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AI for Sustainable Cities

Bridging Innovation and Feasibility

Panelists

Kimon G. Onuma
President
ONUMA, Inc.

Umair Surani
Director, Energy & Sustainability
Environ Energy

Leo Salce
Principal & CEO
AVANT LEAP

Moderator

Eve Lin McNaughton
Director, Innovation and Research
USGBC

AI for Sustainable Cities: Bridging Innovation and Feasibility

This session highlights how AI is being applied to improve sustainability in urban systems such as energy, water, and transportation. Attendees will gain a practical framework to assess AI's real-world impact, implementation feasibility, and adoption potential.

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Learning Objectives

Learning Objectives:

- Examine diverse real-world applications of AI in urban sustainability, including environmental monitoring, infrastructure management, mobility systems, and energy forecasting.
- Apply a structured lens—sustainability impact, implementation readiness, and growth/adoption potential—to evaluate AI technologies in the context of city and community development.
- Identify common barriers to AI adoption in the built environment, such as data limitations, policy gaps, interoperability issues, and ethical concerns.
- Explore practical approaches for responsible AI implementation, including data governance, capacity building, and policy alignment.

Learning Level:

- Intermediate

Today's Journey

1

Panelist Spotlights

Each panelist shares a case study, highlighting impact, readiness, and adoption potential.

2

Panel Dialogue

Guided discussion on barriers, solutions, and responsible AI implementation.

3

Final Reflections & Takeaways

Concise insights and "quick wins" from each panelist.

4

Open Q&A – Extending the Conversation

Audience questions and reflections to deepen the dialogue.

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USGBC RISE™
Readiness & Impact for Sustainable Execution

Sustainability Impact

- Environmental Impact
- Social Impact
- Economic Impact

Implementation Readiness

- Resource Requirements
- Technical Complexity
- Infrastructure Compatibility
- Technology Readiness
- Data Readiness
- Policy & Regulatory Alignment

Growth & Adoption Potential

- Community Acceptance
- Stakeholder Buy-In
- Scalability
- Economic Viability
- AI Maturity

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01

Panelist Spotlights

Each panelist shares a case study, highlighting impact, readiness, and adoption potential.

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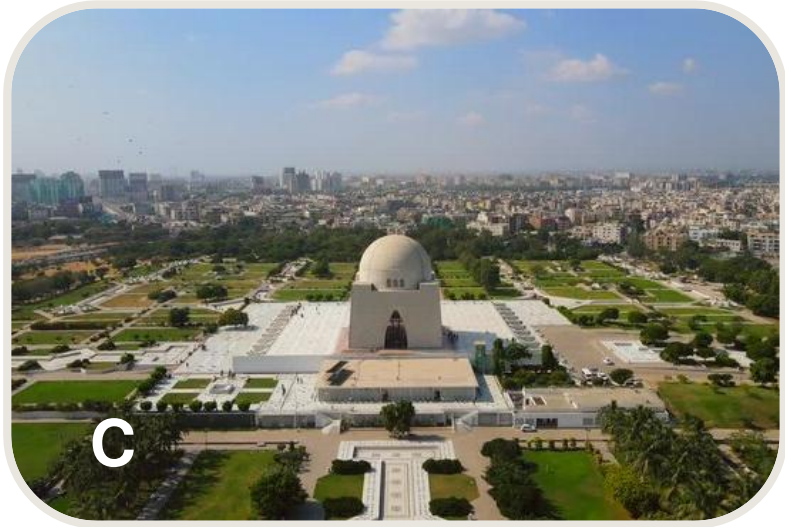

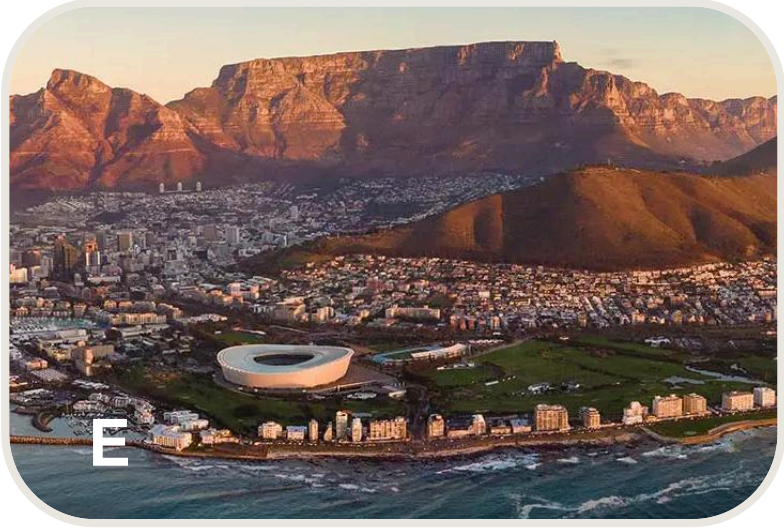

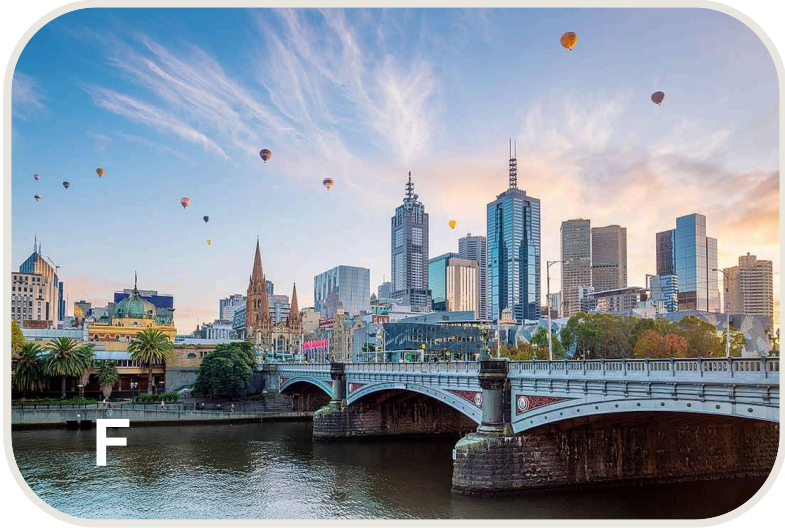

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Umair Surani
Director, Energy & Sustainability
Environ Energy

Aerospace engineer turned energy and sustainability solutions strategist: HVAC, energy efficiency (hardware & software), building automation, renewable energy, DER, microgrids, and VPPs.

14+ years of experience across the built environment - partnering with real estate owners / operators, public-sector officials, universities, utilities, and startups to level-up their infrastructure and business. Skilled at connecting with diverse stakeholders across the value chain (boots-on-the-ground to C-suite), identifying root causes, and delivering robust solutions.

A universal translator, player-coach, and an entrepreneur at heart. I thrive on bridging disparate behaviors and cultures - between technology and operations, and tradition and innovation.

The Role & Impacts of Buildings on a City

Environmental

- 30%-40% GHG
- Air quality issues

Social / Equity

- 90% time indoors
- Health, productivity, equity
- LIDAC often least healthy buildings

Economic

- Manufacturing, conferences…
- Cognition, output, competitiveness

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City-Buildings Symbiosis

Environmental

Social / Equity

Economic

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Make This Possible & The Role of AI

A. What to do with municipal buildings?

B. Smart Policy – AI as the symbiosis enabler

Data Layers:
- EUI
- fuel type
- IAQ
- Solar / green roof potential
- Demand flexibility potential

"Optimizer on Steroids":
- Scenario plan
- Pressure test policies
- Identify best solution
- Automate flexibility

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Case Studies - Proof in Action

LATITUDE MEDIA

How one Texas energy retailer plans to forge a new path for VPPs

LATITUDE MEDIA

On the last Tuesday in July, over 100,000 residential batteries across California simultaneously discharged to the grid for two hours. They were part of a coordinated virtual power plant test — and according to PG&E, the resulting 539-megawatt dispatch was equivalent to the output of a mid-size natural gas plant.

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ARTIFICIAL INTELLIGENCE




Sustainable Materials

ONUMA SYSTEM ZAMAP

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INTELLIGENCE

The NEW Sustainable Resource

ONUMA SYSTEM ZAMAP

Architectural INTELLIGENCE: ONUMA Inc

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Architectural INTELLIGENCE

AI Generated Image
Architectural INTELLIGENCE: ONUMA Inc

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12:54 AM June 14, 2017
Start
Floor 4
AI Generated Image
Architectural INTELLIGENCE: ONUMA Inc
ONUMA SYSTEM
ZAMAP
Greenbuild


1:09 AM June 14, 2017
15
Minutes
Floor 24
AI Generated Image
Architectural INTELLIGENCE. ONUMA Inc
ONUMA SYSTEM
ZAMAP
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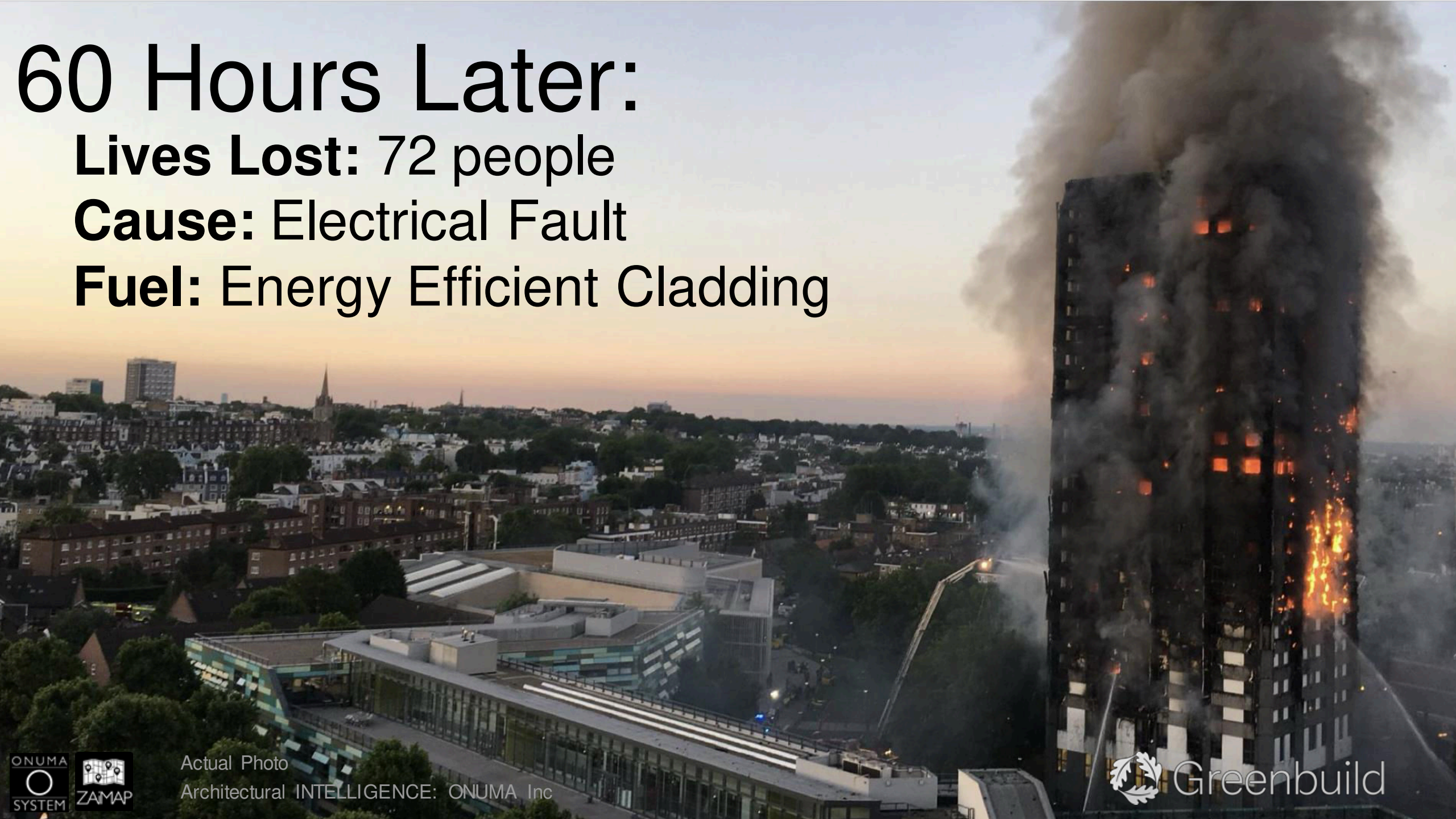
60 Hours Later:

Lives Lost: 72 people

Cause: Electrical Fault

Fuel: Energy Efficient Cladding



Actual Photo

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Why Are Smart Buildings and Cities...Dumb?

Kimon Onuma February 24, 2025 Articles

Automated Buildings.com

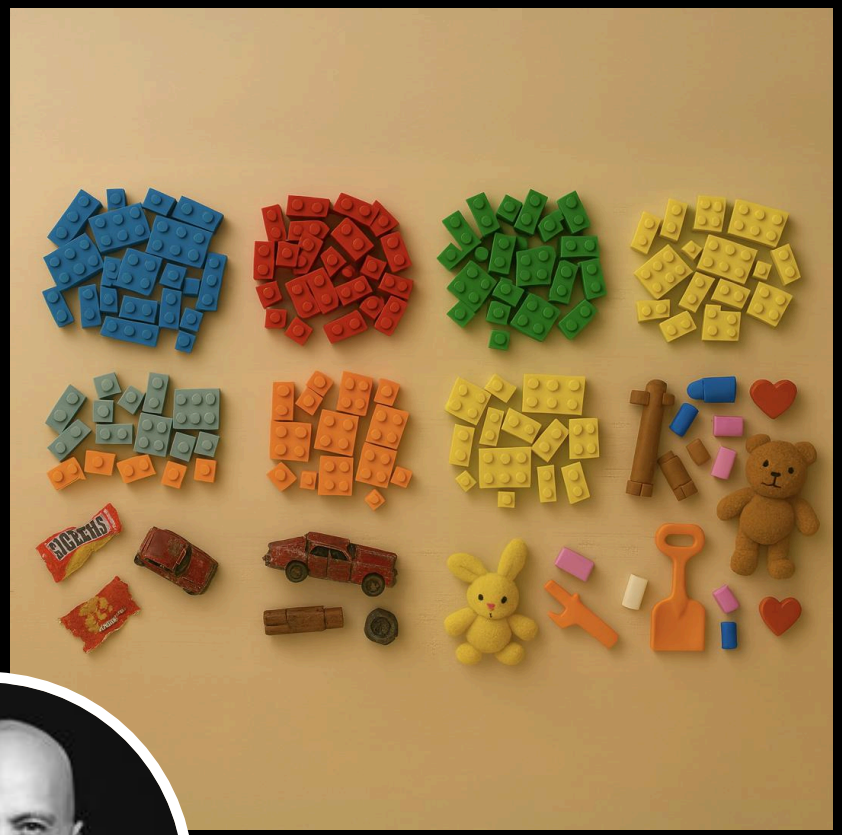
Silos

Proprietary

No Sharing

Black Boxes

Building Informed Environments



Kimon Onuma, FAIA, ONUMA Inc.

