# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>How to Build an Engine for Good</td>
<td>2</td>
</tr>
<tr>
<td>What Makes this Engine Run</td>
<td>2</td>
</tr>
<tr>
<td>Building Community</td>
<td>5</td>
</tr>
<tr>
<td>Innovating Undergraduate Education</td>
<td>5</td>
</tr>
<tr>
<td>Transforming Graduate Education</td>
<td>6</td>
</tr>
<tr>
<td>Empowering Scholarship, Discovery, and Invention</td>
<td>7</td>
</tr>
<tr>
<td>Connecting People and Ideas for Innovation</td>
<td>9</td>
</tr>
<tr>
<td>Enhancing Financial Resources to Support Our Mission</td>
<td>9</td>
</tr>
<tr>
<td>Closing Remarks</td>
<td>10</td>
</tr>
</tbody>
</table>
What the Strategic Plan Means for the School of Engineering—and You

Our school has never been stronger, and the quality of our students and faculty has never been higher. Our full-time tenure-track and non-tenured faculty count stands at approximately 120. Over 850 undergraduate and 750 graduate students are enrolled across B.S., M.S., Ph.D., post-baccalaureate, and certificate programs. At the undergraduate level, we offer 15 degree programs, eight of which are ABET/CAC accredited, in six departments. At the graduate level, the SOE continues to launch innovative and interdisciplinary degrees, including, most recently, M.S. and joint Ph.D. programs in Human-Robot Interaction and Materials Science and Engineering, and M.S. and certificate programs in both Data Science and Computer Engineering.

So why, you might ask, would the School of Engineering want to change anything?

The answer isn’t revolutionary. It’s evolutionary. Engineering practices, technology, and industry are all advancing rapidly. The SOE must evolve, too.

That’s the imperative behind our 10-year strategic plan, An Engine for Good. It maps out the next phase in the SOE’s evolution. The plan addresses key initiatives that will enable us to:

• Attract and retain the best and brightest students, faculty, and staff
• Increase the SOE’s reputation and ranking among peer institutions
• Build an infrastructure of innovative technology that will support academic efforts in our classrooms and research in our state-of-the-art laboratories
• Enhance student learning experiences

Building on the strategic plan, the SOE will redesign and implement undergraduate and graduate curricula to provide students with the professional skills to thrive in a global economy—and the ethical background to appropriately guide their efforts.

There has never been a more exciting time to be a part of our school. We invite you to join us in realizing our bold ambitions for Tufts School of Engineering. Together, we will create a healthier, safer, and more equitable world, and help today’s Jumbo Engineers become the principled leaders and innovators of tomorrow.
How to Build an Engine for Good

At the outset of its planning process, the SOE identified four critical needs:

1. To assess current achievements in relation to future goals
2. To revise goals as needed so that they would more closely align with the changing face of industry and engineering education
3. To craft strategies for achieving the SOE’s goals
4. To document a sound method for measuring success and recording milestones

The planning process began in early 2017 with two mini-retreats among the department chairs and school deans. The school-wide exercise started with an official kickoff in October 2017. Six sub-committees consisting of SOE faculty and staff were formed to address the main points for review:

• Administrative support (HR, administrative support, and marketing and communications)
• Finance and facilities (budget and facilities)
• Undergraduate education (advising, academic support, and curriculum)
• Graduate education (M.S., Ph.D., and certificate programs)
• Research (strategic foci and research administration)
• Vision, mission, and cross-cutting initiatives

Each sub-committee was led by two co-chairs and met numerous times throughout the fall and spring semesters. A SWOT analysis was conducted by each sub-committee to assess current strengths, weaknesses, opportunities, and threats. Based upon these analyses and in line with the overall mission and vision of the School of Engineering and Tufts University, short-term, mid-term, and long-term objectives were established. The sub-committees then submitted reports that incorporated their SWOT analyses, vision statements, goals to achieve, metrics to measure progress, and implementation plans.

The Engine for Good strategic plan summarizes these group reports. In addition to the strategic plan, an operational plan has been developed to provide details on implementation.

What Makes this Engine Run

At the core of An Engine for Good are the school’s mission, vision, and guiding themes.

Our two-fold mission:
• To educate students committed to the innovative and ethical application of science and technology, and empower them to address the most pressing societal needs
• To employ research to advance scientific and engineering knowledge and discover, develop, and disseminate new technologies and innovations that can enhance the well-being and sustainability of society

Our three-faceted vision:
Tufts School of Engineering is an academic community where
• Students prepare themselves to be well-rounded professionals, responsible leaders, and lifelong learners through a rigorous engineering education enhanced by interdisciplinary connections in arts, humanities, and science
• Faculty members strive to develop the next generation of engineers; and seek, through research, to create knowledge and technology for the benefit of the planet and its population
• Diversity and inclusion are embraced to empower all students, faculty, and staff to succeed in their academic and professional endeavors
6 GUIDING THEMES

