

City of Coral Gables Innovation and Technology

Smart Districts and Broadband Infrastructure

Sustainability, Resilience, Workability, Livability

RAIMUNDO RODULFO, P.E., MSEM, PMP, CSSBB
CHIEF INNOVATION OFFICER / DIRECTOR OF INFORMATION TECHNOLOGY

FEBRUARY 2022



Smart Districts and Broadband Infrastructure

Secure, Resilient, Smart & Connected Districts, Buildings and Facilities

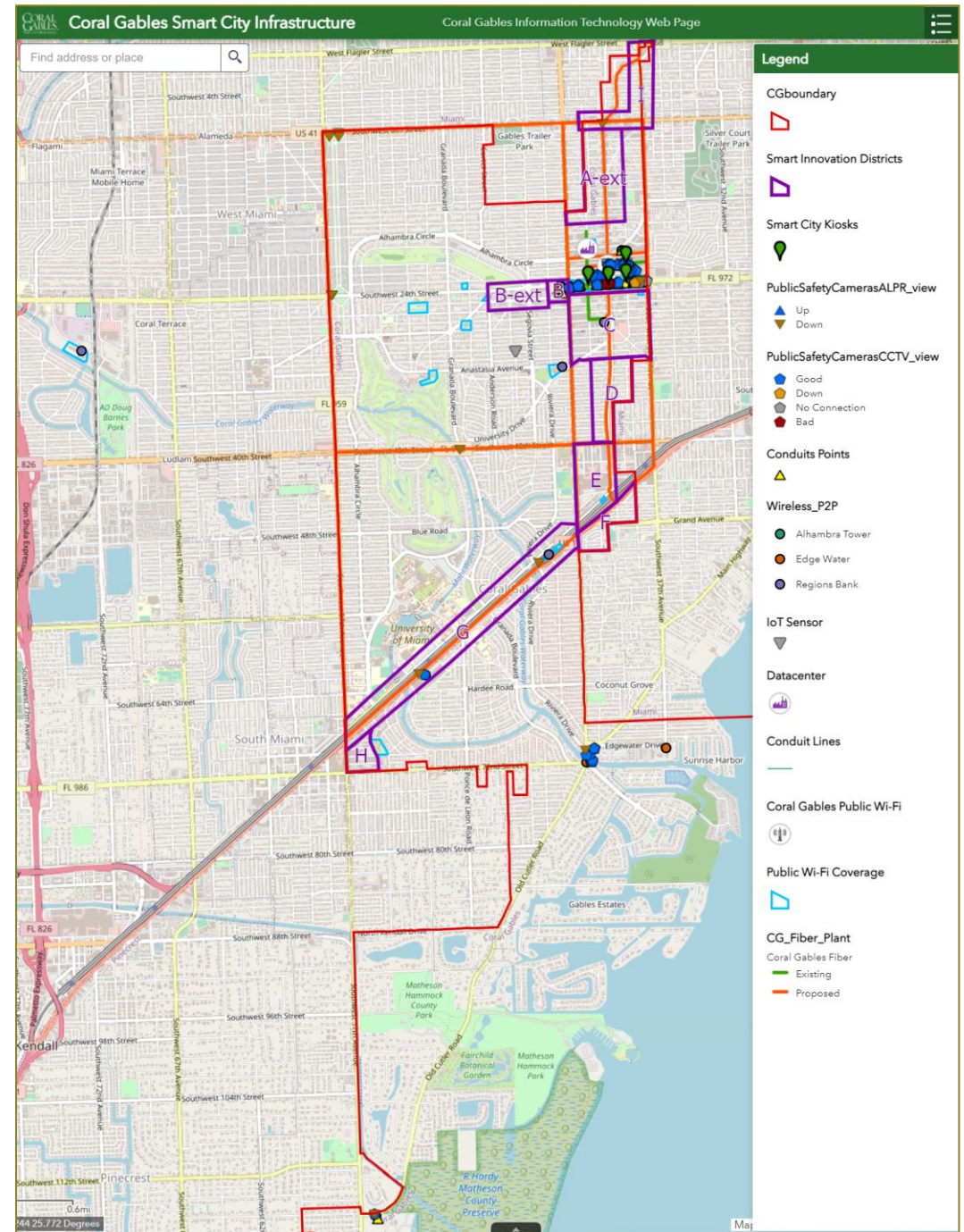
Benefits/Impact:

- High speed connectivity & capacity for city services
- Enhanced network/telecommunications resilience
- Digital services, data, and public connectivity for residents, businesses, students, visitors
- Quality of life, enhanced citizen services
 - Public safety
 - Mobility
 - Digital inclusion, telehealth, tele-education, telework
 - Situational awareness/visibility, urban analytics, automation, real-time actionable information
Environmental, traffic, safety, economic
- Economic, entrepreneurship and jobs opportunities
- Tech/innovation incubators, accelerators, P3s, startups, scaleups, techno-parks, think-tanks, STEM research

What we have

Previous Projects Completed over multiple years:

