

The Land Development Design Initiative (LDDI) 2018 Annual Report



LAND DEVELOPMENT
DESIGN INITIATIVE

Program Coordinator's Message

Welcome to the 2018 Land Development Design Initiative Annual Report! It's hard to believe that it's once again time to celebrate and reflect on another year of LDDI's achievements. Even harder to believe, LDDI is now two years into its second decade of existence! Since 2006, LDDI has continually forged new paths in undergraduate land development design education, and our five separate course offerings comprise the most expansive land development design curriculum found in any undergraduate civil engineering program in the country. While we are extremely proud of our numerous course offerings, we also recognize the tremendous value of our practitioner involvement activities outside of the classroom. From field trips to guest lectures to networking events, LDDI seeks to engage industry professionals at every step along the path of our students' education. While it's critically important that we produce engineers who are technically competent, we also strive to ensure that these young engineers possess the personal and communication skills that are so vital for cultivating client and other professional relationships. To remain on the forefront of land development design education requires ongoing, sustained effort, but it's a labor of love for myself and LDDI Assistant Coordinator Kevin Young. I sincerely hope that you will enjoy reading this report as much as Kevin and I have enjoyed preparing it. We've worked hard to capture the past twelve months in photos and stories that we hope represents the LDDI program well, and that may even provide you with some fond memories of your own time at Virginia Tech!



Each year, during my final review of this report, I'm awestruck by the outpouring of support, financial and otherwise, from the "LDDI constituency" – those of you who attend our General Meetings, serve as student mentors in our courses, drive to campus for after-hours presentations, give up your Saturday to host student field trips – the list goes on and on. Without YOUR continued support and belief in the program we simply would not exist. Therefore, at this time, I feel it appropriate to recognize and thank some of the individuals and organizations, whose contributions of time and resources, have enabled the success and accolades that the LDDI program enjoys. To the 33 individuals currently comprising the LDDI Advisory Board, I extend sincere gratitude on behalf of all of the students whose lives you so positively impact with your contributions to LDDI. Your vision and steering of the program has elevated it to levels that none of us could have imagined twelve years ago. Next, I would like to thank Kevin Young for another year of serving as the LDDI Assistant Coordinator. It's a true pleasure working with Kevin every day, and his contributions to the LDDI program both inside and outside of the classroom can't be overstated. I was thrilled that Kevin was once again recognized by Virginia Tech's College of Engineering with a Certificate of Teaching Excellence for his efforts over the past academic year. Next, I would also like to thank the 45 corporate and municipal sponsors, and nearly 100 individual donors, from whom LDDI enjoyed financial support over the past calendar year. LDDI's corporate sponsorship program is our financial lifeblood, and a majority of the LDDI courses are funded (and made entirely possible!) through the sponsorship program. Contributions from individual donors are now directed in their entirety to an endowment fund, through which we hope to eventually ensure long-term program growth and sustainability. Last but certainly not least, I want to thank all of the industry professionals who over the past year have given so generously of their time as student mentors, guest lecturers, field trip leaders, course instructors, and in countless other ways to improve the educational experience of Virginia Tech CEE students. It is this practitioner-student interaction that truly places LDDI in a class of its own.

Within this report, you'll read about LDDI events and activities over the past year, including course offerings, professional networking events, field trips, research activities, and many others. You'll also read about some of the organizations and individuals who have played important roles in the LDDI program over the past year. As you read about these activities and individuals, I hope that you will be motivated to become involved in the LDDI program. There are numerous ways that you can participate in the program and make a real, positive impact on future land development professionals. On page 24 you will find the contact information for myself, Kevin Young, and our Advisory Board Chair and Co-Chair. Please reach out to any of these individuals if you have questions about the program or have ideas for how you would like to become involved.

Best regards,

A handwritten signature in blue ink, appearing to read "Randy Dymond".

Randy Dymond, PhD, PE, F.ASCE, D.WRE
Coord, Land Development Design Initiative
Professor of Civil & Environmental Engineering
Virginia Tech

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Diamond and Platinum Corporate Sponsors

During our 2017-18 fiscal year, Diamond and Platinum Corporate Sponsors contributed over \$125,000 to LDDI. The following section highlights each of these corporate sponsors, by level alphabetically, and their involvement with LDDI.

Diamond Level:

ADS

From its introduction and championing of corrugated plastic drainage pipe in the United States more than fifty years ago, to its current line of innovative products, Advanced Drainage Systems has been an industry leading materials supplier for the land development industry. The company is focused on drainage products and services that deliver solutions for the most persistent and challenging water management problems. From safely pre-treating and managing stormwater runoff, to helping developers and property owners harvest rainwater, ADS focuses on the development of water solutions that make land more arable, cities more livable, and the world a greener place to live. 2018 marked the inaugural year for ADS’ sponsorship and participation in the LDDI program.



Bohler Engineering

With outstanding, driven professionals and more than 20 locations from Texas to New England, Bohler provides consulting and technical design services to developers and their partners across all commercial, institutional and residential real estate sectors. Bohler arms their clients with critical information to make profitable real estate decisions and designs that deliver exceptional results. From early stage concepts to detailed project closeouts, Bohler owns their role in the development and construction process and operate in their clients’ best interest. Bohler has been a sponsor of LDDI since 2007, and Ginger Greunke, Director of Talent Acquisition, Charlie Yowell, Manager of the Raleigh, NC office, and Brett Buckland of the Atlanta, GA office currently serve on the LDDI Advisory Board.



