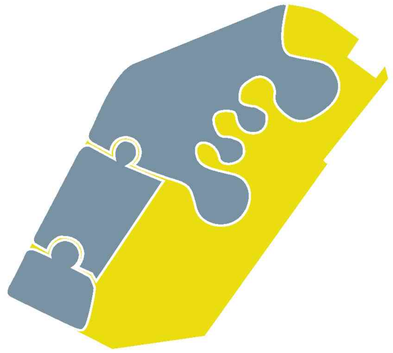
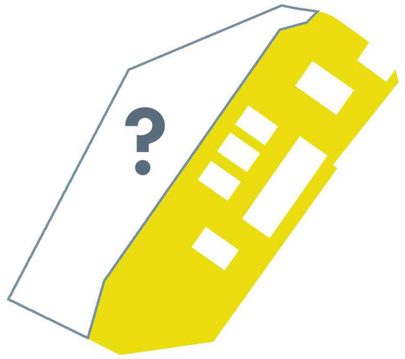


1 ONE (CONNECTED) PLACE

Like pieces of a jigsaw, the two parts of ITMO Highpark – the education and innovation zones - are interlocked in our masterplan to form a single, interconnected place, where the whole is much greater than the sum of its parts.

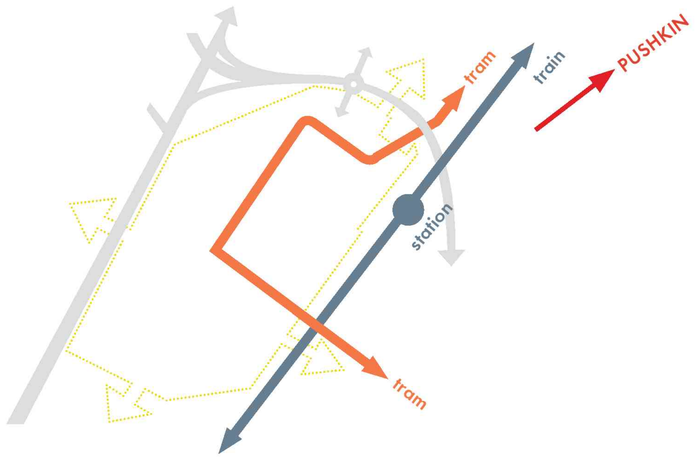


2 TWO TYPES OF MASTERPLAN

It is also however a masterplan that recognises that while many of the elements of the brief can be defined at this early stage, the Advanced Production Zone needs to remain open-ended and fluid.

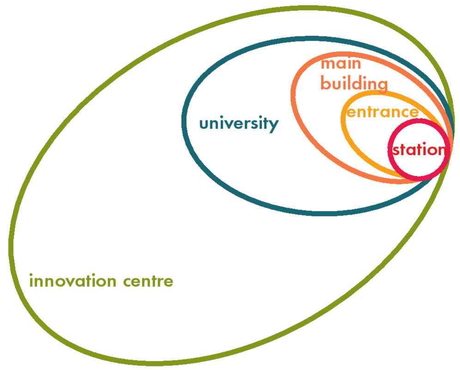
3 A PART OF UZHNY

Reinforcing the relationship between campus and town, ITMO High Park will knit seamlessly into the future new town of Uzhny.



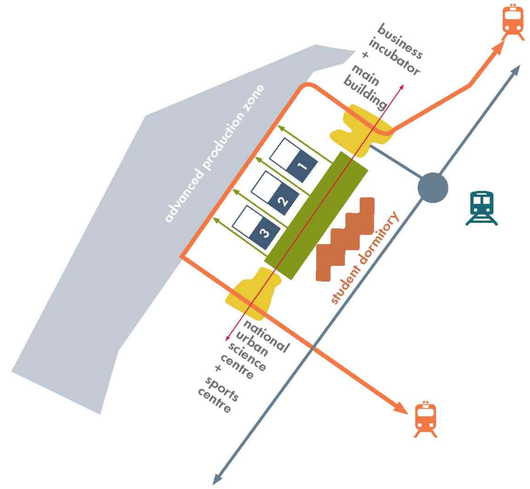
4 SUSTAINABLE CONNECTIONS

From regional rail, district trams and local buses to cycle routes and footpaths our plan for ITMO High Park prioritises sustainable transport connections at every level.



5 A CENTRE ON THE EDGE

In order to ensure that using public transport to reach ITMO High Park is as easy and convenient as arriving by car, we have placed the centre of gravity of the University not in the middle of the site but at its north-east corner, near the railway station and the new transport hub.

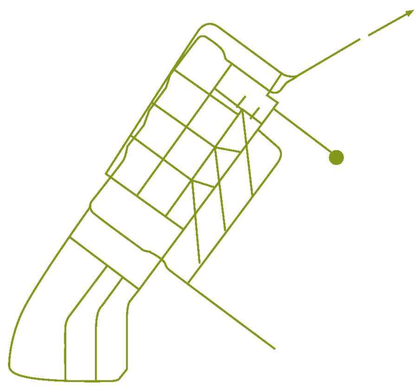


6 UNIVERSITY GREEN

At the heart of the campus is the University Green. An informal landscaped space serving the whole community, the University Green links the Main Building in the north to the Sports Centre in the south, the Student Dormitories in the east to the Academic Centres in the west, and the Advanced Production Zone to the University as a whole.

7 GREEN MATRIX

The University Green forms one part of a larger “green matrix” that encompasses the entire site, structuring movement and uniting all the various components of the masterplan together.



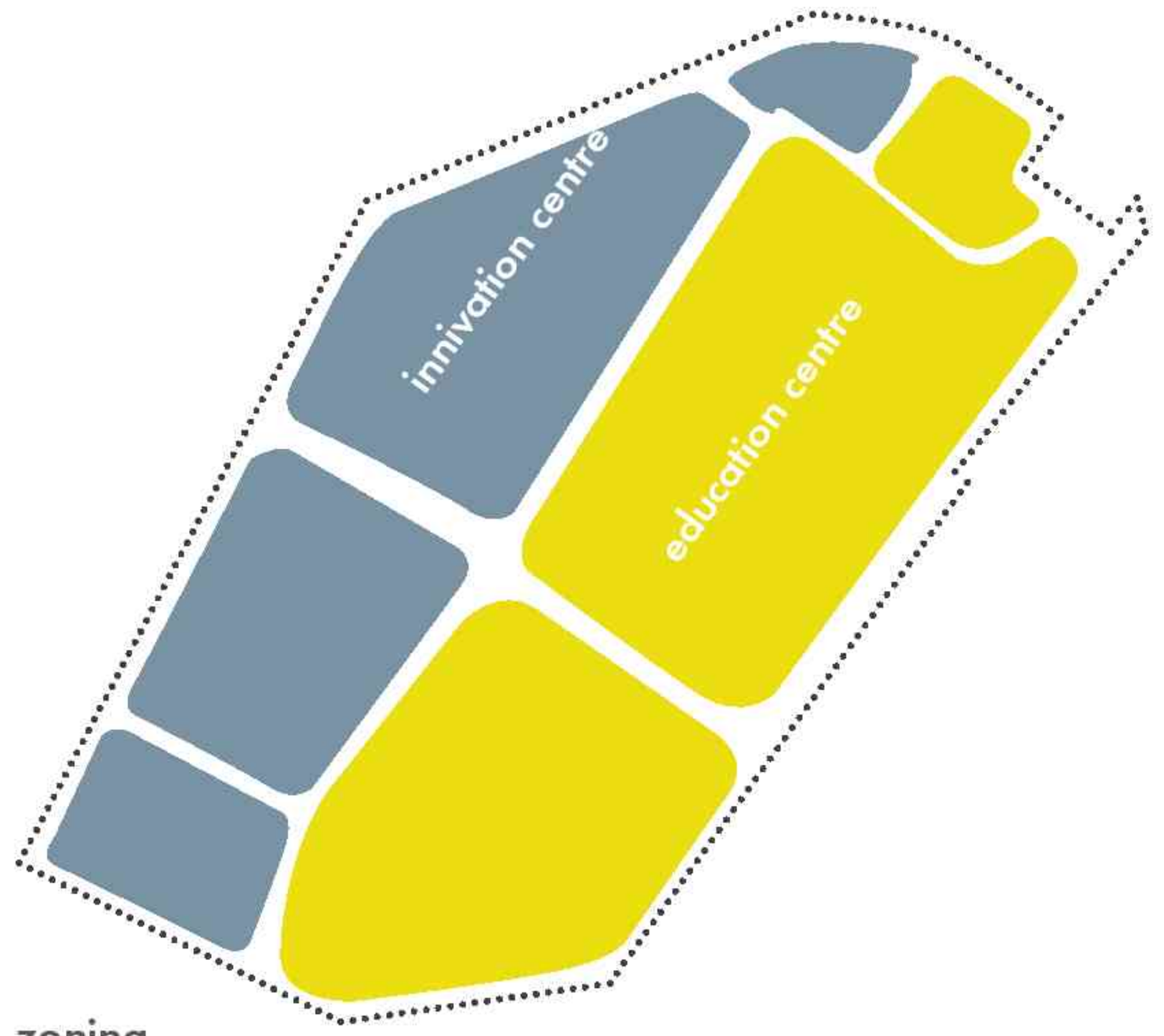
8 ON FOOT

All of the elements of our IMTO Highpark masterplan are connected by multiple movement networks, allowing vehicles, and especially cycles, to move around easily and safely. We have, however, given particular status and significance to the oldest, most familiar, and most social, form of transport - walking.

