



Pro-GREEN-LABs - 101129466

Promoting Green Competences for Integrated Sustainable Development in Architectural Education through Experiential, Lab-based, Active Learning.

D3.4. ESTABLISHED LAB UNIT PORTFOLIOS

Lead Beneficiary: Cairo University

Issued by: AU- CU- AASTMT- UoP- GJU



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EXECUTIVE SUMMARY

This deliverable consolidates the portfolios of the five lab units established at SEMED HEIs. To ensure coherence across partner institutions while allowing contextual flexibility, partners adopted a shared reporting framework, which each university adapted to reflect its specific lab characteristics. Each report is structured into four main sections:

- **Aims, Mission Statement, and Scope of Interests**, outlining the lab's vision and areas of focus;
- **Hard Capacities**, detailing the physical venue as well as the available equipment and software;
- **Soft Capacities**, describing the administrative hierarchy, communication channels, academic and non-academic partnerships, and sustainability strategies;
- **Integration of Teaching and Scientific Research**, explaining how the lab's activities are embedded within educational programs and research initiatives.

NOTES ON LABS INAUGURATION EVENT

The five labs at SEMED partner universities were officially inaugurated during an event held on **Wednesday, June 25, 2025, from 10:00 to 12:00 CEST**. This event marked a key project milestone, **MS05 – Official Lab Inauguration**.

Besides the introductory opening notes and the concluding remarks the online event comprised two main sessions: The first, Session I, featured brief presentations from the five newly established labs followed by a roundtable discussion in the second part, with representatives from EU partner labs. The EU labs representatives shared insights into their lab activities and approaches to integrating lab-based learning into teaching and curricula.

The event program is available at: [\[HERE\]](#)

For the recording of the full event: [\[HERE\]](#)



The poster is a green-themed invitation for the Pro-GREEN-LABs Lab Unit Inauguration event. It includes the following information:

- Event Title:** Pro-GREEN-LABs: LAB UNIT INAUGURATION
- Date:** Wednesday, June 25th, 2025
- Time:** 10:00 - 12:00 CEST / 11:00-13:00 Cairo Time / 11:00-13:00 Amman Time
- Meeting Link:** <https://polimi-it.zoom.us/j/95656631868>
- Labs Networking survey:** A QR code is provided for the survey.
- Project Partners:** Logos for Bauhaus-Universität Weimar, Politecnico Milano 1863, Chalmers, Alexandria University, Cairo University, and GJU are displayed.
- Event Program:**
 - WELCOMING AND OPENING NOTES:** Welcoming notes and introduction to the Project by Prof. Dr. Frank Eckardt, Project Coordinator, Bauhaus-Universität Weimar; Dr. Zahra Al-Said, National Coordinator of the Erasmus Plus Program in Egypt; Ahmed Moustafa, Bauhaus-Universität Weimar.
 - SESSION I: INTRODUCING PRO-GREEN LABS:**
 - City Transformation Lab (CT Lab), Alexandria University, AU (Prof. Dr. Naveed Ghaleb)
 - The Urban Form Lab (UFL), Cairo University, CU (Prof. Dr. Sahar Ibrahim & Prof. Dr. Alaa Alsayed)
 - Environmental Design Lab (EDL), Arab Academy for Arab Academy for Science, Technology & Maritime Transport, AASTMT (Dr. Yasmine Kandil)
 - Sustainable Urbanism Lab, The German Jordanian University, GJU (Dr. Marwan Tawil)
 - The Urban Green Lab, University of Petro, UoP (Dr. Amro Yaghi)
 - SESSION II: INSIGHTS FROM EU LABS:**
 - ROUNDTABLE DISCUSSION:**
 - Panelists | EU Labs:**
 - Dr. Stefania Rogozino, National Research Council, Research Institute on Innovation and Services for Development, Naples, Italy.
 - Prof. Dr. Barbara Figa, LabSimUrb, Department of Architecture and Urban Studies, Politecnico di Milano, Milan, Italy.
 - Dr.-Ing. Tonia Annick Schmitz, Secretary General of BAUHAUS4EU European University Alliance, Bauhaus-Universität Weimar.
 - CONCLUDING REMARKS:** Dr. Ibraa Mahmoud, LabSimUrb, Department of Architecture and Urban Studies, Politecnico di Milano, Milan, Italy.

Figure 1: Poster and Invitation to the Labs Inauguration Event

For Session I, SEMED Partners had 10 minutes to present each of the SEMED Labs. Presentations highlighted aims, objectives, partnerships, the venue, allocated equipment and software applications, upcoming activities among other related topics.

For the round table discussion, the invitation was extended to three experts, however, one of them (Dr.-Ing. Tonia Schmitz) apologized for personal reasons.

In the Roundtable discussion, the moderator, Prof. Eugenio Morello, quickly introduced the two panelists, then he shared the following questions for each of them for reflection.

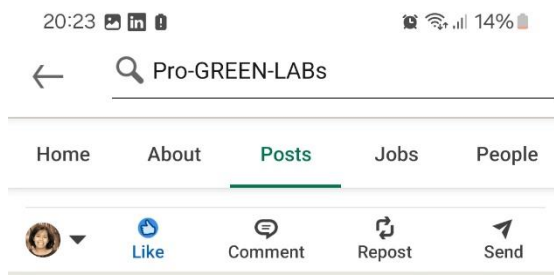
- **Initial reflections** (icebreaker, a very quick comment) Based on what you've just heard about the newly launched SEMED Labs, what did you find particularly interesting or promising? From your experience, what is one challenge you believe these labs should be prepared to face?
- **Lab activities and teaching integration** How do you currently integrate lab activities into teaching at your institution? In particular, how does the principle of sustainability inform your teaching—whether through methods, daily logistics (e.g., use of materials, space, energy), or the content delivered to students?
- **Research perspectives** From your current research projects, what directions or opportunities do you see for research that could be strengthened or expanded through collaboration with the SEMED Labs?
- **Toward a transnational network of sustainability labs** (a final very quick reply) One of the key ambitions of the Pro-GREEN-LABS project is to establish a lasting network of university laboratories across Europe and the SEMED region. Do you see value in building such a network? What forms of collaboration—knowledge exchange, joint research, shared curricula—do you think would be most beneficial?

Invitation posts were shared across all Pro-Green Labs platforms—including the website and social media channels—two weeks, one week, and one day prior to the event. Below are the links to the event invitations. Besides, each of the five labs and EU partners also posted the invitation to their circles.

Below are sample links to the event announcement/ invitation:

https://www.linkedin.com/posts/pro-green-labs_erasmusplus-progreenlabs-sustainability-activity-7340619255232499712-FApU?utm_source=share&utm_medium=member_desktop&rcm=ACoAACD3_2gBDyq7tfkbgQU-Gb3jASsujHZK9zI

<https://www.facebook.com/progreenlabs/posts/pfbid0WGiBsgsHvcP8eDLAQwftjEw8Vitsde mebbg6c9daDef1jUXUgEGqLdrBZoPJynJZl>



Pro-Green-Labs

276 followers
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Pro-Green-Labs: LAB UNIT INAUGURATION

- 📅 Date: Wednesday, June 25th, 2025
- 🕒 Time: 10:00 - 12:00 CEST | 11:00-13:00 Cairo Time | 11:00-13:00 Amman Time
- 🔗 Meeting link: <https://lnkd.in/dWCiZNqR>
- 📅 EVENT PROGRAM: <https://lnkd.in/dA8Vhuut>

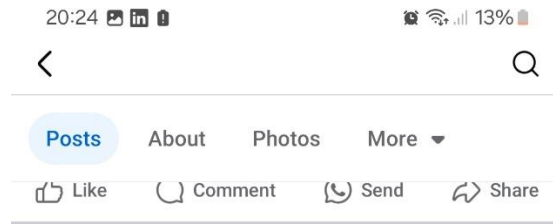
This event marks the soft opening of the newly equipped Pro-Green-Labs units across the five SEMED partner institutions. Each lab is now furnished with a range of hardware and software tools tailored to support research and innovation in sustainable urban development. These include 3D printing, modeling tools, environmental simulation software, and equipment for climate-responsive design testing. The inauguration signifies the completion of Phase 2 of the project and the beginning of Phase 3, where these labs will serve as active hubs for experimentation, teaching, and applied research in green urbanism and resilience.

- 📄 LABs Brochure: <https://lnkd.in/d9dV5uNZ>

Bauhaus-Universität Weimar, Politecnico di Milano, Chalmers University of Technology, Arab Academy for Science, Technology and Maritime Transport, Cairo University, Alexandria University, German Jordanian University, University of Petra "جامعة البترا"

Laboratorio di Simulazione Urbana Fausto Curti
CT Laboratory
Urban Form Lab - Cairo University

#ErasmusPlus #ProGreenLabs #Sustainability
#Architecture #UrbanLabs #CapacityBuilding
#GreenSkills #Lab #inauguration



Pro-Green-Labs

17 Jun ·

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- 🔗 Meeting link: <https://lnkd.in/dWCiZNqR>
- 📅 EVENT PROGRAM: <https://lnkd.in/dA8Vhuut>

This event marks the soft opening of the newly equipped Pro-Green-Labs units across the five SEMED partner institutions. Each lab is now furnished with a range of hardware and software tools tailored to support research and innovation in sustainable urban development. These include 3D printing, modeling tools, environmental simulation software, and equipment for climate-responsive design testing. The inauguration signifies the completion of Phase 2 of the project and the beginning of Phase 3, where these labs will serve as active hubs for experimentation, teaching, and applied research in green urbanism and resilience.

- 📄 LABs Brochure: <https://lnkd.in/d9dV5uNZ>

#ErasmusPlus #ProGreenLabs #Sustainability
#Architecture #UrbanLabs #CapacityBuilding
#GreenSkills #Lab #inauguration



Figure 2: Screenshots from social media pages for the event invitation

ESTABLISHED LAB UNIT PORTFOLIO

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1. AU ESTABLISHED LAB UNIT PORTFOLIO: CT LAB

This report offers a comprehensive overview of the City Transformation Lab, Alexandria University. The lab was established in 2025 through Pro-green labs.

1.1. Aims, Mission Statement and Scope of Interests

The **City Transformation Lab** is an interdisciplinary platform that supports applied research, innovation, and training in the fields of architecture, urbanism, heritage conservation, and environmental design. As cities in the Global South face unprecedented ecological, spatial, and social challenges, the CT Lab seeks to reimagine urban futures through integrative and context-sensitive approaches.

AIMS: The CT Lab seeks to:

- Promote interdisciplinary research that contributes to the development of resilient and inclusive urban environments.
- Support documentation, conservation, and adaptive reuse of cultural heritage assets in rapidly changing urban contexts.
- Enhance education and capacity building in architecture and urban design through hands-on workshops and practice-based learning.
- Encourage knowledge transfer and innovation by connecting researchers, students, and community stakeholders.
- Serve as a catalyst for sustainable urban development through strategic partnerships and academic exchange.

MISSION: Our mission is to foster a dynamic and growth-oriented environment that motivates esteemed professional researchers and practitioners from diverse architectural and urban backgrounds to benefit from our facilities and academic activities. We are also committed to supporting young and undergraduate architects and researchers, guiding them in clearly and confidently shaping their career paths. By focusing on mapping and urban studies, Cultural Heritage Preservation, and environmental studies and materials, we aim to advance innovative research and promote interdisciplinary collaboration.

VISION: We aspire to the CT Lab to be a leading research hub for urban and architectural innovation and academic excellence. Our goal is to adopt interdisciplinary collaboration, inspire critical thinking, and advance sustainable urban solutions. We aim to preserve cultural heritage, enhance environmental resilience, and create sustainable urban environments. We are committed to engaging with the local community to ensure our research has practical benefits and supports urban development.

1.2. Hard Capacities of the City Transformation Lab

This section outlines the **hard capacities** of the **City Transformation Lab** at Alexandria University. These include physical infrastructure, equipment, and software assets that support the Lab's operations, research activities, and academic engagement.

1.2.1. Venue

The **CT Lab** is located on the first Floor of the Department of Architecture, **Faculty of Fine Arts, Alexandria University**, as a part of educational section of the department beside the department library. The space is designed to encourage innovation, interaction, and flexible use for both individual and group work.

