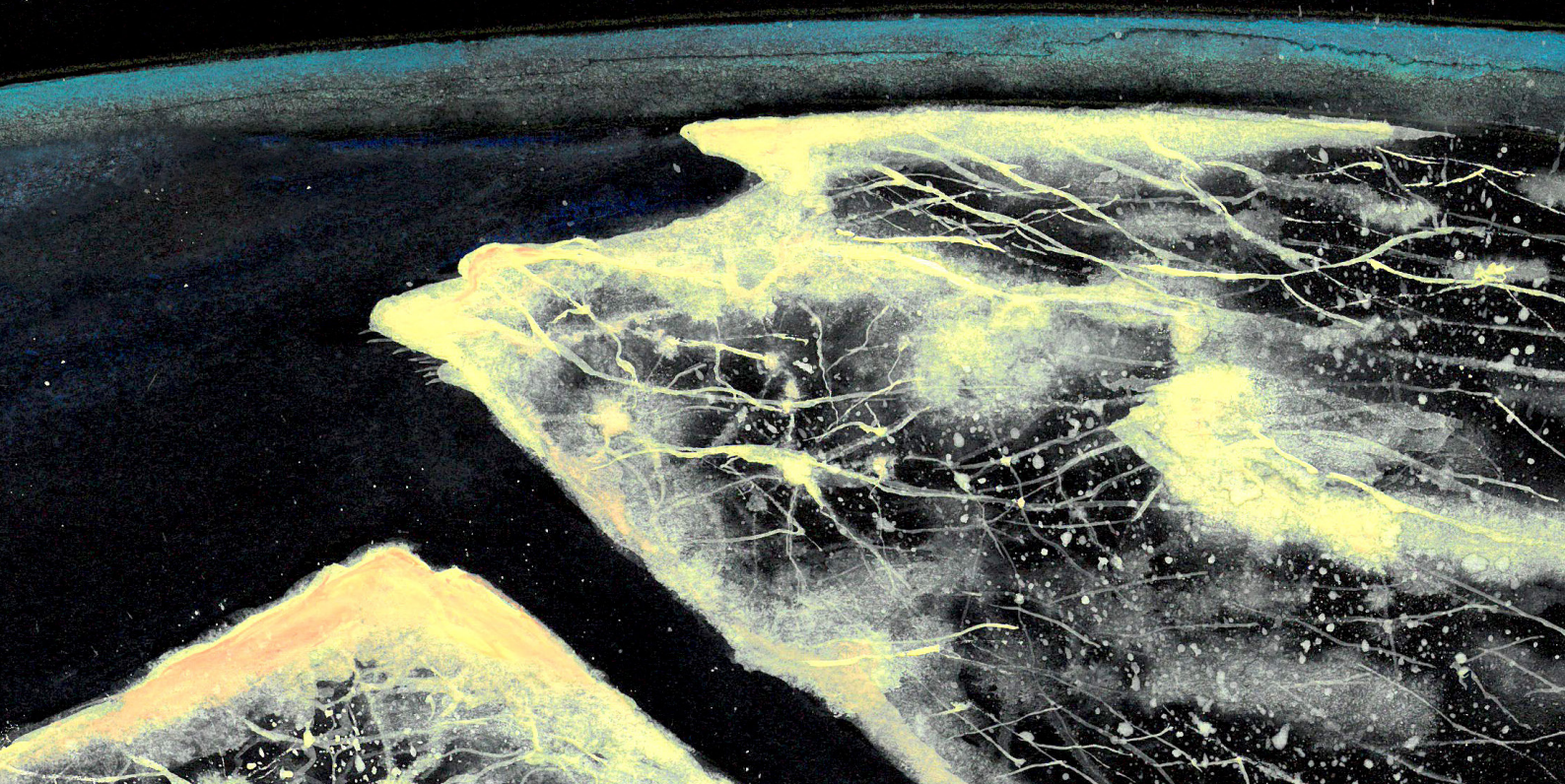


**SPACE STUDIES PROGRAM 2019**  
EXECUTIVE SUMMARY



SPACE FOR

# **Urban Planning**





## ACKNOWLEDGMENTS

The members of Team Project Urban Planning wish to express their sincere appreciation to  
Strasbourg Eurometropolis and Région Grand Est  
for sponsoring this project.

