



SPIN.E

SPACE | INNOVATION | EXPERIENCE

# DESIGN NARRATIVE SUMMARY

The SPINE is a forward-thinking river side development centered around the Innovation & Space Industry. At the core, our vision is to ignite ingenuity, creativity and innovation in the hearts of our future researchers to investigate their inner soul and make their dreams reality. The spine supports three pillars: Space, Innovation & Experience. A catalyst for the improvement of the city's citizens, this dynamic mixed-use development produces a vibrant, diversified, and integrated community that is indicative of North Charleston's expanding innovation industry. The driving factor behind this development is the need for the State to have a permanent NASA facility in the future. With a mission-driven, mixed-use scheme that promotes positive social and economic reform for North Charleston, The Spine's ambitious proposal turns the region into a magnet for space innovation.

The SPINE's Innovation centre will include 25,000 Sq. metres of research and innovation space to support economic and educational opportunities in North Charleston. The SPINE is designed to be a medium-density development that includes a NASA CubeSat centre, planetarium, educational centres, religious spaces, parks and open space, housing, a hotel, retail spaces, a futuristic pod public transportation, history walk. The Innovation District is only an hour from the main university campus, with rapid transit connections throughout the community planned for the near future. NASA's Innovation centre will anchor the development. The university-industry collaborations will build upon the local university's research and development to design creative solutions to problems facing the many growth sectors in the South Carolina region. These collaborations will also enable the educators and industry partners to create new career pathways for students, providing a skilled workforce for changing industry needs that will enhance the regional economy. Our mission is to improve tomorrow by inspiring the next generation of students and professionals who aim to solve complex problems. This innovation centred community facilitates connections and conversations with people from all walks of life consequently improving the employment opportunities of the citizens of Charleston.

Developed largely through public-private partnerships, The SPINE will facilitate internships, create new educational experiences, inspire ideas, advance technology, and foster new research among the community of North Charleston. Our partnership with NASA fosters innovation, which is our specific instrument of entrepreneurship; the act that endows resources with a new capacity to create wealth, and to generate new ideas into futuristic solutions for the betterment of individual, institute and the humanity. With the NASA CubeSat program coming to Charleston. We strongly feel that this will be a foundation block to many more STEM centred institutions in South Carolina.

We are committed to facilitate and solicit community research plans and encourage each single innovation which stimulates the country's economy. As professionals, we are creating and furnishing opportunities to develop and commercialize promising innovative processes, products and technologies according to market-driven requirement for industry transfer, with the aim to improve quality of life through innovation. We follow-out that all progress depends on the creative thinking, and the best way to predict the future is to invent it through optimal combination of knowledge and skills.

Our neighbourhoods are safe and well-planned, offering a variety of housing models that are inclusive of our diverse population. The Live spaces are a mix quiet retreats, with easy access to goods and services, to vibrant high-density by the river front. Each neighbourhood takes advantage of its geographical assets and is designed to offer the best of North Charleston living to residents. Commercial zones are accessible, easy to navigate and offer a thought-out land use and design strategy. Futuristic Intra-city transportation is sustainable, easily accessible, and efficient. Recreation is an essential part of living in the SPINE. We define our sense of place through our recreational pursuits. Whether walking along the river, hiking in our parks or playing in our fields we live life connected with nature. Our residences are within a short distance of vast parks and extensive trails that offer a natural outdoor experience, while the edges of our development border the river.

As part of our flood resilience plan, we incorporated land use design elements combined with structural features like flood walls and gates to address the possibility of flooding. As an example, our design integrates a berm within an elevated plaza by the river in order to maintain views of the water and remain accessible during flood times.

# FINANCIAL NARRATIVE SUMMARY

*The Spine* will be a premier project for North Charleston, anchored by world class amenities, a museum, a library, a planetarium, impressive economic activity, new industries, new jobs, and 1700+ affordable housing units. *The Spine* will attract migration from skilled workers to the world class office spaces and lab facilities, anchored by NASA. Manufacturing workers and young people will be attracted to below market rents, filling a need in the rental market. According to the City of Charleston Department of Housing and Community Development, 80% of the median household income is \$52,560 and falls into the “Low Income” category (Appendix A). Affordable housing for this population must be \$1214/month or less, *The Spine* will offer 147 affordable units to this population (8% of total units) (Appendix B). In addition to offering affordable housing to the “Low Income” population, *The Spine* will offer 1577 more affordable units, meeting the affordability threshold for “A Income” households (Appendix B). According to the City of Charleston Department of Housing and Community Development, 110% of the median household income is \$72,270/year (Appendix A). Affordable housing for this population must be \$1707/month or less, *The Spine* will offer 1577 units that meet this threshold. With this unit mix, *The Spine* will fill a gap in the market, offering affordable units to a market that needs them.

As a result of *The Spine* attracting jobs, economic activity, taxes and over 1700 affordable housing units to the city, it is our expectation that the City of Charleston will contribute to the project. We will assume that the city will contribute \$10m to the PRT Transit Train on the site, \$3M to flood control infrastructure, \$5M to the Sky Bridge on the site (for public use) and \$354K to contribute to roadway infrastructure on the site (See Appendix C).

In addition, we will assume that NASA and the City of Charleston will enter a joint partnership to purchase buildings G and H at \$22M and \$26M respectively. Buildings G and H will be museums, libraries, and planetariums, anchoring amenities on the site and offering an invaluable amenity to the City of North Charleston. We will also assume building F will be purchased by NASA and utilized as an office/lab space. Buildings F, G and H are proposed using special materials to build such building types at \$400/sf and therefore show negative returns in our proforma. We will assume NASA and the City of Charleston will purchase these buildings at their full cost + a 5% premium (See Appendix D).

## MASTER PLAN LEGEND

### SPACE

- 1. NASA VISITOR CENTER, LIBRARY, PLANETARIUM, ZERO G LAB, CUBESAT LAB, MUSEUM, LUNA LAB
- 2. PLANETARIUM
- 3. SPACE DECK

### INNOVATION

- 4. MIXED INCOME - INNOVATION
- 5. INNOVATION LABS
- 6. PRT LINE
- 7. FLOOD RESILIENCE
- 8. COLLABORATION SPACES
- 9. LIVE WORK SPACES

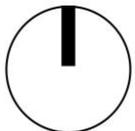
### EXPERIENCE

- 10. MIXED INCOME HOUSING
- 11. GREEN SPINE
- 12. HISTORY WALK
- 13. FARMER'S MARKET
- 14. RAIL PARK
- 15. GROCERY STORE
- 16. HOTEL
- 17. PEDESTRIAN SPIN

### OPEN SPACES

- 18. RETAIL PLAZA
- 19. EVENT LAWN
- 20. DOG PARK
- 21. PICNIC GROVE
- 22. EXERCISE PARK
- 23. FLOODABLE PARK
- 24. COMMUNITY PLAZA
- 25. PRODUCTIVITY COURTYARD
- 26. RAIN GARDEN
- 27. COMMUNITY ROOF GARDEN
- 28. COMMUNITY SPACE AT WATERFRONT

