UNIVERSITY OF TORONTO

OFFICE OF THE GOVERNING COUNCIL

FOR RECOMMENDATION **PUBLIC** **OPEN SESSION**

TO: Planning & Budget Committee

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PRESENTER: Gilbert Delgado, Chief, University Planning Design and Construction
Christine Burke, Director, Campus and Facilities Planning
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DATE: February 5, 2019 for February 27, 2019

AGENDA ITEM: 5

ITEM IDENTIFICATION:

Capital Project: *Report of the Project Planning Committee for University of Toronto Partners in Innovation and Entrepreneurship (PIE) Complex Phase 1*

JURISDICTIONAL INFORMATION:

Pursuant to section 4.2.3. of the Committee's *Terms of Reference*, "…the Committee considers reports of project planning committees and recommends to the Academic Board approval in principle of projects (i.e. space plan, site, overall cost and sources of funds)."

Under the *Policy on Capital Planning and Capital Projects*, "…proposals for capital projects exceeding $20 million must be considered by the appropriate Boards and Committees of Governing Council on the joint recommendation of the Vice-President and Provost and the Vice-President, University Operations. Normally, they will require approval of the Governing Council. Execution of such projects is approved by the Business Board. If the project will require financing as part of the funding, the project proposal must be considered by the Business Board."

GOVERNANCE PATH:

A. Project Planning Report: Site and Space Plan
1. **Planning and Budget [for recommendation] (February 27, 2019)**
2. Academic Board [for approval] (March 14, 2019)
3. Business Board [for approval] (March 18, 2019)
4. Executive Committee [for confirmation] (March 25, 2019)
5. Governing Council [for approval] (April 4, 2019)

B. Execution of the Project:

1. Business Board [for approval] (March 18, 2019)

PREVIOUS ACTION TAKEN:

In 2016, the University of Toronto initiated a *Feasibility Study* to explore development potential on Site 14 of the 2011 St George Master Plan, located across from MaRS Complex. The study proposed a two phased development starting from west (112 College - Best Institute) to east (100 College – Banting Institute, 92 College – parking lot and 88 College – Zion Church), which upon completion will function as a collective whole. The study assumed full demolition of 112 College and 100 College.

On April 17, 2017 CaPS Executive Committee approval to engage consultants to prepare schematic design plans and fundraising materials for PIE Complex Phase 1 was confirmed. Through a proposal call, Teeple Architects, a local architecture firm, teamed with Weiss/Manfredi Architects (New York, USA) were selected as the project architectural team.

On April 6, 2018, CaPS Executive Committee approval to increase consultant fees required to proceed through to end of Design Development was confirmed.

HIGHLIGHTS:

The *Partners in Innovation & Entrepreneurship (PIE) Complex Phase 1* will be a multidisciplinary and collaborative engine to expand research-based innovation by enhancing the University of Toronto's (U of T) industry partnerships and fostering entrepreneurship. All building occupants will be focused on the development of new technologies, products and processes that will enhance industry innovation and increase employment. Students will gain hands-on experience with the latest tools as they work on leading-edge research problems, thus, creating a tremendous new talent pool for the Toronto Region and Canada.

Along with our partner hospitals, University of Toronto is the largest research cluster in Canada, attracting $1.1 billion in sponsored research funding a year and ranking #1 in publications and citations among Canadian institutions. The knowledge and intellectual property created in our labs is a vital source for entrepreneurs and industry both locally and worldwide. To ensure that new research discoveries benefit Canadians and support the development of our national knowledge economy, U of T has dedicated immense resources to promote knowledge transfer, including new staff, new academic programs, and considerable prime space across our campuses including campus linked accelerators (CLA), Toronto JLABS incubators, and University of Toronto Entrepreneurship (UTE). UTE has over 5,000 NASM of space in the Banting Institute (100 College Street) and Best Institute (112 College Street) creating a focal point for the University's acceleration and innovation activities. As a result, the University of Toronto leads Canadian universities as measured by invention disclosures and the creation of start-up companies making it a lead driver of the country's innovation economy.

The Best Institute site, 112 College Street, at the prominent intersection of College Street and University Avenue, is the proposed site of PIE Complex Phase 1. The second phase will be sited on the Banting Institute site at 100 College Street. The PIE Complex lies within a critical institutional research and health sciences precinct in Downtown Toronto, which has been reinforced by the establishment of the MaRS Discovery District. Situated directly across the street from MaRS, of which U of T has a 20% equity stake and occupies a quarter of the fully occupied West Tower, the PIE Complex will be instrumental in creating one of the most powerful innovation clusters in North America. It will be a vibrant hub supporting a kaleidoscope of highly creative individuals all with the common belief that the whole is greater than the sum of its parts.

Both the Banting and Best buildings are demolition ready and suffer from a number of significant physical and workplace limitations. Given their poor condition and inability to meet the needs of the precinct, the Banting and Best buildings are the weak link in U of T's innovation system. Replacing these buildings with new, collaborative, flexible, purpose-built space will allow the University to take necessary next steps in growing its innovation and entrepreneurship initiatives and capitalizing on momentum generated to date.

Occupants will include students, the Innovations & Partnerships Office (IPO), campus linked accelerators Impact Centre, UTEST and ONRamp, plus UTE administration and UTE start-up space. In addition to the noted programs above, the Society & Technology Initiative will be a new programmatic addition to the PIE ecosystem. The initiative intends to engage proactively and provocatively, organize discussions, share insights, provide thought leadership, be responsive to questions and concerns from the public, and create educational material that advances the understanding of how one can consider the impact of technologies on society and how one should be thinking about the design of technologies to benefit humanity and advance society.The heart of the building is a group of Shared Spaces, including an Atrium, Multipurpose Room, Instructional Spaces and a café, all serving to foster collaboration, encourage exchange and build a community of entrepreneurs and innovators. These collective, collaborative spaces will be used for showcasing and hosting events and conferences related to entrepreneurship and commercialization as well as provide much needed event space for the St. George campus as a whole.

The space program proposes a total of 4,379 net assignable square metres (nasm)* of space dedicated to IPO, Impact Centre, UTEST, ONRamp, UTE, Society & Technology, Shared Spaces and Building Services. The remaining area totaling 8,059 net square metres (nsm)** will be flexible office/collaboration space, potential swing space for the University and space for start-ups who will benefit from co-location with UTE, IPO, Impact Centre, UTEST and ONRamp and whose work aligns well with U of T's innovation and entrepreneurship mission. As these spaces have not been identified for a particular tenant, and fit-out will occur in future, it is not possible to assign net assignable metres at this stage. The building is expected to have a total of 4,379 nasm and 8,059 nsm, (23,480 gross square metres (gsm) with 20,707 gsm provided above grade and an additional 2,772 gsm below grade).

The Best Institute and Banting Institute are situated in the University of Toronto's in-force Secondary Plan (1997) called, "Site 14", which also includes 88 College Street, the deconsecrated Zion Church, and 92 College Street, a surface parking lot. In 2016, a feasibility

study was completed for Site 14. It proposed a two phased development starting from west (112 College) to east (100 College, 92 College and 88 College), which upon completion will function as a collective whole. The feasibility study assumed full demolition of 112 College and 100 College, with 88 College Street, the former church, conserved.

Overarching building design objectives include:

1. Encouraging a Lively and Active Environment;
2. Cultivating a Community of Innovators and Entrepreneurs;
3. Making Activity Visible;
4. Connecting Spaces and Uses; and,
5. Providing Flexible and Adaptable Space.

The building design consists of a tapered 13-storey tower plus mechanical penthouse. All Shared Spaces will be distributed vertically throughout the building in order to leverage adjacencies and collaboration between users. At the 9th and 11th floors are double height Winter Gardens to create flexible meeting and event space that capture views northwest to the historic campus and Ontario Legislature Building and southeast to the MaRS complex. One level of below grade parking is proposed, providing 11 spaces adjacent to the building loading and servicing area. The existing vehicular access point off College Street will be maintained in Phase 1. In Phase 2, all vehicular and loading access will be relocated to Grenville Street, to promote a more open and cohesive public realm along College Street.

The PIE Complex Phase 1 landscape design, similar to MaRS, allows for a welcoming and permeable presence through the introduction of elements such as a generous continuous building setback and significant landscape improvements along College Street. The character of the streetscape responds to and balances new social areas beside an enhanced double lined tree walkway. The introduction of an active ground plane, both inside and out, will enhance the campus pedestrian experience along the north side of College Street. The public engagement spaces are envisioned to be welcoming at the scale of the building as well as at the urban scale. The ground floor of PIE Complex Phase 1 will be designed to engage with the city at a public level and become a permeable edge to draw in and attract students, researchers, entrepreneurs, Delegates, Industry and Government. Likewise, the landscape and architecture will support event spill-out space to provide a connection to the pedestrian right-of-way and neighbouring open space. To the west the building addresses the Ontario Fire Fighter's Memorial through carving out the ground floor plane, creating a strong linkage to the building lobby and atrium. Activation of Queen's Park Lawn East and College Street are opportunities that can help energize and transform this remote corner of the campus to become a gateway that bridges campus and city. The building will employ sustainable building strategies as part of the University's mandate including the University's Energy Modelling Guidelines.

> **NASM (Net Assignable Square Metre): is the amount of area, which can be used by the occupants of the building. NASM is the sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant (except Custodial, Circulation and Mechanical area). Net assignable space is counted for Categories 1-20, excluding Category 16 of COU Space Standards.*
>
> ***NSM (Net Square Metre): is the usable space for interior rooms, including circulation*

Secondary Effects

Prior to demolition of the Best Institute, the existing program is to be accommodated as follows:

- Existing ACE function will be relocated to existing facilities on campus or off campus as required.
- UTE central administration space and entrepreneurial space (Impact Centre) will be temporarily accommodated in the Banting building. This program will then be relocated to PIE Complex Phase 1 upon construction completion.
- Faculty of Medicine has committed to vacating their space and will not require swing space.
- UTM Vive Crop will not require swing space and will not be provided space within PIE Complex Phase 1.

All existing surface parking to the north of the Best building is to be removed and does not need to remain accessible throughout the construction of the PIE Complex Phase 1 construction.

With the severing of the existing connections between the Banting and Best buildings at the sub-basement and level 5 there will be a need to 'make good' affected infrastructure (building envelope, mechanical, electrical) and finishes of the Banting building at these locations. Throughout demolition and PIE Complex Phase 1 construction, consideration must be given to the existing occupants in the Banting building to ensure their workplace remains safe and disruptions are kept to an acceptable level.

Schedule

The proposed schedule for the project is as follows:

• CaPS Executive approval (Consultant fees)	April 17, 2017
• Consultant Selection	October 2017
• Schematic Design	November 2017 – June 2018
• CaPS Executive approval (Consultant fees increase)	April 6, 2018
• Design Development	July 2018 – March 2019
• Cycle 3 Governance (CaPS Executive)	November 30, 2018
• Cycle 3 Governing Council approval	February 28, 2019
• Construction Documents	April 2019 – August 2019
• Tender and award	September 01 – October 31, 2019
• Abatement/Demolition start	July 2019
• Mobilization and Construction start	November 2019
• Full operational occupancy	November 2021

**To meet the proposed schedule, UofT requires commitment from and partnership with the city to accelerate the project through municipal approvals and permitting processes*

FINANCIAL AND PLANNING IMPLICATIONS:

Discussion of overall costs and sources of funds can be found in the *in camera* document for this project.

RECOMMENDATIONS:

Be It Recommended:

THAT the *Report of the Project Planning Committee for University of Toronto Partners in Innovation and Entrepreneurship (PIE) Complex Phase 1*, dated November 28, 2018, be approved in principle; and,

THAT the project totaling 23,480 gross square metres (gsm), be approved in principle, to be funded by Fundraising, Central and divisional reserves, Four Corners reserves, Borrowing (Institutional) and Borrowing (Four Corners).

DOCUMENTATION PROVIDED:

- *Report of the Project Planning Committee for University of Toronto Partners in Innovation and Entrepreneurship (PIE) Complex Phase 1*, dated November 28, 2018.

