

COLLEGE OF ENGINEERING, TECHNOLOGY, AND COMPUTER SCIENCE

Strategic Plan

August 2017–July 2022

Version 1.1

ENGINEERING | POLYTECHNIC | COMPUTER SCIENCE | LEADERSHIP

PURDUE
UNIVERSITY®
FORT WAYNE

College of Engineering, Technology,
and Computer Science

DEAN'S MESSAGE

In fall 2016, the College of Engineering, Technology, and Computer Science embarked on a first-ever comprehensive strategic planning process to continue the tradition of excellence and to realize the vision of becoming the premier college of choice in northeast Indiana and beyond. What emerged was the 2022 plan, featuring exciting new initiatives to create value propositions for our stakeholders, the region, and the global community. The plan was developed with input from many constituents, including current students and alumni, faculty and staff, industry, and several key individuals at Purdue West Lafayette. The first draft, Version 1.0, of the plan was presented at the fall 2017 faculty and staff convocation. Subsequently, an implementation framework was devised to execute the four identified strategic areas in the ensuing three to five years, grounded in continuous improvement at all levels.

Since the first publication of the plan, the university has witnessed a major transformation, fueled by the separation of its predecessor—IPFW (Indiana University–Purdue University Fort Wayne)—into two separate universities, Purdue University Fort Wayne and Indiana University Fort Wayne, through a massive realignment process. Our college has always benefited from its close affiliation with the Purdue University system and the degrees that have been granted by Purdue University. The new brand designation, along with the university's status as a metropolitan university, provides us with tremendous potential for growth and development.

The strategic plan has played a pivotal role in the college's transformational journey. An outcome of the realignment has been the creation of the School of Polytechnic, merging the two separate technology departments. While still residing within the college of ETCS, this new recognition resonates with Purdue's system-wide initiative of polytechnic that emphasizes Purdue's applied learning programs into a single administrative unit. Furthermore, a proposed building, considered a top priority for the university, to house the School of Polytechnic on the north side of the existing engineering and technology building, will create ample opportunities for growth.

As a college we have always provided experiential learning opportunities, small class sizes, one-on-one relationships between students and faculty members, and close ties with industry. These remain important in our strategic plan. Additionally, Strategic Plan 1.0 has served as an impetus for ETCS faculty and staff to collaborate on a number of initiatives that have made significant differences, particularly in the area of student success. As we look to the future, we envision much growth in the four interdependent focus areas identified within the plan. Watch for updates to this plan, as we report our activities and share progress on each focus area and strategic initiative. We believe that ETCS is on a trajectory to become the college of choice in northeast Indiana and beyond.

Respectfully,



Manoochehr Zoghi

Dean, College of Engineering, Technology, and Computer Science

TABLE OF CONTENTS

INTRODUCTION.....	2
PROCESS	3
SECTION I: Vision, Mission, Core Values, and Identity.....	5
SECTION II: Strategic Focus Areas.....	6
Improve Student Success	8
Create Research Opportunities and Innovation.....	10
Improve Engagement.....	11
Enhance Diversity and Foster Inclusion	12
SECTION III: Academic Departments, Centers of Excellence, Outreach and Student Support Programs, and Emerging Signature Areas	13
APPENDIX A: Committee and Board Members	15
Strategic Planning Steering Committee Members	15
ETCS Chairs and Directors	15
Industrial Advisory Executive Board Members.....	15
APPENDIX B: Collective System Design for ETCS	16

INTRODUCTION

For nearly 50 years, Purdue Fort Wayne has offered degrees in engineering and technology, providing exceptional hands-on education for students with diverse backgrounds from northeast Indiana and beyond. The College of Engineering, Technology, and Computer Science (ETCS), as we know it today, was formed in 1995 and boasts distinctive features, including rigorous academic programs, small class sizes, a small student-to-faculty ratio, and senior design capstone projects, which are typically sponsored by industry.

These attributes, along with a vibrant campus, provide a student-centered learning environment where our students collaborate on projects in and out of the classroom and are mentored by highly qualified and dedicated faculty. In addition, strong industry-based partnerships have enriched the educational experience of ETCS students through internship and co-op programs. Graduates of ETCS programs have been contributing to the economic development of the region in health care, manufacturing, defense, biomedical, and other fields. ETCS will become a premier college in northeast Indiana and beyond. To achieve this objective, the college has established this ambitious strategic plan to realize this vision.