# SITE PLAN

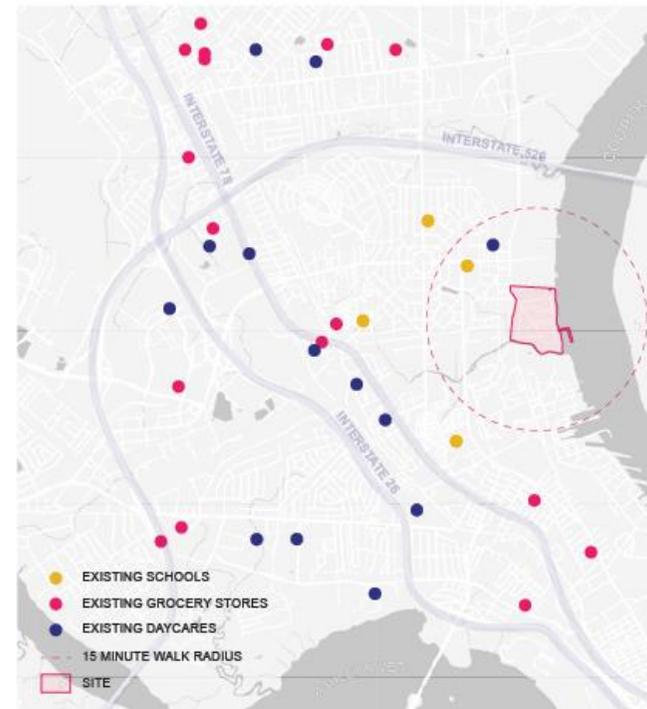


# SITE ANALYSIS

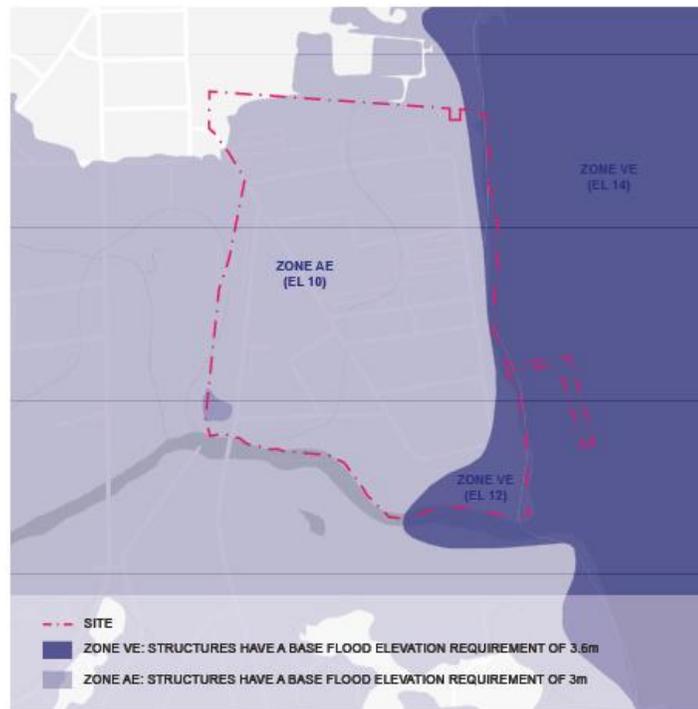
## EXISTING CIRCULATION NETWORK



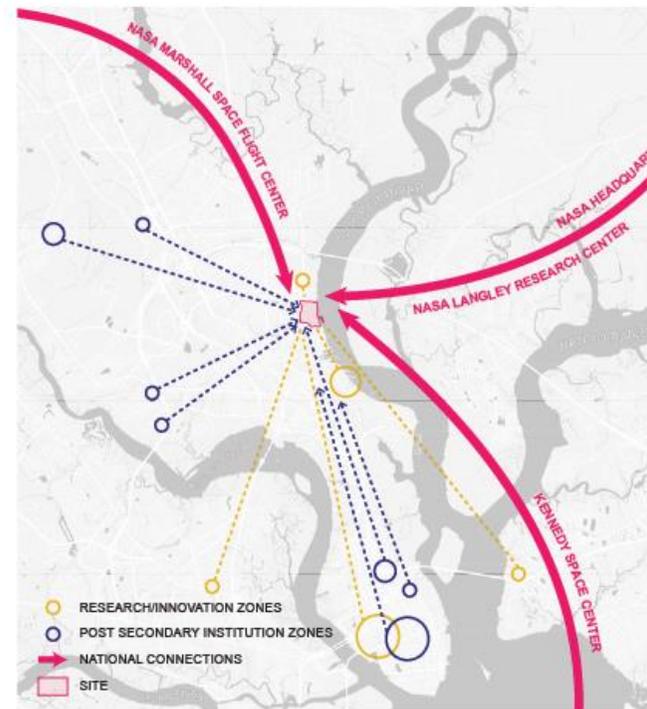
## ACCESS TO AMMENITIES



## FLOOD ANALYSIS

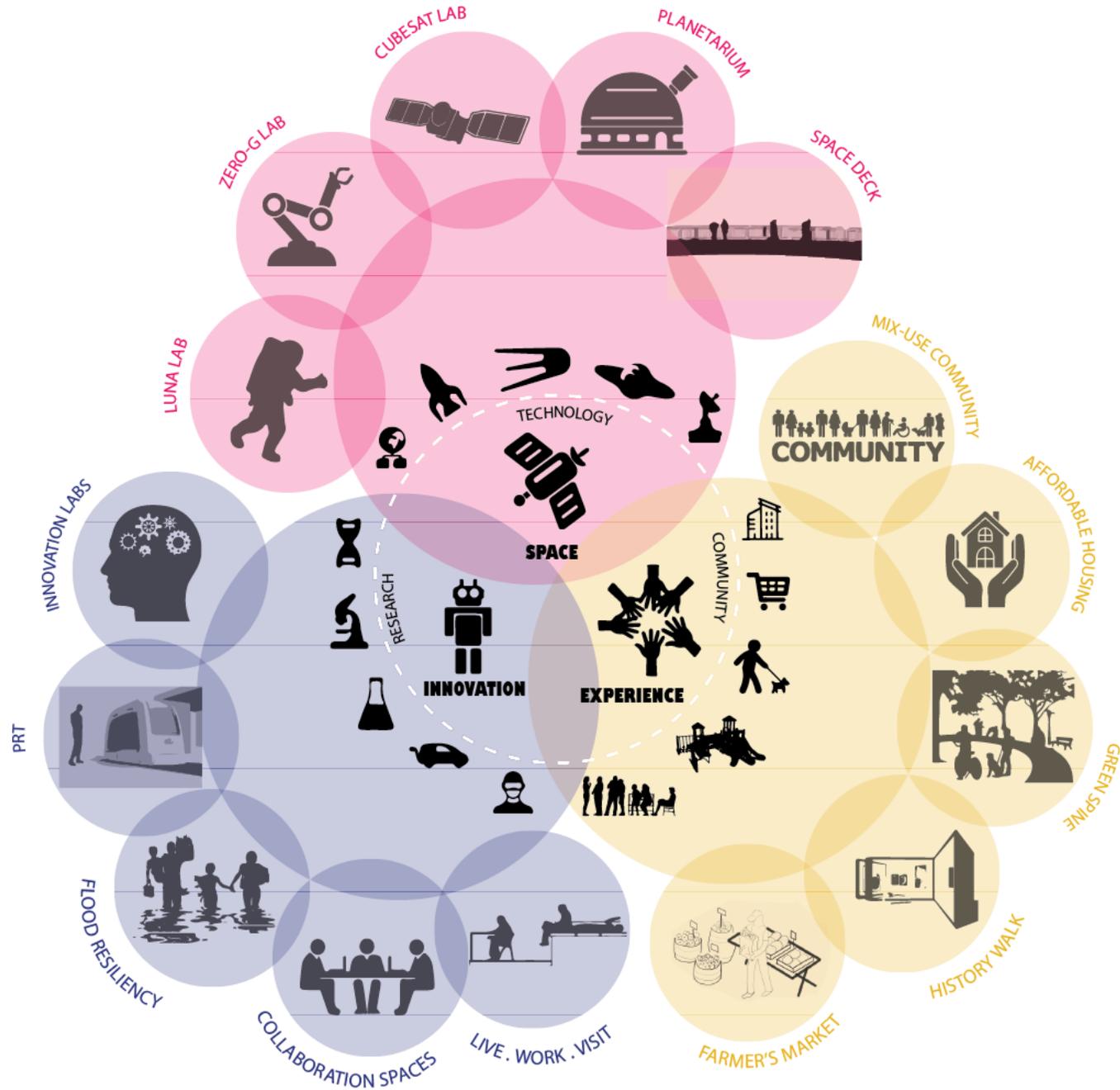


## INNOVATION CONNECTIONS



# CONCEPT

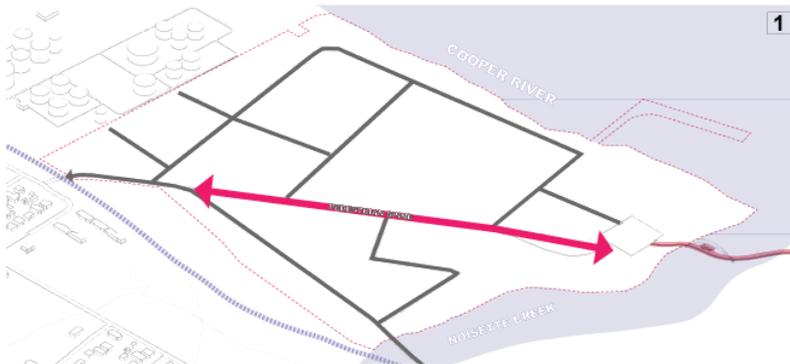
## VISION DIAGRAM



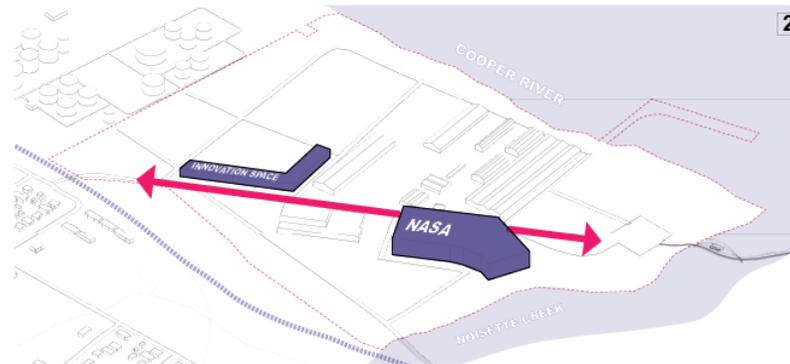
## LYNCH'S MENTAL MAP



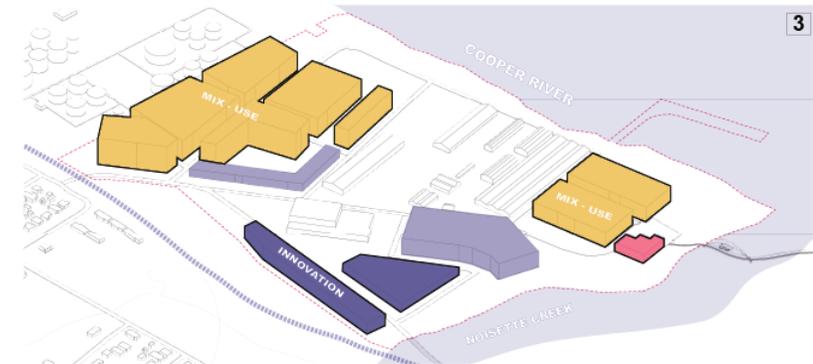
# CONCEPT DEVELOPMENT



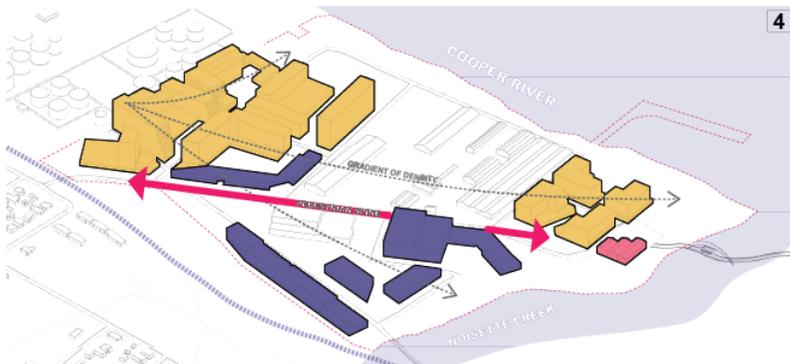
**1**  
**PEDESTRIAN SPINE:** Create a Pedestrian only, human-scale axis along the main spine of the site.



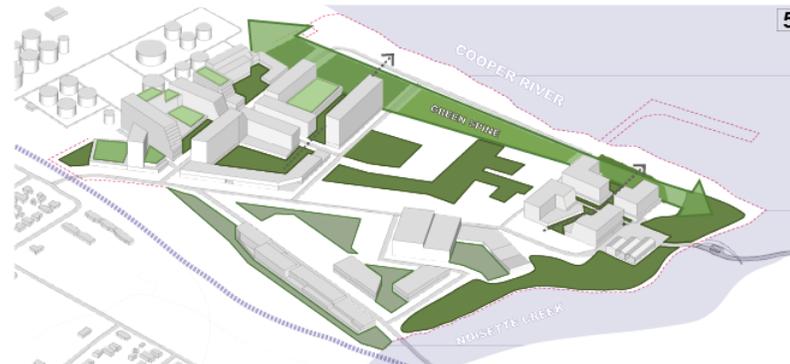
