# STUDIES ON THE CREATION OF A HUB FOR *sustainable development* IN CAMPINAS

SUPPORT

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Hub Internacional para o Desenvolvimento Sustentável

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## INDEX

# The HIDS and Opportunities for the Future

MICHAEL HENNESSEY

The technical cooperation of the IDB for the support of the creation of the International Hub for Sustainable Development (HIDS) began in 2019, in the pre-pandemic context and after yet another IPCC report reaffirmed the need to limit global warming to 1.5 °C. In the following years, which shaped one of the most critical moments in our history, the partnership between the IDB, Unicamp, and the City of Campinas highlighted the fundamental role of science, technology, and innovation in the record-time development of a Covid-19 vaccine.

In Brazil, the public contract for technological orders (ETEC), a public procurement instrument whose legal framework derives from the Innovation Law (Law no. 10.973/2004), facilitated the purchase of the AstraZeneca vaccine, accelerating the population's return to their activities. The instruments supporting science, technology, and innovation played a significant role in overcoming the pandemic and returning to normalcy.

In the post-pandemic world, however, we are faced with a different reality concerning climate change caused by rising global temperatures. While in 2019 the effects of climate change, including a series of extreme weather events, seemed distant, today they are increasingly frequent, making it urgent to take measures to reduce greenhouse gas emissions and, consequently, comply with the Paris Agreement to maintain the temperature within 2 degrees Celsius above pre-industrial levels.

But what do these two trends, or contextual changes, have to do with the HIDS project?

The objective of this technical cooperation is to develop a master plan and support the conceptualization and construction of the strategic framework for the creation of the International Hub for Sustainable Development (HIDS). This includes common elements with Science and Technology Parks, Innovation Ecosystems, and Innovation Clusters, as well as integration and innovation focused on networks and public policies in education, health, art, and culture at Unicamp, in Campinas. Therefore, it also addresses the numerous challenges of the post-pandemic scenario in establishing more sustainable development, especially in cities.

Specifically, HIDS aims to:

- Support scientific and technological (S&T) activities, integrating university and technology campuses with the rest of Campinas;
- Provide a regional development model that stimulates innovative and sustainable growth; and
- Position itself as a leading innovation center in Latin America, aiming to integrate knowledge in S&T to achieve the United Nations Sustainable Development Goals (SDGs).

It is important to remember that the resources for the HIDS Technical Cooperation come from the Korean Knowledge Partnership Fund for Technology and Innovation, a donation-managed fund administered by the IDB that promotes such technical assistance projects to effectively contribute to strengthening the performance of innovation systems at national and regional levels, thus increasing their competitiveness and facilitating their efficient integration into global markets.

In the execution of the technical cooperation, which concluded in March 2024, a series of technical consultancies led to significant results regarding objectives, including:

(I) the development of a physical-spatial plan for HIDS;

(II) a strategic framework for HIDS, including the definition of the hub's positioning; and

(III) a governance structure for HIDS.

With these results, we believe that the city of Campinas, Unicamp, PUC-Campinas, the State of São Paulo, and the other beneficiaries of this partnership with the IDB are well positioned to advance the next steps in implementing the plans and strategies developed from this technical cooperation. This is undoubtedly an opportune moment to move forward, given the challenges the country faces in fulfilling the commitments of the 17 SDGs and addressing the challenges of climate change and deforestation.

The Ecological Transformation Plan, part of the New PAC (Growth Acceleration Program), launched by the Federal Government at COP28, foresees investments of R$1.7 trillion by 2026. It is structured around six axes: sustainable financing, technological development, bioeconomy, energy transition, circular economy, and climate change adaptation. The plan recognizes the importance of innovation in efforts for ecological transformation. Furthermore, the government has allowed the use of the reference rate to lower financing costs for innovation through funding agencies in the country.

In this context, there is a great opportunity for HIDS to combine the knowledge and technological development already present in the territory with financial resources to create solutions for the problems of climate change.

We are uncertain about what technological solutions will help address these challenges: whether advancements in wind and solar energy will be sufficient, whether batteries will be the appropriate solution in the energy transition, whether green hydrogen will play an important role, along with the use of biomass, or if the solutions will relate to nuclear fusion, superconducting materials, whether we will manage to sequester carbon or even remove it from the atmosphere, or if another new technology will emerge to solve this immense challenge. What we can say with a certain degree of confidence is that the solutions to the challenges of climate change will come from science, technology, and innovation. And now is the time to advance! ■

# International Hub for Sustainable Development (HIDS): From Idea to First Steps

MARCO AURELIO P. LIMA AND MARCELO KNOBEL

The autonomy of management with budgetary allocation among the three São Paulo universities (USP, Unicamp, and Unesp) has contributed to placing them among the top ten universities in Latin America. Besides stability, this autonomy allows for long-term planning, which ideally should be constructed together with the entire university community. Taking advantage of the discussions that occur during the succession campaign, the beginning of each management term allows for listening to the community about their main concerns and future perspectives (Knobel, 2021). Right at the start of the 2017-2021 management, five executive directorates were created to better organize the governance of the University (Knobel and Brandão, 2021). Among these directorates, we will focus on the Executive Directorate for Integrated Planning (DEPI).[1] The main objective of DEPI was to create a long-term territorial master plan for Unicamp, with special attention to the newly acquired area of 1.4 million square meters, known as Fazenda Argentina, adjacent to the campus and part of the II High Technology Pole of the city of Campinas (Ciatec II). In reflecting on what the University wanted for this new area, there was an understanding that we could either do more of the same or something different that could further improve the service we provide to the State of São Paulo and Brazil (Knobel and Lima, 2021). It is worth noting that having an unoccupied area was quite concerning, both due to the risk of invasions and depreciation. Indeed, the headquarters of the former farm, the only property on the land, had been completely vandalized, with the theft of doors, flooring, and even electrical wiring. On the other hand, the opportunity to have a vast area adjacent to the University to conceive something completely innovative was a unique challenge worthy of a university like Unicamp.

Exploring possibilities, we highlight here the visit to the then Secretary of State for Energy and Mining, João Carlos Meirelles, in 2017. With a focus on sustainability, we asked him what he thought Unicamp could do to improve its contribution to the State of São Paulo. The summarized response was something along these lines: “It may sound strange what I’m going to say, but oil extraction from the pre-salt layer is working in São Paulo, and we need a research center to assist in the energy transition from fossil sources to clean sources. We have specialists on both sides, but we do not have an institution dedicated to the transition” (the subject, by the way, remains very current and relevant (Peyerl, Relva, da Silva 2023). We left this conversation with the intention of creating the Center for Future Energy. When testing this idea with the scientific director of Fapesp at the time, Prof. Dr. Carlos Henrique de Brito Cruz, we were told that if the idea was to create a center for future energy, why not a center for future health, future food, future education, etc. This pushed us toward the UN sustainable development agenda, which recognizes the need for economic development, provided that such development is reconciled with the environment and with the commitment to ensure that future generations have the same conditions to meet their needs as the present generation

does—note that, in this concept, the social dimension is absolutely included. Thus was born the idea of creating in Unicamp an International Hub for Sustainable Development. It could host technology development centers with a long-term vision, harmonized with


sustainability in its broadest sense (environmental, social, and economic). To achieve this, it was necessary to involve the local community and invite the entire international community interested in the topic.

The urgency is undeniable. Climate change has always been present on a geological scale. Due to a lack of CO2, we have evidence that the Earth became a snowball for more than 50 million years, 717 million years ago (at that time, only microscopic life existed). The current problem is that climate change is being caused by humans at an unprecedented and out-of-control speed. This is scientifically based. Humanity urgently needs to organize its development strategy (a challenge for all areas of knowledge). The HIDS was born to collaborate in the search for solutions to this challenge.

From a practical standpoint, the idea was to seek the much-desired interdisciplinarity with an ambitious public-private connection project and to attract talent and infrastructure for this new area. In parallel with the formulation of the HIDS concept, we began the recovery of the farm's headquarters, establishing a successful partnership with Empresa Campinas Decor, which holds architecture and decoration exhibitions in Campinas. The exhibition took place from April 27 to June 10, 2018, and this partnership resulted in a complete renovation of the farm's headquarters and its adjacent building, which would remain as a legacy for the University. In 2020, the headquarters of the Unicamp Innovation Agency (Inova) was transferred to the farm's headquarters to keep the building occupied and to clearly convey the message of the innovation we had planned for that area.

An important milestone that contributed to the inspiration for the final design of the HIDS was the participation (of MAPL and Prof. Dr. Marcelo Cunha, who was an advisor at DEPI at

the time) in the Hamburg Sustainable Development Summit in 2017 in Germany. There, the project and its implementation of HafenCity in Hamburg were presented, which has become an international reference for the reconstruction of degraded urban areas, based on the premise of urban centrality as Instrument of Revitalization. Witnessing the materialization of HafenCity (Eleftheriou and Knieling 2017), we imagined that it would be possible to conceive the HIDS beyond Unicamp, bringing together the institutions present in the Ciatec II area and inviting the City Hall of Campinas to participate in the project.

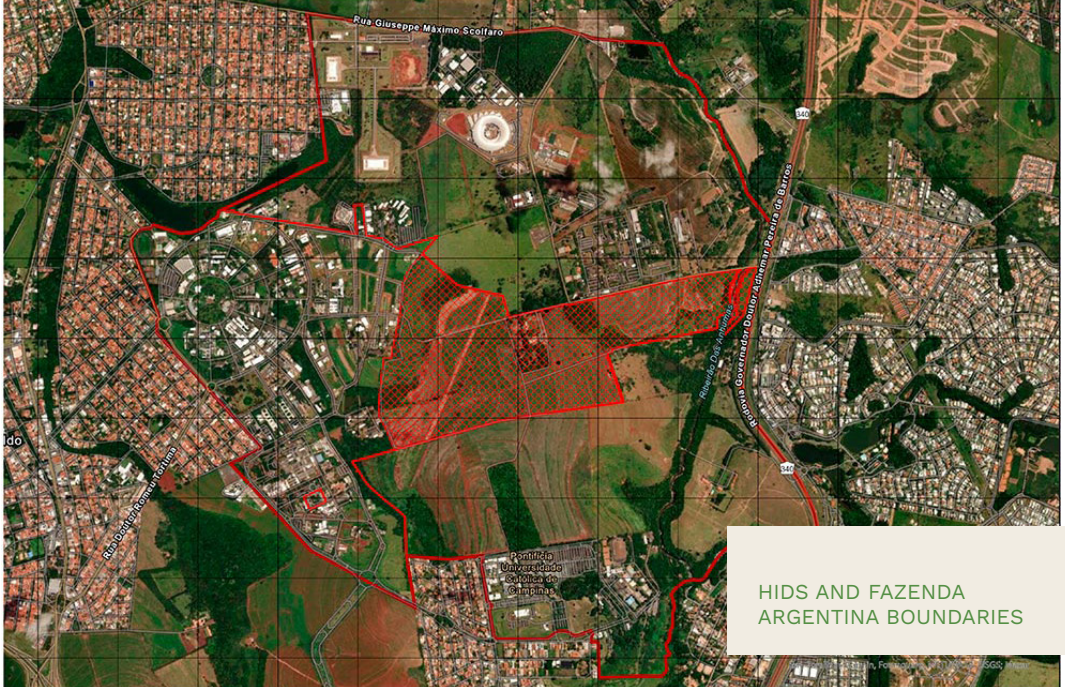
In fact, the City Hall was discussing a proposal to change the land subdivision, use, and occupation law for the region. In a meeting with the main institutions of Ciatec II called by the City Hall, Unicamp reported its plans to create the HIDS and suggested that the project could be expanded to involve the entire area of Technology Polo II. The representative of PUC-Campinas, then Vice-Rector Ricardo Pannain, promptly expressed his desire to participate in the project by including PUC-Campinas campus 1 in the expanded area of HIDS (if approved, it would cover 11.3 million m²).

On February 14, 2019, Unicamp's rector, Marcelo Knobel, invited the mayor of Campinas, Jonas Donizette, and the rector of PUC-Campinas, Germano Rigacci Jr., to a meeting that officially formalized the proposal to create HIDS in the territory involving Ciatec II, PUC-Campinas campus 1, and the Zeferino Vaz campus of Unicamp.

The establishment of HIDS advanced with the creation of its Founding Advisory Council (first meeting on October 8, 2019), composed of institutions conducting research in the territory (the three universities – PUC-Campinas, Unicamp, and Facamp – CNPEM, TRB Pharma, Cargill Innovation Center in Latin America, Global Tech, CPQD, ELDORADO Institute, and Embrapa), the water and sewage concessionaire (SANASA), and the electricity concessionaire (CPFL), as well as stakeholders from the City Hall of Campinas and the government of the State of São Paulo. This Council was conceived as a temporary governance body for HIDS until the best legal model was found to establish this complex multi-institutional and multi-governmental partnership. The plan was to proceed with the planning of HIDS to turn it into an intelligent district that reconciles urbanism and the environment in the form of a living laboratory on various themes, proposing sustainable solutions, measuring results, correcting paths, and above all serving as a model of sustainable development aligned with the principles of the Global Compact and the UN 2030 Agenda.

HIDS was initially structured into six programs, with the respective coordinators: (1) Sustainability Assessment (Prof. Dr. Marcelo Pereira da Cunha, IE-Unicamp); (2) Environmental and Cultural Heritage (Prof. Dr. Wesley Silva, IB-Unicamp); (3) Urban Planning (Prof. Dr. Gabriela Celani, FECFAU-Unicamp); (4) Business Model (Prof. Dr. Miguel Bacic, IE-Unicamp); (5) Communication (Dr. Patrícia Mariuzzo, DEPI-Unicamp); and (6) Legal (Prof. Dr. Josué Mastrodi, PUC-Campinas).[2]

Based on a strategy for the Universities to embrace the initiative and actively participate, DEPI established a visitation agenda for all units of Unicamp and several from PUC-Campinas. We engaged with all institutional councils multiple times – this action, in itself, resulted in the presentation and discussion of HIDS's directions on more than one hundred occasions. Institutes and faculties were invited to participate in HIDS by proposing living laboratories of their interest. The collected material was very rich and clearly demonstrated the actual willingness of the Unicamp community to actively participate in the initiative.




Coordenadoria de Geoprocessamento (CGEO) da Unicamp/DEPI/CSUS

HIDS AND FAZENDA ARGENTINA BOUNDARIES

Furthermore, Unicamp's Integrated Master Plan (under the coordination of Dr. Thalita Dalbelo, DEPI) needed to be fully reconciled with HIDS. This plan was approved by Unicamp's University Council at the end of 2020. The strategy for undertaking new works at Unicamp (under the responsibility of Talita Mendes, DEPI) was also restructured to align with the logic of the new master plan. DEPI brought in the strategy of georeferencing (Dr. Vanderlei Braga) as a tool to assist in the formulation of the Master Plan, also serving as inspiration for HIDS planning. (For a complete report on DEPI's actions, see Lima et al., 2021). The university community realized that, beyond the strategies for occupying or expanding Unicamp, HIDS should serve the purpose of actively and robustly boosting sustainable development in the country.

During discussions about the idea of creating HIDS, it was suggested that we submit a proposal for the conception of the HIDS master plan to the Inter-American Development Bank (IDB), as there were lines of funding available. The project was prepared and submitted, and nearly a year later, following adjustments and negotiations involving the City Hall of Campinas, the funding was approved from a South Korean fund interested in smart city planning. The IDB conditioned the approval of the proposal on presenting a letter of support from then-Governor of the State of São Paulo, João Doria, and then-mayor of Campinas, Jonas Donizette, as the support of both officials was important for the next phase of project implementation. This letter was delivered on June 6, 2019, and the Bank made available 1 million US dollars, as a non-repayable grant, for HIDS planning. The Korean Fund, in turn, conditioned the approval of the investment on the participation of a South Korean company, KRIHS (Korea Research Institute for Human Settlements), specializing in smart city planning. We had all the ingredients to reconcile the smart city with the sustainable city and the commitment of the city and the government of the State of São Paulo for the project's implementation, pending approval by all parties involved.

The agreement with the IDB was signed at the Palácio dos Bandeirantes in the presence of the Vice-Governor of the State of São Paulo (at the time, Rodrigo Garcia) and all members of the HIDS Founding Advisory Council. It is worth noting that this took place on March 11, 2020, one day before Unicamp decreed the suspension of face-to-face activities due to the Covid-19 pandemic. It is unnecessary to explain the challenges of implementing this project remotely.

From this moment on, specific working groups were created to advance the different planning fronts of the project and to dialogue with Korean partners. Besides the

difficulties related to language, the pandemic, and the expectations of various actors, the country was experiencing a politically tumultuous moment, with political campaigns for major offices and a succession process at Unicamp itself, which held a community consultation to choose the rector in February 2021. We indicated to the governance of the IDB project the company Inventta (coordinated by Bruno Moreira), hired by the IDB to fulfill this role. It is important to remember that projects of this magnitude should be long-term and have continuous support from various administrations. After a period of adjustments and adaptations, both the new rector of Unicamp (Antônio José de Almeida Meirelles) and the new Mayor of Campinas (Dário Saadi) understood the importance of HIDS for the University and the city and prioritized the project in their respective administrations. In the case of Unicamp, the coordination of HIDS was entrusted to Prof. Dr. Mariano Laplane, who retained much of the team that had already been working on the project, allowing for its continuity.

HIDS is a project with virtuous ambition, long-term goals, and aims to unite public and private institutions, both national and international, in the form of consortia and partnerships, along with different government spheres. Only with projects of this magnitude can Brazil effectively contribute to the process of sustainable development, produce knowledge, innovative technologies, and educate future generations, mitigating and overcoming the social, economic, and environmental fragilities of contemporary society. We, as the authors of this chapter and active participants in conceiving the idea and implementing the first steps of HIDS, intensely hope that it strengthens and becomes a tangible reality very soon. ■

## NOTES

1. The authors of this chapter actively participated in the management from 2017 to 2021. MK as Rector and MAPL as the first director of DEPI.
2. See the chapter “The Idealization of an Innovation Hub from the University.”