Bowman Consulting

Bowman Consulting was founded in 1995 with 5 people in Fairfax, VA. Since that time, the firm has been recognized as one of the fastest-growing consulting firms with 33 offices distributed across the United States. They offer services in



Civil Engineering, Planning, Landscape Architecture, Surveying, Environmental Consulting, Transportation, and more. Bowman Consulting has been a sponsor of LDDI since 2007. Roy Waugh, Principal from the Chantilly, VA office, is a Life Member on the LDDI Advisory Board and served as the Board's Chair during 2014.

PENNONI

Pennoni was founded in 1966, and over the years has grown to employ more than 1,200 professionals serving the needs of clients around the globe. As a multidisciplinary firm, Pennoni's breadth of services includes civil/site, construction services, environmental, geotechnical, landscape architecture and planning, MEP, structural, survey and geomatics, transportation, water resources, and water/wastewater. Pennoni is a Diamond Level supporter of the LDDI program, and Regional Vice President Susan Wolford, PLA, AICP, ENV SP, LEED Green Associate currently serves as Chair of the LDDI Advisory Board. In addition, Thomas D. Rust, PE, AICP, Vice Chair at Pennoni is on the LDDI Platinum Board.



Platinum Level:

AES Consulting Engineers

Founded in 1980, AES Consulting Engineers (AES) provides land development engineering design services from offices in Richmond, Williamsburg, and Chesapeake, Virginia. AES provides Civil Site Design, Landscape Architecture, Surveying, Land Planning, and Municipal Utilities Design. AES has been a sponsor of LDDI since 2007. Firm President, Arch Marston, currently serves on the LDDI Advisory Board.



ATCS

Employing more than 200 people across nine offices, ATCS is a professional consulting firm dedicated to providing comprehensive, multidisciplinary services including land development, transportation planning and design, traffic engineering, construction management and inspection, environmental sciences, emergency management services, water resources, water/wastewater, and



surveying. ATCS has been a Platinum-level supporter of LDDI since 2016.

christopher consultants

christopher consultants, ltd. (christopher) was founded in 1982 and is a full service civil engineering, land planning, surveying and landscape architecture firm headquartered in Fairfax, Virginia and serving the Washington DC metropolitan region. In their 36 year history,

christopher has had the opportunity to work on many high-profile and award-winning projects in the region and has completed projects throughout the Mid-Atlantic, across the U.S. and around the world. christopher is a designated small business under Virginia's SWaM program. christopher has been a proud sponsor of LDDI since 2007, and Senior Associate Andy Gorecki currently serves on the LDDI Advisory Board.



Clark Nexsen

Clark Nexsen believes partnership – with their clients, with their colleagues, and with their communities – is fundamental to the effective pursuit of transformative design. Clark

Nexsen engineers, planners and architects partner with their clients to shape ideas that transform our world. Their clients benefit from a process forged over more than nine decades of design practice delivering projects that solve real problems. Uncovering innovative solutions is the result of Clark Nexsen's collaborative process undertaken with their clients to discover truly exceptional ideas. Clark Nexsen has been a sponsor of LDDI since 2011. Caleb Hurst, Senior Civil Engineer in the Virginia Beach, VA office, currently serves on the LDDI Advisory Board.



Contech Engineered Solutions

Contech Engineered Solutions provides site solutions for engineers, contractors, architects, and owners. The company's portfolio includes bridges, drainage, erosion control, retaining

wall, sanitary sewer, and stormwater management products. Through cost-effective engineered solutions, Contech ES helps build, support, and sustain land development projects while protecting the environment. Headquartered in West Chester, Ohio, with over 1,400 employees and 60 facilities strategically located across North America, Contech ES' footprint spans every



major U.S. city and all 50 states, allowing the company to provide unmatched customer service and support. Contech ES has been a sponsor of LDDI since 2011, and in 2018 upgraded their sponsorship to the Platinum level.

Dewberry

Dewberry is a leading, market-facing firm with a proven history of providing multidisciplinary professional services to a wide variety of public- and private-sector clients. Established in 1956, Dewberry is headquartered in Fairfax, Virginia, with more than 50 locations and 2,000 professionals nationwide. Dewberry has been a sponsor of LDDI since 2007, and Jack Vega, Vice President, and Skip Notte, Vice President and Business Unit Manager, both currently serve on the LDDI Advisory Board.



Draper Aden Associates

Draper Aden Associates was founded in 1972 with an office in Blacksburg, Virginia and now has nine offices located across Virginia and North Carolina. They are a full service consulting engineering firm offering services in site planning and engineering, sustainable design, infrastructure, geotechnical and structural engineering, and more.



Draper Aden Associates has been a sponsor of LDDI since 2007. Firm president and CEO Jeff Lighthiser is a previous Chair of the LDDI Advisory Board and is a Life Member of the Board.

GORDON

Founded in 1976, GORDON is an award-winning, multi-discipline design firm specializing in urban design, mixed-use, commercial and government facility development. In addition to designing some of the most complex private



developments in the Washington DC Metro region, the firm serves federal agencies such as the Department of Veterans Affairs, U.S. Army Corps of Engineers, and National Institutes of Health nationwide. GORDON offers a full complement of civil engineers, land planners, landscape architects, surveyors, and security professionals. The firm has been a sponsor of LDDI since 2007

and proudly employs over twenty Virginia Tech alumni. Firm COO Bill Junda currently serves as Vice Chair of the LDDI Advisory Board.

J2 Engineers

Jim Bishoff and Jeff Gilliland started J2 Engineers in 2007 in a tough economy and a competitively crowded market. They believed so strongly in their vision that despite these challenges, the future of J2 was certain. The pair committed to developing a multidisciplinary staff that could produce the best work for clients, not just completing projects, but taking care to meet their preferences and goals. The firm continues to grow exponentially under their leadership, combining strong talent and successful engineering for a wide variety of projects. Uniquely, the J2 model offers the technology and broad services of a large engineering firm, with the strong relationships and start-to-finish involvement of a small firm. J2 Engineers has been a sponsor of LDDI since 2007, and Jeff Gilliland is a past Chair and Life Member of the LDDI Advisory Board.



