



HACKCITY | URBAN DESIGN CHALLENGE  
**100 MOVING PIXELS**

**COMPETITION BRIEF**  
Co-build a self-organizing sustainable city  
with 100 modular Moving Spaces

## PREFACE

To city-hackers,

Congratulations on your successful selection to participate in Hackcity Urban Design Challenge. Welcome aboard!

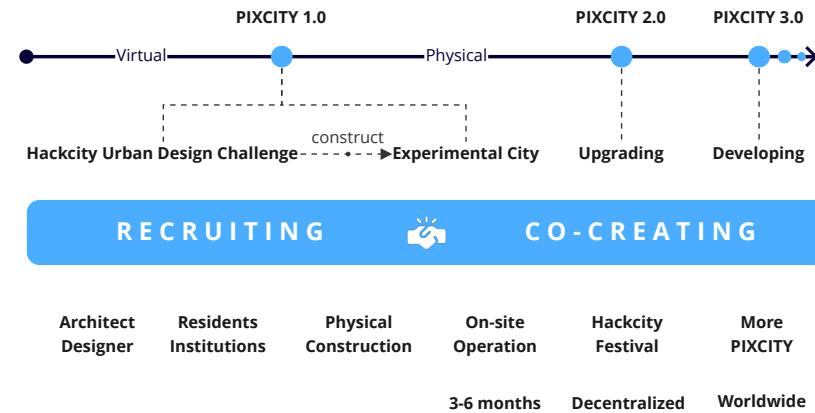
Before you officially start your trip in Hackcity with us, you may find the following information useful:

PIXCITY DAO is an independent decentralized organization that exists to land, run, and support the "Future City" innovation, as well as to inspire every member to explore and design their own future based intuitive activities.

PIXCITY is a prototype proposed by PIXCITY DAO to encourage the exploration, design, and construction of the future city. It is an experimental project that merges new technologies and artistic design, which will be completed both online and offline.

Hackcity will be an ongoing series of decentralized urban design challenge focusing on finishing the design of PIXCITY, a future smart city based on autonomous Moving Spaces.

### PIXCITY DAO MASTERPLAN



Simply speaking, PIXCITY DAO launched the on-and-off-line Hackcity Urban Design Challenge to create the future PIXCITY.

More specifically, PIXCITY is a co-created, self-organizing, and sustainable city which is designed to address issues arising in modern cities. It is co-built by world citizens and digital nomads who are engaged in the city's construction and rule-making processes. Residents of PIXCITY will use modern technology to explore new strategies for better public life, including urban living space and privacy protection, as well as sustainable development. The community will produce a diverse range of musical, artistic, and cultural activities as a result of the multidisciplinary exchanges and co-creation of its inhabitants, where everyone will be a producer, organizer, and participant.

Outstanding solutions in Hackcity will eventually be implemented as an actual project, which may be a short-term event or perhaps turn into a long-term community. The PIXCITY operation will benefit all Hackcity participants. The shape of the city will evolve and improve as a consequence of a series of Challenges, as well as actual city construction and operation.

Every sitting member of PIXCITY DAO is required to vote and pay "chips" before making decisions, resulting in due deliberation. To ensure the project is open, transparent, traceable, efficient, and fair, all rules and transactions will be recorded on the blockchain.

City-hackers in Hackcity Urban Design Challenge, will receive the Genesis POAP (Proof of Attendance Protocol) from PIXCITY DAO, which will provide them with higher-level access and privileges to future PIXCITY DAO communities and projects in addition to its function as a token of PIXCITY Genesis member. They will be invited to help shape DAO's future by attending community meetings and voting. They will also be invited to play an essential part in the development of key IP and making benefits for PIXCITY DAO.



PIXCITY DAO Genesis POAP

Looking forward to see you soon in Hackcity!

Best,

PIXCITY DAO

## CONTENTS

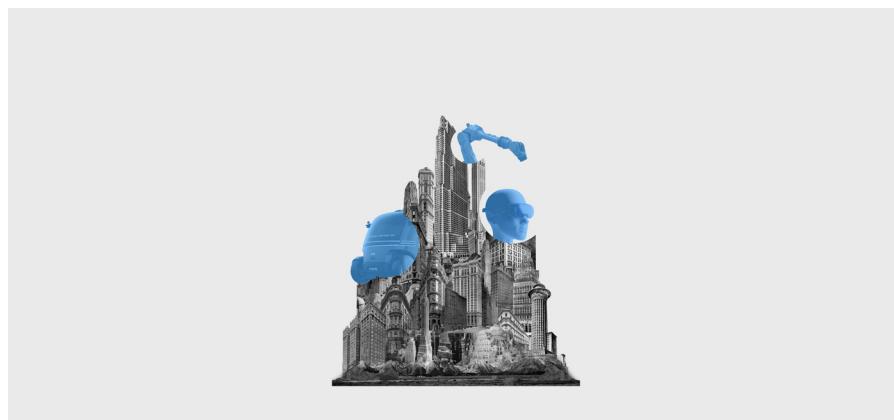
5	INTRODUCTION	15	PARTICIPANTS
7	REQUIREMENT		TEAM-UP GUIDE
8	THE COMPETITION SITE		WHAT PIX OFFERS?
9	PRIZES	16	MOVING SPACE
10	SUBMISSION REQUIREMENTS	19	PRECEDENTS
11	SUBMISSION CONTENT	21	F.A.Q.
	RECOMMENDED PRESENTATION	22	PIXCITY DAO FOUNDER & PARTNERS
12	GUEST & JURY		
13	COMPETITION SCHEDULE		
14	THE OPENING CEREMONY (KICKOFF)		