Special thanks to:

Project Chair: Graziella Caprarelli

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Image Credits:

Cover original artwork: Hervé Cadiou

Graphic Design: Aleksandra Kozawska, Bjoern Brockmann, Hervé Cadiou

Graphic support: Miracle Israel Nazarious, Nicolas German

Icon credits: thenounproject.com

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Thanks to the following scholars for their lectures and workshops:

Joe Pelton (The application of big data technology in smart cities)

Niklas Hedman (Space 2030 Agenda)

Katherine Nip (UNSCO NETEXPLO Smart Cities Forum)

Maik Netzband (Global Urban Dynamics research with geoinformation data and methods)

Henry Adeniyi Ibitolu (Workshop on Data Management for Urban Planning)

Su-yin Tan (Urban planning and space apps; Gaps in access to data)

Thanks to the following experts for their time:

Dumitru Dorin Prunariu (Vice Chair of the Space 2030 Agenda)

Gongling Sun (Professor of Space System Engineering in ISU )

Gray Scott (Futurist and Tech-Philosopher)

Khalil Mirz (Co-Funder of Saffrosystems, LLC)

Thanks to the questionnaire participants.

Electronic copies of the Executive Summary and Report can be downloaded from the ISU Library website at <http://isulibrary.isunet.edu/>

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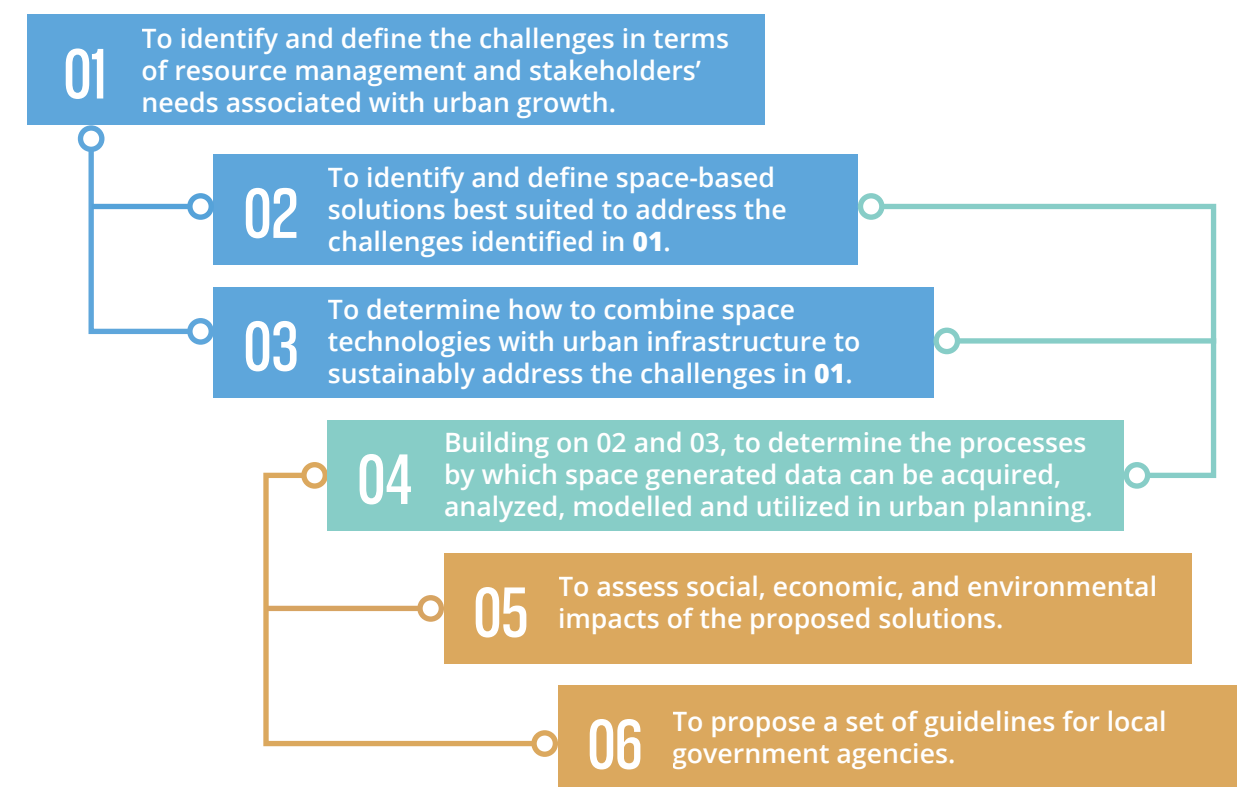
## VISION STATEMENT

