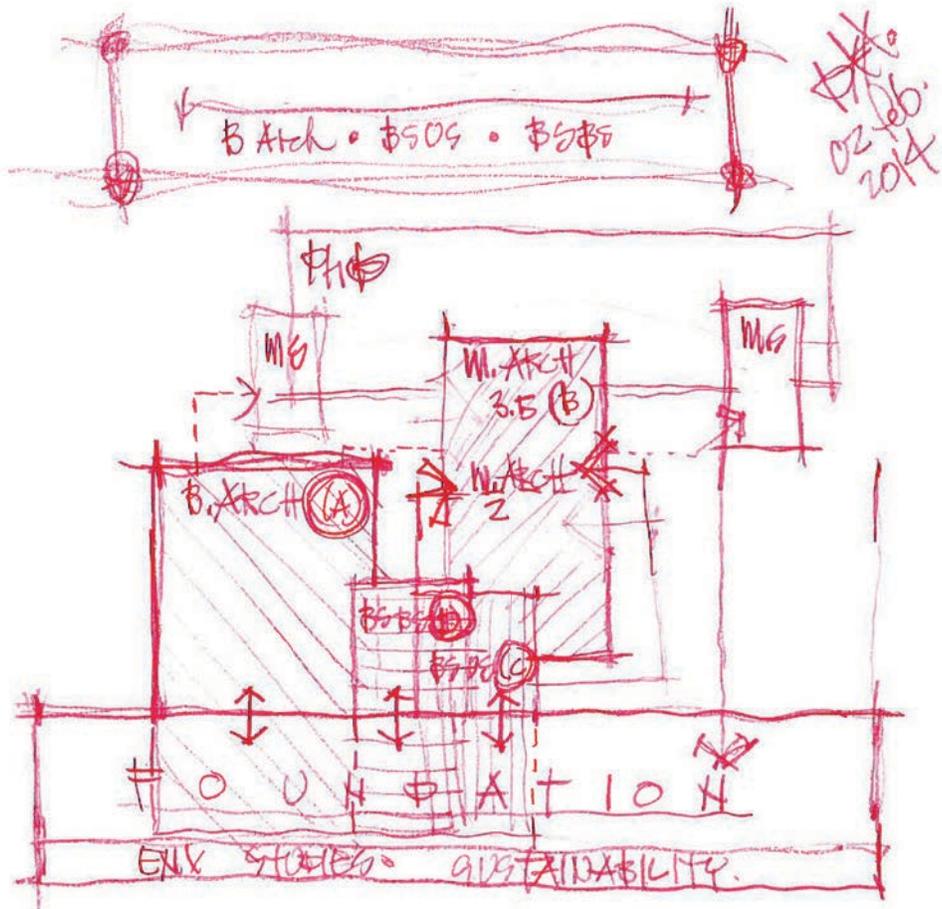


Concept Paper
BACHELOR OF ARCHITECTURE
BACHELOR OF SCIENCE IN URBAN DESIGN & BUILDING SCIENCES
 Golisano Institute for Sustainability



- 3 year A. Feeder to MG, (collaborate w/ CLAS 1.1.1.)
- 4.5 to 5 year B. Feeder to Ph.D.
- 3.5? M. ARCH C. BSOS (B. Science - Urban Studies - collaborate w/ COGX??)
- 2 M. ARCH D. BSBS (B. Science - Building Systems - collaborate w/ CLAS + engineering??)

February 27, 2014
 Rochester Institute of Technology

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Preface

This concept paper is a key element in the strategic planning effort of the Golisano Institute for Sustainability. The curricular portion of the strategic plan is broad, so please note that this proposal focuses solely on the undergraduate options. A description of the overall curricular context may be found at the end of this document.