# INTRODUCTION

Modern cities are now plagued by traffic congestion, over-centralization, unaffordable housing, and privacy disclosure due to the general uneven distribution of resources. It is difficult for promising new technologies like autonomous driving, robotics, blockchain, vertical farming, AI, 3D printing, VR, flying cars etc. to be employed effectively and extensively in cities. Under the influence of Le Corbusier's Charte d'Athènes, **cities and towns were patternized in an excessive pursuit of high productivity, resulting in a degraded quality of people's lives.**

According to Wiener's *Cybernetics*, **a city's complex changing orders necessitate a dynamic loop of "feedback-adjustments" to preserve its inner balance.**

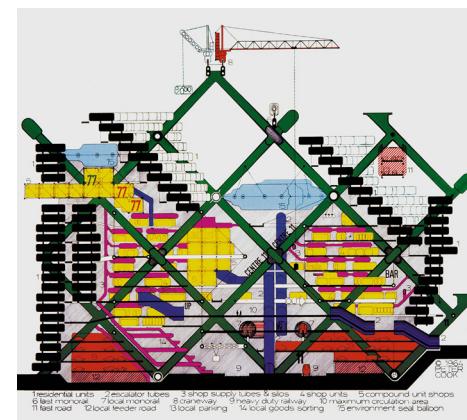
Over the last 2000 years, urban evolution has been centered on "human-space interaction". The residents' needs for modern living change constantly while it took the city decades to complete the loop. The current urban system is gradually collapsing because the cities today are capable of perceiving changes yet reluctant to react.



Early in 1964, Archigram, an avant-garde architectural group founded at Architectural Association School of Architecture, proposed a visionary, but contentious solution called "Plug-in City".

**Space was standardized in this hypothetical city as "capsules", and plugged into megastructures. A massive crane lifts these "capsules" one by one to insert into the city, which, like electronic units, may be plugged in and out, and function at any time.**

Citizens will be able to grow their own dwellings in order to meet changing personal demands. Due to technical limitations and practical concerns, unfortunately, such an edging design was not able to be finished.



Plug-in City (Archigram, 1964)

Hopefully, with autonomous chassis and other new technologies available today, the “crane” and “capsules” will be replaced with modular Moving Spaces – Robobus. **This led to the introduction of PIXCITY as a sustainable superorganism and a self-organized prototype running based on Moving Space.**

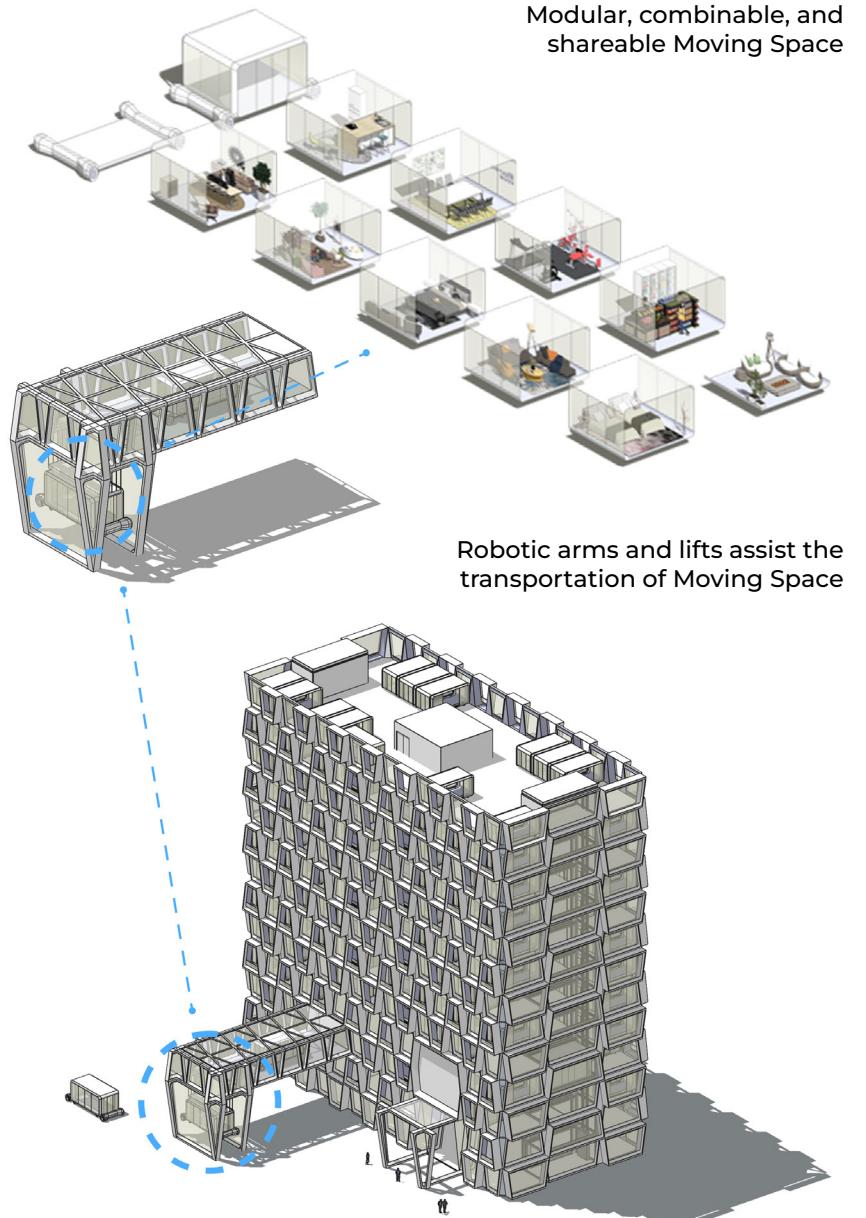
PIXCITY represents skepticism regarding static cities. As a result, Cybernetics is used to the city and community construction of PIXCITY. It will be a sustainable superorganism capable of reacting and adjusting to demand variations based on mobile, configurable, and sharable Moving Spaces.