Report of the Project Planning Committee for
University of Toronto
Partners in Innovation & Entrepreneurship (PIE)
Complex Phase 1

November 28, 2018

Office of Campus and Facilities Planning - University Planning, Design and Construction

I.Executive Summary

The Partners in Innovation & Entrepreneurship (PIE) Complex Phase 1 will be a multidisciplinary and collaborative engine to expand research-based innovation by enhancing the University of Toronto's (U of T) industry partnerships and fostering entrepreneurship. All building occupants will be focused on the development of new technologies, products and processes that will enhance industry innovation and increase employment. Students will gain hands-on experience with the latest tools as they work on leading-edge research problems, thus, creating a tremendous new talent pool for the Toronto Region and Canada.

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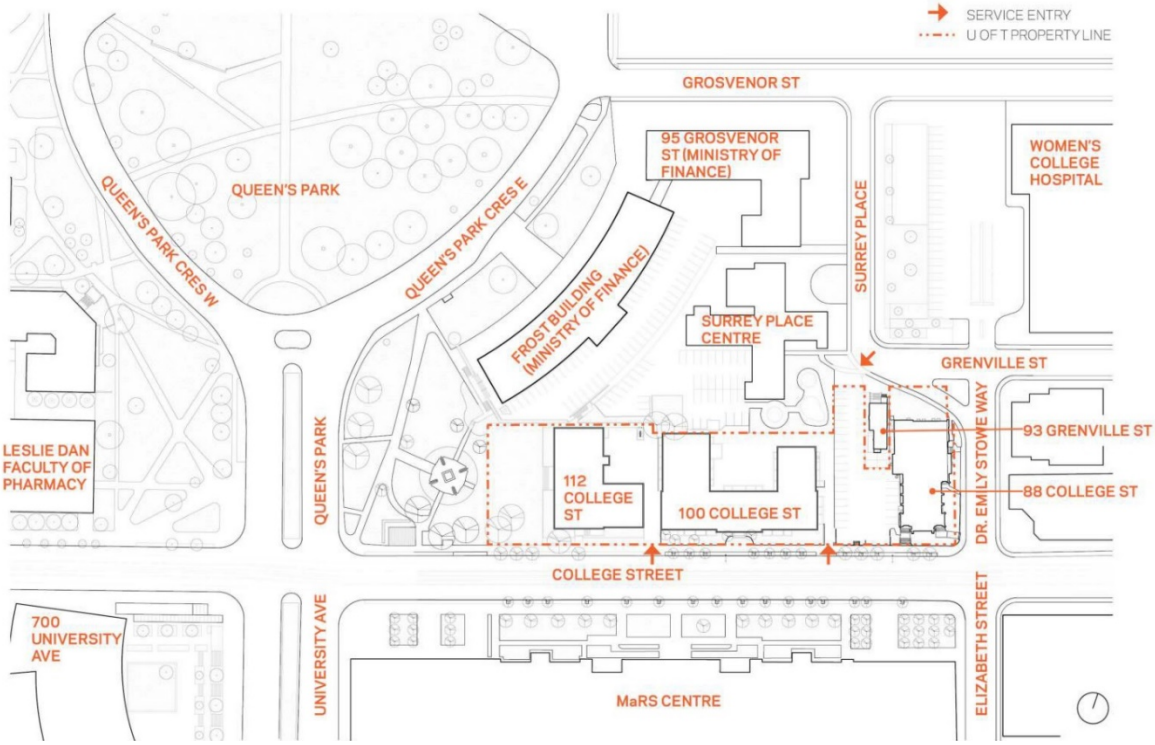

Existing Site Plan of Site 14, showing: 112 College Street (The Best Institute), 110 College Street (The Banting Institute), 92 College Street (parking lot) and 88 College Street (Zion Church).

Proposed PIE Complex Phase 1, view looking east.

Proposed PIE Complex Phase 1, view looking west.

Proposed PIE Complex Phase 1, view from Queen's Park Subway, looking east.

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II.Project Background

a) Membership

Vivek Goel, Vice-President, Research & Innovation
Scott Mabury, Vice-President, Operations & Real Estate Partnerships / Vice-Provost, Academic Operations
Elizabeth Cragg, Director, Operations & Real Estate Partnerships
Derek Newton, Assistant Vice-President, Innovation, Partnerships and Entrepreneurship
Keri Damen, Managing Director of U of T Entrepreneurship
Jay Pratt, Professor, Vice-Dean Research and Infrastructure, Faculty of Arts and Science
Kim McLean, CAO, Faculty of Arts & Science
Lucy Chung, Director of Infrastructure Planning, Faculty of Arts and Science
Kim McLean, Chief Administrative Officer, Faculty of Arts and Science
Safwat Zaky, Professor Emeritus, Department of Electrical & Computer Engineering
Richard Zemel, Professor, Department of Computer Science
Cynthia Goh, Professor, Department of Chemistry / Director, Impact Centre/Academic Director, U of T Entrepreneurship
Leo Mui, Manager, Entrepreneurship Initiatives, Impact Centre
Ammar Ijaz, Entrepreneurship Facilities Coordinator, U of T Entrepreneurship
Calvin Cheng, PhD Candidate, Department of Chemistry, Faculty of Arts & Science / Sciventions Inc.
Ali Punjani, PhD Candidate, Department of Computing Science / CEO, Structura Bio.
Steve Bailey, Director, Academic & Campus Events, UPDC
Anne Macdonald, Director, Ancillary Services
Ron Saporta, COO, Property Services & Sustainability, F&S
Gordon Robins, Director of Utilities and Building Operations, F&S
Gilbert Delgado, Chief, University Planning, Design and Construction (UPDC)
John Smegal, Real Estate Analyst, UPDC
Costas Catsaros, Director, Project Development, UPDC
Christine Burke, Director, Campus and Facilities Planning, UPDC
Evelyn Casquenette, Planner, Campus and Facilities Planning, UPDC

b) Terms of Reference

The Project Planning Committee will:

1. Make recommendations for a detailed space program, functional layout and project scope to accommodate the Phase 1 of the PIE Complex in a new building at 112 College Street.

2. Plan to permit maximum flexibility of space to permit future allocation as program needs change.

3. Identify the space program for non-University uses to conform to agreements with the University, including space related to access and servicing.

4. Demonstrate that the proposed space program will be consistent with the Council of Ontario Universities (COU) and the University of Toronto space standards.

5. Identify all secondary effects, including staging of existing site occupants and impact on the delivery of academic programs during construction.

6. Address campus-wide planning directives as set out in the campus master plan, proposed Secondary Plan, open space plan, urban design criteria and site conditions that respond to the broader University community such as protection of view corridors and heritage considerations.

7. Identify equipment and moveable furnishings necessary to the project and their estimated cost.

8. Identify all data, networking and communication requirements and their related costs.

9. Identify all security, occupational health and safety and accessibility requirements and their related costs.

10. Identify a signage strategy for the new building.

11. Identify all costs associated with transition during construction and secondary effects resulting from the realization of this project.

12. Determine a total project cost estimate [TPC] for the capital cost including costs of implementation in phases if required, and also identifying all resource costs, including a projected increase to the annual operating cost.

13. Identify all sources of funding for capital and operating costs.

14. Identify with University of Toronto Communications a strategy to communicate the project to the broader community.

c) Background Information

Along with our partner hospitals, University of Toronto is the largest research cluster in Canada, attracting $1.1 billion in sponsored research funding a year and ranking #1 in publications and citations among Canadian institutions. The knowledge and intellectual property created in our labs is a vital source for entrepreneurs and industry both locally and worldwide. To ensure that new research discoveries benefit Canadians and support the development of our national knowledge economy, U of T has dedicated immense resources to promote knowledge transfer, including new staff, new academic programs, and considerable prime space across our campuses including campus linked accelerators (CLA), Toronto JLABS incubators, and University of Toronto Entrepreneurship (UTE). UTE has over 5,000 NASM of space in the Banting Institute (100 College Street) and Best Institute (112 College Street) creating a focal point for the University's acceleration and innovation activities. As a result, the University of Toronto leads Canadian universities as measured by invention disclosures and the creation of start-up companies making it a lead driver of the country's innovation economy.

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discussions, share insights, provide thought leadership, be responsive to questions and concerns from the public, and create educational material that advances the understanding of how one can consider the impact of technologies on society and how one should be thinking about the design of technologies to benefit humanity and advance society. The heart of the building is a group of public engagement Shared Spaces, including an Atrium, Multipurpose Room, Instructional Spaces and a Café, all serving to foster collaboration, encourage exchange and build a community of entrepreneurs and innovators. These collective, collaborative spaces will be used for showcasing and hosting events/conferences related to entrepreneurship and commercialization as well as provide much needed event space for the St. George campus as a whole.

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III.Project Description

a) Vision Statement

The University of Toronto is committed to being an internationally significant research university, with undergraduate, graduate and professional programs of excellent quality. U of T is proud to be one of the world's top research-intensive universities, driven to invent and innovate. To this end, the Partners in Innovation & Entrepreneurship (PIE) Complex will be a multidisciplinary and collaborative engine to expand research-based innovation by enhancing the University of Toronto's industry partnerships and fostering entrepreneurship. All occupants of the PIE Complex will be focused on the development of new technologies, products and processes that will enhance industry innovation and increase employment. Students will gain hands-on experience with the latest tools as they work on leading-edge research problems, thus, creating a tremendous new talent pool for the Toronto Region and Canada.

Institutional Priority and Commitment

It is the University's mission to foster excellence in post-secondary education by supporting and promoting outstanding learning and research in an environment that fosters an exceptional student experience. This will be achieved by:

- Fostering an outstanding experience for our diverse student population;
- Creating and promoting opportunities for student professional development; and
- Working collaboratively to advance excellence and innovation in research and education

U of T's unique entrepreneurship programs, offered through Faculty of Arts and Science, and the Campus Linked Accelerators, aim to unlock the immense untapped potential of leading discovery research

programs. Students are the primary vehicle for the transfer of knowledge from the University's labs and classrooms to society, and increasingly they are choosing the path of entrepreneurship. Entrepreneurship empowers students to take charge of their careers and to apply their education purposefully to ventures with visible commercial and social impact. U of T has embraced this generational shift and is now devoting immense resources, both human and financial, to foster our students' entrepreneurial ambitions, from hiring new staff, to establishing new academic programs and devoting considerable prime space. PIE Complex will further focus these efforts and allow U of T to significantly expand entrepreneurial and work-integrated learning and training activities. It will become a central hub to extend these opportunities beyond our students as well.

New Entrepreneurs & Innovators

The PIE Complex will allow U of T to significantly expand the number of innovation organizations it can support, whether by linking companies to faculty for joint research projects, providing access to prototyping and product development equipment, or providing access to student talent and recent graduates. As a tangible outcome, industry-focused events can lead to approximately 50 small and medium enterprises (SMEs) engaging in collaborative projects with researchers per year. The facilities and critical mass of talent will also raise U of T's ability to engage more promising research and commercialization collaborators and provide a nexus to link local start-ups with global market opportunities via these connections.

Key impacts include:

- Enhanced entrepreneurial and work-integrated learning and training activities for our highly-skilled students and graduates, increasing their employability and ensuring alignment to the needs of Canadian industry;
- Creation of new spin-off companies with commercial relevance and job creation outcomes - there have been 151 jobs alone created by student spinoff companies housed in the Banting & Best buildings and another 250 by our commercialization start-ups over the past 5 years;
- Creation of a dynamic, collaborative environment where research-based innovators can exchange ideas, build, test and produce new technologies to address some of the most pressing challenges of our time;
- Better collaboration between academic research and industry, resulting in enhanced productivity and competitiveness of partner industries and Canadian businesses through the adoption of new processes and product technologies;
- Stronger and more plentiful connections between local companies and global centers of innovation, internationalizing the market and partnership opportunities of Canadian industry; and,
- Increased economic growth and long-term prosperity for the Toronto Region and Canada.