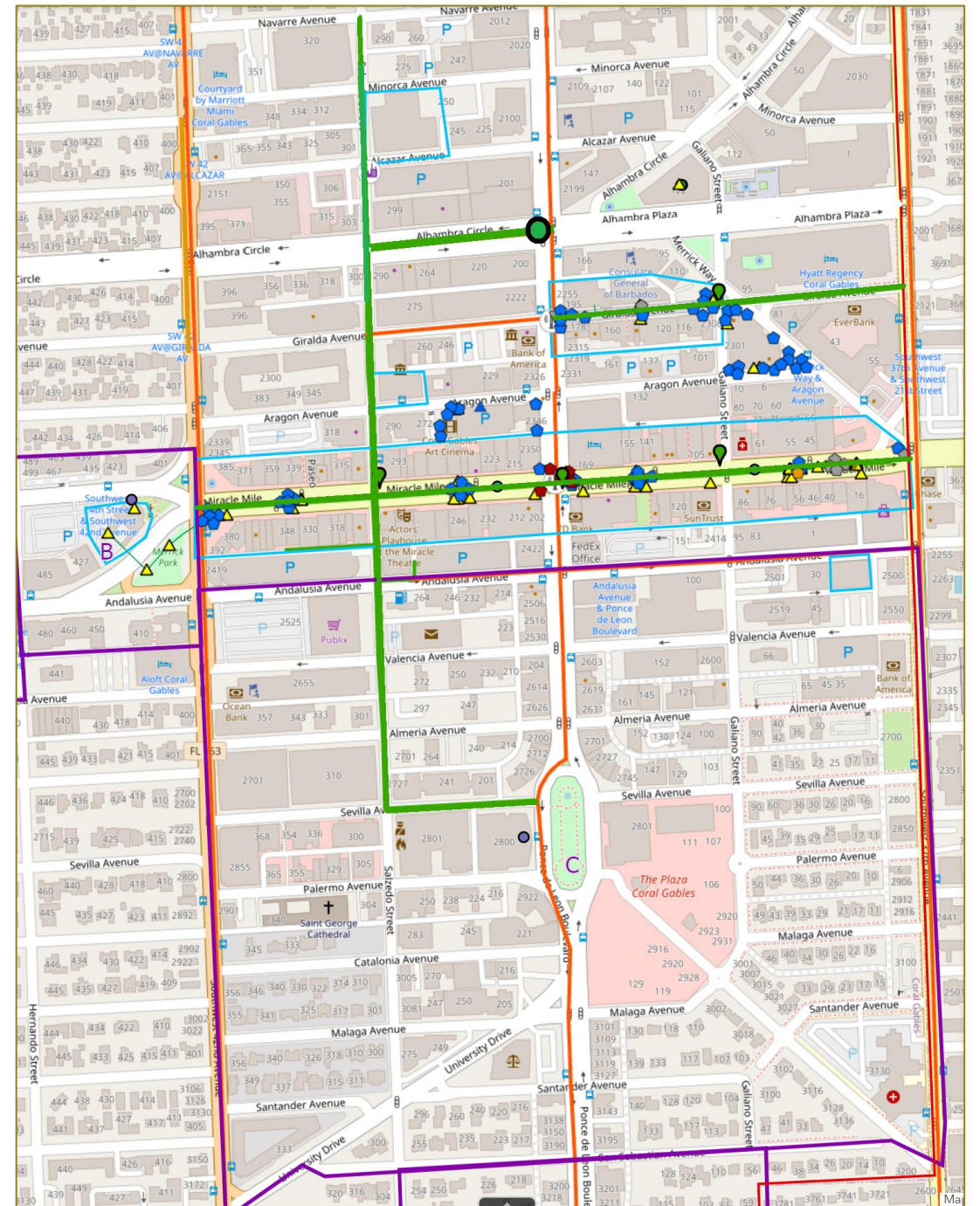
- **Smart Districts (A, B, ..., H, I; & Geofence) Infrastructure**
- Fiber Corridors (20 segments):
 - Miracle Mile, Giralda Plaza, Salzedo, and one-block segments in Sevilla, Andalusia, and Alhambra
 - Connected buildings: Police and Fire HQ, City Hall, Development Serv. Ctr, Parking Garages 1 & 4, network node at Regions Bank Bldg.
- Public Wi-Fi network (CBD/Downtown, Public Parks & Facilities)
- Wireless point-to-point network (redundancy)
- Public Safety cameras/sensors - CCTV, ALPR, Geofence
- IoT Sensors (traffic, safety, environmental, economic)
- Smart lighting poles and controllers
- Smart City AI-powered pole (pilot)
- Smart City kiosks
- Smart and connected buildings, datacenters, network nodes, smart city hub / community intelligence center

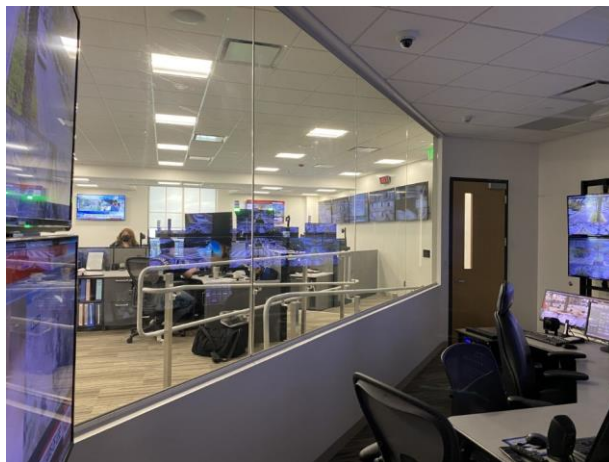


What we have (continued)