The modular Moving Spaces will be a part of everyday life in PIXCITY. **The Residents will have the flexibility and choice to design their home, allowing them to customize rooms and easily replace them when required.** The variety and growability of spaces also shared in PIXCITY. Similar with Uber Eats, citizens can order the additional ‘Moving Spaces’ in the app, such as "gym", "karaoke", and "kitchen" to expand their living space. Life expenses will be greatly reduced, and a sustainable city development paradigm will emerge.



Moving Space

PIXCITY (PIXCITY DAO, 2022)



# REQUIREMENT

The Hackcity Urban Design Challenge "100 Moving Pixels," aims to inspire "city-hackers" (participants) to "plug" the 100 PIX modular Moving Spaces into cities, as Archigram was expected to do, designing and planning a 3-6 months self-responsive trial urban community - PIXCITY.

On the one hand, entries must thoroughly consider **how to connect and assemble the Moving Spaces, as well as conceive a 3-6 months clear real-life dynamic scenario for digital nomads in PIXCITY.**

PIXCITY is people-oriented. The content of the city will be co-created by citizens, and each citizens can organize and participate community events in Moving Spaces. By setting "co-build" as the core and emphasizing civic engagement, please hypothesize the composition of the urban functional zones and potential business models.

Entries, on the other hand, must focus on two areas: modular Moving Space and new technologies, with emphasis on 5 dimensions: shareable, responsive, configurable, connectable, and achievable. The work should be innovative as well as practical, incorporating cutting-edge technologies, and referring to the parameters of the physical Moving Space Robobus to meet feasibility criteria.

**The chassis and cabin are inseparable as a whole Moving Space in the competition. Thus , please consider the Moving Space in its whole and integrate it into the design.**

We encourage city-hackers to innovate from the following, but not limited to, three perspectives:

## **1. To create various real-life scenarios of Moving Space used in the smart urban community that last 3-6 months.**

The modular Moving Spaces will transform the way people acquire space. Entries can include designs for how citizens call for Moving Spaces, the assembly mode of Moving Spaces in architecture structures, the connection method between Moving Spaces, and even scenarios of urban service robots, the Citybot (self-driving cleaning vehicles, delivery vehicles, and mobile charging vehicles), operating in PIXCITY.

## **2. To address the issues afflicting modern cities.**

Offer solutions utilizing 100 Moving Spaces in order to challenge the rigid city paradigm. Apply new technologies, including but not limited to autonomous driving, assembled architecture, blockchain, Web3.0, Metaverse, Internet of Things, VR, 3D printing, and AI, in combination with Moving Spaces in the community to address issues like traffic congestion and over-centralization etc.

## **3. To plan a "15-minute" community ecosystem**

Hackcity encourage city-hackers to plan a smart urban community within a 15-minute Moving Space driving distances (rather than a single tower with 100 units). 100 modular Moving Spaces should be dynamically configured in the 15-minute community ecosystem according to different functional clusters, including office, residential, commercial and public spaces. Citizens will inhabit in this evolving smart city organically with various clusters.

# THE COMPETITION SITE

City-hackers are required to choose one of the six sites list below.

Taking into account the local urban context, climate, culture, geography, etc., city-hackers can set the hypothetical site into the provided cities.



Rio de Janeiro, Brazil.

