



AAK Annual Convention | 2019

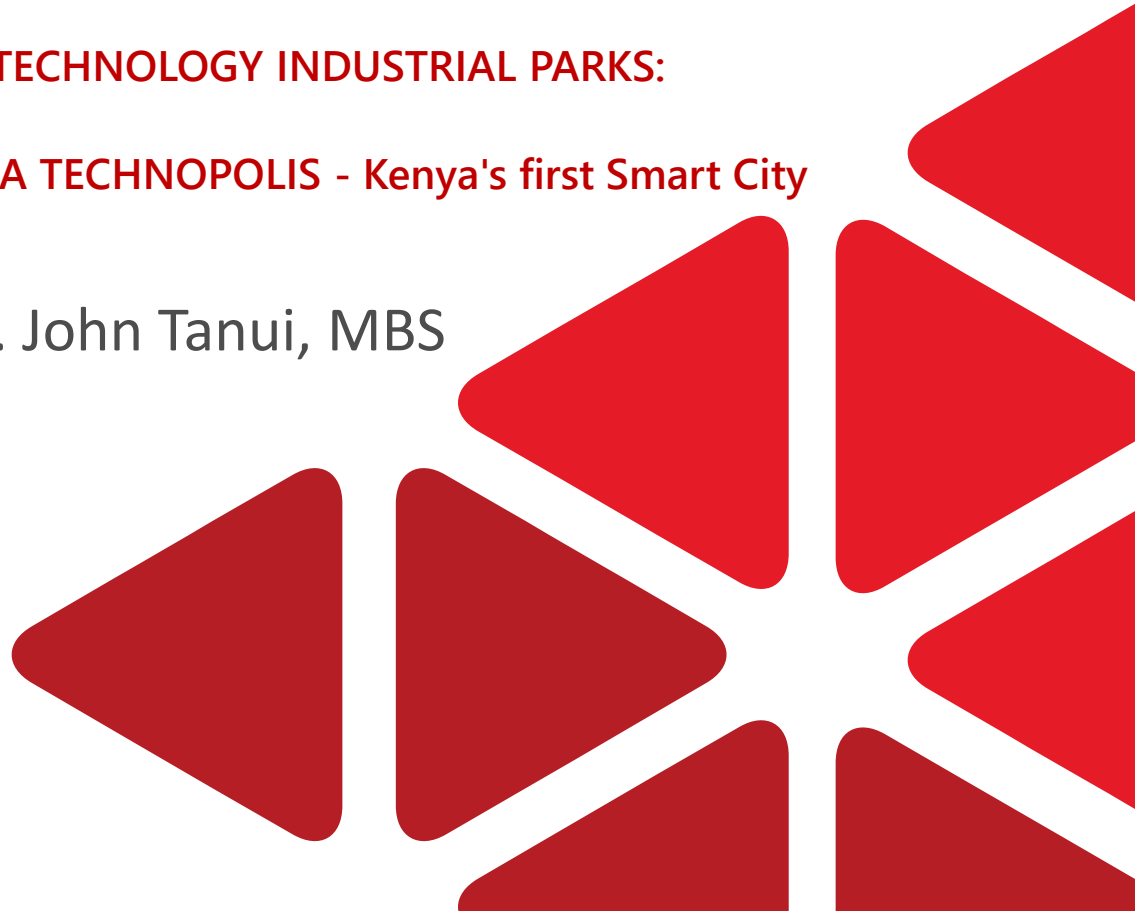
Building Blocks and
the Built Environment

14 - 16 August • Sarova Whitesands Beach Resort
Commonwealth Association of Architects General Assembly

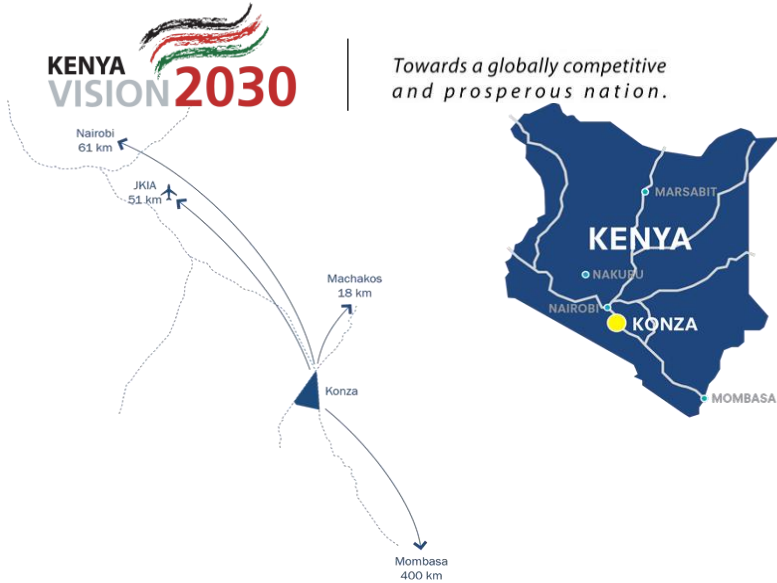
DESIGN OF TECHNOLOGY INDUSTRIAL PARKS:

THE CASE OF KONZA TECHNOPOLIS - Kenya's first Smart City

Eng. John Tanui, MBS



BACK GROUND



Konza Technopolis is a Vision 2030 FLAGSHIP project conceived to capture the growing global Business Processing Outsourcing and Information Technology Enabled Services (BPO/ITES) sectors in Kenya. It is one of the projects under industrialisation in the Big Four Agenda of the Kenyan Government

Development Programme | 2030

ECONOMIC AND MACRO PILLAR

Moving the Economy Up the Value Chain

Business Process Outsourcing(BPO) / IT Enabled Services (ITES)

Establishment of Konza Technology City

About: The government intends to complete the first phase of the Konza Technology City. This will involve construction of BPO Park, Science Park, Residential Buildings, Data Centre and part of Central business District. The first phase will also involve construction of basic infrastructure including sales pavilion, access roads, tele-communications, water and sewerage and energy.