Photo credit: T. Bart Quimby

PROCESS

The college launched the strategic planning process in fall 2016. The vision, mission, and core values were enhanced to reflect the new metropolitan campus designation. Section I provides those updates. The process was designed to ensure input and collaboration from faculty, staff, current students, alumni, and industry partners. Planning took place from November 2016 to July 2017. Key milestones are outlined below.

Strategic Planning Steering Committee: A faculty and staff committee consisting of representatives from each academic department and the dean's office was convened to develop the plan. The committee developed and managed the process for collecting input, reviewed and analyzed data and stakeholder feedback, and drafted the plan.

Strategic Planning Retreat: At the spring 2017 college retreat, we used an appreciative inquiry methodology as the framework to engage all faculty and staff in a SOAR analysis to provide input in relation to our strengths, opportunities, aspirations, and results in order to achieve the vision of ETCS. Participants also reviewed the strategic planning process and timeline, whereby they were invited to share feedback along with the draft mission, vision, core values, and identity. Input from the retreat was compiled and is reflected in this strategic plan.

Collective System Design: Following the retreat, the steering committee members participated in the use of Collective System Design methodology to collaboratively and intentionally define functional requirements and physical solutions in order to best meet the needs of our stakeholders. The resulting ETCS Strategic Plan System Design Map (Appendix B) augments the basis of the strategic plan and provides the framework for our approach. Functional requirements begin with verbs because they reflect what we desire to achieve and aspire to accomplish to meet the needs of our constituents and should be thought of as the goals of the plan. In subsequent sections of this plan, functional requirements are identified as initiatives and sub-initiatives. Physical solutions reflect how we propose to meet the functional requirements, which are stated as nouns (i.e., process, procedure, program, service), that we are proposing to implement in order to achieve the plan's requirements (stated as initiatives and sub-initiatives in ensuing sections). Solutions will be identified as part of the strategic plan implementation beginning fall 2017.

Stakeholder Surveys: Input from key stakeholders was requested via an online survey from current students, alumni, adjunct faculty, and industry advisory board members. Questions focused on our strengths, our challenges, and our opportunities. After being sorted and categorized, the data from each survey were used to inform our strategic initiatives and sub-initiatives.

Open Forums: Manoochehr Zoghi, ETCS dean, held multiple informal gatherings aimed at seeking input from students and listening to their college experiences, both academic and nonacademic.

Input from Faculty and Staff: Each draft of the strategic plan was shared with the ETCS Assembly, the college's faculty governance body, and throughout the college, soliciting input from all internal faculty and staff.

Plan 2020 Alignment: This plan aligns with the university's vision, mission, and values, and supports the four major goal areas outlined in the university-level strategic plan.

Final Review: Feedback from all key stakeholders was incorporated into the draft of the strategic plan and reviewed for final delivery in August 2017.