**2**  
**NASA + INNOVATION:** Established along the main spine to have an interactive frontage.



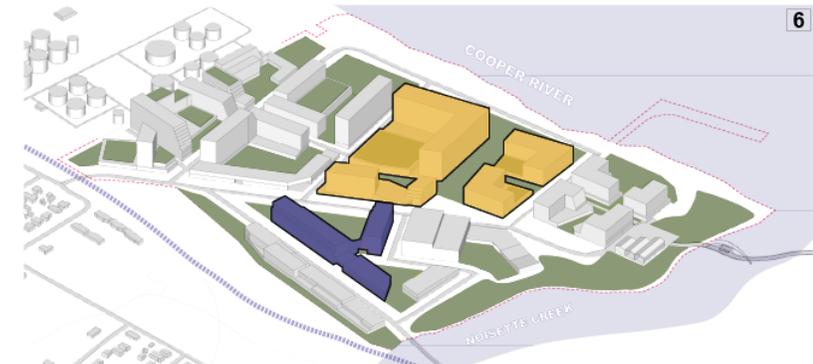
**3**  
**MASSING:** Create a development around the vehicular road system.



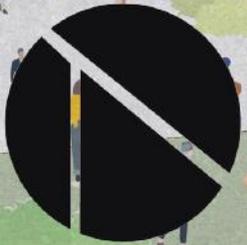
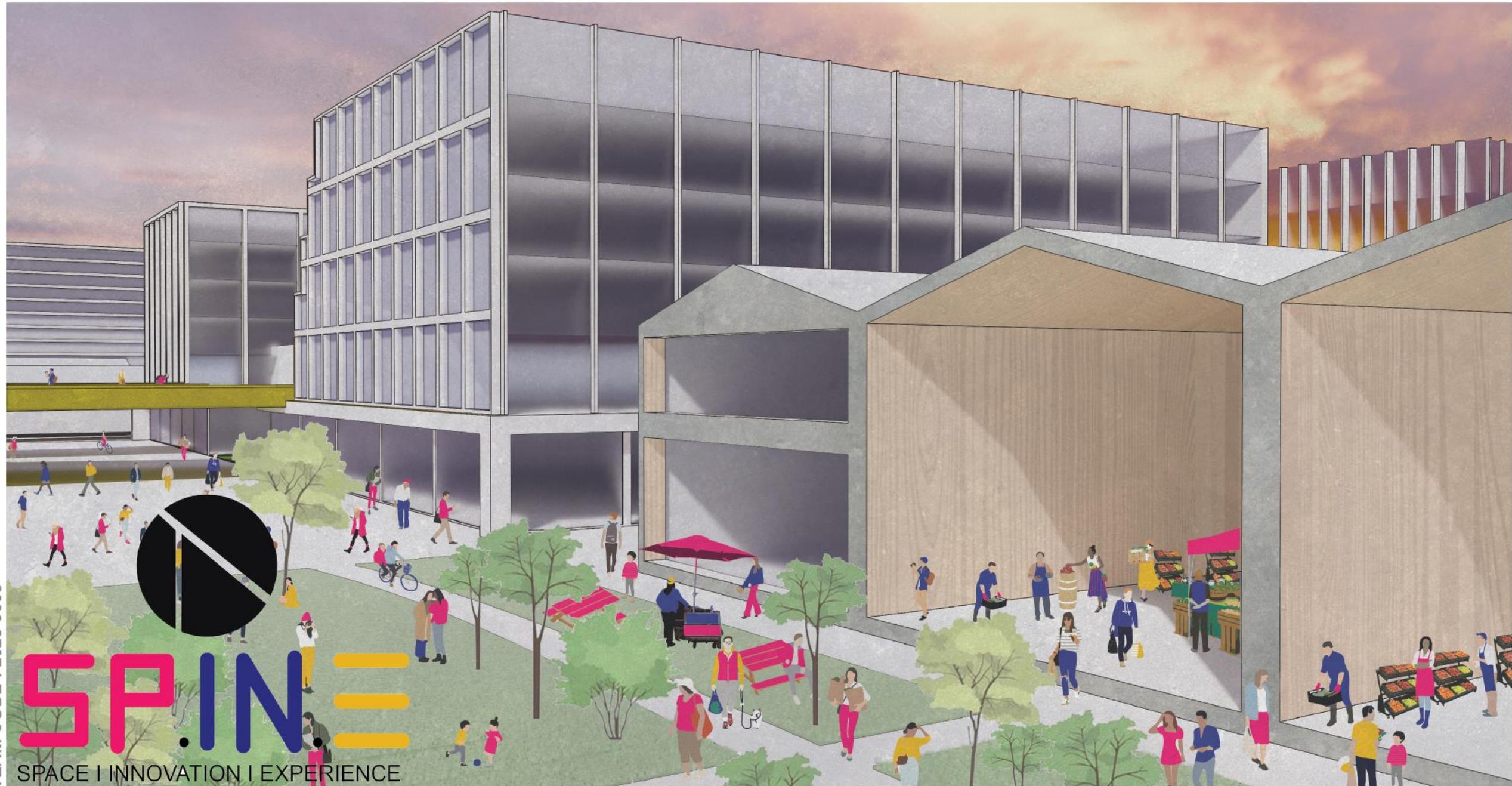
**4**  
**DENSITY DEVELOPMENT:** Create high density closer with the main road, with it decreasing as we get closer to the waterfront.



**5**  
**GREEN SPINE + OPEN SPACES:** Create a Green Spine long the waterfront which acts as a public open space. The openings between the masses create community spaces and working productive green spaces.



