



AMSTERDAM  
INSTITUTE FOR  
ADVANCED  
METROPOLITAN  
SOLUTIONS

**“If we call on the brightest minds, put forward our boldest ideas, and connect unconventional partners, then together we can reinvent our cities.”**

# The Foreword

— by Femke Halsema

© Tom Feenstra



Dear reader,

The fact that you are holding this AMS Institute Playbook in your hands gives me a sense of pride and optimism. This Playbook provides some essential building blocks for groundbreaking research, innovation, and talent-building necessary to create metropolitan solutions. Solutions that are essential to keep our cities the thriving places they are today.

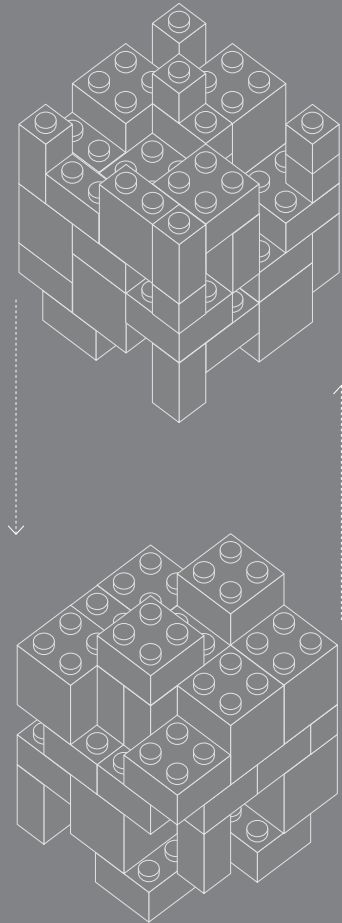
My sense of pride stems from the fact that in 2013, my city took the unprecedented step in launching a design competition for an institute of applied technology that led to the creation of AMS Institute. Founded by core academic partners TU Delft, Wageningen University & Research, and MIT, AMS Institute has developed from a plan on paper to a world leading institute: a true partnership between academic partners and the city which today is the home of a continuous stream of innovation and talent.

My sense of optimism stems from the fact that you, dear reader, are interested or involved in helping our cities become sustainable, resilient, and inclusive. Wherever you may live, the urgency to transform our cities has never been greater and is felt all over the world.

It is a great pleasure to share this Playbook and the insights of 10 years of AMS Institute with you. These may be uncertain times, but as we call on the brightest minds, put forward our boldest ideas and connect unconventional partners, then together we can reinvent our cities. This is what we do in Amsterdam; this is what we do at AMS Institute.

Femke Halsema  
Mayor of Amsterdam

# What is AMS Institute?

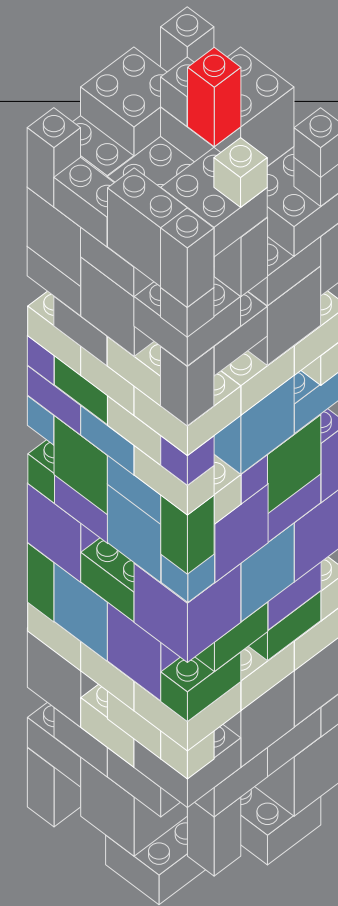


COMPLEX URBAN CHALLENGES

BEFORE

WORLD CLASS ACADEMIC EXCELLENCE

AFTER



AMS Institute Model

CITY OF AMSTERDAM

WAGENINGEN UNIVERSITY & RESEARCH

MIT

TU DELFT

education  
research & innovation  
entrepreneurship

## Reinventing cities

Amsterdam Institute for Advanced Metropolitan Solutions (AMS Institute) is the joint knowledge institute of Delft University of Technology (TU Delft), Wageningen University & Research (WUR), and Massachusetts Institute of Technology (MIT).

In close collaboration with the City of Amsterdam and private and public partners, the institute tackles urgent urban challenges through research and innovation, education, and entrepreneurship. In this way, AMS drives innovative solutions to create metropolitan areas that are livable, sustainable, resilient, and inclusive. We call this 'reinventing cities'.

## The Founding

223,2

Total value of portfolio (2014-2024) in Million Euro

AMS Institute is the result of a keen analysis: despite the presence of prestigious universities, Amsterdam has no cohesive technical-academic community. This gap, identified by the City of Amsterdam, led to a ground-breaking design competition that was launched in the spring of 2013. This had a clear mission: develop an institute to attract talent to Amsterdam, create jobs, and develop technology-based metropolitan solutions to the city's big urban challenges.

The bid book of a consortium of TUD, WUR, MIT and supporting partners convinced the jury chaired by Professor Robbert Dijkgraaf. Once the Amsterdam City Council had approved the establishment of AMS Institute and committed to contributing €50 million over ten years, the partnership contract was finalized on January 30th, 2014. The Institute officially launched on June 20th, 2014.

## Research & Innovation

71

Local Principal Investigators and Research Fellows

35

Research Fellows

36

Principal Investigators

Scientific research is essential to develop robust solutions that can be implemented across society to truly transform cities. Urban experimentation and academic rigor are crucial to this way of working. With an open research and innovation model, AMS Institute projects are always challenge-driven, have low barriers to collaboration, are carried out in a highly diverse community, and have a strong focus on societal impact. The academic backbone is formed by Principal Investigators and Research Fellows from the three core academic partners.

In developing its six research programs — Circularity in Urban Regions, Smart Urban Mobility, Metropolitan Food Systems, Climate-Resilient Cities, Urban Energy, and Responsible Urban Digitalization — AMS Institute is both agenda-setting and responsive to the missions of the City of Amsterdam.

243

Total number of research and innovation projects (2014-2023)

51

Circularity in Urban Regions

31

Metropolitan Food Systems

35

Urban Energy

42

Smart Urban Mobility

52

Climate Resilient City

32

Responsible Urban Digitalization

## Education

163

Total MSc MADE diplomas awarded 2019 - spring 2024

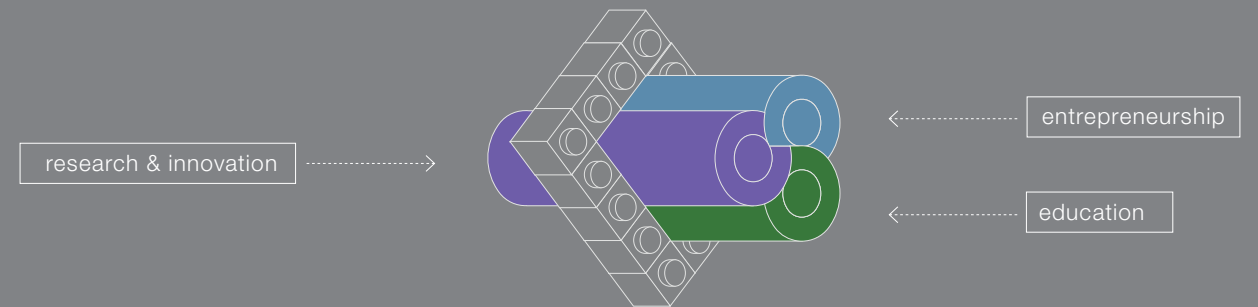
At the heart of AMS Institute's educational activities is MSc MADE: a two-year joint degree from TUD and WUR. Its transdisciplinary and real-world focus allows MSc MADE to provide innovative education and deliver a new type of professional: the urban engineer. Naturally, the students engage with Amsterdam as a 'living laboratory'. All educational activities, including the AMS Academy for professional training and Massive Open Online Courses, aim to accelerate sustainable change in our cities and communities.

## Entrepreneurship

95

Total supported startups

Tightly integrated with its education and Research & Innovation activities, AMS Institute is strongly committed to helping the next generation of ambitious entrepreneurs turn their ideas for sustainable urban solutions into reality. The AMS Startup Booster, a novel pre-incubator program, is an open invitation to early-stage urban tech startups that want to positively impact city life and solve metropolitan challenges.