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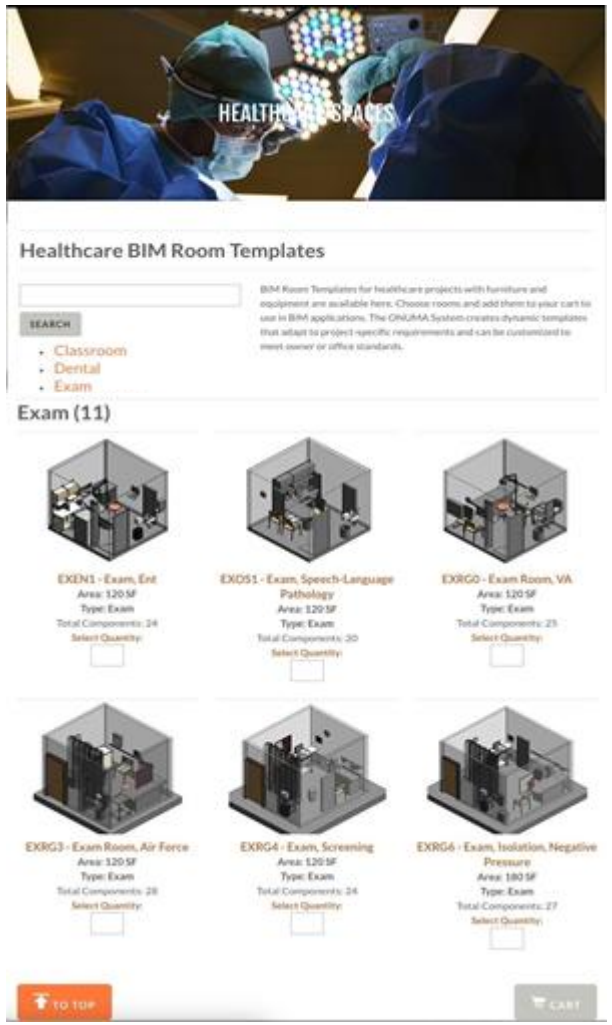
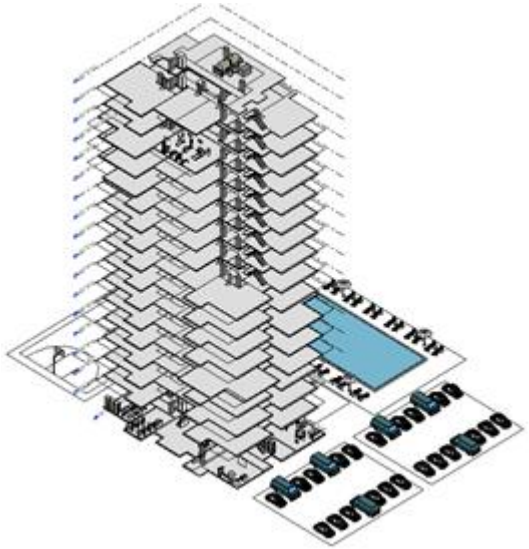
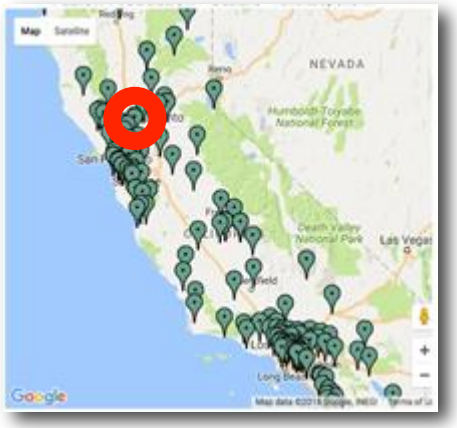
Intelligent Program Requirements for Planning





Largest District in the US

California Community Colleges (CCC)



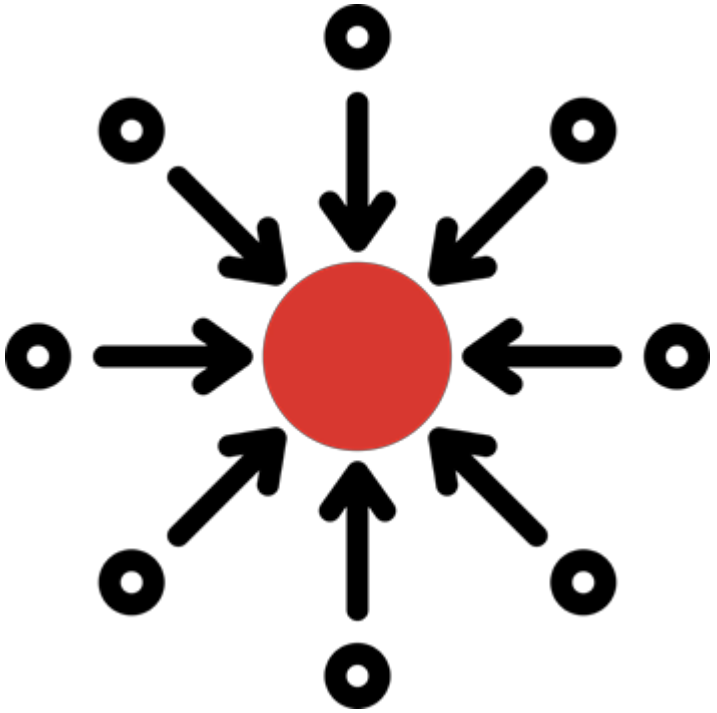
72 CCC Districts
~90M SF as BIMs
Digitial Twins
& GIS

112 Campuses
9 Campuses in LA

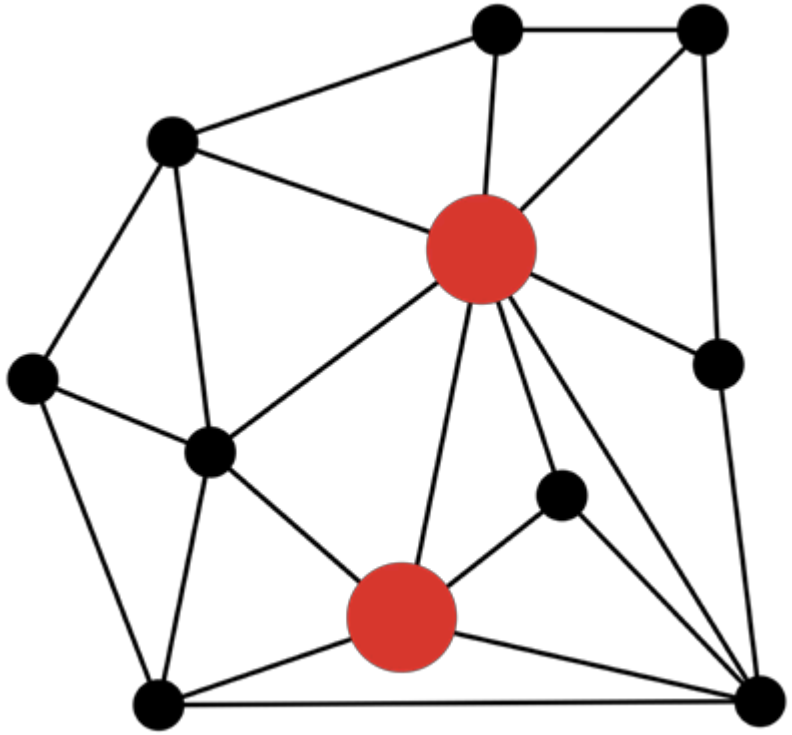
5,000 Existing Buildings
Constant Change
~ 50 New Buildings / Year