## REFERENCES


ELEFTHERIOU, V.; KNIELING, J. (2017), The urban project of HafenCity. Today’s Urban and Traffic profile of the area. Executive summary of methodology and traffic research conducted in the region, *Transportation Research Procedia*, V. 24, pp. 73-80. Available at: <https://doi.org/10.1016/j.trpro.2017.05.070>.

LIMA, M.A.P. et al. (2021), DEPI – Relatório de Gestão (2018-2021), available at <https://www.unicamp.br/unicamp/sites/default/files/2021-04/Relat%C3%B3rio%20de%20Gest%C3%A3o%20DEPI%202017-2021.pdf>

KNOBEL, M. (2021). Electing a Rector in Brazil: Complicated Politics. *International Higher Education*, 108, 22-23. Available at: <https://ejournals.bc.edu/index.php/ihe/article/view/14453>.

KNOBEL, M.; BRANDÃO, R. B. (2021). *Relatório de Gestão*: 2017-2021. Campinas: BCCl Unicamp. ISBN: 978-65-88816-16-5. Available at: <https://unicamp.br/unicamp/sites/default/files/ju/especial/2021-04/01_Apresenta%C3%A7%C3%A3o%20-%20RG%202017-2021%20UNICAMP.pdf>.

KNOBEL, M.; LIMA, M.A.P. (2021). Ousadia para um Futuro Sustentável, Opinião, *O Estado de São Paulo*, 16/04/2021. Disponível em: <https://www.estadao.com.br/opiniao/espaco-aberto/ousadia-para-um-futuro-sustentavel/>.

PEYERL D.; RELVA, S.; DA SILVA, V. (editores). *Energy Transition in Brazil*, Springer 2023. Available at: <https://doi.org/10.1007/978-3-031-21033-4>.

# HIDS: A Window of Opportunity for Implementing SDGs in a Knowledge and Innovation Territory[1]

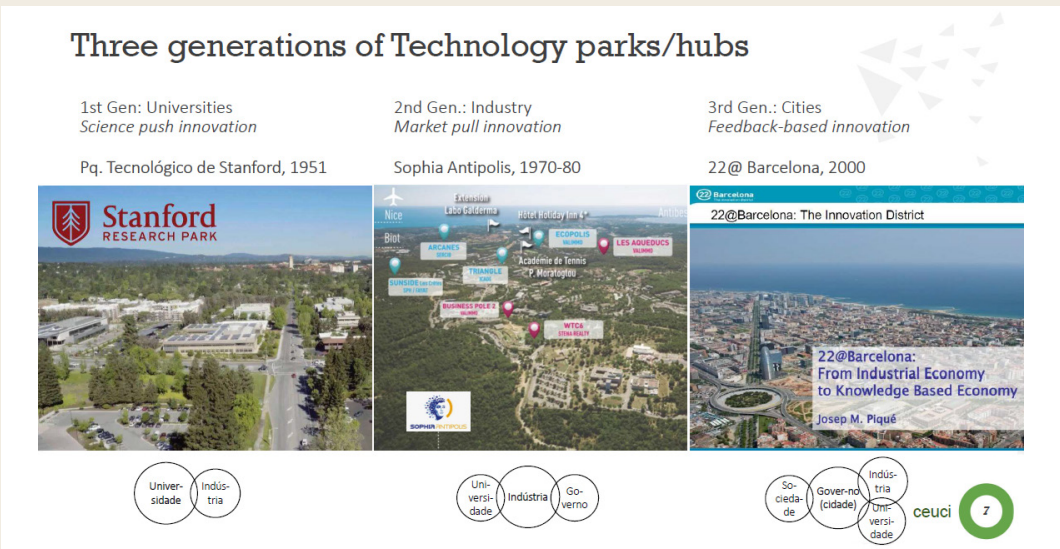
GABRIELA CELANI, MILENA SERAFIM AND EMILIA RUTKOWSKI[2]

Since the Argentina Farm was acquired by Unicamp in 2014, there has been much discussion about the different possibilities for the use and occupation of the area. This article will present concepts about scientific and technological parks, followed by a historical overview of the territory where Unicamp and the Argentina Farm are located, and a description of the proposals already developed for the region. Currently, a land use and occupancy law project for the area is under discussion at the Planning and Urbanism Department of the Municipal Government of Campinas.

## FOUR GENERATIONS OF SCIENTIFIC AND TECHNOLOGICAL PARKS

Scientific and technological parks emerged in the 1950s in the United States and have since been replicated in different countries, aiming to promote interaction between universities and other sectors of the economy and society, fostering knowledge-based economic development (figure below).

Credit: Prepared by the authors




THE FOUR GENERATIONS OF TECHNOLOGY PARKS, WITH EXAMPLES AND MODELS OF INNOVATION

The characteristics of different science and technology parks are directly linked to the nature of the type of innovation intended. Annerstedt (2006) describes three generations of technology parks, which he associates with three styles of innovation: science push (where innovations created in universities are offered to industry), market pull (where industry requests the development of specific products by universities), and interactive or feedback-based, where there is participation from the local community. Moreover, it is possible to associate these three generations of parks with three models of relationships among their actors: double (university and companies), triple (university, companies, and government), and quadruple (university, companies, government, and society). The second and third models were respectively described as triple helix (Etzkowitz and Leydesdorff, 1995) and quadruple (Carayannis and Campbell, 2009). Thus, the first generation of science and technology parks aimed to create economic opportunities for universities through the application of the results of their research. For this reason, these parks were typically created by the universities themselves, usually near or within their campuses, through a partnership with companies. An example of this type of park is the Scientific and Technological Park of Unicamp, created in 2008 and located in the northeastern part of the Zeferino Vaz campus. The second generation of parks aimed to create suitable technologies for economic use and encourage university students to become entrepreneurs. These were generally created by business organizations, with government support and in association with universities. It was with this vision that Professor Rogério de Cerqueira Leite envisioned, in the late 1980s, the High Technology Pole of Campinas and Ciatec, the company responsible for its management.

The third-generation parks are based on the model of interactive innovation and the quadruple helix. They are generally located in urban centers or districts and have as their main objective the improvement of community well-being, contributing to the creation of an entrepreneurial culture and establishing a bidirectional communication between creators and users of knowledge and technologies (Gyurkvics and Lukovics 2014, 198–99). An example of this type of environment in Brazil is Porto Digital, in Recife, a project that renewed and revitalized the old center of the city.

More recently, Carayannis, Barth & Campbell (2012) proposed the concept of innovation based on a quintuple helix, in which, in addition to government, university, industry, and society, the environment is also included. The new generation of science and technology parks corresponding to this model of innovation is Knowledge-Based Urban Development (KBUD). The KBUD is defined as:

> *A new development paradigm of the knowledge economy era that aims to bring economic prosperity, environmental sustainability, a just socio-spatial order, and good governance to cities and produce a city purposefully designed to encourage the production and circulation of knowledge in an environmentally sustainable manner, with a human and economically secure, socially just, and well-governed environment; a knowledge city* (Yigitcanlar 2015).

In KBUDs, the environment is related not only to the quality of life necessary to attract and retain talent but is also the object of innovative businesses linked to environmental sustainability, which is more necessary than ever in a world of climate change and ecological disasters. These areas are typically located in urban fringes, where there is space available for large science and technology facilities, such as large laboratories and university campuses, constituting an opportunity to apply the latest technologies to

achieve a healthy coexistence between human activities and the natural environment. These areas include residential buildings and leisure spaces and are also accessible by public transport, implementing current concepts of sustainable urbanism, such as the compact city, the 15-minute city, biophilia, pedestrian cities, nature-based solutions, and new forms of active mobility. A good example of this type of area is the Urban Operation Zone of Moulon (France), where the "urban campus" of Paris-Saclay University and the Soleil synchrotron accelerator are located. Located 30 km south of Paris, the area has already been certified as an eco-district by the French government. In June 2022, a delegation from Unicamp visited the area to learn about this new urbanization paradigm.

**FROM POLO 2 OF CIATEC TO HIDS**

In 1975, Professor Rogério de Cerqueira Leite, from the "Gleb Wataghin" Institute of Physics at Unicamp, created Brazil's first technology incubator. It was a private company, called Codetec, "with strong ties to Unicamp, dedicated to facilitating the establishment of small companies capable of generating technology appropriate for Brazilian conditions by professors and students of the University" (Leite, 2008, p. 484).

Shortly thereafter, in the 1980s, Cerqueira Leite envisioned the creation of a high technology pole for Campinas, in an area close to the University, inspired by the model he had known in California (USA), where an entire region had been designated for the implementation of high technology industries. As Mariuzzo (2020) reports, "in 1983, during the administration of Mayor Magalhães Teixeira, the Companhia de Desenvolvimento do Polo de Alta Tecnologia de Campinas (Ciatec) was created, responsible for managing Polo 1 [...] and Polo 2 [...], created in 1992." Polo 2 was implemented between the Zeferino Vaz campus and the Adhemar de Barros Highway, an area where two of the many historical farms in the region are still located.

According to Martins (2015), Mayor Magalhães Teixeira was "convinced by Cerqueira Leite of the strategic decision that would be the establishment of a technology park in the municipality, due to the presence of Universities, research centers, and its privileged position in terms of transport and circulation of goods." Therefore, it was clearly a second-generation technology park, aiming to promote the symbiosis between university, industry, and government. However, despite the installation, in the region of CPQD (Research and Development Center in Telecommunications), CNPEM (National Center for Research in Energy and Materials), and some companies, the expectation that Polo 2 of Ciatec would transform the city into the Brazilian Silicon Valley was not realized, precisely due to the difficulty of this interaction. Cerqueira Leite himself (ibid.) stated that "the lack of a more consistent dialogue between the public authorities and the scientific community and barriers to attracting technology-based industries [were] among the reasons for what happened."

Law 8.252 of 1995, which defined land use and occupation in Polo 2 of Ciatec, stipulated that, when parceled, plots larger than ten hectares should allocate 60% of the area for industrial use and only 40% for residential, commercial, service, and institutional uses. The Local Urban Management Plan of Barão Geraldo (1996) already highlighted the high

land prices and the availability of cheaper lots in nearby cities like Jaguariúna and Paulínia as difficulties for the effective development of the Pole: “The land has a price that makes it economically unfeasible to invest in exclusively industrial enterprises and even if other uses are allowed, if it is not possible to “achieve a higher land density for residential purposes, there will be no interest” (p. 49). The plan also pointed out the impossibility of vertical development, as well as the lack of infrastructure in the area, although Law No. 8.252 of 1995 had already established road guidelines compatible with the proposed occupation for Polo 2 of Ciatec.

In 2004, the Innovation Agency Inova Unicamp, through an agreement with Finep (Funding Agency for Studies and Projects), hired Pratec (2005) to develop a Basic Urban Plan for Polo 2 of Ciatec. The analysis carried out by the company also highlighted that the local zoning ignored “on one hand, the market pressures for the opening of the area for the implementation of residential uses and, on the other hand, [was] out of sync with the current demands of the institutions and technology-based companies.” Furthermore, it also pointed out the lack of a road system and the high land prices. The urban plan developed by Pratec proposed densifying the region with industrial and service sectors and creating horizontal and vertical residential zones of low height. The urban concept of this plan was functionalist, with segregation of uses and no provision for mass public transport lines.

In 2008, the Municipal Government of Campinas hired Jaime Lerner’s office (Lerner and Seplama, 2010) to develop another urban proposal for the area. The final version of this plan, from 2015, was based on the concept of Transit-Oriented Development (TOD) and proposed structuring the region along two major mobility axes running South-North, one coinciding with the power transmission line, continuing Avenida Guilherme Campos, and the other closer to the Adhemar de Barros Highway. Along these axes, mixed-use and verticalization would be allowed. The other areas would be dedicated to industrial or residential uses. The major difference between the 1995 Law and the plans proposed by Pratec and Jaime Lerner’s office is that, while the first stipulated a division of residential and industrial uses per plot, the second and third divided these uses considering the territory as a whole. Additionally, Lerner’s project introduced densification and mixed-use areas along the mobility axes, something that had not been foreseen in previous plans and would later be adopted in the Master Plan approved in 2018 (Complementary Law 189/18). Other issues introduced by the projects of Pratec and Lerner included attention to the historical and natural heritage of the region, marked in these plans.

During the last revision of the Master Plan of Campinas, a zoning proposal based on Lerner’s project was presented at a public hearing in Barão Geraldo. After receiving criticism from the public, it was ultimately not incorporated into the Complementary Law approved in 2018. In this law, the Ciatec Polo 2 was defined as a Strategic Development Pole, but its zoning was changed to Economic Activity Zone (ZAE), where residential use is not permitted. Urban development in the area has since remained suspended, awaiting a new proposal for land use and occupation.

In 2014, Unicamp acquired the Fazenda Argentina, extending its campus area by 140 hectares, of which 20 were necessary to expand its Scientific and Technological Park, allowing it to meet the minimum area required for accreditation in the São Paulo

System of Technological Parks (SPTec) (Correio Popular, 2013). With this, the University became the owner of a significant portion of Ciatec Polo 2 and assumed a leadership role in resuming proposals for the establishment of the High Technology Pole. Starting in 2017, a proposal was made for the creation of an International Hub for Sustainable Development (HIDS) in the region, whose guidelines are based on the 17 Sustainable Development Goals (SDGs) proposed by the United Nations (UN). From 2020 to 2022, under a partnership established between the IDB (Inter-American Development Bank), Unicamp, and the Municipal Government of Campinas (HIDS, 2020) worth US$ 1 million, consultancy services were contracted for environmental assessment, business modeling, and urban planning, among others, to support a master plan for the area. The environmental consultancy identified areas of higher environmental vulnerability in floodplains and slopes, as well as areas more suitable for urbanization with greater density on the central ridge. The business modeling consultancy identified favorable themes such as IT, agribusiness, health, and sustainable urban technologies, with potential for establishing living laboratories.

Also in 2020, the Faculty of Civil Engineering, Architecture, and Urbanism at Unicamp created a postgraduate course (specialization) specifically to study the region and analyze possible occupation scenarios. The course, offered online and lasting 15 months, involved professors from different fields and 20 students from various backgrounds across Brazil. The results can be seen on the course page. One outcome of this course was the creation of the Center for Studies on Urbanization for Knowledge and Innovation (Ceuci) from a call for proposals by Fapesp (São Paulo Research Foundation).

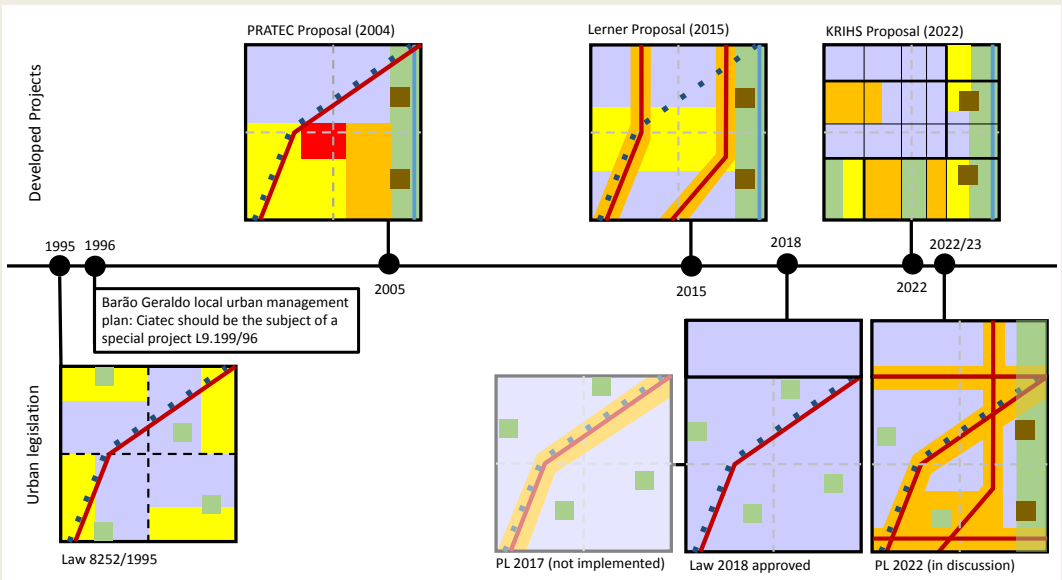
In 2022, during the preparation of the urban plan contracted by the IDB, the Korea Research Institute for Human Settlement (Krihs) based its work on studies from the contracted consultancies and the Unicamp specialization course, relying on the concepts of Knowledge-Based Urban Development. Additionally, a group of professors from the environmental and urbanism departments of Unicamp and the Pontifical Catholic University of Campinas (PUC-Campinas), along with technicians from the Campinas City Hall, monitored the project's development, providing feedback at each stage. Krihs specializes in projects of this type, such as the Pangyo Techno Valley (South Korea), one of the areas visited in September 2022 by a delegation from Unicamp, PUC-Campinas, and Campinas City Hall, under the partnership with the IDB.

The master plan developed proposes the creation of two denser centralities with mixed use (including housing, corporate areas, commerce, and services) and predominantly residential areas (with 10% of the area allocated for commerce and services), including 15% social housing, with decreasing density as they approach floodplain areas. The only areas exclusive for technological activities are those already existing and the area of Fazenda Argentina, which is more economically viable for such use. The plan includes the installation of mass public transport and active mobility systems. Moreover, in the project, areas of architectural and environmental heritage are preserved and integrated into a tourism and leisure system. The master plan developed by Krihs allows for the introduction of complementary activities that will support and enable the full realization of the planned objectives of creating a fourth-generation innovation ecosystem based on the knowledge society and economy.

## A NEW ZONING PROPOSAL FOR THE AREA

After the completion of Krihs's project, the Planning and Urbanism Department (Seplurb) of Campinas City Hall reformulated the land use and occupation proposal for the region. Seplurb added a new expansion area to the north of HIDS and began referring to it as the Innovation and Sustainable Development Pole (Pids). The proposed bill is primarily based on the concept of Transit-Oriented Development (TOD) and on the proposals that were being worked on for the last master plan, but it also incorporates elements from the project developed by Krihs and from Unicamp's specialization course, such as the creation of Anhumas Park, mixed use, walkability, valuing historical heritage, and promoting social housing within the framework of sustainable urbanism, KBUD, and the 15-minute city concept. Furthermore, it proposes various sustainability actions, such as the use of renewable energy and materials, nature-based solutions, mass public transport, low environmental impact lighting, monitoring and protection of wildlife, environmental education, etc. The following figure schematically shows the evolution of urban legislation occurring in parallel with the projects developed for the area.