Overarching vision

A globally competitive and prosperous nation with a high quality of life by 2030

Economic

To maintain a sustained economic growth of 10% p.a. over the next 25 years

Social

A just and cohesive society enjoying equitable social development in a clean and secure environment

Political

An issue-based, people-centered, result-oriented, and accountable democratic political



KONZA TECHNOPLIS MASTER PLAN:

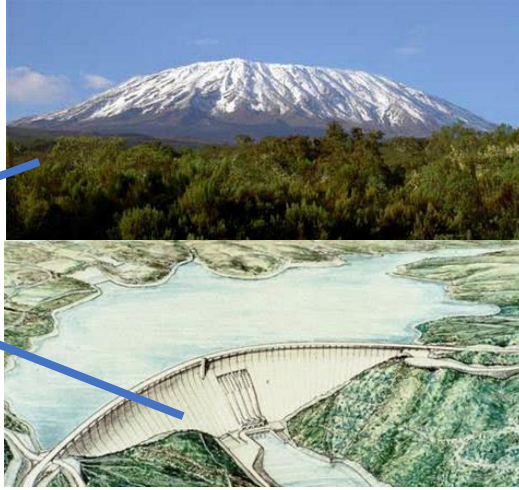
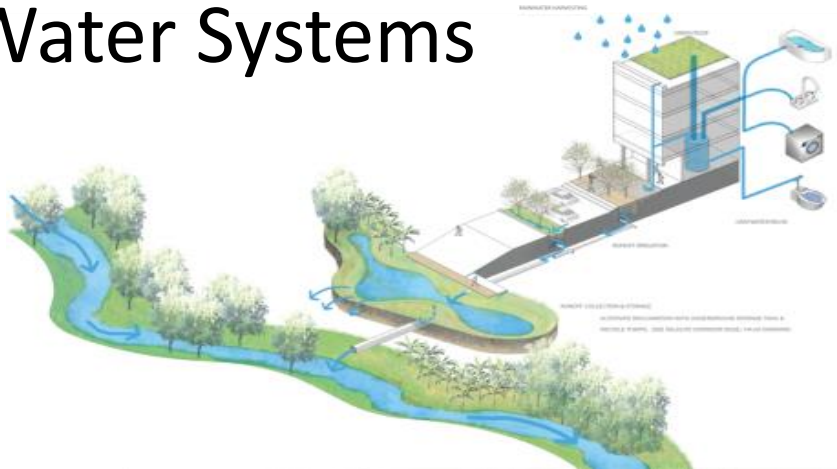


SUSTAINABLE INFRASTRUCTURE

- WATER conservation, storm water management and wastewater recovery
- ENERGY efficiency, renewable energy production, passive design strategies
- Responsible MATERIAL use and waste management
- HEALTH and wellness, non-toxic materials, urban agriculture, safe environment
- ECOSYSTEM and wildlife corridor preservation
- EQUITABLE affordable housing, walkable city, access to healthcare and education