## Moving Forward

312

Total international delegations visiting AMS Institute

Transforming our urban fabric is complex and can only be solved by experimenting with many projects that build upon each other. Re-inventing cities requires collaboration between local, regional, and national governments, private companies, public organizations, knowledge institutions, and citizens.

The roles of these actors are constantly changing, blurring the boundaries and prerogatives of traditional positions. It is a constant search for new configurations to govern, do business, develop ideas, and nurture talent. This is the context in which AMS Institute is moving forward.

# 7 building blocks for urban innovation with impact

Together, these seven building blocks contribute to creating a partnership-driven institute that aims to catalyze urban innovation with tangible impact grounded in scientific rigor. As we reflect on our 10-year journey, we have interwoven these building blocks into a reflection on the evolution of AMS Institute from its inception to today, enriched with inspiring project spotlights.

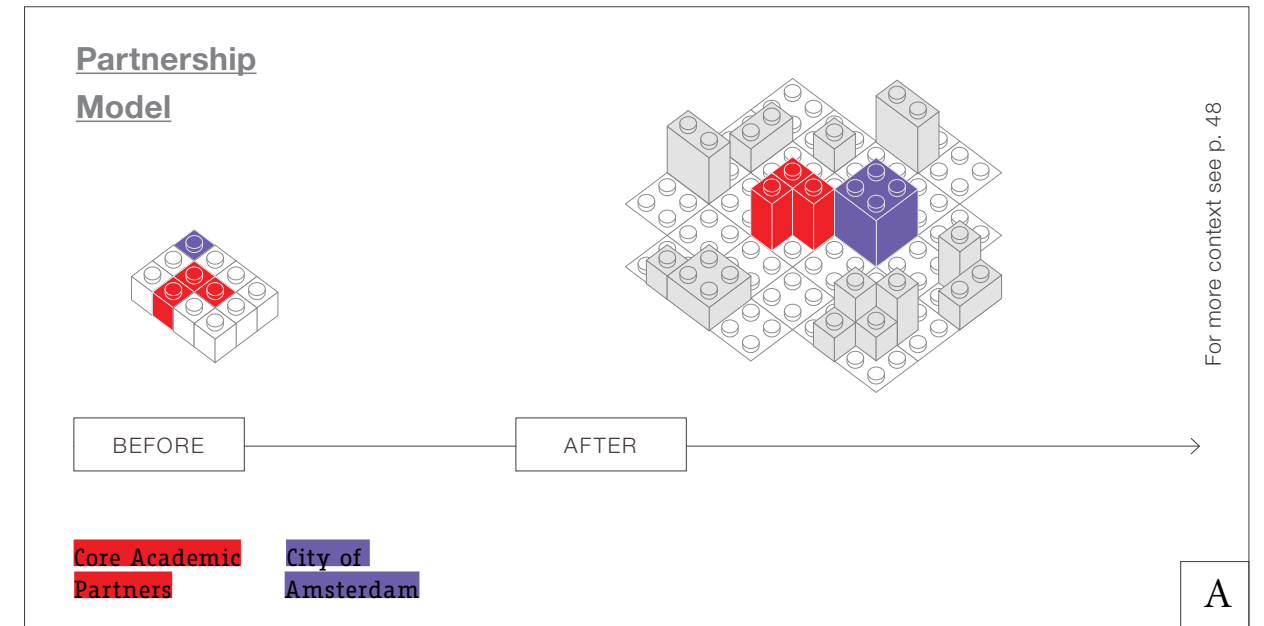


# True Partnership

## building block 01



Making urban innovation happen in real time requires trust, structures, and a special set of skills to bridge differences in rhythms, interests, and cultures. Only a true partnership between a limited set of highly committed partners, with an enduring commitment to the interdependent nature of success, will produce a continuous stream of solutions that matter.



Building the true partnership that we call AMS Institute began in 2013. The original bid emphasized the unique consortium of leading public and private partners, anchored by three core academic institutions: TU Delft (TUD), Wageningen University & Research (WUR), and MIT. These three internationally renowned universities formed the heart of the proposition, providing integrated and long-term thinking to ensure the consortium’s continuity.

In return for a pledge of €50 million from the City of Amsterdam, both WUR and TUD immediately committed to a financial investment of €20 million each over ten years. Building on a total budget of €250 million, the initial plan was to get a handful of key corporate partners also to commit significant funding up front.

In the initial years of fast-paced institute building, program-wide commitments were elaborated with corporate partners, outlining the financial mechanics and the research framework relevant to each party. Ultimately, no industry partner signed an overall institute or program-level formal agreement with serious financial commitment. Instead, a network of public-private engagements formed around specific projects. This early shift from a relatively closed to an open, project-based partnership model would prove fundamental to the scalability and flexibility of AMS Institute, with the true partnership between academic partners and the city of Amsterdam as the foundation. See figure [A].



Did this pose challenges? Yes —particularly in the early years. The agreement with the municipality to achieve a multiplier of 1:4 on its own investment of €50 million created pressure to secure substantial co-investment quickly and to avoid the (financial) consequences of failing to meet this contractual obligation.

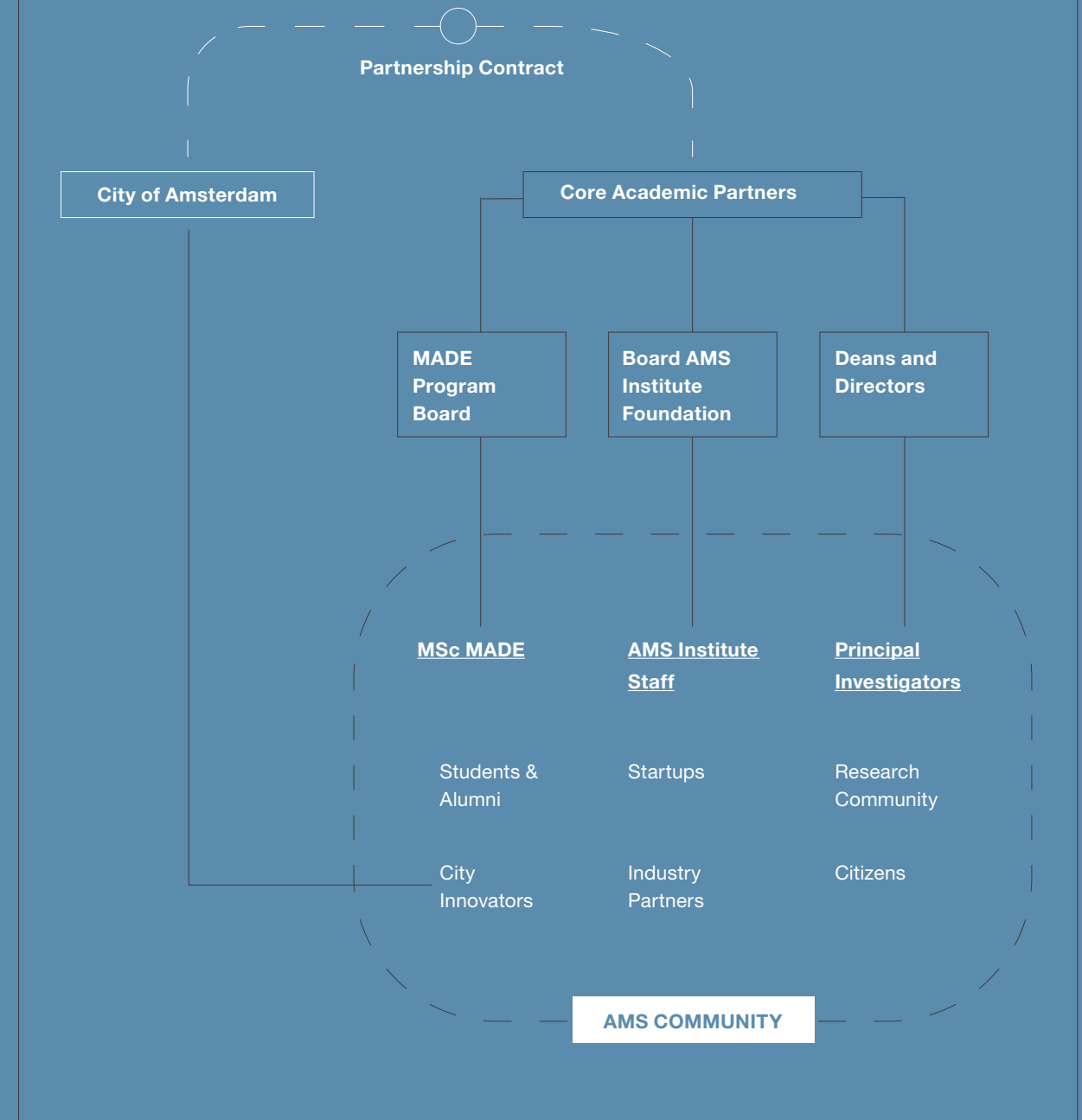
Significant upfront funding from program partners would have provided breathing space. However, this new, more specific model has undoubtedly led to more content-driven partnerships, enabling AMS Institute to engage a broader range of project partners and drive innovation even further.