Kimley-Horn and Associates, Inc.

Kimley-Horn was founded in 1967 in North Carolina, and during the past 51 years has grown to include more than 80 offices in 28 states. The firm has been repeatedly recognized as a top place to work, and provides an array of engineering and land planning service including transportation, water resources, land development, and more. Kimley-Horn has been a sponsor of LDDI since 2007. Derrick Cave, Principal and Senior Vice President is a Life Member on the LDDI Advisory Board and Kyle Bollinger, Associate, serves as an active member on the LDDI Advisory Board.



Maser Consulting

Maser Consulting P. A. is a privately owned, multi-discipline engineering firm with a unique balance of public and private sector experience. Committed to customer service and accountability, Maser Consulting's experienced staff of licensed engineers, planners, surveyors, landscape architects and environmental scientists have a proven ability to add value to the community by delivering quality services and strategies needed to meet its clients' undertakings.



Established in 1984, the firm has offices nationwide and has consistently been recognized by Engineering News Record as one of its Top 500 Design Firms, and ranks on The Zweig Group's Hot Firm List of fastest growing companies. Maser Consulting has been a proud sponsor of LDDI since 2012, and Regional Geographic Discipline Leader Jonathan Jolley is an active member of the LDDI Advisory Board.

McAdams

McAdams is a full-service land planning, landscape architecture, civil engineering and geomatics firm located in Durham and Charlotte, NC. McAdams has built its reputation throughout the industry over 39 years by delivering unmatched expertise and unwavering commitment to clients in a variety of markets including municipal, education, healthcare, as well as commercial and residential development. The firm is comprised of over 200 professionals that are united in their desire to achieve their clients' visions through a thoughtful and resourceful process. Ultimately, McAdams seeks a partnership with their clients to further the opportunity to create meaningful experiences through inspired design. 2018 marked the inaugural year for McAdams Company as an LDDI sponsor, and Charlotte Region Director Rob Reddick also joined the LDDI Advisory Board as an active member.



Tri-Tek

Tri-Tek Engineering was founded in 1988 by Kevin Murray and Ted Britt. To this day, both are actively involved in the firm's projects and they remain personally accessible to the firm's clients. Tri-Tek believes that "doing things according to plan" is not just a slogan, it's the right way to do business. Headquartered in Herndon, Virginia, the company provides a wide array of civil and environmental engineering services for both public and private clients. Tri-Tek Engineering has been a sponsor of LDDI since 2011, and in 2018 upgraded their sponsorship to the Platinum level. Firm founder, Kevin Murray, is an active member of the LDDI Advisory Board and former Chair of LDDI's Practitioner Involvement Committee.



2017-2018 General Meetings

This past year, LDDI kept with its long-standing tradition of hosting a winter meeting in Northern Virginia and a summer meeting in Richmond. Additionally, in April LDDI hosted its first "full scale" General Meeting in Charlotte. LDDI's General Meetings are a key outreach effort that help keep our sponsors and other professionals in the land development industry up to speed on the status and future direction of the LDDI program. The meetings also provide a great opportunity to showcase students, update our general membership on campus happenings, and solicit feedback and ideas on how to continually improve the program. Meeting attendees are provided not only with a tremendous industry network opportunity, but also two valuable continuing education/professional development credits. Last year's summer meeting was held at the Virginia Housing Center at Innsbrook, while the winter meeting was held at the Loudoun Water facility in Ashburn. The inaugural Charlotte General Meeting was held at the Dewberry office in the city.

The Richmond summer meeting was held on Friday, July 21st, 2017 and featured guest speakers Rachel MacCleery (Sr. Vice President, Urban Land Institute), Kim Beard Kacani (Sr. Vice President, HHHunt Communities), and Hans Klinger (Director of Business, HHHunt Communities). Ms. MacCleery spoke from the ULI perspective and focused her discussion on the underlying concepts behind the implementation of healthy communities. Ms. Kacani and Mr. Klinger expanded upon these topics in the form of various case studies of HHHunt Communities' projects that employed these concepts. The meeting agenda also included CEE 4274 student presentations, an LDDI update by Program Coordinator, Dr. Randy Dymond, and a networking social.

LDDI's annual winter meeting was held on Friday, January 12th, 2018 at the newly renovated Loudoun Water facility in Ashburn. Much like the summer meeting, attendees were comprised of a diverse mix of consultants, developers, product and service providers, municipal engineers, and other professionals from the land development industry. Following student presentations and a program update, attendees were treated to an interesting and entertaining series of presentations



Mr. Jim Leach (VP, RagingWire Data Center) speaks at the January 2017 General Meeting in Ashburn

from Buddy Rizer (Executive Director, Loudoun County Economic Development), Mike Latham (Executive Director, Planning and Engineering, Loudoun Water), and Jim Leach (Vice President, RagingWire Data Center). These speakers discussed the exploding data center industry in Loudoun County, and associated land development and infrastructure challenges and opportunities.

On Friday, April 20th, 2018, LDDI hosted its first General Meeting in the City of Charlotte. This meeting builds on a smaller outreach meeting held in Charlotte in the spring of 2017. The meeting was well-attended, and drew an audience of North Carolina professionals, many of whom had never before attended an LDDI General Meeting. In addition to student presentations and a program update, the meeting featured a talk from Amy Bezanson (Director of Development, Crescent Communities) and Dale Stewart (Partner, LandDesign). Ms. Bezanson and Mr. Stewart delivered an interesting presentation on the evolution and development of Charlotte's River District. Looking forward, LDDI envisions that the spring General Meeting in Charlotte will become an annual event.