Water Systems



STORAGE TANKS

Offsite Supply:
Kilimanjaro & Thwake

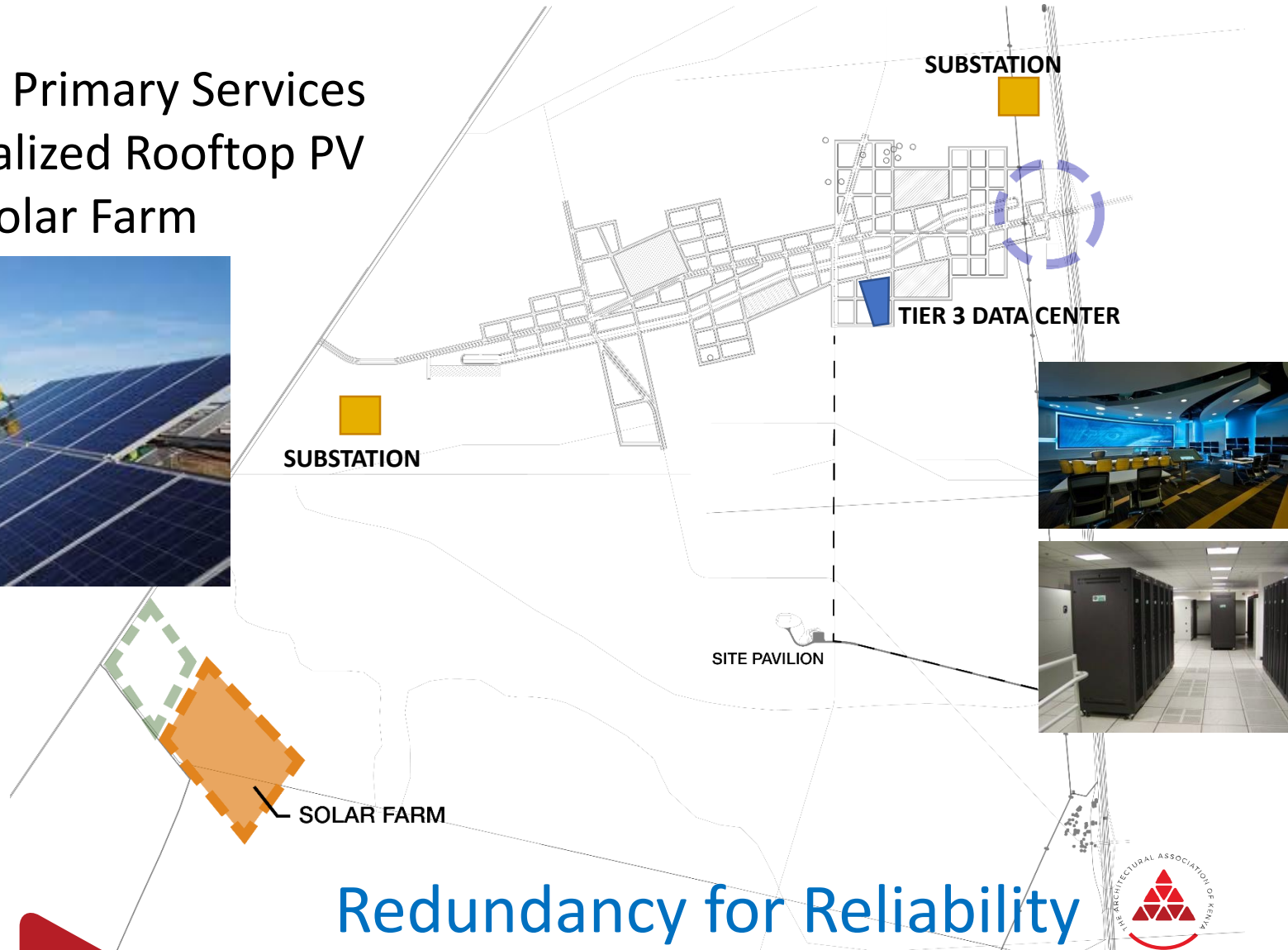
Onsite:
Ground wells
Rainwater harvesting
Storm water storage
Wastewater reclamation



Redundancy for Reliability

Energy Sources

- 2 Offsite Primary Services
- Decentralized Rooftop PV
- Onsite Solar Farm



Redundancy for Reliability

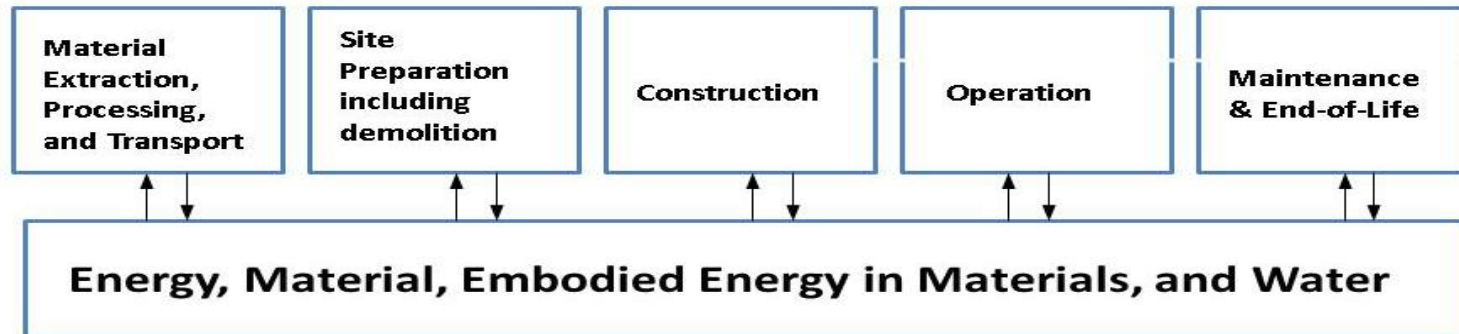
Sustainable Planning Components

- Resiliency and Climate Change
- Sustainable Urbanism and Smart Code
- Resource Management
- Life Cycle Planning

Cradle-to-Grave (not desirable):



Cradle-to-Gate (Embodied Energy):



Cradle-to-Cradle:



Performance Metrics

KEY PERFORMANCE INDICATOR (KPI) VETTING CRITERIA

- Data can be used for multiple purposes
- Match data collection frequency with reporting needs
- Only collect relevant information that is useful to stakeholders