Credit: Prepared by the authors




THE EVOLUTION OF URBAN LEGISLATION APPLICABLE TO THE HIDS AREA

However, the proposal presents some aspects that remain somewhat vague and could be specified more clearly. Additionally, from the standpoint of proposed density, there are no specific actions indicated for areas susceptible to flooding or landslides and

erosion, as noted in the environmental assessment by Carbono Zero, contracted by the IDB. These are some points with which the academic community can collaborate by making qualified and scientifically based suggestions that can contribute to ensuring that urbanization of the area has the least environmental impact possible. For this reason, it is of fundamental importance that the population of Campinas be involved in various phases of the process, making the area a living laboratory.

The expectation is that, following the approval of this law, the necessary conditions will be created for the realization of the project initiated in the 1980s by Professor Rogério de Cerqueira Leite, now much more updated in terms of urban and sustainability principles, no longer as a second-generation technological park, but rather as a true territory of knowledge and fourth-generation innovation that implements the quintuple helix concept, incorporating environmental issues. ■

## NOTES

1. This text is an adaptation of an article originally published in the Jornal da Unicamp (2022). Available at: <https://www.unicamp.br/unicamp/ju/artigos/ambiente-e-sociedade/hids-uma-janela-de-oportunidade-para-implementacao-dos-ods-em-um/>.

2. Fapesp Process 21/11962-4.

## REFERENCES


ANNERSTEDT, Jan. "Science Parks and High-Tech Clustering." In: BIANCHI, Patrizio; LABORY, Sandrine (eds.). *International Handbook on Industrial Policy*. Edward Elgar Publishing, 2006. p. 279–97. Available at: <https://econpapers.repec.org/RePEc:elg:eechap:3451_14>. Accessed on: Nov. 20, 2022.

CARAYANNIS, Elias G.; CAMPBELL, David F. J. "Mode 3 and Quadruple Helix': Toward a 21st Century Fractal Innovation Ecosystem." *International Journal of Technology Management*, v. 46, n. 3–4, p. 201–34, 2009.

CARAYANNIS, Elias G.; BARTH, Thorsten D.; CAMPBELL, David F. J. "The Quintuple Helix Innovation Model: Global Warming as a Challenge and Driver for Innovation." *Journal of Innovation and Entrepreneurship*, v. 1, n. 1, p. 2, 2012. Available at: <https://doi.org/10.1186/2192-5372-1-2>. Accessed on: Nov. 20, 2022.

ETZKOWITZ, Henry; LEYDESDORFF, Loet. "The Triple Helix – University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development." EASST Review, v. 14, n. 1, p. 14–19, 1995. Available at: <https://ssrn.com/abstract=2480085>. Accessed on: Nov. 20, 2022.

GYURKOVICS, János; LUKOVICS, Miklós. "Generations of Science Parks in the Light of Responsible Innovation." In: GYURKOVICS, János; LUKOVICS, Miklós (eds.). *Responsible Innovation*. Szeged: University of Szeged, Faculty of Economics and Business Administration, 2014. p. 193–208.

LERNER, J.; SEPLAMA. *Real Estate Potential to Support the Viability of the High-Speed Train in the Campinas Area*. Campinas: City Hall of Campinas, 2010.

MARIUZZO, Patrícia. “Unicamp Seeks to Strengthen Partnerships to Consolidate HIDS.” HIDS - International Hub for Sustainable Development. Available at: <http://www.hids.unicamp.br/unicamp-busca-fortalecer-parcerias-para-consolidar-hids/>. Accessed on: Nov. 20, 2022.

MARTINS, José Pedro. Cerqueira Leite: Science and Technology Can Advance with Social Organizations. Social News Agency, Apr. 30, 2015. Available at: <https://agenciasn.com.br/arquivos/3287>. Accessed on: Nov. 20, 2022.

YIGITCANLAR, T. “Knowledge-Based Urban Development.” In: KHOSROW-POUR, Mehdi (ed.). ***Encyclopedia of Information Science and Technology***. 3rd ed. Hersey, PA: IGI Global, 2015. p. 7475–7485. Available at: <https://www.igi-global.com/dictionary/?p=Knowledge-based+urban+development>. Accessed on: Nov. 20, 2022.

LEITE, R. C. C. CODETEC – Technology Development Company. ***Brazilian Journal of Innovation***, Campinas, SP, v. 7, n. 2, p. 483–489, 2008. DOI: 10.20396/rbi.v7i2.8648972. Available at: <https://periodicos.sbu.unicamp.br/ojs/index.php/rbi/article/view/8648972>. Accessed on: Nov. 20, 2022.

CITY HALL OF CAMPINAS. ***Local Urban Management Plan for Barão Geraldo***. Campinas, 1996. Available at: <https://saude.campinas.sp.gov.br/seplan/publicacoes/plg/plgbarao/plgbg.pdf>. Accessed on: Nov. 20, 2022.

CITY HALL OF CAMPINAS. Law 8252/95 | Law no. 8252 of January 3, 1995. Available at: <https://leismunicipais.com.br/a/sp/c/campinas/lei-ordinaria/1995/825/8252/lei-ordinaria-n-8252-1995-dispoe-sobre-o-uso-e-ocupacao-do-solo-da-area-destinada-ao-parque-ii-do-polo-de-alta-tecnologia-de-campinas>. Accessed on: Nov. 20, 2022.

PRATEC. ***Scientific and Technological Park of Campinas. Basic Urban Plan***, 2005. Available at: <https://drive.google.com/file/d/1x6ANQ6DqDjJTMzdJhELL1_3e46CQSwyt/view?usp=share_link>. Accessed on: May 10, 2020.

CORREIO POPULAR. Expropriation Confirmed to Expand Unicamp, Mar. 15, 2013. Available at: <https://correio.rac.com.br/confirmada-desapropriac-o-para-ampliar-unicamp-1.1023236>. Accessed on: Nov. 20, 2022.

HIDS. Signature of Agreement between BID, City Hall of Campinas, and Unicamp for the Elaboration of the HIDS Master Plan, Mar. 11, 2020. Available at: <http://www.hids.unicamp.br/assinatura-convenio-entre-bid-prefeitura-de-campinas-e-unicamp-para-a-elaboracao-do-master-plan-do-hids/>. Accessed on: Nov. 20, 2022.

# Strengthening an Innovation Ecosystem

The presence of leading academic and research institutions in Campinas fosters a dynamic environment for the development of the Hub. HIDS plays a pivotal role in positioning Campinas and its surrounding region as a national benchmark in technological innovation and sustainable development solutions.*


*With information from the Municipal Secretariat of Economic Development, Technology, and Innovation of the Campinas City Hall.

# The Ideation of an Innovation Hub from the University

PATRICIA MARIUZZO

In 2013, the State University of Campinas (Unicamp) acquired the Fazenda Argentina, an area of 1.4 million m² adjacent to the university campus in the Barão Geraldo district of Campinas. This acquisition, which represented a 60% expansion of the campus area, sparked intense discussions among the university's technical staff about how to occupy this new area to promote sustainable and equitable development, aligned with societal aspirations, and to strengthen, through the contributions of public universities, this strategic agenda in the contemporary context. Considering the occupation of the area as an opportunity to explore initiatives to promote, address, and encourage the UN's 2030 Agenda, with its 17 Sustainable Development Goals (SDGs), the possibility of creating an International Hub for Sustainable Development (HIDS) in Fazenda Argentina was considered.

As the activities aimed at identifying projects that could be developed in HIDS evolved, the synergy and opportunity of this initiative with the vocations of the various stakeholders in the High Technology Pole (also known as Ciatec II), situated in an area of 8.8 million square meters, where part of the Unicamp campus is located, became evident. Thus, taking into account: (i) the opportunities and challenges related to the Sustainable Development Goals, (ii) the recognition of the area adjacent to Unicamp/Ciatec II as a Strategic Development Pole, and (iii) the vocations of the actors already present in this area (amplified by the presence of the Pontifical Catholic University of Campinas – PUC-Campinas), the prospect of HIDS advanced, with universities as central and irradiating knowledge centers to promote, with Campinas and the surrounding region, the creation of a sustainable district (an international reference for smart cities) with direct local and regional impact.

With the involvement of other institutions, HIDS came to encompass the entire area that includes the Ciatec II region, PUC-Campinas, and Unicamp. This text recalls the initial planning phase of HIDS under the coordination of Unicamp, specifically the Executive Directorate of Integrated Planning (DEPI).

Since the initial discussions about the possibility of creating an innovation hub around Unicamp, the HIDS was envisioned as a structure that combines and articulates actions through partnerships and collaborations among institutions with competencies and interests aimed at providing concrete contributions to sustainable development broadly, including actions that have impacts on social, economic, and environmental axes. These discussions also resulted in the first definitions of its mission and vision.

The mission of HIDS is to contribute to the process of sustainable development by aggregating national and international efforts to produce knowledge, innovative technologies, and education for future generations, mitigating and overcoming the

social, economic, and environmental fragilities of contemporary society. Its vision is to transform the High Technology Pole of Campinas and the surrounding region into the main hub for sustainable development at a global level.

HIDS is an ambitious, long-term project with the potential to transform the city and region of Campinas and strengthen Brazil as a locus for the development of sustainable knowledge and technologies. Its consolidation depends on the definition of a legal structure and a governance model that enable partnerships, agreements, as well as the implementation of urban infrastructure and the attraction of new actors and talents. Proposals around these themes are discussed in other chapters of this book. However, it is certain that effective management of this phase, listening to various stakeholders and articulating diverse competencies, is essential for the success of this journey.

Between 2020 and 2022, an agreement between the Inter-American Development Bank (IDB), Unicamp, and the City Hall of Campinas, with a grant investment of US$ 1 million, enabled a series of studies on HIDS, covering different aspects of the project, including the physical-spatial design, socio-cultural and environmental heritage, and business and governance models. Coordinated by Unicamp, part of these studies was conducted by consultants hired by the IDB, and part by teams formed by researchers and professionals from the founding Advisory Council of HIDS.

These research efforts provided support for the development of a master plan proposal for the HIDS area. Developed by the Korea Research Institute for Human Settlement (KRIHS), the occupancy proposal suggests the creation of two denser centers with mixed-use (including housing, corporate areas, commerce, and services) and predominantly residential areas. The only areas exclusively designated for technological activities are the existing ones and the area of Fazenda Argentina (CEUCI, 2022).

Given the inherent complexity of a project like HIDS, Unicamp's DEPI established seven interdependent work components that should guide the planning and development of the HIDS master plan:

1. **Physical-Spatial Project**: Responsible for monitoring the development of the master plan by KRIHS and interacting with the other components of the project to identify preservation areas and minimize environmental impacts, best sustainability practices, physical spaces conducive to the creation of innovation ecosystems, funding methods for the physical implementation of the project, and defining legislation capable of ensuring spatial results.

2. **Business Model**: This group was responsible for identifying synergies and partnership opportunities based on the mission, objectives, and strategy of the institutions participating in HIDS, as well as articulating the actions of the participants to enable the greatest possible cooperation among them. From this effort, the goal was to arrive at a business model capable of generating positive externalities for all HIDS

participants, such as infrastructure development, legal facilities, and a favorable environment for the primary goal of HIDS: innovation and sustainability through education, technological and social development, and entrepreneurial actions.

3. **Heritage**: This working group sought to establish a reference baseline for the biodiversity and ecosystem services of the territory (inventory of vertebrates; inventory of invertebrate groups that can be used as environmental indicators, inventory of trees, as well as the current connectivity between remnants; baseline inventory of carbon below and above ground). It also aimed to assess the stage of succession of current remnants, along with Permanent Preservation Areas (APP) and biological corridors to establish the best restoration method to be applied.

4. **Legal Model**: This team, coordinated by professors from the Law School of PUC-Campinas, aimed to develop a legal model capable of providing legal protection to the master plan under development, promoting the application of its principles in the HIDS territory, establishing the governance of HIDS, and facilitating agreements and contracts among HIDS stakeholders.

5. **Sustainability Assessment**: To create a grounded methodology, fundamentally based on the concepts of Life Cycle Analysis, to evaluate, in a disaggregated manner, all planned actions and activities for HIDS in terms of their alignment with the 17 Sustainable Development Goals proposed by the UN.

6. **Communication**: To establish a communication strategy in service of the Founding Advisory Council of HIDS (see below) to promote HIDS and engage different audiences (the communities of the institutions that make up HIDS; companies, entrepreneurs, media, and civil society) with a focus on disseminating knowledge about the project, generating a positive image through a narrative on sustainability, value creation, and the concept of a living laboratory.

7. **Governance**: To define, establish, and implement the governance model of the HIDS project, from its conceptual stage to its proper operation, ensuring rhythm and assertiveness in achieving the project's objectives.

With the support and participation of these new actors, in October 2019, the Founding Advisory Council of HIDS was officially established. This council is composed of institutions located in the planning territory of HIDS, the City Hall of Campinas, the Government of the State of São Paulo, represented by the Department of Economic Development, and the water and energy utilities of the city of Campinas.

The Advisory Council of HIDS was created as a consultative body to which all decisions regarding the planning of this territory will be submitted for knowledge and discussion, with the aim of contributing to the definition of the activities that may be part of HIDS and to guide the construction of its governance. Currently, the Council includes 14 institutions:

| Government | Education and Research | Research | Companies | Utilities |
|---|---|---|---|---|
| City Hall of Campinas<br>Government of the State of São Paulo | Unicamp<br>PUC-Campinas<br>Facamp | Embrapa<br>CNPEM | CPQD<br>TRB Pharma<br>Cargill<br>Cariba<br>Eldorado Institute | CPFL<br>SANASA |

Considering its privileged location, which includes the presence of educational and research institutions, companies, and its proximity to the city as a whole, the approach of living laboratories was adopted as a premise for structuring the Hub in Campinas during this initial planning phase of the HIDS.

There is no consensus on the definition of a living laboratory, but in the various definitions on the subject, certain concepts always emerge: multiple stakeholders, co-creation, innovation, and real-life context. In practice, a living laboratory can be defined as a physical location or virtual environment where different actors form what are called 4P partnerships (public-private-people partnerships), involving companies, public agents, universities, research institutes, and users in a collaborative system for creating, prototyping, validating, and testing new technologies, services, products, and systems in real-life contexts (LUCCHESI & RUTKOWSKI, 2019).

The idea is to assess the performance of a product/technology based on its potential adoption by users in a given territory and to make projections for its adoption on a global scale.

The HIDS is envisioned as an innovation cluster oriented toward sustainable development, with thematic laboratories (research and development centers), sustainable infrastructure, and management models for environmental and cultural heritage, along with good service infrastructure (museums, hospitals, and meeting spaces). This smart city structure, which brings together government actors, funding agencies, universities, research centers, large and medium-sized companies, startups, and investors, should provide a conducive territory for applied research focused on sustainable development themes, with sustainability management, partnerships, and connections to form a national and international collaboration network.

Some examples of laboratory themes that can be developed alongside partners already in the territory, as well as others that may emerge, include: zero waste, autonomous transportation, digital agriculture, and clean energy. In this sense, the HIDS has strong potential to receive specific requests from governments at various levels (preservation and governance of heritage, security without walls, epidemic control). To put this model into practice, it will be essential to mobilize the institutions of the HIDS Consultative Council to create partnerships and synergies and to attract other interested partners in developing technologies within the living laboratory approach. ■

## NOTES

1. UNITED NATIONS BRAZIL. “Transforming Our World: The 2030 Agenda for Sustainable Development.” Available at: <https://nacoesunidas.org/pos2015/agenda2030/>.

2. The Argentina Farm and the Technological Park of Unicamp are within the area of the High Technology Pole 2. With the inclusion of all of Unicamp and PUC-Campinas, the target planning area expands to 11.3 million m². The Ciatec II region is identified as a Strategic Development Pole for the municipality of Campinas.

3. HIDS. Conceptual Article: International Hub for Sustainable Development – HIDS. Available at: <https://hids.org.br/wp-content/uploads/2023/11/HUB-Conceptual-Paper-Portuguese-V16.pdf>.

4. See more about the HIDS Council in the chapter “Challenges of Institutionalizing an Innovation Hub”.

## REFERENCES

CEUCI. HIDS: A Window of Opportunity for Implementing the SDGs in a Knowledge and Innovation Territory. Unicamp Journal, December 7, 2022. Available at: <https://unicamp.br/unicamp/ju/artigos/ambiente-e-sociedade/hids-uma-janela-de-oportunidade-para-implementacao-dos-ods-em-um/>.

LUCCHESI, G.; RUTKOWSKI, E. *Living labs: science, society and co-creation*. In Leal Filho et al (eds.), Industry, Innovation and Infrastructure, Encyclopedia of the UN Sustainable Development Goals, Springer Nature, 2019.

# Commitment to Sustainability: Knowing to Conserve[1]

Credit: Wesley Silva

SECTION OF THE ANHUMAS STREAM NEAR THE FAZENDA ARGENTINA

WESLEY RODRIGUES SILVA AND PATRICIA MARIUZZO

Every year, at the bridge over the Ribeirão das Anhumas located on the CPQD road, various species of aquatic birds can be observed. In the dry season, taking advantage of the low water levels, they land on the sandbanks to forage for food. In addition to the diversity of birds, mammals such as the crab-eating fox, raccoon, otter, marmoset, armadillo, capybara, and the puma are some of the animals that inhabit the area of the International Hub for Sustainable Development (HIDS). The territory has five springs, streams, and areas of permanent preservation (APP). On the Unicamp campus alone, there are more than 150 species of native Atlantic Forest plants. According to data from Embrapa, Red Latosol predominates, a type of soil that contributed to the expansion of coffee in the region.