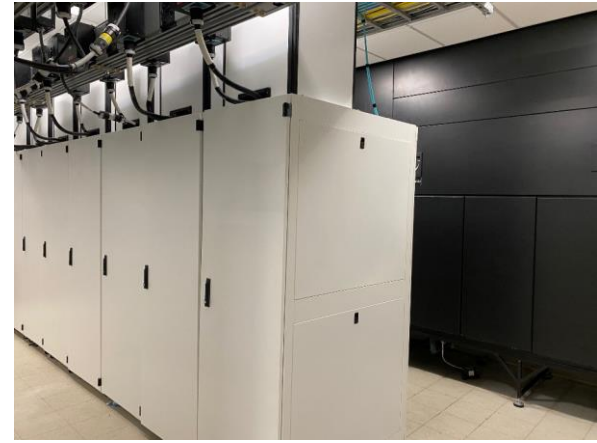
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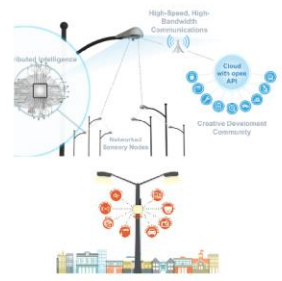
CITY OF CORAL GABLES – SMART BUILDINGS - PFHQ, FS2/TROLLEY NEW NETWORK HQ, 1RY DATA CENTER, BACKUP 911 PSAP



INTERNET OF THINGS

REAL-TIME URBAN AND ENVIRONMENTAL VISIBILITY / PHYSICAL INTERFACING

SMART LIGHTS



TRAFFIC & PARKING SENSORS



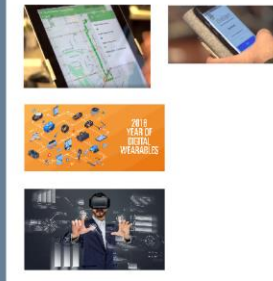
PUBLIC SAFETY SMART EQUIPMENT



ENVIRONMENTAL SENSORS & ACTUATORS



SMART DEVICES



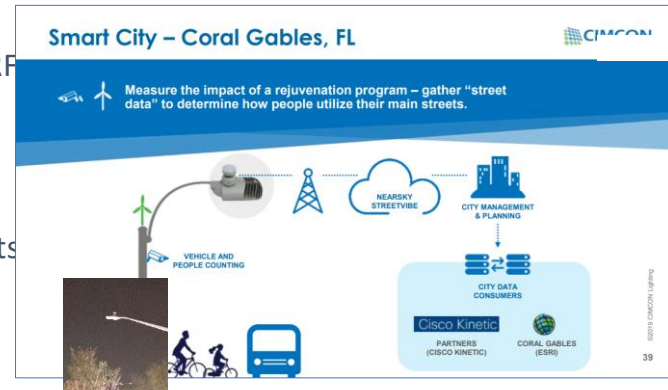
SMART KIOSKS & DIGITAL SIGNAGE



ROBOTICS & SMART VEHICLES



- Traffic sensors: pedestrians, vehicles, bicycles, visitors, RF
- ALPR, CCTV cameras and public safety smart devices
- Environmental sensors: air quality, waterways, noise
- Smart Parking sensors (counting available/occupied spots)
- Smart Lighting controllers & IoT network
- Smart Poles
- Smart City Digital Kiosks
- Smart Building SHM sensors
- Telemetry sensors and actuators
- Fleet Management
- IoT and Urban Analytics AI



Smart City AI-Powered Modular Pole Next Generation - First in the U.S.

Coral Gables Custom Design (current pilot, version 3):