Over the years, the relationship with the City of Amsterdam evolved from being predominantly contract partners into being true partners, in terms of commitment, dedication, management of expectations and communication. The Institute found its true purpose in addressing societally relevant urban challenges. This represented a significant shift in perspective, further elaborated in a strategic plan in 2020: contractual obligations (such as the multiplier condition, which prioritized financial inputs) were no longer strategic objectives. Instead, the Institute shifted its focus exclusively to societal impact based on scientific excellence, steering toward a multiplier defined by the output.

This shift is also evident on a more personal level. In addition to enduring institutional partnerships, the strength of AMS Institute lies in its robust local presence in the city, facilitated by a compact staff deeply rooted in the parent universities. The increasingly close partnership with the City of Amsterdam is driven by competent and committed partners, creating an environment where trust can flourish and serves as a platform for other parties to participate. This trust is the foundation for openness about the city's challenges and the starting point for scientists to understand challenge and arrive at meaningful solutions. The City and AMS Institute have honored this initial 10-year commitment, and that too speaks of trust. Meaningful metropolitan solutions do not thrive on short-termism.

It is helpful that several people, both in the City of Amsterdam and at the core of AMS Institute, have been part of the initiative for a long time —some even since the very beginning. This characteristic cannot be hard-coded into every institution's development initiative, but it does demonstrate the importance of trust, long-term commitment, and stability. Longevity and social capital are fundamental cornerstones of AMS Institute.

## AMS Institute governance model





spotlight

## Urban Bridge and Quay Wall Innovations

Amsterdam's canal system has long been a vital element of the city's infrastructure, part of its DNA, and essential in creating its unique atmosphere. However, many of the historical bridges and quay walls need to be in a better state. The Urban Bridge and Quay Wall Innovations (Urbiquay) program focuses on sustainable, innovative solutions to maintain, repair, and renew the city's bridges and quay walls.

Urbiquay was jointly set up by the City of Amsterdam, AMS Institute, and NWO and is part of the Dutch Research Agenda. Three research projects within the program will work on monitoring the condition of bridges and quay walls, environmentally friendly repair methods, which also consider cultural-historical values, and methods for improving this complex construction project's (circular) approach and logistics.

YEAR

2022 >

PROJECT PARTNERS

TU Delft, Twente University, NWO, City of Amsterdam

AMS PROGRAM

Climate Resilient Cities







# Build on Talent

building  
block — 02

Talent is the foundation of the urban innovation ecosystem. Talent that can constantly adapt to today's global knowledge economy, span boundaries, and make innovation happen, is critical. New institutional structures, such as AMS Institute, help attract, grow, and embed local and international talent to tackle the big urban challenges. That all starts with education.

## Empowering new urban engineers

Central to the educational endeavors of AMS Institute is the MSc MADE program, a joint degree from TU Delft and WUR that has been live since 2022. With a transdisciplinary approach and a focus on hands-on skills development, the two-year master's degree equips students with the tools to become 'urban engineers' capable of tackling multifaceted metropolitan issues.

MSc MADE students engage with Amsterdam as a living laboratory, collaborating with various stakeholders including researchers, the City of Amsterdam, businesses, and societal partners. This real-world immersion ensures that graduates emerge with theoretical knowledge and practical experience in addressing complex urban challenges.

The MADE students bring energy and are highly visible in the city through the Living Lab component of their course. It's been said that the students have had a greater impact on AMS Institute than was hoped for when the bid was submitted. The master's program thrives on its relatively compact size. The originally projected 200 to 250 talented students per year is indeed the scope of the AMS Institute's student community, with MSc MADE accounting for approximately 140 students.



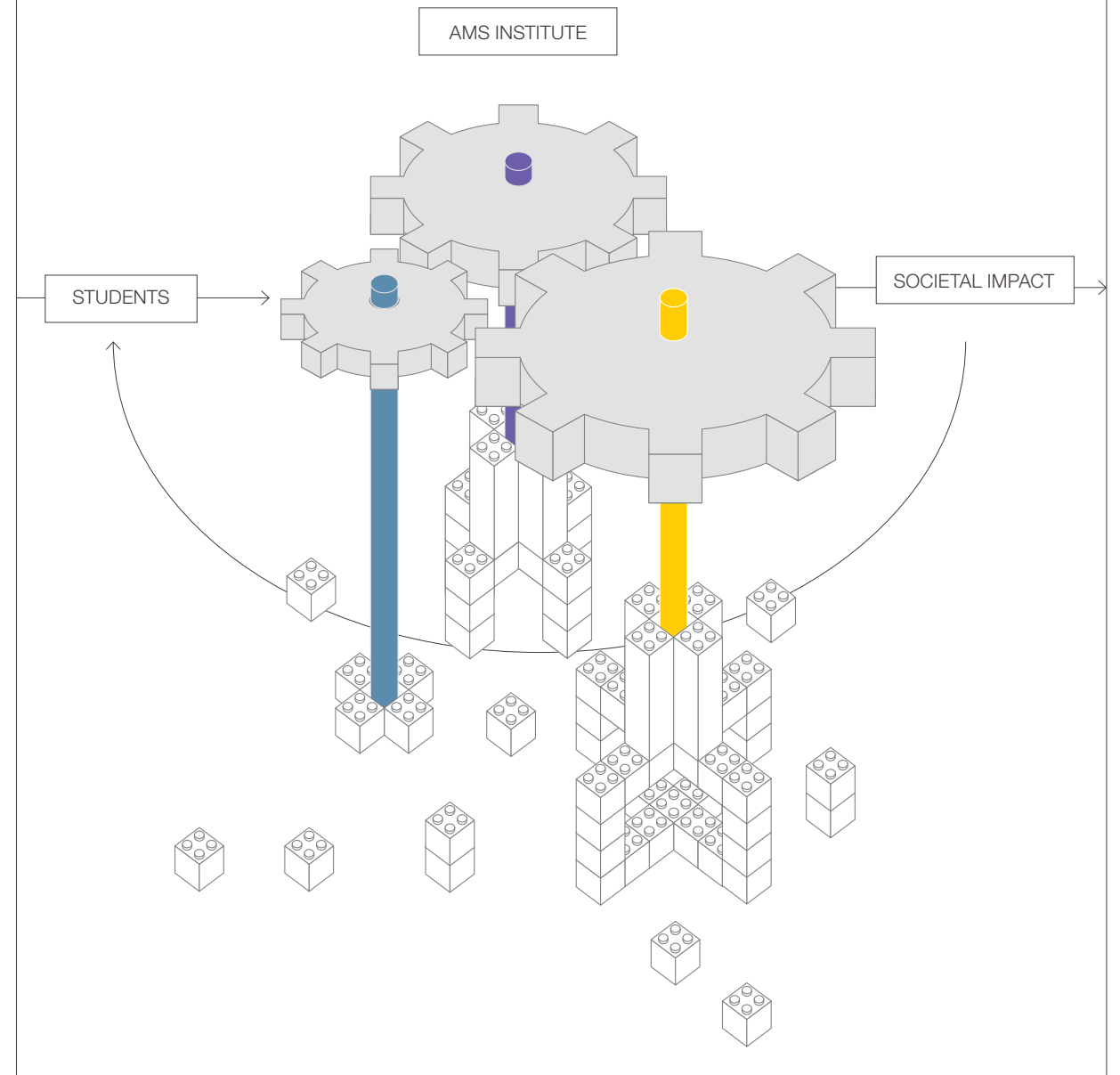
**The role of lifelong learning and talent integration**

Students are often integrated into ongoing Research & Innovation projects. This has proven to be very beneficial: as AMS Alumni, they have the knowledge and skills needed to reinvent cities, and they can also become new project partners when they land a position in the Amsterdam Metropolitan Region, for example. In this way, the MSc MADE has become a principal flywheel for growth across the Institute —and a very sustainable way of further embedding it into society. In a dynamic institute where Research & Innovation programs typically have a somewhat irregular heartbeat, educational programs with their constant flow of students into the Institute offer a solid basis.