This proposal is built on the concept of a single undergraduate entry point for students that provides multiple exit points; either by degree or track. Our goal is to provide a student centered curricular experience that allows for flexibility and change as students pursue a career in sustainability. This approach also creates a resilient package of offerings that allows GIS to rapidly adapt to changes in the marketplace, i.e with expertise in sustainability and the built environment future degree permutations become relatively easy.

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I.	Title
	Department
	College

Proposed Degrees:

- Bachelor of Architecture**
- Bachelor of Science in Urban Design & Building Sciences**
 - As the name implies, the BS degree offers two tracks
 - Urban Design
 - Building Sciences

Department of Architecture & Department of Sustainability
Golisano Institute for Sustainability

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II.	Goals
	Justification

There exists in the Golisano Institute for Sustainability a disconnect between the graduate programs it offers and the flow of incoming high school students into RIT. With increased interest in sustainability among high school graduates¹ this is clearly a missed opportunity. Some high school students are sophisticated enough to select a specific sustainability program such as sustainable engineering or sustainable product development however they are in the minority.² A substantial number of students seek a career in sustainability, especially related to the built environment but haven't yet focused their search. They need time to further explore their options.

1.
Paul, Haley. *Degrees in Sustainability: Risky or Worth It?*. Earth 911. 2011.
<http://earth911.com/news/2011/01/24/degrees-in-sustainability-risky-or-worth-it/>

Berman, Jilian. *College Students are Flocking to Sustainability Degrees, Careers*. USA Today. 2009.
http://usatoday30.usatoday.com/news/education/2009-08-02-sustainability-degrees_N.htm

2.
Rowe, Debra. *Green and Sustainability Jobs and Career Resources*. National Career Development Association. 2013.
http://www.ncda.org/aws/NCDA/pt/sd/news_article/83053/_PARENT/layout_details_cc/false

Thus to fully serve its own mission, and that of the greater Institute, GIS must begin to offer undergraduate degrees. The programs proposed in this document provides this opportunity by offering a common beginning with multiple career paths and degree options.

Therefore the primary goal of this proposal is to capitalize on the reputation of GIS to attract high school students directly into sustainability programs at the baccalaureate level both within GIS as well as the other colleges of RIT. An equally important goal is for GIS to be able to more easily feed its own graduate programs rather than depend on recruiting from other colleges and universities. The financial benefit of this approach is obvious.

Architecture always has been and continues to be a seductive program to high school graduates. However, along with high demand comes

high attrition because of student misconception of the field. Ultimately however, these students do end up in related degrees. These two programs acknowledge this by using the B Arch as an “attractor” program and the BS as a “retainer” program, e.g. 30 students may enter expressing interest in the B Arch program and 10 in the BS program but perhaps 20 would exit in each program with attrition offset by transfer students.

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III. Program Description

The target audience for these program are those high school graduates who are committed to sustainability but may be unsure of the vehicle by which they want to affect change. The proposed programs feature a foundation of two years duration where all students learn fundamental sustainability concepts that are applicable to many fields, especially those related to the built environment. While completing coursework in foundation courses students not only acquire fundamental skills and knowledge but are afforded the opportunity to explore career options. Upon completion of the foundation, students then choose a degree and/or track with the focus that matches their interests and abilities.

The proposed degrees/tracks primarily address the built environment which accounts for more than 40% of the energy use and carbon output in the United States. Job opportunities in this sector are expected to grow faster than average³ over the next decade and demand by students is strong. The following options contain many common courses but result in very different emphases.

Bachelor of Architecture

Although the existing Master of Architecture program is gaining traction as it moves towards graduating its first cohort, a large number of high school graduates seek to enter an architecture program directly. To capitalize on this demand an undergraduate professional degree in architecture is proposed (B Arch). Enrollment management sees the pool of potential applicants for the B Arch larger than that for the M Arch. As with the existing architecture program, collaboration with the School of Design in the College of Imaging Arts & Sciences is possible.