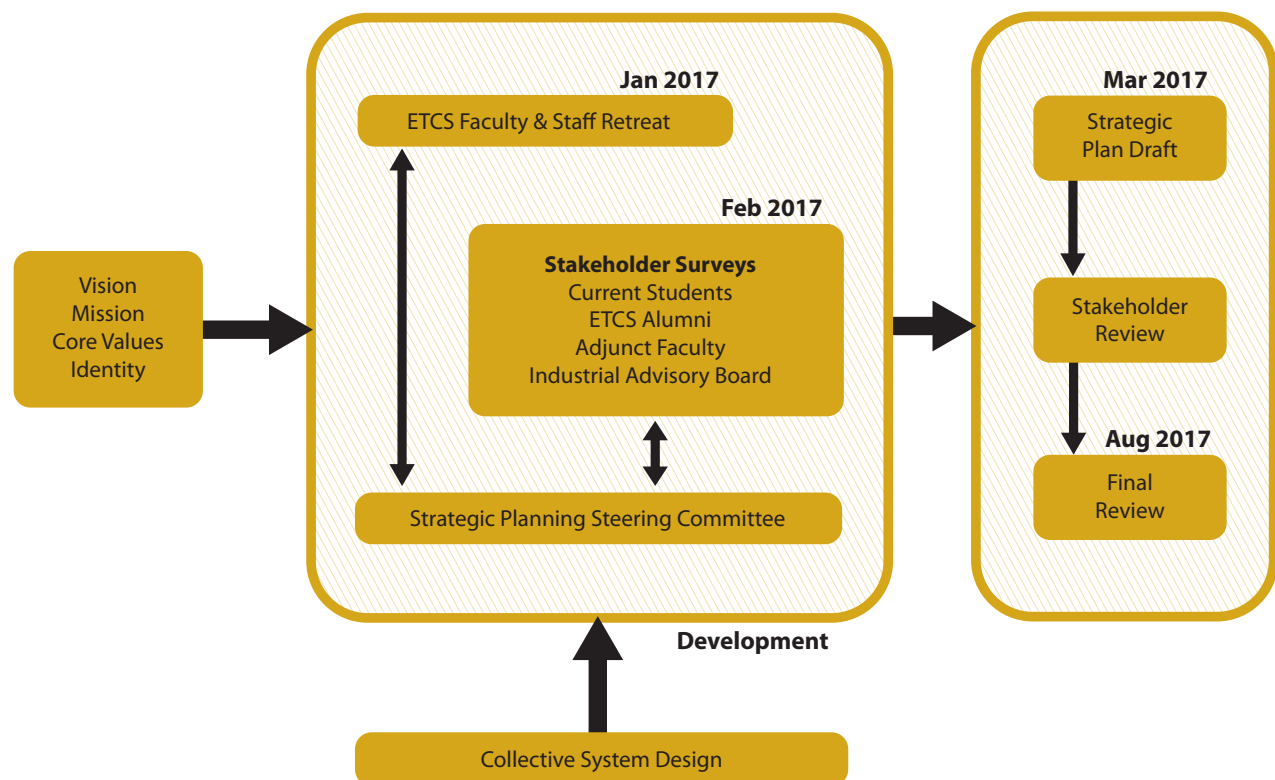


Figure 1: ETCS Strategic Planning Process

SECTION I: Vision, Mission, Core Values, and Identity

VISION

ETCS will be a transformative, premier college of choice, providing a world-class engineering, polytechnic, computer science, and leadership education through excellence in teaching and learning, research and innovation, engagement, collaboration, and entrepreneurship.

MISSION

To provide a comprehensive education that will prepare career-ready graduates for a variety of roles in engineering, polytechnic, computer science, and leadership, serving the needs of northeast Indiana and beyond.

CORE VALUES

- Community engagement
- Continuous improvement
- Creativity and innovation
- Discovery, integration, and application of knowledge
- Diversity and inclusiveness
- Entrepreneurial mind-set and leadership
- High-impact learning practices
- Integrity and professionalism
- Lifelong learning and professional development
- Student-centered approaches
- Supportive, collegial, and collaborative relationships

IDENTITY

ETCS at Purdue University Fort Wayne is grounded in the principles of excellence through industry partnerships, engagement within the region, and affiliation with Purdue, an internationally known university. Dedicated faculty with small class sizes provide personalized, hands-on, enriching educational experiences comparable to prestigious private institutions at a public university price.

SECTION II: Strategic Focus Areas

The Strategic Planning Steering Committee employed the Collective System Design methodology to determine the necessary components for achieving the ETCS mission, vision, core values, and identity. The resulting design identifies that the current and continued success of the college requires an organizational approach that focuses on four pillars:¹

- Sustainability and improvement
- Value creation
- Cost and waste reduction
- Resource allocation and investment

The sustainability and advancement of the college are tied to the creation of an environment of continuous improvement. This environment is necessary to ensure the success of ETCS by growing and adapting to meet the changes and challenges of our students, faculty, staff, and the region. The strategic plan map identifies the need that continuous improvement should be the foundation of how the college operates, and that the college should be based on departmental and interdepartmental continuous improvement.

The opportunity to enhance ETCS and to grow the college comes from the concept of value creation, or providing the best programs and outcomes for our stakeholders. The committee identified four strategic focus areas, which were expanded to add detail to the strategic plan. Data collected from the retreat and stakeholder survey results were used to inform the development of initiatives and sub-initiatives within each area.

The strategic focus areas are:

1.0: Improve student success

Enhance the use of high-impact practices to support students from recruitment to postgraduation success, including advising, learning, and career readiness.

2.0: Create research opportunities and innovation

Bolster the research capacity of the college by creating infrastructure and support for funding, collaborating, and recognizing published and patented research. Stimulate entrepreneurship mind-set, innovation, and design thinking.

