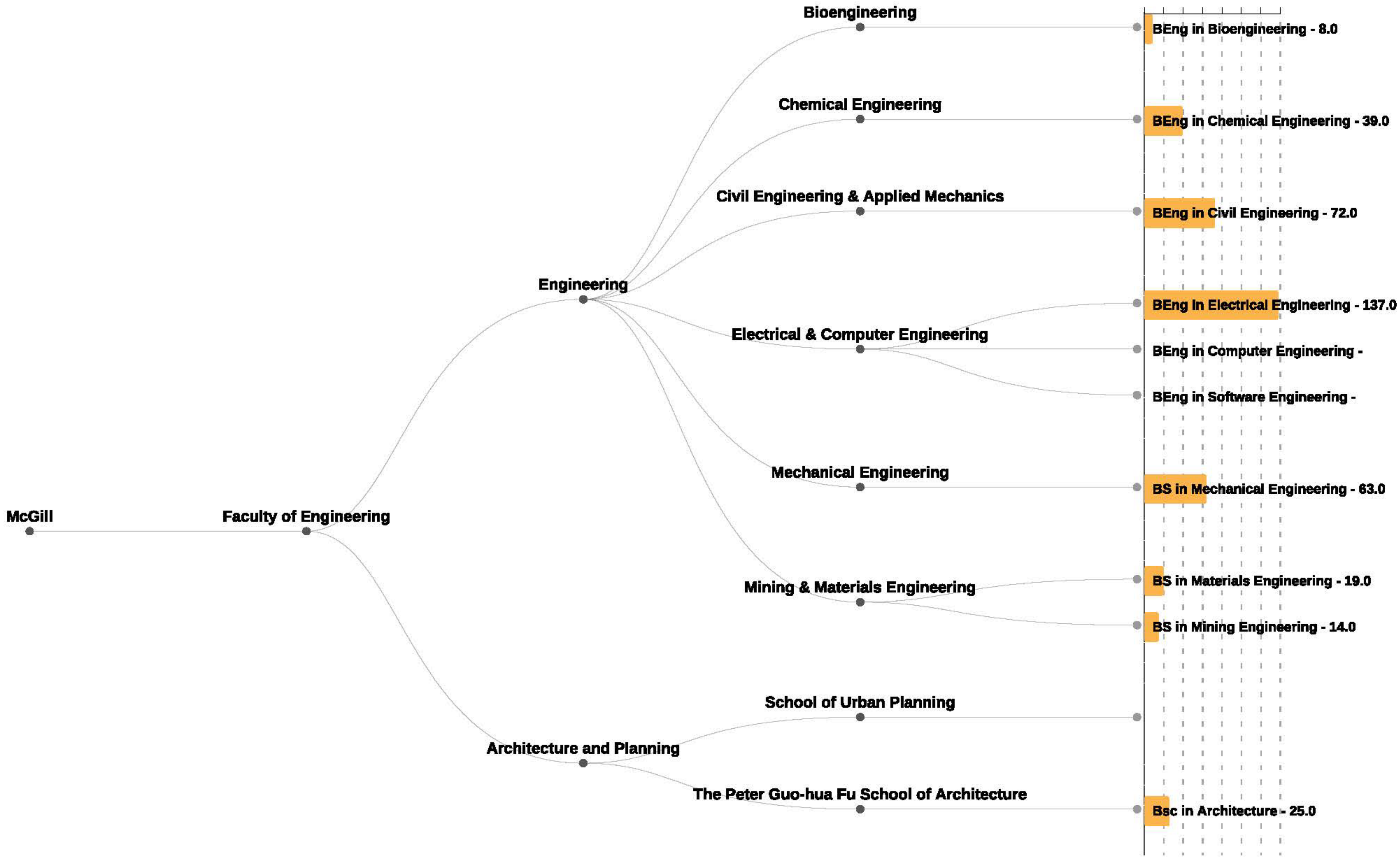

Figure 1. Distribution of undergraduate degrees conferred in 2019 for various programs in the Faculty of Engineering– McGill University

Figure 2. Programs awarding master's degrees within the Faculty of Engineering – McGill University

Figure 3. Distribution of doctoral degrees conferred in 2019 for various programs in the Faculty of Engineering– McGill University

Table 2. Number of personnel for departments and schools of the Faculty of Engineering for McGill University

Faculty of Engineering	Tenured/Tenure Track	Emeritus	NTT/Adjunct	Staff
Bioengineering	**9**	**0**	**9**	**5**
Chemical Engineering	**18**	**4**	**0**	**14**
Civil Engineering & Applied Mechanics	**21**	**2**	**0**	**12**
Electrical & Computer Engineering	**46**	**9**	**17**	**19**
Mechanical Engineering	**29**	**6**	**9**	**7**
Mining & Materials Engineering	**23**	**4**	**16**	**15**
School of Urban Planning	**5**	**3**	**6**	**2**
The Peter Guo-hua Fu School of Architecture	**17**	**4**	**23**	**7**

Organizational Chart: Not available at this time

Financial:

The FY2018 Operating Budget for the Faculty of Engineering was $38.6M (8% of the total academic unit operating budget). Other summary metrics can be found in Table 3.

Table 3. Summary of metrics for FY2016, as well as updated information for FY2017, and planned information for FY2018, FY2019, and FY2020 for Faculties of Engineering at McGill University.[6]

Metrics	FY2016 actual	FY2017 updated	FY2018 planned	FY2019 planned	FY2020 planned
TENURE-TRACK STAFF					
Start of year complement	**155.0**	**154.0**	**158.5**	**162.5**	**162.5**
New hires	5.0	9.0	11.0	6.0	6.0
Resignations	(5.0)	(3.5)	(3.0)	(5.0)	(3.0)
Retirements	(1.0)	(1.0)	(4.0)	(1.0)	(3.0)
Year-end complement*	**154.0**	**158.5**	**162.5**	**162.5**	**162.5**
Target complement		**162.0**	**163.0**	**163.0**	**163.0**
Under (over) complement					**0.5**
*Excluded from count (senior admin & Provostial appointments)	0.0	1.0	1.0	1.0	1.0
CRCs, AWARDS & ENDOWED CHAIRS					
CRC I	7	8	8	8	8
CRC II	12	10	10	10	10
James McGill Professor	9	9	9	9	9
William Dawson Scholar	4	6	6	6	6
Endowed Chairs	14	14	14	14	14
Total	**46**	**47**	**47**	**47**	**47**
ADMINISTRATIVE & SUPPORT STAFF					
Clerical/Management/Technical	136	134	138	138	139
PERFORMANCE ASSUMPTIONS					
Undergrad **FTE** students	2,102.1	2,162.9	2,169.4	2,175.9	2,182.4
Grad **FTE** students	803.6	784.2	786.6	788.9	791.3
Deregulated FTE students	708.6	756.6	758.9	761.1	763.4
UG FTEs/Prof	13.7	13.6	13.4	13.4	13.4
Masters **FTEs**/Prof	3.0	2.8	2.8	2.8	2.8
PhD **FTEs**/Prof	2.2	2.1	2.1	2.1	2.1
Research $/Prof ($000)	$184	$180	$175	$175	$175
RESEARCH ($000)					
	$28,283	$28,500	$28,500	$28,500	$28,500
FUNDRAISING ($000)					
	$1,000	$1,080	$1,100	$1,100	$1,100

Facilities: None available at this time

Student Life/Residential College: McGill University does not have a residential college associated with the Faculty of Engineering.

[6] McGill 2017, Office of the Provost and Vice Principal (Academic) June 2017 Montreal, Quebec, Canada. https://www.mcgill.ca/budget/files/budget/budget_book_fy2018_final_20170905.pdf

Ohio State

Rationale for Inclusion: Ohio State University is one of the few examples in the United States of a College of Engineering which houses a School of Architecture.

Mission/Vision Statement: Ohio State University is a public university that was founded in 1870. It ranks among the top 20 universities in the United States by U.S. News & World Report[7]. The mission of the University is:

> *"The University is dedicated to: 1) creating and discovering knowledge to improve the well-being of our state, regional, national and global communities; 2) educating students through a comprehensive array distinguished academic programs; 3) preparing a diverse student body to leaders and engaged citizens; and 4) fostering a culture of engagement and service."*

General Information: Enrollment in Fall of 2019 was 68,262; with 53,699 undergraduate and 14,593 graduate and professional students. There are 2,839 tenure/tenure-track faculty, 1,836 regular clinical faculty, and 2,795 associated faculty. There are 40 current faculty who are members of various National Academies. Unrestricted revenue funds were $7.0B. Total research expenditures was $931.1M, of which 63% ($582.5M) was sponsored programs, 10% ($88.9M) was Research Institute at Nationwide Children's Hospital, 4% ($38.6M) Transportation Research Center, 9% ($82.9M) other research programs, and 15% ($138.2M) was institutional (cost sharing and support). There are 15 colleges, over 250 undergraduate majors, 171 master's degree programs, 113 doctoral programs, 9 professional degree programs, and an estimated 12,000 courses.

The Ohio State's President 2020 Vision includes three vital areas: 1) access, affordability, and excellence, 2) community engagement, and 3) diversity and inclusion[8]. The Ohio State's four pillars as outlined in their 2019 Strategic Academic Plan[9] are 1) teaching and learning, 2) access, affordability and excellence, 3) research and creative expression, 4) academic health care, and 5) operational excellence and resource stewardship. Their four grand research challenges are: 1) Energy & Environment, 2) Health, 3) Security, and 4) Learning & Computation.

[7] U.S. News and World Report's, 2020 Edition of "America's Best Colleges"
[8] Ohio State's Strategic Plan, *Time and Change: Enable, Empower, and Inspire. 2019.* https://live-president-osu.pantheonsite.io/sites/default/files/documents/2019/09/WEB_Ohio%20State_Strategic_Plan_Narrative_.pdf
[9] Ibid

The College of Engineering:

The College of Engineering has ten departments, one school, and five interdisciplinary centers or institutes located on one campus.The mission of the College of Engineering is:

> *"We create, transfer and preserve knowledge in the disciplines of engineering and architecture for the purpose of enhancing economic competitiveness regionally, nationally and globally". The College of Engineering has identified four grand challenges: Energy & Environment, Health, Security, and Learning & Computation.*

Enrollment: There are fifteen major programs, with a total of 7,931 undergraduate and 1,812 graduate student enrolled (Fall 2019). A table and schematic diagram of the enrollments for the various programs, departments, and schools are illustrated in Table 4. Ninety-seven percent (7,743) of the enrolled students were from engineering programs; three percent (280) were from architecture programs. A closer look at engineering enrollments shows that the Computer Science & Engineering program had the highest undergraduate enrollment (1,902), followed by Mechanical Engineering (1,619). In the Knowlton School of Architecture, the program with the highest undergraduate enrollment was the Bachelor of Science in Architecture (331). Electrical & Computer Engineering had the highest master's enrollment (197) among the engineering programs. The Architecture (59) and City & Regional Planning (52) degree programs had high master's level enrollment within the Knowlton School of Architecture. Several doctoral programs had high enrollments including Computer Science & Engineering (189), Electrical & Computer Engineering (237), and Mechanical & Aerospace Engineering (207). Within the Knowlton School of Architecture, the City & Regional Planning doctoral program has the highest doctoral enrollment with 24 students.

Degrees Conferred: The College of Engineering at Ohio State University has over 50 degree programs (Table 4). Several of the degree programs within the engineering departments in the College of Engineering had greater than 100 graduates (see Table 4). The bachelor's degree in Architecture (68) had the highest number of degrees conferred in the Knowlton School of Architecture (Figure 5). Both the Computer Science & Engineering and Mechanical & Aerospace Engineering programs had the highest number of master's degrees conferred (80 and 97, respectively; Figure 6). In the Knowlton School of Architecture, the Architecture and City & Regional Planning had the highest number of master's degrees conferred (29 and 27, respectively). The greatest number of doctoral degrees were conferred in the Electrical & Computer Engineering program (45), followed by the Mechanical & Aerospace Engineering program (33) Figure 7. Three doctoral degrees were awarded in the City & Regional Planning (Table 4).

Personnel: Table 5 shows the distribution of tenure/tenure track faculty, non-tenure/adjunct, and staff among the departments and schools. There are a total of 425 tenure/tenure-track faculty in the College of Engineering, with 90% (379) in engineering and 10% (46) in Knowlton School of Architecture. Twenty-four percent of the non-tenure faculty were in the Department of Computer Science & Engineering, followed by 15% (37) in the Knowlton School of Architecture. Staff ranged from 8 in Engineering Education to 34 in Mechanical and Aerospace Engineering (Table 5).

Table 4. Number and percent of total enrollment and degrees conferred for various programs in various departments and schools for the College of Engineering at Ohio State University

Departments/Schools	**Enrollment (Fall 2019)**		**Degrees Conferred (SU18-SP19)**	
	Count	**Percent**	**Count**	**Percent**
COLLEGE OF ENGINEERING				
BS	7,931	81	1,715	73
MS	741	8	464	20
PhD	1,071	11	169	7
Sub-total	**9,743**	**100**	**2,348**	**100**
Biomedical Engineering				
BS in Biomedical Engineering	529	6	69	3
MS in Biomedical Engineering	20	0	13	1
PhD in Biomedical Engineering	66	1	15	1
Civil, Environmental and Geodetic Engineering				
BS in Civil Engineering	536	6	158	7
BS in Environmental Engineering	130	2	28	1
MS in Civil Engineering	41	0	30	1
PhD in Civil Engineering	59	1	5	0
Computer Science and Engineering				
BS in Computer Science and Engineering	1,381	16	296	13
BS in Computer and Information Science				
BA in Computer and Information Science				
MS in Computer Science and Engineering	99	1	80	4
PhD in Computer Science and Engineering	189	2	20	1
Electrical and Computer Engineering				0
BS in Electrical and Computer Engineering	759	9	274	12
MS in Electrical and Computer Engineering	197	2	116	5
PhD in Electrical and Computer Engineering	237	3	45	2
Engineering Education				
PhD in Engineering Education	16	0	0	0
Food, Agricultural, and Biological Engineering				
BS in Agricultural Systems Management				
BS in Construction Systems Management				
BS in Food, Agricultural and Biological Engineering	273	3	124	6
MS in Food, Agricultural and Biological Engineering	25	0	3	0
PhD in Food, Agricultural and Biological Engineering	29	0	5	0
Integrated Systems Engineering				
BS in Integrated Systems Engineering	401	5	134	6
MS in Integrated Systems Engineering	34	0	30	1
PhD in Integrated Systems Engineering	46	1	10	0
Materials Science & Engineering				

Departments/Schools	Enrollment (Fall 2019)		Degrees Conferred (SU18-SP19)	
	Count	Percent	Count	Percent
BS in Materials Science and Engineering	230	3	42	2
BS in Welding Engineering	160	2	47	2
MS in Materials Science and Engineering	11	0	27	1
MS in Welding Engineering	77	1	11	1
PhD in Materials Science and Engineering	102	1	19	1
PhD in Welding Engineering	23	0	1	0
Mechanical and Aerospace Engineering				
BS in Mechanical Engineering	1,169	14	119	5
BS in Aeronautical and Astronautical Engineering	450	5	72	3
MS in Aeronautical and Astronautical Engineering	21	0	10	0
MS in Mechanical Engineering	107	1	81	4
MS in Nuclear Engineering	3	0	6	0
PhD in Aeronautical and Astronautical Engineering	38	0	6	0
PhD in Mechanical Engineering	147	2	23	1
PhD in Nuclear Engineering	22	0	4	0
William G. Lowrie Department of Chemical and Biomolecular Engineering				
BS in Chemical Engineering	817	10	243	11
MS in Chemical Engineering	21	0	19	1
PhD in Chemical Engineering	90	1	12	1
Knowlton School of Architecture				
BS	568	77	124	62
MS	143	19	74	37
PhD	24	3	3	1
Total	**735**	**100**	**201**	**100**
Architecture				
BS in Architecture	331	45	68	70
Master of Architecture (MArch)	59	8	29	30
City and Regional Planning				
City and Regional Planning	139	19	28	14
Master in City and Regional Planning (MCRP)	52	7	27	13
PhD in City and Regional Planning	24	3	3	1
Landscape Architecture				
BS in Landscape Architecture	98	13	28	14
Master of Landscape Architecture I (MLA I)	32	4	18	9
Master of Landscape Architecture II (MLA II)	0	0	0	0
Sub-total	**345**	**100**	**201**	**52**
Other Interdisciplinary Programs				
Aviation				
BS in Aviation	73	26	13	18
Engineering Physics Program				0