Public Wi-Fi

Traffic Safety cameras and sensors

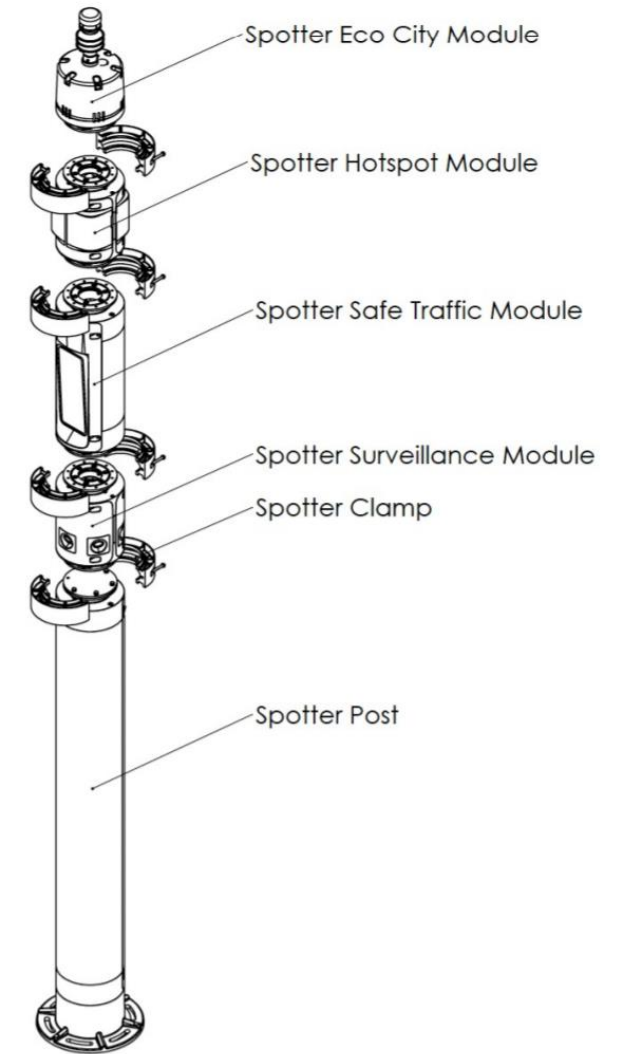
Traffic counters (multimode, vehicle, pedestrian...)

Environmental sensors (air quality, weather...)

Hurricane wind resistant structural design

New Features/Modules (version 4):

Enhanced communications, enhanced cameras,
Coral Gables industrial design and aesthetics,
smart lighting, noise sensor, announcer...