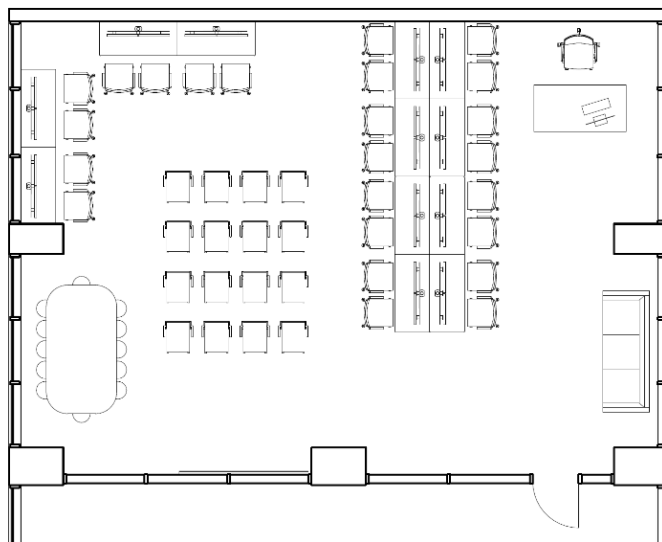


Figure 1: The CT Lab Plan

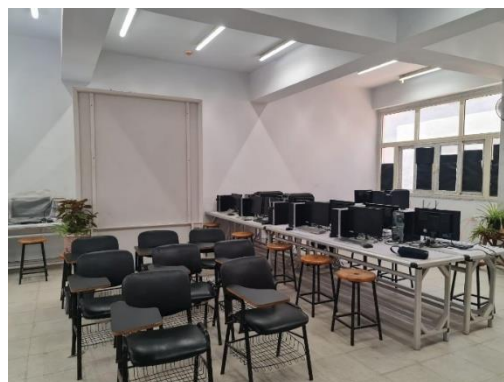
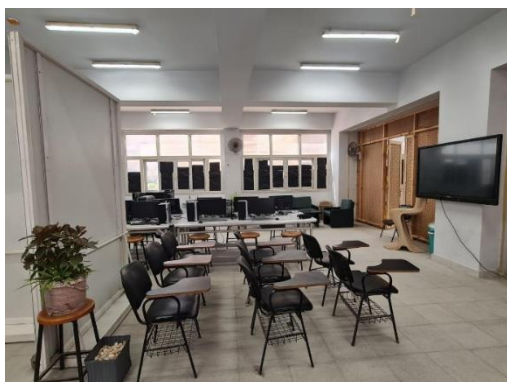
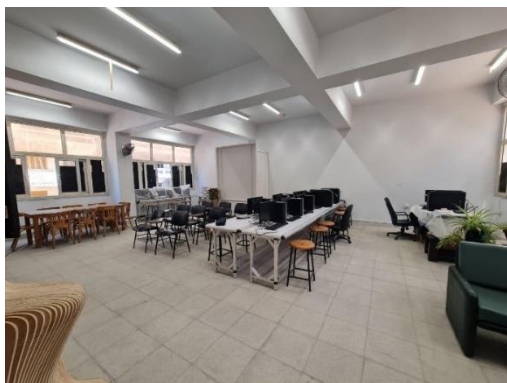


Figure 2 : Photos of CT Lab Venue

1.2.2. List of Equipment and Software

The establishment of the CT Lab marks a pivotal step in advancing interdisciplinary research, sustainable urban innovation, and experimental learning environments. The lab is equipped with a diverse range of tools and technologies that facilitate cutting-edge exploration across architecture, planning, and urban media. The following inventory showcases the specialized resources available within the lab.

Table 1: List of Equipment & Software Applications

NAME	MODEL
COMPUTATIONAL INFRASTRUCTURE	
15x Desktop PC	
3x Work Stations PC	
5x GIS Software	ESRI ArcGIS Pro
Photogrammetry Software	AgiSoft Metashape
PRINTING AND DOCUMENTATION TOOLS	
A3 Printer – Scanner - Copier	Laser Printer, Scanner, and Copier
A3 Printer – Scanner - Copier	Laser Printer, Scanner, and Copier
PRESENTATION AND VISUALIZATION EQUIPMENT	
2x Projector	Projector Full HD
Projector	Projector Full HD
VR Mask	
ENVIRONMENTAL AND MONITORING TOOLS	
Universal IAQ instrument	Testo 440 with CO ₂ + Lux + Vane probes
U-Value Measurement Kit	Testo 635-2 Thermohydrometer set
Thermal Camera	Testo 865s - Thermal imaging camera
3x Data logger	Testo 174 H - Mini data logger for temperature and humidity
2x People Counter	Pearl Wireless People Counter
2x Handheld GPS	
Laser Meter	Bosch
MEDIA AND RECORDING EQUIPMENTS	
Camera	Canon 6D Mark 2
Sound Recorder	H1n
FABRICATION TOOLS	
3D Printer	Prusa MK4 3D

	Equipments already exist
	Purchasing in progress

1.3. Soft Capacities of the CT Lab

This section describes the **soft capacities** of the City Transformation Lab, with a focus on its human resources, organizational structure, and collaborative working culture. These capacities are essential for sustaining the Lab's operations, implementing projects, and engaging with academic, governmental, and community stakeholders.

1.3.1. Administrative Hierarchy of Staff

The CT Lab operates under a well-defined administrative hierarchy designed to ensure effective governance, research excellence, and operational efficiency.

At the **top of the hierarchy** is the **Scientific Committee**, composed of two to three senior academic staff members. This committee sets the strategic direction of the lab, oversees its academic integrity, and ensures alignment with the broader goals of the Faculty of Fine Arts. It plays a central role in research agenda setting, evaluation, and fostering interdisciplinary collaboration.

Directly below the committee is the **Lab Manager**, who supervises the lab's daily operations, maintenance, and compliance with safety and academic standards. The Lab Manager acts as a bridge between strategic oversight and technical execution.

Reporting to the manager is **three Heads of Fields**, each responsible for one of the lab's core domains: Environmental Studies and Materials, Mapping and Urban Studies, and Cultural Heritage Preservation. They guide specialized research, support academic integration, and manage field-specific resources and collaborations.

Each Head of Field is supported by a **Specialist** who assists in daily lab operations, offers technical support, and ensures equipment functionality and safety.

Working alongside the specialists are the **Technical Staff**, who provide hands-on assistance in equipment setup, maintenance, and student training. They also help enforce safety standards and manage lab inventories.

To ensure administrative efficiency, a **Lab Admin Officer** manages user reservations, documentation, and communication, acting as a key liaison between users and lab staff.

Lastly, the **Business Developer** plays a strategic role in expanding the lab's external partnerships, promoting its services, and generating revenue through client acquisition and contract management.

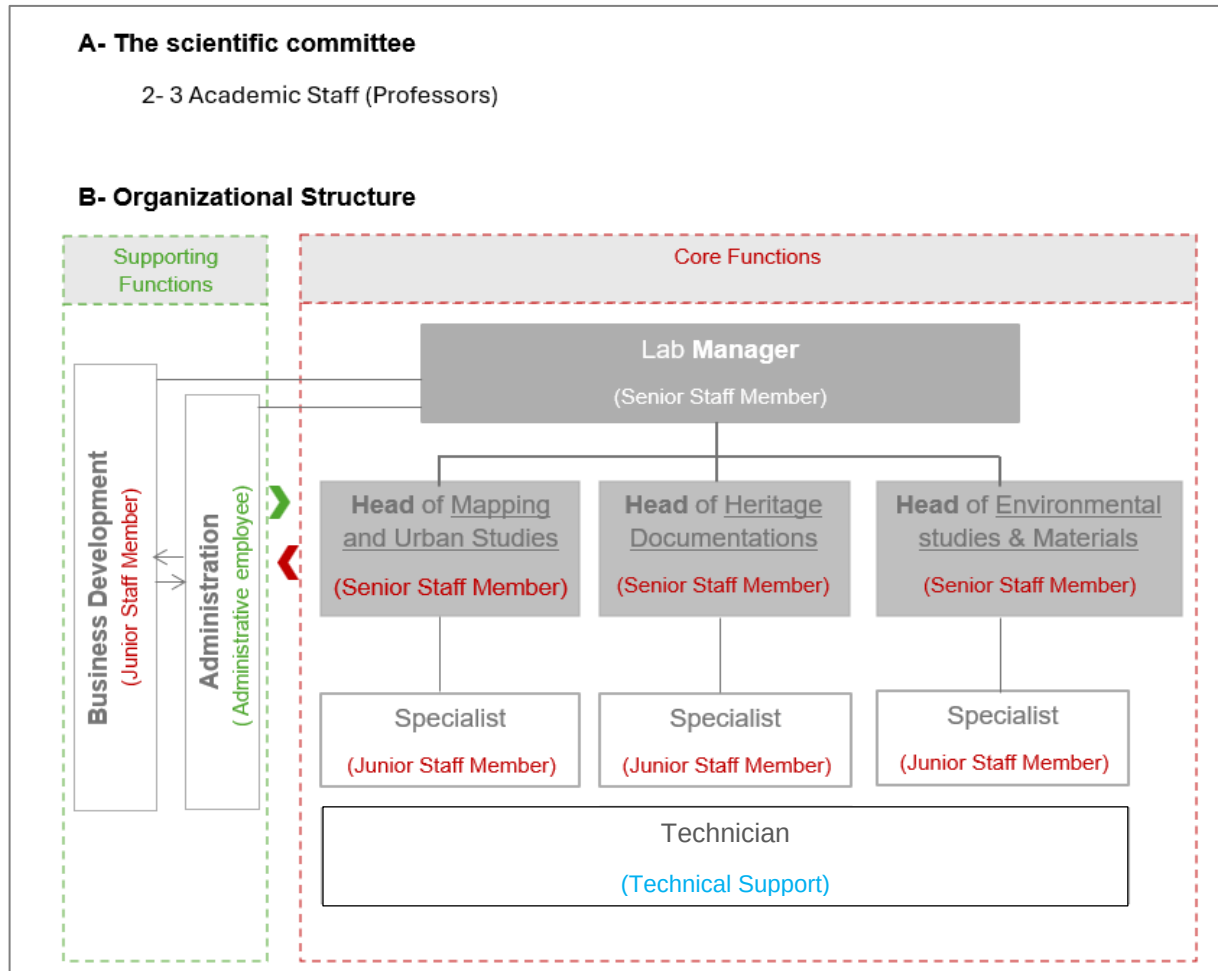


Figure 3: The Organisational Structure of the CT Lab, Alexandria University

1.3.2. Communication Channels and Contacts

The CT Lab, Alexandria University, has established a strong online presence by creating dedicated social media pages. These platforms serve as a vital tool for sharing the lab's activities, research, and projects related to City Transformation and architecture.

LinkedIN: CT Laboratory

<https://www.linkedin.com/in/ct-laboratory-849922364/>

Facebook: CT Lab – City Transformations Lab

<https://www.facebook.com/profile.php?id=61557639250483>

Instagram: citytransformations.lab

<https://www.instagram.com/citytransformations.lab/>

CONTACT PERSONS:

Lab official e-mail: ct.lab@alexu.edu.eg

Dr. Mai Karram : maikarram@alexu.edu.eg

Dr. Hebah Moanis: hebah.m.hatem@alexu.edu.eg

1.3.3. Partners (Academic and Non-Academic)



Figure 4: Academic and non-academic partners of the City Transformation Lab – Alexandria University

The CT lab at Alexandria University is founded on a collaborative ethos, actively engaging with academic and civic partners to advance inclusive urban innovation. These partnerships serve not only to strengthen the lab's research capacity, but also to foster mutual learning and cross-disciplinary exchange.

■ Academic Collaborations

CT lab has established strong ties with institutions such as Brandenburg University of Technology Cottbus-Senftenberg, Universität Kassel, Beirut Arab University, University of Jordan, and University of Duhok. Through joint research, pedagogical exchange, and interdisciplinary dialogue, these partnerships contribute to ongoing inquiries into sustainable architecture, urban morphology, and design-led regeneration.

■ Civic and Professional Engagements

The lab also works closely with non-academic entities, including CLUSTER (Cairo Lab for Urban Studies, Training and Environmental Research), to bridge academic exploration with on-the-ground realities. Such engagements provide valuable insights into local contexts and support the co-development of place-based strategies, allowing the lab to remain responsive to evolving urban challenges and civic aspirations.

1.3.4. Strategies for sustainability

This section describes the urban lab financial and governance strategies, and the framework created to ensure that both financial and governance efforts support long term sustainability.

■ Financial Sustainability Strategies

The CT Lab ensures financial sustainability through a multi-stream strategy integrated within the Faculty of Fine Arts' financial framework at Alexandria University. While it does not operate with an independent budget, it benefits from several coordinated funding sources. Core operations are partially supported through the faculty's annual budget and the Educational Services Fund, which contributes to resource development and maintenance.

To enhance self-sufficiency, the lab generates internal revenue through paid services, specialized workshops, and training activities. These funds are managed within the faculty's

treasury according to university financial regulations. The lab also partners with external institutions and industries via the faculty's Special-Purpose Unit, allowing it to receive and administer funds for collaborative initiatives.

Moreover, the lab may access funding from faculty-led research projects and externally funded grants aligned with its mission. This diversified financial approach not only secures operational stability but also enables the lab to expand its services and research capabilities while remaining compliant with institutional governance structures.

- Governance Sustainability Strategies

The CT Lab's governance sustainability is rooted in a comprehensive monitoring and evaluation framework that ensures accountability, continuous development, and strategic alignment with the Faculty of Fine Arts. Governance operates at multiple levels, starting with internal monitoring led by the Lab Manager, who oversees daily operations, safety, and technical implementation. Weekly coordination meetings with department heads, technical staff, and the business developer support operational efficiency and goal alignment. The Scientific Committee provides high-level academic and strategic oversight through periodic evaluations of research quality, academic integration, and ethical compliance. Stakeholder feedback is actively gathered from students, faculty, and external collaborators via surveys, focus groups, and consultations to refine services and user experience. Performance is assessed using qualitative and quantitative KPIs, such as research outputs, training hours, collaboration metrics, and revenue generation. An annual performance report, reviewed by faculty leadership, informs future strategic planning. For externally funded projects, the lab complies with international evaluation protocols, ensuring governance remains responsive, transparent, and impact-driven.

1.4. Integration of Teaching and Scientific Research within Lab

The CT Lab at the Faculty of Fine Arts, Alexandria University, serves as a cross-disciplinary platform that integrates teaching, research, and innovation. It is open to all academic departments within the faculty—including architecture, design, conservation, and urban studies—providing instructors with access to advanced equipment and specialized spaces to enhance their teaching methodologies through hands-on learning and experimentation.