Please consider the combination with old city, thereby enhancing the local community and way of life.



Black Rock City, United States.

A completely uninhabited area where a new PIXCITY is being constructed and activities are taking place.



The Line City, Saudi Arabia.

The PIXCITY here could integrate with the Line's existing design.



Shanghai KIC, China.

The PIXCITY here should combine with the business district's existing structures and buildings



Lagos, Nigeria.

The PIXCITY should combine with its existing urban form



The moon.

The design should consider the lunar environment, gravity, etc. when designing a space PIXCITY on the moon.

# PRIZES



## "THE FUTURE CITY AWARD | VILLE FUTUR"

*The design outcome meets the criteria of being shareable, configurable, connectable and achievable, and has the potential to be landed in a way that effectively making the urban space autonomously mobile, responding to the demands of citizens, and maximizing the quality of life of future residents*

1st Prize

**15,000\$**

**Project Landing Opportunities**  
Trophy, Exhibition and Forum Promotion, NFT Collaboration,  
PIXCITY Urban CHO Medal of Honor, CG Animation Promotion

2nd Prize

**7,000\$**

**Project Landing Opportunities**  
Trophy, Exhibition and Forum Promotion, NFT Collaboration

3rd Prize

**5,000\$**

**Project Landing Opportunities**  
Trophy, Exhibition and Forum Promotion, NFT Collaboration

*During the construction phase, the design fee will be increased according to the construction content*

## "THE GENESIS CITY AWARD | VILLE GENESIS"

*Most Popular Award.*

*The design outcome is innovative and construct urban aesthetics. It boldly proposes a future smart city scenario that uses new technology to change the quality of human life, and is highly loved by the public.*

**5,000\$**

Trophy, Exhibition and Forum Promotion, NFT Collaboration

## "THE RADIANT CITY AWARD | VILLE RADIEUSE"

*Most Humanistic Valued Award.*

*The design outcome practically take into account specific application scenarios through the application of new technologies and provide future life plans for special groups.*

**5,000\$**

Trophy, Exhibition and Forum Promotion, NFT Collaboration

# SUBMISSION REQUIREMENTS

## Description Board

City-hackers are quired to present the scheme as a whole on **A2 landscape-orientated presentation board (up to 3 boards)**, 300DPI, marked readable (margin 10mm), including:

- description text: less than 1200 words
- design description drawings (sketches, plans, sections, elevations, diagrams), and renders
- Registration number: located in the upper right corner of the drawing, font Arial, font size 20



1 - 3 panels

## The Presentation File (Optional):

City-hackers may submit the following (not limited to) documents according to their needs:

- description animation: MP4 format, 1080p, within 1 to 5 minutes, less than 50mb
- GIF file
- model file (FBX/OBJ/3DM/SKP format)

- Please name the files as concisely as possible and name the files according to the format of "Application No.-Program Name".
- Language of submission: Chinese and English, or English only.
- Cover: The cover must be uploaded as the main visual of the work
- Size limit: 100 MB
- All winning entries will be required to submit source files for curatorial promotion purposes.

## Preliminary Review (Optional):

City-hackers are welcome to submit their competition presentation draft panel/s before submitting it/them as a final competition entry for a preliminary review, and book a open tutorial with jury members. Jury members can review your presentation and give your valuable feedback.

Along with the Participant Agreement, the completed design should be uploaded to a cloud drive. The link to the drive must be emailed to :  
[siyue.zhang@pixmoving.com](mailto:siyue.zhang@pixmoving.com).

# SUBMISSION CONTENT

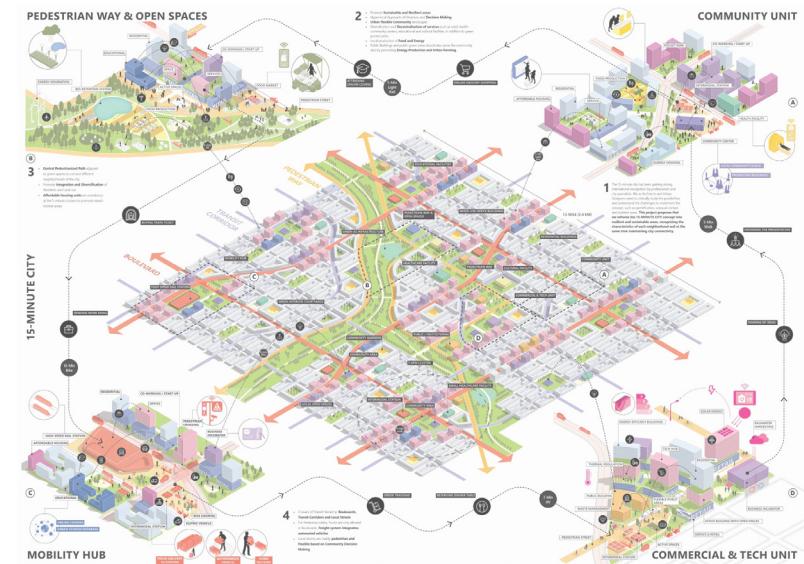
The final design result is expected to contain the following content:

- Smart urban community planning and design
- Architecture structure design
- Dynamic operation and civic service scenarios of Moving Space
- Assembly and connection of Moving Spaces

# RECOMMENDED PRESENTATION

The final design result is expected to contain the following content:

- Urban Plan
- Street elevations
- Sections
- Axonometrics (providing information on connection between Moving Spaces and architecture structures)
- Perspectives
- Diagrams
- Rendering
- Animation



*Recommended Presentation* listed above is a suggestion only. Participants can choose what would explain their design in the most efficient manner.