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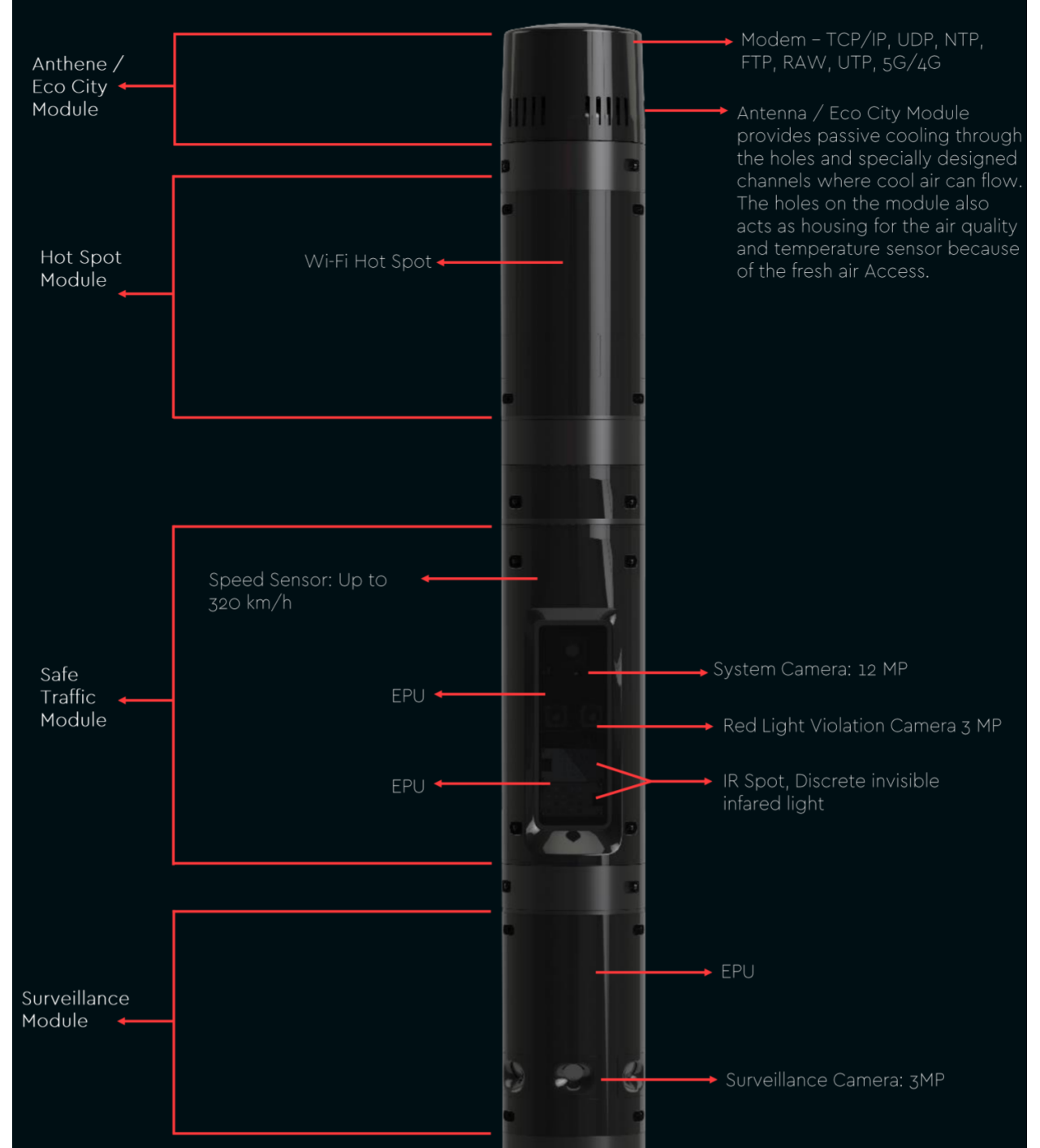
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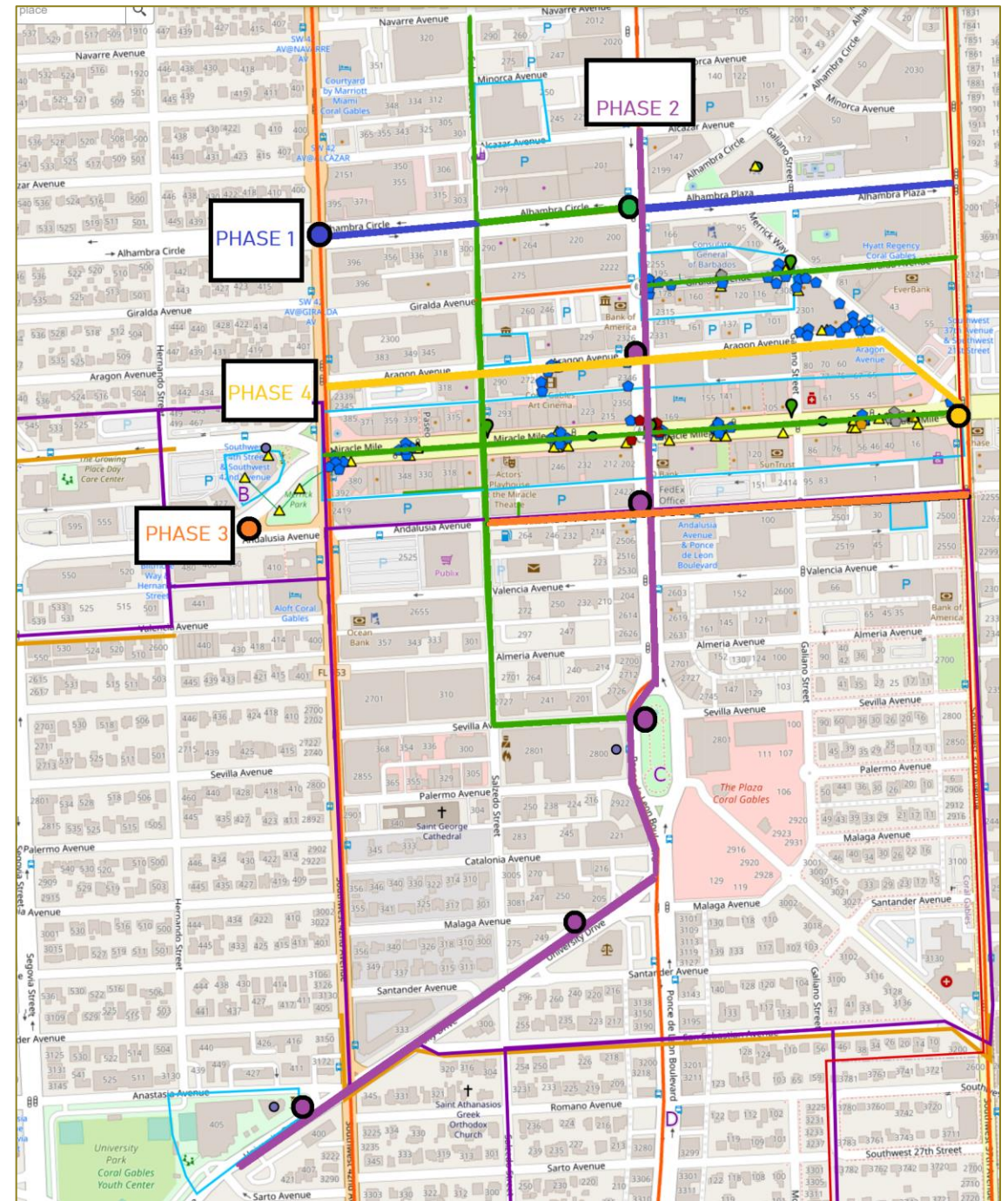
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What's coming

New Phases:

1. Financial Corridor on Alhambra Circle
2. Ponce de Leon and University corridors
3. Mobility Corridor on Andalusia
4. Arts & Culture Corridor on Aragon, and a block segment of Merrick Way



A Robust Foundation of High-Speed, High-Capacity, Secure, Smart & Resilient Communications Infrastructure

Enables and facilitates:

- Real-time urban, environmental, and economic visibility
- Actionable information and analytics
- Access to scalable, highly-available clouds and mobile platforms
- The delivery of services, tools, enterprise applications, and actionable data to a Smart City ecosystem: people, businesses, organizations, smart/autonomous systems
- Alignment with strategic goals, mission, and vision of excellence



STRATEGIC PLANNING – INNOVATION

CONTINUOUS IMPROVEMENT

CUSTOMER SERVICE – QUALITY OF LIFE

SMART CITY ECOSYSTEM

COLLABORATION, PARTNERSHIP, INTELLIGENCE / CUSTOMERS, STAKEHOLDERS AND TECHNOLOGY

PEOPLE



BUSINESSES



ORGANIZATIONS



THINGS



I.T. SYSTEMS



SMART CITY HUB

VALUE, TRANSPARENCY, OPEN DATA AND ANALYTICS, ACTIONABLE INFORMATION, EFFICIENCIES
CITIZEN ENGAGEMENT, MOBILITY, ACCESSIBILITY, INCLUSION, CROWDSOURCING, COLLABORATION