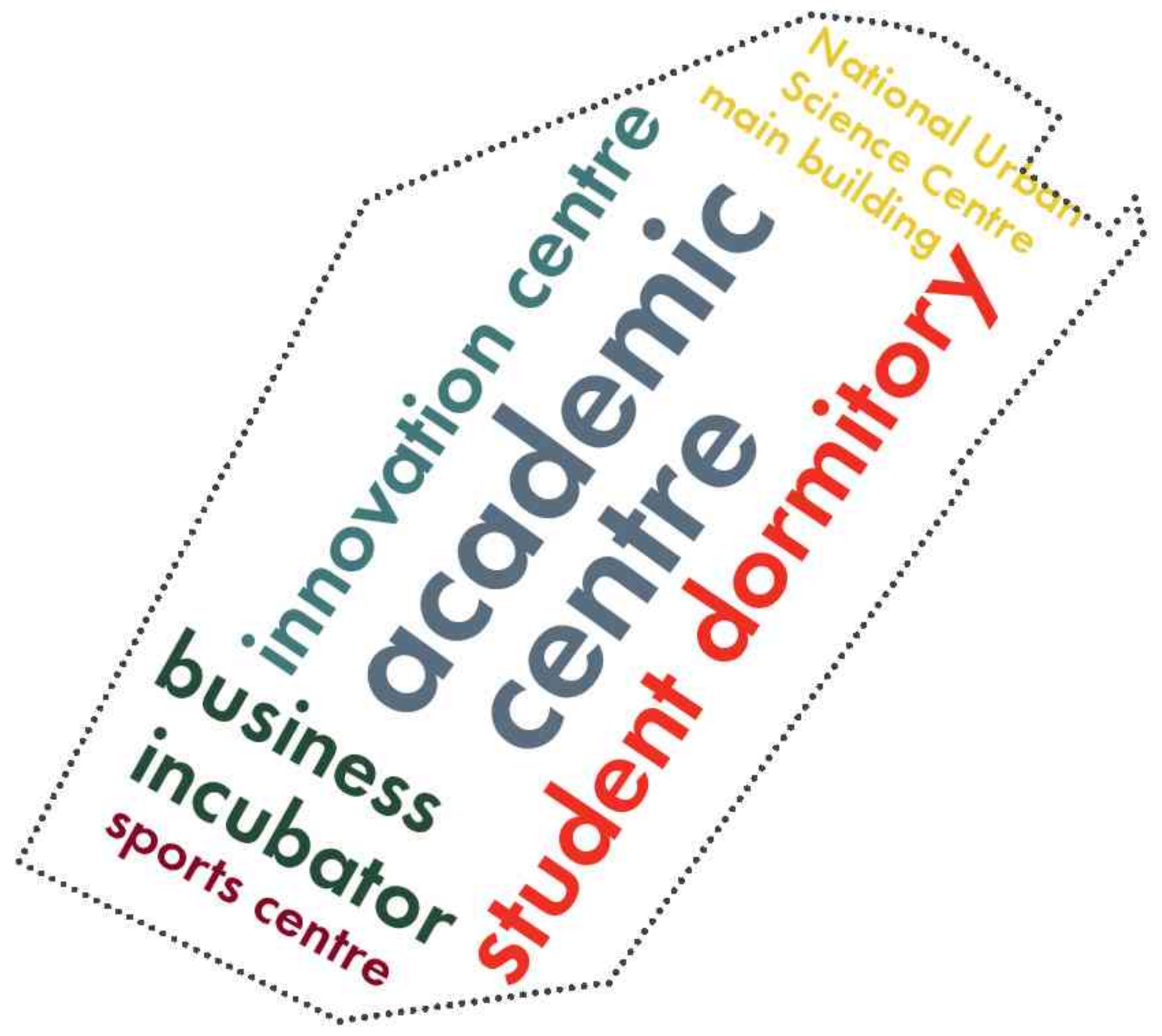
9 A RESPONSIVE ENVIRONMENT

A new site brings new opportunities. We propose a place with all the benefits of urbanity - a place to connect and share with others - that is also in harmony with nature. Its matrix of green spaces are framed by efficient buildings that work with the sun and the wind while below lies a web of future-proof and smart water, energy and data networks.

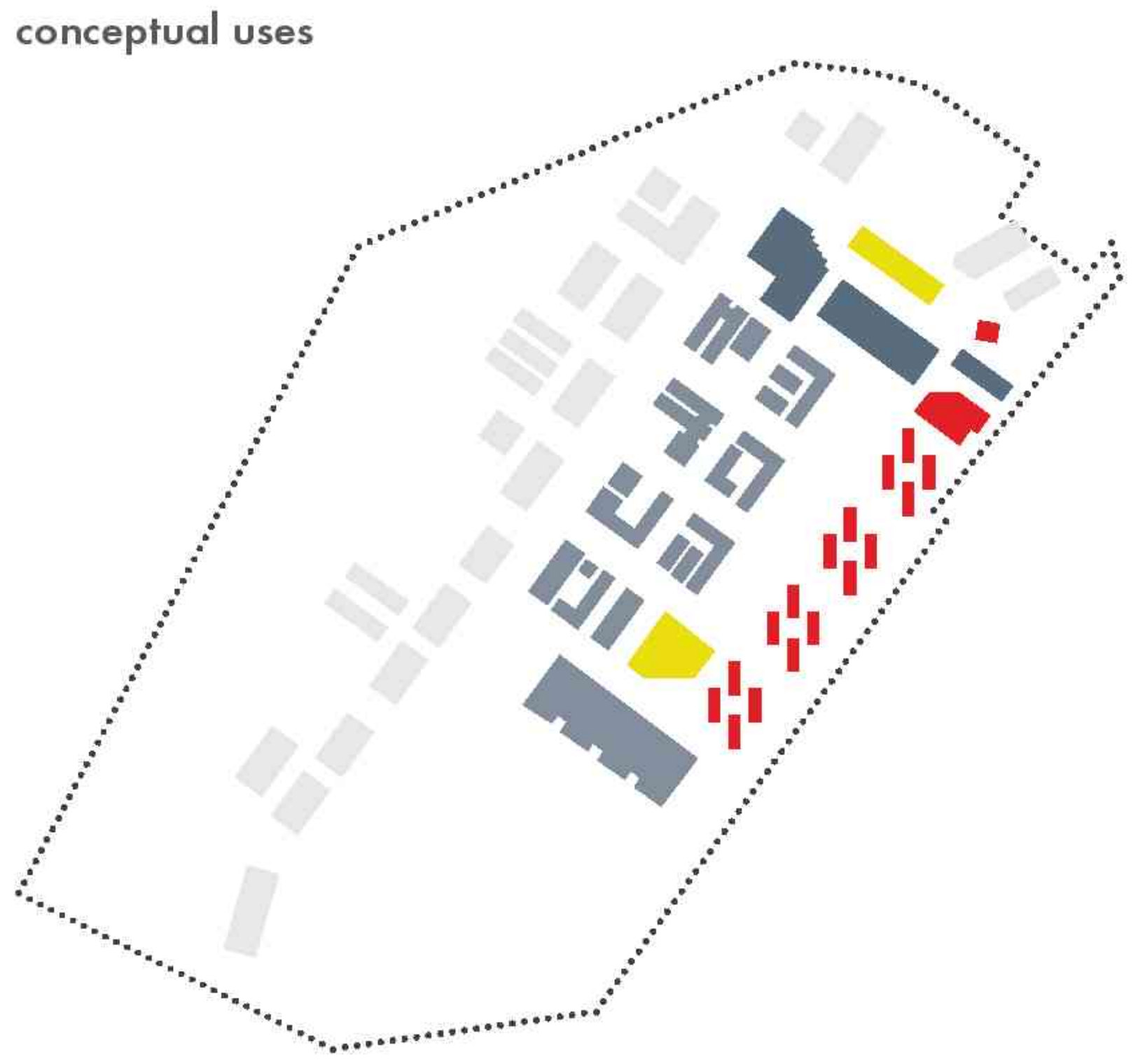
MASTERPLAN PRINCIPLES



zoning



conceptual uses



uses plan

SUSTAINABILITY PRINCIPLES

ITMO Campus Masterplan is ideally placed to deliver an exemplar Campus in line with ITMO University aspirations for Sustainable development. Detailed pre-assessment of the proposal against Green Zoom University and Campus methodology has been undertaken showing that Platinum rating can be achieved. Detailed requirements for each category and targeted credits have been imbedded across the proposal and are highlighted where appropriate. A summary graph shows that a buffer can be achieved ensuring that the rating is secured at Post Construction.

Energy and infrastructure section requirements, in particular, have informed design developments, layout and orientation of campus dwellings and support systems have been adjusted accordingly.

A detailed tracker has been set up by the design team and is available for review upon request. Here explicit commitment to each credit has been confirmed and responsibility clearly allocated.