Beyond its teaching function, the lab supports faculty-affiliated researchers in conducting applied and practice-based research, particularly in the areas of sustainable design, environmental performance, cultural heritage technologies, and digital mapping. This dual focus creates a synergistic relationship between education and research, ensuring that academic programs remain grounded in real-world applications and evolving scientific inquiry.

The CT Lab actively fosters collaboration with academic institutions, cultural entities, industry stakeholders, and governmental bodies, both locally and internationally. By mapping stakeholder interests and aligning them with the lab's research priorities, the lab facilitates joint research projects, co-developed courses, and experimental initiatives such as living labs—where theory meets practical implementation. This integrated approach positions the CT Lab as a dynamic hub where innovation, education, and public engagement intersect.

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1. CU ESTABLISHED LAB UNIT PORTFOLIO: URBAN FORM LAB

This report offers a comprehensive overview of the Urban Form Lab, Cairo University. The lab was established in 2021 and is upgraded through Pro-green labs.

1.1. Aims, Mission Statement and Scope of Interests

The **Urban Form Lab** is a service laboratory, and a Centre for Urban critical and creative thinking, teaching, research and practice in Architecture, Urban Form and Urbanism. The lab is based at the Department of Architecture, Faculty of Engineering, Cairo University.

AIMS: The lab aims at engaging and collaborating with; undergraduate and postgraduate students, researchers, academic and professional partners, local communities, local authorities and international partners to address and investigate issues related to cities and urban areas. The lab seeks to; monitor, extrapolate, and reach better understanding of urban spaces, places and settings, and to propose appropriate solutions to urban problems through detailed analysis of its physical and non-physical contexts; together with the closely related historic, environmental and cultural aspects and influences. The lab seeks to undertake studies, formulate and develop; contextual and environmental, economic and socially sustainable proposals.

MISSION STATEMENT: The lab adopts and deploys urban design and community design methodologies and approaches in addressing; research studies, projects, and urban issues, problems and challenges – this enables the lab to effectively contributing to and enhancing; urban design and community design knowledge and practices and to integrate research studies, projects, practice, and products, into architectural education and learning process, for the undergraduate and postgraduate levels at the Department, the Faculty and the University.

SCOPE OF INTEREST: Projects, research and applied studies, closely related to the aims and objectives of the Urban Form Lab, include the following realms:

- Urban Design (various scales and levels),
- Formulating, developing, and proposing; architectural and urban Development Control Guidelines and Regulations for existing and new urban areas,
- Urban Identity and Character of Historical and Heritage areas (conservation, protection, and control),
- Infill Design in urban Historic, Heritage and Areas of Value,
- Urban Form and Morphology studies,
- Design and development of Urban, Open Spaces and Places.
- Urban Health, Quality of Life, and Quality of the Built Environment,
- Design and development of Public Spaces in Residential areas,
- Urban Design and Development studies.

1.2. Hard Capacities of the Urban Form Lab

This section outlines the **hard capacities** of the **Urban Form Lab** at Cairo University. These include physical infrastructure, equipment, and software assets that support the Lab's operations, research activities, and academic engagement.

1.2.1.Venue

The **Urban Form Lab** is housed on the **4th floor of the Department of Architecture**, Faculty of Engineering, **Cairo University**. The Lab is strategically located within the academic heart of the Faculty of Engineering, Cairo University, fostering daily interaction with faculty members, researchers, and students. Its proximity to lecture halls and design studios supports integrated learning and collaborative research.

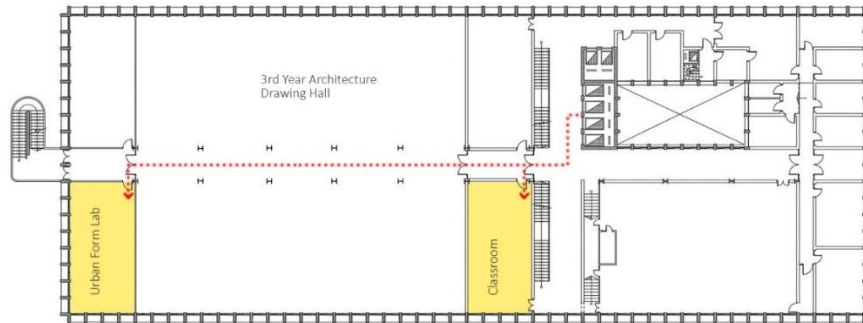


Figure 1: The Urban Form Lab, the 4th Floor, Department of Architecture, Faculty of Engineering, Cairo University



Figure 2 : Plan of Lab Area, and Fabrication Zone

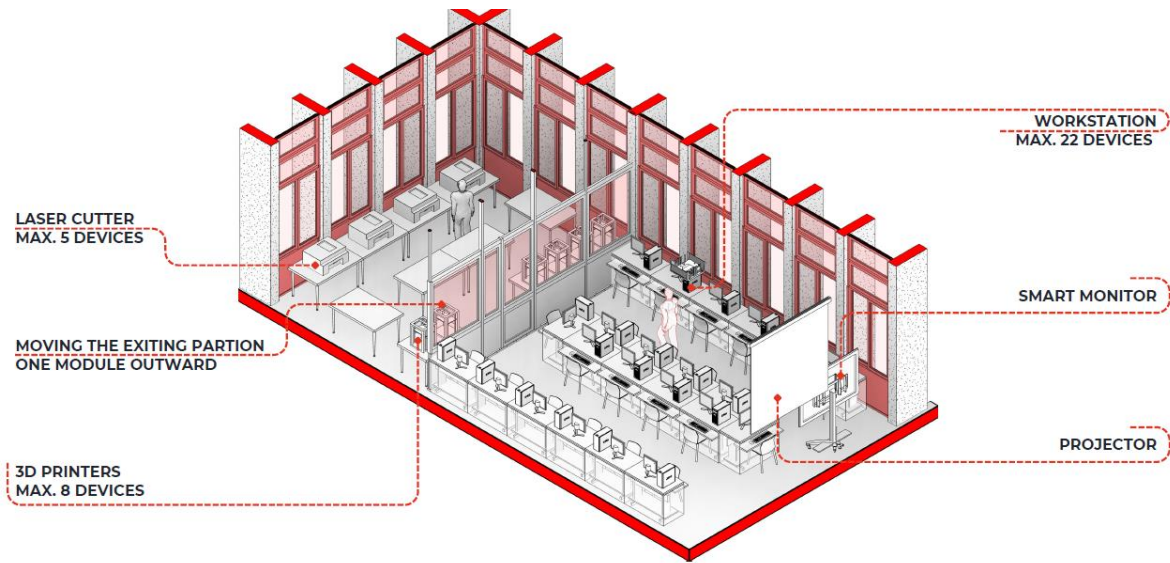


Figure 3 : Axonometric Study of the Lab.

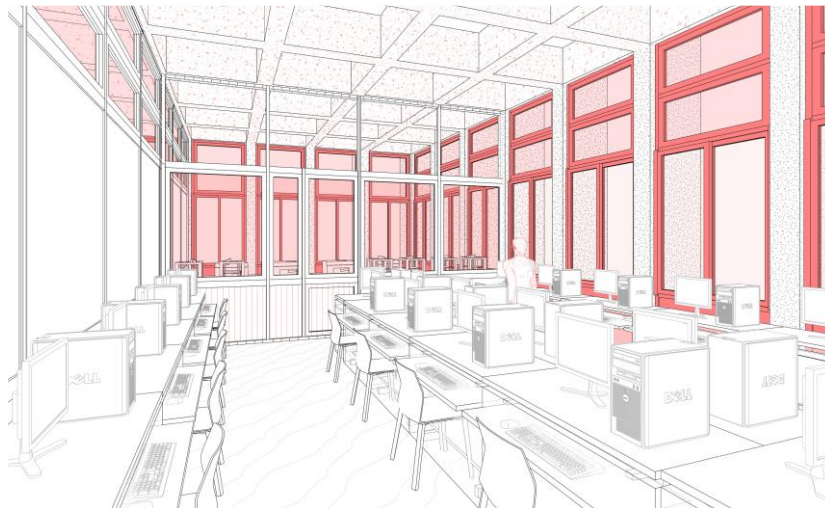


Figure 4 : Interior Shot Lab Area

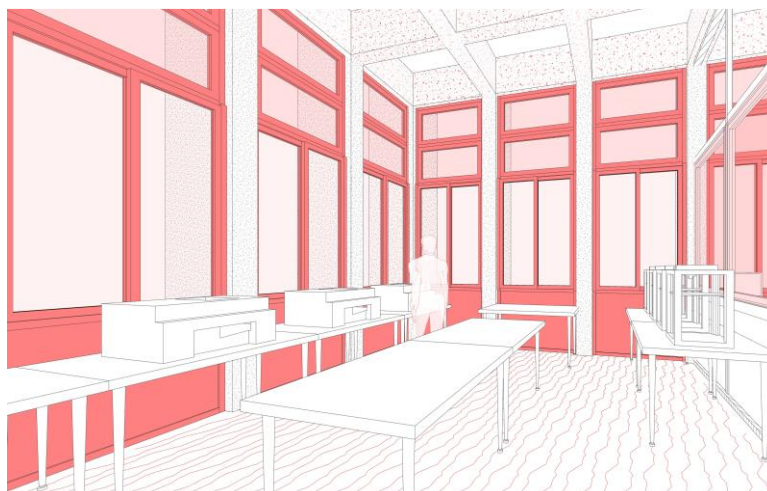


Figure 5: Interior Shot 2 Fabrication Zone

1.2.2. List of Equipment and Software

Table 1: List of Equipment & Software Applications

Name	Model
Cameras	NIKON Z6
Camera Lens	NIKKOR Z DX
360 photo camera	Insta360
4 x 3D Printer	3D Printer Neptune 4 Max
2x Desktop PC	Dell Optiplex
Reality Capture	Reality Capture Software
Tripod	Manfrotto Aluminum Tripod
Smart Interactive Display	Samsung WAD
4 x Laser cutting machine	Laser Cutting Robota 3040
3D Camera	Matterport MC250 Pro2 Professional 3D Camera + Back Bag
4 x AC Stabilizer (4x)	PlusEnergy (SVC-D3K)
2 x Security Camera	HIKVISION
4 x Flexible Magnetic Bed	Bell Tech
NAS backup system	Synology DiskStation® DS923+
4 x HDD Hard disks	Synology Plus Series 3.5" SATA HDD
Projector	Projector Full HD
	Equipment already bought and supplied to CU
	Investigations of Purchasing in progress

1.3. Soft Capacities of the Urban Form Lab

This section describes the **soft capacities** of the Urban Form Lab, with a focus on its human resources, organizational structure, and collaborative working culture. These capacities are essential for sustaining the Lab's operations, implementing projects, and engaging with academic, governmental, and community stakeholders.

1.3.1. Administrative Hierarchy of Staff

The staff within the lab is organized into three distinct groups: **the scientific committee, technical staff, and administrative staff**, each with specific responsibilities that contribute to the overall functioning and success of the lab. The organizational structure of the Urban Form Lab is structured to ensure effective governance and operational efficiency.

At the top of this structure is the **scientific committee**, which holds the responsibility for making key decisions regarding research project topics. This committee plays a crucial role in aligning the lab's research efforts with the broader academic objectives linking the lab to various courses and academic programs.

The **Advisory Board**, composed of experts from academia, industry, and policymaking, provides strategic guidance and oversight into the lab's initiatives. The Director leads the lab, defining its vision, managing its operations, and fostering collaborations. Supporting the Director, the Deputy Director aligns the lab's activities with academic goals and coordinates engagement with faculty and students. The Research Team, comprising graduate students and faculty members, undertakes interdisciplinary research projects addressing urban challenges. The Non-Academic Partners Coordinator bridges the gap between the lab and external communities, fostering meaningful partnerships. Additionally, the Technical Staff ensures the lab's operational efficiency by managing its resources, while the Administrative Staff handles logistical and financial support, ensuring seamless execution of the lab's initiatives. Together, these roles form a cohesive framework for achieving the lab's objectives.

Beneath the scientific committee, there is a **technical staff** team that is responsible for the management of the lab and the distribution of tasks. They play a vital role in supporting the scientific committee's decisions by implementing the necessary logistical and technical arrangements for research projects.

This hierarchical structure promotes a clear division of responsibilities, allowing the **scientific committee** to focus on strategic decision-making while the **technical staff** manages the practical aspects of lab operations.