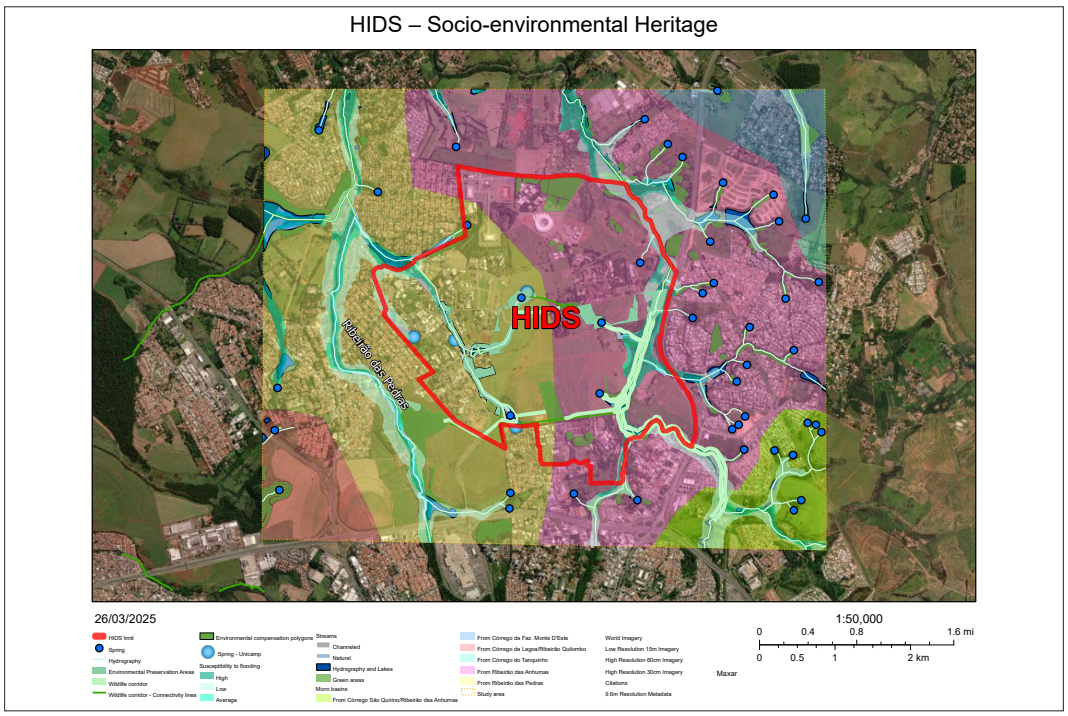
At Fazenda Anhumas and Fazenda Pau D'Alho, both within the HIDS area, remnants of the architecture from the coffee cycle can be found, a product that gave the Campinas region national political and economic prominence.

From its early organizational stages, HIDS has established the 17 Sustainable Development Goals (SDGs) of the UN as the foundation of its guidelines toward an environment that promotes scientific and technological advancement without compromising the sustainability principles implicit in its name. This mission has also been assigned to the HIDS Heritage Component, responsible for diagnosing the

environmental and cultural heritage of the Hub's planning territory, as well as proposing ways to preserve, enhance, and integrate it into the future functional life of HIDS.

The initial studies conducted within this work component resulted in maps representing the green infrastructure of the HIDS territory.[2] The aim is to preserve, recover, or enhance these areas to ensure that vegetation, fauna, waterways, and other important natural elements are present in the territory, guaranteeing their numerous benefits and ecosystem services for the HIDS area and its surroundings.

Credit: Atlas da Unicamp/Coordenadoria de Geoprocessamento (CGEO) da Unicamp/DEPI/CSUS




HIDS is situated within the Anhumas River Basin, which encompasses two sub-basins: the Ribeirão das Anhumas (in the eastern portion) and the Ribeirão das Pedras (in the western portion). The Permanent Preservation Areas (APPs), protected by federal and municipal legislation, correspond to 19.64% of the HIDS area. The predominant type of vegetation is the Semideciduous Seasonal Forest (FES), one of the phytophysiognomies of the Atlantic Forest biome, characterized by leaf loss during the dry season. It is considered one of the most threatened and fragmented ecosystems in Brazil due to urbanization and agricultural expansion. However, despite the high degree of fragmentation, many stretches of FES exhibit high species diversity.

The environmental consulting firm Carbono Zero,[3] contracted by the IDB, conducted detailed studies that classified the entire HIDS area according to its susceptibility and suitability for different types of land use: urbanization in relation to natural disasters, urbanization concerning the geotechnical characteristics of the land, road construction, excavations, and foundations. These assessments, which provided support for the development of the HIDS master plan by the Korean institute KRIHS, also identified the areas most susceptible to flooding, largely coinciding with the Permanent Preservation Areas (APPs) that represent almost 20% of the territory. The fragments of vegetation,

as well as the springs associated with the APPs, will be the subject of recovery and restoration under the strategic project of the Unicamp Ecological Corridors.

The survey on vegetation and associated ecosystem services indicated the presence of 390 species belonging to 94 botanical families. In terms of origin, 300 are native species (79%), and 79 are represented by exotic species (21%, either naturalized or cultivated). Regarding life forms, the vegetation in the HIDS area comprises 266 species of trees, 57 herbaceous plants, 27 lianas, 22 shrubs, and 18 palm species. A specimen of the species Dalbergia nigra, classified as vulnerable and threatened with extinction in the Brazilian Red Book of Flora, was also found.


FLORA SURVEY IN THE HIDS REGION IDENTIFIED 390 SPECIES, INCLUDING SOME EXOTIC ONES

The assessment of the consequences that environmental changes bring to these services, along with the scientific foundations of the necessary actions to enhance their preservation and sustainable use, has been the main theme of numerous studies focused on the classification, evaluation, quantification, mapping, modeling, and valuation of ecosystem services worldwide. This research aims to support decision-making concerning more sustainable development.

Ecosystem services are the benefits that ecosystems provide to humanity. They are divided into provisioning services (food and water), regulating services (flood regulation, drought management, soil degradation), supporting services (soil formation and nutrient cycling), and cultural services (recreational, spiritual, religious, and other non-material benefits).

A list of the ecosystem services present in the HIDS area has been compiled. Key ecosystem services mapped in relation to different land uses and cover types in the HIDS area include erosion and sedimentation control, nutrient cycling, climate regulation, and pollination.

Among the pollinators, the presence of 30 species of bees and four species of wasps stands out. One of these belongs to the genus Ancistrocerus, subfamily Eumeninae. Commonly referred to as solitary wasps, individuals in this subfamily build their nests in pre-existing cavities, such as hollow branches or holes in wood created by other insects. They also construct small mud structures that adhere to masonry surfaces or vegetation. In these mud cells, the female deposits a single egg. The resulting larva will be fed with caterpillars from the order Lepidoptera. Therefore, this wasp species is considered a potential agent for biological pest control in agricultural crops like sugarcane, specifically because they prey on these caterpillars.

Credit: Wikipedia

THIRTY SPECIES OF BEES AND FOUR SPECIES OF WASPS WERE IDENTIFIED IN THE HIDS AREA, BOTH OF WHICH ARE IMPORTANT POLLINATORS

Considering the role of regional fauna in providing ecosystem services, a survey of terrestrial vertebrates in the HIDS region was conducted. Understanding the local fauna is fundamental for making appropriate interventions and proposing not only mitigating measures but also actions that, in the long term, contribute not only to the conservation of existing animal populations but also to their dynamic balance over time.

The survey conducted by Carbono Zero resulted in a list of 439 species of terrestrial vertebrates, including 28 amphibians, 47 reptiles, 279 birds, and 85 mammals. Compiled from both historical and recent published data, the list includes information on the group (amphibians, reptiles, birds, and mammals), order, family, scientific name, common name, and conservation status: critically endangered (CR); endangered (EN); vulnerable (VU); near threatened (NT); least concern (LC); and data deficient (DD).

Most species inhabiting the HIDS are not considered threatened on a global, national, or state level. Almost all amphibians are classified as “least concern,” and only one species of reptile is threatened: the lizard Cercosaura ocellata, which is listed as “vulnerable” in the state of São Paulo. Nine species of birds are classified as “near threatened,” including the true parrot (Amazona aestiva) and the araponga (Procnias nudicollis). The true parrot has been domesticated since colonial times due to its remarkable ability to mimic human voice. The demand for this bird has led to a population decline across much of Brazil. Fortunately, a small population has persisted in the Campinas region for the past

30 years, frequenting open and even urbanized areas, as long as they are tree-covered, such as the Unicamp campus. In contrast, the presence of the araponga is much rarer. If it is still present in the region, it is likely found in the largest forest remnant, the Mata de Santa Genebra.

Among mammals, carnivores exhibit the highest number of threatened species in the HIDS region. An example is the maned wolf, whose sightings have increased in various regions of Brazil due to agricultural expansion and urbanization processes. The loss of its natural habitat has led to accidents and unusual encounters. For the same reasons, sightings of the maned wolf have been reported on the Unicamp campus and in Fazenda Argentina.

Credit: Wikipedia

MANED WOLF IS AN ENDANGERED SPECIES THAT IS PRESENT IN HIDS

The fauna survey of HIDS indicates that species associated with forest habitats, such as the red howler monkey and the tanager, may occur in the Hub area if preservation and restoration conditions for the remaining forest areas are implemented, as outlined in Unicamp's ecological corridors project. This project aims to connect the conservation areas and compensation polygons of the Zeferino Vaz campus and Fazenda Argentina with each other and with the vegetation fragments in the university's external area. These corridors will include the construction of wildlife crossings, planting and maintaining vegetation, as well as fencing and signage.

The native fauna of HIDS is also associated with several ecosystem services, such as pollination, seed dispersal, pest control, and necrophagy (the habit of feeding on decomposing bodies). The vertebrate fauna in the HIDS region is rich in birds and mammal dispersers, which contribute to the reproductive cycle of plants through this natural process, promoting the maintenance of biodiversity in the ecosystems where they operate. An example is the 13 species of hummingbirds that may potentially occur in HIDS. Among the 24 species of bats, at least 11 may include nectar in their diets, thus becoming potential pollinators, such as the nectar-feeding bat.

Among the mammals present in the area, the most active is the crab-eating fox. Nocturnal by nature, it feeds on rodents and insects, but it is common to find seeds

of fruits in the feces it leaves along the trails and roads it travels. The presence of the puma (or cougar) is also significant. This big cat has been regularly recorded at Fazenda Argentina through automatic cameras and tracks found on the dirt roads it traverses. As a top predator, the puma plays a crucial role in controlling the populations of its prey, including the capybara, a rodent involved in the transmission of spotted fever in the Campinas region.

The studies and surveys conducted regarding the environmental and cultural heritage of HIDS are fundamental to guiding all intervention and occupation projects in the area. A next step would be to implement monitoring systems across various axes.

In the case of fauna, for example, it would be important to confirm in the field which species actually occur in HIDS, what their ecological requirements are, the ecosystem services they provide, and their population and behavioral responses to environmental changes. This information, which can be obtained through various existing technologies, will be crucial for the management of biodiversity in HIDS. The goal of HIDS is to provide concrete contributions to sustainable development by fostering participatory processes and the use of disruptive technologies. Therefore, technology should serve as a tool to implement and respect the UN Sustainable Development Goals (SDGs) in this territory.

The Hub is located in a region where land use is transitioning between urban and rural. Literature indicates that urbanization and the lack of vegetation cover contribute to the formation of heat islands and compromise the provision of ecosystem services for climate regulation in society. Additionally, the increase in extreme precipitation and air temperature events has been linked to rising respiratory diseases and those associated with mosquitoes (such as dengue), a recurring problem in major urban centers across the country, including the municipality of Campinas. The HIDS area presents a unique opportunity for monitoring climatic variables and studying the relationship between land use changes and microclimate in an area proposed to have a low environmental impact. Monitoring the area throughout its occupation process would make a significant contribution to studies on the impact of cities on environmental changes. ■

**NOTES**

1. This text was prepared based on reports produced by the Heritage component team of the HIDS master plan and reports from the environmental consulting firm Carbono Zero. The final version was reviewed by Professor Dr. Gabriela Celani, who coordinated the team for the project's physical-spatial component.

2. The maps were created by the Geoprocessing team of the Integrated Planning Executive Directorate (DEPI/Unicamp). The maps are available in the Unicamp Atlas at this link: <https://atlas.unicamp.br/>.

3. A summary of the studies conducted by this consulting firm is available on the HIDS website at this link: <https://hids.org.br/estudos/convenio-bid/>.

4. See the chapter "Implementation of ecological corridors in HIDS Unicamp" in this book.

5. The document detailing the terrestrial vertebrates survey in the HIDS region is available on the HIDS website at this link: <https://hids.org.br/wp-content/uploads/2023/11/Fauna-de-vertebrados-do-HIDS-compressed.pdf>.

# Strategies for the Development of HIDS

MIGUEL JUAN BACIC AND PATRICIA MARIUZZO

The HIDS is being envisioned as a fourth-generation smart district dedicated to creating solutions for the challenges of sustainable development, with universities, research centers, companies, and public authorities interacting in a mixed-use space. This goal is based on the premise that solutions to sustainable development challenges are more promising when they result from partnerships among companies, public authorities, and society. However, to achieve this goal, it will be necessary to attract investments and businesses to the HIDS territory, whether to build their own facilities, rent spaces, or establish partnerships with institutions already present in the Hub area. In this regard, it is crucial to determine HIDS's potential to attract and retain commercial enterprises to support the innovation infrastructure planned for this area.

One of the first studies on HIDS's economic feasibility was conducted between 2018 and 2020 by the Economic Research Institute Foundation (FIPE), with funding from the São Paulo Research Foundation (Fapesp). Entitled "Implementation of Innovation and Creativity Environments in the State of São Paulo", its objective was to establish conceptual and operational parameters for implementing innovation districts in the metropolitan areas of São Paulo and Campinas. The study focused on two areas: the Ceagesp land (64 hectares) in São Paulo, owned by the federal state company, and the Fazenda Argentina area owned by Unicamp.[1]

According to the study, the fact that Unicamp is the anchor institution for the HIDS project and holds ownership of the Fazenda Argentina land influences a strategy of implementation in which large private investors interested in real estate businesses would play a lesser role. Therefore, efforts to attract companies should focus on those interested in associating with the technological development competencies and potential already present in the area. Considering the land-use restrictions, the FIPE-Fapesp study simulates an occupation model based on specific ventures with commercial exploitation potential, such as housing, a shopping center, shared spaces, and laboratories (FIPE-FAPESP, 2020: 32).

## WHERE TO BEGIN

Another study, under the agreement with the IDB, included the development of a business model and a strategic framework for HIDS. To achieve this, in 2021, the Bank hired the Portuguese Society for Innovation (SPI), the International Association of Science Parks and Areas of Innovation (IASP), and IDOM, a consultancy specializing in engineering and architecture projects.

Based on these studies of Campinas' innovation ecosystem and benchmarking sustainable development and innovation hubs worldwide, the consortium of consultancies suggested strategic areas to guide the process of attracting companies, thus boosting the consolidation of the Hub in Campinas. These studies considered two dimensions of the territory: 1. The HIDS implementation area, including the High Technology Cluster 2 (Ciatec 2), Unicamp's campus in Barão Geraldo, and PUC-Campinas' Campus 1 e 2. The HIDS area of influence, initially comprising the Campinas Metropolitan Region (RMC). The proposed business model assumes that stakeholders in this area would be prioritized for service provision and would be the primary beneficiaries of HIDS's results and impacts.

Taking into account the challenges posed by the 17 UN SDGs, the endogenous potential of the Campinas territory, and the local ecosystem's current and potential capacity for generating knowledge and innovation, SPI suggested five areas of specialization for HIDS. These areas, chosen in consultation with the HIDS Founding Advisory Council, are: energy, health, agriculture and Food Production (Agri-Food), and urbanism. The field of Information and Communication Technologies (ICT) would act as a transversal element supporting the above areas. Additionally, themes such as digital transformation, biosciences, and artificial intelligence should underpin projects and businesses at HIDS, offering innovative solutions for sustainable development.

Key elements for attracting investors, companies, and entrepreneurs to solidify HIDS include revising land use and zoning laws. At the end of 2022, the Campinas City Hall drafted a Complementary Law Project (PLC) to amend the zoning of High Technology Cluster 2 to accommodate the HIDS project, including a northern expansion that redefined the area as PIDS. This PLC was submitted to the Campinas City Council and is awaiting a vote. Another challenge relates to land ownership. Since the Hub's development area includes privately owned land, public authorities will play a crucial role in creating incentives for sustainable development while monitoring and controlling unsustainable activities. The attraction of anchor companies was identified as another critical factor for HIDS's success. Additionally, defining common goals among the key stakeholders, particularly the HIDS Founding Advisory Council, is essential to foster synergies and cooperation within the project. To finance infrastructure, new business ventures, and project development, SPI recommended creating a business accelerator exclusive to HIDS.

Considering the ecosystem in which HIDS is embedded, its objectives—to lead and promote a process of social, economic, and environmental transformation in Campinas through key elements such as innovation, technology, education, and sustainability, with emphasis on the areas of energy, health, food production, and sustainable urbanism — and the need to establish guidelines for the strategic planning of the Hub, SPI proposed a mission, a set of values, and a vision for HIDS.

The mission of HIDS would be to contribute to global sustainability based on the urban, economic, and social development of Campinas. Sustainability, innovation, inclusion, cooperation, creativity, entrepreneurship, equality, and connection with nature would constitute the values of the Hub to be implemented in Campinas. Considering that HIDS is envisioned as a living urban laboratory capable of providing solutions for the development of sustainable cities and communities that respect the

environment, the suggested vision for the Hub is to become a global reference in implementing the ESG culture (an acronym for Environmental, Social, and Governance).

A strong HIDS brand would enable the association of its values with products and services originating from its territory, incorporating the concepts of sustainability, innovation, inclusion, etc., into its activities so that these concepts are recognized not only locally but also nationally and internationally. In this sense, the HIDS brand would be "extended" to the companies and organizations within its area. Considering the trend toward digitalization of brands and the current communicational landscape of companies, efforts to develop brands and concepts attractive to the public should be undertaken by HIDS, thus capitalizing on the opportunities generated by its internal demand for communication, marketing, design, branding, etc.