DATA MARKETPLACE

OPEN DATA PORTALS



IoT DASHBOARDS



GIS PORTALS



APP STORE



ENTERPRISE SYSTEMS • eGOV



TRANSPARENCY PORTALS



CITIZEN ENGAGEMENT



CRIME INTELLIGENCE CENTER



DATA PLATFORMS

DATA AGGREGATION, INTEGRATION AND CORRELATION / BUSINESS INTELLIGENCE AND ANALYTICS BACKEND

PUBLIC & PRIVATE CLOUDS & DATACENTERS



BIG DATA-AGGREGATION & ANALYTICS



ARTIFICIAL INTELLIGENCE & MACHINE LEARNING



VIDEO ANALYTICS



OPEN DATA & APIs



HORIZONTAL & VERTICAL INTEGRATION



INTERNET OF THINGS

REAL-TIME URBAN AND ENVIRONMENTAL VISIBILITY / PHYSICAL INTERFACING

SMART LIGHTS



TRAFFIC & PARKING SENSORS



PUBLIC SAFETY SMART EQUIPMENT



ENVIRONMENTAL SENSORS & ACTUATORS



SMART DEVICES



SMART KIOSKS & DIGITAL SIGNAGE



ROBOTICS & SMART VEHICLES



HIGH SPEED COMMUNICATIONS AND RESILIENCE

ROBUST, RESILIENT SMART CITY NETWORK FOUNDATION

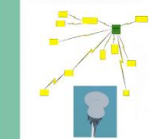
RESILIENT NETWORK



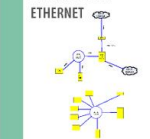
FIBER OPTICS



WIRELESS BACKBONE



METROPOLITAN ETHERNET



PUBLIC & PRIVATE WI-FI NETWORKS



SATELLITE & CELLULAR COMMUNICATIONS



SMART ENERGY RESILIENCE

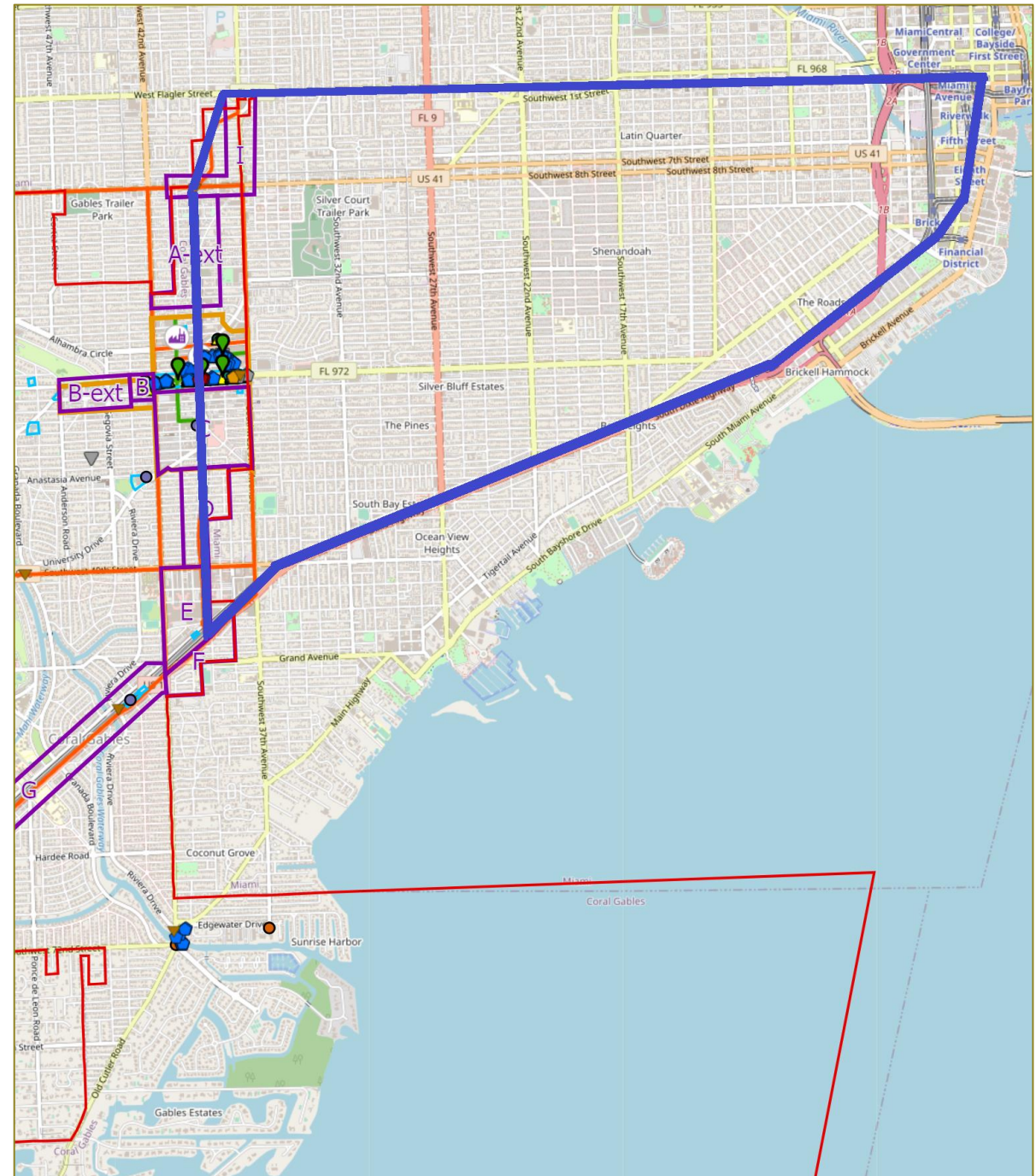


What does the future look like?