3.0: Improve engagement

Expand and strengthen relationships with alumni and regional partnerships with industry, creating enhanced opportunities for student-faculty projects that promote experiential learning and applied research and impact regional economic-development efforts.

1. The full details of the Collective System Design process and results (including the ETCS Strategic Plan Map) are included in Appendix B.

4.0: Enhance diversity and foster inclusion

Foster a diverse population and dedication to inclusion throughout the college, supporting and harnessing diversity for student success, research, innovation, and engagement. The remaining two pillars of cost and waste reduction and resource allocation and investment, while of critical importance, are only significant if the prior pillars are in place. Since achievement of cost and investment constraints relies on the administrative management of the college, the latter two pillars will be addressed in the implementation of the strategic plan in our daily operations.

SECTION II: Strategic Initiatives for Focus Area 1.0

Improve Student Success (FR 21)

Initiative 1.1: Increase use of high-impact, evidence-based practices to improve student success²

Sub-initiative 1.1.1: Identify root causes that impede student success and develop effective solutions to address them

Sub-initiative 1.1.2: Offer applied mathematics classes and enrichment in ETCS, in collaboration with the Department of Mathematics

Sub-initiative 1.1.3: Establish central advising by professional advisors during students' first year (up to 30 credits)

Sub-initiative 1.1.4: Establish peer mentoring program whereby upper division ETCS students mentor freshmen and probationary students

Sub-initiative 1.1.5: Establish intervention advising and enrichment for preprobationary and probationary students

Sub-initiative 1.1.6: Establish high-impact practices, including internships, living-learning communities, and industry mentoring. Incorporate undergraduate research, an interdisciplinary curriculum, service learning, entrepreneurial thinking, and global dimensions into our programs, which constitute the five pillars of the Grand Challenges Scholars Program³

Initiative 1.2: Create an enhanced collaborative learning environment

Sub-initiative 1.2.1: Obtain funding to build and improve laboratories and prepare plans for a new ETCS building

Sub-initiative 1.2.2: Expand classroom and laboratory spaces, and transform existing ones into collaborative learning environments

Sub-initiative 1.2.3: Create a space for students to study and collaborate

Sub-initiative 1.2.4: Ensure faculty availability to support desired faculty-to-student ratios, small class sizes, and out-of-the-classroom engagement

Initiative 1.3: Increase use of high-impact, evidence-based practices to improve teaching and learning

Sub-initiative 1.3.1: Identify best teaching practices for ETCS and other evidenced-based, high-impact practices; share via faculty-led seminars

Sub-initiative 1.3.2: Incentivize, reward, and develop online classes, as well as hybrid and flipped classroom approaches

2. Kuh G, Schneider C., *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter* (e-book). Washington, DC: Association of American Colleges and Universities, 2008.

3. engineeringchallenges.org/GrandChallengeScholarsProgram.aspx.

Initiative 1.4: Enhance strategic partnerships outside the university

Sub-initiative 1.4.1: Establish close collaboration with local schools to improve student readiness for ETCS programs, and create pipelines for recruitment of and outreach to high-quality applicants

Sub-initiative 1.4.2: Establish articulation agreements with community colleges within Indiana and in neighboring states

Sub-initiative 1.4.3: Establish strategic partnerships with schools and industry to create precollege-through-graduation and career-pathway opportunities

SECTION II: Strategic Initiatives for Focus Area 2.0

Create Research Opportunities and Innovation (FR 22)

Initiative 2.1: Support faculty scholarship, entrepreneurship, and creative work

Sub-initiative 2.1.1: Promote interdisciplinary discovery, research collaboration, and scholarly activities

Sub-initiative 2.1.2: Provide seed funding and assigned (release) times to promote faculty research and scholarly activities

Sub-initiative 2.1.3: Establish closer collaborations between faculty and industry partners to promote entrepreneurial solutions for industry's challenging projects

Initiative 2.2: Establish relationships for research collaboration

Sub-initiative 2.2.1: Promote greater faculty collaboration on interdisciplinary projects

Sub-initiative 2.2.2: Strengthen research collaborations with Purdue West Lafayette

Sub-initiative 2.2.3: Engage students in research opportunities and enhance discovery-enriched curriculum

Sub-initiative 2.2.4: Identify signature areas, emerging technologies, and areas of growth