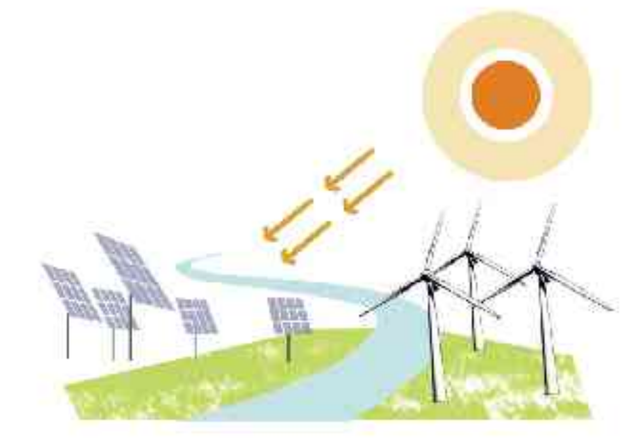
1 SUSTAINABLE NEIGHBOUR HOOD

2 GREYWATER RECYCLING

3 PROMOTE ORGANIC INITIATIVE

4 USE CUT FOR FILL WHERE POSSIBLE

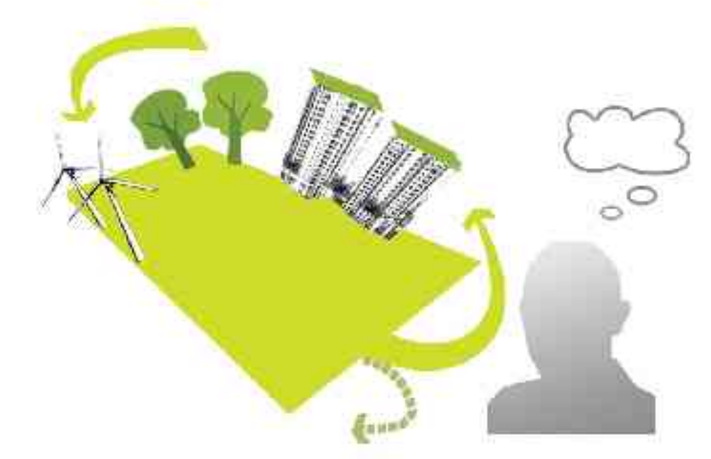
5 RAINWATER HARVESTING AND REUSE



6 RENEWABLE ENERGY PRODUCTION

7 SUSTAINABLE MATERIAL PALETTE

8 PROMOTING BIODIVERSITY

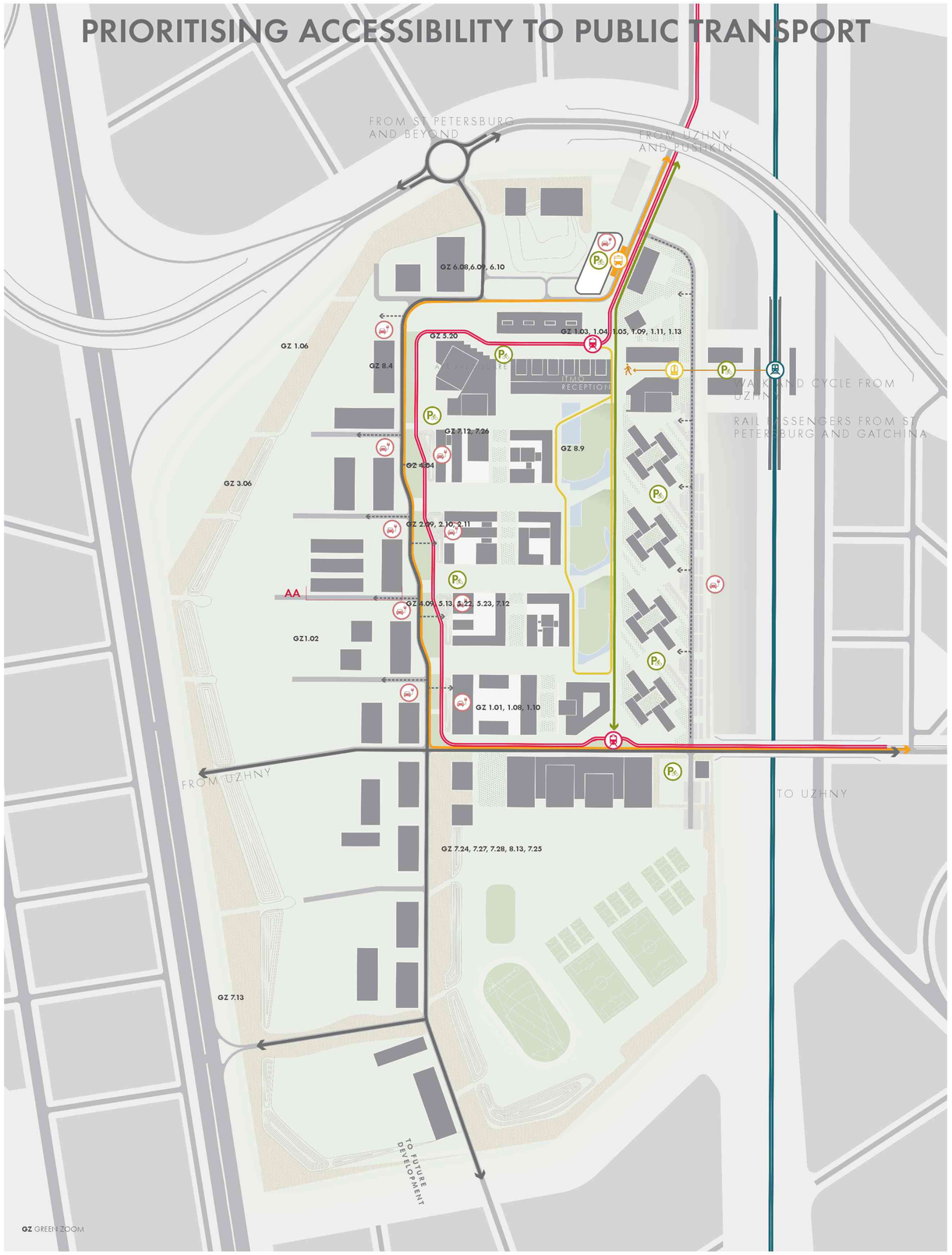


9 SUSTAINABLE LANDSCAPE MANAGEMENT

10 SUSTAINABLE MOVEMENT


sports centre
National Urban Science Centre
Advanced Production Zone
student dormitories
Student Union
office and ITMO reception
FROM STATION
Data Centre
car park and transport hub
TO PUSHKIN
Conference Centre
Learning Centre, Museum and Exhibition Space
Business Incubator

PRIORITISING ACCESSIBILITY TO PUBLIC TRANSPORT

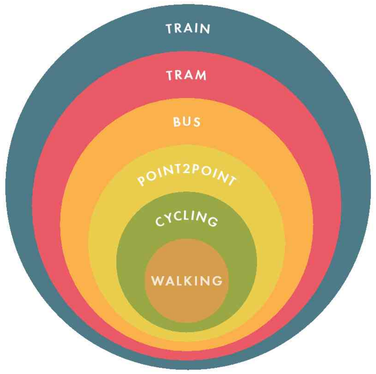


ST. PETERSBURG CONNECTIONS

ITMO Highpark is well connected within Uzhny and St. Petersburg. Links to the city and airport already exist or are planned. Improvements to wider connections are proposed by utilising the existing Lesnoye railway station and increasing frequency of services; routing the proposed tram through the ITMO Highpark campus; and introducing an orbital connection by electric bus.

UZHNY CONNECTIONS

Local connections within Uzhny include linking to a strategic cycle network and maximising the potential of the tram route. It is proposed that an additional rail crossing will be provided over the railway lines to the southeast of ITMO Highpark so that a through tram, cycle and bus route can be delivered connecting to the wider Uzhny catchment.



AN INTEGRATED SOLUTION

Within ITMO Highpark, the emphasis will be to promote and design high quality walking and cycling infrastructure. This will be complemented by Point to Point transport systems, rapid bus services and tram routes through the site and serving the wider Uzhny development. Strategies for car parking, deliveries and emergency vehicles have been carefully considered so that the impact of these vehicles can be minimised.

WALKING

Walking is the sustainable transport of the future. Walking routes are incorporated throughout the design to encourage an active and healthy lifestyle for students, staff and visitors. Heated footpaths and covered walkways will be provided for seasonal travel. A below ground connection will connect the Business Incubator, Main Building and Academic Centres.

CYCLING

Cycling can be an active mode of travel for those who live both within and nearby ITMO Highpark. Cycle routes, cycle parking as well as cycle hire facilities will be provided at the transport hub and throughout. High quality, secure and covered cycle parking facilities will be located within each building as well as in the public realm. Hired cycles could be both traditional bicycles and electric bikes to appeal to different users.

POINT2POINT

To complement walking and cycling, innovative Point to Point Transport is proposed to deliver high quality and frequent connections between the public transport hub and buildings within ITMO Highpark and the wider site. Autonomous pod buses provide an alternative travel option during the winter months and could also assist as a mobility aid. The provision of these can be alongside real time digital information.

BUS

An electric bus rapid transit system is suggested for implementation at the early stages of development. This system can provide a fast service to ITMO Highpark from more local destinations, such as Pushkin, as well as connect the local area to Lesnoye railway station and the public transport hub. A shuttle bus service can also operate between ITMO Highpark and ITMO University at St Petersburg.

TRAM

The proposed strategy for the future tram connection to ITMO Highpark aims to maximise catchment areas and the potential of this to be a key connection between the site and Uzhny. Two tram stops are proposed to serve ITMO Highpark. One will be located at the northern public transport hub where interchange with other public transport services will be available. The second stop will be located at the southern end by the Sports Centre and National Urban Science Centre. A third stop in the Innovation Centre can come forward when required.