2017-2018 Financial Summary

During the 2017-2018 fiscal year, LDDI collected revenue of approximately \$202,000 through its corporate sponsorship program. This figure is greater than revenue collected during our previous fiscal year, and reflects the support of 45 corporate sponsors – our highest number ever! These funds were used to directly support LDDI activities inside and outside of the classroom. The following describes some of LDDI's major expense categories to which this revenue was directed.

Instructor Compensation: Of the eight LDDI course-sections offered each year at Virginia Tech, the University provides financial support for only four. Corporate sponsorships fund the remaining four.

Endowment: In an ongoing effort to ensure the long-term sustainability the LDDI Program, the Advisory Board has ramped up efforts to establish an endowment fund. The funding of an endowment will permit the hiring of additional tenure-track faculty that are essential for LDDI's long-term survival and recognition as a program area within the broader CEE program.

Program Expenses: Program expenses include support for LDDI's student club, including field trips, travel to service project locations, and social gatherings. This expense category also includes event catering for LDDI general and outreach meetings, publication of the *LDDI Bridges* quarterly newsletter, and past funding of the LDDI student internship program.

Operations Expenses: Operations expenses include general overhead costs such as postage, printing and copying, website development and maintenance, telecommunications, and University accounting and service fees.

Travel and Meetings: LDDI has traditionally hosted two general membership meetings each year. Beginning this spring, and moving forward, an additional general meeting will be held in the spring in the city of Charlotte, NC. Outreach efforts such as these comprise a critical part of LDDI's efforts to ensure continued practitioner participation in the program.

Student Support: Though none were awarded this past academic year, to date, LDDI has administered a total of ten \$2,000 scholarships. Eligibility for these scholarships is restricted to students who have completed or are enrolled in certain LDDI courses.

Endowment Efforts Gain Momentum

Since its inception, the financial lifeblood of LDDI has been its corporate sponsorship program. This funding model consists of an annual sponsorship drive to raise operating revenue for program activities and personnel salaries. We are sincerely grateful for the current and past support of our corporate sponsors, but this model is not sustainable in the long term as it is susceptible to market fluctuations and affords no opportunity for program growth. This limited opportunity for growth is at odds with currently increasing market demand for LDDI graduates and increasing enrollment at the University, both of which result in increasing numbers of students attempting to enroll in what are already strained LDDI courses. An Endowment Campaign is currently underway to fund growth of the LDDI program through an endowed

principal fund, allowing LDDI to draw interest from the principal to expand. Our endowment goal is \$10 Million, which will provide an annual anticipated revenue of approximately \$420,000/yr. LDDI's endowment efforts gained major momentum recently with commitments from several long-time LDDI sponsors. At this time, we wish to recognize and thank the following firms and individuals for their belief in the LDDI program and their recent pledges of financial support directly toward the LDDI endowment:

- Pennoni: \$25,000/year for 5 years
- Bohler Engineering: \$12,500/year for 3 years
- Van Metre Homes: \$5,000/year for 3 years
 - Gordon: \$5,000/year for 3 years
- Anonymous Donor: \$5,000/year for 3 years
- Mr. Bill Junda: \$2,000/year for 3 years
 - Mr. John DeBell: \$5,000

LDDI's endowment efforts also received a boost earlier this spring when Virginia Tech held what will become an annual tradition with its inaugural Giving Day. Giving Day events are 24-hour online fundraising challenges that universities and other groups hold to raise donations by drawing together and inspiring alumni, students, faculty, staff, and all members of the affiliated community. The first day of spring provided the perfect backdrop for Giving Day, and for 24-hours, beginning at noon on March 20th, Hokies stepped up and gave. When the dust settled, a total of \$1,626,389 had been raised by the university. LDDI Coordinator Dr. Randy Dymond served as a Giving Day Ambassador, and in this role he put out the call to the LDDI network. The response was tremendous, with a total of \$9,100 in donations made directly to LDDI over this 24-hour period! One donor, Erin Donovan (Whitman, Requardt & Associates), said of her donation, "I truly believe that what LDDI is doing is one of a kind and very deserving of support, both monetary and otherwise. It was my pleasure to make a contribution toward LDDI's long-term growth and success, and Virginia Tech's Giving Day provided the perfect opportunity to do so." All of the donations made to LDDI on Giving Day were directed to the endowment fund.

Curriculum and Course Enhancement

Prior to creation of LDDI, students at Virginia Tech had only one land development design course offering available to them (CEE 4274, Land Development Design). Today, LDDI funding supports a total of five individual courses focused on Land Development design. These five courses comprise the most comprehensive undergraduate land development design curriculum in the entire country. As a direct result of LDDI's efforts over the past eleven years, we are confident in saying that Virginia Tech CEE graduates have a better foundation for a career in land development design than students from any other university.

We are extremely proud of the work we have done with the help of land development professionals to create a program that is vital to the land development industry, and on behalf

of the students benefitting from these courses, LDDI wishes to thank all of our business partners and individual donors without whom our program and curriculum would simply not exist!

The following section briefly summarizes the courses comprising the LDDI curriculum.