Departments/Schools	Enrollment (Fall 2019)		Degrees Conferred (SU18-SP19)	
	Count	Percent	Count	Percent
BS in Engineering Physics	114	41	16	23
Business Logistics Engineering				0
Master of Business Logistics Engineering	42	15	28	39
Environmental Science				0
MS in Environmental Science	6	2	7	10
PhD in Environmental Science	8	3	4	6
Global Engineering Leadership				0
Master of Global Engineering Leadership	37	13	3	4
Total	**280**	**100**	**71**	**100**

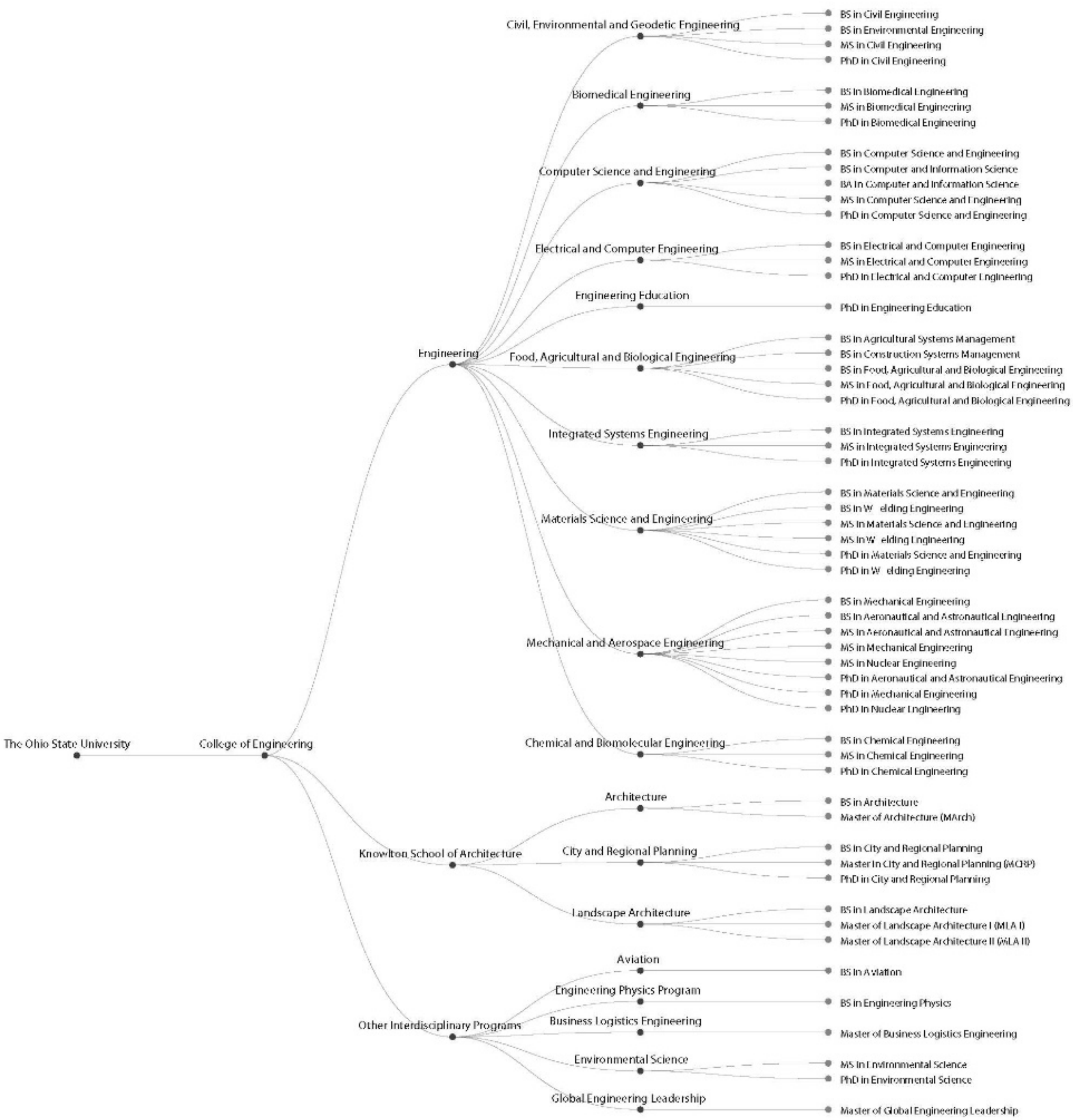

Figure 4. A schematic of the degrees awarded by department or program for the College of Engineering – Ohio State University

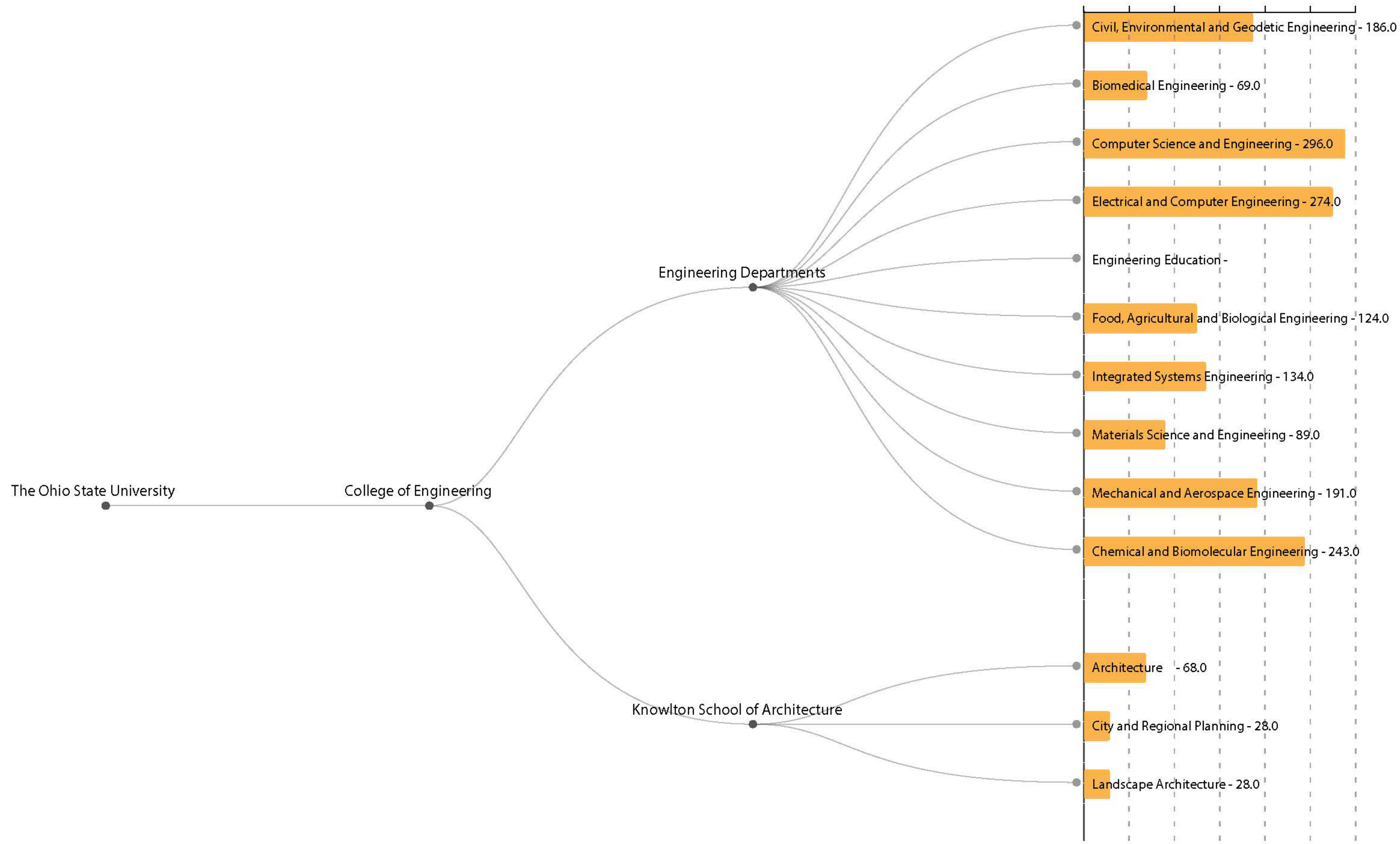

Figure 5. Distribution of undergraduate degrees conferred by program in 2019 – Ohio State University

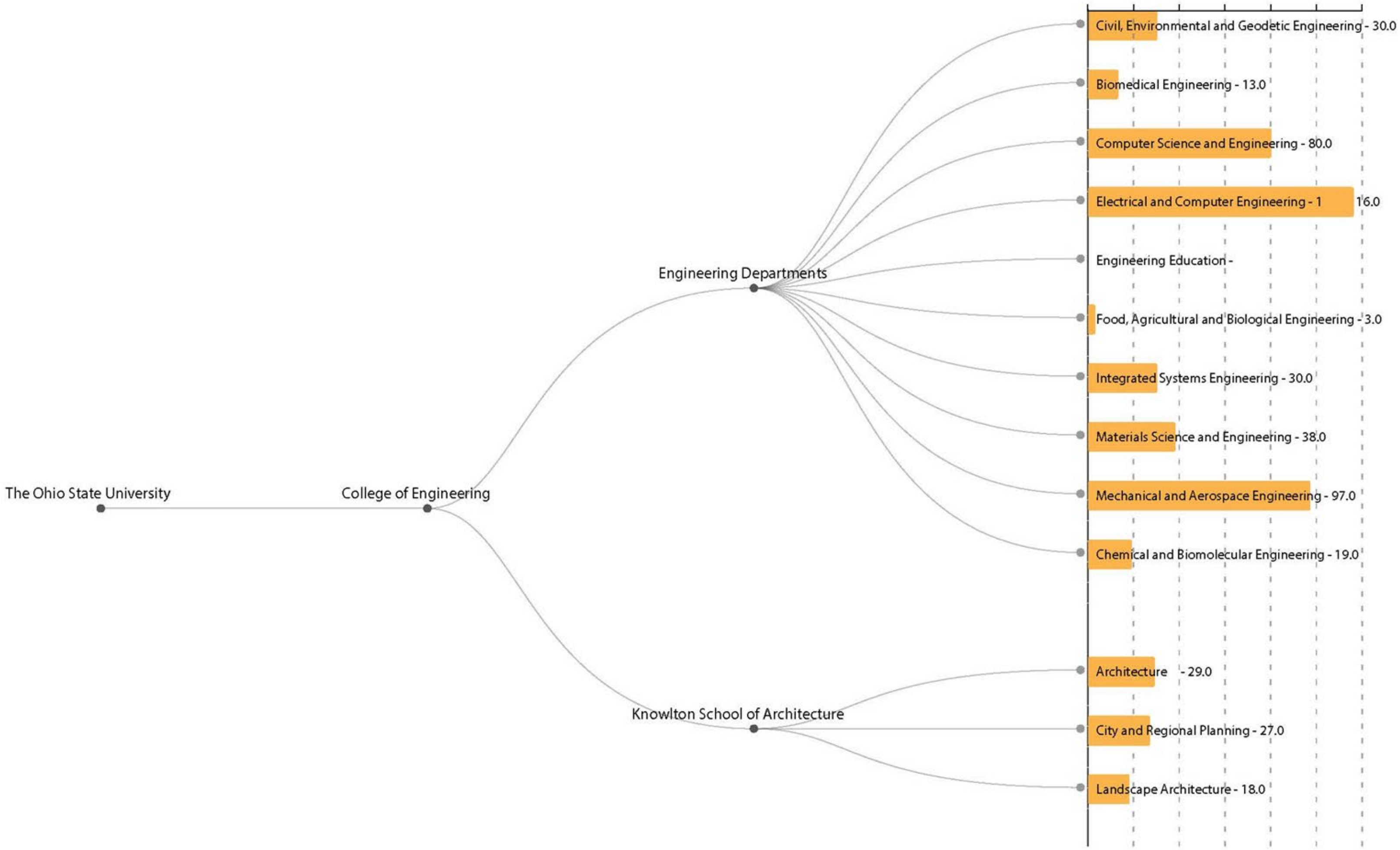

Figure 6. Distribution of master's degrees conferred by program in 2019 – Ohio State University

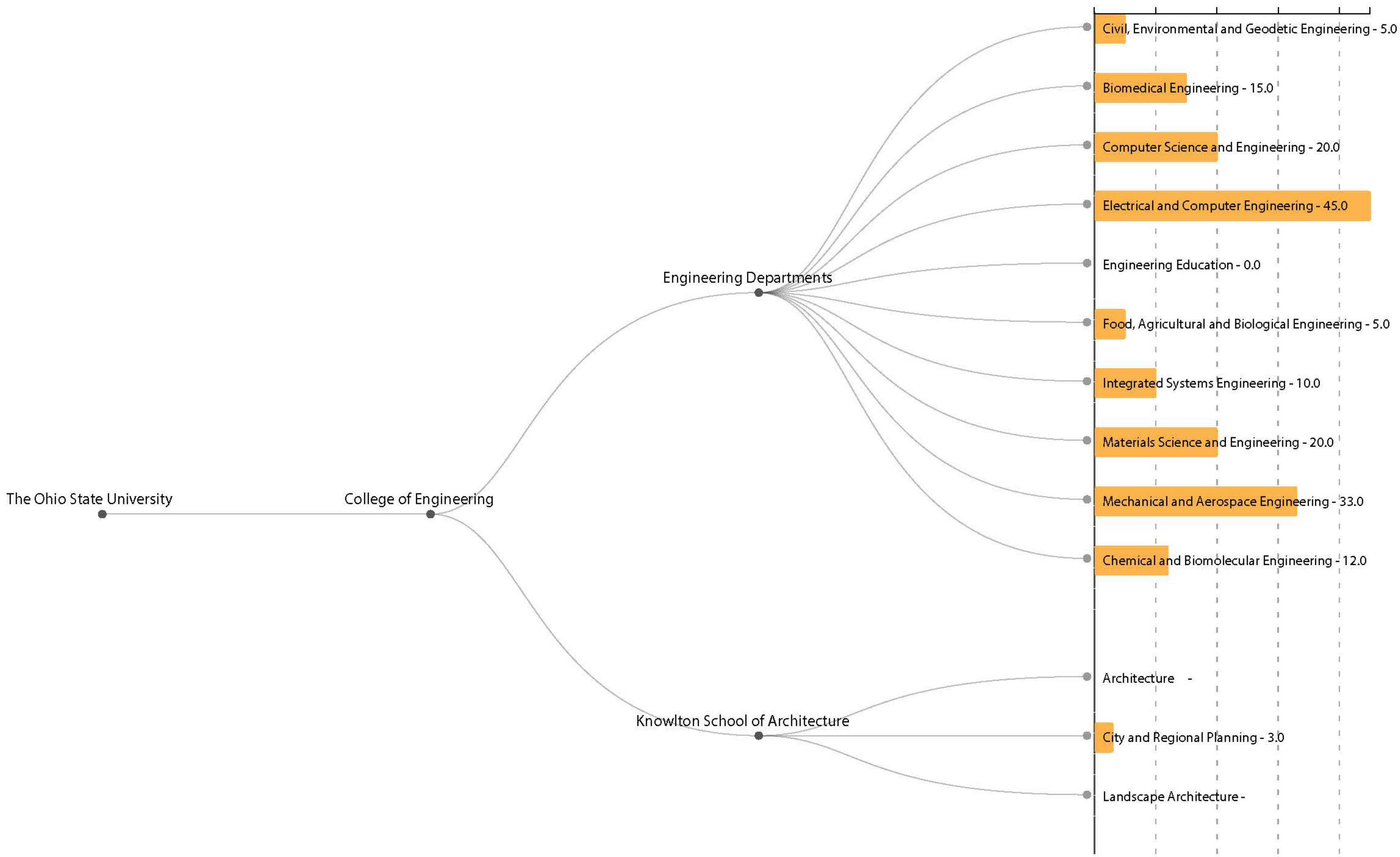

Figure 7. Distribution of doctoral degrees conferred by program in 2019 – Ohio State University

Table 5. Number of personnel for departments and schools of the College of Engineering for Ohio State University

Personnel, College of Engineering	Tenure/Tenure Track	Emeritus	NTT/Adjuncts	Staff
Civil, Environmental and Geodetic Engineering	29	16	21	20
Biomedical Engineering	23	4	6	25
Computer Science and Engineering	50	10	60	20
Electrical and Computer Engineering	65	19	16	17
Engineering Education	7	0	31	8
Food, Agricultural and Biological Engineering	27	17	23	31
Integrated Systems Engineering	26	4	15	32
Materials Science and Engineering	50	13	18	17
Mechanical and Aerospace Engineering	68	37	18	34
Chemical and Biomolecular Engineering	34	3	5	17
Knowlton School of Architecture	46	23	37	18

Organizational Chart - Research Administration for the College of Engineering:

An organizational chart was not available for the College of Engineering, however an organizational chart for Research Administration was found and is presented in Figure 8.