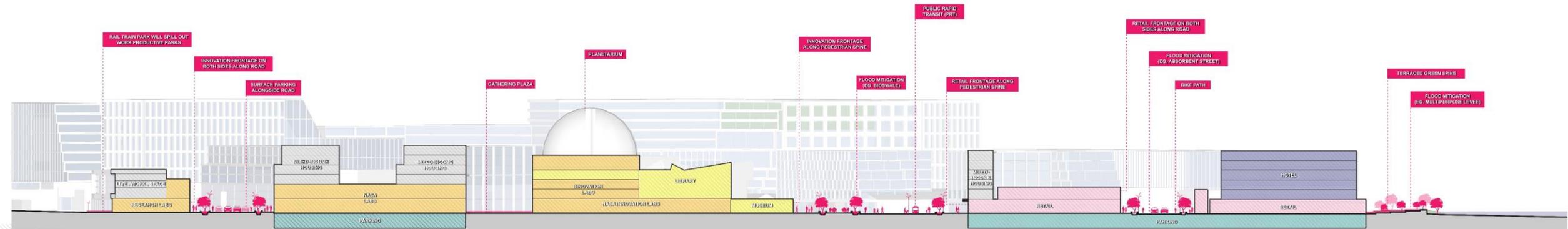
**6**  
**FUTURE DEVELOPMENT:** Mixed-use building along with a future NASA facility is proposed on the DOD parcel for development after the 10 year period.



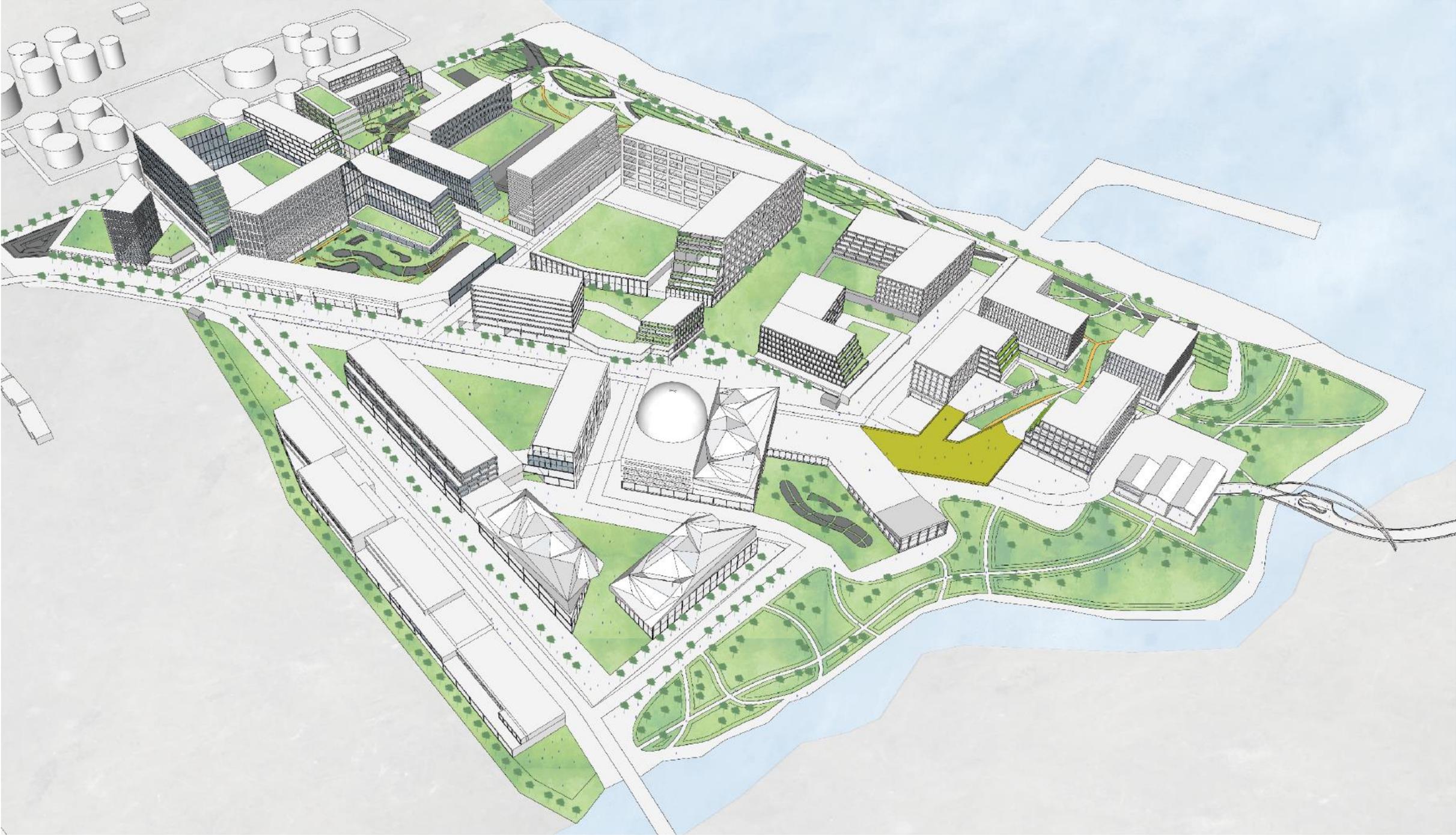
**SPIN**

SPACE | INNOVATION | EXPERIENCE

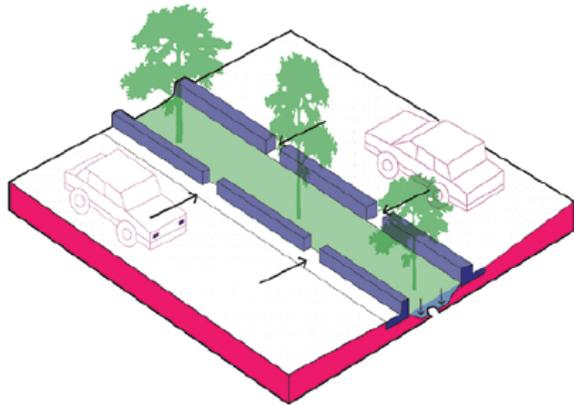
# SECTION



# AERIAL SHOT

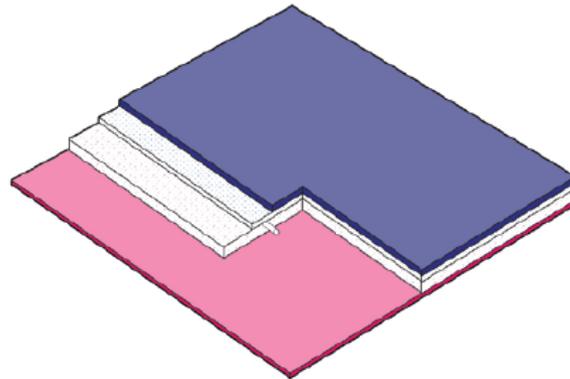


# FLOOD RESILIENCY



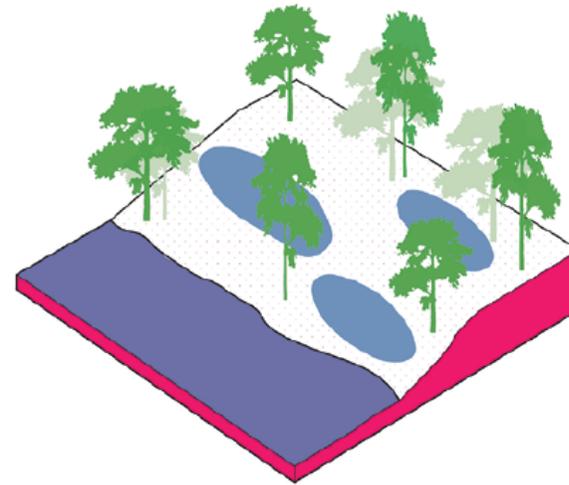
## BIOSWALE

Bioswales are vegetated swales with a porous bottom that can collect, convey, filtrate and filter storm-water runoff, and reduce flood potential.



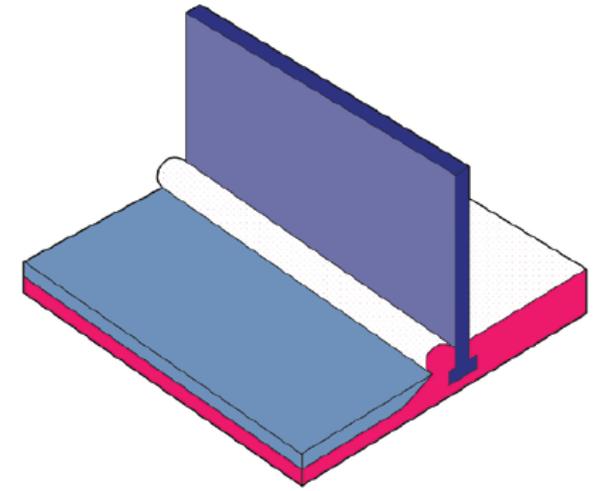
## ABSORBENT STREET

Absorbent streets can effectively runoff volume and storm-water pollutants on driveways and roads. This also helps in flood mitigation.