KEY PERFORMANCE INDICATOR METRICS

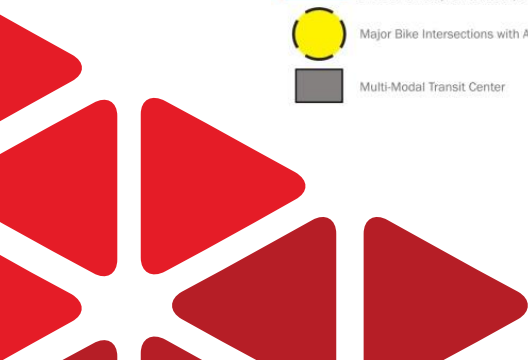
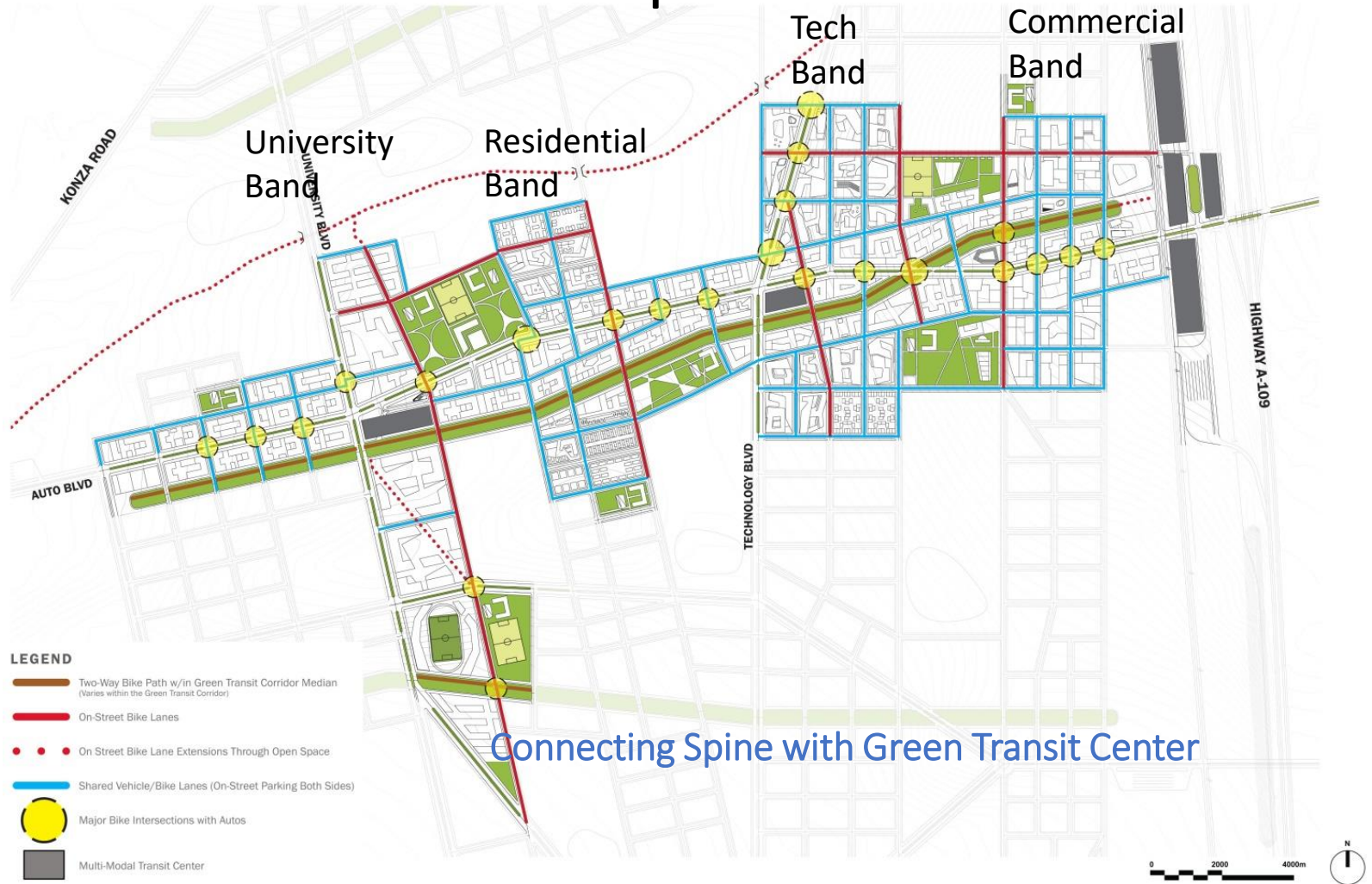
- Cumulative Carbon Footprint
- Energy and Water Use, Smart Metering
- Transportation Data
- Economic, Employment, Housing and Demographic Data
- Planning and Zoning
- Primary Construction Materials

COLLECTION

- One-Stop Center
- Information Management System - internal
- Sustainability Dashboard – public information
- Transparency