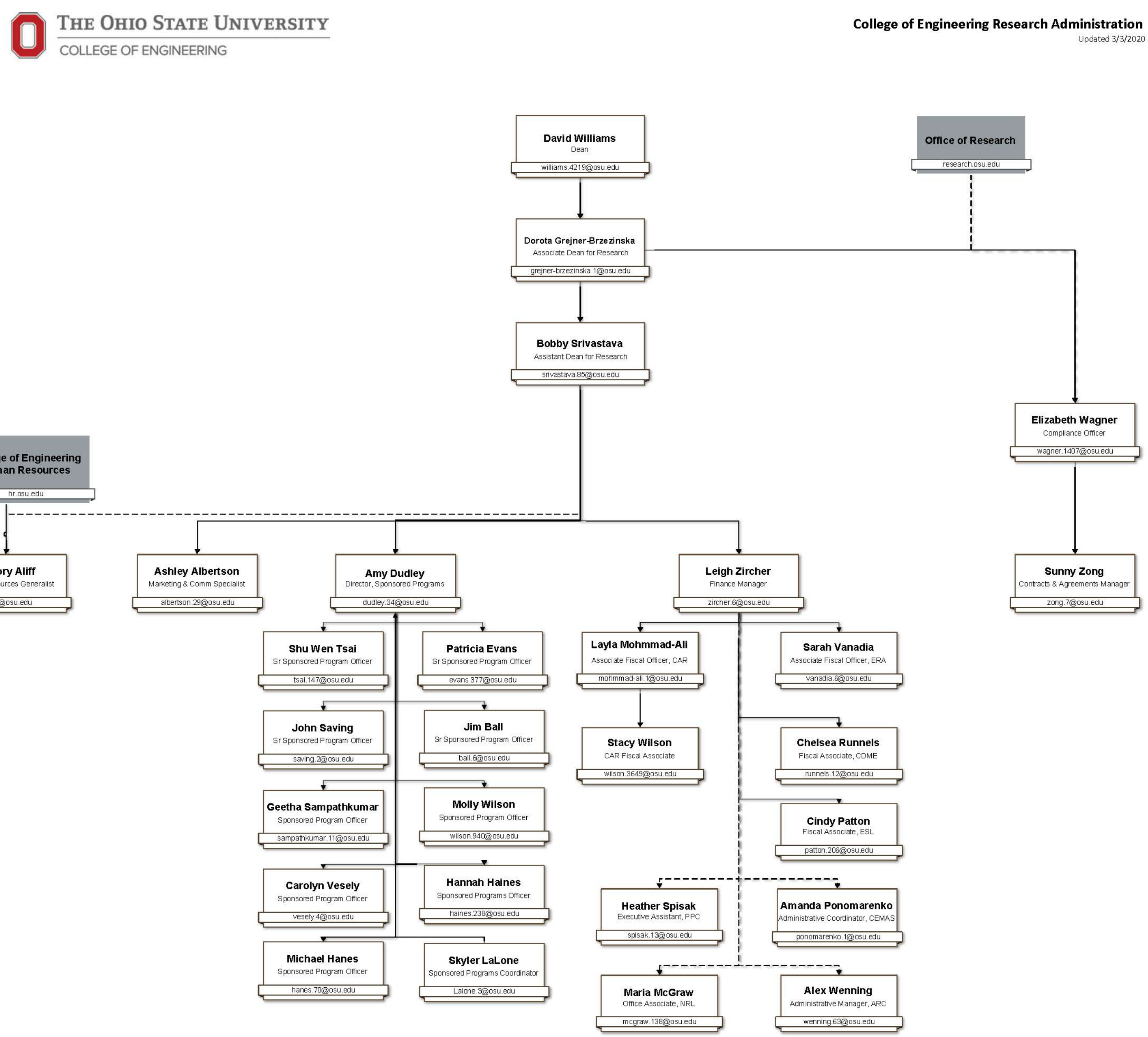

Figure 8. Organizational Chart - Research Administration for the College of Engineering at Ohio State University

Financial: The College of Engineering annual budget is approximately $300M and external gifts and donations exceed $370M. General funds (tuition and the State Share of Instruction) make up 55% of the budget, earnings (core labs) is 5%, and restricted is 40% (endowments, gifts, grants & contracts).

Facilities: None available at this time

Student Life/Residential College: Ohio State University does not have a residential college associated with the College of Engineering.

Washington State University

Rationale for Inclusion: Washington State is one of the few examples in the United States of a College of Engineering which houses a School of Architecture.

Mission Statement/Vision: The mission of Washington State University is

> *"To advance knowledge through creative research and scholarship across a wide range of academic disciplines. To extend knowledge through innovative educational programs in which emerging scholars are mentored to realize their highest potential and assume roles of leadership, responsibility, and service to society. To apply knowledge through local and global engagement that will improve quality of life and enhance the economy of the state, nation, and world."*

General Information: Washington State University is a public university with six academic program campuses that was founded in 1890. It is ranked 166th in national universities by US News & World Report[10]. Enrollment in the Fall of 2019 was 31,607; with 26,062 undergraduate and 4,262 graduate students. Additionally, there were 1,283 postdoctoral, residents, and fellows. There are 918 tenure/tenure-track faculty, 27 regents' professors, and 11 National Academy members. The total 2017-2019 proposed budget was 1.6B. Total research expenditures was $360.5M, of which 42% ($151.19M) was federal, 14% ($49) was State, 2% ($7.6M) not-for-profits, 4% was industry ($14.6M), and 37% ($133.9M) was from institutional (cost sharing and support). There are 11 colleges, which administer 98 bachelor's degrees, 78 master's degrees, 65 doctoral degrees, and 3 professional degree programs (medicine, pharmacy, and veterinary).

Washington State Universities has identified five research Grand Challenges as outlined in their 2020-2025 Strategic Academic Plan[11]. They are 1) sustaining health, 2) sustainable resources, 3) opportunity and equity, 4) smart systems, and 5) national security.

[10]U.S. News & World Report. https://www.usnews.com/best-colleges/washington-state-3800
[11]WSU System Strategic Plan. https://strategicplan.wsu.edu/documents/2020/06/strategic-plan-iv.pdf/

The College of Engineering: There are eight schools or departments within the Voiland College of Engineering and Architecture. Three of the Washington State campuses (Pullman, Tri-Cities, and Vancouver) have degree programs in the Voiland College of Engineering and Architecture (Table 6). The mission statement for the Voiland College of Engineering & Architecture as stated in their 2015 – 2020 Strategic Plan[12] is

> *"As a core college in a Research University with very high research activity, as well as a land-grant university, our mission is threefold: 1) To conduct fundamental and applied disciplinary and cross-cutting research that leads to new knowledge, transformative technology, and innovative designs.2) To educate and prepare students through state-of-the-art programs, preparing them for professional careers and leadership in engineering and design professions. 3) To engage people, industry, and communities to improve quality of life and enhance economic development." The College's broad research themes are: 1) Energy, 2) Environment, 3) Health, 4) Security, and 5) Technology Innovation. The College identified four areas of preeminence: 1) electrical power grid, 2) chemical catalysis, 3) air quality research, and 4) materials science & engineering. The College also identified four emerging or desired areas of preeminence: 1) water resources, 2) smart systems, 3) computational and data sciences, and 4) sustainable infrastructure and design.*

Enrollment: Enrollment data was limited and only enrollments for engineering programs were found. Data for 2018 was found at the American Society for Engineering Educators[13]. Undergraduate enrollment was highest in Mechanical Engineering (1,048, 27%) and Computer Science (831, 21%) (Table 6). Enrollment for master's programs was highest in Mechanical Engineering (17); the doctoral program in Materials & Engineering was the highest (16).

Degrees Conferred: Three of the Washington State campuses (Pullman, Tri-Cities, and Vancouver) have degree programs in the Voiland College of Engineering and Architecture (Table 6). The Pullman campus awarded the greatest number of degrees (789); with 174 and 79 degrees awarded at the Vancouver and the Tri-Cities campuses, respectively. Data for degrees conferred was not complete; however based on the data obtained, the Bachelor of Mechanical Engineering awarded the most degrees (270, 25%) followed by the bachelor's degrees in Computer Science (151, 14%), Electrical Engineering (138, 13%), and Civil Engineering (135,

[12] Voiland College of Engineering & Architecture 2015-2020 Strategic Plan. https://vcea.wsu.edu/faculty-staff/documents/2015/05/vcea-strategic-plan-2015-2020-final.pdf/
[13] http://profiles.asee.org/profiles/8176/print_all

12%; Figure 9). In the School and Design + Construction, the Bachelor of Science in Construction Management (49, 5%) had the greatest number of degrees awarded, followed by the Bachelor Degree in Architecture (37, 3%) and the Master's degree in Architecture (25, 2%; Figure 10). The doctoral programs in Civil Engineering and Material Science & Engineering each awarded 9 (1%) doctorates (Figure 11).

Personnel: Table 7 shows the distribution of tenure/tenure track faculty, adjunct and non-tenure faculty, and staff among the departments and schools. There are total of 185 faculty within the Voiland College of Engineering and Architecture, with 87% within engineering (43; 23% in Civil and Environmental Engineering) and 13% within the School of Design + Construction (25). The School of Chemical Engineering and Bioengineering had the highest number of non-tenure/adjunct faculty (10; 34%) of non-tenure faculty. Electrical Engineering and Computer Science had the greatest number of staff (15, 34%; Table 7).

Table 6. Listing of degree programs and degrees conferred for various programs in various departments and schools for the Voiland College of Engineering and Architecture at Washington State University

Departments/Schools	Enrollment (2016)[14]		Degrees Conferred[15] (2018-2019)	
	Count	Percent*	Count	Percent
PULLMAN CAMPUS				
BS			632	80
MS			105	13
PhD			52	7
Total			**789**	**100**
School of Chemical Engineering and Bioengineering				
BS in Chemical Engineering	228	6	55	5
BS in Bioengineering	152	4	20	2
MS in Chemical Engineering	1	0	5	0
MS in Engineering			3	0
MS Biological and Agriculture Engineering	5	0		
PhD (Chemical Engineering)	5	0	6	1
PhD (Engineering Science)	2	0		
PhD (Biological and Agriculture Engineering)	14	0		
Department of Civil and Environmental Engineering				
BS in Civil Engineering	494	13	135	12
BS in Construction Engineering	46	1		
MS in Civil Engineering	15	0	17	2
MS in Environmental Engineering	3	0	3	0
PhD in Civil Engineering	2	0	7	1
School and Design + Construction				
BS Architecture			37	3
MS Architecture			25	2
BS Construction Engineering				
BS Construction Management			49	5
BA Interior Design			20	2
MA Interior Design			5	0
BA Landscape Architecture			9	1
Interdisciplinary Doctoral Program				
School of Electrical Engineering & Computer Science				
BS in Electrical Engineering	469	12	138	13
BS in Computer Science	831	21	151	14
BA in Computer Science	54	1		0

[14] ASEE Profiles 2016. http://profiles.asee.org/profiles/7426/print_all

[15] IPEDS, Institutional Resource Website Washington State University, https://ir.wsu.edu/degrees-conferred/.

Departments/Schools	Enrollment (2016)[14]		Degrees Conferred[15] (2018-2019)	
	Count	Percent*	Count	Percent
BS in Software Engineering	88	2	6	1
BS in Computer Engineering	46	1	18	2
BS in Data Analytics				
MS Computer Science	8	0	26	2
MS Electrical Engineering	14	0		
MS Software Engineering				
PhD Computer Science	5	0		
PhD Electrical Engineering	12	0		
Engineering and Technology Management – Online				
Master Engineering and Technology Management	33	1		
Certificates				
Constraints Management				
Logistics and Supply Chain Management				
Manufacturing Leadership				
Project Management				
Six Sigma Quality Management				
Systems Engineering Management				
School of Mechanical and Materials Engineering				
BS in Materials Science and Engineering	89	2	25	2
BS Mechanical Engineering	1,048	27	270	25
MS Materials Science and Engineering	11	0	3	0
MS Mechanical Engineering	17	0	18	2
PhD in Mechanical Engineering	12	0	10	1
PhD in Materials Science & Engineering	16	0	9	1
School of Engineering & Applied Sciences - Tri-Cities				
BS			68	86
MS			5	6
PhD			6	8
Total			**79**	**100**
BS in Civil Engineering				
BS in Computer Science				
BS in Electrical Engineering				
BS in Materials Science and Engineering				
MS in Civil Engineering				
MS in Computer Science	1	0		
MS Electrical Engineering	2	0		
MS Mechanical Engineering	6	0		
PhD in Civil Engineering				

Departments/Schools	Enrollment (2016)[14]		Degrees Conferred[15] (2018-2019)	
	Count	Percent*	Count	Percent
PhD in Computer Science			14	1
PhD Electrical Engineering				
PhD Mechanical Engineering				
School of Engineering & Computer Science - Vancouver				
BS			158	91
MS			16	9
Total			**174**	**100**
BS Computer Science				
BS Electrical Engineering				
BS Mechanical Engineering				
MS Computer Science	4	0		
MS Electrical Engineering				
MS Mechanical Engineering	12	0		
Undeclared	129	3		
Total	**3,925**	**100**	**1,084**	**100**

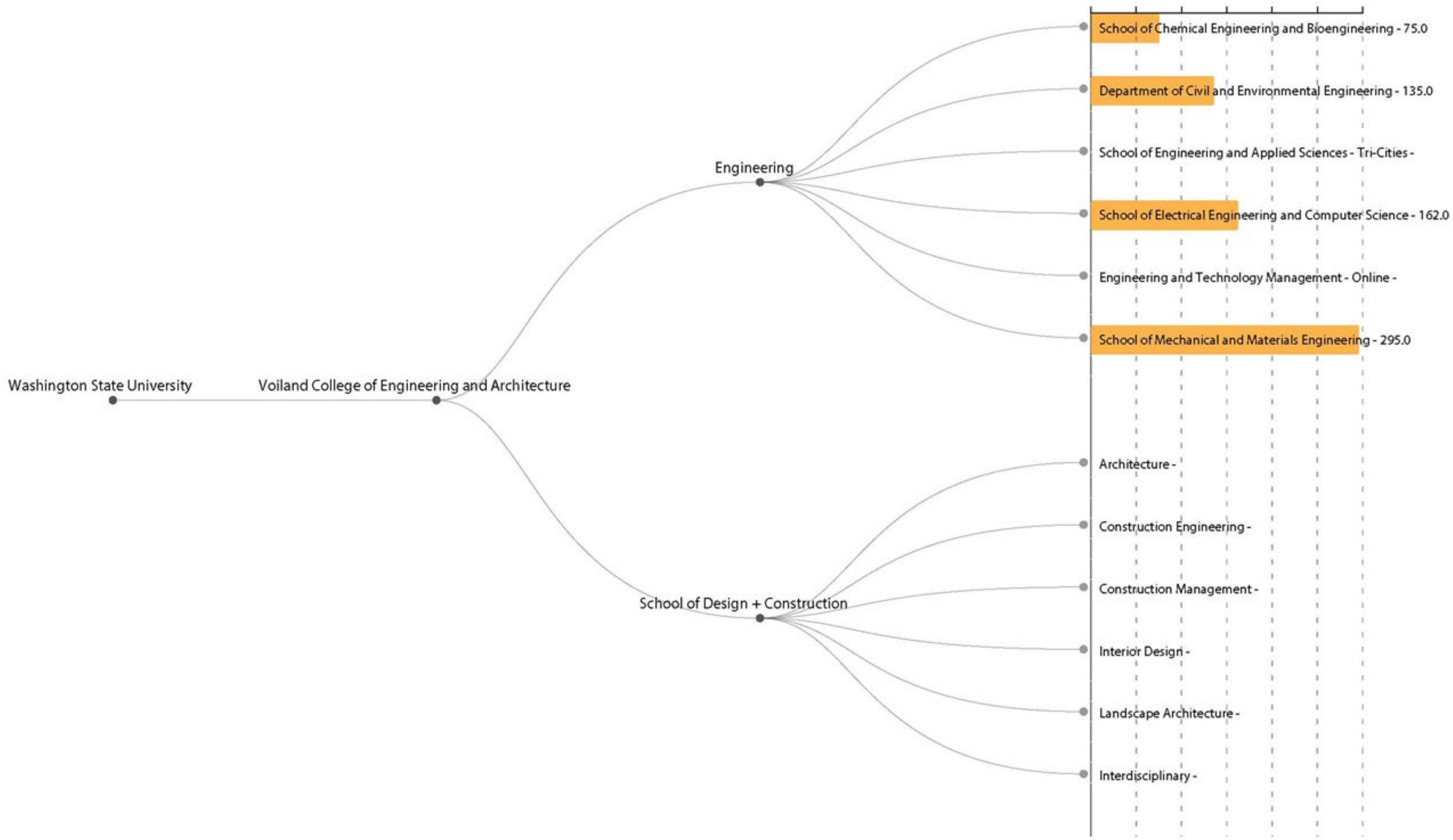

Figure 9. Distribution of undergraduate degrees conferred in 2019 by programs – Voiland College of Engineering and Architecture for Washington State University