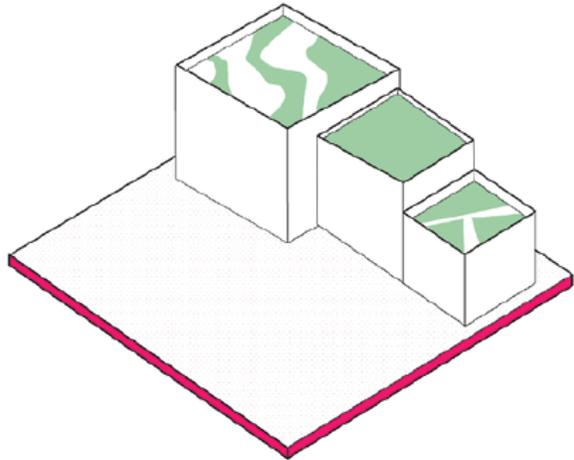
## FLOOD-ABLE PARK

Parks designed to flood - they retain or slowly release water to prevent runoff or storm surges from causing catastrophic flooding.



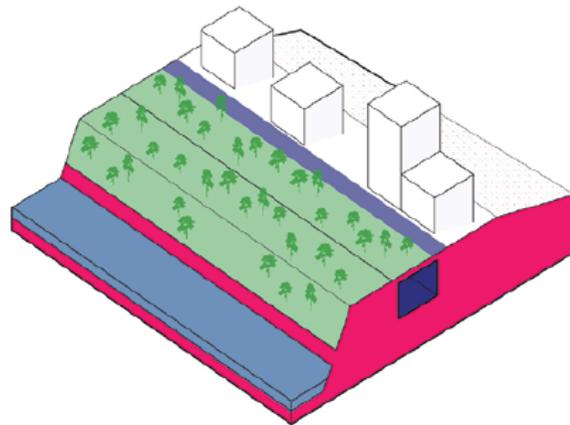
## FLOODWALLS

Typically engineered structures made of reinforced concrete. They can be built up to 20 feet in height, require less space and landscaping, and are more resistant to erosion.



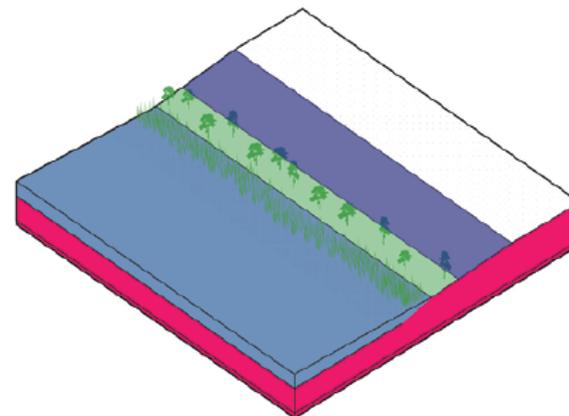
## GREEN ROOF

Green Roofs are build with vegetated plants atop the conventional roof. This not only helps with the storm-water runoff but also reducing building energy consumption



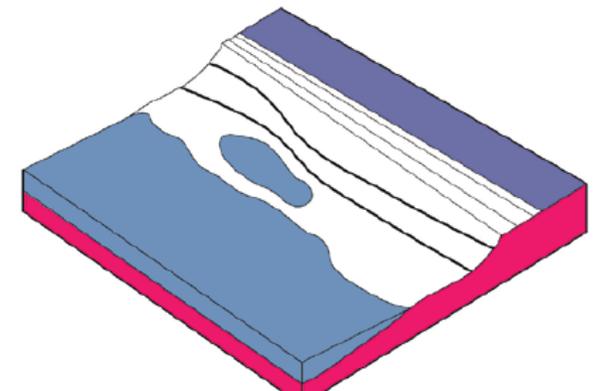
## MULTIPURPOSE LEVEE

A multi-purpose levee is an embankment constructed to withstand flooding, with residential, commercial and open space built atop it.



## LIVING SHORELINE

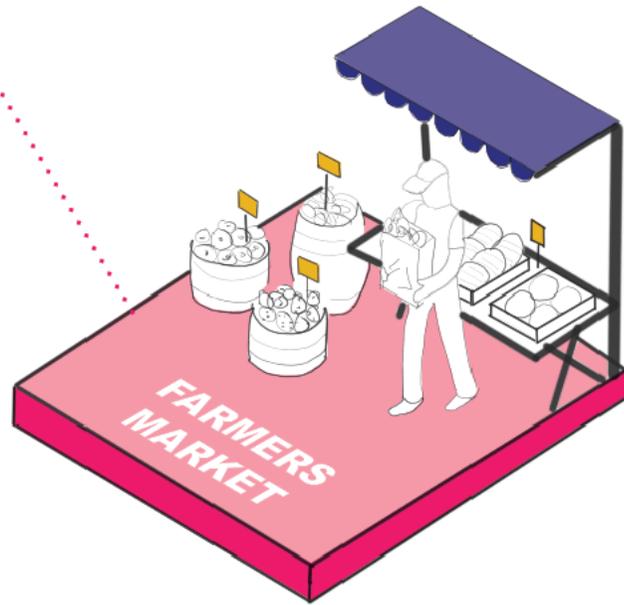
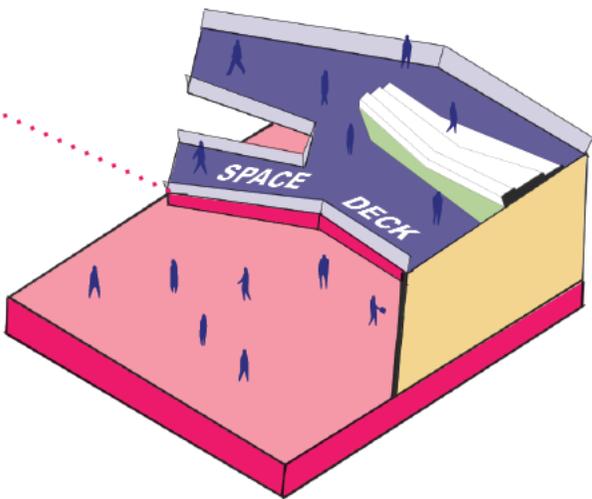
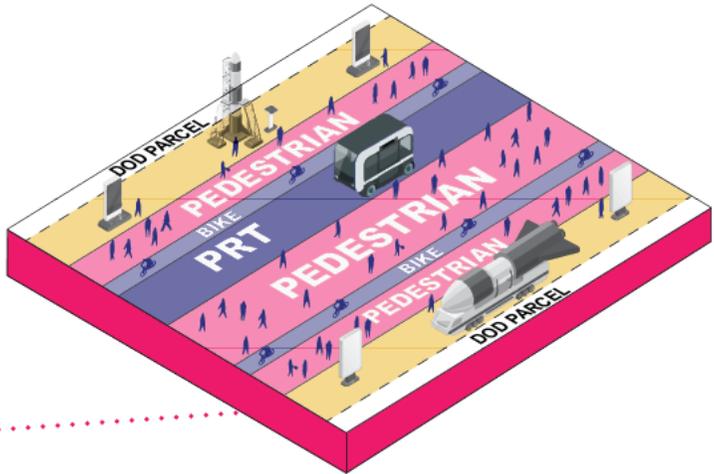
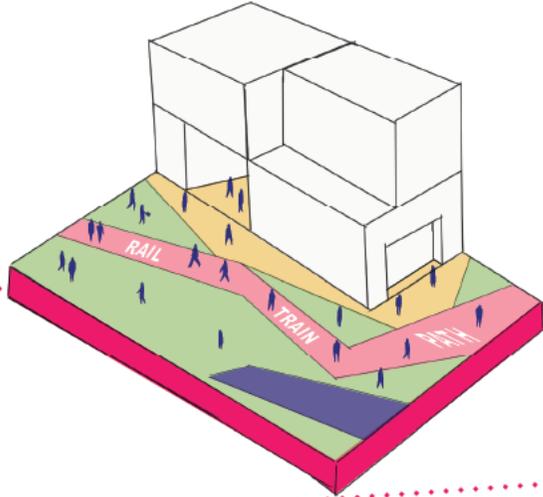
Use wetland plants, and natural structures, this method can also help to protect from regular flooding and storm damage.