BS: Urban Design Track

Design of complexes of buildings, revitalizing entire urban neighborhoods, and reclaiming suburban and rural towns and villages is part of the re-urbanization that is occurring across America. There is nothing more central to sustainability than the recognition and promotion of a more dense style of living and the development of community. This particular track provides a viable exit point at the baccalaureate level but could also feed both existing GIS master degree programs. Collaboration with the College of Liberal Arts is possible.

BS: Building Sciences Track

Sustainable building performance has emerged as a specialty area in the architecture, engineering and construction industry. A program that focuses on building sciences is a natural for RIT and GIS and

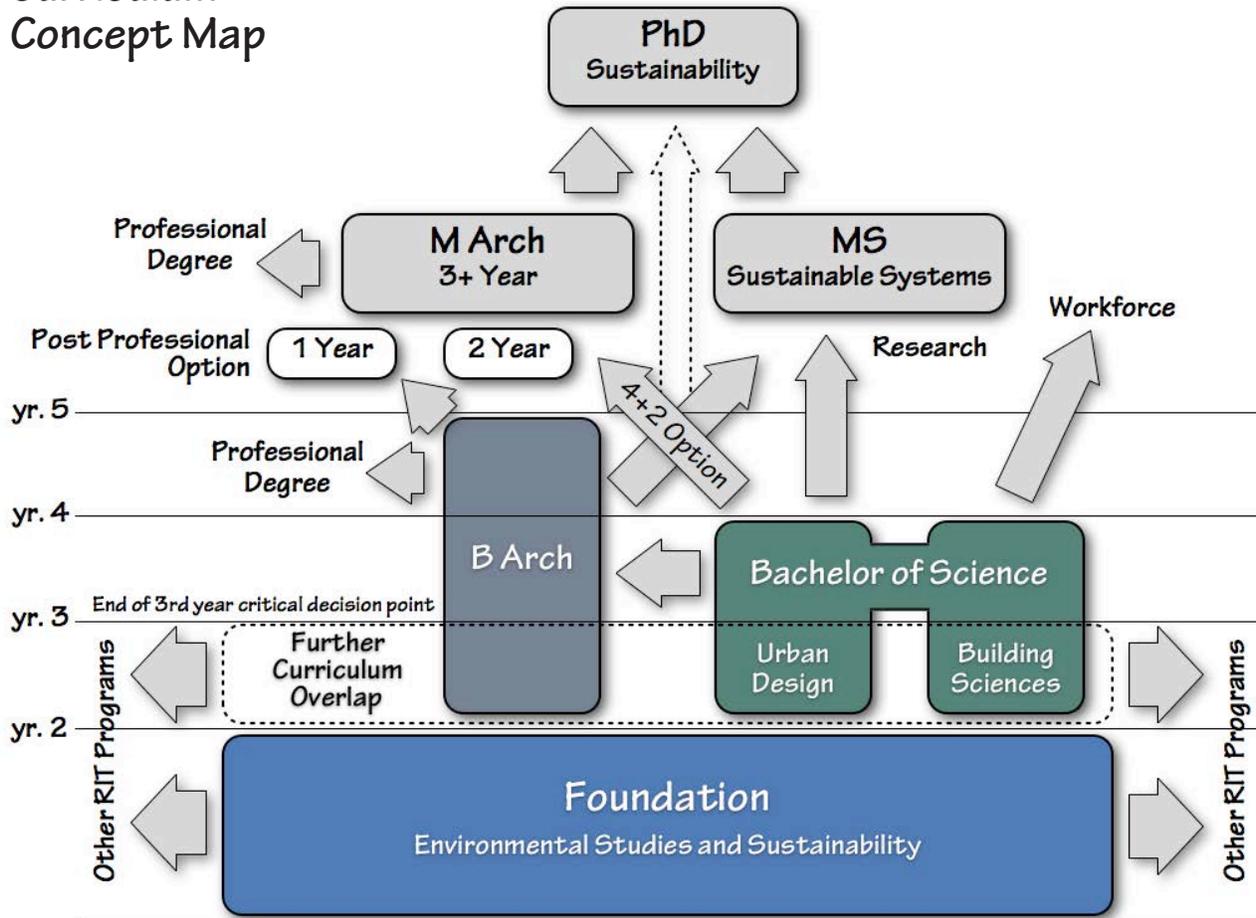
3.