An improved urban growth model that reassesses the traditional approach to urban planning to reflect sustainable development goals through a better resource management.

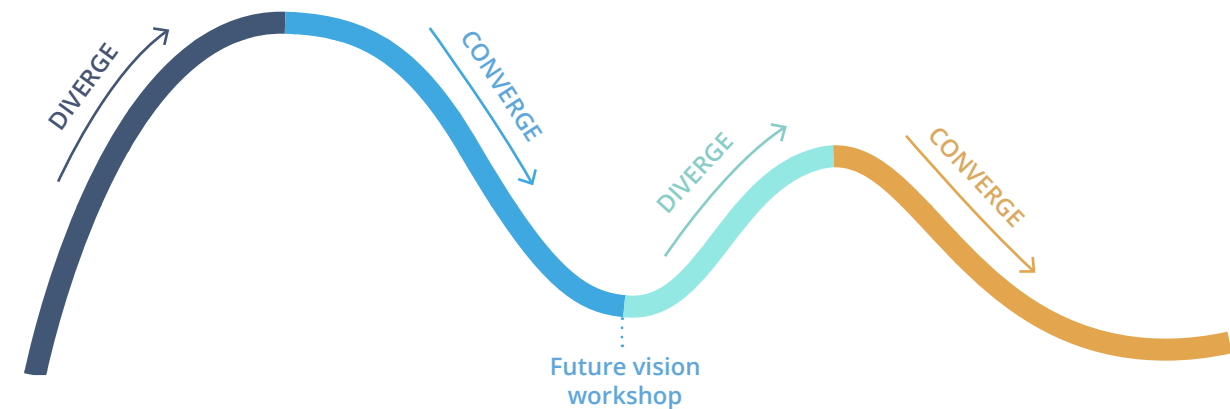
## MISSION STATEMENT

Investigating the impact of space technology and applications on urban planning to achieve a more sustainable future for global society.

## OBJECTIVES



# PROJECT METHODOLOGY



## Discover

Identify the challenges, and explore the context and available research relevant to space solutions.

## Define

Find the most suitable combination of space technologies to answer the challenges identified.