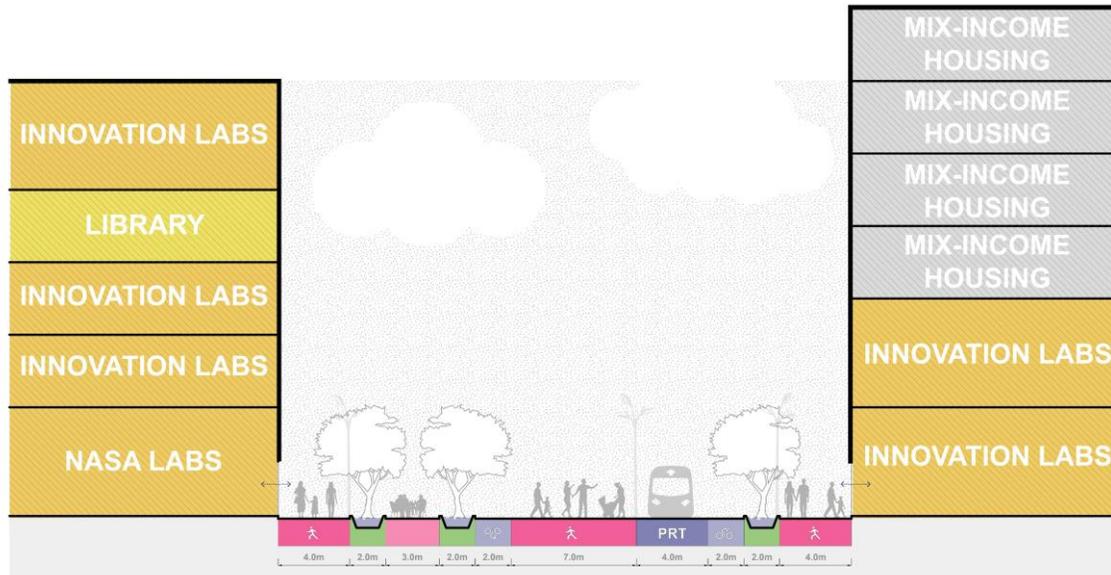
## WATERFRONT PARK

Waterfront parks reduce the impacts of flooding by creating a space that can capture and store floodwaters during flood events with minimal damage to the park infrastructure.

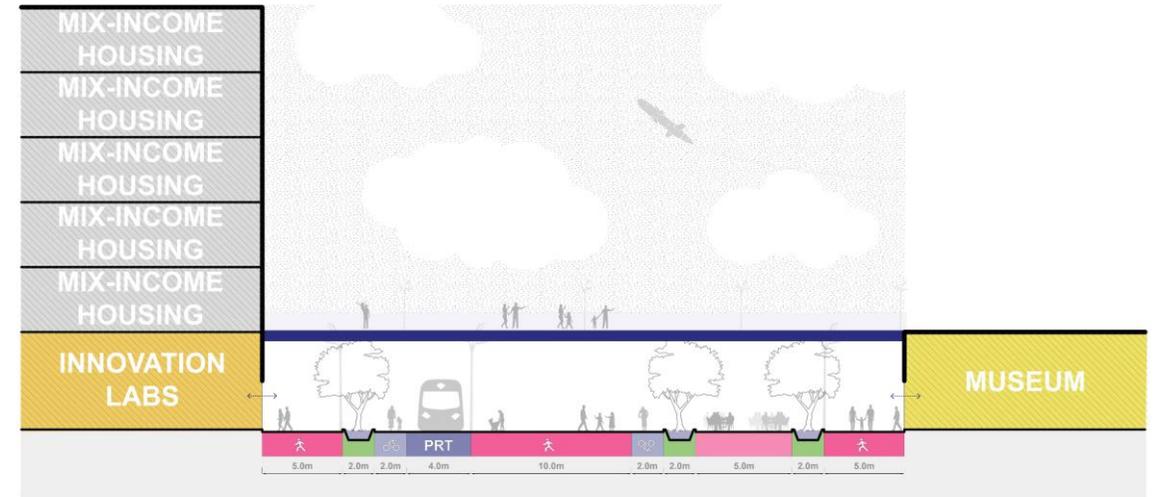
# ACTIVITIES ON SITE



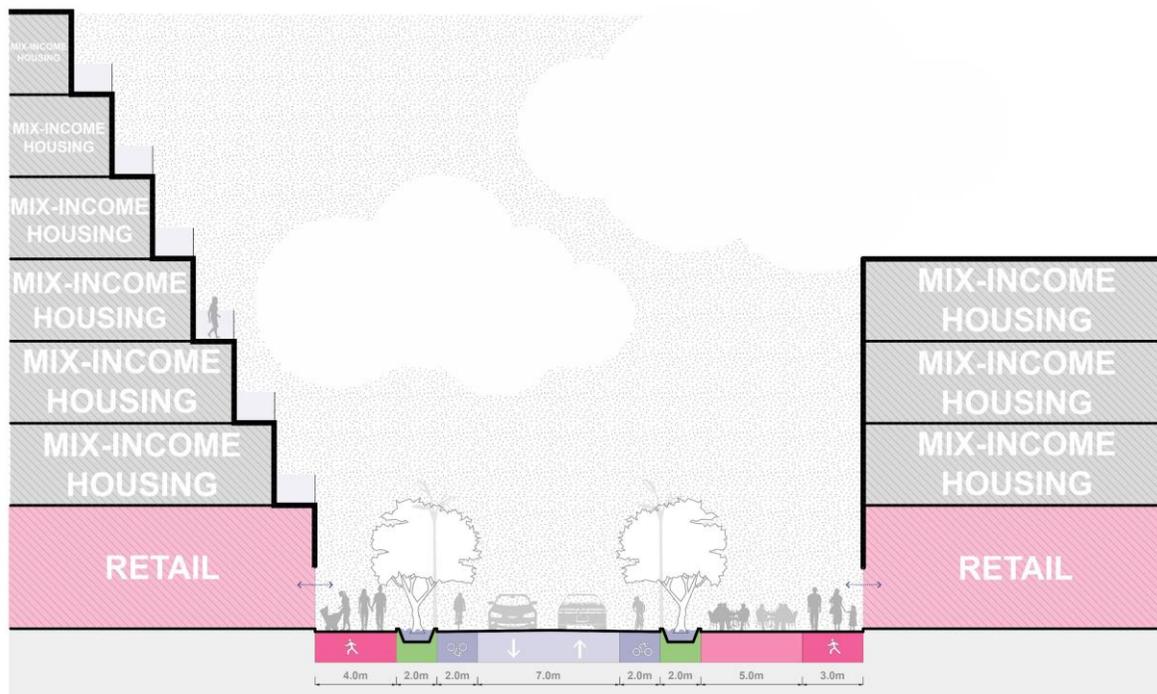
# STREET SECTIONS



ALONG THE PEDESTRIAN SPINE



ALONG THE SPACE DECK



ALONG THE RETAIL SPINE

# AERIAL SHOTS



**WORKING AND PRODUCTIVE LANDSCAPE**



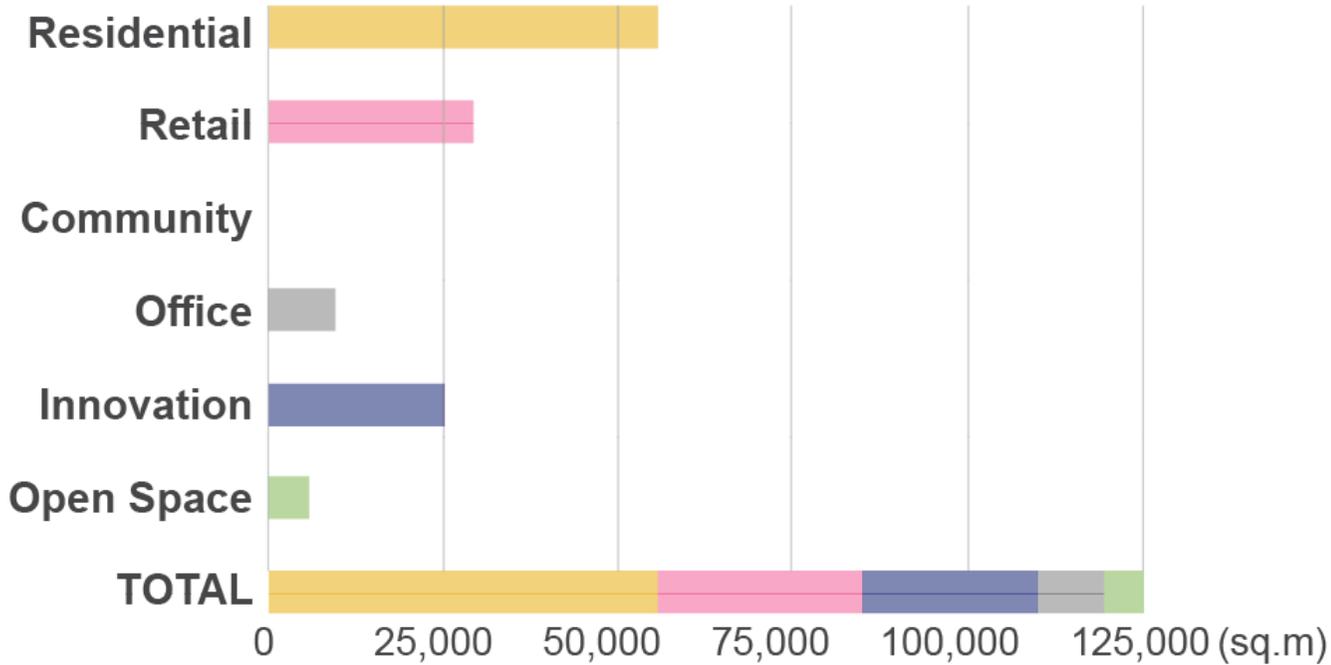
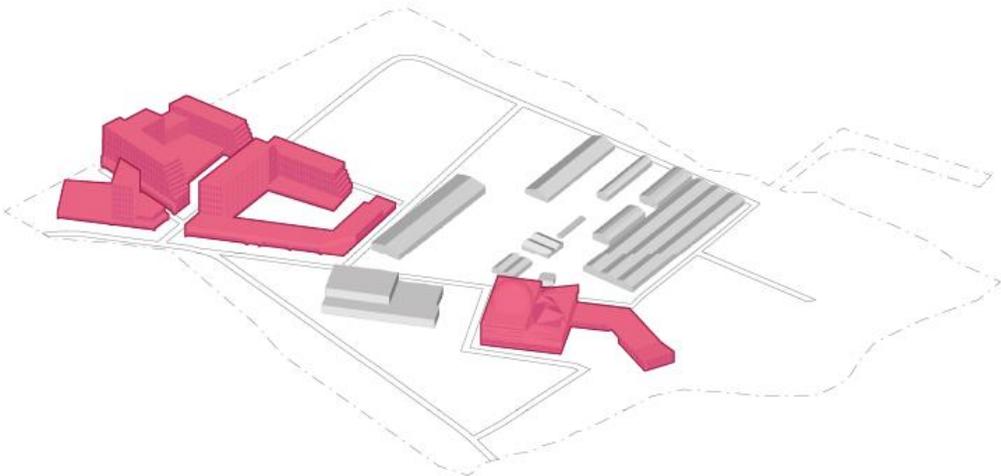
**COMMUNITY GARDEN**