One conclusion from the studies conducted by SPI and other consultancies is the need for an effective HIDS communication strategy, through the creation of HIDS' own communication agency. In addition to providing services to potential partners and clients, the agency would directly support HIDS' communication strategy, promoting engagement with key stakeholders, thereby contributing to its visibility, attraction of investments, and territorial identity cohesion among the local population.

Finally, it is important to note that the area where HIDS is being developed, Ciatec II, hosts various actors, including companies, research institutions, educational entities, public and private organizations, and individuals. While most of them support the creation of this center, others are interested in maximizing their economic benefits. The HIDS value proposition must consider all these existing interests. Furthermore, the territorial definition and urban design of HIDS must address the following challenges: the area must be connected to its surroundings and the city of Campinas, promoting the use of its resources by the local population; it must provide the necessary infrastructure to create an internal mobility network to enhance the area's connectivity; offer the mixed-use infrastructure needed to support the Hub's activities; and, given that sustainability is a key aspect of this project, all urban development must prioritize nature-based solutions, such as the use of renewable energies and the preservation of the area's natural values, including its fauna and flora. In this context, land occupation must align with the values established for this innovation Hub. ■

**NOTE**

1. This study considers only the Fazenda Argentina area and does not include the "expanded" HIDS area. Available at: <https://hids.org.br/wp-content/uploads/2024/03/Sumario-Executivo-Fipe-Fapesp-ult.pdf>.

# Sustainability Assessment at HIDS[1]

PATRICIA MARIUZZO AND MARCELO CUNHA

The International Hub for Sustainable Development (HIDS) was designed to become a smart district that blends urbanism and the environment into a living laboratory, addressing a wide range of topics. It aims to be an environment for knowledge and innovation, capable of proposing solutions for more sustainable development, aligned with the principles of the Global Compact and the UN's 2030 Agenda. Even when the first discussions about the Hub's implementation began, it was envisioned, in a pioneering way, that its governance should incorporate tools to measure results and adjust strategies.

From this premise, the theme of sustainability assessment became one of the six study programs that would contribute to the development of the HIDS master plan[2]. Its goal was to create a mechanism through which recommendations, revisions, evaluative questions, as well as the establishment of criteria and the generation of indicators for the activities carried out within the HIDS area, could be made, providing evaluation tools both in terms of result indicators and impact, either quantitatively and/or qualitatively.

Multidisciplinary and coordinated by Professor Marcelo Pereira da Cunha from the Institute of Economics at Unicamp, the "Sustainability Assessment Component" team included researchers and collaborators from Unicamp, Embrapa, PUC-Campinas, Facamp, Cargill, Instituto Eldorado, CPQD, CPFL, and Sanasa, indicating strong engagement from the institutions on the HIDS Advisory Board. Furthermore, the development of a sustainability assessment methodology for a still-implementing innovation hub was also supported by two consultants specializing in corporate sustainability, hired under the Technical Cooperation agreement between Unicamp and the Inter-American Development Bank (IDB)[3].

Given the complexity of a project like HIDS, the construction of its sustainability assessment methodology was guided by a multidimensional approach: institutional issues, the activities carried out at HIDS (or that will be), and the living laboratories that will be installed there. Additionally, the proposal took into account the sustainability assessment models of the stakeholders that form the HIDS Founding Advisory Board.

From these layers, seven dimensions of analysis were defined:

1. Governance and institutional capacity
2. Environment and climate change
3. Social dimension and human rights

4. Economic-financial dimension

5. Mobility and accessibility

6. Education and research

7. Integration with the Sustainable Development Goals (SDGs)

These dimensions compose four evaluation modules that use sustainability assessment methodologies already established worldwide. They are: Life Cycle Assessment through the Economic Input-Output Life Cycle Assessment (EIOLCA), which allows the evaluation of socio-economic and environmental impacts of 67 economic activities at the national level; Life Cycle Analysis (LCA), focusing on the environmental impacts of a construction system; the practices recommended by the United Nations Global Compact, based on commitments made by CEOs of participating companies to implement universal sustainability principles[4]; and the global GreenMetric university ranking, which aims to analyze and monitor sustainability indicators in universities or higher education institutions[5].

The goal was to create a baseline for the situation of these organizations in relation to sustainability. In this sense, as the methodology developed, some projects were selected to test the effectiveness of the proposed sustainability assessment method for HIDS, including AgNest Farm, an initiative by Embrapa Meio Ambiente and Embrapa Agricultura Digital to promote open innovation in the agricultural sector, and the smart campus project at PUC-Campinas, which includes initiatives related to the rational use of water and energy.

In the context of the initial discussions about implementing an innovation hub focused on generating solutions for sustainable development, the sustainability assessment component studies provided important lessons to anticipate aspects that could form a future governance model for HIDS. One step towards disseminating the implementation of the developed methodology in the future is the development and implementation of an online platform for sustainability assessment at HIDS, a tool that can facilitate access, application, and consolidation of the evaluated data. In the second half of 2020 and early 2021, an exploratory collaboration with Professor Juliana Freitag Borin from the Institute of Computing at Unicamp enabled the development of a pilot version of this platform. It will be crucial to establish partnerships with companies to both improve the online platform and conduct further testing of the methodology. The formal establishment of a legal entity for HIDS, through the Fundação Fórum Campinas Inovadora, should aid in the prospecting of these partnerships[6].

Finally, it will be crucial for HIDS to fulfill its mission of contributing to the sustainable development process by aggregating national and international efforts to produce knowledge, innovative technologies, and education for future generations, while mitigating and overcoming the social, economic, and environmental weaknesses of contemporary society. It should also adopt internal and external mechanisms to guide ethical behaviors and compliance with legislation, such as fair purchasing practices, anti-corruption mechanisms, and equitable supplier contracting practices.

Regarding environmental aspects, HIDS must create mechanisms to measure environmental impacts on the ecosystem related to the operations of the organizations based in its territory. It is also important to promote a low greenhouse gas emission economy with goals linked to national and regional commitments and policies, both at the state and municipal levels. ■

**NOTES**

1. This text is an adaptation of the report "Development of the methodology and conduction of the preliminary Sustainability Assessment for the creation of the International Hub for Sustainable Development (HIDS) – Product 8 – Presentation of the results of the preliminary sustainability assessment of the planned content of HIDS within this project," available at <https://hids.org.br/wp-content/uploads/2024/06/Relatorio-8-HIDS-BID-Nov22-Final.pdf>.

2. In its initial phase, HIDS was structured into six programs, with the respective coordinators: (1) Sustainability Assessment (Prof. Dr. Marcelo Pereira da Cunha, IE-Unicamp); (2) Environmental and Cultural Heritage (Prof. Dr. Wesley Silva, IB-Unicamp); (3) Urban Planning (Profa. Dra. Gabriela Celani, FECFAU-Unicamp); (4) Business Model (Prof. Dr. Miguel Bacic, IE-Unicamp); (5) Communication (Dra. Patrícia Mariuzzo); and (6) Legal Model (Prof. Dr. Josué Mastrodi, PUC-Campinas). See chapter "The idealization of an innovation hub from the University," in this book.

3. Technical Cooperation BR-T1430. See <https://hids.org.br/wp-content/uploads/2023/11/TC-Document-BR-T1430vf-1.8.2020.pdf>. For invested values, see <https://hids.org.br/transparencia/#investimento>.

4. The Global Compact is a UN voluntary initiative based on commitments made by the CEOs of participating companies to implement universal sustainability principles and take actions that support the achievement of the Sustainable Development Goals (SDGs). See <https://www.pactoglobal.org.br/>.

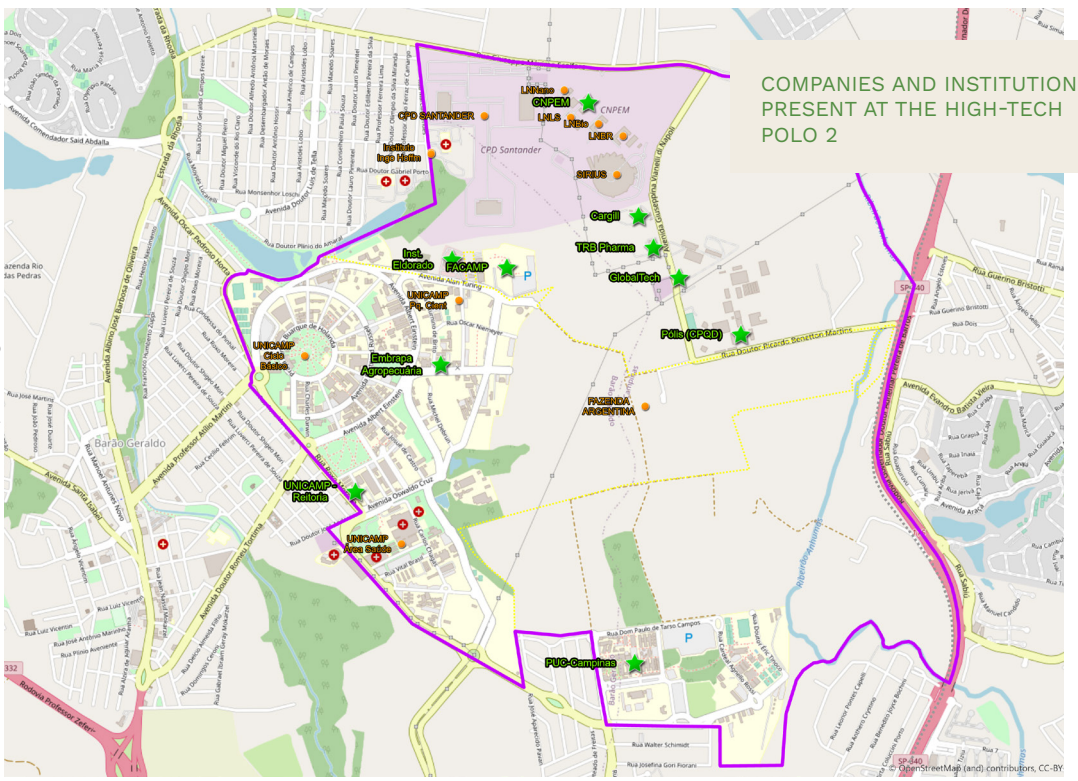
5. Unicamp and PUC-Campinas are annually evaluated by the UI GreenMetric ranking.

6. See chapter "Challenges of institutionalizing an innovation hub," in this book.

# Challenges in the Institutionalization of an Innovation Hub

JOSUÉ MASTRODI NETO AND CLAUDIO JOSÉ FRANZOLIN

The city of Campinas already has one of the main innovation ecosystems in the country, with cutting-edge research centers, incubators, business accelerators, startups, and unicorns[1], in addition to three technology parks. The creation of the International Hub for Sustainable Development (HIDS) has the potential to establish Campinas as a major technological development hub. Unprecedented, the proposal is to establish an innovation cluster in an area of approximately 11 million square meters, focused on generating solutions to address the challenges of the climate emergency and sustainable development. The fact that the Hub is located in a peri-urban area, meaning a transition zone between strictly rural spaces and urban areas, and houses both private rural properties and research institutions, universities, and technology companies, represents both a significant challenge and a great opportunity.




Credit: Geoprocessing Coordination (CGEO) of Unicamp/DEPI/CSUS

There is no previous experience similar to HIDS, and therefore, there is no ready-made legal framework on which it can rely. Partnerships and cooperations – a premise of the project – will only occur in a legally secure environment, capable of ensuring speed, autonomy, and flexibility in the relationships between all the institutions involved.

Moreover, a system of tax incentives would attract other actors – companies, startups, national and international research and education institutions, local entrepreneurs, and investors – favoring the consolidation of an environment for ongoing exchanges and the construction of partnerships focused on sustainable development. The definition of a legal and governance model for HIDS is, therefore, one of the major challenges in the process of institutionalizing the Hub in the city of Campinas.

The existing legal model closest to the reality of HIDS is the one that structures technological parks. According to the Ministry of Science, Technology, and Innovation[2], the legal model of a technological park involves defining the park's legal personality, considering the intended governance model, as well as the interests, needs, duties, and responsibilities of stakeholders. The governance model, in turn, should establish the set of internal and external mechanisms necessary to align the relationship between the main stakeholders of HIDS, as well as their rights and responsibilities.

The studies for the preparation of a proposal for the most appropriate legal and governance models for the consolidation of HIDS were assigned to a team from the Law School at PUC-Campinas, contracted by the BID[3]. The goal of the consultancy was to propose normative models capable of institutionalizing HIDS as an entity able to act autonomously, as well as organize the urban space of its territory, with the possibility for stakeholders to obtain benefits not only from serendipity but also from extrafiscalities.

The proposals presented served as subsidies for the development of the master plan by the Korean institute KRIHS and for the drafting of bills at the municipal and state levels. The consultancy had the support of a group of lawyers from the institutions of the Founding Advisory Board of HIDS (component of the Legal Model)[4].

Considering some characteristics of the HIDS project, such as the existence of a delimited area and the legal and regional context of Campinas, one of the proposals was to structure HIDS as a Special Economic Zone, that is, a geographically delimited space with a differentiated legal regime, where there will be government incentives for external investments (such as, for example, tax benefits and international mobility), with the expectation of high economic returns, including the transfer of land rights and concessions for resource exploration[5].

Special economic zones originally emerged as specific locations for receiving imports (also raw materials, but mainly the acquisition of know-how in new technologies) and production predominantly aimed at export, to attract foreign capital. In China, special zones have almost their own local government dedicated to managing their territory and the activities carried out there. The specific local governance in Chinese special economic zones is explained in terms of attracting foreign capital and guaranteeing investors market rules and free trade policies that are not applicable in the rest of the country, as well as a local authority that enforces the specific rules of that Special Economic Zone.

In Brazil, there is no specific legislation for the creation of special economic zones. In the case of HIDS, the proposal is to create municipal legislation aimed at the urbanization of the area in a specific way, focusing on the vocation for technological innovation and granting tax exemption benefits. The initial normative base is

already used to structure technological parks, but this would only be the first step in a more sophisticated normative organization, which does not yet exist in the Brazilian legal system. From this point, one could consider (i) the eventual creation of a State Law declaring the HIDS area as a Special Economic Zone, focused on the development of the area through the promotion of innovation and research; (ii) the creation of a Municipal Law declaring the HIDS area for the installation of innovative infrastructures, through which a smart and sustainable city could be built; (iii) the establishment of a Nonprofit Civil Association, qualifying as a Social Organization, to manage the HIDS area and the activities to be carried out there, either through management contracts for the area and activities, or by its establishment as the administrator of HIDS according to the purposes set forth in the State law establishing the Special Economic Zone.

It is important to emphasize that special economic zones are not a ready-made solution for countries to achieve greater development and economic growth. The joint action of various social actors is essential, as well as governmental support to encourage external investment, as well as the maintenance of the area's own culture. There must, therefore, be coordinated action to manage a project that will have long-term results, characteristics that are present in the initial projects of HIDS and in its technical feasibility studies.

The consultancy studies[6] on the legal model also focused on tax exemption as a tool to stimulate the economy of a particular region, with taxes serving, in this sense, an extrafiscal function. The group drafted a proposal for a bill for a tax incentive program for companies located in the HIDS area[7], granting tax benefits in the form of exemption from the Urban Property and Land Tax (IPTU) and reduction of the rate of the Tax on Services of Any Nature (ISSQN).

According to the proposal, legal entities located in the HIDS area would have a 60% reduction in the ISSQN rate, which would be set at 2%. Considering that municipalities also have the authority to establish and exempt the collection of IPTU, and based on examples of specific municipal legislation for innovation hubs and districts, it was suggested that IPTU collection be waived for properties located in the HIDS area where research and technological innovation related to sustainable development are promoted, thus contributing to the urban development of this territory[8].

The accreditation of HIDS in the São Paulo Technological Parks System (SPTec)[9] would allow it to benefit from certain incentives, as the managing entities of the developments can receive tax incentives and enter into agreements with the State for the allocation of funds for works and the acquisition of equipment, while the companies that settle there could participate in the state tax incentive program (Pró-Parques). Furthermore, support institutions and technology-based companies could use accumulated ICMS credits or defer the tax for the payment of goods and merchandise to be used in investments and for the payment of ICMS related to the importation of goods intended for fixed assets[10].

Based on studies about the legal governance forms used in innovation areas (technology parks, hubs, smart cities) in Brazil and around the world, the PUC-Campinas consultancy proposed the creation of a non-profit Civil Association, which could be qualified as a Social Organization. The point being made is that, regarding the personification of the

HIDS (International Hub for Sustainable Development) – acquiring legal personality – this happens through the establishment of a legal entity, which can take various forms. In this case, the suggested option was the Association.

A civil association is the most common legal entity in the governance of smart cities and technology parks in Brazil. As an association, HIDS could represent the interests of its members, as well as implement the interests and goals outlined in its Bylaws[11]; submit accreditation projects to SPTec; act in the installation of living laboratories; sign agreements, contracts, partnerships, and incentive proposals for activities within its scope of operation. The establishment of a legal personality for HIDS – with the suggested format of an association – would grant functional, financial, administrative, and operational autonomy, allowing it to enter into legal agreements (public or private) independently. Therefore, HIDS would be managed by elected individuals, according to the procedures for selection established in its Constitutive Acts (Association Bylaws).

**THIS CONSULTANCY** prepared the "Agreement for the Creation of the International Hub for Sustainable Development", aimed at fostering broad cooperation between the parties involved (Unicamp; PUC-Campinas; CNPEM; CPQD; Cargill Agrícola; Global Tech; TRB Pharma; Instituto Eldorado; Embrapa; and the Government of the State of São Paulo). The agreement's objectives are to [i] create conditions to structure the HIDS; [ii] establish its Founding Advisory Council; [iii] define the activities that will be part of the HIDS; and [iv] guide its planning and governance development.

The current agreement does not confer legal personality to HIDS. Given the challenges in creating a new legal personality for HIDS, in 2023, the Advisory Council decided to integrate into the Fórum Campinas Inovadora Foundation (FFCi). The core of the proposal is for the HIDS Council to function as a Sustainable Development Council within the structure of the Foundation.