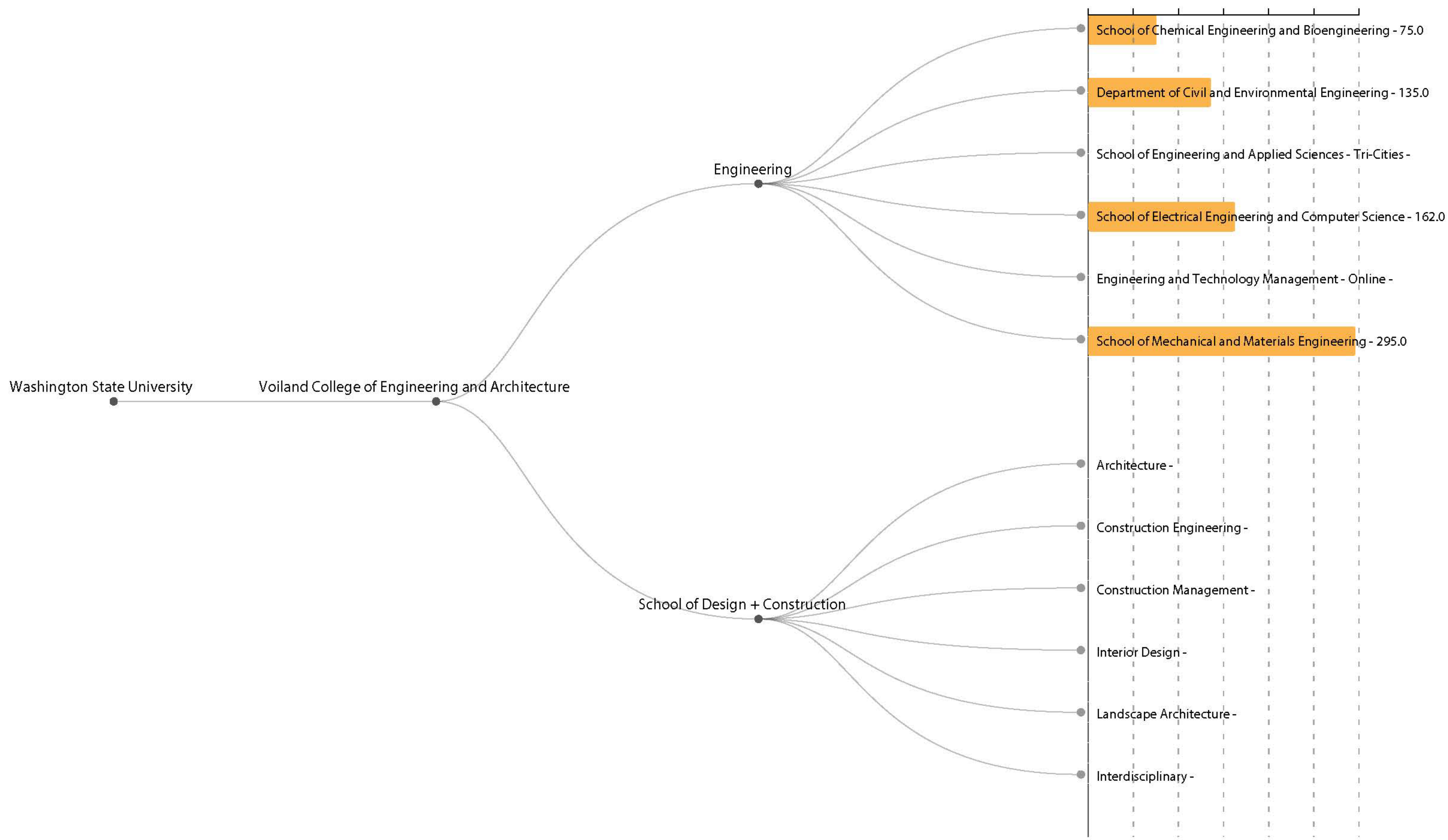

Figure 10. Distribution of undergraduate degrees conferred in 2019 by programs – Voiland College of Engineering and Architecture for Washington State University

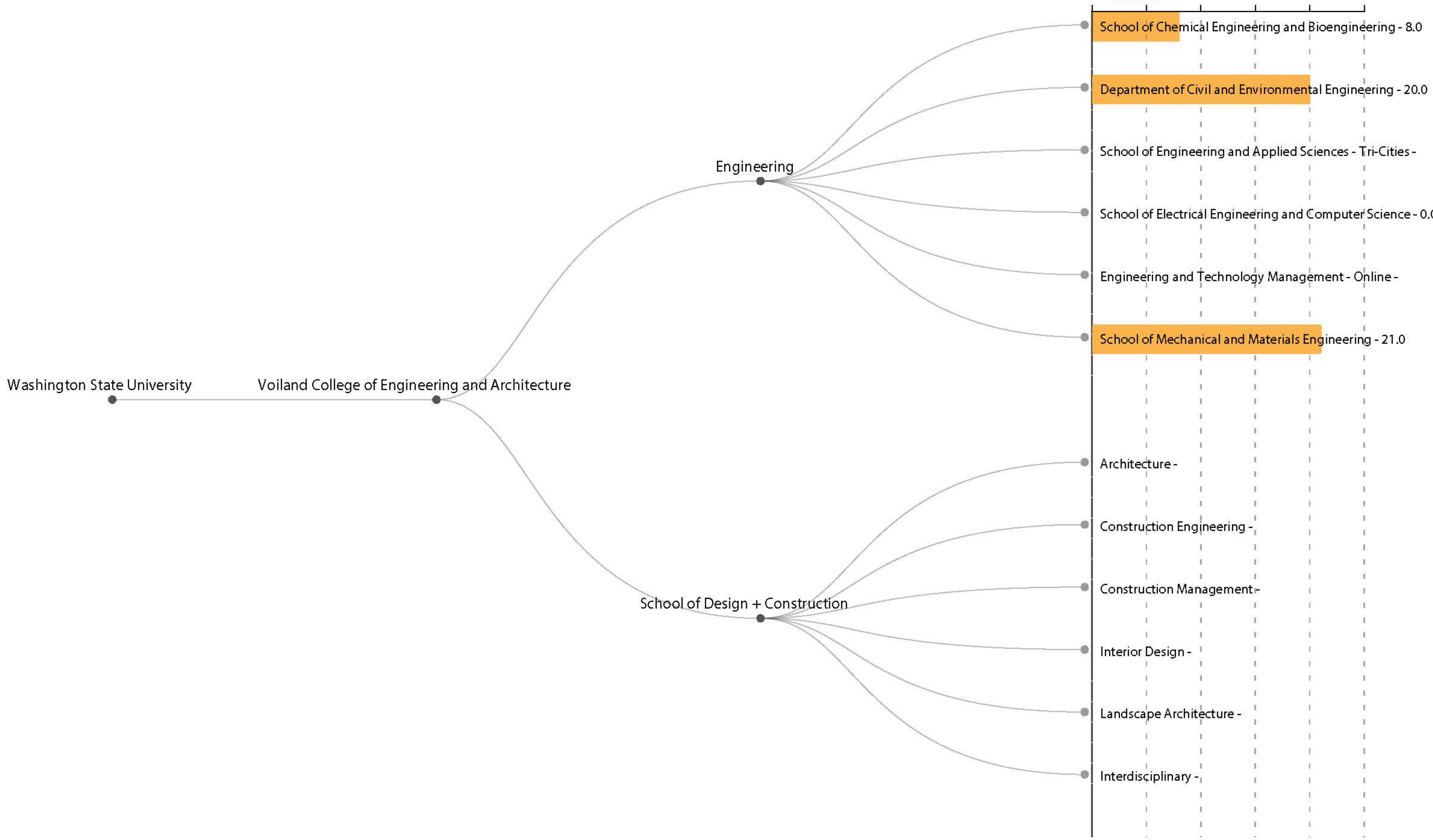

Figure 11. Distribution of master's degrees conferred in 2019 by programs – Voiland College of Engineering and Architecture for Washington State University

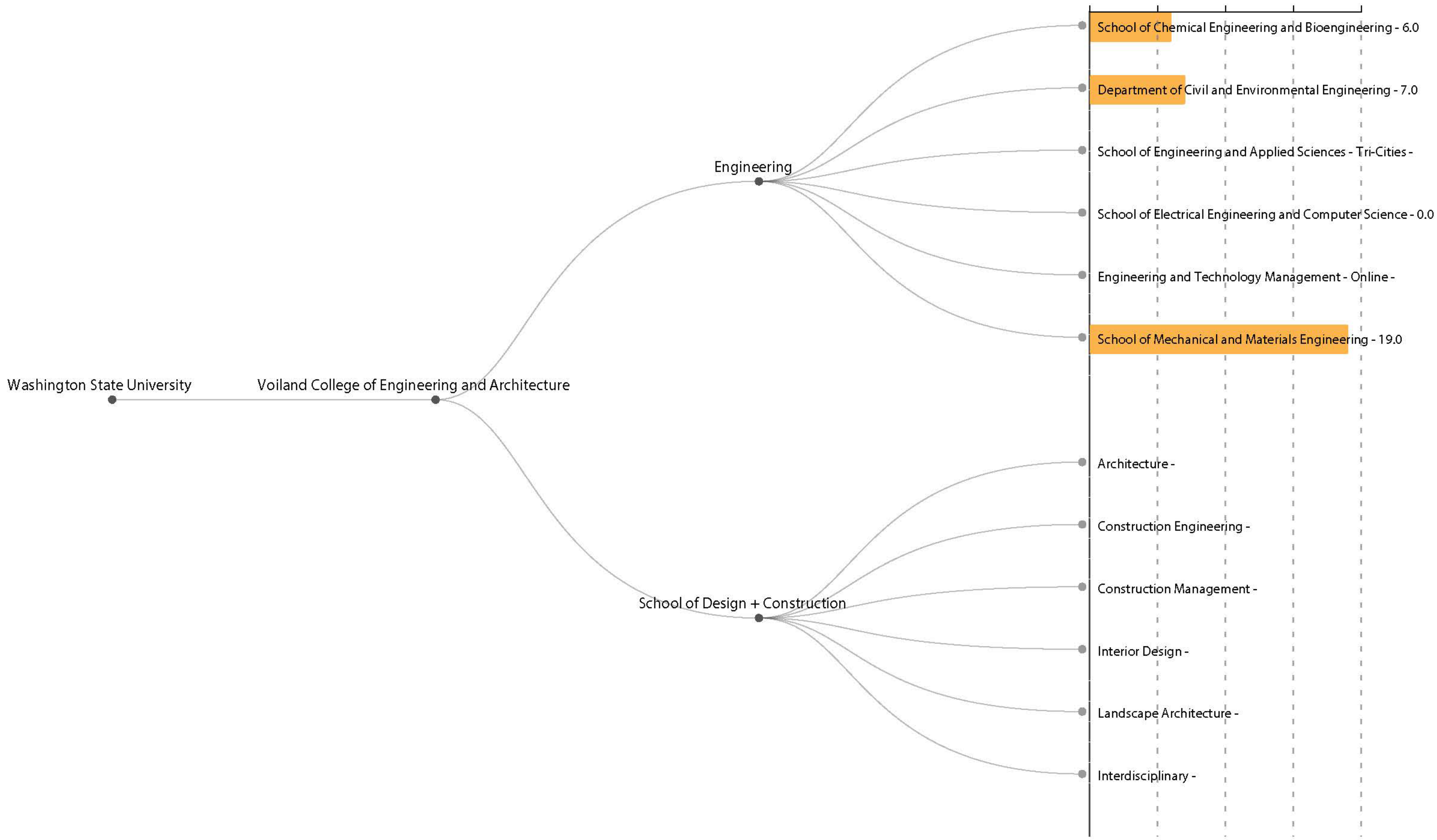

Figure 12. Distribution of doctoral degrees conferred in 2019 by programs - Voiland College of Engineering and Architecture for Washington State University

Table 7. Number of personnel for departments and schools of the Voiland College of Engineering and Architecture for Washington State University

Personnel, College of Engineering and Architecture	Tenured/ Tenure Track	Emeritus	NTT/ Adjuncts	Staff
School of Chemical Engineering and Bioengineering	21	7	10	8
Department of Civil and Environmental Engineering	43	6	0	9
School of Engineering and Applied Sciences - Tri-Cities	9	0	4	2
School of Electrical Engineering and Computer Science	42	3	1	15
Engineering and Technology Management - Online	5	2	3	2
School of Mechanical and Materials Engineering	40	0	3	2
School of Design + Construction	25	1	8	6

Organizational Chart: No organizational chart was found.

Financial: Very little budget information was found. We were able to find information related to student to advisor ratios, which are presented in Table 8. This may be helpful in evaluated financial commitments to the various programs.

Table 8. Student to advisor ratios for various in Voiland College of Engineering and Architecture from 2015 at Washington State University

Program	Student to Advisor Ratio
Architecture	431:1
Chemical Engineering and Bioengineering	454:1
Civil Engineering	525:2
Electrical Engineering and Computer Science	970:2
Mechanical and Materials Engineering	896:2

Facilities: There are 13 buildings associated with the Voiland College of Engineering and Architecture, ranging in size from 30,126 ft^2 and 123,391 ft^2 (Table 9).

Table 9. Buildings and their square-footages associated with the College of Engineering and Architecture at Washington State University.

Building	Gross Square Footage
Albrook	35,247
Carpenter Hall	66,049
Commons	35,351
Daggy Hall	98,138
Dana Hall	90,023
Electrical-Mechanical Engineering Building	94,148
Engineering Laboratory Building	44,593
Engineering Teaching/Research Labs	123,391
Paccar Environmental Technology Building	101,211
Research & Technology Park	32,283
Sloan Hall	106,887
Thermal-Fluids Research Building	30,126
Wegner Hall	97,649
Total	**955,096**

Student Life/Residential College: Washington State University does not have a residential college associated with the Faculty of Engineering.

Arizona State University

Rationale for Inclusion: While Arizona State does not have an academic unit which is composed of engineering and architecture disciplines, it does have interdisciplinary collaborations between the Ira A. Fulton Schools of Engineering, the School of Sustainability, and the Herberger Institute for Design and the Arts. Based on this, the subcommittee thought it would be a good model for this task force.

Mission/Vision Statement: The mission of Arizona State University is

> *"To demonstrate leadership in academic excellence and accessibility, establish national standing in academic quality and impact of colleges and schools in every field, establish ASU as a leading global center for interdisciplinary research, discovery and development by 2025, and enhance our local impact and social embeddedness. ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves. ASU has become the foundational model for the New American University, a new paradigm for the public research university that transforms higher education. ASU is committed to excellence, access and impact in everything it does."*

General Information: Arizona State University is a public university with six academic program campuses that was founded in 1885. It is ranked 117th in national universities by US News & World Report[16]. Enrollment in Fall of 2019 was 119,951; with 62,186 undergraduate and 23,225 graduate students. Additionally, there were 380 postdoctoral, residents, and fellows. There are 1,464 tenure/tenure-track faculty. Scholars include 4 Nobel laureates, 6 Pulitzer Prize winners, 4 MacArthur Fellows Program "Genius Grant" members and 19 National Academy of Sciences members. Additionally, among the faculty are 180 Fulbright Program American Scholars, 72 National Endowment for the Humanities fellows, 38 American Council of Learned Societies fellows, 36 members of the Guggenheim Fellowship, 21 members of the American Academy of Arts and Sciences, 3 members of National Academy of Inventors, 9 National Academy of Engineering members and 3 National Academy of Medicine members. Total revenue funds were $2,950M and total research expenditures was $635M. There are 17

[16]U.S. News & World Report. https://www.usnews.com/best-colleges/arizona-state-university-tempe-1081

colleges, which administer 350 bachelor's degrees, 450 master's degrees and certificates, and ~175 doctoral degrees.