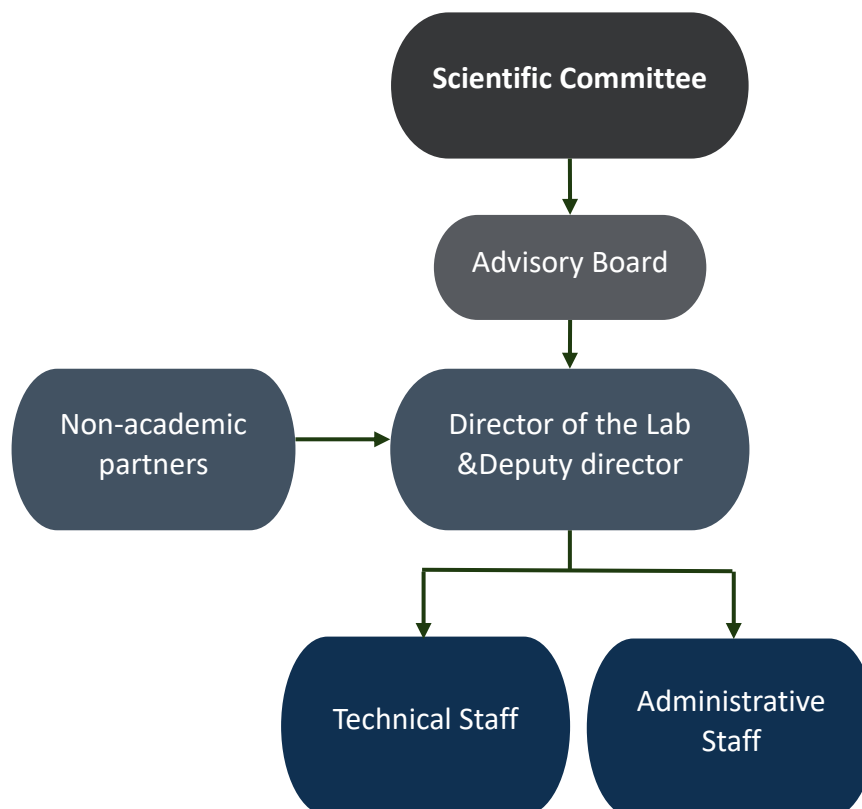


Figure 6: The Organisational Structure of the Urban Form Lab, Cairo University

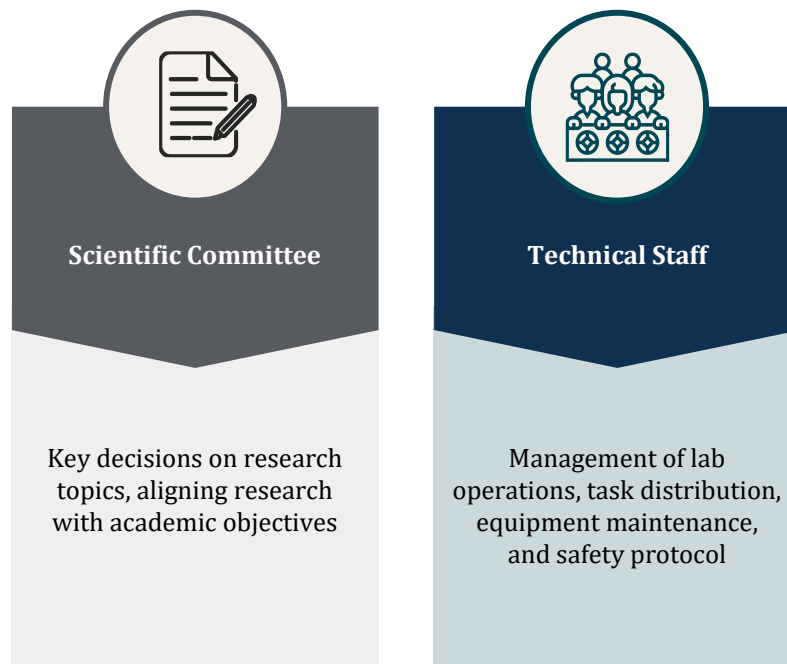


Figure 7: Hierarchy and Decision-making System at the Urban Form Lab, Cairo University

1.3.2. Communication Channels and Contacts

The Urban Form Lab (UFL), Cairo University, has established a strong online presence by creating dedicated official website and social media pages. These platforms serve as a vital tool for sharing the lab's activities, research, and projects related to urban form and architecture. Through these pages, the UFL engages with a broader audience, including students, researchers, and professionals, fostering discussions on critical urban issues. The social media presence also promotes the lab's role as a hub for creative and critical thinking in urban design, providing insights into the latest trends, events, and collaborations in the field of urbanism and architecture.

URBAN FORM LAB LINKTREE: <https://linktr.ee/UrbanFormLab>

Website: <https://ufl.eng.cu.edu.eg/en/>

LinkedIn: <https://www.linkedin.com/company/101050893/admin/dashboard/>

Facebook: <https://www.facebook.com/urbanform.lab/>

Instagram: <https://www.instagram.com/urbanform.lab/>

CONTACT PERSONS:

Prof. Dr. Sahar Imam: saharimam@eng.cu.edu.eg

Prof. Dr. Aliaa AlSadaty: aliaa_alsadaty@eng.cu.edu.eg

1.3.3. Partners (Academic and Non-Academic)



Figure 8: Academic and non-academic partners of the Urban Form Lab – Cairo University

In addition to the official project partners, the Urban Form Lab has actively collaborated with a range of academic and non-academic institutions that have enriched its research, outreach, and impact.

Academic Partners:

The lab has established academic partnerships with several esteemed institutions, including **Brandenburg University of Technology Cottbus-Senftenberg**, **Newcastle University (UK)**, and the **International Seminar on Urban Form (ISUF)**. These partnerships have contributed to knowledge exchange, joint research initiatives, and shared teaching and training experiences, particularly in the fields of urban morphology, sustainable urbanism, and heritage-led regeneration.

Non-Academic Partners:

Non-academic partners play a vital role in bridging theory and practice, as they bring local knowledge, real-world challenges, and policy-oriented perspectives to the lab's work. The Urban Form Lab has collaborated closely with **the Cairo Governorate** and **the Governorate of the New Valley**, among others. These partnerships aim to co-develop context-sensitive solutions for pressing urban issues, ranging from the revitalization of historic areas to the planning of emerging settlements.

1.3.4. Strategies for sustainability

This section describes the urban lab financial and governance strategies, and the framework created to ensure that both financial and governance efforts support long term sustainability

Financial Sustainability Strategies

The long-term financial plan proposed for the urban lab aims to ensure its sustainability, growth, and the successful achievement of its research and operational goals. To accomplish this, diverse funding sources should be explored, including the development of a strategy for consistently applying for grants. Building partnerships with local government, private stakeholders, and academic institutions is also crucial, as is fostering relationships with alumni and local businesses to secure sponsorships. Implementing an effective accounting system is essential to accurately monitor income and expenses, with regular financial reporting serving to maintain transparency and accountability. Additionally, it is important to assess potential financial risks, such as funding shortages, economic downturns, or shifts in research priorities, and to develop strategies to mitigate these risks. These strategies might include diversifying

funding streams or establishing emergency funds. By integrating these components into the long-term financial plan, the urban lab can establish a sustainable financial model that supports its mission, encourages innovation, and effectively addresses pressing urban challenges.

- Governance Sustainability Strategies

Governance strategies focus on developing frameworks that aim to enhance staff capacity over the long term by improving their skills, knowledge, and overall effectiveness. The goal is to boost research productivity, foster innovation, and strengthen collaborative efforts within the team. These frameworks involve conducting comprehensive needs assessments to identify existing competencies and highlight gaps that need to be addressed to meet the lab's objectives. Additionally, establishing channels for staff to communicate their training needs is essential, along with organizing targeted training and development programs such as workshops and seminars. It is important to allocate time during work hours to allow staff members to participate in these professional development activities. Facilitating opportunities for interdisciplinary collaboration is another key aspect, encouraging staff to work on joint research projects that enhance their skills and expand their professional networks. Building partnerships with universities, research organizations, and private stakeholders further supports these efforts. Moreover, implementing leadership development programs aimed at strengthening management, strategic planning, and communication skills among staff members contributes to a sustainable and effective governance framework.

1.4. Integration of Teaching and Scientific Research within Lab Activities

The lab is accessible to all courses within the Faculty of Engineering, Cairo University. Instructors are welcome to utilize the space and its resources for teaching activities with their students. Additionally, the lab and its facilities are available to all researchers affiliated with the Faculty of Engineering, providing support for their academic and research endeavors.

The lab is committed to creating strong linkages between research and education by fostering collaboration with local and international partners, as well as private and public stakeholders. This integration ensures that research outputs inform teaching practices while academic programs contribute to applied research.

A key step in this process is mapping and engaging relevant stakeholders, including academic institutions, industry partners, governmental bodies, and community organizations. Understanding their roles, interests, and expectations will enable the lab to design tailored strategies for collaboration.

Equally important is the clear articulation of research objectives and shared goals, ensuring all partners align with the lab's mission. This common understanding will enhance the impact of cooperation through joint research projects, co-developed educational modules, and innovative platforms such as living labs, creating a dynamic ecosystem that bridges theory and practice.

AASTMT

ESTABLISHED LAB UNIT PORTFOLIO

Project ID

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1. AASTMT ESTABLISHED LAB UNIT PORTFOLIO: ENVIRONMENTAL DESIGN LAB

This report offers a comprehensive overview of the Environmental Design Lab at the AASTMT. The lab initially inaugurated in 2022, as part of a previous Erasmus+ Project entitled “UPGRADE”, as it was established as a Sustainable Urban Mobility Lab. It was then upgraded in 2025, and reinaugurated as a more comprehensive Environmental Design Lab, through the Pro-Green Labs project.

1.1. Aims, Mission Statement and Scope of Interests

The **Environmental Design Lab** is based at the Architectural Engineering and Environmental Design Department, at the AASTMT. It is a research and academic services laboratory, adopting and deploying urban design and community design methodologies and approaches in addressing; research studies, projects, and urban issues, problems and challenges – this enables the lab to effectively contributing to and enhancing; urban design and community design knowledge and practices and to integrate research studies, projects, practice, and products, into architectural education and learning process, for the undergraduate and postgraduate levels at the Department, the Faculty and the University.

AIMS: The lab aims at fostering multisectoral collaboration between engaging and collaborating with; undergraduate and postgraduate students, researchers, academic and professional partners, local communities, local authorities and international partners to address and investigate issues related to cities and urban areas.

MISSION STATEMENT: In order to achieve this vision, the EDL adopts a 5-year plan, which extends beyond the lifetime of PGL. The plan comprises 3 phases, each with a different category of stakeholders, in order to capitalize on the role of the EDL as an effective and efficient lab unit and data centre for environmental urban and architectural design in Egypt. The 3 phases of implementation are outlined in Figure 1.

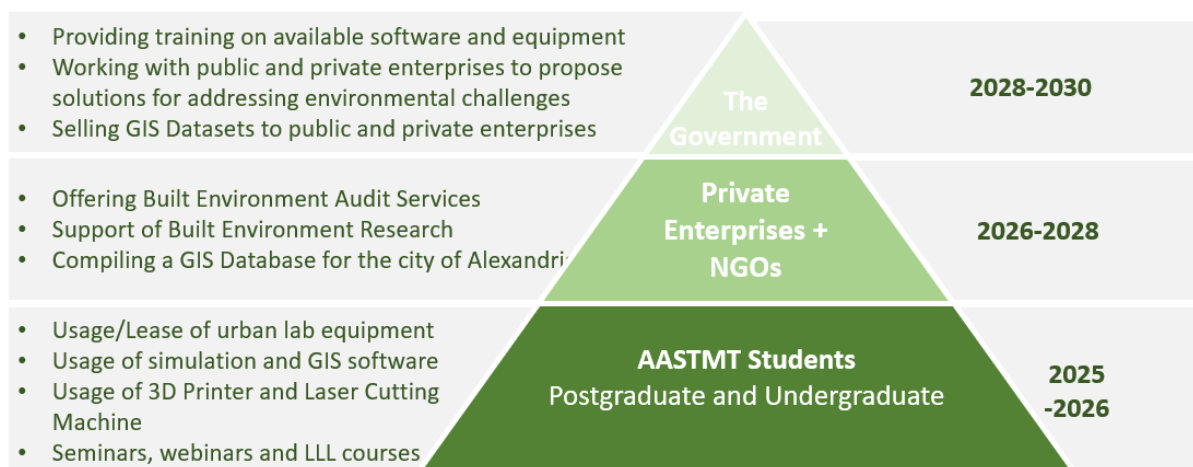


Figure 1: The 5-year long strategic plan of the EDL

SCOPE OF INTEREST: The EDL aims to be a centre for fostering innovative environmental design thinking, to be implemented in Architecture, Urban Planning and Design, and Interior Design, through fostering evidence-based design and providing students and researchers with various tools and equipment for data gathering, data synthesis and simulation. Research and studies relevant to the aims and objectives of the EDL, include the following topics:

- Sustainable Architecture
- Sustainable Urban Planning and Design
- Climate-responsive Architecture, Urban Design and Interior Design
- Sustainable Urban Mobility Planning
- Smart and Intelligent Urbanism
- Human-centric approaches to Architecture, Urban Planning and Design

1.2. Hard Capacities of the Environmental Design Lab

This section outlines the **hard capacities** of the **Environmental Design Lab** at AASTMT. These include physical infrastructure, equipment, and software assets that support the Lab's operations, research activities, and academic engagement.

1.2.1. Venue

The **Environmental Design Lab** is located at the Ground floor of the Architectural Engineering and Environmental Design Department, Faculty of Engineering and Technology, AASTMT. It is strategically located at a prime, accessible location for students, staff members, researchers, and visitors from outside the department. Its proximity to the department's main auditorium, exhibition, and library emphasizes the importance of the lab as a research and academic hub serving a wide range of stakeholders.

Figure 2: Environmental Design Lab [EDL], Ground Floor, Architectural Engineering and Environmental Design Department, AASTMT





Figure 3: Current State of the EDL at AASTMT

1.2.2. List of Equipment and Software

1.2.2.1. Urban Mobility Planning Equipment and Software

These items were purchased and installed through the Erasmus+ project UPGRADE.