Situated directly across the street from MaRS, of which U of T has a 20% equity stake and occupies a quarter of the fully occupied West Tower, the PIE Complex will be instrumental in creating one of the most powerful innovation clusters in North America. It will be a vibrant hub supporting a kaleidoscope of highly creative individuals all with the common belief that the whole is greater than the sum of its parts.

PIE Complex Phase 1 is to be made up of three interdependent parts:

1. Shared Spaces program consisting of multipurpose rooms and spaces that can host undergraduate, graduate and post-graduate instruction as well as public engagement endeavours, such as the hosting of events and exhibitions serving to encourage exchange, promote scholarship and build a

community of innovators. The Shared Spaces program also includes a main atrium and café that serve not only the building occupants but also the University and the city at large.

2. New purpose-built space for IPO, Impact Centre, UTEST, ONRamp and UTE currently housed in the 112 College, 100 College and 88 College. Impact Centre, UTEST, ONRamp and UTE are part of the University's ecosystem of incubators, accelerators, courses/programs and networks to help entrepreneurs turn ideas into viable ventures through the provision of mentorship, expertise, space and experience for all stages of the innovation pipeline. Alternately, IPO helps build successful partnerships between industry, business, government, and the University of Toronto research community and manages U of T's portfolio of intellectual property – turning ideas and innovation into products, services, companies and jobs. PIE Complex will fill a notable gap for more mature start-ups/companies that are too large for on-campus accelerators and too small for rentals outside the University. These start-ups will benefit in particular from networking/collaboration spaces, access to mentors and advisors, as well as lab facilities to develop their products.

3. The remaining area will be flexible office/collaboration space, potential swing space for the University and space for start-ups who will benefit from co-location with UTE, IPO, Impact Centre, UTEST and ONRamp and whose work aligns well with U of T's innovation and entrepreneurship mission.

b) Statement of Academic Plan

Fostering entrepreneurship is a central institutional priority at the University of Toronto. PIE Complex Phase 1 represents the next step in U of T's long-term commitment to this effort.

i. Innovations and Partnerships Office (IPO), Impact Centre, UTEST, ONRamp and University of Toronto Entrepreneurship (UTE)

The University of Toronto has a leading track record for entrepreneurship and commercialization over 80 years in the making. The growth and support of such endeavours is central to the University's long-term development, as described in *Towards 2030* planning framework, and re-emphasized in the President's *Three Priorities*. Entrepreneurship is also a significant element in our *Strategic Mandate Agreement* with the Ontario Ministry of Advanced Education and Skills Development.

This effort is bearing impressive results. In the last five years, U of T has generated 837 invention disclosures, filed 243 patent applications filed, nurtured 89 IP-based start-up companies created, and received $50 million in license income. Through our burgeoning on campus accelerator system, in the last eighteen months our Campus Linked Accelerators (CLA) have mentored 387 new start-up teams and reached almost 29,000 youth through our outreach events. The groups having made use of UTE and IPO resources have directly created 388 robust new jobs over the past five years in suboptimal space. It is expected that future groups accommodated in new purpose-built space will yield greater achievements.

Currently UTE provides space and support for spin-off companies. UTE also manages the RBC funded ONRamp student entrepreneurship space, labs for centres of commercialization (Centre for Commercialization of Anti-bodies and Biologics or CCAB), the commercialization arm of IPO, office space for innovation partners such as Mitacs Ontario and space for in-person and web-based delivery of

courses and seminars. Also part of the ecosystem are two of U of T's campus linked accelerators, Impact Centre and UTEST, more information regarding these programs is described below:

University of Toronto Campus Linked Accelerators (CLAs)

- ONRamp – Co-working and start-up workspace for young innovators offering collaborative environments for entrepreneurs to support them in developing commercial ideas. It also provides networking and showcasing opportunities, supports drop-in activity and is not specific to any one field of entrepreneurial endeavor.
- UTEST – The U of T Early Stage Technology innovation hub, UTEST, provides space for student –led start-up companies with a focus on health science related initiatives. It is jointly managed between U of T and MaRS Innovation. UTEST provides a one-year mentorship program with work space for approximately 20 start-up companies per year. After the one-year program, approximately 5-6 companies continue to stay within UTEST to further develop the technology and business pitch while benefiting from access to the network of mentors, coaching and support.
- Impact Centre – The Impact Centre nurtures the creation and growth of student-led start-ups developing products rooted in the physical sciences and engineering. The Centre has helped more than 130 student-led teams and launched 88 start-ups since 2010. Impact Centre provides space for entrepreneurs to test drive their product or service and focus on development and commercialization of their business along with support from Impact Centre's one-year mentorship program. Impact Centre takes in hundreds of applications each year from which approximately 25 start-ups are accepted. After the one-year program, approximately 8-15 companies continue to stay within Impact Centre to further develop the technology and access support.

Regional and National Commercialization Partners (examples from current companies presently located in UTE)

- **Mitacs Inc.** – This not-for-profit agency funds and promotes student-industry interactions through paid internships and fellowships.
- **CCAB** – The Centre for the Commercialization of Antibodies and Biologics supports start-up companies focused on antibody therapeutics, reagents, and related technologies.
- **Techna** – This University Health Network institute focuses on accelerating the development and exploitation of promising new health-care technologies.
- **OBIO** – The not-for-profit Ontario Bioscience Innovation Organization promotes collaborative partnerships between industry, academia, industry, and government.
- Other examples include Canadian Institutes of Health Research (CIHR) Institute of Nutrition, Metabolism and Diabetes and the Institute for Global Health Equity and Innovation.

Small Companies (examples from current companies presently located in UTE)

- **Vive Crop Protection** – This successful company was founded out of the Department of Chemistry at the University of Toronto. It is developing nano-products and technologies which increase farm efficiency & productivity, as well as reduce the environmental impact pesticide applications have on the world. The company has R&D operations in Toronto and Guelph.
- **OTI Lumionics** – This company is working to unlock the full potential of OLED technology. It was founded in 2011 by an award winning team of researchers and engineers from the Department of Materials Science and Engineering at the University of Toronto.
- **Arrowonics** – This start-up technology company is a spin-off from the Flight Systems and Control research group at the University of Toronto Institute for Aerospace Studies. Over the past

10 years, the research group has been pushing the boundaries of Unmanned Aerial Vehicles (UAV) control.

The commercialization partners and small companies listed above demonstrate types of companies expected within PIE Complex Phase 1 ecosystem. As these partners and companies evolve they will eventually outgrow the need for UTE/IPO resources, relinquishing their space to newer start-ups.

ii. Initiative in Technology, Humanity & Society

The proposed Initiative in Technology, Humanity and Society will be a multi-disciplinary, academic collaborative hub to further the understanding of the impact of technologies on society and thinking about the design of technologies to benefit humanity and advance society. Technologies such as artificial intelligence, digital media, social networks, robotics, and virtual reality have become part of our human interactions and have the potential to change all areas of life dramatically. The impact of these technologies on people and on society more generally is only just beginning to be understood. Science and technology are in turn shaped by politics, public opinion, public policy, beliefs and cultural practices. The Initiative will also support research, discussions, identification, sharing, and the recommendation of best practices in development, testing, and fielding of new technologies—addressing such areas as fairness and inclusivity, explanation and transparency, security and privacy, values and ethics, collaboration between people and new technological systems, and the trustworthiness, reliability, containment, safety, and robustness of the technologies. Examples of research themes are:

- Law, Ethics and the Digital Interface,
- Mind, Brain and the Human; and
- Humane Technology/Social Interactions of Technology.

The Initiative in Technology, Humanity & Society is new and does not have existing space on campus.

iii. Academic & Campus Events (ACE)

To support the PIE Complex Phase 1 project vision flexible instructional spaces are essential. These spaces must be suitable for a variety of pedagogical strategies, delivery models and events both for the building occupants and the University at large.

It is proposed that the instructional spaces for PIE Complex Phase 1 continue to support periodic or modular course delivery and events. The intermittent nature of this type of activity is often in conflict with the more common term scheduling of classes, and thus cannot be easily accommodated elsewhere on campus. It should be noted that there is an increased demand for instructional space that can accommodate modular course schedules.

c) Space Requirements, Program and Functional Plan

Existing space

Inventory of all three buildings on Site 14 is provided for context as UTE, IPO and ACE program is located in each building. Note that PIE Complex Phase 1 is intended to accommodate the future needs of UTE and IPO to allow the Banting building to be fully vacated to set the stage for PIE Complex Phase 2. Not all existing occupants noted below will relocate to Phase 1. Refer to the *Space Requirements* section of the report for further detail.

Name	COU Cat.	COU Space Type	Best Institute 112 College NASM	Banting Institute 100 College NASM	88 College NASM
University Advancement	10.0	Central Admin Office		52.43	
Environmental Health & Safety	9.0	Plant Maintenance		44.43	
Vice President & Provost	10.0	Central Admin Office		23.22	
Innovations & Partnerships Office IPO	10.0	Central Admin Office		494.9	
U of T Early-Stage Technology UTEST	19.0	Other University Facilities		232.51*	190.25
ACE	1.0	Classroom Facilities	100.98	282.43	
UTE - Central Administrative Offices	10.0	Central Admin Office	39.18	233.06	
	19.0	Other University Facilities	126.61		
UTE - Impact Centre	19.0	Other University Facilities	587.34		
UTE - VPUO - CCRM	19.0	Other University Facilities		702.26*	
UTE - VPUO - Mitacs	19.0	Other University Facilities		205.91	
Building Services, Grounds & Trades	9.0	Plant Maintenance		126.39	
Campus Mail Services	12.0	Central Services		20.05	
Parking & Transportation Services	9.0	Plant Maintenance		26.64	
	10.0	Central Admin Office		180.15	
Utilities & Building Operations	9.0	Plant Maintenance		286.67	
	10.0	Central Admin Office		77.94	
Dean's Office Medicine	3.0	Research Laboratory Space	42.34		
	19.0	Other University Facilities		384.64	
Banting & Best Medical Research	3.0	Research Laboratory Space	838.97		
	4.0	Academic Dept Offices	294.15		
Standardized Patient Program	4.0	Academic Dept Offices			486.56
UTE - Vive Crop Protection	19.0	Other University Facilities	681.62		
UTE - Arrowonics	19.0	Other University Facilities		29.51	
UTE - CanSyn Chem. Corp	19.0	Other University Facilities		23.51	
UTE - CCRM	19.0	Other University Facilities		125.63	
UTE - CIHR-INMD	19.0	Other University Facilities		125.02	
UTE - Flarian	19.0	Other University Facilities		22.93	
UTE - In Vitro Drug Safety & Biotech	19.0	Other University Facilities		22.73	

Name	COU Cat.	COU Space Type	Best Institute 112 College NASM	Banting Institute 100 College NASM	88 College NASM
UTE - Ontario Bioscience innovations	19.0	Other University Facilities		97.12	
UTE - OTI Lumonics	19.0	Other University Facilities		298.05	
UTE - RBC Innovation Lab	19.0	Other University Facilities		89.32	
UTE - Sheba Microsystems Inc.	19.0	Other University Facilities		39.74	
UTE - Smart Finance LLC	19.0	Other University Facilities		23.42	
UTE - TapTrack	19.0	Other University Facilities		38.83	
UTE - Techna	19.0	Other University Facilities		462.24	
UTE - VitaHub	19.0	Other University Facilities		111.95	
University of Toronto Student's Union	14.0	Student Office		37.06	
Non Assignable Space	16.0	Non Assignable Space	1,924.04	2,504.76	758.06
Unallocated Space	19.0	Inactive - Assignable	1,260.43	679.49	
TOTAL NASM			**5,895.66**	**8,104.94**	**1,434.87**

*This space has been vacated to provide temporary space for ONRamp in the Banting Institute (1,279 nasm total) until PIE Complex Phase 1 is available for occupancy. ONRamp renovation was completed in July 2017.

The existing ACE instructional space in both the Banting and Best buildings hosts a variety of activities including academic, continuing education, campus groups, test/exams, and other University events. These events are typically of a periodic or modular nature, and are scheduled at Banting and Best largely because they cannot be accommodated elsewhere on campus.