Thousands of Work Orders a Day
Asset Management

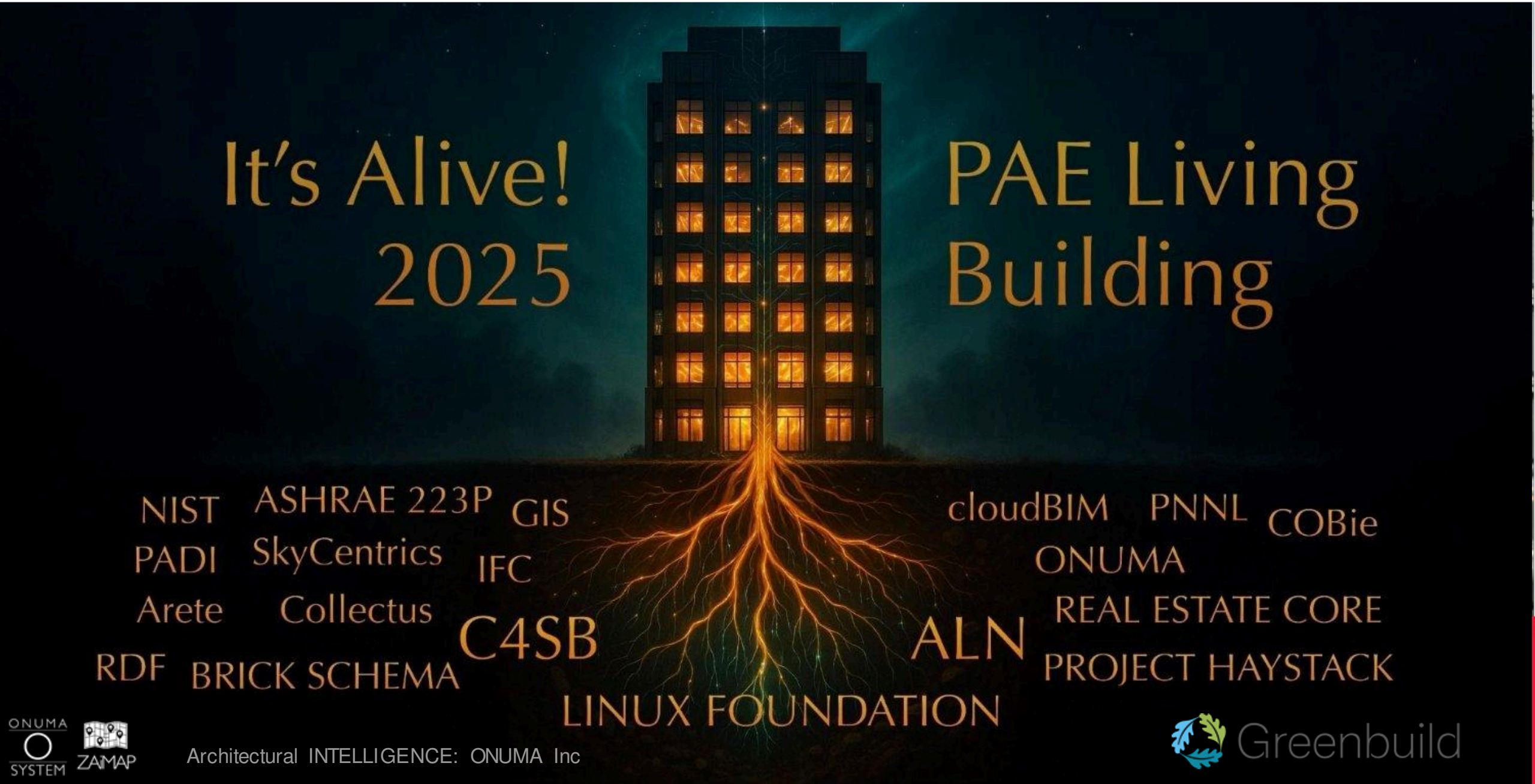
CLOSED



OPEN



THE LINUX FOUNDATION C4SB FOUNDATION



ONUMA SYSTEM ZAMAP

Architectural INTELLIGENCE: ONUMA Inc

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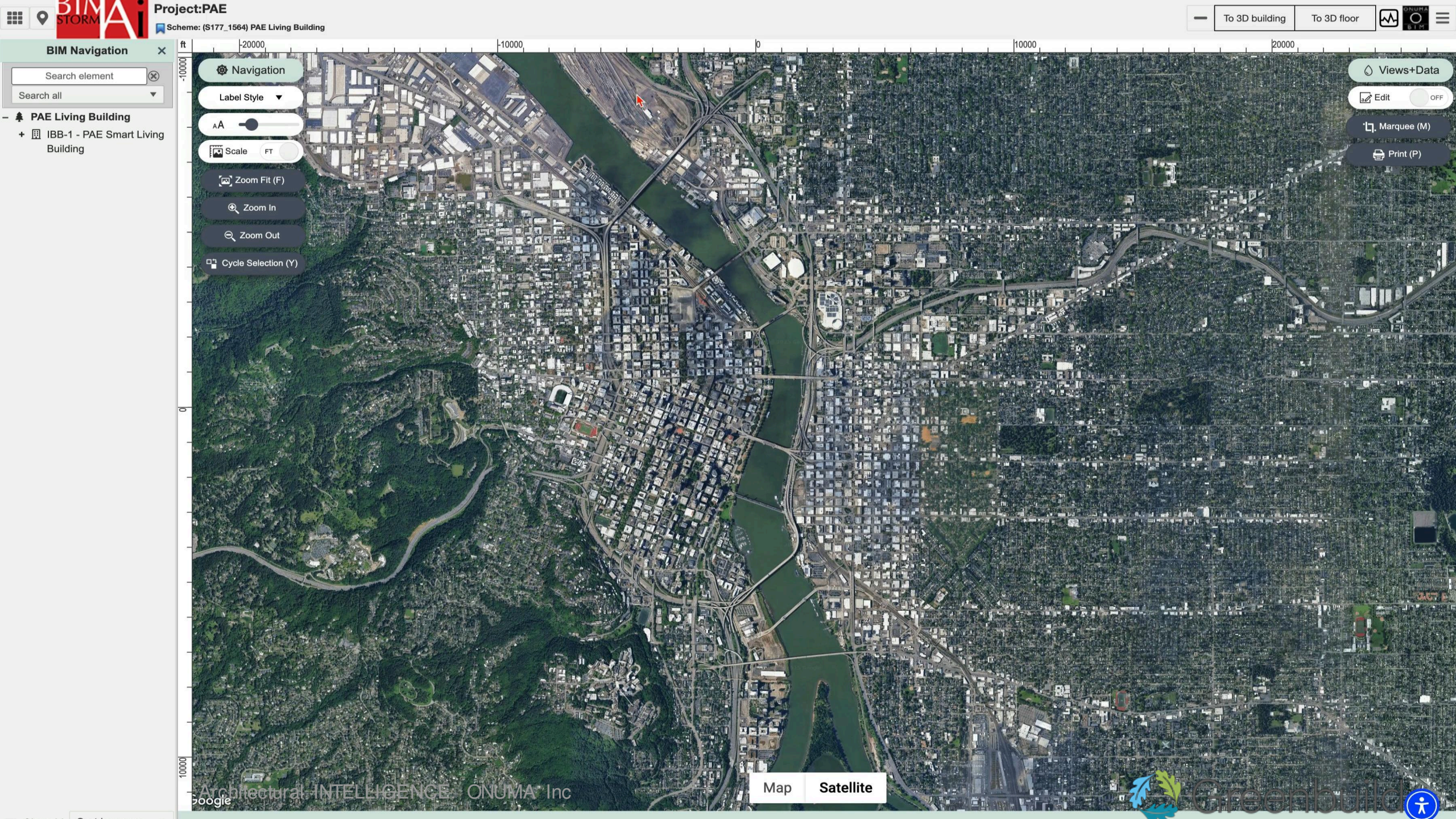
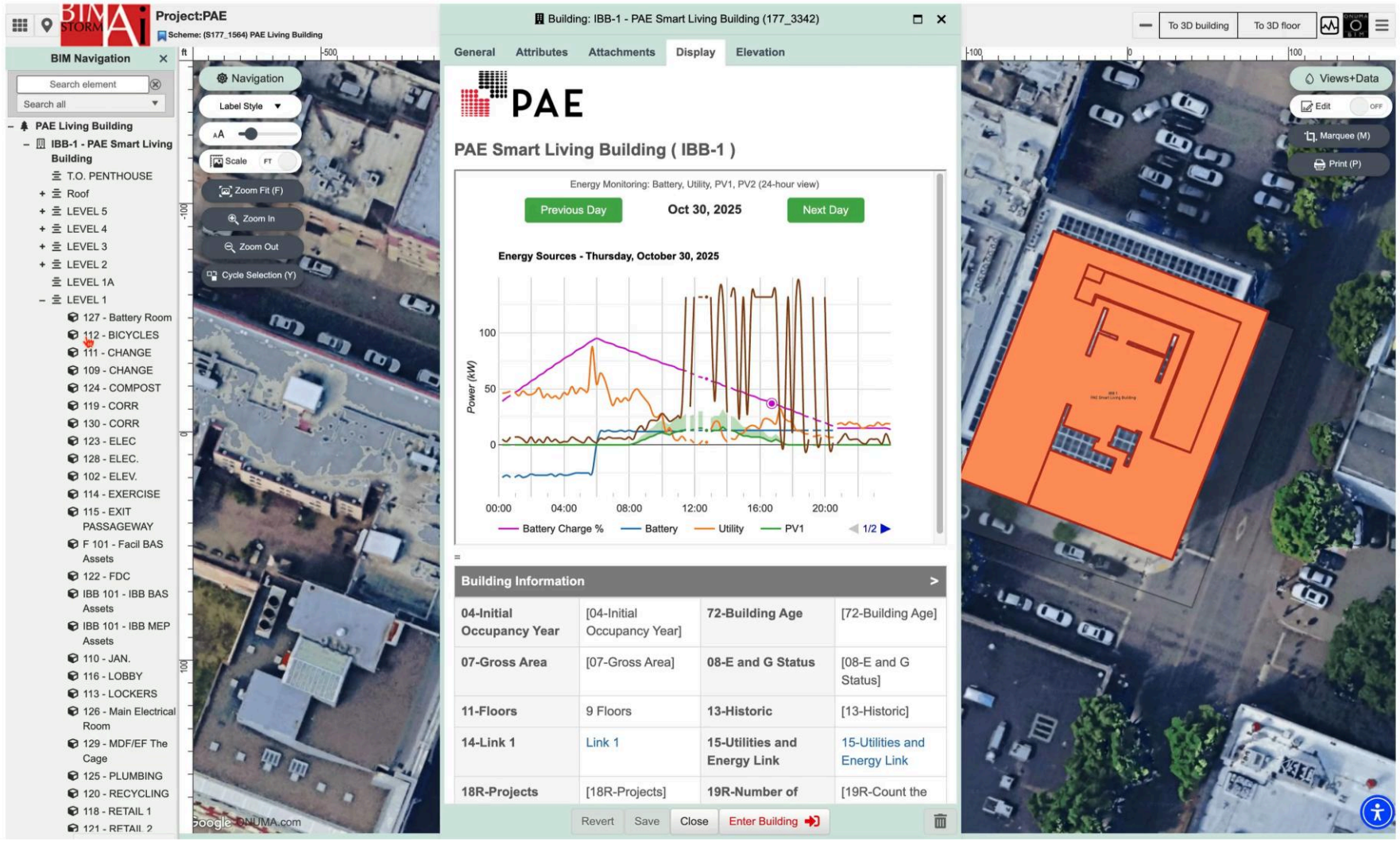
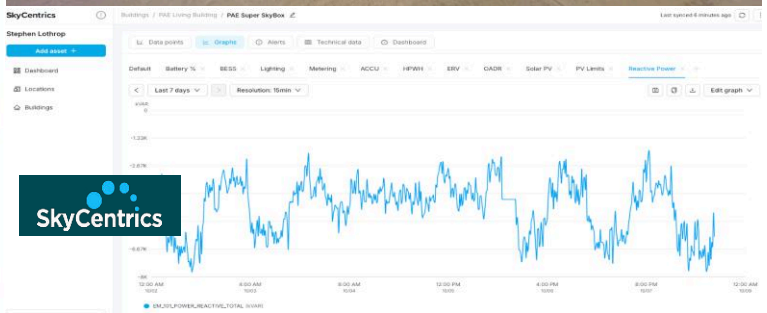
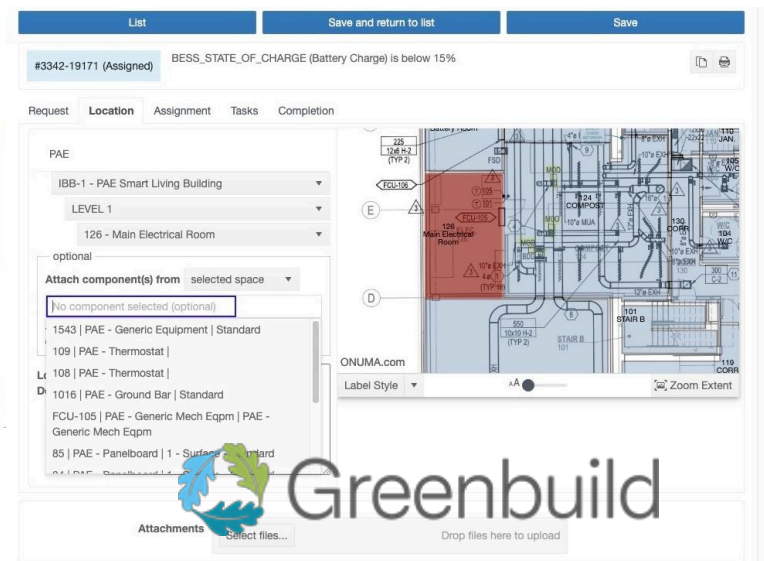

Project:PAE
Scheme: (S177_1564) PAE Living Building
To 3D building
To 3D floor
BIM Navigation
Search element
Search all
PAE Living Building
IBB-1 - PAE Smart Living Building
Navigation
Label Style
Scale
FT
Zoom Fit (F)
Zoom In
Zoom Out
Cycle Selection (Y)
Views+Data
Edit
OFF
Marquee (M)
Print (P)
Map
Satellite
Architectural INTELLIGENCE - ONUMA Inc
Google

PAE Living Building and Digital Twin







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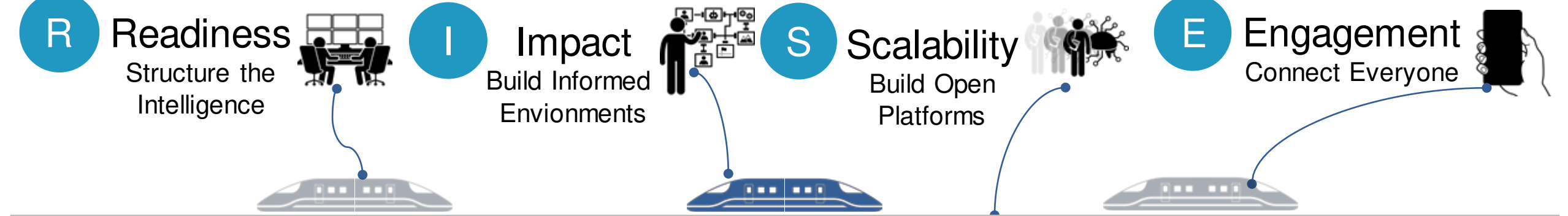
The Architecture for Intelligent Sustainable Cities

R **Readiness**
Structure the Intelligence

I **Impact**
Build Informed Envionments

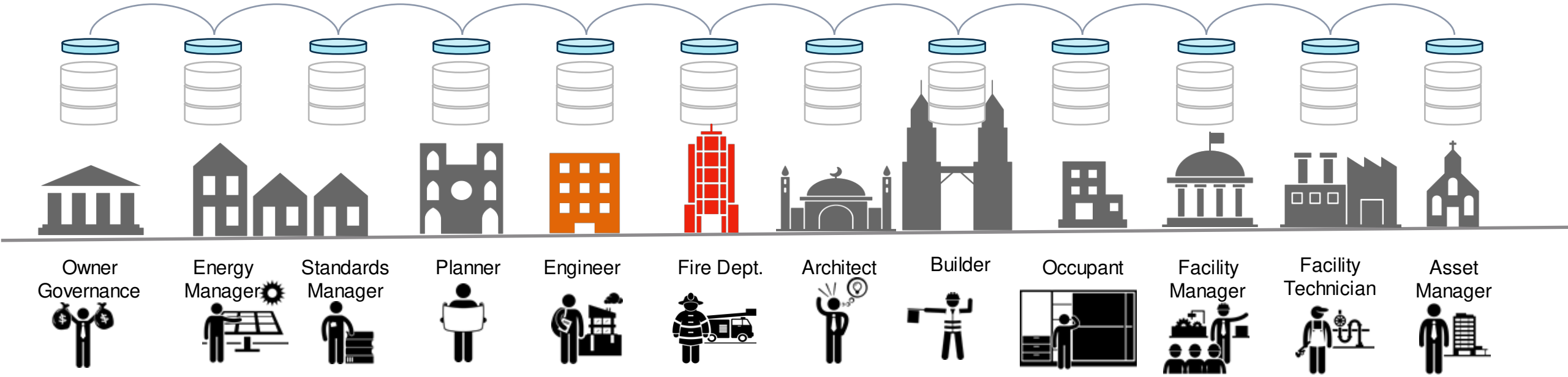
S **Scalability**
Build Open Platforms

E **Engagement**
Connect Everyone



THE LINUX FOUNDATION

CSB FOUNDATION



ONUMA SYSTEM ZAIMAP

Architectural INTELLIGENCE: ONUMA Inc

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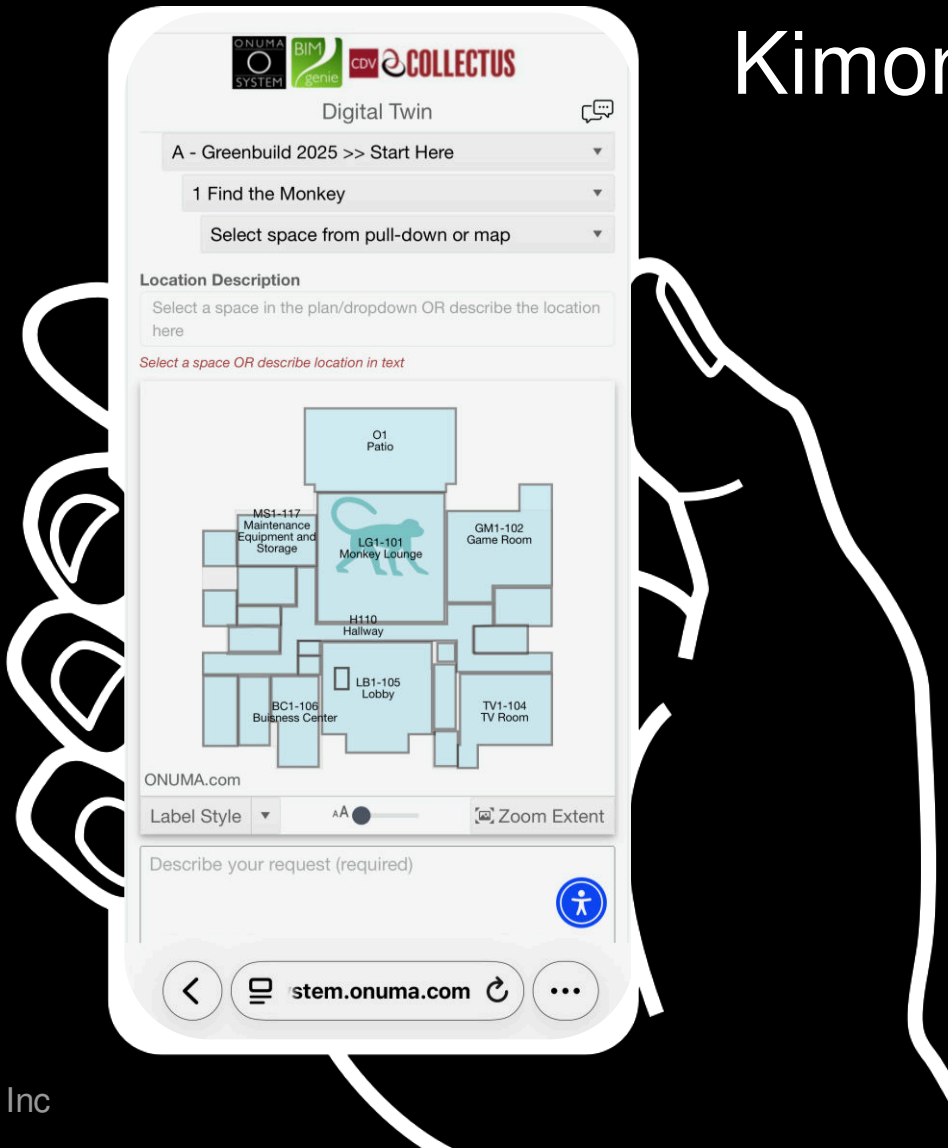
AI: LEAD with INTELLIGENCE