Figure 4: Urban Mobility Planning Equipment at the EDL, AASTMT



PTV Traffic Simulation Package

- PTV Vissum
- PTV Vissim
- PTV Viswalk



ARC GIS



Esri City Engine



Q GIS

Figure 5: Urban Mobility Planning Software at the EDL, AASTMT

1.2.2.2. PCs + 3D Modeling Equipment

These items were purchased and installed through Pro-Green Labs.

Elgoo Neptune- 3D Printer



AirCircle 7070- Laser Cutting Machine



Dell- 17 Desktop Pcs



Figure 6: PCs and 3D Modeling Equipment at the EDL, AASTMT

1.2.2.3. Environmental Monitoring Equipment [Purchase in progress]

- Weather Station
- Sound-recorder
- Luxometer

1.2.2.4. Digital Documentation Tools [Purchase in progress]

- Laser scanner
- 3D Camera
- VR oculus

1.3. Soft Capacities of the Environmental Design Lab

This section describes the **soft capacities** of the Environmental Design Lab, in terms of human resources and organizational structure. These capacities are essential for sustaining the Lab's operations, implementing projects, and engaging with academic, governmental, and community stakeholders.

1.3.1. Administrative Hierarchy of Staff

1.3.1.1. The EDL Academic Committee:

This committee is responsible for initiating, guiding, and conducting research that utilizes the capabilities of the EDL. It is also responsible for fostering engagement in international and collaborative projects and attainment of funds for expanding the facilities of the EDL. It comprises 3 faculty members who work collaboratively to achieve the EDL'S mission and vision.

1.3.1.2. Administrative Staff:

This group handles the administrative functions that support the lab's operations, in terms of keeping documents, managing budgets, and coordinating events.

1.3.1.3. Technical Staff:

One staff member is responsible for the technical support of the lab, in terms of curation and maintenance of equipment and software.

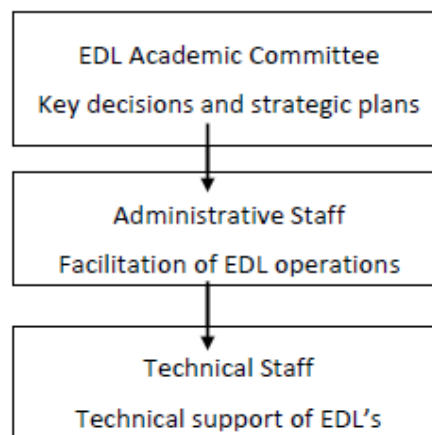


Figure 7: The Organisational Structure and roles of staff of the EDL at AASTMT

1.3.2. Communication Channels and Contacts

The EDL is currently establishing its online presence through social media platforms. These platforms serve as a vital tool for sharing the lab's activities, events, research, and projects related to environmental design within the 3 fields studies throughout the department

[architectural design, urban design, and interior design]. Through these platforms, the EDL aims to reach out to a broader audience, including students, researchers, professionals, and the community, in order to generate opportunities for collaboration to address relevant pressing challenges within the city of Alexandria.

ENVIRONMENTAL DESIGN LAB LINKS:

Facebook: <https://www.facebook.com/share/1AT172QFhQ/>

Instagram:

https://www.instagram.com/environmental_design_lab?igsh=dnhhcWFrem1vdzB4

CONTACT PERSONS:

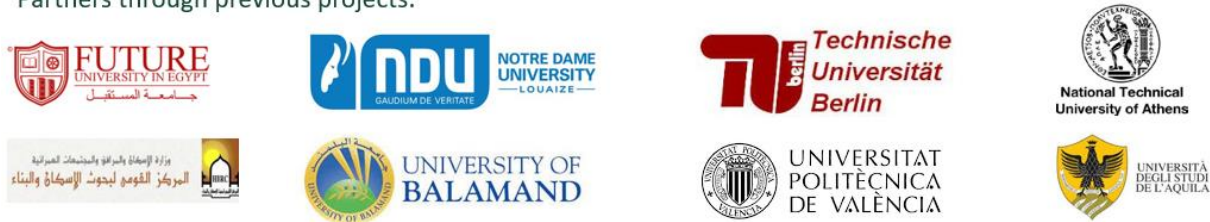
Dr. Yasmin Kandil: yasminkandil@yahoo.com

Dr. Sawsan Mokhtar: sawsan.mokhtar@aastmt.edu

Dr. Hend AbdelWahab: hoabdelrazek@gmail.com

1.3.3. Partners (Academic and Non-Academic)

Partners through previous projects:



Partners through PGL:



Non-Academic Partners:



Figure 8: Academic and non-academic partners of the EDL, AASTMT

In addition to the official project partners, the Environmental Design Lab has actively collaborated with a range of academic and non-academic institutions that have enriched its research, outreach, and impact.

Academic Partners:

The lab has established academic partnerships with several esteemed institutions from multiple European and middle-eastern countries. These partnerships were established through previous Erasmus+ Projects and are still ongoing as collaborative research between the partners extends beyond the lifetime of the projects. This has immensely enriched the academic, research and training content that the EDL lab offers to students, staff and the community.

Non-Academic Partners:

Non-academic partners have been an essential part of establishing the EDL at the very early stages, as the team's collaboration with Transport for Cairo has helped generate multiple opportunities for collaborative research and training projects. It has also been a seminal part of the selection process of the urban mobility equipment and software programs that have initiated the former SUMP lab.

1.3.4. Strategies for sustainability

This section describes the urban lab financial and governance strategies, and the framework created to ensure that both financial and governance efforts support long term sustainability

- Financial Sustainability Strategies

The EDL's financial sustainability strategy begins with a focus on diversifying funding sources. In addition to the services provided by the EDL, which will represent the greater majority of funding for the lab's operations, the EDL also aims to pursue the support of the AASTMT and of private and public enterprises, as well as international research grants for funding both foundational and future activities of the lab. By aligning the lab's research objectives with current Sustainable Development Goals, which are prioritized within the institution, across the nation, and internationally, the EDL increases its potential eligibility for international and national funding opportunities.

To plan and support these efforts, the EDL plans to develop a robust internal financial management system. Thus, the EDL works collaboratively with administrative board members of the Engineering Projects Consultancy Center at AASTMT.

- Governance Sustainability Strategies

The Environmental Design Lab (EDL) at AASTMT ensures governance sustainability through a clearly defined organizational structure, a phased development plan, and strong stakeholder engagement. The lab is managed by an academic committee supported by administrative and technical staff, ensuring efficient operation and long-term leadership. Its five-year phased implementation strategy allows for gradual growth, aligning governance with expanding roles and responsibilities. Additionally, the EDL integrates with academic programs and actively collaborates with local and international partners, supported by ongoing evaluation and feedback mechanisms that enable responsive and resilient governance.

1.4. Integration of Teaching and Scientific Research within Lab Activities

The lab is accessible to all courses, students and all teaching staff within the Faculty of Engineering and Technology. Additionally, the lab fosters cross-institutional collaboration with researchers, enterprises and the public sector in order to accentuate its role as a hub for research and academia within the city of Alexandria.

The Environmental Design Lab is firmly rooted in the belief that scientific research and academic instruction must evolve together to address complex environmental and urban challenges. By embedding lab-based research activities within both undergraduate and postgraduate curricula, the EDL fosters an experiential learning environment where students actively engage in real-world investigations. Faculty members are encouraged to align their research agendas with ongoing teaching modules, creating opportunities for students to contribute to live projects, data collection, and field analysis. This synergy enhances critical thinking, promotes evidence-based design practices, and ensures that academic content remains relevant and responsive to contemporary issues. The integration also empowers students to co-produce knowledge alongside researchers and community stakeholders, strengthening the lab's role as a collaborative platform for innovation, sustainability, and interdisciplinary inquiry.

UOP

ESTABLISHED LAB UNIT PORTFOLIO

Project ID

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Action:	Capacity Building in Higher Education		
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1. UOP ESTABLISHED LAB UNIT PORTFOLIO: URBAN GREEN LAB

The **Urban Green Lab** is a dedicated research unit within the Department of Architecture at the University of Petra, focusing on innovative research and practice in sustainable urbanism. Established through the Pro-GREEN-LABs initiative (Erasmus+), the lab addresses contemporary urban challenges through interdisciplinary approaches, serving as a center for critical thinking, teaching, and community-oriented research in architecture and urban design.

1.1. Aims, Mission Statement and Scope of Interests

AIMS: The lab aims to actively engage students (undergraduate and postgraduate), researchers, and faculty in applied urban research and innovation, and to forge strong partnerships with local authorities, community organizations, and international collaborators in addressing pressing urban challenges. It seeks to conduct comprehensive analyses of urban spaces in order to develop sustainable, context-specific solutions tailored to local needs and conditions, while also investigating the environmental and socio-economic factors that shape cities and urban life. Furthermore, the lab aspires to develop research-driven urban interventions that promote ecological balance, economic viability, and the preservation of cultural heritage in the built environment. Through these objectives, the Urban Green Lab positions itself as a catalyst for evidence-based urban improvements in Jordan and the wider region.

MISSION STATEMENT: The Urban Green Lab is committed to advancing the integration of research, education, and practice in sustainable urban development. By employing innovative urban design methodologies and participatory planning approaches, the lab seeks to push the boundaries of urban knowledge and best practices, enrich architectural education with real-world, research-driven projects, and promote sustainable urban solutions to contemporary challenges. Its mission emphasizes bridging the gap between academic inquiry and practical implementation, ensuring that research outcomes are both academically rigorous and directly applicable to improving urban environments. In doing so, the lab contributes to cultivating a new generation of architects and planners who are equipped with green competences and committed to sustainable city-building.

SCOPE OF INTEREST: The lab's activities and research interests closely align with its aims and the curriculum of UoP's architecture programs. Key focus areas include:

- Climate change and the city: exploring urban resilience and climate-adaptive design strategies.
- Mapping for urban planning and design: employing GIS and spatial analysis for urban studies.
- Heritage and cultural management: integrating conservation of historic urban fabric with modern development.
- Methodologies in urban planning and design: innovating planning processes and design-thinking approaches.

- Participatory planning and design: engaging communities in co-design and decision-making for urban projects.
- Sustainable urban planning and design: formulating strategies for environmentally sustainable city development.
- Principles of sustainable and smart cities: applying smart technologies and sustainability principles in urban contexts.
- Urban planning policy: analysing and contributing to policy frameworks for sustainable urban growth.

These focal areas ensure that the Urban Green Lab remains multidisciplinary and forward-looking, tackling issues from climate resilience to cultural heritage, and from community engagement to technological innovation in urban settings.

1.2. Hard Capacities of the Urban Form Lab

This section outlines the hard capacities of the Urban Green Lab at UoP, including its physical infrastructure and the technical tools that support the lab's operations, research activities, and educational engagement.

1.2.1. Venue

The Urban Green Lab is located on the 2nd Floor of the Department of Architecture building, Faculty of Architecture & Design, at the University of Petra. This central location within the faculty ensures the lab is in close proximity to studios and classrooms, facilitating daily interaction with students and faculty and enabling seamless integration of lab activities into the department's academic life. The dedicated lab space provides an accessible environment for collaborative research, hands-on workshops, and student projects focused on sustainable urban design.



Figure 1: The Urban Green Lab, the 2nd Floor, Department of Architecture, Faculty of Architecture and Design, University of Petra



Figure 2 : Lab Area, and Fabrication Zone

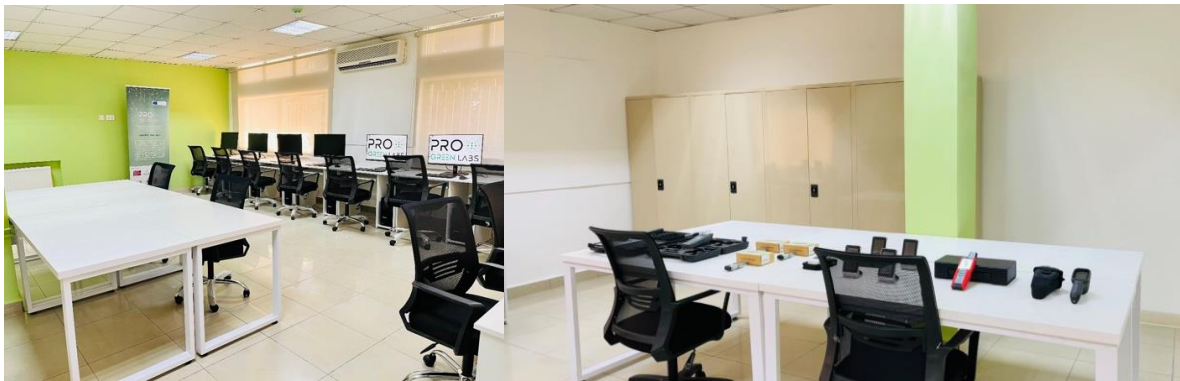


Figure 3 : Interior Shots of Urban Green Lab Area

1.2.2. List of Equipment and Software

The Urban Green Lab is equipped with a range of modern hardware and software tools to support its teaching and research objectives. Table 1 below summarizes the key equipment and software resources available in the lab (as procured under project Work Package 3):

- **High-performance Computing:** 8 desktop PCs and 2 laptops with advanced specifications (multi-core Intel Core i9 processors and NVIDIA RTX 4070 GPUs) provide the computing power needed for intensive tasks such as 3D modeling, simulations, and data analysis. These machines enable students and researchers to run building performance simulations, GIS analyses, and other computational urban design workflows efficiently.
- **3D Printers (2 units):** A pair of desktop 3D printers (FLSUN Super Racer S1 and Creality K1 models) are available for rapid prototyping and model fabrication. These printers allow architecture students to quickly produce physical models of urban forms or building components, facilitating an experiential learning process in sustainable design and testing of innovative concepts.