- Banting Institute - 131 seat capacity, booked an average of 21 hours/week, 62% usage
- Best Institute - 114 seat capacity, booked an average of 22 hours/week, 64% usage

Occupant profile

The total number of FTE for 2016/17 and projected for 2020/2021 were used as input measures in the Council of Ontario Universities space formula to generate a benchmark requirement for facilities as described in the next section, Space Analysis. COU input measures are used by all Ontario postsecondary institutions for this purpose.

i. UTE Administration & IPO

Name	Occupant Category	Existing FTE	Anticipated FTE	Change FTE	Change %
Category 10: Central Administrative Office and Related Space					
UTE	Central Admin	2.6	5.5	2.9	212%
IPO	Central Admin	35.1	47.0	11.9	134%
Category 10 - FTE Total		**37.7**	**51.5**	**13.8**	**137%**

Name	Occupant Category	Existing FTE	Anticipated FTE	Change FTE	Change %
Category 19: Other University Facilities					
UTEST	Non-academic - Staff	0.3	1.0		
	Non-academic - Companies	32.0	37.0		
UTEST Total		32.3	38.0	5.7	118%
ONRamp	Non-academic - Staff	1.0	1.0		
	Non-academic - Companies	140.0	58.0		
ONRamp Total		141.0	59.0	-82.0	42%
Impact Centre	Central Admin - Staff	2.0	2.0		
	Non-academic - Companies	91.0	81.0		
Impact Centre Total		93.0	83.0	-10	89%
Small Companies	Non-academic - Companies	300.0	95.0	-205.0	32%
Commercialization Partners	Non-academic - Companies	32.0	60.0	28.0	188%
Category 19 - Seat Total		**598.3**	**387**	**-212.0**	**65%**

UTEST staff are primarily IPO staff and sit in IPO office space.

In order to analyze space requirements, the number of occupied seats within the Campus Linked Accelerators was used to represent occupant load, as COU space category 19 does not generate space formulaically. Note, the summer months are estimated to be the busiest time of year in ONRamp, UTEST and Impact Centre, as students will be either working as interns or researching how to develop their own ideas in the entrepreneurship work spaces.

As an occupant type, the Entrepreneur changes in tandem with the "evolution" of their company – this in turn is reflected as requirements in the Space Program. The stages are described below:

Stage 1 – After an intensive training course, the entrepreneur/company works in a large open office environment to promote collaboration within its own company and with other companies. Most new companies have similar tasks to accomplish so this co-location allows for support and camaraderie. The company size is typically up to 4 people working between 25-50 hours/week. Most of these companies work off their own laptops at a hoteling station with a small footprint.

Stage 2 – As the company develops, activities diverge and become more specialized. An office within a co-working space or a quiet corner in an open workstation area affords more privacy for the team, but also allows access to spaces like communal meeting rooms to meet with clients which are needed on a semi-regular basis.

Stage 3 - Once the company is more established financially and working full-time with 7 people or more, these teams can graduate out of the accelerator/incubator and move into their own space.

The various UTE platforms support entrepreneurs depending on which of the aforementioned stages they are at. The estimated occupant profiles in proportion are as follows:

- ONRamp – 85% @ stage 1, 15% @ stage 2
- Impact Centre and UTEST – 25% @ stage 1, 60% @ stage 2 and 15% @ stage 3
- Small Companies and Commercialization Partners (~ 15 – 20 companies) – all stage 3

ii. Initiative in Technology, Humanity & Society

The Occupant Profile for Initiative in Technology, Humanity & Society is in development. It is anticipated that two Fellows will be from the University of Toronto, and two Fellows will be from another academic institution. Total anticipated FTE is below.

Name	Occupant Category	Anticipated FTE
Category 4 Academic	Academic Fellows	4.0
	Academic Staff	5.0
Total		9.0

iii. ACE

The proposed instructional spaces will accommodate ACE-managed activities, instructional or otherwise, as well as similar activity hosted by UTE, IPO and VIAI; this programming will maximize utilization of space and create synergies within the PIE Complex Phase 1.

Based on usage of the existing instructional spaces in the Banting & Best buildings, PIE Complex Phase 1 will need one 150-200 seat Multipurpose Room, one 70 seat Instructional Room and one 30 seat Seminar room. The mix of sizes will complement various pedagogical deliveries and group requirements.

Summary of ACE, UTE, IPO Activities and Space Generation:

Enrolment	*Hours/Month*	*COU Analysis**	*# of Rooms Generated*	*# of Rooms Proposed*
30-70	122	0.9	1	1
150-200	156	1.1	1	1

*Due to the modular nature of room usage in this context, a monthly assessment has been used. The analysis is based on a minimum utilization of 136 hours/month, extrapolated from the standard minimum utilization of 34 hours/week. This is common to all Summaries of Activities and Space Generation hereafter.

In addition to the building occupants, these rooms will serve a campus cohort that relies on modular delivery. There are currently numerous types of programs offered on campus that are delivered in a periodic or modular style. Many of these programs incorporate a culture of lifelong learning, and provide

the opportunity for students to develop advanced skills and expertise at various stages of their professional lives. These include Continuing Education Programs such as those offered by the School of Continuing Studies and Professional Graduate Programs, such as those offered by the Institute of Health Policy, Management, and Evaluation (IHPME).

The School of Continuing Studies is an ideal complementary occupant, as many of the School's academic programs are STEM focused. Program offerings include data science, cybersecurity, digital marketing management, multimedia storytelling, e-learning, building science, and engineering (LIEP) programs; these programs would leverage these instructional spaces and allow for an up-to-date, high tech course experience that aligns with both course material and industry applications. SCS course offerings are 'hands-on' by nature, informed by Subject Matter Experts and leading practitioners who integrate technology and project based learning into their instructional delivery. SCS learners are professionals who expect a high-tech, University of Toronto branded experience. The School is also well positioned to leverage non-traditional learning space in a wide range of academic programs, including traditional 12-16 week programs, hybrid courses and short, accelerated high profile professional development programs, which are daytime/employer supported.

IHPME offers multiple professional degree programs, all of which have unique course scheduling that combine modular (periodic), intensive (full week), or concentrated (seasonal) course offerings. As previously noted, this type of variable program structure is typically difficult to coordinate within a standard scheduling system. The instructional spaces in PIE Complex Phase 1 will provide a specialised suite for this type of program delivery.

Summary of Professional Masters Exemplar (IHPME) Activities and Space Generation:

Enrolment	*Hours/Month*	*COU Analysis**	*# of Rooms Generated*	*# of Rooms Proposed*
12-40	36.15	0.3	1	1

The program delivery illustrated by IHPME indicates these purpose-built spaces will be well-used by the intended occupants, both within and beyond the PIE Complex Phase 1.

Summary of ACE, UTE, IPO Activities and Space Generation:

Enrolment	*Hours/Month*	*COU Analysis**	*# of Rooms Generated*	*# of Rooms Proposed*
12-40	100.15	1.0	1	1

<u>Space Requirements</u>

i. UTE & IPO

The space requirements for central administration staff being accommodated within PIE Complex Phase 1 project, COU space category 10.0, have been projected based on examination of any existing space accommodations, occupant profile, approved academic plan changes. These are briefly documented for each group below.

Space Requirements As Measured By COU Space Standards

DEPARTMENT NAME: UTE Central Administration

Cat		Existing Space NASM	Input Measure	Space Factor	Generated Space NASM	Space Factor NASM	Proposed Space NASM	% P / G
	OFFICE - ADMINISTRATIVE							
10.1	Office/Open Work	35.41	5.5	12.0	66.0	10.5	58.0	87.9
10.2	Office Support	3.77*	66.0	0.5	33.0	0.0	1.0	3.0
	Total Admin. Office	39.18			99.0		59	
19.5	Inactive Assignable	126.61			0.0			
	TOTAL AREAS	**165.79**			**99.0**		**59.0**	**59.6**

*233.06 NASM at Banting is used as meeting space for BBCIE/UTE companies and has been excluded from existing Office Support space above. Instead this area has been factored into PIE Complex UTE Shared Spaces, where 200 NASM for bookable Meeting Rooms has been allocated.

Space Requirements As Measured By COU Space Standards

DEPARTMENT NAME: IPO

Cat		Existing Space NASM	Input Measure	Space Factor	Generated Space NASM	Space Factor NASM	Proposed Space NASM	% P / G
	OFFICE - ADMINISTRATIVE							
10.1	Office/Open Work	396.07	47.0	12.0	564.0	8.4	396.0	70.2
10.2	Office Support	98.83	552.0	0.5	282.0	0.2	71.0	25.2
	Total Admin. Office	494.90			846.0		467.0	
TOTAL AREAS		**494.90**			**846.0**		**467.0**	**55.2**

The remainder of U of T spaces are ONRamp, UTEST, Impact Centre, Small Companies and Commercialization which fall under COU Category 19.6, Non-Institutional Agencies Occupying University Space, which do not generate space formulaically. Space utilization was examined by comparing existing area per person against proposed area per person.

Space Requirements As Measured By Area per Person

DEPARTMENT NAME: ONRamp

		Existing			Proposed		
Cat	**Category Name**	**Area NASMS**	**# of people**	**NASMS per person**	**Area NASMS**	**# of people**	**NASMS per person**
19.6	Non-Instit- Office/Open Work	628.0	141	4.5	211.0	59	3.6
19.6	Non-Instit - Office Support	562.0		4.0	90.0		1.5
	TOTAL AREAS	**1,190.0***		**8.4**	**301.0**		**5.1**

*Existing area is space assigned to the ONRamp renovation minus RBC Innovation Hub (89 nasms) or 1,279 Total.

Space Requirements As Measured By Area per Person

DEPARTMENT NAME: Impact Centre

		Existing			Proposed		
Cat	**Category Name**	**Area NASMS**	**# of people**	**NASMS per person**	**Area NASMS**	**# of people**	**NASMS per person**
19.6	Non-Instit- Office/Open Work	176.8	93	1.9	290.0	83	3.5
19.6	Non-Instit - Office Support	410.6		4.4	254.0		3.1
	TOTAL AREAS	**587.34**		**6.3**	**544.0**		**6.6**

Space Requirements As Measured By Area per Person

DEPARTMENT NAME: UTEST

		Existing			Proposed		
Cat	**Category Name**	**Area NASMS**	**# of people**	**NASMS per person**	**Area NASMS**	**# of people**	**NASMS per person**
19.6	Non-Instit- Office/Open Work	171.3	32.3	5.3	164	38.0	4.3
19.6	Non-Instit - Office Support	19.0		0.6	97		2.6
	TOTAL AREAS	**190.25**		**5.9**	**261**		**6.9**

*Only existing area at 88 College for UTEST was used in the analysis, as the UTEST area at Banting shown under Existing Space (p16) has been vacated (assigned to ONRamp).

ii. Initiative in Technology, Humanity & Society

Space Requirements for Initiative in Technology, Humanity & Society is a new initiative, thus proposed space was compared with COU generated.

Space Requirements As Measured By COU Space Standards
DEPARTMENT NAME: Initiative in Technology, Humanity & Society

Cat	Category Name	Proposed FTE	Space Factor	Generated Space NASM	Proposed Space NASM	% P / G
	OFFICE - ACADEMIC					
4.1	Total FTE Faculty/Fellows	4.00	12.0	48.0	44.0	
4.4	Total FTENon-Acd Staff	5.00	12.0	60.0	41.0	
				108.0	85.0	79%
4.5	Office Service		0.5	54.0	41.0	76%
TOTAL AREAS		**9.00**		**162.0**	**126.0**	**78%**

iii. ACE

All instructional rooms are sized for flexibility, to facilitate an active learning model of delivery (expected use ~ 75% of the time) and enable traditional lecture format delivery. This alternate delivery model is characterized by collaborative group activity for people at tables of 4-6-8 people with appropriate space for movement and circulation, and whose size is typically 3.0 NASM per person. It is expected that the rooms will be reconfigured and used for other purposes as needs arise.