Long-Term Regional Collaboration Broadband Vision:

● Innovation and Research Triangle

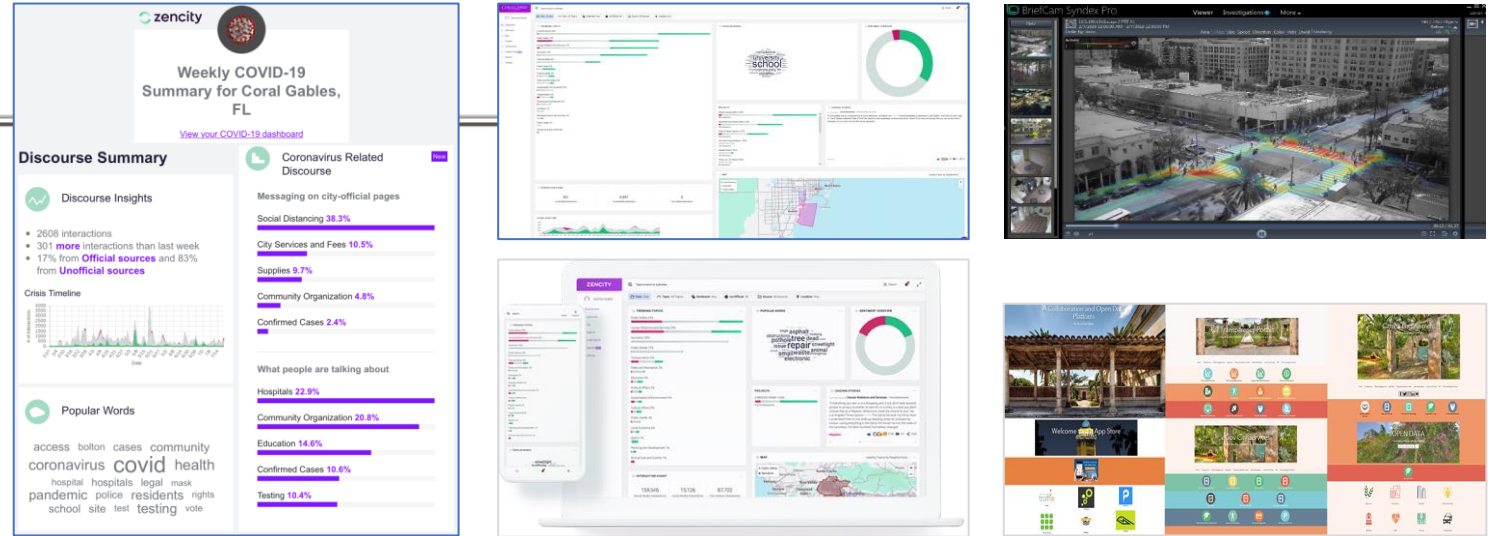
- Connecting Coral Gables smart districts with the Underline/Metrorail corridor to the South and the Flagler corridor to the North
- Provides last-mile connectivity for other N-S and E-W broadband and technology/innovation corridors
- Regional Data Sharing and Research Collaboration
- Inter-agency mutual network redundancy, hurricane/disaster recovery and resilience
- Quality-of-life Collaboration Projects (mobility, safety, education, healthcare, jobs, recreation, community programs, sustainability and environmental conservation, resilience, digital inclusion...)
- Tech-driven Economic Zones
- High-tech smart cities centers of excellence
- Job creation, Upskilling
- Regional STEM projects
- Attracting high-tech employers



TRAFFIC CPS/IOT DATA



A.I., PUBLIC SENTIMENT ANALYTICS, SE DATA MODELS, DATA HUBS



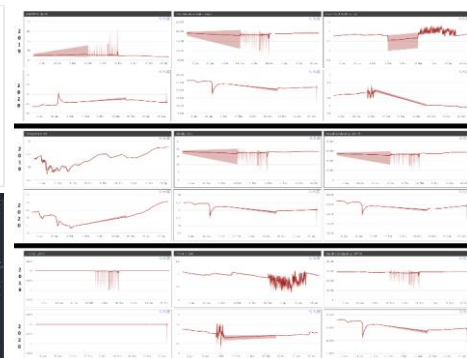
High-Visibility from IoT/CPS Sensors for First Responders - Integrated into SOPs and Business Continuity Plans Smart City Response to the COVID-19 Pandemic Crisis - Organic Resilience → Mission-Driven Alignment