- **Portable Traffic Counter:** A field-deployable traffic counting device is part of the lab's equipment, used to measure vehicular flow and speed in urban settings. This device supports research and student projects on urban mobility, allowing for the collection of real-world data on traffic patterns to inform transportation planning and walkability studies.
- **Outdoor Weather Stations (2 units):** Two advanced meteorological stations have been installed for real-time monitoring of environmental conditions. These weather stations record micro-climatic data (temperature, humidity, wind, etc.) on campus or in study areas, underpinning research on urban heat islands, thermal comfort, and climate-responsive design strategies. Students are able to engage in hands-on learning by analysing climate data and evaluating passive design solutions.
- **Storm Water Management Model (SWMM):** The lab utilizes the EPA's SWMM software for hydrological modeling and simulation of urban stormwater systems. This tool is employed in both teaching and research to design and evaluate green infrastructure interventions (such as permeable pavements or rain gardens) and to simulate how different urban designs affect runoff and flood risk. By integrating SWMM into coursework, the lab helps students learn about climate adaptation in city planning through practical, software-based exercises.

Table 1: UOP List of Equipment & Software Applications

Name	Model	Specs
Desktop PC	Intel Core 20	Cores up to 5.5 GHz, Nvidia RTX 4070, 12 GB (8 units)
Laptop	Intel Core i9	24 Cores, Nvidia RTX 4070, 16 GB (2 units)
3D Printer	FLSUN S1	Crealty K1, High-speed desktop 3D printer (2 units)
Portable Traffic Counter	–	Field-deployable traffic volume and speed measurement tool
Storm Water Management Model	SWMM	EPA-developed dynamic rainfall-runoff simulation model
Weather Station (Outdoor)	–	Advanced meteorological station for real-time climate monitoring (2 units)
Air Quality Monitor	MET-AQ100-72B	Air Quality Monitor: Measuring PM 2.5/1.0/10, CO ₂ , TVOC, Temperature, and Humidity
CO ₂ Meter with Datalogger	CENTER 512	CO ₂ Meter with Datalogger
Sound Level Meter with Datalogger	CENTER 32/323	Sound Level Meter with Datalogger
CO ₂ Meter with Temperature & Humidity	AZ-77535	CO ₂ Meter with Temperature & Humidity

Sound Level Meter with Datalogger	CENTER 324	Sound Level Meter with Datalogger
LED Light Meter	CENTER 531	LED Light Meter
Temperature & Humidity Datalogger	SSN-22	Temperature & Humidity Datalogger
Multi-Field EMF METER	TM190	Multi-Field EMF METER
Thermal Imager / Camera	Flir TG267	Thermal Imager / Camera

	Equipment already bought
	Purchasing in progress
	Additional existing equipment incorporated into the lab

Each of these hard capacity elements is aligned with the lab's educational and research goals. The high-performance computers and modeling software enable data-driven analysis and design; the 3D printing and sensing equipment encourage hands-on experimentation; and the specialized simulation tools integrate cutting-edge sustainability practices into the curriculum. Together, these resources create a state-of-the-art environment where students and faculty can explore innovative solutions for green urban development.

1.3. Soft Capacities of the Urban Green Lab

This section describes the soft capacities of the Urban Green Lab, focusing on its human resources, organizational structure, communication channels, partnerships, and strategies for long-term sustainability. These capacities ensure the lab's activities are effectively managed, widely disseminated, and institutionally sustained.

1.3.1. Administrative Hierarchy of Staff

The Urban Green Lab operates within a well-defined governance framework that is integrated into the Faculty of Architecture and Design's existing structure. The lab's organizational hierarchy involves five primary groups of personnel, each with distinct roles and responsibilities, working together to achieve the lab's mission and objectives:

- **Faculty Leadership:** Oversight of the lab is provided by the Dean of the Faculty of Architecture and Design and the Faculty Council. The Dean and Faculty Council ensure that the lab's activities align with the university's academic priorities and strategic goals, and they offer high-level guidance on research directions and resource allocation. The Dean, as part of the university's top leadership, also helps secure institutional support and external funding for the lab, and represents the lab's interests in university-wide decision-making forums. The Faculty Council (comprising senior faculty and experts) advises on the lab's strategic priorities, reviews major research proposals, and facilitates connections with industry and policymaking bodies as needed.

- **Departmental Leadership:** The Head of the Department of Architecture provides direct academic leadership for the Urban Green Lab. In this role, the Head of Department guides the lab's strategic and research direction and ensures that lab initiatives are integrated with the department's curriculum and long-term development plans. The Head coordinates closely with the Dean to make sure the lab's activities complement faculty goals and oversees the incorporation of lab research into teaching (for example, linking lab projects to design studio topics or thesis work). Additionally, the Head of Department plays a key role in establishing external collaborations on behalf of the lab, such as partnerships with other academic institutions, government agencies, or industry stakeholders, to expand the lab's impact and resources.
- **Scientific Research Committee:** At the core of the lab's academic activity is the Scientific Research Committee, which is responsible for setting the lab's research agenda and ensuring that projects meet high academic standards as well as practical needs. This committee approves and oversees research projects, aligning them with both university objectives and real-world urban challenges. The committee is composed of faculty members and researchers who bring expertise in the lab's focus areas. Within this committee, a dedicated Research Team (including faculty researchers, Master's students, and teaching assistants) carries out the day-to-day research work and project implementation. The Research Team conducts interdisciplinary studies and pilot's new methodologies in sustainable urban design and also feeds insights back into the committee for decision-making. Through regular meetings, the Scientific Research Committee evaluates progress, provides mentorship to student researchers, and adjusts the research direction to remain relevant to evolving urban issues.
- **Technical Staff:** The lab's technical staff provides essential operational support, ensuring that the lab's facilities and equipment are fully functional and effectively utilized. The technical team manages the lab's resources (such as computers, software licenses, sensors, and fabrication tools) and maintains the technical infrastructure. They assist with research tasks by helping students and faculty in data collection, simulation runs, and the use of specialized equipment. Technical staff also offer training or troubleshooting for lab technologies, thereby enabling faculty and students to focus on research and learning without technical hindrances. By keeping all hardware and software up-to-date and running optimally, the technical staff ensures the lab's projects proceed smoothly and safely.
- **Administrative Staff:** The lab's administrative staff handles organizational and logistical tasks that keep the Urban Green Lab running daily. This team manages the lab's budget and finances (including any grants or project funds), coordinates meetings and events (such as workshops, lectures, or community outreach programs), and oversees documentation and record-keeping for all lab activities. Administrative staff serve as the point of contact for communications: they facilitate information flow between the research team, faculty, and external partners, and manage the lab's email inquiries and scheduling. In essence, they provide the necessary administrative backbone, handling procurement, reporting, and internal coordination, which allows the academic and technical staff to focus on content-driven work.

This multi-tiered hierarchy and clear division of roles ensure effective governance and operational efficiency within the Urban Green Lab. Strategic decisions and oversight come

from faculty leadership, academic quality is maintained by the research committee, and day-to-day functions are supported by dedicated technical and administrative personnel. Such a structure not only aligns the lab with UoP’s institutional framework but also fosters collaboration among all members of the lab, creating a cohesive team working toward shared sustainability goals.

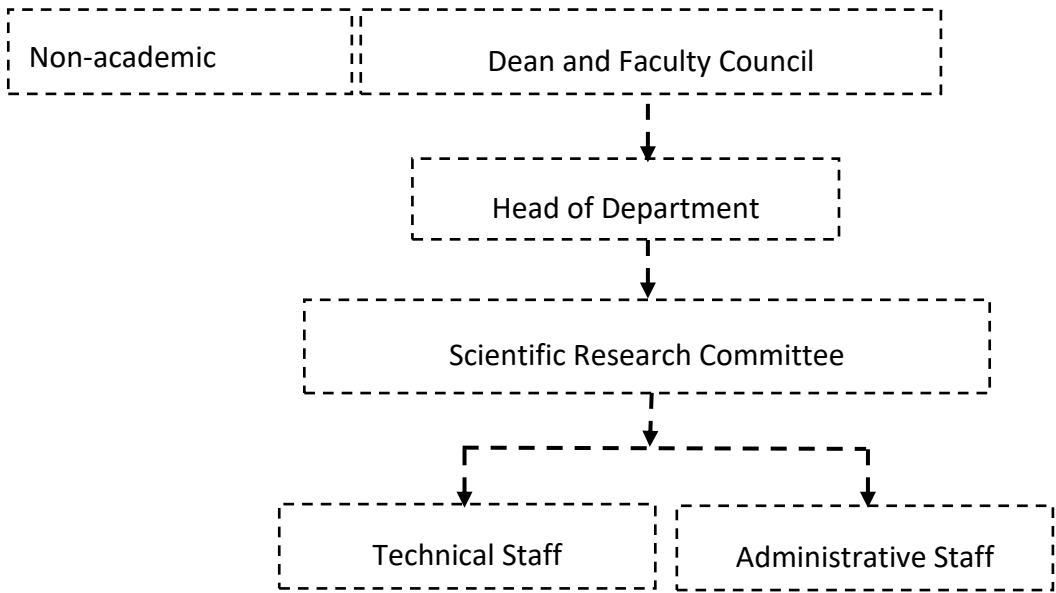


Figure 4: The Organisational Structure of the Urban Green Lab, University of Petra

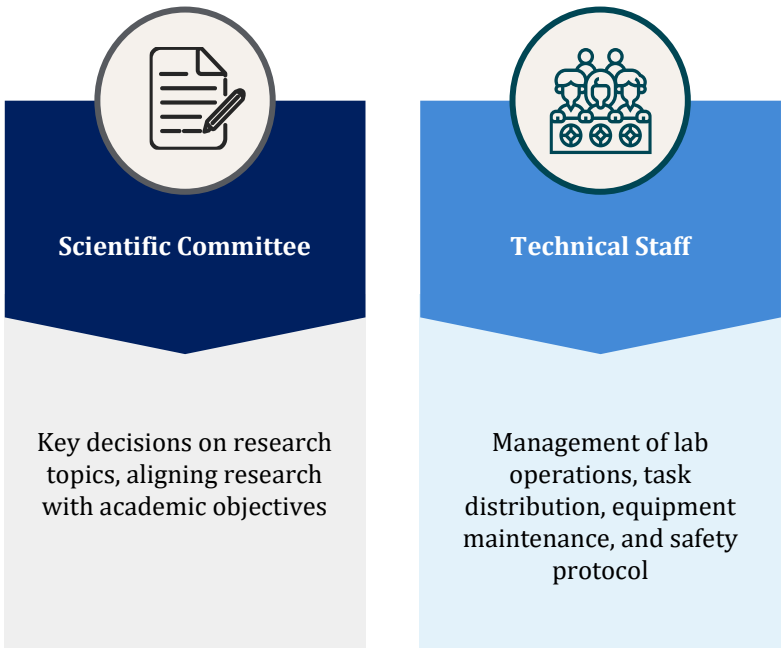


Figure 5: Hierarchy and Decision-making System at the Urban Green Lab, University of Petra

1.3.2. Communication Channels and Contacts

Effective communication is vital for promoting the Urban Green Lab and engaging both the university community and external stakeholders. The lab primarily utilizes the University of Petra's official website as its main platform for dissemination and outreach. The Urban Green Lab has a dedicated webpage hosted under the Department of Architecture section of the UoP website, which serves as a central hub of information about the lab's mission, activities, and opportunities. This webpage provides a comprehensive overview of the lab's vision and strategic focus, details of ongoing and completed research projects (highlighting contributions to sustainable urban development), access to the lab's publications and reports, announcements of upcoming events (such as workshops or seminars), and information on collaboration opportunities for partners or students. By maintaining an up-to-date and informative web presence, the lab ensures transparency and encourages interested parties to connect with its work.

In addition to the official website, the Urban Green Lab communicates through the university's internal channels and direct contacts. Lab news and updates are shared via departmental newsletters and notice boards to reach faculty and students on campus. For external outreach, the lab leverages UoP's social media and networking events (e.g., public lectures or open days) to showcase its projects and invite community engagement. Contact information for the lab (email and phone through the Department of Architecture office) is provided on the lab's webpage, enabling prospective partners, students, or other stakeholders to reach out easily. This multi-channel communication approach ensures that the Urban Green Lab remains visible within the academic community and accessible to external collaborators, thereby broadening its impact and network.

URBAN GREEN LAB:

Website: <https://arch.uop.edu.jo/En/pages/urbangreenlab.aspx>

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1.3.3. Partners (Academic and Non-Academic)

Building strong partnerships is a cornerstone of the Urban Green Lab's strategy to enhance its research impact and real-world relevance. The lab engages both academic and non-academic partners, recognizing that sustainable urban development challenges are best addressed through collaborative efforts across different sectors.