*1st prize in the "15-Minute City 2021" competition (GATE ARCHITECTS, 2021)*

## GUEST & JURY



**Maria  
Fedorchenko**

Urban Consultant  
Co-Director of Karta Architecture Ltd  
Diploma Unit Master of  
Architectural Association



**Ling  
Fan**

Founder and CEO of Tezign  
Director of  
Tongji University Design A.I. Lab



**Tiantian  
Lo**

Assistant Professor of  
The Hong Kong Polytechnic University  
School of Design



**Enea  
Colombo**

General Manager of  
Icona Design Group  
Leader of Icona Smart City Project



**Susan  
Du**

Head of  
Business Development  
at BIG



**Ivan  
Tallarico**

Founder and CEO of Hi-Interiors  
Ecosystem Builder of DesignTech



**Benjamin  
Chan**

Director of  
LWK + PARTNERS



**Tommaso  
Boralevi**

President of Federal Innovation @  
MIND  
CTO of LendLease



**BIAO  
Hu**

Director of Environmental Planning  
and Design Department Hunan  
University

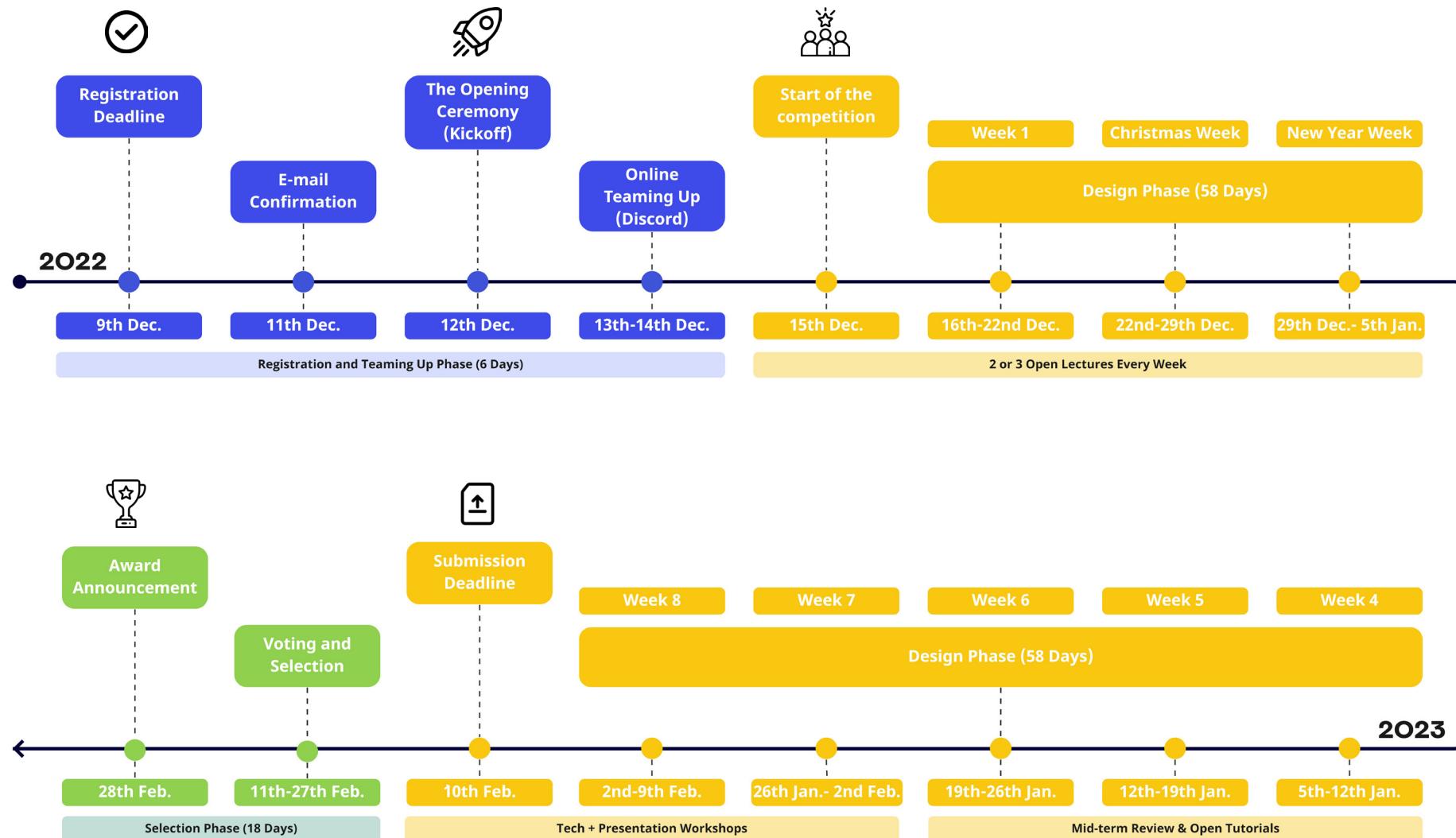


**Chuan  
Yu**

CEO of PIX Moving  
The skeptic of static cities

All jury members will also participate in open lecture during design phase and share their insightful urban expertise

# COMPETITION SCHEDULE



Hackcity Timeline

# THE OPENING CEREMONY (KICKOFF)

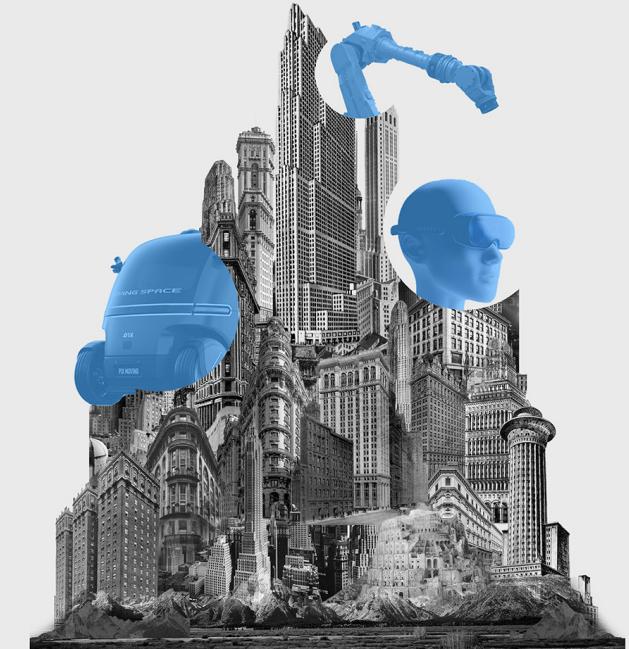
December 12th 2022  
CST 21:00 (CHINA)  
GMT 13:00 (UK)  
EST 8:00 (USA)



The opening ceremony will be held on Spatial (Online)  
Please scan the QR code to enter the virtual space

Event Record:

<https://www.youtube.com/watch?v=gU4hvJ9NXk0&t=10926s>



## URBAN DESIGN CHALLENGE **HACKCITY** 100 MOVING PIXELS OPENING CEREMONY

Event Kickoff  