The proposed instructional space will include:

- Multipurpose Room (MPR), 150 – 200 Seats
  The proposed flat-floored MPR will accommodate a variety of functions, including lecture, collaborative workspace, showcase events, and conferences. This room will function primarily as a high-quality lecture hall, outfitted with the furniture and technology required for large-scale instructional delivery. Inherent within the design however, will be the capacity to transform from this primary use for a variety of additional activities. For example, as the nature of *breakout spaces* evolves, and subgroups gather for discussion both locally and in smaller discreet environments, flexibility in layout and furniture within these environments will be essential in order to facilitate these activities within the room itself.

- Instructional Rooms, 70 Seats, 30 Seats
  The Instructional Rooms will be designed as flexible active learning environments, and have been modelled after a number of innovative spaces already developed on campus. They will provide breakout opportunities for the larger Instructional spaces. Multiple precedents for this typology currently exist at the University, and include the following:

Pilot TEAL (Technology Enhanced Active Learning) - The campus pilot TEAL rooms, Sandford Fleming 3201 and OISE 4422, were created to test the above noted model at a capacity of 72 and 48 respectively. These rooms incorporate strategic design, ample technology, and a generous space factor to allow for a dynamic, collaborative, and participatory pedagogical model.

Myhal Centre for Engineering Innovation and Entrepreneurship - In addition to a 468-seat interactive lecture hall, MCEIE has a number of active learning environments, including five TEAL Rooms and seven Design Meet Studios. These spaces incorporate the fundamental spatial components piloted in the original TEAL rooms, and include multiple accessible presentation and writing surfaces, modular furniture, and a flexible room layout.

Space Program

The **SUMMARY SPACE PROGRAM** for PIE Complex Phase 1 is as follows:

Name	**Area (NASM)**
Shared Spaces	1,094
IPO, Impact Centre, UTEST, ONRamp, UTE*	2,959
Initiative in Technology, Humanity & Society	126
Building Services, Grounds & Trades	192
Subtotal NASM (Shared spaces, IPO, Impact Centre, UTEST, ONRamp, UTE)	**4,370**
Subtotal NSM (flexible office/swing space)	**8,059**
TOTAL GSM	**23,480**
Net-to-gross factor (building average that includes NASM and NSM)	**1.89**

*UTE includes UTE Administration, UTE Shared Spaces, Small Companies and Commercialization Partners

Typically, the building net-to-gross factor used for planning purposes is 2.0. Since the buildings area is apportioned into NASM and NSM, the net-to-gross is averaged over the total building and is slightly lower than 2.0 as NSM contains circulation (refer to definition below).

NASM (Net Assignable Square Metre): is the amount of area, which can be used by the occupants of the building. NASM is the sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant (except Custodial, Circulation and Mechanical area). Net assignable space is counted for Categories 1-20, excluding Category 16 of COU Space Standards.

NSM (Net Square Metre): is the usable space for interior rooms, including circulation

The DETAILED **SPACE PROGRAM** for PIE Complex Phase 1 is as follows:

PROGRAM ELEMENT	RDS	ROOM COUNT	NASM	TOTAL NASM
Shared Spaces				
Atrium/Prefunction	15.1-01	1	225	225
Event Storage	15.1-02	1	36	36
Café	7.1-01	1	41	41
Café Storage	7.2-02	1	5	5
Catering Kitchen	7.2-01	1	37	37
Multipurpose Room (MPR), 150-200 Seats	1.2-01	1	402	402
Instructional Room, 70 Seats	1.2-02	1	206	206
Instructional Room, 30 Seats	1.2-03	1	92	92
A/V Support Room	1.3-01	1	21	21
Shared Spaces Total				**1094**
UTE – Central Admin				
Private Office, Large, UTE Managing Director	10.1-01	1	15	15
Private Office, UTE Facilities Coordinator, 2 workstations	10.1-04	1	11	11
Open Office, 3 workstations	10.1-05	1	30	16
Open Office, Reception, 2 workstations	10.1-06	1	15	15
Coat Room	10.2-08	1	1	1
UTE – Central Admin Total		**5**		**59**
ONRamp				
Open Office Area, 28 workstations/area	19.6-19	2	105	211
Waiting Area, 6-7 persons	19.6-24	1	21	21
Kitchenette/Lounge	19.6-30	1	33	33
Work Room	19.6-37	1	6	6
Storage Room	19.6-39	1	8	8
Meeting Room, 4 persons	19.6-25	1	11	11
Telephone Room	19.6-36	1	4	4
Coat Room	19.6-41	1	3	3
Lockers, 68 cube lockers	19.6-42	1	3	3
ONRamp Total				**300**
Impact Centre				
Research Lab: Storage	19.6-11	1	11	11
Research Lab: Dry, Electronics	19.6-01	1	37	37
Research Lab: Dry, Large Equipment	19.6-02	1	33	33
Research Lab: Dry, General	19.6-03	1	62	62
Research Lab: Wet, Food/Special Project	19.6-08	1	25	25
Private Office, Large, 7 workstations/office	19.6-16	1	22	22
Private Office, Small, 4 workstations/office	19.6-17	5	11	54
Open Office, 30 workstations/area	19.6-19	1	214	214

Meeting Room, 6 people	19.6-26	2	17	35
Kitchenette/Lounge	19.6-31	1	35	35
Coat Room	19.6-41	1	1	1
Lockers, 60 cube lockers	19.6-42	1	2	2
Storage Room	19.6-39	1	12	12
Impact Centre Total				**543**
UTEST				
Private Office, Small	10.1-03	1	11	10
Research Lab: Dry , Workshops/Prototyping	19.6-04	1	32	32
Private Office, Large, up to 5 workstations/office	19.6-16	1	24	24
Private Office, Small, up to 3 workstations/office	19.6-17	4	14	56
Open Office, 10 workstations/area	19.6-19	2	36	73
Kitchenette/Lounge	19.6-31	1	55	55
Coat Room	19.6-41	1	3	3
Lockers, 20 cube lockers	19.6-42	1	1	1
Storage Room	19.6-39	1	7	7
UTEST Total				**261**
Small Companies				
Research Lab: Dry, Workshops/Prototyping	19.6-05	2	21	42
Private Office, XXLarge, 12 workstations/office	19.6-14	1	44	44
Private Office, XLarge, 8 workstations/office	19.6-14	4	35	140
Private Office, Large, 6 workstations/office	19.6-15	6	22	132
Private Office, Small, 3 workstations/office	19.6-18	5	14	73
Kitchenette/Lounge	19.6-32	1	29	29
Telephone Room	19.6-36	1	8	8
Storage Room	19.6-39	1	8	8
Small Companies Total				**472**
Commercialization Partners				
Private Office, Small, Company A, 3 workstations/office	19.6-18	3	11	32
Open Office, Company A, 12 workstations/area	19.6-20	3	51	153
Kitchenette/Lounge, Company A	19.6-32	1	15	15
Telephone Room, Company A	19.6-36	1	5	5
Private Office, Small, Company B, 3 workstations/office	19.6-18	1	10	10
Open Office, Company B, 12 workstations/area	19.6-20	1	50	50
Kitchenette/Lounge, Company B	19.6-32	1	15	15
Telephone Room, Company B	19.6-36	1	3	3
Storage Room	19.6-39	2	8	17
Commercialization Partners Total				**304**
UTE - Shared				
Conference Room, Shared, 30 people	19.6-43	1	73	73
Meeting Room, Shared, 12 people	19.6-27	4	26	104

Meeting Room, Shared, 8 people	19.6-25	2	19	38
Meeting Room, Shared, 4 people		4	11	45
Telephone Room, Shared	19.6-36	2	4	8
Winter Garden, 7th floor	19.6-34	1	113	113
Winter Garden, 10th floor		1	158	158
Winter Garden, 10th floor Catering Kitchen		1	11	11
UTE – Shared Total				**443**
IPO				
Private Office, Large, Assistant Vice-President	10.1-01	1	15	15
Private Office, Small	10.1-03	5	11	59
Open Office, 40 workstations	10.1-05	1	360	322
Meeting Room, 15 people	10.2-03	1	32	32
Kitchenette/Lounge	10.2-05	1	24	24
Telephone Room	10.2-04	1	4	4
Coat Room	10.2-08	1	3	3
Storage Room	10.2-07	1	7	7
IPO Total				**467**
Initiative in Technology, Humanity & Society				
Private Office, Small		1	11	11
Semi-Private Office for Fellows		4	11	44
Open Office, 5 workstations		5	6	30
Meeting Room, 4 people		1	11	11
Kitchenette/Welcome Lounge		1	20	20
Work Room		1	10	10
Initiative in Technology, Humanity & Society				**135**
Building Services, Grounds & Trades				
Change Room, Caretaking Female	9.1-03	1	13	13
Change Room, Caretaking Male	9.1-03	1	13	13
Enclosed Office (S), Caretaking	10.1-07	1	13	13
Lunch Room, Caretaking	9.1-01	1	12	12
Enclosed Office (S), Shipping/Receiving	10.1-08	1	9	9
Lunch Room, Grounds	9.1-02	1	11	11
Storage, Grounds	9.1-04	1	13	13
Building Storage	9.1-05	1	24	24
Campus Services - Mail Room	12.2-01	1	10	10
Security Booth	10.2-09	1	25	25
Building Services, Grounds & Trades				**192**
GRAND TOTAL				**4,370**

The Proposed NASM/NSM-to-GROSS Ratio by Floor

FLOOR	PROPOSED NSM	PROPOSED NASM	PROPOSED GSM	NASM-/NSM-to-GROSS RATIO
15			340	
14			650	
13	932		1,344	1.44
12	962		1,392	1.45
11	731		1,153	1.58
10	538	295	1,383	1.64
9	1,092		1,556	1.42
8	166	535	1,224	1.75
7	263	630	1,446	1.62
6	347	823	1,758	1.50
5	327	803	1,815	1.61
	1,424		1,873	1.32
3	1,061		1,556	1.47
2		797	1,529	1.92
1	192	371	1,690	3.00
P1	25	117	2,772	19.42
TOTAL	**8,059**	**4,370**	**23,480***	**1.89**

Without P1 level, GSM is 20,707

Functional Plan

The following are overarching **building design objectives** as established through the project planning committee:

1. *Encourage a Lively and Active Environment*

   A building that houses innovation is one of activity and energy, a lively working environment that is flexible and responsive to changing projects, evolving ideas and expanding companies.

   While an orderly and spacious work space may be seen as a desirable design outcome, in the experience of UTE it is often the organic, dense clusters of activity that best encourage a healthy entrepreneurship ecosystem. In order for these spaces to be most productive however, they also need to be complemented by a range of other types of spaces that allow larger group work, working sessions and gatherings.

2. *Cultivate a Community of Innovators and Entrepreneurs*

   A central open space would provide a valuable place of connection for all groups within PIE Complex Phase 1. It should be a space that everyone passes through on their way in and out of their respective areas, encouraging wider networking opportunities and serendipitous encounters that could lead to new collaborative growth. This central space is also the zone of overlap between building occupants and visitors. The provision of smaller areas accessible only to building occupants complement the more publically accessible areas, further encouraging a sense of community within the complex.

3. *Make Activity Visible*

   There is an opportunity to make visible the energy and activities within PIE Complex Phase 1 to the more public areas of the facility, leveraging the unique nature of the work within to create a strong identity for the building.

   Some lab or work areas could be selectively located within view of public areas, possibly taking advantage of borrowed natural light. With frequent tours and visitors anticipated, PIE Complex Phase 1 will also need to accommodate different degrees of confidentiality and access within the lab and work environments.

4. *Connect Spaces and Uses*

   Integrating elements of open circulation can serve to both physically and visually connect key spaces and activities within the building.

Some of the more public areas of the building may need to be located above the ground level, and would be well served by open circulation in addition to the main circulation infrastructure. Providing views between different program elements could also help strengthen the legibility of the building circulation and contribute to the clarity of wayfinding.

5. *Provide Flexible and Adaptable Space*

   The entrepreneurship, innovation and commercialization ecosystem is one of constant change and requires space that is responsive to rapidly evolving ideas and project developments. Research activities shift, companies grow bigger and new ones are hatched, resource allocations expand and contract relative to need. Flexible space is critical for this environment.