- Strategic Planning, Preparedness
 - Incident Response, Emergency Management, Continuity of Operations
 - Collaboration & Interoperability, Mobile Workforce, Risk Assessment
 - Concurrent Crises Management
- Engineering Framework
 - Scalable Capacity, Resilient, Secure Design, Industry Standards, Best Practices
 - Business Composability, Hyperconnectivity
 - High Visibility, Data Insight
- Adaptability and Agility
 - Cybersecurity Awareness, Digital Literacy & Adoption, Continuous Improvement / Learning
 - Adaptable COOP, Agile response & Solution delivery, Resourcefulness

ENERGY CPS/IOT DATA



ENVIRONMENTAL IOT DATA





Coral Gables Smart City Case Studies - Papers and Publications

IEEE Internet of Things Magazine, June 2020 Edition
Smart Cities Case Study:
City of Coral Gables Leverages the Internet of Things to Improve Quality of Life
<https://ieeexplore.ieee.org/document/9125438>

ASPA PA Times Magazine, Fall 2020 Edition
Dealing with COVID-19:
How Coral Gables, FL is Using IoT and Data Analytics to Respond
<https://patimes.org>



PAGE 9 **Managing a City in a Pandemic**
 PAGE 22 **Can ALICE Households Survive the COVID-19 Pandemic?**
 PAGE 39 **The Response to COVID-19 in Mexico**



NIST GCTC, Covid-19 Resource Kit
Smart Cities Case Study:
City of Coral Gables COVID-19 CPS/IoT Data Analysis
https://gctc.opencommons.org/images/a/a5/CGIT_COVID-19_IOTDataAnalysis.pdf

OneWater Academy, Covid-19 Resource Kit
Smart Cities Case Study:
Smart City Technology Strategies for Water Management
<https://onewateracademy.org/onewaterblog/blogpost/5e9e3bfec7f2310017e68994>



Other Papers: https://www.coralgables.com/media/IT/CGIT_PublishedOriginalPapers.pdf



CITY OF CORAL GABLES

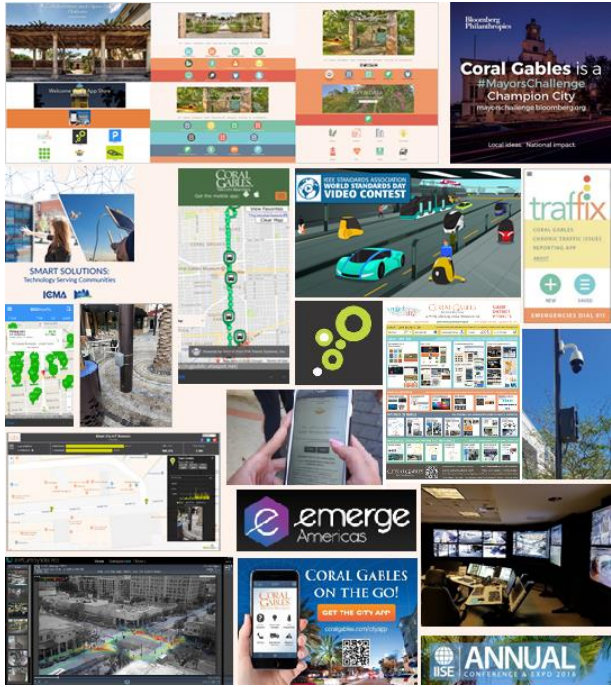
SMART CITY STRATEGIC PARTNERSHIP, RESEARCH AND COLLABORATION MODEL

OUTREACH, CO-INNOVATION, CO-CREATION, BENCHMARKS, STANDARDS AND BEST PRACTICES

Performance Benchmark and Awards Organizations



Citizen Engagement, Outreach and Communication



Research & Development Co-Innovation



Strategic Partnerships: Industry, Academia, Government, Nonprofits

Improve Programs, Augment Capacity
Sustainability, Resilience, Workability, Livability





2018 Digital Cities Award, First Place
>75K Population Category



2020 Smart 50 Award Winner
Urban Infrastructure Category



Named to 8 Smart Cities to Watch in 2020
StateTech Magazine



2020 Open Cities Index Award
Winner, U.S. 1st Place



American Society for Quality
2019 International Team Excellence
Award
Case Study Competition - 3rd Place



Named to 10 Top-Performing ITEA Teams
from around the world, 2019
Quality Progress Magazine



IEEE 2017 World Standard Day
Smart City Video Contest Prize



2019 Open Cities Index Award
Winner, U.S. 1st Place



2021 Impact in Local Governments
2021 Pioneer in Local Governments



National Institute of Science and Technology
Global City Teams Challenge (NIST GCTC)
Supercluster Co-Chair, Action Cluster Chair



INNOVATION AND TECHNOLOGY

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SUSTAINABILITY, RESILIENCE, WORKABILITY, LIVABILITY

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Thank you

www.coralgables.com/smarty