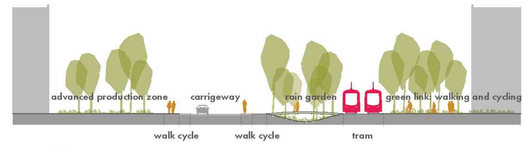
TRAIN

ITMO Highpark benefits from being located next to Lesnoye railway station. This will be a key arrival point for those coming from St Petersburg and further afield. A high quality connection is proposed between the station and ITMO Highpark.

CAR

Car parking will be provided at a number of locations within ITMO Highpark. There will be flexibility to convert these parking areas to alternative land uses in the future. Electric charging, Smart Parking Systems, Car Clubs and Car Sharing platform will be provided to minimise the impact of private car use and encourage use of alternate fuel cars only within the campus.

A Consolidation Centre for deliveries will be provided and no lorries will be allowed further into the site. Last mile deliveries will be undertaken using automated pods, freight cycles and electric vehicles.



section AA

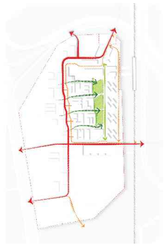
STREETS

A grid of tree lined streets imposes a strong gesture on the campus and knits together the various buildings and functions. The grid is aligned with the arrangement of the buildings, roads and parking areas.

A central water spine along the N/S boulevard can act as a storm water treatment and harvesting system.

key elements

- Primary green N/S and E/W green boulevards shared between cars, pedestrians cars
- E/W internal spines/shared surfaces
- Tree lined streets/green environment.
- Raised tables at key junctions
- Swales and SUDS
- Pedestrian friendly environment
- Seating opportunities

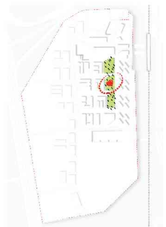


UNIVERSITY GREEN

The central space is the centrepiece for the campus, where the choice and opportunities for learning and socialising in a landscape setting all come together. The new Green offers a unique opportunity to socialise, learn and enjoy campus life. A multi-functional space.

key elements

- The design creates a multitude of opportunities to bring people together by providing the social infrastructure to create places for people.
- The Green is a terraced space that can be used for both special events and informal daily activities.
- The space allows ceremonial gathering space for students and visitors.
- Both hard and soft; it can feature lawn, tree groves and garden.
- Key circulation paths to building's cores.
- Pavilions and pop ups at key junctions.
- Key feature such as water feature or infiltration garden.

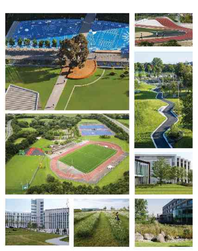


INFORMAL PARKLAND

A more informal parkland setting complements the sports building to the south and the west edge of the site. The area is open and informal and incorporates outdoor sports areas as well as ecological features within a parkland setting.

key elements

- MUGAs and sports areas
- Running tracks and trim trails
- Informal amphitheatre spaces
- Walkway in the park
- Ecological areas/wetlands/attenuation ponds
- Strong seasonal variation and colour
- Landforms
- Wild-flower meadow



ITMO HIGH PARK IS STRUCTURED BY ITS LANDSCAPE

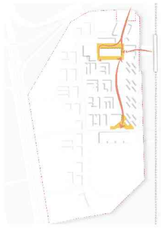
SQUARES

Arrival Square is the main gateway into campus. A flexible hard space providing a Forecourt to the main building. It directs people to key areas and gets activated by events and gatherings.

South Square provides a forceourt to The National Urban Science Centre.

key elements

- Hard and flexible
- Seating areas
- Way-finding and feature lighting
- High quality materials
- Pedestrian friendly environment
- Seating opportunities
- Events and gatherings
- Feature trees

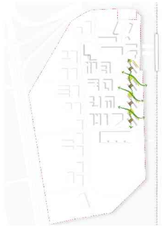


RESIDENTIAL COURTS

The residential courts include social areas and informal facilities to cater for students occupying different accommodation blocks. Spaces encourage socialisation in a more private and intimate environment.

key elements

- Soft and hard gravel informal areas
- Gardens and trees
- Informal social spaces
- Seating areas, moveable chairs, power outlets for laptops, BBQ facilities and Ping Pong tables.
- The changing scales of the spaces create many opportunities for day and night time use.
- Strong seasonal variation and colour

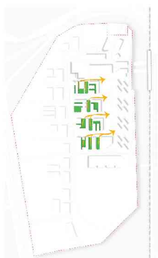


OUTDOOR CLASSROOMS

The collegiate spaces provide outdoor learning areas and 'pods' to the main academic buildings.

key elements

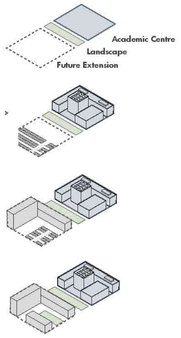
- Mainly hard flexible gravel areas
- Feature trees with seasonal interest
- Informal social spaces
- Seating areas
- Outdoor stages for lectures.
- Wi-Fi areas
- Communal spaces with tables and chairs

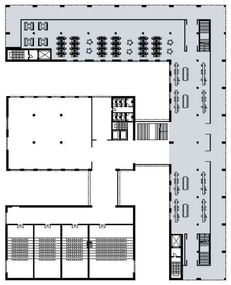


looking south along University Green from the Main Building

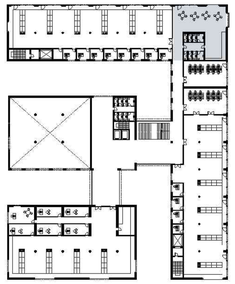
ACADEMIC CENTRE

Immediately visible from the main northern entrance to the site, the three Academic Centres (Centres for Information Technologies, Photonic and Quantum Technologies, and Health and Life Sciences) all occupy prominent positions on the western edge of the University Green. They are each unique but share a number of common characteristics.





ground floor



first floor

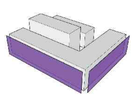
possible future extension and typical floor layout

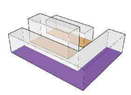
BASELINE DESIGN
The baseline design corresponds to the anticipated energy consumption of the building type when designed to local code compliance. This provides valuable insight into energy trends upon which we can develop strategies to improve performance - outlined further below.

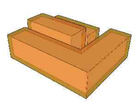
PRODUCTION

FUNCTIONAL FLEXIBILITY
Configuration of the academic centres ensures both operational and environmental efficiency. A variety of teaching spaces are positioned along the two primary elevations, with supporting administration spaces and lecture theatres configured to suit each faculty behind.

PRIMARY FACADES
The academic buildings will each provide two primary facades that orient towards the main building - North and East. This provides ideal conditions for teaching spaces, maximising daylight provision internally while also mitigating any risk of occupant glare.





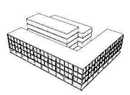


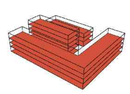
FORM AND FABRIC PERFORMANCE
The academic buildings are developed with compact form and high performance external envelope. These strategies conserve heat energy, in addition to enhancing thermal comfort conditions internally.

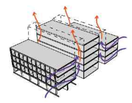
OPTIMISATION

THERMAL MASS
The academic buildings benefit from a consistent periods of high occupancy which generates considerable amounts of free heat. Considered provision of exposed thermal mass to interior spaces can greatly assist in regulating internal conditions and dampening temperature fluctuations.

FACADE DESIGN
The buildings facade plays a critical role in providing comfortable internal conditions and minimising energy demand. Glazing ratio limits have been set for each facade to encourage high levels of daylight into teaching zones, with integrated shading to protect from excessive solar exposure.