**PEDESTRIAN SPINE WITH PRT**

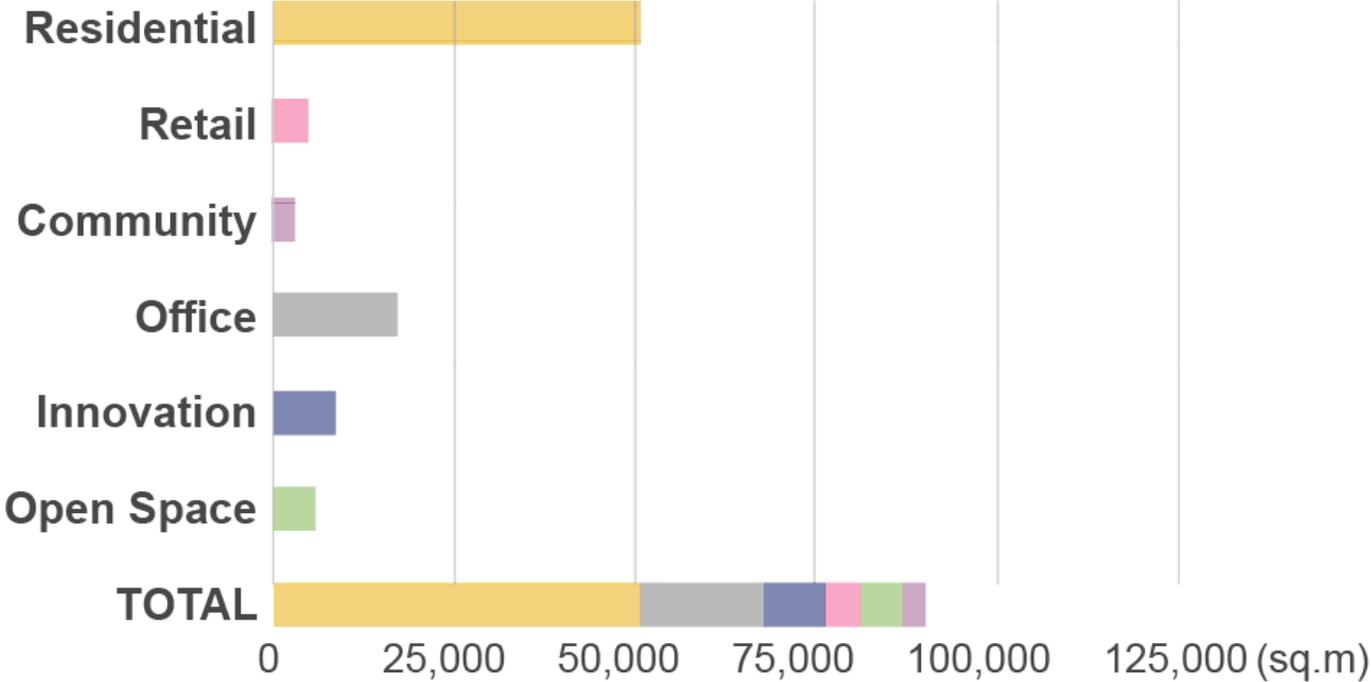
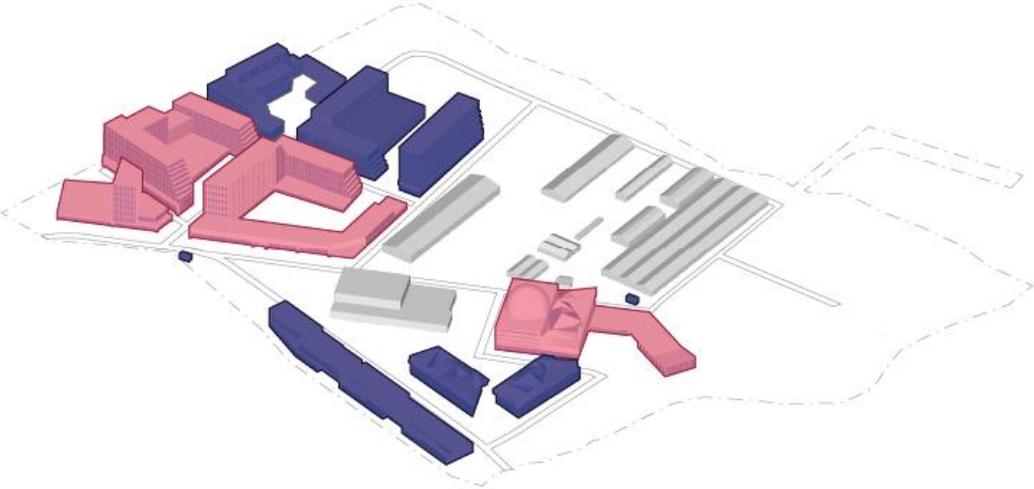
# PHASE I

(2025 – 2028)