Introduction to Land Development (CEE 3274)

Making its debut during the fall 2009 semester, CEE 3274 – Introduction to Land Development Design quickly became an integral part of the overall LDDI curriculum. Prior to the creation of CEE 3274, no prerequisite existed for LDDI’s senior design course, CEE 4274. As a result, students often found themselves overwhelmed in the design course, not having the benefit of previously completing an applied introductory course on the



Sandy Collins-Camargo (ADS) speaks to a section of CEE 3274 during the spring '18 semester

subject matter. Fast forward to the 2017-18 academic year, and CEE 3274 has become entrenched not only in the LDDI curriculum, but also in the overall undergraduate CEE curriculum, as it is one of eight courses from which students must complete seven in order to graduate. The popularity of LDDI’s junior course has not come without its drawbacks. As a matter of departmental policy, junior-level, introductory CEE courses are capped at a maximum enrollment of 65 students. Prior to 2016, only two sections of CEE 3274 could be taught each year, with more than 60 students routinely left on waiting lists unable to take the course. As CEE 3274 is a prerequisite for CEE 4274, this resulted in an LDDI curriculum bottleneck and declining enrollment in our senior design course. In August 2016, Mrs. Claire White, PE was hired as an Assistant Professor of Practice with teaching assignments in both Civil & Environmental Engineering as well as the University’s Real Estate Program. Enabled by the hiring of Mrs. White, the fall 2016 semester marked the first time that two sections of CEE 3274 were offered. Since that time, and including the most recent academic year, LDDI Assistant Coordinator Kevin Young and White each teach a section of the course in both the fall and spring semesters, for a total of four course sections each academic year. Young and White coordinated closely to ensure that the two course sections remain chronologically on pace with each other, and they also hold common time exams across the two sections of the course. Looking ahead, two sections of CEE 3274 will continue to be offered during both the fall and spring semesters.

Land Development Design (CEE 4274)

LDDI’s “hallmark course”, CEE 4274, remains tremendously popular despite students being well aware of its demanding workload and time commitment! Beginning in the fall 2006 semester, and

facilitated through LDDI, students taking CEE 4274 have been paired with a professional engineering firm who serves as their mentor throughout the entirety of a semester long design project. LDDI would like to thank the following firms for their time and energy to serve as mentors to CEE 4274 students during the 2017-18 academic year:

AES Consulting Engineers
 ATCS
 Bohler Engineering
 Bowman Consulting
 christopher consultants
 Clark Nexsen
 Dewberry

Kimley Horn & Associates
 Gordon
 J2 Engineers
 McAdams Company
 Pennoni
 Tri-Tek Engineering



*Mentors from Bohler Engineering meet with their CEE 4274 student design team
 During the spring '18 semester*

Municipal Engineering (CEE 4254)

CEE 4254 – Municipal Engineering is offered during the spring semester of alternating years, and was taught during the spring 2018 semester, with an enrollment of 48 students. The 2018 offering of the course was taught by Mr. Randy Formica (Director of Engineering and GIS, Town of Blacksburg). Mr. Formica was assisted in course organization and design by James Patteson (Fairfax County Director of Public Works and Environmental Services) and Dr. Randy Dymond (LDDI Coordinator). The course focused on familiarizing students with the role of the municipal engineer, and the important relationship that exists between municipal engineers and the land development industry. The course included many guest speakers and 12 municipal engineering mentors who worked directly with students on projects. The course will next be taught during

the spring 2019 semester, marking the first time that it's been offered in consecutive academic years!

Sustainable Land Development (CEE 4264)

Sustainable Land Development was first offered during the spring 2008 semester as a one-credit seminar and was expanded to a three credit course shortly afterwards. The course continues to be very popular with students and the fall 2017 offering was no exception with an enrollment of 52 students! It is important to note that enrollment in the course is restricted to only those students with senior standing; however, students from *any* major may enroll. The intent of this arrangement is to introduce various perspectives to classroom discussion and better prepare students for careers where they will inevitably cross paths with professionals from a diversity of academic backgrounds. That being said, the course is incredibly popular among CEE students and these students dominate course enrollment. Taught by LDDI Coordinator, Dr. Randy Dymond, the Sustainable Land Development course focuses on the developed site's long term sustainability and preservation of the pre-development quality of its environment. Specific topics include site selection and linkage; neighborhood pattern and design, development impacts on water, air, and soil; microclimate; industrial ecology and materials; energy; and incentive driven sustainability efforts. The course also introduces students to third party site evaluation methods including Leadership in Energy and Environmental Design for Neighborhood Development (LEED ND), Envision, and Earthcraft Communities. Students visit development projects employing innovative, sustainable design features and a number of outside guest speakers give interesting presentations.

Advanced Land Development Design (CEE 4284)

CEE 4284 – Advanced Land Development is offered during the spring semester of alternating years, and was last taught during the spring 2017 semester. The course was taught by teams of industry consultants from Bohler Engineering, Draper Aden Associates, and Kimley-Horn & Associates. When CEE 4284 was first developed, the course focused on site grading and ADA requirements, storm sewer design and basin routing, and erosion and sediment control. Students are now being introduced to these topics in CEE 3274 and again, in the context of a design project, in CEE 4274. Through the growth and evolution of the LDDI curriculum, the CEE 4284 course now addresses the following topics:

- Stormwater quantity issues, including channel velocity/energy requirements set forth in the Virginia RRM regulations
- Stormwater quality treatment, including
 - Low Impact Development strategies and design of structural BMPs
 - Selection and installation of proprietary BMPs
 - Virginia's "Runoff Reduction Method"
- Site selection, due diligence and project entitlements
- The design-build process
- Infill development and development challenges in urban environments
- Security issues in certain developments

Advanced Land Development Design will next be offered in the spring of 2019.

Student Impressions of the LDDI Program

The core mission of LDDI is to produce civil and environmental engineering graduates who are not only aware of the career opportunities in land development, but prepared to hit the ground running in this exciting and ever-changing field. The following are testimonials from graduates of the LDDI curriculum.