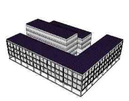


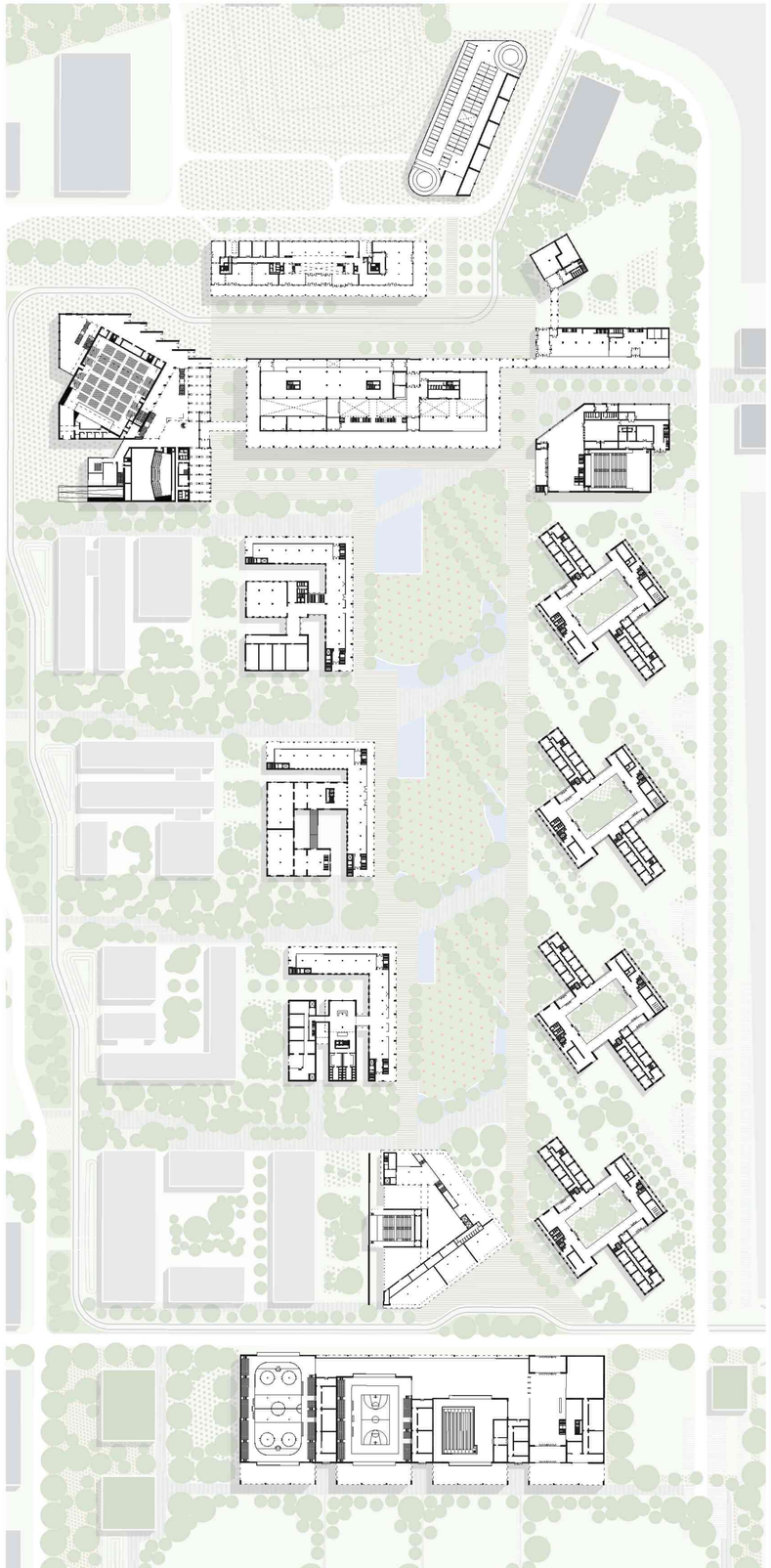


NATURAL VENTILATION
Our early study of the St Petersburg climate revealed periods of the year in which natural ventilation could be utilised. This strategy can produce substantial reductions in both cooling and fan energy demand by removing mechanical ventilation at these periods. The academic massing can be configured to introduce atria which can be used to facilitate a stack effect and exhaust warm stale air.

EFFICIENCY

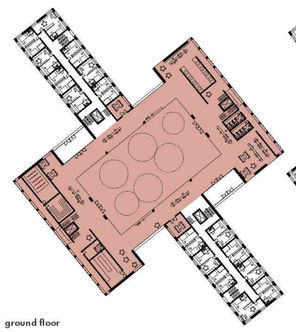
PHOTOVOLTAIC PANELS
The electrical energy demand of the academic buildings can be met through incorporation of roof mounted PV panels, with any excess redistributed into the campus's smart grid.



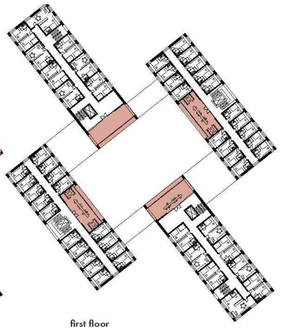


STUDENT DORMITORY

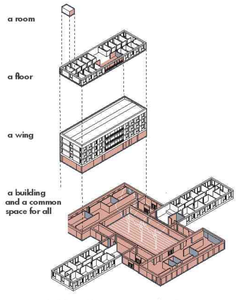
The four student residence buildings line the eastern edge of University Green. Unlike the Academic Buildings, they not oriented with the space but rather to the sun - aligned on a north-south axis to bring sunlight into every room, even in mid-winter. Each building is composed of four separate wings that, together, frame intimate communal gardens.



ground floor



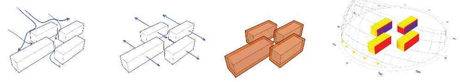
first floor



a building with common space for all

communal areas, conceptual foundation and typical floor layout

PRODUCTION



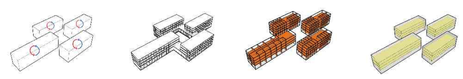
FORM AND FABRIC PERFORMANCE
The residential buildings are developed with compact form and high performance external envelope. These strategies conserve heat energy in addition to enhancing internal thermal comfort conditions.

PASSIVE SOLAR DESIGN
The massing design and orientation has been developed to maximise solar exposure to vertical facades. Detailed solar analysis was carried out to establish exposure levels during winter months when solar availability is lowest. This strategy ensures an effective passive solar strategy can be developed to offset heating demand.

MAXIMISING VIEWS
The design of the residential 'cluster' optimises views out, both into the semi-exposed courtyards and out across the ITMO campus. This strategy helps to strengthen a sense of identity and community within each cluster, but can increase security by providing overlook into more isolated areas.

ENHANCING MICROCLIMATE
The layout of each residential cluster serves to dampen the effects of cold westerly winds observed during winter periods in the St Petersburg climate.
This ensures that the conditions within each courtyard space are shielded from higher wind flows, extending periods for students to gather and spend time.

OPTIMISATION



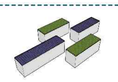
THERMAL MASS
Considered provision of exposed thermal mass to interior spaces can greatly assist in regulating internal conditions .This can be of particular benefit to dampen temperature fluctuations during St Petersburg's warm summer months and mitigate risk of overheating.

LIGHTING POWER
Artificial lighting can be reduced substantially through use of low energy fixtures, in addition to regulating usage through daylight and occupancy sensors, ensuring artificial light is only used when required.

FACADE DESIGN
The buildings facade plays a critical role in providing comfortable internal conditions and minimising energy demand. Glazing ratio limits have been set for each facade to encourage a passive design approach, with integrated shading to protect spaces from excessive solar exposure during summer.

HEAT RECOVERY
Residential buildings are heating dominated buildings, and yet they also waste large amounts of heat from existing processes. Much of this waste heat can be recovered and redistributed in the building to minimise heating energy demand. Mechanical ventilation units will incorporate heat recovery from exhaust air, and heat can be recovered from shower drainage to pre-heat hot water supply.

EFFICIENCY



PHOTOVOLTAIC PANELS
The electrical energy demand of the residential buildings can be met through incorporation of roof mounted PV panels, with any excess redistributed into the campus's smart grid.
The residential rooftop spaces also present opportunities to incorporate rooftop gardens, allowing students the opportunity to grow food and add amenity space to strengthen connections.

Car park
and Transport Hub

Data Centre

Business Incubator

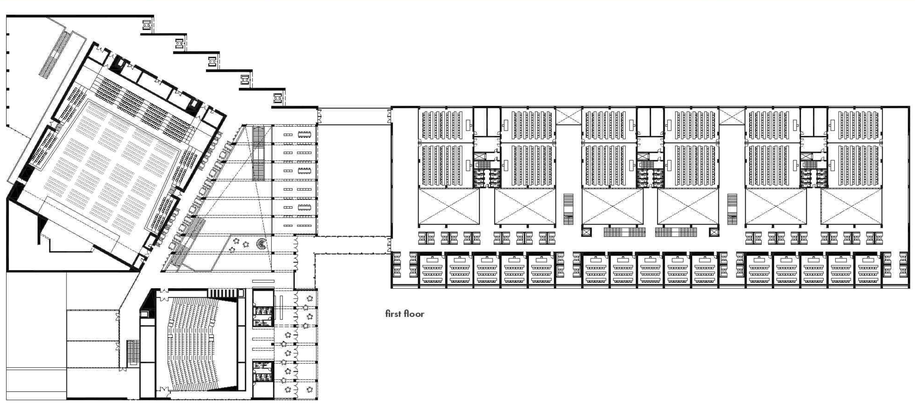
Office and ITMO Reception

Conference Hall

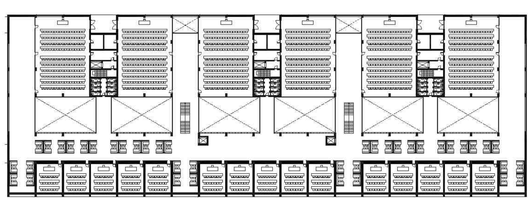
Learning Centre, Museum and Exhibition Space

Student Union

Lecture Hall



first floor



second floor

section

8 MAIN BUILDING

Learning Centre cafe

Museum

Learning Centre foyer

The Main Building is divided into three interconnected parts. The first contains the University offices. The second contains the cafeteria, the museum/exhibition space and the teaching spaces, as well as a variety of areas for social learning. The third contains the main lecture hall, the conference hall and the Centre for Culture and Creativity.

This subdivision allows each component part to assume its own form, scale and identity. Importantly, it also enables the detailed briefs for the different parts to be developed independently.