Founded in 2002, FFCi is an entity that brings together the most relevant Institutions of Science and Technology (ICTs) in the Campinas region, as well as major business associations and government bodies, with direct involvement or influence in the region's innovation ecosystem. The Foundation's main goal is to promote and expand the use of Science, Technology, and Innovation (S,T&I) to contribute significantly to increasing competitiveness and strengthening regional and national socio-economic development. Currently, the Foundation gathers 31 entities from research, education, industry, and the public sector.

With the integration, the members of the HIDS Council now form part of the Superior Council of the Foundation. The partnership was motivated by the convergence of social objectives and purposes related to sustainable development. The Foundation has a Superior Council with 31 members, seven of whom also sit on the HIDS Council.

The City Hall of Campinas, Unicamp, PUC-Campinas, CPQD, CNPEM, Embrapa, and Instituto Eldorado. Therefore, there is an overlap of representation, which is positive in

the integration process. The FFCi's Board of Trustees has nine members (a number that could be expanded to up to 15). There is also an overlap in this Board, as four members are also part of the HIDS Board. They are: Unicamp, PUC-Campinas, CPQD, and Instituto Eldorado.

With the integration through FFCi, contracts, partnerships, and agreements should be facilitated. Furthermore, HIDS will gain support from the entire innovation ecosystem in Campinas, increasing its visibility and contributing to the consolidation of the Hub in Campinas. ■

**NOTES**

1. The company IFood, created by former Unicamp students, is one of the first Brazilian startups to be considered a unicorn, a term used for startups that reach a market value of US$1 billion.

2. Faria, Adriana Ferreira de. Technological Parks in Brazil / Adriana Ferreira de Faria, Andressa Caroline de Battisti, Jaqueline Akemi Suzuki Sediyama, Jeruza Haber Alves, José Antônio Silvério. – Viçosa, MG: NTG/UFV, 2021.

3. The studies by this consultancy were conducted within the scope of the legal model component for HIDS, coordinated by Professor Josué Mastrodi, with the participation of Professor Claudio Franzolin and representatives from the institutions on the HIDS Board.

4. See chapter "The Ideation of an Innovation Hub from the University," in this book.

5. The article "Special Economic Zones: Applying Its Concept to the HIDS Project," developed by the Legal Model consultancy, is available on the HIDS website: <https://hids.org.br/wp-content/uploads/2024/03/Entrega4-HIDS-como-Zona-Economica-Especial-e-Zona-Franca-do-Conhecimento.pdf>.

6. The reports with the results of the studies on tax exemptions for the HIDS area are available on the project website: <https://hids.org.br/wp-content/uploads/2024/03/Sobre-o-ICMS-e-possibilidade-de-beneficios-fiscais.pdf>.

7. The proposed draft bill for a tax exemption program in the HIDS area is available on the HIDS website: <https://hids.org.br/wp-content/uploads/2024/03/Entrega5-2020-11-12-SOBRE-INCENTIVOS-FISCAIS-DE-COMPETENCIA-DOS-MUNICIPIOS.pdf>.

8. In Campinas, there is already a legal provision for granting tax benefits to companies with a technological base, including those located within the Ciatec II Technological Park, which almost coincides with the HIDS installation area. This is established by Law No. 12.653/2006, which provides for the possibility of reducing the ISS rate to the lowest possible level, 2%, and reducing the IPTU rates (by 30% to 50%) and ITBI (50% reduction), depending on each company's score.

9. SPTec (Complementary Law No. 1.049, June 19, 2008) is an association of technological parks in the state of São Paulo within the São Paulo Innovation Environments System (SPAI), managed by the State Department of Economic Development, Science, Technology, and Innovation (SDECTI).

10. The Unicamp Scientific and Technological Park and the CPQD Technological Park, both within the HIDS area, are accredited in SPTec.

11. A proposal for the Social Statute of HIDS has been developed. The document is available at the following link: <https://hids.org.br/wp-content/uploads/2024/03/proposta-de-estatuto-social_P.pdf>.

# Ten Fundamentals for the Implementation and Continuity of HIDS

BRUNO MOREIRA, THAÍS COLICCHIO, FELIPE BARBOSA AND JORDANA ANDRADE

HIDS was created from the opportunity to strengthen and direct the assets and vocations of the Campinas region to promote the United Nations 2030 agenda and achieve the 17 Sustainable Development Goals. It is being designed to be a smart and sustainable district, occupying the campuses of Unicamp (in Barão Geraldo) and PUC-Campinas, as well as the entire Ciatec II region (High Technology Hub), totaling 11.3 million m². Following the signing of the agreement with the IDB, which aimed to deliver a proposal for a master plan[1] or territorial development plan for the HIDS area, the Executive Board of Integrated Planning (DEPI), then responsible for the project, established a work strategy to support the development of this master plan[2].

Five interdependent work components were created to support the development of the HIDS master plan, managed by the Korean institute KRIHS: Physical-Spatial Project, Business Model, Legal Model, Heritage, Sustainability Assessment, and Communication.

Given the complexity and diversity of stakeholders, and aiming to mitigate the risks of weakening the project during the significant leadership transitions (at the Unicamp Rectorate and the Campinas City Hall) that would take place during the project's execution, the IDB hired Inventta, a strategy and innovation consultancy with a focus on corporate innovation, to converge and communicate the efforts of all those involved in the project. This would ensure that HIDS, the IDB, and all stakeholders involved in the HUB's conception could update their activities and understand the overall progress of the project. Inventta has become one of the leading innovation consultancies in the country, leading projects, strategy, and new business with the most innovative companies in the country, across almost all sectors of the economy.

In HIDS, Inventta's scope of work involved supporting the activities of the HIDS Advisory Board, recording information and reporting the project's status to all stakeholders, managing the strategic aspects of the project, and creating an attraction strategy focused on the private sector. This strategy aimed to identify potential tenants, services, facilities, and infrastructure required by the private sector to consider establishing in HIDS. Based on contributions from other consultancies under the Cooperation Agreement with the IDB[3], a business attraction strategy was developed, with narratives and justifications for the private sector to establish itself in HIDS.

## BUILDING A CONCEPT

The HIDS, although already inspired by the mission of promoting a culture of sustainable development by acting as an innovation cluster, is still a concept in formation. Each person or stakeholder involved in its construction has an image of what it should be, as well as what it should not be. Since the beginning, one of the major challenges in

the creation and implementation of HIDS has been making the concept of the Hub tangible, inspired by the mission to meet the sustainable development goals. The HIDS concept must emerge from the convergence of the vision agreed upon by many people, stakeholders, and institutions.

Among these stakeholders are the actors physically allocated in the area designated as the physical space for HIDS, some of whom already make up the HIDS Advisory Council. However, considering the universities and research centers as key drivers of relationships with businesses, and the government as the regulator and promoter of economic activity, the idea is to attract new actors from both the regional ecosystem and beyond, so that HIDS can become a network of innovation for sustainability, operating for the benefit of society.

For HIDS to be successful as an innovation district, it is crucial that it is integrated into the surrounding environment. In other words, it cannot be a segregated district from the region in which it is located, but must be integrated with society in such a way that society feels part of HIDS, regardless of its connection with academia.

With the delivery of the master plan by KRIHS in 2022, the major challenge is to establish a clear strategy for continuing the HIDS project and making its implementation viable as a fourth-generation innovation district, based on a knowledge-driven urban development model (CEUCI, 2022).

As defined by The Global Institute on Innovation Districts (GIID), innovation districts are a combination of anchor institutions, businesses, startups, and ecosystem-building intermediaries in hyperlocal geographies that leverage density, proximity, and accessibility. These districts actively promote an agenda of “collaborate to compete” to tackle some of the world’s most complex challenges. Typically strategically located, powered by clean energy, and connected to digital technology, innovation districts are ambitious in their efforts to strengthen local and regional competitiveness, create jobs with decent wages, establish businesses, and foster inclusive growth and equity throughout the region.

To generate impactful and truly transformative results, HIDS is guided by objectives centered on sustainable development in its broadest sense, including actions with impact across the social, economic, and environmental pillars. HIDS aims to:

- Organize society in favor of advancing sustainability
- Use essential natural resources more widely and responsibly
- Support and encourage the UN’s 2030 Agenda with the 17 SDGs
- Develop a sustainable and intelligent city, designed as an innovation and research hub model
- Foster an environment of synergy between educational and research institutions and entrepreneurs in developing solutions that contribute to sustainable development

Thus, HIDS aims to become a global reference in innovation and sustainability by:

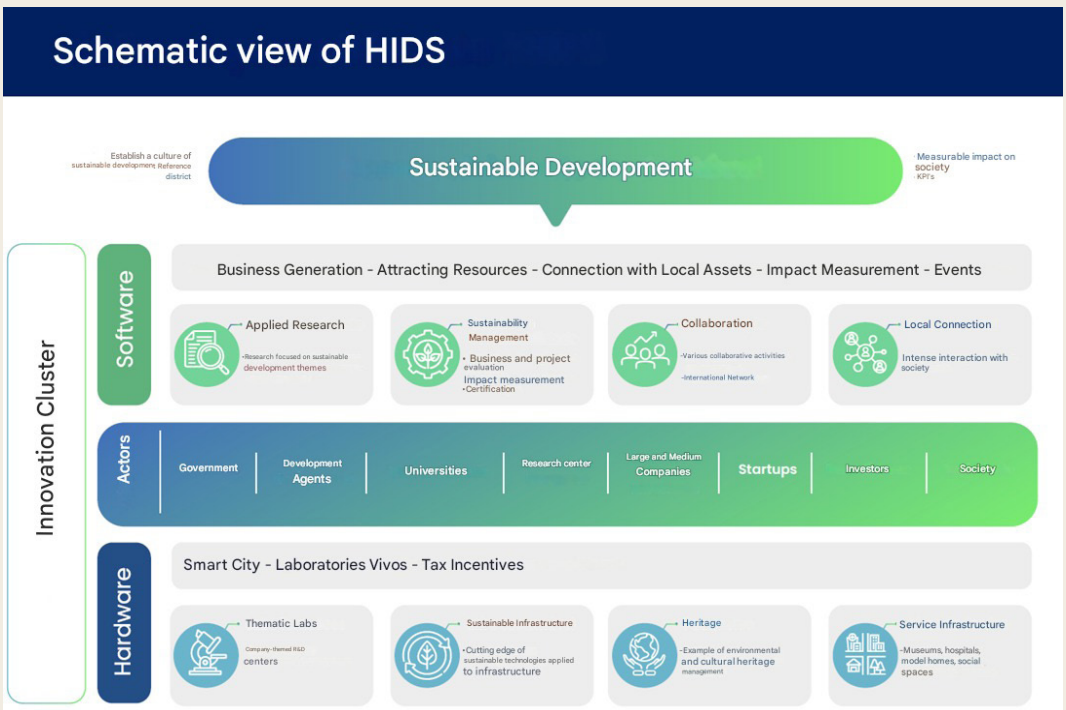
1. Monitor the demands of a more sustainable world: “Organize society in favor of advancing sustainability, where all agents are co-responsible for using essential natural resources more widely and collectively working to meet and encourage the UN’s 2030 Agenda with the 17 Sustainable Development Goals.”

2. Deliver an integrated sustainable development plan: “Develop a sustainable and intelligent city, designed based on an innovation and research hub model.”

3. Be a reference in local and global connectivity: “Promote an environment of synergy between educational and research institutions and entrepreneurs in developing solutions that contribute to sustainable development.”

In seeking to collaborate on the vision-building that could support the construction of HIDS in the city of Campinas, and in dialogue with the approach of Environmental, Social, and Corporate Governance (ESG), Inventta proposes that HIDS incorporate the concept of “innovability,” which combines innovation and sustainability to promote strategies for competitive, profitable development with socio-environmental responsibility (HAKIME, 2021).

Credit: Inventta




**HIDS IN THE CONTEXT OF INOVABILITY**

In our governance vision for the Hub, eco-innovation has strong potential to create business opportunities, develop new products, benefit the environment, avoid or reduce environmental impact, and optimize resource usage. “This concept is closely related to the way natural resources are used and to production and consumption patterns, as well as being linked to two concepts in Circular Economy: eco-efficiency and eco-industry” (HAKIME, 2021).

Since its inception, HIDS has established sustainability as a premise and, with that, aims to attract so-called greentechs or "green startups," which will find in HIDS the ideal environment—through partnerships and collaborations—to achieve their purpose: developing solutions for environmental and social issues (NIGGLI, 2022).

The idea is, therefore, to accelerate impact projects with innovation methodologies to produce real, measurable results in the form of win-win-win partnerships, demonstrating global impact through the lens and metrics of the ESG agenda — accelerated by the context of climate crises, which are driving investments and bringing together the entire ecosystem and its shared value chain to address complex challenges requiring collective action from companies, academia, governments, and civil society.

Based on national and international examples of innovation districts, we outline what could be the 10 fundamentals for HIDS to become an innovation district focused on sustainable development:

1. Pact for productive, inclusive, and sustainable development.

2. Strategic investments for the renewal of the local economy.

3. Development strategies based on regional vocations.

4. Diffusion of science through solutions focused on emerging societal issues.

5. Sustainable development as a driver of economic and social development.

6. Ensuring quality of life and reducing inequalities through a green economy.

7. Creation of specific policies to accelerate development.

8. Integration of public and private sectors for economic and social development.

9. Strengthening the network, ecosystem, and relationships between anchor entities and interested stakeholders.

10. A development model that is genuinely Brazilian. ■

**NOTES**

1. A master plan is a sophisticated model prepared by public or private organizations that shows how the streets, squares, and open spaces of a neighborhood should be connected; defines the heights, mass, and volume of buildings; establishes suggested relationships between buildings and public spaces; determines the distribution of activities/uses permitted in a given space; identifies the mobility network for people traveling on foot, by bicycle, by car, and for public transport vehicles; establishes how urban structures relate to the natural environment (adapted from Creating Successful Master Plans - A Guide for Clients, 2004). Available at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20110118095356/http:/www.cabe.org.uk/files/creating-successful-masterplans.pdf>.

2. See the article “International Hub for Sustainable Development (HIDS): From Idea to First Steps,” in this book.

3. Technical Cooperation (BR-T1430). Available at: <https://hids.org.br/wp-content/uploads/2023/11/Of.DEPI-05-2020-Prefeitura-Munic-de-Campinas-Jonas-Conv.BID_-1.pdf>.

4. The Global Institute on Innovation Districts (GIID). Available at: <https://www.giid.org/global-institute-on-innovation-districts/>.

**REFERENCES**


HAKIME, J. *Ecoinovação e Inovabilidade: inovações com olhar para o futuro*. Inventta, 09/12/2021. Available at: <https://inventta.net/ecoinovacao-e-inovabilidade-inovacoes-com-olhar-para-o-futuro/>.

CEUCI. *HIDS: uma janela de oportunidade para a implementação dos ODS em um território do conhecimento e inovação*. Jornal da Unicamp, 07/12/2022.

NIGGLI, D. *Sinergias entre inovação + ESG: uma jornada de impacto positivo no mundo*. Inventta, 15/09/2022. Available at: <https://inventta.net/sinergia-entre-invoacao-e-esg/>.

22@Barcelona (Spain). Available at: <https://www.smartcitiesdive.com/ex/sustainablecitiescollective/case-study-22-barcelona-innovation-district/27601/>.

Pittsburgh Innovation District (EUA). Available at: <https://www.pittsburgh-id.com/>.

MIND – Milano Innovation District (Italy). Available at: <https://www.mindmilano.it/>.

EPAPS Paris Saclay (France). Available at: <https://epa-paris-saclay.fr/>.

The Parks (South Africa). Available at: <https://urb.ae/projects/theparks/>.

Songdo (Coréia do Sul). Available at: <https://publications.iadb.org/en/international-case-studies-smart-cities-songdo-republic-korea>.

Jurong Innovation District (Singapore). Available at: <https://estates.jtc.gov.sg/jid/about>.

Fujisawa Sustainable Smart Town (Japan). Available at: <https://fujisawasst.com/>.

Porto Digital (Recife, PE, Brazil). Available at: <https://portodigital.org/>.

The Global Institute on Innovation Districts (GIID). Available at: <https://www.giid.org/global-instituteon-innovation-districts>.

# A Proposal for a Master Plan for a Sustainable Innovation Hub[1]

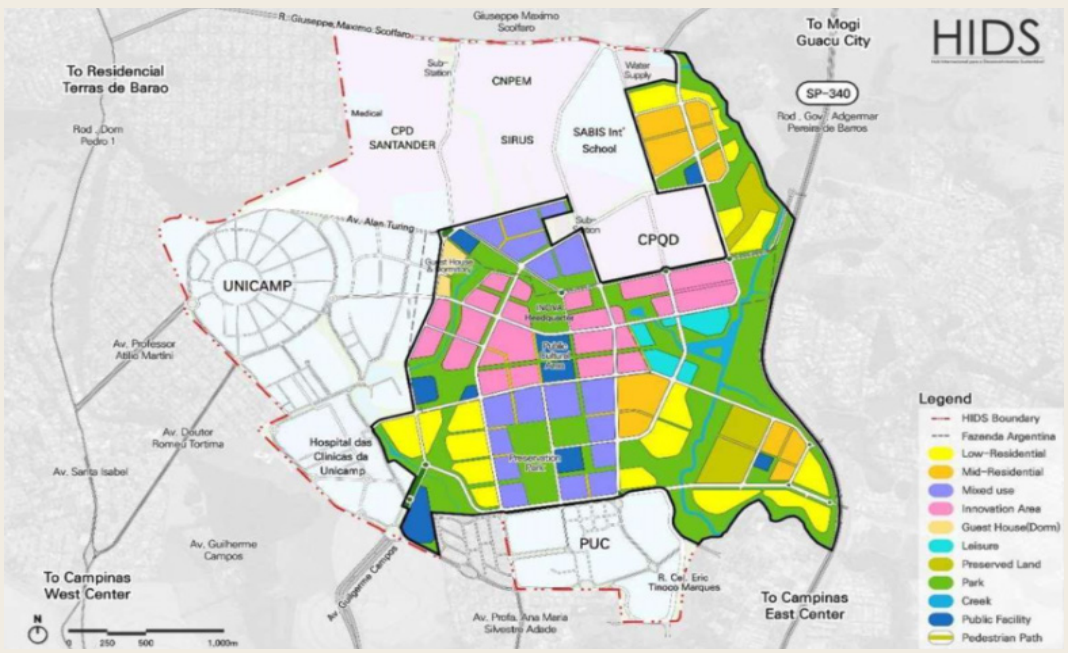
PATRICIA MARIUZZO

The agreement between the Inter-American Development Bank (IDB), the City of Campinas, and Unicamp resulted in a proposal for a master plan for the HIDS area. A master plan is a flexible planning document with a long-term vision to guide future growth and development of a specific area. The master plan proposal for HIDS was developed by the South Korean research institute KRIHS – Korea Research Institute for Human Settlements.