A decade ago, the bid book barely mentioned the concept of lifelong learning for professionals. For AMS Institute, there is great potential in targeting its learning framework to urban professionals, especially those already working in local government. Building Block 7 (page 43) will consider how the Institute supports the City of Amsterdam in practical innovation and capacity building through this expanding learning community.

Another way to enhance the learning community's impact is cooperation with vocational education (ROC's) and institutes like Amsterdam University of the Arts. By investing in the full spectrum of talent, from the practical to the more theoretical and from technical to artistic, we have a tremendous opportunity to develop a truly diverse and inclusive funnel of talent that works together to reinvent the city.

**A learning community that drives solutions and societal impact and continually feeds new challenges back to the Institute**





spotlight

## The Ideal(s) City

How can a city build progress based on its deepest ideals? The Ideal(s) City project, a collaboration between Wageningen University & Research, TU Delft, the City of Amsterdam, and AMS Institute, analyzed the municipality's visions, values, and ambitions described in thirty years of program and coalition agreements. The multi-year project revealed how complex data underpins Amsterdam's aspirations – from inclusiveness to sustainability – and shows how it can guide decision-making. Forty monitors for policy analysis and 550 indicators corresponding to specific ideals were identified.

YEAR

2022-2023

PROJECT PARTNERS

Wageningen UR, TU Delft, City of Amsterdam

AMS PROGRAM

Circularity in Urban Regions



# The Power of Permeability

## building block — 03



Research and innovation thrive in permeable and diverse ecosystems. Encourage boundary-spanning behavior and low barriers to participation, while setting up projects that address today's complex urban challenges. This makes outcomes innovative, inclusive, and truly impactful.

The talent working at AMS Institute are deeply rooted in the core academic partners, TUD, WUR, and MIT. This affiliation was the quickest way to attract talent to Amsterdam in the early years. Across the team, from the core group of program developers to the scientists involved in AMS projects, they all have in common a strong sense of 'boundary-spanning' behavior.

These people are inclined to look beyond conventional boundaries, both organizational and disciplinary. It's not about what you are or aren't allowed to do from your specific role or position, but about what you want to achieve and how you can do so through exceptional scientific research. AMS Institute naturally attracts people inclined to cross boundaries — sometimes more than they could in previous roles at their parent institutions.

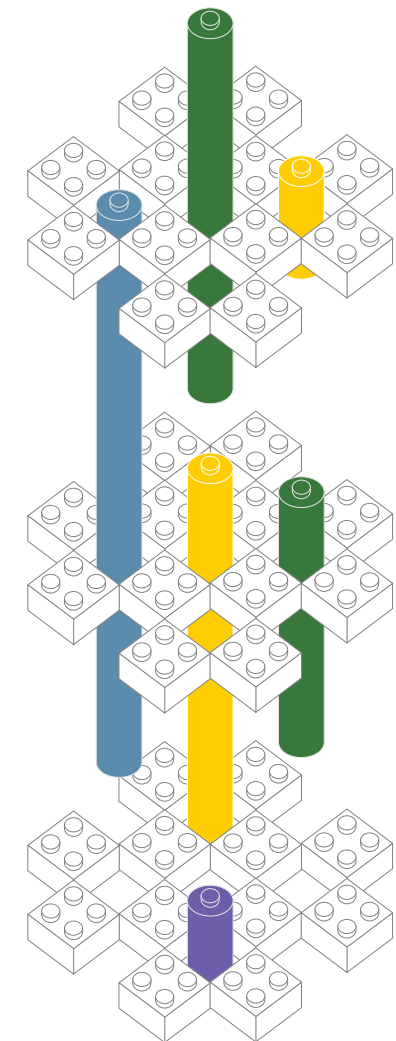
The organizational structure of the Institute is also characterized by strong boundary permeability. Conceptually, there are no strict boundaries around themes, teams, or organizations, rather dotted lines. This enables innovative approaches to work: program developers build bridges and actively broker between urban challenges in the city, scientific resources in Cambridge, Wageningen, and Delft, and other innovators in the field. AMS Institute is often described as being 'transdisciplinary by nature', with these permeable boundaries being essential to its operation.

In a framework where Research & Innovation projects no longer rely solely on large institutional partnerships, but are open to specific project coalitions, it's crucial to maintain a low barrier to participation for new partners. At AMS Institute, prospective partners can easily get involved if they have the know-how and innovative ideas and can invest a reasonable amount of time or money. In this way, a complicated formal membership, including a fee for instance, is unnecessary.

The initial financial support from the City of Amsterdam has been instrumental. It's enabled the Institute to mobilize top scientists, kick-start the research portfolio, develop the basic infrastructure and capacity, and remove tensions and adverse effects of short-termness and risk aversion. This low barrier increases project partners' diversity and increases projects' social inclusivity — ultimately making research more innovative, authentic, and impactful.

The AMS governance model also plays a crucial part in the permeable nature of the Institute. The Institute is able to set its own low-barrier rules of engagement for partners as the distance, both physically and in terms of governance, between the Institute and its parent universities and the municipality, allows it to do so.

### A permeable ecosystem to nurture boundary-spanning behavior





spotlight

## Culinary Cultural Heritage

More than 180 nationalities live in Amsterdam. Which fruits and vegetables are part of the cultural eating habits of all these communities? Where are these foods produced?

This project explores the culinary heritage of different cultures to identify opportunities for local and sustainable production of traditional 'exotic' vegetables, fruits and herbs. In close collaboration with the City of Amsterdam, Wageningen University & Research, and local stakeholders, AMS Institute explores how urban agriculture can contribute to the preservation of culinary heritage in Amsterdam South East and defines a roadmap of steps that can be taken to stimulate further development of urban agriculture in this area of Amsterdam.