US Department of Labor. *Occupational Outlook Handbook*. US Bureau of Labor Statistics. 2014.

<http://www.bls.gov/ooh/architecture-and-engineering/architects.htm>

forms the perfect bridge between sustainability science and architecture. This track would appeal to those students interested in the technical side of building design and construction. And for those seeking a masters degree this option could be combined with two years in the existing Master of Architecture program to provide a 4+2 BS/M Arch professional degree sequence. Collaboration with the College of Applied Science and Technology is possible.

Curriculum Concept Map



The three existing GIS academic programs are shown in light gray. Proposed degrees are in color, M Arch 1 and 2 year options would be future proposals.

Foundation courses would likely be a mix of existing courses taught in GIS and other colleges of RIT. This foundation would be very similar to and could work in conjunction with the foundation proposed in the College of Liberal Arts Environmental Studies proposal. Options would be built in to allow course substitutions for students who enter the program with a track already in mind, i.e. the foundation would be generic but not overly restrictive.

As students discover their own career path it is hoped that an ongoing percentage will remain in this proposed program, some will transfer into programs in other colleges of RIT but few will find the need to leave RIT to satisfy their needs.

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**IV. Fit with RIT
Academic Portfolio
Blueprint**

The Academic Portfolio Blueprint Task Force provided the Institute with six characteristics and four criteria by which to measure curricular proposals. We believe this proposal satisfies these metrics.

Characteristics:

Scholarship, Research and Creativity

GIS finds itself in the position of having two programs that are heavily scholarship and research based (sustainability) and a third that is heavily creativity based (architecture). A good deal of positive synergy has already occurred between these two extremes but their dichotomy points out the inherent weakness. Many students seek a middle ground of studies that suit their goals and skills but find each end of the spectrum too restrictive. This proposed degree is conceived as a flexible vehicle that bridges this gap to help students and faculty alike to explore, find, and make progress in their careers with the right mix of these three characteristics.

Innovative Teaching and Learning

The unusual mix noted above has already caused creativity to permeate research work and research to permeate creative work. This is due to the unconventional methods already in use and a basis for continued development. The key to maintaining an innovative environment is to assure that GIS maintains a diverse and talented faculty. These will be the primary criteria used in acquiring faculty members that will be required for the new program as well as hires already scheduled for the existing programs.

Experiential Learning

The degrees/tracks proposed have traditionally been best taught/learned in an experiential way. Courses that comprise the core of these degrees will take full advantage of relationships already established in the community (Rochester Regional Community Design Center, Landmark Society of Western NY, AIA Rochester, and the Genesee/Finger Lakes Regional Planning Council). As much as possible, academic work will be based on real, community based projects where work with the stakeholders is assumed. Additionally, a co-op experience will be required for both degrees.

International and Global Education

Another requirement of the programs will be a global experience. Several such experiences have already been established in the existing architecture program and will provide the basis for commingling of students with multiple opportunities around the world.

Synergy and Interdisciplinarity

As noted under each of the degrees, synergies with at least three other colleges are possible and desired. This will be critical in the foundation years to achieve efficiencies but also to expose incoming students to the range of options, knowledge bases, resources available at RIT and the opportunity for interdisciplinary team work.

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**IV. Fit with RIT
Academic Portfolio
Blueprint
(Continued)**

Inclusive Excellence

If the above characteristics are achieved, suffice to say we believe inclusive excellence will also be achieved.