ADVANCED PRODUCTION ZONE

The indeterminant phasing of the Advanced Production Zone allows for programmable landscape areas that can be adapted for a number of uses and initiatives.

key elements

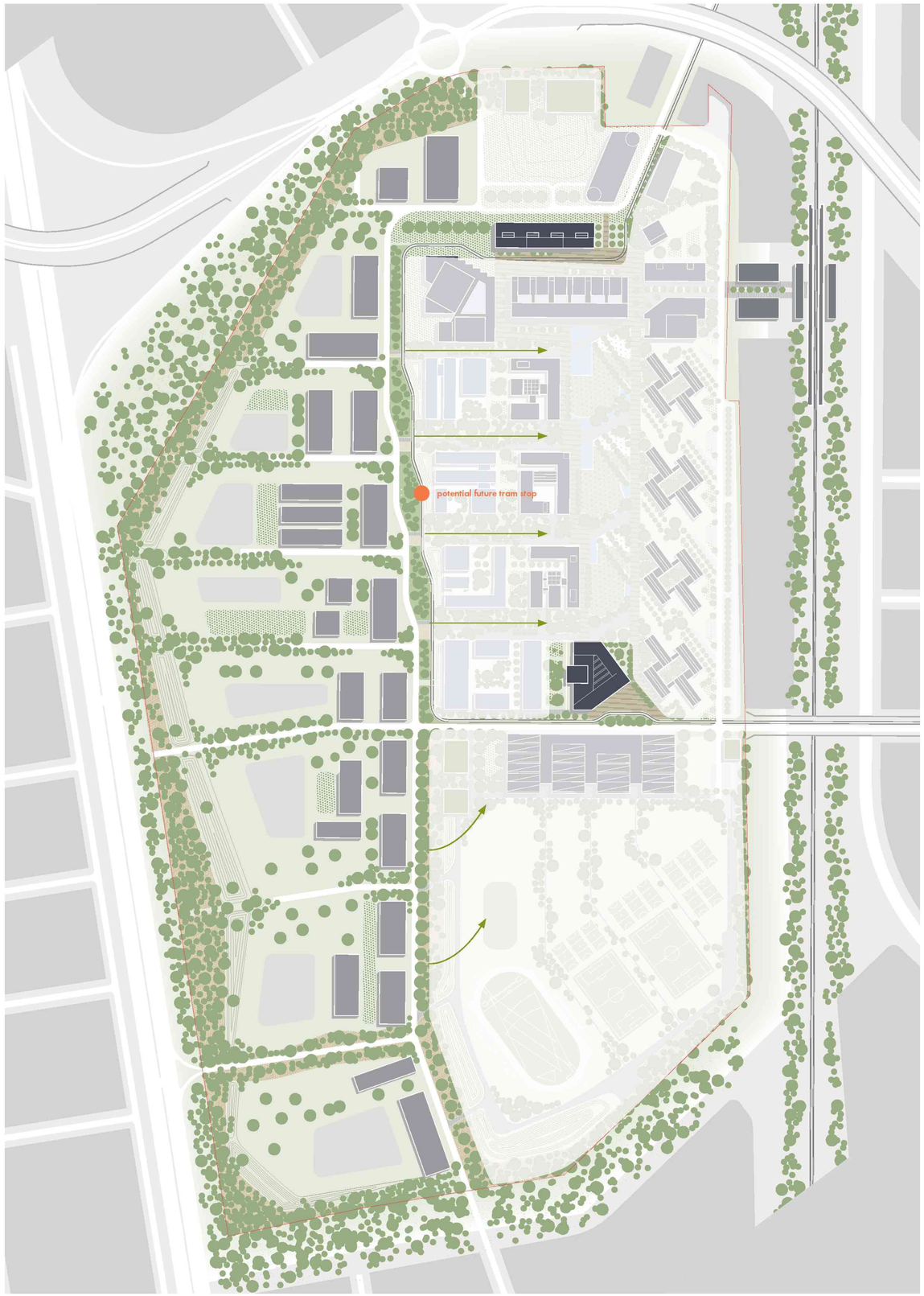
- Modular landscape/e.g.. Temporary garden areas
- Sculptural landscape/landforms (e.g.. Re-use material for excavation) providing snow scape in winter
- Modular greenhouses for food production (e.g.. fruits/vegetables)
- Temporary sports areas/ice rinks
- Pre-verdissement and temp nurseries.
- Grow trees for future uses in permanent landscape areas. The trees can be left adjusting to the local climate for several years.


Food production


Winter sports


Grow trees


Art and Installations

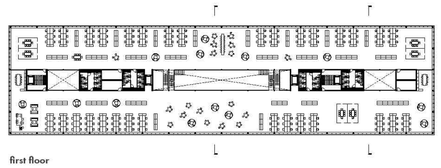


Advanced Production Zone
development option 2

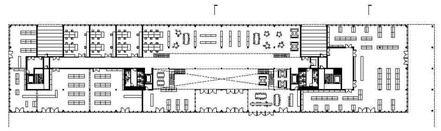
Advanced Production Zone
development option 3

The area allocated to the APZ is largely flat and unconstrained, and served both by the main site road and by the tram. To the east it connects directly to the University via footpaths and cycle paths feeding through the green matrix. To the west it has the advantage of clear visibility from the M20, which will be available to every plot.

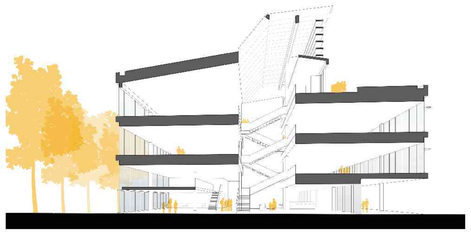
BUSINESS INCUBATOR

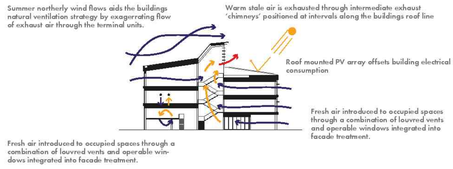


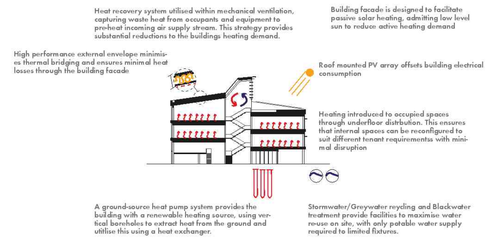
first floor



ground floor

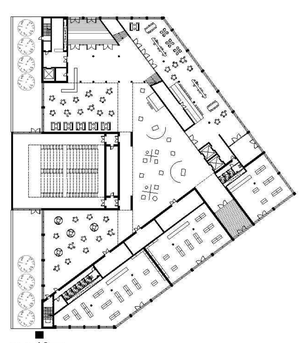




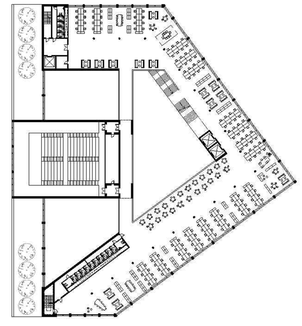


The Business Incubator is a place for exchange and interaction - a place for new ideas to grow, new relationships to form and new opportunities to emerge. It is designed to cultivate collaboration, to be highly flexible, and as a zero-carbon exemplar, to be very sustainable.

NATIONAL URBAN SCIENCE CENTRE



ground floor



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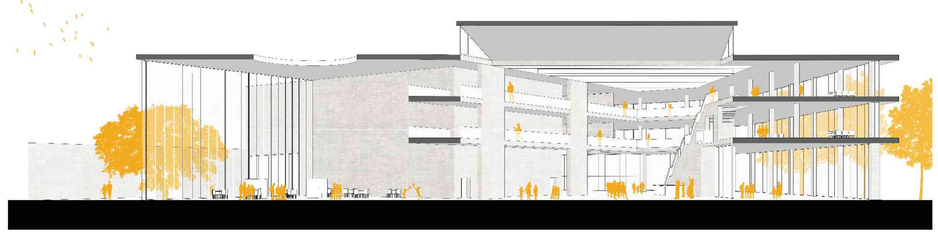


This building fulfils two roles in the masterplan; it defines the southern edge of University Green while also bringing life and activity to the South Square. Internal commons lies at its heart, with a large light-filled exhibition space flanked by a wide "social stair" and a prominent public lecture theatre.

INTRODUCTION

The key infrastructure and engineering topics that we have developed strategies for are:

- Earthworks, Basements and Utility Tunnels
- Water Supply and Foul Drainage
- Flood Risk Reduction and Surface Water Drainage
- Energy
- Information and Communications Technology

Our methodology for developing these strategies includes: gaining a good understanding of the site context, proposing topic-specific objectives and strategies to meet these objectives and integrating the preferred strategy into the masterplan.

Our vision for ITMO is to create a place which is not only an exemplar of the Green Zoom guidance but also an exemplar of the UN Sustainability Design guidelines and the aims of Planetary Boundaries thinking.

Context

The site is a "green field" site located 17km south of St Petersburg and has an area of 86.7ha with 40ha proposed for development as an Innovation Centre. The site is bounded in the west by the Pulkovskoe highway and in the east by the St Petersburg – Gatchina - Luga railway line. A grade separated junction on the Pulkovskoe highway was built in 2011 and connects to the road to Lescoe in the immediate north west of the site and provides a good opportunity for road access to the site.

The new campus will have 3,300 Masters, 400 PhD students and 2,500 students and 300 academic staff will be residential.
The site is relatively flat in the southern half with a gentle gradient falling from 96m in the west to 94m AOD in the east. There is a slight mound in the north west of the site at 96.6mOD falling 10m to a depression in the north east at 89.6mOD.

The geology consists of a variety of surface soils overlying sedimentary rocks.