Shared Spaces

The Shared Spaces program will function as complementary spaces geared toward creation of a lively and dynamic interconnected space where one can learn and connect. Whether one is taking a class, participating in a conference, having a coffee or pitching their idea, these shared spaces are intended to be an animated platform that supports and permits engagement of those involved and those who visit. The space and finish of these spaces should be inviting, stately and composed of high quality and durable materials. These spaces will be designed to be flexible and multi-functional.

Multipurpose Spaces

As prominent event spaces, the MPR and the Atrium will provide complementary programming, and will be able to function separately or in tandem as desired. This relationship will provide the opportunity to sequence elements of an event, and to move between an open and public area and a more controlled interactive environment as needed. This arrangement will also create an opportunity to showcase other focused initiatives hosted by the University, and which would be of benefit to the PIE Complex. A contiguous relationship between the Multipurpose Room and the Atrium/Multipurpose Open Space will ensure this dynamic space will most effectively serve the building and its mandate.

The Multipurpose Spaces (MPR and Atrium), Instructional Spaces and Café will be publically accessible space due to anticipated hosting of signature events. Some of the events to be hosted in the Multipurpose Spaces and Instructional Spaces may include:

- Announcements and publicity (University, Government, etc.)
- Research supporting events and workshops
- AGM's
- Presentations and showcases
- Courses and seminars
- International delegations (anticipated weekly)

Hosting of the various events mentioned above may involve the serving of alcohol or food. The following spaces should be designed to allow for liquor license:

- Multipurpose Room MPR
- Atrium
- Instructional Room, 70 person
- Seminar Room, 30 persons
- North and South Winter Gardens
- UTE Shared Conference Room

Rooms/spaces supporting licensed events are to comply with the University of Toronto's Alcohol Policy http://www.food-beverage.utoronto.ca/beverage-services/university-alcohol-policy.

Instructional Spaces
As an emerging minimum standard for collaborative environments, these spaces will be fully equipped with power and data infrastructure to support presentation technologies, multiple writing and presentation surfaces for collaboration and comfortable and flexible furnishings. They will be designed to accommodate a wide range of uses, such as meeting, exhibit and public outreach programming to support the project's public engagement mandate. These spaces are located at the lower levels of the building for ease of access, recognizing that they will serve high volumes of people at concentrated times of the day.

Café
In addition to providing convenient food and beverage options for full time building occupants and visitors, the Café has the opportunity to double as an informal work setting, hub and meeting place. The Café will help support a culture already burgeoning in Toronto among student entrepreneurs and small business – in 2016 the City of Toronto launched "StartUP Toronto" a platform to start, create and grow one's business at the StartUP HERE Café. Similarly, the PIE Complex Phase 1 Café will promote a social platform that may lead to sparking new ideas and forming important new relationships. The Café is located at the ground level.

UTE Central Administration
This Central Administration space is for UTE staff that directs and manages the UTE platform and meets and greets visitors to this building. This suite is located adjacent to the South Winter Garden.

ONRamp/Impact Centre/and UTEST
ONRamp, UTEST and Impact Centre are separate suites of co-working and co-research space – each hosting different sized companies stemming from the early to mid-stage of the entrepreneur evolution. The design will allow for differentiated spaces within each suite to not only support the evolution of the company but also provide a balance between collaborative space and focused space – "We" and "Me" space.

ONRamp's drop-in workspace is catered to early stage entrepreneurs—offering a range of small to large offices and a mix of open workspace types: some informal soft seating and café table arrangements, some individual hoteling stations and more formal computer workstations. The ONRamp program is the most public of the UTE ecosystem workspaces and will cater to students and graduates from U of T and other young companies. The ONRamp Kitchenette should encourage cross-pollination and be a flexible space. This suite is conveniently located adjacent to the South Winter Garden, close to collaborative event space.

UTEST space, being an early-stage incubator for technology companies commercializing IP, should allow for a mix of work space, research (dry lab) space and meeting space.

Impact Centre, with its focus on the natural sciences and engineering, should offer spaces that support research and development activities: dry lab and prototyping space. These labs will be prioritized for companies in Impact Centre but available to other companies supported by UTE. Wet and dry labs should be planned with modular benching, with services fed from above, to allow for maximum flexibility. The work space will encourage collaboration between individuals and companies but also support a productive work atmosphere by offering some quieter work areas.

Small Companies & Commercialization
The Small Companies and Commercialization Partners suite of spaces do not need to be co-located but instead can be distributed vertically throughout to mix with the other occupants.

IPO
This suite of work spaces is for central administration staff that connects largely with industry, businesses and government and, as such, requires a collaborative work environment. The open office space is to lean more towards a quieter arrangement of open workstations and project work.

Shared Spaces
The shared spaces specific to UTE are to round-out the range of support spaces required by the collective body of UTE and IPO. Vertical distribution of these shared spaces through the podium floors will create opportunities for unplanned interaction between users. The Winter Gardens are conceived as legible vertical connectors for the PIE Complex and may be used as informal work, meeting spaces or small-scale event space.

*Initiative in Technology, Humanity & Society*The interface between the Initiative in Technology, Humanity and Society and the PIE Complex building should emulate the vision to collaborate across disciplines and promote exchange timely between leading technology scholars, humanist and social scientists in consideration of the design and development of humane, and society-centred technologies. Collaboration among researchers from the Initiative should be celebrated by dissolving boundaries in favor of spaces that promote exchange within the engine of the PIE Complex. Locating the initiative near a prominent space and proximal to various UTE, IPO or the CLAs and Shared Spaces is ideal to encourage dialog between the research fellows and other building users. This new exemplar academic research space in development and will be refined in the project Design Development stage.

d) Building Considerations

<u>Standards of Construction</u>

Levels of Finish

- High Quality/Showcase – All Shared Spaces program and other select program where public interface is anticipated (entry/reception/waiting areas, lounges and select meeting rooms for various UTE, and IPO). The Initiative in Technology, Humanity & Society will also be high quality space.
- Standard/Mid-Range – All other UTE, IPO, UTEST, Impact Centre and ONRamp program
- Economical – Building Services program

PIE Complex will be a beacon on the northeast corner of University Avenue and College Street and is of equal or greater quality to buildings in its immediate surroundings, such as CCBR, Leslie Dan Pharmacy Building and MaRS. The proposed building's design makes the spaces supporting public engagement on the building's floors highly visible through the articulation of the glazed, recessed, double height spaces at grade and at both Winter Gardens.

Equally important, the building must be functional and robust with durable materials and details that can be easily maintained. Building design should minimize horizontal ledges and other external surfaces or attachments that encourage perching, nesting, etc. by pigeons and other pest animals.

Building Characteristics and Massing

The Weiss/Manfredi and Teeple Architects design of the proposed PIE Complex Phase 1 will be 13 storeys plus mechanical penthouse with one level of below grade parking. Floor-to-floor heights are approximately 4.15m, with exception of below grade parking that is higher at approximately 6.65m to accommodate loading dock and waste management. The double height mechanical penthouse is approximately 10m. The footprint of the proposed building is generally trapezoidal in shape while the mass of the building is similar to a flat-topped pyramid in that all four facades angle inwards as the height of the building increases. The bulk of the mass is located on the lower levels with smaller floor plates on the upper levels. At its closest point, the building will be setback approximately 6 metres from College Street. The setback along College Street for the first two storeys is greater at approximately 10.6 metres, with the exception of a set of stairs leading to the second floor where the setback is approximately 8.2 metres. The building is located 2.5 metres from the property line to the west. On the north side, the building setback increases from east to west, creating more open space between the proposed and existing properties to the north—currently there is an existing pedestrian dirt path on 112 College Street from Queen's Park Subway that cuts through to 2 Surrey Place and other properties beyond. Given the tapered design of the building, the setbacks increase above the 3rd storey.

The proposed 55.0 metre building height (65.0 metres including mechanical penthouse) is within the range of that approved for other non-residential buildings in the area. The building to the west of the College and Queen's Park Crescent intersection, the Leslie L. Dan Pharmacy Building is 12 storeys, at the southwest corner the building at 700 University Avenue is 19 storeys and at the southeast corner the MaRS building is 20 storeys. The proposed height of 13 storeys (55 metres or 65 metres with mechanical penthouse) does not negatively impact the neighboring buildings and integrates well with the existing institutional, office and mixed use buildings in the immediate surroundings including along University Avenue, College Street and Queen's Park Crescent.

The building was designed to minimize shadow impacts. The sculpting of the building with smaller floorplates as the height of the building increases was designed in part to maximize sky views and minimize shadow impacts. As part of the zoning bylaw amendment application submitted on November 23, 2018, a Sun/Shadow study was included as one of the required application documents of the proposed PIE Phase 1 building. As per the City's terms of reference, shadow impacts have been demonstrated for March 21 and September 21 between the hours of 9:18am and 6:18pm. Additional models have been included for June 21 and December 21. The study includes shadows for existing buildings and net shadows created from the proposed building. In consideration of the TOcore Plan policies, the proposal does not cast net new shadows on Queen's Park on September 21 from 10:18am to 4:18pm, but does cast a small net new shadow at 10:18am on March 21, which is not present at 11:18am. As the TOcore Plan has been forwarded to the Minister for approval, this standard has been considered in our analysis which is not an in-effect policy. Planning subconsultants on the project have determined that the proposal meets the intent and is consistent with the TOcore Plan policies as the PIE Phase 1 proposal does not produce shadows on Queen's Park between the hours of 11:18am and 4:18pm on March 21 and between the hours of 10:18am and 4:18pm on September 21.

The Best Institute has two existing connections to the Banting Institute, a tunnel at the sub-basement level and a bridge at level 5. For PIE Complex Phase 1, neither of these connections will be provided. However, the design of PIE Complex Phase 1 will anticipate future physical connections to Phase 2 building at all lower levels.

PIE Complex Phase 1 will not include an interior physical connection to MaRS, but feasibility to connect to Queen's Park subway station is being explored. A physical connection from the Banting Institute to MaRS currently exists below grade. However, the tunnel is old and constrained in size and therefore is not viable for pedestrian use, only to run services. A future connection to MaRS from PIE Complex Phase 2 will be assessed as part of the Phase 2 scope of work via potential expansion of the existing physical below grade connection.

Instructional Spaces - The Multipurpose Room will have a ceiling height of at least 6.0m, to accommodate necessary sightlines between AV screens and viewers. The 70-seat Instructional Room will have a minimum ceiling height of 3.5m. All instructional spaces are to be free of structural columns or situated at the room/space perimeter so as not to interfere with programmatic function.

Parking

Parking on the campus is regulated by a City of Toronto Zoning By-Law that requires 1930 - 2130 spaces to be provided within delineated areas of the St. George campus. Site 14 currently provides at total of 41 parking spaces at grade: 7 spaces at the Best Institute property, 9 spaces at the Banting Institute property and 25 spaces at 92 College Street.

The below-grade parking proposed for PIE Complex Phase 1 allows for 11 parking spaces, including 2 spaces reserved for building services related use – 1 for Grounds and 1 for other F&S-related vehicles (Fire prevention, Trades, Property Management, Campus Mail, Caretaking, etc.). The remaining spaces will be available for U of T faculty, staff and students or for public use, operated by Ancillary Services. One Barrier-free parking space has been provided. The parking facility will be in operation 24 hours a day, 7 days a week.

The proposed development includes bicycle parking spaces. Bicycle spaces are currently provided outdoors along the College Street frontage. The proposal will provide 54 short-term bicycle spaces in proximity to College Street.

Long term bicycle parking is provided at the rear of the building underground and is accessed via a doorway on the northern side of the building. The long term bicycle parking area will provide 30 bicycle parking spaces and includes 4 change rooms with showers.

Elevators

The proposed design calls for 4 passenger elevators and 1 dedicated service elevator to reach all floors of the building, providing maximum flexibility with regards to occupant type/occupant count. One of the four elevators will service the below-grade parking level.