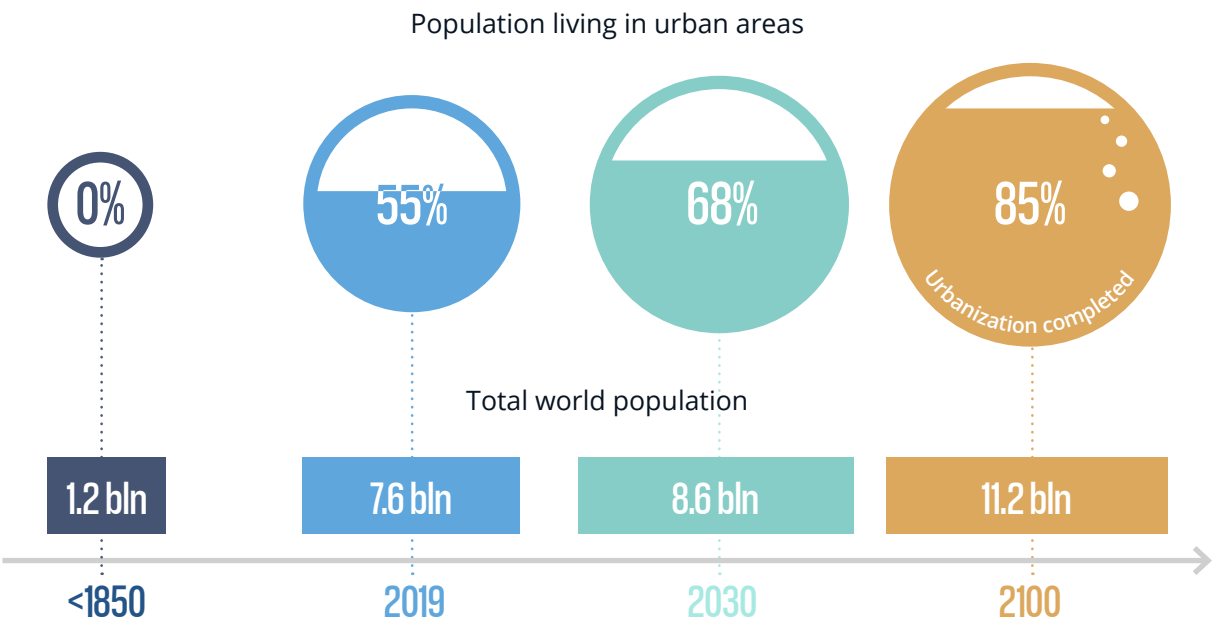
## Develop

Imagine solutions for urban infrastructure planning processes based on space technologies.

## Evaluate

Assess the feasibility and impact of the proposals and provide recommendations to city planners.

# URBAN POPULATION



# POSSIBLE FUTURE SCENARIOS



# SUSTAINABLE DEVELOPMENT GOALS



We developed a scenario based on a combination of Grow and Transform. We assume that Space 2030 Agenda is fulfilled and that access to space and its resources is directly or indirectly available to all nations.

The core outcome of this project is to address the sustainable development goals (SDGs) highlighted in the chart. Our proposal for improving the current urban conditions are meant to be the first step towards meeting the goals of the UN 2030 agenda.

CURRENT CHALLENGES

Our focus on resource management enables us to explore the largest number of space-related technologies and challenges.

Soil quality and soil property	01
Urban sprawl	
Lack of vacant land	
Land use and land cover change	
Insufficient infrastructures	
Natural disaster management	
Poor energy consumption patterns	03
Low energy efficiency	
Inadequate energy production	
Inadequate energy distribution	
Energy waste	
Alarming greenhouse gas emissions	



02	Water scarcity
	Limited availability of space based hydrological data
	Inadequate wastewater treatment
	Potential conflicts between countries/states
	Low investments on water technologies
04	Lack of sustainable water system
	Traffic congestion
	Increased commuting time
	Inadequate public transportation
	Loss of public space
04	Higher maintenance costs
	Road safety hazards caused by human error

LAND

- 1. Land use/cover change analysis
- 2. Soil health status card
- 3. Geo-tagging urban assets
- 4. Flood monitoring system

WATER

- 5. Citywide sustainable water system model
- 6. Water recycling plants
- 7. Real-time EO hydrological data
- 8. Deliquescence-driven atmospheric moisture separator

ENERGY

- 9. Thermal insulation and control
- 10. Radiative cooling
- 11. Third generation solar panels
- 12. Solar power satellites