The surface deposits consist of:
- Lake Deposits
- Glacial deposits
- River deposits
- Organic rich soils including peat

The solid geology consists of Limestone underlain by sands and gravels.

Foundations in Limestone need careful consideration because of dissolution features creating hollows and caves but can be designed for. Other considerations are variability of the surface soils, potential for differential settlement and ground gases from organic soils including peat. Seismicity is relatively low.

There is likely to be a high groundwater level, within 2m of the ground surface and a deeper aquifer in the limestone.

It is likely that there will be a degree of surface water flooding and ponding after prolonged wet periods in the low-lying depression in the north east of the site.

Groundworks Objectives

- Respect the natural levels and topography,
- Minimise cut and fill – acknowledging that there will be excavations for basements, logistics and utility tunnels,
- Minimise import and export of earthworks materials,
- Use the excess material generated from excavations to reflect and enhance the existing topography, and
- Create smart basements which are flexible in their use and integrated with the development, the logistics system and the utility tunnels.

Groundworks Strategy

The basement internal height is proposed at 3.5 m to provide flexibility for future uses, and the logistics/utility tunnels are designed to provide easy access, maintenance and connections to development plots without impact at the surface.

Water Objectives

- Be self-sufficient with respect to water supply, particularly in the early phases and link into the water supply system of the wider masterplan for future phases to provide additional resilience for both the ITMO site and the wider masterplan,
- Significantly reduce demands and use appropriate recycling and reuse strategies,
- Provide an appropriate level of flood protection for the site, and
- Ensure the development has no adverse effect on flood risk for adjacent sites and where appropriate reduces this risk.

Water Strategy

- The water supply will be from on-site boreholes and will extract high quality water from the aquifer in the limestone. The water treatment plant is located in the upstream part of the site to reduce potential for cross contamination.
- Sustainable urban drainage will be used and infiltration and groundwater recharge will be used to mimic the natural system.
- The main pedestrian routes will be permeable and heated to ensure that ice and snow are not a problem and ensure that no de-icing chemicals are required. This will allow the rainwater to be either harvested directly for non-potable use or infiltrated into the ground to recharge the aquifer.

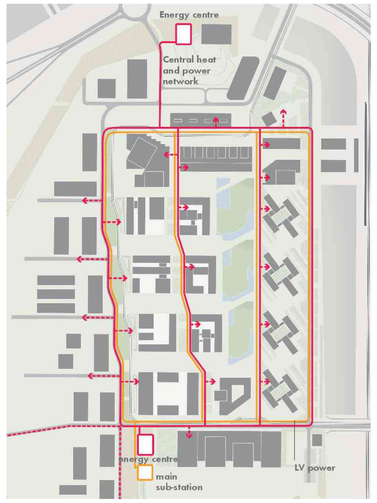
Foul water can be treated on site through a natural process, including filtration reed beds for non-potable reuse on site.

ENERGY

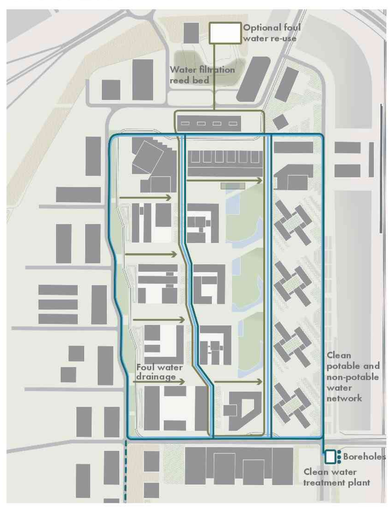
Energy Objectives

- Be self-sufficient with respect to energy supply, particularly in the early phases and link into the energy systems of the wider masterplan for future phases to provide additional resilience for both the ITMO site and the wider masterplan,
- Significantly reduce energy demands for the project,
- Optimise the proportion of sustainable energy generation for the project both on-site and off-site, and
- Identify synergies between systems.

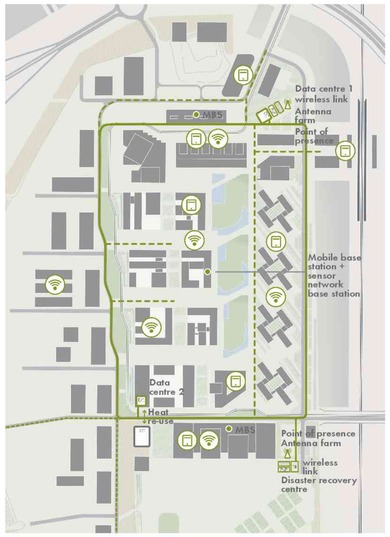
Energy Solution:
The site will have its own energy centre form the outset linked to the gas network and capable of providing all the electricity and district heating requirements. For resilience the site will also be connected to national electricity grid and will also incorporate sustainable onsite generation from solar and wind. It will also harvest heat from the ground, air, substation and wastewater.



WATER



SMART CITIES



SMART TRANSPORT

Smart transport is defined here as a more time efficient and sustainable transport service by using data to digitalise existing transport modes and enable new model of urban mobility.

We consider the future models of urban mobility as the solutions that could provide a new way to move people from A to B within the campus, including:

- Electric Motor Scooter Sharing: To meet the needs of last mile mobility and the desire of providing comfortable public transport service, ITMO Highpark could install and maintain an electric motor sharing service. This service could be integrated into a tap payment card system and an app could support its use in the campus and surrounding area.
- Autonomous Vehicle Shuttles A "car-lite" campus should be introduced to reduce the reliance on cars and move towards more sustainable modes of transportation. To realise this, ITMO Highpark will need to reduce the number of cars on roads and shift trips made by private cars to other transport modes.

SMART PARKING

Smart parking strategies are increasingly implemented in cities and towns. Its purpose is to mitigate congestion and cut carbon emissions by distributing real time parking space information to help drivers reduce circling time.

To help ITMO further contribute to the car-lite vision, they could encourage the use of electric vehicles, car sharing or ride sharing customers by prioritising their parking space requests in the smart parking service. We consider smart parking as a possible initiative for ITMO based on the following three reasons:

- Balance Parking Space Demand and Supply: It could help ITMO manage onsite parking space demand and supply in real time. By distributing parking information across the site in different time, ITMO could improve parking space utilisation and provision parking space demand. This could also inform the future planning for parking space allocation and overall site land use.
- Economic Opportunity: Smart parking could enable ITMO to introduce dynamic pricing based on real time parking space demand and supply over time. This could be an opportunity to increase revenue from parking service. In addition, automating parking service by using sensors, digital portals and integrating payment systems could help ITMO reduce the cost of parking enforcement.
- Positive Use Experience: It could help reduce time taken to find parking and reach final destinations. By disseminating real time parking service information, it could influence people's travel behaviours.

REAL-TIME WAYFINDING

Real-time site data gathered from sensors could enable responsive routing, for example for pedestrians to take the cooler, shaded walking path. In addition to dynamic, interactive wayfinding and route information that inform users of the various mobility and route options available, further digital intervention could help create an environment which is more accessible and viable for alternative forms of transport, such as walking, cycling or electric scooters.

Digital wayfinding will also enable increased levels of access across languages for foreign visitors and enable users to choose their mobility options according to their own personal priorities, such as carbon emissions, activity level or time.

SMART BUS STOPS

In addition to bus journey data collected in real time, ITMO Highpark could use smart bus stops that monitor the number of people waiting at a bus stop to inform efficient service delivery. This could space out bus services if demand is low and provides the operator with a new and informative data set. Smart bus stops also utilise digital signage to interact with passengers and can display a range of personalised information from local events to marketing. This initiative would therefore suit ITMO Highpark for the following reasons:

- Positive User Experience: Users would enjoy the interactive elements of the bus stop, enabling them to plan their journeys more effectively with clarity of the location of buses. Digital signage can also promote local events and businesses
- Environmental Sustainability: By informing the operator of the number of passengers at each bus stop, services can be spaced out or increased to fit demand, which reduces the number of unnecessary journeys.
- Economic Opportunity: Interactive digital signage can add a revenue stream for advertising, particularly if this is targeted based on the user or location of the bus stop.

SHARED RESOURCE KIT

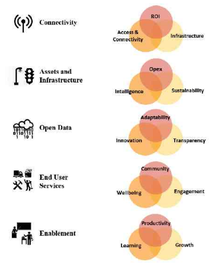
A 'social network for tools and skills' enables a resource-effective sharing of resources across the campus, from tools, kitchen equipment and camping gear through to industrial machinery, along with the skills required to use them well.

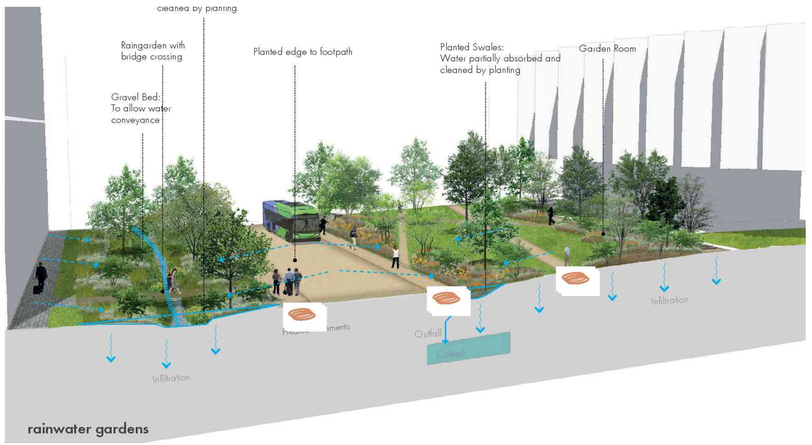
Hackable Spine

Exposed service conduit snaking through the campus, providing open network access, hooks and connections for digital and physical prototyping, a 'hackable' structure used by students and researchers as the basis for an IoT living lab, as well as a colonnade-like landscape feature.