Criteria:

Centrality

With the addition of bachelor degree programs GIS would be able to contribute much more fully to RIT's mission of offering career-oriented educational programs while at the same time serving its own commitment to research and graduate education. Due to the global nature of the sustainability problem and the international reputation of GIS, this proposal is clearly central to RIT's mission, vision, and values. What has already been presented, coupled with the proposed administrative structure fully address the four key result areas of the *2005-2015 Strategic Plan*.

Marketability

The enrollment management section below speaks to the marketability of the program. There is high demand externally and growing demand in the marketplace. The program should enhance enrollment in other programs due to the planned student-centered approach. An additional benefit is the attractiveness of these programs to women. The existing architecture program boasts more than 50% female enrollment which is extremely high for a technical program.

Quality

With GIS's tradition of graduate education, existing dedicated faculty, the program's proposed integration with other programs, and its experiential educational basis there is little doubt this can and should be a high quality program.

Financial Viability

Financial viability is a critical driver of this proposal. GIS does not have the revenue generation capability that undergraduate programs afford. The addition of these programs will be a first step in balancing the expense of graduate education with new revenues.

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**V. Synergy with Other
Programs**

These programs offer potential synergies with at least three other colleges. As previously noted, the foundation years of this program parallel those of the Environmental Studies proposal by the College of Liberal Arts. GIS would collaborate with COLA on planning the respective foundations (should both be approved). This will create efficiencies while offering students diversity and richness at the beginning of their program by taking courses in more than one college.

GIS already collaborates well with faculty from the Civil Engineering Technology program in the College of Applied Science and Technology. Faculty teach units of instruction for each other as requested. With a track that focuses on building sciences there at the very least exists the potential for sharing course offerings. An increase in student interaction in and out of the curriculum would be an easily attainable

goal for both programs. Collaboration with the Facilities Management program in CAST has yet to occur but also offers excellent possibilities.

The existing Architecture Program is already cosponsored by the College of Imaging Arts & Sciences. An articulation agreement with the Interior Design program has been established. An undergraduate degree in architecture will make such an articulation even easier for students in the School of Design to transfer, take electives, or potentially earn a dual degree. The existing Sustainability Programs also currently collaborate with the School of Design. Thus an already successful synergy with CIAS will be enhanced with the addition of B Arch and BS programs in GIS.

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VI. Administrative Structure

The new program would be administered by the Department of Architecture in GIS. The Department of Sustainability would continue as currently configured. Faculty from both departments would be utilized in these new programs. However it is understood that student success and the management of all academic programs will need more attention with the addition of baccalaureate degrees.

With the greater Institute seeking inter and multi-disciplinary degrees, requesting more scholarly work from faculty, and asking chairs to spend more time raising funds, student and curriculum management requires more affirmative action. As a start, GIS will appoint a faculty member with 50% assignment to coordinate curriculum and be the primary student advisor. This coordinator will be the front line in assuring that the relationship between curriculum and student success is a strong one.

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VII. Enrollment Management Expectations and Sustainment

“Enrollment Projection: Proposed B.Arch. in Architecture and BS in Built Environment

“The following recommendations, assumptions and observations form the basis of the projection:

- 1. While EMCS fully supports the concept of a single entry point for the two degrees, we recommend that the proposal be refined to reflect the following degrees: the B.Arch. and a BS in Urban Design and Building Sciences. Our concern is that prospective students, especially freshmen, will not comprehend the “built environment” concept and may overlook the “built environment degree” to discover the proposed individual tracks. Additionally, urban design and building sciences are more closely aligned with major titles in the College Board’s Student Search Service enabling us to more accurately identify student interest in the programs.*
- 2. If the programs are approved simultaneously, we recommend that GIS also offer prospective freshmen an “undeclared” or “exploration” option that allows them time to explore and decide between the two degree programs.*
- 3. The program will attract new students from both freshman and transfer markets with the majority of new students entering in the fall. In addition, given RIT’s recent conversion to a semester calendar, spring semester is an even more opportune time for new students to enroll, especially transfer students.*