In developing the proposal, the Korean institute collaborated with the company Demacamp and was supported by a committee of specialist professors from Unicamp and PUC-Campinas.

Completed in September 2022, the plan is a draft version and should therefore not be considered a definitive project for local development. Some aspects of the proposal were incorporated by the City of Campinas when drafting the Preliminary Bill for the Parceling, Use, and Occupation of Land in the Innovation Hub for Sustainable Development (PIDS)[2] and in the Occupation Plan for the HIDS Unicamp (Fazenda Argentina), developed by the coordination team of HIDS Unicamp[3].

Credit: KRIHS




PROPOSED LAND USE FOR HIDS

The KRIHS proposal is based on the establishment of a multifunctional city, with a balanced distribution of workspaces, services, and leisure and cultural areas, adopting a mixed land use and medium-density model. The study also includes a series of suggestions that could be implemented in the HIDS area, based on the Korean experience in creating smart cities. In general terms, the project suggests the creation of open innovation areas, mixed zones (residential, public, and green areas) (Figure 1), with medium-density vertical collective housing, a more orthogonal street grid, and north-south circulation. It advocates the adoption of sustainable urban transport infrastructure, with options for public and non-motorized transportation, the allocation of 15% of housing for social purposes, and the conservation and promotion of natural spaces.

Innovation activities – related to R&D, education, and knowledge industries – would be concentrated in Fazenda Argentina, both due to the usage restrictions of this area, which belongs to Unicamp, and its location in the central portion of HIDS. This area is also close to educational and innovation facilities present in the region and benefits from an existing road connection through Avenida Ricardo Benetton Martins, linking this area to the SP-340 highway (Figure 2). The innovation area should also house large public facilities, administrative support, convention centers, and libraries, which could support R&D functions.

Credit: KRIHS

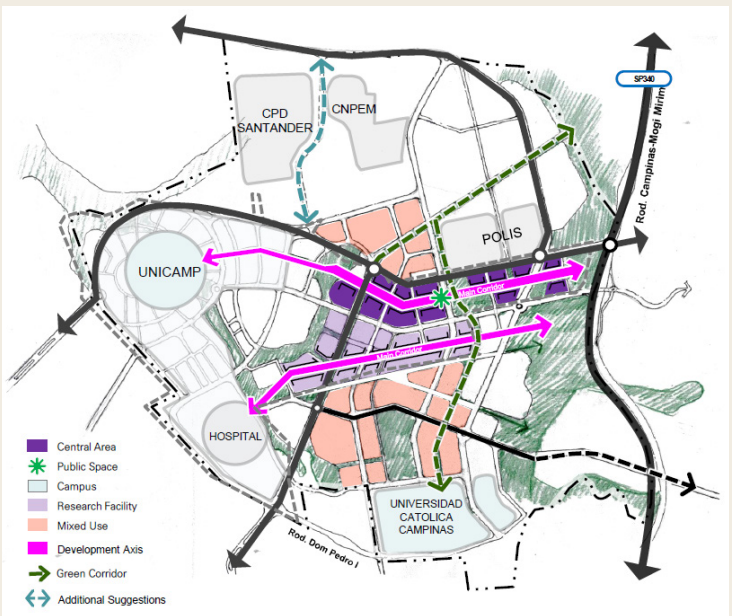



FIGURE 2: HIDS DEVELOPMENT AXES

Reserved for residential, commercial, and business installations derived from innovation activities, the mixed-use areas would be located to the north and south of the innovation area in order to create a synergistic effect with existing facilities in the territory, such as CNPEM to the north and PUC-Campinas to the south. To facilitate the integration of housing and work, approximately 20% of this area (mixed-use) would be temporarily allocated to business functions, 20% to commercial functions, and the remaining 60% to residential functions. The residential areas would be divided into medium and low-density residential areas, through

apartment buildings, avoiding the model of isolated houses and gated communities. In addition, the proposal foresees 15% of the residential area being allocated to social housing.

The public areas would be located in the innovation area and would be occupied by schools, community centers, government installations, as well as museums and art galleries. The Korean institute's study suggests that some of these public facilities be highly symbolic in order to become connection points between the Unicamp Innovation Agency, Inova, and the open spaces to the south of the territory.

Finally, the green area would be represented by an ecological corridor surrounding the innovation area and an area near the Ribeirão Anhumas, along the East-West axis. The areas along the Northeast-Southeast axis should remain occupied by agricultural activities. According to the KRIHS proposal, if these cultural resources are properly used, they will contribute to increasing the cultural diversity of HIDS.

The plan emphasizes the importance of preserving Ribeirão Anhumas and suggests creating a linear park along the Ribeirão, as well as establishing detention ponds to temporarily accumulate rainwater, with the aim of reducing urban flooding. These measures could increase the green spaces available to people and make the Ribeirão shoreline a highlight throughout HIDS. The maintenance of green areas aims to maximize the preservation of the natural resources in the HIDS territory, ensure their coexistence with urban development, and contribute to improving the quality of life for those living, working, and moving through HIDS.

The KRIHS study recommends the adoption of wildlife corridors to connect fragmented green areas caused by urban development, ensuring the movement of wildlife. It also proposes green roofs covering at least 20% of building roofs to reduce heat and help manage stormwater runoff. Additionally, it suggests providing spaces such as terraces and gardens on building roofs, adding convenience for users.

Regarding the road system, the master plan indicates the creation of a road network with two axes connecting the eastern and western regions, complemented by internal connection roads. It also suggests building a new road between the Santander Data Processing Center and CNPEM/Sirius to improve circulation between the research institutes located in this area, and the construction of a roundabout at the boundary between Facamp and the entrance to Fazenda Argentina, to improve the road structure in that area through a circulation system that encourages speed reduction by drivers instead of relying on signage.

Considering that HIDS is being designed as an innovative, safe, and inclusive environment, the Korean institute's study suggests adopting some tools for the street and block design. One of these is establishing anchor functions – public or commercial – on the building facades (active frontage) to encourage pedestrian circulation through an attractive environment (figure 3). Additionally, the plan suggests connecting the building's external area with key public spaces, such as parks, sidewalks, and bike lanes, and creating resting places and small open spaces outside the buildings to encourage people to stay on the streets.

Credit: KRIHS

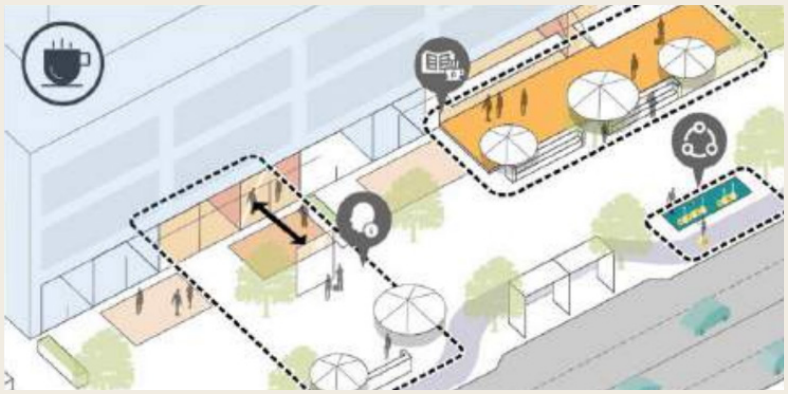


FIGURE 3: ILLUSTRATION OF AN ACTIVE FACADE

Considering that the creation of the HIDS aims to establish a new urban occupation paradigm in Campinas, the study emphasizes the need for a solid public transportation plan, which would include connections to the city center via light rail transport, implementation of electric bus networks for connecting surrounding neighborhoods to HIDS, and the construction of pathways for individual active mobility, such as electric scooters and bicycles, to increase accessibility to areas neglected by public transportation services.

One of the characteristics of HIDS is that it will be composed of both public lands, such as those of Unicamp and CNPEM, and private lands, occupied by farms, businesses, and private universities. In this sense, the Korean study highlights that the areas at the boundary between public and private lands hold special importance as a key space where all activities converge. To create an integrated urban space and facilitate interaction between private and public activities, it is important to locate facilities that can be used by both sides in these boundary areas. Specifically, private activities such as restaurants, gyms, cafés, etc.

The concept of the smart city emerged in the 2000s, attracting the attention of urban policymakers as a solution to urban problems and as a tool for sustainable urban development. Countries around the world are promoting various smart city policies, with variations tailored to the conditions of each country and city. While initial smart city projects focused on infrastructure construction and testing new technologies, recent strategies for smart cities focus on solving urban problems and seek to improve the quality of life for people.

South Korea has several smart city projects, including the Songdo International City in Incheon, which was built from scratch, 40 kilometers from the South Korean capital. The Songdo smart city project is divided into six sectors, including transportation, crime prevention, disaster prevention, environment, and citizen interaction. Seoul, the capital of South Korea, is considered one of the best places to live in the country, with excellent infrastructure and public transportation based on the application of information and communication technology.

Considering Campinas' potential to become a smart city, especially in areas like the environment, health, and safety, the Korean institute suggests smart city strategies for HIDS. All public buildings should be low-carbon emission and equipped with renewable

Credit: Patricia Mariuzzo

INTERNATIONAL CITY OF SONGDO, SOUTH KOREA

energy systems. The governance of HIDS should establish support plans to encourage commercial, business, and residential buildings to use renewable energy. One strategy in this direction would be to build a model building in HIDS for the use of renewable energy. Another suggestion is to create a pilot project for rainwater collection and storage from rooftops and the ground in public buildings and facilities for use in bathrooms, fountains, and gardens.

Regarding transportation, one strategy would be to establish a traffic management system integrated with the rest of the city and road traffic, based on ICT, which would allow people to access traffic information more easily, as an incentive to use public transportation. Finally, following the example of Songdo, the Korean study recommends that HIDS adopt a city management center that, through a unified communication network, connects the entire city by integrating information on administration, traffic, crime and disaster prevention, environmental management, and underground utility systems (if HIDS adopts this infrastructure model).

In September 2022, as part of the Technical Cooperation with support from the IDB, KRIHS organized the Benchmarking Workshop in South Korea to share experiences in urban development, smart cities, and innovation districts from Korea with the policymakers of Campinas and the team involved in the HIDS project at Unicamp and PUC-Campinas, as well as to promote discussions on the HIDS master plan. The mission included lectures and technical visits to the capital Seoul, the Pangyo Techno Valley (known as Korea's Silicon Valley), the international city of Songdo, with a focus on the Smart City Monitoring Center, and the administrative city of Sejong (where KRIHS is headquartered), which was inspired by the planning of Brasília and created to house government agencies. ■

## NOTES

1. This text is a summary of the master plan proposal developed by KRIHS.

2. The Planning and Urbanism Department (Seplurb) of the Campinas City Hall restructured the land use and occupation proposal for the Ciatec 2 area and added a new expansion area to the north, which was designated as the Innovation and Sustainable Development Hub (PIDS). For more information on PIDS, visit: <https://campinas.sp.gov.br/secretaria/planejamento-e-desenvolvimento-urbano/pagina/pids-polo-de-inovacao-e-desenvolvimento-sustentavel>.

3. For information on the land use plan for HIDS Unicamp, consult the link: <https://hids.org.br/unicamp/plano-de-ocupacao/>.

# Implementation of Ecological Corridors at HIDS Unicamp[1]

THALITA DALBELO, MARIANO LAPLANE AND HENRIQUE SÁ EARP

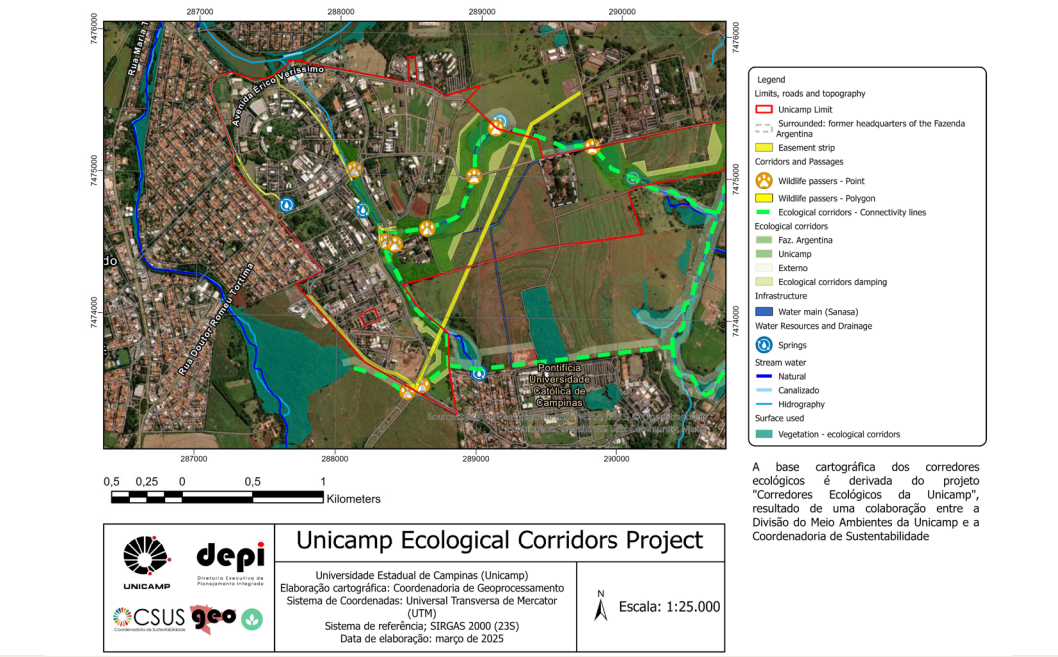
The cornerstone of the Zeferino Vaz campus at Unicamp was laid on October 5, 1966, on a 30-alqueire plot, 12 kilometers from downtown Campinas. The planning and occupation of this new university campus did not consider the connectivity of existing green areas, resulting in fragmentation. Studies indicate that forest fragmentation is responsible for the reduction of biological diversity, changes in the hydrological regime of watersheds, degradation of natural resources, isolation of animal populations, and deterioration of their quality of life.

Ecological corridors are vegetated areas designed to connect forest fragments, such as conservation units and Permanent Preservation Areas, which have been isolated by human interference (roads, agriculture, or other types of activities), as described on the website of the Municipal Secretary of Green, Environment, and Sustainable Development. Their main goal is to allow the movement of fauna between isolated areas and, consequently, promote genetic exchange between species and the dispersal of seeds. The Municipal Green Plan (2016) established a Connectivity Line and its Area of Influence as a way to connect green areas with predominantly ecological functions. However, although these corridors are official through municipal resolutions, much of them still lack real connections.

Over the past 15 years, the Animal Monitoring Center of Unicamp (CEMA/DMA) has been working to reestablish connectivity between vegetation fragments on the Zeferino Vaz campus. This effort resulted in collaborations in the Municipal Green Plan, the Reconecta RMC project, and the Integrated Master Plan of Unicamp. In an initiative aligned with the University's Strategic Plan (Planes Unicamp 21-25) and with investments amounting to R$ 6 million, in 2022, Unicamp approved the Ecological Corridors Unicamp project. This project is the result of a partnership between the Environmental Division of Unicamp's Campus City Hall, the Sustainability Coordination, the Executive Directorate of Human Rights, and the International Hub for Sustainable Development (HIDS).

The objective of the project is to connect the preservation areas and compensation polygons of the Zeferino Vaz campus and Fazenda Argentina, as well as the vegetation fragments outside the university area, allowing the flow of fauna and flora through the construction of wildlife passages, forest restoration, and the planting of native vegetation in the corridors, as well as their fencing and signage. The project benefits from the collaboration of the Campinas Municipal Government through the Urban Planning Department and the Secretary of Green, Environment, and Sustainable Development.

The forecast is that within five years, 217,000 square meters of ecological corridors will be established, 92 meters of wildlife passages, 6,500 meters of fencing, and 300,000 square meters of forest restoration area. The expectation is to reduce the degree of isolation of the remaining vegetation areas, improve seed dispersal, and increase the survival rate of animal and plant species. Species such as armadillos, marmosets, hedgehogs, hares,




opossums, and capybaras cross streets and avenues in search of food and water, posing a risk to the safety of both these animals and humans. A survey by CEMA showed a fourfold increase in the number of wildlife accidents on the Unicamp campus between 2005 and 2022. One of the objectives of the Ecological Corridors Unicamp project is to reduce the number of collisions at the intersections between wildlife passages and the road system.

The selection of the ecological corridor sections was based on the routes that fauna historically uses, due to the proximity of fragments and resources such as food and water. In areas where there is interference from road axes, which act as barriers, wildlife passages will be built. These passages may be elevated, but most of the time they need to be subterranean to ensure the animals can cross these axes safely.

The Ecological Corridors Unicamp project also foresees the connection and restoration of springs in the Fazenda Argentina and the university campus, continuing Unicamp's environmental preservation actions, strengthening the Municipal Green Plan, and integrating the initial initiatives under HIDS, a long-term project that aims to establish a model district in sustainability. As a protective measure, the master plan of HIDS, in its final stage of development, designates areas with lower occupancy density in regions near the corridors and in buffer zones.

The establishment of the Ecological Corridors Unicamp project reflects the university's commitment to the Sustainable Development Goals (SDGs). It represents how Unicamp envisions the occupation of Fazenda Argentina and, more broadly, the entire HIDS area. ■

**NOTE**

1. Article originally published in the *Correio Popular* newspaper on 02/01/2023. Available at: <https://hids.org.br/wp-content/uploads/2023/11/0102CPAA03.pdf>.