Kimon Onuma, f.AI.a

Greenbuild Digital Twin



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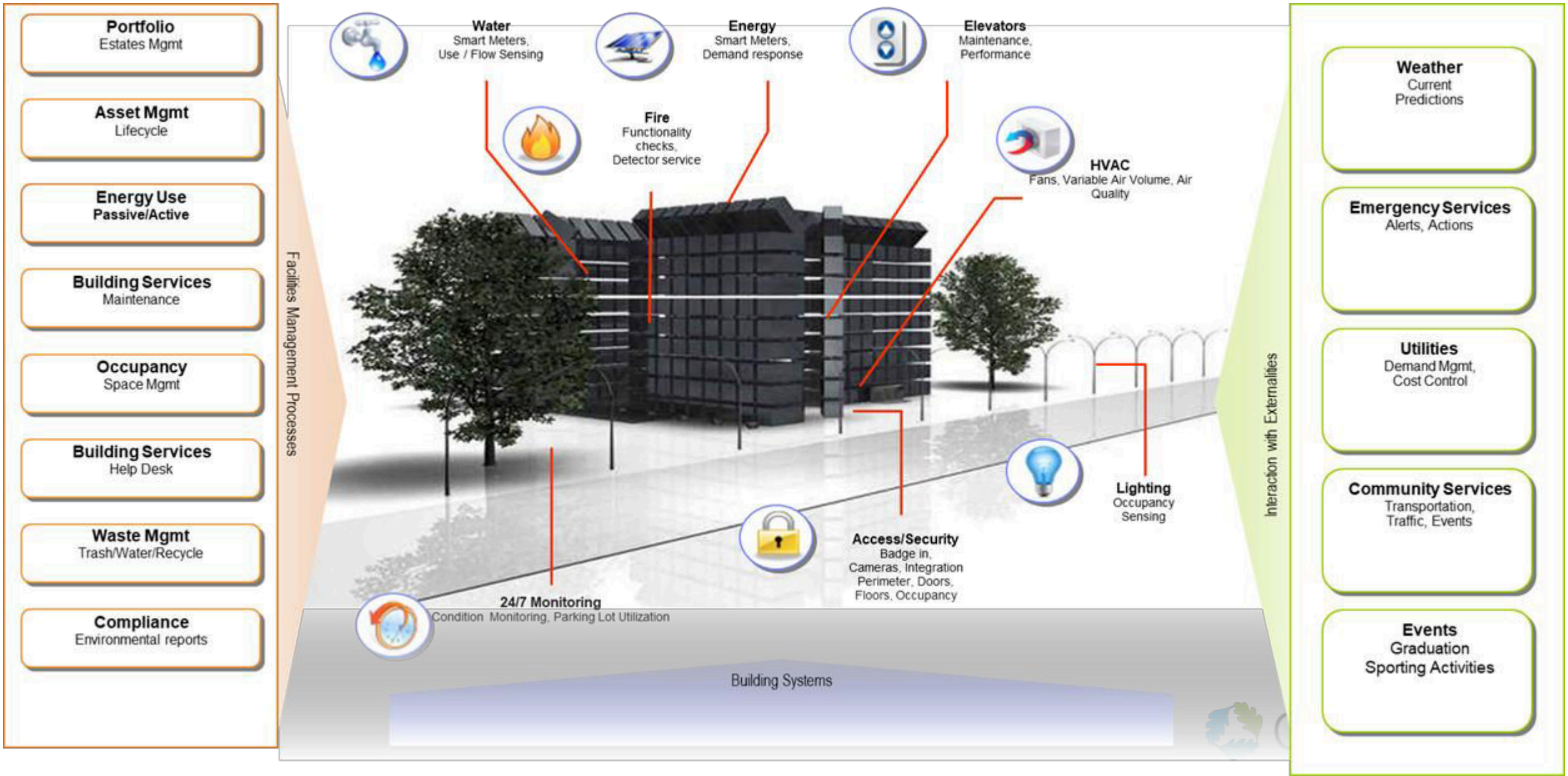
Leo Salce
Principal & CEO
AVANT LEAP

I’m the Principal and CEO of Avant Leap, where I lead strategy and innovation for cutting-edge solutions across the building lifecycle. With over 20 years of experience as an Architect, Technology Strategist, and Consultant, I specialize in implementing next-generation technologies, ranging from AI-powered BIM and smart digital twins to integrated BIM + IoT + AI systems for operations and maintenance.
My career blends architecture, computer science, and sustainability to drive digital transformation in design, construction, and asset management. I’m passionate about sharing knowledge and regularly speak at global conferences on topics including smart digital twins, AI in AEC, and emerging visualization technologies.
I’ve authored multiple publications, filed patents, and led the development of innovative, real-world applications of emerging tech. I’m a registered architect in the Dominican Republic, a LEED Accredited Professional, and an International Associate of the American Institute of Architects (AIA).

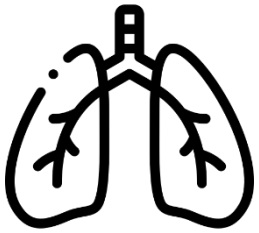
Leo Salce
Principal & CEO
AVANT LEAP

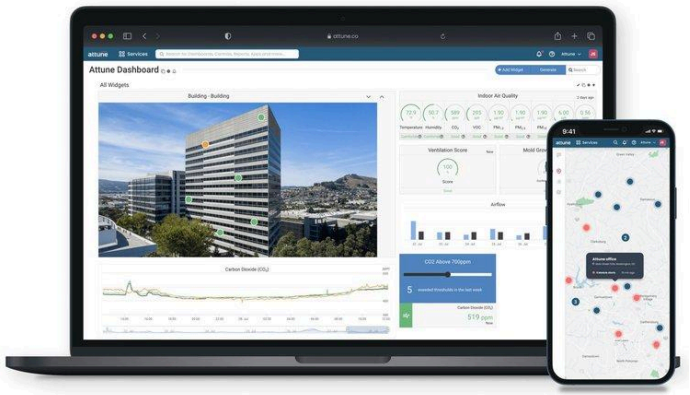
Smarter Digital Twins
IoT + AI Gamification and Modularity

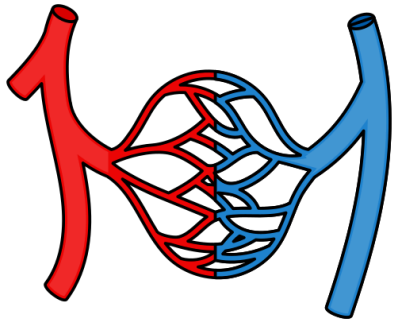
When buildings talk...do we listen?



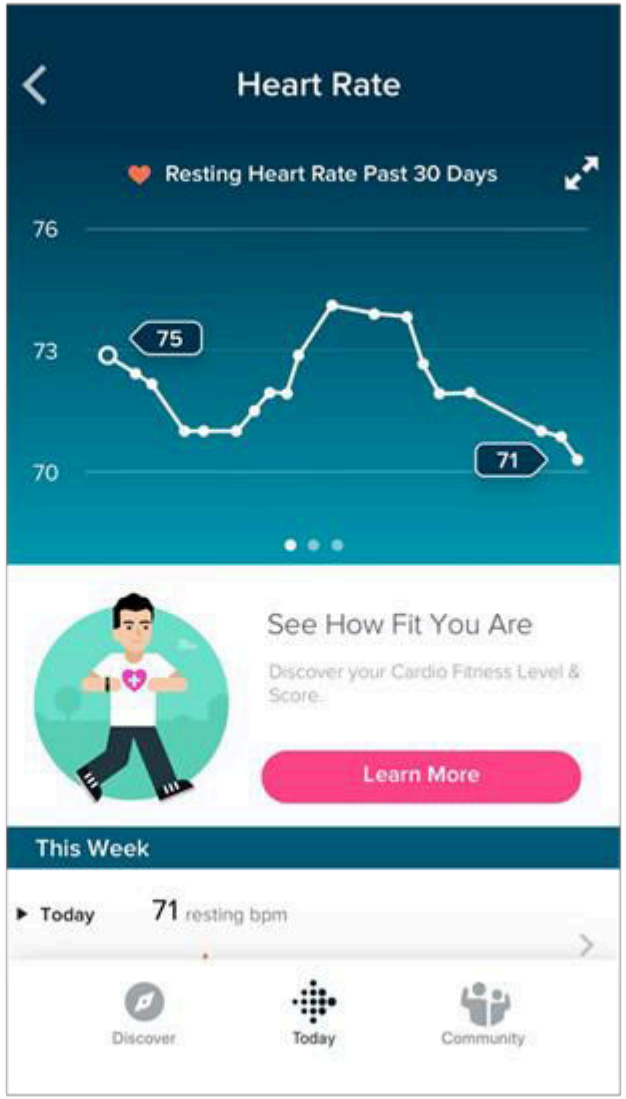
Enabling Insights

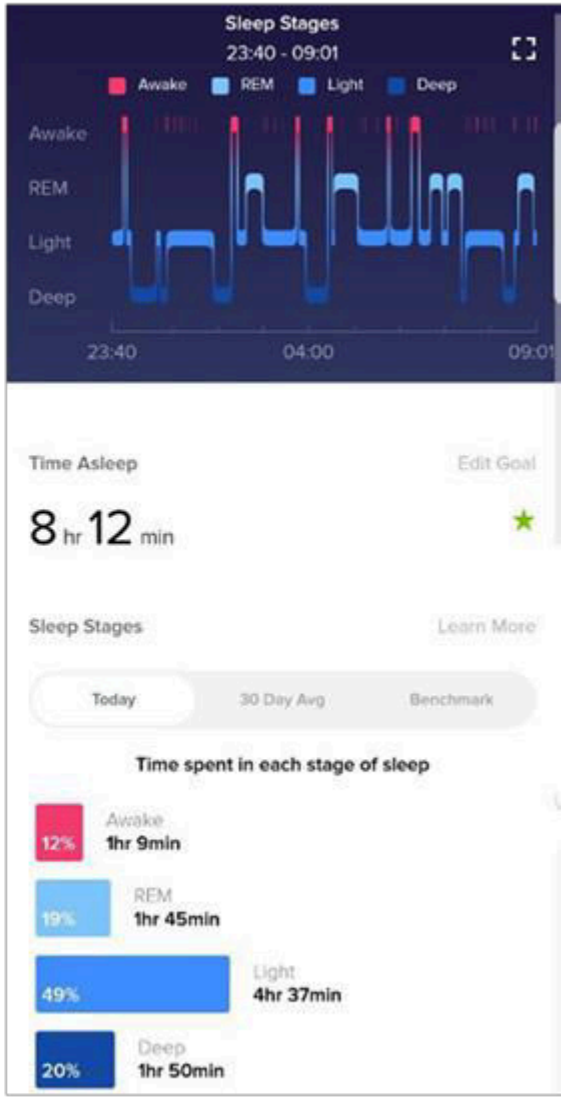






Enabling “Smart” - Fitbit Approach





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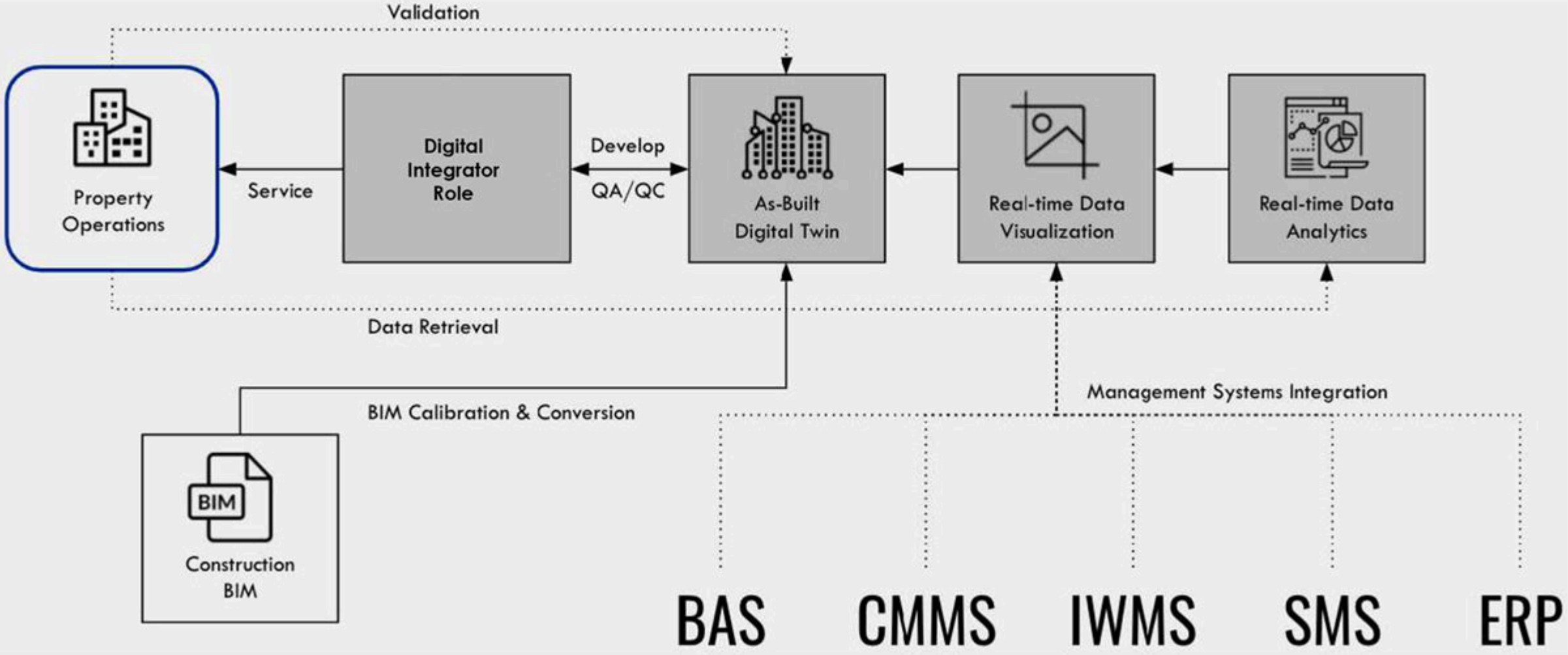
Open Source & Custom Tech stack Strategy