YEAR

2020-2022

PROJECT PARTNERS

Wageningen UR, City of Amsterdam

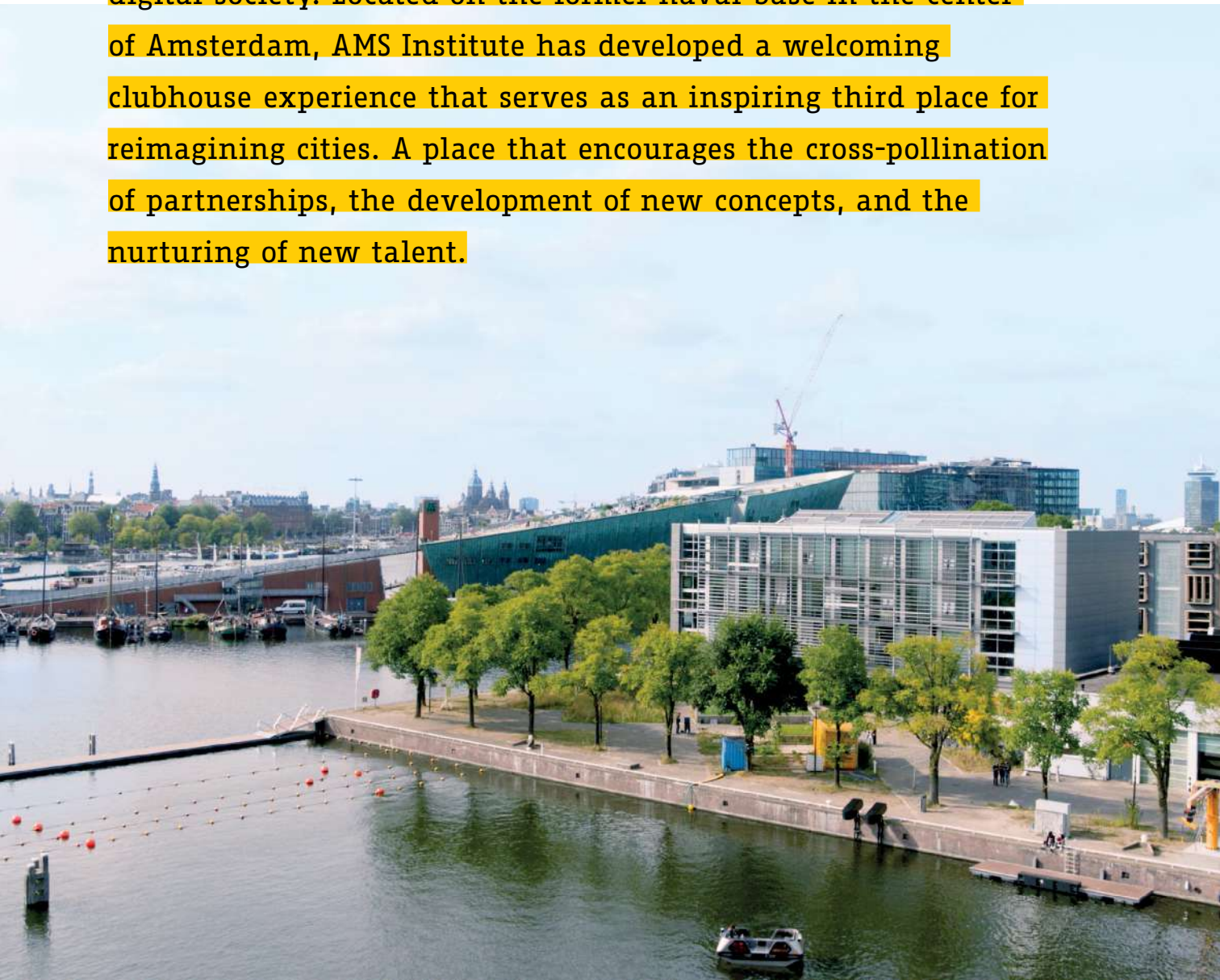
AMS PROGRAM

Metropolitan Food Systems



# Place Matters

Place matters in many ways. Physicality is a fundamental principle of urban innovation, even more so in today's digital society. Located on the former naval base in the center of Amsterdam, AMS Institute has developed a welcoming clubhouse experience that serves as an inspiring third place for reimagining cities. A place that encourages the cross-pollination of partnerships, the development of new concepts, and the nurturing of new talent.



● AMS Institute

## building block 04

### Campus or Clubhouse?

In 2018, the AMS Institute moved to the Marineterrein, the former navy base adjacent to Amsterdam Central Station. This move quadrupled the available space for researchers and the quickly expanding master's program. Additionally, there is room for a dedicated workshop and ample outdoor space, ideal for conducting experiments — particularly for projects like Roboat and the Living Labs.

Visitors encounter a hospitable environment and a buzz. It may be a little messy, but it's certainly not unkempt. There is some debate over whether to label this place as a campus. Preferably, it's referred to as a 'clubhouse'. Its primary quality is serving as a 'third place' for researchers, offering a haven away from the bustle of their respective universities to work freely and brainstorm aloud. This draws on Ray Oldenburg's 1989 classic in which he introduced third places as 'levellers': places where there are no prerequisites that would prevent acceptance or participation in the place.

### Marineterrein

Since 2013, the national government and the municipality of Amsterdam have worked together to transform the Marineterrein into an innovative urban district. The aim is to make the area inclusive and experimental, addressing urban challenges for a sustainable city. Since joining the Marineterrein in 2018, AMS Institute has been a major player in achieving this aim by collaborating on projects and experimenting on the Marineterrein, and setting up the structures for others to engage. In 2023, the Amsterdam University of the Arts (AHK), Codam Coding College, and AMS Institute launched an open education and knowledge coalition to harness the transformative power of art, technology, and science.

A strength of the Marineterrein is the curation of the innovation ecosystem by the Project Bureau, reflecting the diverse mix of educational institutions in the area. Paradoxically, Marineterrein isn't the most accessible place in Amsterdam. With the further decommissioning of the naval area, there's an opportunity to densify the area and better connect it to the surrounding neighborhoods. The addition of housing for students and young professionals seems obvious, with consideration given to how to continue allowing for experimentation in the area.

The coming years will be crucial for the Marineterrein: will it continue its development towards a unique and thriving urban innovation district or will it fall short of its full potential?



An inspiring clubhouse that serves as a 'third place' for partners, providing a haven away from the hustle and bustle of their respective universities and municipal desks to work freely and brainstorm aloud.



spotlight

## Responsible Sensing Lab

Technologies like smart sensors and cameras can help solve urgent urban challenges. But when collecting data, what public values are involved? Our Responsible Sensing Lab explores how to integrate society's public and democratic values in designing sensing systems in public spaces.

The Responsible Sensing Lab is a collaboration between TU Delft, the City of Amsterdam, and AMS Institute. In essence, this Lab is a testbed for conducting rigorous, transparent, and replicable research on how to 'responsibly' place smart technologies in public space.

YEAR

2021 >

PROJECT PARTNERS

City of Amsterdam

AMS PROGRAM

Responsible Urban Digitalization



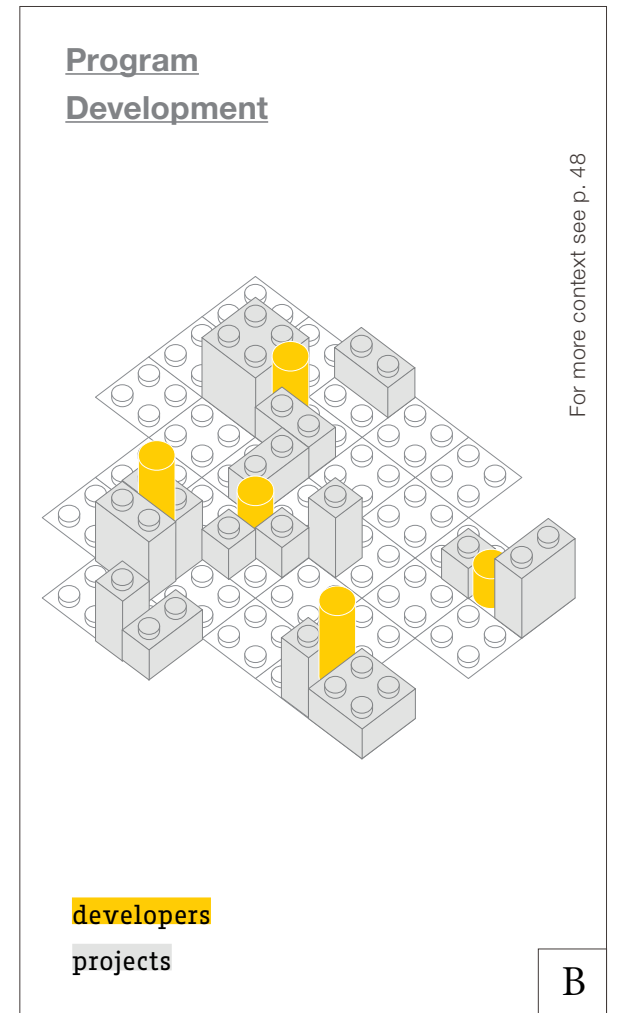




Solutions to the real challenges facing our cities and communities today will not come from applying what we already know in the way we have always done it. Now, we need continuous urban experimentation combined with scientific rigor to address the complex nature of our cities—challenge by challenge.

# Solutions that Matter

building block — 05



**Challenge driven**

AMS Institute tackles the real challenges of Amsterdam, developing specific knowledge and solutions with and for the city. In recent years, AMS has significantly shifted towards a more focused, demand-driven research and innovation portfolio. The thematic framework on urban challenges is strikingly similar to initial bid book from over ten years ago, but the way in which this research is delivered has changed.

Now, Research & Innovation projects are more tailored to meet the city's articulated demand for knowledge or know-how. AMS program developers precisely explore the challenge and consider how scientific research could find a solution, brokering connections between the city, partners, and scientists. This takes attention, time and requires managing expectations and being open about what is and isn't suitable for AMS Institute. Ultimately, there must be a real need for scientific knowledge and a real opportunity to have positive impact on the city. This is a constant balancing act between high levels of uncertainty and risk, as well as high potential for positive impact. The transparency of this balancing act builds trust and allows us to effectively address the challenges behind the challenges.

**Focused on societal impact**

There is a strong belief within AMS Institute that solutions created by diverse stakeholders are more robust and will be adopted more effectively in the long run—resulting in long-term impact and truly transformed living environments. Ultimately, societal impact follows implementation. Following the Technology Readiness Levels (TRL) model, AMS Institute is now explicitly extending innovation activities from Proof-of-concept and Validation of prototypes (Levels 3-6) to Demonstration of system prototypes in operational environments (Level 7). Public and private partners take over urban solutions and scale them further at this level. In some cases, entrepreneurial students or researchers take over solutions, creating startup companies or bringing the knowledge and results with them as they move to new positions and implement the know-how there.