4. *Most of the students will come from the Middle Atlantic States and New England.*
5. *The Office of Undergraduate Admissions will work with the college to determine appropriate academic profile parameters for entering students with final authority for admission decisions resting in the Office of Undergraduate Admissions. These discussions will include specific guidelines for the submission of a portfolio as a part of the admission process.*
6. *The Golisano Institute for Sustainability will work with the Office of Undergraduate Admissions to maintain and enhance RIT's relationships with two-year schools to promote the new programs and develop articulation agreements to facilitate the recruitment and enrollment of transfer students into the programs. Flexibility in the application of transfer credits will be critical to enrolling those students.*
7. *The proposed programs have the potential to draw some prospective students away from other programs at RIT. Additionally, the programs will attract internal transfers from other RIT colleges, and the University Studies program. For purposes of these projections, however, only students who are new to RIT are included in the projections.*
8. *The projections are based upon an assessment of the College Board's Student Search Service data using the following parameters to determine the level of interest in the student market: Combined PSAT scores at 110 or higher, high school grades of B+ or higher, and high school class rank in the top quartile of the graduating class. Entering transfer students would generally present a GPA of 3.0 or higher for admission. [Note: The proposed programs would be supportive of the university's diversity and gender balance goals. An analysis of the data mentioned above indicates that the prospective freshman market for the programs is approximately 40% female and 30% ALANA.]*
9. *The proposal contains an enrollment projection and a cost model analysis. While the cost model analysis overstates projected revenues, we feel that the enrollment projection, slightly modified, is reasonable. The proposal indicates an enrollment projection of 40 FT and 5 PT students. We believe that 40 to 45 full-time students is a realistic enrollment estimate at the outset, and once accreditation has been secured and the programs fully marketed, it is possible that demand for the programs could exceed that number.*

Please let me know if you have any questions."

Sincerely,

Ed Lincoln

In response to Ed's comments by number the following points are made:

Comment 1. The name of the BS degree was changed to Urban Design & Building Sciences as suggested.

Comment 2. An "undeclared" matriculation option can be easily instituted.

Comment 3. To be conservative with enrollment numbers transfer students have not been considered, however Ed's point is an important one that these programs could attract a substantial number of transfer students.

Comment 9. The financial model that was submitted to Ed did not yet include any expenses. The summary of the completed model is included in this document.

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VIII. Impact on Resources

With its new building, GIS has a head start in managing the increase in student numbers these programs would bring. Existing space and equipment would likely only need incremental increases. The main incremental space need would be studio space. Much of the increased capacity could be accommodated by building out the mezzanine as originally planned for in the main studio in Slaughter Hall (Bay 3), providing an additional 4,000 s.f. to this area. In addition, by year three new studio space would be required and could be located in GIS Sustainability Hall or within Slaughter Hall. Minimally the program would need about 3,000 s.f. by year 3 and need an additional 3,000 s.f. by year 5 with anticipated growth. This includes creation of a fabrication shop as increased student numbers will make use of the CIAS shop infeasible.

Existing faculty would be utilized to commence the proposed program but approximately 6-7 new faculty positions would be needed once the program reached its full capacity (as predicted by the budget template provided by the Institute). Based on enrollment projections the target acceptance goal each year would be 40 full-time and 5 part-time students. This number allows for two sections of lecture courses and four sections of design studios.

Based on Enrollment Management's projection for student recruitment the cost model analysis looks promising. The program could return a profit by the second year and increase steadily in subsequent years. The full cost model will be submitted as requested.