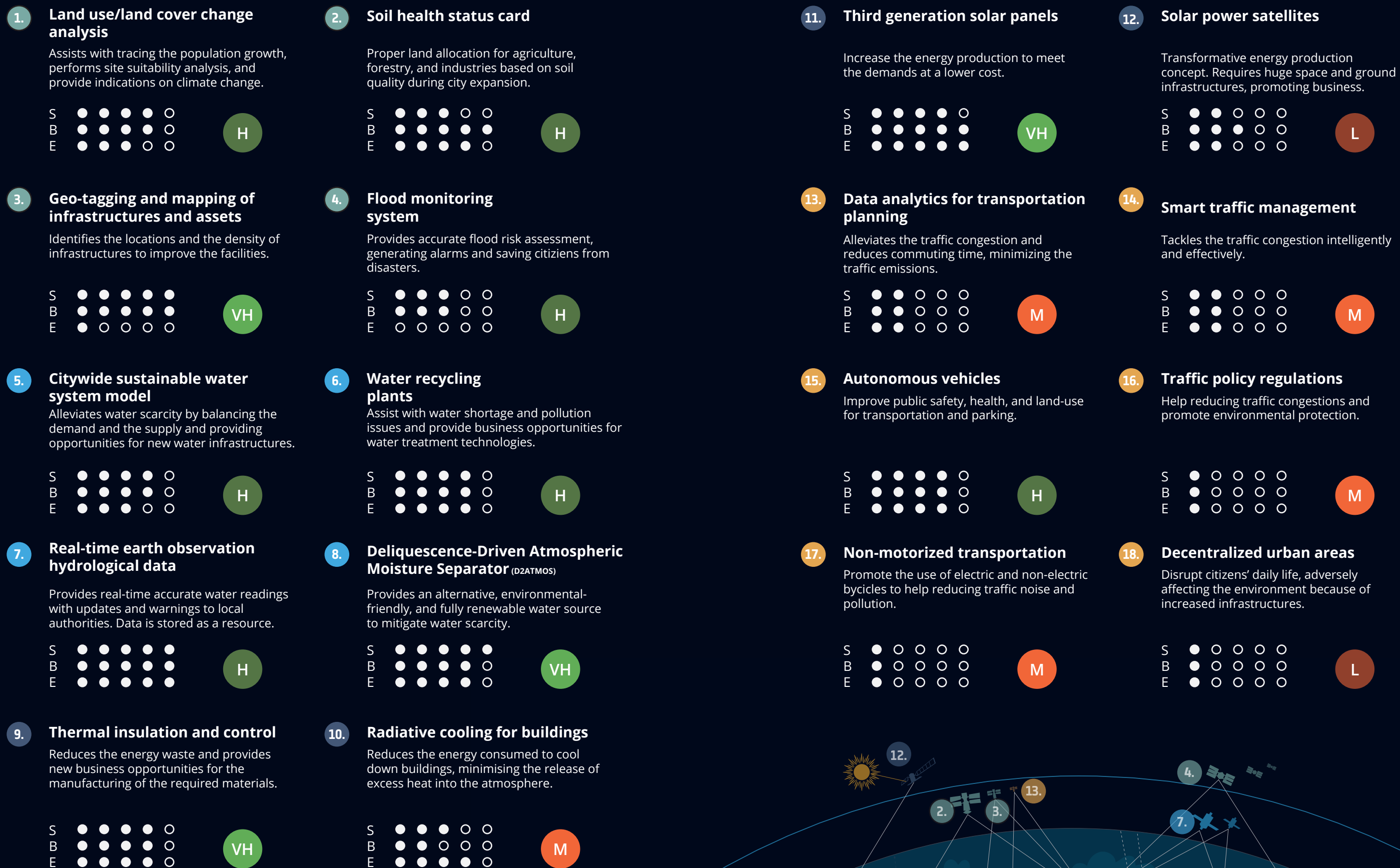
TRANSPORT

- 13. Data analytics for transportation planning
- 14. Smart traffic management
- 15. Autonomous vehicles
- 16. Traffic policy regulation
- 17. Non-motorized transportation
- 18. Decentralized urban areas

Feasibility  
Low High







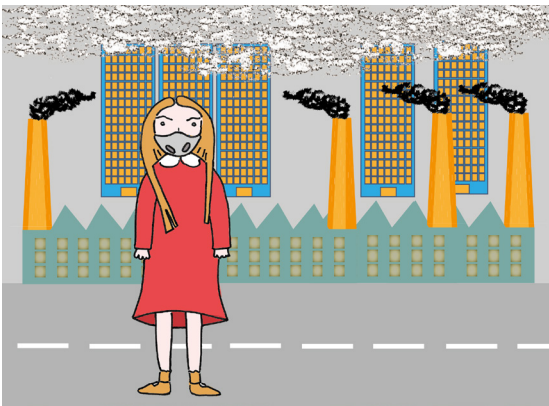
S - Social Impact  
B - Economic Impact  
E - Environmental Impact