Initiative 2.3: Publish and patent research

Sub-initiative 2.3.1: Provide faculty, staff, and students the tools and knowledge they need to support and bolster research and discovery

Sub-initiative 2.3.2: Create opportunities and encourage undergraduate and graduate students to publish research from theses, course projects, and/or poster presentations

SECTION II: Strategic Initiatives for Focus Area 3.0

Improve Engagement (FR23)

Initiative 3.1: Provide effective marketing of ETCS programs

Sub-initiative 3.1.1: Identify and allocate funding for an ETCS marketing person

Sub-initiative 3.1.2: Make ETCS marketing a priority

Sub-initiative 3.1.3: Designate a program for marketing focus each semester

Sub-initiative 3.1.4: Request a designated person in Development for ETCS

Initiative 3.2: Establish more active alumni outreach

Sub-initiative 3.2.1: Designate an alumni coordinator at the college level and provide appropriate release time

Sub-initiative 3.2.2: Maintain an up-to-date database of all alumni and send regular emails to update on current status of graduates and college

Sub-initiative 3.2.3: Send annual department newsletters to alumni

Sub-initiative 3.2.4: Create an alumni section on each department website

Initiative 3.3: Enhance collaboration with industry

Sub-initiative 3.3.1: Invite experts/speakers in their field for in-class discussions

Sub-initiative 3.3.2: Enhance infrastructure (facilities, resources, curriculum/programs) to facilitate faculty-student-industry collaborations

Sub-initiative 3.3.3: Track and promote faculty involvement with TAP⁴ (Technical Assistance Program), IN-Mac⁵ (Indiana Manufacturing Competitiveness), and TAA (Technical Assistance Agreement)

Sub-initiative 3.3.4: Partner and engage with industry in order to raise funds for collaborative research projects, potential endowments, and other college priorities

4. Find more information at tap.purdue.edu.

5. Find more information at purdue.edu/in-mac.

SECTION II: Strategic Initiatives for Focus Area 4.0

Enhance Diversity and Foster Inclusion (FR24)

Initiative 4.1: Improve gender, racial, and ethnic diversity

Sub-initiative 4.1.1: Recruit and support underrepresented students in ETCS programs

Sub-initiative 4.1.2: Recruit and develop underrepresented faculty and staff in ETCS programs

Sub-initiative 4.1.3: Develop international relationships and collaborations

Initiative 4.2: Support the needs of our existing ETCS community

Sub-initiative 4.2.1: Develop diversity safe zones

Sub-initiative 4.2.2: Remove language barriers and improve communication

Sub-initiative 4.2.3: Support work-family-life balance for ETCS community

Initiative 4.3: Use diversity to enhance student success, research opportunities, and engagement

Sub-initiative 4.3.1: Establish international educational opportunities and collaborations

Sub-initiative 4.3.2: Encourage and support faculty to add diversity into course content

Sub-initiative 4.3.3: Encourage diverse educational and research partnerships outside of ETCS

SECTION III: Academic Departments, Centers of Excellence, Outreach and Student Support Programs, and Emerging Signature Areas

The ETCS academic departments, Purdue Fort Wayne Centers of Excellence, outreach and student support programs, and emerging signature areas reflect the college's commitment to leading-edge education, research, and engagement to meet the needs of the Fort Wayne metropolitan area. These areas play a transformational role in enhancing the economic development and prosperity of our region, generate cross-disciplinary collaboration, and foster partnership between academe, industry, and government.

Academic Departments

Civil and Mechanical Engineering

Computer Science

Electrical and Computer Engineering

School of Polytechnic

Organizational Leadership

Purdue Fort Wayne Centers of Excellence

Information Analytics and Visualization Center

Systems Engineering Center

Wireless Technology Center

Outreach and Student Support Programs

Outreach Programs

Student Success Center

Emerging Signature Areas

In partnership with industry and considering the *Report on Role and Governance of Indiana University–Purdue University Fort Wayne (IPFW)*, ETCS has identified the following regional needs that could be developed into signature areas:⁶

- Advanced Manufacturing Technologies and Systems

- Bioengineering

- Health Care

- Data Analytics, IoT, and Cybersecurity

Development of the emerging signature areas will require additional resources, investment, and industry partnerships to be successful.