- **Academic Partners:** The Urban Green Lab collaborates with universities and research institutes, both nationally and internationally, to exchange knowledge and undertake joint research initiatives. Through the Pro-GREEN-LABs project consortium, UoP is already connected to European partners (such as Politecnico di Milano and Bauhaus-Universität

Weimar) and regional universities, fostering an international exchange of best practices in architectural education and green design. Beyond the consortium, the lab seeks partnerships with other faculties and research centers in topics like urban planning, environmental science, and engineering. These academic collaborations enable faculty and students at UoP to participate in exchange programs, co-authored research, and comparative studies, thereby elevating the quality of research and integrating global perspectives into local urban issues.

- **Non-Academic (Industry and Community) Partners:** Equally important, the lab has been forging links with non-academic stakeholders. This includes local government agencies and municipal authorities (e.g. city planning departments or the Greater Amman Municipality) to work on research and pilot projects that inform public urban policy. It also involves private sector partners such as architectural design firms, real-estate developers, and technology companies interested in sustainable city solutions. Partnerships with these industry actors can lead to sponsored research, internships for students, or adoption of the lab's proposals in real development projects. Moreover, the Urban Green Lab reaches out to community organizations and NGOs focused on urban issues (like heritage conservation groups or environmental advocacy organizations). By involving community partners, the lab ensures that its projects are grounded in local needs and that there is a path for implementing solutions on the ground. These diverse collaborations, spanning academia, government, industry, and civil society amplify the lab's interdisciplinary approach and resource base, allowing it to tackle complex urban sustainability challenges from multiple angles.

Through these partner networks, the Urban Green Lab gains access to additional expertise, data, and funding opportunities while also extending its influence beyond the university. Joint workshops, stakeholder meetings, and memorandum-of-understanding agreements are among the mechanisms used to formalize and maintain these partnerships. By actively engaging external partners, the lab not only enhances its research output and educational offerings but also helps bridge the gap between academic research and practical implementation in urban planning and design. This collaborative ethos supports the overarching goal of the Pro-GREEN-LABs project: to create a regional hub of innovation and knowledge exchange for green urban development.

1.3.4. Strategies for sustainability

To ensure the long-term sustainability of the Urban Green Lab beyond the Pro-GREEN-LABs project timeline, a comprehensive strategy has been developed that addresses financial, organizational, and human resource dimensions. This strategy is geared towards maintaining the lab's operations, continuing its growth, and solidifying its role as a center of excellence in sustainable urban research and education.

Financial Sustainability: The lab's financial plan emphasizes diversification of funding sources and prudent financial management. In the coming years, the Urban Green Lab will actively pursue a variety of funding opportunities, including national and international research grants (from government agencies or programs like Erasmus+), sponsorships or donations from private foundations and industry, and collaborative projects funded through partnerships. UoP has empowered the lab to seek strategic partnerships with local authorities, architectural

firms, and industry stakeholders whereby those partners provide financial contributions or in-kind support for research in areas of mutual interest. Additionally, the lab plans to generate revenue through fee-for-service activities, for example, offering consultancy services, specialized training workshops, or access to lab equipment/expertise for external projects – which can funnel income back into supporting the lab's core educational mission.

On the expenditure side, the lab has adopted a strategic budgeting approach to ensure that available funds are used effectively. This involves allocating sufficient resources for maintaining and upgrading lab equipment (to keep pace with technological advances) and setting aside budgets for key activities like student competitions, community outreach events, or publication costs. The lab's finances are managed with transparency and oversight: regular financial reports are prepared as part of the department's budgeting process, and there are provisions for periodic audits to evaluate the lab's financial health. Risk management is also a part of the strategy by diversifying funding streams and building a modest reserve, the lab aims to be resilient against funding shortfalls or economic fluctuations. In summary, through proactive fundraising, partnerships, entrepreneurial services, and sound financial governance, the Urban Green Lab is positioned to sustain its operations and growth in the long run.

Human Resources and Continuous Improvement: Beyond finances, sustaining the lab's impact relies on its people and processes. The Urban Green Lab places strong emphasis on capacity-building for its staff and associated faculty. A structured professional development program will be implemented, including regular training workshops to update technical skills (such as new software tools or research methods in sustainability), opportunities for staff to attend or present at conferences, and exchanges with partner institutions to learn from their lab setups. Mentorship is another key element: senior researchers and faculty mentors will guide junior staff and students, build leadership skills and ensuring knowledge transfer within the team. By investing in its human capital, the lab ensures that it remains at the forefront of emerging topics in green urbanism and that it can adapt to new challenges over time.

Concurrently, the lab has established a monitoring and evaluation framework to continually assess and improve its performance. Clear key performance indicators (KPIs) have been defined to measure various aspects of the lab's success: for instance, the amount of research funding secured, the number and quality of research outputs (publications, prototypes, etc.), and the extent of student involvement in research activities. The integration of lab work into teaching is also tracked (e.g. how many courses include lab components or how many students do thesis projects through the lab), to ensure the lab is enriching academic programs in a meaningful way. Regular internal reviews are scheduled (annually or semi-annually) where the lab's team and faculty advisors analyze these KPIs and gather feedback from participants. Mechanisms such as feedback sessions with students and external partners, plus annual strategic meetings, allow the lab to identify areas for improvement and update its strategies accordingly. This commitment to continuous improvement means the lab can evolve with changing educational needs and urban trends, thereby sustaining its relevance and effectiveness.

In essence, the Urban Green Lab's sustainability strategy ensures that it is not a one-off project facility, but rather a lasting institution within UoP. By securing diverse funding, building a skilled and dynamic team, and rigorously evaluating its progress, the lab is well-prepared to

continue promoting green competences in architectural education and generating impactful research for years to come.

1.4. Integration of Teaching and Scientific Research within Lab Activities

A defining feature of the Urban Green Lab is the seamless integration of its research activities with the teaching and learning process at the University of Petra. Rather than functioning as an isolated research center, the lab is embedded into the department's academic programs, thereby serving as a bridge between theoretical knowledge and practical application in architectural education. Courses and studios within the Faculty of Architecture and Design are closely linked with the lab's focus areas, ensuring that cutting-edge research informs teaching content and, conversely, that pedagogical needs shape the lab's research agenda. For example, findings from the lab's research on sustainable urban design and climate-responsive architecture are introduced into classroom discussions and design assignments. At the same time, questions and challenges raised in undergraduate and postgraduate studios often become starting points for new research projects in the lab, creating a feedback loop that benefits both domains.

One way this integration manifests is through hands-on student involvement in lab projects. Students are encouraged to participate in ongoing research – whether as research assistants, interns, or through capstone projects, allowing them to apply concepts from their coursework to real-world problems under the mentorship of faculty researchers. This experiential learning approach gives students invaluable exposure to research methodologies, data collection in the field, and the collaborative problem-solving process. In studio courses, the lab's equipment (such as environmental sensors or modeling software) is utilized for assignments, so students learn to use professional tools in an academic setting. The lab also hosts workshops and training sessions that are built into the academic calendar, for instance, a workshop on urban climate analysis using the lab's weather station data, or a seminar series on green building materials co-taught by faculty and industry experts. Such activities enrich the curriculum and ensure that theoretical lessons are complemented by practical investigation. As a result, students gain a deeper, research-informed understanding of sustainable design principles, and faculty can teach emerging topics with the support of empirical evidence and case studies developed in-house.

Moreover, the lab's integration with teaching extends to the formulation of new courses and academic offerings. The presence of the Urban Green Lab has supported the development of specialized electives and a planned Master's program in Sustainable Smart Cities at UoP, wherein lab projects form a core component of the syllabus. Graduate students in these programs base their thesis work on lab research themes, ensuring alignment between academic outputs (theses, publications) and the lab's objectives. This synergy elevates the academic profile of the department – students and faculty co-author papers, present joint work at conferences, and incorporate lab research into design exhibitions and critiques. The institutional commitment to this integration is evident: the lab's directors and the Department Head jointly coordinate to schedule lab activities in tandem with the academic calendar, and the Dean's office facilitates the recognition of lab contributions in curriculum development.

In summary, the Urban Green Lab functions as an intellectual engine at the heart of the Department of Architecture. By weaving research into the fabric of teaching, the lab helps produce graduates who are not only well-versed in sustainability theories but also capable of applying research-driven insights to real architectural and urban design challenges. This model of integration, aligning academic programs with active research and using the lab as a pedagogical resource, exemplifies the Pro-GREEN-LABs vision of experiential, lab-based learning. It ensures that the advancements made within the lab directly contribute to educational excellence, and that academic endeavors remain grounded in addressing tangible urban issues. Through this dynamic interplay of teaching and research, the Urban Green Lab is contributing to a transformative learning environment at UoP, one that equips future architects and planners with both the knowledge and the practical skills to drive sustainable urban development.

GJU

ESTABLISHED LAB UNIT PORTFOLIO

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1. GJU ESTABLISHED LAB UNIT PORTFOLIO: SUL LAB

This report offers a comprehensive overview of the Sustainable Urbanism Lab (SUL) established at the German Jordanian University (GJU) as one of Pro-green labs Network.

1.1. Mission statement and objectives

This section presents the foundational mission and primary objectives of the Sustainable Urbanism Lab (SUL) at the German Jordanian University (GJU). These elements reflect the Lab's strategic alignment with the Pro-GREEN-LABS initiative and its commitment to transforming architectural education through sustainability innovation.

Mission Statement: The mission of the Sustainable Urbanism Lab is to enhance the competencies of architectural education in the Southern Mediterranean region by fostering sustainable development through experiential, lab, active learning methodologies. The Lab aims to provide transformative educational experiences that equip future architects with the technical, ecological, and social competencies needed to address environmental challenges and contribute to the socio-economic development of their communities.

Vision Statement: The Lab envisions itself as a pioneering hub within GJU, integrating advanced technologies and interdisciplinary learning to empower students and faculty in addressing both local and global urban challenges. Through its collaborative platform, the Lab seeks to foster excellence in sustainable urbanism by linking theoretical foundations with applied practice and community collaboration.

Objectives: The Sustainable Urbanism Lab pursues a range of objectives designed to advance sustainability in architectural education:

- **Curriculum Enhancement:** To modernize educational offerings by integrating Sustainable Development Goals (SDGs) and green competencies across teaching modules and academic programs.
- **Faculty Development:** To provide academic staff with advanced pedagogical strategies and training in emerging sustainable technologies and methodologies.
- **Lab Management and Operational Excellence:** To implement green technologies and efficient resource management, enhancing the functionality and sustainability of lab environments.
- **Stakeholder Engagement:** To strengthen connections between academia, industry, and local communities, fostering applied research and real project collaborations.
- **Continuous Improvement:** To establish a responsive monitoring and evaluation system that supports adaptive learning and alignment with international educational standards.

Overall, the Sustainable Urbanism Lab serves as an educational and research platform that integrates digital innovation, interdisciplinary collaboration, and sustainable development principles. This strategic focus ensures its contribution to regional capacity building and the cultivation of future professionals in sustainable urban design.

1.2. Hard Capacities of Lab Unit

This section outlines the physical and technological infrastructure of the Sustainable Urbanism Lab at GJU. It includes documentation of the premises and a detailed list of equipment and software, reflecting the Lab's capacity to support sustainable architectural education and research.

1.2.1. Documentation of premises

The Sustainable Urbanism Lab is situated within the School of Architecture and Built Environment (SABE) at the German Jordanian University, located on the first floor of the Othman Bdeir Building at the Jabal Amman Campus. The space was strategically selected and upgraded to support interdisciplinary collaboration, digital fabrication, and stakeholder engagement.



Figure 1: Sustainable Urbanism Lab Premises at GJU

The upgraded infrastructure includes:

- A hybrid lab space combining digital modeling, material research, and immersive technologies.
- A dedicated area for community engagement and stakeholder meetings.

These features position the Lab as a dynamic educational environment designed to support active learning and applied research.

1.2.2. List of Equipment and Software

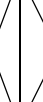
The following table presents the updated list of equipment and software applications installed in the Lab. These tools were selected based on institutional needs, benchmarking feedback, and alignment with sustainability focused learning goals.