“Since graduating from Virginia Tech and beginning my career in land development, I have repeatedly heard LDDI spoken of highly by those in industry for its outstanding preparation of students through offering “real-world” experiences and building skills. I agree with this perspective, as I am using the the foundation gained through the LDDI curriculum to begin my career. The wealth of experience and knowledge offered through the program is essential to furthering the success of students and thus the success of the program.”

- Jonathan Balderson, CEE '18, Designer I with LDDI Sponsors McAdams

“While at Virginia Tech, I was fortunate enough to take three of LDDI’s courses, including the CEE 4274 Design class. These classes made me feel more prepared and knowledgeable for civil engineering than all of my other classes combined. My first week in the workforce after graduating, I was neither surprised nor overwhelmed by the stacks of plan sets or large excel sheets. I was already accustomed to everything in the land development field thanks to these excellent classes at VT. While I truly believe VT’s land development education curriculum is matched by none, LDDI’s true benefit is its valuable access to unique networking opportunities. Whether it be the design charrette, its numerous guest speakers, or its Hokie House Career Night; I felt connected to those in my career field and confident I would find an employer where I could continue practicing land development right where I left off with LDDI.”

- John Connor Hill, CEE '18, Project Engineer with LDDI Sponsor J2 Engineers

“Throughout all of the LDDI courses, I enjoyed the practical design applications and the emphasis on “real world” problem solving strategies. The professional guidance for the CEE 4274 design class is unique to the course and I was able to learn invaluable technical and communication skills from my mentors at J2. The LDDI courses offer a unique method of teaching that provides students with the ability to learn in a classroom setting as well as to practice working in a group with land development professionals. Taking the LDDI courses helped me grow as an engineering professional.”

- Michele Mackey, CEE '18, Engineer with LDDI sponsor Whitman, Requardt & Associates

LDDI Assistant Coordinator Receives Award

Each academic year, Virginia Tech's College of Engineering awards four Certificates of Teaching Excellence (CTE). The selection process for this recognition is highly competitive, as the College employs nearly 400 faculty across 13 departments. During the spring 2018 semester, LDDI Assistant Coordinator Kevin Young was notified that he was awarded a CTE for his instructional efforts during the 2016-17 academic year. Kevin's recognition is noteworthy, as he now becomes a two-time CTE recipient, having also been recognized during the 2014-15 academic year.



LDDI Assistant Coordinator Kevin Young with Virginia Tech College of Engineering Dean, Dr. Julia Ross, following the 2018 Dean's Award Reception

Kevin's commitment to his instructional duties is well-documented, and along with this most recent CTE recognition he has previously been awarded the G.V. Loganathan Faculty Achievement Award and the prestigious College of Engineering Sporn Award for Excellence in Undergraduate Education. Regarding Kevin's commitment to his students, LDDI student and member of the Virginia Tech Honors class of 2019, Alison Beisner, states, "When I first approached Kevin for guidance in both my career and academic goals, it was the first time I met a professor who so readily put in extra time with a genuine concern about his students' success. Kevin has been eager to take on additional work to help me better understand challenging subject matter and work toward my Honors diploma, and I've witnessed him make these accommodations for numerous other students."

Kevin received his CTE at the Dean's Award Reception on April 30th. Please join us in recognizing and thanking Kevin for his commitment to LDDI and Virginia Tech's CEE students!

Practitioner Involvement Committee Update

The major objective of LDDI's Practitioner Involvement Committee (PIC) is to develop a strong and sustainable relationship between all sectors of the land development profession and the students within the Via Department of Civil and Environmental Engineering. This mentoring and social interaction helps prepare students for a career in the land development design business and gives

them professional contacts. The following describes some of the PIC-supported activities during the 2017-18 academic year.

Student Club Activities

With the aid of faculty advisors Kevin Young and Randy Dymond, and working closely with the LDDI Advisory Board, the Sustainable Land Development Club (SLDC) brings together students with a common interest in sustainability as it relates to land development design. Seniors Dante Coronado and Barrett Terrell provided student leadership for the SLDC this year, serving as co-presidents.

The SLDC coordinated with LDDI over the past year on a number of “standing” events, including fall and spring semester Career Night networking mixers, an overnight field trip to visit active construction sites, and a design competition/charrette. In April, for the sixth consecutive year, SLDC members provided stakeout surveying of the track for Virginia Tech’s annual Relay

for Life Event – the largest collegiate Relay event in the entire world! Throughout the 2017-18 academic year, the SLDC continued its partnership with Across the Way Productions, the group responsible for organizing the annual FloydFest music festival. In past years, SLDC members developed a series of site maps to help festival organizers address these issues. This year, the SLDC worked on the FloydFest site as well as other festivals across Virginia organized by Across the Way Productions. In other exciting news, this year the SLDC organized not one but two fundraiser events! It’s been an exciting year for LDDI students both inside and outside of the classroom!



CEE faculty member Claire White with SLDC students and food collected for the Montgomery County Christmas store during the fall '17 SLDC Food Drive



Students and practitioners mingle at the spring '18 Career Night Mixer at the Hokie House

Career Nights

This year, LDDI and the Sustainable Land Development Club (SLDC) continued their tradition of hosting a “Land Development Career Night” on the eve of the Civil & Environmental Engineering career fairs. This was the 19th and 20th consecutive semesters that a student-practitioner mixer of this type has been held by LDDI. The event was very well attended in both the fall and spring semesters with a good ratio of students to representatives from various LDDI sponsoring firms. These career nights are beneficial for

both the students and practitioners for numerous reasons. It allows the students to learn more about various roles and career opportunities in the land development field. The event also provides an opportunity for students to meet and mingle with prospective employers in a relaxed atmosphere prior to the potentially stressful atmosphere of the career fair. The casual setting of the Hokie House, a local restaurant and bar in Blacksburg, provides opportunities not only for career networking, but for practitioners to reminisce on their time as a student at Virginia Tech.