UNREAL ENGINE

unity

CRYENGINE

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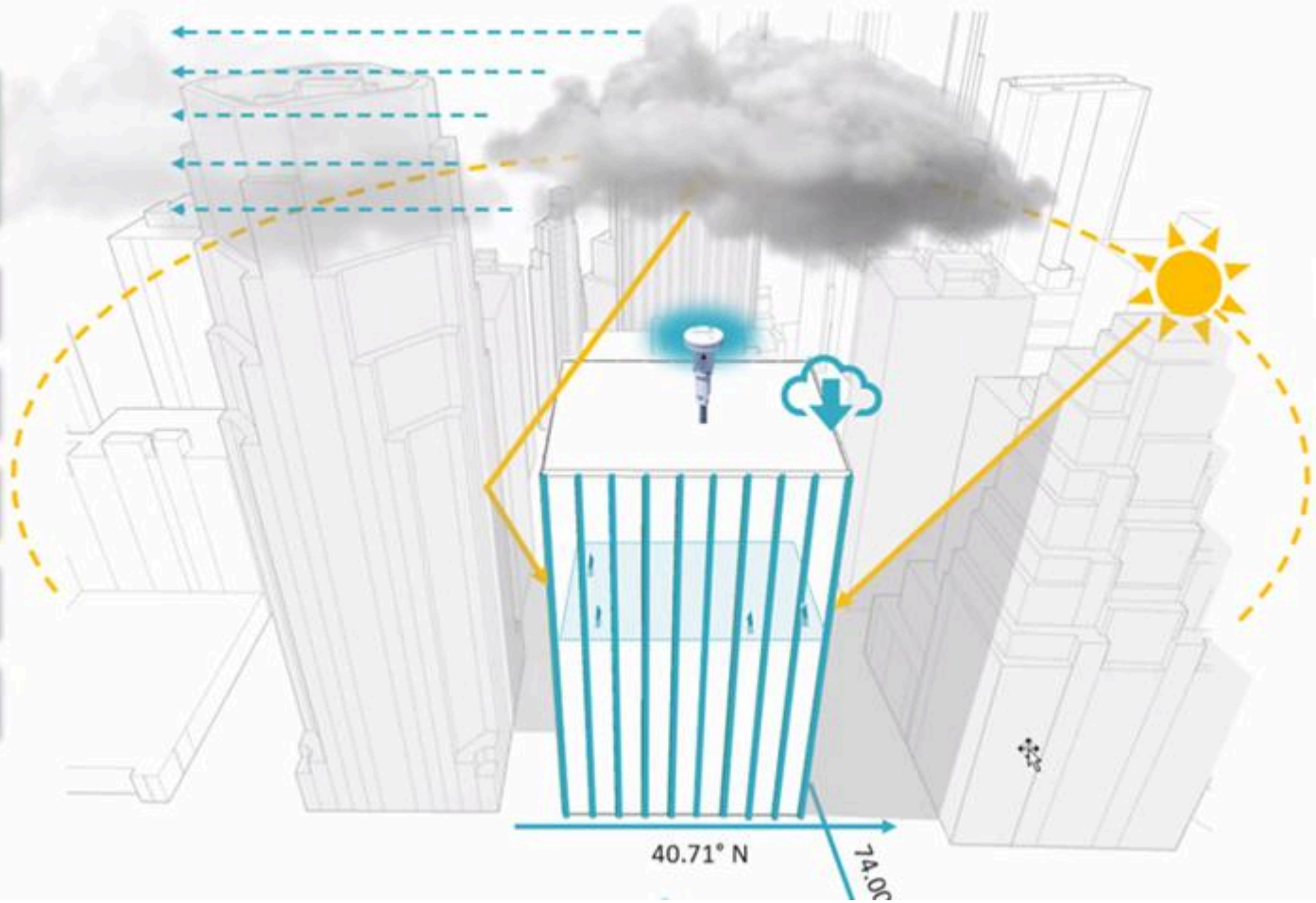
Case Study. Predictive Intelligence to optimize comfort

Digital Twin

- Latitude & Longitude
- Orientation
- Fixed Shading
- Surrounding Context
- Occupancy zones



Weather Prediction

- Sun Position
- Shadowing & Reflections
- Sky Sensor
- Machine Learning
- OTA Software Updates

Sustainability Impact

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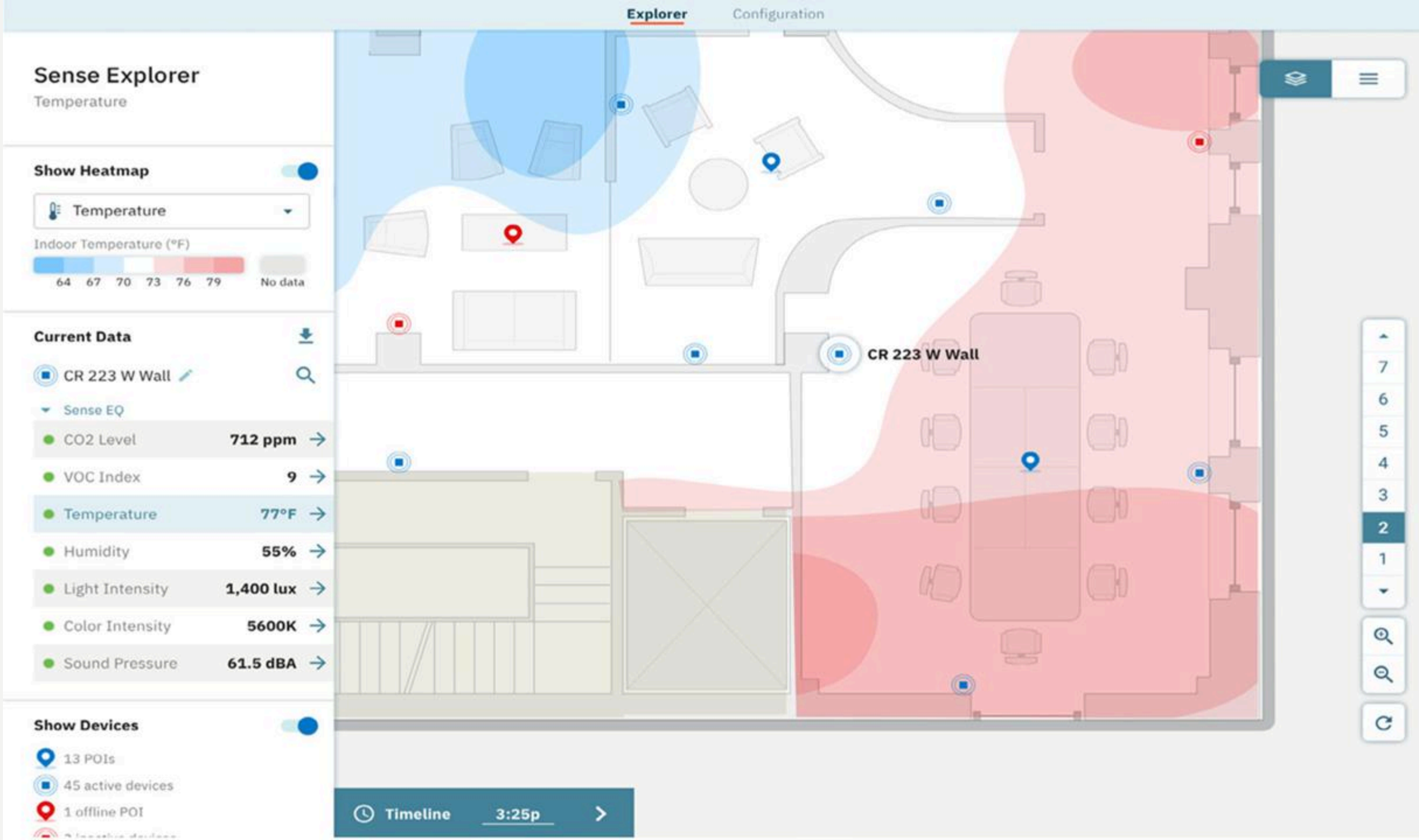
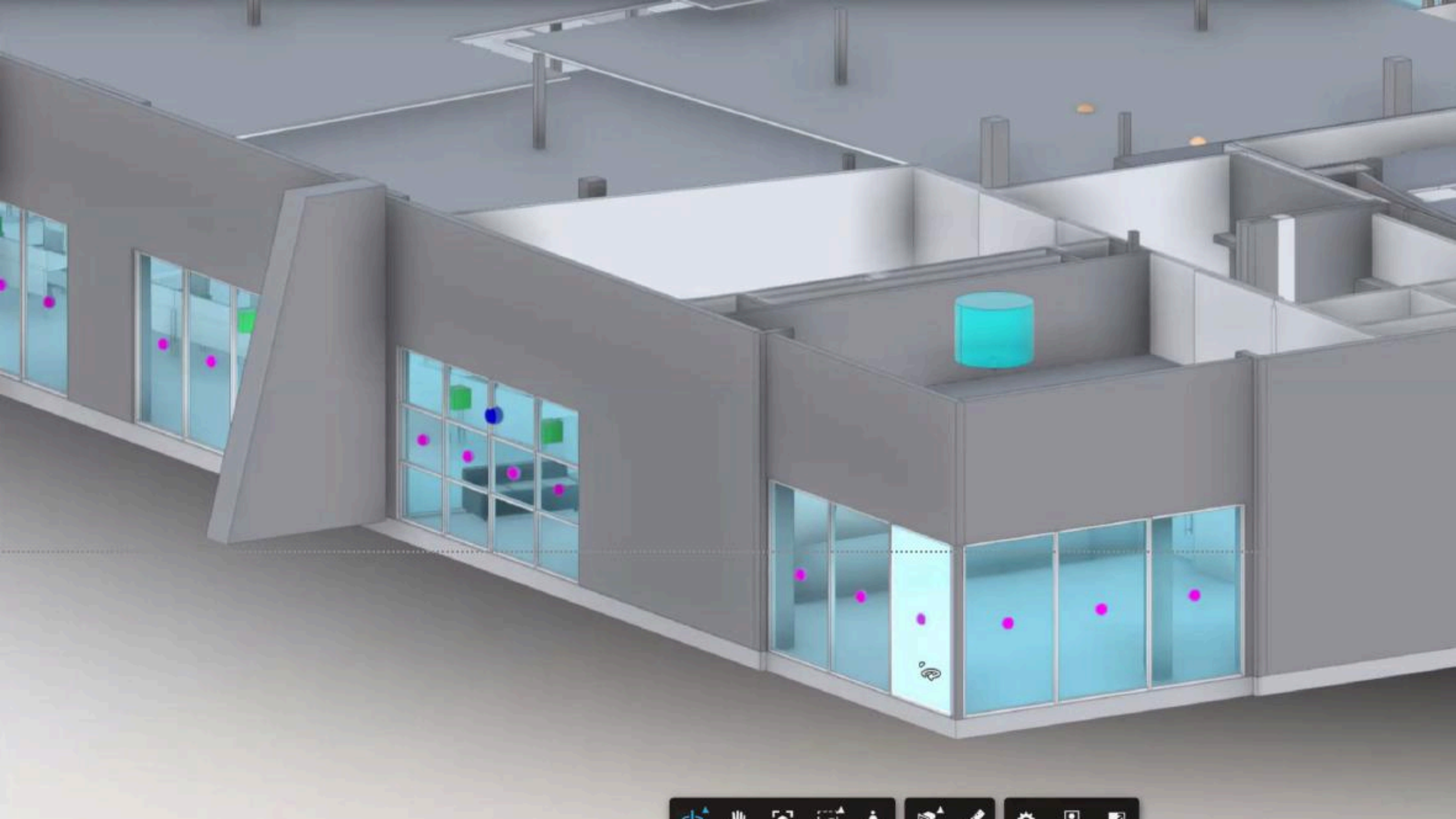

Explorer
Configuration
Sense Explorer
Temperature
Show Heatmap
Temperature
Indoor Temperature (°F)
64 67 70 73 76 79
No data
Current Data
CR 223 W Wall
Sense EQ
CO2 Level 712 ppm
VOC Index 9
Temperature 77°F
Humidity 55%
Light Intensity 1,400 lux
Color Intensity 5600K
Sound Pressure 61.5 dBA
Show Devices
13 POIs
45 active devices
1 offline POI
CR 223 W Wall
7
6
5
4
3
2
1
Timeline 3:25p



Building Overview

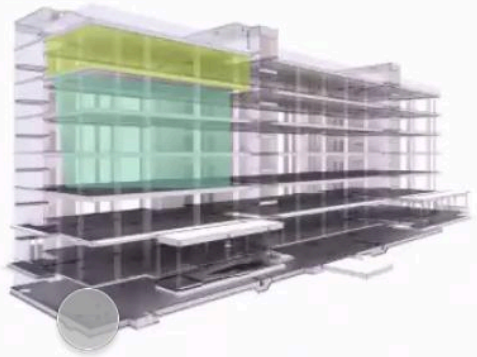
Safety >
Moderate
Overview safety element

Health >
Excellent
Overview health element

Performance >
Excellent
Overview performance element

Health / Overview

HELP



Metrics

Status Excellent
Opacity

TINT STATUS | RENTABLE SPACE | Co_2 CO₂ LEVELS | TIME & DATE | TINT SENSOR

Metrics

Status Excellent
Opacity

73% MEMORY

Co_2

70 Temp

70 Temp

TINT STATUS | RENTABLE SPACE | Co_2 CO₂ LEVELS | TIME & DATE | TINT SENSOR

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首都机场集团北京大兴国际机场一体化运维平台

Beijing Daxing International Airport (BDIA) Integrated Operation and Mangement Platform