Arizona State University has as outlined in their 2019 Year in Review[17] several research foci. They are 1) unlocking the mysteries of deep Space, 2) creating a better environment for a thriving planet, 3) advancing knowledge across international borders, 4) connecting with communities to drive economic development, and 5) creating human well-being one discovery at a time.

The Ira A. Fulton Schools of Engineering: The Ira A. Fulton School of Engineering offers 25 graduate program and 46 graduate programs in seven schools (Figure 10 and Figure 12).

Table 10. List of Schools within the Ira A. Fulton Schools of Engineering at Arizona State University

Schools within the Ira A. Fulton Schools of Engineering at Arizona State
School of Biological and Health Systems Engineering
School of Computing, Informatics, and Decision Systems Engineering
School of Electrical, Computer and Energy Engineering
School of Engineering of Matter, Transport, and Energy
School of Sustainable Engineering and the Build Environment
The Polytechnic School
The Global School

The Schools of Engineering are

> *". . . dedicated to the "Fulton Difference" with degree programs that combine a strong core foundation with hands-on experience, personalized advising, our innovative E2 program to welcome freshmen, top faculty and a reputation for graduating students who are aggressively recruited by top companies or become superior candidates for graduate studies in medicine, law, engineering and science."*[18]

Enrollment: A list of the degree programs, enrollments, and degrees conferred by level are presented in Table 11. Count and percent of various degrees awarded in the Ira A. Fulton Schools of Engineering at the Arizona State University. A total of 18,873 undergraduate students were enrolled in the Schools of Engineering. Undergraduate programs in Computer Science, Electrical Engineering, and Information Technology had over 2,000 majors. Several

[17] 2019 Year in Review, Knowledge Enterprise. https://research.asu.edu/sites/default/files/pdfs/2019-KE-YIR.pdf
[18] https://engineering.asu.edu/about/

programs had over 1,000 majors (Table 11). Enrollment at the master's level was 3,607 with Computer Science having the highest enrollment (1,046; 29%), followed by Electrical Engineering (512; 14%). Enrollment at the doctoral level was 1,187 with Computer Science and Electrical Engineering having over 200 students (Table 11).

Degrees Conferred: Computer Science, Electrical Engineering, and Mechanical Engineering had the highest number of degrees conferred (383, 13%; 311, 11%; and 341, 12%; respectively; Table 11). Of the total 1,652 master's degrees conferred, Computer Science had the highest number of degrees conferred (268; 16%). Of the 164 doctoral graduates in the Schools of Engineering, Electrical Engineering awarded the most degrees (42, 26%).

Personnel: Table 12 shows the number of personnel in the Ira A. Fulton Schools of Engineering. The School of Computing, Informatics, and Decision Systems Engineering and the School of Electrical, Computer and Energy Engineering had the greatest number of tenure/tenure track faculty, which parallels the metrics of enrollment and degrees awarded.

Table 11. Count and percent of various degrees awarded in the Ira A. Fulton Schools of Engineering at the Arizona State University.

Schools of Engineering	Enrollment (Fall 2019)		Degrees Conferred (2018-2019)	
	Count	Percent	Count	Percent
Bachelor's Degrees				
Aerospace Engineering	831	4	98	3
Aviation	519	3	73	3
Biomedical Engineering	699	4	142	5
Chemical Engineering	648	3	178	6
Civil Engineering	726	4	152	5
Computer Science	2,981	16	383	13
Computer Systems Engineering	436	2	87	3
Construction Engineering	85	0	19	1
Construction Management	417	2	103	4
Electrical Engineering	2,369	13	311	11
Engineering	1,022	5	207	7
Engineering Management	669	4	70	2
Engineering Technology	0	0	1	0
Environmental and Resource Management	38	0	17	1
Environmental Engineering	146	1		0
Graphic Information Technology	1,096	6	166	6
Human Systems Engineering	85	0	17	1
Industrial Engineering	313	2	81	3
Informatics	153	1	25	1
Information Technology	2,067	11	123	4
Manufacturing Engineering	57	0	18	1
Materials Science and Engineering	151	1	26	1
Mechanical Engineering	1,505	8	341	12
Software Engineering	1,322	7	143	5
Technological Entrepreneurship and Management	425	2	72	2
TEM Operations Mgmt	113	1	36	1
Total	**18,873**	**100**	**2,889**	**100**
Master's				
Aerospace Engineering	54	1	31	2
Aviation	18	0	16	1
Biomedical Engineering	72	2	64	4
Chemical Engineering	51	1	37	2
Civil, Environmental & Sustainable Engineering	84	2	75	5
Computer Engineering (Computer Science)	143	4	76	5
Computer Engineering (Electrical Engineering)	130	4	66	4
Computer Science	1,046	29	268	16

Schools of Engineering	Enrollment (Fall 2019)		Degrees Conferred (2018-2019)	
	Count	**Percent**	**Count**	**Percent**
Construction Engineering	9	0	13	1
Construction Management	154	4	52	3
Dean's Office Programs	337	9	221	13
Electrical Engineering	512	14	221	13
Engineering	48	1	37	2
Environmental and Resource Management	45	1	17	1
Graphic Information Technology	53	1	27	2
Human Systems Engineering	62	2	25	2
Industrial Engineering	93	3	76	5
Information Technology	83	2	23	1
Manufacturing Engineering	23	1	3	0
Materials Science and Engineering	86	2	30	2
Mechanical Engineering	199	6	142	9
Robotics and Autonomous Systems (AI)	27	1	0	0
Robotics and Autonomous Systems (EE)	14	0	0	0
Robotics and Autonomous Systems (MAE)	35	1	0	0
Robotics and Autonomous Systems (Systems Engineering)	7	0	0	0
Software Engineering	196	5	112	7
Solar Energy Engineering & Commercialization	10	0	14	1
Sustainable Engineering	7	0	0	0
Technological Entrepreneurship and Management	11	0	6	0
Total	**3,609**	**100**	**1,652**	**100**
Doctoral				
Aerospace Engineering	26	2	3	2
Biological Design	33	3	5	3
Biomedical Engineering	55	5	10	6
Chemical Engineering	41	3	6	4
Civil, Environmental & Sustainable Engineering	115	10	26	16
Computer Engineering (Computer Science)	59	5	4	2
Computer Engineering (Electrical Engineering)	28	2	1	1
Computer Science	202	17	25	5
Construction Management	21	2	6	4
Electrical Engineering	277	23	42	26
Engineering	54	5	1	1
Human Systems Engineering	16	1	1	1
Industrial Engineering	60	5	4	2
Materials Science and Engineering	89	7	14	9
Mechanical Engineering	111	9	16	10
Total	**1,187**	**100**	**164**	**100**

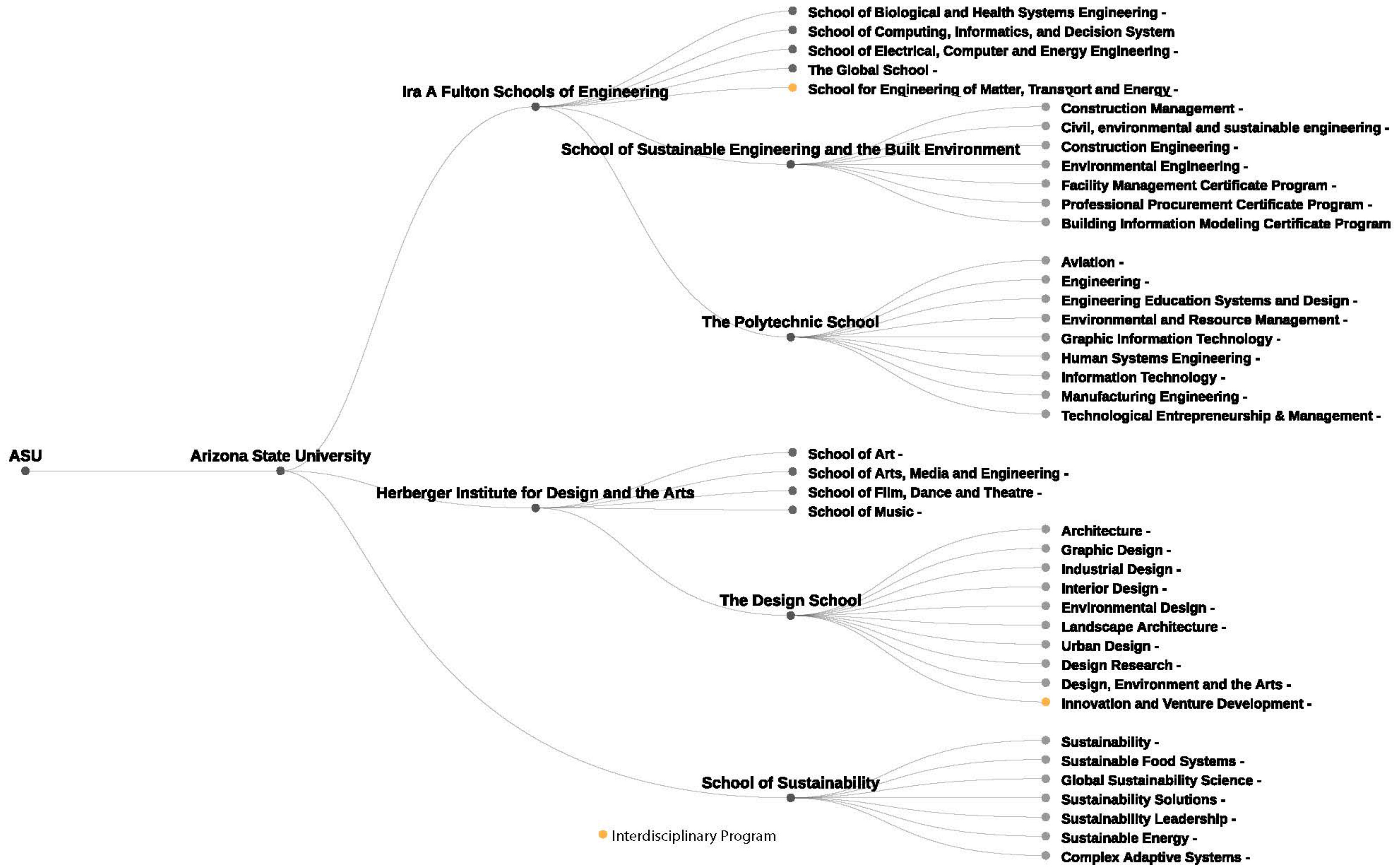

Figure 13. A schematic of the degrees awarded by departments or programs for the Ira A. Schools of Engineering, Herberger Institute for Design and the Arts, and the School of Sustainability – Arizona State University

Table 12. Estimate of the number of personnel for Ira A. Fulton Schools of Engineering Arizona State University

Ira A. Fulton Schools of Engineering	Tenure/ Tenure Track	Emeritus	NTT/ Adjuncts	Staff
School of Biological and Health Systems Engineering	29	4	5	19
School of Computing, Informatics, and Decision Systems Engineering	72	1	30	59
School of Electrical, Computer and Energy Engineering	80	8	18	45
School of Sustainable Engineering and the Build Environment	54	8	17	29
The Polytechnic School	47	3	42	46
The Global School	Interdisciplinary			
Total	**282**	**24**	**112**	**198**

The School of Sustainability: The mission statement for the Julie Ann Wrigley Global Institute of Sustainability as stated in their strategic plan "*Toward 2025 and Beyond*"[19] is

> *"Our mission is to foster innovative research, impactful education and engaged communities to achieve environmental integrity, social equity and well-being.*

Enrollment: There were a total 477 students registered in the School of Sustainability distributed in eleven degree programs (3 bachelor's, 5 master's, and 3 doctoral), shown in Table 13. Additionally, the Minor in Sustainability has 565 students; and sustainability concentrations offered in Business (~600), Engineering (~100), Interdisciplinary Studies (~250), Public Policy (~100), and Tourism (~50)[20].

Degrees Conferred: Data for degrees conferred for the School of Sustainability was not available.

Personnel: Table 14 shows the number tenure/tenure track faculty, adjunct and non-tenure track faculty, and staff with the School of Sustainability. There are 31 tenured/tenure-track faculty, 52 non-tenure/adjunct faculty, and 33 staff.

[19] School of Sustainability *Toward 2025 and Beyond.* Arizona State University. https://issuu.com/asusustainability/docs/sos_charter_brochure
[20] Dr. Christopher Boone, Dean of the School of Sustainability, personal communication.

Table 13. Count and percent of various degrees in the School of Sustainability at Arizona State University.

Colleges/Schools	Fall 2019	
	Count	Percent
SCHOOL OF SUSTAINABILITY		
Sustainability (BA)		
Sustainability (BS)	485	100
Sustainable Food Systems		
Sub-Total	**485**	**100**
Sustainability (MA)	6	5
Sustainability (MS)	13	11
Global Suitability Science	9	8
Sustainability Solutions	33	28
Sustainability Leadership	59	49
Sub-Total	**120**	**100**
Sustainability	50	82
Sustainability Energy	7	11
Complex Adaptive Systems	4	7
Sub-Total	**61**	**100**
Grand Total	**666**	

Table 14. Number of personnel for the School of Sustainability Arizona State University

Personnel, College of Engineering and Architecture	Tenure/ Tenure Track	Emeritus	NTT/ Adjuncts	Staff
School of Sustainability	23	1	47	33

The Herberger Institute for Design and the Arts/the Design School: This section focus on the Design School, which is a part of the Herberger Institute at Arizona State. The Institute is made up of five schools and the ASU Art Museum; and has over 5,365 students, 400 faculty members, and 125 program options. The mission statement for the Herberger Institute for Design is:

> *"To position designers, artists, scholars and educators at the center of public life and prepare them to use their creative capacities to advance culture, build community and imaginatively address today's most pressing challenges."*

The Design School has 52 faculty, 1,425 students, and offers 14 degrees.

Enrollment: No data was available.

Degrees Conferred: No data was available.

Personnel: Table 16 shows the personnel for the Design School within the Herberger Institute for Design and the Arts at Arizona State University.

Table 15. Count and percent of various degrees in the Design School within the Herberger Institute for Design and the Arts at Arizona State University.

Colleges/Schools	Fall 2019		2018-2019	
	Count	Percent	Count	Percent
HERBERGER INSTITUTE FOR DESIGN AND THE ARTS/THE DESIGN SCHOOL				
Bachelors				
Architectural Studies				
Environmental Design				
Graphic Design				
Industrial Design				
Interior Design				
Industrial Design				
Landscape Architecture				
Masters				
Architectural (Energy perf/climate responsive Arch)				
Architecture				
Industrial Design				
Interior Architecture				
Interior Design				
Landscape Architecture				
Urban Design				
Doctoral				
Design, Environment and the Arts (design)				
Design, Environment and the Arts (digital culture in design)				
Design, Environment and the Arts (healthcare and healing environments)				
Design, Environment and the Arts (history, theory and criticism)				
Design, Environment and the Arts				
Sub-Total				
Grand Total				

Table 16. Number of personnel for the Design School within the Herberger Institute for Design and the Arts at Arizona State University

Personnel, The Design School	Tenure/ Tenure Track	Emeritus	NTT/ Adjuncts	Staff
Architecture	23		?	
Industrial Design	11			
Interior Design	7			
Landscape Architecture	10			
Master of Science in Design	9			
Visual Communication Design	11			
The Design School	34*	8	?	13

*Total is not the sum of the column because some faculty are associated with several categories.

Section II. Research Institutes

Introduction

The following section provides an overview of Research Institutes that pursue transdisciplinary work within the fields of architecture, construction science, engineering, and/or urban planning. Hopefully this list, which includes some of the leading Research Institutes in the United States and abroad, will inspire new models for transdisciplinary research within the new College at UTSA. This inspiration might come in the form of ideas for expanded or new Research Institutes at UTSA. Alternatively, some characteristics of the Research Institutes might translate to the scale of the new College, informing its academic mission or organizational structure.