PIXCITY Project Introduction  
Hackcity Competition Introduction  
Design Brief Announcement  
Q&A  
Open Discussion



**DECEMBER 12**  
CST 21:00 (CHINA) | GMT 13:00 (UK) | EST 8:00 (USA)

**Location: Spatial (Online)**



Scan to enter the Hackcity Kickoff Virtual Space

# PARTICIPANTS

Hackcity 1.0 is looking for innovative

- architects
- urban designers
- urban scientists
- institutions
- students and enthusiasts with related background

In the spirit of decentralization, all participants will be gathering in the PIXCITY DAO virtual prep-camp in Discord/Spatial before the event, getting to know and connect with each other before teaming up to enter the tournament.

 **Discord channel link:** <https://discord.gg/adqFyVKK>

# TEAM-UP GUIDE

1. It is not mandatory to team up, you can participate individually or directly as a team.
2. 2-4 people per team
3. Each person can only participate in one team
4. Please add your personal (team) profile on the Google sheet we have created after the opening ceremony, and then freely communicate and team up in Discord.
5. The deadline for team up is December 14.
6. After the teams are formed, please complete the team's name and team members on the Google sheet by 23:59 BST on December 14.

# WHAT PIX OFFERS?

- open-source technical information on Moving Spaces (specifications, performance, 3D models, features, videos)



- 100 physical autopilot Moving Spaces (urban construction hardware facilities)



- urban construction resources (planning, funding, sites, government liaison, media, business, landing, PR)