电力资源管理 | 照明控制分析 | 空调控制分析 | 系统设置

异常记录 | 基础数据 | 退出登录

TM1概况

单位:A

总余量	本月异常数
1887	4

已使用容量 / 容量上限	使用率
613 / 2500	24.5%

利用峰值 / 已使用容量	
829 / 613	

当前使用 / 本月峰值	已使用容量利用率
613 / 802	33.1%

TM2概况

单位:A

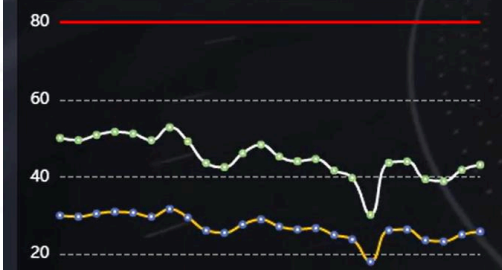
总余量	本月异常数
1478	24

已使用容量 / 容量上限	使用率
1022 / 2500	40.9%

利用峰值 / 已使用容量	
1381 / 1022	

当前使用 / 本月峰值	已使用容量利用率
1023 / 1337	55.2%

24小时实际使用率(%)分析



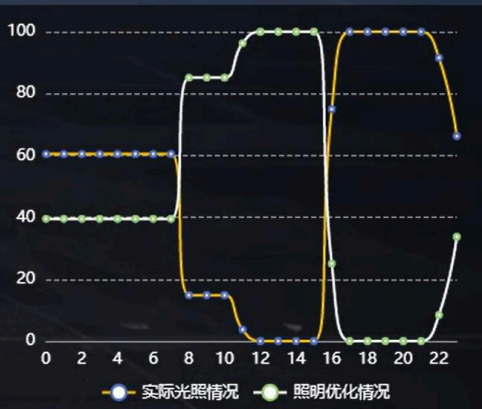
照明优化总体概况

优化数 / 设备总数	照明优化指数
127 / 200	63.5%

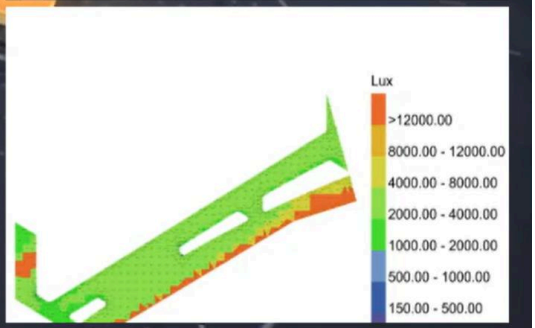
本月节能指数 / 历史节能指数
1675kWH / 1675kWH

24小时照明优化分析

单位:kVA



实时照度参数可视化分析



首都机场集团北京
Beijing Daxing International Airport (BDI

TM1概况

1887 总余量

4 本月

613 / 2500
已使用容量 容量上限

829 / 613
利用峰值 已使用容量

613 / 802
当前使用 本月峰值

TM2概况

1478 总余量

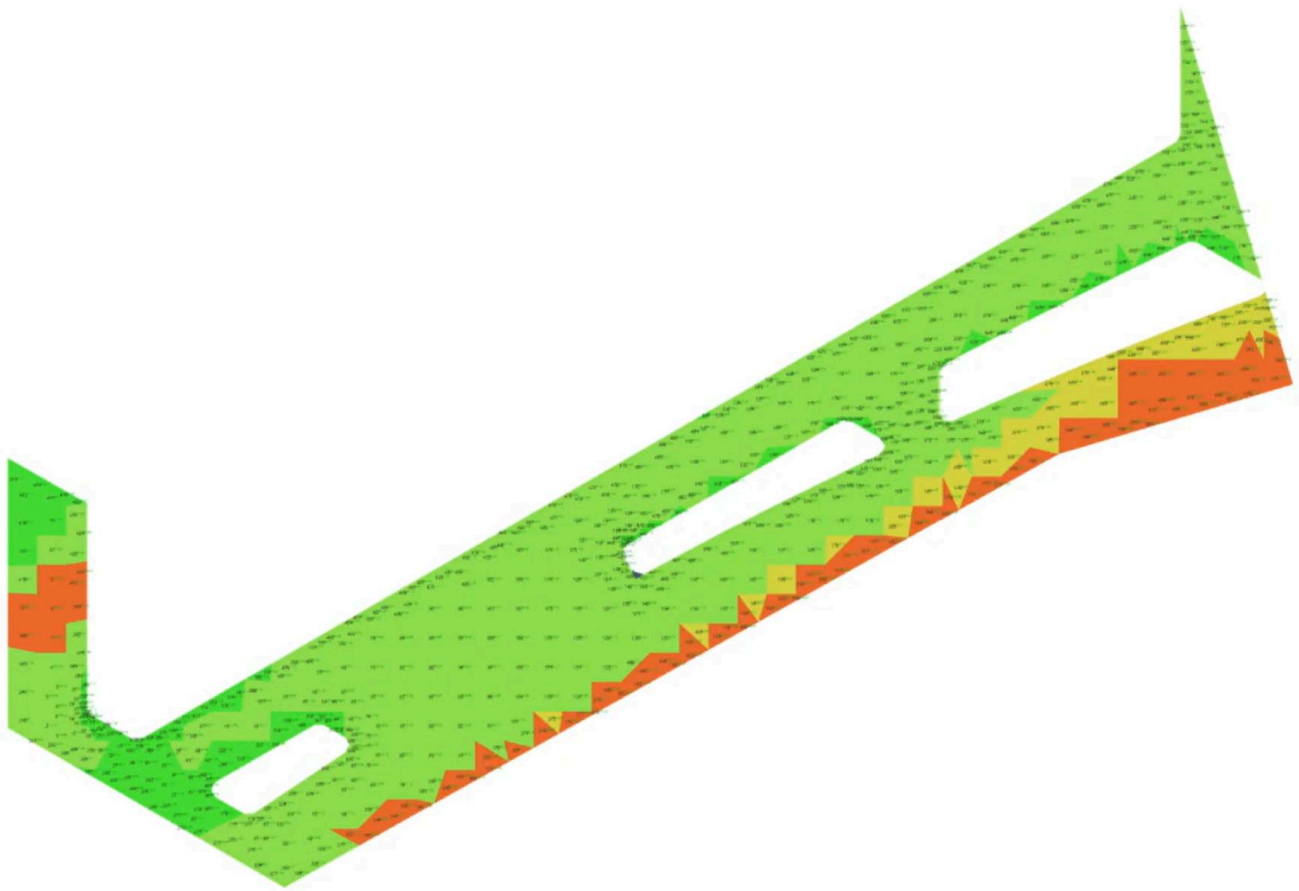
24 本月

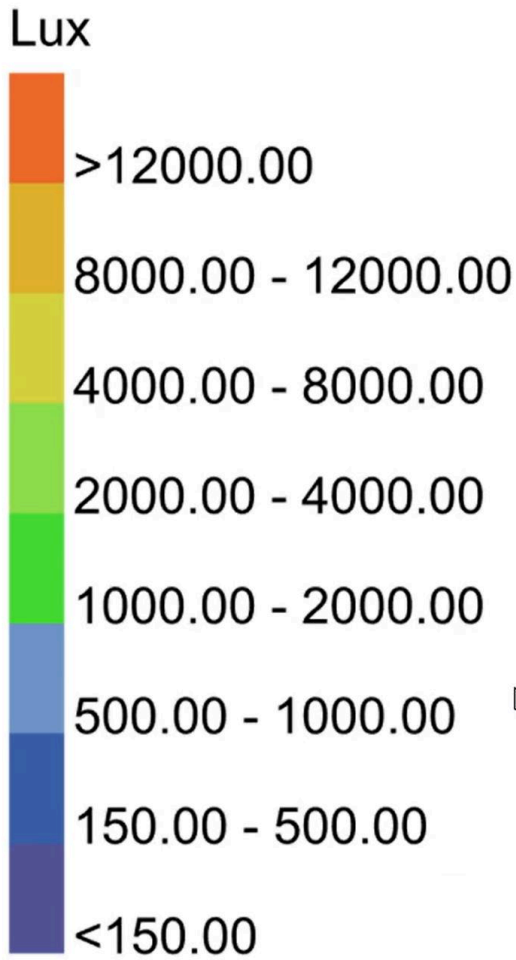
1022 / 2500
已使用容量 容量上限

1381 / 1022
利用峰值 已使用容量

1023 / 1337
当前使用 本月峰值

24小时实际使用率(%)分析





基础数据

退出登录

200 设备总数

63.5%

照明优化指数

1675kWH

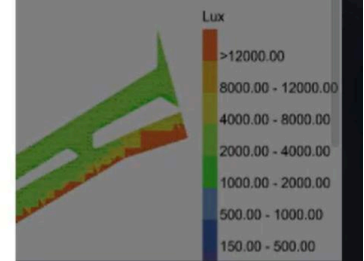
历史节能指数

分析 单位:kVA

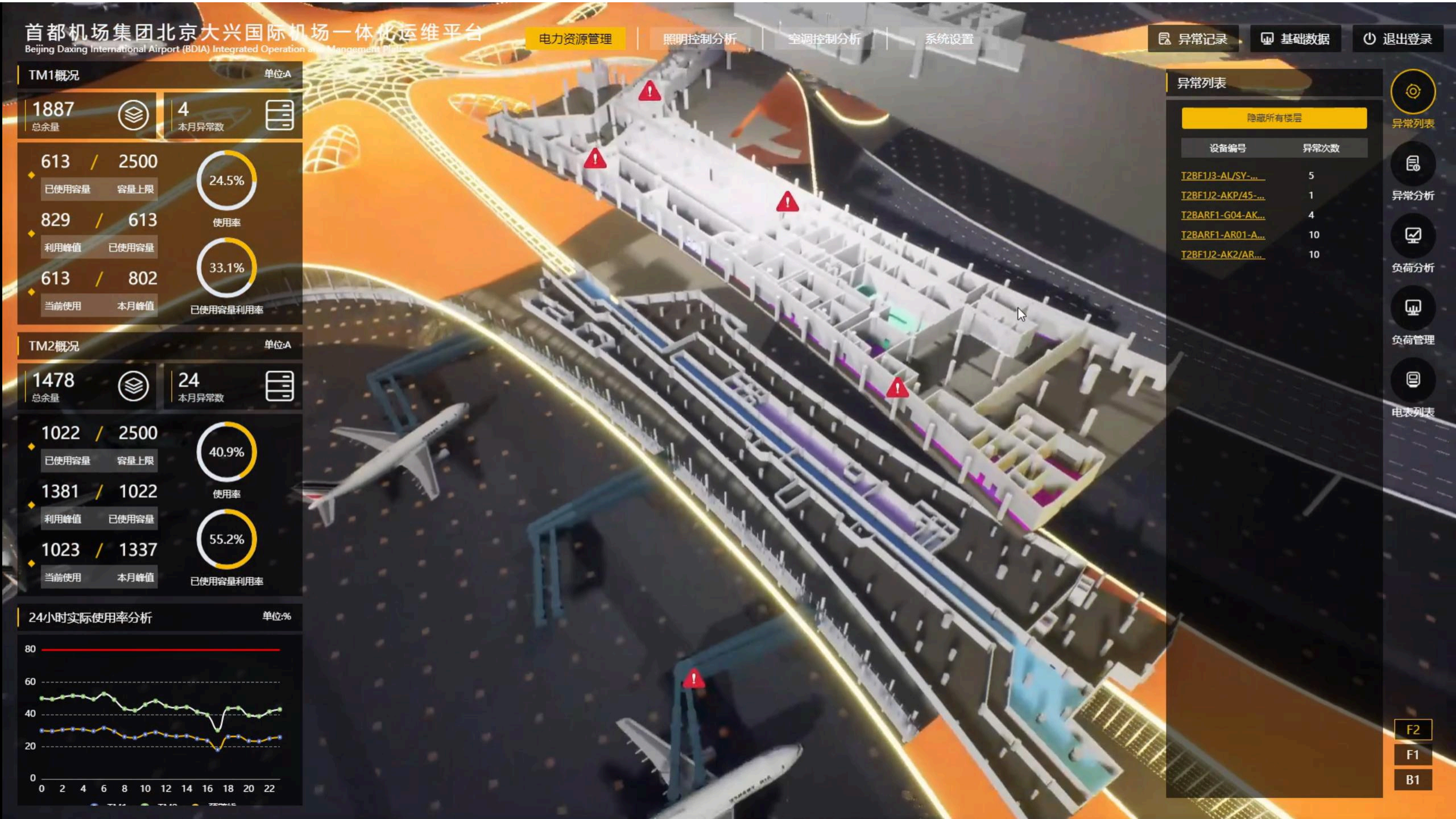
8 10 12 14 16 18 20 22

光照情况 照明优化情况

化分析

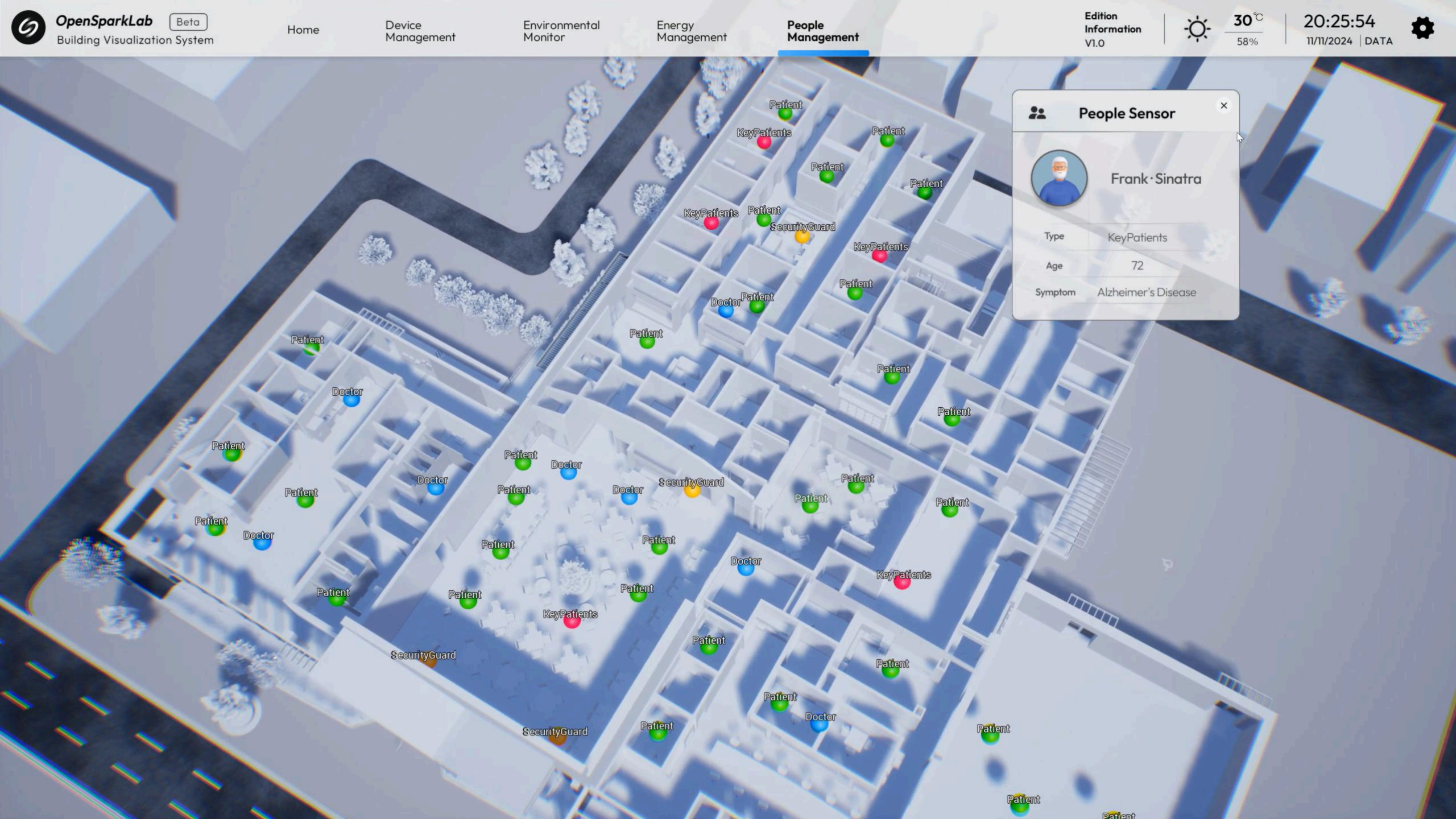


Sustainability Impact


首都机场集团北京大兴国际机场一体化运维平台
Beijing Daxing International Airport (BDIA) Integrated Operation and Management Platform
电力资源管理
照明控制分析
空调控制分析
系统设置
异常记录
基础数据
退出登录
TM1概况
单位:A
1887
总余量
4
本月异常数
613 / 2500
已使用容量 容量上限
24.5%
使用率
829 / 613
利用峰值 已使用容量
613 / 802
当前使用 本月峰值
33.1%
已使用容量利用率
TM2概况
单位:A
1478
总余量
24
本月异常数
1022 / 2500
已使用容量 容量上限
40.9%
使用率
1381 / 1022
利用峰值 已使用容量
1023 / 1337
当前使用 本月峰值
55.2%
已使用容量利用率
24小时实际使用率分析
单位:%
80
60
40
20
0
0 2 4 6 8 10 12 14 16 18 20 22
异常列表
隐藏所有楼层
设备编号
异常次数
T2BF1J3-AL/SY-...
5
T2BF1J2-AKP/45-...
1
T2BARF1-G04-AK...
4
T2BARF1-AR01-A...
10
T2BF1J2-AK2/AR...
10
异常列表
异常分析
负荷分析
负荷管理
电表列表
F2
F1
B1

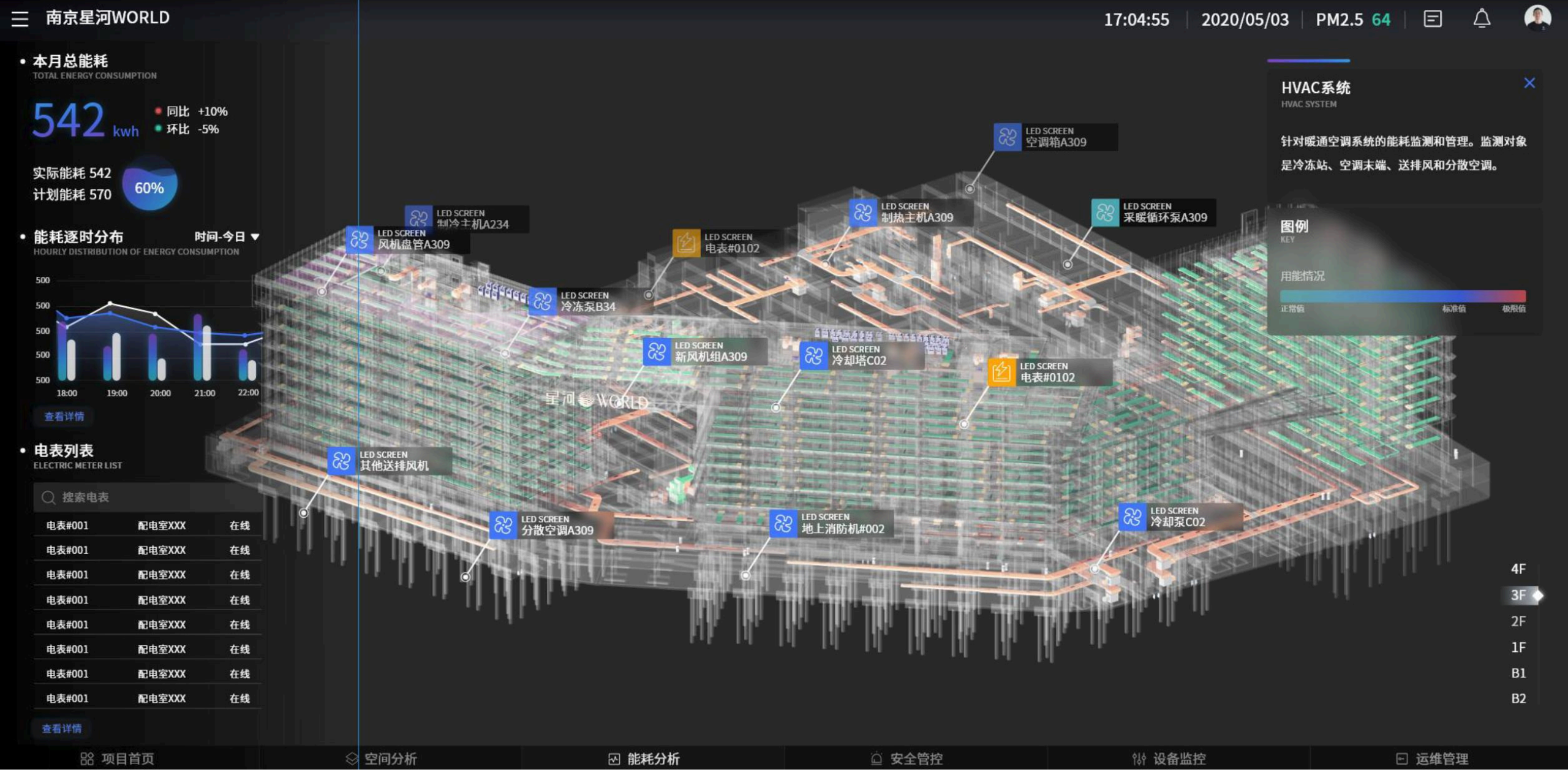

OpenSparkLab
Beta
Building Visualization System
Home
Device Management
Environmental Monitor
Energy Management
People Management
Edition Information
V1.0
30℃
58%
20:25:01
11/11/2024 | DATA
Environmental Sensor Panel
Real-time
Device View
Enviromental Parameter
AQI
Temperature
Humidity
PM2.5
PM10
HCHO
CarbonDioxide
Environmental
ViewMore
AQI
48
GOOD
CarbonEmission
587 TCO²
This Year
CarbonEmission
49 TCO²
This Month
CarbonEmission
5.2 TCO²
This Day
Environmental Monitor Event
2024/10/28 18:23 Humidity 82% Anomaly
2024/10/28 18:00 Temperature 27° Anomaly
2024/10/28 18:00 Carbon Dioxide 0.048 Anomaly
2024/10/28 18:00 Carbon Dioxide 0.048 Anomaly
Environmental Sensor
TYPE Environmental Sensor
ID C000290435
STATUS Online
Temperature 26°
Humidity 57%
PM2.5 16 μg/m³
Formaldehyde 0.03
CarbonDioxide 0.05


OpenSparkLab
Beta
Building Visualization System
Home
Device Management
Environmental Monitor