Sustainability Design and Energy Conservation

Integration of environmentally sustainable principles into buildings, landscapes and transportation options, has been a high priority in discussions with both campus and neighbouring communities. At a minimum, all new buildings shall be designed to meet the Toronto Green Development Standardv.3, Tier 1 and LEED Canada – NC Silver rating with at least 10 points achieved for "Optimizing Energy Performance", 2 points achieved for "Enhanced Commissioning" and 4 points achieved for "Water Use Reduction". This will significantly reduce the building's operating costs over its lifetime.

It is recommended that PIE Complex Phase 1 undergo full LEEDv.4 Canada NC Silver certification. This will ensure that features planned at the beginning of the project to enhance the environmental sustainability of the building will still exist at the end of the construction, will be properly commissioned and will be monitored for performance after construction is complete.

Please refer to the City of Toronto Green Roof Bylaw No. 583-2009, Chapter 492 for specific green roof requirements.

Sustainable strategies to be considered during the design phase include:

- Heat recovery systems
- Low flow and water efficient fixtures
- Grey water re-use
- Super insulated low albedo roofing
- LED lamps
- Solar shading
- High performance building envelope
- Limit of exterior glass area to 40% of wall surface
- Equipment and systems must be put in place so that the long term energy and water efficiency can be monitored and verified.
- Air and water free cooling
- Outside air demand management strategies

As of 2016, U of T modified Design Standards for Energy Efficiency for New Construction, as follows: "Capital projects must meet ASHRAE 90.1-2013 + 20% at a minimum. Projects are required to add components which have payback of less than 15 years to reach an ASHRAE 90.1-2013 + 40%." ASHRAE provides Standards for all components within buildings – HVAC, windows, lighting, modeling, envelope, ventilation and reviewed by industry experts. It allows for prescriptive and performance based compliance paths to meet the minimum energy use. Toronto Green Standards (TGS), OBC and LEED use ASHRAE 90.1 to define their energy efficiency standards.

The building will employ sustainable building strategies as part of the University's mandate including the University's own Energy Modelling Guidelines. The proposed design slightly exceeds 20% better than ASHARAE 90.1-2013. Additional sustainable measures include meeting the City of Toronto's Tier 1 Green Standard (TGS version 3) and LEED Canada NC Silver version 4 certification. A water-size economizer is being assessed for potential further reductions to better approach the 40% target.

Accessibility

The University is committed to equitable access to all of the building facilities, including parking. Additional enhanced criteria includes equipment such as visual alarms and power door operators, and clearance for mobility devices resulting in wider door widths, turning radius, and path of travel.

Personal Safety and Security

All publically accessible program elements will be located at the lower floors of the building. These public areas will remain open and accessible during regular operating hours as well as for scheduled after-hour events. In addition to a manned security station visible from the main lobby, a sophisticated access control system will be required to provide building occupants appropriate access to specified building locations as necessary. At a minimum, access control will be supplied at one building entrance as well as each elevator and each door from an egress stair to the floor.

Exterior lighting design will be abundant and provide for ease of movement around the exterior of the building at all times of the day.

Signage, Donor Recognition

Exterior and interior signage will be a required element of the detailed project design for building identification and wayfinding purposes.

Specific fundraising strategies have not been established for this project. Should there be a requirement for donor recognition, its accommodation must be appropriately integrated within the building. The building design should consider the provision of opportunities for creative donor recognition of various types. These could include but are not limited to temporary banners, signage and/or public art/installations.

Non-Assignable Space

Included in the building project are non-assignable elements that are not specifically described in the Space Program, but are part of the architect's responsibility for design.

Non-assignable spaces include: lobbies, corridors, stairs, mechanical stacks etc. These areas will be included in the gross up factor of 2.0. Specific requirements include:

- Corridors, stairs, ramps, and public circulation space
- Elevator shafts and elevator service rooms
- Lobbies
- Loading dock(s) and staging area
- Waste storage room
    - Located adjacent to loading dock area with water supply and drain, min. 37 sm.
- Waste alcoves
    - Located along corridors to accommodate waste warriors, and laboratory glass and plastic recycling bins.

- Security closet - one in the middle floor, stacked with the data closets to use the same floor plate opening
- Data & communication closets - min. one on every other floor
- Mechanical and electrical rooms
    - Mechanical and electrical service rooms and vertical shafts shall be sized for accommodation, easy access, operation and maintenance of indoor air handling equipment as well as specialty equipment such as central RO systems, compressed air, specialty gasses. The design shall be capable to accommodate future individual equipment capacity increases and incremental equipment additions based on the expected building use flexibility.
- Transformer room - ideally accessible at grade by service vehicles
    - 4.0m clear height
    - Sized to accommodate incoming feeders from Toronto Hydro and secondary feeders for phase 1 and phase 2 projects
- Caretaking closets – one closet per floor
    - The ground floor and basement level closets should be at least 2.5 x 6.0m in size to store custodial carts, supplies, equipment, storage shelves, and should include a slop sink and dedicated outlets for recharging equipment. Upper level closets should include a slop sink and storage.
- Caretaking storage room
    - Located adjacent to the caretaking office/lunchroom/change rooms, min. 19 sm.
- Washrooms
    - The provision of public washrooms must exceed minimum code requirements and should also include an accessible stall, sink, and mirror in gendered washrooms and in separate universal washrooms. Universal washrooms must comply with current AODA standards.
- Shower rooms - general use
    - Because it is recommended that PIE Complex Phase 1 undergo full LEED Canada NC Silver certification, shower rooms may be required.
- Parking
- Bicycle Storage – underground storage for bicycles
- Building Storage –underground storage for UTE

Mechanical/ Electrical and Data

Please refer to the University of Toronto St. George Campus Design Standards for information on mechanical, electrical and data design standards as well as commissioning information:http://www.fs.utoronto.ca/.

Wireless connectivity is required throughout the building.

Audio-visual requirements are to be determined.

Environmental Health and Safety

Wet Laboratories – Existing and Proposed

The existing Best building houses a number of wet laboratories, including radioactivity research-related labs at the basement level. All wet labs are required to be decommissioned after their use, leaving them it in a state suitable for re-occupancy, renovation or demolition.

There is a small number of wet laboratories to be accommodated in PIE Complex Phase 1. Detailed wet lab accommodation is described in the room specification sheets, included in Appendix C.

The University of Toronto's Environmental Health and Safety office, including an Environmental Protection Services team, provides a broad range of health and safety services to the University community and whose responsibility it is to ensure environmentally responsible, safe and healthy work, research and study environments on campus. Please refer to their website for information, https://ehs.utoronto.ca/.

Demolition
The existing Best building at 112 College Street is to be demolished. This is to include the demolition of the bridge to the Banting building at level 5. There is an existing tunnel to the Banting building at the sub-basement level which is not required to be maintained in PIE Complex Phase 1. This tunnel should be accessible only to support building service related needs if necessary.

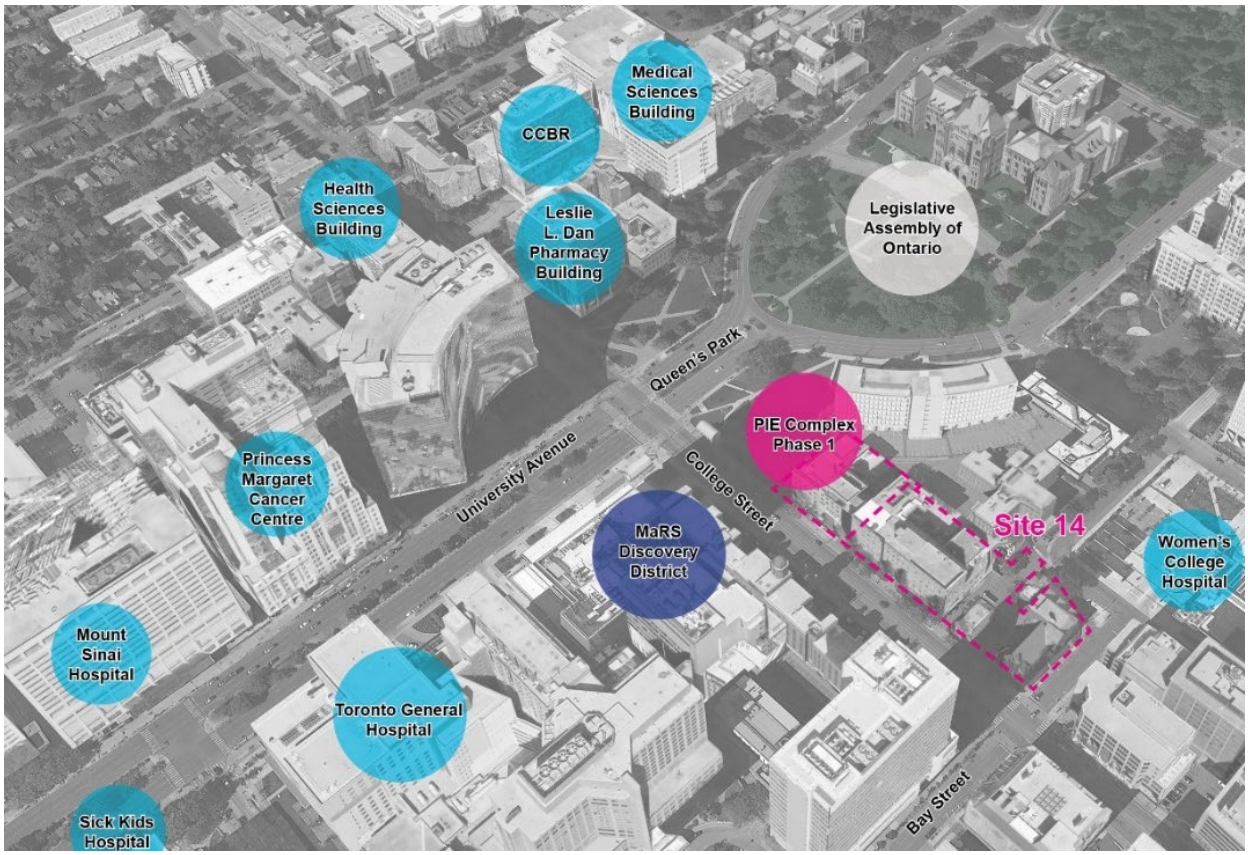
Hazardous Materials
The Best building is known to contain hazardous materials. A Summary of Asbestos-Containing Materials is provided in Appendix B for the existing Best building. A pre-construction survey will be carried out prior to building demolition.

e) Site Considerations

Site Context

Site 14 is located within the medical and health sciences district of the University of Toronto St. George campus. PIE Complex Phase 1 is to be constructed on what is currently the Best Institute site at 112 College Street. *This north side of College Street is a mixed collection of architectural styles that share a continuous green frontage.* To the north of the site are several buildings housing offices for the Government of Ontario, Surrey Place and Women's College Hospital. Northwest of 88 College is a private property, 93 Grenville Street, "The Sound Post". To the northwest lies the Ontario Legislative Assembly at Queen's Park. Immediately to the west lies the Queen's Park Lawn, a significant open green space with the Ontario Fire Fighter's Memorial.

The site lies within an important institutional research district, which has been reinforced by the establishment of the MaRS Discovery District in recent years. MaRS is located on the south side of College Street at University Avenue, directly across the street from the site. This development consists of an adaptive reuse of an original hospital building and the addition of an 8-storey south building and two east-west flanking towers, 15 and 20-storeys respectively. This development has changed the character of the area and has introduced larger building form to this section of College Street.



Aerial Photograph of the Discovery District, Legislature Buildings and southeast corner of St George Campus

Zoning

112 College Street is identified as part of Site 14 in the City of Toronto's University of Toronto 1997 Secondary Plan. The University of Toronto Secondary Plan (1997) is a municipal zoning by-law developed specifically for the St. George campus area. The existing approved Site 14 development envelope allow for the demolition of the existing structure at 112 College Street and 100 College Street with a site envelope capacity of 36,300 gsm.