Success Rate  
Sum of impact and  
feseability factors

Low  
Medium  
High  
Very high



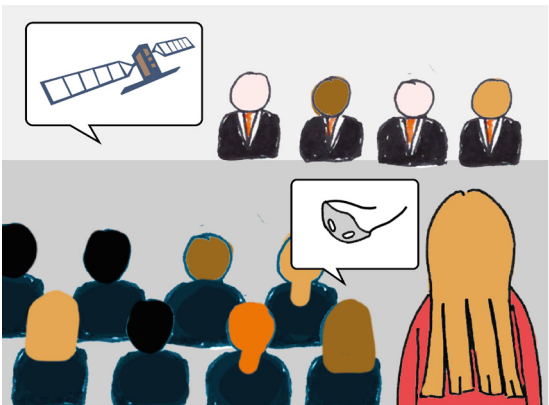
BEYOND 2030 STORY



A young woman walks through a sidewalk, head low and shoulders leaning forward, navigating through the crowd. A cloth mask covers her lower face, revealing only her deep brown eyes, momentarily closed to escape from the insanity of urban life. She adjust her red dress and sighs, feeling a familiar irritation creeping down her throat.



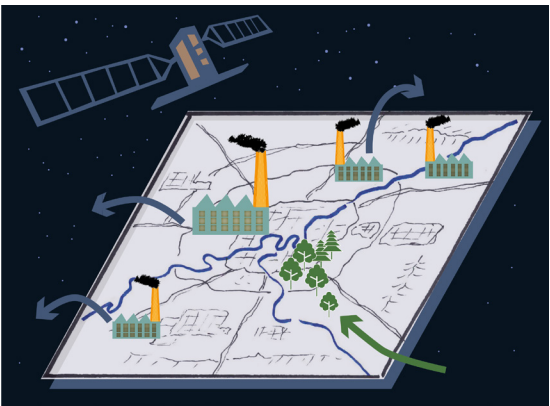
One morning she notices a flyer for an upcoming citizen forum. She briefly looks around, wondering what she could say about her city.



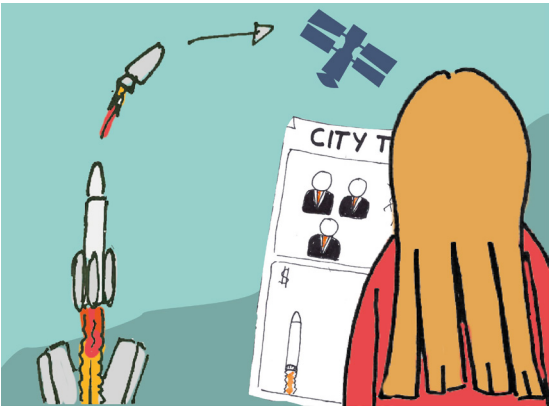
A few days later, at the citizen forum, she shares her story, surrounded by researchers, city workers, and fellow citizens. “The buses are hard to reach,” she explains. “The air hurts my throat, and I’m constantly coughing.”  
“Thank you for sharing your experience,” an urban planner says. “We believe we can improve things with the help of space technology.”



“Space?,” she replies indignant. “My problems are down here, why should I care about space?”  
The urban planner explains how space technology affects our everyday life, and how to liberate congested streets by using space-based smart navigation and traffic avoidance technology.



“We can trace and analyze land to improve resource distribution and pollution control, helping the urban environment remain in balance,” he concludes.



The county officials have made a big effort to engage the public. In the city square, a monitor shows a live coverage of a rocket launch.