**Bachelor of Architecture, BS in Urban Design & Building Sciences
SUMMARY REPORT**

Fiscal Year	2016	2017	2018	2019	2020	Total
Avg Enrollment: Students (FT + PT)	32	65	100	130	139	467
Part-time Faculty expense	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Full-time faculty expense	\$ 469,553.17	\$ 798,240.39	\$ 1,302,728.32	\$ 1,660,978.61	\$ 1,694,198.18	\$ 5,925,698.68
Total Expenses	\$ 1,067,517.58	\$ 1,529,531.56	\$ 2,216,941.54	\$ 2,676,360.20	\$ 2,726,367.40	\$ 10,216,718.28
Revenue (Net of Aid)	\$ 756,055.18	\$ 1,594,378.61	\$ 2,541,583.79	\$ 3,414,828.64	\$ 4,351,509.65	\$ 12,658,355.87
CONTRIBUTION MARGIN Surplus/(Deficit)	\$ (311,462.40)	\$ 64,847.05	\$ 324,642.25	\$ 738,468.45	\$ 1,625,142.24	\$ 2,441,637.59

The model is based on a conservative retention rate of 85% per year which results in a 61.4% completion rate. Enrollments were assumed to be 32 in year one, 38 in year two, and 45 thereafter.

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IX. Conclusion

The Golisano Institute for Sustainability has quickly built an enviable international reputation. During this time students have been exiting high school looking for programs of study in sustainability at an ever increasing rate. By offering only graduate degrees GIS and RIT are not capitalizing on a very precious resource. GIS has the capability of attracting more students to RIT and releasing them to the world to affect real change.

The proposed Bachelor of Architecture and Bachelor of Science in Urban Design & Building Sciences degrees offer flexibility. They could become mainstream sustainability programs at the Institute, enhancing existing programs, stimulating further collaboration, and most importantly creating a much richer environment for students at all levels to study sustainability.

The Golisano Institute for Sustainability endeavors to offer a research and educational environment that inspires students and faculty to affect change in the world in which they live. To do this GIS sees the need to provide opportunities at many levels and in different ways. The table below outlines current thinking on the broader curriculum context under which the proposals in this document are offered.

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Appendix: Overall Curriculum Context

Academic Programs

Degree		Description
EXISTING	PhD in Sustainability	Existing program.
	MS in Sustainable Systems	Existing program.
	M Arch: 3.5 year	Existing program.
FUTURE	2 year	Easily accomplished with existing courses. In conjunction with the proposed BS program this creates a 4+2 M Arch degree track.
	1 year	Easily accomplished with existing courses. In conjunction with the proposed B Arch program creating a post-professional degree. This would also be attractive to the generation of graduates holding B Arch degrees looking to upgrade - especially with a sustainability focus. This could be locally based as well as on-line.
NOW	B Arch	As proposed in this document.
	BS in Urban Design & Building Sciences	As proposed in this document.
FUTURE	Advanced Certificates	In specific areas of sustainability as dictated by industry demand.
	Outreach Courses On-line Courses	For individuals and organizations interested in specific topics. There is considerable interest for example from the architecture/engineering/construction industry for courses in building performance. In fact GIS has already begun working with the US Green Building Council in a partnership to deliver this expertise to USGBC members and LEED Accredited Professionals.
	Sustainable Community Development Program	Malmo University offers a Sustainable Urban Management degree that could be a model for RIT. This would truly bring together the three legs of the sustainability triangle: environment - economy - society. The program could be developed in collaboration with the COB Center for Urban Entrepreneurship and the COLA Urban and Community Studies specialization program.

Potential Student Paths

Degree Paths	Potential Jobs
Bachelor of Architecture	Architect
Bachelor of Architecture → Master of Architecture (1-year)	Architect with focus/specialization
Bachelor of Architecture → MS in Sustainable Systems	Research Architect
BS in Urban Design and Building Sciences	Urban Designer, Building Performance Specialist
BS in Urban Design and Building Sciences → M Arch (2-year)	Architect, Urban Designer, Building Performance Specialist
BS in Urban Design and Building Sciences → MS in Sustainable Systems	Built Environment Researcher, Sustainability Manager in A/E offices

The PhD in Sustainability is an additional exit point after any of the scenarios listed above.