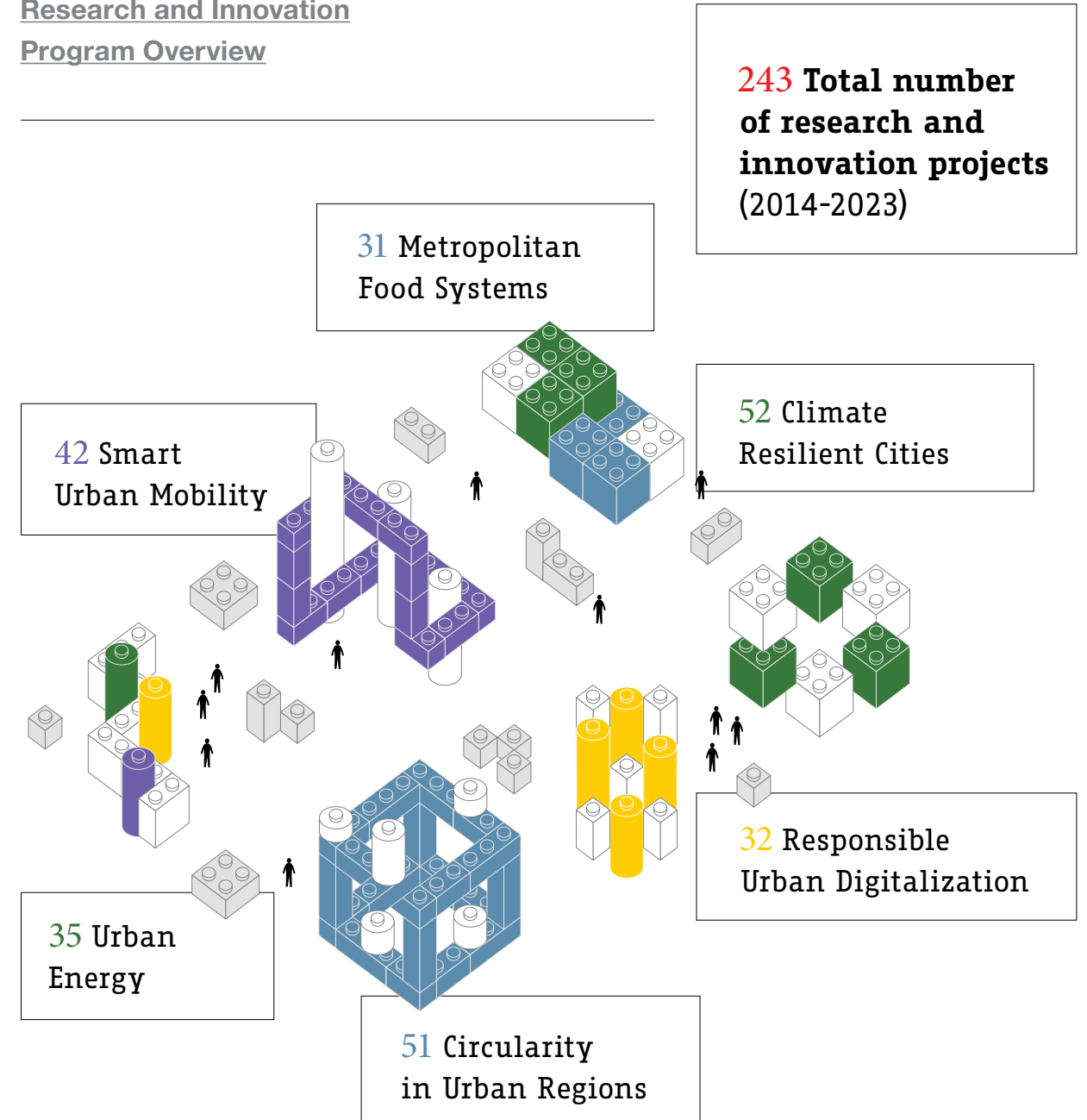
**Rooted in scientific rigor**

Scientific research is crucial to developing sound and legitimate solutions for today's and tomorrow's cities. AMS Institute flexibly brings together leading scientists from the core academic partners TU Delft, WUR, and MIT to challenge Amsterdam's urban problems.

Not only does the city benefit, but in return for delivering scientifically sound solutions and innovations, the scientists also gain access to new insights and data rooted in the city. Real urban data leads to real validation of theories and concepts that drive scientific progress — this reciprocity is key.

The rapidly advancing ability to collect and analyze vast amounts of data about cities has spurred worldwide urban science institutes to develop new, scalable research and innovation frameworks. With its distinct positioning, AMS Institute is part of a global movement of mission-driven urban innovation institutes from around. We've mapped a selection of these on page 52-53.

**Research and Innovation  
Program Overview**





spotlight

## ROBOAT

With 165 canals meandering alongside busy city streets, about a quarter of Amsterdam's surface area is water. The Roboat project introduced the world to a revolutionary concept in mobility: autonomous and self-navigating boats for the urban environment. An idea born to take the pressure off Amsterdam's busy inner-city roads and to revitalize Amsterdam's canals with new functions and possibilities.

Roboat isn't just about automating boats; it's about reimagining water-based mobility and transportation. Its potential applications are vast: autonomous urban ferry services, waste collection in busy inner cities, assisting with quay wall and bridge renovations, for example. After six years of MIT and AMS Institute research, the technology was transferred to the spin-off company RoboatTech in 2023. They will launch the first commercial products for autonomous urban ferries soon.

YEAR

2015-2021

PROJECT PARTNERS

MIT, AMS Institute

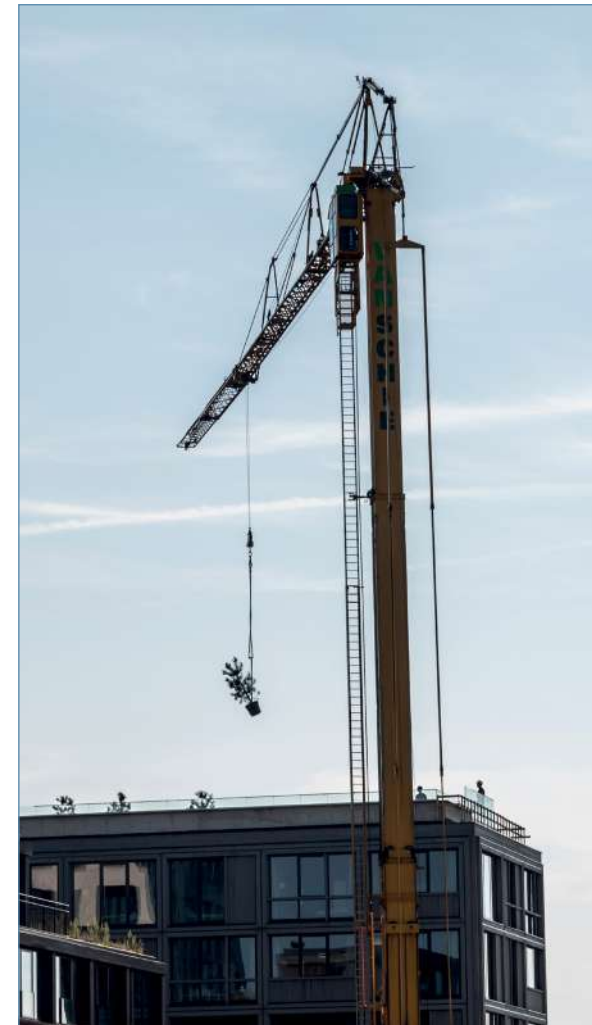
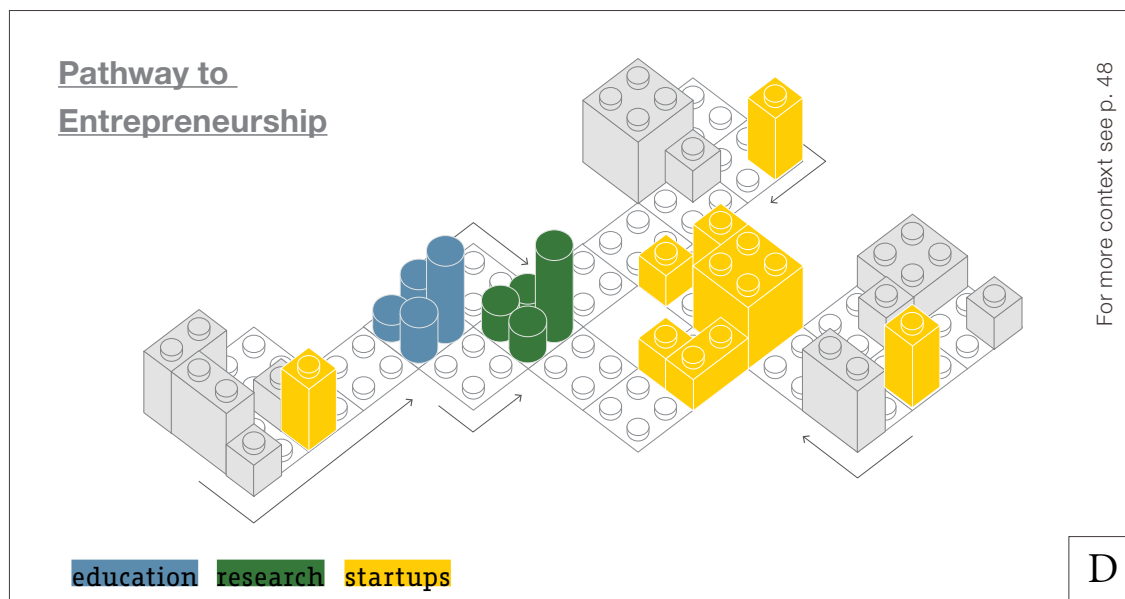
AMS PROGRAM

Smart Urban Mobility



# The Entrepreneurial State of Mind

Societal impact at scale requires break-through solutions to spread across many different cities around the world. An entrepreneurial mindset is fundamental: first, to dare to think differently, to explore different ideas and concepts, to go off the beaten path. And second, to dare to do things differently, to go beyond the usual research report, and to make change happen.