# MOVING SPACE

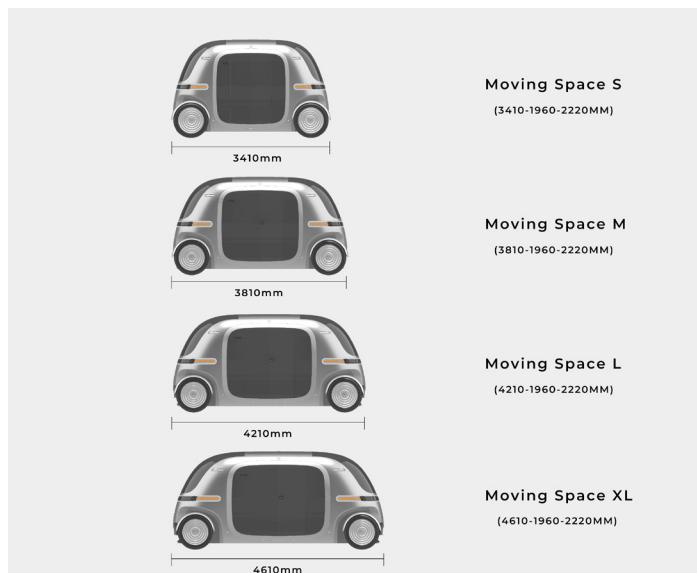
PIX Moving Space is the modular pixel block that will consist the PIXCITY. There are 4 different scales provided for city-hackers to choose.

The chassis and cabin are inseparable as a whole Moving Space in the competition. Thus , please consider the Moving Space in its whole and integrate it into the architectural structures.

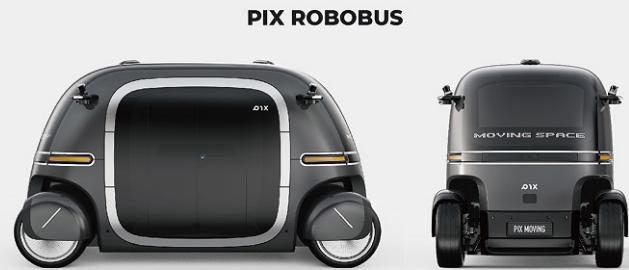
Detailed information about Moving Space please refer to the left list.

Moving Space Materials (Model + Handbook)

Download link: <https://www.dropbox.com/scl/fo/rn34se8g1fwwqgw2zt3tbg/h?dl=0&rlkey=lhw187wncsinjde1picp69fq6>



**PIX Moving Space**



**PIX ROBOBUS**

**PIX Ultra-Skateboard**



**Autonomous Driving Sensor Stack**



PIX	
Length/Width/Height	3810-1960-2220mm
Internal Height	1780mm
Seat Height	430mm
Floor Height	368mm
Minimum Turning Radius	450mm
Passengers	6 people
Maximum Payload	510kg
Area Covered	7.4m <sup>2</sup>
Range	70-100km
Maximum Gradeability	20%
Battery Capacity	21.5 kwh
Speed	15-30 km/h
Rated Power	4 X 3kw
Rated Torque	4 X 9.55N.m
Drive Motor	Permanent Magnet Motor
Fast Charge - Slow Charge	1.5 - 5h
Millimeter-wave Radar	2
32-Channel LiDAR	4
12mm Camera Set	1
6mm Camera Set	2
Wide-angle Camera Set	7
Fisheye Camera Set	4
Ultrasonic Radar	1
Switch	1
BRAV-7521/BDS002-E Industrial Computer	1
Computing Unit	1
Integrated Navigation System	1
4G Router	1
Power Adapter	1



Karaoke Box



Gaming Space



Make Up Room



Bedroom



Cafe



Fresh Food Shop



Study



Gym



Office

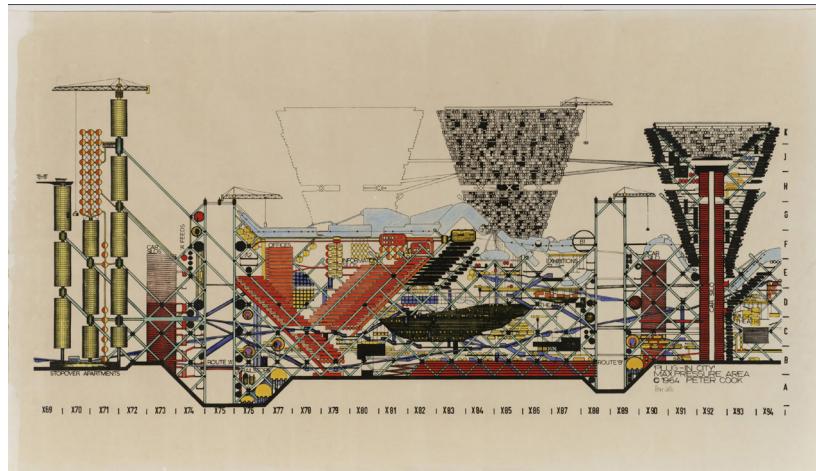
Various types of Moving Space



Different application scenarios of Moving Space in city

# PRECEDENTS

## Cases Sharing



## Plug-in City, Archigram

<https://www.dezeen.com/2020/05/12/archigram-plug-in-city-peter-cook-dennis-crompton-video-interview-vdf/>



## Nakagin Capsule Tower, Kisho Kurokawa

<https://www.archdaily.com/110745/ad-classics-nakagin-capsule-tower-kisho-kurokawa>