6. Indiana Legislative Services Agency (LSA) *Report on Role and Governance of Indiana University–Purdue University Fort Wayne (IPFW)*, pfw.edu/dotAsset/10c6d811-8e55-48c0-b331-7587d305ad0a.pdf.

APPENDICES

APPENDIX A: Committee and Board Members

Strategic Planning Steering Committee Members

Jason Barnes

Associate Director, Center of Excellence in Systems Engineering

Harold Broberg

Professor of Electrical Engineering Technology

David Cochran

Professor of Systems Engineering and Director, Center of Excellence in Systems Engineering

Barry Dupen

Associate Professor of Mechanical Engineering Technology

Kim McDonald

Professor of Organizational Leadership and Associate Dean

Donald Mueller

Associate Professor of Mechanical Engineering

Jennifer Oxtoby Hunter

Senior Research Associate, Center of Excellence in Systems Engineering

Jennifer Pilkington

Business Manager, College of Engineering, Technology, and Computer Science

Gordon Schmidt

Associate Professor of Organizational Leadership

Manoochehr Zoghi

Dean

ETCS Chairs and Directors

David Cochran

Director, Center of Excellence in Systems Engineering

Todor Cooklev

Director, Center of Excellence in Wireless Technology

Carol Dostal

Director, Outreach Programs

Beomjin Kim

Chair, Department of Computer Science and Director, Center of Excellence in Information Analytics and Visualization

Kim McDonald

Associate Dean

Kim O'Connor

Chair, Faculty Assembly

Gordon Schmidt

Chair, Organizational Leadership

Gary Steffen

Director, School of Polytechnic

Guoping Wang

Interim Chair, Electrical and Computer Engineering

Nashwan Younis

Chair, Department of Civil and Mechanical Engineering

Manoochehr Zoghi

Dean

Industrial Advisory Executive Board Members

Andrew Bain

Ford Meter Box Co. Inc.

Dana Berkes

NIPSCO

Austin Ehle

Visionaire Robotics

Angel Guillen

Android Industries

Michael Hawkins

Orthoworx

Michael Hensley

Besiege LLC

Cindy King

Pana Pacific

Tom McLaughlin

Raytheon

Mark Michael

Fort Wayne Metals Research Products Corp.

Dan Ritzert

Shambaugh & Son L.P.

Eric Sank

Design Collaborative

Brett Stilwell

General Motors

Alan Tio

MKS Plan/Design/Building

Ryan Twiss

Northeast Indiana Regional Partnership

APPENDIX B: Collective System Design For ETCS

The Strategic Planning Steering Committee collaborated to create the ETCS Strategic Plan System Design Map, shown in the figure below. The map describes how the ETCS strategic plan proposes to achieve the mission, vision, core values, and identity of ETCS. Due to the solution implementation sequence determined during the design process, the map illustrates that value creation should drive the cost and resource investments for the college. Similarly, continuous improvement is required to sustain the strategic plan for its planned lifespan and affects the value creation, cost and waste reduction, resource allocation, and investment portions of the map.

The Strategic Focus Areas of this plan are related to Level 2 of the design, while the planned initiatives are at Level 3 and sub-initiatives are at Level 4.

The approach of Collective System Design used to create the ETCS Strategic Plan Design Map gains organizational agreement and understanding of the design purpose before implementing programs, procedures, or resources. To accomplish this common understanding, Collective System Design uses a language to separate requirements (FR) from solutions (PS). The requirements describe the necessary system functions based on stakeholder needs and are described as verbs and defined as initiatives and sub-initiatives in Section I and II of the plan. Each solution is a physical thing being chosen as a proposed means to satisfy a single requirement. The physical solutions are nouns, which indicate the item to implement. To evaluate the success of the design, measures are added to gauge the achievement of individual functional requirements (FRm).

The physical solution (PS) implementation sequence is defined by the dotted lines, which were determined by asking the question, Does the PS affect the achievement of an FR for each set of FR-PS relationships for each branch and level of the map?