1. Building Community
2. Innovating Undergraduate Education
3. Transforming Graduate Education
4. Empowering Scholarship, Discovery, and Invention
5. Connecting People and Ideas for Innovation
6. Enhancing Financial Resources to Support Our Mission
1 Building community

Our environment will empower faculty, staff, and students to fully realize their capacities and abilities. Our culture will be respectful, supportive, anticipatory, and responsive to community needs. We aim to:

• **Foster a culture of respect** for faculty, students, and staff at every level—a culture that recognizes accomplishments and values people’s time and efforts
• **Provide a diverse and inclusive learning and working environment** that promotes fairness and equity, and eliminates all forms of discrimination, at all levels, throughout all constituencies of the institution
• **Establish a culture of excellence** that focuses on individuals and career advancement; emphasizes quality and impact; demands transparency and shared expectations on all fronts; fosters a sense of accountability at every organizational level; recognizes faculty and staff; and rewards their excellence and dedication
• **Continue to integrate advanced, reliable technologies** to strengthen administrative infrastructure and encourage communication and collaboration
• **Rally alumni, parents, and friends** to become integral, engaged participants in the school’s success

2 Innovating undergraduate education

When it comes to innovating, the SOE has a sizeable advantage. Our small size gives us the agility to explore and experiment with new ideas and practices in engineering education. To maintain our leadership in undergraduate education, we will:

• **Foster deep learning in chosen fields of study** and set high standards for a rigorous curriculum where fundamental knowledge and mastery of engineering skills are expected and promoted
• **Prepare our students for success in the global marketplace** by equipping them with fundamental engineering knowledge, leadership skills, and enthusiasm for lifelong learning—plus the ability to question, reflect upon, master, and embrace new technologies quickly, critically, and effectively
• **Impart a clear understanding of the socio-cultural impact of engineering** through classroom discussions, increased participation in study abroad programs, and meaningful internship experiences
• **Nurture an interdisciplinary culture of learning** by freeing students to select among multiple program tracks of an interdisciplinary curriculum—thus preparing them for advanced graduate study, professional leadership, or entrepreneurial undertakings
• **Integrate research into teaching** by encouraging faculty members to supervise undergraduate research experiences, share scholarly work with undergraduates in the classroom, and enhance their teaching skills through knowledge and practice of pedagogical research
3 Transforming graduate education

The faster technology advances, the more rapidly the job market evolves. Lifelong learning and skill refreshment are important keys to keeping pace. To help our graduate students stay ahead of the curve, the SOE will:

• Introduce flexible master’s programs in new and emerging areas to prepare students for novel industries

• Create a rigorous and supportive doctoral environment that encourages students to think critically, communicate effectively, and develop the technical and leadership skills required to compassionately solve interdisciplinary challenges on a global scale

• Provide Ph.D. students with a transformational experience through dedicated faculty mentorship, participation in cross-disciplinary research teams, and professional development activities

• Support the discovery, creation, invention, and sharing of knowledge by offering Ph.D. students the highest standard of resources and training

• Help graduate students become leaders of thought and innovation in their fields by developing an array of professional opportunities, including graduate internships, co-ops, and other programs that offer platforms for connection, networking, and launching entrepreneurial ventures with companies across the science and technology sectors

• Develop educational programs and increase opportunities for non-traditional adult learners to gain a clear path to career advancement in industry, government, or academia
Empowering scholarship, discovery, and invention

Tufts is a student-centered research university, and the SOE translates research excellence into scholarship, discovery, and inventions that positively impact the world. Here is our plan for continually enhancing our ability to deliver meaningful societal impact:

- **Maintain and elevate our innovative edge** by attracting and retaining faculty whose research is of the highest caliber and by recruiting exceptional Ph.D. students
- **Invest in state-of-the-art research facilities**—including renovated as well as new facilities—that are conducive to interactive, collaborative, hands-on learning
- **Build on and expand beyond our traditional cornerstones** by investing in existing research and program strengths, and by pioneering research and education in emerging areas
- **Spur innovations that address fundamental gaps in scientific and engineering knowledge** by creating a system of incentives that reward creativity, invention, and entrepreneurship—within and beyond the SOE
- **Enhance cross-fertilization and faculty collaboration across disciplines** by developing interdisciplinary research opportunities in such areas of strength as: energy, water, and environment; human-technology interaction; human health and bioengineering; the Internet of Things; and learning science
- **Create strong and lasting synergies with other Tufts schools** by nurturing interdisciplinary research connections across the Tufts community
- **Support and promote high-tech partnerships with local, national, and global industry** to promote research innovation, student training, and the translation of knowledge to tangible products addressing challenging societal needs
5 Connecting people and ideas for innovation

The SOE’s leadership role extends beyond academia. We are committed to partnering with leading industries, governmental entities, and Tufts alumni to drive positive change throughout the world. We will:

- **Engage the global community**—including industry, governments, non-governmental organizations, and other entities—in order to facilitate innovation and collaboration and provide scalable methods for translating research
- **Enhance the school’s national and worldwide reputation** through marketing efforts that will help make the SOE a top-of-mind brand for industries, peer and aspiring institutions, alumni, prospective students, and potential donors
- **Establish a variety of cross-school educational and research programs**—including formal collaborative agreements with other universities as well as international research firms—with the end goal of expanding the SOE’s sphere of influence and ability to effect global change
- **Bridge the gap between ideas and real-world impact** by increasing faculty and students’ understanding of key social and economic challenges, and by encouraging research and experimentation that can lead to valuable new benefits and possibilities for society

6 Enhancing financial resources to support our mission

Strong, stable financial resources are the fuel that empowers the SOE to innovate engineering education, provide transformational experiences for our students, advance scholarship, and inspire discovery and invention. To ensure the SOE’s financial strength, we will:

- **Expand existing and explore alternative revenue streams** and experiment with unconventional modes of teaching and learning in order to make a Tufts Engineering education more affordable and accessible to a broader population
- **Leverage Brighter World: The Campaign for Tufts University** to invite students, alumni, parents, friends, corporations, and foundations to support the SOE’s academic mission with generous contributions
Why there has never been a better time to be part of the SOE

The SOE has always been a breed apart. Not just one of the world’s great engineering schools, but an institution dedicated to inspiring new technologies and innovations for a better world.

Now it’s time to take the SOE to the next level. This bold new strategic plan, *An Engine for Good*, is the blueprint for building on our legacy and advancing our mission to educate students committed to using science and technology in innovative, ethical ways to address society’s greatest challenges.

At the core of the new plan is the Tufts Engineering student—who, through rigorous curricula and transformational learning and research experiences, will emerge from the SOE prepared to succeed in the global marketplace and make a meaningful difference in the socioeconomic culture of tomorrow.

*An Engine for Good* is a living document. It will evolve right along with our school and the world, changing and adapting to meet new challenges and opportunities as they emerge.

What will not change is our commitment to maintaining an engaging and welcoming community; enabling and supporting transformational experiences for our students; ensuring faculty excellence; embracing diversity in all its forms; and providing students and alumni with lifelong engagement and learning opportunities.

We invite you to be part of the SOE’s future. Part of something bigger than just a great engineering school.

An incubator for the engineering leaders of the future.

A spark for innovations that can elevate society.

A powerful force for positive change.

*An Engine for Good.*
Tufts begins offering engineering courses and degrees

Founding of College of Engineering; B.S. degrees offered in Civil, Electrical, Mechanical, and Chemical Engineering

First graduate programs introduced

Tufts Gordon Institute (TGI) joins college; M.S. in Engineering Management offered

First Ph.D. programs offered

School of Engineering becomes seventh independent school at Tufts University, gaining ability to grant its own graduate degrees

Launch of the Center for Engineering Education and Outreach (CEEEO)

Launch of the Tufts Micro and Nano Fabrication Facility

Tissue Engineering Resource Center founded

Launch of the Tufts Microcharacterization Core Facility

Center for STEM Diversity (CSD) established

Launch of the Initiative for Neural Science, Disease & Engineering (INSciDE@Tufts), Tufts Interdisciplinary Advanced Materials Center (TIAMAT), Tufts Advanced Microscopic Imaging Center (TAMIC), and Tufts Epitaxial Core Facility

Center for Applied Brain and Cognitive Sciences (CABCS) founded

Nolop FAST (Fabrication, Analysis, Simulation, and Testing) Facility opens its doors

 Establishment of the Institute for Research on Learning and Instruction (IRLI), supported by an $8 million commitment from James S. McDonnell Family Foundation

SOE Strategic Plan launched
Illustrious alumni

Here are just some of the engineering greats who graduated from Tufts, and what they went on to achieve.

Frederick Stark Pearson (B.S., CEE, 1883) developed Boston’s electronic rail systems

Vannevar Bush (B.S., M.S., EE, 1913) helped create the National Science Foundation, founded Raytheon, and headed the U.S. Office of Science and Research during World War II

Edward “Eddie” Dugger (B.S., ME, 1941) was one of the first African American aeronautical engineers in the United States and a national collegiate record-holder in track and field

Dave Power (B.S., M.S., CEE, 1975) serves as the President and CEO of Perkins School for the Blind

Ellen J. Kullman (B.S., ME, 1978) is the former CEO of DuPont and serves on the Board of Advisors for the School of Engineering

Susan Decker (B.S., CS, 1984) became president of Yahoo!, Inc., and now runs the online platform Rafr

Ioannis (Yannis) Miaoulis (B.S., ME, 1983, Ph.D., ME, 1987) leads Boston’s Museum of Science as President and Director and is a trustee of Tufts University

Pierre Omidyar (B.S., CS, 1988) is the founder of eBay