Energy Management
People Management
Edition Information
V1.0
30℃
58%
20:25:23
11/11/2024 | DATA
Energy Sensor Time
Real-time
Energy Sensor Type
Electricity
Water
Gas
Energy Consumption Ranking
101 15181
102 9864
103 9864
104 9864
105 9864
106 9864
107 9864
108 9864
109 9864
110 9864
110 9864
111 9864
112 9864
113 9864
Water Consumption
587 T
This Month
ElectricityConsumption
142 KWh
This Month
Gas Consumption
52³
This Month
Energy
ViewMore
97%
Number Of EnergySor
288
Total Number Of Energ Sensor
Camera 8.94%
Air Conditioner 33.5%
FireSprinkler 12.5%
Energy Monitor 6.59%
FireSprinkler 9.01%
Light Device 21.07%
FireSprinkler 8.39%


OpenSparkLab
Beta
Building Visualization System
Home
Device Management
Environmental Monitor
Energy Management
People Management
Edition Information
V1.0
30℃
58%
20:25:54
11/11/2024 | DATA
People Sensor
Frank·Sinatra
Type
KeyPatients
Age
72
Symptom
Alzheimer's Disease
Patient
KeyPatients
Doctor
SecurityGuard


南京星河WORLD
17:04:55
2020/05/03
PM2.5 64
本月总能耗
TOTAL ENERGY CONSUMPTION
542 kwh
同比 +10%
环比 -5%
实际能耗 542
计划能耗 570
60%
1台 主变台数
150KVA 运行容量
340个 计量点数
能耗逐时分布
HOURLY DISTRIBUTION OF ENERGY CONSUMPTION
时间-今日
18:00
19:00
20:00
21:00
22:00
查看详情
年度能耗统计分析
YEARLY DISTRIBUTION OF ENERGY CONSUMPTION
时间-今年
1月
2月
3月
4月
5月
6月
7月
查看详情
HVAC#A001
本月总能耗：504kWh
计划能耗：620kWh
同比：+10%
室内公共照明#A01
本月总能耗：504kWh
计划能耗：620kWh
同比：+10%
14:20 2号楼2层#567设备温度过高!
14:10 2号楼2层#567设备温度异常关机!
14:05 2号楼2层#567设备温度异常关机!
14:00 2号楼2层#567设备温度异常关机!
综合能耗分析
综合对比分析
计划对比分析
租户能耗分析
招商鉴定分析
总能耗逐时分析
总能耗年度分析
租户能耗分析
电表统计
能耗计划
能耗拓扑
N
W
E
S
4F
3F
2F
1F
B1
B2
主视角
图纸
气候
日夜
系统排名（月度）
SYSTEM RANKING
动力用电 4.9%
LED屏幕 66.6%
给排水 66.6%
照明系统 24.7%
HVAC系统 24.7%
分类 计划(kwh) 实际(kwh) 实际占计划比例 占总能耗比
HVAC系统 23.2 2.1 105.3% 55.2%
室内照明 9.2 8.8 105.1% 17.7%
夜景照明 2.1 2.1 103.2% 5.1%
LED屏幕 0.5 0.5 95.9% 1.1%
电梯 2.2 2.2 97.8% 5.5%
停车场 5.6 5.6 96.1% 11.2%
给排水 1.3 1.3 105.3% 2.7%
动力用电 1.27 1.4 103.2% 5.7%
查看详情
租户能耗曲线
ENTERPRISE ENERGY CONSUMPTION CURVE
时间-今年
周一
周二
周三
周四
周五
周六
查看详情
项目首页
空间分析
能耗分析
安全管控
设备监控
运维管理

Greenbuild


南京星河WORLD
17:04:55
2020/05/03
PM2.5 64
本月总能耗
TOTAL ENERGY CONSUMPTION
542 kwh
同比 +10%
环比 -5%
实际能耗 542
计划能耗 570
60%
能耗逐时分布
时间-今日
HOURLY DISTRIBUTION OF ENERGY CONSUMPTION
500
500
500
500
500
18:00
19:00
20:00
21:00
22:00
查看详情
电表列表
ELECTRIC METER LIST
搜索电表
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
电表#001 配电室XXX 在线
查看详情
LED SCREEN 制冷主机A234
LED SCREEN 风机盘管A309
LED SCREEN 电表#0102
LED SCREEN 冷冻泵B34
LED SCREEN 空调箱A309
LED SCREEN 制热主机A309
LED SCREEN 采暖循环泵A309
LED SCREEN 新风机组A309
LED SCREEN 冷却塔C02
LED SCREEN 电表#0102
LED SCREEN 其他送排风机
LED SCREEN 分散空调A309
LED SCREEN 地上消防机#002
LED SCREEN 冷却泵C02
星河WORLD
HVAC系统
HVAC SYSTEM
针对暖通空调系统的能耗监测和管理。监测对象是冷冻站、空调末端、送排风和分散空调。
图例
KEY
用能情况
正常值
标准值
极限值
4F
3F
2F
1F
B1
B2
项目首页
空间分析
能耗分析
安全管控
设备监控
运维管理