Multi-Modal Transportation



Green Transit Corridor

- 60 meters wide
- Stage for variety of outdoor activities



Konza Welcome Center

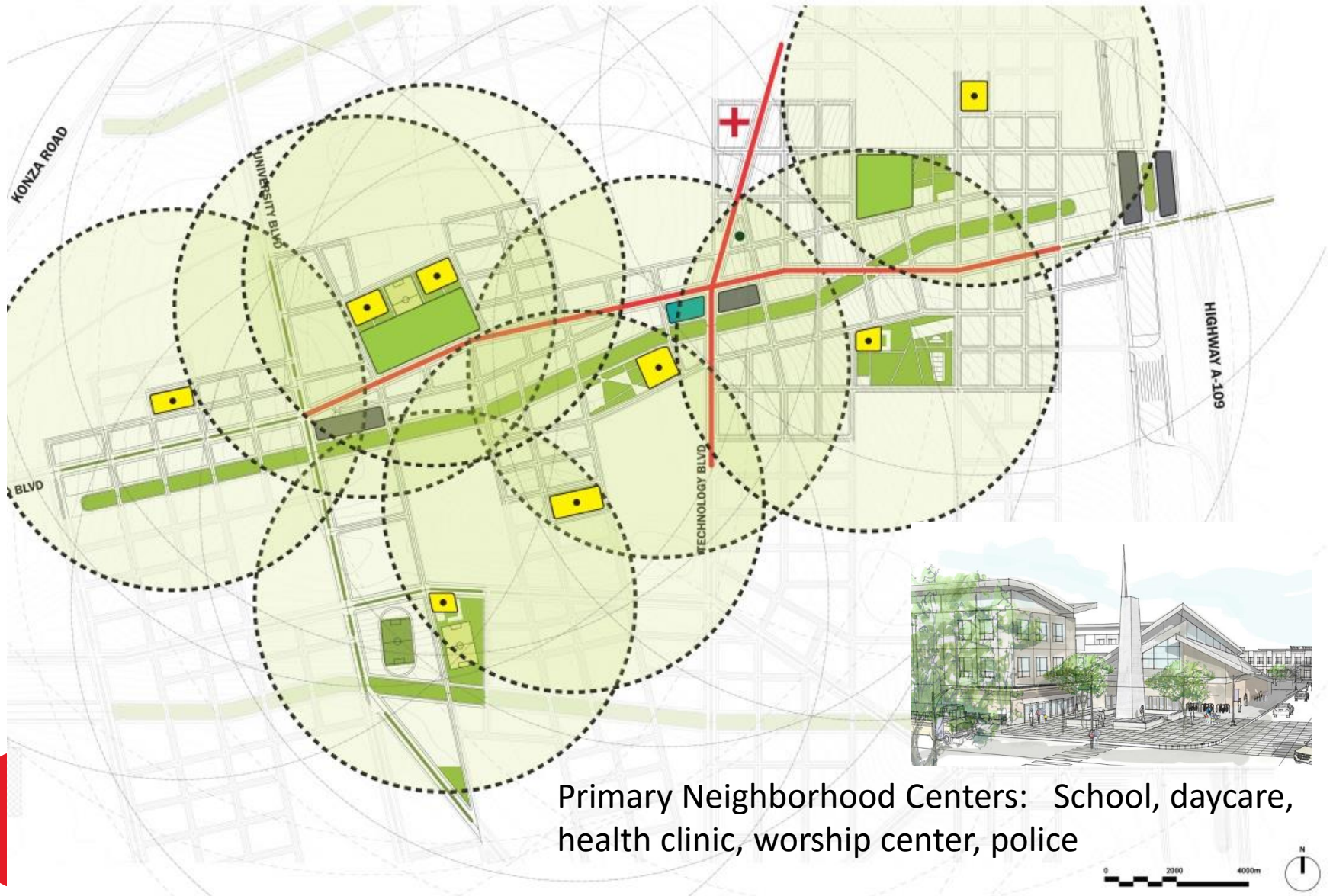
Global Community



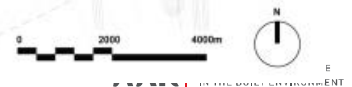
Interactive Public Realm Stage



Convenient access to services for all



Primary Neighborhood Centers: School, daycare, health clinic, worship center, police



General Architectural Design Guidelines

- Diversity with Unity
- Sustainable Architecture
- Exterior materials, color and design
- Building height, massing and scale
- Building roof forms and materials
- Solar photovoltaic requirements
- Structured parking Guidelines



L'HEMISFÈRIC - SANTIAGO CALATRAVA - VALENCIA, SPAIN - EXAMPLE OF VARIATION EXTERIOR MATERIALS AND FORMS



J. PAUL GETTY MUSEUM, LOS ANGELES, CALIFORNIA - EXAMPLE OF DIVERSITY WITHIN UNITY

Housing

Housing typologies

- Inclusionary housing
- Neighborhood private/semi-private
- Common areas and accessory structures