ETCS Strategic Plan System Design Map

Revision 0.5 (Last revised Aug. 2, 2017)



College of Engineering, Technology,
and Computer Science

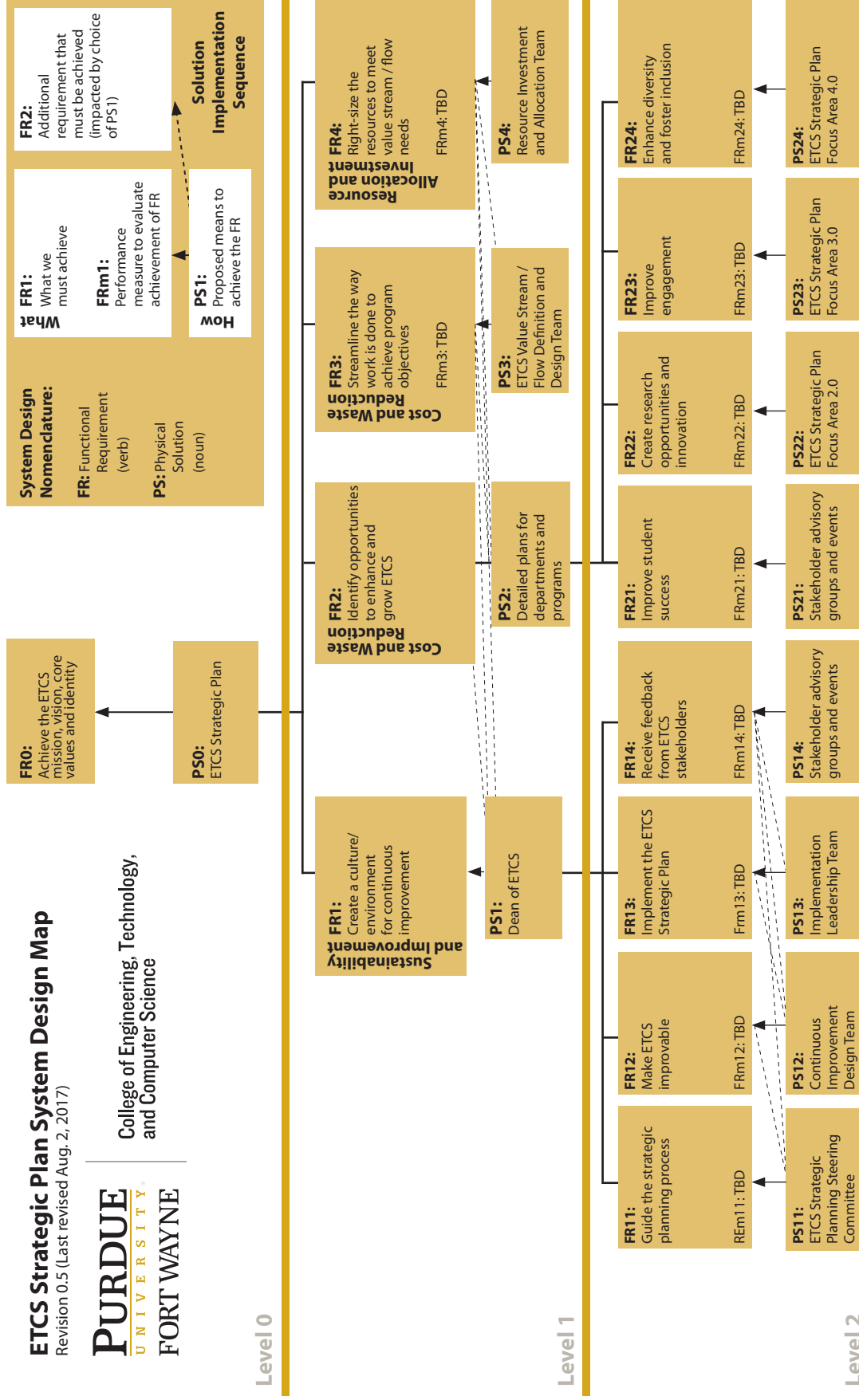


Figure B1: ETCS Strategic Plan System Design Map through Level 2

VISION

ETCS will be a transformative, premier college of choice, providing a world-class engineering, polytechnic, computer science, and leadership education through excellence in teaching and learning, research and innovation, engagement, collaboration, and entrepreneurship.

Engineering, Technology, and Computer Science Building
2101 E. Coliseum Blvd., Fort Wayne, IN 46805
260-481-0146 | pfw.edu/etcs

ENGINEERING | POLYTECHNIC | COMPUTER SCIENCE | LEADERSHIP

PURDUE
UNIVERSITY®
FORT WAYNE

College of Engineering, Technology,
and Computer Science