The following list breaks the Research Institutes into six related topics: Sustainability and Environment, Resilience and Infrastructure, Urbanism and Urban Science, Construction and Material Science, Community Design and Outreach, Energy and Environment.

List of “Sustainability and Environment Research Institutes

- Birmingham City University, Center for the Built Environment
- Brown University, Institute at Brown for Environment and Society
- Columbia University, The Earth Institute
- Cornell University, Atkinson Center for Sustainability
- Duke University, Nicholas Institute for Environmental Policy Solutions
- Johns Hopkins, Environment, Energy, Sustainability & Health Institute
- McGill University, Trottier Institute for Sustainability in Engineering and Design
- Northwestern University, Institute for Sustainability and Energy
- Penn State University, Institutes of Energy and the Environment
- Princeton University, Environmental Institute
- Savannah College for Art and Design, Program in Design for Sustainability
- Stanford University, Woods Institute for the Environment
- Texas A & M, Energy Institute
- The Ohio State University, Sustainable and Resilient Economy
- University of Arizona, Institute of the Environment
- University of Arizona, Institute on Place, Wellbeing and Performance

- University College London, Institute for Environmental Design and Engineering
- University College London, Institute for Sustainable Resources
- University College London, Centre of Excellence in Sustainable Building Design, Centre for Urban Sustainability and Resilience, Centre for Resource Efficiency and Environment, Centre for Transport Studies, Centre for Artificial Intelligence
- UCLA, Institute on the Environment and Sustainability
- University of Illinois at Urbana-Champaign, Institute for Sustainability, Energy, and Environment
- University of Michigan, Graham Sustainability Institute
- University of Michigan, Center for Sustainable Systems
- University of Michigan, Erb Institute for Global Sustainable Enterprise
- University of Minnesota, Institute of the Environment
- University of North Carolina Charlotte, Integrated Design Research Lab
- University of Oregon, Institute for Sustainable Environment
- University of Oregon, Sustainable Cities and Landscape Hub
- University of Pennsylvania, Center Architectural Conversation
- University of Toronto, School of the Environment
- University of Wisconsin-Madison, Nelson Institute for Environmental Studies
- Vanderbilt University, Institute for Energy and the Environment

Case-study: Trottier Institute for Sustainability in Engineering and Design, McGill University

Mission

Aimed at minimizing natural resources and energy consumption; and reducing or eliminating generation of waste and pollution in industrial operations. This includes research on manufacturing and industry, materials and nanotechnology, energy and water with particular emphasis on prospective or consequential life cycle assessments of products and processes, development of new materials, products and/or production systems that lead to significant reductions in societal energy use, resource use, and environmental impacts.

Research Areas

- Sustainable Industrial Processes & Manufacturing
- Renewable Energy & Energy Efficiency
- Sustainable Infrastructure & Urban Development
- Climate Change Adaptation & Resilience

Research Description

TISED's main research activities include:

- The Innovative Solutions for Planetary Health program, jointly offered by TISED and the Global Health Program, provides seed funding for interdisciplinary research in the area of global health and engineering
- Two Faculty Scholar Awards support sustainability in engineering and design research and provide funding to PhD students
- The Research Workshop program supports research and policy-related outreach and publications
- The Scholar-in-Residence program and visiting professorships bring in prominent scholars form outside McGill and foster collaboration
- The Trottier Chair in Sustainability in Engineering and Design drives research leadership at TISED and the Faculty of Engineering

TISED works partly to benefit McGill professors, graduate and undergraduate students alike, enabling positive change in the world. Funding for TISED includes an Endowed Chair, a Scholars-in-Residence program, administrative support for teaching and research projects, Faculty

Scholar Awards to attract and retain outstanding junior professors, master's and doctoral fellowships, "Summer Undergraduate Research in Engineering" (SURE) awards, and support for undergraduate student competitions and design projects.

Website

https://www.mcgill.ca/tised/

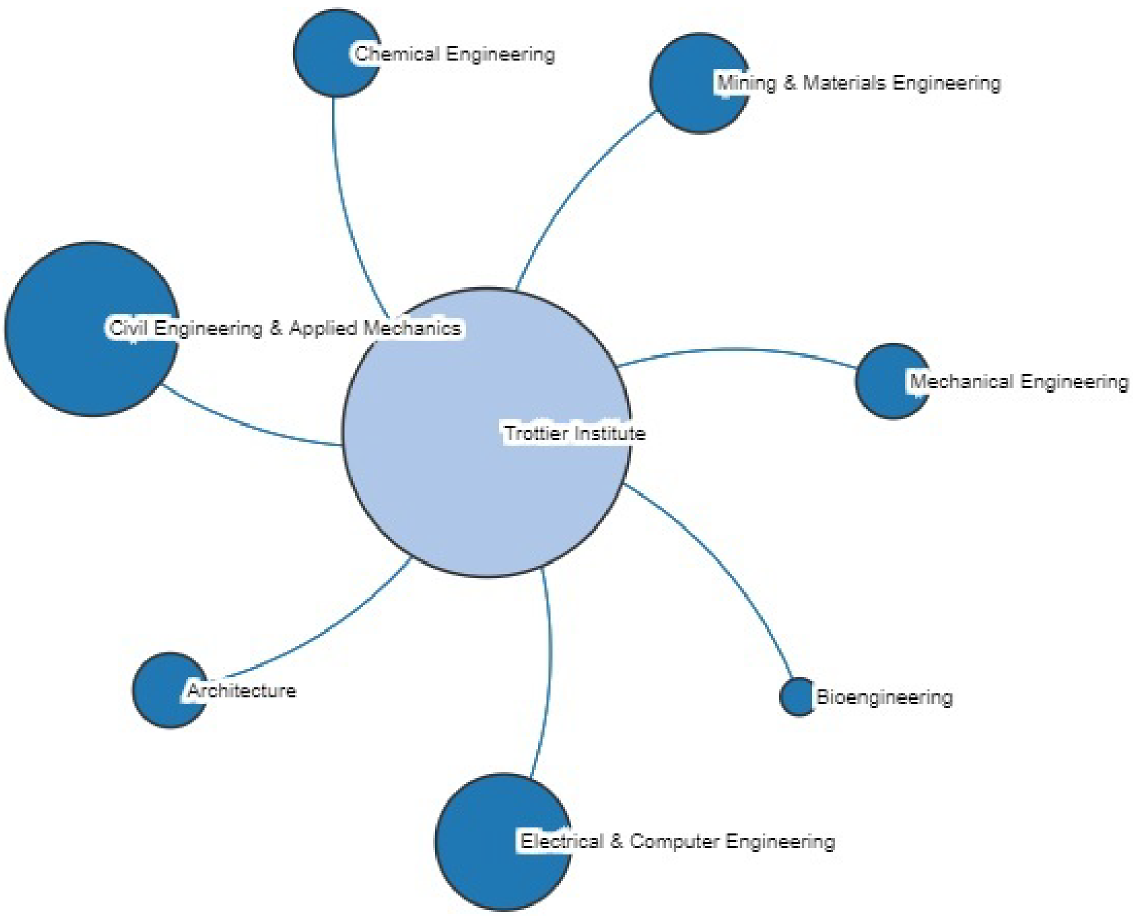

Figure 14. Relative Number of Faculty Collaborators by Discipline for Trottier Institute for Sustainability in Engineering and Design, McGill University

List of Resilience and Infrastructure Research Institutes

- Arizona State University, Metis Center for Infrastructure and Sustainable Engineering
- Carnegie Mellon University, Center for Engineering and Resilience for Climate Adaptation (CERCA)
- George Mason University, Center for Resilient and Sustainable Communities
- Northeastern University, Global Resilience Institute
- Northwestern University, Center for Engineering Sustainability and Resilience
- Norwich University, Center for Global Resilience & Security
- Purdue University, Center for Resilient Infrastructures, Systems, and Processes (CRISP)
- Texas A&M, Center for Infrastructure Renewal
- The University of Alabama, Center for Sustainable Infrastructure
- University College London, EPICentre: An Interdisciplinary Centre for Natural Hazards Resilience
- University College London, Institute for Sustainable Heritage
- University College London, Institute of Communications and Connected Systems
- University of Central Florida, National Center for Integrated Coastal Research
- University of Florida, Florida Institute for Built Environment Resilience (FIBER)
- University of Illinois, Critical Infrastructure Resilience Institute
- University of New Hampshire, UNH Center for Infrastructure Resilience to Climate
- University of North Carolina Charlotte, The Infrastructure, Design, Environment & Sustainability Center
- UT Arlington, Sustainable and Resilient Civil Infrastructure

Case-study: EPICentre, University College London

Mission

EPICentre looks to provide a forum for multidisciplinary research into risk from natural hazards and disaster risk reduction. With the driving force behind EPICentre research work being the ambition to drastically reduce loss of life, livelihoods and economic loss in natural disasters.

EPICentre research projects are highly multi-disciplinary, and strongly linked to industry, local government and NGO needs. EPICentre brings together researchers from different fields and promotes dialogue, data and knowledge exchange both within individual projects, as well as across research projects.

Research Areas

- Risk Representation and Behaviours in Individuals
- Post Disaster Recovery and Reconstruction
- Vulnerability of Cities and Infrastructure to Natural Hazards
- Societal and Engineering Resilience
- Heritage Conservation Engineering

Research Description

Understanding Risk and Behaviours in Individuals: This stream of EPICentre's work focuses on the assessment, management and understanding of risk in both societal and scientific contexts. The work can be divided broadly into two complementary strands: one focusing on risk representation and behavioural response in individuals and communities, and the other on risk quantification.

Post Disaster Recovery and Reconstruction: Disaster recovery is relatively under-researched and there are many gaps in our knowledge and understanding. Members of EPICentre have been involved in several initiatives in this area of disaster studies in recent years. These include empirical research into long-term post-disaster change, the influence of short-term decision making on longer-term reconstruction pathways, and investigation of alternative approaches to supporting people left homeless by disaster. EPICentre members have also supported disaster shelter response (most recently in Typhoon Haiyan in the Philippines in 2014) and taken part in a number of post-disaster reconnaissance missions (including the 2009 L'Aquila earthquake in Italy and 2011 Tohoku earthquake and tsunami in Japan) to look at reconstruction processes from an engineering perspective.

Vulnerability of Cities & Infrastructure to Natural Hazards: Cities are composed of complex and interdependent social and physical infrastructure systems, which can be affected by natural hazards in several ways. Within EPICentre we are undertaking research to: 1) Shed new light on natural hazard characteristics and how they are modified by their interaction with the built environment; 2) Better characterize the response of individual infrastructure systems to single and multiple hazards; 3) Study the change in vulnerability that occurs in cities when exposure changes (e.g. with urban development); 4) Investigate how interdependency of infrastructure systems affect the vulnerability of cities to natural hazards, and their ability to respond to these events; 5) Understand the effectiveness of large scale mitigation interventions on city vulnerability to natural hazards.

Societal & Engineering Resilience: Research in this area has to date concentrated on the hazards of earthquakes, tsunami, floods, wind and fire, with approaches being developed and applied for assessing individual structures, populations of buildings, lifeline components and networks. From a more social science perspective, significant work has been undertaken by EPICentre to investigate social and physical metrics of resilience, and on the interplay between different stakeholders and infrastructure systems in the face of natural hazards.

Heritage Conservation Engineering: EPICentre's conservation engineering team works on condition assessment of historic buildings, diagnosis of structural and material damage, performance appraisal, using a multi hazard approach. Such hazards include seismicity and climate-induced threats such as flooding, wind-driven rain and thermal loading. EPICentre staff employ their expertise on a wide range of tools and methods including, but not limited to, on-site surveys, non-destructive techniques, laboratory testing, computer modelling, dynamic testing, and environmental monitoring.

EPICentre staff have worked on a multitude of historic buildings and sites around the world from the UK to Italy, Turkey, Algeria, Jordan, Nepal and the Philippines. Based on our holistic approach, tailored case-specific strengthening and retrofitting solutions are developed on a case by case basis. For the retrofit of historic rubble masonry churches exposed to seismic hazard we have developed in collaboration with industry a patented dissipative device to be mounted with metallic ties.

Website

https://www.ucl.ac.uk/epicentre/

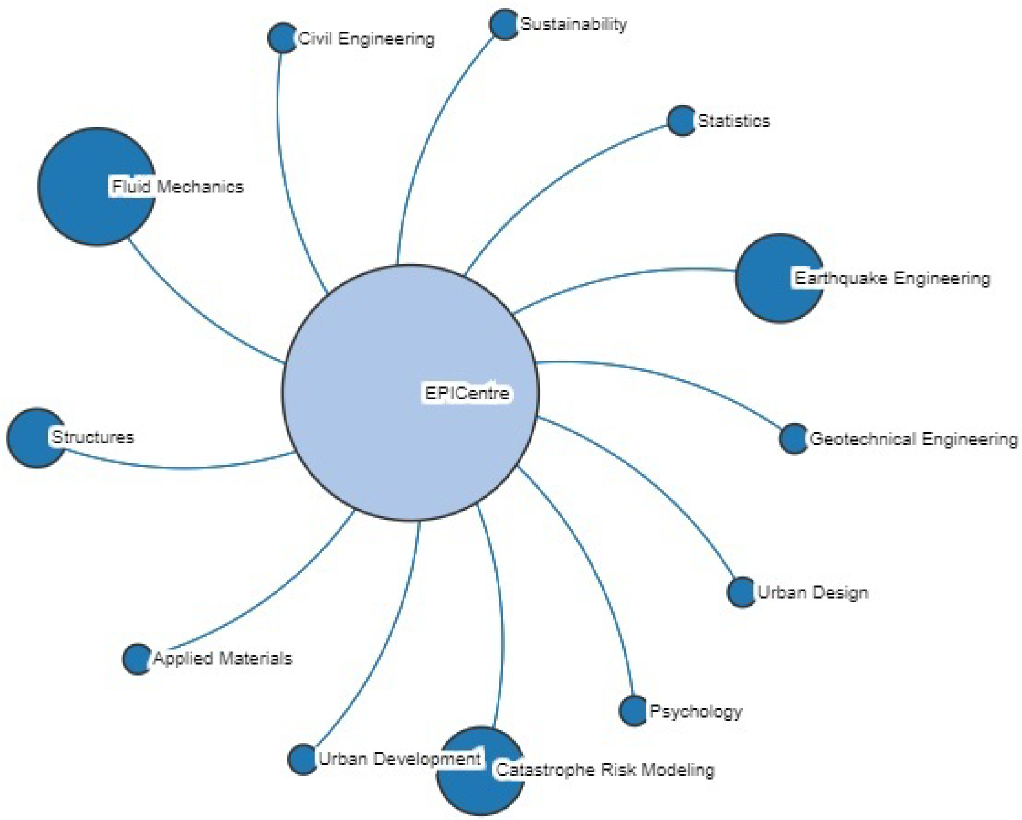

Figure 15. Relative Number of Faculty Collaborators by Discipline for EPICentre, University College London

List of Urbanism and Urban Science Research Institutes

- Arizona State University School of Geographical Sciences and Urban Planning
- The Bartlett School of Architecture, Space Syntax Lab
- Georgia Tech, The Center for Spatial Planning Analytics and Visualization
- The New School/Parsons, School of Design Strategies: Cities, Services, Ecosystems
- Massachusetts Institute of Technology, Media Lab
- Massachusetts Institute of Technology, Center for Advanced Urbanism
- Massachusetts Institute of Technology, Civic Data Design Lab
- Massachusetts Institute of Technology, City Form Lab
- Howard University, Howard University Transportation Research Center (HUTRC)
- New York University, The Urban Expansion Program
- Portland State, Sustaining Urban Places Research (SUPR) Lab
- The New School/Parsons, School of Constructed Environments
- University of Texas at Austin, School of Design and Creative Technologies
- University of Texas at Austin, Urban Information Lab
- Washington University in Saint Louis, Divided City Initiative,
- Virginia Tech, The Super Studio
- Virginia Tech, Human Centered Design
- University of Buffalo, Regional Institute
- University of California Berkeley
- UCLA, cityLab
- University of Chicago, Urban Labs Innovation Challenge
- University College London, Centre for Advanced Spatial Analysis
- University College London, Development Planning Unit
- University of Michigan, Ecosystem Management Initiative
- University of Oregon, Sustainable Cities Institute
- University of Oregon, Sustainable Cities Initiative
- University of Oregon, Urbanism Next
- University of Pennsylvania, Institute for Research

- University of Pennsylvania, McHarg Center for Urbanism and Ecology
- University of Pennsylvania, Penn Institute for Urban Research
- University of Pennsylvania, PennPraxis
- University of Toronto, School of Cities
- Urban Institute, Urban Institute
- Yale University, Seto Lab
- University of Southern California, Center for Sustainable Cities
- University of Utah, Metropolitan Research Center

Case study: School of Cities, University of Toronto (follow the links in this section to learn more).