Fundraisers

During the fall 2017 semester, the SLDC organized two fundraiser events to support charitable causes. In November, the Club held a cornhole tournament to raise money for *Save the Children's* hurricane relief efforts in Puerto Rico. The event, held on the lawn behind Patton Hall, brought out students who ignored the cold, rainy conditions to pitch a game of cornhole for a good cause. In total, the SLDC raised \$160 through the tournament, an amount that was matched by the Virginia Tech Chapter of ASCE!

During the last full week of classes in early December, and responding to a call put forth to the community from the Montgomery County Christmas store, the SLDC organized a food drive. Club members placed boxes around Patton Hall and promoted the drive to their friends inside and outside of CEE. The end result was the back of SLDC faculty advisor Kevin Young's truck being packed full with what Christmas Store employees estimated to be over \$700 worth of donated food items!



Students have fun pitching cornhole while raising money for Save the Children

Field Trip

In April, LDDI Assistant Coordinator Kevin Young led a group of students on a field trip to Northern Virginia where they toured land development projects hosted by Bohler Engineering and J2 Engineers. Bohler's Michael O'Shaughnessy led students on a tour of a commercial site under construction in Chantilly, and of the field trip stated, "Having the LDDI students out to our site was a great experience for me, and Bohler was honored to be involved. The students were very engaged throughout the entire site visit and it was evident that they understood the fundamentals of Land Development. Being able to see the site under construction definitely helped them to understand the process even further." Following the tour of the Chantilly commercial development, the students met up with Jeff Gilliland in Leesburg to tour the enormous Meadowbrook residential project that his firm has been heavily involved with. By touring both a commercial and residential site, students were exposed to some of the unique design challenges associated with contrasting types of developments.



Jeff Gilliland (J2 Engineers) reviews plans with students before touring the Meadowbrook development in Leesburg

LDDI has long recognized and appreciated the value in getting students out of the classroom and onto active job sites, and this spring's field trip marks the sixth such voyage out of town. By visiting development projects in the various regions of Virginia, including NOVA, Richmond, and Tidewater, students gain insight into site conditions that are significantly different than those found on and around the Virginia Tech campus. CEE student Andrew Plato attended the field trip, and offered the following comments on the experience. "The LDDI spring field trip is a fantastic opportunity to learn about the land development and cultivate relationships with peers that share a common interest. It is extremely encouraging to hear industry professionals validate the teachings of our LD courses at Virginia Tech."



Michael O'Shaughnessy (Bohler Engineering) talks to students on the Chantilly Wegman's active construction site

Design Charrette and Competition

This spring, LDDI hosted its sixth annual Design Charrette Challenge. Leading the event for the fourth time, Dewberry's Skip Notte traveled north from Charlotte to present student teams with a site design challenge. Following a brief introduction to the site and the "client's" development goals, student teams were given one-hour to work toward a design that met these goals while also adhering to relevant codes and design principles. Dinner was provided to the student participants while their designs were judged by Notte, CEE department faculty members, and Draper Aden Associates' Kyle White. In total, 27 students participated in the contest, and the top team took home a \$100 gift card to Buffalo Wild Wings! All event participants were given prizes for their efforts. This year's design charrette winners are noteworthy in that they are repeat winners, duplicating their first place efforts from the prior spring's competition! It's clear that this team knows how to effectively work on a site design challenge under the pressure of a ticking clock! Congratulations to our two-time winning team comprised of Mandy Dejonghe, Franklin Heinzmann, Michael Jeska, and Kyle Vaughan.



A student team at work during the 2018 Design Charrette & Competition



The two-time defending champions of the LDDI Design Charrette & Competition proudly show off their winning 2018 effort

LDDI Students are Recognized

This April, for the fourth consecutive year, the LDDI Advisory Board recognized some of the outstanding students in the LDDI program. As enrollment across Virginia Tech, and in particular the College of Engineering, continues to increase, it is important to note that most LDDI courses typically have enrollments ranging from 40 - 70 students. There are many outstanding students in the LDDI curriculum, and for a student to distinguish his or herself among their peers from within these large class sizes is truly commendable. It is with a great deal of pride that we recognize the following students for the 2017-18 academic year.

Hokie Stone Award: This award is given annually to the LDDI student who is as solid as its namesake – a team player whose leadership and personality elevated the performance of all those around him. The recipient of this year's Hokie Stone Award is senior Barrett Terrell. Barrett was integral to the success of a 4274 team mentored by J2 Engineers during the fall 2017 semester, and that team was invited to present at the 2018 LDDI winter meeting. Barrett has also been a committed officer of the SLDC, doing everything asked of him and doing so with a tremendously positive attitude. Through his position in the SLDC, Barrett played a lead role in securing approval for the ESC plans for the expansion of a Baja test track for the Mechanical Engineering Department. Barrett led a group of CEE and ME students in the survey of the existing Baja track and the development of design plans for its improvement.

Leadership in Sustainability: The Leadership in Sustainability award is given annually to recognize an LDDI student with a commitment to sustainability as it relates to land development design. This year's recipient of the Leadership in Sustainability award is Helen Chen. During the fall 2017 semester, Helen immediately caught the attention of CEE 4264 (Sustainable Land Development) instructor Dr. Randy Dymond and course TA Meghan Hekl. Helen demonstrated a commitment to topics of sustainability with truly stellar performance across all subject matter in CEE 4264. We're pleased to note that Helen will be continuing her academic pursuits at Virginia Tech as she prepares to begin pursuit of a Master's degree under the advisement of LDDI Coordinator Dr. Randy Dymond.