In 2011, the University approved in principle a new Master Plan for the St. George campus. The Master Plan was the result of a consultative process with University planners and stakeholders, area residents and City officials. The Master Plan provided updated planning strategies for the future development of the University and includes new proposed envelopes for development sites, including Site 14.

The strategies and proposals in the Master Plan were subsequently refined and developed into a new approach to development, culminating in an application for a new Secondary Plan. Moving away from pre-determined, site-specific development, the proposed new Secondary Plan recognizes the importance of providing flexibility to respond to changing programmatic requirements for institutional space, while also providing certainty to where and how change is accommodated. The University submitted the application to the City of Toronto in September 2016. It is currently under review by the city with a final staff report anticipated moving through Council in the first quarter of 2019.

The new Secondary Plan includes 112 College Street within a zone of greater intensity where taller institutional elements would be appropriate consistent with the height and scale of the adjacent context including MaRS Towers and other nearby buildings. Enhancement of the College Street public realm is encouraged as well as limiting shadow impacts on Queen's Park Lawn at certain times of year.

The University of Toronto Campus Master Plan (June 2011) and Draft Secondary Plan application (February 2018 resubmission) can be accessed from the University of Toronto, University Planning, Design & Construction website:
http://www.updc.utoronto.ca/re/Campus_Master_Plans/St_George_Campus.htm
http://stgeorgesecondaryplan.utoronto.ca/

A Zoning Bylaw Amendment application for PIE Complex Phase 1 was submitted to the city on November 23, 2018.

Landscape and Open Space Requirements

The PIE Complex Phase 1 landscape design, similar to MaRS, allows for a welcoming and permeable presence through the introduction of elements such as generous continuous building setback and significant landscape improvements along College Street. The character of the streetscape responds to and balances new social areas beside an enhanced double lined tree walkway. The introduction of an active ground plane, both inside and out, will enhance the campus pedestrian experience along the north side of College Street. The public engagement spaces are envisioned to be welcoming at the scale of the building as well as at the urban scale. The ground floor of PIE Complex Phase 1 will be designed to engage with the city at a public level and become a permeable edge to draw in and attract students, researchers, entrepreneurs, Delegates, Industry and Government. Likewise, the landscape and architecture will support event spill-out space to provide a connection to the pedestrian right-of-way and neighbouring open green space. To the west the building addresses the Ontario Fire Fighter's Memorial through carving out the

ground floor plane, creating a strong linkage to the building lobby and atrium. Activation of Queen's Park Lawn East and College Street are opportunities that can help energize and transform this remote corner of the campus to become a gateway that bridges campus and city.

The proposed landscape provides an appropriate transition to Queen's Park Lawn East and enhances the relationship to College Street through the following measures:

- Providing options for pedestrian circulation and to enhance the campus environment with opportunities for informal learning and gathering;
    - A 6m setback along College Street, extends to approximately 10.6m for first two stories, allowing for ample space for site furnishings, benches, trees and plantings.
- Open spaces are integrated with their adjacent built form to maximize their utility;
    - Along the College Street side, the drip line of the building waters the rain gardens below.
- Design of internal building-related open spaces considers the visual experience from within the space, and vice-versa from the exterior; and
    - Design for the PIE Complex adopts a broad approach to the idea of sustainability where there is a deep integration of landscape and architecture through both physical connections and views.
- Design that mitigates sun and wind exposure in order to create a comfortable pedestrian experience.
    - Ensuring that wind safety criterion is met at all areas on and surround the development, including the main entrances and emergency exists throughout the year.

<u>Site Access</u>

The primary pedestrian point of access will be from College Street at the south end of the PIE Complex Phase 1. The College Street entrance will be level with the sidewalk and is setback to create a welcoming front plaza. A secondary pedestrian point of access is located on the west side of the building and with the potential to connect with existing pathways of the Fire Fighter's Memorial. Because the western entrance is lower than the primary southern entrance a gentle-sloped ramp is proposed at the western edge of PIE Complex Phase 1 to provide accessible access to both entrances. A third pedestrian point of entry is provided on the north side of the building. The walkway, on the west and north sides of the building, provides access to the third entrance and maintains the access to the existing stairs to the adjacent property to the north.

All vehicular, loading, and servicing will utilize the existing access at the eastern edge of the site from College Street. A 6-metre wide vehicular driveway will lead to an underground ramp where parking, loading, and servicing will be located. The proposal provides 2 Type B loading spaces, 2 Type C loading spaces and 11 parking spaces, all located below grade.

PIE Complex Phase 1 has excellent access to public transit services. It is located approximately 60 metres east from the TTC Queen's Park subway station, and 490 metres from the College Street subway station both on Line 1, Yonge-University-Spadina. Line 1 provides trains every 2-3 minutes during the rush hours and every 4-5 minutes outside rush hours. The site is also located 60 metres from the streetcar stop at the northeast corner of College Street and Queen's Park for the westbound 506 streetcar and approximately 120 metres from the streetcar stop at the southwest corner of College Street and University Avenue for the eastbound 506 streetcar. The 306 Carlton Blue Night Streetcar route also services the site.

Upon completion of Phase 2, all vehicular and loading access will be from Grenville Street, to allow for a more open and cohesive connected public realm along College Street.

Site servicing – Existing and Proposed

The existing Banting and Best buildings are each separately serviced from local utilities, with the exception of steam service from Enwave. The existing Enwave steam pipe crosses College Street from MaRS, enters the Banting building then sub-feeds the existing Best building. Over time, some services have been extended between buildings.

Services to both phases of the PIE Complex will be independent of the campus infrastructure, being serviced directly from other service providers ie. City of Toronto Utilities and Toronto Hydro as required.

f) Campus Infrastructure Considerations

Utilities

Electrical
The electrical design will be sized to accommodate the new incoming service from Toronto Hydro, metering, secondary distribution for phase 1 and with provisions for phase 2. The associated transformers and low voltage distribution for phase 1 shall be designed to accommodate both phases on the PIE Complex. This can be done by locating the incoming service along the east wall of the first phase enabling extension into phase 2 upon completion. Incoming high voltage power service to the building shall come from Toronto Hydro (THES) from College Street and shall be complete with two radial main incoming feeders and primary metering to deliver 100% of the building load for Phase 1 and include future expansion of Phase 2. This assumes that the total new load shall not exceed 10MVA as per the preliminary load calculation, which was based on the gross floor areas identified in the Request for Proposal and as included in the current plans.

Although the emergency generator location was preferred near the loading area on the ground floor, schematic design ruled this out in favor of locating at the mechanical penthouse, in order to avoid the cost of a 2-hour rated shaft and lose valuable floor space at the lower levels where there are high demands for space.

A minimal photovoltaics system is currently included in the drawings on the high roof. Early schematic design calculations show an area of 360sm of PV array generating up to 14,400 kWh/yr. This system will be connected to the normal power distribution system.

Mechanical
Steam from the central plant will not be used. A conventional local boiler and chiller plant will be employed to serve the proposed system: perimeter in-floor heating/cooling, fan powered boxes for core spaces, and heat reclaim chiller. The proposed system will utilize internal hydronic heating systems with a dedicated outside air system. Heating will be provided by high efficiency condensing boilers. The size of the heating and cooling plant will be determined by a study considering future development and utility distribution opportunity for this end of the campus. The Mechanical design engineers will conduct a study to determine the optimum plant size and design.

There will be a central chilled water plant located at P1 level. There will also be a heat reclaim chiller. Cooling towers will be located in the mechanical penthouse.

Domestic Water
The proposed building will be serviced by a PVC water service, split from the property line. A water meter and a backflow preventer will be provided for the domestic water service while a double check detector assembly will be provided for the fire water service.

Sewer and storm water management

The water and sewage services will be serviced from the local City utilities.

Storm water management shall be complete with an underground cistern at P1 level with capacity to hold site runoff and withhold 100 year storm's water, which shall prevent rain water to enter the building.

Grounds

Infrastructure requirements include:

- Cistern
- Irrigation - must be Rainbird IQ System
- Snow melt on major walkways, with drainage
- Exterior building address signs
- Exterior benches
- Protection and replacement of historical building plaque, to be considered
- Hard and soft landscaping – please refer to the University of Toronto St. George Campus Design Standards Part 1
- 1 Parking space, dedicated space at the parking level

Waste Management

A minimum of one 30-cubic yard compactor is required. Vertical movement of waste, supplies or equipment must be via elevator(s) to the applicable basement and/or penthouse levels.

Bicycle parking

The in-force by law requires provision of 850 bicycle parking spaces within the boundaries of the St. George Campus. This requirement is currently exceeded by more than three times with ±3,234 short-term spaces (type 2) and 158 long term spaces (type 1). Thus, according to the in force by-law additional spaces are not required. However, through the certification of LEED Canada NC Silver certification, long-term bicycle storage is required, thus, area was reserved in the space program. Long-term bicycle storage at the below-grade parking level includes 30 long-term spaces (type 1) along with shower facilities. 54 short-term spaces (type 2) are to be located at grade. Of the 54 short term spaces, 20 short term spaces are under the building's covered waiting area, providing shelter from the elements.

Bicycle access is via the rear of the site (north), accessible from College Street via the walkways around the site.

g) Secondary Effects

Prior to demolition of the Best Institute, existing program is to be accommodated as follows:

- Existing ACE function will be relocated to existing facilities on campus or off campus as required.
- UTE central administration space and entrepreneurial space (Impact Centre) will be temporarily accommodated in the Banting building. This program will then be relocated to PIE Complex Phase 1 upon construction completion.
- Faculty of Medicine has committed to vacating their space and will not require swing space.
- UTM Vive Crop will not require swing space and will not be provided space within PIE Complex Phase 1.

All existing surface parking to the north of the Best building is to be removed and does not need to remain accessible throughout the construction of the PIE Complex Phase 1 construction.

With the severing of the existing connections between the Banting and Best buildings at the sub-basement and level 5 there will be a need to 'make good' affected infrastructure (building envelope, mechanical, electrical) and finishes of the Banting building at these locations. Throughout demolition and PIE Complex Phase 1 construction, consideration must be given to the existing occupants in the Banting building to ensure their workplace remains safe and disruptions are kept to an acceptable level.

h) Schedule

Project Milestones include the following:

CaPS Executive approval (Consultant fees)	April 17, 2017
Consultant Selection	October 2017
Schematic Design	November 2017 – June 2018
CaPS Executive approval (Consultant fees increase)	April 6, 2018
Design Development	July 2018 – March 2019
Cycle 4 Governance (CaPS Executive)	February 1, 2019
Cycle 4 Governing Council approval	April 4, 2019
Construction Documents	April 2019 – August 2019
Tender and award	September 1 – October 31, 2019
Abatement/Demolition start	July 2019
Mobilization and Construction start	November 2019
Full operational occupancy	November 2021

**To meet the proposed schedule, UofT requires commitment from and partnership with the city to accelerate the project through municipal approvals and permitting processes*

IV. Resource Implications

a) Total Project Cost Estimate

The total estimated cost for the project includes estimates or allowances for:

- construction costs
- contingencies
- taxes
- hazardous waste removal
- site service relocates
- infrastructure upgrades in the sector
- secondary effects
- demolition
- landscaping
- permits and insurance
- Professional fees, architect, engineer, misc. consultants (i.e. LEED etc.), project management
- computer and telephone terminations
- moving and staging, decommission of labs being vacated
- furniture and equipment
- miscellaneous costs [signage, security, other]
- commissioning
- escalation

b) Operating Costs

Determination of operating costs for PIE Complex Phase 1 is in progress. The latest energy modelling (June 2018) demonstrated a range of annual operating costs depending on the systems design which will be further refined as the project moves through Implementation.

Operating costs will be apportioned to building occupants based on amount and type of space occupied, as well as use of shared amenities.

c) Funding Sources

PIE Complex Phase 1 will be funded through a combination of Fundraising, Central and divisional reserves , Four Corners revenues, Borrowing (Institutional) and Borrowing (Four Corners).

APPENDICES:

A. Summary of Asbestos-Containing Materials (on request)

B. Room Specification Sheets (on request)

C. Total Project Cost Estimate (on request, limited distribution)