# The University We Want to Be[1]

ANTONIO JOSÉ DE ALMEIDA MEIRELLES AND MARIANO LAPLANE

Droughts and dry spells, floods and inundations, forest fires, heatwaves, and cold waves are examples of extreme weather events, unfortunately becoming more frequent everywhere. A 2023 study conducted by researchers from the Institutes of Biology (IB) and Geosciences (IG) at Unicamp showed that the city of Campinas had an increase of 1.2°C in average temperatures between 1989 and 2022, highlighting that the region is already experiencing the effects of global warming caused by climate change. According to the study, starting from the 2000s, the occurrence of hot days accelerated in our region. The record occurred in 2014, with 30 such events in Campinas, the same year that the Southeast region faced a severe water crisis.

According to the 2024 ranking by Times Higher Education (THE) World University Rankings, Unicamp is among the top 351-400 universities in the world and holds the second-best position among the best universities in Brazil and Latin America. Our university advanced one position – from 74th in 2022 to 73rd in 2023 – in the UI GreenMetric World University, an international ranking assessing the sustainability performance of universities. In the 2025 edition of the QS World University Ranking (QS WUR 2025), one of the major international university rankings, our University was ranked 232nd, placing Unicamp in the group of the top 15.6% universities worldwide. According to the QS WUR 2025, Unicamp is the second-best university in the country and the 10th in Latin America.

While these results are a source of pride for the entire academic community, being among the best institutions in the world comes with the responsibility to enhance our development strategies and reflect on the future: what kind of university do we want to be in the next 50 years? What university are we building? What do we want to be in 2050?

The occupation of Fazenda Argentina, a portion of Unicamp within the HIDS (International Hub for Sustainable Development), referred to here as HIDS Unicamp, is part of this answer. It is based on the premise that the University has a fundamental role in addressing the challenges of climate change and sustainable development, and that in carrying out its core activities – teaching, research, and extension – the Sustainable Development Goals (SDGs) should serve as a beacon lighting the path to where we want to go.

That is why we are investing in a master plan for the occupation of Fazenda Argentina, based on the principles of sustainable urbanism, which can consolidate Unicamp's role as a provider of new knowledge, technologies, and innovations for sustainable development. The master plan proposal for the HIDS area, developed by the Korea Research Institute for Human Settlement (KRIHS), suggests the creation of two more densely populated central areas in the territory, with mixed-use (including housing, corporate areas, commerce, and services) and predominantly residential areas, following the most updated concepts of knowledge production territories, which go far beyond the technological parks of the 20th century. This is because the proposal recommends

the introduction of complementary activities in the region to support the university campuses and research centers already present, enabling the full realization of the goals set for the creation of a fourth-generation innovation ecosystem, based on the society and knowledge economy and the quintuple helix innovation model, involving academia, government, industry, society, and the environment.

In this context, the occupation of Fazenda Argentina – or HIDS Unicamp – through research, development, and innovation projects, represents an opportunity window for the implementation of the SDGs (CEUCI, 2022). And for HIDS Unicamp to consolidate as a successful project, it is essential that it is exemplary in its interaction with the environment in all its components: air, land, water, energy, flora, and fauna.

Sustainability management in relation to HIDS' environmental heritage is based on two distinct but complementary concepts: the sustainable use of resources and the promotion of environmental integrity. The first incorporates practices that have become established in recent years and characterize various aspects of the green economy, such as more efficient and rational use of water resources, the search for clean and low-carbon energy in production processes, waste management, etc. The second is reflected in a set of measures that drive development but preserve natural resources, not only preventing their depletion but also creating the necessary conditions to promote resilience and the restoration of local biodiversity.

Our commitment to the United Nations 2030 Agenda goes beyond simply fulfilling its objectives; it expresses the conviction that these objectives are relevant and necessary for transforming our relationships with people and the environment. Therefore, we are investing R$6.2 million in the recovery of ecological corridors[2] and water springs in the Fazenda Argentina region.

**EFFORT AND PROPOSALS**

In addition, researchers from the Center for Studies on Urbanization for Knowledge and Innovation (CEUCI) made an effort to align the master plan developed by KRIHS for the Fazenda Argentina area, resulting in an occupation proposal that will be submitted for approval by the Unicamp community at the appropriate time. The main innovation of this proposal is the concentration of built-up areas, an essential condition for establishing a more sustainable model of occupation, with the maintenance of large green and permeable areas.

The planned blocks represent 59 hectares of the total 140 hectares of the Fazenda area. Since the permeability rate must be at least 20% of the lot area, only 25% of the total Fazenda area can be developed. The remaining territory can be used for activities such as sustainable food production and clean energy generation. The minimum construction utilization coefficient must be equal to 1 (built area equal to the land area). If the initial occupation of a block is not carried out with the maximum utilization coefficient (twice the land area), it must be done in a way that allows for the completion of constructions to eventually achieve that coefficient. The use of the maximum utilization coefficient will result in smaller projection areas for the buildings and, consequently, a lower impermeabilization index.

Credit: SEC Unicamp

HEADQUARTERS OF THE INOVA INNOVATION AGENCY LOCATED IN THE HIDS UNICAMP AREA

The occupation of the 59 hectares available for construction at Fazenda Argentina will occur gradually, in three phases. In the first phase (2025-2030), only 23 hectares will be occupied, with buildings in the blocks closest to the headquarters of Inova Unicamp and the area in front of CPQD, as these two portions of the territory already have existing road infrastructure. Moreover, CPQD is also an important research institution, which can help boost collaborative projects. The remaining area will only receive buildings in the second and third phases.

In 2019, Unicamp made a bold decision to create an Integrated Master Plan, with a future vision for the University, expressed in guidelines for the territorial occupation of its campuses until 2031. The planning for the occupation of HIDS Unicamp aligns with these premises and aims to strengthen them to encourage a new paradigm of occupation, without disregarding past experiences.

Zeferino Vaz campus currently has 600,000 square meters of built area. When observing an aerial photograph of our campus today, it is clear that the space is entirely occupied by a road system. However, the blocks still have many idle areas, with large distances between buildings. On days with intense sun or heavy rain, it becomes difficult to move between institutes, and those who can, end up opting to drive, even for small distances, avoiding walking or using other forms of active mobility.

The occupation of HIDS Unicamp is an opportunity to rethink this paradigm and implement a more rational occupation plan, recognizing that urban land is a scarce resource that must be used in the best possible way, allowing for more green space preservation and reducing infrastructure costs. No less important is the fact that densification contributes to promoting encounters and social interaction, which in turn fosters knowledge generation by bringing people closer together and providing a richer community life!

By reducing distances, densification also enables more sustainable mobility. In this sense, the HIDS Unicamp occupation plan includes the creation of a road network of various dimensions, with collector and arterial roads, shared streets, and buffer zones around ecological corridors and Permanent Protection Areas (APPs). Shared streets will

be local access routes, with controlled vehicular traffic and a speed limit of 30 km/h. Their pavement should be permeable and have a color and texture different from the pavement of collector and arterial roads. The road system also envisions creating green pathways crossing blocks and other public use areas. The idea is to create stimuli for active mobility, such as using bicycles, electric scooters, or walking in a pleasant environment.

The buildings at HIDS Unicamp must meet international sustainability certifications. In general, this model represents an extra cost that we have chosen to assume to meet the requirements of a more sustainable occupation. The established guidelines include thermal, acoustic, and lighting comfort through passive technologies; efficiency in water and energy usage; rainwater harvesting and reuse; adoption of energy from renewable sources; landscaping; waste minimization; use of local materials; accessibility; and appreciation of the local landscape.

Finally, through this project, we aim to establish a new model for the use and occupation of spaces, to encourage and enable the development of interdisciplinary and interinstitutional research and activities. Thus, we believe that the allocation of space will not be permanent to any specific institute or faculty; it should be renewed periodically based on adherence to the values of HIDS Unicamp and the results of the projects. The goal is to establish conscious, rational, shared, and frugal use of space, without idle areas and waste, and with minimal negative environmental impact, ensuring construction and energy sustainability, greater collaboration between projects, and sharing of infrastructure (exploiting possible synergies). This approach also aims for openness, transparency, and permeability to the surrounding environment and society at large (for example, through exhibition areas and hosting visitor groups).

In the 1960s, Zeferino Vaz, in a pioneering manner, envisioned a university open to experiences and encounters. The location of the buildings in a circle around a large green space would encourage the integration of knowledge and people. HIDS Unicamp should inspire the same boldness as Zeferino's vision, the boldness to imagine and plan the University we want in 2050, within the new concepts of sustainable urbanism. ■

**NOTES**

1. This text is an adaptation of the article originally published in *Jornal da Unicamp* on 19/10/2023. Available at: <https://www.unicamp.br/unicamp/ju/artigos/unicamp-2050-construindo-hoje-universidade-que-queremos-ser>.

2. See "Implementation of Ecological Corridors at HIDS Unicamp" in this book.

# Who Made This Book

**ANTONIO JOSÉ DE ALMEIDA MEIRELLES** – Rector of Unicamp (2021-2025). Full Professor at the Faculty of Food Engineering (FEA) at Unicamp. He defended his first doctorate in Thermal Process Engineering from Technische Hochschule Merseburg (now part of Martin Luther University) in Germany in 1987. He completed his second doctorate in Economics (1997) at the Institute of Economics (IE) at Unicamp. His engineering research focuses on bioenergy, biorefineries, and food and agro-industrial product purification processes. The technology developed as part of his doctoral research abroad earned him the 1989 Young Scientist Award from the National Council for Scientific and Technological Development (CNPq) and is currently responsible for about 30% of Brazil's anhydrous alcohol production. In economics, his main.

**BRUNO MOREIRA** – Founder of the innovation consultancy Inventta, partner at KPTL, and advisor to large companies. He has experience in innovation management, business development, and project management. Between 2021 and 2022, Inventta's team managed Unicamp's agreement with the IDB.

**CLAUDIO JOSÉ FRANZOLIN** – Professor and researcher at the Master's Program in Law at Pontifical Catholic University of Campinas and professor of civil law, consumer law, and environmental law in the undergraduate programs of Law and Environmental Engineering. His research focuses on the vulnerability of human beings. Between 2020-2023, he was part of the Legal Model component team for HIDS (PUC/Unicamp). Since 2023, he has been an associate researcher at the São Paulo Center for Studies in Energy Transition (CPTEn) at Unicamp, focusing on energy transition regulation. He participates in the Vitalitá project (Center for Aging and Longevity) at PUC-Campinas. He is an author of scientific articles and a lawyer.

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**FELIPE BARBOSA** – Undergraduate student in Economics at Unicamp, working on innovation projects with companies, academia, and government for 6 years. He debates future strategies and emphasizes the importance of constant transformation for business sustainability. In his professional experience, he has worked with the DPCT (IG - UNICAMP), Inventta Consultancy, StoneX, Patronos UNICAMP, and ABGi Brazil, collaborating with large companies (CPFL, Boticário, J&J, BASF, COPASA), academia (UNICAMP and HIDS), the public sector (IDB and MCTI), and the third sector (CNI and ANPEI).

**GABRIELA CELANI** – Architect, full professor at the School of Civil Engineering, Architecture and Urbanism (FECFAU) at Unicamp and director of the Center for Studies on Urbanism for Knowledge and Innovation. She served as coordinator of the team for the physical-spatial component of the HIDS project between 2020 and 2023.

**HENRIQUE SÁ EARP** – Professor and researcher at the Institute of Mathematics, Statistics, and Computational Science (IMECC) at Unicamp since 2010. He holds a master's in Theoretical Physics from the University of Cambridge, a PhD in Mathematics from Imperial College London, and a habilitation in Geometry & Topology from Unicamp. His research areas include differential geometry, string theory, and quantum information theory. He is the executive manager of the Brazilian Institute of Data Science (BIoS) and faculty advisor for the Integrated Planning Executive Directorate (DEPI) at Unicamp.

**JORDANA ANDRADE** – Undergraduate student in Architecture and Urbanism at the Faculty of Civil Engineering, Architecture, and Urbanism (FECFAU) at Unicamp. She has experience as an illustrator,

social media manager, and artist. She works in marketing, design, and communication at the innovation consultancy Inventta.

**JOSUÉ MASTRODI NETO** – Full Professor at the Law Faculty of PUC-Campinas. He has research experience on human rights and public policies, especially in areas involving the protection and promotion of social rights, with a focus on the right to the city, budget, and public policies. He was the coordinator of the legal model component of HIDS between 2020 and 2023.

**MARCELO CUNHA** – Associate Professor at the Institute of Economics at Unicamp, where he has been since 2012. He was a visiting professor at the Centre of Policy Studies (CoPS) at Victoria University (Melbourne, Australia) in 2023. He was an advisor to the Executive Directorate of Integrated Planning (DEPI) at Unicamp from 2018 to 2021 and a faculty advisor at the rector's office from 2021 to 2022. He coordinated the Sustainability Assessment component of the HIDS project from 2019 to 2022. He works in Mathematical Economics and Business Economics. He has experience in building input-output models and general equilibrium models to evaluate socio-economic and environmental impacts due to the inclusion of new productive sectors, technological and structural changes in the economy, with a focus on energy sectors.

**MARCELO KNOBEL** – Full Professor at the Department of Condensed Matter Physics, investigating experimental nano-structured magnetic materials at the Gleb Wataghin Institute of Physics (IFGW-Unicamp). He was the Rector of Unicamp from 2017 to 2021 and Vice-Rector for Undergraduate Education at Unicamp from 2009 to 2013, responsible for implementing the Interdisciplinary Higher Education Program (ProFIS), which combines social inclusion with general education. He is also involved in scientific outreach, collaborating with the Advanced Journalism Studies Laboratory (LABJOR) and the Creativity Development Center (NUDECRI) since 2000. He is a Fellow of the Eisenhower Fellowships and the John Simon Guggenheim Memorial Foundation.

**MARCO AURÉLIO PINHEIRO LIMA** – Retired. He was a Full Professor in Atomic and Molecular Physics at the Department of Quantum Electronics at the Gleb Wataghin Institute of Physics (IFGW-Unicamp). He completed his PhD at the California Institute of Technology, Caltech, Pasadena, USA (1981-1986). He was responsible for the creation of the National Laboratory of Science and Technology of Bioethanol (CTBE/CNPEM), where he served as director from 2008-2012. He received the Zeferino Vaz Academic Recognition Award twice, in 2001 and 2013. In 2015, he was elected a full member of the São Paulo Academy of Sciences. He was appointed Executive Director of Integrated Planning at Unicamp (DEPI) during Prof. Marcelo Knobel's administration (2017-2021). He coordinated the creation of the International Hub for Sustainable Development (HIDS).

**MARIANO LAPLANE –** Professor at the Institute of Economics at Unicamp. He holds a degree in Social Sciences from the Hebrew University of Jerusalem (1980), a Master's in Urban Planning from the University of California, Berkeley (1982), and a PhD in Economics from the University of Campinas, Unicamp (1992). He served as director of the Institute of Economics at Unicamp (2007-2011), president of the Center for Management and Strategic Studies in Science, Technology, and Innovation (CGEE) in Brasília (2011-2017), and Executive Director of International Relations at the University of Campinas (2017-2021). His research focuses on industrial development, particularly on competitiveness, industrial and innovation policy, regional integration, and foreign direct investment. He coordinated the HIDS Unicamp implementation team and currently continues as a member, working on projects with the New Development Bank, also known as the BRICS Development Bank.

**MICHAEL HENNESSEY** – Specialist in the Competitiveness, Technology, and Innovation (CTI) Division at the Inter-American Development Bank (IDB) in Brazil. Over more than 10 years of work at the IDB, he has also worked extensively in the English-speaking Caribbean and the Dominican Republic. His areas of focus include entrepreneurship, innovation funds, public-private dialogue, and the development of value chains.

He previously worked in the financial services sector in the United States and as a strategy consultant. He holds a degree in Economics from Georgetown University and an MBA from IESE Business School in Barcelona.

**MIGUEL JUAN BACIC** – Full Professor at the Institute of Economics at Unicamp and researcher at the Industrial Economics and Technology Center. He holds a Livre Docência in Economics (Business Economics) from Unicamp (2002). He has experience in the areas of Business Administration and Economics, focusing primarily on the following topics: cost management, business strategy, small business economics, local development policies, entrepreneurship, solidarity economy, and sustainability. He was the coordinator of the Business Model component of HIDS from 2020 to 2023. He is a member of the HIDS Unicamp implementation team.

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**PATRICIA MARIUZZO** – Executive manager of the HIDS Unicamp implementation team and associate researcher at the Center for Studies on Urbanization for Knowledge and Innovation (CEUCI). She holds a degree in History (1993), a specialization in scientific journalism (2004), and a PhD in Environment and Society (2016), all from Unicamp. She was the creator and editor of the Campinas Inovadora Portal, a BID project to promote the innovation ecosystem in Campinas. Between 2021 and 2022, she was the editor of the *Unicamp Journal*.

**THAIS COLICCHIO** – Consultant in Innovation and Sustainability. Coordinator of the Campinas Impact Business Ecosystem, through the Coalition for Impact. She holds a Master's in Information and Communication Systems from the Faculty of Technology at Unicamp. Her research focuses on collaboration in ecosystems and knowledge sharing. She has been working for 10 years as a Project Manager and Facilitator of participatory processes.

**THALITA DALBELO** – Urban architect with a focus on sustainability. In her Master's, she researched sustainability in industrial buildings through ecology and industrial symbiosis. In her PhD, she analyzed the interaction process between urban systems that ensures resilience and solves disturbances while maintaining the city's identity, both at the Faculty of Civil Engineering, Architecture, and Urbanism (FECFAU) at Unicamp. She coordinated the development of the Territorial Master Plan for Unicamp and works as the Sustainability Coordinator at the university. She is a member of the HIDS Unicamp Implementation Coordination.

**WESLEY RODRIGUES SILVA** – Assistant Professor at the Institute of Biology at Unicamp, teaching Vertebrate Zoology and Ecology. He organized and coordinates the Vertebrate-Plant Interaction Laboratory (LIVEP) at Unicamp, where he conducts research with students and collaborators in the area of seed dispersal by animals. Between 2020 and 2023, he was the coordinator of the Socioenvironmental Heritage component of HIDS. He is a member of the HIDS Unicamp implementation team.

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