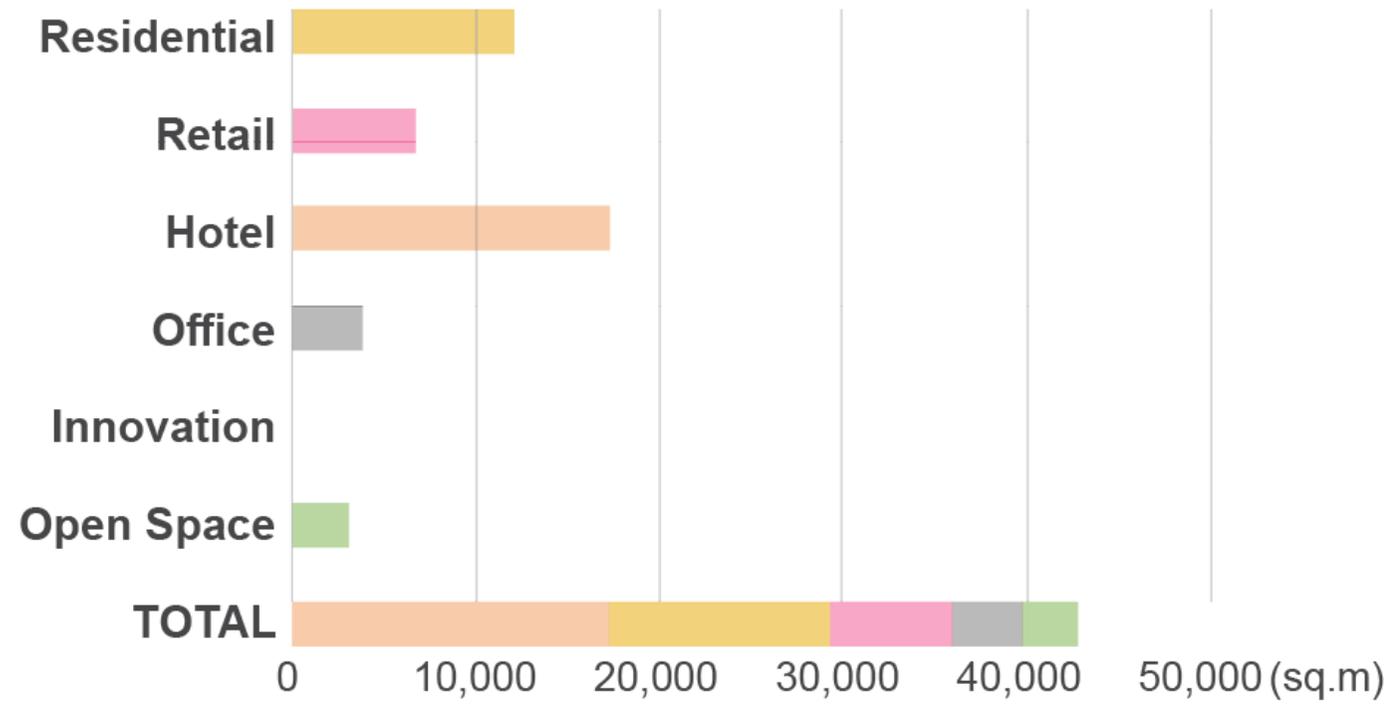
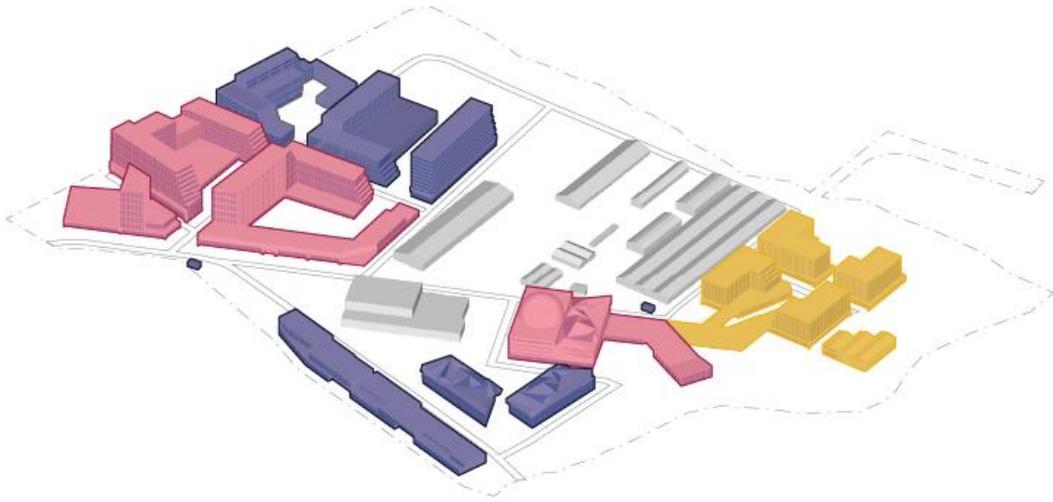
# PHASE II

(2028 – 2031)



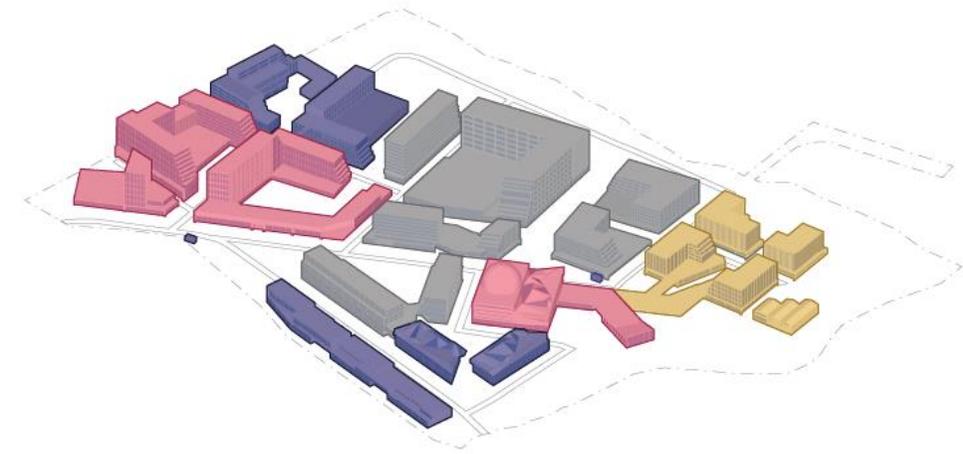
# PHASE III

(2031 – 2034)

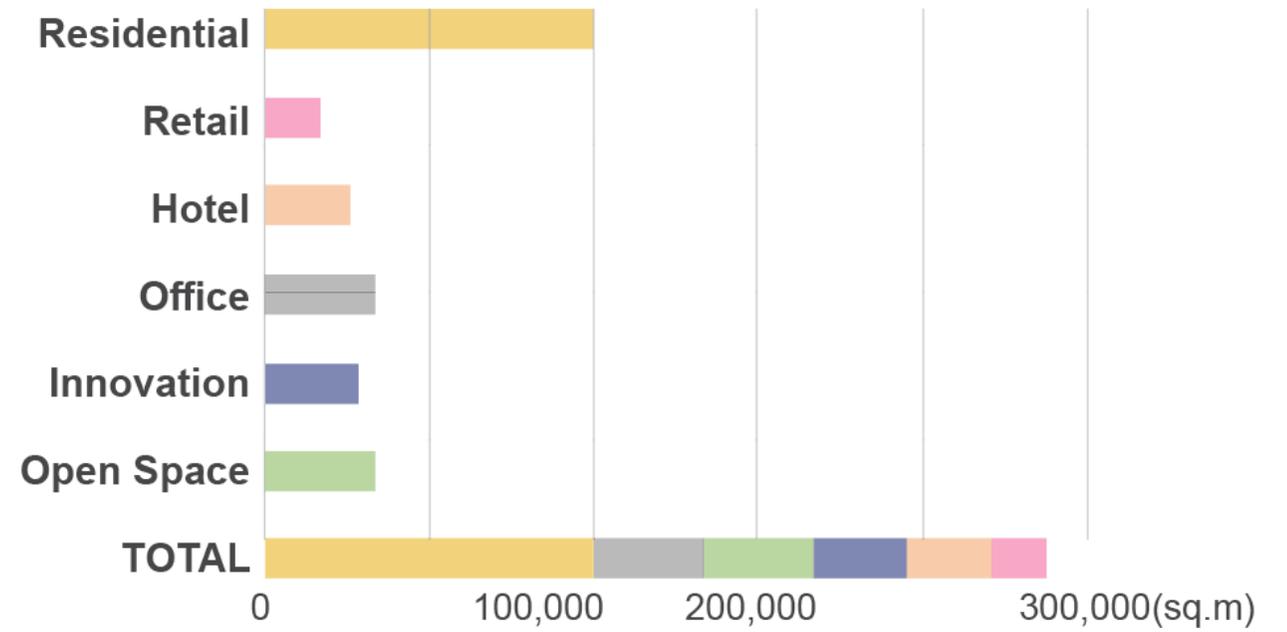


# PHASE IV

FUTURE DEVELOPMENT (AFTER 10 YEARS)



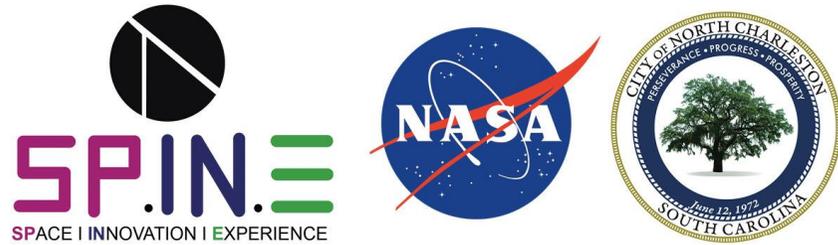
**TOTAL DEVELOPMENT**



# PARTNERSHIP NETWORK

## PRIVATE-PUBLIC PARTNERSHIPS

### Development Partnerships



### Public Agencies



### Community Equity Partners



### Charleston Corporations



# FINANCIAL PERFORMANCE

TOTAL DEVELOPMENT  
COST

UNLEVERED IRR

LEVERED IRR

EQUITY

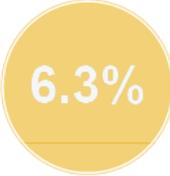
PHASE I



PHASE II



PHASE III



TOTAL

814M

6.7%

12.9%

1.93X

# KEY ASSUMPTIONS

## MARKET CONDITIONS

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POPULATION	117K
MULTIFAMILY VACANCY RATE	9.00%
MEDIAN HOUSEHOLD INCOME	\$65,700

## UNDERWRITING ASSUMPTIONS

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EFFICIENCY	85.00%
MIXED - USE CAP RATE	4.45%
HOSPITALITY CAP RATE	7.20%
OFFICE CAP RATE	7.60%
RETAIL CAP RATE	6.30%