Landscaping

- Integration of neighborhood retail
- Service and trash/recycling/composting

Exterior

- Parking Requirements
- Architectural Character and Neighborhood compatibility



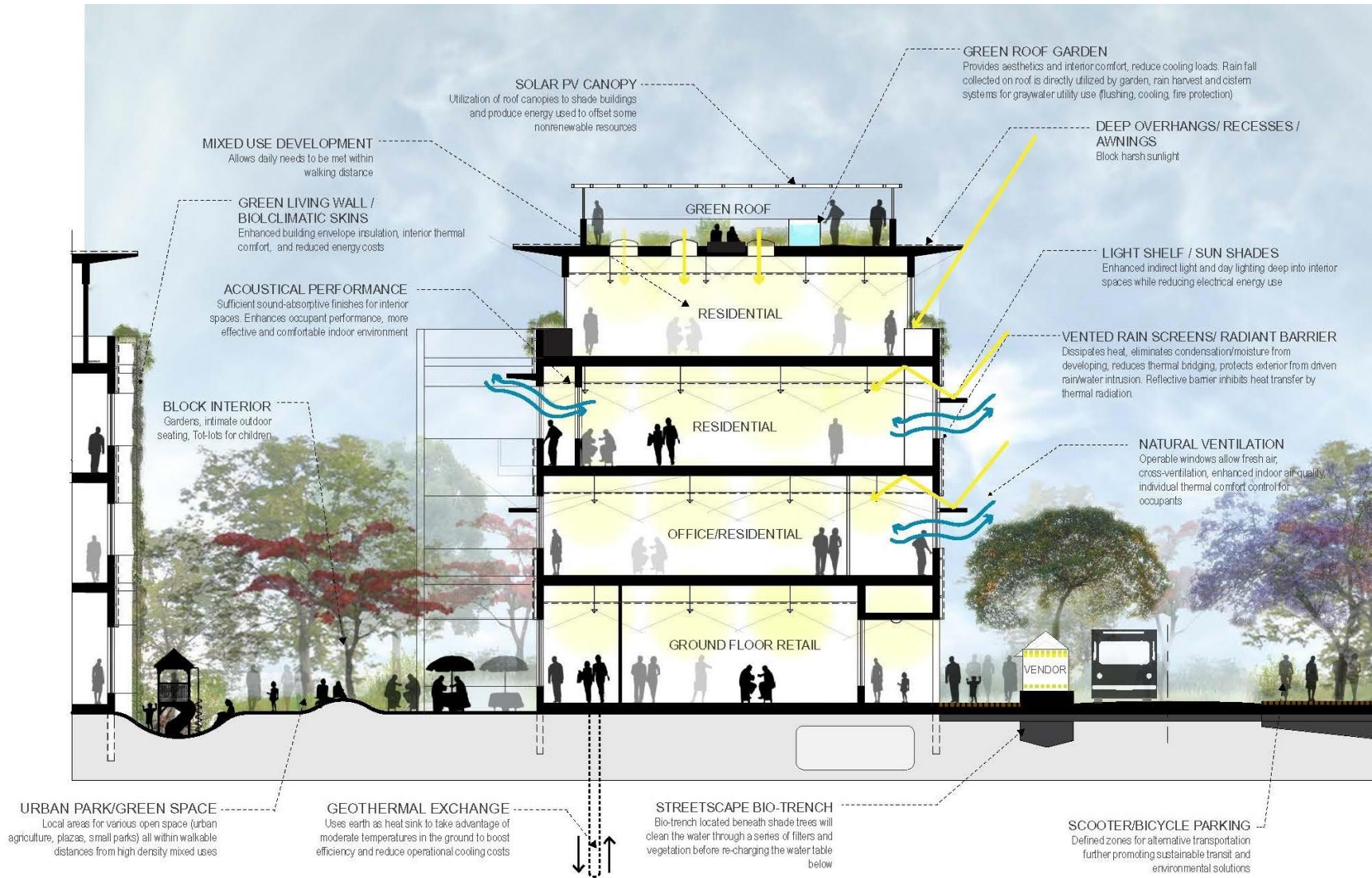
TANGIER BAY HOUSING - MALKA ARCHITECTURE - TANGIER, MOROCCO



AVENUE GROVE - HOUSE + PARTNERS - HOUSTON, TEXAS

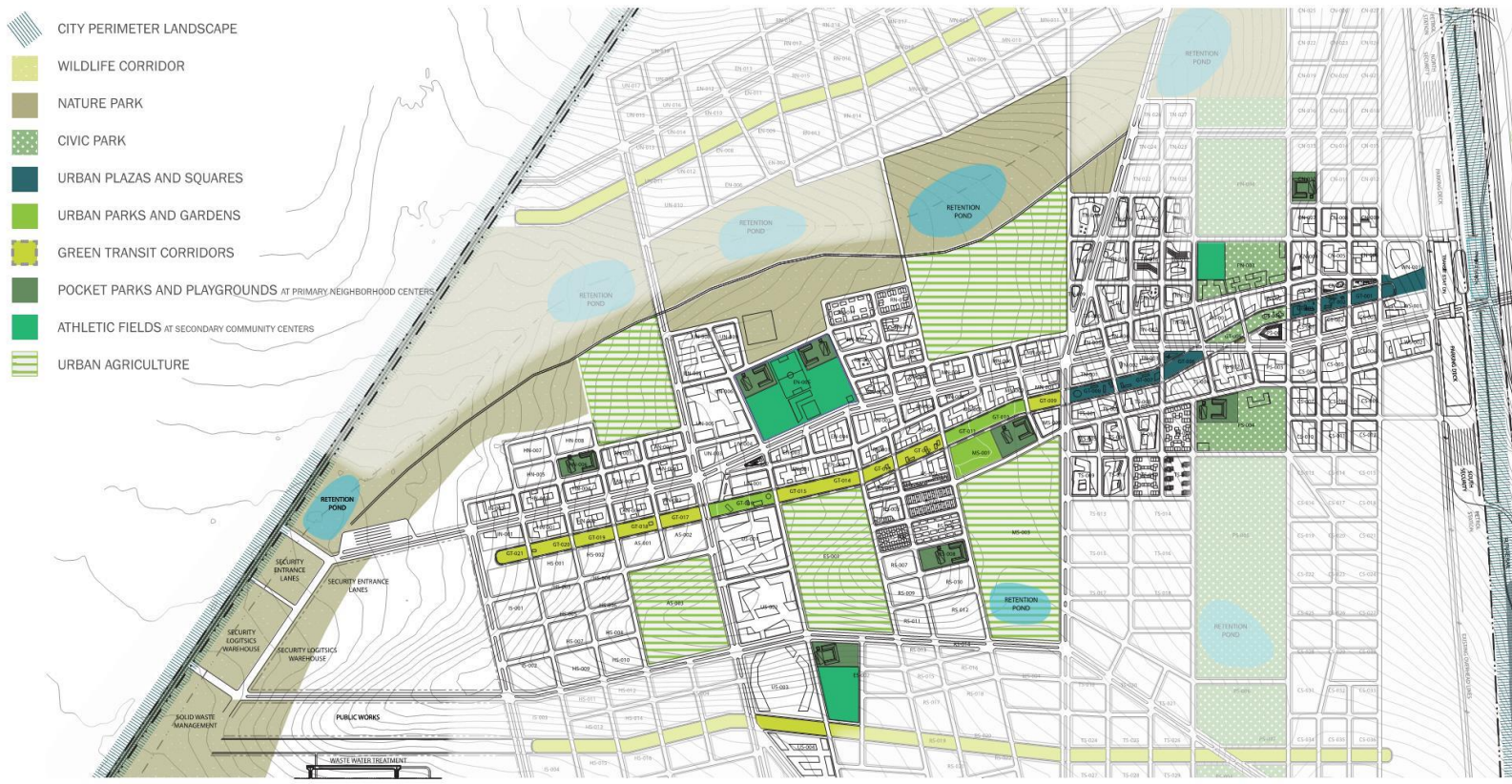


Konza Sustainability Strategies



Parks and open spaces

8.0 | DESIGN GUIDELINES FOR PARKS AND OPEN SPACE



Commercial, Mixed-Use & Residential Guidelines

4.0 | COMMERCIAL, MIXED-USE AND RESIDENTIAL GUIDELINES

4.2.10 ACTIVATED ZONES

A positive relationship of a building to the streetscape is essential for its:

1. Contribution to a vibrant public space around it, and;
2. Success in gaining the benefits of public exposure and engagement. This zone is called the Activated Zone and defines both required and allowable elements that compose this important zone of the City. Activated Zone criteria varies to some degree with street type and building use.

[REFERENCE CHAPTER 3.0 STREET AND MOBILITY GUIDELINES FOR ADDITIONAL INFORMATION ON ACTIVATED ZONES]

- (A) - upper floor balconies
- awnings
- signs
- roof overhangs
- shading devices
- bioclimatic skins
- signs and displays
- landscaping
- paving
- sidewalk cafe
- area wells

- (no symbol) - above grade structural columns

THE ACTIVATED ZONE



- (B) - building interior (w/ windows)
- arcades
- recessed entry
- landscaping
- building structure
- set back for residential
- setback for blank walls (for mech/utility service rooms)
- (no symbol) - blank walls > 6 m
- noise generating equipment

Materials and Colors

COLOR AND MATERIALS PALETTE

The following swatches are recommended colors and materials to be used on the exterior of the building.

Cementitious Materials:

- + Concrete
 - o White poured in place with architectural foam liners.
 - o Pre-cast architectural panels with etched finish.
 - o Structural pre-cast or poured in place with finish coating.
- + Stucco
 - o Variety of trowel and stipple textures with light natural colors.