Free Time Node Trailer Cage, Archigram

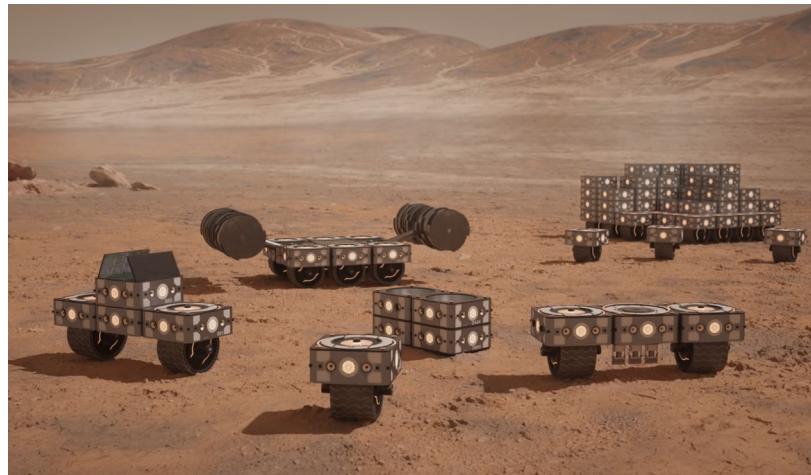


Woven City, BIG



Trojena (NEOM), Zaha Hadid Architects

<https://www.neom.com/en-us/regions/trojena>



NASA 3D Printed Habitat Challenge, Hassell

<https://www.youtube.com/watch?v=AIrH01N9AsE&t=206s>



Telosa, BIG

<https://cityoftelosa.com/>



BiodiverCity, BIG

<https://www.youtube.com/watch?v=2ZG2pHiBDm8>

# F.A.Q.

## Frequently asked question

### • Why Hackcity?

To create a better future habitat for humans through decentralized co-creation and the use of new technologies such as autonomous driving, blockchain, and 3D printing etc.

### • What is Hackcity?

Hackcity is an architectural competition to design the smart city of the future, as well as a platform to bring together the world's top city hackers. Designing cities based on PIX Moving Spaces will be a city hacker activity, and the top teams/individuals will receive bountiful prizes.

### • What is the difference between PIXCITY and Hackcity?

Hackcity is a series of design competitions to collect creative designs for PIXCITY, a future smart city with a fully functional community that will soon be deployed. Hackcity might be considered the process, and PIXCITY the end result.

### • Why design cities based on self-driving Moving Spaces?

Theoretically, cities are complex dynamic systems, according to Wiener's Cybernetics. They need to establish a "feedback-dynamic adjustment" cycle in order to maintain the balance of the system. Moving Spaces are flexible and responsive enough to react to residents' need in time. Practically, with Moving Spaces, dull "commuting hours" can be blurred and even eliminated with their personalized functions, allowing people live and play while moving through the cities.

### • Is it possible to register as an individual?

Yes. We warmly welcome individual participants as well as group/team registration. Individuals will also be able to freely partner up with others at the PIXCITY DAO Warm-up Camp.

### • Who are the organizers of Hackcity?

PIXCITY DAO. It is decentralized and independent self-organization initiated by PIX Moving. It will initiate, support, operate creative design events for PIXCITY.

### • Are there any guests?

Yes. There will be guests from the field of architecture and urban design sharing their expertise in the community during the design phase.

### • Who can participate Hackcity?

Hackcity welcomes architects, urban planners, urban designers, and institutions in the same sector. Practitioners, students, and enthusiasts of architecture and urban design are also welcome.

### • Is the winning design going to be put into construction?

PIXCITY DAO will pool resources to provide technical and financial support to the winning teams (or individuals) in order for the design to be implemented in real sites.

### • What is the construction schedule for the landing?

PIXCITY's construction program will formally start in the second and third quarters of 2023. Under the guidance of feasibility criteria, the site will be chosen in accordance with the preferences of the Hackcity winner.

### • What are the entry work's scoring criteria? Is an animated video required?

Animated videos will be served an extra credit option. Please see the event's upcoming brochure for specific scoring criteria.

### • Is the Moving Space mentioned in the article real? Is it required that I use it as a base module?

It is, indeed. The PIX Moving Space, also called Robobus, is a moving space built on a self-driving skateboard chassis designed and mass-produced by PIX.

Yes, it is certainly required. However, the Robobus parameters are provided for reference because we are currently in the concept design phase of the city. Let it inspire you, not constrain your brilliant ideas.

PIXCITY DAO FOUNDER

PIX

PIXCITY DAO GENESIS PARTNERS



AUTODESK

城市中国  
URBAN WISDOM ADVANCING WITH CHINA



Designtech®



lendlease

INNOSPACE



LWK  
+PARTNERS



MIXLAB  
无界社区

MixDAO

706青年空间

PolyU Design

NICE COMMUNE 好公社

DESIGN Harvests  
设计丰收

SEED 社会创新  
种子社区  
SEED FOR SOCIAL INNOVATION

T-LAB

特有想象力

TECHN(O)LOGY  
EDUCATI(O)N  
ART

X ACADEMY