Table 1: Equipment Overview for Sustainable Urban Lab at GJU

Category	Equipment/Tool	Included	Priority	Notes
Digital Fabrication	3D Printers (Larger, Smaller, Resin), Mercury Wash & Cure	Yes	●/○	Support urban prototyping and iterative design
Urban Visualization	Hologram Display, Meta Quest Pro, 3D Scanners	Yes	●	Facilitate immersive learning and spatial analysis
Measurement and Monitoring Tools	Energy Logger, Power Analyzer, Thermal Imager, Flow Meter	Yes	●/○	Aid in sustainability metrics, HVAC audits, and simulations
Cutting and Forming Tools	Hot Wire Cutter, CNC Cutter, Vinyl Cutter, Acrylic Bending Machine	Yes	●	Enable model fabrication and sustainable packaging
Sustainable Practices Tools	Cardboard Perforator	Yes	○	Promote eco-friendly reuse in design and prototyping

Table 2: Overlaying of List of Equipment and Software Applications for GJU

BE nr	Beneficiary Name	[E] Equipment - [S] Software		Name	Estimate Purchase Cost	Item incorporation based on recommendation of:			Will the Equipment be included in the final list	Financial Means			Priority	Comments Justification modification	/ of
						Propo	Needs	Bench		EU	Co-	Other			
6	GJU	E		Interactive Flat Panel	6,000				Yes	✓			○		
6	GJU	E		Audio Video Devices	4,000				Yes	✓			○		
6	GJU	E		Video Conference Camera	2,000				Yes	✓			○		
6	GJU	E		Creality K1 3D Printer	2,000				No					Changed to a model that meets higher speed and precision requirements for creating accurate, large-scale urban design prototypes.	
6	GJU	E		3D Printer (Larger)	1,500				Yes	✓			●		
6	GJU	E		3D Printer (Smaller)	1,120				Yes	✓			●	Added to support increased prototyping capacity.	
6	GJU	E		Resin 3D Printer	540				Yes	✓			○	New addition for high-detail prototypes essential for precise urban design modeling.	
6	GJU	E		Mercury Plus V3.0 Wash & Cure Plus Machine	170				Yes	✓			○	New addition to improve the quality and durability of urban design prototypes.	
6	GJU	E		3D Scanner	1,720				Yes	✓			●	2 pieces	
6	GJU	E		Hot Wire Cutter	240				Yes	✓			●	2 pieces	
6	GJU	E		Acrylic PVC Hot Bending Machine	1,500				Yes	✓			●	Important for 360 Camera	
6	GJU	E		Hologram Display	4,000				Yes	✓			●	Added to enhance visualization for design	

														and architectural education.
6	GJU	E		Meta Quest Pro	3,915			Yes	✓				●	Increased quantity to facilitate immersive learning experiences.
6	GJU	E		Energy Logger	500			Yes	✓				○	
6	GJU	E		Power Quality Analyzer	300			Yes	✓				○	
6	GJU	E		Thermal Imager	250			Yes	✓				○	
6	GJU	E		Air Quality Tools	250			Yes	✓				○	
6	GJU	E		Flow Meter	700			Yes	✓				○	
6	GJU	E		Infrared Thermometer	100			Yes	✓				○	
6	GJU	E		Power Meter	500			Yes	✓				○	
6	GJU	E		Airflow Measurement Devices	200			Yes	✓				○	
6	GJU	E		Vinyl Cutters	1,500			Yes	✓				○	
6	GJU	E		CNC Cutters	3,500			Yes	✓				●	
6	GJU	E		Cardboard Perforator	1,500			Yes	✓				○	
6	GJU	E		Laser Cutters	€6300			No						Item removed, as the university has one and no need for additional laser cutter.

This comprehensive infrastructure enables a high degree of flexibility in teaching, experimentation, and interdisciplinary research. The Lab also integrates Building Information Modelling (BIM), GIS tools, and energy modelling software to facilitate data-driven sustainability analysis.

1.3. Soft Capacities of Lab Unit

This section outlines the non-material assets that underpin the functioning of the Sustainable Urbanism Lab at GJU. These include the administrative structure, academic and non-academic partnerships, and strategies designed to ensure the lab's long-term sustainability.

1.3.1. Administrative Hierarchy of Staff - Contact persons

The Sustainable Urbanism Lab operates under a structured governance model that promotes evidence decision-making and collaborative management. The governance follows a bottom-up structure, involving multiple stakeholders within the academic hierarchy.

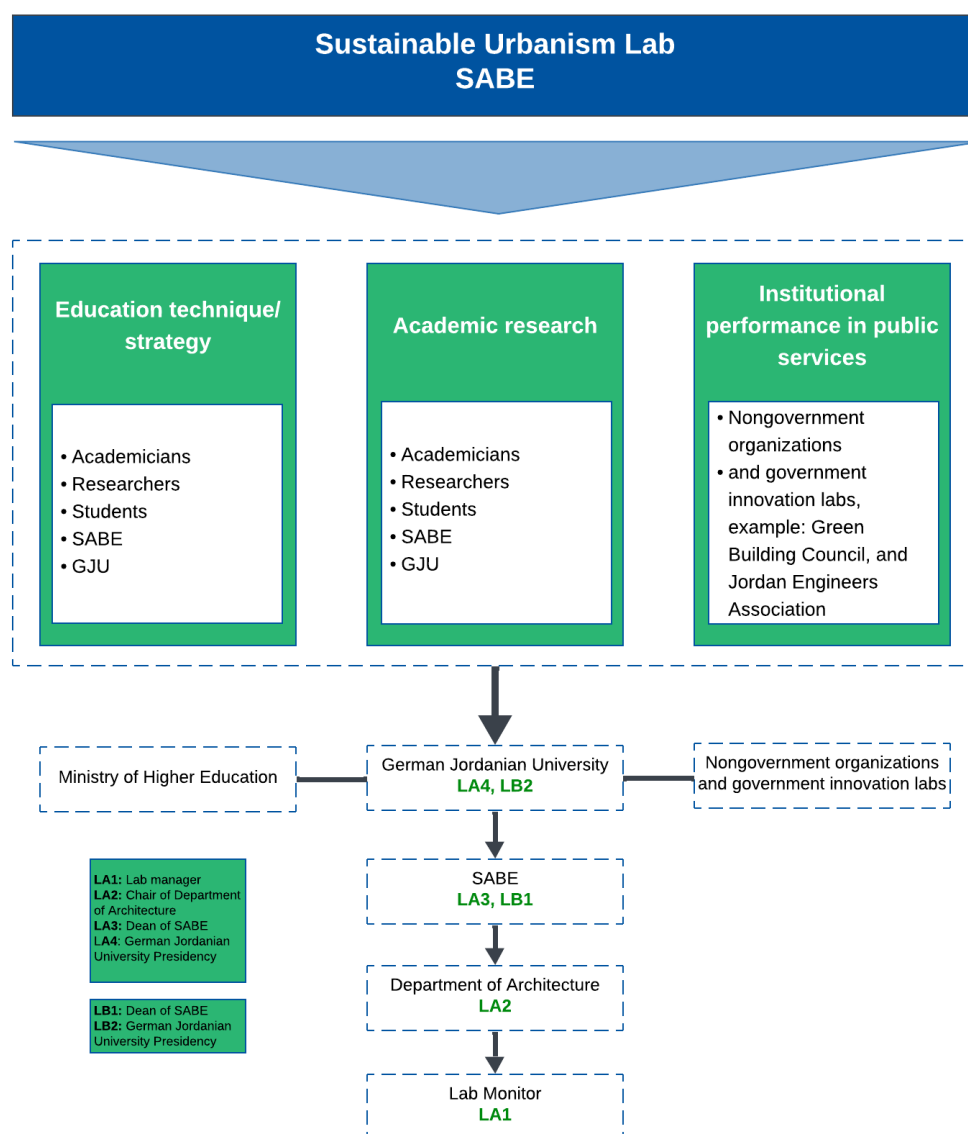


Figure 2: Administrative and Decision-Making Hierarchy

Table 3: Administrative Layers and Roles within the Sustainable Urbanism Lab Governance Structure

Layer	Role	Affiliation
LA1	Lab Manager	SABE - GJU
LA2	Chair of Department of Architecture	SABE - GJU
LA3	Dean of SABE	SABE - GJU
LA4	University Presidency	GJU

Table 4: Key Personnel and Contact Information for the Sustainable Urbanism Lab at GJU

Name	Position	Email	Office Location
Arch. Mohammad Khaled	Industrial Professor	mohammed.zaghmouri@gju.edu.jo	Darat Othman Bdeir
Dr. Maram Tawil	Associate Professor	maram.tawil@gju.edu.jo	
Dr. Raed Altal	Associate Professor	raed.altal@gju.edu.jo	
Fadi Amer	Content Admin & Editor	Fadi.amer@gju.edu.jo	

These individuals are responsible for lab operations, content development, curriculum integration, and strategic planning.

1.3.2. Partners (Academic and Non-Academic)

The Lab has established a robust network of academic and non-academic partners to support its interdisciplinary focus and applied research approach.

ProGreen Lab Academic Partners:

- Bauhaus-Universität Weimar (Germany)
- Chalmers University of Technology (Sweden)
- Politecnico di Milano (Italy)
- Cairo University
- Petra University
- Alexandria University
- Arab Academy University

Non-Academic and Local Partners

- Jordan Green Building Council (JGBC)
- Adaa Consultants
- Greater Amman Municipality (GAM)
- UN HABITAT Amman
- Cities and Villages Development Bank (CVDB)

- Technical and Vocational Skills Development Commission (TVSDC)
- Jordan Engineers Association

These partnerships facilitate co-teaching, research collaboration, student internships, and planned living lab activities.

1.3.3. Strategies for sustainability

The long-term success of the Sustainable Urbanism Lab is underpinned by two strategic dimensions: financial and governance sustainability.

1.3.3.1. Financial Sustainability Strategies

To ensure operational continuity beyond the project's initial funding phase, the following strategies have been developed:

- **Diversified Funding Sources:** Combining Erasmus+ grants with contributions from government agencies, municipal entities, and future funded projects.
- **Public-Private Partnerships:** Collaborating with industry actors to co-finance equipment and infrastructure.

1.3.3.2. Governance Sustainability Strategies

A multi-tiered governance system supports institutional accountability, stakeholder participation, and continuous evaluation:

- **Bottom-Up Planning:** Engaging students, faculty, and external actors in lab operations and feedback mechanisms.

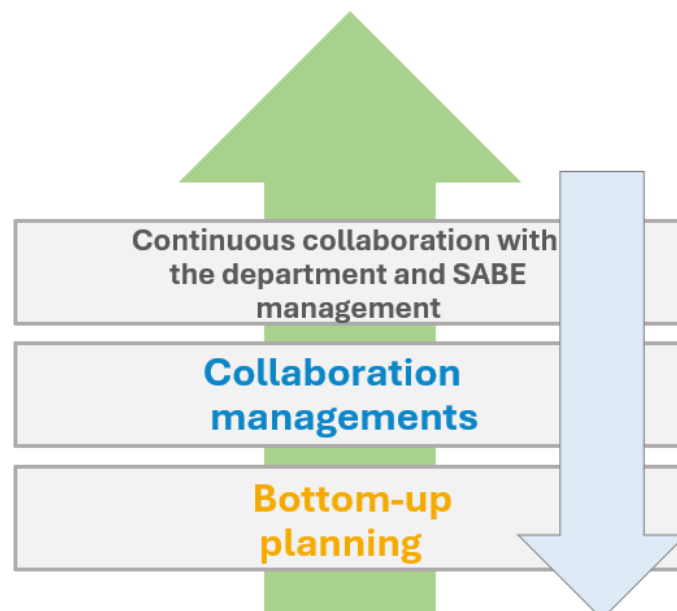


Figure 3: Hierarchical Collaboration and Planning Structure within the Sustainable Urbanism Lab

- **Evidence Based Evaluation:** Utilizing KPIs, accreditation scores, and observational metrics to assess lab performance.
- **Integrated Monitoring Systems:** Periodic review meetings, annual reports, and stakeholder dialogues to ensure transparent decision-making and strategic alignment.

Table 5: Governance Sectors, Stakeholders, and Evaluation Indicators for Sustainable Urbanism Lab Operations

Governance sector	Focus group	Indicator (s)
Education technique/strategy	– Students – Dept. of Architecture – SABE – GJU – Ministry of Higher Education	• Education performances records • Official administrative records combined with facility surveys • Direct continuous observation • national and international accreditation • scores
Academic research	– Academics – Researchers – Students – SABE – GJU	• Education performances records • Official administrative records combined with facility surveys
Institutional performance in public services	– Nongovernment organizations – and government innovation labs ex. Green Building Council, – Jordan Engineers Association	• Interviews with public officials, recipient • institutions • Annual workshops

The soft capacities of the Lab reflect its institutional commitment to collaboration, transparency, and sustainability, factors that are essential for long-term academic and social impact.

1.4. Integration of Teaching and Scientific Research within the Lab Activities

This section outlines the strategic approach adopted by the Sustainable Urbanism Lab (SUL) at GJU to integrate teaching and scientific research. The lab has been designed to function as an academic and practical platform, facilitating the seamless connection between curriculum delivery and applied urban sustainability research.

Purpose

The integration of teaching and research is central to the lab's mission of equipping students with the skills and competencies needed to address contemporary urban and environmental challenges. By bridging theory and practice, the lab fosters innovation, critical thinking, and evidence problem solving.

Content and Applications

To realize this integration, the lab has implemented the following mechanisms and programs:

- **Joint Teaching Modules:** The lab supports the delivery of interdisciplinary and co-taught courses that include practical components such as urban simulation, digital fabrication, and sustainability assessments. These modules are embedded into the existing SABE curricula and are aligned with the Sustainable Development Goals (SDGs).
- **Design Studios and Living Labs:** Project studios engage students in real challenges, encouraging collaborative work on topics such as urban change, co design and co development, and climate-responsive planning.
- **Research-Informed Practice:** Equipment such as the Meta Quest Pro, hologram display, and energy audit tools facilitate data-driven investigations. Students participate in faculty-led teaching and research projects, often collaborating with local municipalities or industry partners to address urban issues through analytical modeling and simulations.
- **Faculty Research Integration:** Academic staff utilize the lab to conduct interdisciplinary research in areas such as sustainable development, integrated planning, and green infrastructure. This research informs course content and provides students with exposure to ongoing scientific inquiry.
- **International Collaborations:** Partner institutions such as the ProGreen Labs network contributes to research and teaching exchanges, offering joint research opportunities and co-developed educational content.

Implication

By embedding scientific research into teaching activities, the Sustainable Urbanism Lab enhances the learning process through experiential methods and real engagement. This integration contributes to the following outcomes:

- Elevating the quality and relevance of architectural education.
- Strengthening students' capacity for applied research and innovation.
- Enhancing institutional visibility through collaborative academic outputs.
- Promoting sustainable urban development through community linked research.



DISCLAIMER: This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.