Masonry Materials:

- + Stone
 - o Light colored limestone or sandstone
 - o Other locally quarried stone such as granite or marble
 - o Applied with horizontal grain as structural bearing or as non-bearing veneer horizontally or vertical face panel or tile.
- + Brick
 - o Light colored clay brick
- + Concrete Masonry Units
 - o With glazed, ground or textured face for exposed conditions
 - o Stucco coated structural blocks

Metal Materials:

- + Aluminum with Recycled Content
 - o Wall Panels, Extrusions, Glazing and Door Frames, Louvers
 - o Clear or light champagne anodized or high performance coating
- + Steel
 - o Wall Panels, Bars, Tubes, Structural Sections
 - o Stainless steel or high performance coating to prevent rust
- + Screens
 - o Perforated, custom cut sheet, wire or expanded mesh
- + High Performance Coatings for Metal include:
 - o Light or white powder coating
 - o White solid or light metallic polyvinylidene fluoride resin (PVDF)

Composite Materials: Composite wall panels that are weather and temperature resistant can be used as a surface material, rain-screen or vented skin made of high pressure compact resin laminates.

Tile:

- + Ceramic
- + Porcelain
- + Concrete
- + Stone
- + Terracotta

Glass:

- + Clear vision glass
- + Spandrel glass with light color translucent or opaque coating
- + Fitted glass



White Powder Coated Steel Mesh



White Travertine Tile



Cream Textured Stucco



Powder Coated Aluminum Louvers



Glass Spandrel Panels



Ceramic Fitted Glass



White Textured Stucco



Off-White Travertine



Marble Panels



University Design Guidelines

5.0 | UNIVERSITY DESIGN GUIDELINES

5.7.3 PEDESTRIAN/BICYCLE CIRCULATION GUIDELINES

HIERARCHY:

- Within the University Band, priority must be given to the pedestrian and bicyclist
- Pedestrians have the right of way and priority on the main north-south pedestrian promenade.
- Bicyclists are allowed within the campuses, but must dismount on all internal walkways.
- Bicycles are only given a dedicated lane on the eastern edge of the university campus; within the urban local street.