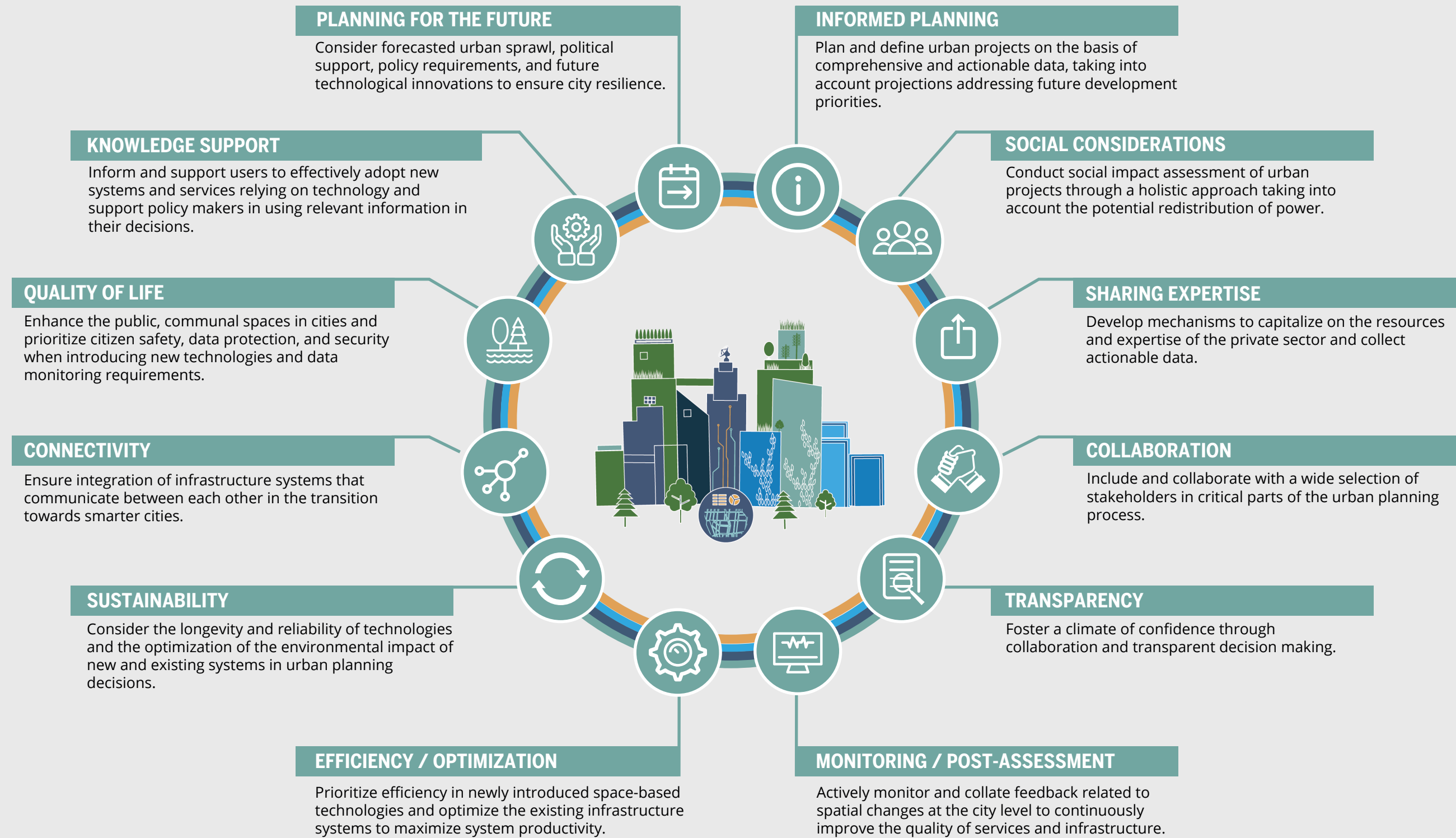
Red is involved in a new construction project, raising concerns in the area. While urban growth can be messy, a new generation of space resources is making her city more resilient.



Years later, Red leaves the office earlier than usual looking for a nice place to read her textbook and prepare for her degree in urban policy. She lays on the grass at sunset, refreshed and relaxed, realizing she doesn’t need a breathing mask anymore.

# MAKING THE VISION REALITY: GUIDELINES

Effective urban planning through the integration of space data and technology to achieve inclusive, integrated, and resilient cities.





# SPACE FOR URBAN PLANNING



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