Mission

Our Vision: The School of Cities will be a world-leading center for innovative interdisciplinary urban *research*, *education* and *engagement*. It is where diverse communities will come together to spark new insights and design creative ways for cities and their citizens to thrive.

Our Mission: The University of Toronto School of Cities convenes urban-focused researchers, educators, students, practitioners and the general public to explore and address complex urban challenges, with the aim of making cities and urban regions more sustainable, prosperous, inclusive and just.

Our Community: The School of Cities seeks to leverage our *extraordinary community of urbanists and urban-oriented researchers* to create a rich, multidisciplinary community of urban faculty, researchers and students across disciplines and perspectives.

In addition to facilitating *interdisciplinary research projects* and *partnerships and funding opportunities*, we provide a *hub for urban-focused interdisciplinary and collaborative learning*.

Research Areas

- Science of Cities
- Cities by Design
- Cities of Opportunity
- Urban Sustainability

Research Description

The School of Cities' mission is to convene urban-focused researchers, educators, students, practitioners, institutions and the general public to explore and address complex urban challenges, with the aim of making cities, urban regions and communities more sustainable, prosperous and just. Using a team-based approach that spans disciplines at the University of Toronto and involving partners from leading international institutions, large-scale, long-term projects will tackle the most vexing urban challenges by seeking to understand the fundamental components of a city and how they interact. The projects seek to not only develop the underlying theories but to also demonstrate their relevance in urban and community laboratories.

Website

https://www.schoolofcities.utoronto.ca

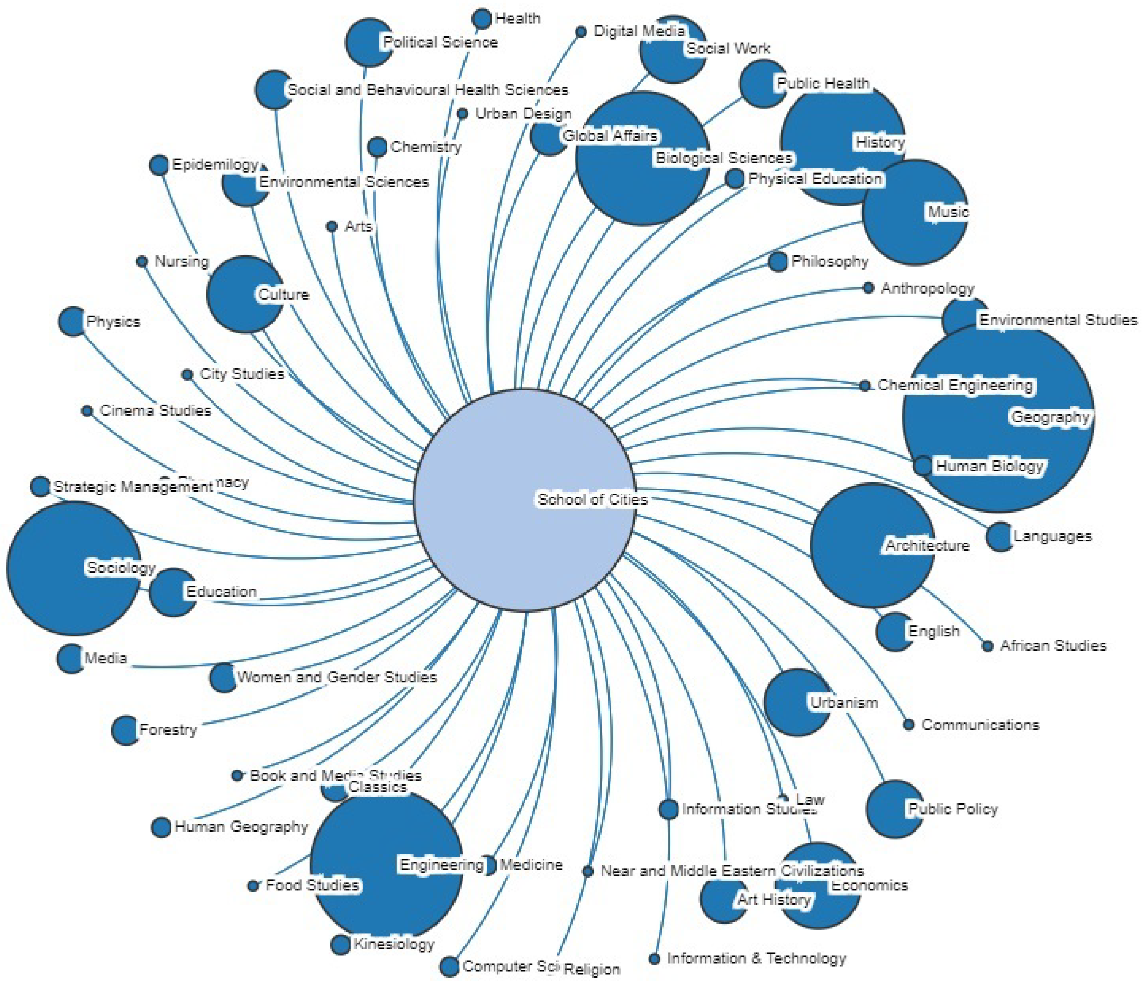

Figure 16. Relative Number of Faculty Collaborators by Discipline for School of Cities, University of Toronto

List of Construction and Material Science Research Institutes

- Arizona State University, Adaptive Intelligent Materials & Systems Center (AIMS)
- Birmingham City University, Centre for Engineering
- Clemson University, Institute for Intelligent Materials, Systems, Environments
- Florida International University, Accelerated Bridge Construction University Transportation Center (ABC-UTC)
- Florida International University, Advanced Materials Engineering Research Institute (AMERI)
- Georgia Institute of Technology, The Digital Building Laboratory
- Penn State University, Pennsylvania Housing Research Center
- Texas A&M, Center of Innovation in Mechanics for Design and Manufacturing,
- The Ohio State University, Materials and Manufacturing for Sustainability
- University College London, Real Estate Institute
- University of Calgary, Laboratory of Integrated Design
- University of Florida, Powell Center for Construction and Environment
- University of Michigan, Computational Design and Material Systems Innovation Cluster
- University of Stuttgart, Integrative Computational Design and Construction for Architecture
- University of Washington, Center for Integrated Design
- UT Austin, Center for Mechanics of Solids, Structures and Materials
- UT Austin, Construction Industry Institute
- UT Austin, Texas Materials Institute
- Western Michigan University, Georgeau Construction Research Center

Case study: Digital Building Lab, Georgia Tech

Mission

The Digital Building Laboratory serves as a catalyst for envisioning future work processes and technologies, and assists the architectural and building industries in adopting these developments on professional projects. The rapid pace of technology innovation is impacting the built environment with increasing speed.

The Digital Building Laboratory (DBL) connects Georgia Tech researchers to professionals in the architecture, engineering, construction, and operations (AECO) industries. We bring practitioners working in the field together with cutting edge research in data science, robotics, 3D visualization, and materials science. Working together with industry partners, DBL research teams create new tools and ways of working, and help industry adopt these advances through training, standards development, and student internships.

Our interdisciplinary lab draws researchers -- faculty and students -- from academic units across Georgia Tech, including architecture, computing, building construction, civil engineering, and mechanical engineering. Industry partners span professional design and construction firms, software and building product companies, owners and government institutions, and industry trade groups.

Research Areas

- Data Standards and Interoperability
- Design Fabrication, Construction Automation
- Project Delivery Systems
- Smart Buildings, Infrastructure, Environments

Research Description

The DBL's research programs are organized into four tracks with an emphasis on industry data standards, practice automation, collaboration, and connectivity.

Data Standards and Interoperability: The DBL is a leading research center developing standards supporting the development and exchange of building information modeling (BIM) data. Over the past decade, the DBL has led research in creating interoperability standards for a diverse set of construction industry consortia, including BuildingSmart, the American Institute of Steel Construction, The Precast Concrete Institute, and the Masonry Institute of America. The DBL's long-standing expertise in AEC data interoperability and exchange processes provides the background for developing the next generation of web-connected paradigms for the AEC industry. Traditional file-based design engineering and construction software are increasingly going online. Today's standards for building information are being refactored to take advantage of emerging web-based information standards that can enable a host of next-generation advancements in the industry.

Design, Fabrication, and Construction Automation: The DBL brings a number of distinct capabilities that create a unique environment for advancing automated design and construction practices. The lab's partner program connects technology partners with professional members who have specific aspects of practice they seek to advance. The lab's focus on advanced computing research -- from geometry and parametric modeling to machine learning and data analytics -- brings a spectrum of the industry's leading expertise and resources to develop and implement strategies for automating the design and engineering of specific projects and systems. Automated design methods in turn support follow-on capabilities, including design optimization and data analysis. These capabilities in design and engineering automation are matched by its capacities in fabrication and construction automation.

Project Delivery Systems: The DBL provides research and implementation that integrates numerous aspects of process information and system design to undertake advanced ways of building design and construction. Project Delivery Systems takes on both general industrywide topics as well as specific members' project needs through an integrated system development approach. This approach incorporates: Process Engineering; Data Modeling; Integrated Data Systems, and; Connected Tools and Devices.

Smart Buildings, Infrastructure, and Environments: Georgia Tech has numerous research and development initiatives pursuing smart buildings, cities, and construction processes, and the DBL connects to many of these. Within the spectrum of smart infrastructure initiatives, DBL leverages its foundations in building information data modeling and integrated systems to provide the infrastructure for connecting physical and digital assets to create intelligent built environments.

Website

http://www.dbl.gatech.edu

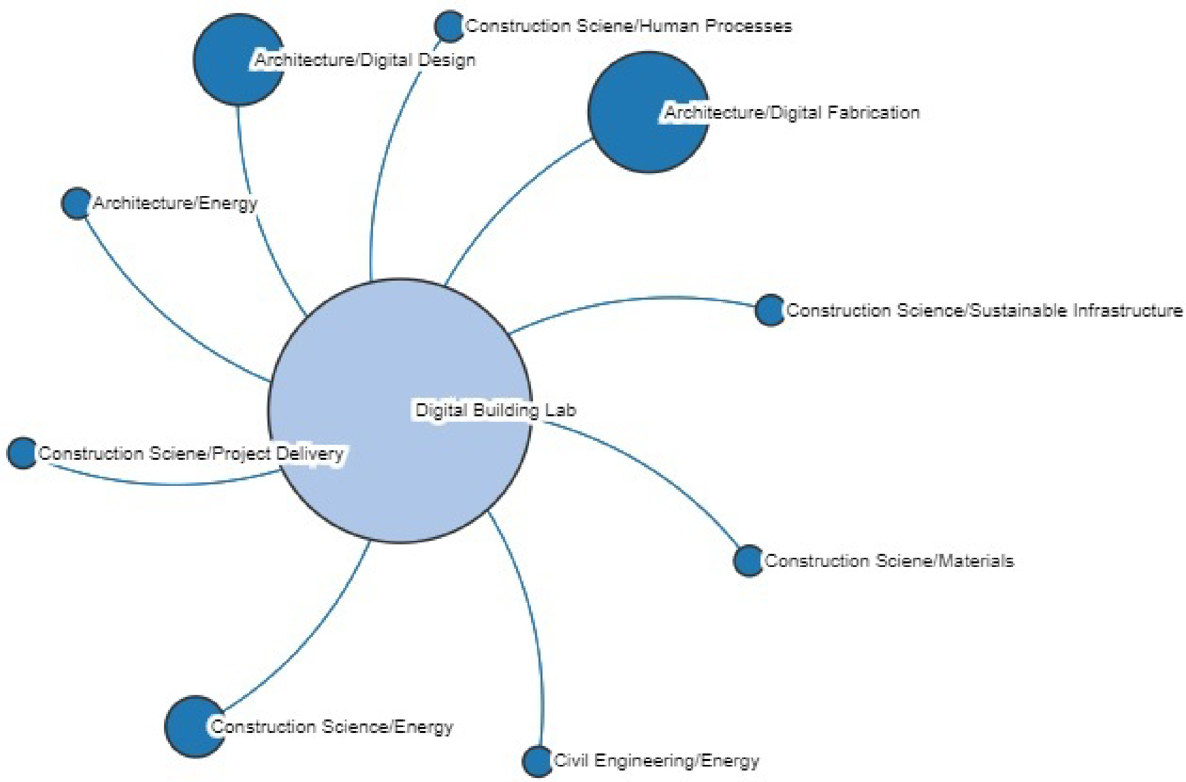

Figure 17. Relative Number of Faculty Collaborators by Discipline for Digital Building Lab, Georgia Tech

List of Community Design and Outreach Research Institutes

- Detroit Mercy, Detroit Collaborative Design Center
- Kent State University, Cleveland Urban Design Collaborative
- Louisiana State University, Coastal Sustainability Studio
- Mississippi State, Community Design Studio
- University of Arkansas, Community Design Center
- University of Idaho, Urban Design Center
- University of Louisville, Urban Design Studio
- University of Louisville, BUDAS, City Solutions Center, City Explorer, Capstone Studios
- University of Minnesota, The Minnesota Design Center (MDC)
- University of North Carolina Charlotte, UNC Charlotte Urban Institute
- University of North Carolina Charlotte, Charlotte Action Research Project (CHARP)
- University of Houston, Community Design Resource Center
- University of Texas at Arlington, Arlington Urban Design Center

Case Study: Coastal Sustainability Studio, Louisiana State University

Mission

The LSU Coastal Sustainability Studio seeks to:

- **Enable new models of integrated research and design applications.** CSS engages disciplines from across campus in a systems approach to solving complex coastal issues. It is essential that projects supported by the studio operate outside the boundaries of traditionally defined disciplines and lead to design products that are meaningful to a broad audience.
- **Develop design thinking with a systems approach using performance-based methodologies.** CSS projects use a hybrid of methodologies developed from design, systems ecology, and engineering to try and tackle complex problems facing coastal Louisiana. CSS projects utilize ideas from many disciplines while also embracing the concepts of sustainability (resolving environment, equity, and economics) and ecosystem design (green engineering) that expand the design capabilities of any one discipline.
- **Maintain a studio space fostering openness and collaboration.** The physical space of CSS promotes an inclusive and adaptable environment where interdisciplinary project teams work and meet. In addition to meeting areas and conference rooms, the CSS studio work space is an essential element for interactive and collaborative work.
- **Work closely with community-based partners.**CSS projects are developed through collaboration with local partners. Projects are subject to input and review by community members, local authorities, and other outside experts. Project teams are expected to engage these inputs and develop new ways to accomplish the multi-purpose goals of various projects and effectively represent these ideas to broader communities.
- **Work in support of local, state, and federal initiatives.** The CSS works closely with the Coastal Protection and Restoration Authority to innovate, implement, and extend the State Masterplan for a Sustainable Coast. In addition to CPRA the CSS works to engage other agency and funding opportunities.

The challenge of sustaining the ecological, settlement, and economic framework of the coast is one of the Gulf South's most pressing issues.

At CSS, scientists, engineers, and designers come together to intensively study and respond to issues of settlement, coastal restoration, flood protection, and the economy. CSS was conceived as a laboratory to develop new strategies that reduce risk to social, economic, and natural resources. The results of this design experimentation provide a sound basis for major policy decisions for adaptation through more sustainable land-use planning, protection, and education.

The CSS approach centers on supporting resilient human communities in the dynamic Gulf of Mexico environment. These communities face tremendous challenges, many of which are not being solved because the various disciplines alone cannot cope with the complexity and enormity of the problems. CSS was created as a trans-disciplinary institute for this reason. We work to envision and design sustainable systems that reduce vulnerability to increased storm strength, coastal hazards, habitat degradation, and global environmental change.

Louisiana is a working coast home to two million residents who face tremendous risks including climate change, sea level rise, land subsidence, habitat degradation, marsh collapse, threat of inundation, wetlands loss, and change in rainfall patterns, to name just a few. Through our innovative, trans-disciplinary approach, CSS aims to serve as a national and worldwide model for addressing coastal sustainability.