WAYFINDING:

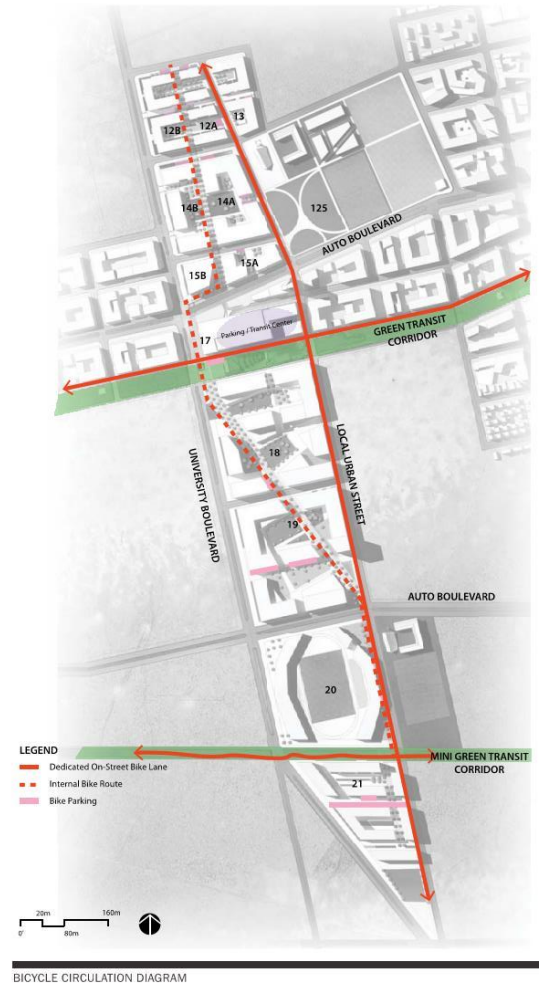
- Strategically place bike parking on the eastern edge of the campus so that cyclists entering the university band from the local street may dismount and park.
- Bicycle parking areas should be clearly delineated with signage discourage random parking.

CONNECTIVITY:

- Provide multiple points of connections between the university campus and the city bike trails system: At the Green Corridors, along the entire eastern edge of the university band an at local streets crossing the university band
- Every effort shall be made to encourage the use of alternative transportation modes within Konza through the provision of functional and attractive bicycle parking conveniently located and in adequate numbers.



PEDESTRIAN CIRCULATION DIAGRAM



BICYCLE CIRCULATION DIAGRAM

University Design Guidelines

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KONZA

GREEN DEVELOPMENT FRAMEWORK

First of a kind

LEED and/or Green Star Certified - Buildings

- Integrated rainwater harvesting, materials, utilities tracking

Envision for Reliable Infrastructure

- Long lasting, resilience designed, infrastructure systems

Dashboard: LEED for Cities

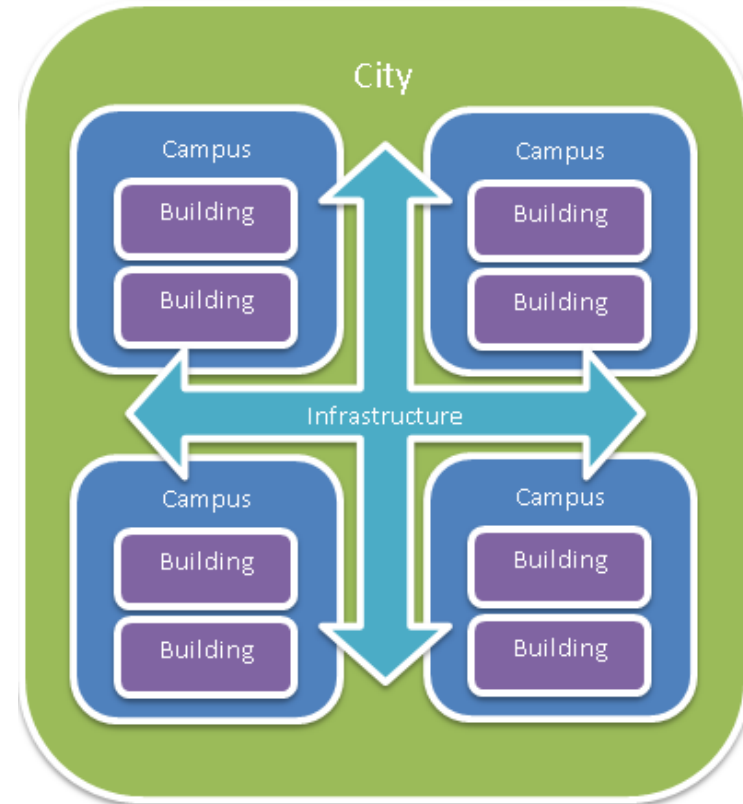
- All utility data publicly tracked for dashboard
- Aggregated utility usage for tracking sustainability
- Resource Efficiency: Key resources tracked
- Communication & Accountability



Certification Goals

Horizontal and Vertical Components :

- **Horizontal Infrastructure:**
Envision Rating System (ISI)
- **Vertical Buildings:**
LEED or Green Star
- **Parcels and Communities:**
LEED for Neighborhood
Development (ND),
Green Villages for Green Star
- **Future Completed City:**
LEED for Cities



Beyond Construction

OPERATIONS AND MAINTENANCE

Konza will need to develop a long term Operations and Maintenance plan for basic city services (energy, water, wastewater, solid waste) and the long term sustainability of infrastructure and buildings.

RESILIENCY AND CLIMATE CHANGE

To ensure the longevity of the city, Konza must create a mitigation plan for future natural and human caused disasters. A plan should include a risk assessment of vulnerabilities, mitigation infrastructure, building and zoning regulations, an early warning system and public preparedness drills.