Drone Stableyards

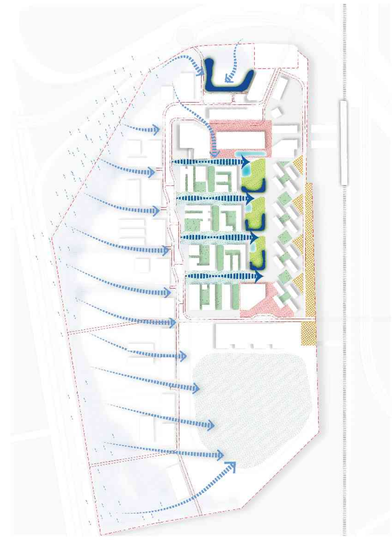
Rooftop drone docks provide a hub for super-local logistics and deliveries, as well as repair and recharge. Part of overall roofscape strategy, combined with local renewable energy and shared social spaces.





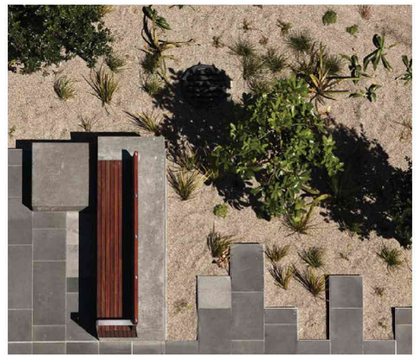
rainwater gardens

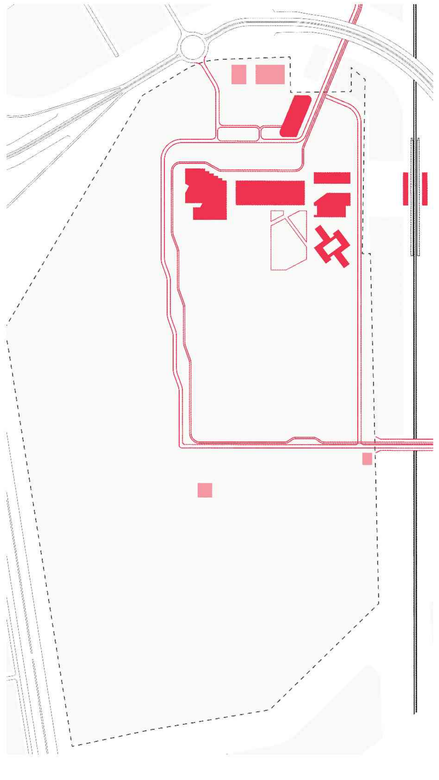
SUDS



A robust network of sustainable urban drainage is integrated throughout the site. Rain water falls through the woodland at the western edge of the site toward the spine road and campus. The spine road contains rain gardens and bio-swales to collect surface water runoff and prevent flooding.

The green links into the campus continue to direct the water through the rain gardens on the University Green to collection points where it can enter the water recycling network. Pavements are heated in winter to maintain walkable routes and facilitate year-round water collection.





stage 1

2019

ITMO University Main Building

Student Union

Student Dormitory, building 1

tram line

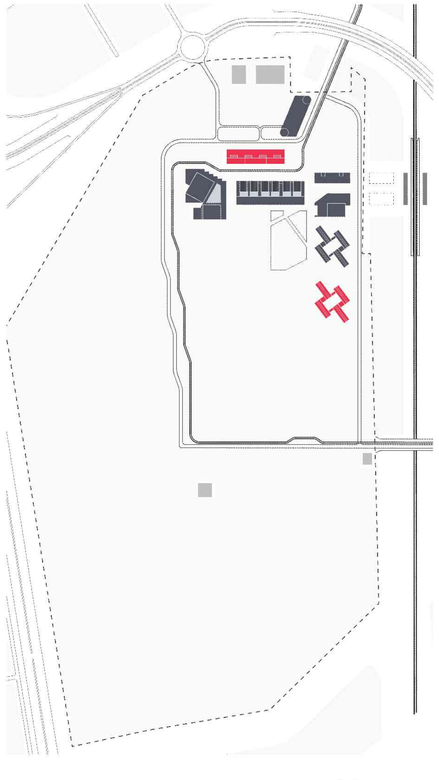
spine road

improved train station

transport hub

energy centre and substation

water treatment plant



stage 2

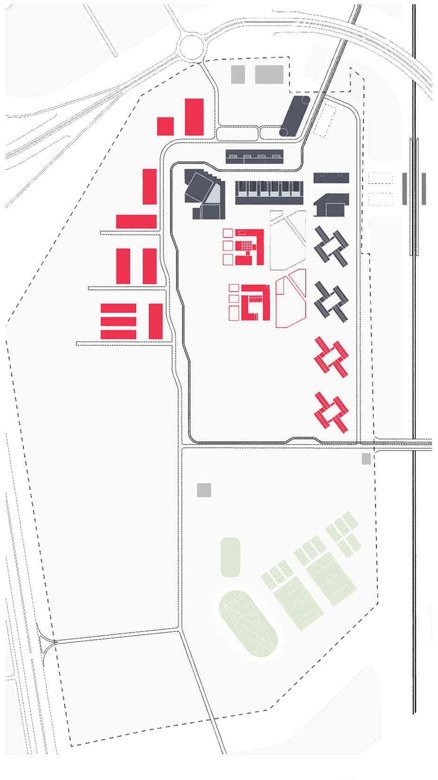
2020

Student Dormitory, building 2

Business Incubator

Campus Green

temporary landscape in the APZ



stage 3

2021

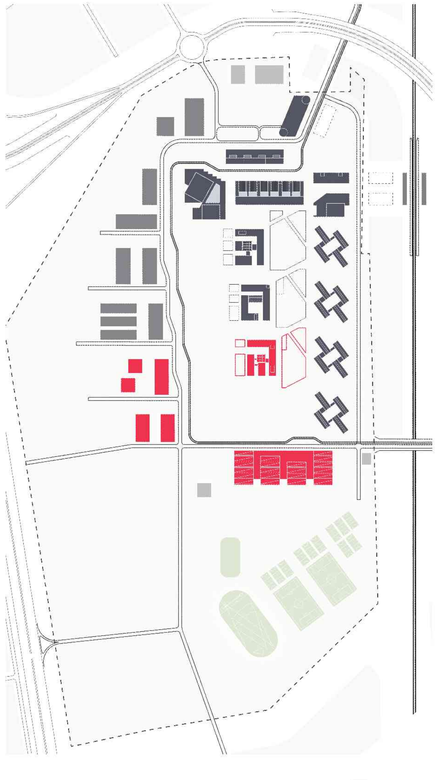
Student Dormitory, building 3 and 4

Centre for Information Technologies

Centre for Photonic and Quantum Technologies

Advanced Production Zone

playing fields



stage 4

2023

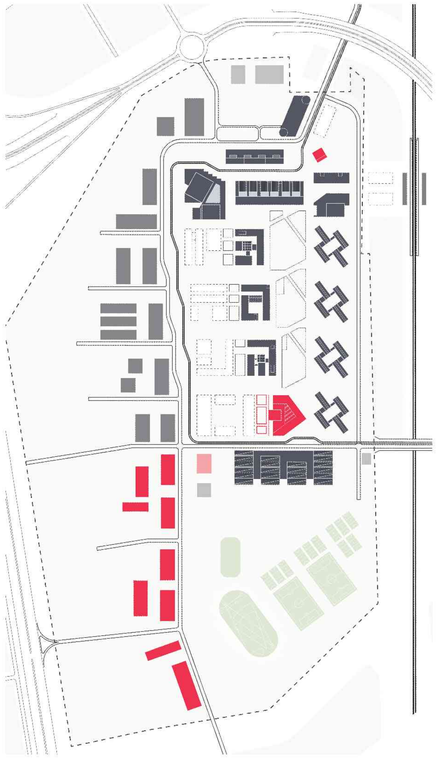
Centre for Health and Life Science

Sports Centre and Cafeteria

Advanced Production Zone

energy centre 2

data centre 2



stage 5

2025

Data Processing Centre

National Urban Science Centre

Advanced Production Zone

view north towards the Main Building

ITMO Highpark will be a new kind of place.

It will be a place that combines the best qualities of the city - a clear urban hierarchy, well-defined patterns of movement, and continuity with adjacent neighbourhoods - with those of a campus - an all-embracing landscape structure and a powerful sense of identity and community.

It will be a place that puts people first; its students, teachers, researchers, visitors, entrepreneurs. A rich network of common spaces, both external and internal, will provide a year-round platform for community and collaboration.

It will be a place that is future proof and flexible. That will allow incremental implementation while still feeling complete at every stage. With sustainable buildings that work with the sun, the wind, and the cycle of the seasons and smart infrastructure designed to grow and change.

And, perhaps above all, it will be both a catalyst, and an exemplar. Stimulating and inspiring the evolving form and character of Uzhny - and setting a new standard for future urbanism.