Research Areas

- Research: CSS supports trans-disciplinary research, design, and outreach projects that envision innovative solutions to coastal challenges through collaboration across a variety of academic perspectives. Through this program CSS facilitates new ideas and new partnerships that contribute to creating a more adaptive, resilient, and sustainable coastal Louisiana.
- Capacity Building: CSS builds capacity by bringing together a variety of disciplines to address the most pressing issues facing coastal Louisiana. Through trans-disciplinary projects, events, internships, and educational curricula, CSS connects experts, fosters

interdisciplinary collaboration, and builds a collective body of knowledge that crosses disciplinary boundaries.

- Visual Communication: Visualizations such as graphics, animations, and exhibits provide a powerful platform for communicating complex ideas. Through a trans-disciplinary and iterative process, CSS creates and employs visuals to stimulate thoughtful explorations, encourage dialogue, and ultimately galvanize action.
- Community Planning: By collaborating with community leaders and planners, fostering network connections, and providing a suite of resources and training opportunities, CSS enhances the community planning process. This work is crucial to strengthen community, economic, cultural, and ecosystem resiliency in coastal Louisiana.
- Design Speculation: Through design speculation the CSS puts forward new ideas and reimagines future possibilities for coastal Louisiana (and other modern deltaic systems worldwide). These designs are provocative and make proposals that challenge our assumptions, expand our understanding of the subject matter, and facilitate the creation of bold, innovative solutions. Because of the engagement of so many disciplines these projects have gone far beyond provocative design speculative to inform real policy and decision making.

Website

https://css.lsu.edu

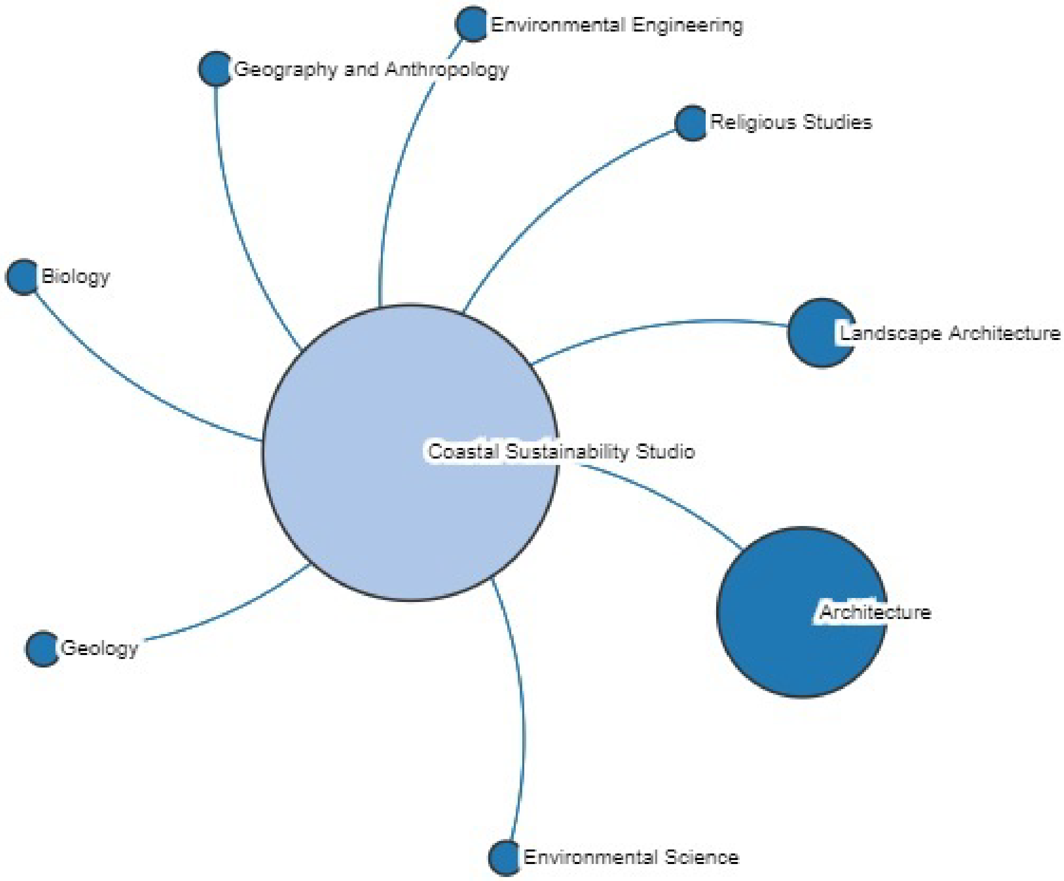

Figure 18. Relative Number of Faculty Collaborators by Discipline for Coastal Sustainability Studio, Louisiana State University

List of Energy and Environment Research Institutes

- Arizona State University, Center for Negative Carbon Emissions (CNCE)
- Arizona State University, National Center of Excellence on SMART Innovations
- Boston University, Institute for Sustainable Energy
- Drexel University, A.J. Drexel Institute of Energy and the Environment (IExE)
- Georgia Institute of Technology, Center for Distributed Energy (CDE)
- Georgia Institute of Technology, Strategic Energy Institute
- Howard University, Center for Energy Systems and Control (CESaC)
- Penn State University, Engineering, Energy, & Environmental Institute
- University College London, Energy Institute
- University of Oregon, Energy Studies in Buildings Laboratory
- University of Oregon, Fuller Center for Productive Landscapes
- University of Oregon, High Performance Environments
- University of Pennsylvania, Kleinman Center for Energy Policy
- UT Austin, Center for Energy and Environmental Resources
- UT Austin, Energy Institute
- Washington State University, Center for Environmental Research, Education and Outreach

Case study: Energy Institute, University College of London [Ibukun]

Mission

Our aim is to help to build a globally sustainable energy system, by bringing to bear multiple disciplinary perspectives to observe, analyze, model and interpret energy use and energy systems.

Our approach blends expertise from across UCL to make a truly interdisciplinary contribution to the development of a globally sustainable energy system.

Research Areas

- Energy and Environmental Systems
- Energy and Data Analytics
- Energy and Transport
- Energy and Buildings

Research Description

Energy and Environmental Systems: The highly interdisciplinary team does research focusing on the interactions of different energy system elements, across a wide range of geographical scales (UK, EU, the World), with different tools focusing on different elements of the system (technology, economy, environment & climate change).

Energy Systems and Artificial Intelligence Lab: The Energy Systems and Artificial Intelligence Lab focuses on the application of artificial intelligence methods to solve problems in the energy system. Artificial Intelligence promises to be one of the most revolutionary technologies of the 21st century. The Energy Systems and Artificial Intelligence Lab (ESAIL) aims to deploy the most cutting edge and state of the art algorithms and AI methods to solve problems of sustainability, from reducing energy consumption to increasing the stability of the grid to support increased penetration of renewables and the intelligent use of resources. We work across the different domains of the Energy Institute supporting and collaborating with our colleagues in the buildings, systems and transport themes.

Energy and Transport: The UCL Energy Institute studies all motorized modes of transport across space and time. The UCL-Energy Transport theme is divided into three groups: 1) Aviation; 2) Shipping, and; 3) MaaSlab. The UCL-Energy Transport theme: leads the development of integrated assessment models of the global air and sea transportation system; provides the shipping component to models of the International Energy Agency and the International Transport Forum; are active in future transportation fuels research (hydrogen and biofuels) through participation in the Supergen Consortia; accommodates a growing number of PhD students in the energy and transport area, and; produces a large number of publications about our research, including many journal articles, book chapters and a book.

Energy and Buildings: Our work can be divided into 4 broad topics: 1) domestic buildings; 2) non-domestic buildings; 3) smart energy (aka demand-side management), and; 4) district-level heating. We look at these through a range of different lenses: energy epidemiology concerns the pulling-together of data sets to gain fresh insights into the energy consumption across the entire built environment; building physics (or physical monitoring) allows us to interpret the epidemiology, and; socio-technical systems, which combine monitoring and data with the social sciences, look at how behavior affects energy consumption.

Website

https://www.ucl.ac.uk/bartlett/energy/

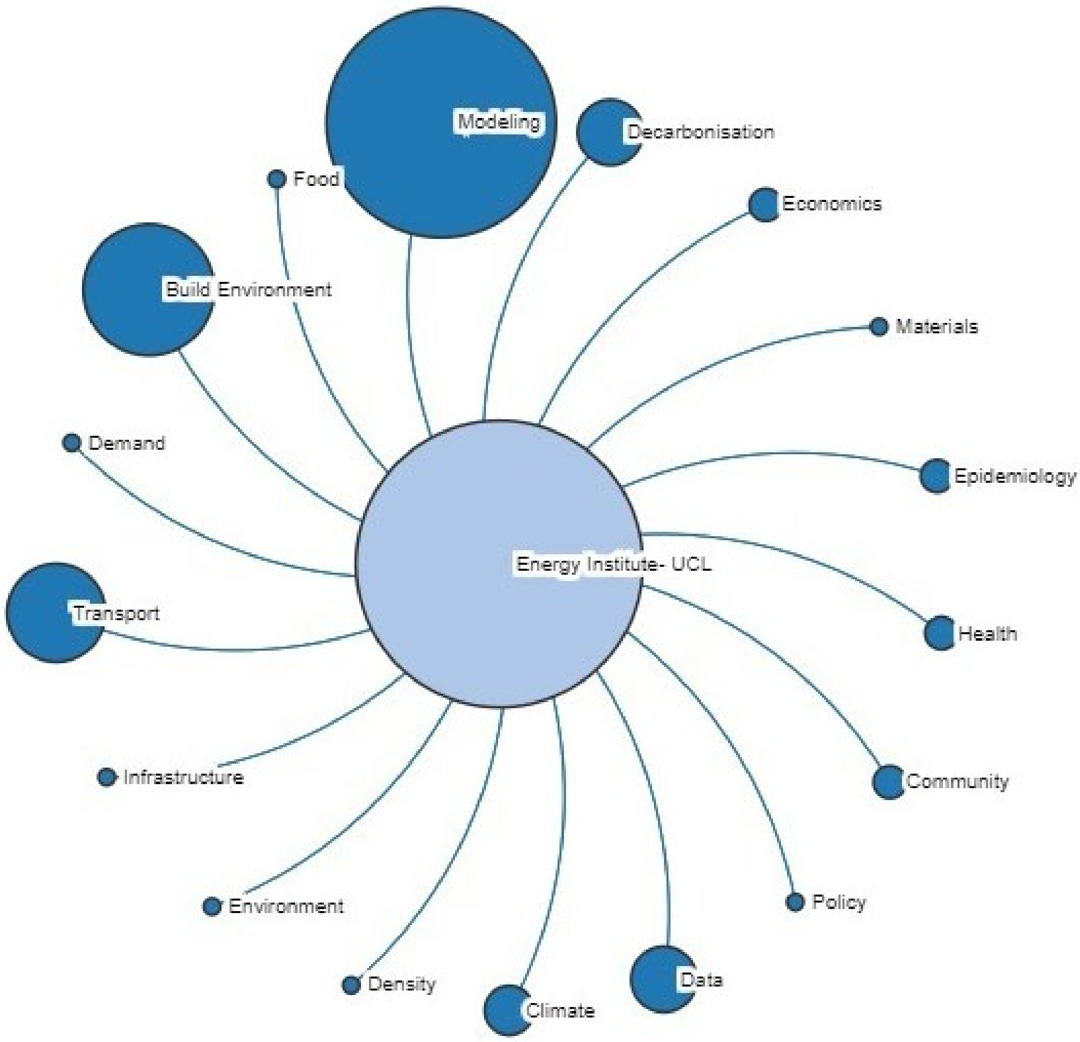

Figure 19. Relative Number of Faculty Collaborators by Discipline for Energy Institute, University College of London

SECTION III: RESIDENTIAL COLLEGE MODELS

Introduction:

Rationale for Inclusion: Our committee also thinks it is important to build in such a manner that we might become a Residential College in the future. This would allow full integration across student life, research, and instruction in a fully engaged, communal environment. This may also give a direction in which to think about building future buildings. Michigan State's residential college for the arts and humanities, UVA's International Residential College, and ASU's Barrett's Honors College, though not focusing on integrated design, are excellent models to map on to. We suggest building a plan to develop fully from FIGs to a Residential College be considered.

Michigan State University, Residential College in the Arts and Humanities (RCAH)

Summary:

The Residential College in the Arts and Humanities (RCAH) at Michigan State University is where students live their passions while changing the world. In RCAH, students prepare for meaningful careers by examining critical issues through the lens of culture, the visual and performing arts, community engagement, literature, philosophy, history, writing, and social justice. RCAH features a media center, an art studio and gallery, artists-in-residence, music practice rooms, a theater, unique education abroad programs, community engagement opportunities, and the Center for Poetry. Each semester, students meet and learn with some of the world's leading writers, artists, performers, and activists. RCAH is situated in historic Snyder-Phillips Hall, where students learn and live together in a small-college setting, with all the advantages of a major university. http://rcah.msu.edu/about/mission.html

All first year students live in Snyder-Phillips Hall in MSU's North Neighborhood. While most students spend a minimum of two years living on campus, students can select any living option upon reaching sophomore status.

Mission/Values Statement:

Students in the Residential College in the Arts and Humanities at Michigan State University are committed to building a better world. Through interdisciplinary study, imagination, and community partnerships, RCAH inspires and prepares graduates to be collaborative learners and visionary change-makers. We value engagement. We live this value by collaborating with students, faculty, staff and community partners to respond to real world problems.

We value critical thinking. We live this value by challenging ourselves—and others—to constantly explore new ideas and critically examine familiar ones.

We value creativity. We live this value by providing dedicated creative space, nurturing multiple forms of expression, encouraging students to solve problems in innovative ways.

We value the human experience. We live this value by exploring our past to understand present commonalities and differences.

We value a common set of ethics. We live this value by treating our students, faculty, staff and community partners with care, respect and integrity, and by offering a curriculum committed social justice and inclusion. http://rcah.msu.edu/about/mission.html

Arts and Humanities Degree, Programs + Centers

Art Studio
Artists in Residence
Center for Poetry
Community Engagement
Cultures and Languages across the Curriculum
LMC - Language and Media Center
LookOu Gallery
Network for Global Civic Engagement
RCAH Theater
Student Organizations
WNL - Wednesday Night Live
Writing Center Snyder Satellite

General Information:

40+ faculty and staff
Student enrollment at graduation unknown at this time.
View book: http://rcah.msu.edu/_assets/pdfs/rcah-viewbook.pdf

University of Colorado Boulder, residential academic programs (RAPs)

Summary:

CU Boulder has several residential academic programs (RAPs), which give students the chance to build community and share academic experiences. RAPs feature:

-Unique courses taught only in the RAP, with small class sizes.

-A full-time faculty director and upper-division mentors.

-Fun social activities and other unique program opportunities.

Engineering-focused RAPs include: Engineering Honors (Andrews Hall) and Global Engineering (Kittredge Central Hall) https://www.colorado.edu/ceae/prospective-students/undergraduate-studies/engineering-housing-options

Engineering Quad Living and Learning Community

Founded in 1987, the Engineering Quad Living and Learning Community (LLC) is made up of students studying a wide range of engineering or applied science disciplines in the College of Engineering and Applied Science. Participation in the LLC is required for students living in the Quad residence halls. Students living in the Engineering Quad Living and Learning Community have unique opportunities and experiences only open to LLC including those listed below. https://www.colorado.edu/engineering-advising/EngineeringLLC

The University of Virginia, International Residential College

Summary:

The IRC is a Residential College, meaning academics and social life are infused into a comprehensive and cohesive fabric. This concept of such a dynamic living and learning environment was envisioned by Thomas Jefferson for UVA at its founding. Today, living in the IRC offers students a satisfying and nurturing environment that fosters a sense of belonging and promotes positive relationships among all members of the community. It is a vibrant, enriching, residential and academic community where 300 undergraduate students, both domestic and international, develop their intellectual capabilities, networking skills, and profound global perspectives. https://housing.virginia.edu/area/1156

Mission/Vision Statement:

The International Residential College (IRC) is a vibrant, enriching, residential and academic community for undergraduate students, both domestic and foreign. The IRC strives to integrate its unique characteristics with Jefferson's vision for an integrated faculty-student Academical Village. The IRC programs will celebrate cultural diversity, study abroad opportunities, student governance, community outreach, academic excellence, as well as intellectual discourse between students, and with faculty. These programs will promote IRC's distinct international identity while drawing inspiration from the world's foremost residential colleges, such as

Cambridge and Oxford. This mission will allow IRC to strengthen UVA's residential experience as well as its global perspective, presence, and connections. https://irc.virginia.edu/about-college

Additional Statistics:

IRC has over 300 undergraduate students, and 5 staff.