## building block 06

The bid book was explicit in 2011: ‘Metropolitan solutions are public-private opportunities.’ All over the world, cities are looking for solutions to preserve and improve urban living and working conditions. Their challenge represents an opportunity for public and private parties to be innovative and entrepreneurial enough to develop and deliver such solutions.

Today, AMS Institute has 95 affiliated startups, showing significant progress in the past years. With Roboat (page 36-37) going from an exciting research and innovation project to a spin-off within five years, AMS Institute has proven its pathway to entrepreneurship approach. The Startup Booster program is a successful pre-incubator program for MSc MADE students, as well as early-stage urban tech startups in the city. This shows that the pathway to innovation is no longer strictly linear: from the ‘inside-out,’ but increasingly also from the ‘outside-in’. See figure [D]. Startups can even join research projects to strengthen their own capabilities and validate solutions.

An original goal was to globally market metropolitan solutions ‘Made in Amsterdam’ — thereby creating economic value for the Amsterdam Metropolitan Region. This can still be further promoted, and commercialization will take time. New large-scale research and innovation initiatives using the National Growth Fund, such as the Future Proof Living Environment program, show an entrepreneurial approach to raising capital, while paving the way for partners who can turn practical solutions into spin-offs.

This entrepreneurial mindset is about taking risks and being allowed to fail. It’s about challenging the status quo. AMS Institute deliberately goes against established structures because that’s how innovation thrives. And fundamentally, the institution would otherwise not add value compared to what is already offered in Amsterdam’s rich ecosystem of knowledge institutions. More than a pillar in the institution, entrepreneurship is an attitude.



spotlight

## Local Inclusive Future Energy (LIFE)

How can local electricity best be generated, stored, and distributed as electricity consumption increases? A Living Lab test location for an innovative neighborhood energy platform will be built in Amsterdam Southeast in the ArenAPoort area, making the most of the deep local ecosystem that Energie Lab Zuidooost has cultivated. Coined the 'LIFE City platform' (Local Inclusive Future Energy City), it will help to smartly manage the electricity grid – local exchange, distribution, and storage of local energy.



YEAR

2021 >

PROJECT PARTNERS

TU Delft, City of Amsterdam, Alliander, Spectral, Johan Cruijff Arena

AMS PROGRAM

Urban Energy





# Learning by Doing

building  
block — 07

Is how we arrive at solutions, now and in the future, as important as the solutions themselves? Learning by doing in institutes like AMS unravels processes, powers, and principles through which partners can achieve their own innovation and capacity building. Through learning by doing, partnerships emerge as purposeful stimulators of new ideas from the ground up.

## A Living Lab way of working

The complexity of urban environments lies in the constant overlap and occasional collision of ecological, spatial, technical, and social domains. Such complexity can only be truly understood and harnessed via real-world research that involves all stakeholders. Collaborative innovation, particularly within Living Labs, is essential to achieving metropolitan solutions with tangible impact that all stakeholders readily adopt.

Although seen as a global trend in research methodology, Amsterdam arguably offers the ideal scale to function as a Living Lab. It is a small global city, sufficiently exposed to contemporary urban challenges yet intimate enough to address them effectively. While there is a large body of literature on how Living Labs work and their different variations, it's not the aim of this Playbook to delve into those details. However, it's important to emphasize that the Living Lab methodology is at the heart of AMS Institute's identity as a way of working and providing practical insights into translating excellent research into real-world, context-rich settings. It is also at the heart of how AMS Institute continues to develop as an unconventional solution-oriented partnership.



AMS Institute aims to be a 'critical friend' to the city of Amsterdam, able to reflect constructively and critically on processes and projects. A role that the city could not fulfil on its own and wouldn't readily seek from a consultancy.

### Institute building

AMS Institute embodies an experimental endeavor, bringing together education, basic research, the application of research results, and the creation of innovative societal solutions and commercially viable spin-offs under one roof. Driven by a clear mission-driven approach, AMS Institute not only takes on the city's challenges, but also challenges the city itself.

Since its launch in 2014, AMS Institute has evolved into an adaptive and learning ecosystem, providing all partners with a safe space to discover, learn, develop, apply, and improve — within and alongside the city. This naturally involves an element of 'building the plane as you fly it,' not unprepared, but with the understanding that the constellation of three core academic partners, the city as a partner and the city as a testbed, is highly dynamic. This changing context guides everything that happens within AMS Institute. It demands an exceptionally high degree of responsiveness in absorbing change, learning from it, and translating it into new strategies for the Institute. We have captured some of these changes on page 48-49.

A crucial point is that different urban challenges vary significantly in terms of complexity: stakeholders involved, stage of existing solutions, whether there are already high sunk costs in existing infrastructure or long-term investments, and so on. This means that there is usually no general approach to addressing these challenges. As a result, research institutes such as AMS Institute need to be adaptive and flexible, constantly balancing the nature of the challenge and the current state of knowledge.

### Innovation & capacity building within the city

An interesting by-product is the way in which AMS Institute acts as a catalyst for innovation and capacity building within the city government. While the design competition and the winning proposal focused primarily on enhancing the academic ecosystem, building the regional economy and accumulating knowledge, there was little discussion of how this could also provide innovative and unexpected impetus for the way the city government operates.



Fundamental to this is the concept of science as a safe space. AMS Institute aims to be a 'critical friend' to Amsterdam, able to reflect constructively and critically on processes and projects — a role the city could not fulfill on its own and wouldn't readily seek from a consultancy.

This unexpectedly early and robust response underlines the reliance of cash-strapped and risk-averse governments worldwide on the consulting industry. It calls for investment, mission focus, and the collective intelligence of all partners to rebuild governments that are fit for purpose. Novel knowledge ecosystems like AMS Institute are meaningful building blocks in this endeavor.



spotlight

## Crowd sensing at SAIL

Monitoring crowds at large events has traditionally relied on manpower or video surveillance. However, advances in measurement technology are enabling new forms of crowd monitoring. For SAIL 2015, which attracted more than 2.3 million visitors over five days, TU Delft researchers at AMS Institute developed a specialized system that was tested during the event.

The Crowd Monitoring Dashboard integrates various sensors and real-time data collection techniques, including Wi-Fi and Bluetooth sensors, and social media analysis. It provides insights into crowd density, movement patterns and potential bottlenecks – all aimed at improving safety and enhancing the event experience. This early demonstrator project has evolved into multiple Living-Lab-driven research projects, including the flagship EIT Urban Mobility project CityFlows.