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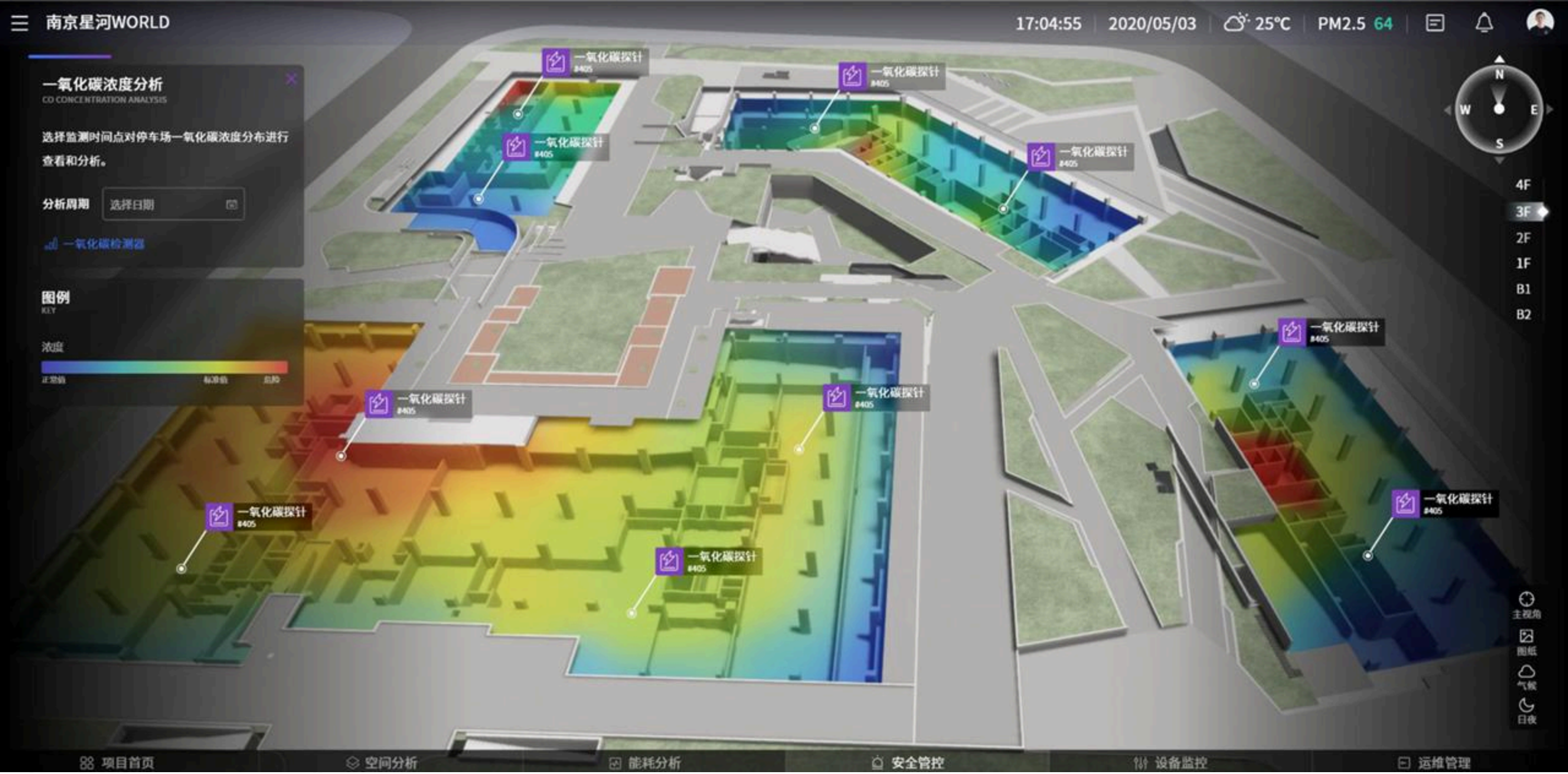
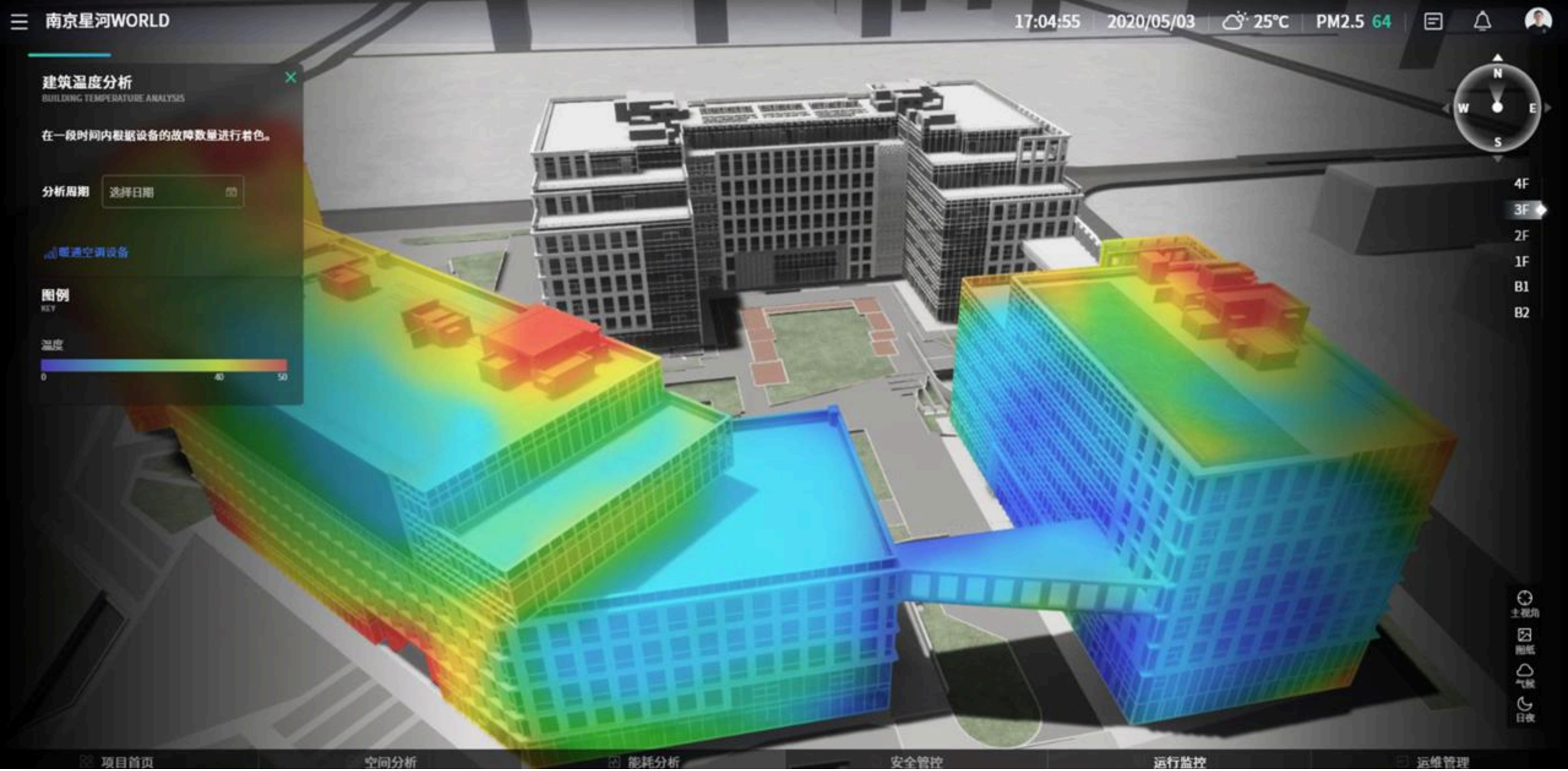
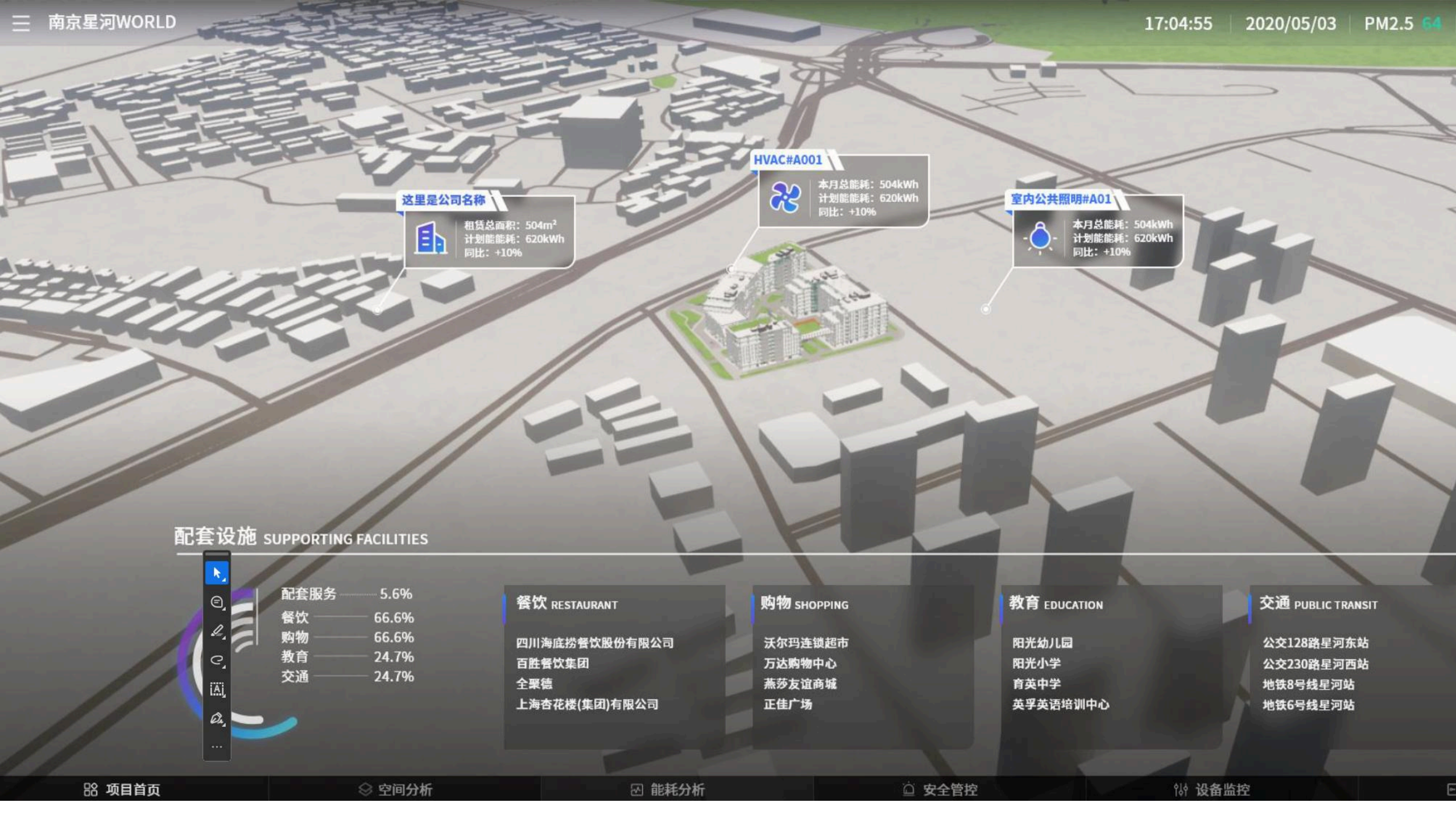

南京星河WORLD
17:04:55
2020/05/03
25°C
PM2.5 64
一氧化碳浓度分析
CO CONCENTRATION ANALYSIS
选择监测时间点对停车场一氧化碳浓度分布进行查看和分析。
分析周期
选择日期
一氧化碳检测器
图例
KEY
浓度
正常值
标准值
危险
一氧化碳探针
#405
N
W
E
S
4F
3F
2F
1F
B1
B2
主视角
图纸
气候
日夜
项目首页
空间分析
能耗分析
安全管控
设备监控
运维管理


南京星河WORLD
17:04:55
2020/05/03
25°C
PM2.5 64
建筑温度分析
BUILDING TEMPERATURE ANALYSIS
在一段时间内根据设备的故障数量进行着色。
分析周期
选择日期
暖通空调设备
图例
KEY
温度
0
40
50
N
W
E
S
4F
3F
2F
1F
B1
B2
项目首页
空间分析
能耗分析
安全管控
运行监控
运维管理



配套设施 SUPPORTING FACILITIES

配套服务	5.6%
餐饮	66.6%
购物	66.6%
教育	24.7%
交通	24.7%

餐饮 RESTAURANT

四川海底捞餐饮股份有限公司
百胜餐饮集团
全聚德
上海杏花楼(集团)有限公司

购物 SHOPPING

沃尔玛连锁超市
万达购物中心
燕莎友谊商城
正佳广场

教育 EDUCATION

阳光幼儿园
阳光小学
育英中学
英孚英语培训中心

交通 PUBLIC TRANSIT

公交128路星河东站
公交230路星河西站
地铁8号线星河站
地铁6号线星河站


ELEVATOR
WELCOME JEFF
Service Requests
Inventory Report
Profile
Log Out
TAC 20 elevator
Location
San LaMonte Building
MAX Data
Video Tutorial
DANGER
Low Clearance
10 Rules for Health & Safety
Service Manuals
LD-03 Door Operator
TAC 20 Door Operator

02

Panel Dialogue

Guided discussion on barriers, solutions, and responsible AI implementation.

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ROUND 1:
Common Barriers & Solutions

Explore the most significant barriers to AI adoption in sustainable cities—from data and interoperability to policy and institutional readiness—and highlight practical strategies to overcome them. This round focuses on lessons learned from real-world implementation challenges.

> *From your case and experience, what is the most significant barrier you've encountered in AI adoption for sustainable cities? What is one practical strategy you used (or would recommend) to address it?*

Kimon G. Onuma
President
ONUMA, Inc.

Leo Salce
Principal & CEO
AVANT LEAP

Umair Surani
Director, Energy & Sustainability
Environ Energy

ROUND 2:
Practical Approaches for Responsible Implementation

Identify actionable steps that ensure AI adoption in cities is not only innovative but also ethical, transparent, and equitable. This round emphasizes principles and practices that build public trust and long-term sustainability.

> *Based on your work, what is one practical step cities or organizations can take to ensure AI is implemented responsibly—balancing innovation with ethics, transparency, and equity?*

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AVANT LEAP

Umair Surani
Director, Energy & Sustainability
Environ Energy

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03

Final Reflections & Takeaways

Concise insights and “quick wins” from each panelist.

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Final Reflections: Takeaways & Quick Wins

Close the session with concise, forward-looking insights from each panelist. This round highlights personal reflections—the key lessons, dos and don’ts, or quick wins that cities and organizations can apply immediately to guide responsible AI adoption.

> *What is one actionable takeaway or guiding principle you want practitioners to leave with to advance AI for sustainable, equitable, and resilient cities?*

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AVANT LEAP

Umair Surani
Director, Energy & Sustainability
Environ Energy

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04

Open Q&A: Extending the Conversation

Audience questions and reflections to deepen the dialogue.

Greenbuild

Connect with Us

Kimon Onuma FAIA

Building Informed Environments | President at ONUMA, Inc.

Eve Lin McNaughton

Ph.D. | WELL AP | LEED AP BC + D, O+M, HOMES | CPHD/C ...

Leo Salce

Founder & CEO at @Avant Leap | Architect & Technologist | Strategic I...

Umair Surani

Energy & Sustainability Solutions Strategist | Transforming Buildings ...

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Thank you!
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