LDDI Assistant Coordinator Kevin Young presents Michelle Mackey with the CEE 4274 2017-18 Female Student of the Year Award

CEE 4274 Female Student of the Year: This award is given annually to the exceptional female student in the fall and spring offerings of CEE 4274. During the fall 2017 semester, working under the mentorship of J2 Engineer's Jeff Gilliland, Michele Mackey demonstrated outstanding proficiency across all course topics in CEE 4274. Michele and her teammates' efforts resulted in an invitation to present their design project at the 2018 LDDI winter meeting. Of working with Michele in CEE 4274, mentor Jeff Gilliland offered the following comments. I really enjoyed working with Michele and her group last fall. I challenged them from the first day we met. With each LM, they put forth increased effort to meet the challenge. We had a weekly online meeting and Michele typically took the lead for her group. She always had very good questions that made the calls productive. The best compliment that I can offer is that she also listened to the advice that I offered along the way. Michele's group did an excellent job on their project. I definitely think that some of the group's success can be attributed to Michele's leadership on the calls; and to their efforts to apply what they learned from those meetings." Michele will begin work later this summer with LDDI sponsor Whitman, Requardt & Associates.

CEE 4274 Male Student of the Year: This award is given annually to the exceptional male student in the fall and spring offerings of CEE 4274. During the spring 2018 semester, Franklin Heinzmann was a member of a student group mentored by a team of engineers from Bohler Engineering. Franklin's leadership, professionalism, and attention to detail helped his team earn an invitation to present their CEE 4274 design project at the 2018 LDDI summer meeting. Chris Rose from Bohler Engineering says of Franklin, "Right off the bat I could tell Franklin is a confident individual who isn't afraid to take lead. He has proved to be a strong team player and communicator, and I am sure he will be successful in the future." It's also worth noting that Franklin was a key member of a student design team that won first place in back-to-back LDDI Design Charrette Competitions! Franklin is now employed with LDDI sponsor WithersRavenel.

At this year's award ceremony, we also recognized Meghan Hekl, who over the past two years has served as a GTA in multiple LDDI courses, as well as serving as the student representative to the LDDI Advisory Board. Meghan defended her Master's thesis in May and will begin work later this summer with LDDI sponsor VHB in their Richmond office.

Research Committee Update

LDDI's Research Committee was established over five years ago with its primary objective defined as overseeing efforts to conduct and administer independent research aimed at providing scientifically-based evidence concerning the practicality and suitability of existing and emerging techniques, technologies, and policies to address engineering issues related to land development design. The Committee is further charged with identifying research goals, seeking funding, and providing overall, strategic direction to the broader research team, as well as promoting the pursuit of research within the industry and encouraging the use of LDDI as the vehicle of investigation.

To date, a LDDI's research activities have largely focused on urban stormwater issues. With Virginia adopting new stormwater management regulations just a few short years ago – regulations that greatly impacted and continue to impact the land development industry - this research focus remains both timely and demonstrative of LDDI's commitment to remaining at the forefront of issues that most directly impact the land



LDDI Coordinator, Dr. Randy Dymond, presents at the ASCE EWRI Congress in Minneapolis, MN

development industry. Over the past year, LDDI, through the Via Department of Civil & Environmental Engineering, completed funded research contracts with the Town of Blacksburg, the City of Roanoke, and Fairfax County. Work with these municipalities involved developing innovative technologies and strategies to assist them in better managing their assets, complying with Municipal Separate Storm Sewer System (MS4) and other legislative requirements, and developing watershed master plans.

Earlier this summer, LDDI's research activities received major national exposure when program Coordinator Dr. Randy Dymond and Assistant Coordinator Kevin Young each presented research at ASCE's Environmental & Water Resources Institute (EWRI) Congress in Minneapolis, MN. Exposure of this type is invaluable in spreading awareness of LDDI and research efforts at Virginia Tech.

Outreach Committee Update

The major objectives of LDDI's Outreach Committee are: 1) to promote the field of land development engineering to students and encourage their participation and support; and 2) to promote the Land Development Design Initiative to land development professionals and encourage their participation and support of the program. The committee has remained active this year serving as the primary logistics coordinator for the long-standing summer and winter

general meetings, as well as the new spring general meeting in Charlotte. The outreach committee also takes the lead role on LDDI's annual spring sponsorship drive. The Outreach Committee is co-chaired by Bohler Engineer's Charlie Yowell and Brett Buckland.

How to Get Involved with LDDI

To continue the success and sustainability of the Land Development Design Initiative, both time and money is needed from the industry. You and your company can get involved by becoming a financial contributor, becoming a general member, or donating your time by serving on a committee or helping with course offerings.

Corporate Sponsorship and Individual Giving

Over the last year, LDDI enjoyed the support of 45 corporate sponsors and nearly 100 individual donors. There are four levels of annual corporate sponsorship which afford varying levels of student/corporate interaction and exposure. For more information, please contact Kevin Young or Randy Dymond and view our website at <http://www.lddi.cee.vt.edu>.

General Membership

Since its earliest beginnings, LDDI has depended heavily on the volunteer efforts of its general membership to achieve program goals. The past twelve years have seen LDDI grow to become a nationally-recognized leader in undergraduate land development design education. Despite the program's rapid growth, LDDI continues to embrace an organic, grass roots operational model. This model relies on the participation of industry professionals who sincerely believe in LDDI's mission. There are currently well over 750 general members of LDDI, many of whom attend semi-annual meetings, both on-campus and at locations across the state. During these meetings, these general members contribute ideas for practitioner involvement, courses, and other aspects of the program.

For more information on how to get involved with LDDI, please contact:

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