YEAR

2015

PROJECT PARTNERS

TU Delft, City of Amsterdam, AMS Institute

AMS PROGRAM

Smart Urban Mobility





# Five big changes, in 10 years of institute building

**A**

**Partnership model**  
From a closed consortium of public-private partners around pre-defined research topics, to a much more fluid ecology of collaborators clustered around a close partnership between AMS Institute (with its three core academic partners) and the City of Amsterdam.

core academic partners  
City of Amsterdam

BEFORE → AFTER

**B**

**Program Development**  
From two program developers within a pre-defined, top-down Research & Innovation program to twelve program developers in a more dynamic construct of bespoke projects. Also, greater involvement of Research Fellows, as opposed to a pure focus on Principal Investigators.

program developers

BEFORE → AFTER

**C**

**Data Platform**  
From a comprehensive, program-wide data platform with a city dashboard to decentralized data sharing initiatives around individual research and innovation projects.

data platform

BEFORE → AFTER

**D**

**Pathway to Entrepreneurship**  
From a more linear, 'inside-out' approach to entrepreneurship based on education and research, to an 'outside-in' approach where the Startup Booster program includes many local startups working with the AMS incubator.

education  
research  
startups

BEFORE → AFTER

**E**

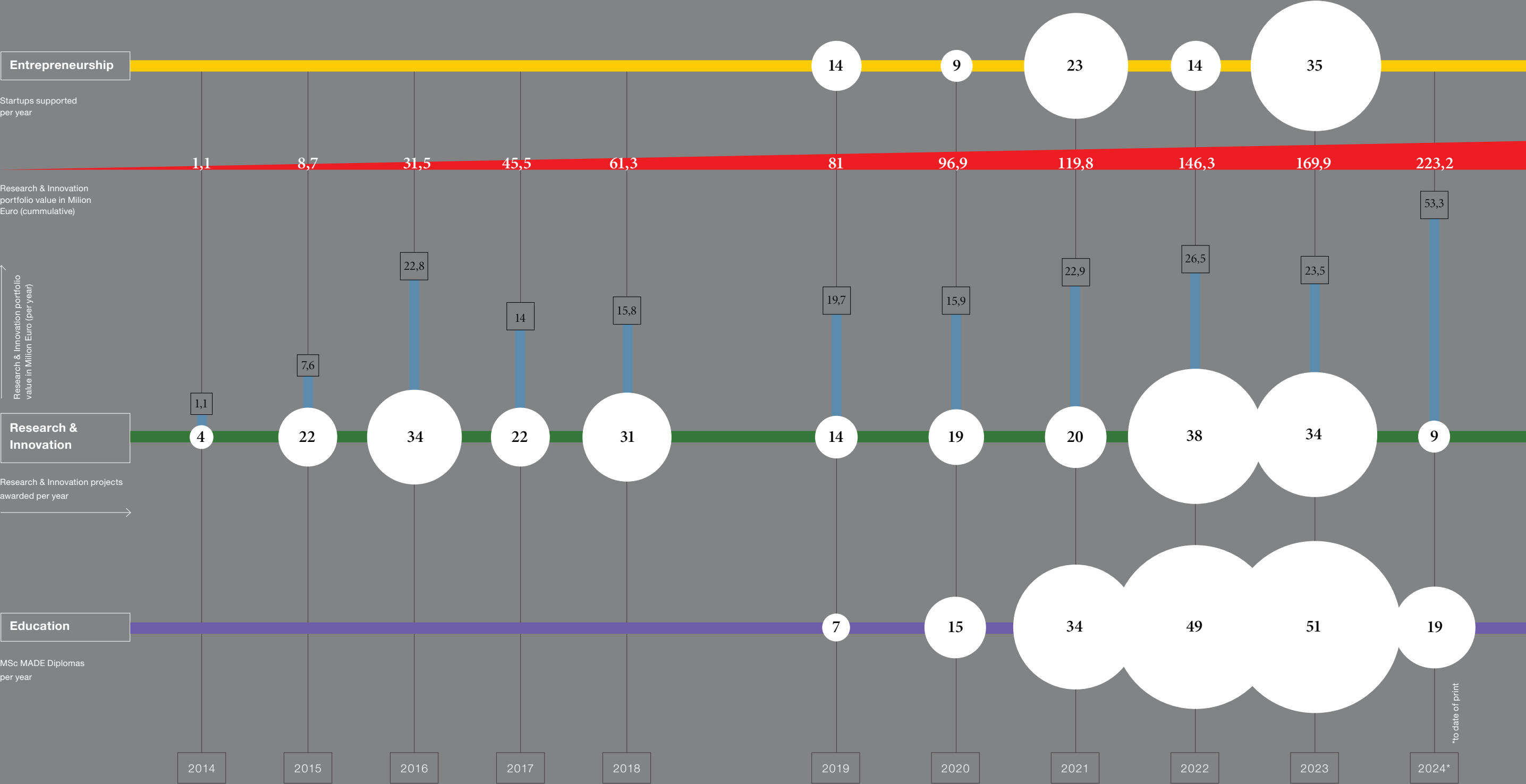
**The Multiplier**  
From a funding model that applied a rather strict multiplier to the funding of AMS Institute — matching €1 from the city with €4 from the market — to a model that values societal impact and recognizes that as the cornerstone of the partnership with the City of Amsterdam.

input  
impact

BEFORE → AFTER

# AMS Institute Evolution

2014 — 2024



\*to date of print

# The International Perspective

As part of the AMS Institute's eight-year review in 2022, we studied 38 emerging mission-driven public-private partnerships, selecting ten that best fit the AMS Institute profile.

In-depth interviews were conducted with four of them: Center for Urban Science + Progress (CUSP) at New York University, Urban Tech Hub at Cornell Tech, Future Cities Lab at the National University of Singapore & ETH Zurich, and LSE Cities at the London School of Economics. Founded in 1999, LSE is the oldest, while Urban Tech Hub, founded in 2019, is the newest kid on the block.





Collectively, this benchmark highlighted some underlying truths in the broad movement of urban innovation institutes. Here are a few of our key takeaways:

- Graduate education programs address similar urban challenges, but often through a discipline-specific lens typically rooted in the parent institution. AMS Institute has the most independent learning environment.
- Institutes vary in the depth of their professional development programs, with LSE Cities being particularly comprehensive and recognized. There is potential here for AMS Institute to grow.
- Research themes range from sharply defined areas to broad, overarching questions across multiple institutes. The AMS Institute Research & Innovation program is uniquely challenge-driven and shaped by a close and interactive partnership with City of Amsterdam.
- While many institutes promote entrepreneurship, dedicated (pre-) incubation programs for upcoming entrepreneurs, such as at AMS Institute and the Urban Tech Hub, are rare.
- AMS Institute has uniquely cultivated its own ecosystem, anchored in its urban context and informed by the founding universities' profiles, but quite distinct in its location, supporting infrastructure, and organizational identity and reputation.
- The extent to which institutions engage with government agencies varies. While some level of involvement is common across the board, no institution has gone as far as AMS Institute in continuously co-creating the research agenda at a strategic and structural level.

## Forward together

As we look back on our 10-year journey and learn from inspiring examples from around the world, we are proud of our Research & Innovation program's evolution, educational ecosystem, and pathway to entrepreneurship programs. However, we also learn that our close partnership with the City of Amsterdam sets us apart and drives us to fulfill our mission of societal impact.

We hope this Playbook will be a useful resource for anyone interested in building urban innovation ecosystems. From city leaders to educators, researchers, and policymakers, we hope the learnings can help address today's major urban challenges, nurture talent as the foundation for sustainable economic development, and promote new mechanisms for innovation and capacity building with and within our governments.

Our exploration of metropolitan innovation institutes around the world reveals a tapestry of approaches to urban challenges. New institutions can take many forms and functions when working on scalable urban solutions. Now armed with the seven building blocks distilled from 10 years of institute building at AMS Institute, it's up to you to seize the moment and start applying them in your culture, community, and city.

The urgency is profound, but so is the potential for transformative impact. Together, let's drive urban innovation guided by scientific rigor and an unwavering commitment to societal well-being. With collective determination, we can shape sustainable, resilient, and inclusive cities.



# Colophon

## COLLABORATION

AMS Institute collaborated with Blossity to analyze the lessons learned from a decade of collaborative Institute building. These lessons were distilled into this pragmatic playbook, tailored for those interested in understanding the building blocks used by innovation institutes focused on driving societal impact in today's cities.

Authored by—

Jorick Beijer<sup>Blossity</sup> and AMS Institute

Graphic Design—

Christian Pappalardo<sup>Blossity</sup>

Photography—

Stadsarchief Amsterdam, Alex Schroder, Julia Gunther, Maarten Nauw, Tom Feenstra.

## ACKNOWLEDGEMENTS

This was a collaborative effort that brought together a wide range of insights. Thank you to everyone who gave their time and guidance to make this playbook a reality.

## CALL TO ACTION

If you are interested in applying these building blocks in your city and community, please be inspired by this Playbook and contact us at [playbook@ams-institute.org](mailto:playbook@ams-institute.org) if you want to learn even more about the AMS Institute approach.

Let's work together to build an ever-growing network of initiatives where academic excellence and societal impact merge to create scalable urban solutions for a sustainable, resilient, and inclusive cities around the world.



**AMSTERDAM INSTITUTE FOR  
ADVANCED METROPOLITAN SOLUTIONS**